Agenda City of Loma Linda

From the Department of Community Development

PLANNING COMMISSION

REGULAR MEETING OF
April 2, 2014
7:00 p.m.
CITY COUNCIL CHAMBERS

A. CALL TO ORDER - Persons wishing to speak on an agenda item are asked to complete an information card and present it to the secretary. The Planning Commission meeting is recorded to assist in the preparation of the minutes, and you are, therefore, asked to give your name and address prior to offering testimony. All testimony is to be given from the podium.

B. ROLL CALL

C. PLEDGE OF ALLEGIANCE

D. ITEMS TO BE DELETED OR ADDED

E. ORAL REPORTS/PUBLIC PARTICIPATION ON NON-AGENDA ITEMS (LIMITED TO 30 MINUTES; 3 MINUTES ALLOTTED FOR EACH SPEAKER) - This portion of the agenda provides opportunity to speak on an item, which is **NOT** on the agenda. Pursuant to the Brown Act, the Planning Commission can take no action at this time; however, the Planning Commission may refer your comments/concerns to staff, or request the item be placed on a future agenda.

F. NEW BUSINESS

None.

G. AGENDA (THREE MINUTES IS ALLOTTED FOR EACH SPEAKER PER AGENDA ITEM) CONTINUED ITEM

1. **CONDITIONAL USE PERMIT NO. 14-016 – (PUBLIC HEARING – LIMITED TO 30 MINUTES) –** A request to approve the construction of a drive-through automatic teller machine (ATM) in the parking lot of the Mountain View Plaza shopping center, located 11235 Mountain View Avenue, in the Neighborhood Business (C-1) zone.

   STAFF RECOMMENDATION:

   Staff recommends the Planning Commission approve CUP No. 14-016.

2. **PRECISE PLAN OF DESIGN (PPD) NO. 13-127, PLANNED DEVELOPMENT/ZONE CHANGE NO. 13-128 – (PUBLIC HEARING – LIMITED TO 30 MINUTES) –** A request to approve a planned development based upon the proposed development plan to construct a three-story, 345,000 gross square foot veteran's administration medical clinic on a vacant 36 acre parcel, located at 26001 Redlands Boulevard, west of Bryn Mawr Avenue. The project is located within Special Planning Area D and within the East Valley Corridor Specific Plan-Special Development Zone, with a General Plan Land Use Designation of Special Planning Area "D." The proposed project consists of the construction of a new 3-story structure totaling 345,000 gross square feet on a vacant 36.9 acre parcel, and intended for use as an outpatient health care services facility to be operated by the U.S. Department of Veterans Affairs for the care of Veterans. The proposed project includes an approximate 5.5-acre linear park and 2,035 on-site parking spaces. The project approval will include a Precise Plan of Design for the site layout, design and architecture; Zone Change to change the zone designation from EVC-SD to EVC-SD-(PD); and a Planned Development to establish site-specific development standards based upon the development plan and conditions of approval for the development.

STAFF RECOMMENDATION:

Staff recommends the Planning Commission recommend the following actions to the City Council:

1. Adopt the Mitigated Negative Declaration (Attachment B);
2. Adopt the Mitigation Monitoring Report (Attachment C);
3. Approve Planned Development/Zone Change No. 13-128, based on the Findings;
4. Approve Precise Plan of Design No. 13-128, based on the Findings, and subject to the attached Conditions of Approval (Attachment D);

H. APPROVAL OF MINUTES – (LIMITED TO 5 MINUTES)

1. February 5, 2014

I. REPORTS BY THE PLANNING COMMISSIONERS

J. COMMUNITY DEVELOPMENT DIRECTOR REPORT

K. ADJOURNMENT - Reports and documents relating to each agenda item are on file in the Department of Community Development and are available for public inspection during normal business hours, Monday through Thursday, 7:00 a.m. to 5:30 p.m. The Loma Linda Branch Library can also provide an agenda packet for your convenience.

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the City Clerk at (909) 799-2819. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting. Later requests will be accommodated to the extent feasible.

Staff Report City of Loma Linda

From the Department of Community Development

PLANNING COMMISSION MEETING OF APRIL 2, 2014

TO: **PLANNING COMMISSION**

FROM: **KONRAD BOLOWICH**
ASSISTANT CITY MANAGER

SUBJECT: **CONDITIONAL USE PERMIT (CUP) NO. 14-016**

SUMMARY

The representatives for Wells Fargo request approval to construct a drive-through automatic teller machine (ATM) in the parking lot of the Mountain View Plaza shopping center, located at 11235 Mountain View Avenue, in the Neighborhood Business (C-1) zone. A copy of the project plans is available in Exhibit B.

RECOMMENDATION

The recommendation is for the Planning Commission to approve CUP No. 14-016 based on the Findings, and subject to the Conditions of Approval (Exhibit C).

PERTINENT DATA

Property Owner/Applicant:	Loma Linda University/CIM Group, LLC
General Plan/Zoning:	Neighborhood Commercial (C-1)
Site:	5.27 acre commercial shopping center
Topography:	Mainly flat
Vegetation:	Perimeter landscaping

BACKGROUND AND EXISTING SETTING

Background

On February 10, 2014, the Applicant CIM Group, LLC, on behalf of Wells Fargo submitted a CUP application with the required forms, plans, and mailing labels for the above referenced project. On March 13, 2014, the Administrative Review Committee (ARC) reviewed the project and deemed the project complete for processing pursuant to the California Permit Streamlining Act.

ITEM G1

Existing Setting

The project site is part of an existing 5.27 commercial shopping center. The subject site is located at the northeast corner of Mountain View Avenue and Barton Road. The proposed ATM will be located along the southwest corner of the parking lot off Mountain View Avenue, just north of the Rite Aid property.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) STATUS

The proposed construction has a Class 3 exemption from CEQA per CEQA, Guidelines § 15303(c), which allows for the construction of commercial structures not exceeding 2,500 square feet in floor area.

PUBLIC COMMENTS

On March 20, 2014, public hearing notices for this project were posted and mailed to property owners and occupants located within 300 feet of the project site. As of this report, the City has received no written or oral comments on the project.

ANALYSIS

Project Description

The Applicant is proposing to construct a 45 square foot, 24-hour drive-thru ATM. The ATM will include a 99-foot long drive-way, with stacking for four vehicles (includes the vehicle at the ATM). Ten parking spaces will be eliminated as a result of the ATM. As stated above, the project will be located adjacent to the Rite Aid property, along the south property line.

The ATM measures approximately 11 square feet in area and 12 feet in height. The ATM will include a bronze finish along the front and back, with red semi smooth gloss finish along the sides. The ATM will include the “Wells Fargo” name on all façades of the ATM on a red translucent vinyl background with yellow lettering. The ATM will also include a 4-foot overhang to protect customers from the elements during their transaction. A 9-foot high vehicle height detector will be located 10-feet in front of the ATM.

The ATM will be protected by 3.5-foot high, yellow bollards located around the ATM.

Staff has added a condition of approval that requires that all bolts, hold downs, etc., be covered with a decorative cover, to match the structure they are supporting.

C-1 (Neighborhood Business) Zone

	Required	Proposed	Complies
Setback - Front - Side - Rear	 20' min 0' min 10' min	 Approx: 80' 17' N/A	 Yes Yes N/A
Lot Coverage	(114,781 sq.ft.) 50%	(42,530 sq.ft.) 18.52%	Yes
Minimum Lot Size	7,200 sq.ft.	5.27 acres	Yes
Parking	386 spaces	431 spaces	Yes

Parking and Driveway

The Mountain View Shopping center is presently over parked. The center is required to provide 386 parking spaces. The shopping center presently provides 441 spaces, of which 11 are handicapped accessible. The installation of the ATM, driveway and landscaping will eliminate 10 parking spaces, and reduce the total amount of parking provided to 431 spaces, 45 spaces more than the minimum required.

The ATM will also include an approximate 100-foot long driveway. The driveway will include stacking for up to four vehicles. The ATM driveway will be separated from the main driveway aisle by 4-foot wide lane striping. According to the Applicant, the four-vehicle stacking is sufficient to serve the number of customers anticipated to use this ATM, even during "payday Fridays". They typically find that at most, between two and three cars use the ATM at any one time.

Landscaping

The total amount of landscaping provided at the center is not known, however, the applicant will be increasing the amount of landscaping provided by approximately 720 square feet. The planting materials will match those presently found within the shopping center. The planter will include a combination of *daylilies* and *elijah blue* fescue grass, over bark mulch (to match existing).

Lighting

The development will include two light standards with LED lighting, and will match the design of the existing light standards found within the existing parking lot. For security purposes, the easternmost light standard will also include a security camera directed at the ATM. A condition of approval has been included that requires the camera be maintained in proper working condition during the operation of the ATM facility.

Conditional Use Permit Findings

The following findings must be addressed when considering a conditional use permit. As per LLMC Section 17.30.210, "The Planning Commission, in approving a conditional use permit, shall find as follows:"

1. *That the use applied for at the location set forth in the application is properly one for which a conditional use permit is authorized by this title.*

Drive-in/thru businesses are permitted in the C-1 zone subject to approval of a conditional use permit, pursuant to Section 17.44.020(B). The project will occupy an extremely small portion (approximately 1,800 square feet) of an existing 5.27 acre shopping center. The proposed construction of the ATM and improvements will eliminate 10 parking spaces, but the shopping center will still be over-parked by 45 spaces. The installation of the ATM will also increase the amount of landscaping by approximately 720 square feet.

2. *That the said use is necessary or desirable for the development of the community, is in harmony with the various elements and objectives of the general plan, and is not detrimental to existing uses specifically permitted in the zone in which the proposed use is to be located.*

The proposed project is consistent with both the Zoning Code (LLMC Title 17) requirements and the goals and policies of the adopted General Plan (May 26, 2009). Specifically, the project is consistent with Commercial/Office Guiding Policy 2.2.4.1, which encourages that the City attract new, and maintain existing, commercial and office uses to better serve the retail and service needs of the community. LLMC Section 17.95.060 permits the construction of drive-in/thru businesses with an approved Conditional Use Permit (CUP).

3. *That the site for the intended use is adequate in size and shape to accommodate said use and all of the yards, setbacks, walls, or fences, landscaping and other features required in order to adjust said use to those existing or permitted future uses on land in the neighborhood.*

The project site is adequate in size and shape to accommodate the proposed drive-thru ATM and equipment. As indicated, the ATM will occupy approximately 1,800 square feet of the existing 5.27 acre property. The project layout and design are consistent with the development standards of the C-1 zone as outlined in LLMC Chapter 17.44, (*C-1 Neighborhood Business Zone*).

4. *That the site or the proposed use related to streets and highways properly designed and improved to carry the type and quantity of traffic generated or to be generated by the proposed use.*

The proposed ATM drive-thru will eliminate 10 parking spaces within the existing parking lot. The proposed ATM drive-through will not significantly alter or restrict on-site circulation as the adjacent driveway aisle will still comply with the minimum commercial driveway width and allow for 25-foot back-out space for those spaces that use the existing driveway aisle. The installation of the ATM will not significantly increase traffic to or from the commercial shopping center. No other changes are being proposed.

5. *That the conditions set forth in the permit and shown on the approved site plan are deemed necessary to protect the public health, safety and general welfare.*

The public health, safety and general welfare will be protected with the implementation of the Conditions of Approval for this application to insure compatibility with the neighborhood and to prevent any negative impacts to the surrounding area.

CONCLUSION

All elements of project are consistent with the adopted General Plan (May 26, 2009). The project is also in compliance with the C-1 Zone development standards (Chapter 17.44. The site design and layout will significantly alter or restrict on-site traffic flow nor reduce parking availability below the minimum required by the Development Code. After the installation of the ATM, the shopping center will still be over parked by 35 parking spaces. The project has been designed in a manner that is compatible with the existing shopping center, and will increase the amount of landscaping by approximately 720 square feet.

Staff has determined that the project is eligible for a Class 3 Categorical Exemption from the California Environmental Quality Act (CEQA) and a Notice of Exemption will be filed with the County Clerk of the Board of Supervisors pending approval of the Planning Commission.

Respectfully submitted by:

Guillermo Arreola
Associate Planner

EXHIBITS

A. Vicinity Map
B. Project Plans
C. Conditions of Approval

City of Loma Linda

Community Development Department
25541 Barton Road, Loma Linda, CA 92354
(909) 799-2830; Fax (909) 799-2894

Vicinity Map	CUP No. 14-016

EXHIBIT — A

WELLS FARGO BANK NEW ATM KIOSK- Mountain View & Barton Offsite

PROJECT ADDRESS
NEC MOUNTAIN VIEW AVE & BARTON ROAD
LOMA LINDA, CA 92354

OWNER
LOMA LINDA UNIVERSITY
c/o BEVERLY REEVES

PARCEL NO
0295-421-05-0000

LEGAL DESCRIPTION
PARCEL MAP 7352 PARCEL 3

TYPE OF CONSTRUCTION
1 STORY

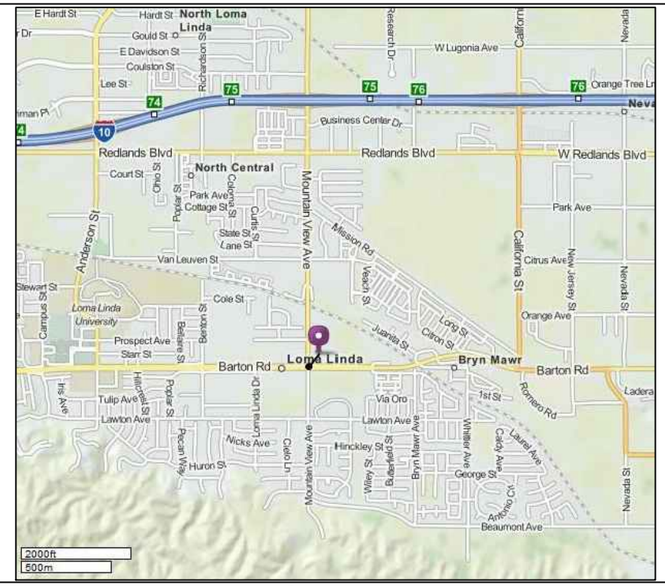
CODES
- 2013 CALIFORNIA BUILDING CODE
- 2013 CALIFORNIA ELECTRICAL CODE
- 2013 CALIFORNIA MECHANICAL CODE
- 2013 CALIFORNIA PLUMBING CODE
- 2013 CALIFORNIA ENERGY CODE
- 2013 CALIFORNIA FIRE CODE

PROJECT DATA

PROJECT PROPONENT
WELLS FARGO BANK
525 MARKET STREET
21ST FLOOR
SAN FRANCISCO, CA 94105

GENERAL CONTRACTOR
CIM GROUP, INC.
960 E DISCOVERY LANE
ANAHEIM, CA 92801
714.956.2827

PROJECT TEAM



VICINITY MAP

PROPOSED RENDERING

- REMOVE (10) PARKING STALLS.
- DEMO PORTION OF PAVED AREA.
- TRENCH/LINE BORE TO TELCO/TELCO LOCATIONS.
- INSTALL NEW DATA & ELECTRICAL CABLES.
- FORM & POUR NEW PAD & ISLAND.
- INSTALL NEW UTILITY PEDESTAL.
- INSTALL (5) NEW BOLLARDS.
- INSTALL NEW VHD.
- INSTALL NEW B3877 MULITUSE SURROUND,
- INSTALL NEW NCR 6638 ATM.
- PAINT NEW LANE STRIPING.
- INSTALL (2) NEW LIGHT STDs w/ (1) FIXTURE EACH.

SCOPE OF WORK

GENERAL INFORMATION
A0.0 GENERAL INFORMATION
A0.1 PARCEL MAP

ARCHITECTURAL
A1.0 SITE PLAN
A2.1 PLAN VIEW (EXISTING)
A2.2 PLAN VIEW (PROPOSED)
A2.3 EXTERIOR ELEVATION (PROPOSED)
A2.4 ISLAND DETAILS

GENERAL DETAILS
D1–D6 CONSTRUCTION DETAILS
REFERENCE DETAILS

MANUFACTURED SURROUND DETAILS
1–7 ATTACHED

SHEET SCHEDULE

Construction Installation Maintenance Group, Inc.
CIM GROUP INC
KNOWLEDGE QUALITY EXPERIENCE
906 E Discovery Lane
Anaheim, CA 92801
714.956.2827
WWW.CIMGROUPINC.COM

Wells Fargo ATM

TITLE PAGE

TITLE	TITLE PAGE
SCALE	Not To Scale
DRAWN	J. SPIX
DATE	03/19/14
DWG#	Mountain View
SHEET	A0.0
BRANCH	NEC Mountain View & Barton Rd

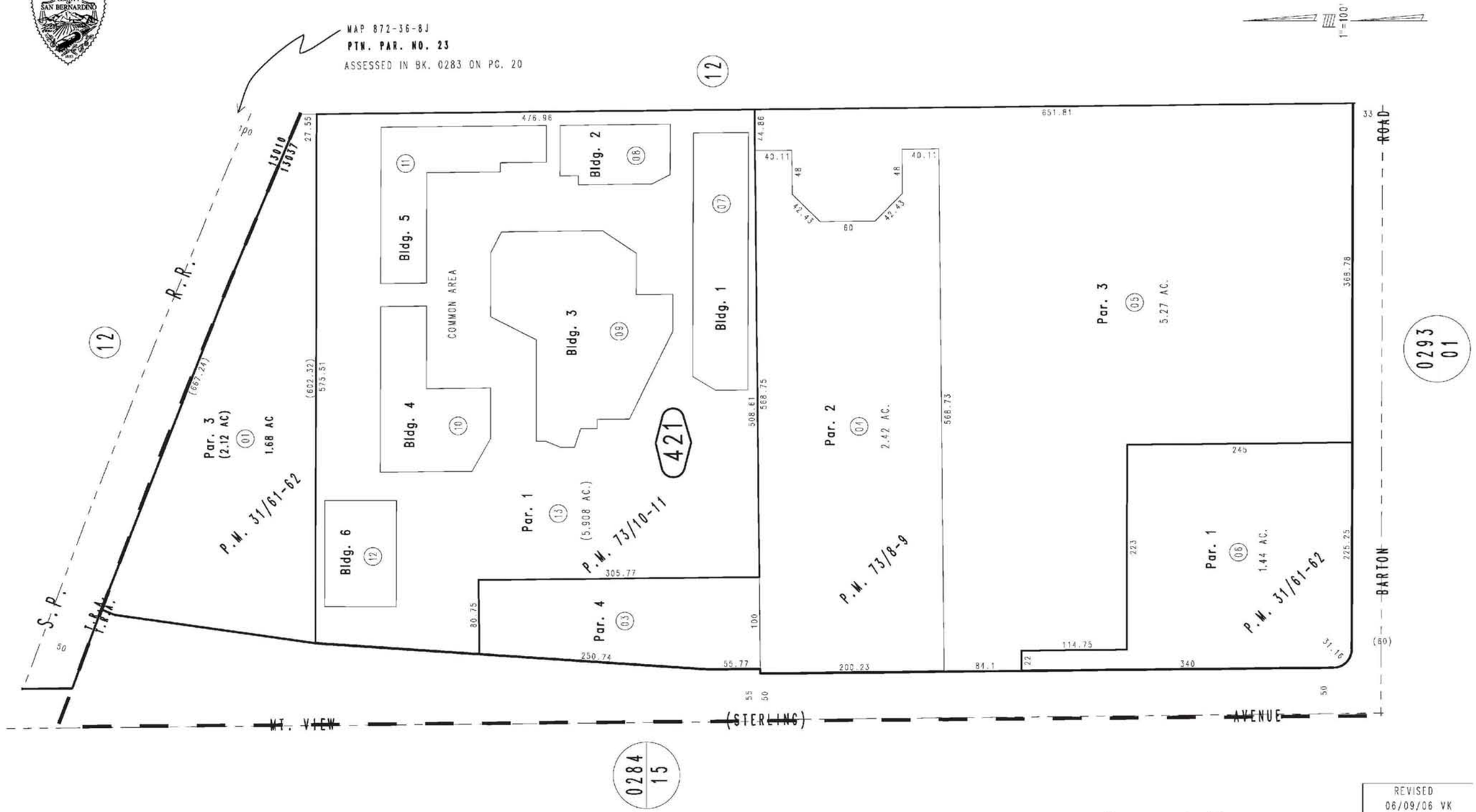
EXHIBIT - B

THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY.

Parcel Map No. 6960, P.M. 73/10-11
Condominium Plan, O.R. 83-065350

City of Loma Linda
Tax Rate Area
13010 13037

0292- 42



REVISED 06/09/06 VK

February 2004

Ptn. Parcel Map No. 7352, P.M. 73/8-9
Ptn. Parcel Map No. 3397, P.M. 3'/6'-62

Ptn. S.W.1/4, Sec. 30
T.1S., R.3W.

Assessor's Map
Book 0292 Page 42
San Bernardino County

PARCEL MAP

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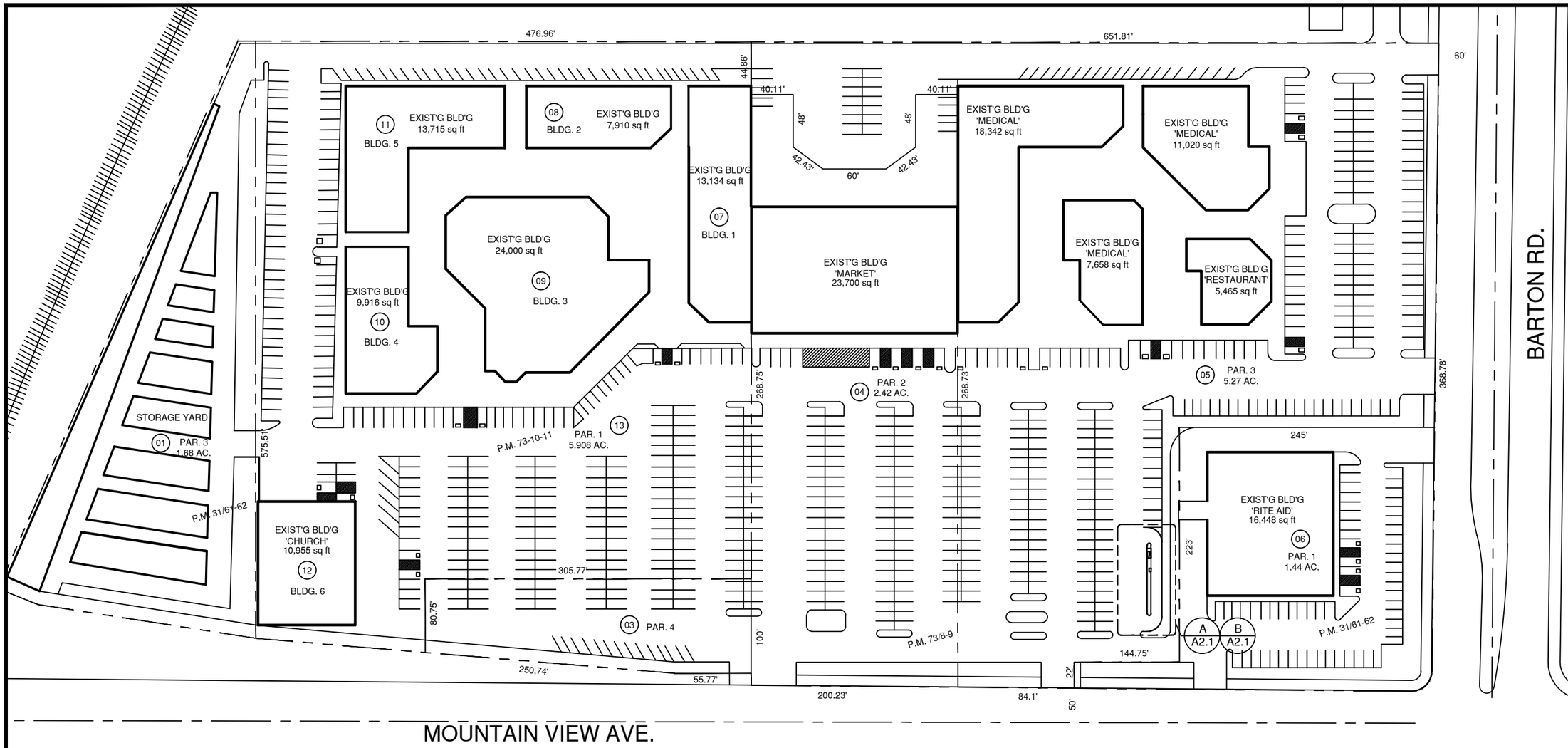
WWW.CIMGROUPINC.COM

Wells Fargo ATM

BRANCH: NEC Mountain View & Barton Rd
TITLE: PARCEL MAP
SCALE: Not To Scale
DRAWN: J. SPIX
DATE: 03/19/14
DWG#: Mountain View
SHEET: A0.1



SITE PLAN
SCALE: 1"=100'-0"

PARCEL NO
0295-421-05-0000

LEGAL DESCRIPTION
PARCEL MAP 7352 PARCEL 3

PARKING DATA (Par. 03/04/05)

MARKET	=	23,700 s.f.	@	5/1000	=	119
RESTAURANT	=	5,465 s.f.	@	10/1000	=	55
MEDICAL	=	37,020 s.f.	@	6/1000	=	212
		REQUIRED PARKING				386

EXISTING STANDARD SPACES PROVIDED	430
EXISTING HANDICAP SPACES PROVIDED	11
TOTAL EXISTING SPACES PROVIDED	441
PROPOSED STANDARD SPACES	420
PROPOSEDHANDICAP SPACES	11
TOTAL PROPOSED SPACES	431

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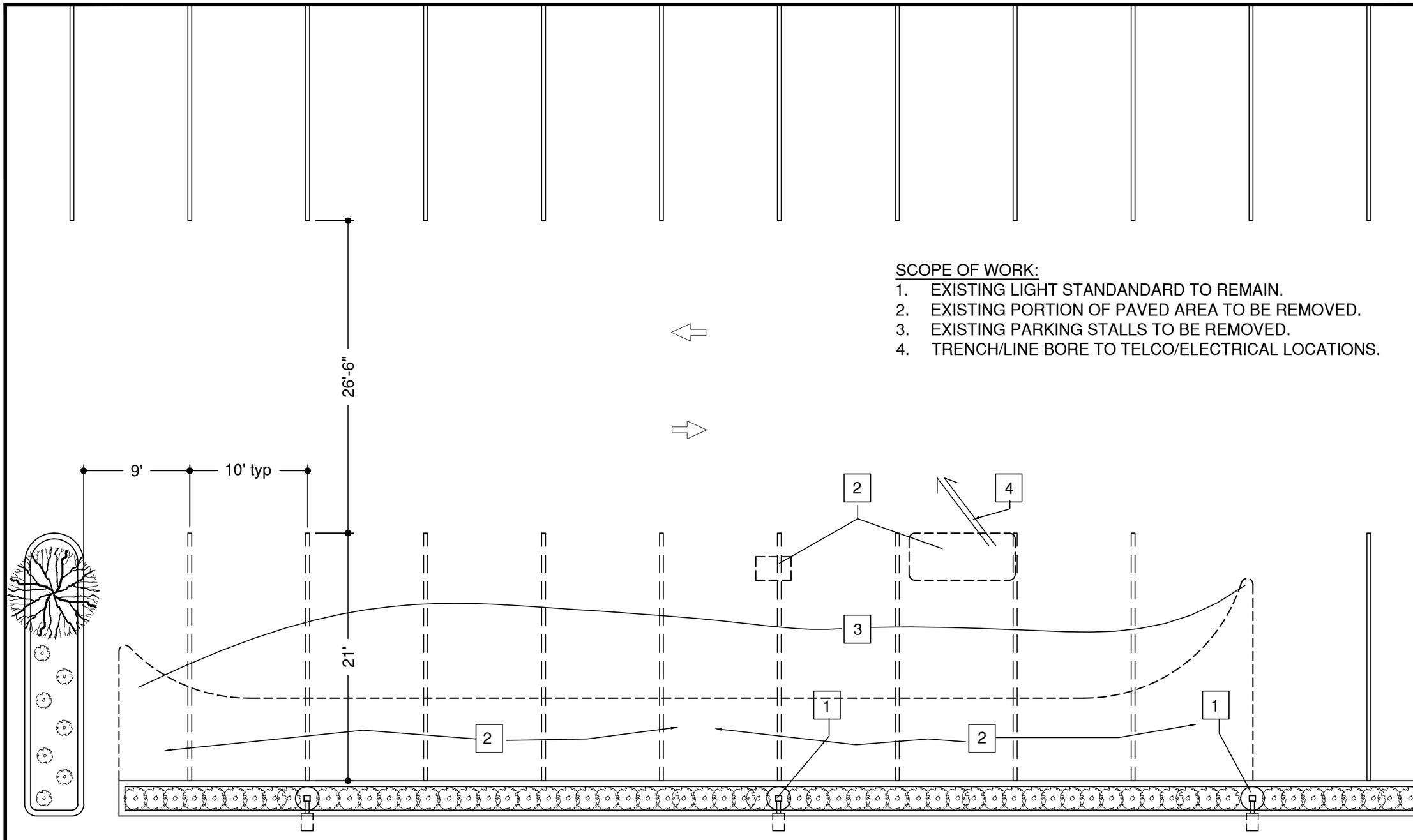
Wells Fargo ATM

TITLE: Site Plan
SCALE: Not To Scale
DRAWN: J. SPIX
DATE: 03/19/14
DWG#: Mountain View
SHEET: A1.0
BRANCH: NEC Mountain View & Barton Rd



SCOPE OF WORK:

1. EXISTING LIGHT STANDANDARD TO REMAIN.
2. EXISTING PORTION OF PAVED AREA TO BE REMOVED.
3. EXISTING PARKING STALLS TO BE REMOVED.
4. TRENCH/LINE BORE TO TELCO/ELECTRICAL LOCATIONS.

N

EXISTING PLAN VIEW (A)
SCALE: 1/8" = 1'-0"

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Wells Fargo ATM

BRANCH: NEC Mountain View & Barton Rd

TITLE: Existing Plan View

SCALE: Not To Scale

DRAWN: J. SPIX

DATE: 03/19/14

DWG#: Mountain View

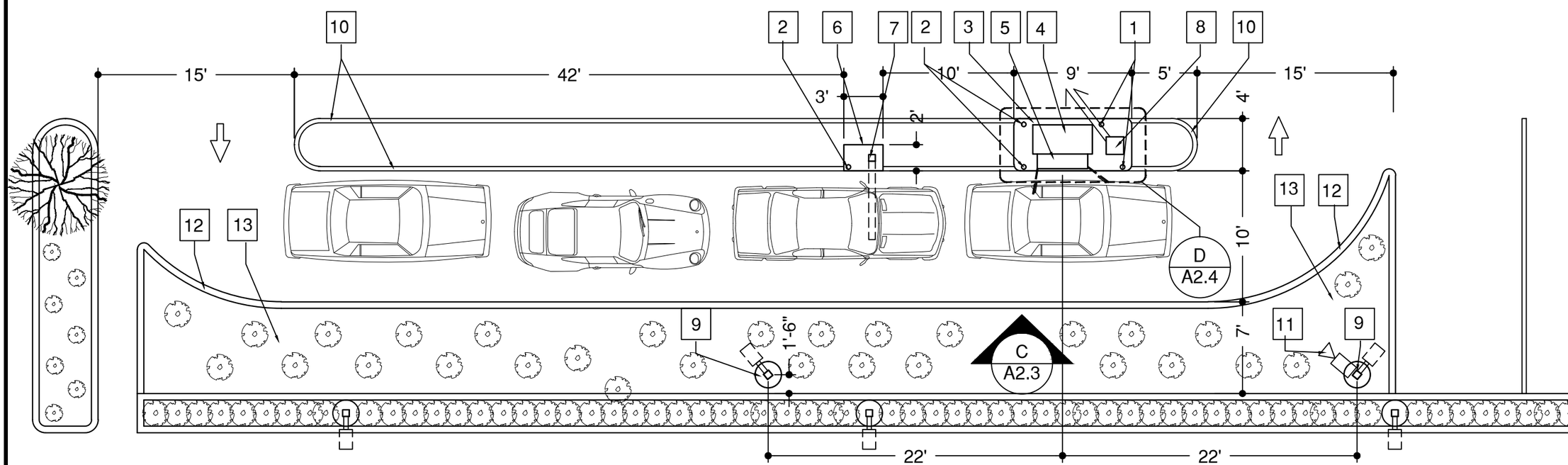
SHEET: A2.1

SCOPE OF WORK:

1. INSTALL NEW 1-1/2" CONDUIT FOR DATA/TELCO CABLES. INSTALL NEW 1" CONDUIT FOR ELECTRICAL CIRCUITS. REPAIR TRENCH.
2. CORE & INSTALL (5) NEW CONCRETE FILLED STEEL BOLLARDS. (G / D3)
3. FORM AND POUR NEW CONCRETE ISLAND. (D / A2.4)
4. INSTALL NEW COMPANION MODEL 3887 MULTIUSE ATM SURROUND. (F / D2)
5. INSTALL NEW NCR MODEL 6638 ATM. (E / D1)
6. FORM & POUR NEW PAD.
7. INSTALL NEW VEHICLE HEIGHT DETECTOR. (J / D5)
8. INSTALL NEW UTILITY PEDESTAL. (K / D6)
9. INSTALL (2) NEW LIGHT STANDARDS w/ (1) 147WATT LED FIXTURE EACH. (H / D3)
10. PAINT NEW LANE STRIPING AND DIRECTIONAL ARROWS.
11. INSTALL NEW SECURITY CAMERA.
12. FORM & POUR NEW CURB.
13. INSTALL NEW LANDSCAPE AREA.

LANDSCAPING

TYPE	SIZE	QTY
HEMEROCALLIS "GRAPE MAGIC" DAYLILY	8"	120
FESTUCA OVINA 'ELIJAH BLUE' FESCUE GRASS	1 GAL	80
GROUND COVER BARK TO MATCH EXISTING	n/a	THROUGHOUT



N PROPOSED PLAN VIEW (A)
SCALE: 1/8" = 1'-0"

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WWW.CIMGROUPINC.COM

Wells Fargo ATM

BRANCH: NEC Mountain View & Barton Rd

TITLE: Proposed Plan View

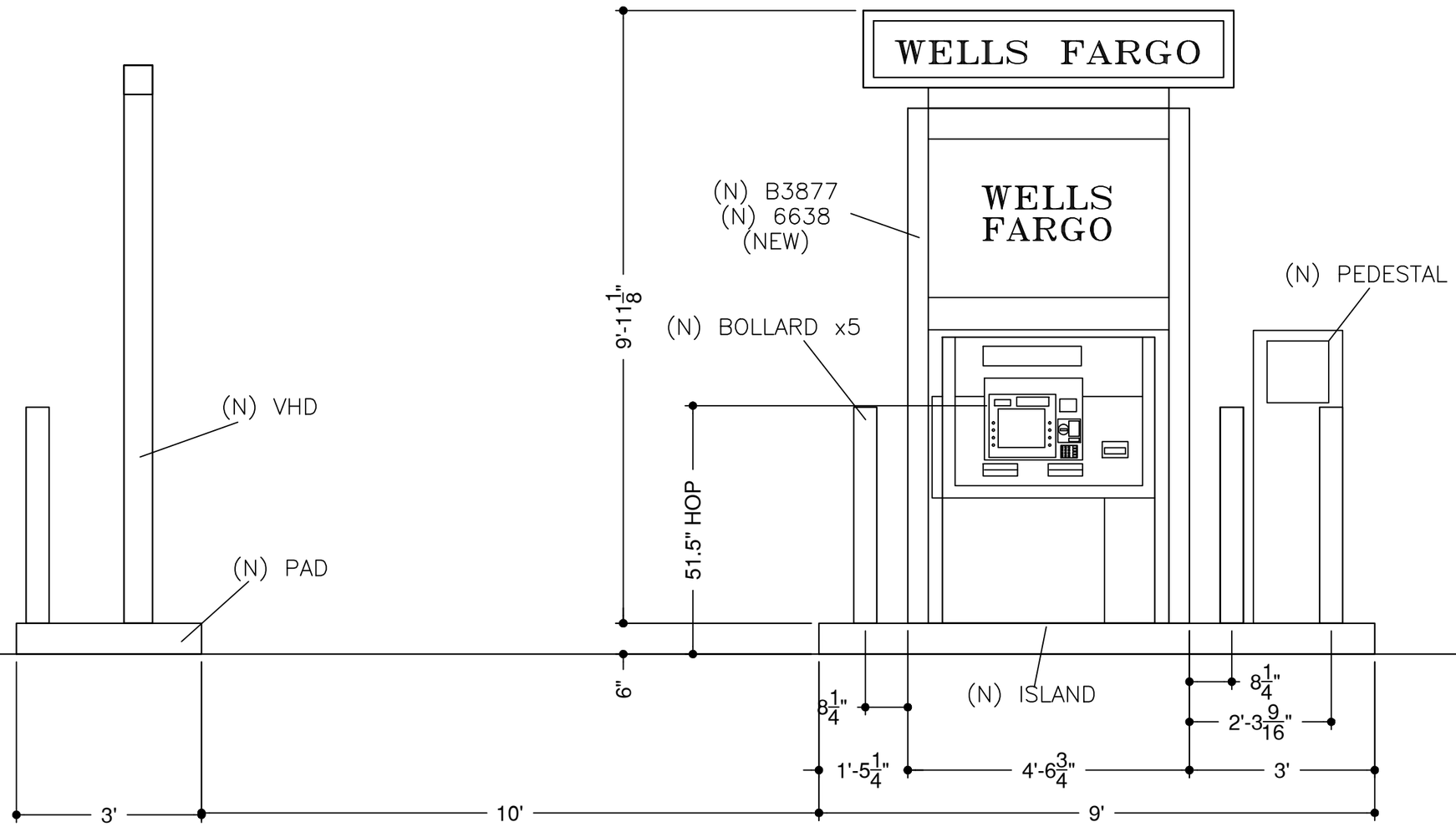
SCALE: Not To Scale

DRAWN: J. SPIX

DATE: 03/19/14

DWG#: Mountain View

SHEET: A2.2



PROPOSED ELEVATION (C)
SCALE: 1/2" = 1'-0"

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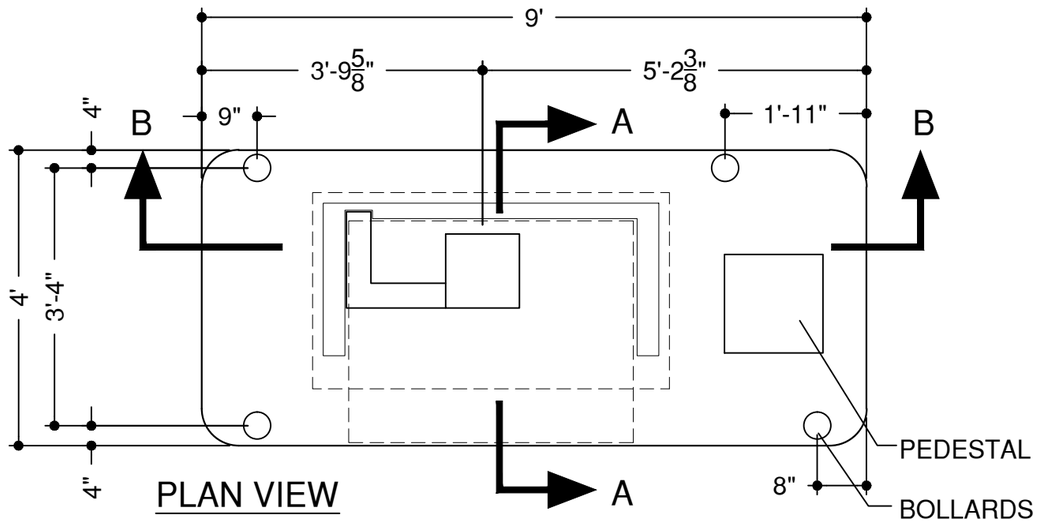
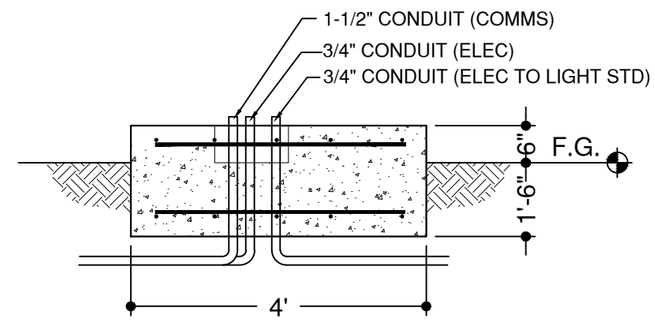
Wells Fargo ATM

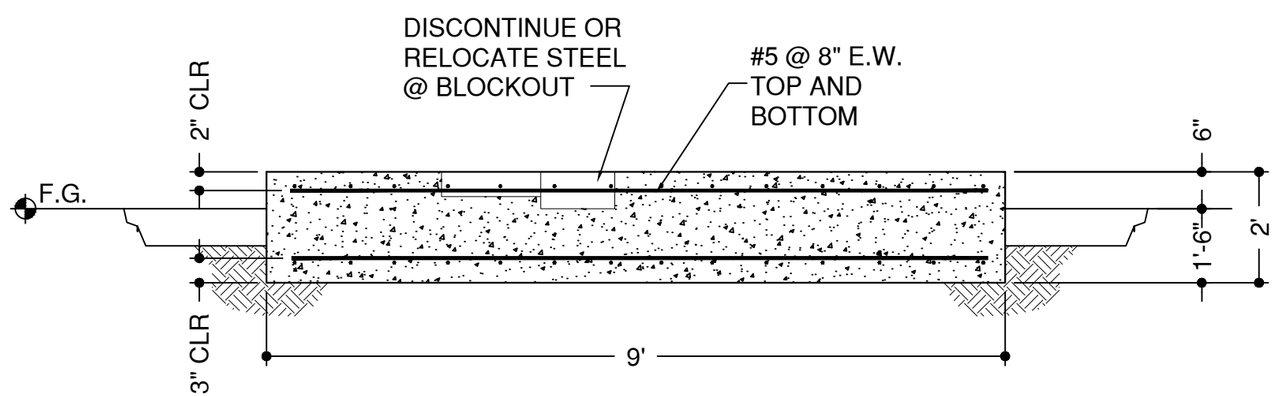
TITLE: Proposed Elevation
SCALE: Not To Scale
DRAWN: J. SPIX
DATE: 03/19/14
DWG#: Mountain View
SHEET: A2.3
BRANCH: NEC Mountain View & Barton Rd



PLAN VIEW



SECTION 'A-A'



SECTION 'B-B'

ISLAND PLAN
SCALE: 1/2" = 1'-0"
D

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Wells Fargo ATM

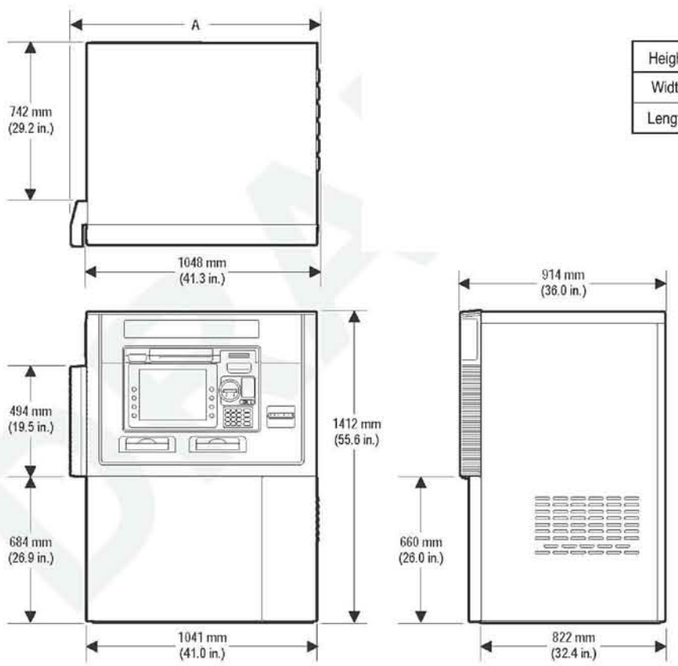
TITLE: Island Plan
SCALE: Not To Scale
DRAWN: J. SPIX
DATE: 03/19/14
DWG#: Mountain View
SHEET: A2.4
BRANCH: NEC Mountain View & Barton Rd

NCR SelfServ 38 ATM Site Preparation Datasheet (B006-6921-B000)

Drive-Up version with CEN Security Enclosure.

This Site Preparation Datasheet is to be used in conjunction with the following documents:
NCR SelfServ 38 ATM Site Preparation (B006-6586)
NCR SelfServ 38 Installation Guide (B006-6590)
NCR SelfServ 32, 34 and 38 ATMs Site Preparation Requirements (B006-6670)

ATM DIMENSIONS



	UL	CEN Grade L
A	**1100 mm** (43.3 in.)	**1106 mm** (43.5 in.)

Package Dimensions

	ATM and Pallet	ATM, Pallet and Carton
Height	**1702 mm** (67.0 in.)	**1836 mm** (72.3 in.)
Width	**977 mm** (38.5 in.)	
Length	**140.5 mm** (55.3 in.)	

Floor Loading

	UL	CEN Grade L
Maximum weight	**990 kg** (2183 lb.)	**1075 kg** (2371 lb.)
Floor loading	**1268 kg/m²** (260 lb./ft²)	**1377 kg/m²** (282 lb./ft²)

ENVIRONMENTAL REQUIREMENTS

Temperature and Humidity

Normal Operating Range

	Interior Environment	Exterior Environment	
	Lobby & Through the Wall ATMs	Through-the-Wall ATMs	Freestanding Drive-Up ATMs
Temperature (dry bulb)	**10°C** to **40°C** (50°F to 104°F) See Note 1.	**-35°C** to **50°C** (-31°F to 122°F) See Note 3.	Without air conditioning **-35°C** to **45°C** (-31°F to 113°F) With air conditioning **-35°C** to **50°C** (-31°F to 122°F)
Relative humidity	**20%** to **80%** See Note 2.	**10%** to **100%** See Note 3.	**10%** to **100%**
Dew point temperature restriction	**26°C** (79°F) max.	**26°C** (79°F) max.	**26°C** (79°F) max.

Note 1: If severe environment is fitted, the minimum temperature is 0°C (32°F).
Note 2: For Through the Wall ATMs, the humidity inside the building is restricted to a maximum of 30% at an outside temperature of -35°C (-31°F), with a linear relationship between temperature and humidity to a maximum humidity at 0°C (32°F).
Note 3: If a passbook printer is fitted, the minimum exterior temperature is 0°C (32°F) and the maximum relative humidity is 80%.

ATM installation through an exterior wall must meet the requirements of both the Interior and Exterior (through the wall) environments.

	Storage Range (Up To Three Months)	Transit Range (Up To One Week)	Extreme Power On Range (Up To One Hour)
Temperature	**-10°C** to **50°C** (14°F to 122°F)	**-40°C** to **60°C** (-40°F to 140°F)	**0°C** to **45°C** (32°F to 113°F)
Relative Humidity	**10%** to **90%**	**5%** to **95%**	**10%** to **95%**.

Barometric Pressure

Operating and transit limits	**105 kPa** (15.2 lb. F/in.) to **70 kPa** (10.2 lb. F/in.)
Equivalent altitude	Up to a maximum of **3000 m** (9842.52 ft).

POWER REQUIREMENTS

Voltage transients, line noise, surges, sags, impulses, and spikes may be experienced routinely or sporadically. When such phenomena occur, the use of protective devices may be required to ensure proper operation of the equipment.

AC Power Requirements
The maximum current requirements at the stated input voltages are:
- 10A at 120V
- 6.3A at 230V

The maximum inrush current is 100A

Input Voltage Setting
The ATM can operate from the following input mains voltages:
- 90V to 138V at 50/60Hz
- 180V to 284V at 50/60Hz.

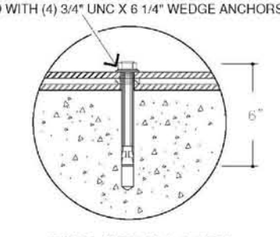
Power Cable
The ATM is supplied either as a 120V or a 220-240V unit.
120V ATMs are supplied with a power cable fitted with a NEMA type 5-15P power source connecto
220-240V ATMs are supplied with an unterminated power cable.
Information about suitable power connectors is supplied with the accessories.
The power cable supplied is 3 m (9.8 ft) in length. If it is necessary to increase this length to meet site requirements, then the extension must satisfy local or country regulations.

WARNING
This equipment must be grounded (earthed)

Grounding Requirements
The ATM operates from a single phase, 3 wire supply; live, neutral and ground.
The power requirements of this unit will normally permit it to operate within existing wiring configurations and from existing branch mains outlets providing:
1. Where the supply is provided from a general purpose distribution panel, then the other branch circuits from this panel must not be used to support heavy inductive loads such as air conditioners, elevators, microwave ovens, and so on. Nor may such equipment be operated on the same branch circuit as the ATM.
2. If using distribution panels, all branch circuit grounding conductors must be connected to an insulated terminal strip in the distribution panel. The grounding conductor from the distribution panel to the building ground point must be at least equal in size to the power conductor necessary to supply the NCR system.

Note: The building ground point can affect data integrity.
For additional information, refer to the Data Line Transient Protection section in the publication 'NCR SelfServ 32, 34 and 38 ATMs Site Preparation Requirements'.

INSTALLER TO DRILL (4) 3/4" DIAMETER HOLES TO BE DRILLED INTO THE CONCRETE ISLAND. ATM TO BE SECURED TO THE CONCRETE ISLAND WITH (4) 3/4" UNC X 6 1/4" WEDGE ANCHORS.



BOLT INSTALLATION

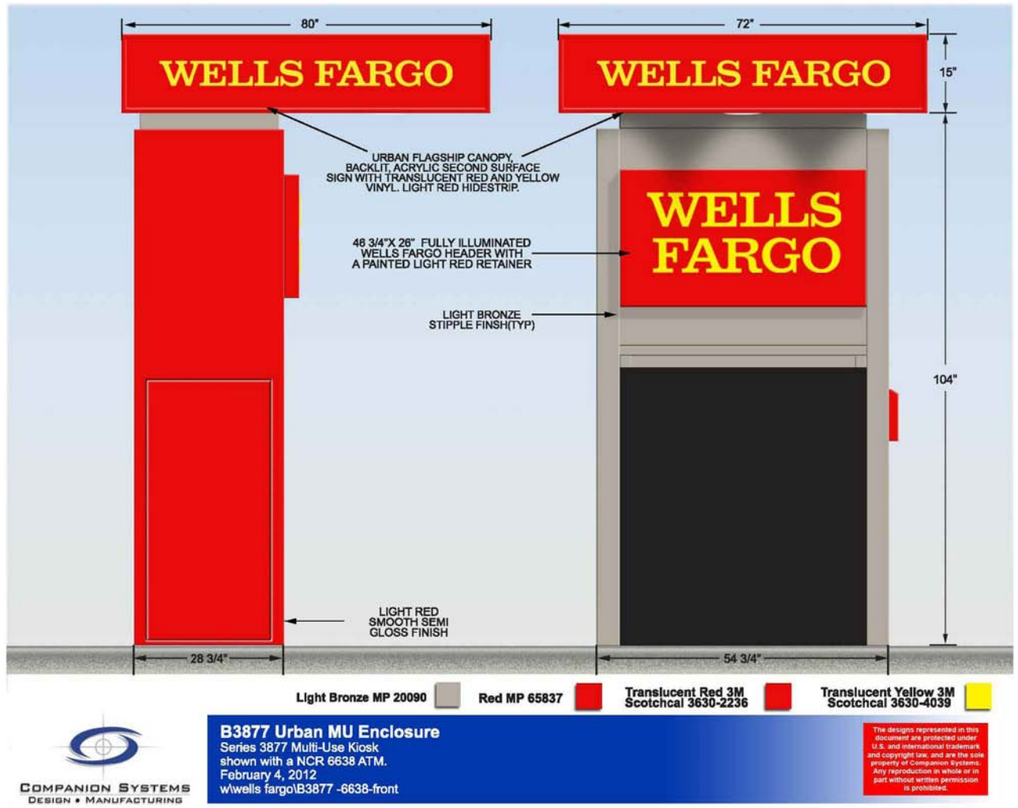
PHYSICAL SECURITY
THE SECURITY SAFE MEETS THE BANK PROTECTION ACT 82 STAT 295, 12 USC 882, AND MEETS THE ATTACK TEST PER UL 291-15. THE SAFE DOOR HAS A POSITIVE RELOCKING FEATURE. THE SAFE DOOR IS CONTROLLED BY A GROUP 2 COMBINATION LOCK WITH OR WITHOUT KEYLOCKING DIAL CAPABILITY OR OPTIONAL ELECTRONIC LOCK.

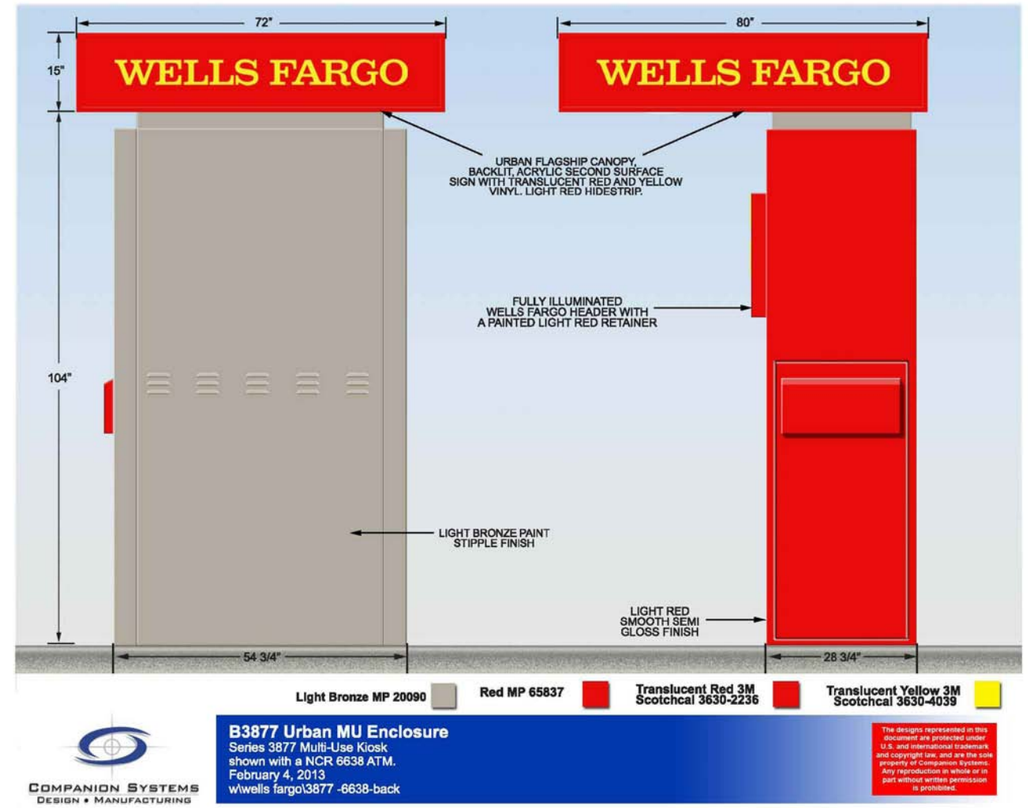
ALARM PROTECTION
THE UL-LISTED SAFE IS EQUIPPED WITH A BASIC ALARM SENSOR PACKAGE. THE BASIC PACKAGE INCLUDES A SAFE DOOR OPEN SWITCH, ALARM SHUNTING SWITCH, AND RATE-OF-RISE HEAT SENSOR.

E ATM MANUFACTURER DETAILS (FOR REFERENCE ONLY)

Construction Installation Maintenance Group, Inc.
CIM GROUP INC
KNOWLEDGE QUALITY EXPERIENCE
906 E Discovery Lane
Anaheim, CA 92801
714.956.2827
WWW.CIMGROUPINC.COM

TITLE: Wells Fargo ATM DETAILS
SCALE: Not To Scale
DRAWN: J. SPIX
DATE: 03/19/14
DWG#: Mountain View
BRANCH: NEC Mountain View & Barton Rd
SHEET: D 1





F | SURROUND MANUFACTURER DETAILS (FOR REFERENCE ONLY)

Construction Installation Maintenance Group, Inc.
CIM GROUP INC
KNOWLEDGE | QUALITY | EXPERIENCE
906 E Discovery Lane
Anaheim, CA 92801
714.956.2827
WWW.CIMGROUPINC.COM

Wells Fargo ATM

TITLE: DETAILS

SCALE: Not To Scale

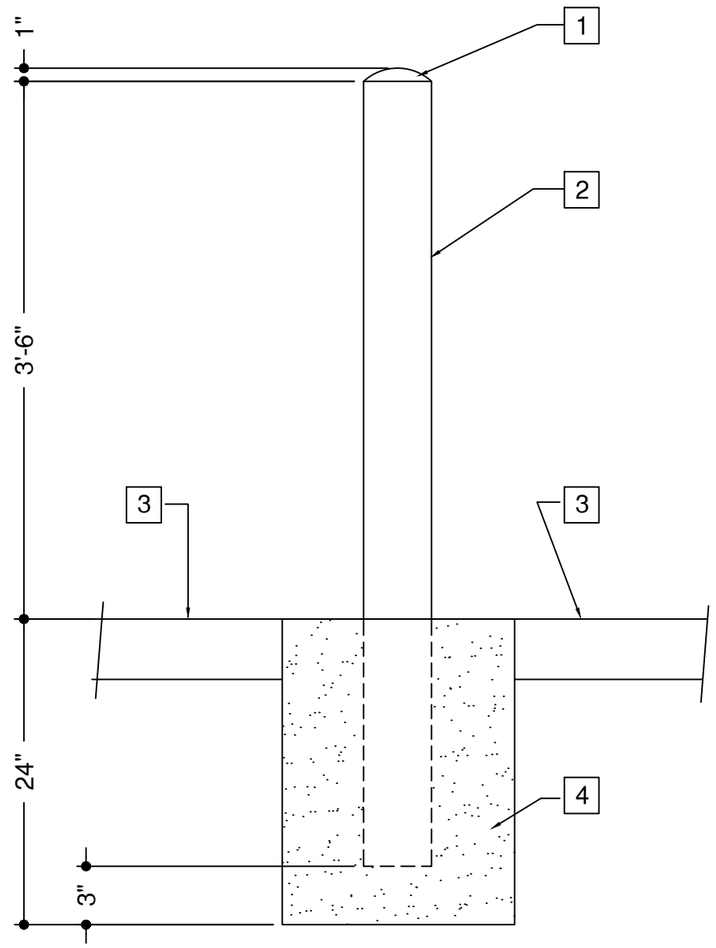
DRAWN: J. SPIX

DATE: 03/19/14

DWG#: Mountain View

BRANCH: NEC Mountain View & Barton Rd

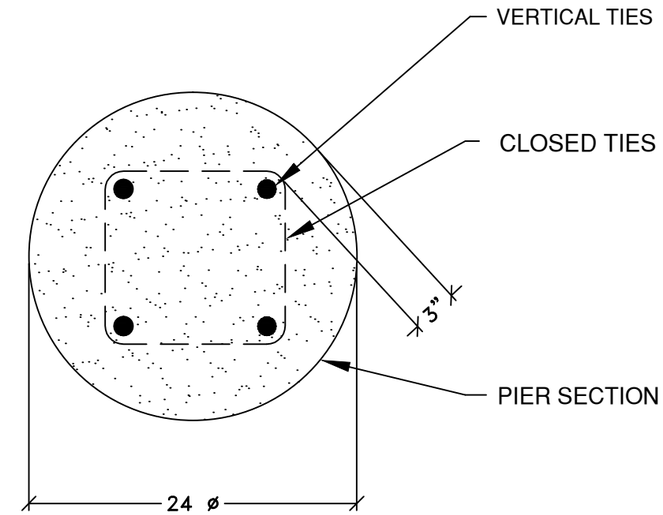
SHEET: D2

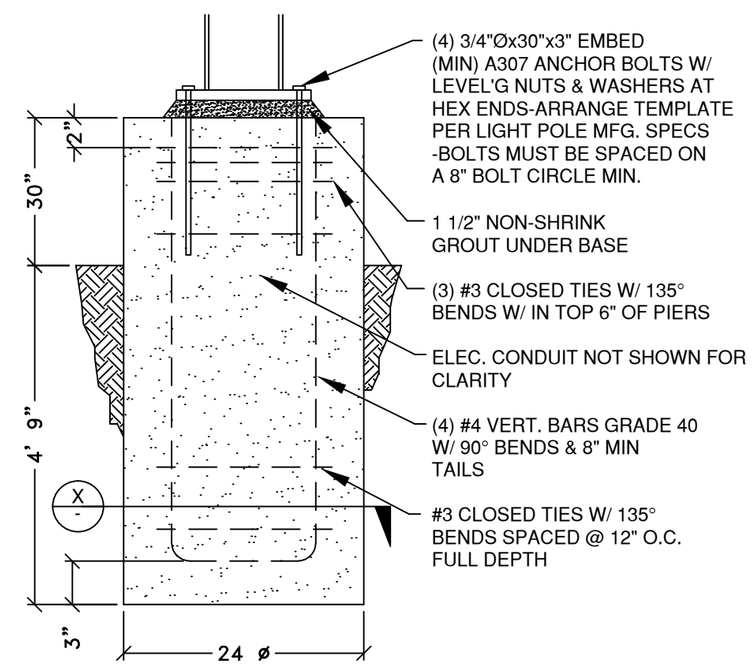


NOTES:

1. CROWN GROUT CAP SMOOTH TROWEL FINISH.
2. 4" DIA STEEL PIPE - GROUT SOLID PAINT P-8.
3. EXISTING ASPHALT.
4. 12" DIAMETER CONCRETE FOOTING.

G BOLLARD





H LIGHT STANDARD BASE

Construction Installation Maintenance Group, Inc.
CIM GROUP INC
KNOWLEDGE QUALITY EXPERIENCE
906 E Discovery Lane
Anaheim, CA 92801
714.956.2827
WWW.CIMGROUPINC.COM

Wells Fargo ATM

TITLE DETAILS

SCALE Not To Scale

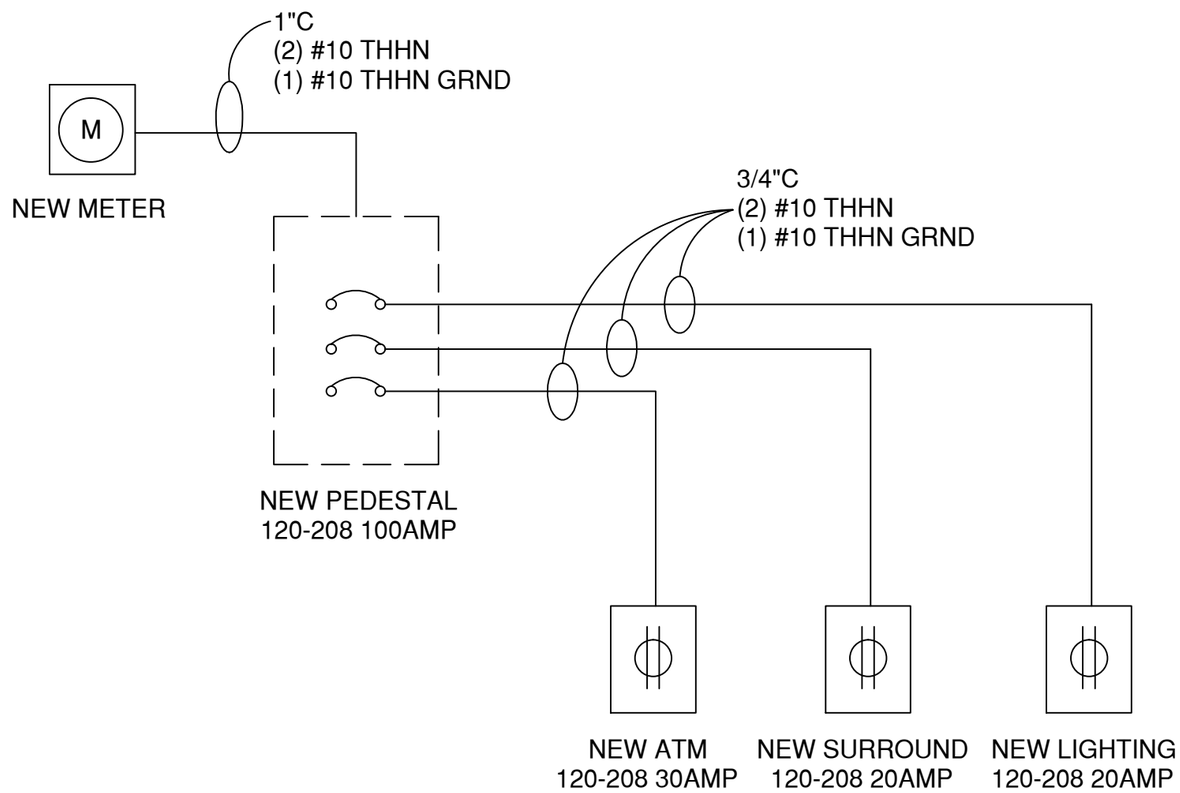
DRAWN J. SPIX

DATE 03/19/14

DWG# Mountain View

BRANCH NEC Mountain View & Barton Rd

SHEET D3



I SINGLE LINE DIAGRAM

Construction Installation Maintenance Group, Inc.
CIM GROUP INC
KNOWLEDGE | QUALITY | EXPERIENCE
906 E Discovery Lane
Anaheim, CA 92801
714.956.2827
WWW.CIMGROUPINC.COM

Wells Fargo ATM

BRANCH: NEC Mountain View & Barton Rd

TITLE: DETAILS

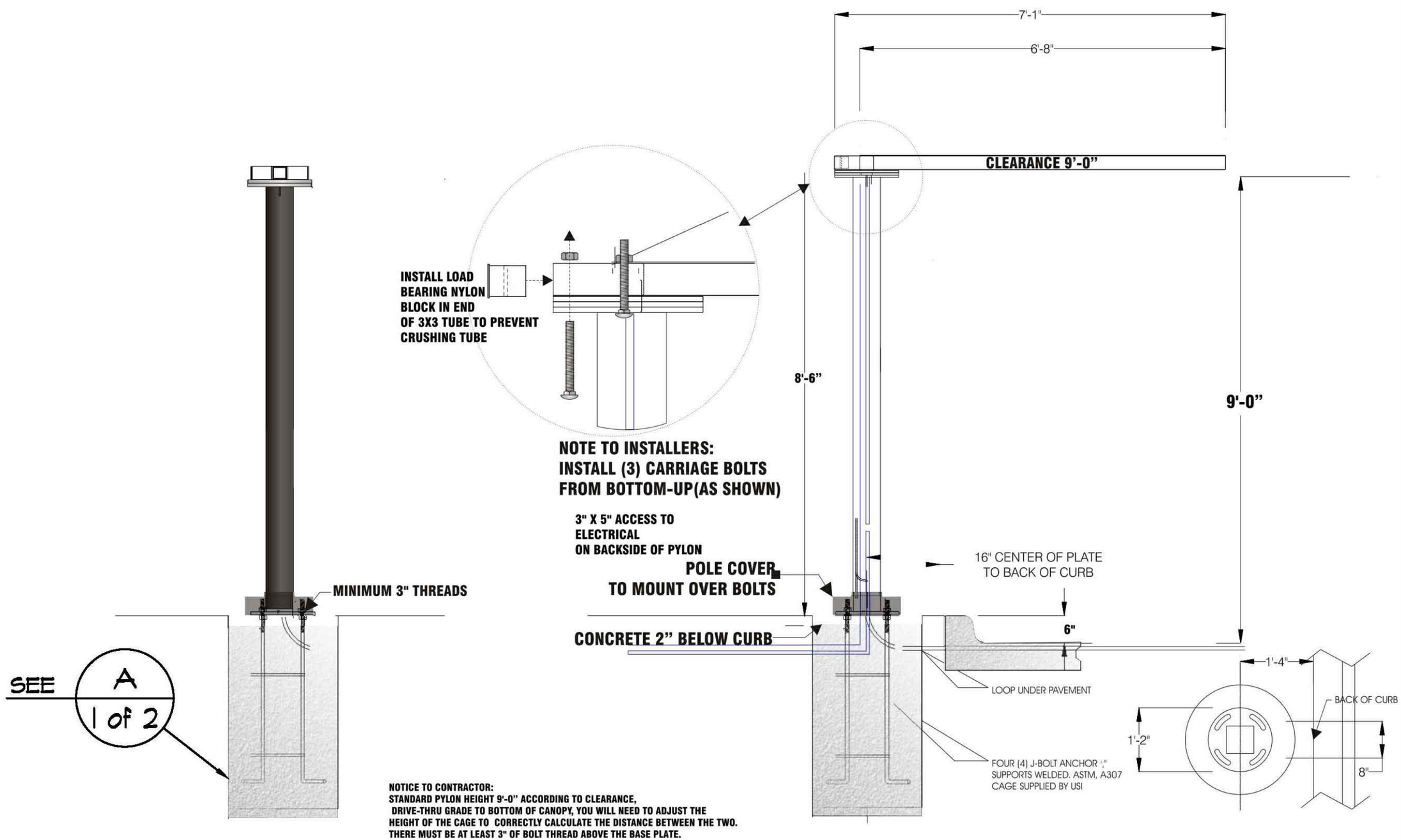
SCALE: Not To Scale

DRAWN: J. SPIX

DATE: 03/19/14

DWG#: Mountain View

SHEET: D4



J | VHD - "VEHICLE HEIGHT DETECTOR (FOR REFERENCE ONLY)

Construction Installation Maintenance Group, Inc.
CIM GROUP INC
KNOWLEDGE | QUALITY | EXPERIENCE
906 E Discovery Lane
Anaheim, CA 92801
714.956.2827
WWW.CIMGROUPINC.COM

Wells Fargo ATM

TITLE: DETAILS

SCALE: Not To Scale

DRAWN: J. SPIX

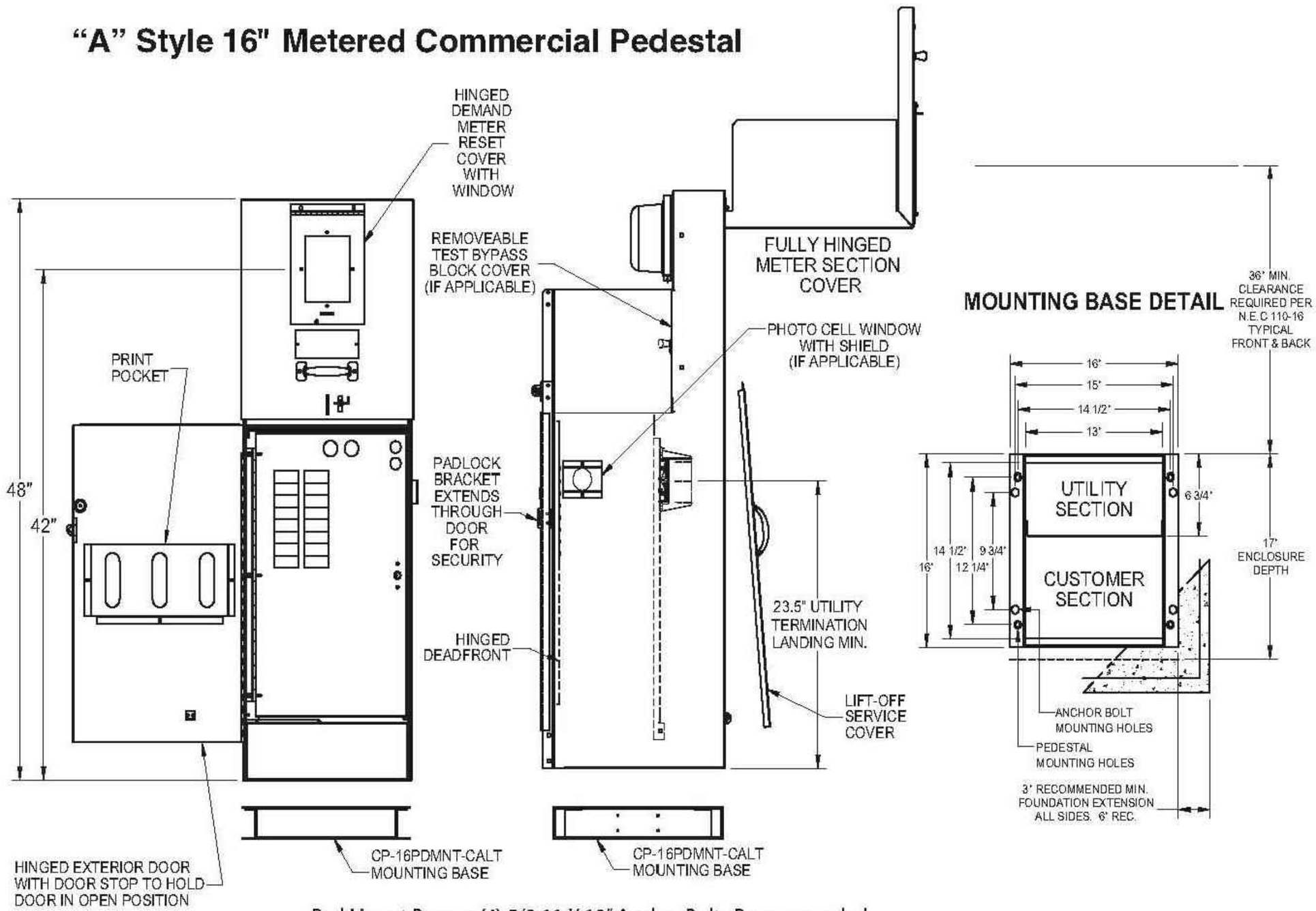
DATE: 03/19/14

DWG#: Mountain View

BRANCH: NEC Mountain View & Barton Rd

SHEET: D5

"A" Style 16" Metered Commercial Pedestal



Pad Mount Base or (4) 5/8-11 X 18" Anchor Bolts Recommended

K UTILITY PEDESTAL (FOR REFERENCE ONLY)

Construction Installation Maintenance Group, Inc.
CIM GROUP INC
KNOWLEDGE QUALITY EXPERIENCE
906 E Discovery Lane
Anaheim, CA 92801
714.956.2827
WWW.CIMGROUPINC.COM

Wells Fargo ATM

TITLE DETAILS

SCALE Not To Scale

DRAWN J. SPIX

DATE 03/19/14

DWG# Mountain View

BRANCH NEC Mountain View & Barton Rd

SHEET D6

CONDITIONS OF APPROVAL FOR CUP NO. 14-016

1. Within two (2) years of this approval, substantial construction of the project shall have commenced or the permit/approval shall become null and void. In addition, if construction of the project is discontinued for a period of six (6) months, then the permit/approval shall become null and void.

   PROJECT: **CONDITIONAL USE PERMIT NO. 14-016**

   EXPIRATION DATE: **APRIL 2, 2016**

2. Within forty-eight (48) hours of approval of the subject project, the applicant shall deliver to the Community Development Department, check or money order made payable to the **CLERK OF THE BOARD OF SUPERVISORS** in the amount of $50.00 (fifty dollars) to enable the City to file the appropriate environmental documentation (Notice of Exemption) for the project. If within the forty-eight (48) hour period, the applicant has not delivered to the Community Development Department the above-noted check, the statute of limitations for any interested party to challenge the environmental determination under the provisions of the California Environmental Quality Act shall be 180 days. The timely filing of the environmental documentation with the County within five (5) days of project approval reduces the statue of limitations to thirty five days or less.

3. Construction shall be in substantial conformance with the plan(s) approved by the Director, Planning Commission or City Council. Minor modification to the plan(s) shall be subject to approval by the Director through a minor administrative variation process. Any modification which exceeds 10% of the following allowable measurable design/site considerations shall require the refiling of the original application and a subsequent hearing by the appropriate hearing review authority.

4. In the event that this approval is legally challenged, the City will promptly notify the applicant of any claim or action and will cooperate fully in the defense of the matter. Once notified, the applicant agrees to defend, indemnify, and hold harmless the City, its officers, agents and employees from any claim, action or proceeding against the City of Loma Linda. The applicant further agrees to reimburse the City of any costs and attorneys' fees that the City may be required by a court to pay as a result of such action, but such participation shall not relieve applicant of his or her obligation under this condition.

5. This permit or approval is subject to all the applicable provisions of the Loma Linda Municipal Code, Title 17 in effect at the time of approval, and includes development standards and requirements relating to: dust and dirt control during construction and grading activities; emission control of fumes, vapors, gases and other forms of air pollution; glare control; exterior lighting design and control; noise control; odor control; screening; signs, off-street parking and off-street loading; and, vibration control. Screening and sign regulations compliance are important considerations to the

developer because they will delay the issuance of a Certificate of Occupancy until compliance is met.

6. Any exterior structural equipment, or utility transformers, boxes, ducts or meter cabinets bolts, hold-downs shall be architecturally screened by wall, cover or structural element, blending with the building design and include landscaping when on the ground.

7. The applicant shall implement SCAQMD Rule 403 and standard construction practices during all operations capable of generating fugitive dust, which will include but not be limited to the use of best available control measures and reasonably available control measures such as:

   a. Water active grading areas and staging areas at least twice daily as needed;
   b. The project proponent shall ensure that all disturbed areas are treated to prevent erosion until the site is constructed upon.
   c. The project proponent shall ensure that landscaped areas are installed as soon as possible to reduce the potential for wind erosion.
   d. Suspend grading activities when wind gusts exceed 25 mph;
   e. Sweep public paved roads if visible soil material is carried off-site;
   f. Enforce on-site speed limits on unpaved surface to 15 mph; and
   g. Discontinue construction activities during Stage 1 smog episodes.

8. The operator shall maintain and effectively utilize and schedule on-site equipment in order to minimize exhaust emissions from truck idling.

9. The operator shall comply with all existing and future CARB and SCAQMD regulations related to diesel-fueled trucks, which may include among others: (1) meeting more stringent emission standards; (2) retrofitting existing engines with particulate traps; (3) use of low sulfur fuel; and (4) use of alternative fuels or equipment.

10. All utilities to the site shall be underground. [Per City Standards]

11. All graffiti and other forms of vandalism shall be promptly removed and/or repaired within 48 hours of notification.

12. The security camera shall be maintained in proper working condition throughout the operation of the ATM.

13. The applicant shall pay all required development impact fees to cover 100 percent of the pro rata share of the estimated cost of public infrastructure, facilities, and services. Development Impact Fees shall be paid prior to issuance of building permits or a Certificate of Occupancy.

14. The developer shall provide infrastructure for the Loma Linda Connected Community Program, which includes providing a technologically enabled development that includes coaxial, cable and fiber optic lines to all outlets in each unit of the development. Plans for the location of the infrastructure shall be provided with the precise plan of design, which includes providing a technologically enabled development that includes coaxial, cable, and fiber optic lines to all outlets in each unit of the development. Plans for the location of the infrastructure shall be provided with the precise grading plans and reviewed and approved by the City of Loma Linda prior to issuing grading permits.

Landscaping

15. The applicant shall submit three sets of the final landscape plan prepared by a state licensed Landscape Architect, subject to the approval of the Community Development Department, and Public Works Department for landscaping in the public right-of-way.
16. Final landscape and irrigation plans shall be in substantial conformance with the approved conceptual landscape plan and these conditions of approval. Any and all fencing shall be illustrated on the final landscape plan.
17. Landscape plans shall depict the utility laterals, concrete improvements, and tree locations. Any modifications to the landscape plans shall be reviewed and approved by the Public Works and Community Development Departments prior to issuance of permits.
18. The applicant, property owner, and/or business operator shall maintain the property and landscaping in a clean and orderly manner and all dead and dying plants shall be replaced with similar or equivalent type and size of vegetation.

FIRE DEPARTMENT

19. The applicant shall submit a complete set of plans to the Loma Linda Fire Department for review and approval prior to the issuance of building permits.
20. All construction shall meet the requirements of the editions of the California Building Code (CBC) and the California Fire Code (CFC)/International Fire Code (IFC) as adopted and amended by the City of Loma Linda and legally in effect at the time of issuance of building permit.

PUBLIC WORKS DEPARTMENT

21. All utilities shall be underground.
22. All public improvement plans shall be submitted to the Public Works Department for review and approval.
23. Any damage to existing improvements as a result of this project shall be repaired by the applicant to the satisfaction of the City Engineer.
24. Prior to issuance of grading permits, the applicant shall submit to the City Engineer a Notice of Intent (NOI) to comply with obtaining coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Storm Water Permit from the State Water Resources Control Board. Evidence that this has been obtained (i.e., a copy of the Waste Dischargers Identification Number) shall be submitted to the City Engineer for coverage under the NPDES General Construction Permit.
25. All site drainage shall be handled on-site and shall not be permitted to drain onto adjacent properties.
26. All necessary precautions and preventive measures shall be in place in order to prevent material from being washed away by surface waters or blown by wind. These controls shall include at a minimum: regular wetting of surface or other similar wind control method, installation of straw or fiber mats to prevent rain related erosion. Detention

basin(s) or other appropriately sized barrier to surface flow must be installed at the discharge point(s) of drainage from the site. Any water collected from these controls shall be appropriately disposed of at a disposal site. These measures shall be added as general notes on the site plan and a statement added that the operator is responsible for ensuring that these measures continue to be effective during the duration of the project construction.

27. The project proponent shall comply with City adopted policies regarding the reduction of construction and demolition (C&D) materials.

28. The project shall comply with the Low Impact Development (LID) Principles and LID Best Management Practices (BMPs) for Southern California.

Applicant signature	Date
Owner signature	Date

END OF CONDITIONS

Staff Report **City of Loma Linda**

From the Department of Community Development

PLANNING COMMISSION MEETING OF APRIL 2, 2014

TO: PLANNING COMMISSION

FROM: KONRAD BOLOWICH, ASSISTANT CITY MANAGER, COMMUNITY DEVELOPMENT DEPARTMENT

SUBJECT: A REQUEST TO APPROVE A PLANNED DEVELOPMENT BASED UPON THE PROPOSED DEVELOPMENT PLAN TO CONSTRUCT A THREE-STORY, 345,000 GROSS SQUARE FOOT VETERANS AFFAIRS MEDICAL CLINIC ON A VACANT 36.9 ACRE PARCEL, LOCATED AT 26001 REDLANDS BOULEVARD, WEST OF BRYN MAWR AVENUE. THE PROJECT IS LOCATED WITHIN SPECIAL PLANNING AREA D AND WITHIN THE EAST VALLEY CORRIDOR SPECIFIC PLAN-SPECIAL DEVELOPMENT ZONE.

SUMMARY

The proposed project is of a request to approve Precise Plan of Design (PPD) No. 13-127 to construct a three-story, 345,000 gross square foot Veterans Affairs medical clinic on a vacant 36.9-acre parcel, located at 26001 Redlands Boulevard, west of Bryn Mawr Avenue (see Attachment A, Site Vicinity Map). A Planned Development is established in the same manner as a zone reclassification. Specifically, the Project would result in a change of zone from EVC-Special Development District (EVC-SD) to EVC-Special Development District-Planned Development overlay (EVC-SD (PD)) for the entire 36.9-acre parcel, recognizing Parcel 1 as Planned Development. The Planned Developed is tied to development standards, the development plan and conditions of approval associated with the Precise Plan of Design.

This public hearing of April 2nd is, in part, a continuation of the hearing of March 5th held for the review of design-related issues. This public hearing of April 2nd for other project issues, including consideration of the Planned Development, Zone Change and environmental review (i.e., proposed Mitigated Negative Declaration), has been properly noticed.

ITEM G2

RECOMMENDATION

Staff recommends that the Planning Commission recommend the following actions to the City Council:

1. Adopt the Mitigated Negative Declaration (see Attachment B, NOI/IS/MND);
2. Adopt the Mitigation Monitoring Report (Attachment C);
3. Approve Planned Development and Zone Map Change No. 13-128 and adopt the Ordinance, based on the findings and subject to the Conditions of Approval (see Attachment E, Conditions of Approval);
4. Approve Precise Plan of Design No. 13-127 (see Attachment E, Project Plans), and adopt the Resolution, subject to the Conditions of Approval (see Attachment E, Conditions of Approval).

PERTINENT DATA

Applicant:	Walsh Construction II, LLC
Property Owner:	Lewis Investment Company, LLC
General Plan:	Special Planning Area D / Phase One Concept Area
Specific Plan/Zoning:	East Valley Corridor Specific Plan-Special Development District (EVC-SD)
Site Area:	Parcel 1 of Parcel Map No. 19018 – approximately 36.9 acres
Topography:	Generally flat with mild slope from southeast to northwest
Vegetation:	Disturbed and agricultural.

BACKGROUND AND EXISTING SETTIING

Background

An application was received on November 14, 2013 for the Planned Development (and related Precise Plan of Design), which would authorize the proposed uses, development plan and development standards related to the proposed Veterans Affairs Health Care Center.

On January 15, 2014, the applicant made a presentation before the Planning Commission to introduce the proposed project and receive preliminary comments.

On March 5, 2014, the Planning Commission opened the Public Hearing for the proposed project to consider project design issues and evaluate consistency with design-related policies of the General Plan and development standards of the East Valley Corridor Specific Plan. At the March 5th hearing the Commission raised a number of questions about the parking requirement, off-site access by pedestrians and bicyclists, function of the park areas, pedestrian access along Bryn Mawr Avenue and to future adjacent commercial area, proposed water features and several other details. No specific recommendations or design modifications were requested at that time.

Existing Setting

The 36.9-acre project site is undeveloped and is an open uncultivated area that had previously been in production as a citrus grove. Surrounding and nearby land uses include single-family homes, the Southern California Edison (SCE) easement and the Orangewood apartment complex immediately west of the Project area. The Heritage Park and Mission Road are toward the south, with property south of Mission Road developed with single-family residential. The Corporate Business Center (a business and industrial park) are located north of Redlands Boulevard. The area east of the Project area is primarily agricultural and vacant area with scattered single-family homes and the Mission Elementary School. Property to the east, between the project site and California Avenue, is also within Special Planning Area D. The proposed project site is at the northwest corner of Special Planning Area D, which consists of 299.81 acres located within the northeast portion of the City of Loma Linda, south of Redlands Boulevard and west of California Avenue.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) STATUS

The project is subject to CEQA and an Initial Study has been prepared to address the potential environmental impacts of the project. A Notice of Intent (NOI) to Adopt a Mitigated Negative Declaration is proposed. The CEQA mandated 20-day public review period for this project began on Friday, March 14, 2014 and will end on Wednesday, April 2, 2014. No comments on the environmental documents have been received as of the writing of this Report. A copy of the NOI/initial Study/Mitigated Negative Declaration is attached (see Attachment B).

PROJECT DESCRIPTION

Project Entitlements and Approvals

The proposed project will require the following entitlements and decision-maker actions:

MND	Adopt a Mitigated Negative Declaration (MND) and related Mitigation Monitoring Program (MMP) for the proposed Project.
PPD 13-127	Approved Precise Plan of Design and adopt Development Plan related to physical improvements for the Veterans Affairs Heath Care Center,

a proposed a three-story, 345,000 gross square foot outpatient care facility with associated parking, landscaping and a linear park.

PD/ZC 13-128 Adopt Planned Development related to physical improvements for a three-story, 345,000 gross square foot outpatient health care center, and approve a Zone Map Amendment to change the zone from EVC-Special Development District (EVC-SD) to EVC-Special Development District (EVD-SD (PD)) for Parcel 1 of Parcel Map No. 19018.

The zone change tied to the Planned Development (PD/ZC No. 13-128) request does not result in any change in the underlying zoning (EVC-SD). The sole purpose of the zone change is to identify that the Planned Development (PD) overlay has been applied to the subject property (i.e., Parcel 1 of Parcel Map No. 19018), thereby linking a specific set of development standards, conditions of approval and development plan (i.e., PPD No. 13-127) to the parcel.

Project Characteristics

A detailed project description was provided in the March 5th Staff Report (Attachment A, Staff Report) and during presentation to the Planning Commission at meetings held on January 15th and March 5th. Following is a brief summary of the proposed Project.

The U.S. Department of Veterans Affairs (VA) proposes the construction and operation of the Loma Linda Health Care Center (hereinafter referred to as the “VA Clinic” or “Project”), which would be an outpatient health care clinic in the city of Loma Linda. This facility would house outpatient services including dialysis, nephrology, oncology, prosthetics, as well as elements of primary care, dental health, mental health, women’s health, and various other services.

The VA Clinic would include the construction and operation of a build-to-suit lease of an outpatient health care clinic consisting of approximately 345,000 gross square feet (gsf) (or 327,614 rentable square feet or 271,000 usable sf) on approximately 36.9 acres located south of Redlands Boulevard and west Bryn Mawr Avenue (see Attachment E, Project Plans). Specifically, the Proposed Project would be located on Parcel 1 of Parcel Map No. 19018.

The Project would provide a total of five gated vehicle entrances; four from Bryn Mawr Avenue and one from Redland Boulevard. The Project would provide surface lot parking for approximately 2,035 vehicles, including 169 accessible spaces, 35 motorcycle spaces, and 20 spaces available to the general public.

The Project would also incorporate a 5.17-acre of linear park and greenbelt along the site’s north and east perimeter that would serve as both an extension of the VA Clinic facility grounds and be accessible to the general public for both passive and active recreational uses.

ANALYSIS

Design Policy and Development Standards Context

Design and development guidance for the project area comes from the City's General Plan, the East Valley Corridor Specific Plan, and the City's Municipal Code/Zoning Ordinance. Because the project site is located within Special Planning Area D, implementing policies in the General Plan for Planning Area D that address land uses, site plan design and amenities. Also, because the VA Clinic is characterized as an institutional use, design policies for institutions provided in the Community Design Element of the General Plan would apply. Finally, because the project site is located with the Special Development zone of the East Valley Corridor Specific Plan, the Community Design standards of the Specific Plan apply. For development issues not otherwise addressed by the East Valley Corridor Specific Plan, the Loma Linda Municipal Code would apply. Key policies for consideration include:

General Plan – Special Planning Area D Policies

a. Allow retail and service commercial, office, institutional, single-family residential, multi-family residential, senior housing, and public open space uses in Special Planning Area D consistent with Table 2.B.

c. Design multiple building developments that might not include "pad" buildings, such as an office building or business park complex to feature a strong street presence by placing buildings so that they side on to the street and by placing parking lots so that they are easily accessed but not dominating the street frontage.

i. Limit non-residential buildings to a maximum of three stories in height, with taller "signature buildings" conditionally permitted at key intersections and locations within the Special Planning Area.

n. The appropriate density for shopping centers, business parks, and office buildings shall be 0.5 FAR. The appropriate density for small institutional uses (e.g., religious assembly uses and schools) shall also be 0.5 FAR.

o. Implementation of development within Special Planning Area D shall be through a coordinated process so that specific siting of land uses/buildings, architectural design, landscaping, road infrastructure, utilities, and other elements can be planned and implemented in a comprehensive, rather than piecemeal, manner throughout the Special Planning Area. Such implementation shall reinforce development standards and guidelines to: …..Maintain a feeling of "openness" within the area;

q. Development of commercial, office, and business park development within the Redlands Boulevard/California Street Special Planning Area shall comply with the following:

(1) Provide plazas, pocket parks, public art, and similar amenities to create gathering places with a high level of visual interest.

(2) Provide a strong mix of commercial uses including neighborhood retail, specialty retail, restaurant, entertainment, office-based employment and/or professional services.

(3) Encourage a pedestrian-oriented character through detailed, pedestrian oriented architecture; pedestrian amenities such as seating areas, landscaping, and lighting; water features such as fountains and public art; signs that are placed and scaled to the pedestrian; wide sidewalks and/or pathways to link buildings; and open areas such as plazas to encourage gathering.

(4) Limit buildings to a maximum of three stories in height, with taller "signature buildings" conditionally permitted at key intersections and locations within the Special Planning Area.

<u>General Plan – Community Design Element Goals and Policies</u>

- Create an image and sense of place that reflects the community's present, past, and future by reflecting: (a) traditional values teamed with innovation; (b) excellence and achievement; (c) focus on health and well-being; and (d) agricultural heritage.
- Ensure high quality and functionality of new development.
- Convey a sense of vitality and create more "gathering places" within the community.
- Make sound investments in Loma Linda's built environment by promoting a timeless appearance in design so that the need for frequent renovations and remodels is alleviated.
- Site planning, building orientation, building scale, and architectural character should be appropriate for the type of development or the nature of the use proposed.
- For institutional development ensure that site and building design reduce traffic and circulation conflicts, minimize disruption to adjacent sensitive uses, and promote high quality architectural design.
- Provide vehicular access via a collector road, instead of from an arterial, wherever feasible. Vehicular access points should be consolidated and designed with proper width and turning radii to alleviate impacts to traffic flow.
- When located within or adjacent to residential areas, facilitate pedestrian access from off-site.
- Avoid impacts to adjacent sensitive uses (e.g., residences, hospitals) through proper design that limits effects from noise and glare (i.e., through site layout, building

orientation, circulation/parking layout, noise attenuation, landscape buffering, and lighting design/location).

- Design the various buildings within an institutional facility so that the architectural style, materials, and colors are complementary.
- Feature architectural details that relate to the building's scale and acknowledge pedestrian entryways through the use of detailed rooflines, enhanced entry statements for principal buildings, and building ornamentation.
- Encourage the use of architectural elements that define the main entrance of buildings and organize space at the ground plane (e.g., arcades, colonnades, and covered walkways) is encouraged. Such elements help to reinforce the pedestrian scale of the building and contribute to its overall low-rise character. Ensure that the site design of institutional uses distinguishes between primary and secondary uses within the site.
- Encourage the grouping of buildings or the configuration of a building to create courtyards, plazas, or seating areas where people can gather.

General Plan policy recognizes that institutional uses are unique, often with special architectural requirements and style preferences that reflect the buildings' users; therefore, requirement of specific institutional building styles for Loma Linda are not defined and are considered on a case-by-case basis. Further, the City of Loma Linda acknowledges that some uses within the institutional category may be outside of the jurisdictional control of the City and that the corresponding public entities might not be required to follow the City's development standards.

East Valley Corridor Specific Plan Community Design Standards

The project site is zoned Special Development, and thus development is required to comply with the Community Design standards set forth in Division 4 of the East Valley Corridor Specific Plan. The Community Design standards address circulation and site development requirements, including parking, landscaping, setbacks, lighting and fencing/walls. The final construction plans for the proposed Project will be required to demonstrate compliance with the Community Development standards except for design modifications excepted through the Planned Development. An expanded discussion of development standards was provided in the March 5th Staff Report.

Project Analysis

The March 5th Staff Report addressed project compliance with a number of development standard and design requirements. This analysis is summarized below and a more detailed discussion can be found in the March 5th Staff Report.

1. Site Plan and Building Frontage

Several of the General Plan policies encourage that development within Special Planning Area D create a strong street edge by placing buildings so that they interface

with the street and help to screen parking areas. Nonetheless, these policies recognize that larger buildings may dominate the street and can be setback as appropriate to maintain a friendly street scale.

The size and massing of the proposed VA Clinic building is influenced by the institutional nature of the health care facility and the desire and need to have services in a compact and centralized configuration that facilitates efficient use of shared facilities and services. Although the General Plan policies indicate a preference for placement of buildings closer to the street edge, particularly along Redlands Boulevard, the General Plan also recognizes that institutional uses are unique, often with special architectural requirements and style preferences that reflect the buildings' users. For the VA Clinic, it is further acknowledged that the relationship of this facility with the Veteran's Affairs requires compliance with certain federal standards that necessitate a particular site plan configuration.

Design requirements specific to the needs for the VA Clinic place the building central to the project site. However, the site design incorporates several features, such as a 5.17-acre linear park along the public interface perimeter and a strong pedestrian orientation, that meet the intent to present a strong street frontage and generate an interactive atmosphere. Thus, the proposed Project is substantially consistent with General Plan design policies regarding site design. Further, the proposed Project complies with site planning requirements of the East Valley Corridor Specific Plan.

2. Access, Internal Circulation and Loading

Community Design policies encourage that vehicular access for institutional uses be via a collector road, instead of from an arterial, wherever feasible; and that vehicular access points be consolidated and designed with proper width and turning radii to alleviate impacts to traffic flow.

The VA Clinic would have a total of five entrances, four of which would be from Bryn Mawr Avenue and one from Redlands Boulevard. The two primary accesses are accentuated by wide driveway widths and entry-way landscape features to draw visitors to those entry points. The proposed access configuration provides that the majority of the vehicles accessing the property will be via Bryn Mawr Avenue, thus minimizing the potential traffic flow conflicts along Redlands Boulevard.

The proposed Project is consistent with access policies because it takes primary access from a collector road rather than Redlands Boulevard. The proposed Project will comply with the development and design standards for driveways, drive aisles, loading, line-of-sight setbacks and such already required by the East Valley Corridor Specific Plan, thus ensuring that internal access and entry to the site is safe and efficient.

3. Linear Park and Open Space

Implementing Policy (a) for Special Planning Area D requires that development of Parcel 1 provide 5.67 acres of parks and open space. The proposed Development Plan provides for almost 5.2 acres of linear park along Bryn Mawr Avenue and Redlands

Boulevard for public use. An additional 7.9 acres of landscaped area is provided internal to the project site, several areas of which are designed as outdoor plaza, trails and sitting gardens. The VA Clinic plan places high importance on the use of well-defined walkways and outdoor use areas that establish a network of open spaces that give the facility a park-like campus setting. These internal open space areas connect with the surrounding linear park via a prominent pedestrian promenade leading between the front of the Clinic building to Redlands Boulevard, as well as several walkways linking to Bryn Mawr Avenue.

The proposed Project meets the requirement of park space by providing its “fair share” of park area within the project site. Thus, the VA Clinic would be consistent with GP policies requiring park area and emphasizing passive use and recreational amenities.

4. Historic Preservation

Parcel 1 lies within the Historic Mission Overlay District. On November 4, 2013, the Historical Committee reviewed the VA Clinic project and issued as Certificate of Appropriateness. The proposed Project Landscape Plan incorporates a commemorative orchard-like tree planting within the linear park in the vicinity of the primary access drive ways to capture the historic uses in the project area. Further, the proposed Project will incorporate the use of stone and other materials that reflect the history and rural character of the area.

5. Architecture

The project architecture recognizes the VA Clinic’s role as a federal facility and incorporates various symbolic features to honor the Veterans it serves. The architectural design also establishes an overall sense of organization and structure to assist with clarity of locating medical services and facilitate visitor access.

The project architecture brings a level of sophistication to the building design that is not commonly associated with large institutional structures. Further, the design is heavily influenced by a desire to relate to the pedestrian level and places much emphasis on the outdoor space through the landscape details. Thus, the proposed Project is consistent with the intent of the Community Design Element policies for institutional development.

6. Fences, Walls and Screening

Section EV4.0255 of the EVCSP requires that where parking areas are located adjacent to residential districts, they shall be separated there from by a decorative solid masonry wall six (6) feet in height.

The Project proposes a modification from this standard by providing a “green screen” in lieu of a masonry wall. The green screen offers a more aesthetically pleasing view from the residential area, as well as from on-site. It is anticipated that the green screen would serve to break-up the building appearance from both the west and south views toward the site and function as a visible buffer. The green screen would accomplish the necessary buffer and security between the project use and adjacent residential area,

thus this modification from the development standard is considered to meet the intent of the development code.

7. Transit, Bicycle and Pedestrian Orientation

Section EV4.0145 encourages adequate planning for transit and pedestrian interface and provides that bus turnouts and bus shelters may be requested during the design-review stage of development processing.

The proposed Development Plan does not specifically include accommodations for transit users but direct pedestrian access provided via the proposed Promenade to the Redlands Boulevard frontage where transit routes run. Also, provisions for bicycle parking are included in the plan design with multiple bicycle parking areas provided at each entrance to the facility building offering flexibility and convenience.

8. Utility Lines

Section EV4.0220 of the EVCSP requires that existing and new utilities of 12KV or less within the project and along adjacent major arterials shall be installed underground. The Applicant proposes to keep existing facilities above ground initially, but will contribute financially toward the undergrounding of local overhead utilities at a future date under a coordinated effort with the utility provider.

Public Comments

As of the date of this report, staff has not received any agency inquiry or public comment based on the Notice of Public Hearing that was mailed on February 20, 2014 or March 14, 2014 to property owners and occupants within 300 feet of the project site.

FINDINGS

General Plan Amendment Findings

Section 17.64.040 of the Loma Linda Municipal Code requires that a precise plan of design through a Planed Development may only be adopted only if all of the following findings are made:

1. That the approval thereof is consistent with the public peace, health, safety, and general welfare;

Approval of the proposed Project will be consistent with the intent and policies of Special Planning Area D, the Community Design Element for institutional uses and the East Valley Corridor Specific Plan, and thus in accordance with the public interest, health, safety, convenience and welfare of the City per the adopted General Plan Also, the propose Project is properly conditioned to meet the City's development criteria to improve community safety and welfare. Further, an Initial Study/Mitigated Negative Declaration prepared for the proposed Project determined that no significant impacts are anticipated and thus the public health, safety and welfare would not be detrimentally affected by physical changes to the environment.

2. That the development proposed is consistent with the city's general plan, and any applicable specific plan relating to the areas included in such plan;

The proposed Project is substantially consistent with the General Plan and the East Valley Corridor Specific Plan. Approval of the proposed Project would implement the provisions of Phase One Concept within Special Planning Area D (General Plan Section 2.2.7.4). The VA Clinic would provide a mix of institutional, office and park uses that is consistent with the General Plan intent for this area. The proposed Project is substantially consistent with the implementing policies for Special Planning Area D because it provides a range of project amenities that attract pedestrian users and create a stimulating visual environment.

Further, the proposed Project is substantially consistent with the East Valley Corridor Specific Plan because the proposed uses and application of a Planned Development are in compliance with the Specific Development zone district for the property. The proposed Project would be required to comply with the development standards set forth in the Specific Plan, thus further ensuring consistency.

3. That the substantial compliance will be had with the purpose and intent of the zoning regulations of the city.

The proposed Project is consistent with the intent and purpose of the City's zoning ordinance, as well as the East Valley Corridor Specific Plan. The project will comply with all required zoning standards with the exception of the requirement for a perimeter masonry wall. However, in lieu of the wall the proposed Project will provide a green screen that has been determined to meet the intent of the zoning and development regulations.

Zone Change Findings

Changes to the zoning map are considered legislative acts and do not require findings. State law does require that the zoning be consistent with the General Plan. The proposed zone is consistent with the proposed Special Planning Area D land use designation. Parcel 1 is suitable for a range of land uses development, including institutional, medical and office uses under the EVC-SD (East Valley Corridor Specific Plan–Special Development District) zone and would not cause substantial environmental damage or be detrimental to the public welfare. Further, the General Plan requires that development within this area be comprehensively planned and coordinated through a process such as a Planned Development. The proposed Project is consistent with this requirement by application of the Planned Development overlay for the project site.

MEASURE V

On November 7, 2006, the Loma Linda voters passed Measure V, *The Residential and Hillside Development Control Measure* As outlined in Section" (A) (3) of Measure V, the project shall pay all of the required development impact fees to cover 100 percent of their pro rata share of the estimated cost of public infrastructure, facilities and services.

> **Section II (A) (3) -** In accord with the provisions of California Government Code Sections 66000 et seq., all development projects as defined therein shall be required to pay development fees to cover 100% of their pro rata share of the cost of any public infrastructure, facilities, or services, including without limitation roads, sewer, utility, police and fire services, necessitated as a result of the approval of such development. The City Council shall set and determine development fees sufficient to cover 100% of their pro rata share of the estimated cost of such public infrastructure, facilities, and services based on appropriate cost-benefit analyses, as required by the provisions of California law.

The proposed Project will generate demand of public services and utilities, and will generate traffic that places a burden to the level of service along local roadways. The Initial Study/Mitigated Negative Declaration (Appendix B) analyzed the Project's effect on city infrastructure and services and determined that no significant impacts are anticipated provided that the Project pays the required development impact fees to address its pro rata share for demand created by the proposed Project. Further, the proposed Project is conditioned (see Appendix D, Conditions of Approval) to comply with all nonexempt provisions of Measure V and required to pay the full amount of development fees required of each subsequent future development project, and any recalculated development impact fees, including traffic impact fees.

Section" (F) (2) of Measure V requires that traffic levels of service (LOS) be maintained at level C or better.

> **Section II (F) (2) -** To assure the adequacy of various public services and to prevent degradation of the quality of life experienced by the residents of Loma Linda, all new development projects shall assure by implementation of appropriate mitigation measures that, at a minimum, traffic levels of service (LOS) are maintained at a minimum of LOS C throughout the City, except where the current level of service is lower than LOS C. In any location where the level of service is below LOS C at the time an application for a development project is submitted, mitigation measures shall be imposed on that development project to assure, at a minimum, that the level of traffic service is maintained at levels of service that are no worse than those existing at the time an application for development is filed. In any location where the Level of Service is LOS F at the time an application for a development project is submitted, mitigation measures shall be imposed on that development project to assure, at a minimum, that the volume to capacity ratio is maintained at a volume to capacity ratio that is no worse than that existing at the time an application for development is filed. Projects where sufficient mitigation to achieve the above-stated objectives is infeasible shall not be approved unless, and until the necessary mitigation measures are identified and implemented.

Measure V requires that traffic levels of service (LOS) be maintained at level C or better.

The proposed Project is projected to generate a total of approximately 4,031 daily vehicle trips, 414 of which will occur during the morning peak hour and 482 of which will occur during the evening peak hour. The Traffic Analysis prepared for the proposed Project determined that with the recommended roadway improvements either all intersections would remain at LOS C or that reduced levels of service would be mitigated to pre-project levels. Consistent with the City's Measure V and as mitigation for the potential traffic impacts, the proposed project shall contribute on a fair share basis in the implementation of the recommended intersection lane improvements or freeway improvements, or in dollar equivalent in lieu mitigation contributions, or in the implementation of additional capacity on parallel routes to offset potential impacts to study area intersections. Thus, project traffic impacts are less than significant with the payment of the project's pro rata fair share as is required by City regulations.

CONCLUSION

The proposed VA Clinic Development Plan would be substantially consistent with the intended goals and policies of the Loma Linda General Plan and generally complies with development standards and design guidelines in the East Valley Corridor Specific Plan. Exceptions to these design guidance documents include: 1) placement of buildings within the site interior, rather than along the street frontage; 2) use of green screen fencing in lieu of masonry block wall along the west edge; and 3) retaining overhead electric utility lines. For each of these design considerations, the Applicant proposes alternative approaches to the site design that is intended to effectively meet the underlying intent of the original policy provisions and development standards, while simultaneously responding to and balancing design and development constraints established by the U.S. Department of Veterans Affairs.

The Planning Commission is requested to review the project materials and environmental documentation and forward a recommendation of approval to the City Council.

Respectfully submitted,

Melanie Traxler
Contract Planner

ATTACHMENTS

A. Planning Commission Staff Report, March 5, 2014
B. NOI/Initial Study/Mitigated Negative Declaration
C. Draft Mitigation Monitoring Program
D. Conditions of Approval
E. Project Plans

Staff Report **City of Loma Linda**

From the Department of Community Development

PLANNING COMMISSION MEETING OF MARCH 5, 2014

TO: PLANNING COMMISSION

FROM: KONRAD BOLOWICH, ASSISTANT CITY MANAGER, COMMUNITY DEVELOPMENT DEPARTMENT

SUBJECT: A REQUEST TO APPROVE A PLANNED DEVELOPMENT BASED UPON THE PROPOSED DEVELOPMENT PLAN TO CONSTRUCT A THREE-STORY, 345,000 GROSS SQUARE FOOT VETERANS AFFAIRS MEDICAL CLINIC ON A VACANT 36.9 ACRE PARCEL, LOCATED AT 26001 REDLANDS BOULEVARD, WEST OF BRYN MAWR AVENUE. THE PROJECT IS LOCATED WITHIN SPECIAL PLANNING AREA D AND WITHIN THE EAST VALLEY CORRIDOR SPECIFIC PLAN-SPECIAL DEVELOPMENT ZONE.

SUMMARY

The proposed project is of a request to approve Precise Plan of Design (PPD) No. 13-127 to construct a three-story, 345,000 gross square foot Veterans Affairs medical clinic on a vacant 36.9-acre parcel, located at 26001 Redlands Boulevard, west of Bryn Mawr Avenue (see Attachment A, Site Vicinity Map). A Planned Development is established in the same manner as a zone reclassification. Specifically, the Project would result in a change of zone from EVC-Special Development District (EVC-SD) to EVC-Special Development District-Planned Development overlay (EVC-SD (PD)) for the entire 36.9-acre parcel, recognizing Parcel 1 as Planned Development. The Planned Developed is tied to development standards, the development plan and conditions of approval associated with the Precise Plan of Design.

This public hearing of March 5th has been noticed for design review of the development plan. To facilitate critical schedule needs of the applicant, design review is being initiated in advance of completion of the environmental review and hearings for the planned development. The purpose of the preliminary design review, separate from the other required approval components, is to allow an opportunity for the Commission to address design issues and evaluate consistency with design-related policies of the General Plan and development standards of the East Valley Corridor Specific Plan.

ATTACHMENT – A

RECOMMENDATION

Staff recommends that the Planning Commission review the proposed planned development plan, provide comments as appropriate, and continue the public hearing to a date certain of either March 19 or April 2, 2014.

PERTINENT DATA

Applicant:	Walsh Construction II, LLC
Property Owner:	Lewis Investment Company, LLC
General Plan:	Special Planning Area D / Phase One Concept Area
Specific Plan/Zoning:	East Valley Corridor Specific Plan-Special Development District (EVC-SD)
Site Area:	Parcel 1 of Parcel Map No. 19018 – approximately 36.9 acres
Topography:	Generally flat with mild slope from southeast to northwest
Vegetation:	Disturbed and agricultural.

BACKGROUND AND EXISTING SETTIING

Background

On June 11, 2013, the City Council approved a series of actions that established a Phase One implementation policy for Special Planning Area D and put in place the framework for future development within the Phase One concept area. A General Plan Amendment approved at that time establishes general guidance for phased development of a ±46.42 acre area within Special Planning Area D and defines the conceptual development envelop for future Phase One implementation. A Specific Plan Amendment and Zone Change approved at the time reconciled the specific plan and zone district boundaries to align with new property lines created by Parcel Map No. 19018. These approvals established a foundation for institutional uses, such as a health care clinic, at the proposed project site.

An application was received on November 14, 2013 for the Planned Development (and related Precise Plan of Design), which would authorize the proposed uses, development plan and development standards related to the proposed Veterans Affairs Health Care Center.

On November 4, 2013, the applicant made a presentation before the Historical Commission for review of the project design and consistency with the Mission Historic Overlay District.

On January 15, 2014, the applicant made a presentation before the Planning Commission to introduce the proposed project and receive preliminary comments.

Existing Setting

The project area is located in the northeastern portion of the City and within an area referenced as Special Planning Area D. The project area is bounded by Redlands Boulevard on the north, Bryn Mawr Avenue on the east, and multi-family development on the west.

The 36.9-acre project site is undeveloped and is an open uncultivated area, which had previously been in production as a citrus grove. Surrounding and nearby land uses include single-family homes, the Southern California Edison (SCE) easement and the Orangewood apartment complex immediately west of the Project area. The Heritage Park and Mission Road are toward the south, with property south of Mission Road developed with single-family residential. The Corporate Business Center (a business and industrial park) are located north of Redlands Boulevard. The area east of the Project area is primarily agricultural and vacant area with scattered single-family homes and the Mission Elementary School. Property to the east, between the project site and California Avenue, is also within Special Planning Area D. The proposed project site is at the northwest corner of Special Planning Area D, which consists of 299.81 acres located within the northeast portion of the City of Loma Linda, south of Redlands Boulevard and west of California Avenue.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) STATUS

The project is subject to CEQA and an Initial Study is under preparation to address the potential environmental impacts of the project. Notice of the CEQA review document is forthcoming within the next several weeks.

ANALYSIS

Project Description

Project Entitlements and Approvals

Although no project action can be taken at the March 5th hearing, approval and implementation of the proposed project will require the following entitlements and decision-maker actions:

MND Ongoing CEQA review anticipates adoption of a Mitigated Negative Declaration (MND) and related Mitigation Monitoring Program (MMP) for the proposed Project.

PPD 13-127 Approved Precise Plan of Design and adopt Development Plan related to physical improvements for the Veterans Affairs Heath Care Center, a proposed a three-story, 345,000 gross square foot outpatient care facility with associated parking, landscaping and a linear park.

PD/ZC 13-128 Adopt Planned Development related to physical improvements for a three-story, 345,000 gross square foot outpatient health care center, and approve a Zone Map Amendment to change the zone from EVC-Special Development District (EVC-SD) to EVC-Special Development District (EVD-SD (PD)) for Parcel 1 of Parcel Map No. 19018.

The zone change tied to the Planned Development (PD/ZC No. 13-128) request does not result in any change in the underlying zoning (EVC-SD). The sole purpose of the zone change is to identify that the Planned Development (PD) overlay has been applied to the subject property (i.e., Parcel 1 of Parcel Map No. 19018), thereby linking a specific set of development standards, conditions of approval and development plan (i.e., PPD No. 13-127) to the parcel.

<u>Project Characteristics</u>

The U.S. Department of Veterans Affairs (VA) proposes the construction and operation of the Loma Linda Health Care Center (hereinafter referred to as the “VA Clinic” or “Project”), which would be an outpatient health care clinic in the city of Loma Linda. This facility would house outpatient services including dialysis, nephrology, oncology, prosthetics, as well as elements of primary care, dental health, mental health, women’s health, and various other services.

The VA Clinic would include the construction and operation of a build-to-suit lease of an outpatient health care clinic consisting of approximately 345,000 gross square feet (gsf) (or 327,614 rentable square feet or 271,000 usable sf) on approximately 36.9 acres located south of Redlands Boulevard and west Bryn Mawr Avenue (see Attachment B, Project Plans). Specifically, the Proposed Project would be located on Parcel 1 of Parcel Map No. 19018.

The Project would have two primary entrances off of Bryn Mawr Avenue on the east side of the site. Two additional entrances from Bryn Mawr would serve as a secondary public entrance and the other would be a service and staff entrance. A single service and staff entrance drive would also be located from of Redlands Boulevard at the west edge of the property. Each entrance would be access controlled and equipped with sliding gates. A service loading dock would be located on the west side of the building, and accessed by both the Redlands Boulevard and southerly Bryn Mawr Avenue staff/service drives.

The Project would provide surface lot parking for approximately 2,035 vehicles, including 169 accessible spaces, 35 motorcycle spaces, and 20 spaces available to the general public. The parking areas would be zoned to distinguish between parking available for the patients/visitors and the staff. Parking zones would be generally coordinated with the access points, such that patient/visitor parking is accessible from the two primary and one secondary access drives from Bryn Mawr Avenue and staff parking accessible from the two secondary access drives from Redlands Boulevard and the southern drive off Bryn Mawr.

The Project would consist of a three-story structure having an approximate 125,120 square foot building footprint generally centralized within the 36.9-acre parcel. The VA Clinic structure would be comprised of four distinct “wings.” Each building wing would be identified by its own unique architectural style/treatment and be assigned a specific medical clinic function. The four wings would be connected at the ground level by a shared public pedestrian access network formed from three sides for the facility and which lead to the central core of the structure. Facilities within each wing would be accessed directly from the centralized core. The main pedestrian entries of the building would connect to Redlands Boulevard and Bryn Mawr Avenue by broad walkways that also facilitate pedestrian access from the parking areas.

The Project would incorporate a 5.5-acre of linear park and greenbelt along the site’s north and east perimeter that would serve as both an extension of the VA Clinic facility grounds and be accessible to the general public. The linear park would incorporate both passive and active recreational uses. Active recreational uses may include exercise courts, bocce ball courts, table tennis facilities and horseshoe pits, and would be located along Bryn Mawr Avenue. Passive recreational uses, such as walking trails, reflective seating areas, open space and landscape feature points, would be located along Redlands Boulevard and Bryn Mawr Avenue. Additional landscape area and private passive recreation areas would be located around the building perimeter and interspersed throughout the parking zones.

The proposed VA Clinic would be in close proximity to the existing Loma Linda Veterans Affairs Medical Center (VAMC) located at 11201 Benton Street and also within the City of Loma Linda. The VAMC is approximately 1.75 miles southwest of the project site. The Project would provide the necessary space to house a variety of fundamental outpatient services and administrative functions currently provided at the VAMC. Transfer of certain outpatient services from the VAMC would reduce overcrowding at the VAMC and allow it to function and its intended capacity. With the VA Clinic, the VA also proposes to replace an existing interim clinic, the Veterans Affairs Clinic Redlands Boulevard (VACRB), located at 25828 Redlands Boulevard within the City of Loma Linda, and just over one-quarter mile west of the proposed Medical Clinic site. The VACRB is an approximately 15,905-square-foot interim clinic that would be closed upon completion of the proposed Medical Clinic.

The VA Clinic would have up to 500 staff on-site daily, and the facility would accommodate a total building occupancy of 1,400 persons. It is anticipated that a substantial number of the staff would be transferred from the other VA facilities within the city, including 30 of which would be transferred from the existing VACRB and 420 from the VAMC.

The health care center would have general hours of operation from 7:00 a.m. to 9:00 p.m., Monday through Saturday.

The Project incorporates and assumes commitments consisting of best management practices and regulatory compliance measures otherwise required would be fully implemented. The Project would target a minimum LEED rating of Silver.

Design Policy and Development Standards Context

The current review before the Planning Commission on March 5, 2014 is limited to Design Review of the proposed Development Plan. Review of other aspects of the proposed project, including CEQA documentation, General Plan consistency of non-design aspects, and other approval requirements, will be considered at a noticed public hearing at a future date.

Design guidance for the project area comes from both the City's General Plan and the East Valley Corridor Specific Plan. Because of the project site's location within Special Planning Area D, design-related policies in the General Plan for Planning Area D that address site plan design are appropriate. Because the VA Clinic is characterized as an institutional use, design policies for institutions provided in the Community Design Element of the General Plan would apply. Finally, because the project site is located with the Special Development zone of the East Valley Corridor Specific Plan, the Community Design standards of the Specific Plan apply. These design policies and standards are described below.

General Plan – Special Planning Area D Policies

The General Plan sets forth Guiding Policies for Special Planning Area D, several of which define a concept for design, building placement, connectivity, building scale and pedestrian-orientation. These include:

a. Allow retail and service commercial, office, institutional, single-family residential, multi-family residential, senior housing, and public open space uses in Special Planning Area D consistent with Table 2.B.

c. Design multiple building developments that might not include "pad" buildings, such as an office building or business park complex to feature a strong street presence by placing buildings so that they side on to the street and by placing parking lots so that they are easily accessed but not dominating the street frontage.

i. Limit non-residential buildings to a maximum of three stories in height, with taller "signature buildings" conditionally permitted at key intersections and locations within the Special Planning Area.

n. The appropriate density for shopping centers, business parks, and office buildings shall be 0.5 FAR. The appropriate density for small institutional uses (e.g., religious assembly uses and schools) shall also be 0.5 FAR.

o. Implementation of development within Special Planning Area D shall be through a coordinated process so that specific siting of land uses/buildings, architectural design, landscaping, road infrastructure, utilities, and other elements can be planned and implemented in a comprehensive, rather than piecemeal, manner throughout the Special Planning Area. Such implementation shall reinforce development standards and guidelines to:

- Maintain a feeling of "openness" within the area;
- Provide for varying front yard setbacks and a mix of one- and two-story residential dwelling units;
- Development of an area of lots larger than those found in a typical suburban subdivision; and
- Preserve existing oak trees and provide for replacement at an appropriate ratio of those trees than cannot feasibly be preserved.

p. The design of development within Special Planning Area D must encompass a variety of amenities to serve the project…including, but not limited to:

- 25 percent usable open space;
- Trails and paseos;
- Child care facilities;
- Neighborhood/satellite community libraries;
- Fountains and water features;
- Public art;
- Amphitheaters and public gathering places;
- Public facilities/parks substantially in excess of that required by Quimby Act provisions;
- Provision of one or more high density, walkable village areas and/or
- Public facilities with a recognizable connection to the project that are substantially in excess of the city's minimum requirements.

q. Development of commercial, office, and business park development within the Redlands Boulevard/ California Street Special Planning Area shall comply with the following:

(1) Provide plazas, pocket parks, public art, and similar amenities to create gathering places with a high level of visual interest.

(2) Provide a strong mix of commercial uses including neighborhood retail, specialty retail, restaurant, entertainment, office-based employment and/or professional services.

(3) Encourage a pedestrian-oriented character through detailed, pedestrian oriented architecture; pedestrian amenities such as seating areas, landscaping, and lighting; water features such as fountains and public art; signs that are placed and scaled to the pedestrian; wide sidewalks and/or pathways to link buildings; and open areas such as plazas to encourage gathering.

(4) Limit buildings to a maximum of three stories in height, with taller "signature buildings" conditionally permitted at key intersections and locations within the Special Planning Area.

t. Phase One implementation shall be established for an approximate 42.45 acre area located at the northwest corner of Special Planning Area D. Proposed future development within Phase One shall only be allowed subject to the following:

(1) Submittal and City approval of planned development permit(s), or equivalent planning review process as determined acceptable by the City, which demonstrates comprehensive site planning, site-specific development standards and design guidelines.

(2) The detailed development proposal (e.g., planned development application) shall demonstrate through the project design and accompanying plans and guidelines that the proposed land uses and siting are consistent with the Guiding and Implementing policies for Special Planning Area D, and shall demonstrate that sufficient land area is provided within the proposed Phase to accommodate Phase One's fair share contribution (as determined by the City) for parks, open space, trails, roadways and other community amenities expected within the broader context of Special Planning Area D.

<u>General Plan – Community Design Element Policies</u>

Chapter 3.0 (Community Design Element) of the General Plan establishes policy guidance to define the visual character desired for Loma Linda. This vision embraces the following design quality goals:

- Create an image and sense of place that reflects the community's present, past, and future by reflecting: (a) traditional values teamed with innovation; (b) excellence and achievement; (c) focus on health and well-being; and (d) agricultural heritage.
- Ensure high quality and functionality of new development.
- Convey a sense of vitality and create more "gathering places" within the community.

- Make sound investments in Loma Linda's built environment by promoting a timeless appearance in design so that the need for frequent renovations and remodels is alleviated.

Site planning, building orientation, building scale, and architectural character should be appropriate for the type of development or the nature of the use proposed. For institutional developments, the Community Design Element provides the following:

Guiding Policies for Institutional Development

For institutional development ensure that site and building design reduce traffic and circulation conflicts, minimize disruption to adjacent sensitive uses, and promote high quality architectural design.

Implementing Policies for Institutional Development

a. Provide vehicular access via a collector road, instead of from an arterial, wherever feasible. Vehicular access points should be consolidated and designed with proper width and turning radii to alleviate impacts to traffic flow.

b. When located within or adjacent to residential areas, facilitate pedestrian access from off-site.

c. Avoid impacts to adjacent sensitive uses (e.g., residences, hospitals) through proper design that limits effects from noise and glare (i.e., through site layout, building orientation, circulation/parking layout, noise attenuation, landscape buffering, and lighting design/location).

d. Design the various buildings within an institutional facility so that the architectural style, materials, and colors are complementary.

e. Feature architectural details that relate to the building's scale and acknowledge pedestrian entryways through the use of detailed rooflines, enhanced entry statements for principal buildings, and building ornamentation.

g. Encourage the use of architectural elements that define the main entrance of buildings and organize space at the ground plane (e.g., arcades, colonnades, and covered walkways) is encouraged. Such elements help to reinforce the pedestrian scale of the building and contribute to its overall low-rise character. Ensure that the site design of institutional uses distinguishes between primary and secondary uses within the site.

h. Encourage the grouping of buildings or the configuration of a building to create courtyards, plazas, or seating areas where people can gather.

General Plan policy recognizes that institutional uses are unique, often with special architectural requirements and style preferences that reflect the buildings' users; therefore, requirement of specific institutional building styles for Loma Linda are not defined and are considered on a case-by-case basis. Further, the City of Loma Linda acknowledges that some uses within the institutional category may be outside of the jurisdictional control of the City and that the corresponding public entities might not be required to follow the City's development standards.

East Valley Corridor Specific Plan Community Design Standards

The project site is zoned Special Development, and thus development is required to comply with the Community Design standards set forth in Division 4 of the East Valley Corridor Specific Plan.

The circulation section (Chapter 1) of the community design standards establishes Redlands Boulevard as a major arterial and requires streetscape design to enhance the visual quality along this corridor, unify the landscape elements and address pedestrian circulation. Of particular not is a requirement for meandering sidewalks, six (6) foot in width and setback from the curb a minimum of three (3) feet. Key criteria for sidewalks are:

(1) The sidewalk system shall provide for a safe, continuous pedestrian circulation and access system to all parts of the development. Pedestrian access shall be provided from public streets and parking lots to building entries, and walkways provided on-site shall connect with those off-site.

(2) The sidewalk system shall connect to pedestrian trails through the open-space areas.

Section EV4.0145 provides guidance for a strong pedestrian-oriented environment:

(e) Bus turnouts and bus shelters may be required during the design-review stage of development processing. These facilities shall be designed to maximize security features and shall be located in proximity to both traffic signals and pedestrian crosswalks, so as to provide for ease of ingress for buses and ease of access for pedestrians. Bus stops shall be a minimum of fifty (50) feet in length.

(f) Building configuration and placement shall provide for pedestrian courtyards, plazas, or open spaces between and/or adjacent to buildings.

(g) The design of pedestrian plazas or courtyards shall provide shaded seating areas with attractive landscaping and should include water features, public art, kiosks, and covered walkways.

(h) Benches, light standards, trash receptacles, and other street furniture shall be provided in an attractive and comfortable setting and shall be designed to enhance the appearance and function of a site and open space areas.

Chapter 2 of the Community Design standards of the East Valley Corridor Specific Plan sets forth development standards for parking, lighting, utility location, screening, architecture, landscaping and grading. General design and compatibility guidance applicable to the VA Clinic project includes:

Section EV4.0225 Compatibility Standards

(a) Where a Special Development area abuts a residential district, an orderly transition of uses and building types should be established as follows:

(1) There should not be a drastic and abrupt building scale change; the transition from residential to more intensive building types should be gradual, in order to prevent massive structures from dominating and intruding upon neighborhoods. Smaller buildings should be located near the residential area, with the largest buildings farther away.

(2) Land uses should transition gradually from residential to more intensive uses. In placing uses within these transitional areas, consideration should be given to traffic generation, truck traffic, hours of operation, noise, light and glare, and other characteristics which might impact adjacent residential neighborhoods.

Section EV4.0240 Architectural Guidelines

(c) The following guidelines shall apply to site design:

(1) Developments should be designed to maximize any existing views of mountain ranges, open space, palm rows, or other view amenities.

(2) Building placement should vary to include both parallel and skewed angles to the street plane in order to provide diversity and discourage continuous building facades along street frontage.

(d) The following guidelines shall apply to building design:

(1) Building construction and design shall be used to create a structure with equally attractive sides of high quality, rather than placing all emphasis on the front elevation of the structure. Architectural facade treatments will be required on all portions of the building(s) exposed to public views. Extra treatment may be given to the street frontages as long as the basic façade treatments are carried around the structure.

(2) Any accessory buildings and enclosures, whether attached to or detached from the main building, shall be of similar compatible design and materials as the main building.

(3) Large, continuous surface treatments of a single material shall be minimized. Changes in texture, relief or materials, and use of decorative features such as planters, varied roof lines, decorative windows and accent panel treatment should be encouraged.

(4) Pre-engineered metal buildings with corrugated exteriors are prohibited and other predominantly painted metal facade treatments are strongly discouraged.

Section EV4.0245 Landscaping Guidelines

The intent of landscape guidelines within the Community Design explains that: "Landscaping is of primary importance to the establishment of the design character of the East Valley Corridor. The landscape guidelines are intended to promote the establishment of compatible and continuous landscape development to enhance and unify the East Valley Corridor. Specifically, the guidelines are intended to enhance and preserve the existing site character, to minimize the adverse visual and environmental impacts of large buildings and paved areas, to promote the conservation of water, and to provide micro-climate control for energy conservation where possible."

Section EV4.0250 General Guidelines

(a) Plant materials should be used in a logical, orderly manner, helping to define spaces and complement adjacent architecture.

(b) Landscape designs should be coordinated between the areas of a development. However, all areas within a project need not be identical. Different landscape themes may be utilized in larger developments to distinguish spaces from one another, yet these themes should be consistent with a unifying concept which establishes a cohesive design throughout the project.

(c) In addition to the selection and distribution of plant materials, landscape plans should incorporate various site furnishings and features. Lighting, seating, paving, fountains, etc., should be considered integral components of the landscape plan and therefore included in the overall landscape concept.

(d) The scale and character of the landscape materials to be selected should be appropriate to the site and/or architecture. Large-scale buildings or projects require large-scale landscaping treatments.

Project Analysis

1. Site Plan and Building Frontage

Several of the General Plan policies encourage that development within Special Planning Area D create a strong street edge by placing buildings so that they interface with the street and help to screen parking areas. Nonetheless, these policies recognize that larger buildings may dominate the street and can be setback as appropriate to maintain a friendly street scale.

The proposed VA Clinic building would be three stories and approximately 345,000 gross square feet, with an overall building footprint of approximately 125,120 square feet. The size and massing of the building is influenced by the primarily institutional nature of the health care facility and the desire and need to have services in a compact and centralized configuration that facilitates efficient use of shared facilities and services.

The VA Clinic building is centrally located within the 36-acre project site and surrounding by parking on all sides. Placement of the building central to the site, rather than along the street edges offers several advantages. Setting the building away from the street edge allows the opportunity to soften the street frontages with a linear park and walkways. Because of the scale of the institutional structure, it is less overpowering and does not dominate the street frontage. The linear park along the street perimeter ranges in depth between 100 and 150 feet, providing both a buffer and screening of the parking area, and allowing for a visual transition from lower intensity uses along Redlands Boulevard toward the center of the parcel.

The building setback offers a functional purpose for safety. The building placement must meet the following VA criteria per the Physical Security Design Manual for VA Facilities Life Safety Protected (2007). The VA requires a minimum “standoff” distance of 25 feet between the closest parking lot or access road. To enhance the physical security and the protection of the building the philosophy is to maximize set-backs from public roadways to decrease the threat potential from vehicle routes.

The building placement provides several other functional benefits. First, the main access from a vehicle to the site is off of Bryn Mawr Avenue, at a distance of 350 feet from the Redlands Boulevard intersection. It is important for the building's main entrance to face Redlands Boulevard for visibility to the visitors. The building itself has a footprint of over 125,000 square feet and if the building were moved closer to Redlands Boulevard, the main entrance drop-off at the front of the building would be difficult to achieve because primary access is not provided from Redlands Boulevard. In addition, the site is over 36.5 acres in size, with a majority of the site being distributed surface parking for visitors and staff (2,035 spaces currently). In order to decrease the walking distances for the visitors from parking stalls to the entrances of the building, the building was sited near the center of the site to help distribute the walking distances for visitors and patients, many with the physical and way-finding impairments.

Although the General Plan policies indicate a preference for placement of buildings closer to the street edge, particularly along Redlands Boulevard, the General Plan also recognizes that institutional uses are unique, often with special architectural requirements and style preferences that reflect the buildings’ users. For the VA Clinic, it is further acknowledged that the relationship of this facility with the Veteran’s Affairs requires compliance with certain federal standards that necessitate a particular site plan configuration.

2. Access, Internal Circulation and Loading

Community Design policies encourage that vehicular access for institutional uses be via a collector road, instead of from an arterial, wherever feasible; and that vehicular access points be consolidated and designed with proper width and turning radii to alleviate impacts to traffic flow.

The VA Clinic has two primary visitor entrances that are located from Bryn Mawr Avenue. These entrances are accentuated as primary access by wide driveway widths and entry-way landscape features to draw visitors to those entry points. A secondary visitor entrance is also located from Bryn Mawr Avenue, but at the southeast corner of the site. Two staff and service driveways are provided, one directly from Redlands Boulevard at the west edge of the property, and the other along the south edge from Bryn Mawr Avenue. The proposed access configuration provides that the majority of the vehicles accessing the property will be via Bryn Mawr Avenue, thus minimizing the potential traffic flow conflicts along Redlands Boulevard.

Once vehicles enter the project site, visitors are directed to parking zones. Staff parking areas are separate from visitor parking areas. Effective site planning eliminates the need for security bollards or vehicular barrier fencing by creating buffer zones aimed at protecting the facility. In addition access road configuration was designed to prevent vehicles from attaining speeds in excess of 25 mph and avoid any straight-line vehicular approaches to the facility. This configuration results in some circuitous internal circulation patterns, however, landscape design and prominent walkway linkages are used to assist with defining drive aisle areas.

Section EV4.0210 of the East Valley Corridor Specific Plan provides development standards and specifications for loading areas. In particular, institutions shall provide loading spaces not less than ten (10) feet in width, twenty (20) feet in length and fourteen (14) feet in height, with five (5) loading spaces required for institutions greater than 110,000 gross square feet of floor area. The design standards further require that sites shall be designed so that parking areas are separate from loading areas. Aisle width to loading docks shall be a minimum of fifty (50) feet in width exclusive of truck parking area, and the minimum aisle width adjacent to loading areas shall be sixteen (16) feet one way and twenty-eight (28) feet for two way.

The loading dock area appears to be undersized for the size of the facility, which otherwise would require five (5) loading spaces. The Applicant does not anticipate the need for significant volume of truck deliveries. The following represents a typical delivery schedule:

- US Mail delivery truck size medium to small once a day (mid-day)
- Fed EX or UPS delivery trucks twice a day either (morning /or mid-morning and late afternoon)
- Food delivery truck size medium once a day. (morning)
- Food delivery truck size “large” once or twice a week. (mid-morning)

- Supply trucks mainly medical supplies “medium or large vehicles” two – three deliveries per day mostly (morning and afternoon)
- Paper goods delivery large truck twice a month (afternoon delivery)

Because the overall size of the site offers sufficient area for truck queuing and they potential for overlap of major deliveries is low, it appears that the loading area as shown on the plan could be adequate.

3. Linear Park and Open Space

Implementing Policy (a) for Special Planning Area D requires that development of Parcel 1 provide 5.67 acres of parks and open space. The proposed Development Plan provides for almost 5.2 acres of linear park along Bryn Mawr Avenue and Redlands Boulevard for public use. An additional 7.9 acres of landscaped area is provided internal to the project site, several areas of which are designed as outdoor plaza, trails and sitting gardens. The VA Clinic plan places high importance on the use of well-defined walkways and outdoor use areas that establish a network of open spaces that give the facility a park-like campus setting. These internal open space areas connect with the surrounding linear park via a prominent pedestrian promenade leading between the front of the Clinic building to Redlands Boulevard, as well as several walkways linking to Bryn Mawr Avenue.

The linear park includes both active and passive areas. A portion of the linear park located at the southwest corner of Parcel 1 would be dedicated for active uses, such as bocce courts, horseshoe pits and table tennis facilities. A meandering walkway runs through the length of the park, functioning as a connective trail as well as offering passive recreation opportunity.

4. Historic Preservation

On November 4, 2013, the Historical Committee reviewed the VA Clinic project and issued as Certificate of Appropriateness. Parcel 1 lies within the Historic Mission Overlay District. The intent of the district is defined in Section 17.82.020 of the Loma Linda Municipal Code. Two key goals include:

- Preserve and enhance the rural atmosphere of the area;
- Allow for consistent, compatible, and complementary development of the vacant properties (structures and lands) within the Mission Road area; and, encourage that all new development in the area is pedestrian friendly through the incorporation of livable/walkable community concepts.

During its review, the Historical Commission made a request that the Landscape Plan capture elements of the historical context by incorporating features that reflect the citrus groves previously located in the area and incorporate natural stone walls consistent with the style found throughout the area.

The Landscape Plan incorporates a commemorative orchard-like tree planting within the linear park in the vicinity of the primary access drive ways.

5. Architecture

The project architecture recognizes the VA Clinic's role as a federal facility and incorporates various symbolic features to honor the Veterans it serves. The architectural design also establishes an overall sense of organization and structure to assist with clarity of locating medical services and facilitate visitor access.

The proposed structure consists of four separate building wings that are connected by a centralized ground-level core, which is the receiving area and "bridge" to services located in the upper floors of each building. To assist with wayfinding, add architectural interest, and create the effect of multiple smaller buildings, each building wing would have its own unique architectural style and palette of materials. The proposed building materials, a combination of wood, glass and three categories of metal add visual interest and reinforce the commemorative link to the Veterans.

The building designs employ a 'Commercial Style" characteristic of the early 1900's. Design features include the use of metal skeletal framing, heavy fenestration, and multiple divide windows. The buildings would generally have straight fronts and flat roofs with shallow projections.

6. Fences, Walls and Screening

Section EV4.0255 of the EVCSP requires that where parking areas are located adjacent to residential districts, they shall be separated there from by a decorative solid masonry wall six (6) feet in height.

The Orangewood apartment complex is located immediately west of the project site. The proposed development plan includes parking along the length of its western edge. The loading area is also located along the west side of the building, facing the apartment property.

In lieu of a masonry wall, the Applicant proposes a "green screen", which would consist of wire mesh fencing and a dense hedge of landscape plantings. The green screen offers a more aesthetically pleasing view from the residential area, as well as from on-site. It is anticipated that the green screen would serve to break-up the building appearance from both the west and south views toward the site and function as a visible buffer.

7. Transit, Bicycle and Pedestrian Orientation

Section EV4.0145 encourages adequate planning for transit and pedestrian interface and provides that bus turnouts and bus shelters may be requested during the design-review stage of development processing.

The proposed Development Plan does not specifically include accommodations for transit users. The linear park could provide opportunities for transit shelter for future bus and transit stops.

Provisions for bicycle parking are included in the plan design with multiple bicycle parking areas provided at each entrance to the facility building.

8. Utility Lines

Section EV4.0220 of the EVCSP requires that existing and new utilities of 12KV or less within the project and along adjacent major arterials shall be installed underground. The Applicant proposes to keep existing facilities above ground initially and contribute financially toward the undergrounding of local overhead utilities at a future date.

Public Comments

As of the date of this report, staff has not received any agency inquiry or public comment based on the Notice of Public Hearing that was mailed on February 20, 2014 to property owners and occupants within 300 feet of the project site.

FINDINGS

When the project returns to the Planning Commission for recommendation to Council, appropriate findings will be made for the CEQA determination, Precise Plan of Design, Zone Change, Measure V and Planned Development actions. At this date, Commission action is limited to review and comment of the design aspects of the proposed Development Plan and no findings are required.

CONCLUSION

The proposed VA Clinic Development Plan would be substantially consistent with the intended goals and policies of the Loma Linda General Plan and generally complies with development standards and design guidelines in the East Valley Corridor Specific Plan. Exceptions to these design guidance documents include: 1) placement of buildings within the site interior, rather than along the street frontage; 2) use of green screen fencing in lieu of masonry block wall along the west edge; and 3) retaining overhead electric utility lines. For each of these design considerations, the Applicant proposes alternative approaches to the site design that is intended to effectively meet the underlying intent of the original policy provisions and development standards, while simultaneously responding to and balancing design and development constraints established by the U.S. Department of Veterans Affairs.

The Planning Commission is requested to review the site plan, landscape plan, open space plan and building elevations that comprise the proposed Development Plan and

provide comments, and continue the public hearing to a date certain (recommended March 19 or April 2, 2014).

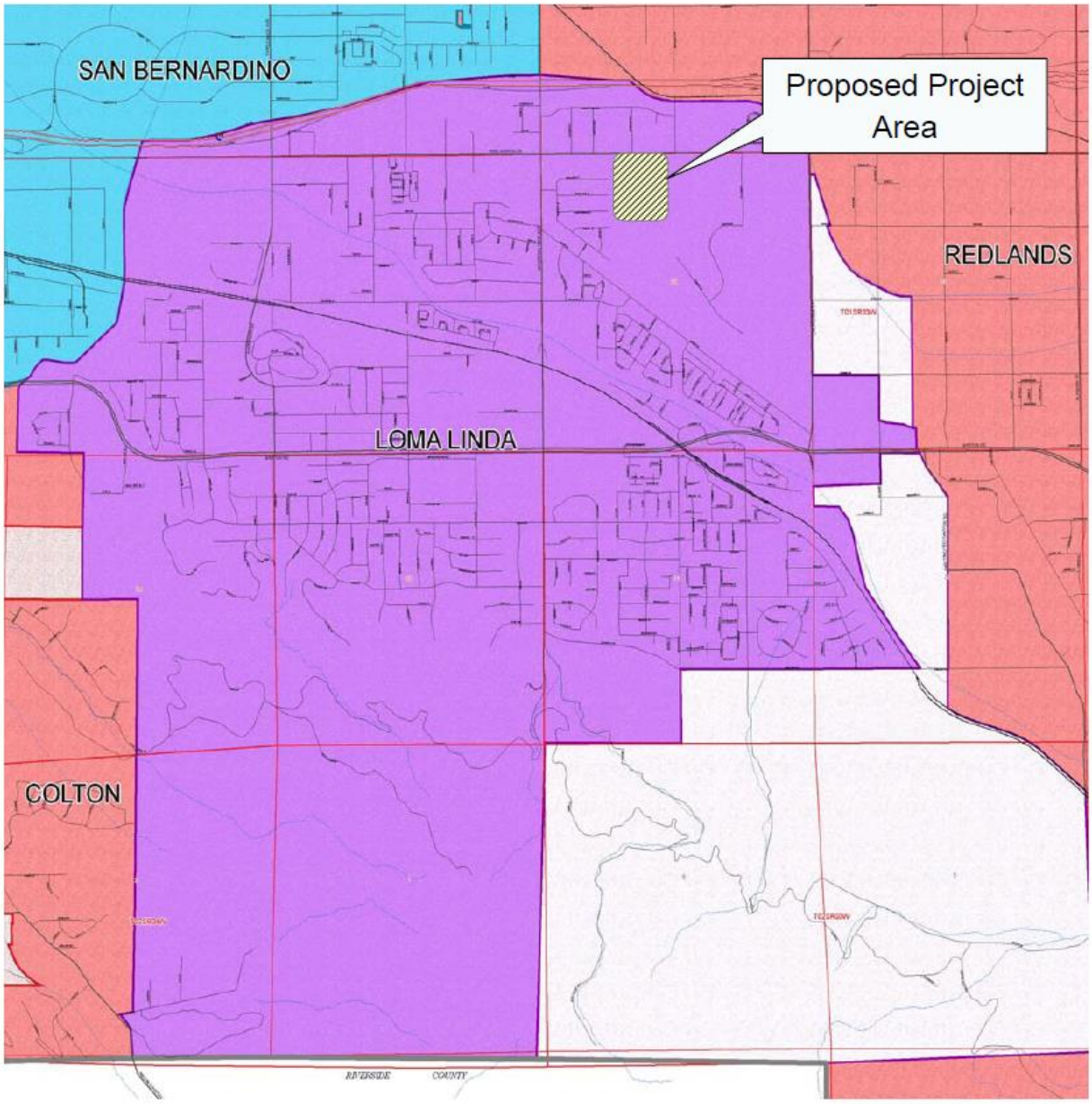
Respectfully submitted,

Melanie Traxler
Contract Planner

ATTACHMENTS

A. Site Vicinity Map
B. Project Plans

VICINITY MAP



Source: San Bernardino County Local Agency Formation Commission (2013)

Attachment B
Note: Includes Technical Appendicies (partial) with calculation worksheets excluded

DRAFT INITIAL STUDY
AND MITIGATED NEGATIVE DECLARATION

FOR THE

VETERANS AFFAIRS HEALTH CARE CENTER PROJECT

PRECISE PLAN OF DESIGN NO. 13-127
PLANNED DEVELOPMENT/ZONE CHANGE NO. 13-128

Lead Agency:

CITY OF LOMA LINDA
25541 Barton Road
Loma Linda, California 92354

March 14, 2014

ATTACHMENT - B

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NOTICE OF INTENT
TO ADOPT A MITIGATED NEGATIVE DECLARATION
FOR THE
VETERANS AFFAIRS HEALTH CARE CENTER PROJECT
PRECISE PLAN OF DESIGN NO. 13-127
PLANNED DEVELOPMENT/ZONE CHANGE NO. 13-128

Notice is hereby given that the City of Loma Linda intends to adopt a Mitigated Negative Declaration for the following proposed Project:

PRECISE PLAN OF DESIGN NO. 13-127 AND PLANNED DEVELOPMENT/ZONE CHANGE NO. 13-128 - The proposed project consists of construction of a new 3-story structure totaling 345,000 gross square feet on a vacant 36.9 acre parcel, and intended for use as an outpatient health care services facility to be operated by the U.S. Department of Veterans Affairs for the care of Veterans. The proposed project includes an approximate 5.2-acre linear park and 2,035 on-site parking spaces. The project approval will include a Precise Plan of Design for the site layout, design and architecture; Zone Change to change the zone designation from EVC-SD to EVC-SD-(PD); and a Planned Development to establish site-specific development standards based upon the development plan and conditions of approval for the development.

PUBLIC REVIEW AND COMMENT

Comments on the Initial Study and proposed Mitigated Negative Declaration must be submitted in writing prior to the close of the public comment period. From **March 14 to April 2, 2014**, this Mitigated Negative Declaration, inclusive of the Initial Study (which discusses the potential environmental effects) and the proposed Project application file are available for public review during normal office hours (7:30 a.m. to 5:30 p.m., Monday through Thursday) at the City of Loma Linda Community Development Department within City Hall located at 25541 Barton Road, Loma Linda, CA 92354. Copies are also available at the San Bernardino County Library (25581 Barton Road, Loma Linda, CA). Written comments on the Initial Study and proposed Mitigated Negative Declaration should be submitted prior to 5:30 p.m. on **Wednesday, April 2, 2014** to:

Guillermo Arreola
City of Loma Linda
Community Development Department
25541 Barton Road
Loma Linda, CA 92354
Email: garreola@lomalinda-ca.gov
Phone: (909) 799-2830

PROJECT OVERVIEW

Veterans Affairs Health Care Center Precise Plan of Design and Planned Development/Zone Change Project, herein referred to as the "VA Clinic" or the "Project." An application for the proposed Project was initiated by WI Loma Linda, LLC, 929 West Adams Street, Chicago, IL 60607.

The proposed Project affects 36.86 acres that is the westerly portion of Special Planning Area D, south of Redlands Boulevard and west of California Avenue. More specifically, the proposed Project area includes Parcel 1 of Parcel Map No. 19018. The proposed project consists of construction of a new 3-story structure totaling 345,000 gross square feet on a vacant 36.9 acre parcel, and intended for use as an outpatient health care services facility to be operated by the U.S. Department of Veterans Affairs for the care of Veterans. The proposed project includes an approximate 5.2-acre linear park and 2,035 on-site parking spaces.

PREFACE

PURPOSE

This document is an Initial Study ("IS") and Mitigated Negative Declaration ("MND") that evaluates environmental impacts resulting from the ***Veterans Affairs Health Care Center***, inclusive of Precise Plan of Design No. 13-127 and Planned Development/Zone Change No. 13-127.

The purpose of this IS/MND is to describe for the public and decision-makers the potential environmental consequences of implementing the proposed Project. The California Environmental Quality Act ("CEQA") requires that projects that may significantly affect the quality of the environment be analyzed to reduce or eliminate adverse effects on the environment.

CALIFORNIA ENVIRONMENTAL QUALITY ACT REQUIREMENTS

As defined by CEQA Section 21065, the VA Clinic and related entitlements, constitutes a "project" and therefore CEQA evaluation is required. As defined by *CEQA Guidelines* Section 15063), an IS was prepared to provide the Lead Agency with information to be used as the basis for determining whether an Environmental Impact Report ("EIR"), Negative Declaration (ND), or Mitigated Negative Declaration ("MND") would be appropriate for providing the necessary environmental documentation and clearance for the proposed project.

According to CEQA Guidelines Section 15065, an EIR is deemed appropriate for a particular proposal if the proposal has the potential to substantially degrade quality of the environment; the proposal has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals; the proposal has possible environmental effects that are individually limited but cumulatively considerable; or the proposal could cause direct or indirect adverse effects on human beings.

According to CEQA Guidelines Section 15070(a), a ND is deemed appropriate if the proposal would not result in any significant effect on the environment and does not otherwise require an EIR. According to CEQA Guidelines Section 15070(b), an MND is deemed appropriate if it is determined that a proposal could result in a significant effect but mitigation measures are available and incorporated as part of the project to reduce these significant effects to insignificant levels.

This IS has determined that the proposed Project would not result in any significant effect on the environment when specified mitigation measures are incorporated, thus ensuring that all potential impacts would remain less than significant. Therefore, an MND is deemed as the appropriate document to provide the necessary environmental evaluations and clearance for the proposed Project. This IS and MND document is prepared according to the aforementioned CEQA Guidelines and applicable requirements of the City of Loma Linda.

This MND provides decision-makers and the public with information that enables them to intelligently consider the environmental consequences of adopting and implementing the proposed Project. It also functions to provide concerned citizens and other applicable public agencies with an opportunity to collectively review and evaluate baseline conditions and environmental impacts through a process of full disclosure.

The City of Loma Linda is designated the Lead Agency, in accordance with CEQA Guidelines Section 15050. The Lead Agency is the public agency that has the principal responsibility for review and approval of the proposed Project.

CIRCULATION OF THE IS/MND AND AGENCY REVIEW

The environmental review process has been established to allow public agencies to evaluate environmental consequences and to examine and implement methods of eliminating or reducing any potentially adverse impacts. While CEQA requires that consideration be given to avoiding environmental damage, the Lead Agency and other responsible public agencies must balance adverse environmental effects against other public objectives, including economic and social goals.

The IS/MND was circulated for a period of 20 days for public and responsible agency review from March 14 through April 2, 2014. Public notice was provided in accordance with CEQA Guidelines Section 15072 by newspaper publication on March 14, 2014.

Comments received on the IS/MND will be considered by the final decision-makers along with the findings of this document. A Public Hearing to consider the proposed Project and receive comments on this IS/MND will be held before the Loma Linda Planning Commission on April 2, 2014 at 7:00 p.m. The Loma Linda City Council will consider the Project on a date yet to be announced.

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SECTION 1: PROJECT DESCRIPTION

1.1 PROJECT TITLE

Veterans Affairs Health Care Center, Planned Development/Zone Change and Precise Plan of Design Project, herein referred to as the "VA Clinic" or the "Project."

1.2 LEAD AGENCY

City of Loma Linda

1.3 CONTACT

Guillermo Arreola
City of Loma Linda
Community Development Department
25541 Barton Road
Loma Linda, CA 92354
Email: garreola@lomalinda-ca.gov
Phone: (909) 799-2830

1.4 PROJECT LOCATION

The proposed Project affects 36.86 acres that Parcel 1 of Parcel Map No. 19018. The project site is within the westerly portion of Special Planning Area D, which consists of 299.81 acres located within the northeast portion of the City of Loma Linda, south of Redlands Boulevard and west of California Avenue.

More specifically, the project site is south of Redlands Boulevard and west of Bryn Mawr Avenue. See Exhibit 1, Project Location Map.

1.5 PROJECT SPONSOR

An application for the proposed Project was initiated on November 14, 2013 by:

WI Loma Linda, LLC
929 West Adams Street
Chicago, IL 60607

1.6 GENERAL PLAN LAND USE DESIGNATION

The project site is designated as "Special Planning Area D", and within the Phase One Concept Area of the Special Planning Area. The Loma Linda General Plan provides specific policies to guide future development within Special Planning Area D and the Phase One Concept Area.

1.7 ZONING DISTRICT

The project site is entirely within the East Valley Corridor Specific Plan (EVC Specific Plan) and is designated and regulated by that plan as Special Development (EVC-SD).

1.8 PROJECT DESCRIPTION

PROJECT OVERVIEW

The proposed project is of a request to approve Precise Plan of Design (PPD) No. 13-127 to construct a three-story, 345,000 gross square foot Veterans Affairs medical clinic on a vacant 36.9-acre parcel, located at 26001 Redlands Boulevard, west of Bryn Mawr Avenue. A Planned Development is established in the same manner as a zone reclassification. Specifically, the Project would result in a

change of zone from EVC-Special Development District (EVC-SD) to EVC-Special Development District-Planned Development overlay (EVC-SD (PD)) for the entire 36.9-acre parcel, recognizing Parcel 1 as Planned Development. The Planned Developed is tied to development standards, the development plan and conditions of approval associated with the Precise Plan of Design.

PROPOSED AND REQUIRED ENTITLEMENTS AND APPROVALS

To approve and implement the proposed Project, the following entitlements are requested:

MND	Adopt a Mitigated Negative Declaration (MND) and related Mitigation Monitoring Program (MMP) for the proposed Project.
PPD 13-127	Provide Site Plan Review and adopt Precise Plan of Design related to physical improvements for the Veterans Affairs Health Care Center, a three-story, 345,000 gross square foot medical clinic and outpatient care center to be established on a vacant 36.9-acre parcel, and inclusive of a minimum 5.5-acre park for public use..
PD/ZC 13-128	Approve a Zone Map Amendment to add the Planned Development (PD) suffix to the zoning designation for Parcel 1 of Parcel Map No. 19018. The related Zone Change would change the zones from EVC-Special Development (EVC-SD) to EVC-Special Development – Planned Development (EVD-SD-PD). The Zone Change would also tie the approved Development Plan and Development Standards to the property.

PROJECT BACKGROUND

EVC Specific Plan

The East Valley Corridor Specific Plan (EVCSP) was adopted August 7, 1989. The EVCSP includes approximately 4,300 acres located in the southeastern portion of the San Bernardino Valley, adjacent to Interstate 10 and State Route 30, and generally between (and including portions of) the cities of Redlands and Loma Linda, and an unincorporated portion of the County of San Bernardino. The EVCSP covers a large amount of undeveloped land along Interstate 10 that has direct freeway and railway access to facilitate future industrial, commercial and residential development. The objective of the EVCSP is to provide a master-planned community that will attract major businesses to the area in order to provide a job base for the East Valley and strengthen the local economy. Within the City of Loma Linda, the EVCSP includes parcels on both sides of Redlands Boulevard between the eastern and western city limits. Within the project area, this includes those large parcels fronting the south side of Redlands Boulevard.

The entire project site lies within the boundary of the EVCSP, and is designated as “Special Development” (EVC-SD). EVC-SD is intended to provide an alternative, more flexible planning process which encourages creative and imaginative planning of administrative professional, commercial or industrial developments, or a mixture of such uses, within the framework of a single cohesive concept plan. Uses permitted within the EVC-SD include General Commercial, Administrative Professional, Public Institutional and Open Space. Development with the EVC-SD is permitted subject to approval of a Planned Development application.

Loma Linda General Plan and Final EIR

In 2006, the City of Loma Linda adopted a General Plan, which was a comprehensive revision and update to the 1973 Loma Linda General Plan. That update effectively replaced the previous General Plan and established goals and policies to reflect the current community-wide vision. It was the first major update since the City’s incorporation in 1970. The General Plan was subsequently amended in 2009 to incorporate and reflect the will of the community per voter approved “Measure V.” The General Plan is the City’s most important statement regarding its ultimate physical, economic, and cultural development within the 25-year planning period. It is intended to be used by officials and others to guide decisions governing development and management of human and natural resources. The General Plan is comprised of text, maps and illustrations to document the organization of physical, environmental, economic, and social activities desired by the City’s residents in order to create and maintain a healthful,

functional, and desirable community. The General Plan addresses short-term and long-term goals for key aspects of the community, including land use, traffic/circulation, open space/conservation, noise, safety and other aspects that contribute to the public health, safety, and "quality of life" considerations of the Loma Linda community.

In additional to the traditional land use designations assigned to lands within the City, the General Plan identifies seven general areas within the city that are designated as "Special Planning Areas". Each area is intended to provide a different variety of uses at varied densities according to each area's location, access, size, and adjacent land use designations. Each area has its own purpose and intent and provides a healthy mix of land uses throughout the City. The intent is to create areas in which a mix of uses can come together to meet the commercial, employment, institutional, and residential needs of the neighborhood and community at large through efficient patterns of land use, and allow for flexibility to accommodate changing market forces in the future.

The proposed Project area lies entirely within the 299.81 acres encompassing Special Planning Area D, also known as the Redlands Boulevard/California Avenue Plan Area. In general, the General Plan intends that Special Planning Area D be characterized by a horizontal and vertical mixed uses, including commercial, office, structured parking and high-density residential, developed along the frontages of Redlands Boulevard and California Street. Single-family, medium-density residential (multiple-family) and recreational uses are intended within the central, western and southern portions of the Planning Area. The General Plan's vision for Plan Area D is as a "livable, walkable community" with a high level of amenities for residents, including parks, trails/paseos, and other recreational uses, while also exhibiting a high level of design quality.

On July 17, 2006, the Loma Linda City Council certified an Environmental Impact Report (GP EIR) for its General Plan [State Clearinghouse No. 2003101159]. The GP EIR determined that implementation of the 2006 General Plan would have significant unavoidable impacts related to loss of open space, air quality, biological resources, water supply, and traffic and circulation. The City's certification of the GP EIR included the adoption of findings for five environmental issues that could not be sufficiently mitigated to a below a less than significant level. All other impacts were found to be less than significant over a broad city-wide level, or were reduced to a less than significant level with the incorporation of mitigation. The issues identified significant and unavoidable were:

- Aesthetics: Conversion of open space and obstruction of existing open and panoramic views;
- Air Quality: Increase in regional pollutant emissions associated with vehicle travel, as well as emissions generated during construction activities;
- Biological Resources: Loss of extensive areas of natural habitats;
- Water Supply: Increased water demand will continue to diminish local and regional water sources;
- Transportation and Circulation: No certainty that required improvements to alleviate level of service impacts in surrounding communities and at freeway interchanges will be completed.

Measure V

On November 7, 2006, the Loma Linda voters passed Measure V, *The Residential and Hillside Development Control Measure.* As outlined in Section II (A) (3) of Measure V, all development projects shall be required to cover 100 percent of their pro rata share of the cost of any public infrastructure, facilities and services through the payment of development impact fees. The City Council has the authority to set and determine development fees sufficient to cover 100% of a development's pro rata share of the estimated cost of such public infrastructure, facilities, and services based on appropriate cost-benefit analyses, as required by the provisions of California law. Section II (F) (2) of Measure V requires that traffic levels of service (LOS) be maintained at level C or better.

In general, the provisions of Measure V establish managed growth principals that in turn preserve, enhance, and maintain the special quality of life valued by the community of Loma Linda. Projects which

are consistent with the above provisions (i.e., payment of fair share for infrastructure, facilities and services, and maintain acceptable traffic LOS at C or better) can be considered to be somewhat self-mitigating with regard to potential impacts related to public utilities and services, and local roadway traffic congestion.

Veterans Affairs Environmental Assessment and FONSI

In 2012 U.S. Department of Veterans Affairs considered an Environmental Assessment (EA) prepared for the proposed Veterans Affairs Loma Linda Health Care Clinic and ultimately issued a Finding of No Significant Impact (FONSI) and approved the project. The EA, prepared by Albert A. Webb Associates, evaluated the environmental impacts of the Veterans Affairs decision to construct and operate a build-to-suit lease of an outpatient care facility and evaluated those impacts in accordance with the National Environmental Policy Act (NEPA). Approval of the Health Care Clinic was a preliminary step toward leading to the current VA Clinic project being considered before the city of Loma Linda (and subject of this Initial Study). Because the projects are similar and based on the same medical clinic concept, environmental analysis prepared for the EA may be applicable to the current environmental review and portions of the EA analysis are reflected in the Initial Study. A copy of the Draft Environmental Assessment for U.S. Department of Veterans Affairs Loma Linda Health Clinic, prepared by Albert A. Webb Associates and dated October 16, 2012 is on file with the city of Loma Linda and may be obtained from the Community Development Department.

PROJECT CHARACTERISTICS

Proposed Project Components

The U.S. Department of Veterans Affairs (VA) proposes the construction and operation of the Loma Linda Health Care Center (hereinafter referred to as the “VA Clinic” or “Project”), which would be an outpatient health care clinic in the city of Loma Linda. This facility would house outpatient services including dialysis, nephrology, oncology, prosthetics, as well as elements of primary care, dental health, mental health, women’s health, and various other services.

The VA Clinic would include the construction and operation of a build-to-suit lease of an outpatient health care clinic consisting of approximately 345,000 gross square feet (gsf) (or 327,614 rentable square feet or 271,000 usable sf) on approximately 36.9 acres located south of Redlands Boulevard and west Bryn Mawr Avenue. See Exhibit 2, Project Site Plan. Specifically, the Proposed Project would be located on Parcel 1 of Parcel Map No. 19018.

The Project would have two primary entrances off of Bryn Mawr Avenue on the east side of the site. Two additional entrances from Bryn Mawr would serve as a secondary public entrance and the other would be a service and staff entrance. A single service and staff entrance drive would also be located from of Redlands Boulevard at the west edge of the property. Each entrance would be access controlled and equipped with sliding gates. A service loading dock would be located on the west side of the building, and accessed by both the Redlands Boulevard and southerly Bryn Mawr Avenue staff/service drives.

The Project would provide surface lot parking for approximately 2,035 vehicles, including 169 accessible spaces, 35 motorcycle spaces, and 20 spaces available to the general public. The parking areas would be zoned to distinguish between parking available for the patients/visitors and the staff. Parking zones would be generally coordinated with the access points, such that patient/visitor parking is accessible from the two primary and one secondary access drives from Bryn Mawr Avenue and staff parking accessible from the two secondary access drives from Redlands Boulevard and the southern drive off Bryn Mawr.

The Project would consist of a three-story structure having an approximate 125,120 square foot building footprint generally centralized within the 36.9-acre parcel. The VA Clinic structure would be comprised of four distinct “wings.” Each building wing would be identified by its own unique architectural style/treatment and be assigned a specific medical clinic function. The four wings would be connected at the ground level by a shared public pedestrian access network formed from three sides for the facility and which lead to the central core of the structure. Facilities within each wing would be accessed directly from the

centralized core. The main pedestrian entries of the building would connect to Redlands Boulevard and Bryn Mawr Avenue by broad walkways that also facilitate pedestrian access from the parking areas.

The Project would incorporate a 5.17-acre of linear park and greenbelt along the site's north and east perimeter that would serve as both an extension of the VA Clinic facility grounds and be accessible to the general public. The linear park would incorporate both passive and active recreational uses. Active recreational uses may include exercise courts, bocce ball courts, table tennis facilities and horseshoe pits, and would be located along Bryn Mawr Avenue. Passive recreational uses, such as walking trails, reflective seating areas, open space and landscape feature points, would be located along Redlands Boulevard and Bryn Mawr Avenue. Additional landscape area and private passive recreation areas would be located around the building perimeter and interspersed throughout the parking zones.

The proposed VA Clinic would be in close proximity to the existing Loma Linda Veterans Affairs Medical Center (VAMC) located at 11201 Benton Street and also within the City of Loma Linda. The VAMC is approximately 1.75 miles southwest of the project site. The Project would provide the necessary space to house a variety of fundamental outpatient services and administrative functions currently provided at the VAMC. Transfer of certain outpatient services from the VAMC would reduce overcrowding at the VAMC and allow it to function and its intended capacity. With the VA Clinic, the VA also proposes to replace an existing interim clinic, the Veterans Affairs Clinic Redlands Boulevard (VACRB), located at 25828 Redlands Boulevard within the City of Loma Linda, and just over one-quarter mile west of the proposed Medical Clinic site. The VACRB is an approximately 15,905-square-foot interim clinic that would be closed upon completion of the proposed Medical Clinic.

The VA Clinic would have up to 500 staff on-site daily, and the facility would accommodate a total building occupancy of 1,400 persons. It is anticipated that a substantial number of the staff would be transferred from the other VA facilities within the city, including 30 of which would be transferred from the existing VACRB and 420 from the VAMC.

The health care center would have general hours of operation from 7:00 a.m. to 9:00 p.m., Monday through Friday, and 7:00 a.m. to 5:00 p.m. on Saturday. The facility would be closed on Sunday.

The Project incorporates and assumes commitments consisting of best management practices and regulatory compliance measures otherwise required would be fully implemented. The Project would target a minimum LEED rating of Silver.

Project Assumptions

This IS/MND provides the project evaluation and environmental clearance anticipated to result from the project actions described above, including approval of a Precise Plan of Design (Site Plan/Development Plan) for the construction of up to 345,000 gross square feet of building area for an institutional use as a medical clinic and outpatient care facility, and designation of the Planned Development overlay to Parcel 1 of Parcel Map No. 19018 to tie development standards to the property. The analysis includes the following assumptions:

The applicant/developer for the VA Clinic shall not be approved for occupancy until construction of Bryn Mawr Avenue extension south of Redlands Boulevard is fully implemented and approved in accordance with PPD No. 13-034.

The applicant/developer for the VA Clinic shall not be issued any Building Permit(s) until Parcel Map No. 19018 has been final recorded with the San Bernardino County Recorder pursuant to the provisions of the State Subdivision Map Act.

The applicant/developer/operator shall establish and maintain a minimum of 5.17 acres of improved park area within the Parcel 1 project site, which shall be accessible by and available to the public for recreational use.

The Project Applicant shall ensure that any “green screen” installed along the south and west perimeter boundary of the project site is designed and maintained to include a six (6) foot tall wire mesh fence and hedge-style landscape plantings that are a minimum of six (6) feet tall and three (3) feet in depth for the entire length of the screen area.

Further, it is assumed that the proposed project would incorporate mitigation measures per previous approvals tied to the property or project (i.e., the EA) and provide commitments toward complying with best management practices and all appropriate, required and applicable regulatory compliance measures.

INCORPORATION BY REFERENCE AND TIERING

In accordance with CEQA Guidelines, an IS/MND may “incorporate by reference” and “tier” applicable discussions from documents that have been previously vetted for public information. CEQA Guidelines Section 15150 (a) states: “An EIR or Negative Declaration may incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public. Where all or part of another document is incorporated by reference, the incorporated language shall be considered to be set forth in full as part of the text of the EIR or Negative Declaration.”

In addition, CEQA Guidelines Section 15152 (a) states: "Tiering refers to using the analysis of general matters contained in a broader EIR (such as one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project.”

This IS/MND evaluates the potential impacts associated with approval of the proposed Project, including establishment of a PD overlay at the project site and physical affects related to construction and operation of the VA Clinic.

During preparation of City’s General Plan, considerable effort was completed to compile community conditions information and assess the potential impacts associated with adoption of the policy document. This information is documented in the *City of Loma Linda General Plan Final Program Environmental Impact Report SCH No. 2003101159* (prepared by LSA Associates, Inc., dated June 21, 2004 and certified July 17, 2006), herein referred to as the General Plan EIR. Because the proposed Project would be substantially consistent with the allowed land uses and development intensities already contemplated in the GP EIR, many of the baseline assumptions and land use considerations already addressed in the GP and GP EIR are applicable to the proposed Project. Therefore, the *Loma Linda General Plan* (2009, as amended) is incorporated herein by reference. A copy of the General Plan can be viewed at the Community Development public counter located at the Loma Linda City Hall, 25541 Barton Road, Loma Linda, California, 92354; or on-line at:
<http://www.lomalinda-ca.gov/asp/Site/Departments/CommunityDev/PlanningDivision/GeneralPlan/index.asp>.

1.9 ENVIRONMENTAL SETTING

The project site is located in the northeastern portion of the city of Loma Linda and within an area referenced as Special Planning Area D. The project site is approximately one-half mile south of Interstate 10 (I-10) and is bounded by Redlands Boulevard on the north, vacant land on the south, Enterprise Drive on the west and Bryn Mawr Avenue on the east. Barton Road, one of the City’s major east-west arterials, is approximately one-half mile to the south of the project site.

The 36.9-acre project site is undeveloped and vacant, although it had previously been in agricultural production as citrus groves. The project area lies within an alluvial plain and has an elevation range of approximately 1,200 feet above mean sea level, and soils comprised of various series of sandy loams.

Surrounding land uses include single-family homes, the Southern California Edison (SCE) easement and the Orangewood apartment complex immediately west of the Project area. The Heritage Park has also been established to the south of the project, just northerly of Mission Road. Property to the south of

Mission Road consists of single-family residential development. The Corporate Business Center (a business and industrial park) are located north of Redlands Boulevard. The area east of the project site is primarily agricultural and vacant parcels with scattered single-family homes and the Mission Elementary School. The property to the east, between the project site and California Avenue, is also within Special Planning Area D.

1.10 REQUIRED APPROVALS AND AGENCY REVIEW

The Applicant seeks City Council approval and adoption of a Planned Development that includes a Zone Change to establish the PD designation and approval of a Precise Plan of Design that establishes the Development Plan that will be tied to the property, as well as adoption of this related MND.

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SECTION 2: DETERMINATION

2.1 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

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

2.2 DETERMINATION:

On the basis of this initial evaluation:

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

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

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

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

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

Signature
Guillermo Arreola, Planner
Community Development Department
Name / Title (print)

March 14, 2013
Date

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SECTION 3: ENVIRONMENTAL CHECKLIST AND IMPACT ANALYSIS

EVALUATION OF ENVIRONMENTAL IMPACTS

A brief explanation is provided for all answers. Responses take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

A "No Impact" answer is adequately supported if the referenced information source(s) show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer is explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

When determined that a particular physical impact may occur, the checklist response indicates whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

When determined that a physical impact may occur, but that the level of effect has been demonstrated to be less than potentially significant, the checklist response may indicate if the impact is “Less Than Significant Impact” based on substantial evidence. “Less Than Significant With Mitigation Incorporated" would apply where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." As appropriate, mitigation measures are identified along with a brief explanation how they reduce the effect to a less than significant level.

Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration (pursuant to CEQA Guidelines Section 15063(c)(3)(D)). Mitigation measures from "Earlier Analyses" may be cross-referenced to support a response of “Less Than Significant With Mitigation Incorporated.” References to information sources for potential impacts (e.g., general plans, zoning ordinances) and/or previously prepared or outside document are identified at the end of the checklist.

IMPACT EVALUATION

3.1 AESTHETICS

I. AESTHETICS	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Explanation:

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 view from a state scenic highway?

No Impact. There are no scenic vistas or scenic resources officially designated within the City or immediate vicinity. The Project site is not located along or within the viewshed of a known scenic route designated by the City, County of San Bernardino or State of California.[1] Although the City does correlate the abundance of surrounding open space, hillsides and natural resources as a scenic and aesthetic resource of the City, the conversion of open space to developed uses as the project site would not affect those resources. Because there are no scenic vistas or scenic resources within the City, or within view of a scenic route within the City, implementation of the proposed Project would not affect scenic vistas or resources, and there would be no impact. Further analysis is not required.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact. The city of Loma Linda is predominantly developed with a mix of low to medium intensity land uses, including several large institutional uses and medical centers (such as the Loma Linda University and Veterans Hospital). The General Plan EIR previously considered the intensification of land uses and conversion of open space due to implementation of the General Plan at the project site and concluded that with the implementation of the General Plan policies, potential impacts to the visual character and quality of the City would be less than significant and no mitigation measures are required.[2]

Within the immediate project vicinity, the area can be characterized as semi-rural. Although Redlands Boulevard is predominantly a commercial corridor, the segment between California Avenue and Enterprise Avenue is developed with a mix of multiple-family residential and business park uses, and with several large undeveloped parcels, particularly along the south side of Redlands Boulevard. Surrounding development is a mix of one and two-story buildings. The proposed site was a former orange grove but is currently vacant and void of orange trees.

Implementation for the proposed project would change the character of the site from vacant to developed with a large, institutional use that would introduce new sources of light and glare from project lighting and building materials, resulting in a developed character and a higher intensity of activity at the project site. Construction of a three story building and parking area would change the visual character of the site. However, the site will be landscaped, contain pedestrian paths and would provide view corridors from the parking area to the San Bernardino Mountains. Because the site is large, development would appear to be spread out and have a campus-style and park-like ambience.

Visual impacts would result from construction activities, including the presence of equipment, materials, and workers at the site, and along Redlands Boulevard. Vehicles such as automobiles, pickup trucks, and dump trucks would be visible. Heavy equipment such as backhoes, graders, and excavators and workers would be visible during site clearing, grading, construction, and site cleanup. Construction equipment and activities would be seen by various viewers in proximity to the project site, including adjacent and nearby residents, pedestrians, and motorists on Interstate-10 (I-10) and nearby streets. However, construction activities would be temporary and short-term and thus would have minimal effect on aesthetics and visual quality.

The project site is located in Special Planning Area D and would be an institutional use. The Loma Linda General Plan provides guiding policies and community design guidance for institutional buildings and

[1] Loma Linda General Plan EIR, Chapter 4.2.
[2] Loma Linda General Plan EIR, Chapter 4.2.

development within this Special Planning Area. Because the project would be consistent with the General Plan, it would represent a built character that has already been contemplated for this area. The incorporation of the proposed linear park along the public street frontages and landscaping throughout the project site would screen parking areas from public view, break-up the building massing and reinforce a desirable park-like setting.

Because the proposed Project would be consistent with the General Plan and East Valley Corridor Specific Plan, including policies addressing design for institutional uses and within the Special Development zone and Special Planning Area D designated area, impacts to visual character and resulting from light/glare would be less than significant, and no mitigation measures are required.

3.2 AGRICULTURE AND FORESTRY RESOURCES

II. AGRICULTURE AND FORESTRY RESOURCES	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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) 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?

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use?

Less Than Significant Impact. Although the core of the City is primarily developed, with the exception of the special planning areas that are vacant but targeted for future infill development, Loma Linda also retains substantial acreage of land in agricultural use. However, since its time of incorporation the City has always considered that agricultural uses would transition to urban uses. As evidence, the General Plan does not include an agricultural land use designation even though there are areas within the City's sphere of influence qualified as State prime and unique farmland.[3] Further, the East Valley Corridor Specific Plan (adopted in 1989) had previously designated agricultural parcels fronting Redlands Boulevard, including the Project Site, for special development and urban uses.

[3] Loma Linda General Plan EIR, Chapters 4.9 and 5.0.

Although agricultural uses have historically been present within the Project Site and immediate surrounding area, the Project area is not considered an important agricultural resource and is recognized by the City as an "urban reserve". Further, no current agricultural use or Williamson Act contract exists at the Project Site. Thus, implementation of the Proposed Project would not impact any remaining agricultural land uses within the vicinity. Therefore, even though the Proposed Project would result in the conversion of State prime and unique farmland, impacts would be less than significant and no mitigation measures are required.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The Project Site is not under a Williamson Act contract and there are no existing Williamson Act contracts within the city of Loma Linda.[4] The Proposed Project would have no impact on Williamson Act agricultural lands and further analysis is not required.

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 loss of forest land or conversion of forest land to non-forest use?

No Impact. The City does not include land that is in current timberland production or designated as forest land or timberland. Thus, the Proposed Project would not affect any forest land or timberland, and there would be no impact. Further analysis is not required.

3.3 AIR QUALITY

III. AIR QUALITY	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

a) Conflict with or obstruct implementation of the applicable air quality plan?

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

d) Expose sensitive receptors to substantial pollutant concentrations?

[4] Loma Linda General Plan EIR, Chapter 4.9.

Less Than Significant Impact. An Air Quality/Greenhouse Gas Analysis (AQ/GHG Analysis) was prepared by Albert A. Webb Associates, dated May 19, 2012 to evaluate criteria air pollutant emissions and determine compliance of the proposed project with established air quality and pollutant emission standards, including those for greenhouse gas emissions. These AQ/GHG study was incorporated into the Draft Environmental Assessment for U.S. Department of Veterans Affairs Loma Linda Health Clinic, prepared by Albert A. Webb Associates and dated October 16, 2012. A copy of the Environmental Assessment (EA) is on file with the city of Loma Linda and may be obtained from the Community Development Department.

To ascertain that site conditions had not changed since 2012, and to consider air quality and greenhouse gas emissions and the potential environmental impacts in the context of CEQA, a peer review of the AQ/GHG Analyses was completed by Kunzman Associates in February, 2014 (see Appendix A). The Kunzman Peer Review concluded that updated technical analysis to the Webb AQ/GHG Analysis was required to accurately reflect the proposed project described in this Initial Study. The Kunzman AQ/GHG Analysis Addendum provides updated information and conclusions as appropriate. The discussion below summarizes the findings of the AQ/GHG Analysis and the Peer Review Analysis Addendum.

The proposed project is a medical clinic with 271,000 useable square feet located on approximately 38.86 acres. Located within the 38.86 acres are a 5.17 acre park and 2,035-space parking lot; the balance of the site (7.16 acres) would be landscaped. The project would employ 500 people, 420 of which would be transferred from the nearby Linda Veterans Affairs Medical Center (VAMC) located at 11201 Benton Street. Another 30 employees would be transferred from the nearby Veterans Affairs Clinic Redlands Boulevard (VACRB), located at 25828 Redlands Boulevard. The VACRB is an interim clinic that would close upon completion of this project (the HCC). Therefore, the project will be creating 50 new jobs in the region and re-locating 450 existing VA clinic jobs from within 1.75 miles of the project. The proposed project would also target a minimum LEED rating of Silver; however, to error on the conservative, the air quality emissions analysis does not include LEED factors that ultimately would serve to further reduce emission volumes.

The air quality assessment assumed that the following project design features would be incorporated into the project either due to the fact that state and local standards require them or that these features are reflected in the proposed site plan:

- Install Energy-Star rated appliances such as dishwashers and refrigerators will reduce energy consumption and associated emissions;
- Experience reduced vehicle miles traveled based on the project setting (suburban center), improved destination accessibility and improvements to the on-site pedestrian network;
- Planting trees of more than 400 trees that will sequester CO2 while they are actively growing;
- Compliance with the water efficient landscape ordinance enforced by the city of Loma Linda in Chapter 13.32 of the City Municipal Code5 which requires a 20 percent reduction. Indoor water usage was reduced by 20 percent to account for the mandatory reduction outlined in the California Green Building Standards Code (CalGreen code, p. 17, 306).

Air pollutant emission calculations were run based on the updated the traffic analysis and trip generation reflected in the traffic study prepared by Kunzman Associates, dated February 2014 and provided in Appendix G. As the proposed project would be transferring the majority of staff (450 out of 500) from existing VA facilities just down the street from the project site, the increase in emissions in the region due to more staff is based on the VA hiring 50 new employees.

The project site is within the South Coast Air Basin (SCAB) and under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is responsible for updating the Air Quality Management Plan (AQMP). The AQMP was developed for the primary purpose of controlling emissions to maintain all federal and state ambient air standards for the district.

Short-Term Construction Emissions

The maximum daily regional emissions for project-related construction emissions would be below SCAQMD Daily Regional Construction Thresholds and also below SCAQMD Daily Localized Construction

Thresholds. Because compliance with SCAQMD Rules is expected, impacts from construction emissions would be less than significant and no mitigation is required.

Long-Term Operational Emissions

The results from the emissions modeling provided in the AQ/GHG Analysis Addendum (see Appendix A) for operational criteria pollutants show that criteria pollutant emissions from operation of the proposed project would not exceed the SCAQMD regional daily thresholds. Thus impacts would be less than significant and no mitigation is required.

Greenhouse Gas Emissions

GHG emissions generated by the proposed project were analyzed using CalEEMod version 2013.2.2 (see Appendix A).

The emissions estimate incorporated the construction-related GHG emissions from the Webb AQ/GHG Analysis, and those results were determined to be further reduced by the proposed planting of 407 new trees (estimated as one tree per five parking spaces). This is a conservative estimation of tree planting, as the park use would include the additional trees. The proposed project's GHG emissions would not exceed the SCAQMD draft threshold of 3,000 MTCO2-equivalents per year. Further, the proposed project's greenhouse gas emissions during it operational phase would not exceed the federal threshold of 25,000 tons per year. Impacts would be less than significant and no mitigation is required.

Because the proposed project would not significantly increase local air emissions or exceed criteria pollutant threshold levels, it would not conflict with or obstruct implementation of the air quality management plan. Thus, project impacts would be less than significant and no mitigation measures are required.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. The potential impact for objectionable odors and affect on people would be less than significant. Construction activity would be required to comply with all appropriate regulations and standards of the AQMD, which in turn would minimize the potential for objectionable odors from construction equipment and activity. Operational uses in the VA Clinic would be contained primarily indoors and indoor air would be processed through the facility's air and ventilation system. Thus implementation of the proposed Project would not generate construction or operations-related objectionable odors, and impacts would be less than significant and no mitigation measures are necessary.

3.4 BIOLOGICAL RESOURCES

IV. BIOLOGICAL RESOURCES	*Potentially Significant Impact*	*Less Than Significant Impact 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?	☐	☒	☐	☐
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 federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

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?

Less than Significant Impact with Mitigation Incorporated. A Biological Resources Assessment (BRA) was prepared by AMEC Environment & Infrastructure, Inc., dated May 18, 2012 to review project site conditions and the potential for the proposed project to have impacts to biological resources. Based on a determination of the BRA that suitable habitat for burrowing owl (*Athene cunicularia*) occurred throughout the project site, a Focused Survey for Burrowing Owl was completed and Report prepared by AMEC Environmental & Infrastructure (August 23, 2012). These biological studies were incorporated into the Draft Environmental Assessment for U.S. Department of Veterans Affairs Loma Linda Health Clinic, prepared by Albert A. Webb Associates and dated October 16, 2012. A copy of the Environmental Assessment (EA) is on file with the city of Loma Linda and may be obtained from the Community Development Department.

To ascertain that site conditions had not changed since 2012, and to consider biological resources and potential environmental impacts in the context of CEQA, a peer review of the BRA and Focused Survey was completed by LSA Associates, Inc. in February, 2014 (see Appendix B). The LSA Peer Review concluded that site conditions remain substantially unchanged and the conclusions of the BRA remain valid. The discussion below summarizes the findings of the BRA, Focused Survey and Peer Review.

The project site is undeveloped and highly disturbed due to previous agricultural activity. Trees associated with the former orange grove have been cut and cleared from the property. Since removal of the orchard, the site has been regularly cleared and tilled. Vegetation is sparse, and where present consists primarily of invasive and weedy, herbaceous species.

The Endangered Species Act (ESA) defines species as “endangered” or “threatened” and provides regulatory protection at the federal level. Special-status plant or animal species may be considered sensitive due to declining populations, vulnerability to habitat change or loss, or because of restricted distributions. Certain special-status species have been listed as Threatened or Endangered by the USFWS and are thus protected by the federal ESA. Other species have been designated as having special-status by the USFWS, but have not been formally listed as Threatened or Endangered. The Migratory Bird Treaty Act (MBTA) involves treaties signed by the U.S., Great Britain, Mexico, Japan, and the republics of the former Soviet Union which make it unlawful to pursue, capture, kill, and/or possess, or attempt to engage in any such conduct to any migratory bird, nest, egg or parts thereof listed in the treaty.

No special-status plant species or special-status vegetation communities are identified on the project site. No special status wildlife species were observed during a field assessment and most are not expected to occur. However, despite the highly disturbed state of the site, there is a very low to low potential for

several special-status species to occur onsite, including burrowing owl and California horned lark. Both of these special-status birds are designated as a "Species of Special Concern" by the California Department of Fish and Wildlife (CDFW) and afforded protection by CDFW Section 3505.5 and the federal MBTA. However, none of the species are listed as endangered or threatened by either the United States Fish and Wildlife Service (USFWS) or the CDFW. The project site provides suitable nesting habitat for the horned lark and some of the on-site abandoned irrigation pipes provide suitable habitat and shelter habitat for the burrowing owl, thus there is low potential for both species to nest onsite.[5]

Because the project site is identified to have suitable habitat present for the Western Burrowing Owl, a Focused Survey for Burrowing Owl was conducted in 2012. No burrowing owls or evidence thereof (i.e., whitewash, pellets, feathers, tracks, prey remains, egg shell fragments, nest adornment materials, etc.) were observed on-site or on adjacent properties surveyed during the focused survey.[6] Because the burrowing owl is a mobile species, it has a potential to subsequently occupy any suitable burrows within the site. Per the currently accepted protocol, a take-avoidance survey should be conducted no more than 14 days prior to the initiation of ground disturbance and a final survey should be conducted within 24 hours prior to ground disturbance to determine if the burrowing owl has subsequently occupied the development area. If burrowing owls are found on site, impact avoidance and additional mitigation measures may be required. Because the vacant site continues to provide suitable shelter and nesting habitat for burrowing owls, potential for the species to occur on or adjacent to the site at anytime remains present. For this reason, impacts to burrowing owls are considered potentially significant. Implementation of mitigation measure **BIO-2** would ensure that impacts to burrowing owls remain less than significant.

The project site also provides suitable nesting habitat for at least three common bird species that are protected under the CDFW and the federal MBTA, including the killdeer (*Latin*), American kestrel, and barn owl (*Tyto alba*). Only the American kestrel was observed onsite.[7]

Impacts are anticipated to be less than significant based on conditions at the time of the field assessment. In order to ensure impacts to these species would remain be less than significant, implementation of mitigation measures **BIO-1 and BIO-2** are recommended.

Recommended Mitigation Measures:

BIO-1: Nesting Birds - Trees adjacent to the site may provide nesting habitat to raptors and other birds observed using the site and surrounding areas. Ground-nesting bird species may nest throughout the project site. It is recommended that construction activities be scheduled outside of the avian nesting season (February 15–August 15). If construction must occur during the nesting season, a nesting bird survey will be conducted within 3 days prior to the beginning of construction activities. If nesting birds are found within the project area or adjacent areas (within 150 feet of disturbed habitat or within 250 feet of riparian habitat), project activities including vegetation clearing and encroachment by heavy equipment would not occur until it is verified by a qualified biologist that young have fledged the nest(s) and nesting is completed.

BIO-2: Burrowing Owls. Although no burrowing owls or burrowing owl sign (e.g., whitewash, pellets, scat, tracks, and/or feathers) were observed during the 2012 focused surveys, this species has a potential to subsequently occupy any suitable burrows within the site. Per the currently accepted protocol, a take-avoidance survey should be conducted no more than 14 days prior to the initiation of ground disturbance and a final survey should be conducted within 24 hours prior to ground disturbance to determine if the burrowing owl has subsequently occupied the development area. If surveys determine that burrowing owls occupy the site, a burrowing owl mitigation plan will be prepared, subject to approval by the California Department of Fish and Wildlife (CDFW).

[5] AMEC Biological Resources Assessment (2012).
[6] AMEC Biological Resources Assessment (2012).
[7] AMEC Biological Resources Assessment (2012).

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 federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. The project site is highly disturbed from historic agricultural activity, and the surrounding properties are previously disturbed and/or developed. No important drainages or ridgelines or native habitats were identified within the Project area. No hydrophytic (or riparian) vegetation communities, areas containing hydric soils, wetland hydrology or areas exhibiting a definable bed, bank or intermittent flow were observed on the project site.[8] The project site does not contain any federally protected wetlands as defined by Section 404 of the Clean Water Act. Implementation of the proposed Project would not affect riparian habitats or other sensitive natural communities identified in any local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service, and there would be no impact. Further analysis is not required.

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?

No Impact. The project site is not identified as a protected path for native resident or migratory fish or wildlife species. No area in the city of Loma Linda is regulated by any Habitat Conservation Plan (HCP). The Project site does not contain any significant biological resources that would be protected by any local policy or ordinance. There are no important trees within the project site. Thus, the proposed Project would not conflict with or affect a native resident or migratory wildlife corridor; or conflict with any policy or ordinance related to protected or sensitive trees or other biological resources; or conflict with any HCP. There would be no impact. Further analysis is not required.

3.5 CULTURAL RESOURCES

V. CULTURAL RESOURCES	*Potentially Significant Impact*	*Less Than Significant Impact 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 as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

A Cultural Resources Assessment Report (CRA) was prepared by CRM Tech, dated May 23, 2012 to review project site conditions and the potential for the proposed project to have impacts to cultural resources. Concurrent with that study, a Paleontological Resource Assessment Report (PRA) also was prepared by CRM Tech, dated May 21, 2012. These cultural and paleontological resource studies were

[8] AMEC Biological Resources Assessment (2012).

incorporated into the Draft Environmental Assessment for U.S. Department of Veterans Affairs Loma Linda Health Clinic, prepared by Albert A. Webb Associates and dated October 16, 2012. A copy of the Environmental Assessment (EA), including these technical studies, is on file with the city of Loma Linda and may be obtained from the Community Development Department.

To ascertain that site conditions had not changed since 2012, and to consider cultural resources and potential environmental impacts in the context of CEQA, peer reviews of the CRA and PRA was completed by LSA Associates, Inc. in February, 2014 (see Appendix C). The LSA Peer Reviews concluded that site conditions remain substantially unchanged and the conclusions of the CRA and PRA remain valid. The discussion below summarizes the findings of the CRA, PRA and Peer Reviews.

a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?

No Impact. The project site lies within the Mission Historic Overlay District (Mission District).[9] The Mission District extends along both sides of Mission Road between California Street to the east and Pepper Way to the west. The Historic Mission Overlay District as a whole, appears to be eligible for listing in the National Register of Historic Places, and thus, meets the definition of an "historic property."[10] The CRA (2012) observed that all features that relate to the district's period of significance (1810s–1950s) or otherwise enhance its historical characters, most notably the Victorian farmhouse and the associated citrus groves, have been removed. Thus, the project site does not contribute to the significance or integrity of the district at large. No other potential "historic properties" are known to be present within or immediately adjacent to the. Consequently, the Proposed Project would not have an effect on "historic property."

According to CEQA §15064.5 (b), "substantial adverse change in the significance of a historic resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surrounding such that the significance of a historical resource would be materially impaired." In order to create such a substantial adverse change, the resource must possess historical significance. Because no historic resources exist at the project site, implementation of the Proposed Project would not affect any known historic resources as defined in CEQA Guidelines Section 15064.5, and there would be no impact.

Further, compliance with General Plan policies would further ensure that impacts on historical structures or resources would not occur or remain less than significant.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?
d) Disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant Impact with Mitigation Incorporated. The project area lies within the Mission District, which represents an area where many important events in the early history of the Inland Empire region took place. In addition to a number of historic-period buildings and structures throughout the District, it is believed that subsurface deposits have a high potential for containing artifacts of some significance to local or regional history. However, the surficial layers at the project site have been highly disturbed due previous agricultural activity. Implementation of mitigation measure **CUL-**1 and **CUL-2** would ensure potential impacts to archaeological resources would be less than significant.

According to Figure 4.5.1 of the General Plan EIR, the Project area occurs within an area that has an undetermined potential for paleontological resources. The GP EIR determination was based on the lack of literature and records checks, and other field surveys relative to this area.[11] Surficial soils in the project area are Holocene in age and have been assigned a low potential to adversely impact significant

[9] Loma Linda General Plan EIR, Chapter 4.5.
[10] AMEC, Cultural Resources Assessment (2012).
[11] Loma Linda General Plan EIR, Chapter 4.5.

nonrenewable fossil remains. However, Pleistocene deposits may be present at lower depths, and those deposits have a high sensitivity for paleontological fossils. The PRA (2012) confirms the potential to impact to paleontological resources is low within the Holocene-age surface soils, but high within the subsurface deposits of older Quaternary alluvial sediments at depths in excess of 15 feet below the current ground surface. In the event ground disturbances below 15 feet are required, implementation of mitigation measure **CUL-3** would ensure impacts to paleontological resources would be less than significant.

Construction activities, particularly grading, soil excavation and compaction, could disturb surficial layers that may contain (unknown) human remains. The potential to impact unknown human remains exists when excavation is involved. State law establishes notification and recovery procedures if human remains are discovered during the development process. Implementation of State law and mitigation measure **CUL-4** would ensure that potential impacts would remain less than significant.

The potential of unearthing archaeological or paleontological resources or human remains during grading and excavation is unknown but unlikely given the low potential for these resources to occur on-site. Thus impacts to these resources are considered to be less than significant. However, implementation of mitigation measures **CUL-1 through CUL-4** is recommended to ensure that potential impacts remain less than significant. These mitigation measures require that construction activities be observed by qualified experts.

Recommended Mitigation Measures:

CUL-1: Because of the high sensitivity of the project site for subsurface archaeological remains, archaeological monitoring shall be required during all earth-moving activities and shall be conducted by a qualified archaeologist. Should cultural materials more than 50 years old be discovered, they shall be field recorded and evaluated. Should substantial cultural deposits be encountered, all ground-disturbing activities shall cease in the area of the discovery and a qualified archaeologist shall be retained to evaluate the significance of the finding and determine the appropriate course of action. Appropriate salvage operation requirements shall be followed. Site records or site record updates (as appropriate) incorporating the artifacts encountered during monitoring, shall be prepared and submitted to the Archaeological Information Center as a permanent record of the discovery (as appropriate). A report that documents the methods and results of the monitoring program, including an itemized inventory of recovered artifacts and a detailed artifact analysis, shall be prepared upon completion of the fieldwork. This report shall include an interpretation of the cultural activities represented by the archaeological remains and a discussion of the significance of all recovered cultural material. Collected artifacts shall be cleaned, identified, catalogued, analyzed, and prepared for curation at an appropriate repository with permanent retrievable storage that would allow for additional research in the future.

CUL-2: On-site monitoring shall be coordinated with local Native American groups who request to participate, including requests for government to government consultation.

CUL-3: A paleontologist shall monitor site grading activities with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate reposition, and file a report with the City Planning Department documenting any paleontological resources that are found during site grading. A paleontological mitigation monitoring program shall be developed in accordance with the provisions of CEQA as well as the proposed guidelines of the Society of Vertebrate Paleontology and shall include, but not be limited to, the following:

- Monitoring of excavations that will exceed five feet in depth in the Project Area by a qualified paleontologic monitor. Paleontologic monitors should be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments that re likely to contain the remains of small fossil invertebrates

and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens.

- Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.
- Identification and curation of specimens into a museum respository with permanent retrievable storage. The paleontologist should have a written repository agreement in hand prior to the initiation of mitigation activities.
- Preparation of a report of findings with and appended itemized inventory of specimens. The report an inventory, when submitted to the appropriate Lead Agency, would` signify completion of the program to mitigate impacts on paleontological resources.
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CUL-4: As part of normal field procedures, if suspected human remains are encountered during site activity, all work in the area shall cease and the San Bernardino County Coroner's Office shall be contacted immediately.

3.6 GEOLOGY AND SOILS

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

a) Expose people or structures to 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?

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 (1997), creating substantial 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?

Less Than Significant Impact. A Geotechnical Investigation Report was prepared by CHJ Consultants, dated May 2, 2012 to review project site conditions and the potential for impacts from geotechnical issues and hazards. This geotechnical study was incorporated into the Draft Environmental Assessment for U.S. Department of Veterans Affairs Loma Linda Health Clinic, prepared by Albert A. Webb Associates and dated October 16, 2012. A copy of the Environmental Assessment (EA), including the geotechnical report, is on file with the city of Loma Linda and may be obtained from the Community Development Department.

A Geotechnical and Geologic Constraints Report was prepared by RMA Group, dated February 21, 2013 for Lewis Operating Corporation and associated with processing of Tentative Parcel Map No. 19018. The RMA report covers an approximate 82 acre area, including the 36.9-acre project site. A copy of the RMA Geotechnical and Geologic Constraints Report is provided in Appendix D. The discussion below summarizes the relevant findings of both the CHJ and RMA studies.

Geologic Setting

The City of Loma Linda is situated within the northern Peninsular Ranges Geomorphic Province of California. Locally, the City lies near the transition zone between the Transverse Ranges Geomorphic Province to the north and the Peninsular Ranges Geomorphic Province to the south. The Peninsular Ranges are a northwest-southeast oriented complex of blocks separated by similarly trending faults which extend 125 miles from the Transverse Ranges to south of the California/Mexican border and beyond another 775 miles to the tip of Baja California.[12]

The site is located within a structural mass of the earth's crust known as the Bunker Hill-San Timoteo Basin. This basin formed as a rift zone between the active San Andreas fault on the northeast and the active San Jacinto fault on the southwest. The southern boundary of the basin is less well defined, but it generally coincides with a topographic drainage divide in the Banning-Beaumont region. The basin is infilled with alluvial deposits. There are topographic highs within the basin that expose pre-Cambrian age metamorphic rocks and Pliocene to Pleistocene sedimentary units.[13]

The project site is relatively flat sloping to the northwest at approximately 1 to 2 percent gradient. Groundwater was not encountered above a depth of 75 feet below ground surface (bgs).[14]

Seismic Hazards

The Loma Linda General Plan indicates that the project site is not located within a special studies (Alquist-Priolo) zone. The closest mapped fault is the Loma Linda Fault (inactive) that lies approximately 1/4 mile southwest of the project site.

The site is located between two major, active fault zones, the San Andreas and San Jacinto faults. Between these two faults there are many other faults collectively known as the Crafton Hills fault zone. The Banning fault, a postulated concealed fault, passes through the site; however, this fault is not

[12] Loma Linda General Plan EIR, Chapter 4.6 (Geology and Soils).
[13] RMA, Geotechnical and Geologic Constraints (2013).
[14] CHJ, Geotechnical Investigation (2012).

identified as a surface rupture hazard by a State of California Earthquake Fault Zone map or a similar city of Loma Linda or County of San Bernardino fault rupture hazard zone map.

Southern California is a seismically active region; however, safety provisions identified in the Uniform Building Code and California Building Code (CBC) shall be required which will reduce potential ground shaking hazards to a level below significance.

The project site would be subject ground-shaking and seismic-related hazards due to earthquakes that occur from time to time in the Southern California area. The proposed project would introduce new construction and people to the site and thus would incrementally increase the exposure of people or structures to the risks of seismic activity, including fault rupture, ground-shaking and liquefaction. Utilization of proper construction methods and development standards as defined in the Development Code and the latest adopted building regulations already reduce potential impacts to acceptable and less than significant levels.

Liquefaction refers to a phenomenon where the surface soils, generally alluvial soils, become saturated with water and fail. The potential for liquefaction is increased in areas with susceptibility for high water tables or inundation coupled with groundshaking. At the project site, there is a potential for liquefaction to occur at depths ranging from approximately 59 to 63 feet bgs and seismic settlement may potentially occur ranging from 2.3 to 4.0 inches and maximum seismic differential settlement of approximately 1.75 inches.[15] However, surface manifestation effects of liquefaction on the proposed project would be considered to be negligible. While seismic and differential settlement is anticipated, adherence to the CBC and implementation of seismic design consideration recommendations from the geotechnical reports would supply adequate strength against seismic settlement. Thus, impacts due to seismic-induced liquefaction would be less than significant.

Soils

The site is underlain by artificial fill and Holocene age alluvium. The surficial soils exhibit previous disturbance due to past agricultural activity and installation of utility improvements within the area, and more recently the deposit of artificial fill across the site. The artificial fill was imported onto the site from a stockpile located at the southeast corner of Barton Road and California Street. It was spread across the property to depths ranging from 1½ to 3 feet, but it was not compacted. The fill is composed of light brown and light gray brown silty sand. Small amounts of roots, twigs, wood chips and plastic are present at the base of the fill.[16]

The disturbed native soil mantle is underlain by native alluvium. The alluvium is composed of sandy silts, silty sands and sands that locally contain clay. The alluvium beneath the site is approximately 950 feet thick and that it rests upon granitic bedrock. Slightly to moderately porous alluvial soils are encountered to depths of approximately 4 to 7 feet below the ground surface. At greater depths, non-porous to slightly porous soils were encountered, and data indicates that soils are loose to medium dense to depths of about 14 to 21 feet.[17]

The silty soil materials at the project site exhibit a low potential for expansion and collapse is not anticipated.[18] Soils were tested for corrosivity and determined that soils are “mildly” and “severely” corrosive to ferrous metals at as-received and saturated conditions, respectively. Nitrate contents indicate a concern with respect to corrosion of buried copper. Soluble chloride content of the soil was at levels high enough to indicate a concern with respect to corrosion of reinforcing steel.[19]

Because any improvement projects within the City that involve structural components tied to soils are required to submit for review and approval a soils report or geotechnical report prepared by a State-licensed geotechnical engineer, and to comply with conclusions and recommendations of the soils report

[15] CHJ, Geotechnical Investigation (2012).
[16] RMA, Geotechnical and Geologic Constraints (2013).
[17] RMA, Geotechnical and Geologic Constraints (2013).
[18] CHJ, Geotechnical Investigation (2012).
[19].CHJ, Geotechnical Investigation (2012).

which ensure that the structural integrity of any future construction would not be compromised by the underlying soils, the potential for impacts resulting from expansive soils and other soil-related hazards would be less than significant. Compliance with standard City engineering requirements, as well as the recommendations of any geotechnical and soils report, would minimize the potential for impacts resulting from unstable soils and geotechnical hazards. Therefore, the proposed project would not result in any substantial impact due to landslide, subsidence, collapse or other soil hazard, and impacts would be less than significant.

Other Geotechnical Hazards

Subsidence due to fluid withdrawal (groundwater pumping) has been documented in the San Bernardino Valley region. However, it has not been documented within the area of the proposed site. Further, subsidence generally occurs as a regional-scale phenomenon in which case, it would not be expected to produce building-scale effects in the area of the site.[20] No impact is anticipated and no further study is required.

The potential occurrence of landslides is minimal because the project site is flat and is not on or near a geologic formation that would cause landslides. Further, site conditions are not conducive to lateral spreading.[21] Thus no impacts due to landslides are anticipated and no further study is required.

No septic tanks or alternative wastewater disposal are proposed, thus no impacts due to septic tanks would occur.

Standard conditions of approval applied by the city of Loma Linda already require that all applicable geotechnical recommendations identified in the geotechnical studies, which have been prepared by a qualified and licensed engineer, be implemented. Therefore, it is assumed that construction would address the recommendations made in the geotechnical report to ensure seismic and soils stability and reliability. Development of the proposed project would be required to implement and comply with conclusions and recommendations of the soils report which ensure that the structural integrity of any that construction (or any other future construction and/or improvements) would not be compromised by the underlying soils. Compliance with standard City engineering requirements, as well as the recommendations of any geotechnical and soils report, would minimize the potential for impacts resulting from unstable soils and geotechnical hazards.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. Construction of the proposed project could result in soil erosion and/or the loss of topsoil. Erosion and associated sediment resulting during construction may cause short term impacts. However, projects that disturb over one acre are required to be in compliance with the National Pollution Discharge Elimination System (NPDES) stormwater permit. The purpose of the NPDES is to contain and control sediment on a short-term basis during construction by preventing soil from leaving the site and entering storm drain facilities to impact downstream sources. To comply with NPDES requirements, the Municipal Stormwater Permit (MS4) for San Bernardino County was adopted by the Santa Ana Regional Water Quality Control Board on January 29, 2010 (R8-2010-036, NPDES CAS618036) and as required by the Clean Water Act. The proposed project would be required to adhere to and comply with the MS4 Permit, and thus NPDES General Construction Permit and implement an effective Stormwater Pollution Prevention Plan (SWPPP) during construction. As the proposed site is relatively flat, it is not subject to significant erosion by water through surface drainage during construction. Once construction is complete, the site would be paved and landscaped, thus minimizing open soil surfaces. The proposed project is anticipated to incorporate drainage features and best management practices (BMPs) identified in a water quality management plan (WQMP) to minimize runoff and erosion. During site construction, measures would be taken to minimize fugitive dust and thus minimize the potential for exposed soils to be carried off-site due to wind. Therefore, any future improvements resulting from the proposed project would not result in any substantial soil erosion or loss of topsoil, and impacts

[20] CHJ, Geotechnical Investigation (2012).
[21] CHJ, Geotechnical Investigation (2012).

would be less than significant because required practices and compliance with applicable regulations minimize the potential for soil erosion. See also Responses 3.9.a and 3.9.f.

3.7 GREENHOUSE GAS EMISSIONS

VII. GREENHOUSE GAS EMISSIONS	*Potentially Significant Impact*	*Less Than Significant Impact 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) 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?

Less Than Significant Impact. See Response 3.3.a through 3.3.c. The proposed project would not result in the generation of greenhouse gas emissions that exceed federal, state or local criteria. Construction activities would produce emissions over a short-term that would result in a temporary incremental increase of greenhouse gas emissions. However, the construction emissions are anticipated to be less than significant and short-term. The proposed project would be consistent with applicable air quality plans that address greenhouse gas emissions. Thus the proposed Project would have less than significant impact relative to the generation of greenhouse gas emissions. No mitigation is required.

3.8 HAZARDS AND HAZARDOUS MATERIALS

VIII. HAZARDS AND HAZARDOUS MATERIALS	*Potentially Significant Impact*	*Less Than Significant Impact 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) Result in a safety hazard for people residing or working in a project area 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?	☐	☐	☐	☒

f) Result in a safety hazard for people residing or working in a project area within the vicinity of a private airstrip?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

A Phase 1 Environmental Site Assessment (ESA) was prepared by CHJ Consultants, dated April 27, 2012 to review project site conditions and the potential for impacts from hazards substances. This Phase 1 ESA was incorporated into the Draft Environmental Assessment for U.S. Department of Veterans Affairs Loma Linda Health Clinic, prepared by Albert A. Webb Associates and dated October 16, 2012. A copy of the Environmental Assessment (EA), including the Phase 1 ESA report, is on file with the city of Loma Linda and may be obtained from the Community Development Department.

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?

Less Than Significant Impact. Hazardous materials in the city of Loma Linda are routinely used, stored, and transported in commercial/retail businesses as well as in educational facilities, institutions, hospitals, and households. A hazardous material is defined as any material that due to its quantity, concentration, physical or chemical characteristics, poses a significant present or potential hazard to human health or to the environment if released. Hazardous materials include, but are not limited to, inorganic and organic chemicals, solvents, mercury, lead, asbestos, paints, cleansers, or pesticides. Hazardous materials were and are being used in the City through manufacturing, auto and truck sales, repair service activities, and other related activities.

The transport of hazardous materials is regulated by the state Department of Transportation (Caltrans) and California Highway Patrol (CHP). Several regional highways, including I-10 (San Bernardino Freeway) that serve as major routes where hazardous materials can be routinely transported pass through or adjacent to the city of Loma Linda. Several other major truck routes (primarily along major arterial roadways) by which hazardous materials are routinely transported by trucks are within in the City area along roadway arterials.

The *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) was developed to protect the environment from the risks created by past chemical disposal practices. The United States Environmental Protection Agency (EPA) maintains a list of all known contaminated sites and the status of clean-up activities. The Hazardous Waste and Substances Sites (Cortese) List is a tool used by the state and local agencies to identify and track the location of hazardous materials release sites. California Government Code Section 65962.5 requires the California EPA to develop an updated Cortese List at least annually.

Existing hazardous materials regulations already protect people and locations from unreasonable exposure to hazardous materials and substances. For example, Titles 8, 22, and 26 of the CCR, and their enabling legislation set forth in Chapter 6.95 of the California Health and Safety Code, were established at the State level to ensure compliance with Federal regulations to reduce the risk to human health and the environment from the routine use of hazardous substances. The following existing Federal, State, and City regulations are established to control exposure to potentially hazardous materials:

Federal Regulations

- Resources Conservation and Recovery Act (RCRA): relates to hazardous waste management.
- Hazardous and Solid Waste Amendments Act (HSWA): relates to hazardous waste management.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): relates to cleanup of contamination.
- Emergency Planning and Community Right-to-Know (SARA Title III): relates to business inventories and emergency response planning.

State Regulations

- Hazardous Materials Management Act: relates to business plan reporting.
- Hazardous Waste Control Act: relates to hazardous waste management.
- Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): relates to release of and exposure to carcinogenic chemicals.
- Hazardous Substances Act: relates to cleanup of contamination.
- California Medical Waste Management Act: relates to medical and bio-hazardous wastes.

These regulations would be implemented by the proposed project and its operators, as appropriate, and would be monitored by the State (e.g., Cal Occupational Health and Safety Administration (OSHA) in the workplace or DTSC for hazardous waste), and/or local jurisdictions (e.g., the Department of Public Safety's Fire and Rescue Division and the San Bernardino County Environmental Health Division), as appropriate. Because substantial regulation and documentation exists to address hazardous materials, aside from a catastrophic event, potential impacts due to use or transport of hazardous materials would be less than significant.

The Mission Elementary School is located approximately one-quarter mile east of the project site. A new middle school is proposed immediately south of the project site, but is not yet constructed

There is a potential for release of hazardous emissions or handling of hazardous materials and substances during the short-term construction activities during construction of the proposed development. However, because substantial federal, state and local regulations addressing the transport, use, storage and disposal of hazardous materials are in place, the potential for substantial impacts and risks from hazardous emissions and schools would be less than significant. Compliance with applicable hazardous materials regulations would reduce the likelihood of unsafe release of hazardous emissions to less than significant levels.

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?

Less Than Significant Impact with Mitigation Incorporated. The Phase 1 ESA determined that no underground storage tank permits were identified on site or within one-quarter mile of the project site. However, four permitted facilities with active and inactive handler/generator permits were identified within one- quarter northwest of the site. One small quantity generator of hazardous waste was identified one-quarter mile east of the site on Redlands Boulevard. Due to distance from the project site and lack of specific groundwater connection, these locations do not pose a hazardous risk at the proposed project.

The Phase 1 ESA concluded the project site shows no obvious evidence of handling or use of hazardous materials. However, because of the historical agricultural uses of the project site, agricultural pesticides may have resulted in pesticide residues in soil at concentrations that are considered to be hazardous. Site reconnaissance completed for the Phase 1 ESA encountered evidence of at least two wind machines (the power source of the wind machines was not apparent) and two empty smudge pots within the project site. Several concrete standpipes and other remnants of a furrow-type irrigation system remain throughout the project site. There was no evidence of underground or above ground storage tanks on the subject site; although investigation of past activity suggests that above ground fuel tanks associated with the wind machines have been previously removed. Additional similar structures may also be present onsite. A few piles of debris including tires, wood, furniture and miscellaneous household items, trash and

debris were noted in the northeastern portion of the site. While no evidence of a septic system was noted, a former residence located on the site was likely to have one.

The site has the potential for the existence of contaminated groundwater and remnants of at least two wind machines on-site represent a recognized environmental condition due to the potential unknown presence of associated underground tanks

To ensure that existing conditions that place hazardous materials/substances within the project site would not result in a significant hazard to the public or the environment during implementation of the proposed project, potential impacts related to the presence of hazardous materials should be reduced to less than significant with the assurance implementation of mitigation measures already identified in the General Plan EIR and required as standard conditions for project development within the city of Loma Linda. However, implementation of the following recommended mitigation measures **HAZ-1 through HAZ-5** would ensure that impacts from potential hazardous materials and reduce the potential for uncontrolled release of hazardous substances at the project site would remain less than significant.

Recommended Mitigation Measures

HAZ-1: All miscellaneous vehicles, maintenance equipment and materials (i.e., fertilizer, lubricants, grease, waste-oil, gasoline), construction/irrigation materials, miscellaneous stockpiled debris, storage tanks, smudge pots, and 5-gallon buckets, shall be removed off-site and properly disposed of at an approved landfill facility. Once removed, a visual inspection of the areas beneath the removed materials shall be performed. Any stained soils observed underneath the removed materials should be sampled. Result of the sampling (if necessary) shall indicate the level of remediation efforts that may be required.

HAZ-2: During site grading, soil sampling shall occur throughout the project site, to determine if pesticide concentrations exceed established regulatory requirements. If concentrations are found to be at excessive levels, the applicant/developer shall notify the Loma Linda City Engineer and identify proper handling procedures (if any) that may be required.

HAZ-3: Should construction require dewatering activities, or should groundwater be encountered during construction, a qualified hazardous materials consultant with Phase II and Phase III experience shall review groundwater documents regarding regional groundwater quality and determine what additional (if any) investigations and research may be required. Should groundwater be encountered, the Loma Linda City Engineer should be notified immediately and appraised of site conditions and informed of all follow-up investigation.

HAZ-4: Any water wells encountered during site grading and construction shall be property removed and abandoned pursuant to the latest procedures required by the local agency with closure responsibilities for the wells. Any associated equipment (i.e., diesel fuel tank, concrete, piping, and associated materials) shall be removed off-site and properly disposed of at a permitted landfill. A visual inspection of the areas beneath the removed materials (if any) shall be performed to determine what (if any) remedial measures may be necessary.

HAZ-5: If unknown wastes or suspect materials are discovered during construction by the contractor, which he/she believes may involve hazardous waste/materials, the contractor shall:

- Immediately stop work in the vicinity of the suspected contaminant, removing workers and the public from the area;
- Notify the Project Engineer of the implementing Agency;
- Secure the areas directed by the Project Engineer; and
- Notify the implementing agency's Hazardous Waste/Materials Coordinator.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The project area is not located within an airport land use plan and is not within two miles of a public airport. The nearest airport is the San Bernardino International Airport (SBIA) located over two miles north of the project site and the Redlands Municipal Airport, located approximately eight miles northeast of the site. There are no private airstrips within the immediate vicinity of the project site. Thus, the proposed project would not be impacted by or pose a safety hazard for any airport or private airstrip. No impact is anticipated and further analysis is not required.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. The California Emergency Services Act requires the City to manage and coordinate the overall emergency and recovery activities within its jurisdictional boundaries. The City's Emergency Operations Plan includes policies and procedures to be administered by the City in the event of a disaster. During disasters, the city of Loma Linda is required to coordinate emergency operations with the County of San Bernardino. The Loma Linda General Plan EIR concluded that the General Plan's policies set adequate performance standards for emergency preparedness within the City and concluded that the impact of development (related to buildout of the General Plan) on emergency plans would be less than significant. Policies within the City's General Plan and updates to the City's Emergency Plan, as required by State law, would ensure the proposed project would not interfere with adopted policies and procedures, and that potential impacts would remain less than significant. Further analysis is not required.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. Although the city of Loma Linda does have defined areas susceptible to wildland fires, these areas are located in the open space/hillside areas south of the City and non-contiguous to the project site The proposed project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires and there would be no impact. Further analysis is not required.

3.9 HYDROLOGY AND WATER QUALITY

IX. HYDROLOGY AND WATER QUALITY	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) 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?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

a) Violate any water quality standards or waste discharge requirements?
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off-site?
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
e) 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?
f) Otherwise substantially degrade water quality?

Less Than Significant Impact. A Preliminary Hydrology Report and Water Quality Management Plan (WQMP) was prepared by Kimley-Horn and Associates, Inc., dated November 21, 2013 to assess project site hydrological conditions for pre and post development. This study is provided in Appendix E. The discussion below summarizes the Preliminary Hydrology Report and WQMP.

The project site is currently vacant and undeveloped with minimal vegetation. Generally, the site has mild slopes less than two percent with elevations ranging from 1150 feet above mean sea level (amsl) in the southeast corner of the site to 1130 feet amsl in the northwest corner of the site. Stormwater runoff flows as sheet flow in the northeast direction toward the only outfall at Redlands Boulevard. At Redlands Boulevard, the roadway curb and gutter conveys flows west several hundred feet to the public storm drain system at the intersection with Mountain View Avenue. From this point, the storm drains flow north and discharge into Mission Channel.

Because the project site is unimproved, no storm drains exist in the immediate vicinity of the site. Presently, the adjacent land owner will be extending Bryn Mawr Avenue south from its current termination at Redlands Boulevard. This extended portion of Bryn Mawr Avenue borders the project property to the east and will include utilities and a new storm drain system. The new storm drain system will discharges into Mission Channel at the northern end of Bryn Mawr Avenue. A lateral connection with a design

capacity of 23.2 cubic feet per second (cfs) will be provided for the project site to utilize as a stormwater outfall.[22]

After construction, the site will utilize both Redlands Boulevard and the new Bryn Mawr storm drain lateral as outfalls for stormwater runoff with contributing drainage areas to each outlet. The city of Loma Linda requires that post-development peak flow must be less than the pre-development peak flow for the 100-year storm based on historical drainage patterns with the exception that flow may be diverted into an engineered, hardened, and maintained stormwater conveyance system with adequate capacity.

The project site would be graded and engineered to reflect two drainage zones: DA1 and DA2. For the DA2 drainage zone, the new lateral connection from the Bryn Mawr storm drain has been designed to accept a 100-year peak flow of 23.2 cfs from the project site runoff. The proposed grading and drainage plan for the proposed project has been designed to divert a portion of the site drainage to the Bryn Mawr storm drain while maintaining a peak 100-year flow rate less than the available capacity. Although stormwater quality and best management practices (BMPs) must be addressed, no additional detention storage or controlled release of flows is necessary or proposed.

However, detention storage would be provided for the DA1 drainage zone to attenuate the 100-year flows to less than pre-development rates. Aboveground detention storage volume would be provided in two broad, shallow, and interconnected surface ponds near the northwest corner of the site. Three parkway drains would serve as outlet control structures to release flow from the ponds at metered rates through the curb face along Redlands Boulevard. Due to the broad geometry, maximum depth of water within the pond would be limited to 36 inches. Due to site constraints, a small portion of the mostly landscaped perimeter of the DA1 drainage zone would bypass the detention pond. However, this flow would be accounted for when determining overall post-development impact of drainage zone DA1. Post-development peak flow would not exceed the pre-development peak flow at Redlands Boulevard.

The proposed project is required to prepare a Water Quality Management Plan (WQMP) to demonstrate compliance with the 2010 Municipal Separate Storm Sewer System (MS4) Permit, issued to San Bernardino County and the city of Loma Linda as a co-permittee. The requirement to implement a program for development planning is based on federal and state statutes including Section 402 (p) of the Clean Water Act. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the National Pollution Discharge Elimination System (NPDES) program. The State of California is authorized to administer various aspects of the National Pollutant Discharge Elimination System (NPDES). Construction activities covered under the State's General Construction permit include removal of vegetation, grading, excavating, or any other activity that causes the disturbance of one acre or more. See also Response 3.6.b.

The MS4 permit requires the implementation of low impact development (LID) BMPs to the maximum extent practicable for the 85th percentile, 24-hour storm. A new on-site storm drain system would be installed to collect and convey runoff to the outlet locations. However, all on-site storm flows would first be routed through one of several infiltration basins dispersed throughout the site. The City routinely requires implementation of Best Management Practices during construction activities, which include screening catch basins during construction and other similar practices. For example, an erosion/sediment control plan and a WQMP are required to address on-site drainage control during construction.

Construction activity related to implementation of the proposed project may cause soil sedimentation and water pollution during grading and other construction activities. Following completion of the project development, ongoing maintenance and irrigation of the related landscaped areas and parks could lead to sedimentation and water contamination. The proposed project would increase the amount of impervious area thereby increasing the amount of potential runoff from the site.

[22] Refer to the Hydrology & Hydraulics Report for TPM 19018, Special Planning Area D, by Parsons Brinckerhoff, dated July 25, 2013, revised September 25, 2013 for additional information regarding the Bryn Mawr storm drain system. A copy of this report is on file with the city of Loma Linda Public Works Department.

With implementation of best management practices and compliance with the NPDES and MS4 Permit programs, the net increase in peak runoff and the resultant impact would be less than significant and would not exceed the capacity of existing or planned stormwater drainage systems, or contribute a significant amount of pollutants to runoff. In accordance with best management practices, the proposed project would protect water quality by complying with City standards and a SWPPP. All physical improvements related to the proposed project would be consistent with appropriate best management practices, low-impact development requirements and applicable water quality considerations typical of all development carried out within the City. Therefore, with adherence to standard conditions and best management practices, the proposed project would not substantially degrade water quality, and impacts would be reduced to less than significant.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less Than Significant Impact. The project site is located within the Santa Ana River Watershed and is located primarily in the Bunker Hill Hydrologic Subarea of the Santa Ana Drainage Province. The site is more specifically situated and served by the southern portion of the Bunker Hill Groundwater Basin, an approximately 200-square mile aquifer. This basin is artificially recharged by surface stream diversions made for groundwater replenishment. The water that replenishes the Bunker Hill Basin comes from annual rainfall and snow pack from the San Bernardino Mountain range. There are no watercourses located within the project area. The depth to groundwater in State Well No. 01S/03W-19L001, located within approximately 0.5 miles north of the proposed site, was 196 feet below ground surface (bgs) in November 2011. The groundwater gradient in the subject site area is toward the west-northwest following the topography and trend of the Santa Ana River.[23]

The City obtains all of its water from groundwater wells in the Bunker Hill Basin, an aquifer underlying the San Bernardino Valley. The proposed project would not deplete groundwater supplies nor would it interfere with recharge since it is not within an area designated as a recharge basin or spreading ground. Thus impacts to groundwater supply and recharge would be less than significant.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

j) Inundation by seiche, tsunami, or mudflow?

No Impact. According to Federal Emergency Management Agency Flood Insurance Rate Maps, the site is located within Flood Zone X, which is defined as outside the zone with 0.2% annual chance floodplain. According to the Loma Linda General Plan and the San Bernardino County General Plan Hazard Overlay Map FH31B, the site is not located within a flood hazard zone.[24]

The proposed Project would not introduce new housing development. Because no new housing or structures are proposed, and the project site is not located within a documented flood zone, there is no potential for impacts due to flood hazards. Further analysis is not required.

Due to the inland distance from the Pacific Ocean and any other significant body of water, tsunamis and seiching are not potential hazards; therefore impacts from seiche and tsunami are not anticipated. Hence, the City is not likely to experience impacts due to inundation by seiche, tsunami or mudflow, and no impacts are expected. Further analysis is not required.

[23] CHJ, Environmental Site Assessment (2012).
[24] RMA, Geotechnical and Geologic Constraints (2013).

3.10 LAND USE AND PLANNING

X. LAND USE AND PLANNING	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

a) Physically divide an established community?

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. The proposed site is currently vacant. It is bordered by multi-family residential uses on the west, vacant land on the east and south, and a major four-lane arterial immediately to the north (Redlands Boulevard) and vacant, business park and multi- and single-family residential uses across Redlands Boulevard. The surrounding area consists of mixed uses that include commercial, office and residential. Interstate 10 (I-10) is located approximately one-quarter mile to the north. A storage facility and single-family residences lie west of the Project. Vacant land, orange groves, a recreational vehicle park and a school are located farther east of the project site. Orange groves and vacant land buffer single-family residential uses lying to the south, but this area has been approved for a middle school site.

The project site is designated by the General Plan Land Use Map as Special Planning Area "D," and is consists of 36.9 acres at the northwest portion of this overall 299-acre Special Planning Area. The project site is also located within the boundary of the East Valley Corridor Specific Plan, which classifies the site as Special Development (EVC-SD). The City of Loma Linda is not regulated by any Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP), thus the project site is not regulated by any of these habitat plans.

The proposed Project would be substantially consistent with the existing land use designation of Special Planning Area D and the Phase One Concept parameters for this designation. The proposed Project is located entirely within the Phase One Concept area and reflects a mix of institutional, retail and mixed uses intended for this area. Consistent with the implementing policies for Special Planning Area D, the proposed Project would include at least 5.2 acres of park area for public use and various on-site amenities, including project parking, outdoor plazas, trails and amenities of visual interest.

The proposed Project involves a request to amend the City Zoning Map in order to reflect the PD overlay designation. The zone change would add the Planned Development (PD) designation to Parcel 1, thus changing the existing zone classification of EVC-SD to EVC-SD-(PD). However, application of the PD designation is required for any development at the project site in order to establish a critical review process that ensures development is found to be consistent with applicant land use regulations and policies.

Land uses associated with the proposed Project would be consistent with the underlying Loma Linda General Plan, EVC Specific Plan and Zoning Code designations, and would be consistent with, and reinforce, the applicable land use plans, policies and regulations that are already in place. Because the proposed Project would be substantially consistent with the applicable land use policies and zoning requirements, no impact to land use is anticipated.

3.11 MINERAL RESOURCES

XI. MINERAL RESOURCES	*Potentially Significant Impact*	*Less Than Significant Impact 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) 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?

No Impact. The proposed Project would not 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 due to urbanization and limited accessibility because there are no identified locally important mineral resources within the project area, and no impact any know mineral resource would occur. Further analysis is not required.

3.12 NOISE

XII. NOISE	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) Exposure of people residing or working in a project area, which is 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, to excessive noise levels?	☐	☐	☐	☒
f) Exposure of people residing or working in the project area, which is within the vicinity of a private airstrip, to excessive noise levels?	☐	☐	☐	☒

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact. The responsibility of noise abatement and control has been delegated to State and local governments, but the noise levels and exposure recommendations developed by EPA under the Noise Control Act are still relevant.

Noise can be measured in the form of a decibel (dB), which is a unit describing the amplitude of sound. The predominant rating scales for human communities in the State of California are the Equivalent-Continuous Sound Level (Leq) and the Community Noise Equivalent Level (CNEL) based on the A-weighted decibel (dBA). Leq is the total sound energy of time-varying noise over a sample period. CNEL is the time-varying noise over a 24-hour period, with a weighting factor of 5 dBA applied to the hourly Leq for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours). For events occurring between 10:00 p.m. and 7:00 a.m. (defined as sleeping hours) a weighting factor of 10 dBA is applied. The purpose of these standards and guidelines is to provide a framework, setting standards for human exposure to noise.

The proposed site is currently vacant and bordered by multi-family residential uses on the western boundary, vacant land on the eastern and southern boundary, and a major four-lane arterial to the north (Redlands Boulevard). The surrounding area is consists of a mix of urban uses, including commercial, office and residential.

A Noise Impact Analysis was prepared by Kunzman Associates, Inc. (dated February 28, 2014) to analyze the effects of the proposed Project to noise and vibration ambient conditions and surrounding uses. A copy of the Noise Impact Analysis is provided as Appendix F. The discussion below summarizes the findings of the Noise Impact Analysis. The Noise Impact Analysis analyzed the potential for project construction noise and operational noise to cause an exposure of persons to or generation of noise levels in excess of established city of Loma Linda noise standards or applicable standards of other agencies.

Noise

Short-Term Construction Noise

The closest receptor to the project site is the multiple-family residential complexes located immediately west of the project site and on the north side of Redlands Boulevard. These residential dwelling units would be impacted by short-term noise impacts associated with the proposed construction activities. Short-term construction activities would include noise generated by the transport of workers and movement of construction materials to and from the project site and from demolition and ground clearing/excavation, grading, and building activities.

Site grading is expected to produce the highest construction noise levels. Grading of the site is estimated to require a grader, backhoe, dozer, excavator, and water truck. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings.

A typical construction day, eight hours in duration would generate a noise level of 84 dBA CNEL at a distance of 50 feet from the noise source, on average. Maximum noise events could reach up to 91dBA at approximately 25 feet from the residential buildings located immediately west of the site; up to 79dBA at the single-family detached residential dwelling units located approximately north of the site and Redlands Boulevard; 56.3 dBA at Mission Elementary School; and 58.7 dBA at the mobile home park located just

east of the project site. Although these would be relatively high single-noise events resulting in potential short-term intermittent annoyances, the effect on long-term ambient noise levels would be small when averaged over a longer period of time.

The city of Loma Linda Municipal Code Section 9.20.070 (Temporary Permit Procedures; Construction Noise) states that the owner or operator of a noise source which violates, or potentially violates any of the provisions of this chapter may file an application with the city manager for a temporary noise waiver from the provisions of Sections 9.20.030 and 9.20.050. Specifically, Section 9.20.070(C) states that "Developers that are involved with building construction and subdivision grading may exceed maximum noise levels between the hours of 7:00 AM and 8:00 PM, Monday through Friday, provided that all equipment is properly equipped with standard noise muffling apparatus specifically for such equipment (i.e., exhaust mufflers). Heavy construction is not permitted on weekends, or national holidays.

Construction activities for the proposed Project must adhere to the Municipal Ordinance which establishes allowed hours for construction activities as long as "all construction equipment shall use noise-reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer. Because the proposed construction activities would conform to the Loma Linda Municipal Ordinance (and the applicable measures listed for construction noise-generating activity) the proposed Project would result in a less than significant impact and no mitigation is necessary.

Long-Term Operational Noise

Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways and from stationary noise sources associated with the proposed project. The following section provides an analysis of potential long-term off-site and on-site noise impacts associated with the ongoing operations of the proposed project.

Off-Site Trip-Generated Noise The Noise Impact Analysis determined that existing traffic noise levels range between 69.2 and 74.5 dBA CNEL and that traffic noise levels once the proposed Project is occupied would range between 69.2 and 74.5 dBA CNEL at the nearest sensitive receptors along each road segment. In no case would project-generated vehicle traffic result in increases of more than 1 dBA along affected road segments. Project generated vehicle traffic would not result in substantial increases in ambient noise levels, and thus would be less than significant.

On-site Operational Noise - Exterior noise levels of up to 55 dBA CNEL are considered to be acceptable at single-family detached residential dwelling units and conditionally acceptable up to 70 dBA CNEL. The Loma Linda General Plan Noise Element discourages new projects that have potential to create ambient noise levels more than 5 dBA above existing background noise levels at sensitive receptors. Project operational noise would be considered a significant noise impact if it caused ambient noise levels to exceeds 55 dBA CNEL at a sensitive receptor or if it resulted in an increase of 5 dBA or greater over existing ambient noise levels.

Stationary noise sources/areas include the parking lots and loading docks. Under a worst-case scenario for delivery/services vehicles and operations at the loading dock area, noise levels at the nearest sensitive receptor would reach up to 52.8 Leq and 49.8 CNEL. Noise levels at the adjacent apartment complex (Orangewood) that may be affected by loading dock are currently 49.3 dBA Leq. Worst-case loading dock operation would result in an increase in ambient noise levels of 3.5 dBA Leq at the complex. Although adjacent residents may be able to discern a slight increase in ambient noise levels, this increase would not exceed 5 dBA and therefore would not be considered substantial. Therefore, operation of the proposed loading dock area would not cause noise levels at nearby sensitive receptors to exceed the City's noise/land uses compatibility criteria of 55 dBA CNEL and impacts due to noise associated with the loading dock would be less than significant..

Other noises that may be noticeable at the adjacent multiple-family residential units located to the west include vehicles starting and stopping, occasional car alarm activation and parking lot maintenance. Landscape maintenance noise would also occur. These noise sources would range between 55 and 70

dBA at 50 feet from the noise source. Project compliance with Section 9.20.050 of the Loma Linda Municipal Ordinance would lower potential parking lot noise to less than significant. This ordinance prohibits the operation of outdoor maintenance equipment (i.e., leaf blowers, lawn mowers, and gas edgers), parking lot sweepers, construction equipment, truck deliveries, and refuse collection between the hours of 10:00 PM and 7:00 AM. Operational noise will not result in a violation of the city of Loma Linda noise standards or cause permanent substantial increases in ambient noise levels.

Noise Impacts to the Proposed Project

The City of Loma Linda has identified noise levels of up to 70 dBA CNEL as “normally acceptable” for a medical clinic (Section 9.20.030 of the Loma Linda Municipal Code); and noise levels of up to 70 dBA CNEL are considered to be normally acceptable for parks as identified in the State of California Community Noise Exposure Table (see Noise Impact Analysis).

Future noise levels at associated with Redlands Boulevard after buildout of the proposed Project are expected to reach up 70dBA CNEL at a distance of 75 feet from the centerline of Redlands Boulevard.. Noise associated with Redlands Boulevard buildout traffic would not exceed City of Redlands standards at the proposed VA Clinic. Noise levels at the portion of the proposed promenade located adjacent to Redlands Boulevard will exceed 70 dBA CNEL under buildout traffic conditions. This is considered acceptable along the road because the promenade is essentially a public walkway, similar to a public sidewalk which would have been in close proximity to Redlands Boulevard. The proposed project is compliance with the City and State standards for hospital and park land uses. Thus impacts due to noise experienced at the project site would be less than significant and no mitigation measures are required.

Vibration

This impact discussion analyzes the potential for the proposed project to cause an exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration levels in the project area may be influenced by construction activities and from the ongoing operations of the proposed project.

A vibration impact would generally be considered significant if it involves any construction-related or operations-related impacts in excess of 0.05 inches per second root mean square (RMS) vertical velocity at nearby sensitive receptors. As reference, 0.035 inches per second is considered barely perceptible.

Short-Term Construction Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Construction activities can produce vibration that may be felt by adjacent uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels.

Although the primary sources of vibration during construction would be from bulldozers, vibratory rollers and other vibratory equipment could be used during installation of pavement over the entire site. A vibratory roller could produce up to a peak particle velocity (PPV) of up to 0.21 inch per second at 25 feet.

The closest receptor to the project site include is the multiple-family residential apartment complex (Orangewood) located approximately 10 feet from the project site’s west edge. It is anticipated that a bulldozer could be used at a distance of 25 feet from the western property line and vibratory equipment could be utilized at the property line, resulting in groundborne vibration levels of up to 0.29 PPV for short periods of time at the adjacent residential units. The threshold for potential structural damage to older residential structures is typically 0.3 PPV. Thus, the proposed project is not anticipated to result in any building damage, and impacts due to ground vibration during construction activity would be less than significant.

Long-Term Operational Vibration

A few heavy trucks can be expected to visit the project site to deliver supplies on a regular basis. These trucks would not be anticipated to exceed 0.10 in/sec PPV at 10 feet. Predicted operational-related vibration levels at the nearest off-site structures, which are located in excess of 25 feet from the traveled roadway segments, would not be anticipated to exceed even the most conservative threshold of 0.2 inch/second PPV. Thus, vibration impacts from long-term operation of the proposed project would be less than significant and no mitigation measures are necessary.

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 expose people residing or working in the project area to excessive noise levels?

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. No public airports are within two miles of the project site. The San Bernardino International Airport, located approximately two miles to the north of the proposed project, is the nearest airport. The project site falls outside the 65 dBA noise contour for this airport. Aircraft noise associated with the San Bernardino International Airport is not considered to be a source that contributes to the ambient noise levels on the project site. The proposed project would not expose persons residing or working within the area to excessive noise levels from aircraft. Thus there would be no noise impacts related to proximity to a public or public use airport. Further analysis is not required.

3.13 POPULATION AND HOUSING

XIII. POPULATION AND HOUSING	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Induce substantial 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 housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a) Induce substantial 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 housing, necessitating the construction of replacement housing elsewhere?

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. Implementation of the proposed Project would not induce population growth. Because no housing is present on the project site, the proposed Project would not directly result in displacement of any housing, and no impact is anticipated.

The proposed Project would create temporary short-term construction jobs. However, as construction is anticipated to be completed within an approximate one-year timeframe, temporary construction workers are not anticipated to relocate to the city of Loma Linda, and temporary demand for increased housing is not anticipated.

The Veterans Affairs Clinic Redlands Boulevard (VACRB) is an approximately 15,905-square-foot interim clinic located at 25828 Redlands Boulevard, Loma Linda CA on the northeast corner of Mountain View Avenue and Redlands Boulevard, just over one-quarter mile west of the project site that currently employs 30 people. The VAMC is located approximately 1.75 miles southwest of the project site. Upon implementation of the proposed Project, services and employees currently located at the VACRB would transfer to the new VA Clinic facility. In addition, 420 employees from the VAMC would transfer to this new facility. Operation of the proposed Project Action would result in 500 jobs, 450 of which would be transferred from other Veterans Affairs facilities within the city of Loma Linda, thereby creating 50 net new full-time positions. Because the proposed Project would not cause a substantial increase in new employees, a substantial increase in housing demand and resident population is not anticipated.

3.14 PUBLIC SERVICES

XIV. PUBLIC SERVICES	*Potentially Significant Impact*	*Less Than Significant Impact 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?	☐	☐	☒	☐

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?

Less Than Significant Impact. Fire protection services are provided by the city of Loma Linda, Fire and Rescue Division of the Department of Public Safety. The City maintains a joint response/automatic aid agreement with fire departments in neighboring cities including Colton, Redlands and San Bernardino to ensure adequate fire protection services in an emergency.

Police protection is provided by and contracted through the San Bernardino County Sheriff's Department. The city of Loma Linda provides deputies and a sheriff's service specialist with an area at City Hall for completing reports, conducting interviews, and crime prevention activities. The City shares the cost of law enforcement personnel and equipment with the city of Grand Terrace. Loma Linda University maintains its own security force with the City providing services on an as-needed basis.

The proposed VA Clinic would replace the current Veterans Affairs Clinic Redlands Boulevard (VACRB) also located in Loma Linda at 25828 Redlands Boulevard. Although the proposed VA Clinic would have 500 employees and have an occupant capacity of 1,400 persons, the net effect on demand for fire, police, schools, parks and other public facilities is anticipated to be less than significant because the proposed project would be transferring existing employees at other facilities and only a net increase of 50 new employees are anticipated. Therefore, the proposed project would resultant in substantial changes to the population and public service needs and impacts would be less than significant. The proposed Project would have a less than significant impact on the service ratios, performance objectives or physical facilities related to public services, including fire, police, schools, parks and other public facilities. As discussed above (see Response 3.13.a), the proposed project would not generate population growth that could result in increased public service needs. Thus, the proposed project would not measurably affect public services, including fire protection, police protection, schools, parks or other public facilities/services, and impacts are anticipated to be less than significant. No mitigation measures are necessary.

3.15 RECREATION

XV. RECREATION	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project;				
a) 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) 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?

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?

Less Than Significant Impact. See Response 3.14.d above. Because the proposed project would result in a substantial change in population, demand for parks and recreational services would be less than significant.

However, the project site is located within the Phase One Concept area of Special Planning Area D, as established by the Loma Linda General Plan. Implementing policies for Special Planning Area D require that new development provide plazas, pocket parks, trails and recreational features that encourage public gathering and physical activity. Within the Phase One area, a minimum of 5.67 acres of park area is required.

The proposed project would provide for almost 5.2 acres of linear park along Bryn Mawr Avenue and Redlands Boulevard for public use. An additional 7.9 acres of landscaped area would be incorporated internal to the project site and provide private park-like amenities via outdoor plazas, trails and sitting gardens. Development of the new park facilities is already contemplated in the context of the proposed project because park area is fully contained the Parcel 1 project area. Thus no additional effects to the environment are anticipated beyond those evaluated for the proposed project. No further analysis is required.

3.16 TRANSPORTATION AND TRAFFIC

XVI. TRANSPORTATION AND TRAFFIC	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☒	☐
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Less Than Significant Impact. A Traffic Impact Analysis was prepared by Kunzman Associates, Inc. (dated February 28, 2014) to analyze the effects of the proposed Project to traffic and roadway level of service conditions. A copy of the Traffic Impact Analysis is provided as Appendix G. The discussion below summarizes the findings of the Traffic Impact Analysis.

The report analyzes traffic impacts for an anticipated opening date with full occupancy of the development in Year 2016, at which time the proposed project would be generating traffic at its full potential, and for the current traffic forecast year, which is the Year 2035.

Existing Conditions

Regional access to the project site is provided by the I-10 Freeway. Local access is provided by various roadways in the vicinity of the site. The north-south roadways which will be most affected by the project

include Tippecanoe Avenue, Anderson Street, Poplar Street, Richardson Street, Benton Street, Loma Linda Drive, Enterprise Drive, Bryn Mawr Avenue, California Avenue, and Alabama Street. The east-west roadways expected to provide local access include Business Center Drive, Redlands Boulevard, Mission Road, Van Leuven Street, and Barton Road.

For evaluation of the proposed project, a total of twenty-one (21) study area intersections are identified in the Traffic Impact Analysis and were analyzed for existing and future conditions. Fifteen (15) of the study area intersections currently operate at Level of Service C or better during the peak hours for existing traffic conditions. The following six (6) intersections currently operate at Level of Service D/E during the peak hours:

#3 - Anderson Street (NS) at Redlands Boulevard (EW)
#4 - Anderson Street (NS) at Barton Road (EW)
#15 - Mountain View Avenue (NS) at Barton Road (EW)
#19 - California Street (NS) at I-10 Freeway EB Ramps (EW)
#20 - California Street (NS) at Redlands Boulevard (EW)
#21 - Alabama Street (NS) at Redlands Boulevard (EW)

Trip Generation, Distribution and Assignment

The approximately 36.86 acre project site is proposed to be developed with a 345,000 gross square foot medical clinic and a 5.17-acre park. The project will have access to Redlands Boulevard and the extension of Bryn Mawr Avenue.

Although the VA Clinic would create approximately 500 jobs, it is anticipated that 30 of those positions would be transferred from the VACRB and 420 would be transferred from the VAMC. Therefore a significant increase in net new jobs in not anticipated and there would be an initial redistribution of traffic generated by the exiting facilities (one of which would be closed following implementation of the proposed project).

The trips generated by the project are determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are based on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and life styles remain similar to what are known today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic and morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land uses. By multiplying the trip generation rates by the land use quantities, the traffic volumes are determined. The proposed development is projected to generate a total of approximately 4,031 daily vehicle trips, 414 of which will occur during the morning peak hour and 482 of which will occur during the evening peak hour.

Assumptions for trip distribution for the proposed project are based on peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area (see Appendix G). These assumptions were applied to the project average daily traffic volumes calculated for morning and evening peak hour intersection turning movement volumes.

The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. The Traffic Impact Analysis concluded that the proposed project would not contribute trips greater than the freeway threshold volume of 100 two-way peak hour trips to the I-10 Freeway, thus analysis of freeway segments is not required. However, the proposed project would contribute trips greater than the arterial link threshold volume of 50 two-way trips in the peak hours on some facilities serving intersections outside of the Loma Linda (i.e., in the city of Redlands).

Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the City of Loma Linda requirements. The definition of an intersection deficiency for this analysis has been derived from the Loma Linda General Plan and Measure V. The General Plan and Measure V state that peak hour intersection operations of Level of Service C or better are generally acceptable. Specifically, Measure V states:

> *To assure the adequacy of various public services and prevent degradation of the quality of life experienced by the residents of Loma Linda, all new development projects shall assure by implementation of appropriate mitigation measures that, at a minimum, traffic Levels of Service are maintained at a minimum of Level of Service C throughout the City, except where the current Level of Service is lower than Level of Service C. In any location where the Level of Service is below Level of Service C at the time an application for a development project is submitted, mitigation measures shall be imposed on that development project to assure, at a minimum, that the level of traffic service is maintained at Levels of Service that are no worse than those existing at the time an application for development is filed. In any location where the Level of Service is F at the time an application for a development project is submitted, mitigation measures shall be imposed on that development project to assure, at a minimum, that the volume to capacity ratio is maintained at a volume to capacity ratio that is no worse than that existing at the time an application for development is filed. Projects where sufficient mitigation to achieve the above stated objectives is infeasible shall not be approved unless and until the necessary mitigation measures are identified and implemented.*

For freeway facilities, the San Bernardino County Congestion Management Program definition of deficiency was used for the Traffic Impact Analysis. The Congestion Management Program definition of deficiency is based on maintaining a Level of Service standard of Level of Service E or better, except where an existing Level of Service F condition is identified in the Congestion Management Program document. A Congestion Management Program deficiency is, therefore, defined as any freeway segment operating or projected to operate at Level of Service F, unless the segment is identified explicitly in the Congestion Management Program document. The identification of a Congestion Management Program deficiency requires further analysis in satisfaction of Congestion Management Program requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level with respect to Congestion Management Program Level of Service standards.
- Calculation of the project share of new traffic on the impacted Congestion Management Program facility during peak hours of traffic.
- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable Level of Service as described above.

The Loma Linda General Plan and its related Circulation Element have been adopted in accordance with CEQA, and any roadway improvements within the city of Loma Linda that are consistent with these documents are not considered a significant impact, so long as the project contributes its “fair share” funding for improvements.

For the proposed project, a traffic impact is considered significant if the project both: i) contributes measurable traffic to and ii) substantially and adversely changes the Level of Service at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the Loma Linda General Plan cannot be constructed.

Projected Traffic Volumes

Project Traffic - Project traffic volumes for future projection scenarios were estimated using the manual approach. Trip generation is based upon rates obtained from the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012 and San Diego Association of Governments, Traffic Generators, April

2002. To determine the trip distribution for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

The proposed project is projected to generate a total of approximately 4,031 daily vehicle trips, 414 of which will occur during the morning peak hour and 482 of which will occur during the evening peak hour. An Existing Plus Project, Opening Year (2016) analysis, and Year 2035 analysis were evaluated. Traffic operations analyses were completed for the morning and evening peak hour for each of these three scenarios. Under all scenarios, the Level of Service (LOS) as those six (6) intersections (identified above) that currently operation at LOS D/E would continue to operate at LOS D to F during peak hours.

For Existing Plus Project traffic conditions, the following eight (8) study area intersections are projected to operate at Level of Service D to F during the peak hours:

#3 - Anderson Street (NS) at Redlands Boulevard (EW)
#4 - Anderson Street (NS) at Barton Road (EW)
#15 - Mountain View Avenue (NS) at Barton Road (EW)
#16 - Enterprise Drive (NS) at Redlands Boulevard (EW)
#17 - Bryn Mawr Avenue (NS) at Redlands Boulevard (EW)
#19 - California Street (NS) at I-10 Freeway EB Ramps (EW)
#20 - California Street (NS) at Redlands Boulevard (EW)
#21 - Alabama Street (NS) at Redlands Boulevard (EW)

These same study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Existing Plus Project traffic conditions, with improvements.

For Opening Year (2016) With Project traffic conditions, the following nine (9) study area intersections are projected to operate at Level of Service D to F during the peak hours:

#3 - Anderson Street (NS) at Redlands Boulevard (EW)
#4 - Anderson Street (NS) at Barton Road (EW)
#15 - Mountain View Avenue (NS) at Barton Road (EW)
#16 - Enterprise Drive (NS) at Redlands Boulevard (EW)
#17 - Bryn Mawr Avenue (NS) at Redlands Boulevard (EW)
#18 - California Street (NS) at I-10 Freeway WB Ramps (EW)
#19 - California Street (NS) at I-10 Freeway EB Ramps (EW)
#20 - California Street (NS) at Redlands Boulevard (EW)
#21 - Alabama Street (NS) at Redlands Boulevard (EW)

These study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Opening Year (2016) With Project traffic conditions, with improvements.

For Year 2035 With Project traffic conditions, the following eleven (11) study area intersections are projected to operate at Level of Service D to F during the peak hours, without improvements:

#3 - Anderson Street (NS) at Redlands Boulevard (EW)
#4 - Anderson Street (NS) at Barton Road (EW)
#10 - Mountain View Avenue (NS) at I-10 Freeway EB Ramps (EW)
#12 - Mountain View Avenue (NS) at Redlands Boulevard (EW)
#15 - Mountain View Avenue (NS) at Barton Road (EW)
#16 - Enterprise Drive (NS) at Redlands Boulevard (EW)
#17 - Bryn Mawr Avenue (NS) at Redlands Boulevard (EW)
#18 - California Street (NS) at I-10 Freeway WB Ramps (EW)
#19 - California Street (NS) at I-10 Freeway EB Ramps (EW)
#20 - California Street (NS) at Redlands Boulevard (EW)

#21 - Alabama Street (NS) at Redlands Boulevard (EW)

These study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Year 2035 With Project traffic conditions, with improvements.

Based on a traffic signal warrant analysis, traffic signals are projected to be warranted at the following study area intersections for Existing Plus Project traffic conditions prior to project occupancy.

#16 - Enterprise Drive (NS) at Redlands Boulevard (EW)
#17 - Bryn Mawr Avenue (NS) at Redlands Boulevard (EW)

Required Off-Site Improvements and Fair Share Costs

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area for the affected intersections indicated above have been identified for Opening Year (2016) and Year 2035 traffic conditions. A complete listing of improvements is provided in the Traffic Impact Analysis in Appendix G. The total cost of needed and unfunded intersection improvements is $470,000. The Traffic Impact Analysis in Appendix G presents the improvement cost and project cost shares at the Year 2035 intersection improvement locations based on the highest of the morning or evening peak hour traffic volumes. The project's fair share of identified intersection costs is estimated at $70,323. It should be noted that the dollar figures are estimates only and final totals will be established at the time of required payment for building permits. As is the case for any roadway design, the city of Loma Linda should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Consistent with the City's Measure V and as mitigation for the potential traffic impacts, the proposed project shall contribute on a fair share basis in the implementation of the recommended intersection lane improvements or freeway improvements, or in dollar equivalent in lieu mitigation contributions, or in the implementation of additional capacity on parallel routes to offset potential impacts to study area intersections. Thus, project traffic impacts are less than significant with the payment of the project's pro rata fair share as is required by City regulations.

The Traffic Impact Analysis includes the following assumptions regarding roadway improvements adjacent to the project site and for the overall design of the proposed project:

- Construction of Redlands Boulevard from the west project boundary to Bryn Mawr Avenue at its ultimate half-section width including landscaping and parkway improvements shall be completed prior to or in conjunction with project development.

- Construction of Bryn Mawr Avenue from Redlands Boulevard to the south project boundary at its ultimate cross-section width including landscaping and parkway improvements shall be completed prior to or in conjunction with project development.

- The project site shall provide sufficient parking spaces to meet city of Loma Linda parking code requirements of 1 space per every 250 square feet of building area in order to service on-site parking demand.

- On-site traffic signing and striping shall be implemented in conjunction with detailed construction plans for the project and which have been reviewed and approved by the City Traffic Engineer.

- Sight distance at project accesses shall comply with standard California Department of Transportation and city of Loma Linda sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with these requirements prior to issue of grading permits.

Provided that the proposed project is in substantial compliance with these development assumptions, and pays its pro-rata fair share of of-site intersection improvements, traffic impacts associated with the proposed project would be less than significant and conflict with existing transportation plans is not anticipated.

Also, during construction of the proposed project, there would be temporary short-term construction impacts. Construction traffic would result in short-term increases in traffic volumes. This traffic would consist mainly of trucks delivering building materials and equipment, and hauling away excavated soil. The maximum construction traffic volumes expected for the proposed project is assumed to be eight truck trips per day. Because construction impacts would short-term in duration and construction traffic typically would not be during the peak hours, contraction traffic impacts are considered to be less than significant.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant Impact. The proposed Project would take access primarily from the newly constructed extension of Bryn Mawr Avenue south of Redlands Boulevard.

Those roadway improvements are in compliance with all applicable City standards and regulations and the City has reviewed and improved the plans to ensure that local circulation and street improvements are designed to minimize safety hazards. Access driveways for the proposed project would be located away from intersections so that turning movements into and out of the project site do not interfere with traffic movement at local intersections. Sight distance at project accesses shall comply with standard California Department of Transportation and city of Loma Linda sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with these requirements prior to issue of grading permits. Therefore, the proposed project is not anticipated to result in any substantial increased safety hazard due to roadway design or incompatible uses, and potential impacts would be less than significant. Further analysis is not required.

e) Result in inadequate emergency access?

Less Than Significant Impact. Proposed Project improvements that relate to traffic circulation and access will be required to comply with all applicable city of Loma Linda standards and regulations. City standards require circulation and street improvements be designed to ensure that significant safety hazards would not result with any development and that adequate access is maintained. See also Response 3.16.d. The project site plan provides for internal access that facilitates access to the VA Clinic building from all sides and five (5) access driveways are included along the north and east sides for the project site. Thus, impacts due to inadequate emergency access would be less than significant. Further analysis is not required.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less Than Significant Impact. Omnitrans provides bus transportation in the area. Bus route 8 currently serves the proposed site with a transfer station located at Redlands Boulevard and Mt. View Avenue. Additionally, according to the City of Loma Linda General Plan, Figure 6.6 – Master Plans of Bikeways, a Class II bike lane is designated along Mt. View Avenue.

The proposed project would incorporate pedestrian linkages both within the project site and to adjacent roadways and sidewalks that provide for adequate pedestrian access. The proposed promenade walkway would create a pedestrian access directly from Redlands Boulevard. The proposed project would include bicycle parking facilities.

See also Responses 3.16.a through 3.16.e. Because the proposed Project does not conflict with applicable plans, policies or ordinances, the potential for impact to plans, policies or programs regarding

public transit, bicycle or pedestrian facilities would be less than significant and no mitigation measures are required.

3.17 UTILITIES AND SERVICE SYSTEMS

XVII. UTILITIES AND SERVICE SYSTEMS	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) 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?	☐	☐	☒	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

e) 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 Impact. Sewer facilities are provided by city of Loma Linda's Public Works, Utilities Division. Wastewater treatment services are provided under provisions outlined in a Joint Powers Agreement (JPA) with the City of San Bernardino and provided by the San Bernardino Municipal Water Department wastewater facility and the Rapid Infiltration/Extraction tertiary treatment facility. Wastewater is treated by both the San Bernardino Municipal Water Department wastewater facility and the Rapid Infiltration/Extraction facility located in Colton both having capacity to serve the city at ultimate buildout conditions.

The project site would be served by the existing sewer facilities in Redlands Boulevard and existing water facilities in Mission Road and Redlands Boulevard. The city of Loma Linda operates an existing 15-inch sanitary sewer main within Redlands Boulevard along the subject site frontage. New lateral connection, at sufficient depth for gravity flow, would be established for the proposed project. One 8-inch sanitary sewer lateral is proposed to serve the project.

Thus, potential to exceed wastewater treatment requirements, treatment capacities, violate water quality standards, or waste discharge requirements of the City and Regional Water Quality Control Board is not anticipated and impacts would be less than significant. No mitigation measures are necessary.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant Impact. The proposed project would utilize storm water facilities that already exist or would be in place prior to project development. See Responses 3.9.c through 3.9.3. Impacts to storm water facilities would be less than significant, and further analysis is not required.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less Than Significant Impact. The proposed site is currently served by the city of Loma Linda's Public Works, Water Division and the proposed project would receive water supply directly from the city of Loma Linda whose source of supply is groundwater. The proposed project would not use excessive amounts of water or have a demand greater than that available to serve the project from existing entitlements and resources. In fact, the proposed project is anticipated to use less water than previous agricultural uses at the project site. The City's current water resources are sufficient to meet the Loma Linda General Plan build out demand, and the proposed project is consistent with the General Plan

Currently, the City of Loma Linda operates a 12-inch water main along Redlands Boulevard. Additionally, the adjacent land owner will be extending Bryn Mawr Avenue south from its current termination at Redlands Boulevard. This extended portion of Bryn Mawr Avenue borders the project property to the east and will include a new 10-inch water main. For fire protection needs, a new 10-inch looped system is proposed to serve the site with connections to both the 12-inch water main in Redlands Boulevard and the 10-inch water main in Bryn Mawr Avenue. Backflow preventers would be provided at both connections to the existing system. Approximately ten (10) site fire hydrants will be dispersed throughout the site around the building for coverage and spacing needs in compliance with the California Fire Code, and a 6-inch tee from the looped system will connect to the building sprinkler system. Domestic water service will be provided by one separate 4-inch water connection to the new 10-inch water main in Bryn Mawr Avenue.

Impacts to water supplies and water distribution infrastructure would be less than significant and no mitigation measures are necessary.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?
g) Comply with federal, state, and local statutes and regulations related to solid waste?

Less Than Significant Impact. The city of Loma Linda contracts with Waste Management to provide solid waste collection services. Solid waste not diverted to recycling, compost or hazardous waste facilities is transported to the San Timoteo Sanitary Landfill located in the city of Redlands. The San Timoteo Sanitary Landfill is permitted to receive up to 1,000 tons per day and has an estimated closure date of May 2016. However, adequate room is available for further expansion.

During construction and operation, solid and hazardous waste would be generated. Standard practices required by regulation would prevent adverse impacts caused by uncontrolled release of solids and hazardous substances. See Responses 3.8.a through 3.8.d.

During construction (short-term) and operation (long-term), bulk solid waste, excess building material, fill, etc., shall be disposed of in a manner consistent with State of California Integrated Waste Management Act of 1989 (CIWMA) and shall be removed from the proposed site. Additionally, every municipality in the State is required by CIWMA to divert 50 percent of its waste from landfills by the year 2000. The Loma Linda Municipal Code Title 15 requires that at least sixty (60) percent of the estimated tonnage of

construction and demolition material be diverted from disposal. Additionally, a waste management plan is required as part of the building permit process.

During its operation, the proposed project would generate an estimated 527 tons of construction waste and 750 tons of waste per year during operation. This equates to approximately 0.06 percent of the landfills yearly intake during construction and 0.21 percent during operation.

Thus, the proposed project would be consistent with Federal, State and local regulations related to solid waste. Because sufficient landfill capacity is available and the proposed project would not utilize a disproportionate share of the remaining landfill capacity, impacts to landfills and solid waste disposal needs would be less than significant and no mitigation measures are necessary.

3.18 MANDATORY FINDINGS OF SIGNIFICANCE

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE	*Potentially Significant Impact*	*Less Than Significant Impact with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
Does the project:				
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) 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) 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 selfsustaining 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 Impact. The Project would not cause impacts to wildlife habitat, or limit the achievement of any long-term environmental goals, or have impacts, which are potentially and individually limited but are cumulatively considerable and could potentially have an indirect adverse impact on plant or animal species.

The Project site is located adjacent to developed properties and the site itself has been heavily disturbed by historic agricultural activity and previous grading (laying of fill). The mitigation measures included in this Initial Study would reduce impacts due to the proposed project to less than significant levels. See Responses 3.1.a through 3.17.g above. As a result, the proposed project and its associated improvements would not significantly impact any fish or wildlife species or habitat; fish or wildlife population; plant or animal community; rare or endangered plant or animal species; or historical or prehistorical resources.

b) Does the project have impacts that are individually limited, but cumulatively considerable?

Less Than Significant Impact. Direct impacts from construction and demolition are typically constrained to the limits of construction and are temporary in nature. If other construction occurs within the same schedule and in the same vicinity as the proposed project, temporary traffic and air quality impacts may be exacerbated. Standard mitigation in compliance with all appropriate, required, and applicable regulations and laws would ensure impacts to air quality, noise, hazardous/solid waste, etc., are not cumulative. No long term negative impacts from operation of the facility are anticipated and therefore would not contribute substantially toward cumulative effects. The project would not cause impacts which are potentially and individually limited but are cumulatively considerable, and thus cumulative effects 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 Impact. The analysis performed in this EA concludes that there would be no significant adverse impact, either individually or cumulatively, to the human environment, provided mitigation measures and commitments consisting of best management practices and all appropriate, required and applicable regulatory compliance measures described in this Initial Study are fully implemented. Thus, as reflected in the responses above, the proposed project and its related improvements would not significantly directly or indirectly affect human beings and impacts would be less than significant.

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SECTION 4: REFERENCES

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SECTION 5: EXHIBITS

Exhibit 1 – Project Location Map

Exhibit 2 – Project Site Plan

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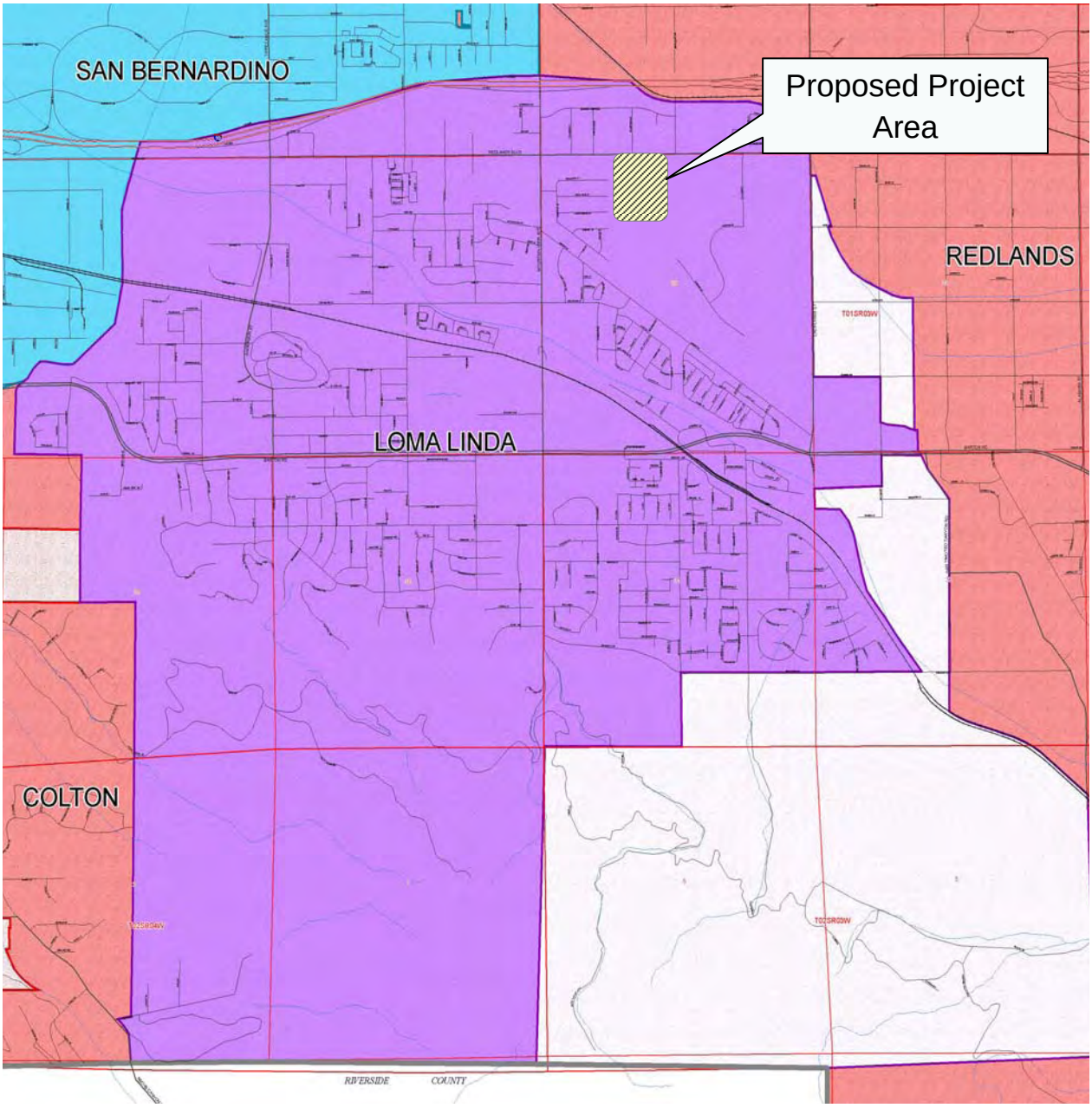
Exhibit 1 – Project Location Map



Source: San Bernardino County Local Agency Formation Commission (2013)

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Exhibit 2 – Project Site Plan

Source: WI Loma Linda LLC)

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APPENDIX A

AIR QUALITY

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KUNZMAN ASSOCIATES, INC.

VA HEALTH CARE MEDICAL CLINIC

AIR QUALITY/GREENHOUSE GAS OPERATIONAL ANALYSIS MEMORANDUM

February 28, 2014

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

KUNZMAN ASSOCIATES, INC.
OVER 35 YEARS OF EXCELLENT SERVICE

February 28, 2014

Mr. Guillermo Arreola, Associate Planner
CITY OF LOMA LINDA
25541 Barton Road
Loma Linda, CA 92354-3160

Dear Mr. Arreola:

Introduction

The firm of Kunzman Associates, Inc. is pleased to provide this Air Quality/Greenhouse Gas Operational Analysis Memorandum as an update to the Air Quality/Greenhouse Gas Analysis for the U.S. Department of Veteran Affairs (VA) Loma Linda Health Care Clinic (HCC) in Loma Linda "(AQIA)", CA dated May 19, 2012, prepared by Albert A. Webb Associates.

The most recent project description includes a medical clinic with 271,000 useable square feet located on approximately 38.86 acres. Located within the 38.86 acres are a 5.17 acre park and 2,035-space parking lot; the balance of the site (7.16 acres) is landscaped. The project will employ 500 people, 420 of which will be transferred from the nearby Linda Veterans Affairs Medical Center (VAMC) located at 11201 Benton Street, another 30 employees with be transferred from the nearby Veterans Affairs Clinic Redlands Boulevard (VACRB), located at 25828 Redlands Boulevard. The VACRB is an interim clinic that will close upon completion of this project (the HCC). Therefore, the project will be creating 50 new jobs in the region and re-locating 450 existing VA clinic jobs from within 1.75 miles of the project. The proposed project would also target a minimum LEED rating of Silver; however, details of LEED-based reduction measures were not provided at the time of this analysis and have not been included in emissions estimates.

This analysis is required as the original AQIA did not analyze the full scope of the project. The insufficient analysis stemmed from discrepancies in the project description and potential under-estimation of mobile source emissions due to errors in trip generate rate estimation (based on the Albert A. Webb Associates Traffic Impact Analysis Report, VA Health Care Clinic "[TIA]" dated May 23, 2012).

The original Webb AQIA analyzed 271,000 useable square foot (SF) medical clinic and a 1,580-space parking lot. The Webb trip generation rate from the TIA was 7.75 daily trips per employee (based on 500 employees) which generated a total of 3,875 trips per day. The trip generation rate for the medical clinic was generated though use of an outdated version (8th Edition) of the Institute of Transportation Engineers, Trip Generation, manual and needed to be updated to the most recent, 9th Edition. Furthermore, the Webb TIA did not include an analysis of the park use.

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Kunzman Associates, Inc. has updated the traffic analysis trip generation in a revised traffic study (February 2014) and has also included trip generation for the park use. The revised trip generation estimates state that the medical clinic will generate 8.01 trips per employee and the park use would generate 5.00 trips per acre. As the project will be transferring the majority of staff (450 out of 500) from existing VA facilities just down the street from the project, the increase in emissions in the region due to more staff is based on the VA hiring 50 new employees. The trip rate for these new employees would equate to 1.48 per thousand square feet (TSF).

Summary of Construction-Related Findings From Webb AQIA

The Webb AQIA showed that the maximum daily regional emissions for project-related construction emissions were below SCAQMD Daily Regional Construction Thresholds (see Table 1). The project-related construction emissions were also below SCAQMD Daily Localized Construction Thresholds. Impacts are not anticipated from the construction of the project on either a regional or localized level, and would not change or worsen due to the project modifications mentioned above. The entire 38.86 acres of the project were analyzed for construction and the Webb AQIA emissions estimates for construction are still valid. Compliance with SCAQMD Rules is expected. No mitigation is required.

Re-Evaluation of Regional Operational Criteria Pollutant Emissions

As stated above, the updated trip generation estimates that the medical clinic will generate 8.01 trips per employee and the park use would generate 5.00 trips per acre. As the project will be transferring the majority of staff (450 out of 500) from existing VA facilities just down the street from the project, the increase in emissions in the region due to more staff is based on the VA hiring 50 new employees. The trip rate for these new employees would be 1.48 per thousand square feet (TSF). The emissions from these uses were analyzed using CalEEMod version 2013.2.2, and the summer and winter daily emissions output from the model is attached in Appendix A. The results from the emissions modeling for operational criteria pollutants are shown in Table 2. As shown in Table 2, criteria pollutant emissions from operation of this project will not exceed the SCAQMD regional daily thresholds. No mitigation is required.

Re-Evaluation of Project-Related Greenhouse Gas (GHG) Emissions

The GHG emissions generated by the uses mentioned above were analyzed using CalEEMod version 2013.2.2, and the annual output from the emissions model is also included as an appendix to this memorandum. The emissions estimate incorporated the construction-related GHG emissions from the Webb AQIA. The GHG emissions estimated are shown in metric tons per year and also include reductions from the planting of 407 new trees (estimated as one tree per five parking spaces). This is a conservative estimation of tree planting, as the park use will likely include the addition of numerous trees. The results from the emissions modeling for project-related GHG emissions are shown in Table 3. As shown in Table 3, the project's GHG emissions will not exceed the SCAQMD draft threshold of 3,000 MTCO2-equivalents per year. No mitigation is required.

Mr. Guillermo Arreola, Associate Planner
CITY OF LOMA LINDA
February 28, 2014

Re-Evaluation of Annual Operational Pollutant Emissions for the Federal Clean Air Act Conformity Analysis

Operational emissions were also re-evaluated in light of NEPA requirements and the Federal Clean Air Act Conformity Analysis. The annual operational emissions (in tons per year) are show in Table 4. As shown by the results in Table 4, the project's operational emissions will not exceed any of the federal "de minimus" thresholds for any pollutant. The revised project's greenhouse gas emissions will also not exceed 25,000 tons per year. No mitigation is required.

It has been a pleasure to service your needs on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Sincerely,

KUNZMAN ASSOCIATES, INC.

Katie Wilson

Katie Wilson, M.S.
Senior Associate

KUNZMAN ASSOCIATES, INC.

William Kunzman

William Kunzman, P.E.
Principal

#5630b

cc: Ms. Melanie Doran Traxler, PLANNING PLUS

Table 1

Construction-Related Regional Criteria Pollutant Emissions[1]

Activity	Peak Daily Emissions (pounds/day)					
	VOC	NOx	CO	SO_2	PM10	PM2.5
Maximum Emissions	72.84	90.74	80.14	0.17	12.53	5.84
SCAQMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Thresholds?	No	No	No	No	No	No

[1] Source: Webb AQIA 2012

Table 2

Operational Criteria Pollutants Regional Air Emissions[1]

Activity	Pollutant Emissions (pounds/day)					
	VOC	NOx	CO	SO2	PM10	PM2.5
Area Sources[2]	33.70	0.00	0.24	0.00	0.00	0.00
Energy Usage[3]	0.03	0.27	0.22	0.00	0.02	0.02
Mobile Sources[4]	1.58	4.57	17.34	0.04	2.42	0.68
Total Emissions	**35.30**	**4.84**	**17.80**	**0.04**	**2.44**	**0.71**
SCAQMD Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold?	No	No	No	No	No	No

[1] Source: CalEEMod Version 2013.2.2

Highest emissions from either winter or summer.

[2] Area sources consist of emissions from consumer products, architectural coatings, and landscaping equipment.

[3] Energy usage consists of emissions from generation of electricity and on-site natural gas usage.

[4] Mobile sources consist of emissions from vehicles and road dust.

Table 3

Project-Related Greenhouse Gas Emissions[1]

Category	Greenhouse Gas Emissions (Metric Tons/Year)					
	Bio-CO2	NonBio-CO_2	CO_2	CH_4	N_2O	CO_2e
Area Sources[2]	0.00	0.06	0.06	0.00	0.00	0.06
Energy Usage[3]	0.00	1,086.79	1,086.79	0.05	0.01	1,091.16
Mobile Sources[4]	0.00	498.87	498.87	0.02	0.00	499.29
Solid Waste[5]	594.20	0.00	594.20	35.12	0.00	1,331.65
Water[6]	10.79	166.89	177.68	1.12	0.03	209.71
Construction[7]	0.00	33.17	33.17	0.00	0.00	113.96
Total Emissions	604.99	1,785.78	2,390.78	36.30	0.04	**3,245.83**
Less sequestration						**288.16**
New Total						**2,957.68**
Threshold						**3,000**
Exceeds Threshold?						**No**

[1] Source: CalEEMod Version 2013.2.2

[2] Area sources consist of GHG emissions from consumer products, architectural coatings, and landscape equipment.

[3] Energy usage consist of GHG emissions from electricity and natural gas usage.

[4] Mobile sources consist of GHG emissions from vehicles.

[5] Solid waste includes the CO_2 and CH_4 emissions created from the solid waste placed in landfills.

[6] Water includes GHG emissions from electricity used for transport of water and processing of wastewater.

[7] Construction GHG emissions CO2e based on a 30 year amortization rate. Values taken from original Webb analysis

Table 4

Annual Operational Criteria Pollutants Emissions[1]

Activity	Pollutant Emissions (tons/year)					
	VOC	NOx	CO	SO2	PM10	PM2.5
Area Sources[2]	6.15	0.00	0.03	0.00	0.00	0.00
Energy Usage[3]	0.00	0.05	0.04	0.00	0.00	0.00
Mobile Sources[4]	0.28	0.85	3.06	0.01	0.43	0.12
Waste[5]	--	--	--	--	0.00	0.00
Water[6]	--	--	--	--	0.00	0.00
Total Emissions	**6.42**	**0.90**	**3.14**	**0.01**	**0.43**	**0.12**
Federal De Minimus Thresholds[7]	**10**	**10**	**100**	**100**	**70**	**100**
Exceeds Threshold?	No	No	No	No	No	No

[1] Source: CalEEMod Version 2013.2.2

[2] Area sources consist of GHG emissions from consumer products, architectural coatings, and landscape equipment.

[3] Energy usage consist of GHG emissions from electricity and natural gas usage.

[4] Mobile sources consist of GHG emissions from vehicles.

[5] Solid waste includes the CO_2 and CH_4 emissions created from the solid waste placed in landfills.

[6] Water includes GHG emissions from electricity used for transport of water and processing of wastewater.

[7] Federal Conformity thresholds per 40 CFR 93.153.

APPENDIX B

BIOLOGICAL RESOURCES

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LSA

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February 14, 2014

Mr. Guillermo Arreola, Associate Planner
Community Development Department, Planning Division
25541 Barton Road
Loma Linda, California 92354

Subject: Peer Review of Biological Resources Reports Prepared for the Department of Veterans Affairs Loma Linda Health Care Clinic Project in the City of Loma Linda, San Bernardino County, California (LSA Project No. LLD1401)

Dear Mr. Arreola:

LSA Associates, Inc. (LSA) is under contract to the City of Loma Linda (City), San Bernardino, County, California to conduct a peer review of the biological resources reports prepared by AMEC Environment & Infrastructure (AMEC) for the Department of Veteran Affairs Loma Linda Health Care Clinic. LSA reviewed the Biological Resources Assessment Report (dated May 18, 2012) and Focused Survey for Burrowing Owl Report (dated August 23, 2012).

The AMEC biological resources reports were peer reviewed by LSA Senior Biologist Sarah Barrera. The methodology and findings in the reports were reviewed and analyzed in the context of compliance with the California Environmental Quality Act (CEQA), consistency with the project description the City provided, adequacy for use in preparation of a Mitigated Negative Declaration (MND), and consistency with current professional standards and practices.

PEER REVIEW METHODS

Ms. Barrera reviewed project-specific reports provided by the City, including:

- *Department of Veteran Affairs Loma Linda Health Care Clinic Biological Resources Assessment Report* (AMEC Environment & Infrastructure, Inc., 2012);
- *Department of Veteran Affairs Loma Linda Health Care Clinic Focused Survey for Burrowing Owl* (Athene cunicularia) *Report* (AMEC Environment & Infrastructure, Inc., 2012);
- *Draft Environmental Assessment for U.S. Department of Veterans Affairs Loma Linda Health Care Clinic* (Albert A. Webb Associates, 2012); and
- *Draft Initial Study and Mitigated Negative Declaration for the Special Planning Area D Phase One Concept Project* (City of Loma Linda, 2013).

In addition, biological resources databases were searched for a 5-mile radius surrounding the project area. Database records for the *Redlands, California; San Bernardino South, California; San Bernardino North, California; Sunnymead, California; Riverside East, California;* and *Harrison Mountain, California* U.S. Geological Survey (USGS) 7.5-minute series quadrangles were searched

on February 6, 2014, using the California Department of Fish and Wildlife's (CDFW) Natural Diversity Data Base *Rarefind 4* online database (commercial version, dated February 4, 2014) and the California Native Plant Society's (CNPS) *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2014. v8-01a, http://www.cnps.org/inventory).

Species records acquired in the database search were used to compile a table of Special-Status Species Occurring in the Vicinity of the Project Site (attached Table A). For the purposes of this table, species are considered special-status that are federally and/or State-listed, proposed for listing, or candidate species as well as species that are on the California Rare Plant Ranks, or designated as a California Species of Special Concern or California Special Animal.

Aerial photographs were reviewed and Geographic Information Systems (GIS) maps of United States Fish and Wildlife Service (USFWS) designated critical habitats were used to determine the locations of critical habitats relative to the project site. Soil information was acquired on February 6, 2014, from the U.S. Department of Agriculture's online *Web Soil Survey* and is from the *Soil Survey of San Bernardino County, Southwestern Part, California* (USDA 1980).

Following the literature review, Ms. Barrera conducted a site visit on February 10, 2014, to verify that site conditions reflect those discussed in the project-specific reports and record any substantial changes to the site conditions that may have occurred since preparation of the project-specific reports.

Ms. Barrera then used the information acquired in the literature review and site visit to analyze the existing biological resources reports to determine their suitability in the context of compliance with CEQA, adequacy for the previous MND, and current professional standards and practices.

RESULTS OF PEER REVIEW

BIOLOGICAL RESOURCES ASSESSMENT

General Comments

1. The project boundary provided in the Biological Resources Assessment (BRA) differs from that in the Draft Environmental Assessment (EA). While the same approximate acreage and Assessor's Parcel Numbers (APNs) are discussed in the biological resources reports and the Draft EA, the project boundaries shown in the maps of the Draft EA differ slightly from those in the BRA. Based on a review of aerial photographs and verification from the site visit, the biological resources in all areas identified within project boundaries are similar and the discussion of biological resources would not be different due to the different project boundaries.
2. The California Department of Fish and Game (CDFG) has changed its name to the California Department of Fish and Wildlife (CDFW) since preparation of the biological resources reports and Draft EA. Future documents referencing these reports should reflect this change.
3. The report does not differentiate between "sensitive" and "special-status" species. The term "sensitive" is only used once, in Section 4.1 of the report and is not defined. The term "special-status" is used in the remainder of the report. LSA recommends consistent use of one of these terms and clear definition of how a species is determined to be considered "sensitive" or "special-status".

4. The site visit conducted for this peer review confirmed that site conditions are similar to those included in the BRA with the exception that all orange trees have been removed from the site since preparation of the BRA. The intended removal of the orange trees was discussed in the BRA.

Specific Comments

Section 4.0: Methods

5. There is no definition of "sensitive biological resources" provided in the discussion of the literature review that was conducted (see General Comments, above). This term is not defined in relation to what agency designations were sufficient to consider a resource "sensitive" (Page 5).
6. The methods do not include a review of critical habitat located on or near the project site.

Section 5.0: Results

Section 5.1: Literature Review

7. While Section 4.0, Methods, indicates that database records within a 5-mile radius of the project site were searched, two topographic quadrangles that lie within 5 miles of the project site were not included. The literature review conducted for this peer review of the six topographic quadrangles within 5 miles of the project site (*Redlands, California; Harrison Mountain, California; San Bernardino North, California; San Bernardino South, California; Sunnymead, California;* and *Riverside East, California*) identified 97 special-status species and vegetation communities known from the vicinity of the project site. The BRA identified only 43 special-status species known from the vicinity of the project site. No fish or amphibians were included in the special status species tables from the BRA.
8. The difference in number of species may be due to the difference of quadrangles included in the review as well as changes to special status listings that have occurred since the time the BRA was prepared.
9. Attached Table A includes all of the special-status species identified in the literature review for this peer review. None of the species included in Table A that were not addressed in the BRA are expected to occur on the project site due to a lack of suitable habitat.

Section 5.5: Special-Status Biological Resources

10. In general, the special-status species tables in the BRA lack details in discussion of habitats in which the species are anticipated to occur.
11. The "Very Low" Occurrence Status designation is not defined in the Key to Tables on Page 17.

Section 5.5.1: Special-Status Plants

12. The following special-status plant species were identified in the February 2014 literature review but are not included in the BRA (Table 1, page 9–11):
    - Singlewhorl burrobush (*Ambrosia monogyra*);

- Horn's milk-vetch (*Astragalus hornii* var. *hornii*);
- Nevin's barberry (*Berberis nevinii*);
- Thread-leaved brodiaea (*Brodiaea filifolia*);
- Round-leaved filaree (*California macrophylla*);
- Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*);
- Bristly sedge (*Carex comosa*);
- San Bernardino Mountain's owl's-clover (*Castilleja lasiorhyncha*);
- Hot springs fimbristylis (*Fimbristylis thermalis*);
- Parish's alumroot (*Heuchera parishii*);
- Mesa horkelia (*Horkelia cuneata* var. *puberula*);
- California satintail (*Imperata brevifolia*);
- Silver-haired ivesia (*Ivesia argyrocoma* var. *argyrocoma*);
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*);
- Parish's desert-thorn (*Lycium parishii*);
- Hall's monardella (*Monardella macrantha* ssp. *hallii*);
- Pringle's monardella (*Monardella pringlei*);
- Parish's yampah (*Perideridia parishii* ssp. *parishii*);
- Black bog-rush (*Schoenus nigricans*);
- Bear Valley checkerbloom (*Sidalcea malviflora* ssp. *dolosa*);
- Salt Spring checkerbloom (*Sidalcea neomexicana*);
- Laguna Mountains jewelflower (*Strepthanthus bernardinus*);
- Southern jewelflower (*Streptanthus campestris*); and
- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*).

13. No expected elevation ranges were provided in the Special Status Plants Table (Table 1, page 9-11), where this information can be useful in determining the potential presence of a plant on site.
14. Plummer's mariposa lily (*Calochortus plummerae*) is identified in the table as on California Rare Plant Ranking List 1B.2 (CRPR List 1B.2), which was accurate at the time of report preparation. However, its status was changed to CRPR List 4.2, indicating that it is more common than originally thought, in September 2012. Future references to this species, if any, should reflect this change.
15. Robinson's peppergrass (*Lepidium virginicum* var. *robinsonii*) is identified in the table as on California Rare Plant Ranking List 1B.2 (CRPR List 1B.2), which was accurate at the time of report preparation. However, its status was changed to CRPR List 4.2, indicating that it is more common than originally thought, in July 2013. Future references to this species, if any, should reflect this change.

Section 5.5.2: Special-Status Reptiles

16. The following special-status reptile species were identified in the February 2014 literature review but are not included in the BRA (Table 2, page 12):
    - Rosy boa (*Charina trivirgata*);
    - Southern rubber boa (*Charina umbratica*); and
    - Two-striped garter snake (*Thamnophis hammondii*).

Section 5.5.3: Special-Status Birds

17. The following special-status bird species were identified in the February 2014 literature review but are not included in the BRA (Table 3, pages 13–14):
    - Tricolored blackbird (*Agelaius tricolor*);
    - Southern California rufous crowned sparrow (*Aimophila ruficeps canescens*);
    - Bell's sage sparrow (*Artemisiospiza belli belli*);
    - Ferruginous hawk (*Buteo regalis*);
    - Swainson's hawk (*Buteo swainsoni*);
    - Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*);
    - Bald eagle (*Haliaeetus leucocephalus*); and
    - Lawrence's goldfinch (*Spinus lawrencei*).

Section 5.5.4: Special-Status Mammals

18. The following special-status mammal species were identified in the February 2014 literature review but are not included in the BRA (Table 4, pages 15–16):
    - San Bernardino flying squirrel (*Glaucomys sabrinus californicus*); and
    - White-eared pocket mouse (*Perognathus alticolus alticolus*)
19. Western yellow bat (*Lasiurus xanthinus*) is identified in the table as "No California special-status designation." However, this species is included on the CDFW's most recent Special Animals List (2011) as a Species of Special Concern. This does not change the analysis of the species' presence on site and will not affect analysis of project impacts to this species. Future references to this species however, if any, should reflect this difference.
20. Habitat for San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) is listed as coastal sage scrub only in Table 4 (page 15). However, this species is known from a variety of herbaceous and desert-shrub areas. This species given an occurrence probability of Absent. However, suitable habitat for this species occurs on site and the site is within the range of the species. Therefore, it is suggested that the occurrence probability be changed to Low or Moderate.

Section 5.5.5: Special-Status Invertebrates

21. The following special-status invertebrate species were identified in the February 2014 literature review but are not included in the BRA (Table 5, page 16):

- Desert cuckoo wasp (*Ceratochrysis longimala*);
- Andrew's marble butterfly (*Euchloe hyantis andrewsi*); and
- Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*).

Section 5.5.6: Special-Status Vegetation Communities

22. The following special-status vegetation communities were identified in the February 2014 literature review but are not included in the BRA (Table 6, page 17):
    - Southern Coast Live Oak Riparian Forest;
    - Southern Cottonwood Willow Riparian Forest; and
    - Southern Mixed Riparian Forest.

No Section: Special-Status Fish

23. The following special-status fish species were identified in the February 2014 literature review but are not included in the BRA:
    - Santa Ana sucker (*Catostomus santaanae*);
    - Arroyo chub (*Gila orcuttii*); and
    - Santa Ana speckled dace (*Rhinichthys osculus* ssp. *3*).

No Section: Special-Status Amphibians

24. The following special-status amphibian species were identified in the February 2014 literature review but are not included in the BRA:
    - San Gabriel slender salamander (*Batrachoseps gabrieli*);
    - California red-legged frog (*Rana draytonii*);
    - Southern mountain yellow-legged frog (*Rana muscosa*); and
    - Western spadefoot (*Spea hammondii*).

Section 6.0: Discussion

25. LSA recommends that a discussion of the potential cumulative impacts of the project to biological resources in accordance with a CEQA-level analysis be added to this section.
26. In order to provide clarity, measures suggested to avoid, minimize, or mitigate for potential project impacts to special-status biological resources should be separated from the rest of the text.
27. The last paragraph of this section (page 19) indicates that a focused survey for burrowing owl is needed, but does not discuss the potential need for a take-avoidance survey or additional avoidance and mitigation measures that may be needed if burrowing owls are found during the focused survey. The following language is recommended for insertion into the paragraph:

    "Because the burrowing owl is a mobile species, it has a potential to subsequently occupy any suitable burrows within the site. Per the currently accepted protocol, a take-avoidance survey should be conducted no more than 14 days prior to the initiation of ground

disturbance and a final survey should be conducted within 24 hours prior to ground disturbance to determine if the burrowing owl has subsequently occupied the development area. If burrowing owls are found on site, impact avoidance and mitigation measures may be required."

FOCUSED SURVEY FOR BURROWING OWL REPORT

General Comments

1. The project boundary provided in the Focused Survey for Burrowing Owl Report differs slightly from that in the Draft EA. While the same approximate acreage and APNs are discussed in the biological resources reports and the Draft EA, the project boundaries shown in the maps of the Draft EA differ slightly from those in the Focused Survey for Burrowing Owl Report. Based on a review of aerial photographs and verification from the site visit, the biological resources in all areas identified within project boundaries are similar and the discussion of biological resources would not be different due to the different project boundaries.
2. The site visit conducted for this peer review confirmed that site conditions are similar to those included in the Focused Survey for Burrowing Owl Report.

Specific Comments

Section 2.0: Methods

3. The Methods section does not identify the source of the methods used to conduct the focused burrowing owl survey. However, the methods discussed are consistent with those identified in the CDFW's *Staff Report on Burrowing Owl Mitigation* (March 2012), the generally accepted protocol.
4. There is no discussion of what areas were included in the study area. Figures 1 and 2 show the Project Site, but not a Study Area. The Results section discusses adjacent areas that were surveyed, but the size and location of adjacent areas included in the survey are not clearly defined anywhere in the report.

CONCLUSION

The biological resources reports prepared for the Veterans Administration Medical Clinic Project by AMEC in May 2012 are generally consistent with professional standards and practices (assumptions, approach, and methodology). The project description, assumptions, data, and site conditions are consistent with the project as presented to the City, and the analysis is generally adequate for use in the MND and in accordance with CEQA guidelines.

Based on the provided project description and current site conditions, the following Avoidance, Minimization, and/or Mitigation Measures for potential project impacts to special-status biological resources should be included in the MND:

- **Nesting Birds.** Trees adjacent to the site may provide nesting habitat to raptors and other birds observed using the site and surrounding areas. Ground-nesting bird species may nest throughout the project site. It is recommended that construction activities be scheduled outside of the avian

nesting season (February 15–August 15). If construction must occur during the nesting season, a nesting bird survey will be conducted within 3 days prior to the beginning of construction activities. If nesting birds are found within the project area or adjacent areas (within 150 feet of disturbed habitat or within 250 feet of riparian habitat), project activities including vegetation clearing and encroachment by heavy equipment would not occur until it is verified by a qualified biologist that young have fledged the nest(s) and nesting is completed.

- **Burrowing Owls.** Although no burrowing owls or burrowing owl sign (e.g., whitewash, pellets, scat, tracks, and/or feathers) were observed during the 2012 focused surveys, this species has a potential to subsequently occupy any suitable burrows within the site. Per the currently accepted protocol, a take-avoidance survey should be conducted no more than 14 days prior to the initiation of ground disturbance and a final survey should be conducted within 24 hours prior to ground disturbance to determine if the burrowing owl has subsequently occupied the development area. If surveys determine that burrowing owls occupy the site, a burrowing owl mitigation plan will be prepared, subject to approval by the CDFW.

Please contact me at (951) 781-9310 or via email at sarah.barrera@lsa-assoc.com if you have any questions regarding this report.

Sincerely,

LSA ASSOCIATES, INC.

Sarah Barrera
Senior Biologist

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
PLANTS				
Ambrosia monogyra **Singlewhorl burrobush**	US: – CA: 2B	Sandy soils in washes and ravines in chaparral and desert scrub below 500 meters (1,640 feet) elevation. In California, known from Riverside, San Bernardino, and San Diego Counties. Also occurs in Arizona, New Mexico, Texas, and Mexico.	August through November (perennial shrub)	**Absent:** No suitable habitat
Arenaria paludicola **Marsh sandwort**	US: FE CA: SE/1B	Sandy soils in marshes from 3 to 170 meters (10 to 560 feet) elevation, where it grows up through mats of *Typha*, *Juncus*, *Scirpus*, etc. Known to presently occur only in San Luis Obispo County. Believed extirpated from Los Angeles, San Francisco, Santa Cruz, Riverside, and San Bernardino Counties, and from the State of Washington. The last known record of this species in Riverside, San Bernardino, or Los Angeles Counties is from 1900.	May through August (perennial herb)	**Absent**
Astragalus hornii var. *hornii* **Horn's milk-vetch**	US: – CA: 1B	Alkaline playas and lake margins from 60 to 850 meters (200 to 2,800 feet) elevation. In California, known only from Inyo and Kern Counties. Believed extirpated from San Bernardino County. Also occurs in Nevada.	May through October	**Absent:** No suitable habitat
Berberis nevinii **Nevin's barberry**	US: FE CA: SE/1B	Gravelly wash margins in alluvial scrub or coarse soils and rocky slopes in chaparral at 275 to 825 meters (900 to 2,700 feet) elevation. Known occurrences at higher elevations are planted (not natural). Known only from Los Angeles, San Bernardino, Riverside, and San Diego Counties, California.	March through June (evergreen shrub)	**Absent:** No suitable habitat
Brodiaea filifolia **Thread-leaved brodiaea**	US: FT CA: SE/1B	Usually on clay or associated with vernal pools or alkaline flats; occasionally in vernally moist sites in fine soils (clay loam, silt loam, fine sandy loam, loam, loamy fine sand). Typically associated with needlegrass or alkali grassland or vernal pools. Occurs from 25 to 1,220 meters (80 to 4,000 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, San Diego, and San Luis Obispo Counties, California.	March through June (perennial herb)	**Absent:** No suitable habitat
California macrophylla **Round-leaved filaree**	US: – CA: 1B	Clay soils in woodland, scrub, and grassland communities from 15 to 1,200 meters (50 to 4,000 feet) elevation. Known from central and south coastal areas and the Central Valley in California. Also occurs in Oregon and Mexico.	March through May (annual herb)	**Absent:** No suitable habitat

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Calochortus palmeri var. *palmeri* **Palmer's mariposa lily**	US: – CA: 1B	Vernally moist places in chaparral and lower montane coniferous forest at 600 to 2,200 meters (2,000 to 7,200 feet) elevation. Known from Riverside, San Bernardino, Santa Barbara, Los Angeles, Ventura, Kern, and San Luis Obispo Counties.	May through July (perennial herb)	**Absent:** No suitable habitat
Calochortus plummerae **Plummer's mariposa lily**	US: – CA: 4	Sandy or rocky sites of (usually) granitic or alluvial material in valley and foothill grassland, coastal scrub, chaparral, cismontane woodland, and lower montane coniferous forest, at 100 to 1,700 meters (300 to 5,600 feet) elevation. Known from the Santa Monica Mountains to San Jacinto Mountains in Riverside, San Bernardino, Orange, Los Angeles, and Ventura Counties, California. In the western Riverside County area, this species is known from the foothills of the San Bernardino Mountains, northeastern Santa Ana Mountains, Box Springs Mountains, and from the Lake Skinner area (*The Vascular Plants of Western Riverside County*, California. F.M. Roberts et al., 2004). Appears to intergrade with *Calochortus weedii* var. *intermedius*, which is mostly from Santa Ana Mountains eastward.	May through July (perennial herb)	**Absent**
Carex comosa **Bristly sedge**	US: – CA: 2B	Bogs and fens, freshwater marshes and swamps, and lake margins below 425 meters (1,400 feet). Known from Lake, Santa Cruz, San Francisco, Shasta, San Joaquin, and Sonoma Counties; and Idaho, Oregon, and Washington. Believed extirpated from San Bernardino County (last known occurrence was in 1882).	May through September	**Absent:** No suitable habitat
Castilleja lasiorhyncha **San Bernardino Mountains owl's-clover**	US: – CA: 1B	Mesic to drying soils in open areas of stream and meadow margins or margins of vernally wet areas in meadows, chaparral, pebble plains, and upper montane coniferous forest at 1,300 to 2,400 meters (4,300 to 7,900 feet) elevation. Known from San Bernardino County, and historically from Riverside County.	June through August (annual herb)	**Absent:** No suitable habitat
Caulanthus simulans **Payson's jewel-flower**	US: – CA: 4.2	Recently burned areas or disturbed sites such as streambeds in chaparral, coastal sage scrub, riparian areas, and grassland at 60 to 2,200 meters (200 to 7,200 feet) elevation. Known from San Diego County (Collections in western Riverside County misidentified, are *C. heterophyllus* var. *pseudosimulans*).	Blooms March through June	**Absent**

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Centromadia pungens ssp. *laevis* **Smooth tarplant**	US: – CA: 1B	Alkaline areas in chenopod scrub, meadows, playas, riparian woodland, valley and foothill grassland below 480 meters (1,600 feet) elevation. Known from Riverside and San Bernardino Counties, extirpated from San Diego County.	April through November (annual herb)	**Absent**
Chloropyron (Cordylanthus) maritimum spp. *maritimum* **Salt marsh bird's beak**	US: FE CA: SE/1B	Coastal dunes and salt marshes below 30 meters (100 feet) elevation. In California, known from Los Angeles, Orange, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura Counties. Historical collections referred to this taxon from alkaline meadow in vicinity of San Bernardino Valley are intermediate to *C. maritimus* ssp. *canescens*. Also occurs in Mexico.	May through October (annual herb)	**Absent**
Chorizanthe parryi var. *parryi* **Parry's spineflower**	US: – CA: 1B	Sandy or rocky soils in chaparral, coastal scrub, or woodlands at 40 to 1,705 meters (100 to 5,600 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties.	Blooms April through June (annual herb)	**Absent**
Cuscuta obtusifolia var. *glandulosa* **Peruvian dodder**	US: – CA: 2B	May be extirpated in California. Formerly found sporadically in freshwater marsh on herbs including *Alternanthera*, *Dalea*, *Lythrum*, *Polygonum*, and *Xanthium* below about 500 meters (1,600 feet). Reported in California from Los Angeles, San Bernardino, Sonoma, Sutter, Butte, Sacramento, and Merced Counties. Also known from eastern and southern US, West Indies, and Mexico.	July through October (annual parasitic vine)	**Absent**
Dodecahema leptoceras **Slender-horned spineflower**	US: FE CA: SE/1B	In the Vail Lake area, occurs in gravel soils of Temecula arkose deposits in openings in chamise chaparral. In other areas, occurs in sandy cobbly riverbed alluvium in alluvial fan sage scrub (usually late seral stage), on floodplain terraces and benches that receive infrequent overbank deposits from generally large washes or rivers, where it is most often found in shallow silty depressions dominated by leather spineflower (*Lastarriaea coriacea*) and other native annual species, and is often associated with cryptogamic soil crusts composed of bryophytes, algae and/or lichens. Occurs at 200 to 760 meters (600 to 2,500 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties, California.	April through June (annual herb)	**Absent**

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Eriastrum densifolium ssp. *sanctorum* **Santa Ana River woollystar**	US: FE CA: SE/1B	Riversidean alluvial fan sage scrub and chaparral in sandy or gravelly soils of floodplains and terraced fluvial deposits of the Santa Ana River and larger tributaries (Lytle and Cajon Creeks, lower portions of City and Mill Creeks) at 90 to 625 meters (300 to 2,100 feet) elevation in San Bernardino and Riverside Counties.	May through September	**Absent**
Fimbristylis thermalis **Hot springs fimbristylis**	US: – CA: 2B	Meadows and seeps (alkaline, near hot springs) in elevations from 120 to 1,340 meters (400 to 4,400 feet). Known from Inyo Kern, Mono, and San Bernardino Counties, California, and Arizona and Nevada.	July through September (perennial herb)	**Absent:** No suitable habitat
Galium californicum ssp. *primum* **Alvin meadow bedstraw**	US: – CA: 1B	Granitic soils in chaparral and lower montane coniferous forest; 1,350 to 1,700 meters (4,400 to 5,600 feet). Known from Riverside and San Bernardino Counties.	May through July	**Absent**
Helianthus nuttallii ssp. *parishii* **Los Angeles sunflower**	US: – CA: 1A	Marshes and swamps (coastal salt and freshwater) at 10 to 500 meters (30 to 1,600 feet) elevation. This species is historically known from Los Angeles, Orange and San Bernardino Counties, California. Last seen in 1937. Presumed extinct. Plants found in 2002 at Castaic Spring along the Santa Clara River in Los Angeles County were initially reported as possibly this taxon, but instead appear to be hybrids or evolutionary intermediates between *H. nuttallii* and *H. californicus*, based on chromosome counts and pollen morphology (*A Quantitative Analysis of Pollen Variation in Two Southern California Perennial* Helianthus *(Heliantheae: Asteraceae)*, J.M. Porter and N. Fraga, 2004).	August through October (perennial herb)	**Absent**
Heuchera parishii **Parish's alumroot**	US: – CA: 1B	Rocky areas in coniferous forests in Riverside and San Bernardino Counties at 1,500 to 3,800 meters (4,900 to 12,500 feet) elevation.	June through August (perennial herb)	**Absent:** No suitable habitat
Horkelia cuneata ssp. *puberula* **Mesa horkelia**	US: – CA: 1B	Sandy or gravelly soils in chaparral, or rarely in cismontane woodland or coastal scrub at 70 to 825 meters (200 to 2,700 feet) elevation. Known only from San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Bernardino Counties, California. Believed extirpated from Riverside and San Diego Counties.	February through July (sometimes to September) (perennial herb)	**Absent:** No suitable habitat

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Imperata brevifolia **California satintail**	US: - CA: 2B	Desert seeps, springs, moist canyons, canals, alkaline sinks, and similar wet areas at 0 to 500 meters (0 to 1,600 feet) elevation. Widespread in California and the western U. S. Also occurs in Mexico.	September through May (perennial grass)	**Absent:** No suitable habitat
Ivesia argyrocoma var. *argyrocoma* **Silver-haired ivesia**	US: – CA: 1B	Alkaline meadows and pavement plains at 1,475 to 2,680 meters (4,800 to 8,800 feet) elevation. In California, known only from San Bernardino County.	June to August (perennial herb)	**Absent:** No suitable habitat
Lasthenia glabrata ssp. *coulteri* **Coulter's goldfields**	US: – CA: 1B	Usually alkaline soils in marshes, playas, vernal pools, and valley and foothill grassland below 1,400 meters (4,600 feet) elevation. Known from Colusa, Merced, Tulare, Orange, Riverside, Santa Barbara, San Diego, San Luis Obispo, and Ventura Counties. Believed extirpated from Kern, Los Angeles, San Bernardino Counties, and possibly Tulare Counties. Also occurs in Mexico.	February through June (annual herb)	**Absent:** No suitable habitat
Lepidium virginicum var. *robinsonii* **Robinson's pepper-grass**	US: – CA: 4	Dry soils in coastal sage scrub and chaparral below 885 meters (2,900 feet) elevation. In California, known only from Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino and San Diego Counties, and Santa Cruz Island. Also occurs in Mexico.	January through July (annual herb)	**Absent**
Lycium parishii **Parish's desert-thorn**	US: – CA: 2B	Coastal scrub and Sonoran desert scrub at 300 to 1,000 meters (1,000 to 3,300 feet) elevation. In California, known from Imperial and San Diego Counties. Report from Riverside County is based on a misidentification. Known only historically from San Bernardino County (benches and/or foothills north of San Bernardino).	March through April (deciduous shrub)	**Absent:** No suitable habitat
Malacothanmus parishii **Parish's bush mallow**	US: – CA: 1A	Known only from one occurrence in 1895, in chaparral and coastal sage scrub at 490 meters (1,600 feet) elevation in vicinity of San Bernardino. Presumed extinct.	June through July (deciduous shrub)	**Absent**
Monardella macrantha ssp. *hallii* **Hall's monardella**	US: – CA: 1B	Dry slopes and ridges in openings in chaparral, woodland, and forest at 695 to 2,195 meters (2,280 to 7,200 feet) elevation. Known only from Los Angeles, San Diego, Orange, Riverside, and San Bernardino Counties, California. In the western Riverside County area, known only from higher elevations in the Santa Ana and Aqua Tibia Mountains (*The Vascular Plants of Western Riverside County, California*. F.M. Roberts et al., 2004).	June through August (sometimes to October) (perennial herb)	**Absent:** No suitable habitat

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Monardella pringlei **Pringle's monardella**	US: – CA: 1A	Sandy hills in coastal sage scrub at 300 to 400 meters (980 to 1,300 feet) elevation. Known only from two occurrences west of Colton. Last seen in 1941. Habitat lost to urbanization. Presumed extinct.	May through June	**Absent:** No suitable habitat
Nasturtium gambelii **Gambel's water cress**	US: FE CA: ST/1B	Marshes and swamps from 5 to 330 meters (20 to 1,100 feet) elevation. Currently believed to occur in California only in Santa Barbara and San Luis Obispo Counties. There are historical records from Los Angeles, Orange, San Diego, and San Bernardino Counties, although the San Diego County records may be based on misidentification of another species. Also occurs in Baja California.	April through September	**Absent**
Perideridia parishii ssp. *parishii* **Parish's yampah**	US: – CA: 2B	Damp meadows or margins of streambeds (usually with an open pine canopy) in meadows and lower and upper montane coniferous forest at 1,420 to 3,000 meters (4,700 to 9,800 feet) elevation. In California, known only from San Bernardino County.	June through August (perennial herb)	**Absent:** No suitable habitat
Ribes divericatum var. *parishii* **Parish's gooseberry**	US: – CA: 1A	Deciduous shrub of willow swales in riparian habitats at 60 to 300 meters (200 to 1,000 feet) elevation. Believed to be extinct. Historical collections from Los Angeles and San Bernardino Counties.	Blooms February through April	**Absent**
Schoenus nigricans **Black bog-rush**	US: – CA: 2B	Marshes and swamps (often in alkali soils) in elevations from 140 to 2,130 meters (500 feet to 7,000 feet). Known from Inyo and San Bernardino Counties, California, and Nevada, Texas, and elsewhere.	August through September (perennial herb)	**Absent:** No suitable habitat
Sidalcea malviflora ssp. *dolosa* **Bear Valley checkerbloom**	US: – CA: 1B	Perennial herb found in meadows and seeps, riparian woodland, lower and upper montane coniferous forest. Known from wet areas within forested habitat, 1,495 to 2,685 meters (4,900 to 8,800 feet) in elevation. Known only from the San Bernardino Mountains in California.	May through Aug (perennial herb)	**Absent:** No suitable habitat
Sidalcea neomexicana **Salt Spring checkerbloom**	US: – CA: 2B	Alkaline springs and brackish marshes below 1,530 meters (5,000 feet) elevation. In California, known only from Kern, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties. Believed extirpated from Los Angeles County. Also known from Arizona, New Mexico, Nevada, Utah, and Mexico.	Blooms March through June (perennial herb)	**Absent:** No suitable habitat

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Sphenopholis obtusata **Prairie wedge grass**	US: – CA: 2B	Wet meadows, stream banks, and ponds at 300 to 2,000 meters (1,000 to 6,600 feet) elevation. Widely distributed. In Southern California, known only from San Bernardino, Riverside (Santa Ana River), and perhaps San Diego Counties.	Blooms April through July (perennial herb)	**Absent**
Streptanthus bernardinus **Laguna Mountains jewel-flower**	US: – CA: 4.3	Chaparral and lower montane coniferous forest; 1,440 (670?) to 2,500 meters (4,700 [2,200?] to 8,200 feet) elevation; Transverse and Peninsular ranges of Southern California; possibly in Baja California.	Blooms May through June	**Absent:** No suitable habitat
Streptanthus campestris **Southern jewel-flower**	US: – CA: 1B	Open rocky areas in chaparral, lower montane coniferous forest and pinyon-juniper woodland at 600 to 2,400 meters (2,000 to 7,800 feet) elevation. In California, known from Riverside, San Bernardino, and San Diego Counties.	Blooms May through July (perennial herb)	**Absent:** No suitable habitat
Symphyotrichum defoliatum **San Bernardino aster**	US: – CA: 1B	Vernally wet sites (such as ditches, streams, and springs) in many plant communities below 2,040 meters (6,700 feet) elevation. In California, known from Ventura, Kern, San Bernardino, Los Angeles, Orange, Riverside, and San Diego Counties. May also occur in San Luis Obispo County. In the western Riverside County area, this species is scarce, and documented only from Temescal and San Timoteo Canyons (*The Vascular Plants of Western Riverside County, California*. F.M. Roberts et al., 2004).	Blooms July through November (perennial herb)	**Absent**
Thelypteris puberula var. *sonorensis* **Sonoran maiden fern**	US: – CA: 2B	Seeps and along streams in meadows at 50 to 610 meters (170 to 2,000 feet) elevation. Known from western Riverside, southwest San Bernardino, Santa Barbara, and Los Angeles Counties.	Blooms January through September (perennial herb)	**Absent:** No suitable habitat
INVERTEBRATES				
Carolella busckana **Busck's gallmoth**	US: – CA: SA	Larval host reported as *Encelia californica* (*HOSTS: a Database of the World's Lepidopteran Host plants*. The Natural History Museum, London, 2007.) Other habitat requirements unknown. Species is known only from historical reports.	Unknown	**Absent**
Ceratochrysis longimala **A Cuckoo wasp**	US: – CA: SA	Habitat requirements unknown. Known from the Gorman area (Los Angeles County), where it is presumed to persist. Also known from a historical record (1915, old part of Riverside) from Riverside County.	Unknown	**Unknown** – likely absent as only known from vicinity historically

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Euchloe hyantis andrewsi **Andrew's marble butterfly**	US: – CA: SA	Yellow pine forest near Lake Arrowhead and Big Bear Lake in the San Bernardino Mountains at 1,500 to 1,800 meters (5,000 to 6,000 feet) elevation. Host plants are *Streptanthus bernardinus* and *Arabis holboelii* var. *pinetorum.* Larval food plant is *Descurainia richardsonii.*	Unknown	**Absent:** No suitable habitat
Rhaphiomidas terminatus abdominalis **Delhi Sands giant flower-loving fly**	US: FE CA: SA	Restricted to Delhi series sands in western Riverside and San Bernardino Counties.	Aboveground emergence August and September. Not visible during the rest of the year.	**Absent:** No suitable habitat
FISH				
Catostomus santaanae **Santa Ana sucker**	US: FT CA: SSC	The Santa Ana sucker's historical range includes the Los Angeles, San Gabriel, and Santa Ana River drainage systems located in Southern California. An introduced population also occurs in the Santa Clara River drainage system in southern California. Found in shallow, cool, running water.	Year-round	**Absent:** No suitable habitat
Gila orcuttii **Arroyo chub**	US: – CA: SSC	Perennial streams or intermittent streams with permanent pools; slow water sections of streams with mud or sand substrates; spawning occurs in pools. Native to Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita River systems; introduced in Santa Ynez, Santa Maria, Cuyama, and Mojave River systems and smaller coastal streams.	Year-round	**Absent:** No suitable habitat
Rhinichthys osculus ssp. *3* **Santa Ana speckled dace**	US: – CA: SSC	Found in the headwaters of the Santa Ana and San Gabriel River drainages. Found in riffles in small streams and shore areas with abundant gravel and rock.	Year-round	**Absent:** No suitable habitat
AMPHIBIANS				
Batrachoseps gabrieli **San Gabriel Mountains slender salamander**	US: – CA: SA	Found under rocks, wood, fern fronds and on soil at the base of talus slopes. This salamander is most active on the surface in winter and early spring. Known only from the San Gabriel Mountains.	Most active on the surface in winter and early spring	**Absent:** No suitable habitat
Rana draytonii **California red-legged frog**	US: FT CA: SSC	Deep, quiet pools of streams, marshes, and occasionally ponds, with dense, shrubby vegetation at edges, usually below 1,200 meters (4,000 feet). Foothills surrounding the Sacramento Valley and coastal streams from Marin County to northwestern Baja California; Believed to be extirpated between Los Angeles County and the Mexican border. Below about 1,000 feet elevation.	December through April	**Absent:** No suitable habitat

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Rana muscosa **Sierra Madre yellow-legged frog**	US: FE CA: SE	Ponds, lakes, and streams at moderate to high elevation; appears to prefer bodies of water with open margins and gently sloping bottom. Transverse Ranges in southern California from 370 to 2,290 meters (1,200 to 7,500 feet) elevation. Restricted to streams in ponderosa pine, montane hardwood-conifer, and montane riparian habitats.	March through June	**Absent:** No suitable habitat
Spea hammondii **Western spadefoot**	US: – CA: SSC	Grasslands and occasionally hardwood woodlands; largely terrestrial but requires rain pools or other ponded water persisting at least three weeks for breeding; burrows in loose soils during dry season. Occurs in the Central Valley and adjacent foothills, the non-desert areas of southern California, and Baja California.	October through April (following onset of winter rains)	**Absent:** No suitable habitat
REPTILES				
Anniella pulchra **California legless lizard**	US: – CA: SSC	Inhabits sandy or loose loamy soils with high moisture content under sparse vegetation from central California to northern Baja California.	Nearly year round, at least in southern areas	**Low**
Aspidoscelis hyperythra **Orangethroat whiptail**	US: – CA: SSC	Prefers washes and other sandy areas with patches of brush and rocks, in chaparral, coastal sage scrub, juniper woodland, and oak woodland from sea level to 915 meters (3,000 feet) elevation. Perennial plants required. Occurs in Riverside, Orange, San Diego Counties west of the crest of the Peninsular Ranges, in extreme southern San Bernardino County near Colton, and in Baja California.	March through July with reduced activity August through October	**Very Low***
Aspidoscelis tigris stejnegeri **Coastal western whiptail**	US: – CA: SA	Wide variety of habitats including coastal sage scrub, sparse grassland, and riparian woodland; coastal and inland valleys and foothills; Ventura County to Baja California.	April through August	**Very Low***
Charina trivirgata **Rosy boa**	US: – CA: SA	In rocky areas in chaparral or scrub habitats or adjacent oak woodland; also in rocky riparian areas. Found in Los Angeles County, southwestern San Bernardino County, south through western Riverside County, and San Diego County into Baja California.	Nocturnal. Rarely active during day. Active between April and September	**Absent:** No suitable habitat
Charina umbratica **Southern rubber boa**	US: – CA: ST	Montane conifer forest; near rock outcrops and woody debris. 1,525 to 2,440 meters (5,000 to 8,000 feet) elevation. San Bernardino and San Jacinto Mountains.	April through October (nocturnal)	**Absent:** No suitable habitat

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Crotalus ruber **Red diamond rattlesnake**	US: – CA: SSC	Desert scrub, thornscrub, open chaparral and woodland; occasional in grassland and cultivated areas. Prefers rocky areas and dense vegetation. Morongo Valley in San Bernardino and Riverside Counties to the west and south into Mexico.	Mid-spring through mid-fall	**Absent**
Diadophis punctatus modestus **San Bernardino ringneck snake**	US: – CA: SA	Under surface objects along drainage courses, preferring mesic chaparral and oak and walnut woodland communities. Moist habitats of southwestern California from about Ventura to Orange Counties.	Diurnal. Crepuscular and nocturnal during warmer periods.	**Absent**
Phrynosoma blainvillii (coronatum) **Coast horned lizard**	US: – CA: SSC	Primarily in sandy soil in open areas, especially washes and floodplains, in many plant communities. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and an abundant supply of ants or other insects. Occurs west of the deserts from northern Baja California north to Shasta County below 2,400 meters (8,000 feet) elevation.	April through July with reduced activity August through October	**Very Low***
Thamnophis hammondii **Two-striped garter snake**	US: – CA: SSC	Highly aquatic. Only in or near permanent sources of water. Streams with rocky beds supporting willows or other riparian vegetation. From Monterey County to northwest Baja California.	Diurnal Year-round	**Absent:** No suitable habitat
BIRDS				
Accipiter cooperii (nesting) **Cooper's hawk**	US: – CA: SA	Forages in a wide range of habitats, but primarily in forests and woodlands. These include natural areas as well as human-created habitats such as plantations and ornamental trees in urban landscapes. Usually nests in tall trees (20 to 60 feet) in extensive forested areas (generally woodlots of 4 to 8 hectares with canopy closure of greater than 60 percent). Occasionally nests in isolated trees in more open areas.	Year-round	Nesting: **Absent** Foraging: **Moderate**
Agelaius tricolor (nesting colony) **Tricolored blackbird**	US: – CA: SSC (breeding)	Open country in western Oregon, California, and northwestern Baja California. Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs and forages in grassland and cropland habitats. Seeks cover for roosting in emergent wetland vegetation, especially cattails and tules, and also in trees and shrubs.	Year-round	Nesting: **Absent** Foraging: **Absent** No suitable habitat

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Aimophila ruficeps canescens **Southern California rufous-crowned sparrow**	US: – CA: SA	Steep, rocky coastal sage scrub and open chaparral habitats, particularly scrubby areas mixed with grasslands. From Santa Barbara County to northwestern Baja California.	Year-round, diurnal activity	Nesting: **Absent** Foraging: **Absent** No suitable habitat
Artemisiospiza (Amphispiza) belli belli **Bell's sage sparrow**	US: – CA: SA	Occupies chaparral and coastal sage scrub from west central California to northwestern Baja California.	Year-round, diurnal activity	Nesting: **Absent** Foraging: **Absent** No suitable habitat
Athene cunicularia (burrow sites) **Burrowing owl**	US: – CA: SSC (breeding)	Open country in much of North and South America. Usually occupies ground squirrel burrows in open, dry grasslands, agricultural and range lands, railroad rights-of-way, and margins of highways, golf courses, and airports. Often utilizes man-made structures, such as earthen berms, cement culverts, cement, asphalt, rock, or wood debris piles. They avoid thick, tall vegetation, brush, and trees, but may occur in areas where brush or tree cover is less than 30 percent.	Year-round	Nesting: **Low** Foraging: **Low**
Buteo regalis (wintering) **Ferruginous hawk**	US: – CA: SA	Forages in open fields, grasslands and agricultural areas, sagebrush flats, desert scrub, fringes of pinyon-juniper habitats, and other open country in western North America. Requires large, open tracts of grasslands, sparse shrub, or desert habitats.	Mid-September through mid-April	Nesting: **Absent** No suitable habitat Foraging: **Low** May forage over site due to open space.
Buteo swainsoni (nesting) **Swainson's hawk**	US: – CA: ST	Open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Breeds and nests in western North America; winters in South America. Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, and Antelope Valley. In Southern California, now mostly limited to spring and fall transient. Formerly abundant in California with wider breeding range.	Spring and fall (in migration)	Nesting: **Absent** No suitable habitat Foraging: **Low** May forage over site due to open space.

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Coccyzus americanus occidentalis (nesting) **Western yellow-billed cuckoo**	US: FC CA: SE	Breeds and nests in extensive stands of dense cottonwood/willow riparian forest along broad, lower flood bottoms of larger river systems at scattered locales in western North America; winters in South America.	May through September	Nesting: **Absent** Foraging: **Absent** No suitable habitat
Dendroica petechia (nesting) **Yellow warbler**	US: – CA: SSC (breeding)	Riparian woodland while nesting in the western U.S. and northwestern Baja California; more widespread in brushy areas and woodlands during migration. Occurs from western Mexico to northern South America in winter. Migrants are widespread and common. Three subspecies breed in California: *morcomi, brewsteri,* and *sonorana.* (Sonoran yellow warbler nests along the Colorado River.)	Summer, winter, or year-round, depending on locale	Nesting: **Absent** Foraging: **Absent**
Empidonax traillii extimus **Southwestern willow flycatcher**	US: FE CA: SE	Rare and local breeder in extensive riparian areas of dense willows or (rarely) tamarisk, usually with standing water, in the southwestern U.S. and possibly extreme northwestern Mexico. Winters in Central and South America. Below 1,830 meters (6,000 feet) elevation.	May through September	Nesting: **Absent** Foraging: **Absent**
Eremophila alpestris actia **California horned lark**	US: – CA: SA	Open grasslands and fields, agricultural area, open montane grasslands. This subspecies is resident from northern Baja California northward throughout non-desert areas to Humboldt County, including the San Joaquin Valley and the western foothills of the Sierra Nevada (north to Calaveras County). Prefers bare ground such as plowed or fall-planted fields for nesting, but may also nest in marshy soil. During the breeding season, this is the only subspecies of horned lark in non-desert southern California; however, from September through April or early May, other subspecies visit the area.	Year-round interior (inland areas)	Nesting: **Low** Foraging: **Moderate**
Haliaeetus leucocephalus (nesting & wintering) **Bald eagle**	US: – CA: SE/CFP	Winters locally at deep lakes and reservoirs feeding on fish and waterfowl. Locally rare throughout North America.	November through February	Nesting: **Absent** Foraging: **Absent** No suitable habitat
Icteria virens (nesting) **Yellow-breasted chat**	US: – CA: SSC (breeding)	Riparian thickets of willow, brushy tangles near watercourses. Nests in riparian woodland throughout much of western North America. Winters in Central America.	Summer in California	Nesting: **Absent** Foraging: **Absent**

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Lanius ludovicianus (nesting) **Loggerhead shrike**	US: – CA: SSC (breeding)	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Inhabits open country with short vegetation, pastures, old orchards, cemeteries, golf courses, riparian areas, and open woodlands. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. Occurs only rarely in heavily urbanized areas, but often found in open cropland. Found in open country in much of North America.	Year-round	Nesting: **Absent** Foraging: **Moderate**
Polioptila californica californica **Coastal California gnatcatcher**	US: FT CA: SSC	Inhabits coastal sage scrub in low-lying foothills and valleys up to about 500 meters (1,640 feet) elevation in cismontane southwestern California and Baja California.	Year-round	Nesting: **Absent** Foraging: **Absent**
Spinus lawrencei (=*Carduelis l.*) (nesting) **Lawrence's goldfinch**	US: – CA: SA	Usually inhabits oak woodlands, but also uses chaparral, riparian woodlands, coastal scrub, forests, pinyon-juniper woodlands, plantings of cypress, cedars, or junipers, tall weedy and adjacent rural residential areas. A water source such as a stream, small lake, or farm pond within 0.5 km is probably required. Nests throughout much of the non-desert portion of California and Baja California.	Fairly common April through August; otherwise uncommon.	Nesting: **Absent** Foraging: **Absent** No suitable habitat
Vireo bellii pusillus **Least Bell's vireo**	US: FE CA: SE	Riparian forests and willow thickets. The most critical structural component of Least Bell's Vireo habitat in California is a dense shrub layer 2 to 10 feet (0.6–3.0 meter) above ground. Nests from central California to northern Baja California. Winters in southern Baja California.	April through September	Nesting: **Absent** Foraging: **Absent**
MAMMALS				
Antrozous pallidus **Pallid bat**	US: – CA: SSC	Most common in open, dry habitats with rocky areas for roosting. Day roosts in caves, crevices, rocky outcrops, tree hollows or crevices, mines and occasionally buildings, culverts, and bridges. Night roosts may be more open sites, such as porches and open buildings. Grasslands, shrublands, woodlands, and forest in western North America.	Year-round; nocturnal	Roosting: **Absent** Foraging: **Low**

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Chaetodipus fallax fallax **Northwestern San Diego pocket mouse**	US: – CA: SSC	Found in sandy herbaceous areas, usually associated with rocks or coarse gravel in coastal scrub, chaparral, grasslands, and sagebrush, from Los Angeles County through southwestern San Bernardino, western Riverside, and San Diego Counties to northern Baja California.	Year-round	**Low:** Habitat very disturbed. Long-term agricultural use likely excludes this species from the site.
Dipodomys merriami parvus **San Bernardino kangaroo rat**	US: FE CA: SSC	Gravelly and sandy soils of alluvial fans, braided river channels, active channels and terraces; San Bernardino Valley (San Bernardino County) and San Jacinto Valley (Riverside County). In San Bernardino County, this species occurs primarily in the Santa Ana River and its tributaries north of Interstate 10, with small remnant populations in the Etiwanda alluvial fan, the northern portion of the Jurupa Mountains in the south Bloomington area, and in Reche Canyon. In Riverside County, this species occurs along the San Jacinto River east of approximately Sanderson Avenue, and along Bautista Creek. Remnant populations may also occur within Riverside County in Reche Canyon, San Timoteo Canyon, Laborde Canyon, the Jurupa Mountains, and the Santa Ana River Wash north of State Route 60.	Nocturnal, active year-round	**Absent**
Dipodomys stephensi **Stephens' kangaroo rat**	US: FE CA: ST	Found in plant communities transitional between grassland and coastal sage scrub, with perennial vegetation cover of less than 50%. Most commonly associated with *Artemesia tridentata*, *Eriogonum fasciculatum*, and *Erodium.* Requires well-drained soils with compaction characteristics suitable for burrow construction (neither sandy nor too hard). Not found in soils that are highly rocky or sandy, less than 20 inches deep, or heavily alkaline or clay, or in areas exceeding 25% slope. Occurs only in western Riverside County, northern San Diego County, and extreme southern San Bernardino County, below 915 meters (3,000 feet) elevation. In northwestern Riverside County, known only from east of Interstate 15. Reaches its northwest limit in south Norco, southeast Riverside, and in the Reche Canyon area of Riverside and extreme southern San Bernardino Counties.	Year-round, nocturnal	**Absent**

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Eumops perotis californicus **Western mastiff bat**	US: – CA: SSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc.; roosts in crevices in vertical cliff faces, high buildings, and tunnels, and travels widely when foraging.	Year-round; nocturnal	Roosting: **Absent** Foraging: **Low**
Glaucomys sabrinus californicus **San Bernardino flying squirrel**	US: – CA: SSC	Inhabits a wide variety of woodland habitats primarily consisting of conifers, mixed coniferous-deciduous forest and occasionally broad-leaf-deciduous forest. Commonly found in white fir, coulter pine, Jeffrey pine, sugar pine, lodgepole pine forests, and ponderosa pine forest. May occur in hardwoods where old or dead trees have numerous woodpecker-type nesting holes. Requires nearby water. Occurs at elevations between 1,200 to 2,560 meters (4,000 to 8,400 feet) in the San Bernardino and San Jacinto Mountains.		**Absent:** No suitable habitat
Lasiurus xanthinus **Western yellow bat**	US: – CA: SSC (in process)	Found mostly in desert and desert riparian areas of the southwest US, but also expanding its range with the increased usage of native and non-native ornamental palms in landscaping. Individuals typically roost amid dead fronds of palms in desert oases, but have also been documented roosting in cottonwood trees. Forage over many habitats.	Year-round; nocturnal	Roosting: **Very Low*** Foraging: **Low**
Lepus californicus bennettii **San Diego black-tailed jackrabbit**	US: – CA: SSC	Variety of habitats including herbaceous and desert scrub areas, early stages of open forest and chaparral. Most common in relatively open habitats. Restricted to the cismontane areas of Southern California, extending from the coast to the Santa Monica, San Gabriel, San Bernardino, and Santa Rosa Mountain ranges.	Year-round, diurnal and crepuscular activity	**Absent**
Neotoma lepida intermedia **San Diego desert woodrat**	US: – CA: SSC	Found in desert scrub and coastal sage scrub habitat, especially in association with cactus patches. Builds stick nests around cacti, or on rocky crevices. Occurs along the Pacific slope from San Luis Obispo County to northwest Baja California.	Year-round, mainly nocturnal, occasionally crepuscular and diurnal	**Absent**
Nyctinomops femorosaccus **Pocketed free-tailed bat**	US: – CA: SSC	Usually associated with cliffs, rock outcrops, or slopes. May roost in buildings (including roof tiles) or caves. Rare in California, where it is found in Riverside, San Diego, and Imperial Counties. More common in Mexico.	Year-round; nocturnal	Roosting: **Absent** Foraging: **Low**

Table A: Special-Status Species Occurring in the Vicinity of the Project Site

Species	Status	General Habitat Description	Active Period	Occurrence Probability
Onychomys torridus ramona **Southern grasshopper mouse**	US: – CA: SSC	Believed to inhabit sandy or gravelly valley floor habitats with friable soils in open and semi-open scrub, including coastal sage scrub, mixed chaparral, low sagebrush, riparian scrub, and annual grassland with scattered shrubs, preferring low to moderate shrub cover. More susceptible to small- and large-scale habitat loss and fragmentation than most other rodents, due to its low fecundity, low population density, and large home range size. Arid portions of southwestern California and northwestern Baja California.	Nocturnal, active year-round	**Absent**
Perognathus alticola **White-eared pocket mouse**	US: – CA: SSC	Found in ponderosa pine habitats, and mixed chaparral and sagebrush habitats in the San Bernardino Mountains from 1,065 to 1,800 meters (3,500 to 5,900 feet) elevation. Burrows are constructed in loose sandy soils. Apparently, this species has not been collected since 1938 in the San Bernardino Mountains.	Nocturnal. Aestivates in very hot weather and hibernates in very cold weather.	**Absent:** No suitable habitat
Perognathus longimembris brevinasus **Los Angeles pocket mouse**	US: – CA: SSC	Prefers sandy soil for burrowing, but has been found on gravel washes and stony soils. Found in coastal sage scrub in Los Angeles, Riverside, and San Bernardino Counties.	Nocturnal. Active late spring to early fall.	**Very Low***
Taxidea taxus **American badger**	US: – CA: SSC	Primary habitat requirements seem to be sufficient food and friable soils in relatively open uncultivated ground in grasslands, woodlands, and desert. Widely distributed in North America.	Year-round	**Absent**

LEGEND FOR TABLE A

* The **Very Low** Occurrence Probability comes from AMEC's 2012 BRA, but was not defined in that report.

Shaded cells indicate that the species was included in AMEC's 2012 BRA. All conclusions regarding Occurrence Probability in these cells are taken directly from AMEC's 2012 BRA.

Status:
US: FE—Taxa listed as Endangered.
FT—Taxa listed as Threatened.
FC—Candidate for listing as Threatened or Endangered.
None—Species is not federally listed as an endangered, threatened, or candidate species.
CA: SE—Taxa State-listed as Endangered.
ST—Taxa State-listed as Threatened.
SSC—California Species of Special Concern. Refers to animals with vulnerable or seriously declining populations.
CFP—California Fully Protected. Refers to animals protected from take under Fish and Game Code Sections 3511, 4700, 5050, and 5515.
SA—Special Animal. Refers to any other animal monitored by the Natural Diversity Data Base, regardless of its legal or protection status.
1A—California Rare Plant Rank 1A: Presumed extinct in California.
1B—California Rare Plant Rank 1B: Rare, threatened, or endangered in California and elsewhere.
2B—California Rare Plant Rank 2B: Rare, threatened, or endangered in California, but more common elsewhere.
3—California Rare Plant Rank 3: A review list of plants about which more information is needed.
4—California Rare Plant Rank 4: A watch list of plants of limited distribution.
California Rare Plant Rank Extensions
0.2—Fairly endangered in California (20 to 80% occurrences threatened).
0.3—Not very endangered in California (less than 20% of occurrences threatened).
None—Species is not State listed as an endangered, threatened, or candidate species.

Habitat: Definitions of Occurrence Probability included here are for those species that were not analyzed in AMEC's 2012 BRA.
Absent—No habitat present and no further work needed.
Low—Habitat is or may be present, but high level of site disturbance has deteriorated habitat to point where species is unlikely to be present.
Moderate—The species is not known to occur within 1.6 km (1.0 mile) or in the project site, but suitable habitat areas are present or near the project site.

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APPENDIX C

CULTURAL AND PALEONTOLOGICAL RESOURCES

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February 10, 2014

Mr. Guillermo Arreola, Associate Planner
Community Development Department, Planning Division
25541 Barton Road
Loma Linda, California 92354

Subject: Peer Review of Cultural Resources Assessment Prepared for the Veterans Administration Medical Clinic Project in the City of Loma Linda, San Bernardino County, California (LSA Project No. LDD1401)

Dear Mr. Arreola:

LSA Associates, Inc. (LSA) is under contract to the City of Loma Linda (City), San Bernardino, County, California to conduct a peer review of the cultural resources assessment report prepared by CRM Tech for the Veterans Administration Medical Clinic Project in the City (dated May 23rd 2012). The purpose of the assessment was to comply with the City's requirements specifically developed for the project and with the California Environmental Quality Act (CEQA).

The CRM Tech assessment report was peer reviewed by LSA Senior Archaeologist Riordan Goodwin. The methodology and findings in the report were reviewed and analyzed in the context of compliance with CEQA, adequacy for the previous Mitigated Negative Declaration (MND; City of Loma Linda, May 3rd 2013), and current professional standards and practices.

RESULTS OF REVIEW

General Comment

"Area of Potential Effects" (APE) is an applicable reference in projects that are federal undertakings and certain state transportation studies (i.e. for Caltrans). Otherwise, "project area" is an appropriate reference for the project parcels included in a CEQA-level Phase I cultural resources assessment such as this one.

Executive Summary

While this section is generally adequate, the acreage given for the project (40) is inconsistent with that given in the Draft Environmental Assessment (DEA) and by the City (approximately 38).

Introduction

A more detailed project description is appropriate that includes the information in the DEA and the updated project description provided by the City, such as the square footage of the proposed building, correct acreage, and parcel numbers. The project description should also indicate that the project area

is Parcel 1 of (Tentative) Parcel Map No. 19018 to clarify its role as a supporting document to the MND.

Setting

The historic context should address the late 19th century regional transportation (railroad history) theme, as well as the agricultural theme that relate to the resource formerly located within the project area (Site 36-013892, an 1890s farmhouse and citrus groves) and the historic district that includes the Historic Mission Overlay District (P-1063-46H, see below).

Research Design

While informative, this section is not essential for this level of study (Phase I survey assessment) and could be summarized.

Research Methods

Native American consultation should put in its own section or the overall section title should be revised to "Methods."

Results and Findings

While this section includes more than adequate records search and historical research information, a map of the referenced Historic Mission Overlay District (P-1063-46H) would have been helpful in illustrating the project area's location within the district.

Per the City's request, Archaeologist Riordan Goodwin visited the project site on January 5, 2014, and determined the project site conditions are consistent with those indicated in the report.

Discussion

A review of the previous National Register of Historic Places (National Register) and California Register of Historical Resources (California Register) evaluations of the historic district that includes the project area and the resource formerly located within the project area are informative, but the results of these evaluations could be summarized for the purposes of this report. Given the nature of the resource and the project area's location within a National Register-eligible historic district, the finding of sensitivity for "subsurface deposits of potentially significant archaeological remains" is appropriate.

Conclusion and Recommendations

Although recommendations regarding archaeological monitoring and treatment of resources are appropriate, they could be more concise.

Attachments

While documentation of Native American Consultation provided in Appendix 2 is generally adequate, a summary table indicating details of correspondence with each representative (including non-respondents and status of correspondence at termination of consultation) would be more informative.

CONCLUSION

The report prepared for the Veterans Administration Medical Clinic Project by CRM Tech in May 2012 is generally consistent with professional standards and practices (assumptions, approach, and methodology).The project description, assumptions, data, and conditions are consistent with the project as presented to the City, and the analysis is generally adequate for use in the current MND and in accordance with CEQA guidelines. However, LSA has the following suggestions:

- The project description should be updated to include the information in the DEA and the current project description provided by the City (square footage of the proposed building, correct acreage, and parcel numbers). The project description should also indicate that the project area is Parcel 1 of (Tentative) Parcel Map No. 19018 to clarify its role as a supporting document to the current MND.
- The historic context should address the late 19th century regional transportation and agricultural themes that relate to the resource formerly located within the project area (railroad and an 1890s farmhouse and citrus groves) and the National Register-eligible Historic Mission Overlay District that includes the project area.
- A research design is not essential for this level of study (Phase I survey assessment) and could be summarized.
- Native American consultation should put in its own section or the overall section title should be revised to “Methods.”
- A map of the referenced Historic Mission Overlay District would be helpful in illustrating the project area’s relationship to the district.
- The review of the previous National Register and California Register evaluations of the historic district that includes the project area and the resource formerly located within the APE could be summarized.
- Recommendations regarding archaeological monitoring and treatment of resources could be more concise.

The recommendations in the CRM report are appropriate as mitigation measures with the following qualifications: 1) the recommendation to comply with City guidelines for the historic district is redundant/vague; 2) requirements specifying the process for artifact collection, records keeping, etc., as well as treatment of human remains technically are not necessary as mitigation because these are standard professional practice. LSA has reviewed the recommended (adopted) mitigation measures in the previous MND and find that they are consistent with the recommendations of the CRM Tech report. Thus, if the mitigation measures in the previous MND were to simply "carry forward" to the current MND, potential impacts for construction of the VA Clinic should be adequately mitigated (qualified with the understanding that the site conditions are consistent with those described in the CRM report). Therefore, no additional mitigation measures would be required.

Please contact me at (951) 781-9310 or via email at rory.goodwin@lsa-assoc.com if you have any questions regarding this document.

Sincerely,

LSA ASSOCIATES, INC.

Riordan Goodwin
Archaeologist/Senior Cultural Resources Manager

REFERENCES

City of Loma Linda

2013 Draft Initial Study and Mitigated Negative Declaration for the Special Planning Area D Phase I Concept Project - General Plan Amendment No. 12-107; Specific Plan Amendment No. 13-035; Zone Map Change No. 13-036; Tentative Parcel Map [TPM 19018] No. 13-033; Precise Plan of Design No. 13-034. (Special Planning Area D Phase One Concept and Bryn Mawr Avenue Extension). May 3, 2013.

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February 11, 2014

Mr. Guillermo Arreola, Associate Planner
Community Development Department
Planning Division
25541 Barton Road
Loma Linda, California 92354

Subject: Peer Review of Paleontological Studies prepared for the Veterans Administration Medical Clinic Project in the City of Loma Linda, Los Angeles County, California (LSA Project No. LLD1401)

Dear Mr. Arreola:

LSA Associates, Inc. (LSA) has been tasked by the City of Loma Linda (City) to conduct a peer review of the paleontological study report prepared for the Veterans Administration (VA) Medical Clinic Project by CRM TECH for the Unites States Department of Veterans Affairs Veterans Health Care Clinic Project (Quinn and Encarnación, 2012). The area studied in this document is located within an approximate 40-acre area on the south side of Redlands Boulevard, between the intersections with Enterprise Drive and Bryn Mawr Avenue in the City of Loma Linda, in Los Angeles County, California. The purpose of the study was to provide the VA with the necessary information and analysis to determine whether the proposed project would potentially disrupt or adversely affect any significant paleontological resources, as required by National Environmental Policy Act (NEPA) regulations, and to design a paleontological mitigation program, if necessary.

The CRM TECH report was peer reviewed by LSA Paleontologist Brooks Smith, who has worked in the field of paleontology in the Southern California area for over 21 years.

It is LSA's understanding that the paleontological report was prepared for an Environmental Assessment completed in 2012 and that the City would now like to use the paleontological report as part of a Mitigated Negative Declaration (MND) for the project that will be prepared in compliance with the California Environmental Quality Act (CEQA). In order to ensure that the paleontological report prepared by Quinn and Encarnación (2012) is adequate for use, LSA has completed the following:

- Reviewed the methodology, approach, and assumptions of the report to ensure that the technical analysis is adequate for use in the MND and in accordance with CEQA;
- Reviewed the project description, project assumptions, and project data to ensure that the analysis is based on a project that is substantially consistent with that presented to the City for review;
- Reviewed the project data and site conditions to ensure that the baseline conditions are essentially unchanged since the time the study was completed and to ensure confirmation that no change in site conditions is anticipated or updates required; and

- Provided a written summary of project mitigation measures that should be carried forward into the MND.

Each of these bullet points is discussed separately below.

RESULTS OF REVIEW

Review of Methodology

The CTM TECH report was originally prepared to address NEPA; however, the methodology approach and assumptions contained in this document are also adequate to be used as a CEQA-level document. The study included an examination of geologic maps of the project area, a literature and records review through museums, and a field survey. In addition, all work was conducted following the Society of Vertebrate Paleontology (SVP) guidelines. All of these activities would also be done during the preparation of a CEQA-level document.

Review of Project Description

The CRM TECH report provided little detail on the description of the proposed project aside from stating locational information (i.e., the Area of Potential Effects [APE] was located on approximately 40 acres of former agricultural land located on the south side of Redlands Boulevard between the intersections with Enterprise Drive and Bryn Mawr Avenue). No descriptions were given for the areas where buildings, parking lots, landscaped area, and driveways would be installed.

An examination of the current location map that contains development information shows that the current project is within the APE that was studied by Quinn and Encarnación (2012). As such, no additional studies are required beyond what is contained within the CRM TECH report for the project.

Review of Project Data and Site Conditions

As stated in the CRM TECH report, paleontological resources represent the remains of prehistoric life, and include the localities where fossils have been collected as well as the sedimentary formations in which they were found. Paleontological resources and the sedimentary units in which they were found are typically older than 10,000 years, which roughly corresponds to the temporal boundary marking the end of the last late Pleistocene glaciation and the beginning of the current Holocene epoch 11,700 years ago.

Geologic findings in assessment reports generally will not change for a given project unless there have been substantial changes to a project area such as extensive excavations that might have exposed different geologic units that were not visible during the original assessment, or Artificial Fill has been placed that may obscure previously exposed sediments. As such, areas identified as having “low paleontological sensitivity” and areas identified as having “high paleontological sensitivity” will remain that way, even if the report was prepared years ago, unless there have been substantial changes to the areas being studied.

According to the CRM TECH report, the project area is located within a former citrus grove and the sediments mapped on the surface of the project are composed of Holocene Alluvium. The locality searches that were conducted by the San Bernardino County Museum (SBCM) and the Natural History Museum of Los Angeles County (LACM) indicated that there are no known paleontological localities within the APE or within 1 mile of the APE. In addition, both the SBCM and the LACM stated that the upper portions of the Holocene Alluvium had a Low Paleontological Sensitivity. The SBCM went so far as to say that it was likely that the sediments with low paleontological sensitivity extended to a depth of 15 feet, and then sediments from the Pleistocene that have high paleontological sensitivity would be encountered. During the field survey of the project area by a CRM TECH paleontologist, no paleontological resources were noted and the surface of the project area was observed to be highly disturbed from past land uses.

Summary of Mitigation Measures

Based on the results of the examination of geological maps, locality searches at museums, and a field survey, the CRM TECH report determined that the project has a low sensitivity for containing paleontological resources within the upper 15 feet of the project, and a high sensitivity for containing paleontological resources once a depth of 15 feet is reached. As such, CRM TECH recommended that paleontological mitigation would not be required during ground-disturbing activities that occurred between the surface and 15 feet below the surface. However they state that once a depth of 15 feet is reached that a paleontological resources impact mitigation program (PRIMP) be developed and implemented for all ground-disturbing activities that reach beyond a depth of 15 feet below the current ground surface.

Quinn and Encarnación (2012) recommended that if a PRIMP is developed for the project, it should include, but not be limited to, monitoring in sediments that are likely to contain paleontological resources; screen washing samples of sediment to recover small invertebrate and vertebrate fossils that may be present; identifying any recovered specimens and curating them into a museum repository with permanent retrievable storage; preparing a report of findings that includes, when appropriate, an itemized inventory and a discussion on the significance of any findings; and submitting the report to the appropriate lead agency, such as the City, to signify completion of the program to mitigate impacts on paleontological resources.

CONCLUSIONS

This peer review finds that the CRM TECH report prepared for the VA Health Care Clinic Project following NEPA and SVP guidelines addresses the area studied for the current project and finds that conditions have not changed to alter the findings or the mitigation measures contained in the CRM TECH report. As such, LSA believes that the document will be sufficient to be used during the preparation of the project MND and that additional studies will not need to be completed. LSA believes that all mitigation measures contained within the CRM TECH report should be carried forward into the MND.

Please contact me at (949) 553-0666 or via email at brooks.smith@lsa-assoc.com if you have any questions regarding this Peer Review.

Sincerely,

LSA ASSOCIATES, INC.

Brooks Smith
Associate, Paleontologist

REFERENCES

Quinn Harry M., and Deirdre Encarnación,
2012 *Paleontological Resources Assessment Report U.S. Department of Veterans Affairs Veterans Health Care Clinic Project City of Loma Linda San Bernardino County, California*. Prepared for Albert A. Webb Associates, Submitted to United States Department of Veterans Affairs; prepared by CRM TECH, Contract No. 2598P. May 21, 2012.

Society of Vertebrate Paleontology (SVP)
1995 Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines. Society of Vertebrate Paleontology News Bulletin, No. 163, January 1995, pp. 22–27.

APPENDIX D

GEOLOGY AND SOILS

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GEOTECHNICAL CONSULTANTS

REVIEW OF
MAJOR GEOTECHNICAL AND GEOLOGIC CONSTRAINTS
TENTATIVE PARCEL MAP NO. 19018
SOUTH OF THE INTERSECTION OF
REDLANDS BLVD AND BRYN MAWR AVE
LOMA LINDA, CA

for

Lewis Operating Corporation
1156 N Mountain Ave
P.O. Box 670
Upland, CA 91785-0670

February 21, 2013

11-403-01

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GEOTECHNICAL CONSULTANTS

February 21, 2013

Lewis Operating Corporation
1156 N Mountain Avenue
P.O. Box 670
Upland, CA 91785-0670

Attention: Mr. Daniel Coburn

Subject: Review of Major Geotechnical and Geologic Constraints
Tentative Parcel Map No. 19018
South of Intersection of Redlands Boulevard and Bryn Mawr Avenue
Loma Linda, CA

Dear Mr. Coburn:

In accordance with your request, a review of major geotechnical and geologic constraints has been completed for the above-referenced site. The accompanying report presents a description of our findings, as well as our conclusions and recommendations.

We appreciate this opportunity to be of continued service to you. If you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,

RMA Group

PROFESSIONAL GEOLOGIST
GARY W. WALLACE
No. 1255
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1.00 INTRODUCTION

1.01 Purpose

The purpose of this study was to identify and evaluate general geotechnical, geologic and environmental conditions within Tentative Parcel No. 19018 with respect to a proposed development composed of commercial retail and health care facilities. Tentative Parcel No. 19018 is part of a larger parcel of land known as University Village that was investigated by RMA Group in 2002.

1.02 Scope of the Investigation

The general scope of this investigation included the following:

- Review of prior geologic and geotechnical reports prepared for the University Village project site.
- Review of regional geologic maps and reports prepared by the California Geological Survey including those prepared when the agency was known as the California Division of Mines and Geology, the U.S. Geological Survey and the California Department of Water Resources.
- Review of regional groundwater data compiled by California Division of Mines and Geology, the U.S. Geological Survey, the California Department of Water Resources, and Western Municipal Water District.
- Review of regional land planning documents and hazard maps including: California Earthquake Fault Zone Maps, San Bernardino County General Plan Maps, the City of Loma Linda General Plan, and Federal Emergency Management Agency Flood Zone Maps.
- Examination of aerial photographs available from the RMA Group in-house library and other sources.
- A field reconnaissance to observe existing conditions within the site and adjacent publicly accessible areas.
- Geologic, environmental and geotechnical evaluation of the compiled data.
- Preparation of this report presenting our findings, conclusions and recommendations.

1.03 Site Location and Description

The site consists of approximately 82 acres of land located between Redlands and Mission Boulevards south of the intersection of Redlands Boulevard and Bryn Mawr Street in Loma Linda, California. The property is currently vacant. In general, the property is bounded by Redlands Boulevard to the north; vacant land, a citrus orchard and a residence to the east; Mission Boulevard to the south; and a citrus orchard and residences to the west. The approximate location of the site is illustrated on the accompanying Site Location Map (Figure 1).

The site slopes to the northwest at about a 1 to 2 percent gradient. Drainage is by means of sheet flow.

The property is essentially devoid of vegetation and man-made features, with the exception of remnants of an abandoned irrigation system.

1.04 Current and Past Land Usage

There is no current land use. The site was previously a citrus orchard that dated back to at least 1938. In 2012 soils were imported onto the site from a stockpile located at the southeast corner of Barton Road and California Street. The imported soils were spread across the site to a depth of approximately 1½ to 3 feet.

1.05 Planned Usage

We understand that the site will be developed with a health care facility and a commercial retail development. No further details regarding the proposed development were available at the time this report was prepared.

1.06 Investigation Methods

Our investigation consisted of office research, field reconnaissance, review of the compiled data, and preparation of this report. It has been performed in a manner consistent with generally accepted engineering, environmental and geologic principles and practices. Definitions of technical terms and symbols used in this report include those of the ASTM International (ASTM D653 and D4879), the California Building Code, and commonly used geologic nomenclature.

Technical supporting data are presented in the attached appendices. Appendix A contains a description of the methods and equipment used during prior field exploration of the site and logs of the subsurface exploration. Appendix B contains a description of prior laboratory testing within the currently proposed development area and adjoining property. Chemical test results from prior studies and references are presented in Appendices C and D, respectively.

2.00 FINDINGS

2.01 Geologic Setting

The site is located within a structural mass of the earth's crust known as the Bunker Hill - San Timoteo Basin. This basin formed as a rift zone between the active San Andreas fault on the northeast and the active San Jacinto fault on the southwest. The southern boundary of the basin is less well defined, but is generally coincides with a topographic drainage divide in the Banning-Beaumont region. The basin is infilled with alluvial deposits. There are also topographic highs within the basin that expose pre-Cambrian age metamorphic rocks and Pliocene to Pleistocene sedimentary units. The general geologic setting of the site is illustrated on the accompanying Regional Geologic Map (see Figure 2).

2.02 Earth Materials

Regional geologic maps and prior field investigations indicate that the site is underlain by artificial fill and Holocene age alluvium.

The artificial fill was imported onto the site from a stockpile located at the southeast corner of Barton Road and California Street. It was spread across the property to depths ranging from 1½ to 3 feet, but it was not compacted. The fill is composed of light brown and light gray brown silty sand. Small amounts of roots, twigs, wood chips and plastic are present at the base of the fill.

The alluvium is composed of sandy silts, silty sands and sands that locally contain clay. According to Morton

(1974b), the alluvium beneath the site is approximately 950 feet thick and that it rests upon granitic bedrock. Borings and trenches previously excavated within the site encountered slightly to moderately porous alluvial soils to depths of approximately 4 to 7 feet below the ground surface. At greater depths, non-porous to slightly porous soils were encountered. Sample penetration test blow count and in-situ density test data indicated that soils are loose to medium dense to depths of about 14 to 21 feet.

The locations of the borings and trenches previously excavated within the site are depicted on Figure 3.

2.03 Expansive Soils

Expansion tests performed on samples of alluvial soils collected adjacent to the site within the overall University Village project site were found to have a very low expansion potential. Based on soil classification, it is anticipated that the fill and alluvial soils underlying the Tentative Parcel Map No. 19018 will have similar expansive properties. Results of the prior testing are presented in Appendix B.

2.04 Landslides

The site is nearly level, thus landsliding does not pose a hazard to development of the property.

2.05 Surface and Groundwater Conditions

No standing water was present at the time of our current or prior studies, other than channelized irrigation water that was present during our prior field investigations that were performed when the site was a citrus orchard. Furthermore, no springs or areas of natural seepage were found or known to be present.

According to Dutcher and Garrett (1963), the site is on the easterly fringe of an upper groundwater confining layer. They also report that the depth to groundwater ranged from approximately 30 to 65 feet between 1936 and 1951. More recent groundwater data from Fife (1974), the California Department of Water Resources (1970), Carson and Matti (1985), Matti and Carson (1991) and the Western Municipal Water District (1995) indicate that the depth to groundwater beneath the site since at least the 1960's has been more than about 70 feet, and that the minimum depth to groundwater from 1973 to 1983 ranged from about 70 to 90 feet beneath the ground surface.

During our prior geotechnical investigation of the University Village property, groundwater was encountered in one boring (B-1) at depths of 34 to 36 feet below the ground surface. The groundwater appeared to be perched in a sand layer directly overlying a sandy clay layer. The source of this perched groundwater appeared to be from up-gradient irrigation of orchards and agricultural fields that were present at that time. Other borings drilled during the prior study of the University Village property, which extended to depths of 35 to 51.5 feet below the ground surface, did not encounter groundwater or a coarse sand layer overlying a clayey layer. Groundwater was not encountered in the trenches advanced within the site.

2.06 Faults

The site is located between two major, active fault zones, the San Andreas and San Jacinto faults. Between these two faults there are many other faults collectively known as the Crafton Hills fault zone.

Most regional geologic maps do not show any faults passing through the site. However, a map prepared by the U.S. Geological Survey (Figure 2) shows a postulated concealed fault (the Banning fault) passing through the

site. This postulated fault is also shown on a City of Loma Linda Geologic Hazards Map (Figure 4). However, this fault is not identified as a surface rupture hazard by a State of California Earthquake Fault Zone map or a similar City of Loma Linda or County of San Bernardino fault rupture hazard zone map.

The location of the site with respect to regional faults is illustrated on Figures 4 and 5. The San Andreas, San Jacinto, Crafton Hills and Banning fault zones are briefly described below. Other major faults in the region are listed in Table 1.

San Andreas Fault Zone

The San Andreas fault zone is the longest fault in California and one of the longest faults in North America. It extends approximately 600 miles through California and has a total length of over 1,000 miles. The San Andreas fault is the boundary between the North American and Pacific Tectonic Plates and has been the source of the largest historic earthquakes in California including the magnitude 8.25 San Francisco Earthquake of 1906 and the magnitude 8.25 Fort Tejon Earthquake of 1857. These earthquakes ruptured approximately 250 and 190 miles of the San Andreas fault, respectively, with several feet of right-lateral strike-slip displacement.

The San Andreas fault is located about 5½ miles northeast of the site at its nearest point. It is currently thought that this segment of the fault is capable of generating a magnitude 7.5 earthquake (Cao and others, 2002)

San Jacinto Fault Zone

The San Jacinto fault extends from the San Gabriel Mountains southeast to the Mexican border and beyond, some 150 miles or more. It is a right lateral, strike slip fault and has historically been the most active fault in southern California. More than a dozen earthquakes with magnitudes ranging from 6.0 to 7.1 have been epicentered along this fault zone since the late 1800's. The nearby San Bernardino segment of the San Jacinto fault is thought to be capable of generating a magnitude 6.7 earthquake (Cao and others, 2002).

The San Jacinto is located about 2 miles southwest of the site at its nearest point. In addition, two other faults have been mapped between the site and the San Jacinto fault. The Loma Linda fault approximately parallels the San Jacinto fault and is located about one mile southeast of the site. The San Timoteo Canyon/Live Oak Canyon fault appears to branch off the Loma Linda fault to the east, and is located about 1.5 miles to the south at its nearest point (Figure 4). Morton (1974a) also mapped a suspected subsurface fault based on seismic activity about 1,000 feet southwest of the site. The fault mapped by Morton has no surface expression.

Crafton Hills Fault Zone

The Crafton Hills fault zone consists of at least 10 faults that are caught in a wedge between the San Andreas and San Jacinto fault zones. This area is being pulled apart as a result of the right-lateral strike-slip displacement along the San Andreas and San Jacinto faults. Normal faults typically develop when this sort of extension occurs. Individual faults of the Crafton Hills have lengths of about 6 miles or less. The seismic potential of the Crafton Hills fault zone is low when compared to that of the nearby San Andreas and San Jacinto fault zones.

Faults of the Crafton Hills fault zone nearest the site consist of the Redlands, Reservoir/Crafton, Chicken Hill and Casa Blanca faults located 3 miles to the southeast, 4 miles to the southeast, 8 miles to the southeast and 11 miles to the east-southeast at their nearest points, respectively.

Banning Fault

The Banning fault is an ancestral strike-slip fault that extends from San Bernardino eastward approximately 60 miles to the Coachella Valley. The western segment of the Banning fault, which extends from San Bernardino to Calimesa, has no surface expression and is covered by late Pliocene and Quaternary sediments. This segment of the fault can only be inferred on the basis of gravity data and indirect geologic evidence (U.S. Geological Survey, 2006).

The U.S. Geological Survey (Matti and others, 2003) mapped the western segment of the Banning fault as a concealed fault passing through the site (Figure 2). The fault is shown to be covered by Pleistocene age older alluvial deposits ¾-mile to the southeast of the site. The City of Loma Linda shows the same inferred fault location in its City General Plan on a geologic hazards map (Figure 4). The California Geological Survey Fault Activity Map (Jennings and Bryant, 2010) shows the same fault trend in the vicinity of the site and indentifies the fault as pre-Quaternary, although not necessarily inactive. Regional geologic maps prepared prior to 2003 do not show the Banning fault passing through the site. In addition, a later geologic map prepared by the U.S. Geological Survey (Morton and Miller, 2006) also does not show the Banning fault passing through the site. The Banning fault is not included within a City of Redlands fault rupture hazard zone (Figure 4). The City General Plan (Page 10-2) states that the Banning fault "is generally thought to be inactive". In addition, the postulated Banning fault trace within the site is not included within a State of California Alquist-Priolo Earthquake Fault Zone for fault rupture hazards or a similar County of San Bernardino fault rupture hazard zone.

We did not observe any aerial photo lineaments along the suspected fault trace, further suggesting that the fault, if present, is covered by Holocene to Pleistocene age alluvial deposits and does not reach the ground surface. In addition, the regional geologic map prepared by Matti and others (2003) shows that the western segment of the Banning fault does not offset the Chicken Hills fault, other faults in the Crafton Hills, further attesting to the antiquity of the western segment of the Banning fault.

Regional and local geologic data indicate that western segment of the Banning fault is concealed by Pliocene to Quaternary deposits. Therefore the postulated trace of the Banning fault within the site would be classified as inactive according to current State of California criteria which defines active faults as those faults which have had surface rupture within Holocene time. On the basis of this classification, it is our professional opinion that it is unlikely that future ground surface rupture would occur along the postulated trace of the Banning fault within the site. We propose no further investigation of this postulated fault trace.

2.07 Historic Seismicity

The site is located in a seismically active area, as is the case throughout Southern California. Large historic earthquakes in the region are listed on Table 2 and illustrated on the accompanying Fault and Earthquake Epicenter Map (see Figure 5). The closest large earthquake occurred in the San Bernardino area in 1923. It had a magnitude of about 6.2 and was epicentered about 6 miles of the site. However, since this event occurred prior to the development of seismic monitoring networks, its location and magnitude is only approximate.

2.08 Secondary Earthquake Hazards

Potential secondary seismic hazards that can affect land development projects include liquefaction, tsunamis, seiches, seismically induced settlement, seismically induced flooding and seismically induced landsliding.

Liquefaction

Liquefaction is a phenomenon where earthquake induced ground vibrations increase the pore pressure in saturated, granular soils until it is equal to the confining, overburden pressure. When this occurs, the soil can completely lose its shear strength and enter a liquefied state. The possibility of liquefaction is dependent upon grain size, relative density, confining pressure, groundwater depth, and intensity and duration of ground shaking. In order for liquefaction to occur, three criteria must be met: underlying loose, coarse-grained (sandy) soils, a groundwater depth of less than about 50 feet and a nearby large-magnitude earthquake.

The site is not located within a City, County or State-designated liquefaction hazard zone. However, since historic groundwater depths of less than 50 feet were reported by Dutcher and Garrett (1963) and perched groundwater was encountered in one boring, the potential for soil liquefaction will need to be further evaluated.

Tsunamis and Seiches

Tsunamis are sea waves that are generated in response to large magnitude earthquakes. When these waves reach shorelines, they sometimes produce coastal flooding. Seiches are the oscillation of large bodies of standing water, such as lakes, that can occur in response to ground shaking. Due to the inland location of the site and lack of nearby bodies of standing water, tsunamis and seiches do not pose hazards to this site.

Seismically Induced Settlement

Seismically induced settlement occurs most frequently in areas underlain by loose, granular sediments. Damage as a result of seismically induced settlement is most dramatic when differential settlement occurs in areas with large variations in the thickness of sediments. Due to the presence of loose to moderately dense soil, the potential for seismically induced settlement will need to be further evaluated.

Seismically Induced Flooding

The site is not located downstream of any dams or water reservoirs, thus the potential for seismically induced flooding is very low to nil.

Seismically Induced Landsliding

Due to the low gradient of the site, the potential for seismically induced landsliding is nil. This assumes any slopes created during future grading are properly engineered and constructed.

2.09 Flooding Potential

According to Federal Emergency Management Agency (2008a and 2008b) Flood Insurance Rate Maps, the site is located with Flood Zone X, which is defined as outside the zone with 0.2% annual chance floodplain. According to the City of Loma Linda General Plan and the San Bernardino County General Plan Hazard Overlay Map FH31B, the site is not located within a flood hazard zone.

2.10 Regional Land Subsidence

A study of regional land subsidence due to groundwater withdrawal in the Bunker Hill – San Timoteo area was performed by the U. S. Geological Survey (Miller and Singer) in 1971. That report predicted that groundwater withdrawal would cause approximately 1.5 to 2.5 feet of land subsidence in the vicinity of the site between 1965 and 2015 if groundwater extraction followed a management plan under consideration at that time. The validity of this prediction is uncertain, given the passage of time since the preparation of that report and the lack of follow-up studies. The City of Loma Linda and County of San Bernardino General Plan hazard maps did not give any indication that regional land subsidence has been a problem in the area.

2.11 Chemical Testing

Thirteen soil samples were previously collected within the site for chemical testing. Tests were performed to provide preliminary information regarding potential chemical contaminants at the site. The tests were not performed as part of a full Phase I or full Phase II environmental site assessment.

Three samples were collected from the ground surface and a depth of six inches below the ground surface in 2011, prior to removal the citrus orchard that previously occupied the site. Sampling equipment consisted of a shovel and plastic spoons that were decontaminated in an Alconox solution and double rinsed in de-ionized water. These samples were placed in clean sample containers and transported in a pre-chilled ice chest to E.S. Babcock and Sons Laboratories, a California State Certified hazardous waste testing laboratory in Riverside, California, for chemical testing. Proper chain of custody protocols were followed for all samples. The following laboratory tests were performed:

- EPA Test Method 8080 - Organochlorine Pesticides
- EPA Test Method 8141 - Organophosphorus Pesticides
- EPA Test Method 8151 - Chlorinated Herbicides
- EPA Test Method 6010B - Heavy Metals

Ten additional soil samples were collected in 2012 after the citrus orchard was removal and fill soils were spread across the site. A backhoe was used to remove the fill soils to allow sampling of the underlying alluvial soils. Sampling equipment consisted of plastic spoons that were decontaminated with an Alconox solution and double rinsed in de-ionized water. These samples were placed in clean sample containers and transported in a pre-chilled ice chest to B.C. Laboratories, a California State Certified hazardous waste testing laboratory in Bakersfield, California, for chemical testing. Proper chain of custody protocols were followed for all samples. The following laboratory test was performed:

- EPA Test Method 8080 - Organochlorine Pesticides

The chemicals detected in the soil samples and corresponding California Human Health Screening Levels (CHHSLs) of soils for commercial/industrial land use are presented in the tables below. Detailed laboratory test reports and Chain of Custody forms are presented in Appendix C.

SUMMARY OF CHEMICAL TEST RESULTS FOR PESTICIDES RESIDUES

Sample Identification	Substance Concentration (mg/kg)			
	DDD	DDE	DDT	Edrin
Screening Level Commercial*	**9.0**	**6.3**	**6.3**	**230**
1_{2011}	0.01	0.8	ND	ND
2_{2011}	0.03	ND	2.1**	ND
3_{2011}	0.03	1.1	1.4	ND
1_{2012}	ND	0.34	0.22	0.03
2_{2012}	0.002	0.22	0.046	ND
3_{2012}	ND	ND	ND	ND
4_{2012}	ND	0.081	0.007	ND
5_{2012}	ND	0.15	0.028	ND
6_{2012}	ND	0.022	ND	ND
7_{2012}	ND	ND	ND	ND
8_{2012}	ND	0.0078	ND	ND
9_{2012}	ND	ND	ND	ND
10_{2012}	ND	ND	ND	ND

* California Office of Environmental Health Hazard Assessment Commercial/industrial Soil-Screening levels, 9-23-10.
**Residential Screening Level = 1.6 mg/kg
ND = Not Detected

SUMMARY OF CHEMICAL TEST RESULTS FOR METALS

Substance	Sample Number Laboratory Test Result - Soil (mg/kg)			Screening Level* (mg/kg)
	1_{2011}	2_{2011}	3_{2011}	
Barium	ND	100	93	6,300
Total Chromium	43	41	33	100,000**
Cobalt	12	12	11	3,200
Copper	47	54	49	38,000
Lead	33	52	22	320
Mercury	0.26	ND	0.51	180
Nickel	23	22	20	16,000
Vanadium	52	53	47	6,700
Zinc	190	650	160	100,000

* California Office of Environmental Health Hazard Assessment Commercial/industrial Soil-Screening Levels, 9-23-10.
** Denotes screening number for chromium III based on chronic toxic effects other than cancer and maximum concentration allow. Screening number for chromium VI based on carcinogenic potency factor = 37 mg/kg.
ND = Not Detected

3.00 CONCLUSIONS AND RECOMMENDATIONS

3.01 General Conclusion

Based on the results of this study and our experience with similar projects, it is our professional judgment that the proposed development is geologically and geotechnically feasible. This is provided that a detailed geotechnical report is prepared for the site and that the recommendations contained in that report are fully implemented during design, grading and construction.

3.02 General Earthwork and Grading

The fill soils spread across the site was not compacted and will therefore need to be removed along with loose underlying alluvial soils from areas to support structures or compacted fills. The excavated soils are expected to be suitable for placement as compacted fill. Based on observation of borings, trenches and test holes, the depth of the existing fill that will need to be removed is approximately 1½ to 3 feet. As a minimum, it is expected that removal of alluvial soils will need to extend a few feet deep in order to densify soils loosened by removal of tree roots and irrigation lines. Deeper removals might be necessary to remove and compact potentially compressible, porous soils.

Further geotechnical exploration, testing and analysis will need to be performed to evaluate static and seismically induced settlement of foundation soils, to develop removal recommendations, to determine overexcavation depths for foundations and estimate earthwork shrinkage and subsidence.

3.03 Expansion and Corrosion Potential

Based on observation of surface soils and our experience in the area, soils are expected to have very low to low expansion potential and low to moderate corrosion potential. Actual conditions should be determined during future geotechnical studies and during rough grading of the site.

3.04 Rippability and Oversize Materials

Based the results of prior subsurface investigations and field observations, it is expected that all earth materials within the site will be rippable with conventional, heavy-duty grading equipment. Oversized rocks (i.e., materials greater than 12 inches in maximum dimension) were not encountered during the prior subsurface investigation, and therefore, are not expected to be present during grading of the site. This should be further evaluated during future geotechnical investigation of the site.

3.05 Groundwater

Considering the depth to groundwater, the permeability of the underlying soils and the absence of standing surface water, it is expected that groundwater will not be encountered during site grading and dewatering is not expected to be necessary.

3.06 Slopes

Since the site is nearly level, there are no natural slope stability problems. Cut and fill slopes inclined no steeper than 2:1 (horizontal to vertical) are expected to be grossly and surficially stable. This is provided the fill slopes would be properly keyed, benched and compacted and that cut slopes expose competent soils.

3.07 Foundations

Soils at the site are expected to have good bearing qualities upon the completion of remedial grading. It is also expected that one- and/or two-story structures may be constructed on conventional, continuous and/or spread footings with concrete floor slabs. Design of foundation elements should be evaluated during future studies.

3.08 Pavement Sections

Near-surface soils onsite are apparently composed primarily of fine silty sand and sandy silts with low to moderate R-values. Consequently, moderate to relatively thick pavement sections should be anticipated. Pavement sections should be determined at the completion of rough grading based on representative R-value testing of samples.

3.09 Faulting

The site is not located within the boundaries of an Earthquake Fault Zone or any comparable City or County-designated fault rupture hazard zone. In addition, the Banning fault, which is shown to pass through the site on some maps, is apparently inactive with respect to surface rupture potential. Consequently, it is our professional opinion that it is unlikely that future surface ground rupture would occur along the postulated trace of the Banning fault within the site and that a subsurface geologic fault investigation is not required.

3.10 Seismicity

The site is expected to experience ground shaking as a result of regional seismic activity. Such ground shaking could be substantial, owing to the proximity of the San Andreas, San Jacinto and Crafton Hills fault zones, as well as other fault zones in the region. Mitigation of earthquake ground shaking should be incorporated into design and construction in accordance with requirements set forth in the California Building Code.

3.11 Secondary Seismic Hazards

A preliminary geotechnical study of the site will be needed to evaluate the potential for soil liquefaction and seismically induced settlement. Due to the low gradient of the site, analysis for seismically induced landsliding will not be necessary. At this time, the potential for other secondary seismic hazards at the site appears to be low.

3.12 Chemical Test Results

Several substances were detected by chemical testing of soil samples collected from the site. However, the concentrations of the substances were found to be below the California Office of Environmental Health Hazard Assessment (OEHHA) soil screening numbers for commercial/industrial sites (2010). In addition, all test result concentrations but one (Sample 2_{2011}, DDT = 2.1 mg/kg) were also found to be below OEHHA soil screening for residential sites. However the arithmetic mean and 95% upper confidence level of the arithmetic mean for all DDT test results are below the OEHHA screen number for residential sites.

All test results for chromium were below the screening level for total chromium; however two of the tests results for chromium slightly exceeded that soil screen level for chromium VI. Since chromium VI is associated with industrial activities rather than agriculture, and there is no indication of prior land use other than agriculture, it appears unlikely that the screening level for chromium VI would be exceeded.

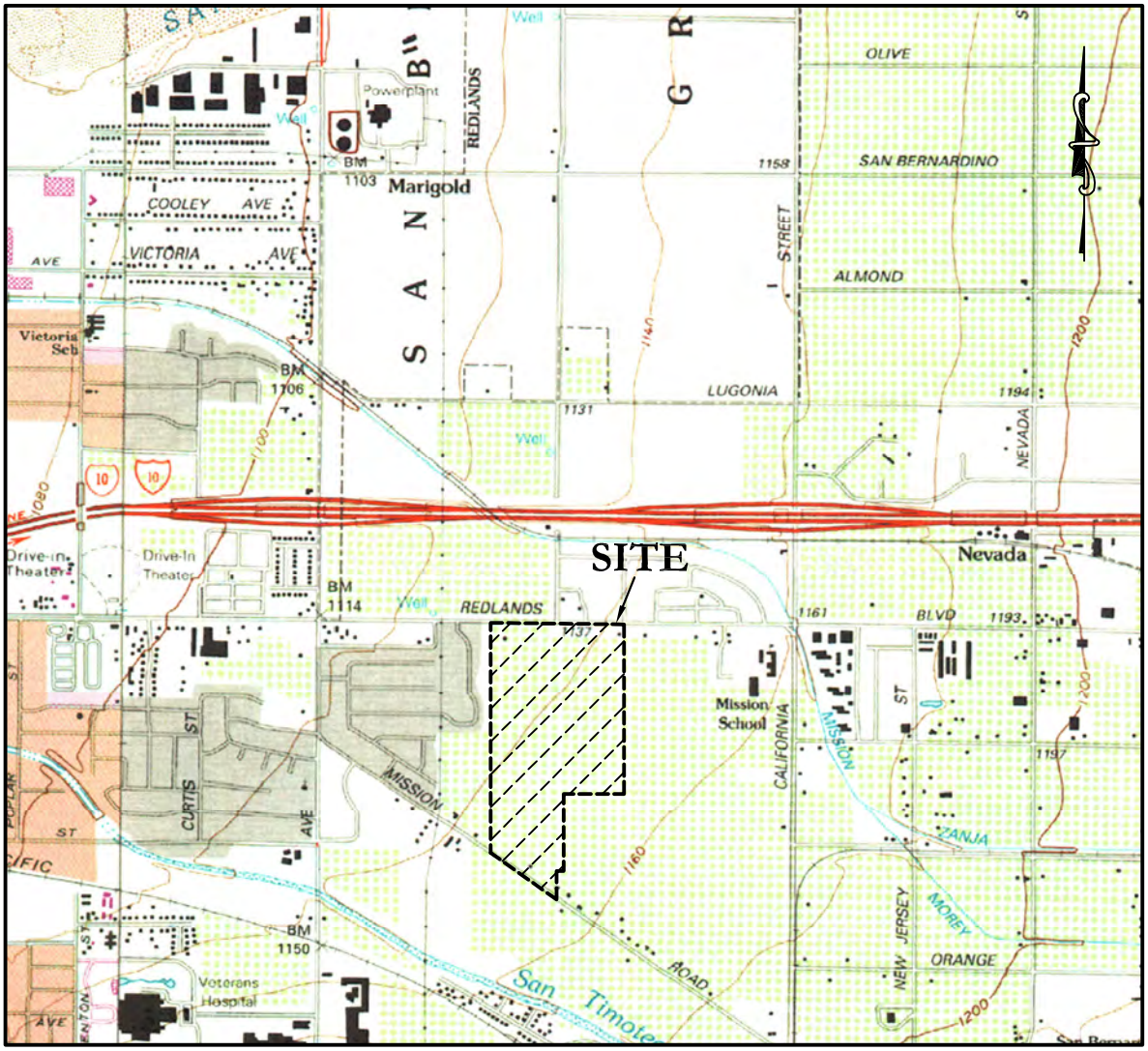
3.13 Additional Studies

As planning progresses, additional environmental, geologic and geotechnical studies should be undertaken in order to verify the findings, conclusions and recommendations of this report, and to develop site-specific design parameters.

4.00 CLOSURE

The findings and recommendations in this report were prepared in accordance with generally accepted engineering and geologic principles and practices. No other warranty, either express or implied, is made. This report has been prepared for Lewis Operating Corporation to be used solely for preliminary planning purposes. Anyone using this report for any other purpose must draw their own conclusions.

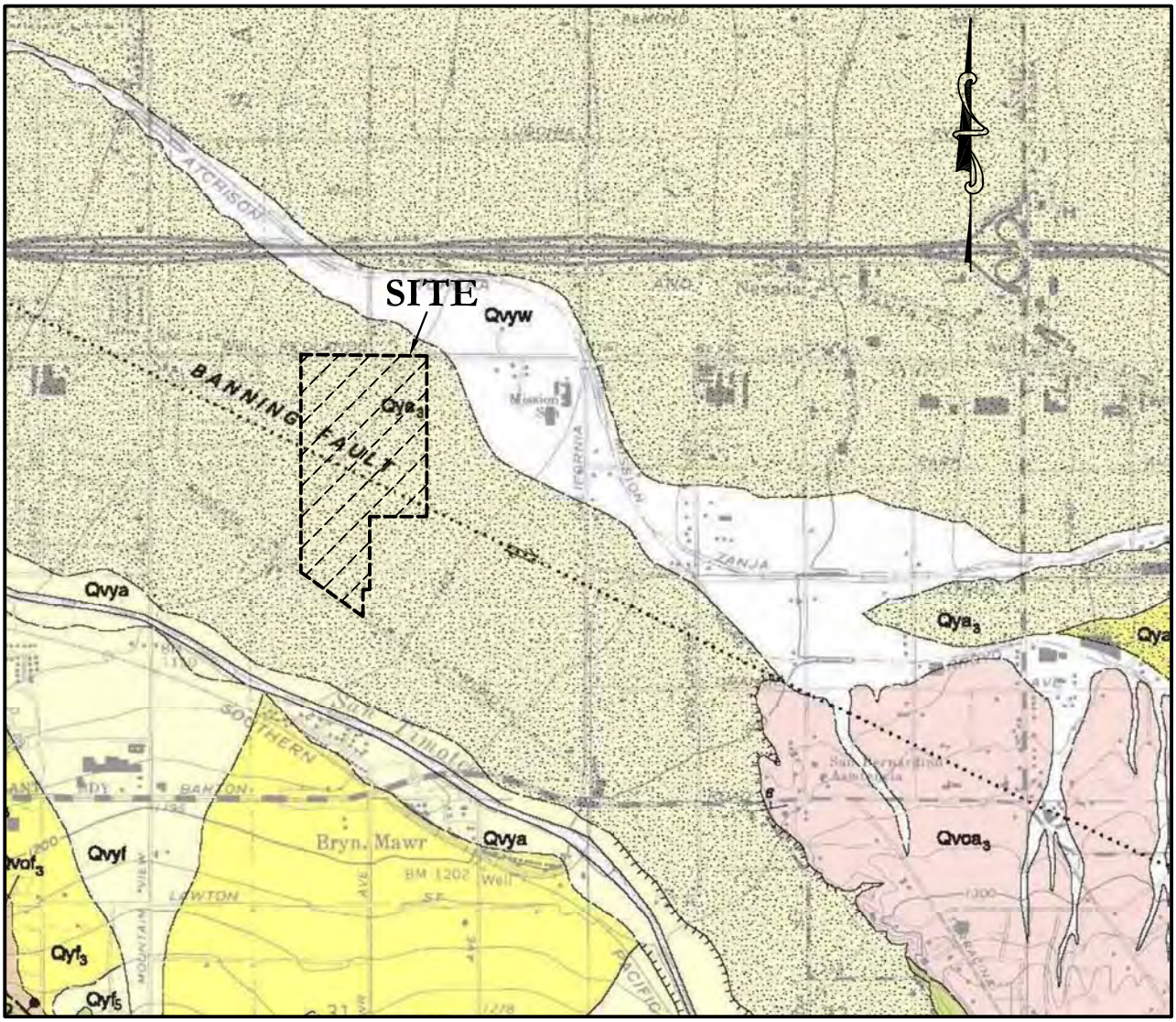
FIGURES AND TABLES



SITE LOCATION MAP

Scale: 1" = 2,000'

Base Map: U.S. Geological Survey Redlands Quadrangle



REGIONAL GEOLOGIC MAP

Scale: 1" = 2,000'

Partial Legend

Qvyw - Very young wash depsoits, active (latest Hoilocene)

Qvya - Very yoing axial-valley deposits (latest Holocene)

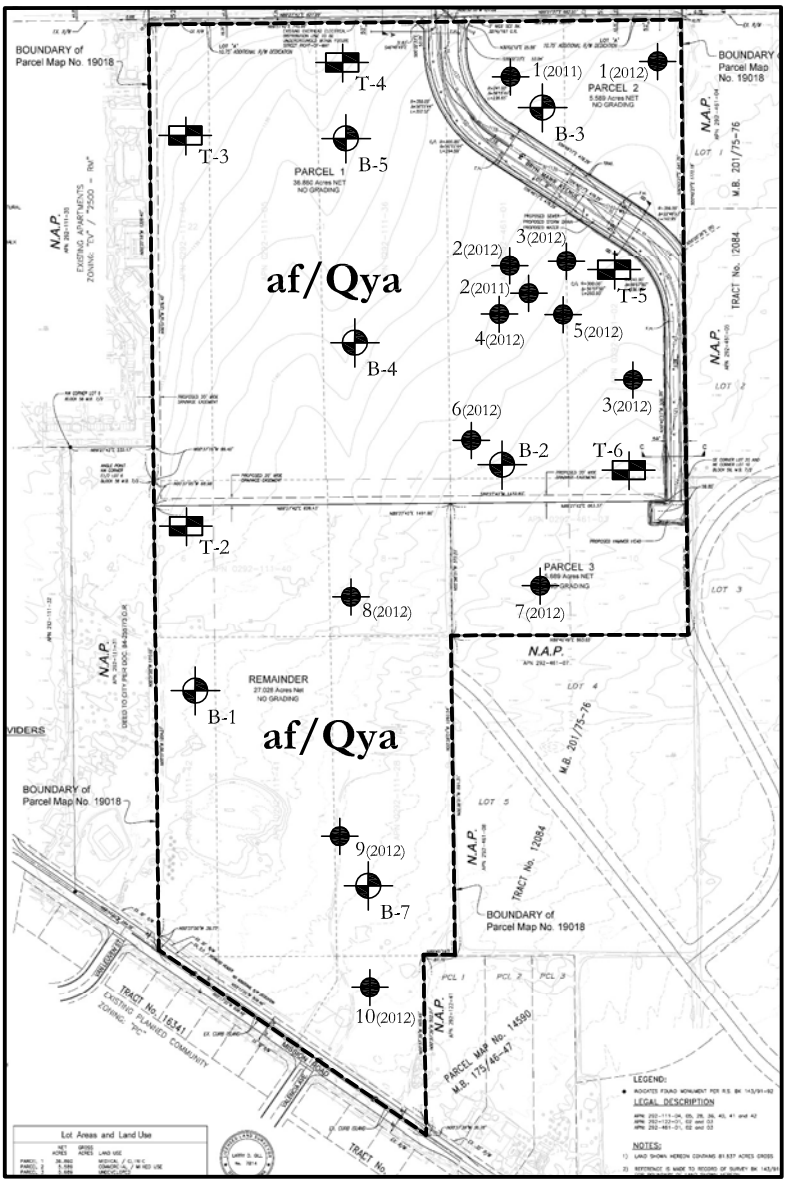
Qvyf - Very young alluvial fans depostis (latest Holocene)

Qya3 - Young axial-valley deposits (late Holocene)

Qvf3, Qyf5 - Young alluvial fan deposits (latest to middle Holocene)

Qvoa3 - Very old axial-valley deposits (middle to early Pleistocene)

Source: Matti and others, 2003 (U.S.G.S. OFR 03-302)



GENERALIZED SITE GEOLOGIC MAP

Scale: 1" ~ 540'

Geologic Legend

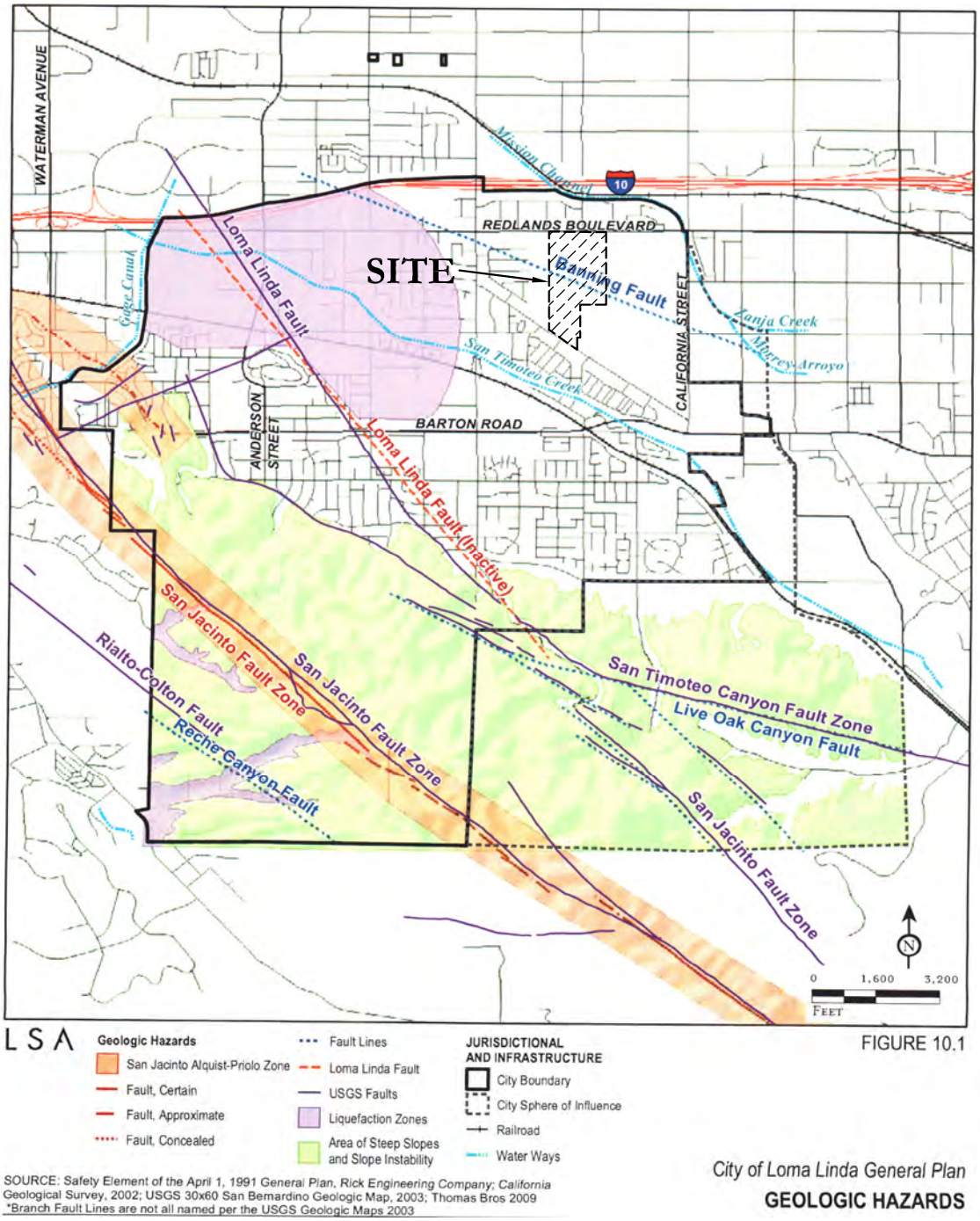
af /Qya- Artificial fill over late Holocene alluvium

B-7 - Approximate location of exploratory boring

T-6 - Approximate location of exploratory trench

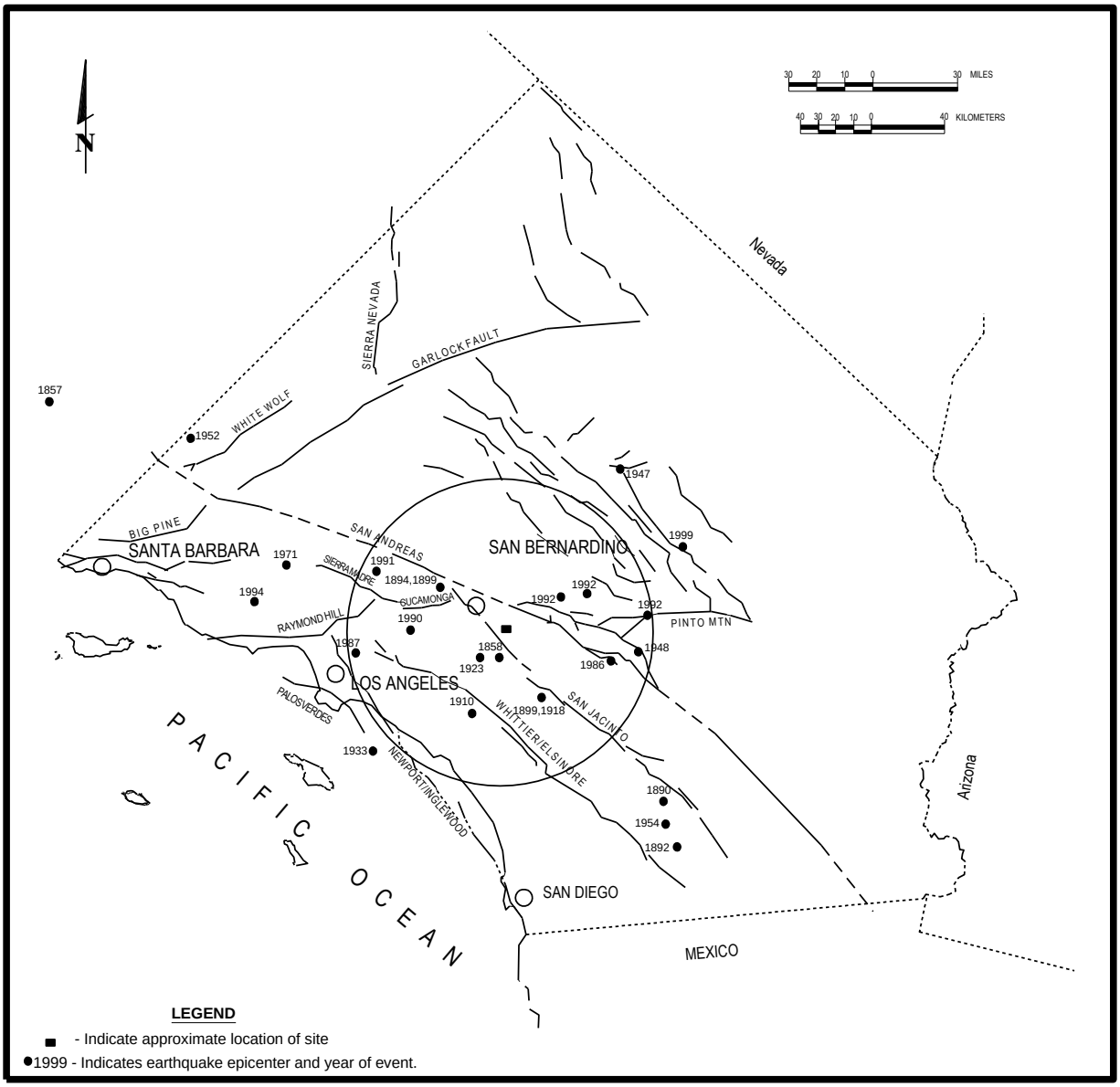
10(2012) - Approximate location of chemical testing soil sample

Base map prepared by Parsons Brinkerhoff, 2013



CITY OF LOMA LINDA GEOLOGIC HAZARDS MAP

Source: City of Loma Linda General Plan



FAULT AND EARTHQUAKE EPICENTER MAP

NOTABLE FAULTS WITHIN 100 KILOMETERS

Fault Zone & geometry	Distance (km)	Distance (mi.)	Maximum Moment Magnitude
Calico-Hidalgo (rl-ss)	93	58	7.1
Chino-Central Ave. (rl-r-o)	40	25	6.7
Clamshell-Sawpit (r)	60	37	6.5
Cleghorn (ll-ss)	24	15	6.5
Compton Thrust (r)	74	46	6.8
Cucamonga (r)	23	14	7.0
Elsinore (rl-ss)	42	26	6.8
Elysian Park (r)	57	35	6.7
Eureka Peak (rl-ss)	78	48	6.4
Gravel Hills-Harper (rl-ss)	95	59	6.9
Helendale (rl-ss)	48	30	7.1
Hollywood (ll-r-o)	92	57	6.4
Johnson Valley (rl-ss)	72	45	6.7
Landers (rl-ss)	76	47	7.3
Lenwood-Lockhart (rl-ss)	64	40	7.3
Newport-Inglewood (rl-ss)	80	50	6.9
North Frontal (r)	21	13	7.0
Pisgah-Bullion (rl-ss)	100	62	7.1
Palos Verde (rl-ss)	99	62	7.1
Pinto Mountain (ll-ss)	47	29	7.0
Raymond (ll-r-o)	72	45	6.5
San Andreas (rl-ss)	11	7	7.4
San Jacinto (rl-ss)	4	2	6.7
San Jose (ll-r-o)	43	27	6.5
Sierra Madre (r)	47	29	7.0
Verdugo (r)	85	53	6.7
Whittier (rl-ss)	44	27	6.8

Notes:

Fault geometry - (ss) strike slip, (r) reverse,
(n) normal, (rl) right lateral, (ll) left lateral, (o) oblique

HISTORIC STRONG EARTHQUAKES IN SOUTHERN CALIFORNIA SINCE 1812

Date	Event	Causitive Fault	Magnitude	Epicentral Distance (miles)
Dec. 12, 1812	Wrightwood	San Andreas?	7	45
Jan. 9, 1857	Fort Tejon	San Andreas	7.6	174
Dec. 16, 1858	San Bernardino Area	uncertain	6	13
Nov. 11, 1880	San Bernardino Area	uncertain	5.5	14
Dec. 12, 1880	San Bernardino Area	uncertain	5.9	14
Feb. 7, 1889	Mount San Bernardino	uncertain	5.6	31
June 6, 1892	Cucamonga	uncertain	5.5	18
July 30, 1894	Lytle Creek	uncertain	6.2	27
July 22, 1899	Cajon Pass	uncertain	5.9	14
Dec.25, 1899	San Jacinto	San Jacinto	6.7	23
Sept. 20, 1907	San Bernardino Area	uncertain	5.8	12
May 15,1910	Elsinore	Elsinore	6	27
Apr. 21,1918	Hemet	San Jacinto	6.6	23
Jul. 23, 1923	San Bernardino	San Jacinto	6	6
Mar. 11,1933	Long Beach	Newport-Inglewood	6.3	53
Apr. 10, 1947	Manix	Manix	6.4	76
Dec. 4, 1948	Desert Hot Springs	San Andreas or Banning	6.5	51
Jul. 21, 1952	Wheeler Ridge	White Wolf	7.7	124
Feb. 9, 1971	San Fernando	San Fernando	6.6	73
Jul. 8, 1986	North Palm Springs	Banning or Garnet Hills	5.6	37
Oct. 1, 1987	Whittier Narrows	Puente Hills Thrust	5.9	50
Feb. 28, 1990	Upland	San Jose	5.5	28
Jun. 28, 1991	Sierra Madre	Clamshell Sawpit	5.8	47
Apr. 22, 1992	Joshua Tree	Eureka Peak	6.1	54
Jun. 28, 1992	Landers	Johnson Valley & others	7.3	48
Jun. 28, 1992	Big Bear	uncertain	6.2	22
Jan. 17, 1994	Northridge	Northridge Thrust	6.7	78
Oct. 16, 1999	Hector Mine	Lavic Lake	7.1	68

Notes:

Earthquake data: U.S. Geological Survey P.P. 1515 & SCEC/CGS online data

Site Location:

Site Longitude: 117.2338

Site Latitude: 34.0611

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APPENDIX E

HYDROLOGY AND WATER QUALITY

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PRELIMINARY HYDROLOGY REPORT AND WATER QUALITY MANAGEMENT PLAN (WQMP)

for

Department of Veterans Affairs Health Care Clinic

26001 Redlands Boulevard
Loma Linda, CA 92373

November 21, 2013

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1. Project Description

This proposed development consists of a new 3-story, 345,000 square-foot healthcare clinic for the Department of Veterans Affairs on a 36.86 acre site. The subject property is located at the southwest quadrant of Redlands Boulevard and Bryn Mawr Drive in the City of Loma Linda, California. Associated improvements include surface parking lots with over 2,000 spaces, drive aisles, fire lanes, underground utility services, drainage facilities, a perimeter security fence, loading docks, active open spaces, landscaping, and other site amenities.

2. Existing, Pre-development Conditions

The site is currently vacant and undeveloped with minimal vegetation. Aerial photography reveals previous agricultural use as an orchard. Generally, the site has mild slopes less than two percent with elevations ranging from 1150 in the southeast corner of the site to 1130 in the northwest corner of the site. Stormwater runoff flows in this direction toward the only outfall at Redlands Boulevard as sheet flow. At Redlands Boulevard, the roadway curb and gutter conveys flows west several hundred feet to the public storm drain system at the intersection with Mountain View Avenue. From this point, the storm drains flow north and discharge into Mission Channel.

Although no storm drains exist in the immediate vicinity of the site, the adjacent land owner will be extending Bryn Mawr Avenue south from its current termination at Redlands Boulevard. This extended portion of Bryn Mawr Avenue borders the project property to the east and will include utilities and a new storm drain system. The new storm drain system also discharges into Mission Channel at the northern end of Bryn Mawr Avenue. A lateral connection with a design capacity of 23.2 cfs will be provided for the project to utilize as a stormwater outfall. Refer to the Hydrology & Hydraulics Report for TPM 19018, Special Planning Area D, by Parsons Brinckerhoff, dated July 25, 2013, revised September 25, 2013 for additional information regarding the Bryn Mawr storm drain system.

3. Proposed, Post-development Conditions

After construction, the site will utilize both Redlands Boulevard and the new Bryn Mawr storm drain lateral as outfalls for stormwater runoff with contributing drainage areas to each outlet identified as DA1 and DA2, respectively. According to discussions with City staff, the post-development peak flow must be less than the pre-development peak flow for the 100-year storm based on historical drainage patterns with the exception that flow may be diverted into an engineered, hardened, and maintained stormwater conveyance system with adequate capacity.

As mentioned, the new lateral connection from the Bryn Mawr storm drain has been designed to accept a 100-year peak flow of 23.2 cfs from the project. The proposed grading and drainage plan for the project has been designed to divert a portion of the site (DA2) to the Bryn Mawr storm drain while maintaining a peak 100-year flow rate less than the available capacity. Rational method calculations for DA2 have been performed to verify this condition. Although stormwater quality and best management practices (BMPs) must still be addressed for DA2, no additional detention storage or controlled release of flows is necessary or proposed for DA2.

However, detention storage must be provided for DA1 to attenuate the 100-year flows to less than pre-development rates. Aboveground detention storage volume will be provided in two broad, shallow, and interconnected surface ponds near the northwest corner of the site. Three parkway drains will serve as outlet control structures to release flow from the ponds at metered rates through the curb face along Redlands Boulevard. Due to the broad geometry, maximum depth of water within the pond will be limited to 36 inches.

Due to site constraints, a small portion of the mostly landscaped perimeter of DA1 will bypass the detention pond. However, this flow must be accounted for when determining overall post-development impact of DA1. Routing calculations have been performed using Hydraflow software to confirm that the post-development peak flow does not exceed the pre-development peak flow at Redlands Boulevard. In accordance with the San Bernardino County Hydrology Manual, AES computer software was used to generate three hydrographs (Pre DA1, Post DA1 Detained, and Post DA1 Bypass) as input data for the pond routing calculations.

Based on the nature of the development, this project is required to prepare a Water Quality Management Plan (WQMP) to demonstrate compliance with the 2010 Municipal Separate Storm Sewer System (MS4) Permit, issued to San Bernardino County and the City of Loma Linda as a co-permittee. The permit requires the implementation of low impact development (LID) BMPs to the maximum extent practicable for the 85th percentile, 24-hour storm.

A new on-site storm drain system will be installed to collect and convey runoff to the outlet locations as discussed previously. However, all on-site storm flows will first be routed through one of several infiltration basins dispersed throughout the site. Runoff will first infiltrate into the soil through a perforated pipe located beneath each basin. As the storm continues, water will stage up into the basins via grate inlets located at the bottom of the basin. Stormwater will remain in the basin until infiltration has completed, or in the case of a larger rainfall event, water will rise above the overflow grates provided toward the outfall locations. Refer to the completed preliminary WQMP template in the appendix for detailed information.

Kimley-Horn and Associates, Inc.

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NOAA Atlas 14, Volume 6, Version 2 - Point Precipitation Frequency Estimates							
P (in)	**1-year**	**2-year**	**5-year**	**10-year**	**25-year**	**50-year**	**100-year**
5-min:	0.097	0.125	0.164	0.195	0.238	0.272	0.307
10-min:	0.139	0.180	0.234	0.280	0.342	0.390	0.440
15-min:	0.168	0.217	0.284	0.338	0.413	0.472	0.532
30-min:	0.247	0.320	0.418	0.498	0.608	0.695	0.783
60-min:	0.363	0.471	0.613	0.731	0.894	1.020	1.150
3-hr:	0.646	0.820	1.050	1.240	1.490	1.690	1.890
6-hr:	0.905	1.150	1.460	1.720	2.070	2.340	2.610
24-hr:	1.580	2.040	2.630	3.110	3.760	4.250	4.760

Phase	Outfall	DA	DMA	Total Area		Impervious Area CN = 98.0		Landscaped Area CN = 56.0		Orchard Area CN = 65.0		Impervious Cover	CN
				sq ft	acres	sq ft	acres	sq ft	acres	sq ft	acres		
Pre-dev.	Redlands	DA1	N/A	1,605,406	36.86	-	0.00	-	0.00	1,605,406	36.86	0.0%	65.0
Pre-dev.	Bryn Mawr	DA2	N/A	-	0.00	-	0.00	-	0.00	-	0.00	0.0%	0.0
Pre-dev.	Entire Site	SITE	-	1,605,406	36.86	-	0.00	-	0.00	1,605,406	36.86	0.0%	65.0
Post-dev.	Redlands	DA1	DMA 1A	101,740	2.34	85,300	1.96	16,440	0.38	-	0.00	83.8%	91.2
Post-dev.	Redlands	DA1	DMA 1B	541,680	12.44	438,700	10.07	102,980	2.36	-	0.00	81.0%	90.0
Post-dev.	Redlands	DA1	DMA 1C	176,000	4.04	106,980	2.46	69,020	1.58	-	0.00	60.8%	81.5
Post-dev.	Redlands	DA1	DMA 1D	128,280	2.94	104,740	2.40	23,540	0.54	-	0.00	81.6%	90.3
Post-dev.	Redlands	DA1	DMA 1E	153,810	3.53	98,130	2.25	55,680	1.28	-	0.00	63.8%	82.8
Post-dev.	Redlands	DA1	DMA 1F	99,960	2.29	2,530	0.06	97,430	2.24	-	0.00	2.5%	57.1
Post-dev.	Redlands	DA1	DETAINED	1,101,510	25.29	833,850	19.14	267,660	6.14	-	0.00	75.7%	87.8
Post-dev.	Redlands	DA1	BYPASS	99,960	2.29	2,530	0.06	97,430	2.24	-	0.00	2.5%	57.1
Post-dev.	**Redlands**	**DA1**	**TOTAL**	**1,201,470**	**27.58**	**836,380**	**19.20**	**365,090**	**8.38**	**-**	**0.00**	**69.6%**	**85.2**
Post-dev.	Bryn Mawr	DA2	DMA 2A	306,500	7.04	219,230	5.03	87,270	2.00	-	0.00	71.5%	86.0
Post-dev.	Bryn Mawr	DA2	DMA 2B	97,440	2.24	8,300	0.19	89,140	2.05	-	0.00	8.5%	59.6
Post-dev.	**Bryn Mawr**	**DA2**	**TOTAL**	**403,940**	**9.27**	**227,530**	**5.22**	**176,410**	**4.05**	**-**	**0.00**	**56.3%**	**79.7**
Post-dev.	Entire Site	SITE	-	1,605,410	36.86	1,063,910	24.42	541,500	12.43	-	0.00	66.3%	83.8

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10-min:	0.139	0.180	0.234	0.280	0.342	0.390	0.440
15-min:	0.168	0.217	0.284	0.338	0.413	0.472	0.532
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60-min:	0.363	0.471	0.613	0.731	0.894	1.020	1.150
3-hr:	0.646	0.820	1.050	1.240	1.490	1.690	1.890
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24-hr:	1.580	2.040	2.630	3.110	3.760	4.250	4.760

							Rational Method Calculations per San Bernardino County Hydrology Manual and WQMP TGD									
Phase	Outfall	DA	DMA	Total Area (A) acres	Imper-vious Cover	CN	Storm Event	AMC	1-hour Precip. (P) in	Slope of IDF Curve (m)	Intercept (k) k = P/60^m	Perv. Infilt. Rate (Fp) in/hr	Time of Conc. min	Rainfall Intensity (I) in/hr	Runoff Coefficient (C)	Peak Flow (Q) cfs
Pre-dev.	Redlands	DA1	N/A	36.86	0.0%	65.0	100-year	3	1.150	-0.600	13.415	0.32	34.0	1.62	0.72	43.0
Pre-dev.	Bryn Mawr	DA2	N/A	0.00	0.0%	0.0	100-year	3	1.150	-0.600	13.415	0.00	5.0	5.11	0.90	23.2
Pre-dev.	Entire Site	SITE	-	36.86	0.0%	65.0	100-year	3	1.150	-0.600	13.415	0.32	34.0	1.62	0.72	43.0
Post-dev.	Redlands	DA1	DMA 1A	2.34	83.8%	91.2	100-year	3	1.150	-0.600	13.415	0.06	10.0	3.37	0.90	7.1
Post-dev.	Redlands	DA1	DMA 1B	12.44	81.0%	90.0	100-year	3	1.150	-0.600	13.415	0.07	10.0	3.37	0.90	37.6
Post-dev.	Redlands	DA1	DMA 1C	4.04	60.8%	81.5	100-year	3	1.150	-0.600	13.415	0.15	10.0	3.37	0.88	12.0
Post-dev.	Redlands	DA1	DMA 1D	2.94	81.6%	90.3	100-year	3	1.150	-0.600	13.415	0.07	10.0	3.37	0.90	8.9
Post-dev.	Redlands	DA1	DMA 1E	3.53	63.8%	82.8	100-year	3	1.150	-0.600	13.415	0.14	10.0	3.37	0.89	10.5
Post-dev.	Redlands	DA1	DMA 1F	2.29	2.5%	57.1	100-year	3	1.150	-0.600	13.415	0.41	15.0	2.64	0.76	4.6
Post-dev.	Redlands	DA1	DETAINED	25.29	75.7%	87.8	100-year	3	1.150	-0.600	13.415	0.09	15.0	2.64	0.89	59.6
Post-dev.	Redlands	DA1	BYPASS	2.29	2.5%	57.1	100-year	3	1.150	-0.600	13.415	0.41	15.0	2.64	0.76	4.6
Post-dev.	**Redlands**	**DA1**	**TOTAL**	**27.58**	**69.6%**	**85.2**	**100-year**	**3**	**1.150**	**-0.600**	**13.415**	**0.11**	**15.0**	**2.64**	**0.89**	**64.8**
Post-dev.	Bryn Mawr	DA2	DMA 2A	7.04	71.5%	86.0	100-year	3	1.150	-0.600	13.415	0.10	10.0	3.37	0.89	21.2
Post-dev.	Bryn Mawr	DA2	DMA 2B	2.24	8.5%	59.6	100-year	3	1.150	-0.600	13.415	0.38	14.0	2.75	0.79	4.8
Post-dev.	**Bryn Mawr**	**DA2**	**TOTAL**	**9.27**	**56.3%**	**79.7**	**100-year**	**3**	**1.150**	**-0.600**	**13.415**	**0.17**	**14.0**	**2.75**	**0.88**	**22.4**
Post-dev.	Entire Site	SITE	-	36.86	66.3%	83.8	100-year	3	1.150	-0.600	13.415	0.13	15.0	2.64	0.89	86.2

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10-min:	0.139	0.180	0.234	0.280	0.342	0.390	0.440
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3-hr:	0.646	0.820	1.050	1.240	1.490	1.690	1.890
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							Rational Method Calculations per San Bernardino County Hydrology Manual and WQMP TGD									
Phase	Outfall	DA	DMA	Total Area (A) acres	Imper-vious Cover	CN	Storm Event	AMC	1-hour Precip. (P) in	Slope of IDF Curve (m)	Intercept (k) k = P/60^m	Perv. Infilt. Rate (Fp) in/hr	Time of Conc. min	Rainfall Intensity (I) in/hr	Runoff Coefficient (C)	Peak Flow (Q) cfs
Pre-dev.	Redlands	DA1	N/A	36.86	0.0%	65.0	2-year	1	0.471	-0.600	5.494	0.86	34.0	0.66	0.00	0.0
Pre-dev.	Bryn Mawr	DA2	N/A	0.00	0.0%	0.0	2-year	1	0.471	-0.600	5.494	0.00	5.0	2.09	0.90	23.2
Pre-dev.	Entire Site	SITE	-	36.86	0.0%	65.0	2-year	1	0.471	-0.600	5.494	0.86	34.0	0.66	0.00	0.0
Post-dev.	Redlands	DA1	DMA 1A	2.34	83.8%	91.2	2-year	1	0.471	-0.600	5.494	0.37	10.0	1.38	0.86	2.8
Post-dev.	Redlands	DA1	DMA 1B	12.44	81.0%	90.0	2-year	1	0.471	-0.600	5.494	0.40	10.0	1.38	0.85	14.6
Post-dev.	Redlands	DA1	DMA 1C	4.04	60.8%	81.5	2-year	1	0.471	-0.600	5.494	0.61	10.0	1.38	0.74	4.1
Post-dev.	Redlands	DA1	DMA 1D	2.94	81.6%	90.3	2-year	1	0.471	-0.600	5.494	0.40	10.0	1.38	0.85	3.5
Post-dev.	Redlands	DA1	DMA 1E	3.53	63.8%	82.8	2-year	1	0.471	-0.600	5.494	0.58	10.0	1.38	0.76	3.7
Post-dev.	Redlands	DA1	DMA 1F	2.29	2.5%	57.1	2-year	1	0.471	-0.600	5.494	0.93	15.0	1.08	0.15	0.4
Post-dev.	Redlands	DA1	DETAINED	25.29	75.7%	87.8	2-year	1	0.471	-0.600	5.494	0.48	15.0	1.08	0.80	22.0
Post-dev.	Redlands	DA1	BYPASS	2.29	2.5%	57.1	2-year	1	0.471	-0.600	5.494	0.93	15.0	1.08	0.15	0.4
Post-dev.	**Redlands**	**DA1**	**TOTAL**	**27.58**	**69.6%**	**85.2**	**2-year**	**1**	**0.471**	**-0.600**	**5.494**	**0.52**	**15.0**	**1.08**	**0.77**	**22.9**
Post-dev.	Bryn Mawr	DA2	DMA 2A	7.04	71.5%	86.0	2-year	1	0.471	-0.600	5.494	0.50	10.0	1.38	0.81	7.8
Post-dev.	Bryn Mawr	DA2	DMA 2B	2.24	8.5%	59.6	2-year	1	0.471	-0.600	5.494	0.92	14.0	1.13	0.23	0.6
Post-dev.	**Bryn Mawr**	**DA2**	**TOTAL**	**9.27**	**56.3%**	**79.7**	**2-year**	**1**	**0.471**	**-0.600**	**5.494**	**0.65**	**14.0**	**1.13**	**0.67**	**7.0**
Post-dev.	Entire Site	SITE	-	36.86	66.3%	83.8	2-year	1	0.471	-0.600	5.494	0.57	15.0	1.08	0.74	29.5

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15-min:	0.168	0.217	0.284	0.338	0.413	0.472	0.532
30-min:	0.247	0.320	0.418	0.498	0.608	0.695	0.783
60-min:	0.363	0.471	0.613	0.731	0.894	1.020	1.150
3-hr:	0.646	0.820	1.050	1.240	1.490	1.690	1.890
6-hr:	0.905	1.150	1.460	1.720	2.070	2.340	2.610
24-hr:	1.580	2.040	2.630	3.110	3.760	4.250	4.760

									Drainage Calculations per SCS / TR-55 Method for Type I, 24-hour Storm Event							
Phase	Outfall	DA	DMA	Total Area (A) acres	Imper-vious Cover	CN	Storm Event	Time of Conc. min	S in	Ia in	Ia/P in	qu csm/in	Rainfall Depth (P) in	Runoff Depth (Q) in	Runoff Volume (V) cu ft	Peak Flow (q) cfs
Pre-dev.	Redlands	DA1	N/A	36.86	0.0%	65.0	2-year	34.0	5.385	1.077	0.528	49.66	2.040	0.15	19,548	0.4
Pre-dev.	Entire Site	SITE	-	36.86	0.0%	65.0	2-year	34.0	5.385	1.077	0.528	49.66	2.040	0.15	19,548	0.4
Post-dev.	Redlands	DA1	DETAINED	25.29	75.7%	87.8	2-year	15.0	1.390	0.278	0.136	353.77	2.040	0.98	90,402	13.8
Post-dev.	Redlands	DA1	BYPASS	2.29	2.5%	57.1	2-year	15.0	7.524	1.505	0.738	52.55	2.040	0.04	296	0.0
Post-dev.	**Redlands**	**DA1**	**TOTAL**	**27.58**	**69.6%**	**85.2**	**2-year**	**15.0**	**1.732**	**0.346**	**0.170**	**336.42**	**2.040**	**0.84**	**83,836**	**12.1**
Post-dev.	**Bryn Mawr**	**DA2**	**TOTAL**	**9.27**	**56.3%**	**79.7**	**2-year**	**14.0**	**2.554**	**0.511**	**0.250**	**289.95**	**2.040**	**0.57**	**19,280**	**2.4**
Post-dev.	Entire Site	SITE	-	36.86	66.3%	83.8	2-year	15.0	1.928	0.386	0.189	326.32	2.040	0.76	102,195	14.4

									Drainage Calculations per SCS / TR-55 Method for Type I, 24-hour Storm Event							
Phase	Outfall	DA	DMA	Total Area (A) acres	Imper-vious Cover	CN	Storm Event	Time of Conc. min	S in	Ia in	Ia/P in	qu csm/in	Rainfall Depth (P) in	Runoff Depth (Q) in	Runoff Volume (V) cu ft	Peak Flow (q) cfs
Pre-dev.	Redlands	DA1	N/A	36.86	0.0%	65.0	100-year	34.0	5.385	1.077	0.226	211.29	4.760	1.50	200,137	18.2
Pre-dev.	Entire Site	SITE	-	36.86	0.0%	65.0	100-year	34.0	5.385	1.077	0.226	211.29	4.760	1.50	200,137	18.2
Post-dev.	Redlands	DA1	DETAINED	25.29	75.7%	87.8	100-year	15.0	1.390	0.278	0.058	373.72	4.760	3.42	314,007	50.5
Post-dev.	Redlands	DA1	BYPASS	2.29	2.5%	57.1	100-year	15.0	7.524	1.505	0.316	215.85	4.760	0.98	8,188	0.8
Post-dev.	**Redlands**	**DA1**	**TOTAL**	**27.58**	**69.6%**	**85.2**	**100-year**	**15.0**	**1.732**	**0.346**	**0.073**	**373.72**	**4.760**	**3.17**	**317,366**	**51.1**
Post-dev.	**Bryn Mawr**	**DA2**	**TOTAL**	**9.27**	**56.3%**	**79.7**	**100-year**	**14.0**	**2.554**	**0.511**	**0.107**	**379.34**	**4.760**	**2.65**	**89,343**	**14.6**
Post-dev.	Entire Site	SITE	-	36.86	66.3%	83.8	100-year	15.0	1.928	0.386	0.081	373.72	4.760	3.04	406,160	65.3

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3-hr:	0.646	0.820	1.050	1.240	1.490	1.690	1.890
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24-hr:	1.580	2.040	2.630	3.110	3.760	4.250	4.760

Retention Volume Calculations for LID BMPs per San Bernardino County WQMP TGD

Outfall	DA	DMA	Total Area (A) acres	Impervious Cover	C**	2-yr, 1-hr Precip. (P2) in	a1 (valley)	Mean 6-hr Precip. (P6) in	a2 (varies) 24-hr=1.582 48-hr=1.963	DCV cu ft
Redlands	DA1	DMA 1A	2.34	83.8%	0.646	0.471	1.4807	0.697	1.582	6,046
Redlands	DA1	DMA 1B	12.44	81.0%	0.611	0.471	1.4807	0.697	1.963	37,760
Redlands	DA1	DMA 1C	4.04	60.8%	0.415	0.471	1.4807	0.697	1.963	8,332
Redlands	DA1	DMA 1D	2.94	81.6%	0.619	0.471	1.4807	0.697	1.963	9,059
Redlands	DA1	DMA 1E	3.53	63.8%	0.439	0.471	1.4807	0.697	1.963	7,706
Redlands	DA1	DMA 1F	2.29	2.5%	0.059	0.471	1.4807	0.697	1.963	674
Redlands	**DA1**	**TOTAL**	**27.58**	**69.6%**	**0.490**	**0.471**	**1.4807**	**0.697**	**1.963**	**67,199**
Bryn Mawr	DA2	DMA 2A	7.04	71.5%	0.509	0.471	1.4807	0.697	1.963	17,782
Bryn Mawr	DA2	DMA 2B	2.24	8.5%	0.101	0.471	1.4807	0.697	1.963	1,121
Bryn Mawr	**DA2**	**TOTAL**	**9.27**	**56.3%**	**0.382**	**0.471**	**1.4807**	**0.697**	**1.963**	**17,596**
Entire Site	SITE	-	36.86	66.3%	0.460	0.471	1.4807	0.697	1.963	84,267

Kimley-Horn and Associates, Inc.

Date: 11/21/2013
Project: VA Loma Linda HCC
Project #: TBD
Locality: City of Loma Linda
County: San Bernardino
Latitude: 34.062
Longitude: -117.2360
HSG: Type B Soils

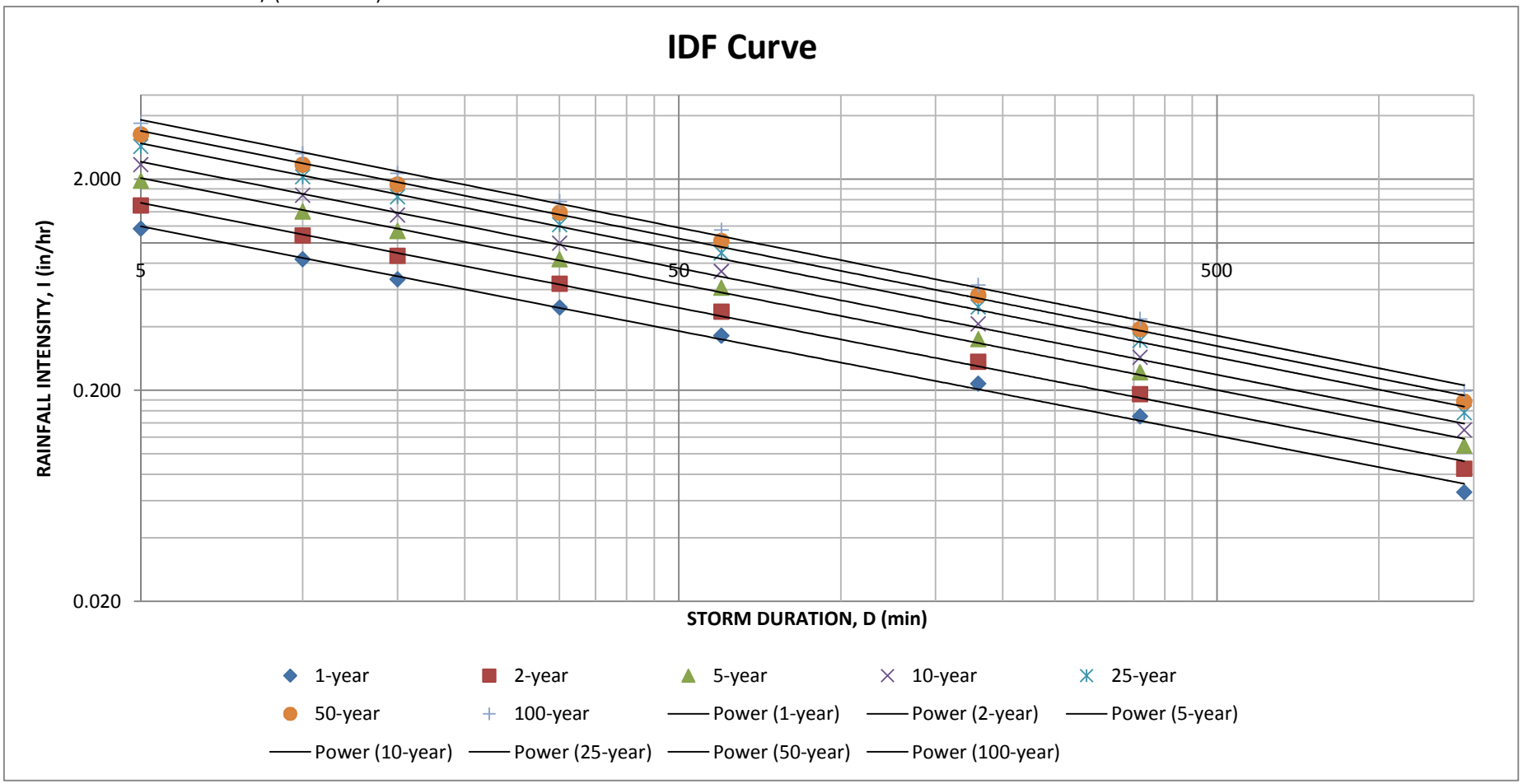
			Infiltration Parameters			Infiltration Basin Design							Infiltration Trench Design				Compliance				
DA	DMA	DCV	Measured Infil. Rate	Factor of Safety	Design Infil. Rate	Surface Area Top	Surface Area Bottom	Surface Area Avg.	Elevation Top	Elevation Bottom	Depth	Basin Volume	Area	Depth	Porosity (n)	Trench Volume	Drawdown Time actual	Drawdown Time maximum	Maximum Ponding	Storage Volume	Volume Retained
		cu ft	in/hr		in/hr	sq ft	sq ft	sq ft	ft	ft	ft	cu ft	sq ft	in		cu ft	hr	hr	ft	cu ft	cu ft
DA1	DMA 1A	6,046	3.800	3.8	1.000	4,490	2,470	3,480	1143.0	1141.0	2.00	6,960	0	0.0	0%	0	20.8	24.0	2.00	6,960	7,830
DA1	DMA 1B	37,760	0.750	2.0	0.375	22,180	17,120	19,650	1134.5	1133.0	1.50	29,475	7,500	24.0	40%	6,000	44.5	48.0	1.50	35,475	38,020
DA1	DMA 1C	8,332	0.900	2.0	0.450	7,790	4,470	6,130	1134.5	1133.0	1.50	9,195	0	0.0	0%	0	36.2	48.0	1.80	9,195	9,885
DA1	DMA 1D	9,059	0.750	2.0	0.375	7,150	5,090	6,120	1135.0	1133.5	1.50	9,180	0	0.0	0%	0	47.4	48.0	1.50	9,180	9,754
DA1	DMA 1E	7,706	0.750	2.0	0.375	9,370	8,370	8,870	1130.0	1129.0	1.00	8,870	0	0.0	0%	0	27.8	48.0	1.50	8,870	9,702
DA1	DMA 1F	674																			
DA1	**TOTAL**	**69,576**										**63,680**				**6,000**				**69,680**	**75,190**
DA2	DMA 2A	17,782	1.625	2.0	0.813	10,560	5,510	8,035	1137.5	1135.0	2.50	20,088	0	0.0	0%	0	32.7	48.0	3.25	20,088	21,720
DA2	DMA 2B	1,121																			
DA2	**TOTAL**	**18,903**										**20,088**				**0**				**20,088**	**21,720**
SITE	-	88,479										83,768				6,000				89,768	96,910

Kimley-Horn and Associates, Inc.

Date: 11/21/2013
Project: VA Loma Linda HCC
Project #: TBD
Locality: City of Loma Linda
County: San Bernardino
Latitude: 34.062
Longitude: -117.2360
Storm: 100-year P = 1.15 (1-hour)
m = -0.600 (default slope for valley)
k = 13.415 k = P / (60 min ^ m)

Rainfall Intensity Table									
I (in/hr)	**D (min)**	**1-year**	**2-year**	**5-year**	**10-year**	**25-year**	**50-year**	**100-year**	**100-year**
5-min:	**5**	1.164	1.500	1.968	2.340	2.856	3.264	3.684	3.684
10-min:	**10**	0.834	1.080	1.404	1.680	2.052	2.340	2.640	2.640
15-min:	**15**	0.672	0.868	1.136	1.352	1.652	1.888	2.128	2.128
30-min:	**30**	0.494	0.640	0.836	0.996	1.216	1.390	1.566	1.566
60-min:	**60**	0.363	0.471	0.613	0.731	0.894	1.020	1.150	1.150
3-hr:	**180**	0.215	0.273	0.350	0.413	0.497	0.563	0.630	0.630
6-hr:	**360**	0.151	0.192	0.243	0.287	0.345	0.390	0.435	0.435
24-hr:	**1440**	0.066	0.085	0.110	0.130	0.157	0.177	0.198	0.198

*Rainfall Intensity, I = (k) x (Storm Duration, Tc) ^ (m)



NOAA Atlas 14, Volume 6, Version 2
Location name: Redlands, California, US*
Coordinates: 34.0620, -117.2360
Elevation: 1137ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.097 (0.081–0.117)	0.125 (0.104–0.152)	0.164 (0.136–0.199)	0.195 (0.160–0.240)	0.238 (0.189–0.303)	0.272 (0.212–0.353)	0.307 (0.233–0.409)	0.343 (0.253–0.470)	0.393 (0.277–0.562)	0.432 (0.294–0.640)
10-min	0.139 (0.116–0.168)	0.180 (0.150–0.218)	0.234 (0.194–0.286)	0.280 (0.230–0.343)	0.342 (0.271–0.434)	0.390 (0.303–0.507)	0.440 (0.333–0.586)	0.492 (0.362–0.674)	0.563 (0.397–0.806)	0.619 (0.422–0.918)
15-min	0.168 (0.140–0.204)	0.217 (0.181–0.264)	0.284 (0.235–0.345)	0.338 (0.278–0.415)	0.413 (0.328–0.525)	0.472 (0.367–0.613)	0.532 (0.403–0.709)	0.595 (0.438–0.815)	0.681 (0.481–0.974)	0.749 (0.510–1.11)
30-min	0.247 (0.206–0.300)	0.320 (0.266–0.389)	0.418 (0.346–0.509)	0.498 (0.409–0.612)	0.608 (0.483–0.774)	0.695 (0.540–0.903)	0.783 (0.594–1.04)	0.876 (0.645–1.20)	1.00 (0.708–1.44)	1.10 (0.752–1.64)
60-min	0.363 (0.302–0.440)	0.471 (0.391–0.572)	0.613 (0.509–0.747)	0.731 (0.601–0.898)	0.894 (0.710–1.14)	1.02 (0.793–1.33)	1.15 (0.872–1.53)	1.29 (0.948–1.76)	1.47 (1.04–2.11)	1.62 (1.10–2.40)
2-hr	0.523 (0.436–0.635)	0.668 (0.555–0.811)	0.859 (0.712–1.05)	1.02 (0.835–1.25)	1.23 (0.977–1.56)	1.40 (1.09–1.81)	1.57 (1.19–2.09)	1.74 (1.28–2.39)	1.98 (1.40–2.84)	2.17 (1.48–3.22)
3-hr	0.646 (0.538–0.783)	0.820 (0.682–0.996)	1.05 (0.869–1.28)	1.24 (1.02–1.52)	1.49 (1.19–1.90)	1.69 (1.31–2.20)	1.89 (1.43–2.52)	2.10 (1.55–2.88)	2.38 (1.68–3.41)	2.61 (1.78–3.86)
6-hr	0.905 (0.753–1.10)	1.15 (0.952–1.39)	1.46 (1.21–1.78)	1.72 (1.41–2.11)	2.07 (1.64–2.63)	2.34 (1.82–3.03)	2.61 (1.98–3.47)	2.89 (2.13–3.96)	3.27 (2.31–4.68)	3.57 (2.43–5.29)
12-hr	1.19 (0.993–1.45)	1.52 (1.26–1.84)	1.94 (1.61–2.36)	2.28 (1.88–2.80)	2.75 (2.18–3.49)	3.11 (2.42–4.03)	3.47 (2.63–4.62)	3.84 (2.83–5.27)	4.35 (3.07–6.22)	4.74 (3.23–7.02)
24-hr	1.58 (1.40–1.83)	2.04 (1.80–2.35)	2.63 (2.32–3.04)	3.11 (2.72–3.62)	3.76 (3.18–4.53)	4.25 (3.53–5.23)	4.76 (3.86–5.99)	5.28 (4.16–6.83)	5.98 (4.53–8.06)	6.52 (4.77–9.09)
2-day	1.93 (1.71–2.23)	2.53 (2.23–2.92)	3.31 (2.92–3.83)	3.95 (3.45–4.60)	4.81 (4.08–5.80)	5.48 (4.55–6.74)	6.16 (4.99–7.76)	6.86 (5.41–8.88)	7.81 (5.91–10.5)	8.55 (6.26–11.9)
3-day	2.07 (1.83–2.39)	2.75 (2.43–3.17)	3.65 (3.22–4.22)	4.38 (3.83–5.11)	5.39 (4.56–6.49)	6.16 (5.12–7.58)	6.96 (5.64–8.77)	7.78 (6.14–10.1)	8.91 (6.74–12.0)	9.79 (7.16–13.7)
4-day	2.20 (1.95–2.54)	2.95 (2.61–3.41)	3.95 (3.48–4.56)	4.76 (4.17–5.56)	5.89 (4.99–7.09)	6.76 (5.61–8.31)	7.66 (6.20–9.64)	8.59 (6.77–11.1)	9.87 (7.47–13.3)	10.9 (7.95–15.2)
7-day	2.54 (2.25–2.93)	3.47 (3.07–4.00)	4.70 (4.14–5.43)	5.71 (5.00–6.66)	7.12 (6.03–8.57)	8.21 (6.81–10.1)	9.34 (7.56–11.8)	10.5 (8.28–13.6)	12.1 (9.18–16.3)	13.4 (9.80–18.7)
10-day	2.76 (2.44–3.18)	3.81 (3.37–4.39)	5.20 (4.59–6.02)	6.36 (5.56–7.42)	7.96 (6.74–9.58)	9.20 (7.64–11.3)	10.5 (8.50–13.2)	11.8 (9.33–15.3)	13.7 (10.4–18.5)	15.2 (11.1–21.1)
20-day	3.39 (3.00–3.90)	4.73 (4.18–5.46)	6.54 (5.76–7.56)	8.04 (7.03–9.37)	10.1 (8.58–12.2)	11.8 (9.77–14.5)	13.5 (10.9–17.0)	15.3 (12.0–19.8)	17.8 (13.5–24.0)	19.8 (14.5–27.6)
30-day	4.01 (3.55–4.62)	5.60 (4.95–6.46)	7.74 (6.82–8.95)	9.53 (8.34–11.1)	12.0 (10.2–14.5)	14.0 (11.6–17.2)	16.1 (13.0–20.3)	18.3 (14.4–23.6)	21.3 (16.1–28.7)	23.8 (17.4–33.1)
45-day	4.84 (4.29–5.58)	6.69 (5.92–7.72)	9.20 (8.12–10.6)	11.3 (9.90–13.2)	14.3 (12.1–17.2)	16.7 (13.8–20.5)	19.1 (15.5–24.1)	21.8 (17.1–28.2)	25.4 (19.3–34.3)	28.4 (20.8–39.6)
60-day	5.71 (5.05–6.58)	7.78 (6.88–8.97)	10.6 (9.35–12.3)	13.0 (11.4–15.1)	16.4 (13.9–19.7)	19.1 (15.8–23.4)	21.9 (17.7–27.6)	24.9 (19.6–32.2)	29.1 (22.1–39.3)	32.6 (23.8–45.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

DATA DESCRIPTION

Data type: precipitation depth **Units:** english **Time series type:** partial duration

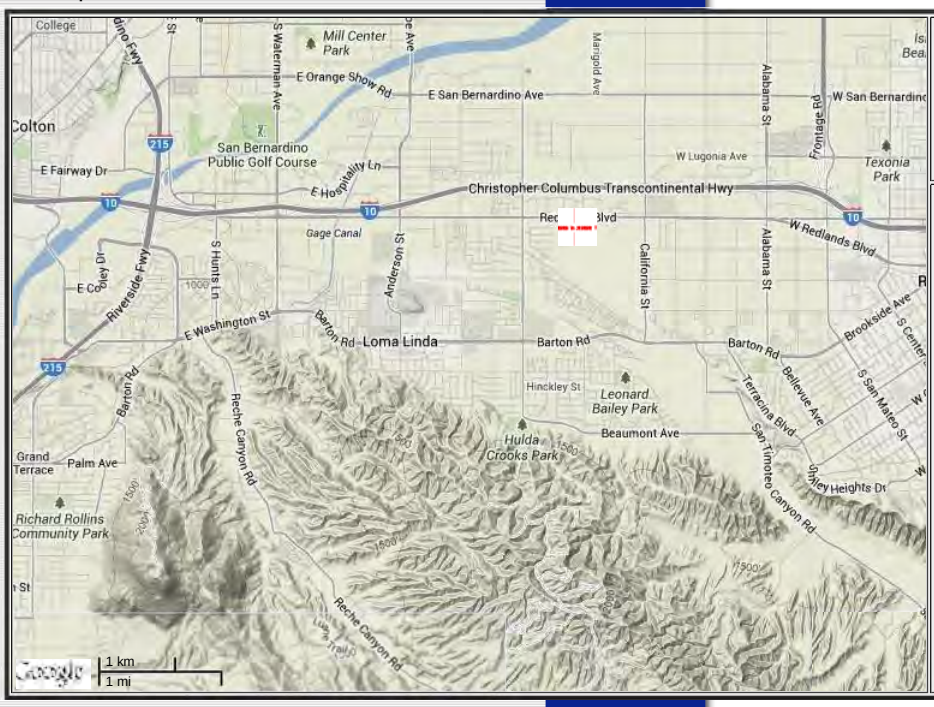
SELECT LOCATION

1. Manually:

a) Enter location (decimal degrees, use "-" for S and W): latitude: 34.062 longitude: -117.236 submit

b) Select station (click here for a list of stations used in frequency analysis): select station

2. Use map:



a) Select location
(move crosshair or double click)

b) Click on station icon
(show stations on map)

LOCATION INFORMATION:
Name: Redlands, California, US*
Latitude: 34.0620
Longitude: -117.2360
Elevation: 1137 ft*

* source: Google Maps

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

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PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.097 (0.081–0.117)	0.125 (0.104–0.152)	0.164 (0.136–0.199)	0.195 (0.160–0.240)	0.238 (0.189–0.303)	0.272 (0.212–0.353)	0.307 (0.233–0.409)	0.343 (0.253–0.470)	0.393 (0.277–0.562)	0.432 (0.294–0.640)
10-min	0.139 (0.116–0.168)	0.180 (0.150–0.218)	0.234 (0.194–0.286)	0.280 (0.230–0.343)	0.342 (0.271–0.434)	0.390 (0.303–0.507)	0.440 (0.333–0.586)	0.492 (0.362–0.674)	0.563 (0.397–0.806)	0.619 (0.422–0.918)
15-min	0.168 (0.140–0.204)	0.217 (0.181–0.264)	0.284 (0.235–0.345)	0.338 (0.278–0.415)	0.413 (0.328–0.525)	0.472 (0.367–0.613)	0.532 (0.403–0.709)	0.595 (0.438–0.815)	0.681 (0.481–0.974)	0.749 (0.510–1.11)
30-min	0.247 (0.206–0.300)	0.320 (0.266–0.389)	0.418 (0.346–0.509)	0.498 (0.409–0.612)	0.608 (0.483–0.774)	0.695 (0.540–0.903)	0.783 (0.594–1.04)	0.876 (0.645–1.20)	1.00 (0.708–1.44)	1.10 (0.752–1.64)
60-min	0.363 (0.302–0.440)	0.471 (0.391–0.572)	0.613 (0.509–0.747)	0.731 (0.601–0.898)	0.894 (0.710–1.14)	1.02 (0.793–1.33)	1.15 (0.872–1.53)	1.29 (0.948–1.76)	1.47 (1.04–2.11)	1.62 (1.10–2.40)
2-hr	0.523 (0.436–0.635)	0.668 (0.555–0.811)	0.859 (0.712–1.05)	1.02 (0.835–1.25)	1.23 (0.977–1.56)	1.40 (1.09–1.81)	1.57 (1.19–2.09)	1.74 (1.28–2.39)	1.98 (1.40–2.84)	2.17 (1.48–3.22)
3-hr	0.646 (0.538–0.783)	0.820 (0.682–0.996)	1.05 (0.869–1.28)	1.24 (1.02–1.52)	1.49 (1.19–1.90)	1.69 (1.31–2.20)	1.89 (1.43–2.52)	2.10 (1.55–2.88)	2.38 (1.68–3.41)	2.61 (1.78–3.86)
6-hr	0.905 (0.753–1.10)	1.15 (0.952–1.39)	1.46 (1.21–1.78)	1.72 (1.41–2.11)	2.07 (1.64–2.63)	2.34 (1.82–3.03)	2.61 (1.98–3.47)	2.89 (2.13–3.96)	3.27 (2.31–4.68)	3.57 (2.43–5.29)
12-hr	1.19 (0.993–1.45)	1.52 (1.26–1.84)	1.94 (1.61–2.36)	2.28 (1.88–2.80)	2.75 (2.18–3.49)	3.11 (2.42–4.03)	3.47 (2.63–4.62)	3.84 (2.83–5.27)	4.35 (3.07–6.22)	4.74 (3.23–7.02)
24-hr	1.58 (1.40–1.83)	2.04 (1.80–2.35)	2.63 (2.32–3.04)	3.11 (2.72–3.62)	3.76 (3.18–4.53)	4.25 (3.53–5.23)	4.76 (3.86–5.99)	5.28 (4.16–6.83)	5.98 (4.53–8.06)	6.52 (4.77–9.09)
2-day	1.93	2.53	3.31	3.95	4.81	5.48	6.16	6.86	7.81	8.55

	(1.71–2.23)	(2.23–2.92)	(2.92–3.83)	(3.45–4.60)	(4.08–5.80)	(4.55–6.74)	(4.99–7.76)	(5.41–8.88)	(5.91–10.5)	(6.26–11.9)
3-day	**2.07** (1.83–2.39)	**2.75** (2.43–3.17)	**3.65** (3.22–4.22)	**4.38** (3.83–5.11)	**5.39** (4.56–6.49)	**6.16** (5.12–7.58)	**6.96** (5.64–8.77)	**7.78** (6.14–10.1)	**8.91** (6.74–12.0)	**9.79** (7.16–13.7)
4-day	**2.20** (1.95–2.54)	**2.95** (2.61–3.41)	**3.95** (3.48–4.56)	**4.76** (4.17–5.56)	**5.89** (4.99–7.09)	**6.76** (5.61–8.31)	**7.66** (6.20–9.64)	**8.59** (6.77–11.1)	**9.87** (7.47–13.3)	**10.9** (7.95–15.2)
7-day	**2.54** (2.25–2.93)	**3.47** (3.07–4.00)	**4.70** (4.14–5.43)	**5.71** (5.00–6.66)	**7.12** (6.03–8.57)	**8.21** (6.81–10.1)	**9.34** (7.56–11.8)	**10.5** (8.28–13.6)	**12.1** (9.18–16.3)	**13.4** (9.80–18.7)
10-day	**2.76** (2.44–3.18)	**3.81** (3.37–4.39)	**5.20** (4.59–6.02)	**6.36** (5.56–7.42)	**7.96** (6.74–9.58)	**9.20** (7.64–11.3)	**10.5** (8.50–13.2)	**11.8** (9.33–15.3)	**13.7** (10.4–18.5)	**15.2** (11.1–21.1)
20-day	**3.39** (3.00–3.90)	**4.73** (4.18–5.46)	**6.54** (5.76–7.56)	**8.04** (7.03–9.37)	**10.1** (8.58–12.2)	**11.8** (9.77–14.5)	**13.5** (10.9–17.0)	**15.3** (12.0–19.8)	**17.8** (13.5–24.0)	**19.8** (14.5–27.6)
30-day	**4.01** (3.55–4.62)	**5.60** (4.95–6.46)	**7.74** (6.82–8.95)	**9.53** (8.34–11.1)	**12.0** (10.2–14.5)	**14.0** (11.6–17.2)	**16.1** (13.0–20.3)	**18.3** (14.4–23.6)	**21.3** (16.1–28.7)	**23.8** (17.4–33.1)
45-day	**4.84** (4.29–5.58)	**6.69** (5.92–7.72)	**9.20** (8.12–10.6)	**11.3** (9.90–13.2)	**14.3** (12.1–17.2)	**16.7** (13.8–20.5)	**19.1** (15.5–24.1)	**21.8** (17.1–28.2)	**25.4** (19.3–34.3)	**28.4** (20.8–39.6)
60-day	**5.71** (5.05–6.58)	**7.78** (6.88–8.97)	**10.6** (9.35–12.3)	**13.0** (11.4–15.1)	**16.4** (13.9–19.7)	**19.1** (15.8–23.4)	**21.9** (17.7–27.6)	**24.9** (19.6–32.2)	**29.1** (22.1–39.3)	**32.6** (23.8–45.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in csv format: precipitation frequency estimates Submit

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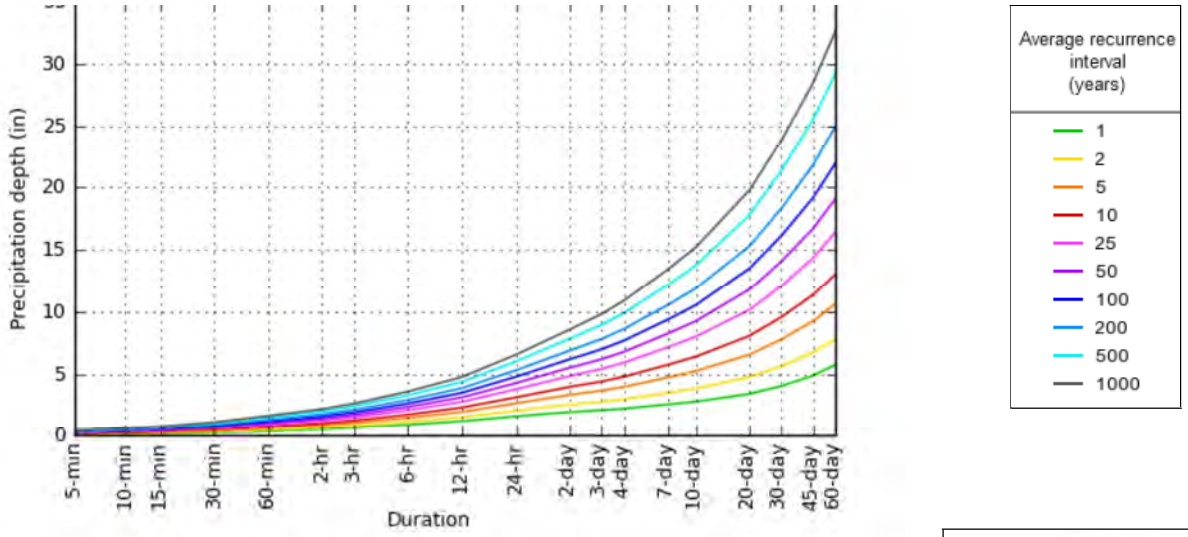
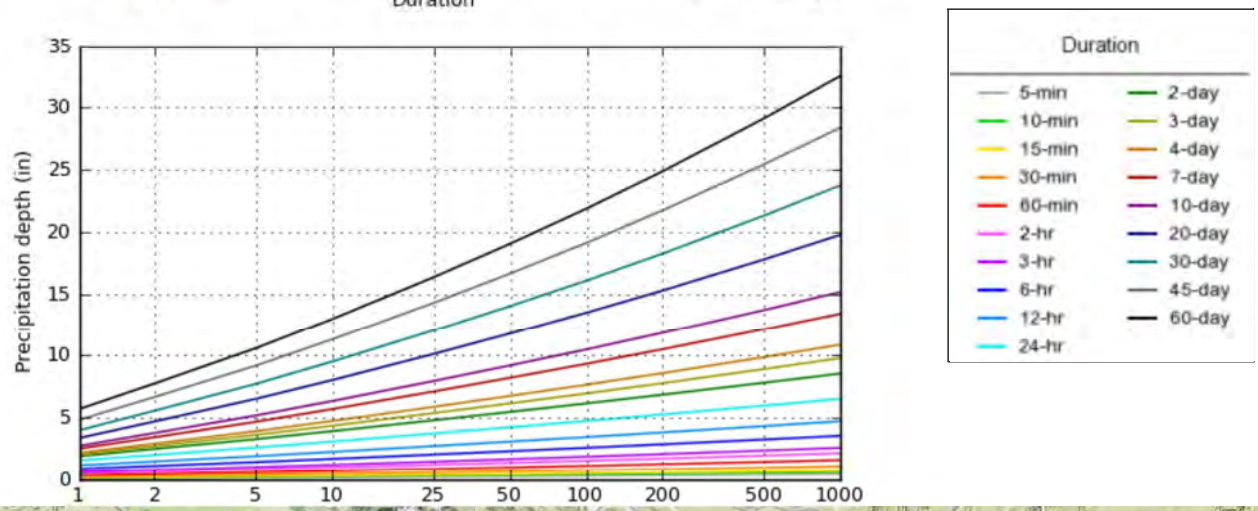

Precipitation depth (in)
0
5
10
15
20
25
30
5-min
10-min
15-min
30-min
60-min
2-hr
3-hr
6-hr
12-hr
24-hr
2-day
3-day
4-day
7-day
10-day
20-day
30-day
45-day
60-day
Duration
Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000


Precipitation depth (in)
0
5
10
15
20
25
30
35
1
2
5
10
25
50
100
200
500
1000
Duration
5-min
10-min
15-min
30-min
60-min
2-hr
3-hr
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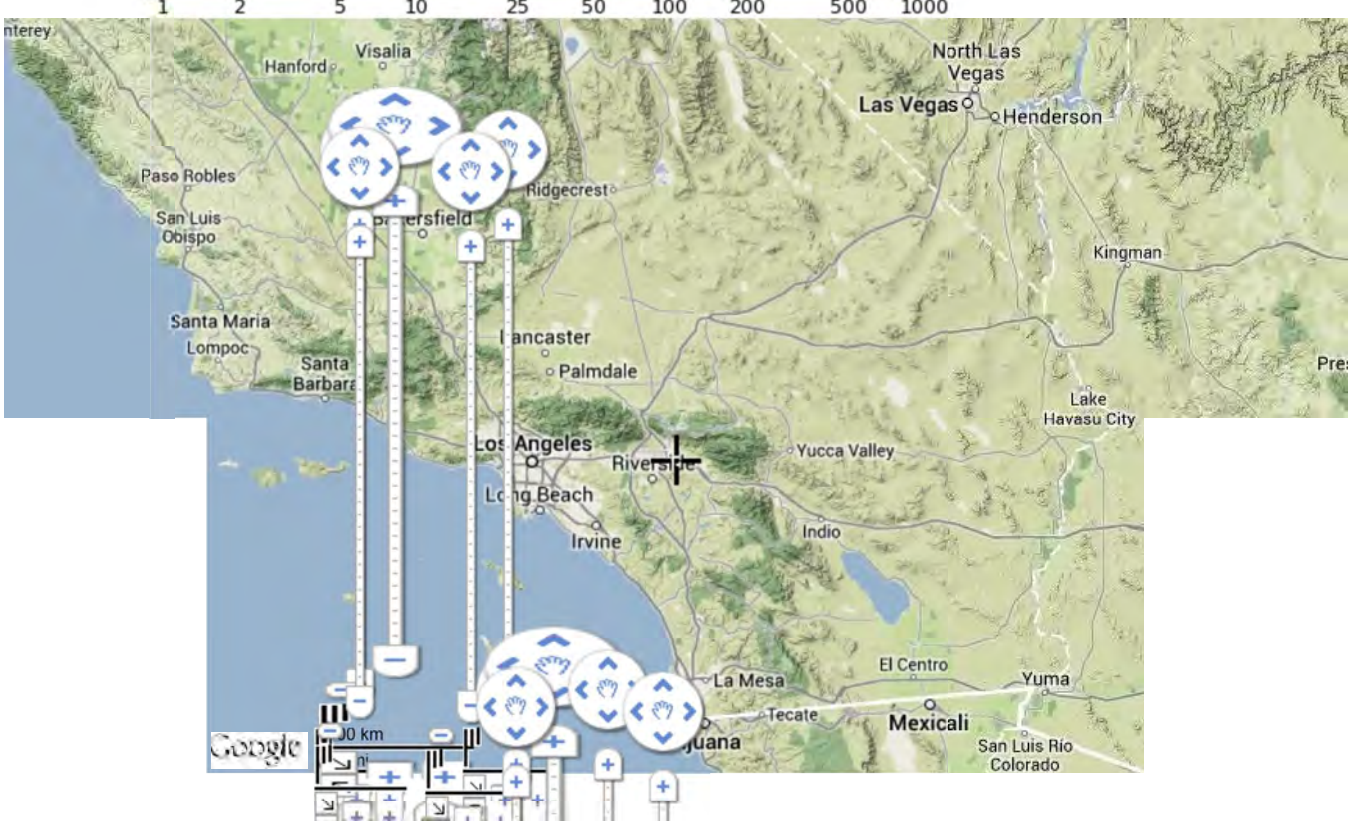
20-day
30-day
45-day
60-day


Visalia
Hanford
North Las Vegas
Las Vegas
Henderson
Paso Robles
San Luis Obispo
Ridgecrest
Kingman
Santa Maria
Lompoc
Santa Barbara
Palmdale
Lake Havasu City
Los Angeles
Riverside
Yucca Valley
Long Beach
Irvine
Indio
El Centro
La Mesa
Yuma
Tecate
Mexicali
San Luis Río Colorado
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Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	Soil Group B	Soil Group C	Soil Group D
AGRICULTURAL COVERS (Continued)					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87

CN determination for existing, pre-development condition

Notes:

1. All curve numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:

   Poor-Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.

   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Figure C-2 for definition of cover types.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (2 of 2)

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	Soil Group B	Soil Group C	Soil Group D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

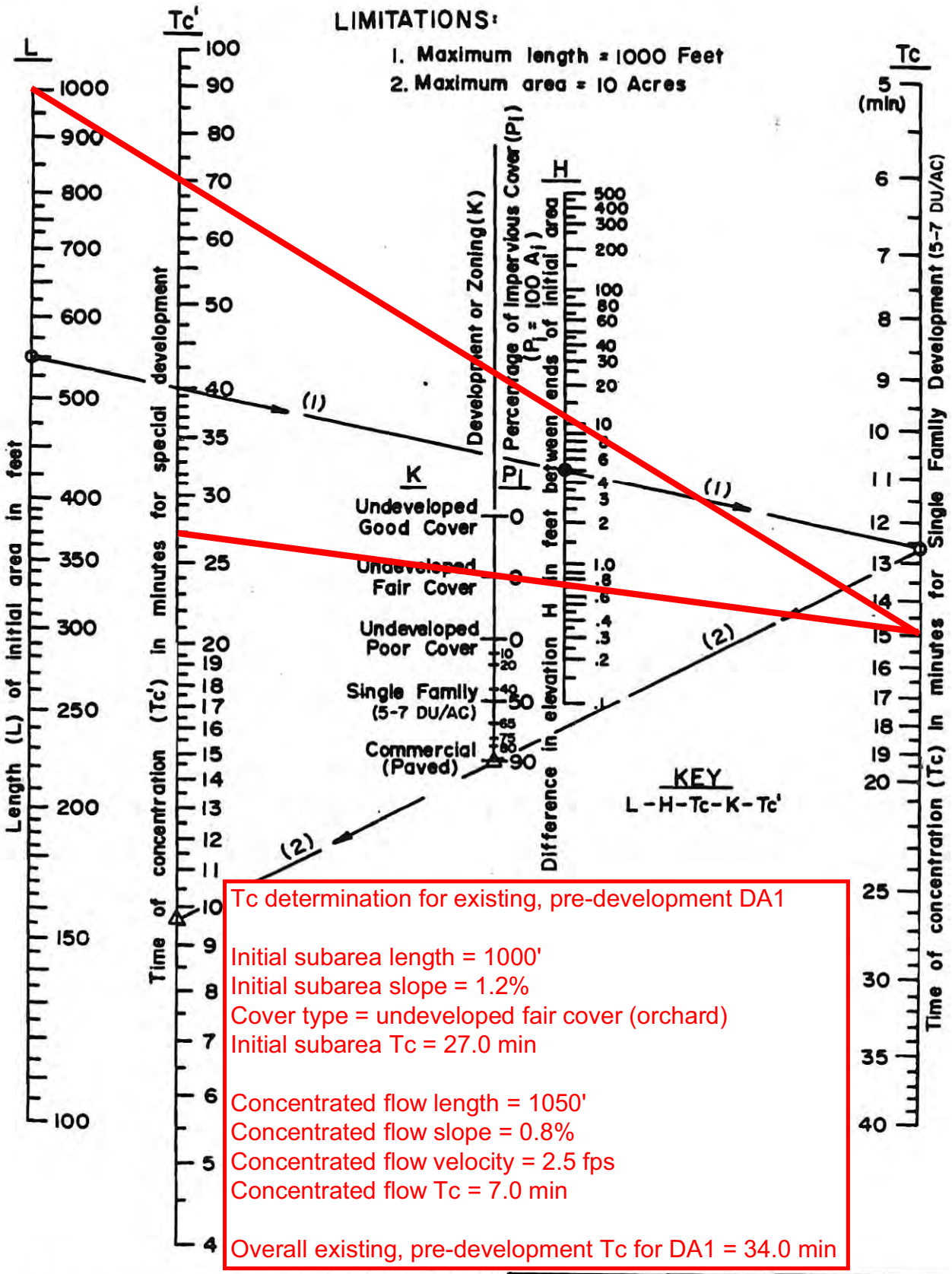
CN determination for proposed, post-development pervious areas (CN = 98 for all impervious areas)

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)



Tc determination for existing, pre-development DA1

Initial subarea length = 1000'
Initial subarea slope = 1.2%
Cover type = undeveloped fair cover (orchard)
Initial subarea Tc = 27.0 min

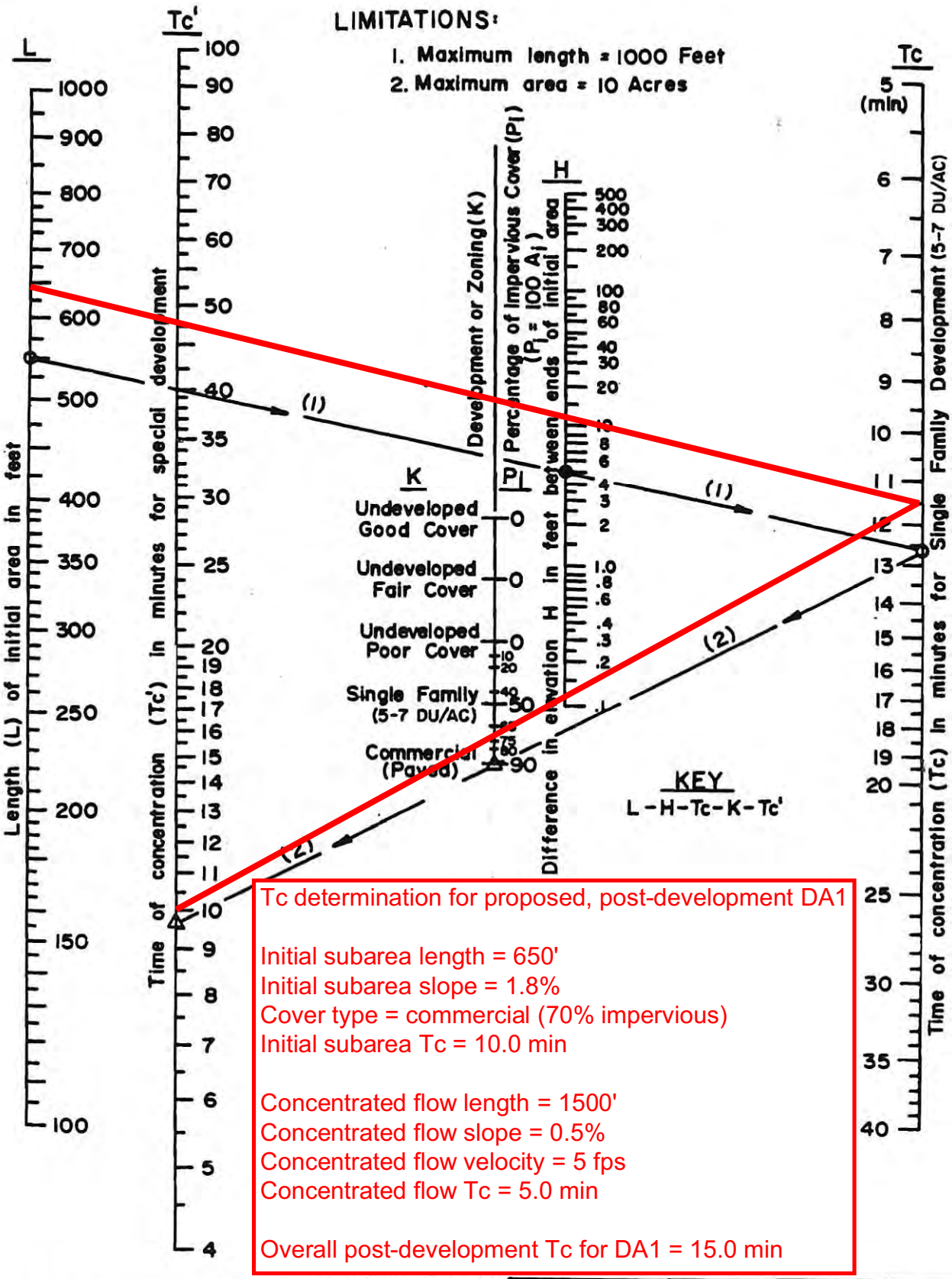
Concentrated flow length = 1050'
Concentrated flow slope = 0.8%
Concentrated flow velocity = 2.5 fps
Concentrated flow Tc = 7.0 min

Overall existing, pre-development Tc for DA1 = 34.0 min

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1



Tc determination for proposed, post-development DA1

Initial subarea length = 650'
Initial subarea slope = 1.8%
Cover type = commercial (70% impervious)
Initial subarea Tc = 10.0 min

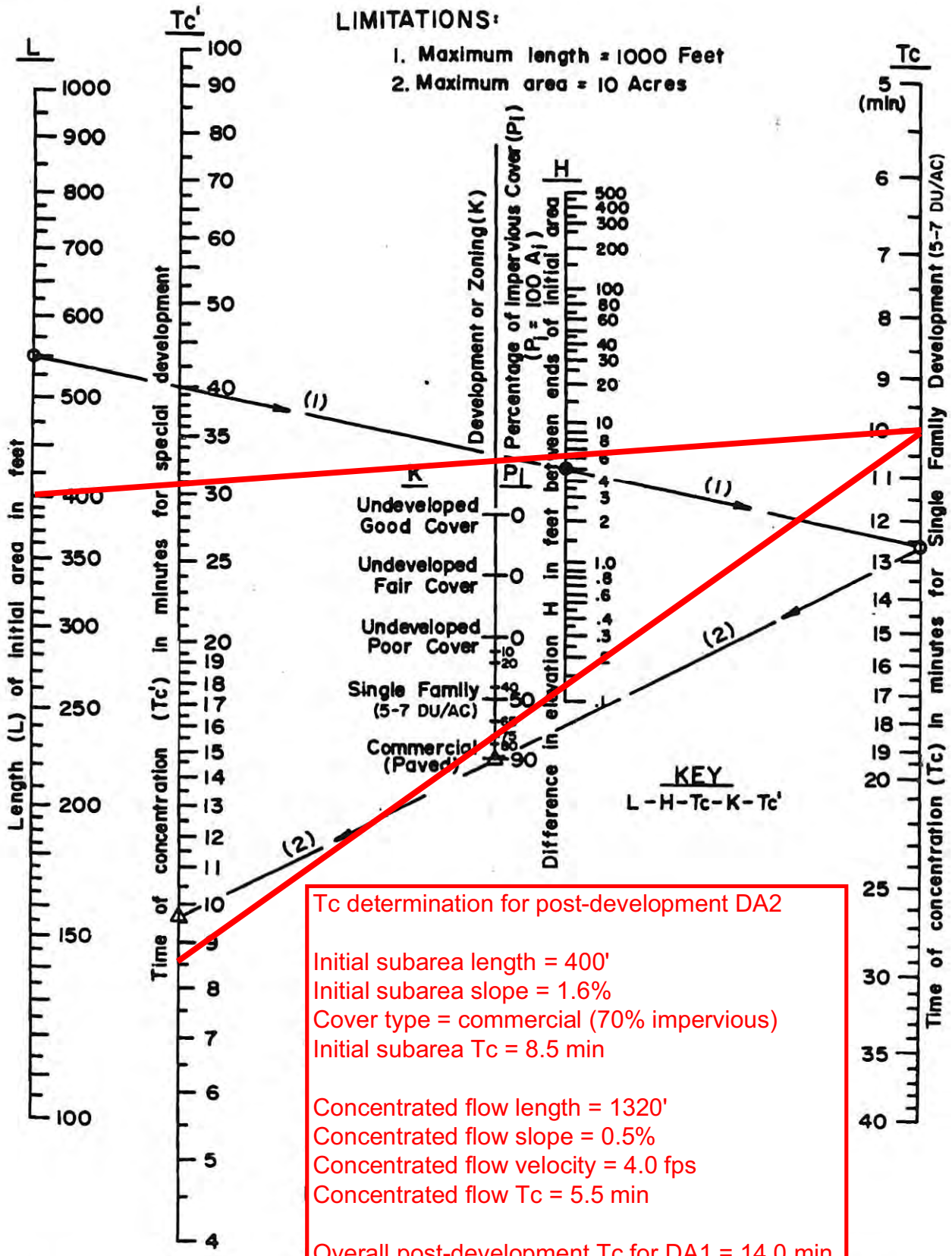
Concentrated flow length = 1500'
Concentrated flow slope = 0.5%
Concentrated flow velocity = 5 fps
Concentrated flow Tc = 5.0 min

Overall post-development Tc for DA1 = 15.0 min

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1



Tc determination for post-development DA2

Initial subarea length = 400'
Initial subarea slope = 1.6%
Cover type = commercial (70% impervious)
Initial subarea Tc = 8.5 min

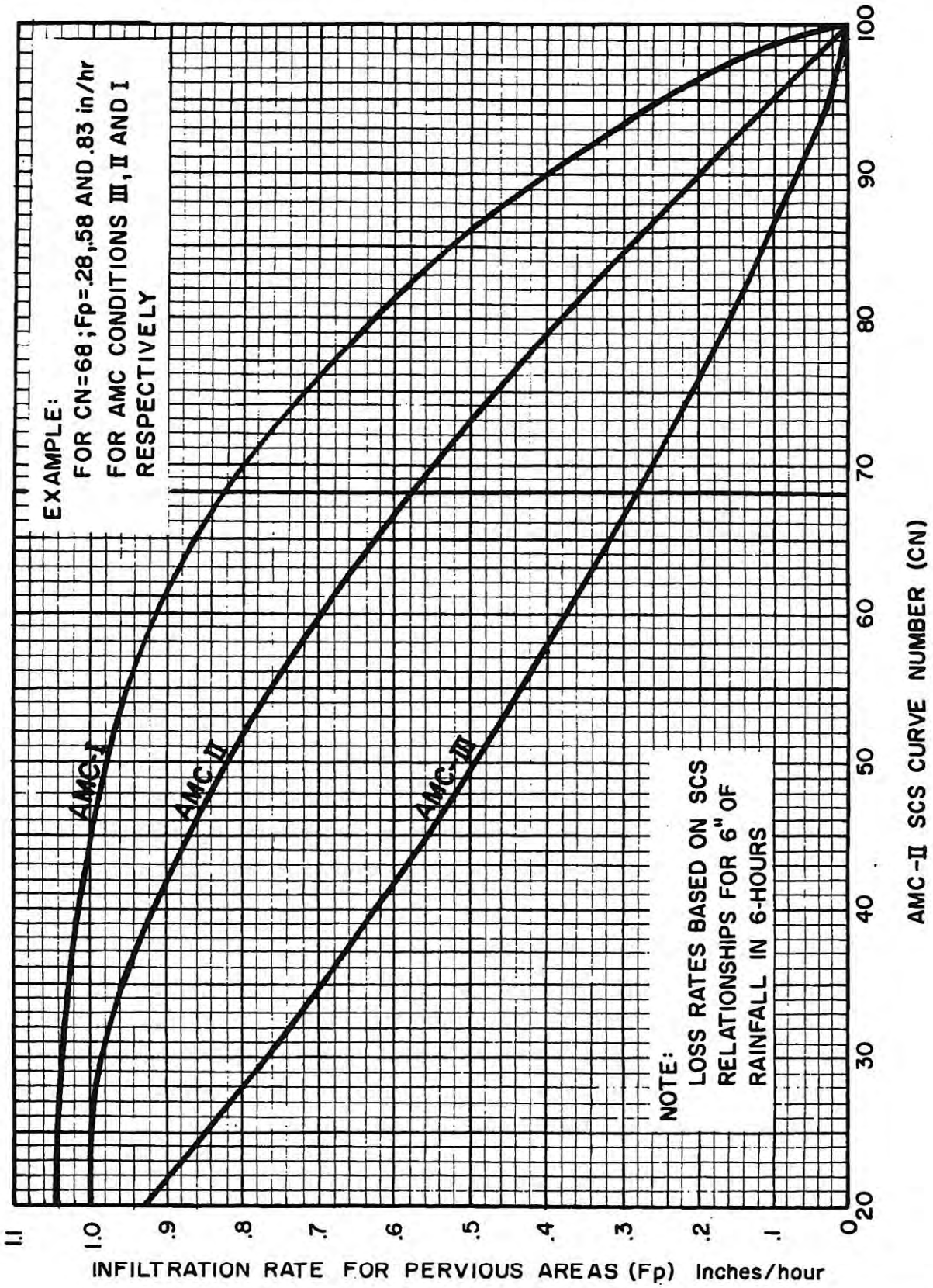
Concentrated flow length = 1320'
Concentrated flow slope = 0.5%
Concentrated flow velocity = 4.0 fps
Concentrated flow Tc = 5.5 min

Overall post-development Tc for DA1 = 14.0 min

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

INFILTRATION RATE FOR PERVIOUS AREAS VERSUS SCS CURVE NUMBERS

Figure C-6

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****************************************************************************

             F L O O D    R O U T I N G    A N A L Y S I S
          USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
             Ver. 18.0  Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* VA LOMA LINDA MOB                                                        *
* HYDROGRAPHS FOR PRE-DEVELOPED CONDITION AND DEVELOPED DETAINED AREA      *
*                                                                          *
 ****************************************************************************

  FILE NAME: VALL100A.DAT
  TIME/DATE OF STUDY: 10:00 11/21/2013

+--------------------------------------------------------------------------+
| EXISTING SITE HYDROGRAPH                                                 |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+


****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      1.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      36.860 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.450 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.320
         LOW LOSS FRACTION = 0.379
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.31
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.78
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.15
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.89
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.61
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  4.76

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 1.000
          30-MINUTE FACTOR = 1.000
           1-HOUR FACTOR = 1.000
           3-HOUR FACTOR = 1.000
           6-HOUR FACTOR = 1.000
```

24-HOUR FACTOR = 1.000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 18.519

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.060	4.725
2	4.051	13.333
3	11.364	32.601
4	22.207	48.334
5	35.018	57.109
6	50.817	70.428
7	65.821	66.885
8	77.350	51.393
9	85.329	35.570
10	90.423	22.705
11	93.962	15.780
12	96.228	10.097
13	97.671	6.434
14	98.281	2.720
15	98.628	1.548
16	98.976	1.548
17	99.323	1.548
18	99.670	1.548
19	100.000	1.470

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 5.1213
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 9.4949

♀

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 12.5 25.0 37.5 50.0
0.083	0.0001	0.02	Q . . . .
0.167	0.0007	0.08	Q . . . .
0.250	0.0023	0.23	Q . . . .
0.333	0.0053	0.44	Q . . . .
0.417	0.0101	0.70	Q . . . .
0.500	0.0171	1.01	Q . . . .
0.583	0.0261	1.31	VQ . . . .
0.667	0.0368	1.55	VQ . . . .
0.750	0.0485	1.71	VQ . . . .
0.833	0.0610	1.82	VQ . . . .
0.917	0.0741	1.89	VQ . . . .
1.000	0.0874	1.94	VQ . . . .

1.083	0.1010	1.98	VQ	.	.	.	.
1.167	0.1148	1.99	VQ	.	.	.	.
1.250	0.1286	2.01	VQ	.	.	.	.
1.333	0.1425	2.02	VQ	.	.	.	.
1.417	0.1565	2.03	VQ	.	.	.	.
1.500	0.1706	2.05	VQ	.	.	.	.
1.583	0.1848	2.06	VQ	.	.	.	.
1.667	0.1991	2.07	VQ	.	.	.	.
1.750	0.2133	2.07	VQ	.	.	.	.
1.833	0.2277	2.08	VQ	.	.	.	.
1.917	0.2420	2.09	.Q	.	.	.	.
2.000	0.2564	2.09	.Q	.	.	.	.
2.083	0.2709	2.10	.Q	.	.	.	.
2.167	0.2854	2.11	.Q	.	.	.	.
2.250	0.3000	2.11	.Q	.	.	.	.
2.333	0.3146	2.12	.Q	.	.	.	.
2.417	0.3292	2.13	.Q	.	.	.	.
2.500	0.3439	2.14	.Q	.	.	.	.
2.583	0.3587	2.14	.Q	.	.	.	.
2.667	0.3735	2.15	.Q	.	.	.	.
2.750	0.3884	2.16	.Q	.	.	.	.
2.833	0.4033	2.16	.Q	.	.	.	.
2.917	0.4182	2.17	.Q	.	.	.	.
3.000	0.4332	2.18	.Q	.	.	.	.
3.083	0.4483	2.19	.Q	.	.	.	.
3.167	0.4634	2.19	.Q	.	.	.	.
3.250	0.4786	2.20	.QV	.	.	.	.
3.333	0.4938	2.21	.QV	.	.	.	.
3.417	0.5091	2.22	.QV	.	.	.	.
3.500	0.5244	2.23	.QV	.	.	.	.
3.583	0.5398	2.23	.QV	.	.	.	.
3.667	0.5553	2.24	.QV	.	.	.	.
3.750	0.5708	2.25	.QV	.	.	.	.
3.833	0.5863	2.26	.QV	.	.	.	.
3.917	0.6019	2.27	.QV	.	.	.	.
4.000	0.6176	2.28	.QV	.	.	.	.
4.083	0.6334	2.28	.QV	.	.	.	.
4.167	0.6492	2.29	.QV	.	.	.	.
4.250	0.6650	2.30	.QV	.	.	.	.
4.333	0.6809	2.31	.QV	.	.	.	.
4.417	0.6969	2.32	.QV	.	.	.	.
4.500	0.7130	2.33	.Q V	.	.	.	.
4.583	0.7291	2.34	.Q V	.	.	.	.
4.667	0.7452	2.35	.Q V	.	.	.	.
4.750	0.7615	2.36	.Q V	.	.	.	.
4.833	0.7778	2.37	.Q V	.	.	.	.
4.917	0.7941	2.38	.Q V	.	.	.	.
5.000	0.8106	2.39	.Q V	.	.	.	.
5.083	0.8271	2.40	.Q V	.	.	.	.
5.167	0.8436	2.41	.Q V	.	.	.	.
5.250	0.8603	2.42	.Q V	.	.	.	.
5.333	0.8770	2.43	.Q V	.	.	.	.
5.417	0.8938	2.44	.Q V	.	.	.	.
5.500	0.9106	2.45	.Q V	.	.	.	.
5.583	0.9275	2.46	.Q V	.	.	.	.
5.667	0.9445	2.47	.Q V	.	.	.	.
5.750	0.9616	2.48	.Q V	.	.	.	.
5.833	0.9788	2.49	.Q V	.	.	.	.
5.917	0.9960	2.50	. Q V	.	.	.	.
6.000	1.0133	2.51	. Q V	.	.	.	.
6.083	1.0306	2.52	. Q V	.	.	.	.
6.167	1.0481	2.53	. Q V	.	.	.	.
6.250	1.0656	2.55	. Q V	.	.	.	.

```
 6.333      1.0833      2.56  . Q V     .         .         .         .
 6.417      1.1010      2.57  . Q V     .         .         .         .
 6.500      1.1187      2.58  . Q V     .         .         .         .
 6.583      1.1366      2.59  . Q V     .         .         .         .
 6.667      1.1546      2.61  . Q V     .         .         .         .
 6.750      1.1726      2.62  . Q V     .         .         .         .
 6.833      1.1907      2.63  . Q  V    .         .         .         .
 6.917      1.2089      2.64  . Q  V    .         .         .         .
 7.000      1.2272      2.66  . Q  V    .         .         .         .
 7.083      1.2456      2.67  . Q  V    .         .         .         .
 7.167      1.2641      2.68  . Q  V    .         .         .         .
 7.250      1.2827      2.70  . Q  V    .         .         .         .
 7.333      1.3014      2.71  . Q  V    .         .         .         .
 7.417      1.3202      2.73  . Q  V    .         .         .         .
 7.500      1.3390      2.74  . Q  V    .         .         .         .
 7.583      1.3580      2.75  . Q  V    .         .         .         .
 7.667      1.3771      2.77  . Q  V    .         .         .         .
 7.750      1.3962      2.78  . Q  V    .         .         .         .
 7.833      1.4155      2.80  . Q  V    .         .         .         .
 7.917      1.4349      2.81  . Q   V   .         .         .         .
 8.000      1.4544      2.83  . Q   V   .         .         .         .
 8.083      1.4740      2.85  . Q   V   .         .         .         .
 8.167      1.4937      2.86  . Q   V   .         .         .         .
 8.250      1.5135      2.88  . Q   V   .         .         .         .
 8.333      1.5335      2.89  . Q   V   .         .         .         .
 8.417      1.5535      2.91  . Q   V   .         .         .         .
 8.500      1.5737      2.93  . Q   V   .         .         .         .
 8.583      1.5940      2.95  . Q   V   .         .         .         .
 8.667      1.6144      2.96  . Q   V   .         .         .         .
 8.750      1.6349      2.98  . Q   V   .         .         .         .
 8.833      1.6556      3.00  . Q   V   .         .         .         .
 8.917      1.6763      3.02  . Q    V  .         .         .         .
 9.000      1.6973      3.04  . Q    V  .         .         .         .
 9.083      1.7183      3.06  . Q    V  .         .         .         .
 9.167      1.7395      3.08  . Q    V  .         .         .         .
 9.250      1.7608      3.10  . Q    V  .         .         .         .
 9.333      1.7823      3.12  . Q    V  .         .         .         .
 9.417      1.8039      3.14  . Q    V  .         .         .         .
 9.500      1.8256      3.16  . Q    V  .         .         .         .
 9.583      1.8475      3.18  . Q    V  .         .         .         .
 9.667      1.8695      3.20  . Q    V  .         .         .         .
 9.750      1.8917      3.22  . Q    V  .         .         .         .
 9.833      1.9141      3.25  . Q     V .         .         .         .
 9.917      1.9366      3.27  . Q     V .         .         .         .
10.000      1.9593      3.29  . Q     V .         .         .         .
10.083      1.9821      3.32  . Q     V .         .         .         .
10.167      2.0051      3.34  . Q     V .         .         .         .
10.250      2.0283      3.37  . Q     V .         .         .         .
10.333      2.0517      3.39  . Q     V .         .         .         .
10.417      2.0752      3.42  . Q     V .         .         .         .
10.500      2.0989      3.44  . Q     V .         .         .         .
10.583      2.1228      3.47  . Q     V .         .         .         .
10.667      2.1469      3.50  . Q      V.         .         .         .
10.750      2.1712      3.53  . Q      V.         .         .         .
10.833      2.1957      3.56  . Q      V.         .         .         .
10.917      2.2204      3.59  . Q      V.         .         .         .
11.000      2.2453      3.62  . Q      V.         .         .         .
11.083      2.2704      3.65  . Q      V.         .         .         .
11.167      2.2958      3.68  . Q      V.         .         .         .
11.250      2.3214      3.71  . Q      V.         .         .         .
11.333      2.3472      3.75  . Q      V.         .         .         .
11.417      2.3732      3.78  .  Q     V.         .         .         .
11.500      2.3995      3.82  .  Q      V         .         .         .
```

```
11.583      2.4260      3.85  .  Q      V         .         .         .
11.667      2.4528      3.89  .  Q      V         .         .         .
11.750      2.4799      3.93  .  Q      V         .         .         .
11.833      2.5072      3.97  .  Q      V         .         .         .
11.917      2.5348      4.01  .  Q      V         .         .         .
12.000      2.5627      4.05  .  Q      V         .         .         .
12.083      2.5909      4.10  .  Q      V         .         .         .
12.167      2.6195      4.15  .  Q      .V        .         .         .
12.250      2.6485      4.22  .  Q      .V        .         .         .
12.333      2.6782      4.30  .  Q      .V        .         .         .
12.417      2.7084      4.39  .  Q      .V        .         .         .
12.500      2.7393      4.49  .  Q      .V        .         .         .
12.583      2.7710      4.59  .  Q      .V        .         .         .
12.667      2.8032      4.68  .  Q      .V        .         .         .
12.750      2.8360      4.77  .  Q      .V        .         .         .
12.833      2.8694      4.84  .  Q      . V       .         .         .
12.917      2.9032      4.91  .  Q      . V       .         .         .
13.000      2.9375      4.98  .  Q      . V       .         .         .
13.083      2.9722      5.05  .   Q     . V       .         .         .
13.167      3.0075      5.12  .   Q     . V       .         .         .
13.250      3.0432      5.19  .   Q     . V       .         .         .
13.333      3.0794      5.26  .   Q     . V       .         .         .
13.417      3.1162      5.34  .   Q     .  V      .         .         .
13.500      3.1535      5.42  .   Q     .  V      .         .         .
13.583      3.1914      5.50  .   Q     .  V      .         .         .
13.667      3.2298      5.58  .   Q     .  V      .         .         .
13.750      3.2689      5.67  .   Q     .  V      .         .         .
13.833      3.3086      5.77  .   Q     .  V      .         .         .
13.917      3.3490      5.86  .   Q     .   V     .         .         .
14.000      3.3901      5.97  .   Q     .   V     .         .         .
14.083      3.4319      6.07  .   Q     .   V     .         .         .
14.167      3.4745      6.18  .   Q     .   V     .         .         .
14.250      3.5178      6.29  .    Q    .   V     .         .         .
14.333      3.5619      6.40  .    Q    .    V    .         .         .
14.417      3.6067      6.51  .    Q    .    V    .         .         .
14.500      3.6523      6.62  .    Q    .    V    .         .         .
14.583      3.6987      6.74  .    Q    .    V    .         .         .
14.667      3.7462      6.89  .    Q    .    V    .         .         .
14.750      3.7947      7.05  .    Q    .    V    .         .         .
14.833      3.8445      7.23  .    Q    .     V   .         .         .
14.917      3.8956      7.43  .    Q    .     V   .         .         .
15.000      3.9483      7.65  .     Q   .     V   .         .         .
15.083      4.0026      7.89  .     Q   .     V   .         .         .
15.167      4.0588      8.15  .     Q   .      V  .         .         .
15.250      4.1170      8.45  .     Q   .      V  .         .         .
15.333      4.1774      8.78  .      Q  .      V  .         .         .
15.417      4.2407      9.18  .      Q  .      V  .         .         .
15.500      4.3073      9.68  .      Q  .       V .         .         .
15.583      4.3787     10.37  .       Q .       V .         .         .
15.667      4.4560     11.22  .       Q .       V .         .         .
15.750      4.5403     12.24  .        Q.        V.         .         .
15.833      4.6330     13.46  .         Q        V.         .         .
15.917      4.7359     14.93  .         .Q       V.         .         .
16.000      4.8518     16.84  .         .  Q      V         .         .
16.083      4.9915     20.28  .         .     Q   .V        .         .
16.167      5.1641     25.06  .         .         QV        .         .
16.250      5.3832     31.81  .         .          . V  Q   .         .
16.333      5.6397     37.24  .         .          .  V     Q.         .
16.417      5.9175     40.34  .         .          .   V     . Q       .
16.500      6.2105     42.55  .         .          .     V   .   Q     .
16.583      6.4840     39.71  .         .          .      V  .Q        .
16.667      6.7149     33.52  .         .          .     Q V .         .
16.750      6.9016     27.12  .         .         .Q       V.         .
```

```
16.833      7.0505     21.61  .          .      Q  .         V.          .
16.917      7.1726     17.73  .          .    Q     .          V          .
17.000      7.2729     14.57  .          .Q         .          V          .
17.083      7.3571     12.23  .         Q.          .          V          .
17.167      7.4281     10.31  .        Q .          .          .V         .
17.250      7.4916      9.22  .       Q  .          .          .V         .
17.333      7.5509      8.60  .      Q   .          .          .V         .
17.417      7.6066      8.10  .      Q   .          .          . V        .
17.500      7.6594      7.66  .      Q   .          .          . V        .
17.583      7.7091      7.22  .    Q     .          .          . V        .
17.667      7.7544      6.58  .    Q     .          .          . V        .
17.750      7.7977      6.28  .    Q     .          .          . V        .
17.833      7.8392      6.03  .   Q      .          .          .  V       .
17.917      7.8792      5.81  .   Q      .          .          .  V       .
18.000      7.9179      5.62  .   Q      .          .          .  V       .
18.083      7.9554      5.44  .   Q      .          .          .  V       .
18.167      7.9918      5.28  .   Q      .          .          .  V       .
18.250      8.0269      5.11  .   Q      .          .          .  V       .
18.333      8.0609      4.94  .  Q       .          .          .  V       .
18.417      8.0938      4.77  .  Q       .          .          .   V      .
18.500      8.1255      4.61  .  Q       .          .          .   V      .
18.583      8.1562      4.45  .  Q       .          .          .   V      .
18.667      8.1858      4.31  .  Q       .          .          .   V      .
18.750      8.2147      4.19  .  Q       .          .          .   V      .
18.833      8.2429      4.09  .  Q       .          .          .   V      .
18.917      8.2704      3.99  .  Q       .          .          .   V      .
19.000      8.2973      3.91  .  Q       .          .          .   V      .
19.083      8.3236      3.83  .  Q       .          .          .    V     .
19.167      8.3495      3.75  .  Q       .          .          .    V     .
19.250      8.3749      3.69  . Q        .          .          .    V     .
19.333      8.3998      3.62  . Q        .          .          .    V     .
19.417      8.4243      3.56  . Q        .          .          .    V     .
19.500      8.4484      3.50  . Q        .          .          .    V     .
19.583      8.4722      3.44  . Q        .          .          .    V     .
19.667      8.4955      3.39  . Q        .          .          .    V     .
19.750      8.5185      3.34  . Q        .          .          .    V     .
19.833      8.5412      3.29  . Q        .          .          .    V     .
19.917      8.5636      3.25  . Q        .          .          .     V    .
20.000      8.5856      3.20  . Q        .          .          .     V    .
20.083      8.6073      3.16  . Q        .          .          .     V    .
20.167      8.6288      3.12  . Q        .          .          .     V    .
20.250      8.6500      3.07  . Q        .          .          .     V    .
20.333      8.6709      3.04  . Q        .          .          .     V    .
20.417      8.6915      3.00  . Q        .          .          .     V    .
20.500      8.7119      2.96  . Q        .          .          .     V    .
20.583      8.7321      2.93  . Q        .          .          .     V    .
20.667      8.7520      2.89  . Q        .          .          .     V    .
20.750      8.7717      2.86  . Q        .          .          .     V    .
20.833      8.7912      2.83  . Q        .          .          .      V   .
20.917      8.8105      2.80  . Q        .          .          .      V   .
21.000      8.8295      2.77  . Q        .          .          .      V   .
21.083      8.8484      2.74  . Q        .          .          .      V   .
21.167      8.8671      2.71  . Q        .          .          .      V   .
21.250      8.8855      2.68  . Q        .          .          .      V   .
21.333      8.9038      2.66  . Q        .          .          .      V   .
21.417      8.9220      2.63  . Q        .          .          .      V   .
21.500      8.9399      2.61  . Q        .          .          .      V   .
21.583      8.9577      2.58  . Q        .          .          .      V   .
21.667      8.9753      2.56  . Q        .          .          .      V   .
21.750      8.9927      2.53  . Q        .          .          .      V   .
21.833      9.0100      2.51  . Q        .          .          .      V   .
21.917      9.0272      2.49  .Q         .          .          .       V .
22.000      9.0441      2.47  .Q         .          .          .       V .
```

```
  22.083      9.0610      2.45  .Q         .         .         .       V .
  22.167      9.0777      2.42  .Q         .         .         .       V .
  22.250      9.0942      2.40  .Q         .         .         .       V .
  22.333      9.1107      2.38  .Q         .         .         .       V .
  22.417      9.1270      2.37  .Q         .         .         .       V .
  22.500      9.1431      2.35  .Q         .         .         .       V .
  22.583      9.1591      2.33  .Q         .         .         .       V .
  22.667      9.1751      2.31  .Q         .         .         .       V .
  22.750      9.1908      2.29  .Q         .         .         .       V .
  22.833      9.2065      2.28  .Q         .         .         .       V .
  22.917      9.2221      2.26  .Q         .         .         .       V .
  23.000      9.2375      2.24  .Q         .         .         .       V .
  23.083      9.2528      2.23  .Q         .         .         .       V .
  23.167      9.2680      2.21  .Q         .         .         .        V.
  23.250      9.2832      2.19  .Q         .         .         .        V.
  23.333      9.2982      2.18  .Q         .         .         .        V.
  23.417      9.3131      2.16  .Q         .         .         .        V.
  23.500      9.3279      2.15  .Q         .         .         .        V.
  23.583      9.3425      2.13  .Q         .         .         .        V.
  23.667      9.3571      2.12  .Q         .         .         .        V.
  23.750      9.3717      2.11  .Q         .         .         .        V.
  23.833      9.3861      2.09  .Q         .         .         .        V.
  23.917      9.4004      2.08  .Q         .         .         .        V.
  24.000      9.4146      2.07  .Q         .         .         .        V.
  24.083      9.4286      2.03  .Q         .         .         .        V.
  24.167      9.4421      1.96  .Q         .         .         .        V.
  24.250      9.4545      1.80  .Q         .         .         .        V.
  24.333      9.4654      1.58  .Q         .         .         .        V.
  24.417      9.4744      1.31  .Q         .         .         .        V.
  24.500      9.4812      0.99  Q          .         .         .        V.
  24.583      9.4860      0.69  Q          .         .         .        V.
  24.667      9.4891      0.46  Q          .         .         .        V.
  24.750      9.4912      0.30  Q          .         .         .        V.
  24.833      9.4925      0.19  Q          .         .         .        V.
  24.917      9.4933      0.12  Q          .         .         .        V.
  25.000      9.4939      0.08  Q          .         .         .        V.
  25.083      9.4942      0.05  Q          .         .         .        V.
  25.167      9.4944      0.03  Q          .         .         .        V.
  25.250      9.4946      0.03  Q          .         .         .        V.
  25.333      9.4948      0.02  Q          .         .         .        V.
  25.417      9.4948      0.01  Q          .         .         .        V.
  25.500      9.4949      0.01  Q          .         .         .        V.
-------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                 Duration
        Peak Flow Rate                      (minutes)
    =======================                 =========
              0%                             1530.0
             10%                              385.0
             20%                              125.0
             30%                               75.0
             40%                               55.0
             50%                               45.0
             60%                               35.0
             70%                               30.0
             80%                               20.0
             90%                               15.0

 +-----------------------------------------------------------------------+
 | DEVELOPED CONDITION DETAINED HYDROGRAPH                               |
```

```
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+


****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

         WATERSHED AREA =      25.290 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.200 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.022
         LOW LOSS FRACTION = 0.050
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.31
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.78
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.15
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.89
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.61
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  4.76

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 1.000
          30-MINUTE FACTOR = 1.000
           1-HOUR FACTOR = 1.000
           3-HOUR FACTOR = 1.000
           6-HOUR FACTOR = 1.000
          24-HOUR FACTOR = 1.000

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  41.667


============================================================================
                       UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 3.134                 9.585
        2                21.048                54.792
        3                52.535                96.302
        4                80.179                84.551
        5                92.566                37.885
        6                97.381                14.724
        7                98.672                 3.949
        8                99.380                 2.167
        9                99.752                 1.137
       10                99.938                 0.568
       11               100.000                 0.189
```

```
-----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =       0.4254
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =       9.6013
-----------------------------------------------------------------------------
♀
=============================================================================

                      2 4 - H O U R    S T O R M
                  R U N O F F    H Y D R O G R A P H

=============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
-----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       15.0      30.0      45.0      60.0
-----------------------------------------------------------------------------
   0.083      0.0004      0.07  Q         .         .         .         .
   0.167      0.0035      0.44  Q         .         .         .         .
   0.250      0.0110      1.10  Q         .         .         .         .
   0.333      0.0226      1.67  VQ        .         .         .         .
   0.417      0.0359      1.94  VQ        .         .         .         .
   0.500      0.0500      2.04  VQ        .         .         .         .
   0.583      0.0643      2.08  VQ        .         .         .         .
   0.667      0.0787      2.10  VQ        .         .         .         .
   0.750      0.0933      2.11  VQ        .         .         .         .
   0.833      0.1079      2.12  VQ        .         .         .         .
   0.917      0.1225      2.13  VQ        .         .         .         .
   1.000      0.1373      2.14  VQ        .         .         .         .
   1.083      0.1520      2.14  VQ        .         .         .         .
   1.167      0.1668      2.15  VQ        .         .         .         .
   1.250      0.1817      2.16  VQ        .         .         .         .
   1.333      0.1966      2.16  VQ        .         .         .         .
   1.417      0.2115      2.17  VQ        .         .         .         .
   1.500      0.2265      2.18  VQ        .         .         .         .
   1.583      0.2416      2.18  .Q        .         .         .         .
   1.667      0.2566      2.19  .Q        .         .         .         .
   1.750      0.2718      2.20  .Q        .         .         .         .
   1.833      0.2870      2.21  .Q        .         .         .         .
   1.917      0.3022      2.21  .Q        .         .         .         .
   2.000      0.3175      2.22  .Q        .         .         .         .
   2.083      0.3328      2.23  .Q        .         .         .         .
   2.167      0.3482      2.23  .Q        .         .         .         .
   2.250      0.3637      2.24  .Q        .         .         .         .
   2.333      0.3792      2.25  .Q        .         .         .         .
   2.417      0.3947      2.26  .Q        .         .         .         .
   2.500      0.4103      2.27  .Q        .         .         .         .
   2.583      0.4260      2.27  .Q        .         .         .         .
   2.667      0.4417      2.28  .Q        .         .         .         .
   2.750      0.4575      2.29  .Q        .         .         .         .
   2.833      0.4733      2.30  .Q        .         .         .         .
   2.917      0.4891      2.30  .QV       .         .         .         .
   3.000      0.5051      2.31  .QV       .         .         .         .
   3.083      0.5211      2.32  .QV       .         .         .         .
   3.167      0.5371      2.33  .QV       .         .         .         .
   3.250      0.5532      2.34  .QV       .         .         .         .
   3.333      0.5694      2.35  .QV       .         .         .         .
   3.417      0.5856      2.36  .QV       .         .         .         .
   3.500      0.6019      2.36  .QV       .         .         .         .
   3.583      0.6182      2.37  .QV       .         .         .         .
   3.667      0.6346      2.38  .QV       .         .         .         .
   3.750      0.6511      2.39  .QV       .         .         .         .
   3.833      0.6676      2.40  .QV       .         .         .         .
```

```
3.917      0.6842      2.41  .QV       .         .         .         .
4.000      0.7009      2.42  .QV       .         .         .         .
4.083      0.7176      2.43  .QV       .         .         .         .
4.167      0.7344      2.44  .Q V      .         .         .         .
4.250      0.7512      2.45  .Q V      .         .         .         .
4.333      0.7681      2.46  .Q V      .         .         .         .
4.417      0.7851      2.47  .Q V      .         .         .         .
4.500      0.8022      2.48  .Q V      .         .         .         .
4.583      0.8193      2.49  .Q V      .         .         .         .
4.667      0.8365      2.50  .Q V      .         .         .         .
4.750      0.8537      2.51  .Q V      .         .         .         .
4.833      0.8711      2.52  .Q V      .         .         .         .
4.917      0.8885      2.53  .Q V      .         .         .         .
5.000      0.9059      2.54  .Q V      .         .         .         .
5.083      0.9235      2.55  .Q V      .         .         .         .
5.167      0.9411      2.56  .Q V      .         .         .         .
5.250      0.9588      2.57  .Q V      .         .         .         .
5.333      0.9766      2.58  .Q  V     .         .         .         .
5.417      0.9944      2.59  .Q  V     .         .         .         .
5.500      1.0124      2.60  .Q  V     .         .         .         .
5.583      1.0304      2.61  .Q  V     .         .         .         .
5.667      1.0484      2.63  .Q  V     .         .         .         .
5.750      1.0666      2.64  .Q  V     .         .         .         .
5.833      1.0849      2.65  .Q  V     .         .         .         .
5.917      1.1032      2.66  .Q  V     .         .         .         .
6.000      1.1216      2.67  .Q  V     .         .         .         .
6.083      1.1401      2.69  .Q  V     .         .         .         .
6.167      1.1587      2.70  .Q  V     .         .         .         .
6.250      1.1774      2.71  .Q  V     .         .         .         .
6.333      1.1962      2.72  .Q  V     .         .         .         .
6.417      1.2150      2.74  .Q   V    .         .         .         .
6.500      1.2340      2.75  .Q   V    .         .         .         .
6.583      1.2530      2.76  .Q   V    .         .         .         .
6.667      1.2721      2.78  .Q   V    .         .         .         .
6.750      1.2914      2.79  .Q   V    .         .         .         .
6.833      1.3107      2.81  .Q   V    .         .         .         .
6.917      1.3301      2.82  .Q   V    .         .         .         .
7.000      1.3496      2.83  .Q   V    .         .         .         .
7.083      1.3692      2.85  .Q   V    .         .         .         .
7.167      1.3889      2.86  .Q   V    .         .         .         .
7.250      1.4088      2.88  .Q   V    .         .         .         .
7.333      1.4287      2.89  .Q   V    .         .         .         .
7.417      1.4487      2.91  .Q    V   .         .         .         .
7.500      1.4689      2.92  .Q    V   .         .         .         .
7.583      1.4891      2.94  .Q    V   .         .         .         .
7.667      1.5095      2.96  .Q    V   .         .         .         .
7.750      1.5299      2.97  .Q    V   .         .         .         .
7.833      1.5505      2.99  .Q    V   .         .         .         .
7.917      1.5712      3.01  . Q   V   .         .         .         .
8.000      1.5921      3.02  . Q   V   .         .         .         .
8.083      1.6130      3.04  . Q   V   .         .         .         .
8.167      1.6341      3.06  . Q   V   .         .         .         .
8.250      1.6552      3.08  . Q   V   .         .         .         .
8.333      1.6765      3.09  . Q   V   .         .         .         .
8.417      1.6980      3.11  . Q    V  .         .         .         .
8.500      1.7196      3.13  . Q    V  .         .         .         .
8.583      1.7413      3.15  . Q    V  .         .         .         .
8.667      1.7631      3.17  . Q    V  .         .         .         .
8.750      1.7851      3.19  . Q    V  .         .         .         .
8.833      1.8072      3.21  . Q    V  .         .         .         .
8.917      1.8294      3.23  . Q    V  .         .         .         .
9.000      1.8518      3.25  . Q    V  .         .         .         .
9.083      1.8744      3.27  . Q    V  .         .         .         .
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 9.167      1.8970      3.29  . Q    V  .          .          .          .
 9.250      1.9199      3.32  . Q    V  .          .          .          .
 9.333      1.9429      3.34  . Q     V .          .          .          .
 9.417      1.9660      3.36  . Q     V .          .          .          .
 9.500      1.9894      3.39  . Q     V .          .          .          .
 9.583      2.0128      3.41  . Q     V .          .          .          .
 9.667      2.0365      3.43  . Q     V .          .          .          .
 9.750      2.0603      3.46  . Q     V .          .          .          .
 9.833      2.0843      3.48  . Q     V .          .          .          .
 9.917      2.1085      3.51  . Q     V .          .          .          .
10.000      2.1328      3.54  . Q     V .          .          .          .
10.083      2.1573      3.56  . Q     V .          .          .          .
10.167      2.1821      3.59  . Q      V.          .          .          .
10.250      2.2070      3.62  . Q      V.          .          .          .
10.333      2.2321      3.65  . Q      V.          .          .          .
10.417      2.2574      3.68  . Q      V.          .          .          .
10.500      2.2829      3.71  . Q      V.          .          .          .
10.583      2.3087      3.74  . Q      V.          .          .          .
10.667      2.3346      3.77  . Q      V.          .          .          .
10.750      2.3608      3.80  . Q      V.          .          .          .
10.833      2.3872      3.83  . Q      V.          .          .          .
10.917      2.4138      3.87  . Q       V          .          .          .
11.000      2.4407      3.90  . Q       V          .          .          .
11.083      2.4678      3.94  . Q       V          .          .          .
11.167      2.4952      3.97  . Q       V          .          .          .
11.250      2.5228      4.01  . Q       V          .          .          .
11.333      2.5506      4.05  . Q       V          .          .          .
11.417      2.5788      4.09  . Q       V          .          .          .
11.500      2.6072      4.13  . Q       V          .          .          .
11.583      2.6359      4.17  . Q       V          .          .          .
11.667      2.6649      4.21  . Q       .V         .          .          .
11.750      2.6942      4.25  . Q       .V         .          .          .
11.833      2.7238      4.30  . Q       .V         .          .          .
11.917      2.7538      4.35  . Q       .V         .          .          .
12.000      2.7840      4.39  . Q       .V         .          .          .
12.083      2.8147      4.45  . Q       .V         .          .          .
12.167      2.8461      4.57  .  Q      .V         .          .          .
12.250      2.8787      4.72  .  Q      .V         .          .          .
12.333      2.9123      4.87  .  Q      . V        .          .          .
12.417      2.9465      4.97  .  Q      . V        .          .          .
12.500      2.9812      5.05  .  Q      . V        .          .          .
12.583      3.0165      5.11  .  Q      . V        .          .          .
12.667      3.0521      5.18  .  Q      . V        .          .          .
12.750      3.0882      5.24  .  Q      . V        .          .          .
12.833      3.1248      5.31  .  Q      .  V       .          .          .
12.917      3.1619      5.38  .  Q      .  V       .          .          .
13.000      3.1994      5.45  .  Q      .  V       .          .          .
13.083      3.2375      5.53  .  Q      .  V       .          .          .
13.167      3.2761      5.61  .  Q      .  V       .          .          .
13.250      3.3153      5.69  .  Q      .  V       .          .          .
13.333      3.3551      5.78  .  Q      .  V       .          .          .
13.417      3.3955      5.86  .  Q      .   V      .          .          .
13.500      3.4365      5.96  .  Q      .   V      .          .          .
13.583      3.4782      6.06  .   Q     .   V      .          .          .
13.667      3.5207      6.16  .   Q     .   V      .          .          .
13.750      3.5638      6.27  .   Q     .   V      .          .          .
13.833      3.6078      6.38  .   Q     .    V     .          .          .
13.917      3.6525      6.50  .   Q     .    V     .          .          .
14.000      3.6982      6.63  .   Q     .    V     .          .          .
14.083      3.7447      6.75  .   Q     .    V     .          .          .
14.167      3.7919      6.86  .   Q     .    V     .          .          .
14.250      3.8397      6.94  .   Q     .    V     .          .          .
14.333      3.8883      7.05  .   Q     .     V    .          .          .
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14.417      3.9378      7.19  .   Q     .     V   .         .         .
14.500      3.9885      7.37  .   Q     .     V   .         .         .
14.583      4.0406      7.56  .    Q    .     V   .         .         .
14.667      4.0941      7.77  .    Q    .      V  .         .         .
14.750      4.1492      8.00  .    Q    .      V  .         .         .
14.833      4.2060      8.25  .    Q    .      V  .         .         .
14.917      4.2648      8.53  .    Q    .      V  .         .         .
15.000      4.3256      8.83  .    Q    .       V .         .         .
15.083      4.3887      9.16  .     Q   .       V .         .         .
15.167      4.4544      9.54  .     Q   .       V .         .         .
15.250      4.5230      9.96  .     Q   .       V .         .         .
15.333      4.5950     10.45  .     Q   .        V.         .         .
15.417      4.6715     11.11  .      Q  .        V.         .         .
15.500      4.7563     12.33  .       Q .        V.         .         .
15.583      4.8532     14.07  .        Q.         V         .         .
15.667      4.9626     15.88  .         Q         V         .         .
15.750      5.0824     17.41  .         .Q        .V        .         .
15.833      5.2126     18.89  .         . Q       .V        .         .
15.917      5.3550     20.68  .         .  Q      . V       .         .
16.000      5.5189     23.80  .         .    Q    . V       .         .
16.083      5.7289     30.49  .         .         Q  V       .         .
16.167      6.0273     43.33  .         .         .    V  Q .         .
16.250      6.3819     51.48  .         .         .     V   .   Q     .
16.333      6.6952     45.50  .         .         .      V  Q         .
16.417      6.9128     31.59  .         .         .Q      V .         .
16.500      7.0676     22.47  .         .   Q     .        V.         .
16.583      7.1814     16.53  .         .Q        .        V.         .
16.667      7.2733     13.34  .       Q .         .         V         .
16.750      7.3514     11.34  .      Q  .         .         V         .
16.833      7.4204     10.03  .     Q   .         .         V         .
16.917      7.4832      9.11  .     Q   .         .         .V        .
17.000      7.5411      8.41  .    Q    .         .         .V        .
17.083      7.5954      7.89  .    Q    .         .         .V        .
17.167      7.6470      7.49  .   Q     .         .         .V        .
17.250      7.6964      7.18  .   Q     .         .         . V       .
17.333      7.7440      6.91  .   Q     .         .         . V       .
17.417      7.7899      6.66  .   Q     .         .         . V       .
17.500      7.8340      6.41  .   Q     .         .         . V       .
17.583      7.8767      6.19  .   Q     .         .         . V       .
17.667      7.9179      5.99  .  Q      .         .         . V       .
17.750      7.9579      5.80  .  Q      .         .         .  V      .
17.833      7.9967      5.63  .  Q      .         .         .  V      .
17.917      8.0344      5.48  .  Q      .         .         .  V      .
18.000      8.0711      5.33  .  Q      .         .         .  V      .
18.083      8.1068      5.19  .  Q      .         .         .  V      .
18.167      8.1412      5.00  .  Q      .         .         .  V      .
18.250      8.1741      4.78  .  Q      .         .         .   V     .
18.333      8.2056      4.57  .  Q      .         .         .   V     .
18.417      8.2361      4.43  . Q       .         .         .   V     .
18.500      8.2659      4.32  . Q       .         .         .   V     .
18.583      8.2950      4.23  . Q       .         .         .   V     .
18.667      8.3235      4.14  . Q       .         .         .   V     .
18.750      8.3515      4.06  . Q       .         .         .   V     .
18.833      8.3789      3.98  . Q       .         .         .   V     .
18.917      8.4058      3.91  . Q       .         .         .    V    .
19.000      8.4323      3.84  . Q       .         .         .    V    .
19.083      8.4583      3.78  . Q       .         .         .    V    .
19.167      8.4838      3.71  . Q       .         .         .    V    .
19.250      8.5090      3.65  . Q       .         .         .    V    .
19.333      8.5338      3.60  . Q       .         .         .    V    .
19.417      8.5581      3.54  . Q       .         .         .    V    .
19.500      8.5822      3.49  . Q       .         .         .    V    .
19.583      8.6059      3.44  . Q       .         .         .    V    .
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19.667      8.6292      3.39  . Q       .         .         .    V    .
19.750      8.6522      3.34  . Q       .         .         .     V   .
19.833      8.6750      3.30  . Q       .         .         .     V   .
19.917      8.6974      3.26  . Q       .         .         .     V   .
20.000      8.7195      3.21  . Q       .         .         .     V   .
20.083      8.7414      3.17  . Q       .         .         .     V   .
20.167      8.7630      3.14  . Q       .         .         .     V   .
20.250      8.7843      3.10  . Q       .         .         .     V   .
20.333      8.8054      3.06  . Q       .         .         .     V   .
20.417      8.8263      3.03  . Q       .         .         .     V   .
20.500      8.8469      2.99  .Q        .         .         .     V   .
20.583      8.8673      2.96  .Q        .         .         .     V   .
20.667      8.8874      2.93  .Q        .         .         .      V  .
20.750      8.9074      2.90  .Q        .         .         .      V  .
20.833      8.9271      2.87  .Q        .         .         .      V  .
20.917      8.9466      2.84  .Q        .         .         .      V  .
21.000      8.9660      2.81  .Q        .         .         .      V  .
21.083      8.9851      2.78  .Q        .         .         .      V  .
21.167      9.0041      2.75  .Q        .         .         .      V  .
21.250      9.0229      2.73  .Q        .         .         .      V  .
21.333      9.0415      2.70  .Q        .         .         .      V  .
21.417      9.0599      2.68  .Q        .         .         .      V  .
21.500      9.0782      2.65  .Q        .         .         .      V  .
21.583      9.0963      2.63  .Q        .         .         .      V  .
21.667      9.1142      2.61  .Q        .         .         .      V  .
21.750      9.1320      2.58  .Q        .         .         .       V .
21.833      9.1497      2.56  .Q        .         .         .       V .
21.917      9.1671      2.54  .Q        .         .         .       V .
22.000      9.1845      2.52  .Q        .         .         .       V .
22.083      9.2017      2.50  .Q        .         .         .       V .
22.167      9.2188      2.48  .Q        .         .         .       V .
22.250      9.2357      2.46  .Q        .         .         .       V .
22.333      9.2525      2.44  .Q        .         .         .       V .
22.417      9.2691      2.42  .Q        .         .         .       V .
22.500      9.2857      2.40  .Q        .         .         .       V .
22.583      9.3021      2.38  .Q        .         .         .       V .
22.667      9.3184      2.37  .Q        .         .         .       V .
22.750      9.3346      2.35  .Q        .         .         .       V .
22.833      9.3506      2.33  .Q        .         .         .       V .
22.917      9.3666      2.31  .Q        .         .         .        V.
23.000      9.3824      2.30  .Q        .         .         .        V.
23.083      9.3981      2.28  .Q        .         .         .        V.
23.167      9.4137      2.27  .Q        .         .         .        V.
23.250      9.4292      2.25  .Q        .         .         .        V.
23.333      9.4446      2.24  .Q        .         .         .        V.
23.417      9.4599      2.22  .Q        .         .         .        V.
23.500      9.4751      2.21  .Q        .         .         .        V.
23.583      9.4902      2.19  .Q        .         .         .        V.
23.667      9.5052      2.18  .Q        .         .         .        V.
23.750      9.5201      2.16  .Q        .         .         .        V.
23.833      9.5349      2.15  .Q        .         .         .        V.
23.917      9.5497      2.14  .Q        .         .         .        V.
24.000      9.5643      2.12  .Q        .         .         .        V.
24.083      9.5784      2.05  .Q        .         .         .        V.
24.167      9.5898      1.66  .Q        .         .         .        V.
24.250      9.5967      1.00  Q         .         .         .        V.
24.333      9.5996      0.42  Q         .         .         .        V.
24.417      9.6006      0.16  Q         .         .         .        V.
24.500      9.6010      0.06  Q         .         .         .        V.
24.583      9.6012      0.03  Q         .         .         .        V.
24.667      9.6013      0.01  Q         .         .         .        V.
24.750      9.6013      0.01  Q         .         .         .        V.
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TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1485.0
10%	330.0
20%	90.0
30%	60.0
40%	40.0
50%	25.0
60%	20.0
70%	15.0
80%	15.0
90%	5.0

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END OF FLOODSCx ROUTING ANALYSIS

VA LOMA LINDA MOB
100-YEAR STORM DEVELOPED AREA HYDROGRAPH
FOR AREA TO BYPASS DETENTION
11/21/2013

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
TOTAL CATCHMENT AREA(ACRES) = 2.29
SOIL-LOSS RATE, Fm,(INCH/HR) = 0.400
LOW LOSS FRACTION = 0.480
TIME OF CONCENTRATION(MIN.) = 15.00
SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
USER SPECIFIED RAINFALL VALUES ARE USED
RETURN FREQUENCY(YEARS) = 100
5-MINUTE POINT RAINFALL VALUE(INCHES) = 0.31
30-MINUTE POINT RAINFALL VALUE(INCHES) = 0.78
1-HOUR POINT RAINFALL VALUE(INCHES) = 1.15
3-HOUR POINT RAINFALL VALUE(INCHES) = 1.89
6-HOUR POINT RAINFALL VALUE(INCHES) = 2.61
24-HOUR POINT RAINFALL VALUE(INCHES) = 4.76

TOTAL CATCHMENT RUNOFF VOLUME(ACRE-FEET) = 0.45
TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) = 0.46

****

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	2.5	5.0	7.5	10.0
0.25	0.0010	0.09	Q	.	.	.	.
0.50	0.0029	0.09	Q	.	.	.	.
0.75	0.0048	0.09	Q	.	.	.	.
1.00	0.0068	0.09	Q	.	.	.	.
1.25	0.0087	0.10	Q	.	.	.	.
1.50	0.0107	0.10	Q	.	.	.	.
1.75	0.0127	0.10	Q	.	.	.	.
2.00	0.0147	0.10	Q	.	.	.	.
2.25	0.0168	0.10	Q	.	.	.	.
2.50	0.0189	0.10	Q	.	.	.	.
2.75	0.0209	0.10	Q	.	.	.	.
3.00	0.0231	0.10	Q	.	.	.	.
3.25	0.0252	0.10	Q	.	.	.	.
3.50	0.0273	0.10	Q	.	.	.	.
3.75	0.0295	0.11	Q	.	.	.	.
4.00	0.0317	0.11	Q	.	.	.	.
4.25	0.0340	0.11	Q	.	.	.	.
4.50	0.0362	0.11	Q	.	.	.	.
4.75	0.0385	0.11	Q	.	.	.	.
5.00	0.0408	0.11	Q	.	.	.	.
5.25	0.0432	0.11	Q	.	.	.	.
5.50	0.0455	0.12	Q	.	.	.	.
5.75	0.0479	0.12	Q	.	.	.	.
6.00	0.0504	0.12	Q	.	.	.	.
6.25	0.0529	0.12	Q	.	.	.	.
6.50	0.0554	0.12	Q	.	.	.	.
6.75	0.0579	0.12	Q	.	.	.	.
7.00	0.0605	0.13	Q	.	.	.	.
7.25	0.0631	0.13	Q	.	.	.	.

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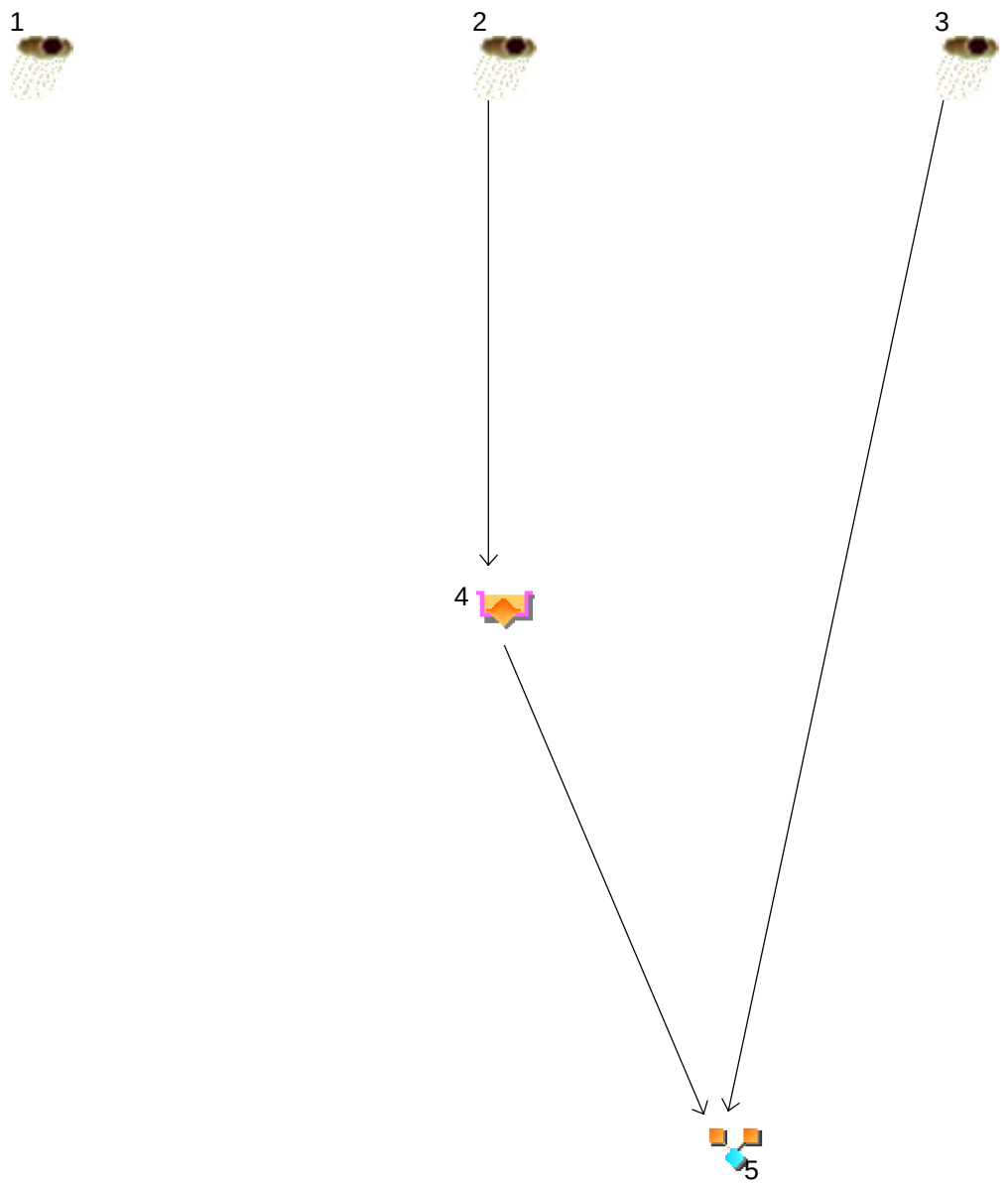
 7.50      0.0658      0.13  Q          .          .          .          .
 7.75      0.0685      0.13  Q          .          .          .          .
 8.00      0.0712      0.13  Q          .          .          .          .
 8.25      0.0741      0.14  Q          .          .          .          .
 8.50      0.0769      0.14  Q          .          .          .          .
 8.75      0.0798      0.14  Q          .          .          .          .
 9.00      0.0828      0.14  Q          .          .          .          .
 9.25      0.0858      0.15  Q          .          .          .          .
 9.50      0.0889      0.15  Q          .          .          .          .
 9.75      0.0920      0.15  Q          .          .          .          .
10.00      0.0952      0.16  Q          .          .          .          .
10.25      0.0985      0.16  Q          .          .          .          .
10.50      0.1019      0.16  Q          .          .          .          .
10.75      0.1054      0.17  Q          .          .          .          .
11.00      0.1089      0.17  Q          .          .          .          .
11.25      0.1126      0.18  Q          .          .          .          .
11.50      0.1163      0.18  Q          .          .          .          .
11.75      0.1202      0.19  Q          .          .          .          .
12.00      0.1242      0.20  Q          .          .          .          .
12.25      0.1285      0.22  Q          .          .          .          .
12.50      0.1330      0.22  Q          .          .          .          .
12.75      0.1378      0.24  Q          .          .          .          .
13.00      0.1428      0.24  Q          .          .          .          .
13.25      0.1479      0.26  .Q         .          .          .          .
13.50      0.1533      0.27  .Q         .          .          .          .
13.75      0.1590      0.28  .Q         .          .          .          .
14.00      0.1650      0.30  .Q         .          .          .          .
14.25      0.1713      0.31  .Q         .          .          .          .
14.50      0.1779      0.33  .Q         .          .          .          .
14.75      0.1851      0.37  .Q         .          .          .          .
15.00      0.1930      0.40  .Q         .          .          .          .
15.25      0.2019      0.47  .Q         .          .          .          .
15.50      0.2122      0.52  . Q        .          .          .          .
15.75      0.2263      0.85  .  Q       .          .          .          .
16.00      0.2468      1.14  .   Q      .          .          .          .
16.25      0.2964      3.67  .          .   Q      .          .          .
16.50      0.3419      0.73  . Q        .          .          .          .
16.75      0.3538      0.43  .Q         .          .          .          .
17.00      0.3618      0.35  .Q         .          .          .          .
17.25      0.3686      0.31  .Q         .          .          .          .
17.50      0.3746      0.27  .Q         .          .          .          .
17.75      0.3800      0.25  Q          .          .          .          .
18.00      0.3849      0.23  Q          .          .          .          .
18.25      0.3894      0.20  Q          .          .          .          .
18.50      0.3934      0.19  Q          .          .          .          .
18.75      0.3971      0.18  Q          .          .          .          .
19.00      0.4007      0.17  Q          .          .          .          .
19.25      0.4041      0.16  Q          .          .          .          .
19.50      0.4073      0.15  Q          .          .          .          .
19.75      0.4104      0.15  Q          .          .          .          .
20.00      0.4133      0.14  Q          .          .          .          .
20.25      0.4162      0.14  Q          .          .          .          .
20.50      0.4189      0.13  Q          .          .          .          .
20.75      0.4216      0.13  Q          .          .          .          .
21.00      0.4242      0.12  Q          .          .          .          .
21.25      0.4267      0.12  Q          .          .          .          .
21.50      0.4291      0.12  Q          .          .          .          .
21.75      0.4315      0.11  Q          .          .          .          .
22.00      0.4338      0.11  Q          .          .          .          .
22.25      0.4361      0.11  Q          .          .          .          .
22.50      0.4383      0.11  Q          .          .          .          .
22.75      0.4404      0.10  Q          .          .          .          .
23.00      0.4426      0.10  Q          .          .          .          .
```

```
 23.25      0.4446      0.10  Q         .         .         .         .
 23.50      0.4466      0.10  Q         .         .         .         .
 23.75      0.4486      0.10  Q         .         .         .         .
 24.00      0.4506      0.09  Q         .         .         .         .
 24.25      0.4516      0.00  Q         .         .         .         .
 ------------------------------------------------------------------------
-----------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                 Duration
        Peak Flow Rate                      (minutes)
    =======================                 =========
               0%                            1440.0
              10%                             135.0
              20%                              45.0
              30%                              30.0
              40%                              15.0
              50%                              15.0
              60%                              15.0
              70%                              15.0
              80%                              15.0
              90%                              15.0
```

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066



Legend

Hyd.	Origin	Description
1	Manual	Pre DA1
2	Manual	Post DA1 Det
3	Manual	Post DA1 Byp
4	Reservoir	Pond
5	Combine	Post DA1

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	42.55	Pre DA1
2	Manual	------	-------	-------	-------	-------	-------	-------	-------	51.48	Post DA1 Det
3	Manual	------	-------	-------	-------	-------	-------	-------	-------	3.670	Post DA1 Byp
4	Reservoir	2	-------	-------	-------	-------	-------	-------	-------	31.25	Pond
5	Combine	3, 4	-------	-------	-------	-------	-------	-------	-------	32.96	Post DA1

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Manual	42.55	5	990	413,634	------	------	------	Pre DA1
2	Manual	51.48	5	975	418,266	------	------	------	Post DA1 Det
3	Manual	3.670	5	975	19,683	------	------	------	Post DA1 Byp
4	Reservoir	31.25	5	985	344,045	2	1132.92	108,594	Pond
5	Combine	32.96	5	985	363,728	3, 4	------	------	Post DA1

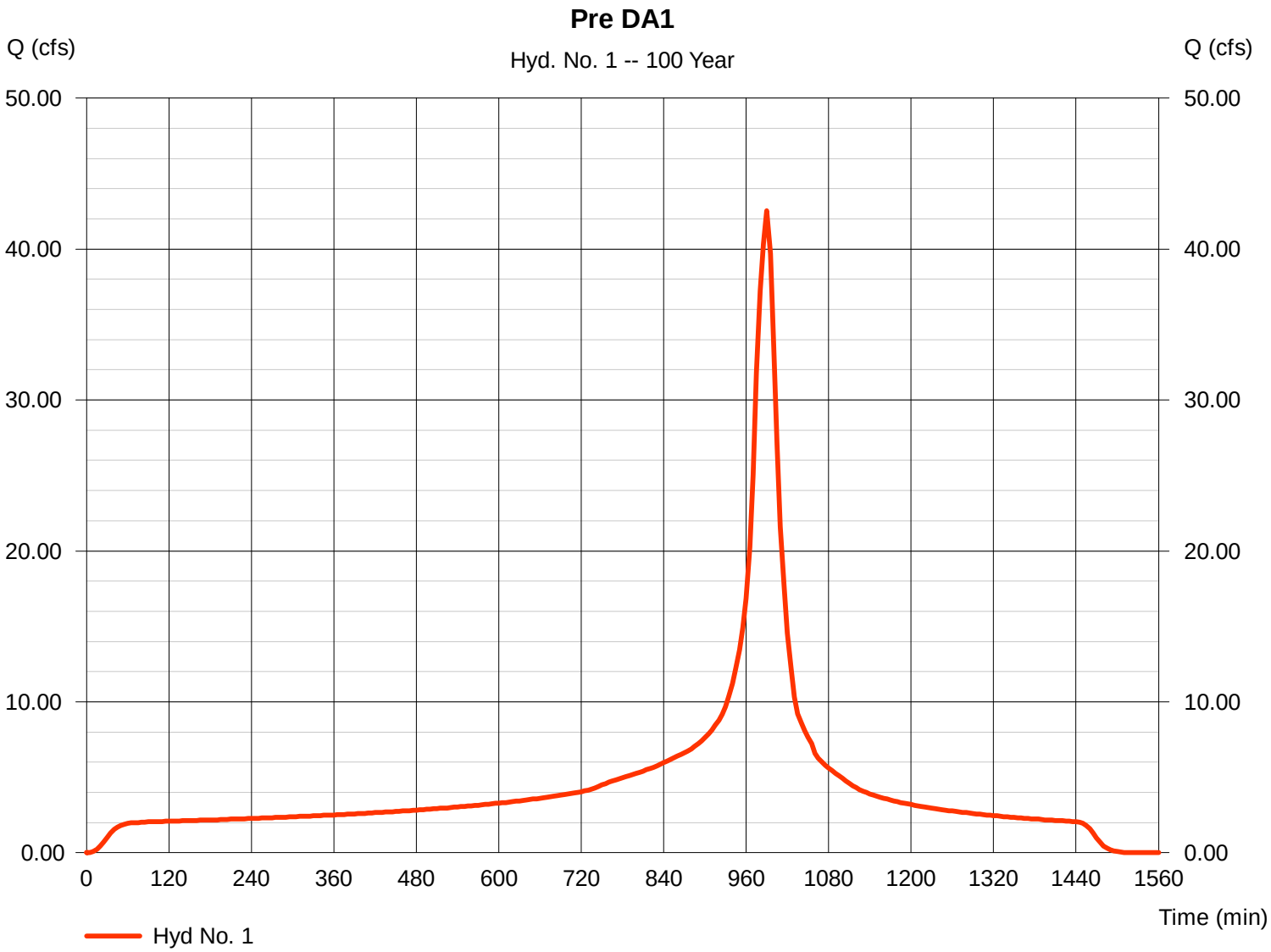
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Nov 21, 2013

Hyd. No. 1

Pre DA1

Hydrograph type	=	Manual	Peak discharge	=	42.55 cfs
Storm frequency	=	100 yrs	Time to peak	=	990 min
Time interval	=	5 min	Hyd. volume	=	413,634 cuft



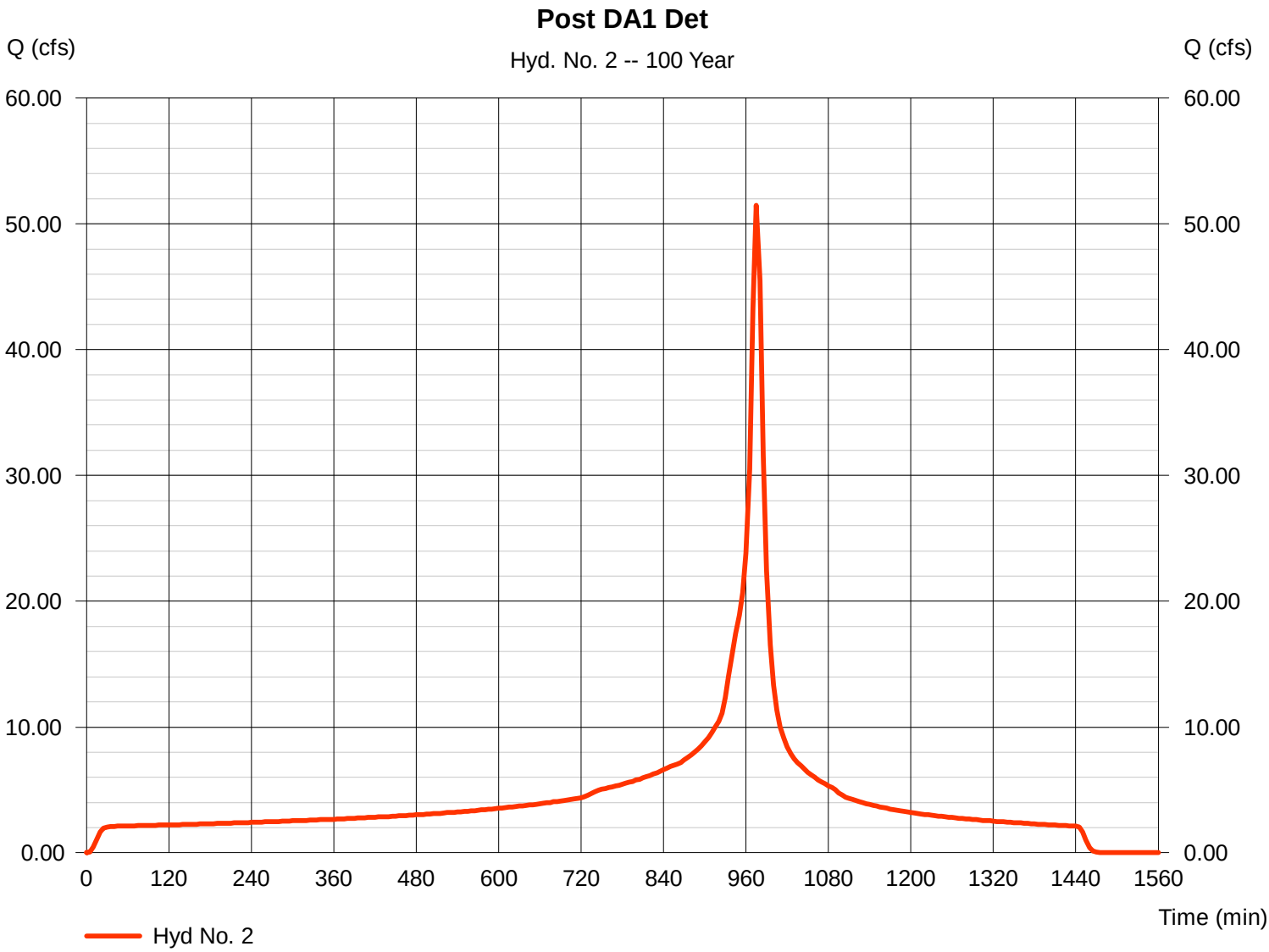
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Nov 21, 2013

Hyd. No. 2

Post DA1 Det

Hydrograph type	=	Manual	Peak discharge	=	51.48 cfs
Storm frequency	=	100 yrs	Time to peak	=	975 min
Time interval	=	5 min	Hyd. volume	=	418,266 cuft



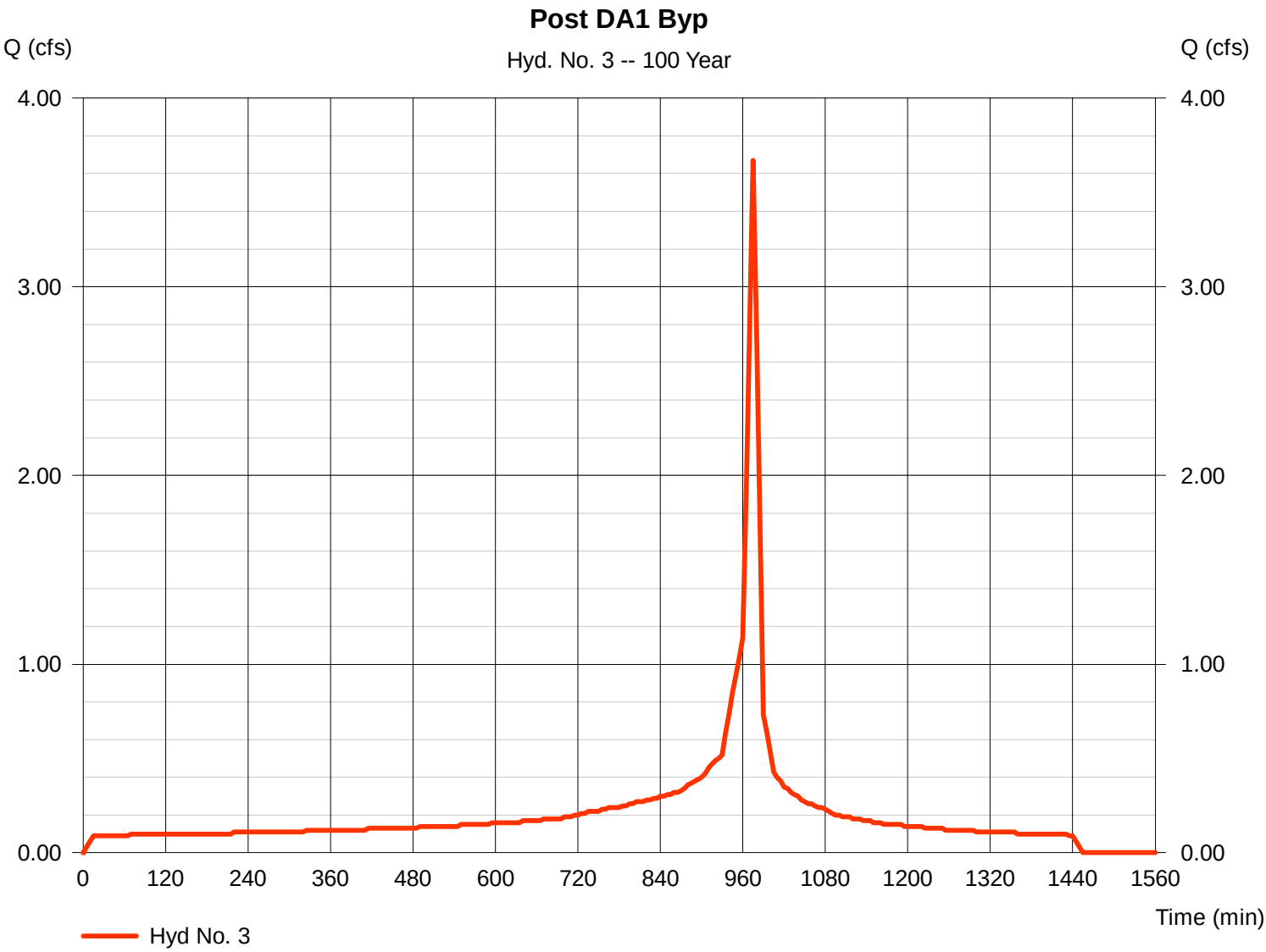
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Nov 21, 2013

Hyd. No. 3

Post DA1 Byp

Hydrograph type	=	Manual	Peak discharge	=	3.670 cfs
Storm frequency	=	100 yrs	Time to peak	=	975 min
Time interval	=	5 min	Hyd. volume	=	19,683 cuft



Hydrograph Report

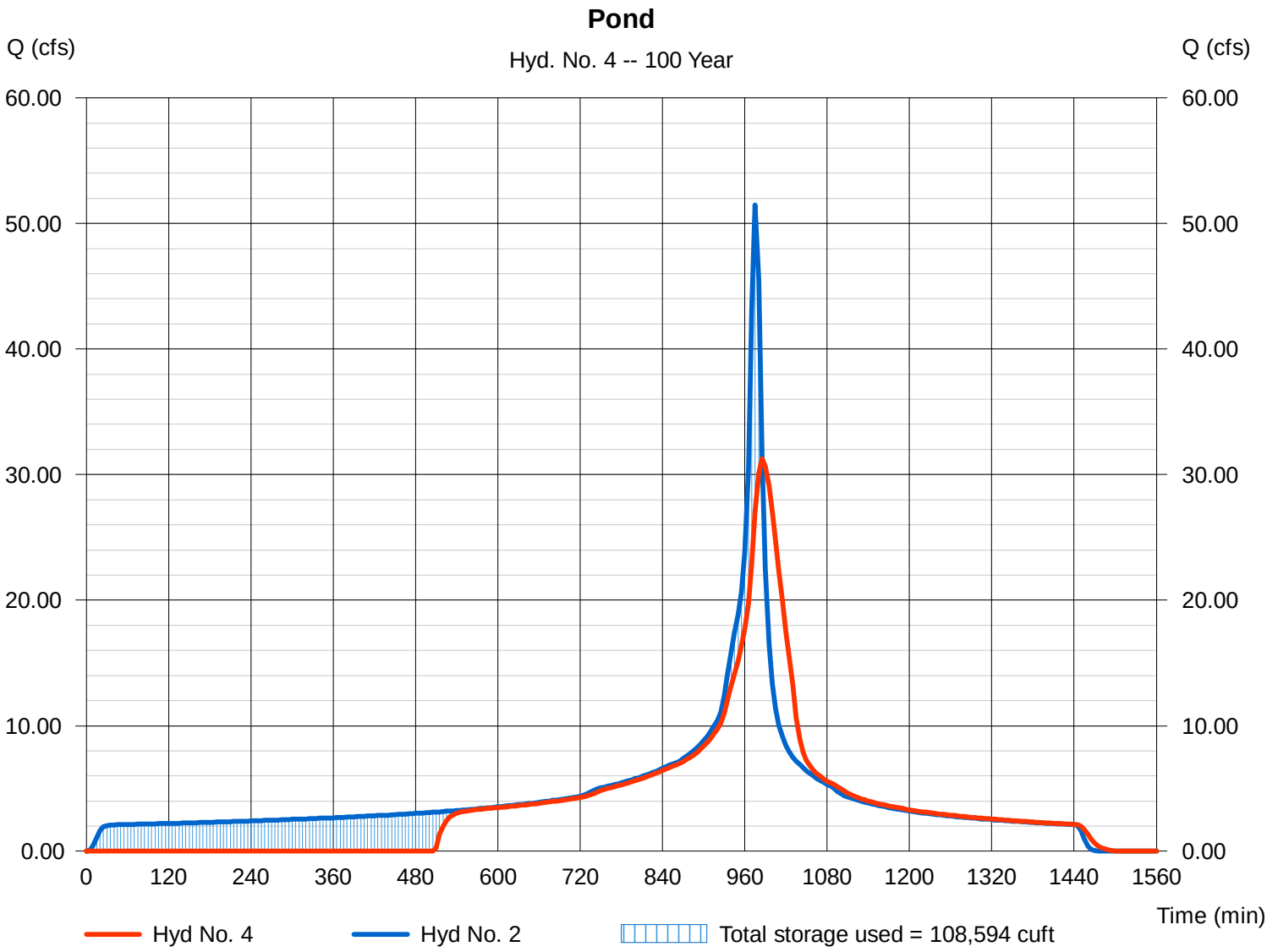
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Nov 21, 2013

Hyd. No. 4

Pond

Hydrograph type	=	Reservoir	Peak discharge	=	31.25 cfs
Storm frequency	=	100 yrs	Time to peak	=	985 min
Time interval	=	5 min	Hyd. volume	=	344,045 cuft
Inflow hyd. No.	=	2 - Post DA1 Det	Max. Elevation	=	1132.92 ft
Reservoir name	=	Pond	Max. Storage	=	108,594 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Nov 21, 2013

Pond No. 1 - Pond

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1125.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1125.00	12,370	0	0
6.00	1131.00	12,370	74,220	74,220
8.00	1133.00	23,470	35,840	110,060

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 4.00	Inactive	0.00	0.00
Span (in)	= 72.00	0.00	0.00	0.00
No. Barrels	= 3	0	0	0
Invert El. (ft)	= 1131.00	0.00	0.00	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	1125.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.60	7,422	1125.60	0.00	---	---	---	---	---	---	---	---	---	0.000
1.20	14,844	1126.20	0.00	---	---	---	---	---	---	---	---	---	0.000
1.80	22,266	1126.80	0.00	---	---	---	---	---	---	---	---	---	0.000
2.40	29,688	1127.40	0.00	---	---	---	---	---	---	---	---	---	0.000
3.00	37,110	1128.00	0.00	---	---	---	---	---	---	---	---	---	0.000
3.60	44,532	1128.60	0.00	---	---	---	---	---	---	---	---	---	0.000
4.20	51,954	1129.20	0.00	---	---	---	---	---	---	---	---	---	0.000
4.80	59,376	1129.80	0.00	---	---	---	---	---	---	---	---	---	0.000
5.40	66,798	1130.40	0.00	---	---	---	---	---	---	---	---	---	0.000
6.00	74,220	1131.00	0.00	---	---	---	---	---	---	---	---	---	0.000
6.20	77,804	1131.20	5.48 ic	---	---	---	---	---	---	---	---	---	5.479
6.40	81,388	1131.40	12.98 oc	---	---	---	---	---	---	---	---	---	12.98
6.60	84,972	1131.60	16.58 oc	---	---	---	---	---	---	---	---	---	16.58
6.80	88,556	1131.80	19.53 oc	---	---	---	---	---	---	---	---	---	19.53
7.00	92,140	1132.00	22.09 oc	---	---	---	---	---	---	---	---	---	22.09
7.20	95,724	1132.20	24.38 oc	---	---	---	---	---	---	---	---	---	24.38
7.40	99,308	1132.40	26.48 oc	---	---	---	---	---	---	---	---	---	26.48
7.60	102,892	1132.60	28.42 oc	---	---	---	---	---	---	---	---	---	28.42
7.80	106,476	1132.80	30.23 oc	---	---	---	---	---	---	---	---	---	30.23
8.00	110,060	1133.00	31.95 oc	---	---	---	---	---	---	---	---	---	31.95

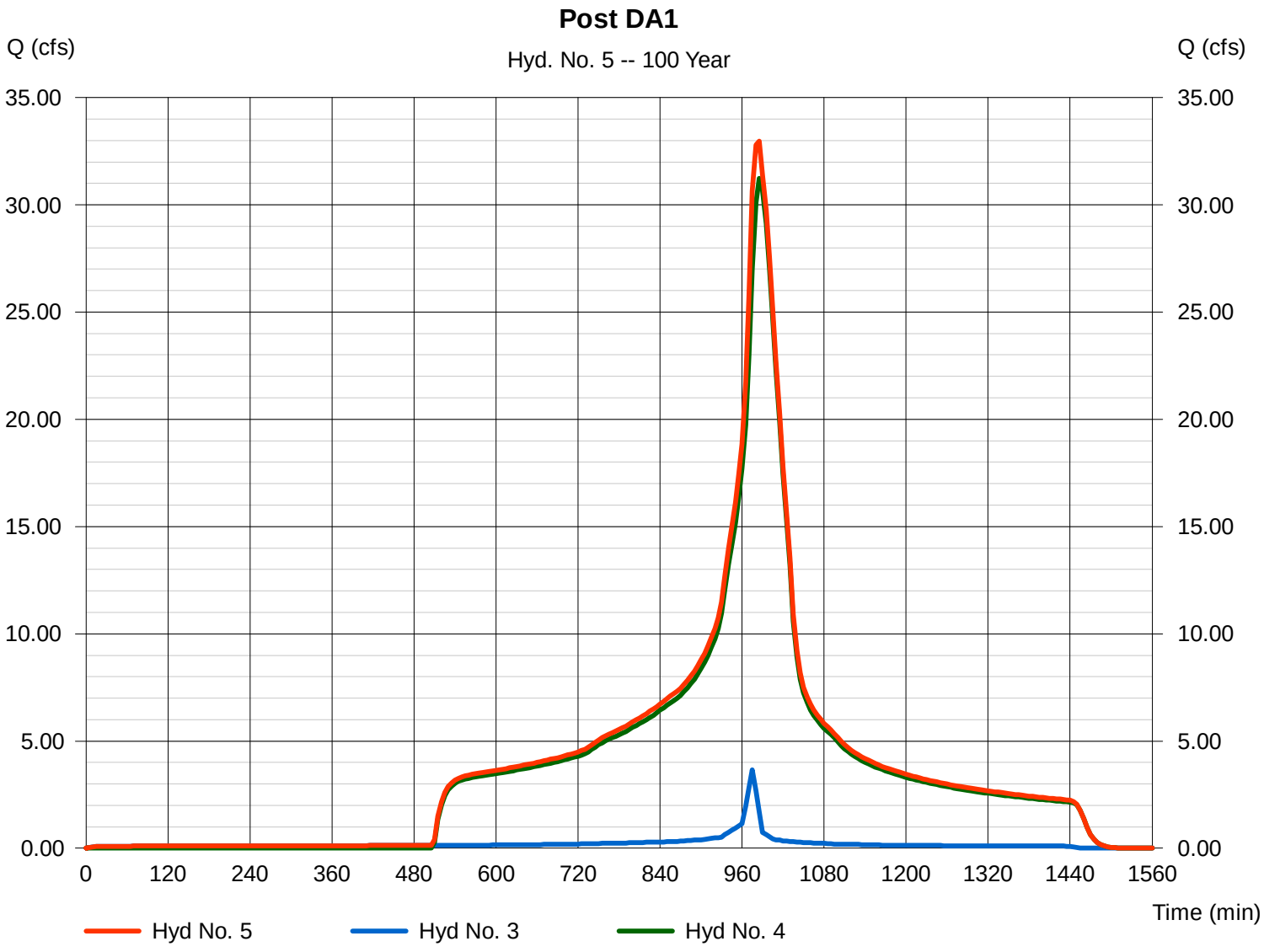
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Nov 21, 2013

Hyd. No. 5

Post DA1

Hydrograph type	=	Combine	Peak discharge	=	32.96 cfs
Storm frequency	=	100 yrs	Time to peak	=	985 min
Time interval	=	5 min	Hyd. volume	=	363,728 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.000 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	78.8366	13.5000	0.9739	--------
3	0.0000	0.0000	0.0000	--------
5	0.0000	0.0000	0.0000	--------
10	61.5447	9.9000	0.8383	--------
25	42.7515	7.3000	0.6995	--------
50	0.0000	0.0000	0.0000	--------
100	47.4485	6.4000	0.6745	--------

File name: WV.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4.60	3.64	3.02	2.58	2.25	2.00	1.80	1.63	1.50	1.38	1.29	1.20
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	6.39	5.02	4.16	3.57	3.13	2.80	2.54	2.32	2.14	1.99	1.86	1.75
25	7.39	5.82	4.87	4.23	3.76	3.40	3.11	2.88	2.68	2.52	2.37	2.25
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	9.19	7.19	6.01	5.22	4.64	4.20	3.85	3.57	3.33	3.13	2.95	2.80

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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AES - Hydraflow.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Thursday, Nov 21, 2013

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Water Quality Management Plan

For:

Department of Veterans Affairs Health Care Center

26001 Redlands Boulevard, Loma Linda, CA 92373

PARCEL 1 OF PARCEL MAP NO. 19018

Prepared for:

WI Loma Linda, LLC

929 West Adams Street

Chicago, IL 60607

312-563-5400

Prepared by:

Kimley-Horn and Associates, Inc.

765 The City Drive, Suite 200

Orange, CA 92868

714-939-1030

Approval Date:_____

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for WI Loma Linda, LLC by Kimley-Horn and Associates, Inc.. The WQMP is intended to comply with the requirements of the City of Loma Linda and the NPDES Areawide Stormwater Program requiring the preparation of a WQMP. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with San Bernardino County's Municipal Storm Water Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

.

Project Data			
Permit/Application Number(s):	TBD	Grading Permit Number(s):	TBD
Tract/Parcel Map Number(s):	Parcel 1 of PM 19018	Building Permit Number(s):	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: POR. 0292-461-01, 02, 03 AND 0292-111-04, 05, 36, 40

Owner's Signature			
Owner Name: Erren OLeary for Lewis Investment Company, LLC			
Title	VP Planned Communities		
Company	Lewis Investment Company, LLC		
Address	1156 North Mountain Avenue, Upland, CA 91786		
Email	erren.oleary@lewisop.com		
Telephone #	909-946-7515		
Signature		Date	

Preparer's Certification

Project Data			
Permit/Application Number(s):	TBD	Grading Permit Number(s):	TBD
Tract/Parcel Map Number(s):	Parcel 1 of PM 19018	Building Permit Number(s):	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: POR. 0292-461-01, 02, 03 AND 0292-111-04, 05, 36, 40

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of Regional Water Quality Control Board Order No. R8-2010-0036."

Engineer: Adam Schmid, P.E. for Kimley-Horn and Associates, Inc.		PE Stamp Below
Title	Project Engineer	
Company	Kimley-Horn and Associates, Inc.	
Address	765 The City Drive, Suite 200, Orange, CA 92868	
Email	adam.schmid@kimley-horn.com	
Telephone #	714-939-1030	
Signature		
Date		

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Section 1 Discretionary Permit(s)

Form 1-1 Project Information					
Project Name	Department of Veterans Affairs Health Care Center, Loma Linda, CA				
Project Owner Contact Name:	(DEVELOPER) Don Wetzel for WI Loma Linda, LLC				
Mailing Address:	929 West Adams Street Chicago, IL 60607	E-mail Address:	dwetzel@walshgroup.com	Telephone:	312-492-1604
Permit/Application Number(s):	TBD	Tract/Parcel Map Number(s):	Parcel 1 of PM 19018		
Additional Information/ Comments:	None				
Description of Project:	New development for three-story, 345,000± square-foot medical office building for the Department of Veterans Affairs including associated surface parking areas and drive aisles				
Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.	None (Initial Submittal)				

Section 2 Project Description

2.1 Project Information

This section of the WQMP should provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

Form 2.1-1 Description of Proposed Project

1 Development Category (Select all that apply):

☐ Significant re-development involving the addition or replacement of 5,000 ft^2 or more of impervious surface on an already developed site	☒ New development involving the creation of 10,000 ft^2 or more of impervious surface collectively over entire site	☐ Automotive repair shops with standard industrial classification (SIC) codes 5013, 5014, 5541, 7532- 7534, 7536-7539	☐ Restaurants (with SIC code 5812) where the land area of development is 5,000 ft^2 or more
☐ Hillside developments of 5,000 ft^2 or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more	☐ Developments of 2,500 ft^2 of impervious surface or more adjacent to (within 200 ft) or discharging directly into environmentally sensitive areas or waterbodies listed on the CWA Section 303(d) list of impaired waters.	☒ Parking lots of 5,000 ft^2 or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft^2 or more, or have a projected average daily traffic of 100 or more vehicles per day

☐ Non-Priority / Non-Category Project *May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements*.

2 Project Area (ft2):	1,605,406 (36.855 acres)	**3** Number of Dwelling Units:	0	**4** SIC Code:	8011

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.*

6 Does Project include roads? Yes ☐ No ☒ *If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)*

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management
Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:
The entire subject site and project area is currently owned by Lewis Investment Company, LLC. However, WI Loma Linda, LLC has entered into contract with the current owner for sale of the property pending approval of the project and issuance of all necessary permits for development and construction. Upon transfer of the property, WI Loma Linda, LLC will assume all ownership and management responsibilities for long-term maintenance of WQMP stormwater facilities. The Department of Veterans Affairs will enter into a long-term lease agreement for use of the site from WI Loma Linda, LLC.

2.3 Potential Stormwater Pollutants

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-3 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern			
Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	Pollutant also causing impairment to Santa Ana River, Reach 4 and Santa Ana River, Reach 3
Phosphorous	E ☒	N ☐	
Nitrogen	E ☒	N ☐	
Sediment	E ☒	N ☐	
Metals	E ☒	N ☐	Pollutant also causing impairment to Santa Ana River, Reach 3
Oil and Grease	E ☒	N ☐	
Trash/Debris	E ☒	N ☐	
Pesticides / Herbicides	E ☒	N ☐	
Organic Compounds	E ☒	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

2.4 Water Quality Credits

A water quality credit program is applicable for certain types of development projects if it is not feasible to meet the requirements for on-site LID. Proponents for eligible projects, as described below, can apply for water quality credits that would reduce project obligations for selecting and sizing other treatment BMP or participating in other alternative compliance programs. Refer to Section 6.2 in the TGD for WQMP to determine if water quality credits are applicable for the project.

Form 2.4-1 Water Quality Credits			
[1] Project Types that Qualify for Water Quality Credits: *Select all that apply*			
☐ Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = % impervious reduced]	Higher density development projects ☐ Vertical density [20%] ☐ 7 units/ acre [5%]	☐ Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]	☐ Brownfield redevelopment (redevelop real property complicated by presence or potential of hazardous contaminants) [25%]
☐ Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%]	☐ Transit-oriented developments (mixed use residential or commercial area designed to maximize access to public transportation) [20%]	☐ In-fill projects (conversion of empty lots & other underused spaces < 5 acres, substantially surrounded by urban land uses, into more beneficially used spaces, such as residential or commercial areas) [10%]	☐ Live-Work developments (variety of developments designed to support residential and vocational needs) [20%]
[2] Total Credit % *(Total all credit percentages up to a maximum allowable credit of 50 percent)*			
Description of Water Quality Credit Eligibility (if applicable)			

Section 3 Site and Watershed Description

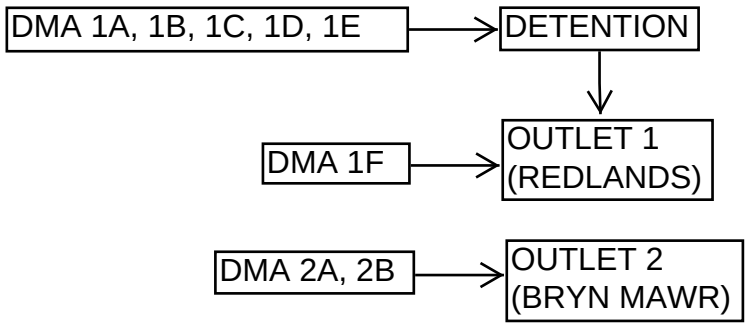
Describe the project site conditions that will facilitate the selection of BMP through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed DMAs) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. The form below is provided as an example. Then complete Forms 3.2 and 3.3 for each DA on the project site. ***If the project has more than one drainage area for stormwater management, then complete additional versions of these forms for each DA / outlet.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate center of site*	Latitude 34.062	Longitude -117.236	Thomas Bros Map page 607

1 San Bernardino County climatic region: ☒ Valley ☐ Mountain

2 Does the site have more than one drainage area (DA): Yes☒ No☐ *If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached*



Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA

DMAs 1A, 1B, 1C, 1D, and 1E will all be routed to infiltration basins. Overflow drains convey runoff from larger rainfall events to a detention pond prior to release at Redlands Blvd. DMA 1F consists primarily of perimeter landscaped areas and will bypass the infiltration basins and detention pond and outfall directly to Redlands Blvd.

DMA 2A will be routed to an infiltration basin with overflow drains provided to convey runoff from larger rainfall events to the Bryn Mawr storm drain system. DMA 2B consists primarily of perimeter landscaped areas and will bypass the infiltration basins and outfall directly to the Bryn Mawr storm drain system.

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	1,605,406			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC-2			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	B			
5 Longest flowpath length (ft)	2,050			
6 Longest flowpath slope (ft/ft)	1%			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Agricultural - Orchard			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	Fair			

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1 (use only as needed for additional DMA w/in DA 1)				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA E	DMA F	DMA G	DMA H
1 DMA drainage area (ft^2)				
2 Existing site impervious area (ft^2)				
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*				
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*				
5 Longest flowpath length (ft)				
6 Longest flowpath slope (ft/ft)				
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*				
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*				

Form 3-2 Existing Hydrologic Characteristics (DA 2)				
For Drainage Area 2's sub-watershed DMA, provide the following characteristics	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	0 (see explanation below)			
2 Existing site impervious area (ft^2)				
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*				
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*				
5 Longest flowpath length (ft)				
6 Longest flowpath slope (ft/ft)				
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*				
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*				

In the existing, pre-development condition, Redlands Blvd. serves as the outfall location for all on-site drainage (DA 1).

However, in the proposed, post-development condition, the new Bryn Mawr storm drain system provides a second outfall location. The Bryn Mawr storm drain discharges at Mission/Zanja Creek and has been designed and engineered to accept a peak flow of 23.2 cfs from the site.

Refer to the Hydrology & Hydraulics Report for TPM 19018, Special Planning Area D, by Parsons Brinckerhoff, dated July 25 2013, revised September 25, 2013 for additional information.

Form 3-3 Watershed Description for Drainage Area 1	
Receiving waters *Refer to Watershed Mapping Tool -* *http://sbcounty.permitrack.com/WAP* *See 'Drainage Facilities" link at this website*	Mission Channel via sheet flow to Redlands Blvd.
Applicable TMDLs *Refer to Local Implementation Plan*	None
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	None
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	None
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	None
Hydrologic Conditions of Concern	☐ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☒ No (see explanation below)
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

DA1 meets HCOC exemption criterion 2 (pre = post). This exemption states that hydromodification does not need to be addressed if the runoff flow rate, volume, and velocity for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour rainfall event. For DA1, since the entire post-development, 2-year, 24-hour runoff volume will be infiltrated through LID BMPs, zero runoff will be released.

Form 3-3 Watershed Description for Drainage Area 2	
Receiving waters *Refer to Watershed Mapping Tool -* *http://sbcounty.permitrack.com/WAP* *See 'Drainage Facilities" link at this website*	Mission Channel via Bryn Mawr storm drain system
Applicable TMDLs *Refer to Local Implementation Plan*	None
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	None
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	None
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	None
Hydrologic Conditions of Concern	☐ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☒ No (see explanation below)
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

DA2 meets HCOC exemption criterion 2 (pre = post). This exemption states that hydromodification does not need to be addressed if the runoff flow rate, volume, and velocity for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour rainfall event. For DA2, since the entire post-development, 2-year, 24-hour runoff volume will be infiltrated through LID BMPs, zero runoff will be released.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater BMPs	☐	☐	Educational materials provided in appendix and will be provided to property owner
N2	Activity Restrictions	☒	☐	Activity restrictions described in lease agreement
N3	Landscape Management BMPs	☒	☐	Property owner will be responsible for maintenance. Operation and maintenance plan provided in appendix.
N4	BMP Maintenance	☒	☐	Property owner will be responsible for maintenance. Operation and maintenance plan provided in appendix.
N5	Title 22 CCR Compliance (How development will comply)	☒	☐	Property owner will be responsible for compliance
N6	Local Water Quality Ordinances	☐	☒	No local water quality ordinance
N7	Spill Contingency Plan	☒	☐	Property owner will provide spill contingency plan
N8	Underground Storage Tank Compliance	☐	☒	No underground storage tanks necessary or proposed with project
N9	Hazardous Materials Disclosure Compliance	☒	☐	Property owner will be responsible for hazardous material disclosure compliance

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N10	Uniform Fire Code Implementation	☒	☐	City of Loma Linda will enforce these code provisions
N11	Litter/Debris Control Program	☒	☐	Property owner will be responsible for litter and debris control
N12	Employee Training	☒	☐	Property owner will be responsible for employee training
N13	Housekeeping of Loading Docks	☒	☐	Property owner will be responsible for housekeeping of loading docks
N14	Catch Basin Inspection Program	☒	☐	Property owner will be responsible for inspections
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	Property owner will be responsible for sweeping
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	No other non-structural measures anticipated
N17	Comply with all other applicable NPDES permits	☒	☐	Property owner will obtain NPDES Construction General Permit. Civil engineer will prepare SWPPP.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	Stenciling and signage to be installed during construction phase
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	No outdoor hazardous material storage area necessary or proposed
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	Project will include designated trash enclosure area with paved surface
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	Irrigation system will meet Model Water Efficient Landscape Ordinance
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	Project construction documents will detail this requirement
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☐	☒	Project does not involve any existing or proposed steep slopes or channels
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☒	☐	Lodading dock drains will not connect directly to the MS4
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	Project does not involve maintenance bays
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Project does not involve vehicle wash areas
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	Project does not involve outdoor processing areas

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Project does not involve equipment wash areas
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	Project does not involve fueling areas
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	Project does not involve any existing or proposed steep slopes or hillsides
S14	Wash water control for food preparation areas	☒	☐	Exterior grease interceptor with watertight cover will be provided for sanitary sewer discharge from food preparation areas. Grease interceptor will connect to public sanitary sewer system.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	Project does not involve community car washes

4.1.2 Preventative LID Site Design Practices

Site design practices associated with new LID requirements in the MS4 Permit should be considered in the earliest phases of a project. Preventative site design practices can result in smaller DCV for LID BMP and hydromodification control BMP by reducing runoff generation. Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Preventative LID Site Design Practices Checklist
Site Design Practices *If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets*
Minimize impervious areas: Yes ☒ No ☐ Explanation: Project will provide extensive open space per general plan amendment in addition to landscaping requirements required by zoning ordinance.
Maximize natural infiltration capacity: Yes ☒ No ☐ Explanation: Project will make a reasonable attempt to utilize permeable pavement for the fire lane surrounding the building. However, final determination of permeable pavement use will depend on recommendations from geotechnical engineer.
Preserve existing drainage patterns and time of concentration: Yes ☒ No ☐ Explanation: Most of the site will drain to infiltration basins prior to discharge through overflow drains. This routing increases the post-development time of concentration.
Disconnect impervious areas: Yes ☒ No ☐ Explanation: Most of the site will drain to infiltration basins prior to discharge through overflow drains. This routing disconnects the impervious areas from the outfall locations.
Protect existing vegetation and sensitive areas: Yes ☐ No ☒ Explanation: Existing on-site vegetation is minimal, but must be disturbed for grading and construction activities. However, no sensitive areas have been identified.
Re-vegetate disturbed areas: Yes ☒ No ☐ Explanation: Extensive landscaping will be provided for pervious areas.
Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☒ No ☐ Explanation: The infiltration basin locations will be noted on the erosion control plan with fencing provided to minimize unnecessary and incidnetal compaction during construction.
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: Yes ☐ No ☒ Explanation: Due to site constraints, vegetated swales cannot be provided. However, most of the site will drain to infiltration basins prior to discharge through overflow drains. Pipes beneath infiltration basins will be perforated to promote infiltration.
Stake off areas that will be used for landscaping to minimize compaction during construction : Yes ☒ No ☐ Explanation: The infiltration basin locations will be noted on the erosion control plan with fencing provided to minimize unnecessary and incidnetal compaction during construction.

4.2 Project Performance Criteria

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in the MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection of any downstream waterbody segments with a HCOC. ***If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.***

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Stormwater Program requires use of the P_6 method (MS4 Permit Section XI.D.6a.ii) – Form 4.2-1
- For HCOC pre- and post-development hydrologic calculation, the San Bernardino County Stormwater Program requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi^2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for HCOC performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1)		
1 Project area DA 1 (ft^2): 1,201,470	**2** Imperviousness after applying preventative site design practices (Imp%): 69.6	**3** Runoff Coefficient (Rc): _0.490 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.471 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.697 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 67,200 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2)

1 Project area DA 2 (ft^2): 403,940	**2** Imperviousness after applying preventative site design practices (Imp%): 56.3	**3** Runoff Coefficient (Rc): _0.382 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.471 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*

5 Compute P_6, Mean 6-hr Precipitation (inches): 0.697

*P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*

6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*	24-hrs ☐ 48-hrs ☒

7 Compute design capture volume, DCV (ft^3): 17,600

*DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)*
Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2

Form 4.2-2 Summary of HCOC Assessment (DA 1)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☐ No ☒

Go to: http://sbcounty.permitrack.com/WAP

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below

(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 19,548 *Form 4.2-3 Item 12*	**2** 34.0 *Form 4.2-4 Item 13*	**3** 0 *Form 4.2-5 Item 10*
Post-developed	**4** 83,836 *Form 4.2-3 Item 13*	**5** N/A *Form 4.2-4 Item 14*	**6** 0 *Form 4.2-5 Item 14*
Difference	**7** *64,288* *Item 4 – Item 1*	**8** *N/A* *Item 5 – Item 2*	**9** *0* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *329%* *Item 7 / Item 1*	**11** *N/A%* *Item 8 / Item 2*	**12** *N/A%* *Item 9 / Item 3*

DA1 meets HCOC exemption criterion 2 (pre = post). This exemption states that hydromodification does not need to be addressed if the runoff flow rate, volume, and velocity for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour rainfall event. For DA1, since the entire post-development, 2-year, 24-hour runoff volume will be infiltrated through LID BMPs, zero runoff will be released.

Form 4.2-2 Summary of HCOC Assessment (DA 2)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☐ No ☒

Go to: http://sbcounty.permitrack.com/WAP/

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below

(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 0 *Form 4.2-3 Item 12*	**2** N/A *Form 4.2-4 Item 13*	**3** 23.2 *Form 4.2-5 Item 10*
Post-developed	**4** 19,280 *Form 4.2-3 Item 13*	**5** N/A *Form 4.2-4 Item 14*	**6** 0 *Form 4.2-5 Item 14*
Difference	**7** *19,280* *Item 4 – Item 1*	**8** *N/A* *Item 5 – Item 2*	**9** *N/A* *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *N/A%* *Item 7 / Item 1*	**11** *N/A%* *Item 8 / Item 2*	**12** *N/A%* *Item 9 / Item 3*

DA2 meets HCOC exemption criterion 2 (pre = post). This exemption states that hydromodification does not need to be addressed if the runoff flow rate, volume, and velocity for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour rainfall event. For DA2, since the entire post-development, 2-year, 24-hour runoff volume will be infiltrated through LID BMPs, zero runoff will be released.

Regarding Item 3 above, the Bryn Mawr storm drain discharges into Mission/Zanja Creek and has been designed and engineered to accept a peak flow of 23.2 cfs from the site (from DA2). Refer to the Hydrology & Hydraulics Report for TPM 19018, Special Planning Area D, by Parsons Brinckerhoff, dated July 25, 2013, revised September 25, 2013 for additional information.

Form 4.2-3 HCOC Assessment for Runoff Volume (DA 1)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Orchard							
2a Hydrologic Soil Group (HSG)	B							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	1,605,406							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	65.0							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed		
2b Hydrologic Soil Group (HSG)	B	B	B	B	B	B		
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	101,740	541,680	176,000	128,280	153,810	99,960		
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	91.2	90.0	81.5	90.3	82.8	57.1		

5 Pre-Developed area-weighted CN: 65.0	**7** Pre-developed soil storage capacity, S (in): 5.385 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 1.077 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 85.2	**8** Post-developed soil storage capacity, S (in): 1.732 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 0.346 *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in): 2.040
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 19,548
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 83,836
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3): 60,096
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-3 HCOC Assessment for Runoff Volume (DA 2)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type								
2a Hydrologic Soil Group (HSG)								
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	0							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	Mixed	Mixed						
2b Hydrologic Soil Group (HSG)	B	B						
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	306,500	97,440						
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	86.0	59.6						

5 Pre-Developed area-weighted CN: N/A	**7** Pre-developed soil storage capacity, S (in): N/A *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): N/A *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 79.7	**8** Post-developed soil storage capacity, S (in): 2.554 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 0.511 *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in): 2.040
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 0
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 19,280
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3): 18,316
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

In the existing, pre-development condition, Redlands Blvd. serves as the outfall location for all on-site drainage (DA1). Accordingly, items 1a, 2a, 3a, 4a, 5, 7, and 9 do not apply. However, in the proposed, post-development condition, the new Bryn Mawr storm drain system provides a second outfall location (for DA2). This system discharges into Mission/Zanja Creek and has been designed and engineered to accept a peak flow of 23.2 cfs from the site (from DA2). Refer to the Hydrology & Hydraulics Report for TPM 19018, Special Planning Area D, by Parsons Brinckerhoff, dated July 25, 2013, revised September 25, 2013 for additional information.

Form 4.2-4 HCOC Assessment for Time of Concentration (DA 1)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*								
2 Change in elevation (ft)								
3 Slope (ft/ft), S_o = *Item 2 / Item 1*								
4 Land cover								
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*								
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*								
7 Cross-sectional area of channel (ft^2)								
8 Wetted perimeter of channel (ft)								
9 Manning's roughness of channel (n)								
10 Channel flow velocity (ft/sec) V_{fps} = *(1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*								
11 Travel time to outlet (min) T_t = *Item 6 / (Item 10 * 60)*								
12 Total time of concentration (min) T_c = *Item 5 + Item 11*								

13 Pre-developed time of concentration (min): *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet HCOC requirement (min): $T_{C\text{-}HCOC}$ = *(Item 14 * 0.95) – Item 13*

Form 4.2-5 HCOC Assessment for Peak Runoff (DA 1)

Compute peak runoff for pre- and post-developed conditions

Variables	Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
	DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*						
2 Drainage Area of each DMA (ft^2) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*						
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*						
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*						
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*						
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*						
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)* — DMA A	*n/a*			*n/a*		
DMA B		*n/a*			*n/a*	
DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A:	**9** Pre-developed Q_p at T_c for DMA B:	**10** Pre-developed Q_p at T_c for DMA C:
*Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	*Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	*Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*

10 Peak runoff from pre-developed condition confluence analysis (cfs): *Maximum of Item 8, 9, and 10 (including additional forms as needed)*

11 Post-developed Q_p at T_c for DMA A:	**12** Post-developed Q_p at T_c for DMA B:	**13** Post-developed Q_p at T_c for DMA C:
Same as Item 8 for post-developed values	*Same as Item 9 for post-developed values*	*Same as Item 10 for post-developed values*

14 Peak runoff from post-developed condition confluence analysis (cfs): *Maximum of Item 11, 12, and 13 (including additional forms as needed)*

15 Peak runoff reduction needed to meet HCOC Requirement (cfs): *$Q_{p\text{-}HCOC}$ = (Item 14 * 0.95) – Item 10*

4.3 Project Conformance Analysis

Complete the following forms for each project site DA to document that the proposed LID BMPs conform to the project DCV developed to meet performance criteria specified in the MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the MS4 Permit (see Section 5.3.1 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design and Hydrologic Source Controls (Form 4.3-2)
- Retention and Infiltration (Form 4.3-3)
- Harvested and Use (Form 4.3-4) or
- Biotreatment (Form 4.3-5).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2.1 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Forms 4.3-2 and 4.3-4 to determine the feasibility of applicable HSC and harvest and use BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable HSC BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of LID HSC, retention and infiltration, and harvest and use BMPs are unable to mitigate the entire DCV, then biotreatment BMPs may be implemented by the project proponent. If biotreatment BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with LID BMPs (TGD for WQMP Section 5.4.4.2). **Under no circumstances shall any portion of the DCV be released from the site without effective mitigation and/or treatment**.

Form 4.3-1 Infiltration BMP Feasibility (DA 1)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

1 Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒

Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

2 Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒

(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)

3 Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

4 Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

5 Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

6 Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒

See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

7 Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒

If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 9 below.

8 Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒

If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

9 All answers to Item 1 through Item 6 are "No":

Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

Form 4.3-1 Infiltration BMP Feasibility (DA 2)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

1 Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒

Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

2 Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒

(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)

3 Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

4 Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

5 Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

6 Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒

See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

7 Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒

If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 9 below.

8 Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒

If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

9 All answers to Item 1 through Item 6 are "No":

Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

4.3.1 Site Design Hydrologic Source Control BMP

Section XI.E. of the Permit emphasizes the use of LID preventative measures; and the use of LID HSC BMPs reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable HSC shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of HSC, if a project cannot feasibly meet BMP sizing requirements or cannot fully address HCOCs, feasibility of all applicable HSC must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design HSC BMP. Refer to Section 5.4.1 in the TGD for more detailed guidance.

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 1)			
1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): 0 *$V_{retention}$ =Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) *$V_{retention}$ = (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): 0 *$V_{retention}$ =Sum of Item 12 for all BMPs*			

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 1)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) *$V_{retention}$ = Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): 0 *$V_{retention}$ =Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☐ *If yes, complete Items 20-2. If no, proceed to Item 24*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): 0 *$V_{retention}$ = Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrels/cisterns: Yes☐ No ☐ *If yes, complete Items 27-28; If no, proceed to Item 29*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns	0		
28 Runoff volume retention from rain barrels/cisterns (ft^3) *$V_{retention}$ = Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): 0 *$V_{retention}$ =Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: 0 *Sum of Items 5, 13, 20, 25 and 29*			

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 2)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): 0 $V_{retention}$ *=Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ *= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): 0 $V_{retention}$ *=Sum of Item 12 for all BMPs*			

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 2)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) *$V_{retention}$ = Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): 0 *$V_{retention}$ =Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☐ *If yes, complete Items 20-2. If no, proceed to Item 24*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): 0 *$V_{retention}$ = Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrels/cisterns: Yes☐ No ☐ *If yes, complete Items 27-28; If no, proceed to Item 29*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns	0		
28 Runoff volume retention from rain barrels/cisterns (ft^3) *$V_{retention}$ = Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): 0 *$V_{retention}$ =Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: 0 *Sum of Items 5, 13, 20, 25 and 29*			

4.3.2 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix D of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5.1 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

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Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 67,200 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*			
BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA 1A BMP Type Infiltration Basin	DA 1 DMA 1B BMP Type Infiltration Basin	DA 1 DMA 1B BMP Type Infiltration Trench *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	3.80	0.75	0.75
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	3.8	2.0	2.0
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	1.000	0.375	0.375
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	24	48	48
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	2.00	1.50	N/A
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	2.00	1.50	N/A
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	3,480	19,650	7,500
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0	0	0
10 Amended soil porosity	N/A	N/A	N/A
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0	0	2.00
12 Gravel porosity	N/A	N/A	40%
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3	3	3
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	7,830	31,317	6,703
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	0	0	0
16 Total Retention Volume from LID Infiltration BMPs: 75,190 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*			
17 Fraction of DCV achieved with infiltration BMP: 112% *Retention% = Item 16 / Form 4.2-1 Item 7*			
18 Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs? Yes ☒ No ☐ *If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the*			

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 67,200 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*			
BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA 1C BMP Type Infiltration Basin	DA 1 DMA 1D BMP Type Infiltration Basin	DA 1 DMA 1E BMP Type Infiltration *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	0.90	0.75	0.75
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.0	2.0	2.0
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	0.450	0.375	0.375
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	48	48
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	1.80	1.50	1.50
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	1.50	1.50	1.00
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	6,130	6,120	8,870
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0	0	0
10 Amended soil porosity	N/A	N/A	N/A
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0	0	0
12 Gravel porosity	N/A	N/A	N/A
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3	3	3
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	9,885	9,754	9,702
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	0	0	0
16 Total Retention Volume from LID Infiltration BMPs: 75,190 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*			
17 Fraction of DCV achieved with infiltration BMP: 112% *Retention% = Item 16 / Form 4.2-1 Item 7*			
18 Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs? Yes ☒ No ☐ *If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.*			

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 2)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 17,600 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 2 DMA 2A BMP Type Infiltration Basin	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	1.625		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.0		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	0.813		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	3.25		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	2.50		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	8,035		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0		
10 Amended soil porosity	N/A		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0		
12 Gravel porosity	N/A		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	21,720		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	0		

16 Total Retention Volume from LID Infiltration BMPs: 21,720 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 123% *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.3 Harvest and Use BMP

Harvest and use BMP may be considered if the full LID DCV cannot be met by maximizing infiltration BMPs. Use Form 4.3-4 to compute on-site retention of runoff from proposed harvest and use BMPs.

Volume retention estimates for harvest and use BMPs are sensitive to the on-site demand for captured stormwater. Since irrigation water demand is low in the wet season, when most rainfall events occur in San Bernardino County, the volume of water that can be used within a specified drawdown period is relatively low. The bottom portion of Form 4.3-4 facilitates the necessary computations to show infeasibility if a minimum incremental benefit of 40 percent of the LID DCV would not be achievable with MEP implementation of on-site harvest and use of stormwater (Section 5.5.4 of the TGD for WQMP).

Form 4.3-4 Harvest and Use BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16*			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Describe cistern or runoff detention facility			
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*			
4 Landscaped area planned for use of harvested stormwater (ft^2)			
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day			
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*			
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*			
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			
9 Total Retention Volume (ft^3) from Harvest and Use BMP *Sum of Item 8 for all harvest and use BMP included in plan*			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest and use BMPs? Yes ☐ No ☐ *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration, and harvest and use BMPs. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-5 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV w. Biotreatment computations are included as follows:

- Use Form 4.3-6 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-7 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-8 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 1)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.*	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume*
	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*		

Form 4.3-6 Volume Based Biotreatment (DA 1) – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*			
2 Amended soil infiltration rate *Typical ~ 5.0*			
3 Amended soil infiltration safety factor *Typical ~ 2.0*			
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*			
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*			
8 Amended soil surface area (ft^2)			
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity, *n*			
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
12 Gravel porosity, *n*			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-7 Volume Based Biotreatment (DA 1) – Constructed Wetlands and Extended Detention

Biotreatment BMP Type *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (e.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA DMA BMP Type		DA DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} = *Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ =*(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V =*Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} = *(Item* $8_{forebay}$ *+ Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ = *(Item* $8_{forebay}$ *+ Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-8 Flow Based Biotreatment (DA 1)			
Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) b_w *= (Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2^1.67 * Item 3^0.5)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) SA_{top} *= (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-9 to demonstrate how on-site LID DCV is met with proposed site design hydrologic source control, infiltration, harvest and use, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 67,200 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 75,190 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 0 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☐
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☐
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 2)

1 Total LID DCV for the Project DA 2 (ft^3): 17,600 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 21,720 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 0 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☐
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☐
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

4.3.6 Hydromodification Control BMP

Use Form 4.3-10 to compute the remaining runoff volume retention, after LID BMP are implemented, needed to address HCOC, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential HCOC. Describe hydromodification control BMP that address HCOC, which may include off-site BMP and/or in-stream controls. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-10 Hydromodification Control BMPs (DA 1)

1 Volume reduction needed for HCOC performance criteria (ft^3): 60,096 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 75,190 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): 0 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

Form 4.3-10 Hydromodification Control BMPs (DA 2)

1 Volume reduction needed for HCOC performance criteria (ft^3): 18,316 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 21,720 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): 0 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐

  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☒ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐

  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, harvest and use, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance. Alternative compliance plans may include one or more of the following elements:

- On-site structural treatment control BMP - All treatment control BMP should be located as close to possible to the pollutant sources and should not be located within receiving waters;
- Off-site structural treatment control BMP - Pollutant removal should occur prior to discharge of runoff to receiving waters;
- Urban runoff fund or In-lieu program, if available

Depending upon the proposed alternative compliance plan, approval by the executive officer may or may not be required (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMP included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and may require a Maintenance Agreement (consult the jurisdiction's LIP). If a Maintenance Agreement is required, it must also be attached to the WQMP.

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
All	Property Owner	Operation and Maintenance Plan to be provided with Final WQMP	Regularly

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (consult the LIP), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

6.4 Other Supporting Documentation

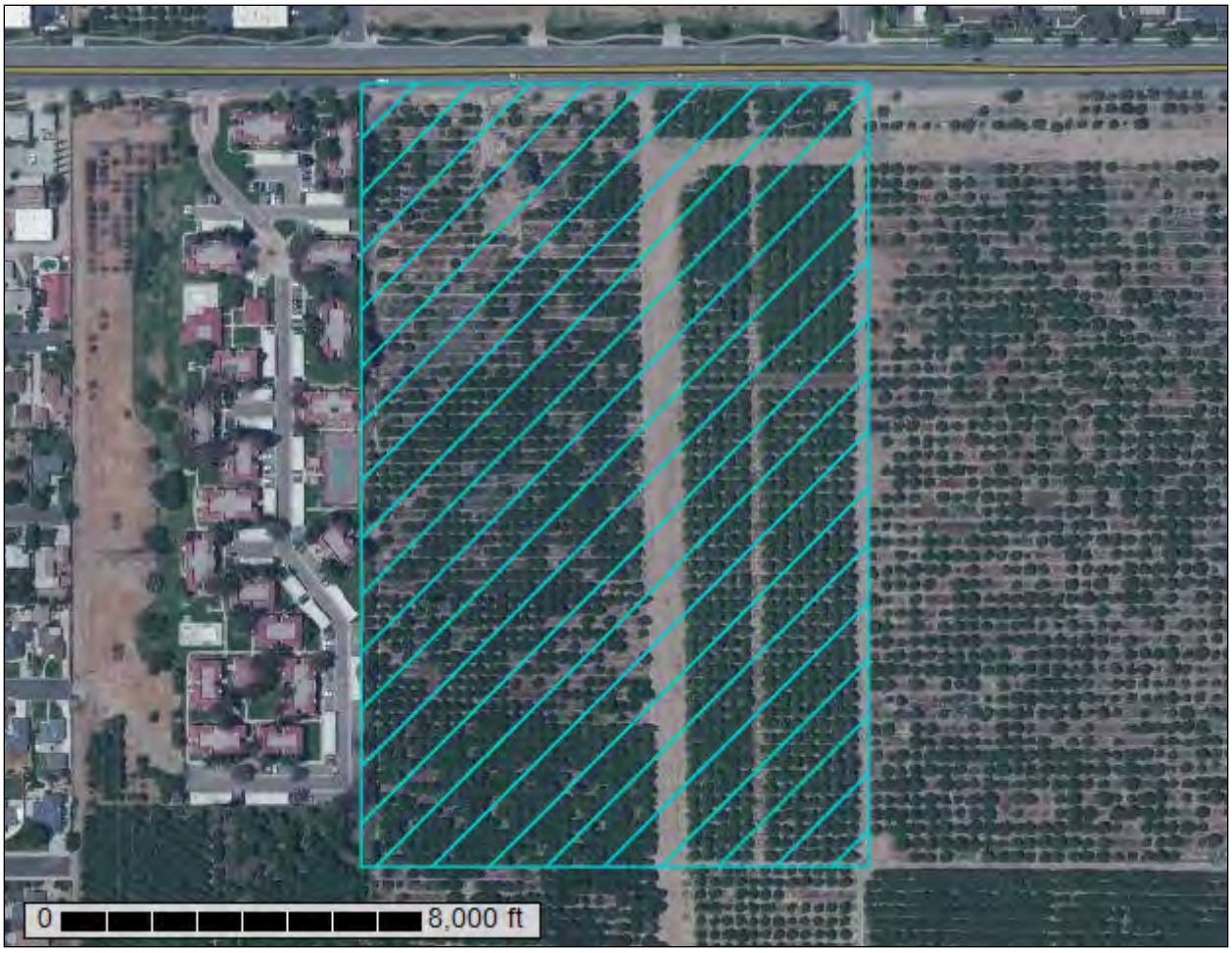
- BMP Educational Materials
- Activity Restriction – C, C&R's & Lease Agreements

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Bernardino County Southwestern Part, California



September 30, 2013

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,340 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Bernardino County Southwestern Part, California
Survey Area Data: Version 4, Jan 3, 2008

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

Date(s) aerial images were photographed: May 5, 2010—Jul 3, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

San Bernardino County Southwestern Part, California (CA677)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
HbA	HANFORD SANDY LOAM, 0 TO 2 PERCENT SLOPES	9.8	38.2%
ScA	SAN EMIGDIO FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES	15.8	61.8%
Totals for Area of Interest		**25.6**	**100.0%**

Map Unit Descriptions

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

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

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

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

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

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

San Bernardino County Southwestern Part, California

HbA—HANFORD SANDY LOAM, 0 TO 2 PERCENT SLOPES

Map Unit Setting

Elevation: 150 to 900 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 280 days

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water capacity: Very high (about 20.3 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 3c
Hydrologic Soil Group: B

Typical profile

0 to 12 inches: Sandy loam
12 to 60 inches: Fine sandy loam, sandy loam, coarse sandy loam

Minor Components

Hanford, steeper slopes

Percent of map unit: 5 percent

Greenfield sandy loam

Percent of map unit: 5 percent

Unnamed

Percent of map unit: 5 percent

ScA—SAN EMIGDIO FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES

Map Unit Setting

Elevation: 1,000 to 2,000 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 230 to 280 days

Map Unit Composition

San emigdio and similar soils: 85 percent
Minor components: 15 percent

Description of San Emigdio

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 22.9 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 3c
Hydrologic Soil Group: B

Typical profile

0 to 8 inches: Fine sandy loam
8 to 60 inches: Fine sandy loam, sandy loam, loam

Minor Components

Hanford, cosl

Percent of map unit: 5 percent

Metz coarse sandy loam

Percent of map unit: 5 percent

Unnamed

Percent of map unit: 5 percent

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LOR GEOTECHNICAL GROUP, INC.
Soil Engineering ▲ Geology ▲ Environmental

INFILTRATION FEASIBILITY INVESTIGATION
PROPOSED VA CLINIC
SOUTH OF THE INTERSECTION OF
REDLANDS BOULEVARD AND BRYN MAWR AVENUE
LOMA LINDA, CALIFORNIA

PROJECT NO. 53021.41
NOVEMBER 4, 2013
REVISED NOVEMBER 11, 2013

Prepared For:

Walsh Construction
13000 Bruce B. Downs Boulevard
Tampa, Florida 33612

Attention: Mr. Randy Moon

6121 Quail Valley Court ▲ Riverside, CA 92507 ▲ (951) 653-1760 ▲ (951) 653-1741 (Fax) ▲ www.lorgeo.com
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LOR GEOTECHNICAL GROUP, INC.
Soil Engineering ▲ Geology ▲ Environmental

November 4, 2013
Revised November 11, 2013

Walsh Construction
13000 Bruce B. Downs Boulevard
Tampa, Florida, 33612

Project No. 53021.41

Attention: Mr. Randy Moon

Subject: Infiltration Test Results, Proposed VA Clinic, Loma Linda, California.

LOR Geotechnical Group, Inc. is pleased to present this report summarizing the results of our double-ring infiltrometer testing recently conducted within the proposed commercial development located south of the intersection of Redlands Boulevard and Bryn Mawr Avenue in the City of Loma Linda, California.

Information provided by you indicates that detention basin type facilities will be used for the infiltration of onsite runoff waters. The locations and elevations of the proposed facilities were indicated by you.

INFILTRATION TESTING AND TEST RESULTS

A double ring infiltration test was conducted at each of the seven requested locations approximately illustrated on the enclosed Infiltration Test Location Map, Enclosure 1. The testing was conducted within the bottom of an excavation that was made, and later backfilled, using a rubber-tire backhoe. The locations of the test holes were surveyed using a hand held GPS. A 12-inch diameter steel casing was installed within the center of the test location, with a 24-inch diameter steel casing centered around it. Each casing was imbedded a minimum of 3 inches. These liners extended approximately 17-inches above the bottom of the test location. The test location was tested immediately after the casings were installed by filling both the inside and outside casings and maintaining a water level to a depth of approximately 3-inches above the ground surface.

The testing procedure was in general accordance with ASTM D 3385 and was as follows:

Both the inside and outside area of the casings were filled with water to a level of approximately 3-inches above the ground surface. Water was then metered into the test hole to maintain this water level within both casings by inverting glass, 5-gallon

water bottles with vacuum seals. The volume of water used in a given time period was recorded at various time intervals to establish the infiltration rate of the inner ring. The purpose of the outer ring is to promote one dimensional flow beneath the inner ring.

The infiltration rate is measured as the drop in water level compared to the permeability of the bottom surface area soils in the bottom of the test hole. If casing is not used, the water column in the test hole is allowed to seep into both the bottom and sidewalls of the hole, for which the drop in water level must be corrected and reduced for the volume of water seeping into the sidewall and for the diameter of the test hole. As described above, the tests described herein were conducted using a 12-inch diameter inner casing and 24-inch diameter outer casing.

The test holes were found to have the following measured infiltration rates:

Infiltration Test No.	Depth (ft.)*	Infiltration Rate (inches/hour)**
DRI-1	5	0.3
DRI-2	10	0.4
DRI-3	5	1.5
DRI-4	10	0.3
DRI-5	15	0.9
DRI-6	10	3.8
DRI-7	10	0.7

* depth measured below existing ground surface
** average of final two readings rounded to the nearest tenth

The results of our testing are attached as Enclosures 2 through 8.

CONCLUSIONS

Based upon our infiltration test data, the clear water infiltration rate ranges from 0.3 inches per hour (4.5 gal/sf/day) to 3.8 inches per hour (57 gal/sf/day). An appropriate factor of safety should be applied as deemed applicable per county and/or local governing agency recommendations. A minimum factor of safety of 2.0 is required (San Bernardino County Stormwater Program, 2011).

To ensure continued infiltration capability of the infiltration areas, a program to maintain the facilities should be considered. This program should include periodic removal of accumulated materials, which can slow the infiltration and decrease the water quality. Materials to be removed from the catch basin areas typically consist of litter, dead plant matter, and soil fines (silts and clays). Proper maintenance of the system is critical. A maintenance program which meets or exceeds those developed by the local governing agency should be prepared and properly executed.

The program should also incorporate the recommendations presented below and any other jurisdictional agency requirements.

> Systems should be set back at least 10 feet from foundations or as required by the design engineer.
>
> Any geotextile filter fabric utilized should consist of material that prevents soil piping but has greater permeability than the existing soil.
>
> During site development, care should be taken to not disturb the area(s) proposed for infiltration as changes in the soil structure could occur resulting in a change of the soil infiltration characteristics.

Should you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,
LOR Geotechnical Group, Inc.

John P. Leuer, GE 2030
President

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EXPIRATION DATE
09/30/15
GEOTECHNICAL
STATE OF CALIFORNIA

AAT:JPL:amp

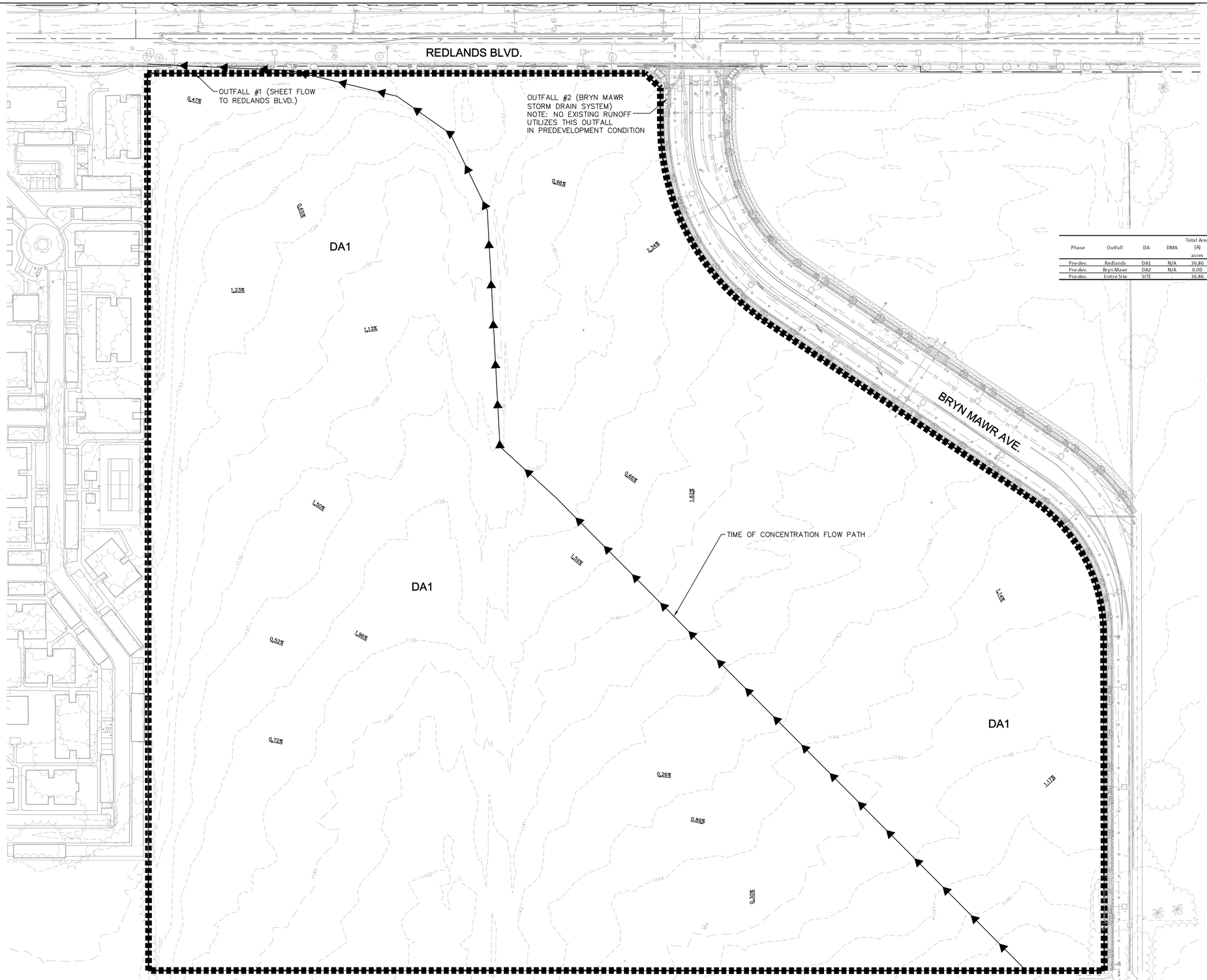
Distribution: Addressee (2)

REFERENCES

Annual Book of ASTM Standards, 206, Section 4, Volume 04.08, Soil and Rock (1): D 420 - D 5611.

Johson, A.I., 1963, A Field Method for Measurement of Infiltration, U.S. Geological Survey Water-Supply Paper 1544-F.

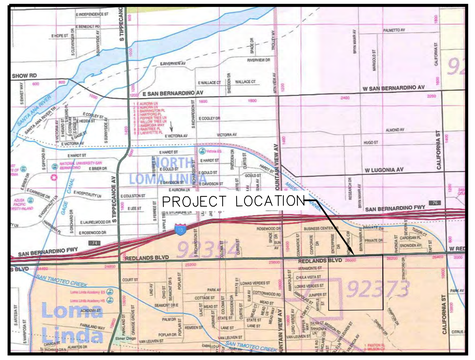
Technical Guidance Document for Water Quality Management Plans (WQMP), 2011, San Bernardino County Storm Water Program, July 28, 2011.



Rational Method Calculations per San Bernardino County Hydrology Manual and WQMP TGD

Phase	Outfall	DA	DMA	Total Area (A) acres	Imper-vious Cover	CN	Storm Event	AMC	1-hour Precip. (P) in	Slope of IDF Curve (m)	Intercept (k) k = P/60^m	Perv. Infilt. Rate (Fp) in/hr	Time of Conc. min	Rainfall Intensity (I) in/hr	Runoff Coefficient (C)	Peak Flow (Q) cfs
Pre-dev.	Redlands	DA1	N/A	36.86	0.0%	65.0	100-year	3	1.150	-0.600	13.415	0.32	34.0	1.62	0.72	43.0
Pre-dev.	Bryn Mawr	DA2	N/A	0.00	0.0%	0.0	100-year	3	1.150	-0.600	13.415	0.00	5.0	5.11	0.90	
Pre-dev.	Entire Site	SITE	-	36.86	0.0%	65.0	100-year	3	1.150	-0.600	13.415	0.32	34.0	1.62	0.72	43.0

RATIONAL METHOD CALCULATIONS



VICINITY MAP

NORTH

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0 1000 2000 4000

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Drawing Title: EXISTING HYDROLOGY MAP

Approved: Project Director

Project Title: HEALTH CARE CENTER LOMA LINDA, CALIFORNIA

Location: LOMA LINDA, CALIFORNIA

Date: November 21, 2013

Checked

Drawn

Project Number: VA-101-13-R-0026

Building Number

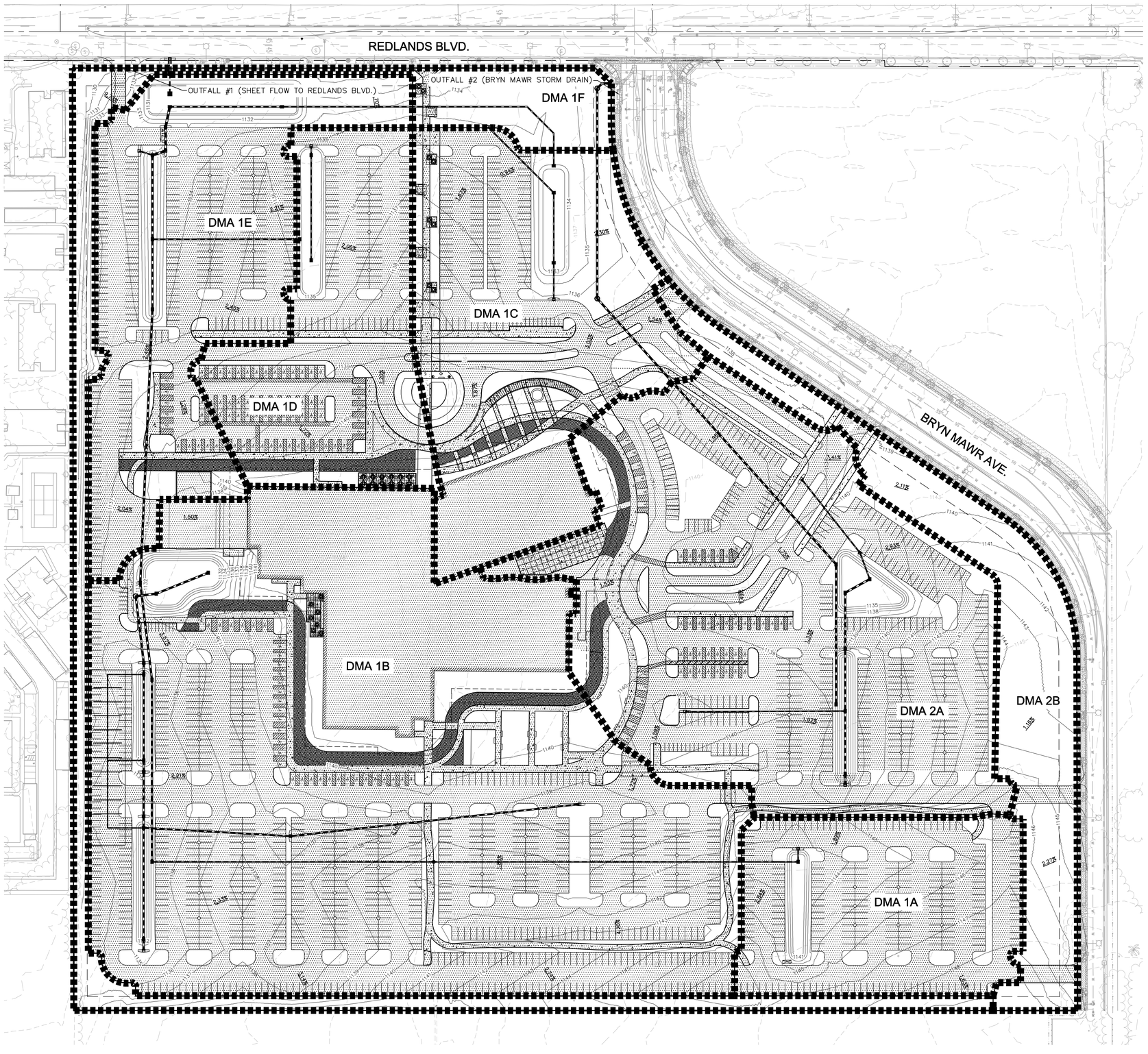
Drawing Number

Dwg. of

Office of Construction and Facilities Management

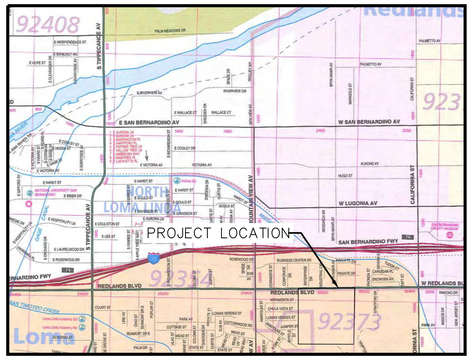
Department of Veterans Affairs

VA FORM 08-6231



LEGEND

- DRAINAGE MANAGEMENT AREA BOUNDARY
- IMPERVIOUS AREA
- PERVIOUS AREA



VICINITY MAP

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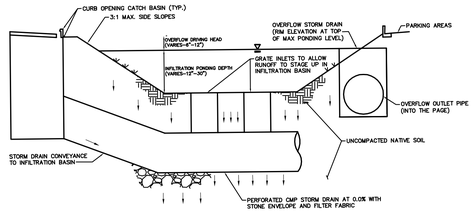

TYPICAL INFILTRATION BASIN DETAIL

DRAINAGE MANAGEMENT AREA SUMMARY

			Retention Volume Calculations for LID BMPs per San Bernardino County WQMP TGD						
Outfall	DA	DMA	Total Area (A) acres	Impervious Cover	C**	2-yr, 1-hr Precip. (P2) in	a1 (valley)	Mean 6-hr Precip. (P6) in	a2 (varies) 24-hr=1.582 48-hr=1.963	DCV cu ft
Redlands	DA1	DMA 1A	2.34	83.8%	0.646	0.471	1.4807	0.697	1.582	6,046
Redlands	DA1	DMA 1B	12.44	81.0%	0.611	0.471	1.4807	0.697	1.963	37,760
Redlands	DA1	DMA 1C	4.04	60.8%	0.415	0.471	1.4807	0.697	1.963	8,332
Redlands	DA1	DMA 1D	2.94	81.6%	0.619	0.471	1.4807	0.697	1.963	9,059
Redlands	DA1	DMA 1E	3.53	63.8%	0.439	0.471	1.4807	0.697	1.963	7,706
Redlands	DA1	DMA 1F	2.29	2.5%	0.059	0.471	1.4807	0.697	1.963	674
Redlands	**DA1**	**TOTAL**	**27.58**	**69.6%**	**0.490**	**0.471**	**1.4807**	**0.697**	**1.963**	**67,199**
Bryn Mawr	DA2	DMA 2A	7.04	71.5%	0.509	0.471	1.4807	0.697	1.963	17,782
Bryn Mawr	DA2	DMA 2B	2.24	8.5%	0.101	0.471	1.4807	0.697	1.963	1,121
Bryn Mawr	**DA2**	**TOTAL**	**9.27**	**56.3%**	**0.382**	**0.471**	**1.4807**	**0.697**	**1.963**	**17,596**
Entire Site	SITE	-	36.86	66.3%	0.460	0.471	1.4807	0.697	1.963	84,267

LID BMP DESIGN SUMMARY

		Infiltration Parameters			Infiltration Basin Design							Infiltration Trench Design				Compliance				
DMA	DCV	Measured Infil. Rate	Factor of Safety	Design Infil. Rate	Surface Area Top	Surface Area Bottom	Surface Area Avg.	Elevation Top	Elevation Bottom	Depth	Basin Volume	Area	Depth	Porosity (n)	Trench Volume	Drawdown Time actual	Drawdown Time maximum	Maximum Ponding	Storage Volume	Volume Retained
	cu ft	in/hr		in/hr	sq ft	sq ft	sq ft	ft	ft	ft	cu ft	sq ft	in		cu ft	hr	hr	ft	cu ft	cu ft
DMA 1A	6,046	3.800	3.8	1.000	4,490	2,470	3,480	1143.0	1141.0	2.00	6,960	0	0.0	0%	0	20.8	24.0	2.00	6,960	7,830
DMA 1B	37,760	0.750	2.0	0.375	22,180	17,120	19,650	1134.5	1133.0	1.50	29,475	7,500	24.0	40%	6,000	44.5	48.0	1.50	35,475	38,020
DMA 1C	8,332	0.900	2.0	0.450	7,790	4,470	6,130	1134.5	1133.0	1.50	9,195	0	0.0	0%	0	36.2	48.0	1.80	9,195	9,885
DMA 1D	9,059	0.750	2.0	0.375	7,150	5,090	6,120	1135.0	1133.5	1.50	9,180	0	0.0	0%	0	47.4	48.0	1.50	9,180	9,754
DMA 1E	7,706	0.750	2.0	0.375	9,370	8,370	8,870	1131.0	1130.0	1.00	8,870	0	0.0	0%	0	27.8	48.0	1.50	8,870	9,702
DMA 1F	674																			
TOTAL	**69,576**										**63,680**				**6,000**				**69,680**	**75,190**
DMA 2A	17,782	1.625	2.0	0.813	10,560	5,510	8,035	1137.5	1135.0	2.50	20,088	0	0.0	0%	0	32.7	48.0	3.25	20,088	21,720
DMA 2B	1,121																			
TOTAL	**18,903**										**20,088**				**0**				**20,088**	**21,720**
-	88,479										83,768				6,000				89,768	96,910

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

DESIGN DEVELOPMENT-
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Drawing Title: PROPOSED HYDROLOGY MAP

Approved: Project Director

Project Title: HEALTH CARE CENTER LOMA LINDA, CALIFORNIA

Location: LOMA LINDA, CALIFORNIA

Date: November 21, 2013

Checked

Drawn

Project Number: VA-101-13-R-0026

Building Number

Drawing Number

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Department of Veterans Affairs

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APPENDIX F

NOISE

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KUNZMAN ASSOCIATES, INC.

VA HEALTH CARE MEDICAL CLINIC

NOISE IMPACT ANALYSIS

February 28, 2014

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

KUNZMAN ASSOCIATES, INC.

VA HEALTH CARE MEDICAL CLINIC

NOISE IMPACT ANALYSIS

February 28, 2014

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I. Introduction and Setting

A. Purpose and Objectives

The purpose of this report is to provide an assessment of potential noise impacts that may result with development of the proposed VA Health Care Medical Clinic project and to identify mitigation measures necessary to reduce any impacts. The City of Loma Linda is the lead agency responsible for preparation of the noise impact analysis, in accordance with California Environmental Quality Act authorizing legislation.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to noise and vibration, is provided in Table 1.

B. Project Location

The proposed project is located south of Redlands Boulevard, between Enterprise Drive and Bryn Mawr Avenue in the City of Loma Linda (see Figure 1).

C. Project Description

The U.S. Department of Veterans Affairs (VA) proposes the construction and operation of an outpatient health care clinic in the City of Loma Linda. The project will include construction and operation of a 3-story outpatient health care clinic consisting of approximately 345,000 gross square feet. Two primary access points are proposed; a main driveway on Bryn Mawr Avenue and a staff entrance on Redlands Boulevard. A service loading dock is proposed on the west side of the building and will be accessed via Redlands Boulevard and Bryn Mawr Avenue staff/service driveways. The proposed site plan is shown on Figure 2.

The project would also include a 5.5-acre linear park and greenbelt along the site's north and east perimeter. The linear park would incorporate both passive and active recreational uses.

The proposed health care clinic will operate from 7:00 AM to 9:00 PM.

Figure 1
Project Location Map

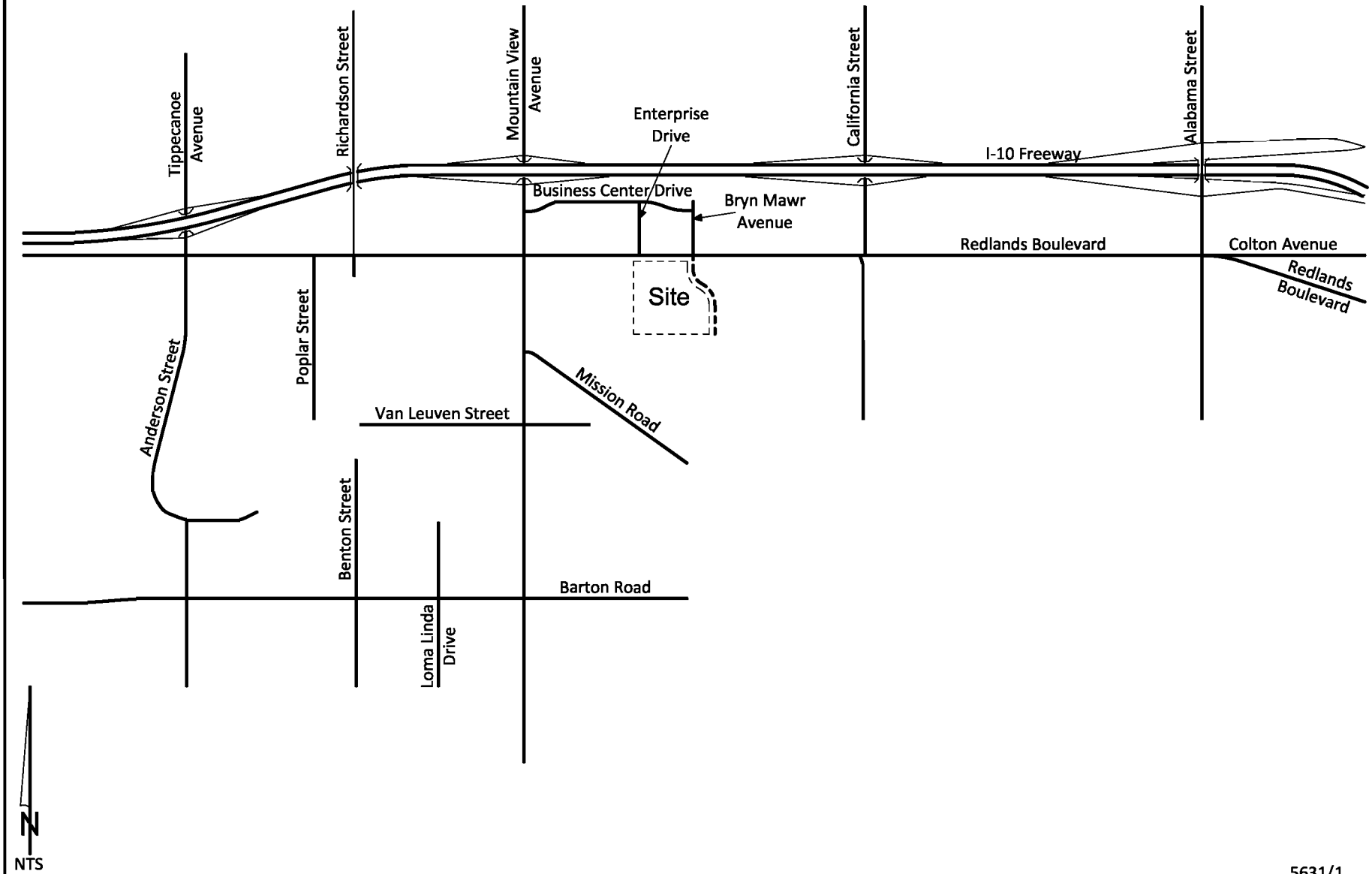

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Figure 2
Site Plan

N

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II. Noise and Vibration Fundamentals

A. Noise Fundamentals

Sound is a pressure wave created by a moving or vibrating source that travels through an elastic medium such as air. Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in extreme circumstances, hearing impairment.

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

Commonly used noise terms are presented in Table 1. The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dBA or dBA.

Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease.

Figure 3 shows the relationship of various noise levels to commonly experienced noise events.

Average noise levels over a period of minutes or hours are usually expressed as $dBAL_{eq,}$or the equivalent noise level for that period of time. For example, $L_{eq(3)}$ would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

Noise standards for land use compatibility are stated in terms of the Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (L_{dn}). CNEL is a 24-hour weighted average measure of community noise. CNEL is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human

sensitivity to noise during the evening and nighttime hours. L_{dn} is a very similar 24-hour average measure that weights only the nighttime hours.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by the California Department of Transportation's Traffic Noise Analysis Protocol for New Highway and Reconstruction Projects.

B. Vibration Fundamentals

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (RMS) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as L_V and is based on the RMS velocity amplitude. A commonly used abbreviation is VdB, which in this text, is when the particle velocity level (L_V) or sound velocity level (SVL) is based on the reference quantity of 1 microinch per second. The L_V should not be confused with the speed of sound.

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration.

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform median, while groundborne vibrations travel through the earth, which may contain significant geological differences. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

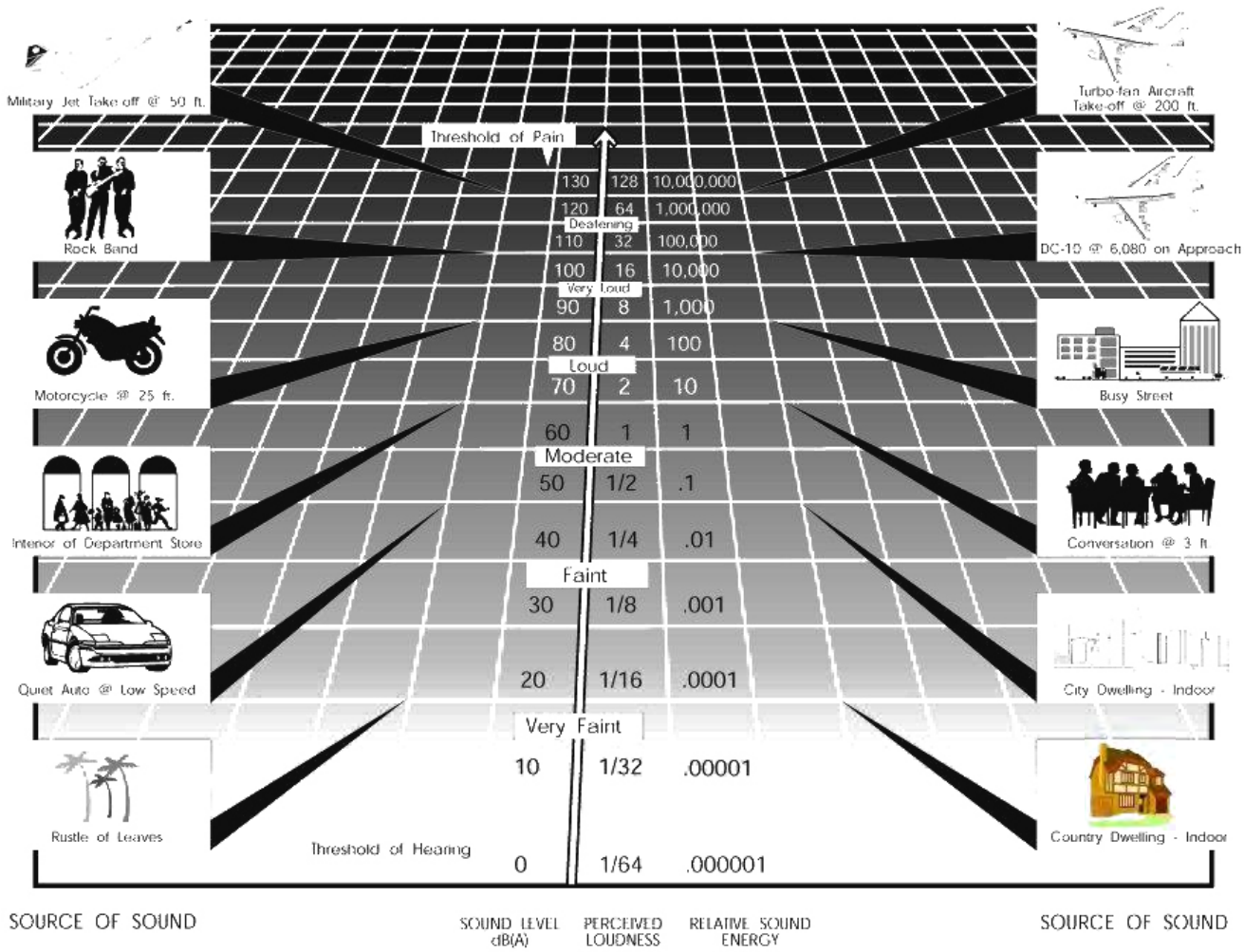
Table 1

Definitions of Acoustical Terms[1]

Term	Definition
Decibel, dB	A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hertz	In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.
Root Mean Square (RMS)	A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.
Fast/Slow Meter Response	The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.
L_{02}, L_{08}, L_{50}, L_{90}	The A-weighted noise levels that are equaled or exceeded by a fluctuating sound level, 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	A level of steady state sound that in a stated time period, and a stated location, has the same A-weighted sound energy as the time-varying sound.
L_{max}, L_{min}	L_{max} is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. L_{min} is the minimum level.
Ambient Noise Level	The all-encompassing noise environment associated with a given environment, at a specified time, usually a composite of sound from many sources, at many directions, near and far, in which usually no particular sound is dominant.
Offensive/ Offending/ Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.

[1] Adapted from: Cyril M. Harris; Handbook of Acoustical Measurement and Noise Control, 1991.

Figure 3
Common Noise Sources and Noise Levels



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III. Existing Noise Environment

A. Existing Land Uses and Sensitive Receptors

The project site is bounded by Redlands Boulevard on the north, multi-family attached residential dwelling units to the west and vacant land to the south and east.

The project site is relatively flat and slopes gently to the southwest, with on-site elevations ranging from 1115 feet above mean sea level (amsl) to 1121 feet amsl.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, and residential uses make up the majority of these areas. Sensitive receptors that may be affected by project generated noise include the multi-family attached residential dwelling units located west of the site.

B. Ambient Noise Measurements

An American National Standards Institute (ANSI Section SI4 1979, Type 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels. Two 15-minute daytime noise measurements were taken between 9:36 AM and 10:12 AM on February 18, 2014. Ambient noise levels are presented in Table 2 and measurement output data is included within Appendix A.

As shown on Figure 4, noise measurements were taken at the southwest corner of the nearby elementary school and at the project's shared boundary with existing multi-family attached residential dwelling units. Ambient noise levels ranged between 48-49 $dBAL_{eq}$ and 57-59 L_{max}. Birds and children were the dominant noise sources.

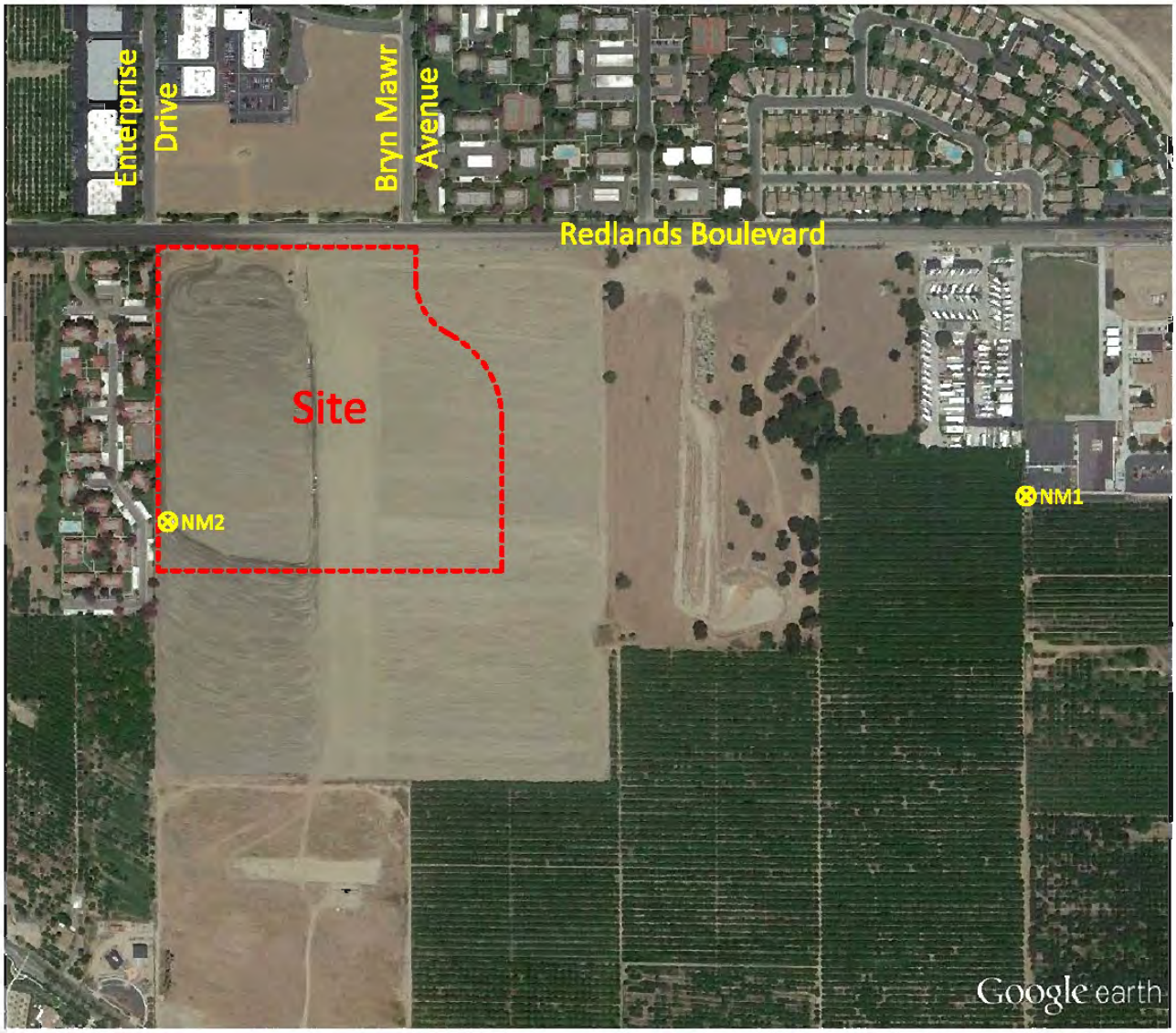
Table 2

Measured Ambient Noise Levels[1]

Name	Time	Measurement Period	Description	Existing Ambient Noise Levels (dBA)					
				L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
NM1	9:41 AM - 9:49 AM	15 min	SW corner of nearby Elementary School. Birds were the nearest noise source. Playing children audible during the last five minutes.	48	57.4	51.0	49.5	48.4	47.5
NM2	9:57 AM - 10:12 AM	15 min	Eastern edge of adjacent MF property. Parking lot noise was dominant.	49.3	59.3	55.3	52.3	49.8	47.5

[1] Source: Site Visit, Kunzman Associates, Inc. (September 17, 2013).

Figure 4
Noise Measurement Location Map



Legend

⊗ = Noise Measurement Location

N

NTS

5631/4

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

IV. Regulatory Setting

A. Federal Regulations

1. Federal Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In addition, the Levels of Environmental Noise identified five dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBALdn (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies, allowing more individualized control for specific issues by designated Federal, State, and local government agencies.

2. Federal Transportation Administration

The FTA has established guidelines for Ground-Borne Vibration and Noise Criteria. The FTA Manual provides recommended vibration thresholds, and reference data for assessing probable ground-borne vibration. Table 3 outlines the FTA's vibration standard for various land uses.

B. State Regulations

1. State of California General Plan Guidelines 2003

Though not adopted by law, the State of California General Plan Guidelines 2003, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provide guidance for the compatibility of projects within areas of specific

noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the Normally Acceptable outdoor exposure of noise-sensitive uses. The OPR Guidelines include a Noise and Land Use Compatibility Matrix (see Table 4) identifies acceptable and unacceptable community noise exposure limits for various land use categories.

2. California Environmental Quality Act

Appendix G of the California Environmental Quality Act (CEQA) Guidelines includes a list of questions regarding a proposed project that are to be considered. The Guidelines state that a significant impact related to noise would occur if a proposed project is determined to result in any of the following conditions:

- Exposure of persons to or generate of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generate excessive ground borne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or
- Exposure of persons residing or working in the project area to excessive noise levels from aircraft.

Two of the above thresholds apply to what is referred to as a "substantial increase" in ambient noise levels. Neither the California Environmental Quality Act nor the City of Upland General Plan Noise Element recognizes an official numerical increase as a “substantial increase”. Industry-accepted standards for what is considered to be a “substantial increase” range from 3 dB to 12 dB. It should be noted that a change of 3 dB is considered to be “barely audible” to a trained ear and that a change of 5 dB is considered to be a readily audible change. Noise generated by transportation sources propagates differently than noise generated by point sources.

For purposes of this analysis, the following two thresholds were utilized to evaluate the project's potential to result in substantial increases in ambient noise levels.

Project operations, including noise from loading and unloading activities, and parking lot noise etc., may produce an increase noise levels which disturbs the peace and quiet

of adjacent residential areas or cause discomfort/annoyance to area residents. For the purposes of this report, a substantial increase in ambient noise levels due to stationary noise sources shall be considered 5 dBA Leq.

C. Local Regulations

1. City of Loma Linda General Plan Noise Element

Table 5 shows the City's policies related to land use and acceptable noise levels which are based on the California Office of Noise Control Community Compatibility Matrix.

The City of Loma Linda has also established the following polices pertaining to noise to support the goal of achieving an acceptable noise environment for existing and future residents of the City of Loma Linda.

a) Achieve and maintain exterior noise levels appropriate to planned land uses through Loma Linda as indicated below:

- Residential:
  Single-Family: 65 dBA within rear yards.
  Multifamily: 65 dBA within private yard or enclosed balcony spaces.
  Single/Multifamily, indoor noise level: 45 dBA with windows closed.

- Schools:
  Classrooms: 65 dBA exterior noise environment at the classroom location.
  Play and sports areas: 70 dBA.

- Libraries, Churches, Hospitals, Nursing Homes:
  60 dBA exterior noise environment at the building location.

- Commercial/Industrial:
  70 dBA exterior noise environment at the building location, unless additional interior mitigation is provided.

b) Maintain a pattern of land uses that separates noise-sensitive land uses (e.g., residential, churches, schools, hospitals) from major noise sources to the extent possible, and guide noise-tolerant land uses into the noisier portions of the Planning Area.

c) Require new developments to limit noise impacts on adjacent properties through acoustical site planning, which may include, but not limited to the following actions:

- Increased setbacks from adjacent buildings;
- Screen and control noise sources, such as parking, and loading facilities, outdoor activities and mechanical equipment;
- Use soundproofing materials and double-glazed windows;
- Retain fences, walls and, landscaping that serve as noise buffers;

- Orient delivery, loading docks, and outdoor work areas away from noise-sensitive areas;
- Cluster office, commercial, or multifamily residential structures to reduce noise levels within interior open space areas.

d) Where new development (including construction and improvement of roadways) is proposed in areas exceeding the noise levels identified in the General Plan, or where the development of proposed uses could result in an increase of more than 3.0 dBA above existing background noise, require a detailed noise attenuation study prepared by a qualified acoustical engineer to determine and incorporate mitigation into project design and implantation to reduce potential noise levels to acceptable noise levels as identified in the General Plan.

e) Utilize site plan design and architectural design features to the extent feasible to mitigate impacts on residential neighborhoods and other noise-sensitive uses. In addition to sound barriers, design techniques to mitigate noise impacts may include, but are not limited to:

- Increased building setbacks to increase the distance between the noise source and sensitive receptors.
- Orienting buildings that are noise-compatible with adjacent to noise generators or in a manner that shields noise-sensitive uses.
- Orienting delivery, loading docks, and outdoor work areas away from noise sensitive uses.
- Placing noise tolerant activity areas, (e.g., parking) between the noise source and sensitive receptors.

f) Provide double glazed and double paned windows on the side of the structure facing a major noise source, and place entries away from the noise source to the extent possible.

g) Continue enforcement of California Noise Insulation Standards (Title 25, Section 1092, California Administrative Code).

h) Discourage new projects that have potential to create ambient noise levels more than 5 dBA above existing background noise within 250 feet of sensitive receptors, (e.g., schools, hospitals, churches, residential uses, etc.).

i) Require new sources to use best available control technology (BACT) to minimize noise from all sources.

j) Ensure that construction activities are regulated as to the hours of operation in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.

k) Require proposed development adjacent to occupied noise-sensitive uses to implement a construction-related noise mitigation plan that identifies the location of construction equipment storage and maintenance areas, and documents the

methods that will be used to minimize impacts on adjacent noise-sensitive land uses, including, where needed, installation of temporary barriers.

l) Require that all construction equipment utilize noise-reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

2. City of Loma Linda Municipal Ordinance

The City of Loma Linda's Municipal Code establishes the following noise regulations that are relevant to the proposed project.

9.20.030 Excessive Noise—Unlawful.

It is unlawful for any person at any location to create any noise, or to allow the creation of any noise in the City of Loma Linda, when such noise causes the noise level to exceed any noise level as specified in Section 9.20.040.

Furthermore, notwithstanding any specified noise level, it is also unlawful for any person to make or continue, or cause to be made or continued, any loud, unnecessary, or unusual which disturbs the peace or quiet of any neighborhood or which causes discomfort, or annoyance to any reasonable person residing in the area, and it shall be unlawful for any person in ownership, or control of any premises to knowingly permit a violation of this section upon said premises (Ord. 481 § 1 (part), 1992).

Section 9.20.040 Land Use Compatibility for Community Noise Environments

These standards are established guidelines from the City's general plan that provide a decibel range for the city manager, or designee to follow and help determine what type of noises are nuisances and are unacceptable to the community. This determination will be based on a case-by-case basis at the discretion of the city manager. Table 6 outlines the City's Performance Standards. Noise levels of up to 55 dBA CNEL are considered to be acceptable for single-family residential units and levels of up to 70 dBA are considered to be normally acceptable for hospital/medical land uses.

Section 9.20.050 Prohibited Noises

Noises considered to be a nuisance between the hours of 10:00 PM and 7:00 AM shall include but not be limited to the following:

- Outdoor maintenance equipment (i.e., leaf blowers, lawn mowers, gas edgers, parking lot sweepers, etc.);
- Construction related noises; amplified sounds including but not limited to church, chimes, loud speakers, or musical devices;
- Truck deliveries for commercial or industrial land use types adjacent to residential properties;
- Refuse collection trucks are prohibited between the hours 10:00PM and 6:00AM

Special waivers may be granted per Sections 9.20.060 and 9.20.070 (Ord. 48 § 1 (part), 1992).

Section 9.20.070 Temporary Permit Procedures

a) The owner or operator of a noise source which violates, or potentially violates any of the provisions of this chapter may file an application with the city manager for a temporary noise waiver from the provisions of Sections 9.20.030 and 9.20.050. This property owner, lessee, or operator shall set forth all actions taken to comply with such provisions, the reasons why immediate compliance cannot be achieved, a proposed method of achieving compliance, and a proposed time schedule from it accomplishment. The application shall be accompanied by a fee set forth by resolution of the city council.

b) A separate application shall be filed for each noise source; provided, however, that several mobile sources under common supervision, or several fixed sources on a single property, may be combined into one application. Upon receipt of the application and fee, the city manager shall refer to it with his/her recommendation within thirty days to the hearing board for action in accordance with the provisions of this chapter. Copies of all applications for variances and other notices shall be sent to the city.

c) Developers that are involved with building construction and subdivision grading may exceed maximum noise levels between the hours of 7:00AM and 8:00PM, Monday through Friday, provided that all equipment is properly equipped with standard noise muffling apparatus specifically for such equipment (i.e., exhaust mufflers). Heavy construction is not permitted on weekends, or national holidays.

d) No provision contained herein exempts any individual from complying with stricter noise standards imposed as condition(s) of development approvals such as subdivision and conditional use permits and similar approvals by the city (Ord. 481 § 1 (part), 1992).

Table 3

Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria for General Assessment[1]

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch /sec)			GBN Impact Levels (dB re 20 micro Pasacals)		
	Frequent Events[2]	Occasional Events[3]	Infrequent Events[4]	Frequent Events[2]	Occasional Events[3]	Infrequent Events[4]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[5]	65 VdB[5]	65 VdB[5]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep.	72VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime uses.	75VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

[1] FTA Noise and Vibration Manual

[2.] "Frequent Events" is defined as more than 70 vibration event of the same source per day. Most rapid transit projects fall into this category.

[3.] "Occasional Events" is defined between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.

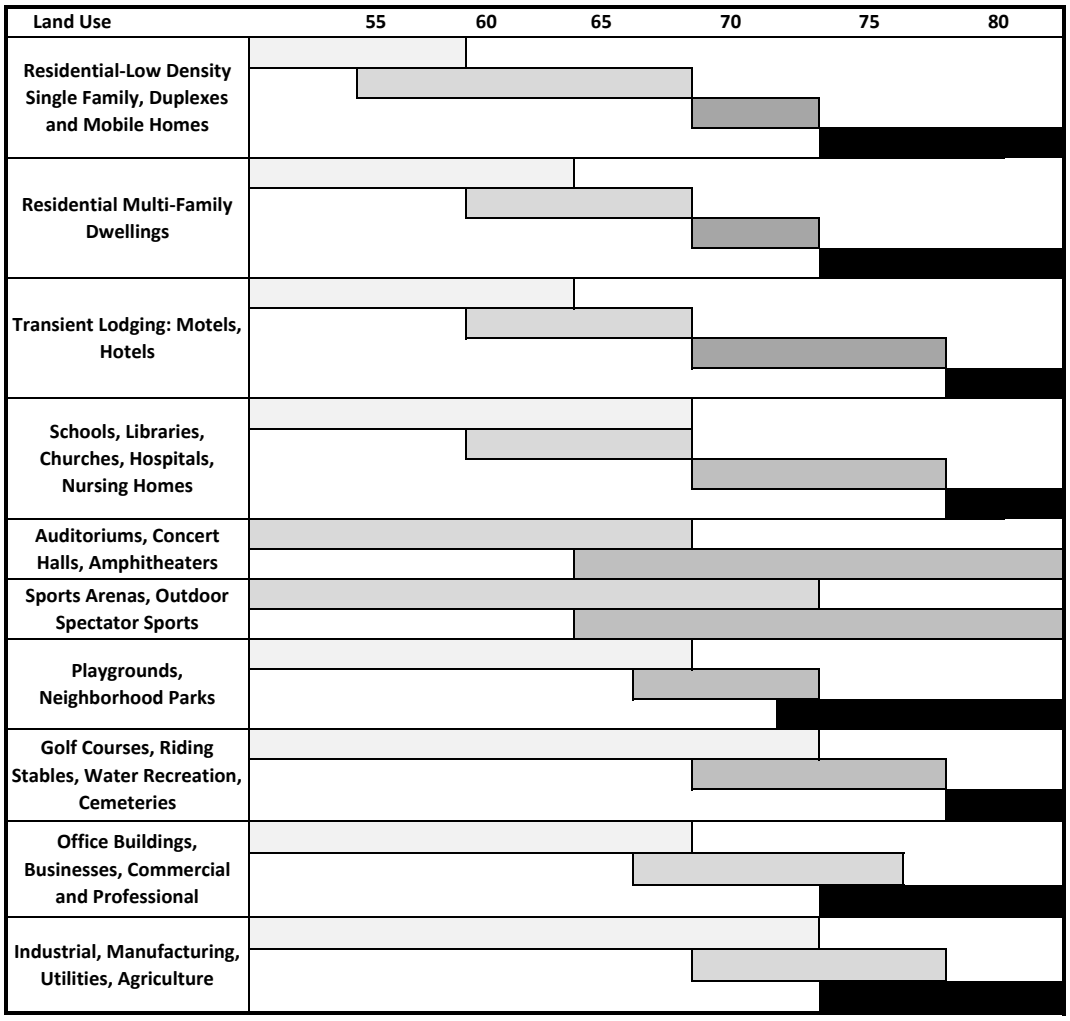
[4.] "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

[5.] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

[6.] Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

Table 4

State of California Land Use Compatibility for Community Noise Exposure[1]
(dBA CNEL or L_{dn})



Normally Acceptable: Specified land uses is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation or requirements.	**Conditionally Acceptable:** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.	**Normally Unacceptable:** New construction and development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.	**Clearly Unacceptable:** New construction or development should generally not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

[1] Source: Governor's Office of Planning and Research, October 2003. and City of Upland General Plan Noise Element, July 1992

Table 5

City of Loma Linda Noise Level Standards[1]

Land Use Category	Energy Average CNEL			
	Normally Acceptable[2]	Conditionally Acceptable[3]	Normally Unacceptable[4]	Clearly Unacceptable[5]
Residential	55	70	75	76 or more
Residential (10 PM to 7 AM)	<50	55 or more	—	—
Schools, Libraries, Churches, Hospitals, Nursing Homes	70	70	75	76 or more
Industrial, Manufacturing, Utilities, Agriculture	70	80	81 or more	—

[1] Source: Loma Linda General Plan, Chapter 7.0, Noise Element, Table 7.C: City of Loma Linda Noise Level Standards. Page 7-5.

[2] Specified land use activities that are satisfactory based upon the assumption that any land use or buildings involved are of ordinary performance standards.

[3] Activities or Actions shall be undertaken only after a detailed analysis of the noise reduction (muffling) requirements is made and noise reduction insulation features are included as a preventive measure.

[4] Noise levels exceeding the following ranges shall generally be discouraged. If new activities or actions proceed, a detailed analysis of the noise reduction requirements must be made and necessary noise insulation features included in the design.

[5] Activities shall not be undertaken or permitted.

Table 6

City of Loma Linda Municipal Ordinance Noise Performance Standards[1]

Land Use Category and Similar Land Uses	Performance Standards	L_{dn} or CNEL, dBA
Residential	Normally Acceptable	55
	Conditionally Acceptable	70
	Normally Unacceptable	75
	Clearly Unacceptable	76
Residential (evening) 10:00 PM to 7:00 AM	Normally Acceptable	<50
	Conditionally Acceptable	55 or more
Schools, Libraries, Churches, Hospitals, and Nursing Homes	Normally Acceptable	70
	Conditionally Acceptable	70
	Normally Unacceptable	80
	Clearly Unacceptable	81 or more
Industrial, Manufacturing Utilities, Agriculture	Normally Acceptable	70
	Conditionally Acceptable	80
	Normally Unacceptable	81 or more

Normally Acceptable is defined as: Specified land uses that are satisfactory based upon the assumption that any buildings involved are of normal performance standards.

Conditionally Acceptable is defined as: Activities or actions shall be undertaken only after a detailed analysis of the noise reduction (muffling) requirements is made and noise reduction insulation features are included as a preventative measure.

Normally Unacceptable is defined as: Noise levels exceeding the following ranges shall generally be discouraged. If new activities or actions proceed, a detailed analysis of the noise reduction requirements must be made and necessary noise insulation features included in the design.

Clearly Unacceptable is defined as: Activities shall not be undertaken or permitted.

[1] Source: City of Loma Linda Municipal Code Section 9.20.040.

V. Analytical Methodology and Model Parameters

A. Noise Modeling and Input

1. Federal Highway Administration (FHWA) Traffic Noise Prediction Model

Existing, Existing Plus Project and Future noise levels along acoustically significant area roadways and were modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108, as modified for CNEL and the "Calveno" energy curves. This model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for total average daily trips (ADT), roadway classification, width, speed and truck mix, roadway grade and site conditions (hard or soft ground surface). Areasadjacent to all modeled roadways were assumed to be "hard sites" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. Possible reductions in noise levels due to intervening topography and vegetation were not accounted for in the analysis.

Project traffic volumes and vehicle mix were obtained from the project's traffic study (Kunzman Associates, Inc., 2014). Existing Plus Project traffic volumes were calculated by adding the proposed project trips to existing conditions. The City of Loma Linda does not have a published truck mix or Day/Evening/Night (D/E/N) split for use in acoustical studies. For existing conditions, road segments were assigned D/E/N splits recommended by the Riverside County Department of Industrial Hygiene for noise modeling. Vehicle speed was based on the posted speed limits and/or observation. FHWA worksheets are included as Appendix B.

VI. Impact Analysis

A. Noise Impacts

This impact discussion analyzes the potential for project construction noise and operational noise to cause an exposure of persons to or generation of noise levels in excess of established City of Loma Linda noise standards or applicable standards of other agencies. Noise levels in the project area would be influenced by construction activities and from the on-going operation of the proposed project.

1. Construction Noise

The closest receptors to the project site are the multi-family attached residential dwelling units located immediately west of the project site and the multi-family attached residential dwelling units located north of the project site on the north side of Redlands Boulevard. These residential dwelling units would be impacted by short-term noise impacts associated with the proposed construction activities. These activities would include noise generated by the transport of workers and movement of construction materials to and from the project site and from demolition and ground clearing/excavation, grading, and building activities.

Construction noise varies depending on the construction process, type of equipment involved, location of the construction-site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work. Site development (fine grading, trenching, and paving), building construction, architectural coatings application, and paving associated with buildings would follow.

Site grading is expected to produce the highest construction noise levels. Grading of the site is estimated to require a grader, backhoe, dozer, excavator, and water truck. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Typical noise sources and noise levels associated with the site grading phase of construction are shown in Table 7. A worst-case construction noise scenario assuming the use of a grader, dozer, excavator and pickup truck was calculated using the Federal Highway Administration's Roadway Construction Noise Model (RCNM) (see Appendix C).

A typical construction day, eighthoursin duration would generate a noise level of 84 dBA CNEL at a distance of 50 feet from the noise source, on average. Maximum noise events could reach up to 91dBA at approximately 25 feet from the multi-family attached residential dwelling units located immediately west of the site; up to 79dBA at the single-family detached residential dwelling units located approximately north of the site and Redlands Boulevard; 56.3 dBA at Mission Elementary School; and 58.7 at the mobile home park located just east of the project site. Although these would be relatively high single noise events resulting in potential short-term intermittent

annoyances, the effect on long-term ambient noise levels would be small when averaged over a longer period of time.

The Municipal Code Section 9.20.070, Temporary Permit Procedures; Construction Noise states that the owner or operator of a noise source which violates, or potentially violates any of the provisions of this chapter may file an application with the city manager for a temporary noise waiver from the provisions of Sections 9.20.030 and 9.20.050. Specifically, Section 9.20.070 (C) states that "Developers that are involved with building construction and subdivision grading may exceed maximum noise levels between the hours of 7:00AM and 8:00PM, Monday through Friday, provided that all equipment is properly equipped with standard noise muffling apparatus specifically for such equipment (i.e., exhaust mufflers). Heavy construction is not permitted on weekends, or national holidays."

Proposed construction activities must adhere to the Municipal Ordinance which establishes allowed hours for construction activities as long as "all construction equipment shall use noise-reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

The proposed construction activities will conform to the Municipal Ordinance and the applicable measures listed and will not result in a significant impact. No mitigation is necessary.

Level of Significance Before Mitigation

Lessthan significant impact.

Mitigation Measures

No mitigation is necessary.

2. Operational Noise

Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways and from stationary noise sources associated with the proposed project. The following section provides an analysis of potential long-term off-site and on-site noise impacts associated with the ongoing operations of the proposed project.

Off-Site Noise

Existing and Existing Plus Project noise levels were modeled for each roadway segment included in the traffic study (Kunzman Associates, Inc., 2014) in order to calculate project generated increases in ambient noise levels, as well as noise levels overall with operation of the project. Noise levels were modeled using the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. Modeling output is included in this report as Appendix B.

Modeled Existing traffic noise levels range between 69.2-74.5dBA CNEL and the modeled Existing Plus Project traffic noise levels range between 69.2-74.5dBA CNEL at the nearest sensitive receptors along each road segment. In no case will project generated vehicle traffic result in increases of more than 1 dBA along affected road segments. Project generated vehicle traffic will not result in substantial increases in ambient noise levels.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

On-site Noise

Exterior noise levels of up to 55dBA CNEL are considered to be acceptable at single-family detached residential dwelling units and conditionally acceptable up to 70dBA CNEL. As mentioned previously, the City of Loma Linda General Plan Noise Element discourages new projects that have potential to create ambient noise levels more than 5 dBA above existing background noise levels at sensitive receptors. Therefore, project operational noise may result in a significant noise impact if it causes ambient noise levels to exceeds 55dBA CNEL at a sensitive receptor or if it results in an increase of 5 dBA or greater over existing ambient noise levels.

Stationary noise sources/areas include the parking lots and loading docks. SoundPLAN was used to model loading dock noise to assess potential impacts to nearby sensitive receptors. For worst-case modeling purposes, the sound power equivalent of one truck continuously traveling from Redlands Boulevard via the driveway located at the northwest corner of the site to the proposed loading docks located at the western side of the proposed building was assumed. Continuous loading and unloading activities during daytime hours were also assumed. No nighttime activities were modeled. Worst-case hourly noise levels (L_{eq} and CNEL) associated with this scenario are shown on Figures 5, 6, and 7.

As shown on Figure 5, noise levels at the nearest sensitive receptor would reach up to 52.8 L_{eq} and 49.8 CNEL. Therefore, operation of the proposed loading dock area would not cause noise levels at nearby sensitive receptors to exceed the City's noise/land uses compatibility criteria of 55 dBA CNEL.

As shown in Table 8, noise levels at the multi-family attached residential dwelling units that may be affected by loading dock are currently 49.3 dBA L_{eq}. Worst-case loading dock operation would result in an increase in ambient noise levels of 3.5 dBA L_{eq}. Although adjacent residents may be able to discern a slight increase in ambient noise levels, this increase would not exceed 5 dBA and therefore would not be considered substantial.

Other noises that may be noticeable at the multi-family attached residential dwelling units located adjacent to the western boundary of the site would include vehicles starting and stopping, occasional car alarm activationand parking lot maintenance. Landscape maintenance noise would also occur.These noise sources would range between 55 and 70 dBA at 50 feet from the noise source.

Project compliance with Section 9.20.050 of the City of Loma Linda Municipal Ordinance would lower potential parking lot noise to less than significant. This ordinance prohibits the operation of outdoor maintenance equipment (i.e., leaf blowers, lawn mowers, and gas edgers), parking lot sweepers, construction equipment, truck deliveries, and refuse collection between the hours of 10:00 PM and 7:00 AM.

Operational noise will not result in a violation of the City of Loma Linda noise standards or cause permanent substantial increases in ambient noise levels.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

No mitigation is necessary.

3. Noise Impacts to the Proposed Project

Motor Vehicle Noise

The City of Loma Linda has identified noise levels of up to 70 dBA CNEL as "normally acceptable" for a medical clinic (Section 9.20.030 of the City of Loma Linda Municipal Code); and noise levels of up to 70 dBA CNEL are considered to be normally acceptable for parks as identified in the State of California Community Noise Exposure Table (see Table 4).

Future traffic noise levels associated with Redlands Boulevard were modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. FHWA worksheets are located in Appendix B. Future noise levels associated with Redlands Boulevard are expected to reach up 70dBA CNEL at a distance of 75 feet from the centerline of Redlands Boulevard.Noise associated with Redlands Boulevard buildout traffic would not exceed City of Redlands standards at the proposed health care building. Noise levels at the portion of the proposed promenade located adjacent to Redlands Boulevard will exceed 70 dBA CNEL under buildout traffic conditions. This is considered acceptable along the road because the promenade is being constructed in place of a sidewalk which would have been immediately adjacent to Redlands Boulevard. The proposed project is compliance with the City and State standards for hospital and park land uses.

Aircraft Noise

The nearest airport to the project site is the San Bernardino International Airport, located approximately two miles to the north of the proposed project. The project site falls well outside the 65 dBA noise contour for this airport (City of San Bernardino 2005). Aircraft noise associated with the San Bernardino International Airport is not considered to be a source that contributes to the ambient noise levels on the project site. The proposed project would not expose persons residing or working within the area to excessive noise levels from aircraft.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

B. Vibration Impacts

This impact discussion analyzes the potential for the proposed project to cause an exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration levels in the project area may be influenced by construction activities and from the ongoing operations of the proposed project.

A vibration impact would generally be considered significant if it involves any construction-related or operations-related impacts in excess of 0.05 inches per second RMS vertical velocity at nearby sensitive receptors (0.035 inches per second is considered barely perceptible). The construction and operations-related vibration impacts have been analyzed separately below.

1. Construction Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction-site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table 9 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

A vibration impact would be generally considered significant if it involves any construction-related or operations-related impacts in excess of 0.05 inches per second RMS vertical velocity at nearby sensitive receptors (0.035 inches per second is considered barely perceptible).

Construction activities can produce vibration that may be felt by adjacent uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. Although the primary sources of vibration during construction would be from bulldozers, vibratory rollers and other vibratory equipment could be used during installation of pavement over the entire site. As shown in Table 9, a vibratory roller could produce up to a PPV of up to 0.21 inch per second at 25 feet.

The closest receptor to the project site include is a multi-family attached residential dwelling unit located approximately 10 feet from the western edge of the proposed project's boundary. It is anticipated that a bulldozer could be used at a distance of 25 feet from the western property line and vibratory equipment could be utilized at the property line, resulting in groundborne vibration levels of up to 0.29 PPVfor short periods of time at the adjacent single-family detached residential dwelling unit. The Transportation and Construction Induced Guidance Manual prepared for Caltrans (Jones & Stokes 2004) identifies 0.3 PPV as the threshold for potential structural damage to older residential structures. The proposed project will not result in building damage.

2. Operational Vibration

A few heavy trucks can be expected to visit the project site to deliver supplies on a regular basis. These trucks would not be anticipated to exceed 0.10 in/sec peak particle velocity (ppv) at 10 feet (Caltrans 2002). Predicted operational related vibration levels at the nearest off-site structures, which are located in excess of 25 feet from the traveled roadway segments, would not be anticipated to exceed even the most conservative threshold of 0.2 inch/second ppv.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Table 7

Typical Construction Equipment Noise Levels[1]

Type of Equipment	Range of Maximum Sound Levels Measured (dBA at 50 ft.)	Suggested Maximum Sound Levels for Analysis (dBA at 50 ft.)
Rock Drills	83-99	96
Jack Hammers	75-85	82
Pneumatic Tools	78-88	85
Pumps	74-84	80
Dozers	77-90	85
Scrapers	83-91	87
Haul Trucks	83-94	88
Cranes	79-86	82
Portable Generators	71-87	80
Rollers	75-82	80
Tractors	77-82	80
Front-End Loaders	77-90	86
Hydraulic Backhoe	81-90	86
Hydraulic Excavators	81-90	86
Graders	79-89	86
Air Compressors	76-89	86
Trucks	81-87	86

[1] Source: Bolt, Beranek & Newman; Noise Control for Buildings and Manufacturing Plants, 1987.

Table 8

Comparison of Existing and Existing Plus Project Traffic Noise Levels[1]

Roadway	Segment	Modeled Noise Levels (dBA CNEL) @ 50 ft from the Centerline		
		Existing	Existing Plus Project	% Increase
Redlands Boulevard	Site to California Street	69.66	69.83	0.17
	California Street to Alabama Street	70.95	70.98	0.03
	East of Alabama Street	70.44	70.46	0.02
	Site to Mountain View Avenue	69.46	69.86	0.40
	Mountain View Avenue to Tippecanoe Avenue	70.21	70.34	0.13
	West of Tippecanoe Avenue	70.27	70.29	0.02
Barton Road	Mountain View to Loma Linda Drive	73.15	73.21	0.06
	Loma Linda Drive to Anderson Street	72.44	72.47	0.03
	West of Anderson Street	72.50	72.52	0.02
Anderson Street	Barton Road to Relands Boulevard	70.85	70.89	0.04
Tippecanoe Avenue	North of Redlands Boulevard	74.46	74.46	0.00
Mountain View Avenue	South of Barton Road	69.19	69.19	0.00
	Barton Road to Redlands Boulevard	72.46	72.53	0.07
	Redlands Boulevard to I-10 Freeway	72.24	72.31	0.07
California Street	South of Redlands Boulevard	69.46	69.48	0.02
Alabama Street	North of Redlands Boulevard	72.91	72.97	0.06

[1] It is important to understand that the above traffic noise levels only represent traffic noise on each particular road segment and not overall ambient noise.

Table 9

Vibration Source Levels for Construction Equipment[1]

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level LV (dVB) at 25 feet
Pile driver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

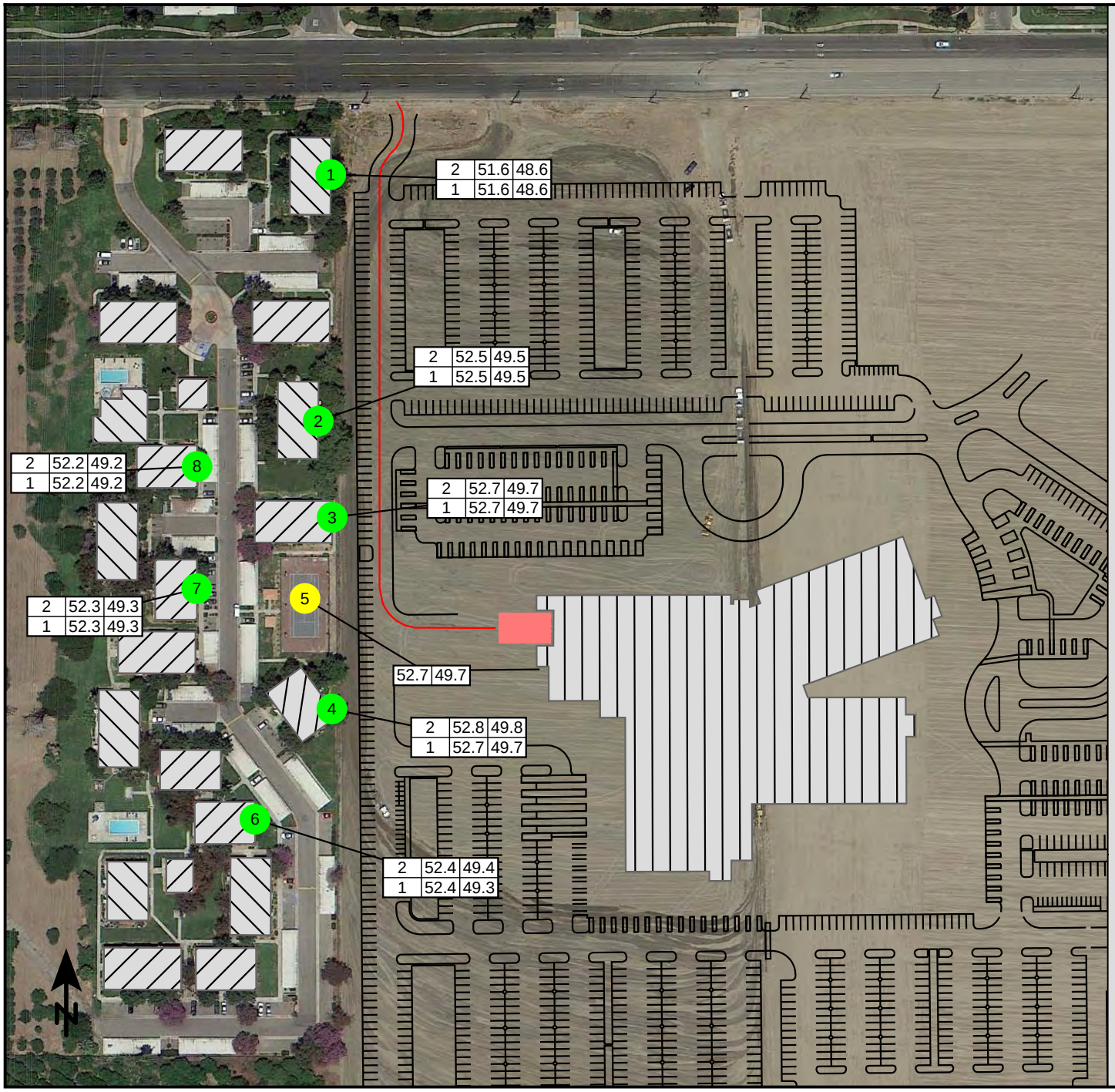


Figure 5

Operational Noise Levels

Signs and symbols

- Receiver
- Receiver at building
- Truck Path
- Truck Docks
- Leq, CNEL by floor

1 : 2218

0 10 20 40 60 80 m

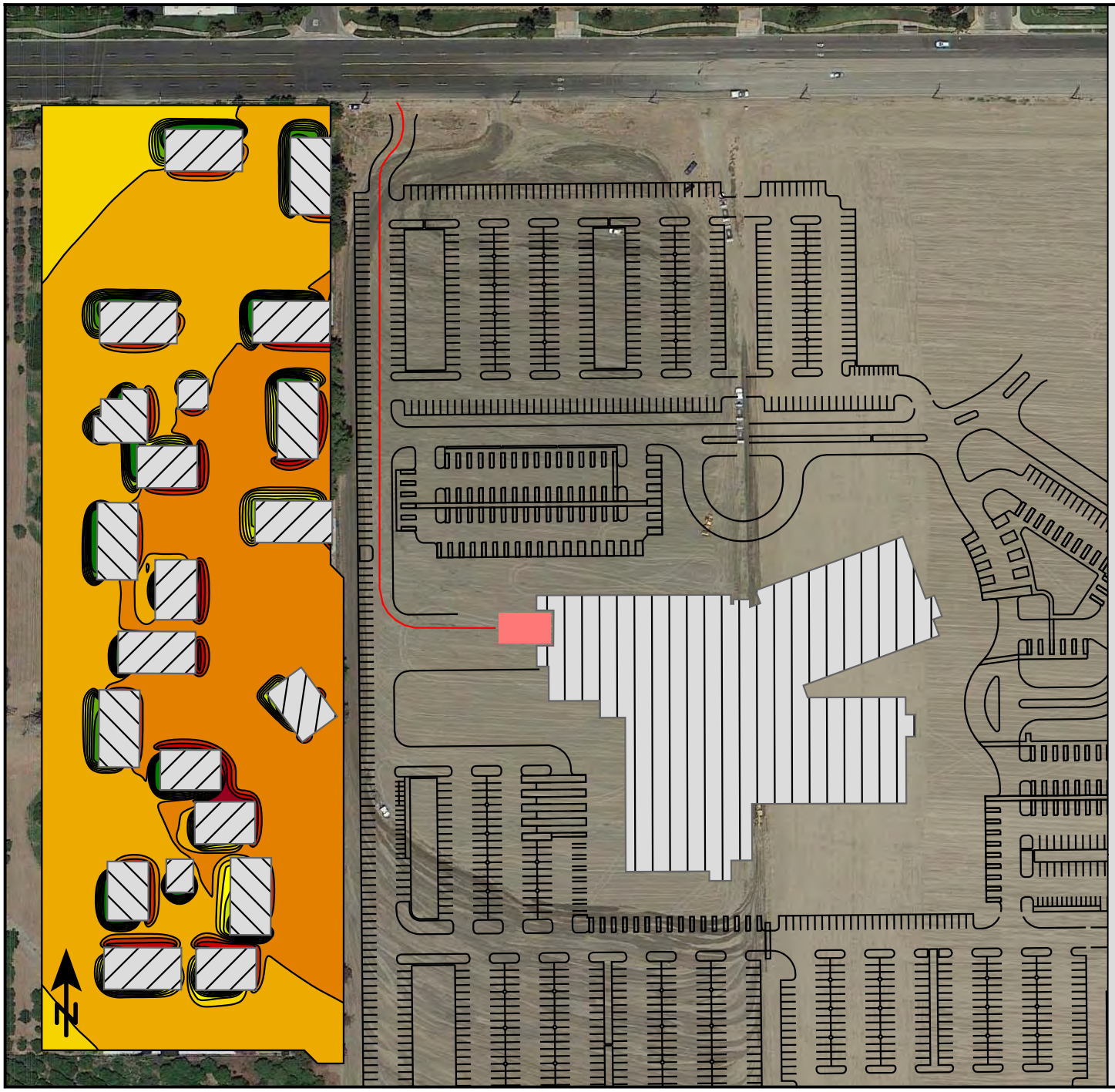


Figure 6

Operational Noise Level Contours (Leq)

Signs and symbols

Truck Path

Truck Docks

Levels in dB(A)

<= 45
45 - 46
46 - 47
47 - 48
48 - 49
49 - 50
50 - 51
51 - 52
52 - 53
53 - 54
54 - 55
55 - 56
56 - 57
> 57

1 : 2218

0 10 20 40 60 80 m

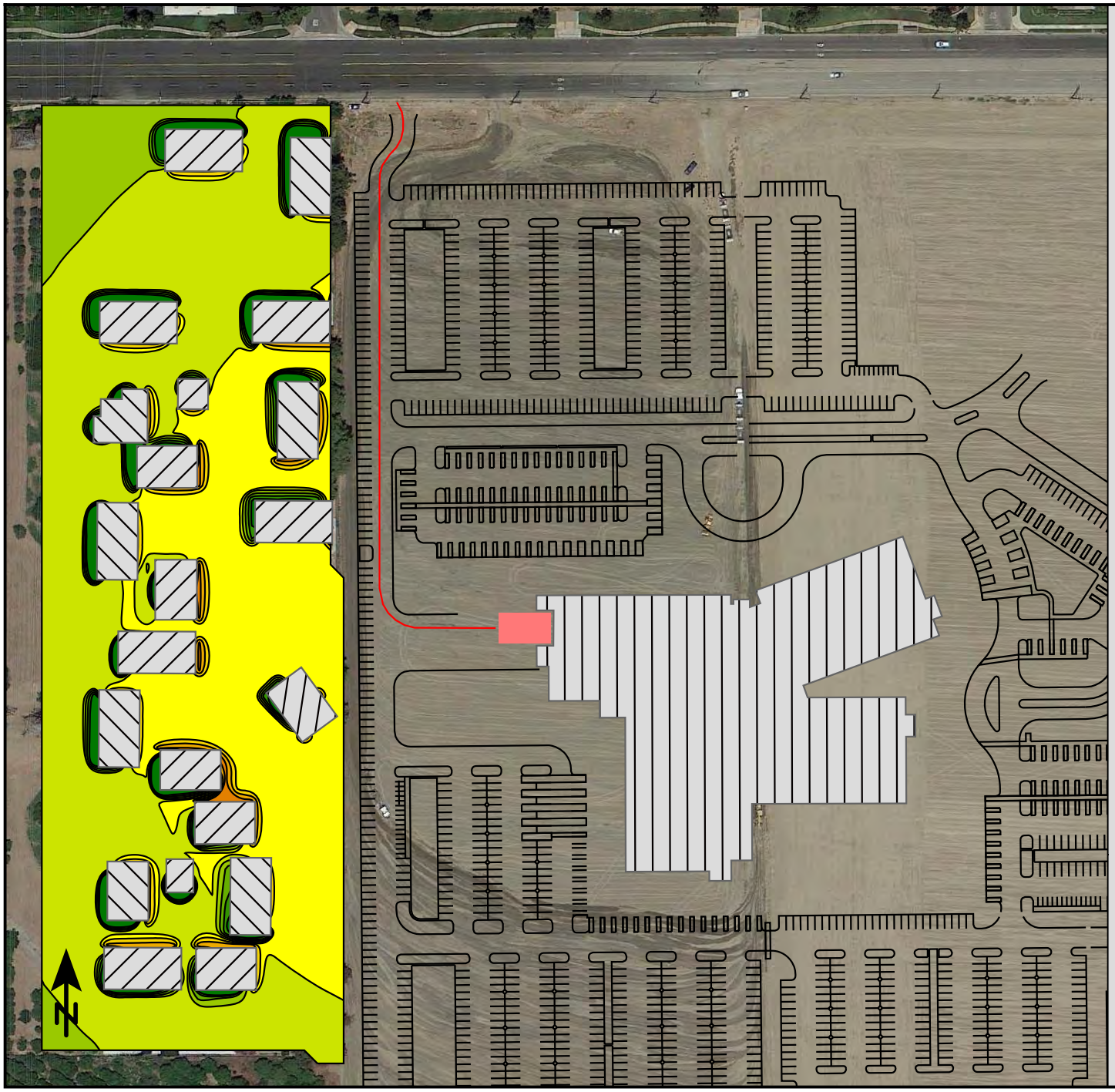


Figure 7

Operational Noise
Level Contours (CNEL)

Signs and symbols

Truck Path

Truck Docks

Levels in dB(A)

<= 45
45 - 46
46 - 47
47 - 48
48 - 49
49 - 50
50 - 51
51 - 52
52 - 53
53 - 54
54 - 55
55 - 56
56 - 57
> 57

1 : 2218

0 10 20 40 60 80 m

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Appendices

Appendix A – Larson Davis Model 820-SLM Output

Appendix B – FHWA-RD-77-108 Model Output

Appendix C – RCNM Noise Modeling Output

APPENDIX G

TRAFFIC

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KUNZMAN ASSOCIATES, INC.

VA HEALTH CARE MEDICAL CLINIC

TRAFFIC IMPACT ANALYSIS

February 28, 2014

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

KUNZMAN ASSOCIATES, INC.

VA HEALTH CARE MEDICAL CLINIC

TRAFFIC IMPACT ANALYSIS

February 28, 2014

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APPENDICES

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Appendix B – Traffic Count Worksheets

Appendix C – Future Growth Increment Calculation Worksheets

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I. Introduction

The purpose of this report is to provide an assessment of the traffic impacts resulting from the development of the proposed VA Health Care Medical Clinic project and to identify the traffic mitigation measures necessary to maintain the established level of service standard for the elements of the impacted roadway system. The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act.

The City of Loma Linda is the lead agency responsible for preparation of the traffic impact analysis, in accordance with California Environmental Quality Act authorizing legislation. This report analyzes traffic impacts for the anticipated opening date with partial occupancy of the development in Opening Year 2016, at which time it will be generating traffic at its full potential, and for the current traffic forecast year, which is the Year 2035.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided in Appendix A.

A. Project Description

The proposed development is located south of Redlands Boulevard between Enterprise Drive and Bryn Mawr Avenue in the City of Loma Linda. A vicinity map showing the project location is provided on Figure 1.

The approximately 36.86 acre project site is proposed to be developed with a medical clinic with 500 employees and 5.17 acre park. The project will have access to Redlands Boulevard and the extension of Bryn Mawr Avenue. Figure 2 illustrates the project site plan.

B. Study Area

Regional access to the project site is provided by the I-10 Freeway. Local access is provided by various roadways in the vicinity of the site. The north-south roadways which will be most affected by the project include Tippecanoe Avenue, Anderson Street, Poplar Street, Richardson Street, Benton Street, Loma Linda Drive, Enterprise Drive, Bryn Mawr Avenue, California Avenue, and Alabama Street. The east-west roadways expected to provide local access include Business Center Drive, Redlands Boulevard, Mission Road, Van Leuven Street, and Barton Road.

A series of scoping discussions were conducted with the City of Loma Linda to define the desired analysis locations for each future analysis year. In addition, the San Bernardino Associated Governments staff has also been contacted to discuss the project and its associated travel patterns.

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the

two-way traffic volumes on the roadway segments near the project site. All arterial segments are required to be included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways.

The project does not contribute trips greater than the freeway threshold volume of 100 two-way peak hour trips to the I-10 Freeway. The project does contribute trips greater than the arterial link threshold volume of 50 two-way trips in the peak hours on facilities serving intersections outside of the adjacent City of Redlands. This means that the City of Loma Linda must notify the City of Redlands and California Department of Transportation. Each of these agencies must also be provided with a copy of the traffic impact analysis, once the document is accepted by the City of Loma Linda. (Note: The purpose of this notification is to allow the California Department of Transportation to identify opportunities to make improvements to intersections concurrent with adjacent development, at considerably less cost and disruption than would occur if it were done after-the-fact).

C. Analysis Methodology

The analysis of the traffic impacts from the proposed development and the assessment of the required mitigation measures were based on an evaluation of the existing and forecast traffic conditions in the vicinity of the site with and without the project. The following analysis years are considered in this report:

- Existing Conditions (2014)
- Existing Plus Project Conditions
- Project Opening Year Conditions (2016)
- Horizon Year Conditions (2035)

Existing intersections traffic conditions were established through morning and evening peak hour traffic counts obtained by Kunzman Associates, Inc. from April/June/July/August/September/October 2013 and February 2014 (see Appendix B). In addition, truck classification counts were conducted at the study area intersections. The existing percent of trucks was used in the conversion of trucks to Passenger Car Equivalent's (see Appendix C).

Project traffic volumes for all future projections were estimated using the manual approach. Trip generation has been based upon rates obtained from the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012 and San Diego Association of Governments, Traffic Generators, April 2002.

The average daily traffic volume forecasts have been determined using the growth increment approach on the SBTAM traffic model Year 2008 and Year 2035 average daily traffic volume forecasts (see Appendix C). Traffic model plots are included in Appendix D. This difference defines the growth in traffic over the 27 year period. The incremental growth in average daily traffic volume has been factored to reflect the forecast growth between Year 2014 and Year 2035. For this purpose, linear growth between the Year 2008 base condition and the forecast Year 2035 condition was assumed. Since the increment between Year 2014 and Year 2035 is 21 years of the 27 year time frame, a factor of 0.78 (i.e., 21/27) was used.

The Year 2035 without project daily and peak hour directional roadway segment volume forecasts have been determined using the growth increment approach on the SBTAM traffic model Year 2008 and Year 2035 peak hour volumes. The growth increment calculation worksheets are shown in Appendix C. Current peak hour intersection approach/departure data is a necessary input to this approach. The existing traffic count data serves as both the starting point for the refinement process, and also provides important insight into current travel patterns and the relationship between peak hour and daily traffic conditions. The initial turning movement proportions are estimated based upon the relationship of each approach leg's forecast traffic volume to the other legs forecast volumes at the intersection. The initial estimate of turning movement proportions is then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program Report 255. A linear programming algorithm is used to calculate individual turning movements that match the known directional roadway segment volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The Opening Year (2016) traffic volumes have been interpolated from the Year 2035 traffic volumes based upon a portion of the future growth increment.

Project traffic volumes were then added to the Year 2035 SBTAM traffic model volumes. Quality control checks and forecast adjustments were performed as necessary to ensure that all future traffic volume forecasts reflect a minimum of 10% growth over existing traffic volumes. The result of this traffic forecasting procedure is a series of traffic volumes suitable for traffic operations analysis.

The technique used to assess the capacity needs of an intersection is known as the Intersection Delay Method (see Appendix E) based on the Highway Capacity Manual – Transportation Research Board Special Report 209. To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection. A signalized intersection is considered deficient (Level of Service F) if the overall intersection critical volume to capacity ratio equals or exceeds 1.0, even if the Levels of Service defined by the delay value is below the defined Level of Service standard. The volume to capacity ratio is defined as the critical volumes divided by the intersection capacity. A volume to capacity ratio greater than 1.0 implies an infinite queue.

The Level of Service analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of two seconds per phase. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossings has also been considered in the signalized intersection analysis. The following formula has been used to calculate the pedestrian minimum times for all Highway Capacity Manual runs:

(Curb to curb distance) / (4 feet/second) + 7 seconds.

For existing/existing plus project/Opening Year traffic conditions, saturation flow rates of 1,800 vehicles per hour of green for through and right turn lanes and 1,700 vehicles per lane for single left turn lanes, 1,600 vehicles per lane for dual left turn lanes and 1,500 vehicles per lane for triple left turn lanes have been assumed for the capacity analysis.

For Year 2035 traffic conditions, saturation flow rates of 1,900 vehicles per hour of green for through and right turn lanes and 1,800 vehicles per lane for single left turn lanes, 1,700 vehicles per lane for dual left turn lanes and 1,800 vehicles per lane for double right turn lanes have been assumed for the capacity analysis.

The peak hour traffic volumes have been adjusted to peak 15 minute volumes for analysis purposes using the existing observed peak 15 minute to peak hour factors for all scenarios analyzed. Where feasible improvements in accordance with the local jurisdiction's General Plan and which result in acceptable operations cannot be identified, the Year 2035 peak hour factor has been adjusted upwards to 0.95. This is to account for the effects of congestion on peak spreading. Peak spreading refers to the tendency of traffic to spread more evenly across time as congestion increases.

The traffic mitigation needs anticipated at the time of the project opening with full occupancy and for the Year 2035 were combined into a summary of mitigation requirements and costs. The mitigation cost responsibility for the proposed development was estimated based on the percent of the increase in traffic from the existing condition to the Year 2035 that was attributed to the project-generated traffic.

D. Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the City of Loma Linda requirements.

1. Definition of Deficiency

The definition of an intersection deficiency has been obtained from the City of Loma Linda General Plan and Measure V. The General Plan and Measure V state that peak hour intersection operations of Level of Service C or better are generally acceptable. To assure the adequacy of various public services and prevent degradation of the quality of life experienced by the residents of Loma Linda, all new development projects shall assure by implementation of appropriate mitigation measures that, at a minimum, traffic Levels of Service are maintained at a minimum of Level of Service C throughout the City, except where the current Level of Service is lower than Level of Service C. In any location where the Level of Service is below Level of Service C at the time an application for a development project is submitted, mitigation measures shall be imposed on that development project to assure, at a minimum, that the level of traffic service is maintained at Levels of Service that are no worse than those existing at the time an application for development is filed. In any location where the Level of Service is F at the time an application for a development project is submitted, mitigation measures shall be imposed on that development project to assure, at a minimum, that the volume to capacity ratio is maintained at a volume to capacity ratio that is no worse than that existing at the time an application for development is filed. Projects where sufficient mitigation to achieve the above stated objectives is infeasible shall not be approved unless and until the necessary mitigation measures are identified and implemented.

For freeway facilities, the Congestion Management Program controls the definition of deficiency for purposes of this study. The Congestion Management Program definition of deficiency is based on maintaining a Level of Service standard of Level of Service E or better, except where an existing Level of Service F condition is identified in the Congestion Management Program document (San Bernardino County Congestion Management Program Table 2-1). A Congestion Management Program deficiency is, therefore, defined as any freeway segment operating or projected to operate at Level of Service F, unless the segment is identified explicitly in the Congestion Management Program document.

The identification of a Congestion Management Program deficiency requires further analysis in satisfaction of Congestion Management Program requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level with respect to Congestion Management Program Level of Service standards.

- Calculation of the project share of new traffic on the impacted Congestion Management Program facility during peak hours of traffic.

- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable Level of Service as described above.

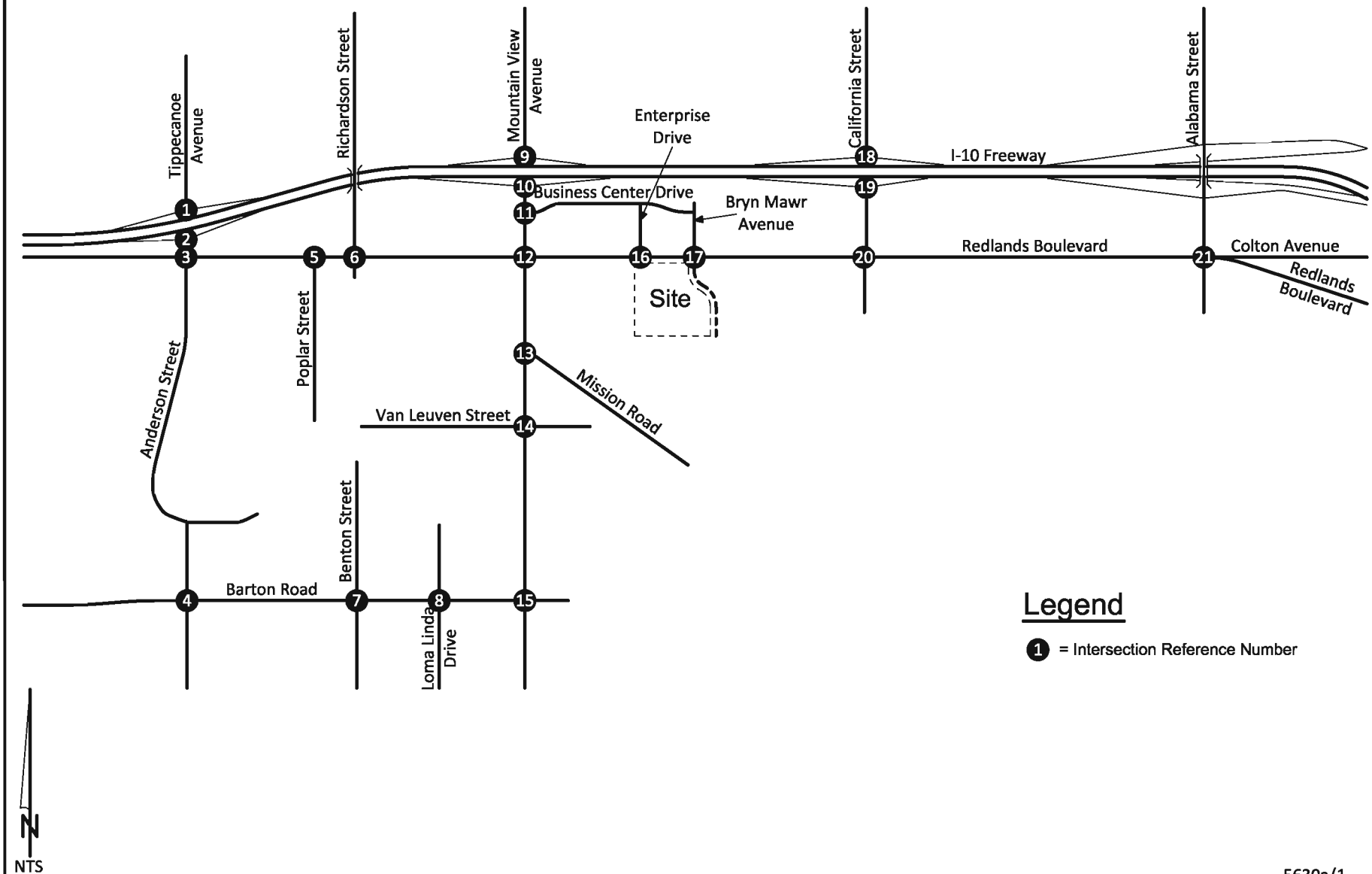
This study incorporates each of these aspects for all locations where a Congestion Management Program deficiency is identified.

2. Definition of Significant Impact

The identification of significant impacts is a requirement of the California Environmental Quality Act. The City of Loma Linda General Plan and Circulation Element have been adopted in accordance with California Environmental Quality Act requirements, and any roadway improvements within the City of Loma Linda that are consistent with these documents are not considered a significant impact, so long as the project contributes its “fair share” funding for improvements.

A traffic impact is considered significant if the project both: i) contributes measurable traffic to and ii) substantially and adversely changes the Level of Service at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the City of Loma Linda General Plan cannot be constructed.

Figure 1
Project Location Map



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KUNZMAN ASSOCIATES, INC.
OVER 35 YEARS OF EXCELLENT SERVICE

Figure 2
Site Plan

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OVER 35 YEARS OF EXCELLENT SERVICE

II. Existing Conditions

A. Existing Roadway System

Figure 3 identifies the existing conditions for the study area roadways. The number of through lanes for existing roadways and the existing intersection controls are identified.

Regional access to the project site is provided by the I-10 Freeway. Local access is provided by various roadways in the vicinity of the site. The north-south roadways which will be most affected by the project include Tippecanoe Avenue, Anderson Street, Poplar Street, Richardson Street, Benton Street, Loma Linda Drive, Enterprise Drive, Bryn Mawr Avenue, California Avenue, and Alabama Street. The east-west roadways expected to provide local access include Business Center Drive, Redlands Boulevard, Mission Road, Van Leuven Street, and Barton Road.

B. Existing Volumes

Figure 4 depicts the existing average daily traffic volumes. The existing average daily traffic volumes were factored from peak hour counts (see Appendix B) obtained by Kunzman Associates, Inc. using the following formula for each intersection leg:

PM Peak Hour (Approach + Exit Volume) x 11.5 = Daily Leg Volume.

This is a conservative estimate and may over estimate the average daily traffic volumes.

Existing intersection traffic conditions were established through morning and evening peak hour traffic counts obtained by Kunzman Associates, Inc. from April/June/July/August/September/October 2013 and February 2014 (see Appendix B) and shown on Figures 5 and 6, respectively. Explicit peak hour factors have been calculated using the data collected for this effort as well. The morning and evening peak hour traffic volumes were identified by counting the two-hour periods from 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM.

C. Existing Level of Service

The existing delay and Level of Service for the intersections in the vicinity of the project are shown in Table 1. The study area intersections currently operate at Level of Service C or better during the peak hours for existing traffic conditions, except for the following study area intersections that are currently operating at Level of Service D/E during the peak hours:

Anderson Street (NS) at:
- Redlands Boulevard (EW) - #3
- Barton Road (EW) - #4

Mountain View Avenue (NS) at:
Barton Road (EW) - #15

California Street (NS) at:
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

Existing delay worksheets are provided in Appendix E.

D. Planned Transportation Improvements and Relationship to General Plan

The City of Loma Linda General Plan Circulation Element is shown on Figure 7. Existing and future roadways are included in the Circulation Element of the General Plan and are graphically depicted on Figure 7. This figure shows the nature and extent of arterial highways that are needed to adequately serve the ultimate development depicted by the Land Use Element of the General Plan. The City of Loma Linda General Plan roadway cross-sections are illustrated on Figure 8.

Table 1

Existing Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tippecanoe Avenue/Anderson Street (NS) at:															
I-10 Freeway WB Ramps (EW) - #1	TS	1	2	0	0	2.5	1.5	0	0	0	1.3	0.3	1.3	20.1-C	17.2-B
I-10 Freeway EB Ramps (EW) - #2	TS	0	2.5	0.5	1	2	0	1.5	0.5	2	0	0	0	14.7-B	20.1-C
Anderson Street (NS) at:															
Redlands Boulevard (EW) - #3	TS	1	1.5	0.5	1	1.5	0.5	1	2	d	1	2	d	27.1-C	36.0-D
Barton Road (EW) - #4	TS	1	0.5	0.5	1	1	1	2	2	1	1	2	1	33.9-C	35.2-D
Poplar Street (NS) at:															
Redlands Boulevard (EW) - #5	TS	0.5	0	0.5	0	0	0	0	2	d	1	2	0	12.4-B	12.0-B
Richardson Street (NS) at:															
Redlands Boulevard (EW) - #6	TS	0	1	0	0.5	0.5	1	1	2	d	1	2	d	16.0-B	17.1-B
Benton Street (NS) at:															
Barton Road (EW) - #7	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	20.7-C	19.9-B
Loma Linda Drive (NS) at:															
Barton Road (EW) - #8	TS	1	1	1	1	1	1	1	2	1	1	2	1	21.8-C	21.6-C
Mountain View Avenue (NS) at:															
I-10 Freeway WB Ramps (EW) - #9	TS	1.5	1.5	0	0	1.5	0.5	0	0	0	1	0.5	0.5	24.0-C	18.9-B
I-10 Freeway EB Ramps (EW) - #10	TS	0	1.5	0.5	1	2	0	0.5	0.5	1	0	0	0	24.9-C	24.8-C
Business Center Drive (EW) - #11	TS	0	2.5	0.5	1	2	0	0	0	0	1	0	d	14.7-B	13.2-B
Redlands Boulevard (EW) - #12	TS	1	1.5	0.5	2	2	1	1	2	d	1	2	d	26.8-C	27.9-C
Mission Road (EW) - #13	TS	0	2.5	0.5	1	2	0	0	0	0	0.5	0	0.5	12.0-B	13.3-B
Van Leuven Street (EW) - #14	TS	1	1.5	0.5	1	2	1	0	1	0	1	0.5	0.5	23.8-C	19.4-B
Barton Road (EW) - #15	TS	1	1.5	0.5	1	1.5	0.5	2	2	1	1	2	1	41.9-D	42.8-D
Enterprise Drive (NS) at:															
Redlands Boulevard (EW) - #16	CSS	0	0	0	0.5	0	0.5	1	2	0	0	2	d	13.6-B	13.9-B
Bryn Mawr Avenue (NS) at:															
Redlands Boulevard (EW) - #17	CSS	0	0	0	0.5	0	0.5	1	2	0	0	2	d	16.5-C	16.9-C
California Street (NS) at:															
I-10 Freeway WB Ramps (EW) - #18	TS	1	2	0	0	3	1	0	0	0	0.5	0.5	1	17.9-B	30.8-C
I-10 Freeway EB Ramps (EW) - #19	TS	0	3	1	1	2	0	0.5	0.5	d	0	0	0	14.9-B	49.3-D
Redlands Boulevard (EW) - #20	TS	0	1	0	1	0.5	0.5	1	1.5	0.5	1	2	1>	79.2-E	50.4-D
Alabama Street (NS) at:															
Redlands Boulevard (EW) - #21	TS	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	2	d	35.2-D	40.9-D

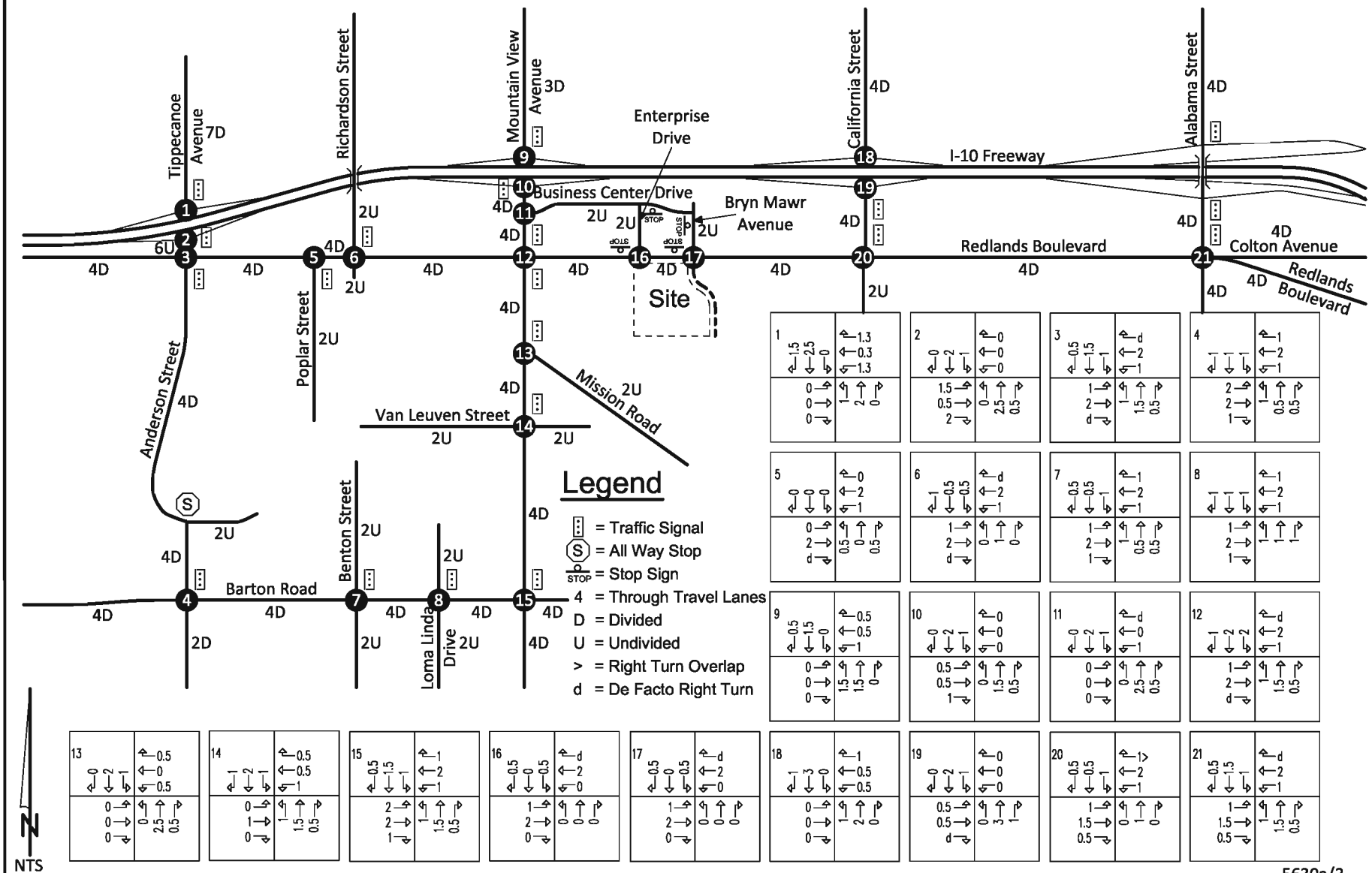
[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right Turn Overlap; d = De Facto Right Turn Lane

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

Figure 3
Existing Through Travel Lanes and Intersection Controls



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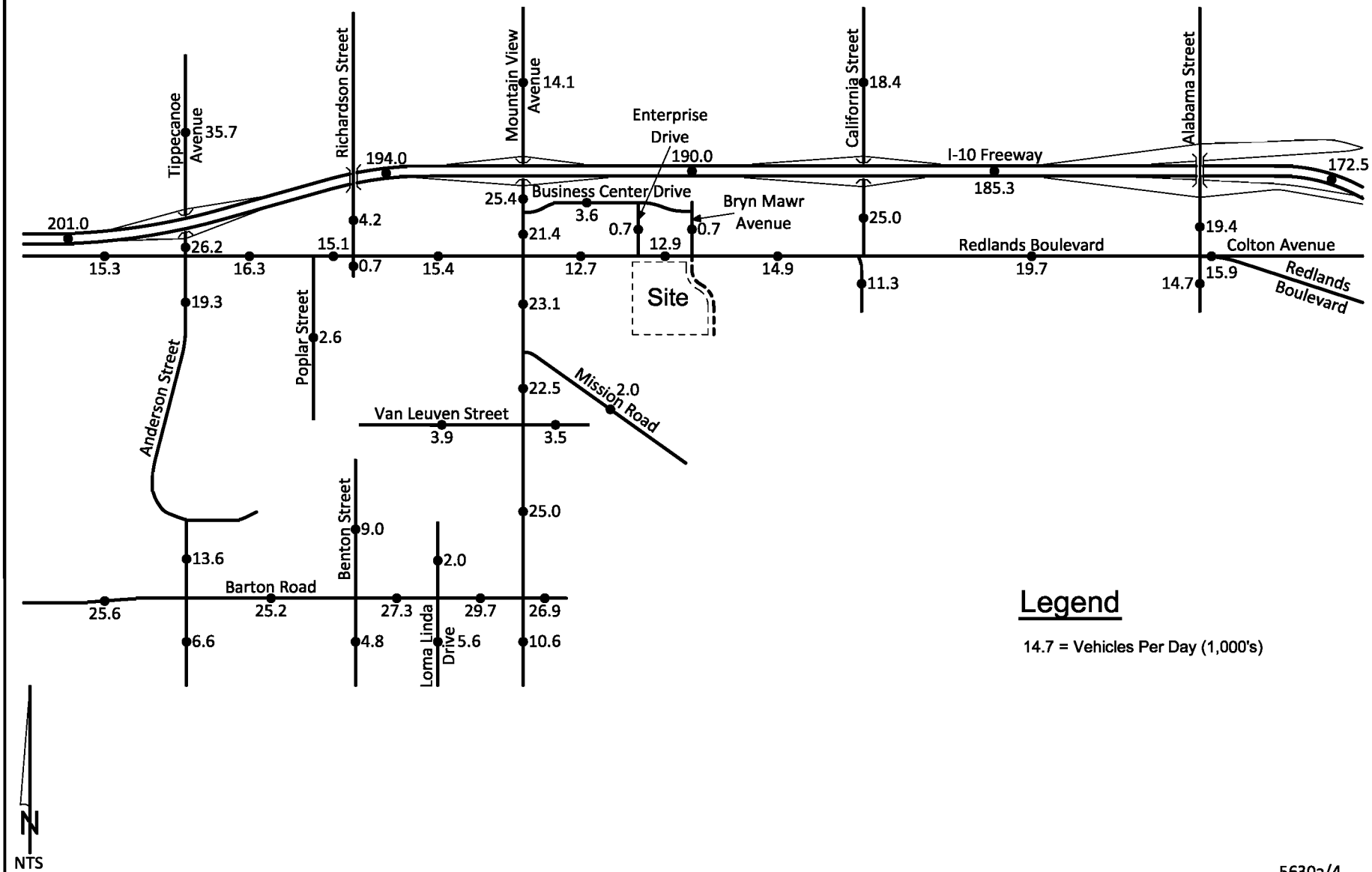
KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 4
Existing Average Daily Traffic Volumes

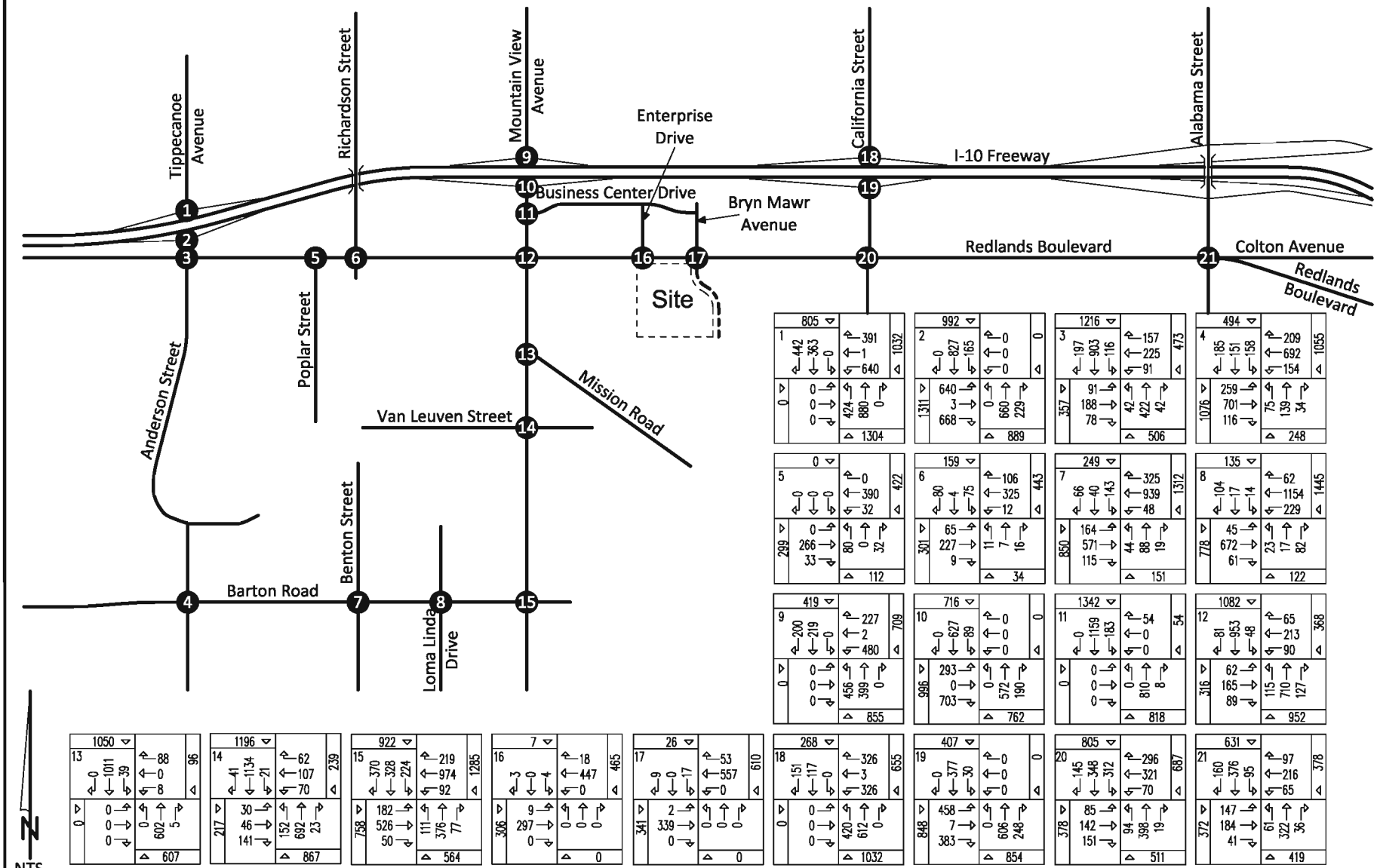


KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

5630a/4

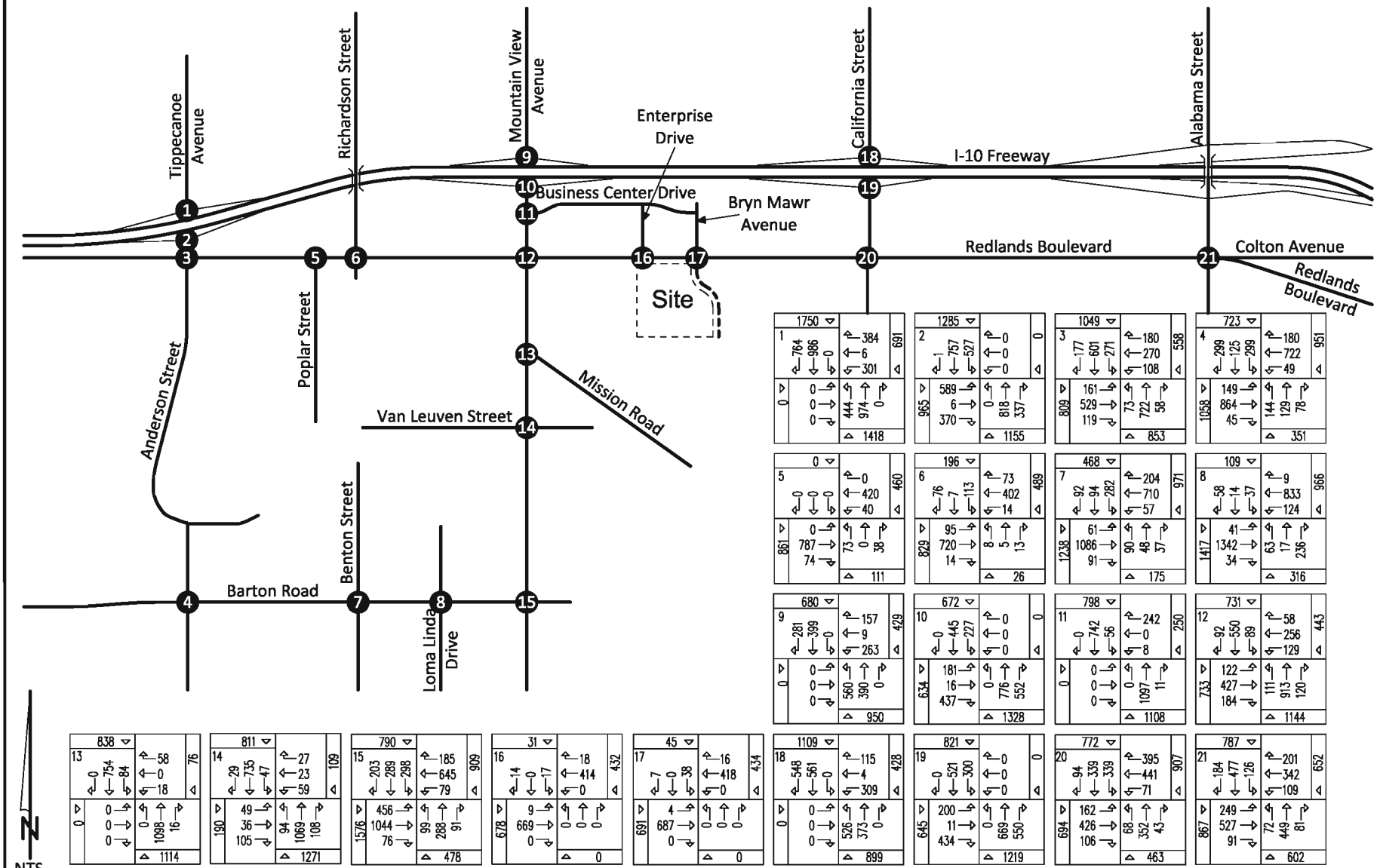
Figure 5
Existing Morning Peak Hour Intersection Turning Movement Volumes



KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 6
Existing Evening Peak Hour Intersection Turning Movement Volumes

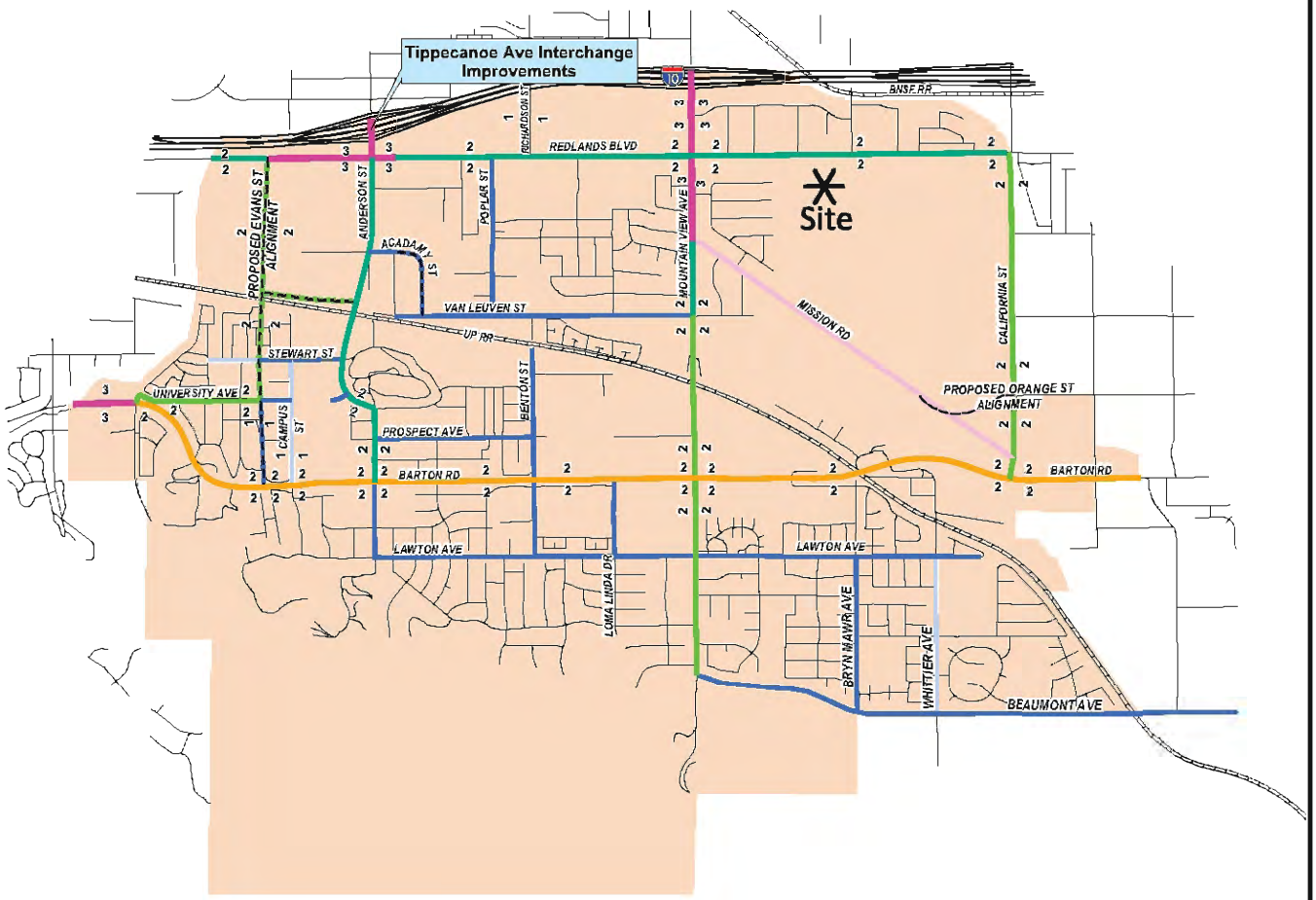


KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

5630a/6

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 7
City of Loma Linda General Plan Circulation Element



Legend

- FUTURE ROADWAY
- 2-LANE UNDIVIDED LOCAL STREET
- 2-LANE UNDIVIDED ROADWAY
- 2-LANE DIVIDED ROADWAY
- 4-LANE UNDIVIDED ROADWAY
- 4-LANE DIVIDED ROADWAY
- MODIFIED 4-LANE UNDIVIDED ROADWAY
- 6-LANE UNDIVIDED ROADWAY
- 6-LANE DIVIDED ROADWAY

JURISDICTIONAL AND INFRASTRUCTURE

- SPHERE OF INFLUENCE
- CITY LIMIT
- FREEWAY
- RAILROAD

N

NTS

Source: City of Loma Linda

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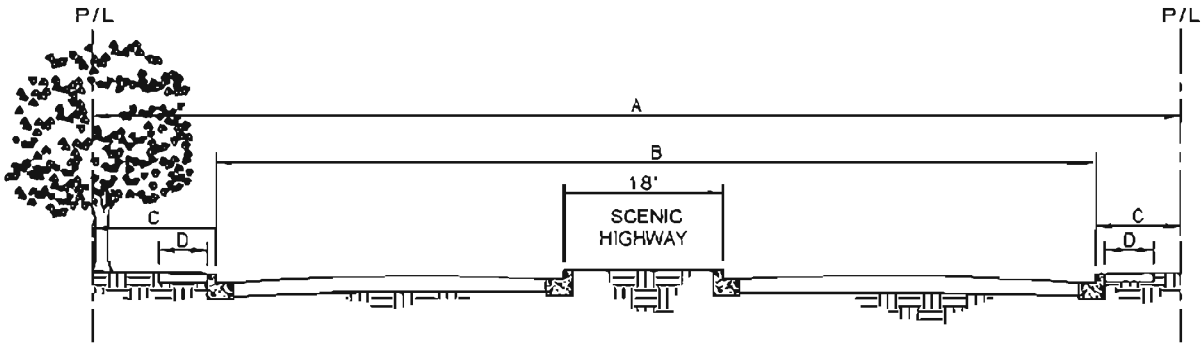
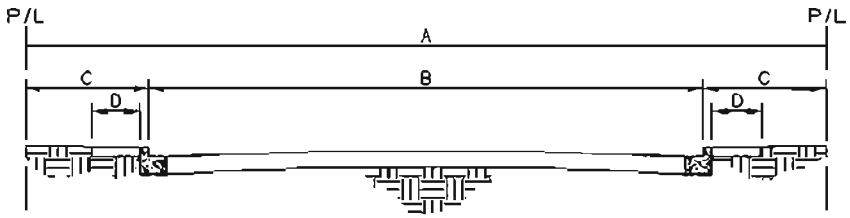
KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 8
City of Loma Linda General Plan Roadway Cross-Sections



MAJOR ARTERIAL SECTION



STANDARD SECTION

	DIMENSIONS				MIN. PAVING	
STREET-TYPE	A	B	C	D*	T.I.	AC"/CAB"
LOCAL	60'	36'	12'	5'	6	3.5"/6"
COLLECTOR	64'	40'	12'	5'	6	3.5"/6"
COLLECTOR (SPECIAL)	66'	44'	11'	5'	7	4/6
SECONDARY HIGHWAY	88'	64'	12'	5'	8	4/7
MAJOR HIGHWAY	100'	72'	14'	5'	9	5/8
SCENIC HIGHWAY	120'	94'	13'	5'	9	5/8

*SIDEWALK EXTENDS TO PROPERTY LINE IN COMMERCIAL ZONE

Source: City of Loma Linda

5630a/8

III. Project Traffic

A. Project Description

The approximately 36.86 acre project site is proposed to be developed with a medical clinic with 500 employees and 5.17 acre park. The project will have access to Redlands Boulevard and the extension of Bryn Mawr Avenue.

B. Trip Generation

The trips generated by the project are determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are based on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and life styles remain similar to what are known today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic and morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land uses. By multiplying the trip generation rates by the land use quantities, the traffic volumes are determined. Table 2 shows the project trip generation based upon rates obtained from the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.

As shown in Table 2, the proposed development is projected to generate a total of approximately 4,031 daily vehicle trips, 414 of which will occur during the morning peak hour and 482 of which will occur during the evening peak hour.

C. Trip Distribution

To determine the trip distribution for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed. Figure 9 contains the directional distribution of the project traffic for the proposed land uses.

D. Trip Assignment

Based on the identified trip generation and distribution, project average daily traffic volumes have been calculated and shown on Figure 10. Morning and evening peak hour intersection turning movement volumes expected from the project are shown on Figures 11 and 12, respectively.

E. Project Traffic Contribution Test

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and

the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. All arterial segments are required to be included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways. Figure 13 graphically depicts the project traffic contribution test volumes on all of the roadway segments until the project volume contribution has clearly dropped below the 50 trip threshold and 100 trip threshold.

The project does not contribute trips greater than the freeway threshold volume of 100 two-way peak hour trips to the I-10 Freeway. The project does contribute trips greater than the arterial link threshold volume of 50 two-way trips in the peak hours on facilities serving intersections outside of the adjacent City of Redlands. This means that the City of Loma Linda must notify the City of Redlands and California Department of Transportation. Each of these agencies must also be provided with a copy of the traffic impact analysis, once the document is accepted by the City of Loma Linda. (Note: The purpose of this notification is to allow the California Department of Transportation to identify opportunities to make improvements to intersections concurrent with adjacent development, at considerably less cost and disruption than would occur if it were done after-the-fact).

Table 2

Project Trip Generation

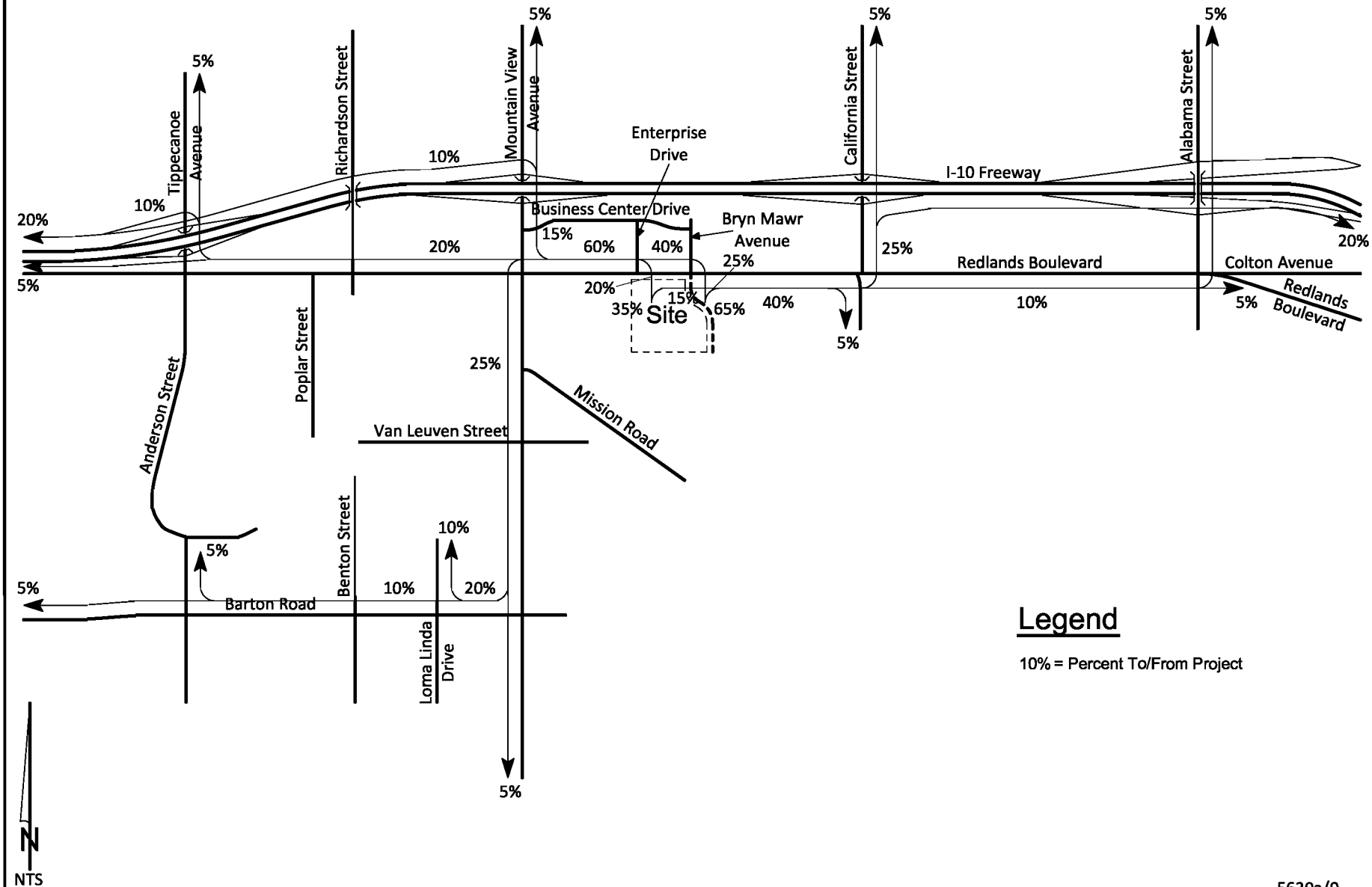
Land Use	Quantity	Units[1]	Peak Hour						Daily
			Morning			Evening			
			Inbound	Outbound	Total	Inbound	Outbound	Total	
Trip Generation Rates									
Medical Clinic[2]		EMP	0.41	0.41	0.82	0.39	0.57	0.96	8.01
Park[3]		AC	0.33	0.33	0.66	0.23	0.23	0.46	5.00
Trips Generated									
Medical Clinic	500	EMP	205	205	410	195	285	480	4,005
Park	5.17	AC	2	2	4	1	1	2	26
Total			207	207	414	196	286	482	4,031

[1] EMP = Employees; AC = Acres

[2] Source: Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012, Land Use Category 630. The AM peak hour of generator was used because AM peak hour of adjacent street traffic trip generation rates are not available.

[3] Source: San Diego Association of Governments, Traffic Generators, April 2002, for neighborhood park.

Figure 9
Project Trip Distribution



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OVER 35 YEARS OF EXCELLENT SERVICE

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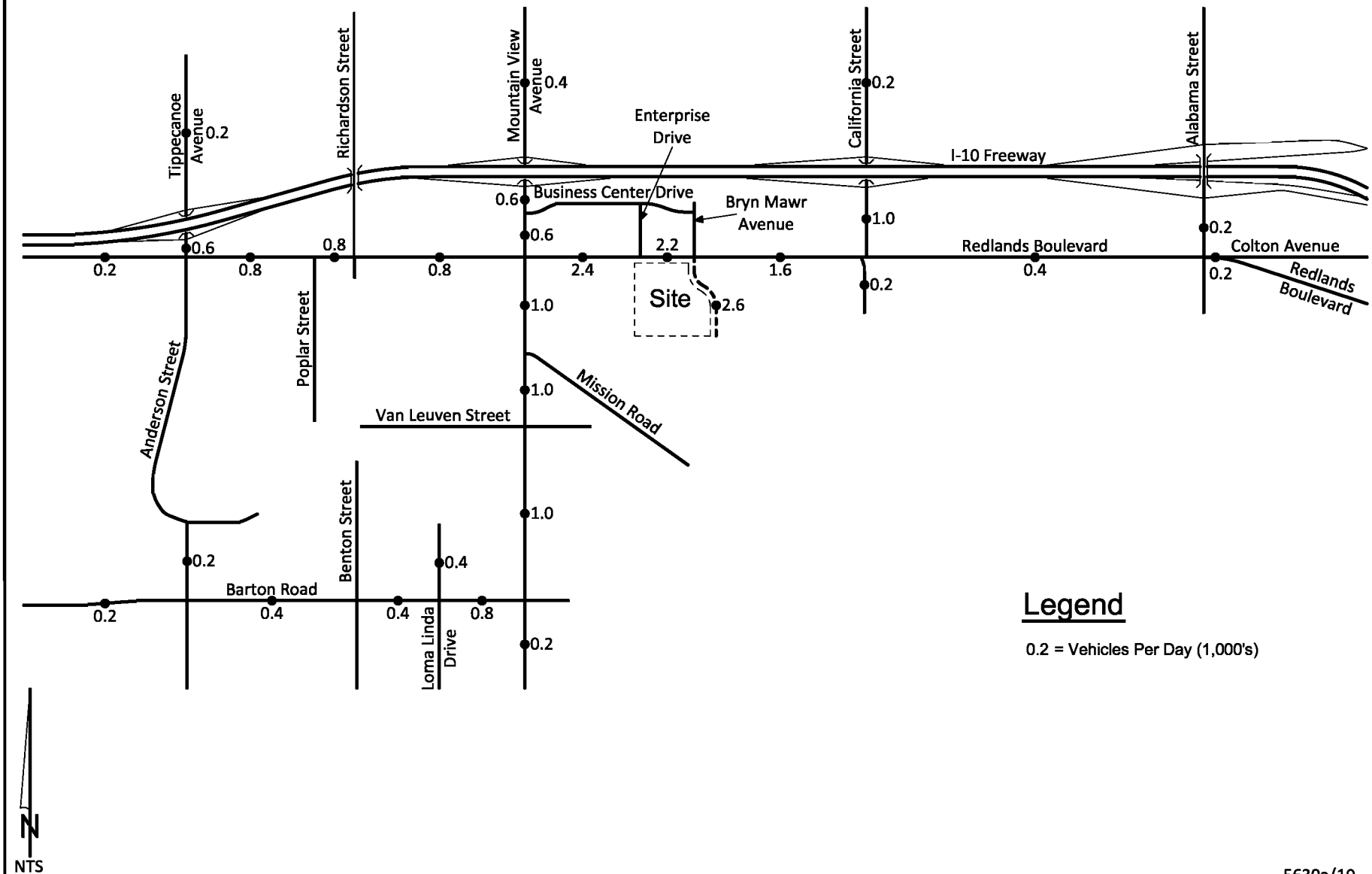
Figure 10
Project Average Daily Traffic Volumes



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OVER 35 YEARS OF EXCELLENT SERVICE

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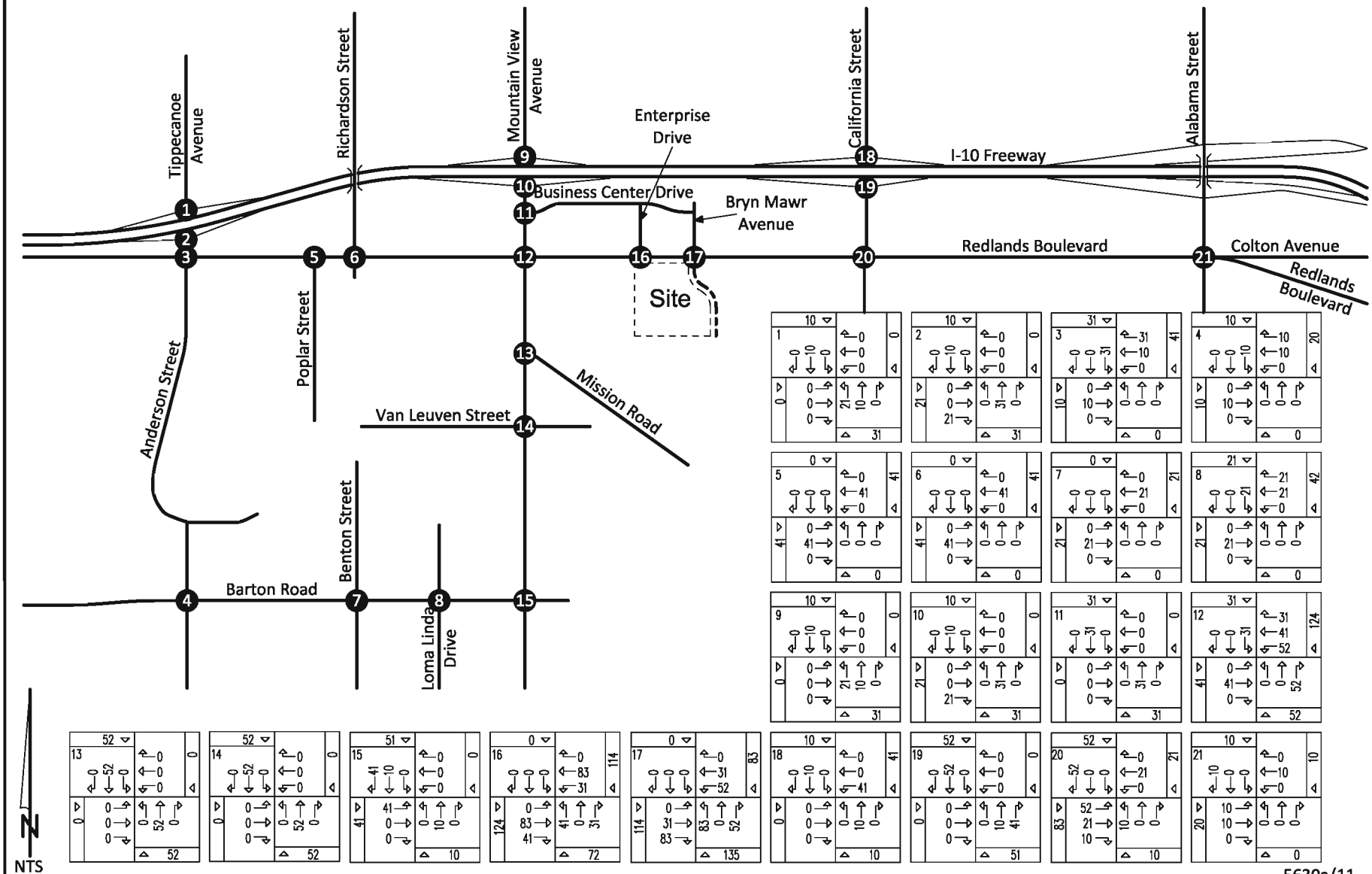
Figure 11
Project Morning Peak Hour Intersection Turning Movement Volumes

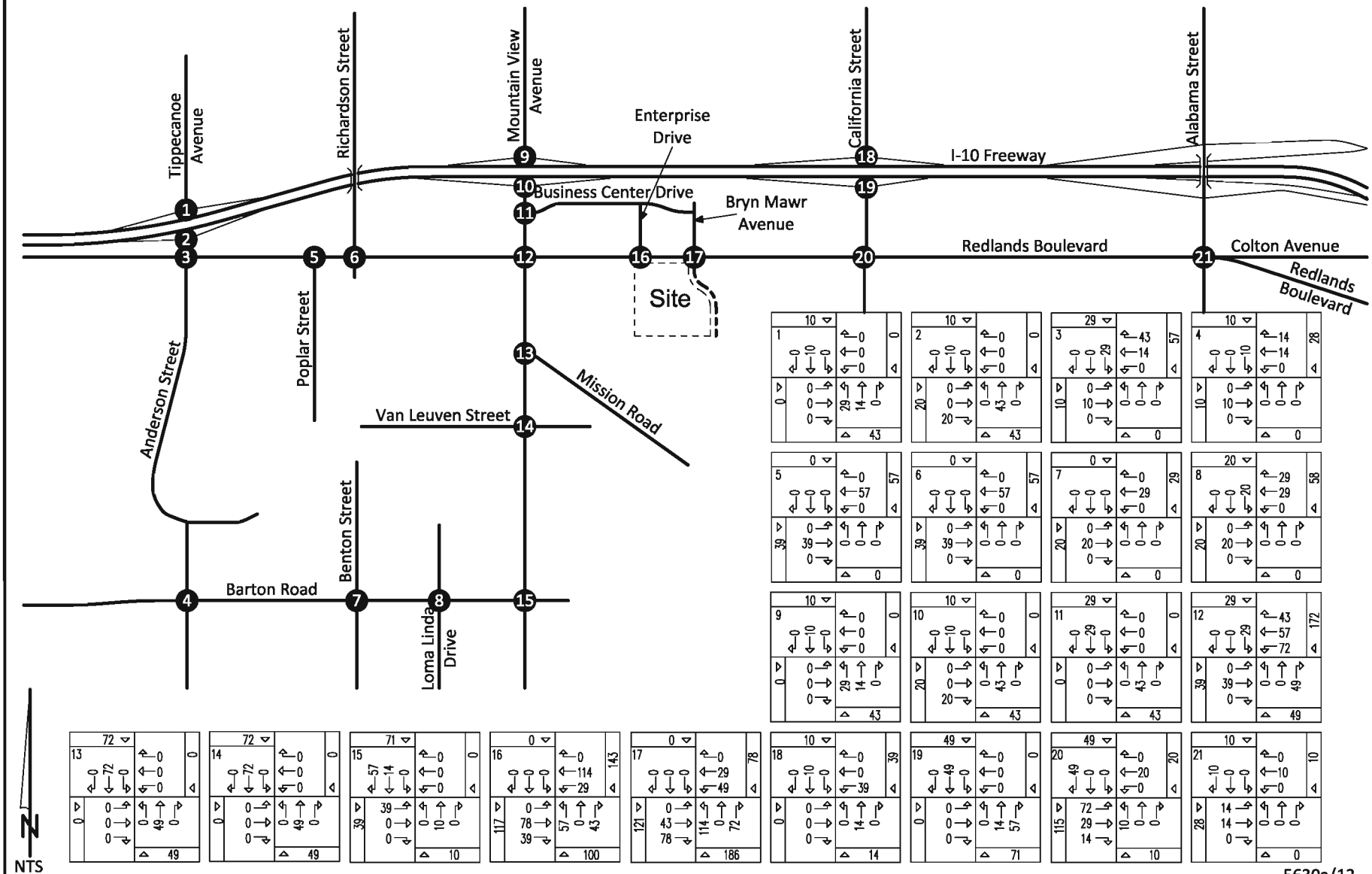


5630a/11

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 12
Project Evening Peak Hour Intersection Turning Movement Volumes

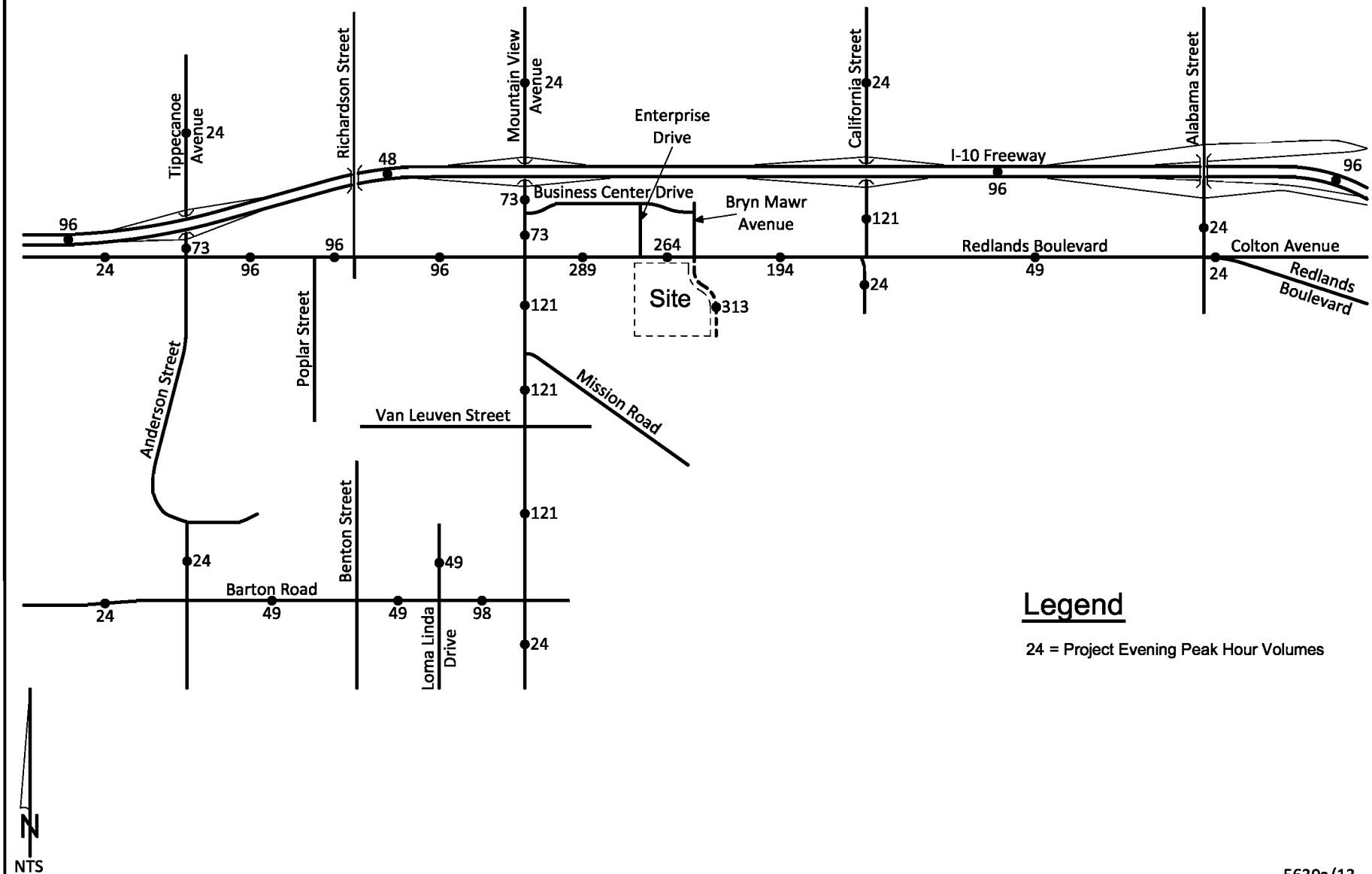


5630a/12

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 13
Project Contribution Test Volumes



KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

5630a/13

IV. Future Conditions

A. Future Volumes

As described within Section I.C., the Year 2035 average daily traffic volume forecasts with the project are developed using a growth increment process based on volumes predicted by the SBTAM traffic model Year 2008 and Year 2035 traffic models. The growth increment for Year 2035 on each roadway segment is the increase in SBTAM traffic model volumes from existing Year 2014 to Year 2035. The final Year 2035 roadway segment volume used for analysis purposes is then determined by adding the Year 2035 growth increment volume to the existing counted volume.

The Opening Year (2016) traffic projections have been interpolated between Year 2035 traffic volumes and existing traffic volumes utilizing a portion of the growth increment (see Section I.C.). Project traffic volumes for all future projections were estimated using the manual approach.

1. Existing Plus Project

   The average daily traffic volumes for Existing Plus Project traffic conditions have been determined. Existing Plus Project average daily traffic volumes are shown on Figure 14.

2. Opening Year (2016) Without Project

   The average daily traffic volumes for Opening Year (2016) Without Project traffic conditions have been determined as described above using the growth interpolation process (see Section I.C). Opening Year (2016) Without Project average daily traffic volumes are shown on Figure 15.

3. Opening Year (2016) With Project

   The average daily traffic volumes for Opening Year (2016) With Project traffic conditions have been determined as described above using the volume addition process (see Section I.C). Opening Year (2016) With Project average daily traffic volumes are shown on Figure 16.

4. Year 2035 Without Project

   The average daily traffic volumes for Year 2035 Without Project traffic conditions have been determined as described above using the growth increment process (see Section I.C). Year 2035 Without Project average daily traffic volumes are shown on Figure 17.

5. Year 2035 With Project

The average daily traffic volumes for Year 2035 With Project traffic conditions have been determined as described above using the volume addition process (see Section I.C). Year 2035 With Project average daily traffic volumes are shown on Figure 18.

B. Future Level of Service

1. Existing Plus Project

The Existing Plus Project delay and Level of Service for the study area roadway network are shown in Table 3. Table 3 shows delay values based on the geometrics at the study area intersections without and with improvements. Existing Plus Project delay calculation worksheets are provided in Appendix E. Existing Plus Project morning and evening peak hour intersection turning movement volumes are shown on Figures 19 and 20, respectively.

For Existing Plus Project traffic conditions, the following study area intersections are projected to operate at Level of Service D to F during the peak hours:

Anderson Street (NS) at:
- Redlands Boulevard (EW) - #3
- Barton Road (EW) - #4

Mountain View Avenue (NS) at:
- Barton Road (EW) - #15

Enterprise Drive (NS) at:
- Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
- Redlands Boulevard (EW) - #17

California Street (NS) at:
- I-10 Freeway EB Ramps (EW) - #19
- Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
- Redlands Boulevard (EW) - #21

As shown in Table 3, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Existing Plus Project traffic conditions, with improvements.

2. Opening Year (2016) Without Project

The Opening Year (2016) delay and Level of Service for the study area roadway network without the proposed project are shown in Table 4. Table 4 shows delay

values based on geometrics at the study area intersections without and with improvements. Opening Year (2016) Without Project delay calculation worksheets are provided in Appendix E. Opening Year (2016) Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 21 and 22, respectively.

For Opening Year (2016) Without Project traffic conditions, the following study area intersection is projected to operate at Level of Service D to F during the peak hours:

Anderson Street (NS) at:
- Redlands Boulevard (EW) - #3
- Barton Road (EW) - #4

Mountain View Avenue (NS) at:
- Barton Road (EW) - #15

California Street (NS) at:
- I-10 Freeway WB Ramps (EW) - #18
- I-10 Freeway EB Ramps (EW) - #19
- Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
- Redlands Boulevard (EW) - #21

As shown in Table 4, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Opening Year (2016) Without Project traffic conditions, with improvements.

3. Opening Year (2016) With Project

The Opening Year (2016) delay and Level of Service for the study area roadway network with the proposed project are shown in Table 5. Table 5 shows delay values based on geometrics at the study area intersections without and with improvements. Opening Year (2016) With Project delay calculation worksheets are provided in Appendix E. Opening Year (2016) With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 23 and 24, respectively.

For Opening Year (2016) With Project traffic conditions, the following study area intersection is projected to operate at Level of Service D to F during the peak hours:

Anderson Street (NS) at:
- Redlands Boulevard (EW) - #3
- Barton Road (EW) - #4

Mountain View Avenue (NS) at:
- Barton Road (EW) - #15

Enterprise Drive (NS) at:
Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
Redlands Boulevard (EW) - #17

California Street (NS) at:
I-10 Freeway WB Ramps (EW) - #18
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

As shown in Table 3, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Opening Year (2016) With Project traffic conditions, with improvements.

4. Year 2035 Without Project

The Year 2035 delay and Level of Service for the study area roadway network without the proposed project are shown in Table 6. Table 6 shows delay values based on the geometrics at the study area intersections without and with improvements. Year 2035 Without Project delay calculation worksheets are provided in Appendix E. Year 2035 Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 25 and 26, respectively.

For Year 2035 Without Project traffic conditions, the following study area intersections are projected to operate at Level of Service D to F during the peak hours, without improvements:

Anderson Street (NS) at:
Redlands Boulevard (EW) - #3
Barton Road (EW) - #4

Mountain View Avenue (NS) at:
I-10 Freeway EB Ramps (EW) - #10
Redlands Boulevard (EW) - #12
Barton Road (EW) - #15

Enterprise Drive (NS) at:
Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
Redlands Boulevard (EW) - #17

California Street (NS) at:
I-10 Freeway WB Ramps (EW) - #18

I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

As shown in Table 6, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Year 2035 Without Project traffic conditions, with improvements.

5. Year 2035 With Project

The Year 2035 delay and Level of Service for the study area roadway network with the proposed project are shown in Table 7. Table 7 shows delay values based on the geometrics at the study area intersections without and with improvements. Year 2035 With Project delay calculation worksheets are provided in Appendix E. Year 2035 With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 27 and 28, respectively.

For Year 2035 With Project traffic conditions, the following study area intersections are projected to operate at Level of Service D to F during the peak hours, without improvements:

Anderson Street (NS) at:
Redlands Boulevard (EW) - #3
Barton Road (EW) - #4

Mountain View Avenue (NS) at:
I-10 Freeway EB Ramps (EW) - #10
Redlands Boulevard (EW) - #12
Barton Road (EW) - #15

Enterprise Drive (NS) at:
Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
Redlands Boulevard (EW) - #17

California Street (NS) at:
I-10 Freeway WB Ramps (EW) - #18
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

As shown in Table 7, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Year 2035 With Project traffic conditions, with improvements.

C. Future Traffic Signal Warrant Analysis

Traffic signals are projected to be warranted at the following study area intersections for Existing Plus Project traffic conditions (see Appendix F):

Enterprise Drive (NS) at:
Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
Redlands Boulevard (EW) - #17

Table 3

Existing Plus Project Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tippecanoe Avenue/Anderson Street (NS)															
I-10 Freeway WB Ramps (EW) - #1	TS	1	2	0	0	2.5	1.5	0	0	0	1.3	0.3	1.3	20.9-C	17.7-B
I-10 Freeway EB Ramps (EW) - #2	TS	0	2.5	0.5	1	2	0	1.5	0.5	2	0	0	0	14.8-B	20.3-C
Anderson Street (NS) at:															
Redlands Boulevard (EW) - #3	TS	1	1.5	0.5	1	1.5	0.5	1	2	d	1	2	d	27.6-C	36.9-D
Barton Road (EW) - #4	TS	1	0.5	0.5	1	1	1	2	2	1	1	2	1	34.3-C	35.7-D
Poplar Street (NS) at:															
Redlands Boulevard (EW) - #5	TS	0.5	0	0.5	0	0	0	0	2	d	1	2	0	12.9-B	12.2-B
Richardson Street (NS) at:															
Redlands Boulevard (EW) - #6	TS	0	1	0	0.5	0.5	1	1	2	d	1	2	d	16.2-B	17.2-B
Benton Street (NS) at:															
Barton Road (EW) - #7	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	20.9-C	20.1-C
Loma Linda Drive (NS) at:															
Barton Road (EW) - #8	TS	1	1	1	1	1	1	1	2	1	1	2	1	21.9-C	21.6-C
Mountain View Avenue (NS) at:															
I-10 Freeway WB Ramps (EW) - #9	TS	1.5	1.5	0	0	1.5	0.5	0	0	0	1	0.5	0.5	24.3-C	19.0-B
I-10 Freeway EB Ramps (EW) - #10	TS	0	1.5	0.5	1	2	0	0.5	0.5	1	0	0	0	27.0-C	27.8-C
Business Center Drive (EW) - #11	TS	0	2.5	0.5	1	2	0	0	0	0	1	0	d	14.8-B	13.2-B
Redlands Boulevard (EW) - #12	TS	1	1.5	0.5	2	2	1	1	2	d	1	2	d	28.4-C	31.7-C
Mission Road (EW) - #13	TS	0	2.5	0.5	1	2	0	0	0	0	0.5	0	0.5	13.2-B	13.3-B
Van Leuven Street (EW) - #14	TS	1	1.5	0.5	1	2	1	0	1	0	1	0.5	0.5	24.1-C	19.4-B
Barton Road (EW) - #15	TS	1	1.5	0.5	1	1.5	0.5	2	2	1	1	2	1	43.9-D	44.3-D
Enterprise Drive (NS) at:															
Redlands Boulevard (EW) - #16															
- Without Improvements	CSS	0	1	0	0	1	0	1	2	d	1	2	d	21.3-C	35.5-E
- With Improvements	**TS**	0	**1**	0	0	1	0	1	2	d	**1**	2	d	7.4-A	8.1-A
Bryn Mawr Avenue (NS) at:															
Redlands Boulevard (EW) - #17															
- Without Improvements	CSS	0	1	0	0	1	0	1	2	d	1	2	d	36.2-E	90.0-F
- With Improvements	**TS**	0	**1**	0	0	1	0	1	2	d	**1**	2	d	8.9-A	9.4-A
California Street (NS) at:															
I-10 Freeway WB Ramps (EW) - #18	TS	1	2	0	0	3	1	0	0	0	0.5	0.5	1	18.7-B	34.6-C
I-10 Freeway EB Ramps (EW) - #19	TS	0	3	1	1	2	0	0.5	0.5	d	0	0	0	15.0-B	54.8-D
Redlands Boulevard (EW) - #20															
- Without Improvements	TS	0	1	0	1	0.5	0.5	1	1.5	0.5	1	2	1>	90.5-F	55.5-E
- With Improvements	TS	**2**	**2.5**	**0.5**	**2**	**2.5**	0.5	**2**	**3**	**1**	**2**	**3**	1>	24.1-C	24.5-C
Alabama Street (NS) at:															
Redlands Boulevard (EW) - #21	TS	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	2	d	36.1-D	41.5-D

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; > = Right Turn Overlap; d = De Facto Right Turn Lane; **1** = Improvement

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

Table 4

Opening Year (2015) Without Project Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tippecanoe Avenue/Anderson Street (NS) a															
I-10 Freeway WB Ramps (EW) - #1	TS	1	2	0	0	2.5	1.5	0	0	0	1.3	0.3	1.3	20.5-C	17.4-B
I-10 Freeway EB Ramps (EW) - #2	TS	0	2.5	0.5	1	2	0	1.5	0.5	2	0	0	0	14.8-B	21.1-C
Anderson Street (NS) at:															
Redlands Boulevard (EW) - #3	TS	1	1.5	0.5	1	1.5	0.5	1	2	d	1	2	d	28.0-C	35.5-D
Barton Road (EW) - #4	TS	1	0.5	0.5	1	1	1	2	2	1	1	2	1	34.7-C	36.0-D
Poplar Street (NS) at:															
Redlands Boulevard (EW) - #5	TS	0.5	0	0.5	0	0	0	0	2	d	1	2	0	12.3-B	12.1-B
Richardson Street (NS) at:															
Redlands Boulevard (EW) - #6	TS	0	1	0	0.5	0.5	1	1	2	d	1	2	d	16.2-B	17.2-B
Benton Street (NS) at:															
Barton Road (EW) - #7	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	21.3-C	20.2-C
Loma Linda Drive (NS) at:															
Barton Road (EW) - #8	TS	1	1	1	1	1	1	1	2	1	1	2	1	22.1-C	21.9-C
Mountain View Avenue (NS) at:															
I-10 Freeway WB Ramps (EW) - #9	TS	1.5	1.5	0	0	1.5	0.5	0	0	0	1	0.5	0.5	24.6-C	19.4-B
I-10 Freeway EB Ramps (EW) - #10	TS	0	1.5	0.5	1	2	0	0.5	0.5	1	0	0	0	26.5-C	29.0-C
Business Center Drive (EW) - #11	TS	0	2.5	0.5	1	2	0	0	0	0	1	0	d	14.9-B	13.4-B
Redlands Boulevard (EW) - #12	TS	1	1.5	0.5	2	2	1	1	2	d	1	2	d	26.9-C	28.6-C
Mission Road (EW) - #13	TS	0	2.5	0.5	1	2	0	0	0	0	0.5	0	0.5	12.5-B	13.4-B
Van Leuven Street (EW) - #14	TS	1	1.5	0.5	1	2	1	0	1	0	1	0.5	0.5	24.3-C	19.6-B
Barton Road (EW) - #15	TS	1	1.5	0.5	1	1.5	0.5	2	2	1	1	2	1	43.8-D	43.6-D
Enterprise Drive (NS) at:															
Redlands Boulevard (EW) - #16	CSS	0	0	0	0.5	0	0.5	1	2	0	0	2	d	14.0-B	15.0-B
Bryn Mawr Avenue (NS) at:															
Redlands Boulevard (EW) - #17	CSS	0	0	0	0.5	0	0.5	1	2	0	0	2	d	17.9-C	18.7-C
California Street (NS) at:															
I-10 Freeway WB Ramps (EW) - #18															
- Without Improvements	TS	1	2	0	0	3	1	0	0	0	0.5	0.5	1	19.1-B	36.6-D
- With Improvements	TS	**2**	**3**	0	0	3	**1>>**	0	0	0	**2**	0.5	**1.5**	13.0-B	14.2-B
I-10 Freeway EB Ramps (EW) - #19															
- Without Improvements	TS	0	3	1	1	2	0	0.5	0.5	d	0	0	0	15.1-B	99.9-F[4]
- With Improvements	TS	0	3	1	**2**	**3**	0	**2**	0.5	**1.5**	0	0	0	13.0-B	15.9-B
Redlands Boulevard (EW) - #20															
- Without Improvements	TS	0	1	0	1	0.5	0.5	1	1.5	0.5	1	2	1>	94.0-F	56.7-E
- With Improvements	TS	**2**	**2.5**	**0.5**	**2**	**2.5**	0.5	**2**	**3**	**1**	**2**	**3**	1>	24.0-C	24.0-C
Alabama Street (NS) at:															
Redlands Boulevard (EW) - #21	TS	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	2	d	35.5-D	41.7-D

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; > = Right Turn Overlap; d = De Facto Right Turn Lane; **1** = Improvement

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

[4] 99.9-F = Delay High, Intersection Unstable, Level of Service F.

Table 5

Opening Year (2015) With Project Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tippecanoe Avenue/Anderson Street (NS)															
I-10 Freeway WB Ramps (EW) - #1	TS	1	2	0	0	2.5	1.5	0	0	0	1.3	0.3	1.3	21.3-C	18.0-B
I-10 Freeway EB Ramps (EW) - #2	TS	0	2.5	0.5	1	2	0	1.5	0.5	2	0	0	0	14.9-B	21.4-C
Anderson Street (NS) at:															
Redlands Boulevard (EW) - #3	TS	1	1.5	0.5	1	1.5	0.5	1	2	d	1	2	d	28.7-C	36.5-D
Barton Road (EW) - #4	TS	1	0.5	0.5	1	1	1	2	2	1	1	2	1	35.0-C	36.6-D
Poplar Street (NS) at:															
Redlands Boulevard (EW) - #5	TS	0.5	0	0.5	0	0	0	0	2	d	1	2	0	12.8-B	12.1-B
Richardson Street (NS) at:															
Redlands Boulevard (EW) - #6	TS	0	1	0	0.5	0.5	1	1	2	d	1	2	d	16.4-B	17.4-B
Benton Street (NS) at:															
Barton Road (EW) - #7	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	21.4-C	20.3-C
Loma Linda Drive (NS) at:															
Barton Road (EW) - #8	TS	1	1	1	1	1	1	1	2	1	1	2	1	22.2-C	21.9-C
Mountain View Avenue (NS) at:															
I-10 Freeway WB Ramps (EW) - #9	TS	1.5	1.5	0	0	1.5	0.5	0	0	0	1	0.5	0.5	25.0-C	19.5-B
I-10 Freeway EB Ramps (EW) - #10	TS	0	1.5	0.5	1	2	0	0.5	0.5	1	0	0	0	28.8-C	32.6-C
Business Center Drive (EW) - #11	TS	0	2.5	0.5	1	2	0	0	0	0	1	0	d	15.0-B	13.4-B
Redlands Boulevard (EW) - #12	TS	1	1.5	0.5	2	2	1	1	2	d	1	2	d	28.5-C	32.7-C
Mission Road (EW) - #13	TS	0	2.5	0.5	1	2	0	0	0	0	0.5	0	0.5	13.3-B	13.4-B
Van Leuven Street (EW) - #14	TS	1	1.5	0.5	1	2	1	0	1	0	1	0.5	0.5	24.7-C	19.6-B
Barton Road (EW) - #15	TS	1	1.5	0.5	1	1.5	0.5	2	2	1	1	2	1	46.0-D	44.5-D
Enterprise Drive (NS) at:															
Redlands Boulevard (EW) - #16															
- Without Improvements	CSS	0	1	0	0	1	0	1	2	d	1	2	d	23.9-C	44.7-E
- With Improvements	**TS**	0	**1**	0	0	1	0	1	2	d	**1**	2	d	7.4-A	8.0-A
Bryn Mawr Avenue (NS) at:															
Redlands Boulevard (EW) - #17															
- Without Improvements	CSS	0	1	0	0	1	0	1	2	d	1	2	d	43.8-E	99.9-F[4]
- With Improvements	**TS**	0	**1**	0	0	1	0	1	2	d	**1**	2	d	8.9-A	9.5-A
California Street (NS) at:															
I-10 Freeway WB Ramps (EW) - #18															
- Without Improvements	TS	1	2	0	0	3	1	0	0	0	0.5	0.5	1	20.0-C	41.1-D
- With Improvements	TS	**2**	**3**	0	0	3	**1>>**	0	0	0	**2**	0.5	**1.5**	13.2-B	14.5-B
I-10 Freeway EB Ramps (EW) - #19															
- Without Improvements	TS	0	3	1	1	2	0	0.5	0.5	d	0	0	0	15.3-B	99.9-F
- With Improvements	TS	0	3	1	**2**	**3**	0	**2**	0.5	**1.5**	0	0	0	13.5-B	17.0-B
Redlands Boulevard (EW) - #20															
- Without Improvements	TS	0	1	0	1	0.5	0.5	1	1.5	0.5	1	2	1>	99.9-F	63.3-E
- With Improvements	TS	**2**	**2.5**	**0.5**	**2**	**2.5**	0.5	**2**	**3**	**1**	**2**	**3**	1>	24.3-C	24.8-C
Alabama Street (NS) at:															
Redlands Boulevard (EW) - #21	TS	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	2	d	36.4-D	42.5-D

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right Turn Overlap; d = De Facto Right Turn Lane**1** = Improvement

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

[4] 99.9-F = Delay High, Intersection Unstable, Level of Service F.

Table 6

Year 2035 Without Project Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tippecanoe Avenue/Anderson Street (NS)															
I-10 Freeway WB Ramps (EW) - #1	TS	1	2	0	0	2.5	1.5	0	0	0	1.3	0.3	1.3	22.2-C	19.5-B
I-10 Freeway EB Ramps (EW) - #2	TS	0	2.5	0.5	1	2	0	1.5	0.5	2	0	0	0	14.5-B	23.8-C
Anderson Street (NS) at:															
Redlands Boulevard (EW) - #3															
- Without Improvements	TS	1	1.5	0.5	1	1.5	0.5	1	2	d	1	2	d	31.7-C	46.4-D
- With Improvements	TS	1	1.5	0.5	1	1.5	0.5	1	**3**	d	1	**3**	d	31.2-C	45.1-D
Barton Road (EW) - #4															
- Without Improvements	TS	1	0.5	0.5	1	1	1	2	2	1	1	2	1	35.8-D	44.6-D
- With Improvements	TS	1	0.5	0.5	1	1	1	2	**3**	1	1	**3**	1	35.1-D	38.2-D
Poplar Street (NS) at:															
Redlands Boulevard (EW) - #5	TS	0.5	0	0.5	0	0	0	0	2	d	1	2	0	8.5-A	7.1-A
Richardson Street (NS) at:															
Redlands Boulevard (EW) - #6	TS	0	1	0	0.5	0.5	1	1	2	d	1	2	d	16.1-B	17.1-B
Benton Street (NS) at:															
Barton Road (EW) - #7	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	21.5-C	21.6-C
Loma Linda Drive (NS) at:															
Barton Road (EW) - #8	TS	1	1	1	1	1	1	1	2	1	1	2	1	17.5-B	18.0-B
Mountain View Avenue (NS) at:															
I-10 Freeway WB Ramps (EW) - #9															
- Without Improvements	TS	1.5	1.5	0	0	1.5	0.5	0	0	0	1	0.5	0.5	27.1-C	26.9-C
- With Improvements	TS	**2**	**2**	0	0	**2**	**1**	0	0	0	1	0.5	0.5	20.1-C	25.3-C
I-10 Freeway EB Ramps (EW) - #10															
- Without Improvements	TS	0	1.5	0.5	1	2	0	0.5	0.5	1	0	0	0	29.0-C	99.9-F[4]
- With Improvements	TS	0	**2**	**1**	**2**	2	0	0.5	0.5	1	0	0	0	22.9-C	27.3-C
Business Center Drive (EW) - #11	TS	0	2.5	0.5	1	2	0	0	0	0	1	0	d	11.2-B	8.6-A
Redlands Boulevard (EW) - #12															
- Without Improvements	TS	1	1.5	0.5	2	2	1	1	2	d	1	2	d	28.3-C	39.1-D
- With Improvements	TS	1	**2**	**1**	2	2	1	1	**3**	**1>**	1	**3**	**1>**	26.5-C	35.7-D
Mission Road (EW) - #13	TS	0	2.5	0.5	1	2	0	0	0	0	0.5	0	0.5	8.6-A	8.7-A
Van Leuven Street (EW) - #14	TS	1	1.5	0.5	1	2	1	0	1	0	1	0.5	0.5	21.5-C	18.0-B
Barton Road (EW) - #15															
- Without Improvements	TS	1	1.5	0.5	1	1.5	0.5	2	2	1	1	2	1	42.7-D	99.9-F
- With Improvements	TS	1	1.5	0.5	1	1.5	0.5	2	**3**	1	1	**3**	1	35.7-D	43.8-D
Enterprise Drive (NS) at:															
Redlands Boulevard (EW) - #16															
- Without Improvements	CSS	0	0	0	0	1	0	1	2	0	0	2	d	19.9-C	42.1-E
- With Improvements	**TS**	0	0	0	0	1	0	1	2	0	0	2	d	0.5-A	1.0-A
Bryn Mawr Avenue (NS) at:															
Redlands Boulevard (EW) - #17															
- Without Improvements	CSS	0	0	0	0	1	0	1	2	0	0	2	d	25.6-D	78.2-F
- With Improvements	**TS**	0	0	0	0	1	0	1	2	0	0	2	d	1.0-A	1.3-A
California Street (NS) at:															
I-10 Freeway WB Ramps (EW) - #18															
- Without Improvements	TS	1	2	0	0	3	1	0	0	0	0.5	0.5	1	31.8-C	99.9-F
- With Improvements	TS	**2**	**3**	0	0	3	**1>>**	0	0	0	**2**	0.5	**1.5**	14.2-B	14.9-B
I-10 Freeway EB Ramps (EW) - #19															
- Without Improvements	TS	0	3	1	1	2	0	0.5	0.5	d	0	0	0	17.3-B	99.9-F
- With Improvements	TS	0	3	1	**2**	**3**	0	**2**	0.5	**1.5**	0	0	0	12.6-B	17.5-B
Redlands Boulevard (EW) - #20															
- Without Improvements	TS	0	1	0	1	0.5	0.5	1	1.5	0.5	1	2	1>	99.9-F	99.9-F
- With Improvements	TS	**2**	**2.5**	**0.5**	**2**	**2.5**	0.5	**2**	**3**	**1**	**2**	**3**	1>	25.3-C	26.3-C
Alabama Street (NS) at:															
Redlands Boulevard (EW) - #21															
- Without Improvements	TS	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	2	d	38.6-D	50.6-D
- With Improvements	TS	**2**	**2.5**	0.5	**2**	1.5	0.5	**2**	**2**	**1**	**2**	2	**1**	25.6-C	27.8-C

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; > = Right Turn Overlap; d = De Facto Right Turn Lane; **1** = Improvement

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

[4] 99.9-F = Delay High, Intersection Unstable, Level of Service F.

Table 7

Year 2035 With Project Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Tippecanoe Avenue/Anderson Street (NS)															
I-10 Freeway WB Ramps (EW) - #1	TS	1	2	0	0	2.5	1.5	0	0	0	1.3	0.3	1.3	22.6-C	20.2-C
I-10 Freeway EB Ramps (EW) - #2	TS	0	2.5	0.5	1	2	0	1.5	0.5	2	0	0	0	14.6-B	24.3-C
Anderson Street (NS) at:															
Redlands Boulevard (EW) - #3															
- Without Improvements	TS	1	1.5	0.5	1	1.5	0.5	1	2	d	1	2	d	32.6-C	48.7-D
- With Improvements	TS	1	1.5	0.5	1	1.5	0.5	1	**3**	d	1	**3**	d	32.0-C	47.4-D
Barton Road (EW) - #4															
- Without Improvements	TS	1	0.5	0.5	1	1	1	2	2	1	1	2	1	36.2-D	45.3-D
- With Improvements	TS	1	0.5	0.5	1	1	1	2	**3**	1	1	**3**	1	35.4-D	38.5-D
Poplar Street (NS) at:															
Redlands Boulevard (EW) - #5	TS	0.5	0	0.5	0	0	0	0	2	d	1	2	0	8.5-A	7.1-A
Richardson Street (NS) at:															
Redlands Boulevard (EW) - #6	TS	0	1	0	0.5	0.5	1	1	2	d	1	2	d	16.2-B	17.4-B
Benton Street (NS) at:															
Barton Road (EW) - #7	TS	1	0.5	0.5	1	0.5	0.5	1	2	1	1	2	1	21.5-C	21.8-C
Loma Linda Drive (NS) at:															
Barton Road (EW) - #8	TS	1	1	1	1	1	1	1	2	1	1	2	1	17.5-B	18.0-B
Mountain View Avenue (NS) at:															
I-10 Freeway WB Ramps (EW) - #9															
- Without Improvements	TS	1.5	1.5	0	0	1.5	0.5	0	0	0	1	0.5	0.5	27.6-C	27.6-C
- With Improvements	TS	**2**	**2**	0	0	**2**	**1**	0	0	0	1	0.5	0.5	20.5-C	25.9-C
I-10 Freeway EB Ramps (EW) - #10															
- Without Improvements	TS	0	1.5	0.5	1	2	0	0.5	0.5	1	0	0	0	30.7-C	99.9-F[4]
- With Improvements	TS	0	**2**	**1**	**2**	2	0	0.5	0.5	1	0	0	0	24.0-C	28.8-C
Business Center Drive (EW) - #11	TS	0	2.5	0.5	1	2	0	0	0	0	1	0	d	11.2-B	8.6-A
Redlands Boulevard (EW) - #12															
- Without Improvements	TS	1	1.5	0.5	2	2	1	1	2	d	1	2	d	30.3-C	45.7-D
- With Improvements	TS	1	**2**	**1**	2	2	1	1	**3**	**1>**	1	**3**	**1>**	28.1-C	37.1-D
Mission Road (EW) - #13	TS	0	2.5	0.5	1	2	0	0	0	0	0.5	0	0.5	8.7-A	8.7-A
Van Leuven Street (EW) - #14	TS	1	1.5	0.5	1	2	1	0	1	0	1	0.5	0.5	21.5-C	18.4-B
Barton Road (EW) - #15															
- Without Improvements	TS	1	1.5	0.5	1	1.5	0.5	2	2	1	1	2	1	44.6-D	99.9-F
- With Improvements	TS	1	1.5	0.5	1	1.5	0.5	2	**3**	1	1	**3**	1	36.6-D	44.0-D
Enterprise Drive (NS) at:															
Redlands Boulevard (EW) - #16															
- Without Improvements	CSS	0	1	0	0	1	0	1	2	d	1	2	d	41.5-E	99.9-F
- With Improvements	**TS**	0	**1**	0	0	1	0	1	2	d	**1**	2	d	2.2-A	2.7-A
Bryn Mawr Avenue (NS) at:															
Redlands Boulevard (EW) - #17															
- Without Improvements	CSS	0	1	0	0	1	0	1	2	d	1	2	d	99.9-F	99.9-F
- With Improvements	**TS**	0	**1**	0	0	1	0	1	2	d	**1**	2	d	3.9-A	4.6-A
California Street (NS) at:															
I-10 Freeway WB Ramps (EW) - #18															
- Without Improvements	TS	1	2	0	0	3	1	0	0	0	0.5	0.5	1	34.1-C	99.9-F
- With Improvements	TS	**2**	**3**	0	0	3	**1>>**	0	0	0	**2**	0.5	**1.5**	14.4-B	15.3-B
I-10 Freeway EB Ramps (EW) - #19															
- Without Improvements	TS	0	3	1	1	2	0	0.5	0.5	d	0	0	0	17.6-B	99.9-F
- With Improvements	TS	0	3	1	**2**	**3**	0	**2**	0.5	**1.5**	0	0	0	12.9-B	18.6-B
Redlands Boulevard (EW) - #20															
- Without Improvements	TS	0	1	0	1	0.5	0.5	1	1.5	0.5	1	2	1>	99.9-F	99.9-F
- With Improvements	TS	**2**	**2.5**	**0.5**	**2**	**2.5**	0.5	**2**	**3**	**1**	**2**	**3**	1>	25.7-C	27.8-C
Alabama Street (NS) at:															
Redlands Boulevard (EW) - #21															
- Without Improvements	TS	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	2	d	39.2-D	51.6-D
- With Improvements	TS	**2**	**2.5**	0.5	**2**	1.5	0.5	**2**	**2**	**1**	**2**	2	**1**	25.7-C	28.1-C

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

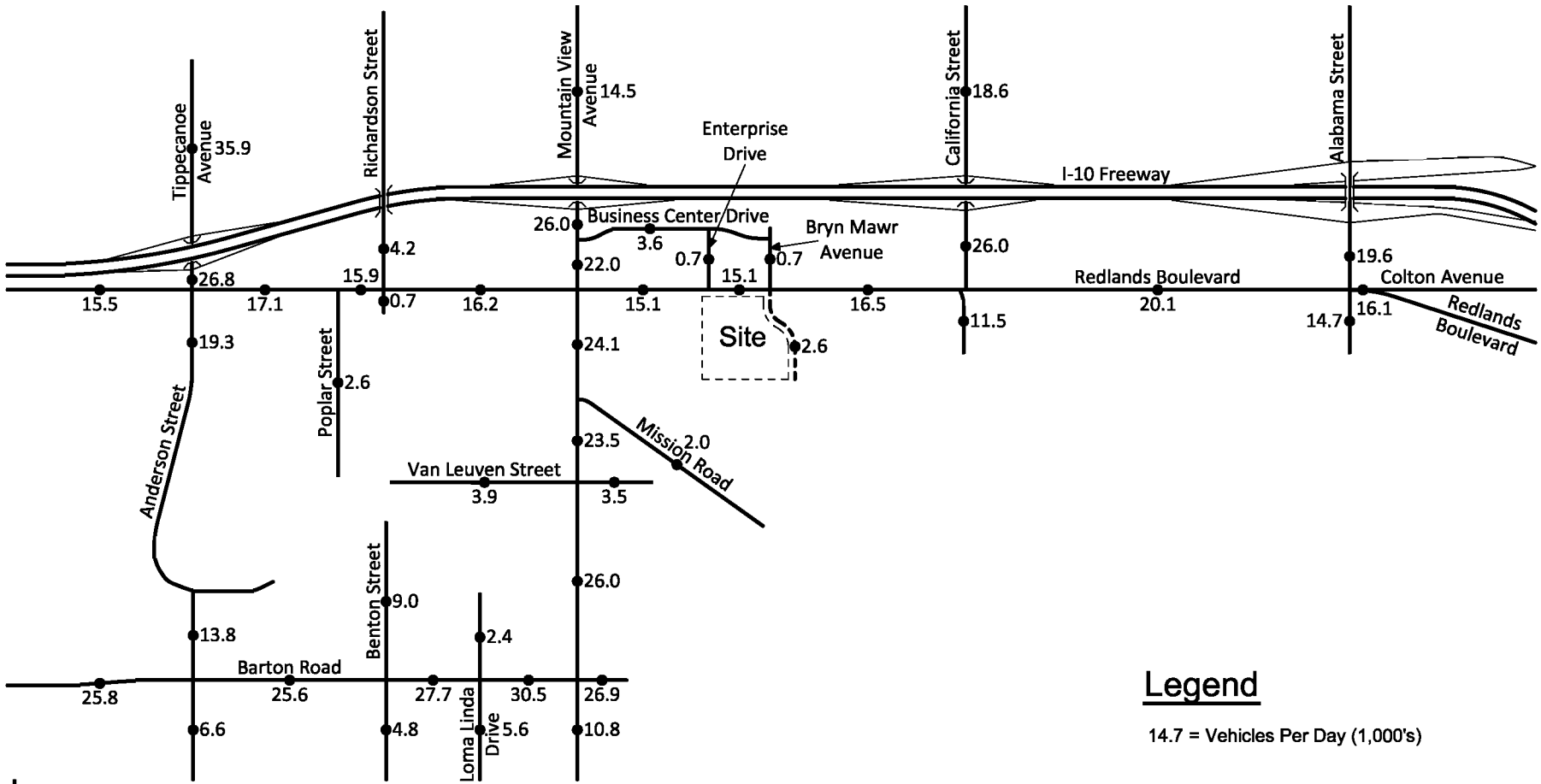
L = Left; T = Through; R = Right; > = Right Turn Overlap; d = De Facto Right Turn Lane**1** = Improvement

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross Street Stop

[4] 99.9-F = Delay High, Intersection Unstable, Level of Service F.

Figure 14
Existing Plus Project Average Daily Traffic Volumes

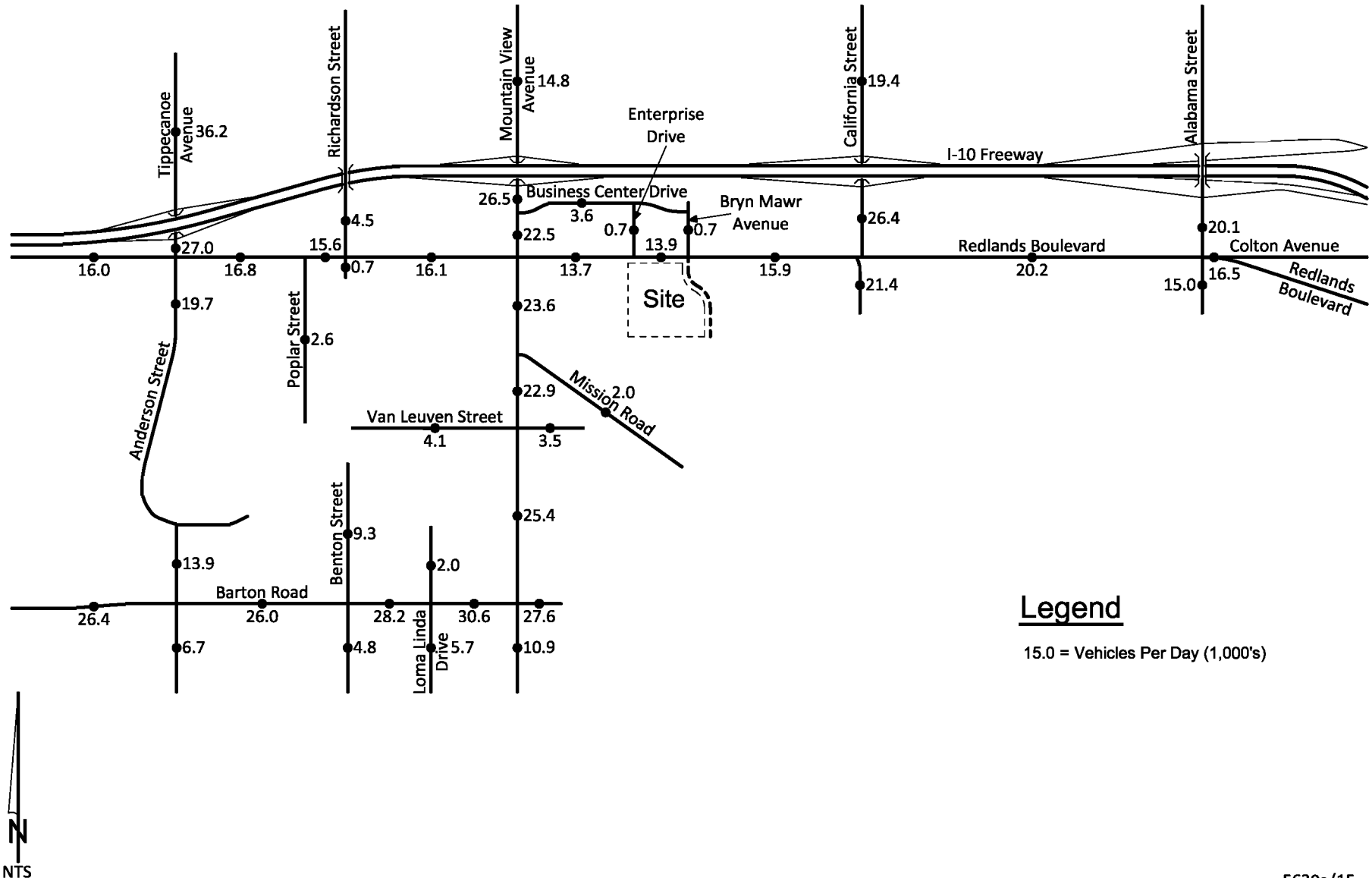


KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

5630a/14

Figure 15
Opening Year (2016) Without Project Average Daily Traffic Volumes

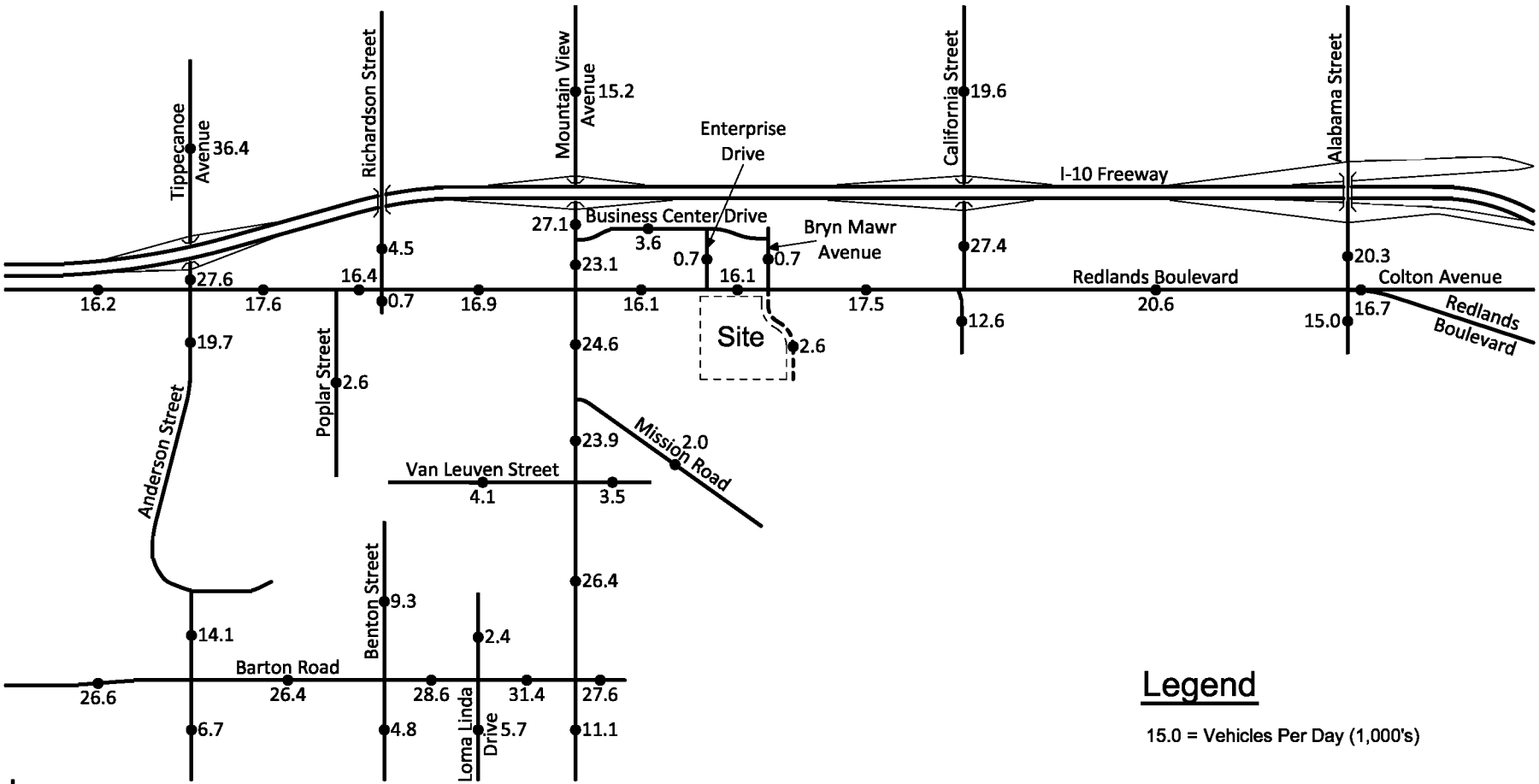


KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

5630a/15

Figure 16
Opening Year (2016) With Project Average Daily Traffic Volumes

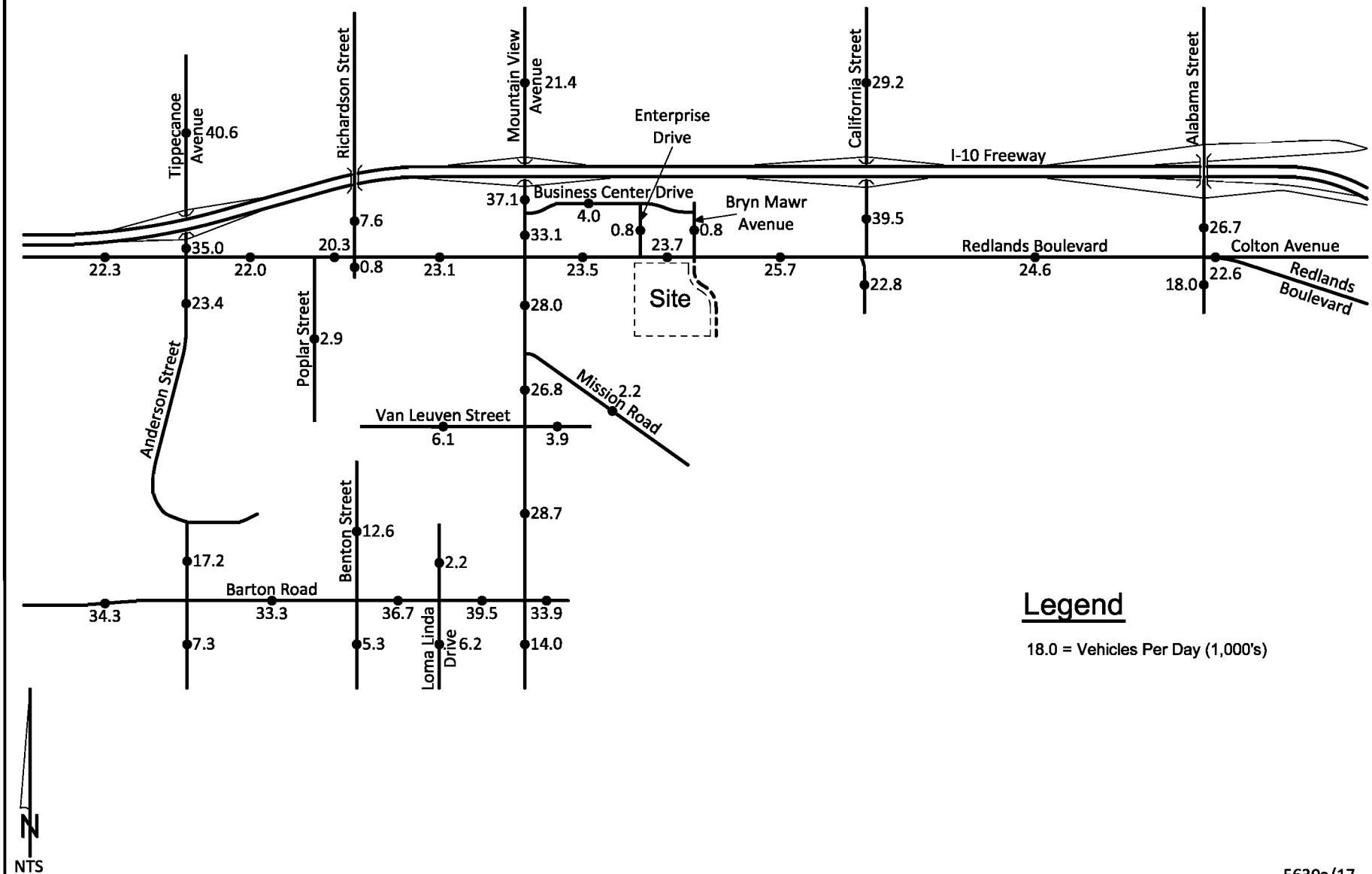


KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

5630a/16

Figure 17
Year 2035 Without Project Average Daily Traffic Volumes

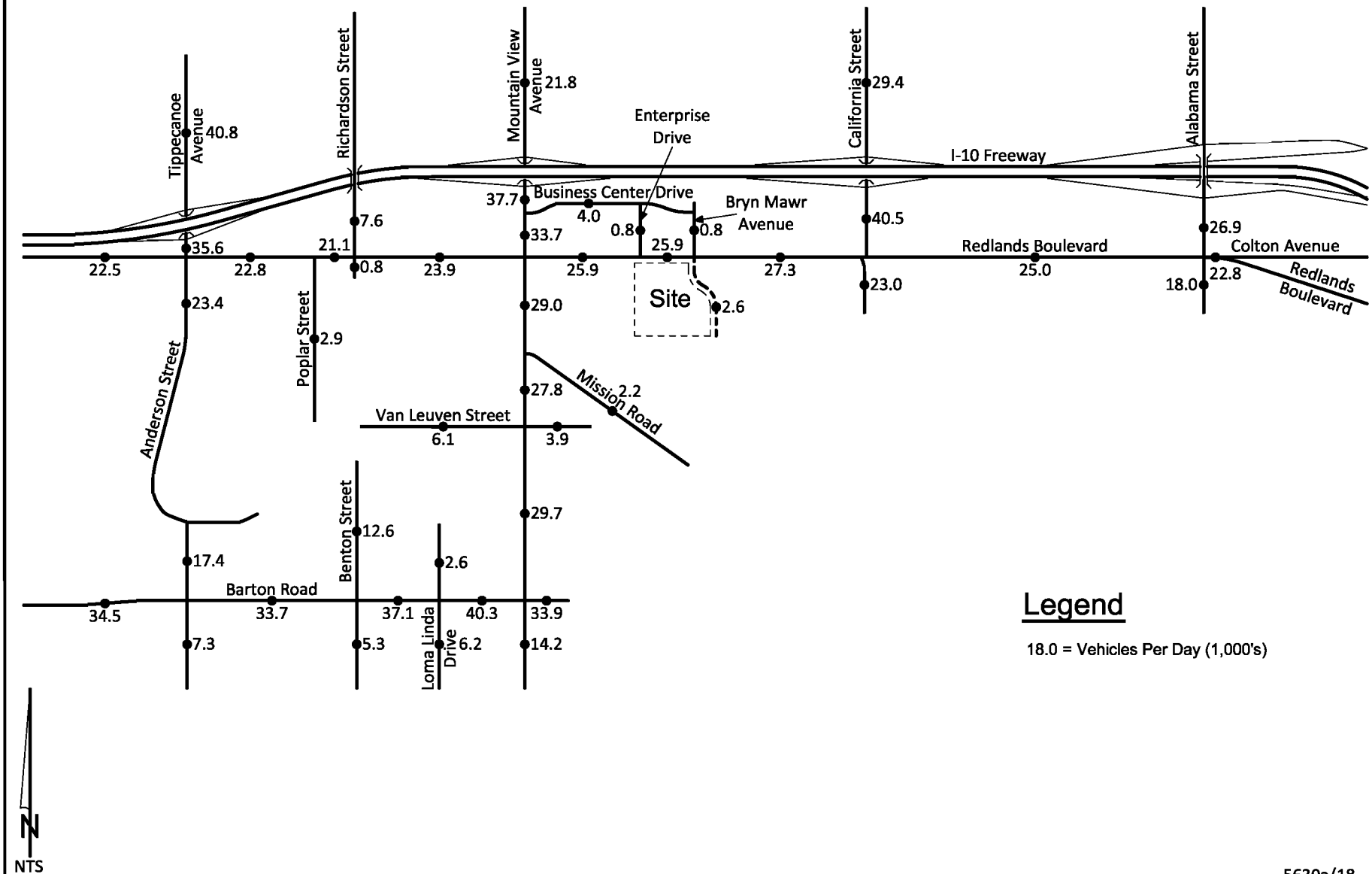


KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

5630a/17

Figure 18
Year 2035 With Project Average Daily Traffic Volumes

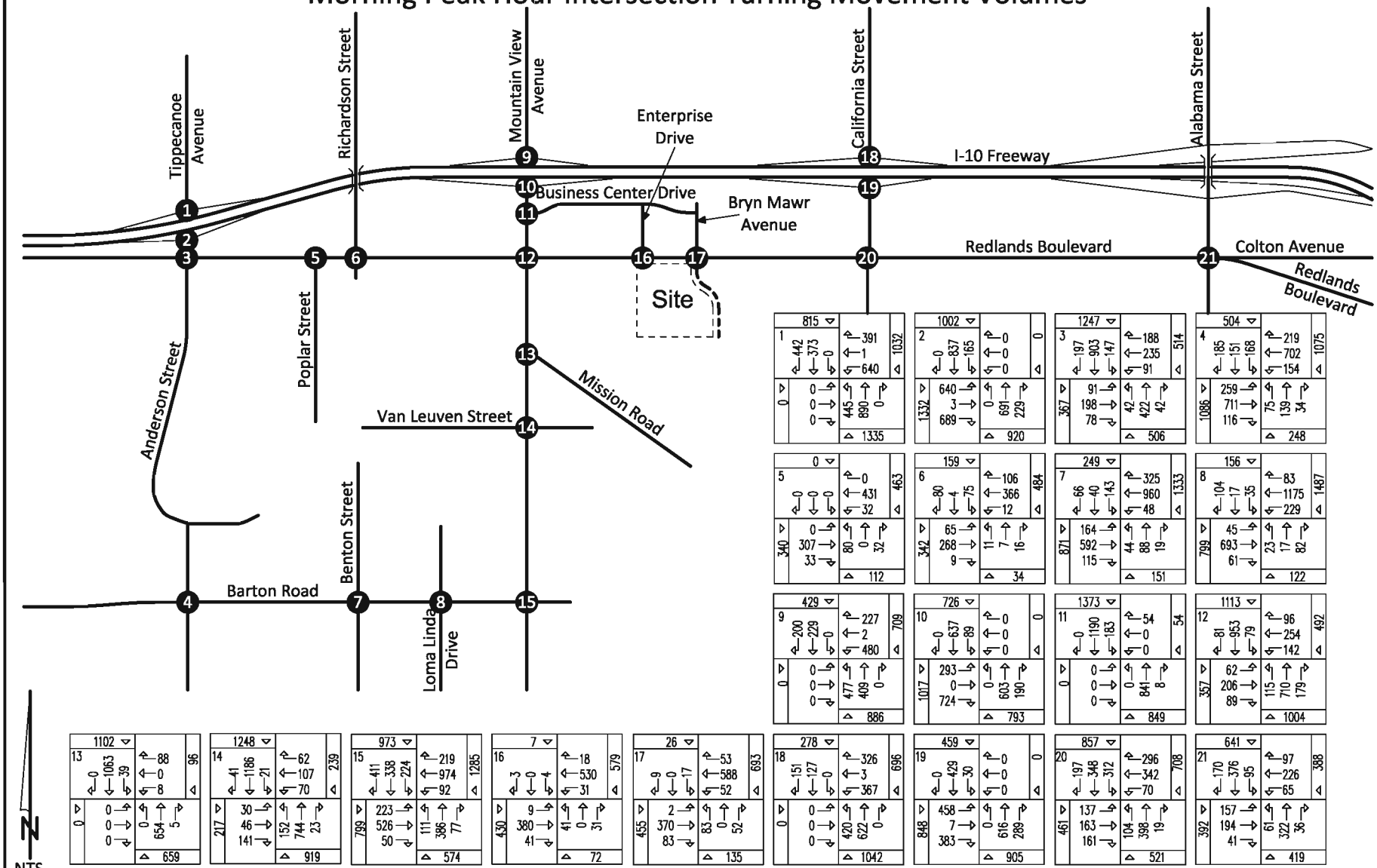


KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

5630a/18

Figure 19
Existing Plus Project
Morning Peak Hour Intersection Turning Movement Volumes

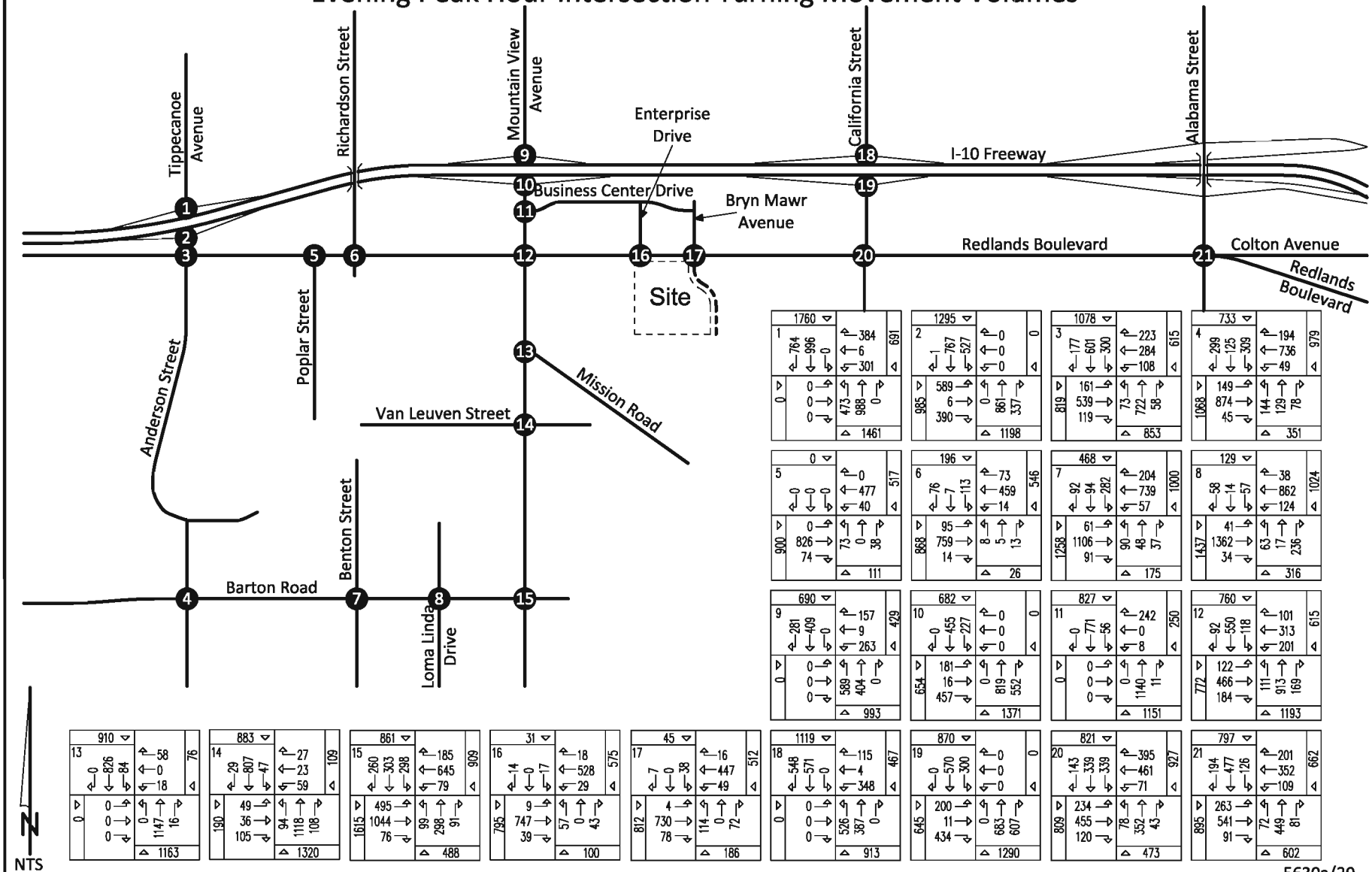


5630a/19

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 20
Existing Plus Project
Evening Peak Hour Intersection Turning Movement Volumes

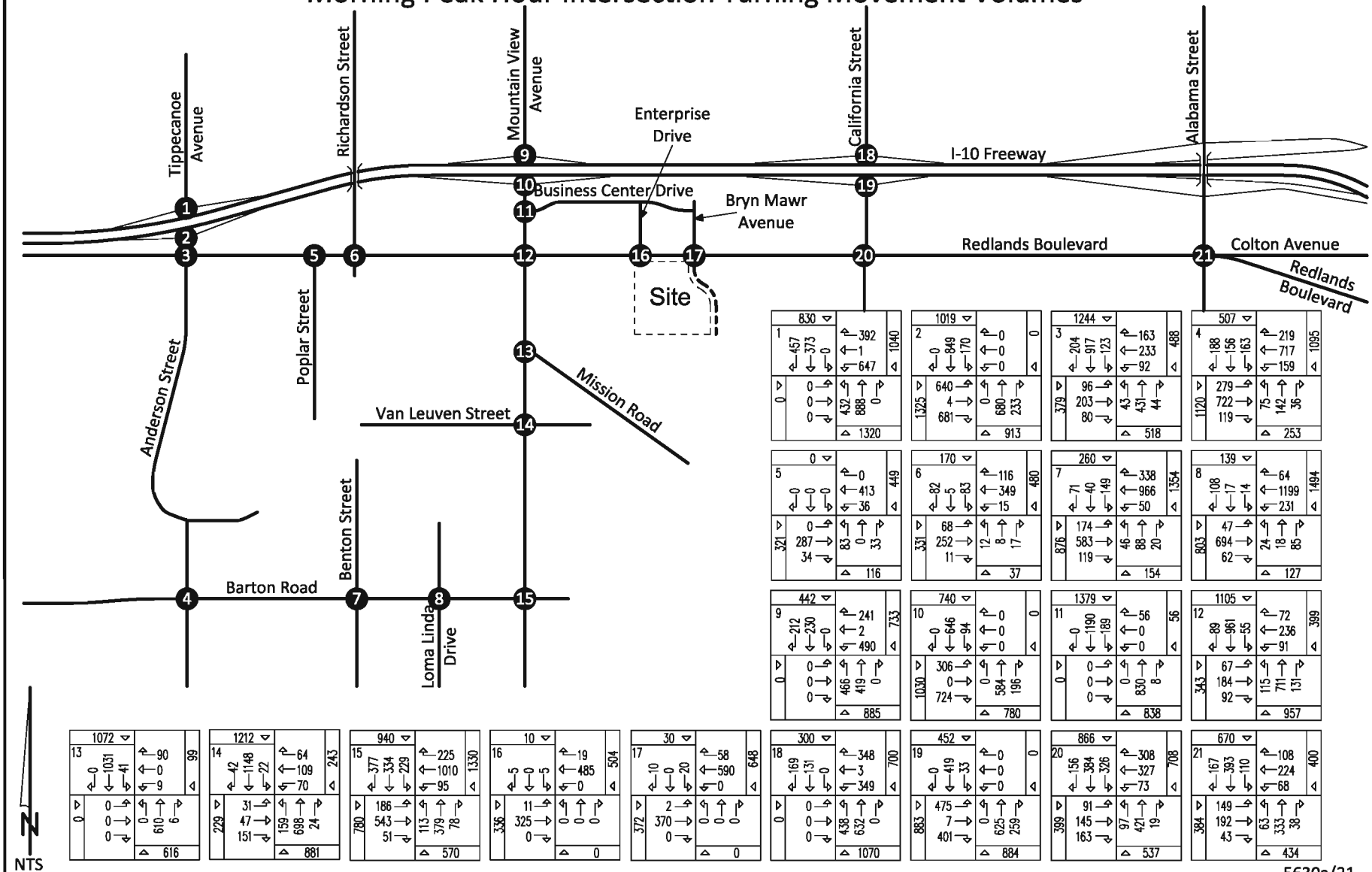


5630a/20

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 21
Opening Year (2016) Without Project
Morning Peak Hour Intersection Turning Movement Volumes

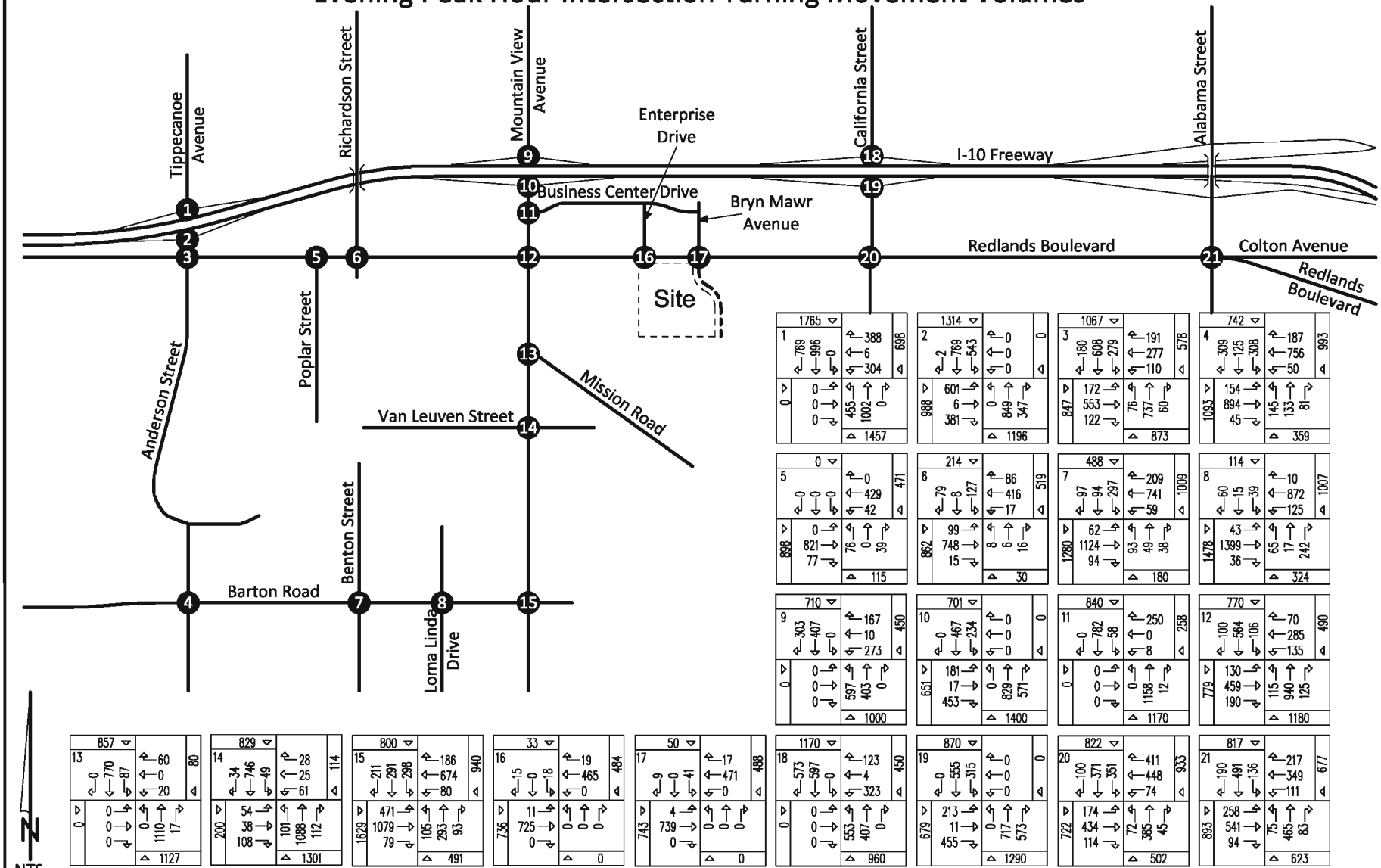


5630a/21

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 22
Opening Year (2016) Without Project
Evening Peak Hour Intersection Turning Movement Volumes

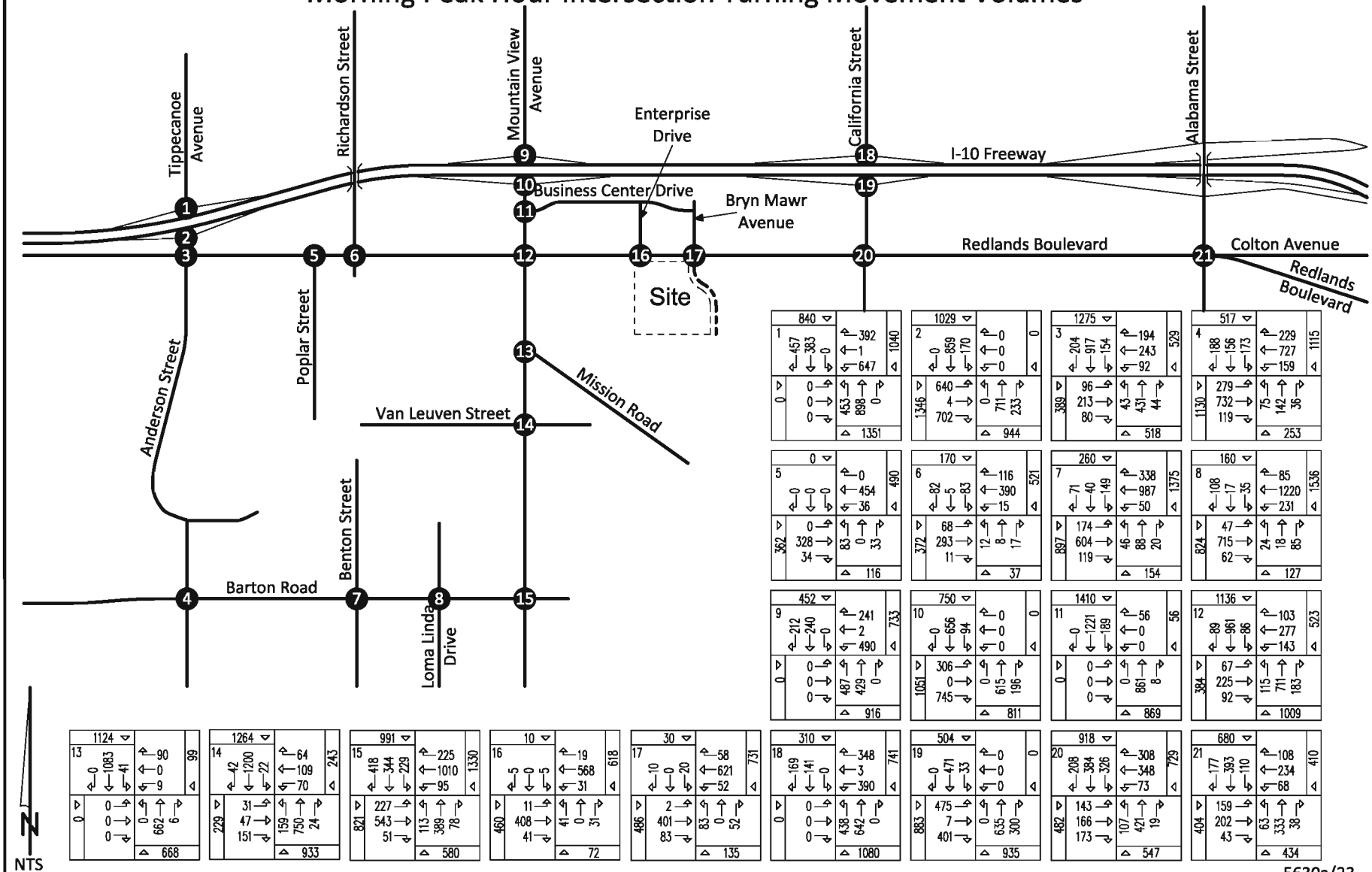


5630a/22

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 23
Opening Year (2016) With Project
Morning Peak Hour Intersection Turning Movement Volumes

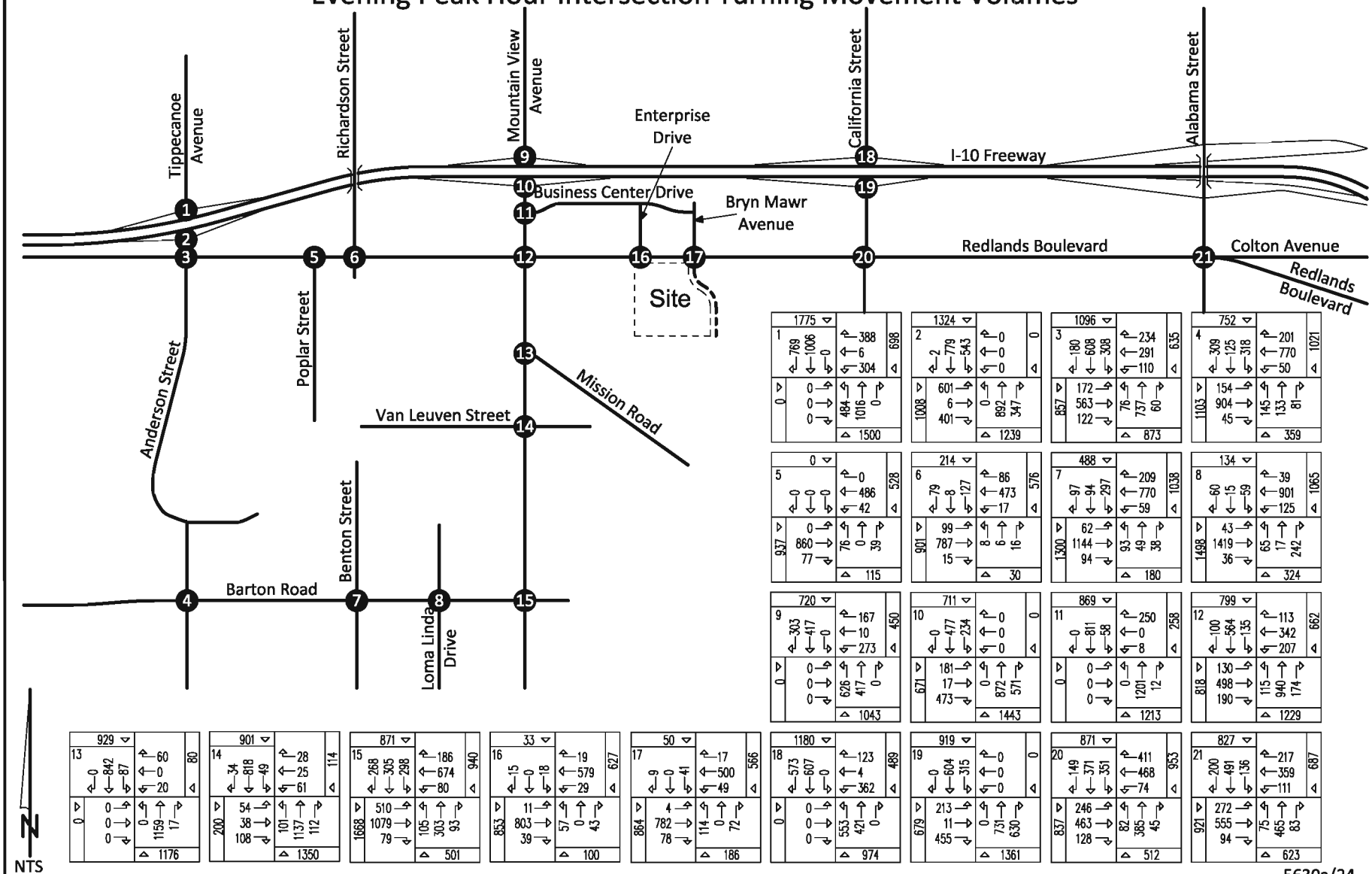


KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

5630a/23

OVER 35 YEARS OF EXCELLENT SERVICE

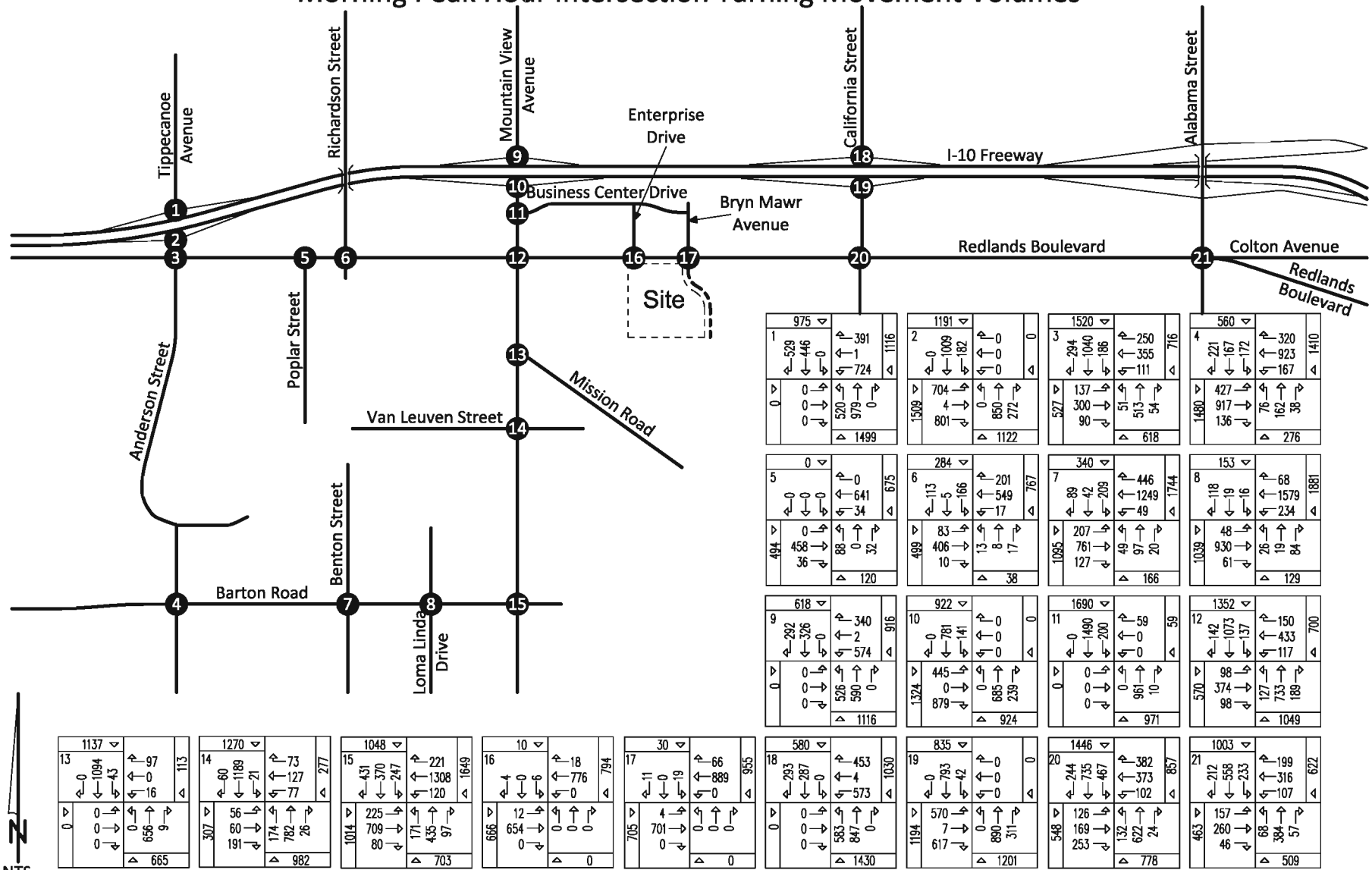
Figure 24
Opening Year (2016) With Project
Evening Peak Hour Intersection Turning Movement Volumes



KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 25
Year 2035 Without Project
Morning Peak Hour Intersection Turning Movement Volumes

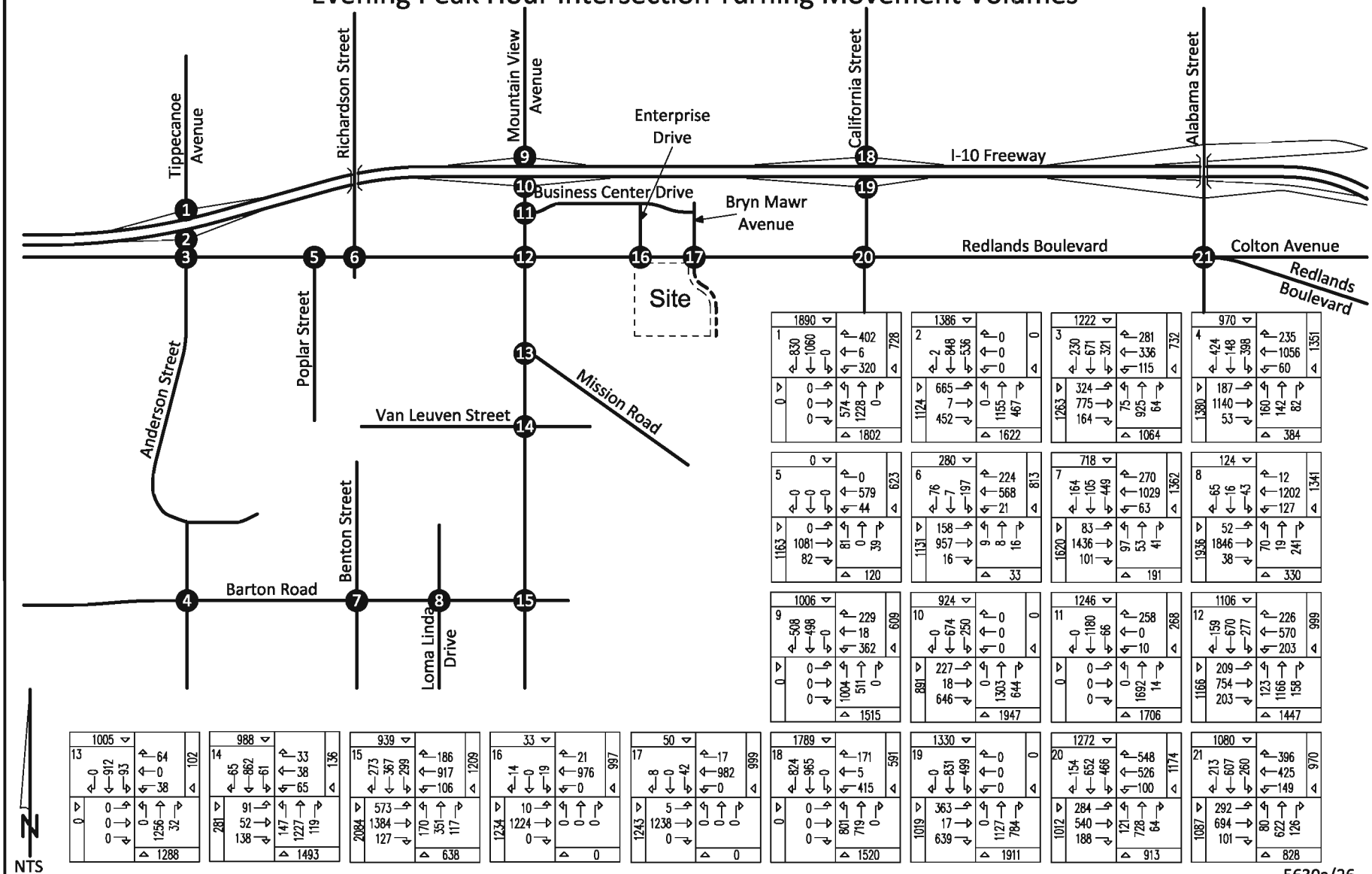


KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

5630a/25

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 26
Year 2035 Without Project
Evening Peak Hour Intersection Turning Movement Volumes

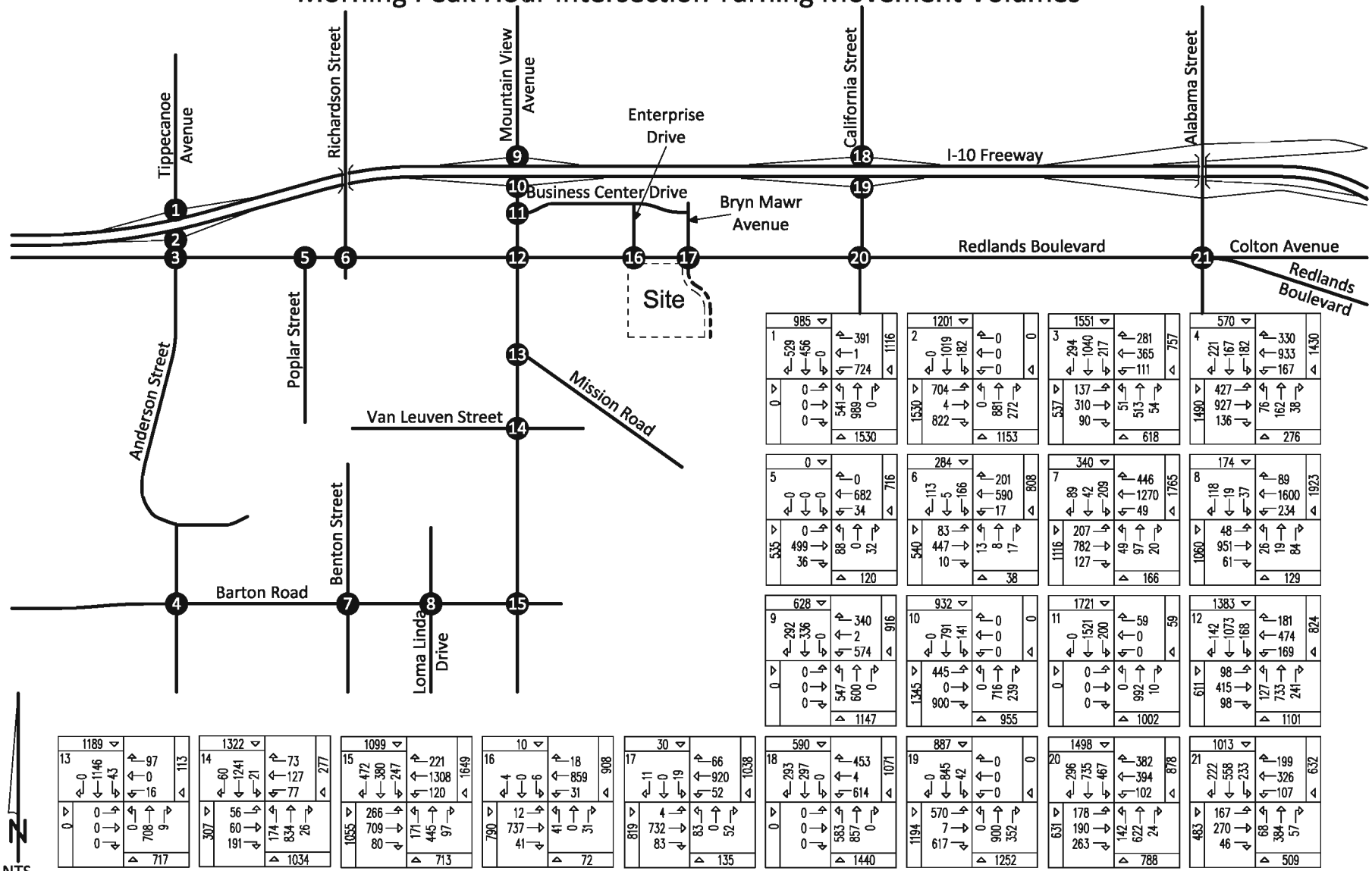


5630a/26

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 27
Year 2035 With Project
Morning Peak Hour Intersection Turning Movement Volumes

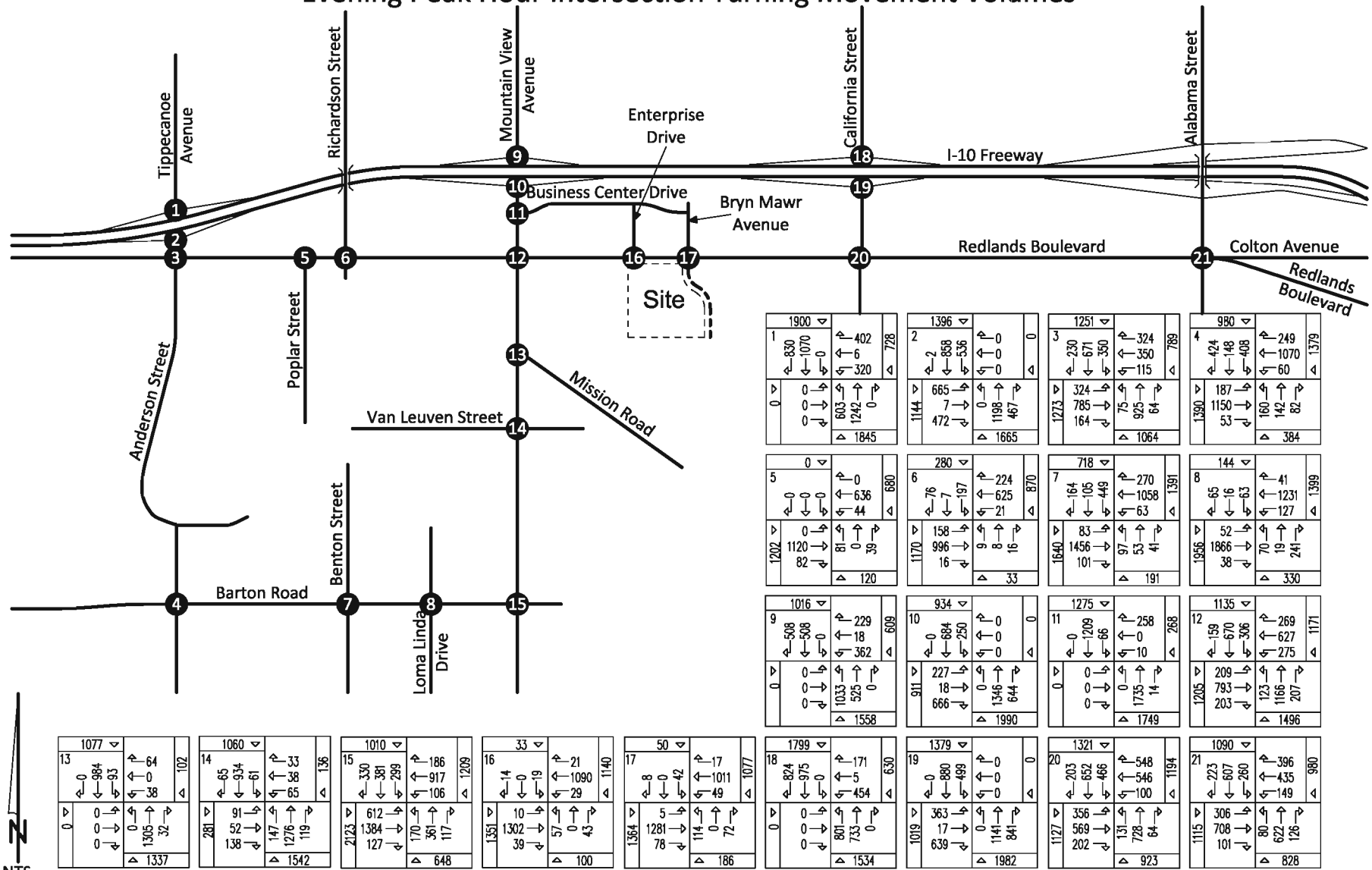


KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

5630a/27

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 28
Year 2035 With Project
Evening Peak Hour Intersection Turning Movement Volumes



Intersection reference numbers are in upper left corner of turning movement boxes.

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

V. Project Mitigation

A. Required Improvements and Costs

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for Existing Plus Project, Opening Year (2016), and Year 2035 traffic conditions. The improvements were determined through the operations analysis of Section IV.

The approximate costs for the Year 2035 improvements have generally been estimated using cost guidelines in the Congestion Management Program Handbook (see Appendix G). A unit cost of $400,000 for installation of a traffic signal has been substituted for the somewhat lower value cited in the Congestion Management Program materials. For adding a through lane, a unit cost of $290,000 has been assumed. The needed improvements and resulting costs are summarized in Table 8 for study area intersections.

The total cost of needed and unfunded intersection improvements is $470,000.

B. Project Contribution and Fair Share Costs

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The project fair share contributions have also been calculated for Year 2035 improvement locations. The project share of cost has been based on the proportion of project peak hour traffic contributed to the improvement location relative to the total new peak hour Year 2035 traffic volume.

Table 9 presents a summary of improvement cost and project cost shares at the Year 2035 intersection improvement locations. The intersection fair share cost calculations are based on the highest of the morning or evening peak hour traffic volumes. As shown in Table 9, the project's fair share of identified intersection costs is $70,323.

The dollar figures are rough order of magnitude estimates only. They are intended only for the discussion purposes of this traffic impact analysis, and do not imply any legal responsibility or formula for contributions or mitigation.

Consistent with Measure V, as mitigation for the potential traffic impacts, the proposed project shall contribute on a fair share basis, through an adopted traffic impact fee program, in the implementation of the recommended intersection lane improvements or freeway improvements, or in dollar equivalent in lieu mitigation contributions, or in the implementation of additional capacity on parallel routes to offset potential impacts to study area intersections.

Table 8

Summary of Intersection Improvements and Costs

Intersection	Improvement	Cost
Anderson Street (NS) at:		
Redlands Boulevard (EW) - #3	Construct Additional EB Through Lane	Nexus[1]
	Construct Additional WB Through Lane	Nexus
Barton Road (EW) - #4	Construct Additional EB Through Lane	Nexus
	Construct Additional WB Through Lane	Nexus
Mountain View Avenue (NS) at:		
I-10 Freeway WB Ramps (EW) - #9	Construct Additional NB Left Turn Lane	Nexus
	Construct SB Right Turn Lane	Nexus
I-10 Freeway EB Ramps (EW) - #10	Construct NB Right Turn Lane	Nexus
	Construct Additional SB Left Turn Lane	Nexus
Redlands Boulevard (EW) - #12	Construct NB Right Turn Lane	$ 50,000
	Construct Additional EB Through Lane	Nexus
	Construct EB Right Turn Lane W/Overlap	$ 60,000
	Construct Additional WB Through Lane	Nexus
	Construct WB Right Turn Lane W/Overlap	$ 60,000
Barton Road (EW) - #15	Construct Additional EB Through Lane	Nexus
	Construct Additional WB Through Lane	Nexus
California Street (NS) at:		
I-10 Freeway WB Ramps (EW) - #18	Construct Additional NB Left Turn Lane	Nexus
	Construct Additional NB Through Lane	Nexus
	Construct SB Free Right Turn Lane	Nexus
	Construct WB Left Turn Lanes	Nexus
	Construct Additional WB Right Turn Lane	Nexus
I-10 Freeway EB Ramps (EW) - #19	Construct Additional SB Left Turn Lane	Nexus
	Construct Additional SB Through Lane	Nexus
	Construct EB Left Turn Lanes	Nexus
	Construct Additional EB Right Turn Lane	Nexus
Redlands Boulevard (EW) - #20	Construct NB Left Turn Lanes	$ 100,000
	Construct Additional NB Through Lanes	Nexus
	Construct Additional SB Left Turn Lane	$ 50,000
	Consttruct Additional SB Through Lanes	Nexus
	Cosntruct Additional EB Left Turn Lane	$ 50,000
	Construct Additional EB Through Lane	Nexus
	Construct EB Right Turn Lane	$ 50,000
	Construct Additional WB Left Turn Lane	$ 50,000
	Construct Additional WB Through Lane	Nexus
Alabama Street (NS) at:		
Redlands Boulevard (EW) - #21	Construct Additional NB Left Turn Lane	Nexus
	Construct Additional NB Through Lane	Nexus
	Cosntruct Additional SB Left Turn Lane	Nexus
	Construct Additional EB Left Turn Lane	Nexus
	Construct EB Right Turn Lane	Nexus
	Construct Additional WB Left Turn Lane	Nexus
	Construct WB Right Turn Lane	Nexus
Total		$ 470,000

[1] Improvement included within the San Bernardino Associated Governments Development Mitigation Nexus Study Fee Program.

Table 9

Project Fair Share Intersection Traffic Contribution

Intersection	Total Cost	Peak Hour	Existing Traffic	Year 2035 With Project Traffic	Project Traffic	Total New Traffic	Project % of New Traffic	Project Cost Share
Anderson Street (NS) at:								
Redlands Boulevard (EW) - #3	Nexus[1]	Morning	2552	3463	82	911	9.0%	--
		Evening	3269	4377	96	1,108	8.7%	--
Barton Road (EW) - #4	Nexus	Morning	2873	3766	40	893	4.5%	--
		Evening	3083	4133	48	1,050	4.6%	--
Mountain View Avenue (NS) at:								
I-10 Freeway WB Ramps (EW) - #9	Nexus	Morning	1983	2691	41	708	5.8%	--
		Evening	2059	3183	53	1,124	4.7%	--
I-10 Freeway EB Ramps (EW) - #10	Nexus	Morning	2474	3232	62	758	8.2%	--
		Evening	2634	3835	73	1,201	6.1%	--
Redlands Boulevard (EW) - #12	$ 170,000	Morning	2718	3919	248	1,201	20.6%	$ 35,104
		Evening	3051	5007	289	1,956	14.8%	
Barton Road (EW) - #15	Nexus	Morning	3529	4516	102	987	10.3%	--
		Evening	3753	4990	120	1,237	9.7%	--
California Street (NS) at:								
I-10 Freeway WB Ramps (EW) - #18	Nexus	Morning	1,955	3,101	61	1,146	5.3%	--
		Evening	2,436	3,963	63	1,527	4.1%	--
I-10 Freeway EB Ramps (EW) - #19	Nexus	Morning	2,109	3,333	103	1,224	8.4%	--
		Evening	2,685	4,380	120	1,695	7.1%	--
Redlands Boulevard (EW) - #20	$ 300,000	Morning	2,381	3,795	166	1,414	11.7%	$ 35,219
		Evening	2,836	4,565	194	1,729	11.2%	--
Alabama Street (NS) at:								
Redlands Boulevard (EW) - #21	Nexus	Morning	1,800	2,637	40	837	4.8%	--
		Evening	2,908	4,013	48	1,105	4.3%	--
Total	$ 470,000							$ 70,323

[1] Improvement included within the San Bernardino Associated Governments Development Mitigation Nexus Study Fee Program.

VI. Conclusions and Recommendations

A. Summary

The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act.

The City of Loma Linda is the lead agency responsible for preparation of the traffic impact analysis, in accordance with California Environmental Quality Act authorizing legislation. This report analyzes traffic impacts for the anticipated opening date with full occupancy of the development in Year 2016, at which time it will be generating traffic at its full potential, and for the current traffic forecast year, which is the Year 2035.

A series of scoping discussions were conducted with the City of Loma Linda to define the desired analysis locations for each future analysis year. In addition, the San Bernardino Associated Governments staff has also been contacted to discuss the project and its associated travel patterns.

No analysis is required further than 5 miles from the project site. The roadway elements that must be analyzed are dependent on both the analysis year (project Opening Year or Year 2035) and project generated traffic volumes. The identification of the study area, and the intersections and highway segments requiring analysis, was based on an estimate of the two-way traffic volumes on the roadway segments near the project site. All arterial segments are required to be included in the analysis when the anticipated project volume equals or exceeds 50 two-way trips in the peak hours. The requirement is 100 two-way peak hour trips for freeways.

The project does not contribute trips greater than the freeway threshold volume of 100 two-way peak hour trips to the I-10 Freeway. The project does contribute trips greater than the arterial link threshold volume of 50 two-way trips in the peak hours on facilities serving intersections outside of the adjacent City of Redlands. This means that the City of Loma Linda must notify the City of Redlands and California Department of Transportation. Each of these agencies must also be provided with a copy of the traffic impact analysis, once the document is accepted by the City of Loma Linda. (Note: The purpose of this notification is to allow the California Department of Transportation to identify opportunities to make improvements to intersections concurrent with adjacent development, at considerably less cost and disruption than would occur if it were done after-the-fact).

The average daily traffic volume forecasts have been determined using the growth increment approach on the SBTAM traffic model Year 2008 and Year 2035 average daily traffic volume forecasts (see Appendix C). Traffic model plots are included in Appendix D. This difference defines the growth in traffic over the 27 year period. The incremental growth in average daily traffic volume has been factored to reflect the forecast growth between Year 2014 and Year 2035. For this purpose, linear growth between the Year 2008 base condition and the forecast Year 2035 condition was assumed. Since the increment

between Year 2014 and Year 2035 is 21 years of the 27 year time frame, a factor of 0.77 (i.e., 21/27) was used.

The Year 2035 without project daily and peak hour directional roadway segment volume forecasts have been determined using the growth increment approach on the SBTAM traffic model Year 2008 and Year 2035 peak hour volumes. The growth increment calculation worksheets are shown in Appendix C. Current peak hour intersection approach/departure data is a necessary input to this approach. The existing traffic count data serves as both the starting point for the refinement process, and also provides important insight into current travel patterns and the relationship between peak hour and daily traffic conditions. The initial turning movement proportions are estimated based upon the relationship of each approach leg's forecast traffic volume to the other legs forecast volumes at the intersection. The initial estimate of turning movement proportions is then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program Report 255. A linear programming algorithm is used to calculate individual turning movements that match the known directional roadway segment volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

Project traffic volumes were then added to the Year 2035 SBTAM traffic model volumes. Quality control checks and forecast adjustments were performed as necessary to ensure that all future traffic volume forecasts reflect a minimum of 10% growth over existing traffic volumes. The result of this traffic forecasting procedure is a series of traffic volumes suitable for traffic operations analysis.

B. Existing Conditions

Regional access to the project site is provided by the I-10 Freeway. Local access is provided by various roadways in the vicinity of the site. The north-south roadways which will be most affected by the project include Tippecanoe Avenue, Anderson Street, Poplar Street, Richardson Street, Benton Street, Loma Linda Drive, Enterprise Drive, Bryn Mawr Avenue, California Avenue, and Alabama Street. The east-west roadways expected to provide local access include Business Center Drive, Redlands Boulevard, Mission Road, Van Leuven Street, and Barton Road.

The existing delay and Level of Service for the intersection in the vicinity of the project are shown in Table 1. The study area intersections currently operate at Level of Service C or better during the peak hours for existing traffic conditions, except for the following study area intersection that is currently operating at Level of Service D/E during the peak hours:

Anderson Street (NS) at:
- Redlands Boulevard (EW) - #3
- Barton Road (EW) - #4

Mountain View Avenue (NS) at:
- Barton Road (EW) - #15

California Street (NS) at:
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

Existing delay worksheets are provided in Appendix E.

C. Project Traffic

Project traffic volumes for all future projections were estimated using the manual approach. Trip generation has been based upon rates obtained from the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012 and San Diego Association of Governments, Traffic Generators, April 2002.

To determine the trip distribution for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

As shown in Table 2, the proposed development is projected to generate a total of approximately 4,031 daily vehicle trips, 414 of which will occur during the morning peak hour and 482 of which will occur during the evening peak hour.

D. Future Conditions

An Existing Plus Project, Opening Year (2016) analysis, and Year 2035 analysis are included in this report. Existing Plus Project traffic operations analyses have been completed for the morning and evening peak hour and are shown in Table 3. Opening Year (2016) traffic operations analysis have been completed for the morning and evening peak hour and are shown in Tables 4 and 5. Morning and evening peak hour traffic operations analysis are summarized in Tables 6 and 7 for Year 2035.

For Existing Plus Project traffic conditions, the following study area intersections are projected to operate at Level of Service D to F during the peak hours:

Anderson Street (NS) at:
Redlands Boulevard (EW) - #3
Barton Road (EW) - #4

Mountain View Avenue (NS) at:
Barton Road (EW) - #15

Enterprise Drive (NS) at:
Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
Redlands Boulevard (EW) - #17

California Street (NS) at:
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

As shown in Table 3, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Existing Plus Project traffic conditions, with improvements.

For Opening Year (2016) Without Project traffic conditions, the following study area intersection is projected to operate at Level of Service D to F during the peak hours:

Anderson Street (NS) at:
Redlands Boulevard (EW) - #3
Barton Road (EW) - #4

Mountain View Avenue (NS) at:
Barton Road (EW) - #15

California Street (NS) at:
I-10 Freeway WB Ramps (EW) - #18
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

As shown in Table 4, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Opening Year (2016) Without Project traffic conditions, with improvements.

For Opening Year (2016) With Project traffic conditions, the following study area intersection is projected to operate at Level of Service D to F during the peak hours:

Anderson Street (NS) at:
Redlands Boulevard (EW) - #3
Barton Road (EW) - #4

Mountain View Avenue (NS) at:
Barton Road (EW) - #15

Enterprise Drive (NS) at:
Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
Redlands Boulevard (EW) - #17

California Street (NS) at:
I-10 Freeway WB Ramps (EW) - #18
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

As shown in Table 3, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Opening Year (2016) With Project traffic conditions, with improvements.

For Year 2035 Without Project traffic conditions, the following study area intersections are projected to operate at Level of Service D to F during the peak hours, without improvements:

Anderson Street (NS) at:
Redlands Boulevard (EW) - #3
Barton Road (EW) - #4

Mountain View Avenue (NS) at:
I-10 Freeway EB Ramps (EW) - #10
Redlands Boulevard (EW) - #12
Barton Road (EW) - #15

Enterprise Drive (NS) at:
Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
Redlands Boulevard (EW) - #17

California Street (NS) at:
I-10 Freeway WB Ramps (EW) - #18
I-10 Freeway EB Ramps (EW) - #19
Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
Redlands Boulevard (EW) - #21

As shown in Table 6, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Year 2035 Without Project traffic conditions, with improvements.

For Year 2035 With Project traffic conditions, the following study area intersections are projected to operate at Level of Service D to F during the peak hours, without improvements:

Anderson Street (NS) at:
- Redlands Boulevard (EW) - #3
- Barton Road (EW) - #4

Mountain View Avenue (NS) at:
- I-10 Freeway EB Ramps (EW) - #10
- Redlands Boulevard (EW) - #12
- Barton Road (EW) - #15

Enterprise Drive (NS) at:
- Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
- Redlands Boulevard (EW) - #17

California Street (NS) at:
- I-10 Freeway WB Ramps (EW) - #18
- I-10 Freeway EB Ramps (EW) - #19
- Redlands Boulevard (EW) - #20

Alabama Street (NS) at:
- Redlands Boulevard (EW) - #21

As shown in Table 7, the study area intersections are projected to operate within acceptable Levels of Service consistent with Measure V during the peak hours for Year 2035 With Project traffic conditions, with improvements.

E. Future Traffic Signal Warrant Analysis

Traffic signals are projected to be warranted at the following study area intersections for Existing Plus Project traffic conditions (see Appendix F):

Enterprise Drive (NS) at:
- Redlands Boulevard (EW) - #16

Bryn Mawr Avenue (NS) at:
- Redlands Boulevard (EW) - #17

F. Cost Summary

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for Opening Year (2016) and Year 2035 traffic conditions. The improvements were determined through the operations analysis of Section IV.

The total cost of needed and unfunded intersection improvements is $470,000.

Table 9 presents a summary of improvement cost and project cost shares at the Year 2035 intersection improvement locations. The intersection fair share cost calculations are based on the highest of the morning or evening peak hour traffic volumes. As shown in Table 9, the project's fair share of identified intersection costs is $70,323.

The dollar figures are rough order of magnitude estimates only. They are intended only for the discussion purposes of this traffic impact analysis, and do not imply any legal responsibility or formula for contributions or mitigation.

Consistent with Measure V, as mitigation for the potential traffic impacts, the proposed project shall contribute on a fair share basis, through an adopted traffic impact fee program, in the implementation of the recommended intersection lane improvements or freeway improvements, or in dollar equivalent in lieu mitigation contributions, or in the implementation of additional capacity on parallel routes to offset potential impacts to Congestion Management Program intersections and freeway segments.

G. Recommendations

Site-specific circulation and access recommendations are depicted on Figure 29.

1. On-Site Improvements

Construct Redlands Boulevard from the west project boundary to Bryn Mawr Avenue at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary.

Construct Bryn Mawr Avenue from Redlands Boulevard to the south project boundary at its ultimate cross-section width including landscaping and parkway improvements in conjunction with development, as necessary.

The project site should provide sufficient parking spaces to meet City of Loma Linda parking code requirements in order to service on-site parking demand.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

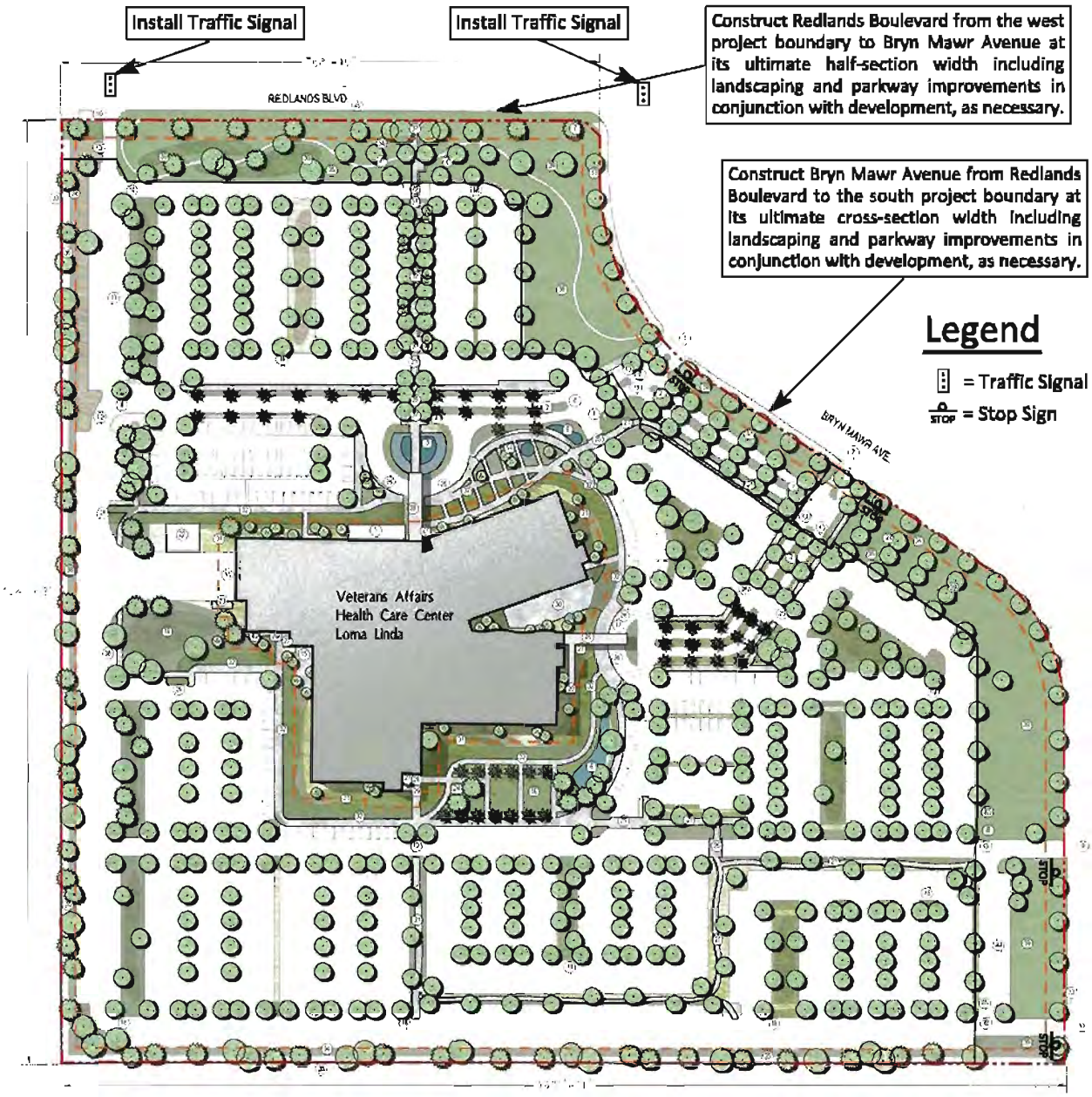
Sight distance at project accesses shall comply with standard California Department of Transportation/City of Loma Linda sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

2. Off-Site Improvements

The necessary off-site improvement recommendations were described in previous sections of this report. The project should contribute towards the cost of necessary study area improvements on a fair share or "pro-rata" basis.

As is the case for any roadway design, the City of Loma Linda should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Figure 29
Circulation Recommendations



The project site should provide sufficient parking spaces to meet City of Loma Linda parking code requirements in order to service on-site parking demand.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

Sight distance at project accesses shall comply with standard California Department of Transportation/City of Loma Linda sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

The project should contribute towards the cost of necessary study area improvements on a fair share or "pro-rata" basis.

As is the case for any roadway design, the City of Loma Linda should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

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Appendices

Appendix A – Glossary of Transportation Terms

Appendix B – Traffic Count Worksheets

Appendix C – Future Growth Increment Calculation Worksheets

Appendix D – Traffic Model Plots

Appendix E – Explanation and Calculation of Intersection Delay

Appendix F – Traffic Signal Warrant Worksheets

Appendix G – Preliminary Construction Cost Estimates for Congestion Management Program

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination; i.e. each trip has two trip-ends. A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

DRAFT MITIGATION MONITORING PROGRAM

FOR VETERANS AFFAIRS HEALTH CARE CENTER PROJECT
PPD NO. 13-127 and PD/ZC NO. 13-128)

Environmental Impact Issue	Required Mitigation Measures	Implementation and Monitoring Requirement
Potential Impacts to Nesting Birds During Construction	**BIO-1:** Nesting Birds - Trees adjacent to the site may provide nesting habitat to raptors and other birds observed using the site and surrounding areas. Ground-nesting bird species may nest throughout the project site. It is recommended that construction activities be scheduled outside of the avian nesting season (February 15–August 15). If construction must occur during the nesting season, a nesting bird survey will be conducted within 3 days prior to the beginning of construction activities. If nesting birds are found within the project area or adjacent areas (within 150 feet of disturbed habitat or within 250 feet of riparian habitat), project activities including vegetation clearing and encroachment by heavy equipment would not occur until it is verified by a qualified biologist that young have fledged the nest(s) and nesting is completed.	**Timeframe:** Prior to Site Disturbance or Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Community Development Department **Reporting Requirement:** Prior to start of site preparation or grading activities, the Applicant/Developer shall provide written notice prepared by a qualified biologist to the Director of Community Development verifying that the required pre-construction nesting bird surveys were completed and that no nest birds were observed on-site during the survey.
Potential Impacts to Burrowing Owls	**BIO-2:** Burrowing Owls. Although no burrowing owls or burrowing owl sign (e.g., whitewash, pellets, scat, tracks, and/or feathers) were observed during the 2012 focused surveys, this species has a potential to subsequently occupy any suitable burrows within the site. Per the currently accepted protocol, a take-avoidance survey should be conducted no more than 14 days prior to the initiation of ground	**Timeframe:** Prior to Site Disturbance or Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Community Development Department **Reporting Requirement:** Prior to start of site preparation or grading activities, the Applicant/Developer shall provide written notice

Environmental Impact Issue	Required Mitigation Measures	Implementation and Monitoring Requirement
	disturbance and a final survey should be conducted within 24 hours prior to ground disturbance to determine if the burrowing owl has subsequently occupied the development area. If surveys determine that burrowing owls occupy the site, a burrowing owl mitigation plan will be prepared, subject to approval by the California Department of Fish and Wildlife (CDFW).	prepared by a qualified biologist to the Director of Community Development verifying that the required pre-construction burrowing owl surveys were completed and that no evidence of burrowing owl was observed on-site during the survey.
Potential Impacts to Unknown Archaeological Resources	**CUL-1:** Because of the high sensitivity of the project site for subsurface archaeological remains, archaeological monitoring shall be required during all earth-moving activities and shall be conducted by a qualified archaeologist. Should cultural materials more than 50 years old be discovered, they shall be field recorded and evaluated. Should substantial cultural deposits be encountered, all ground-disturbing activities shall cease in the area of the discovery and a qualified archaeologist shall be retained to evaluate the significance of the finding and determine the appropriate course of action. Appropriate salvage operation requirements shall be followed. Site records or site record updates (as appropriate) incorporating the artifacts encountered during monitoring, shall be prepared and submitted to the Archaeological Information Center as a permanent record of the discovery (as appropriate). A report that documents the methods and results of the monitoring program, including an itemized inventory of recovered artifacts and a detailed artifact analysis, shall be prepared upon completion of the fieldwork. This report shall include an interpretation of the cultural activities represented by the archaeological remains and a discussion of the significance of all recovered cultural material. Collected artifacts shall be cleaned, identified,	**Timeframe:** During Site Disturbance or Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Community Development Department **Reporting Requirement:** At time of Grading Permit, the Applicant/Developer shall provide written verification to the Director of Community Development that qualified construction monitors shall be present on-site during all grading and excavation activity. The construction monitors shall be required to prepare daily reports verifying field work and findings. Copies of such reports shall be made available to the City upon request. In the event that significant resources are unearthed, the Director of Community Development shall be notified immediately.

Environmental Impact Issue	Required Mitigation Measures	Implementation and Monitoring Requirement
	catalogued, analyzed, and prepared for curation at an appropriate repository with permanent retrievable storage that would allow for additional research in the future.	
Cooperation with Interested Local Native American Groups	**CUL-2:** On-site monitoring shall be coordinated with local Native American groups who request to participate, including requests for government to government consultation.	**Timeframe:** Prior to Site Disturbance or Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Community Development Department **Reporting Requirement:** At time of Grading Permit, the Applicant/Developer shall provide written verification to the Director of Community Development that the Applicant/Developer has made reasonable attempt to outreach and coordinate with interested local Native American groups who may have interest in site monitoring during construction.
Potential Impacts to Unknown Paleontological Resources	**CUL-3:** A paleontologist shall monitor site grading activities with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate reposition, and file a report with the City Planning Department documenting any paleontological resources that are found during site grading. A paleontological mitigation monitoring program shall be developed in accordance with the provisions of CEQA as well as the proposed guidelines of the Society of Vertebrate Paleontology and shall include, but not be limited to, the following: • Monitoring of excavations that will exceed five feet in depth in the Project Area by a qualified paleontologic monitor. Paleontologic monitors should be equipped to salvage fossils as they	**Timeframe:** During Site Disturbance or Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Community Development Department **Reporting Requirement:** At time of Grading Permit, the Applicant/Developer shall provide written verification to the Director of Community Development that qualified construction monitors shall be present on-site during all grading and excavation activity. The construction monitors shall be required to prepare daily reports verifying field work and findings. Copies of such reports shall be made available to the City upon request. In the event

Environmental Impact Issue	Required Mitigation Measures	Implementation and Monitoring Requirement
	are unearthed to avoid construction delays and to remove samples of sediments that re likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. • Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. • Identification and curation of specimens into a museum respository with permanent retrievable storage. The paleontologist should have a written repository agreement in hand prior to the initiation of mitigation activities. • Preparation of a report of findings with and appended itemized inventory of specimens. The report an inventory, when submitted to the appropriate Lead Agency, would` signify completion of the program to mitigate impacts on paleontological resources.	that significant resources are unearthed, the Director of Community Development shall be notified immediately.
Potential Presence of Unknown Human Remains	**CUL-4:** As part of normal field procedures, if suspected human remains are encountered during site activity, all work in the area shall cease and the San Bernardino County Coroner's Office shall be contacted immediately.	**Timeframe:** During Site Disturbance or Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Community Development Department **Reporting Requirement:** In the event that human remains are uncovered, the Applicant/Developer shall immediately notify the County Coroner's Office and contact the Director of Community Development of any findings.

Environmental Impact Issue	Required Mitigation Measures	Implementation and Monitoring Requirement
Potential Presence of Unknown Hazardous Materials	**HAZ-1**:All miscellaneous vehicles, maintenance equipment and materials (i.e., fertilizer, lubricants, grease, waste-oil, gasoline), construction/irrigation materials, miscellaneous stockpiled debris, storage tanks, smudge pots, and 5-gallon buckets, shall be removed off-site and properly disposed of at an approved landfill facility. Once removed, a visual inspection of the areas beneath the removed materials shall be performed. Any stained soils observed underneath the removed materials should be sampled. Result of the sampling (if necessary) shall indicate the level of remediation efforts that may be required.	**Timeframe:** Prior to Site Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Director of Public Works **Reporting Requirement:** Prior to issuance of a Grading Permit, the Applicant/Developer shall provide written notification to the Director of Public Works that all on-site debris and remnants have been removed and that no evidence of contaminated materials or soils was observed. Such verification shall be prepared by a qualified consultant. Verification shall also include that all debris was properly disposed at an approved landfill or recycling facility.
Potential Presence of Unknown High Pesticide Contaminant Levels	**HAZ-2**:During site grading, soil sampling shall occur throughout the project site, to determine if pesticide concentrations exceed established regulatory requirements. If concentrations are found to be at excessive levels, the applicant/developer shall notify the Loma Linda City Engineer and identify proper handling procedures (if any) that may be required.	**Timeframe:** During Site Preparation and Grading **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Director of Public Works **Reporting Requirement:** Upon completion of surface grading activity, the Applicant/Developer shall provide written notification to the Director of Public Works to demonstrate that adequate soil sampling was completed and that high concentrations of residual pesticides were found not present. Such verification shall be prepared by a qualified consultant. If remedial efforts were required, verification shall also include that all contaminate soil was properly disposed at an approved facility.
Potential Impacts to	**HAZ-3**:Should construction require dewatering	**Timeframe:** During Site Grading and

Environmental Impact Issue	Required Mitigation Measures	Implementation and Monitoring Requirement
Local Groundwater Quality	activities, or should groundwater be encountered during construction, a qualified hazardous materials consultant with Phase II and Phase III experience shall review groundwater documents regarding regional groundwater quality and determine what additional (if any) investigations and research may be required. Should groundwater be encountered, the Loma Linda City Engineer should be notified immediately and appraised of site conditions and informed of all follow-up investigation.	Excavation **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Director of Public Works **Reporting Requirement:** If groundwater is encountered during project construction, the Applicant/Developer shall immediately notify the Director of Public Works so that site conditions can be assessed and a plan for appropriate action developed.
Potential Impacts to Local Groundwater Quality	**HAZ-4**: Any water wells encountered during site grading and construction shall be property removed and abandoned pursuant to the latest procedures required by the local agency with closure responsibilities for the wells. Any associated equipment (i.e., diesel fuel tank, concrete, piping, and associated materials) shall be removed off-site and properly disposed of at a permitted landfill. A visual inspection of the areas beneath the removed materials (if any) shall be performed to determine what (if any) remedial measures may be necessary.	**Timeframe:** During Site Grading and Excavation **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Director of Public Works **Reporting Requirement:** If water wells or oil wells are encountered during project construction, the Applicant/Developer shall immediately notify the Director of Public Works so that site conditions can be assessed and a plan for appropriate action developed.
Potential Presence of Unknown Hazardous Substances	**HAZ-5**: If unknown wastes or suspect materials are discovered during construction by the contractor, which he/she believes may involve hazardous waste/materials, the contractor shall: • Immediately stop work in the vicinity of the suspected contaminant, removing workers and the public from the area; • Notify the Project Engineer of the implementing Agency; • Secure the areas directed by the Project Engineer; and	**Timeframe:** During Site Grading and Excavation **Responsibility:** Applicant/Developer **Monitoring Agency:** City of Loma Linda, Director of Public Works **Reporting Requirement:** If suspicious or hazardous materials is encountered during project construction, the Applicant/Developer shall immediately notify the Director of Public Works so that site conditions can be assessed and a plan for appropriate action developed.

Environmental Impact Issue	Required Mitigation Measures	Implementation and Monitoring Requirement
	• Notify the implementing agency's Hazardous Waste/Materials Coordinator.	The Applicant/Developer should first utilize a qualified consultant to make an initial determination of such materials.

CONDITIONS OF APPROVAL

(PPD NO. 13-127 and PD/ZC NO. 13-128)

COMMUNITY DEVELOPMENT DEPARTMENT

General

1. Within two years of this approval, the Precise Plan of Design shall be exercised by substantial construction or the permit/approval shall become null and void. In addition, if after commencement of construction, work is discontinued for a period of one year, the permit/approval shall become null and void.

PROJECT: **EXPIRATION DATE:**
Precise Plan of Design No. 13-127
Planned Development No. 13-128

2. The review authority may, upon application being filed 30 days prior to the expiration date and for good cause, grant a one-time extension not to exceed 12 months. The review authority shall ensure that the project complies with all current Development Code provisions.

3. In the event that this approval is legally challenged, the City of Loma Linda will promptly notify the applicant of any claim or action and will cooperate fully in the defense of the matter. Once notified, the applicant agrees to defend, indemnify, and hold harmless the City, their affiliates, officers, agents and employees from any claim, action or proceeding against the City of Loma Linda. The applicant further agrees to reimburse the City for any costs and attorneys fees, which the City may be required by a court to pay as a result of such action, but such participation shall not relieve applicant of his or her obligation under this condition.

4. Approval of PPD No. 13-127 and PD/ZC No. 13-128 is contingent upon the applicant signing and returning an "Agreement to Conditions Imposed" form as established by the City of Loma Linda Community Development Department.

5. Construction shall be in substantial conformance with the plan(s) approved by the Planning Commission. Minor modification to the plan(s) shall be subject to approval by the Director through a minor administrative variation process. Any modification that substantively results in changes to the Development Plan shall require the refilling of the original application and a subsequent hearing by the appropriate hearing review authority, if applicable. Any modification that exceeds 10% of the following allowable measurable design/site considerations shall considered a substantial change:

    a. On-site circulation and parking, loading and landscaping;
    b. Placement and/or height of walls, fences and structures;

c. Reconfiguration of architectural features, including colors, and/or modification of finished materials that do not alter or compromise the previously approved theme; and,

d. A reduction in density or intensity of a development project.

6. Signs are not approved as a part of this permit. Prior to establishing any new signs, the applicant shall submit an application, and receive approval, for a sign permit from the Planning Division (pursuant to LLMC, Chapter 17.18) and building permit for construction of the signs from the Building Division, as applicable.

7. No vacant, relocated, altered, repaired or hereafter erected structure shall be occupied or no change of use of land or structure(s) shall be inaugurated, or no new business commenced as authorized by this permit until a Certificate of Occupancy has been issued by the Building Division. A Temporary Certificate of Occupancy may be issued by the Building Division subject to the conditions imposed on the use, provided that a deposit is filed with the Community Development Department prior to the issuance of the Certificate, if necessary. The deposit or security shall guarantee the faithful performance and completion of all terms, conditions and performance standards imposed on the intended use by this permit.

8. The applicant shall comply with all of the Public Works Department requirements for recycling prior to issuance of a Certificate of Occupancy.

9. This permit or approval is subject to all the applicable provisions of the Loma Linda Municipal Code, Title 17 in effect at the time of approval, and includes development standards and requirements relating to: dust and dirt control during construction and grading activities; emission control of fumes, vapors, gases and other forms of air pollution; glare control; exterior lighting design and control; noise control; odor control; screening; signs, off-street parking and off-street loading; and, vibration control. Any exterior structural equipment, or utility transformers, boxes, ducts or meter cabinets shall be architecturally screened by wall or structural element, blending with the building design and include landscaping when on the ground.

10. This permit or approval is subject to all the applicable provisions of the East Valley Corridor Specific Plan in effect at the time of approval, and includes development standards and requirements relating to: dust and dirt control during construction and grading activities; emission control of fumes, vapors, gases and other forms of air pollution; glare control; exterior lighting design and control; noise control; odor control; screening; signs, off-street parking and off-street loading; and, vibration control. Any exterior structural equipment, or utility transformers, boxes, ducts or meter cabinets shall be architecturally screened by wall or structural element, blending with the building design and include landscaping when on the ground.

11. The project shall comply with all non-exempt provisions of Measure V and shall pay the full amount or any recalculated development impact fees, including traffic impact fees, prior to occupancy.

12. The proposed project shall contribute on a fair share basis, through an adopted traffic impact fee project, in the implementation of the recommended intersection lane improvements or in dollar equivalent in lieu mitigation contributions, or in the implementation of additional capacity on parallel routes to offset potential impacts to study area intersections as listed in the Traffic Analysis prepared by Kunzman Associates.

13. All Development Impact fees shall be paid to the City of Loma Linda prior to the issuance of a Certificate of Occupancy.

14. The applicant to pay all required development impact fees to cover 100 percent of the pro rata share of the estimated cost of public infrastructure, facilities, and services.

15. Prior to issuance of any Building and/or Construction Permits, the applicant shall submit to the Community Development Department proof of payment or waiver from both the City of San Bernardino for sewer capacity fees and Redlands Unified School District for school impact fees.

16. The Owner shall indemnify, protect, defend, and hold harmless the City, and any agency or instrumentality thereof, and officers, officials, employees, or agents thereof, from any and all claims, actions, suits, proceedings, or judgments against the City, or any agency or instrumentality thereof, and any officers, officials, employees, or agents thereof to attack, set aside, void, or annul, an approval of the City, or any agency or instrumentality thereof, advisory agency, appeal board, or legislative body, including actions approved by the voters of the City, concerning the project and the approvals granted herein. Furthermore, Owner shall indemnify, protect, defend, and hold harmless the City, or any agency or instrumentality thereof, against any and all claims, actions, suits, proceedings, or judgments against another governmental entity in which Owner's project is subject to that other governmental entity's approval and a condition of such approval is that the City indemnify and defend such governmental entity. City shall promptly notify the Owner of any claim, action, or proceeding. City shall further cooperate fully in the defense of the action. Should the City fail to either promptly notify or cooperate fully, the Owner shall not thereafter be responsible to indemnify, defend, protect, or hold harmless the City, any agency or instrumentally thereof, or any of its officers, officials, employees, or agents.

Construction and Grading

17. All construction shall meet the requirements of the latest adopted California Building Code (CBC) as adopted and amended by the City of Loma Linda and legally in affect at the time of issuance of any Building Permit(s).

18. The developer shall require that all construction equipment activities be restricted to occur only between the hours of 7:00 a.m. to 6:00 p.m. weekdays and Sundays. Construction activities shall not occur on Saturdays or Holidays.

19. The developer shall locate construction staging areas as far from existing noise-sensitive land uses, as feasible.

20. The project proponent shall ensure that any portion of the site to be graded shall be pre-watered prior to the onset of grading activities.

    (a) The project proponent shall ensure that watering of the site or other soil stabilization method shall be employed on an on-going basis after the initiation of any grading activity on the site. Portions of the site that are actively being graded shall be watered regularly to ensure that a crust is formed on the ground surface, and shall be watered at the end of each workday.

    (b) The project proponent shall ensure that all disturbed areas are treated to prevent erosion until the site is constructed upon.

    (c) The project proponent shall ensure that landscaped areas are installed as soon as possible to reduce the potential for wind erosion.

    (d) The project proponent shall ensure that all grading activities are suspended during first and second stage ozone episodes or when winds exceed 25 miles per hour.

21. The applicant shall implement SCAQMD Rule 403 and standard construction practices during all operations capable of generating fugitive dust, which will include but not be limited to the use of best available control measures and reasonably available control measures such as:

    - Water active grading areas and staging areas at least three times daily as needed;
    - Require that during grading operations all graders and dozers used on the project site meet Tier 2 or greater emission requirements. Any other heavy equipment used on the project site that is not mentioned shall meet the minimum allowable emissions standards set by the California Air Resources Board.

- Apply water or soil stabilizers to form crust on inactive construction areas and unpaved work areas;
- Suspend grading activities when wind gusts exceed 25 mph;
- Sweep public paved roads if visible soil material is carried off-site;
- Enforce on-site speed limits on unpaved surface to 15 mph; and
- Discontinue construction activities during Stage 1 smog episodes.

22. The applicant shall implement the following construction practices during all construction activities to reduce VOC emission:

    a. The contractor shall utilize (as much as possible) pre-coated building materials and coating transfer or spray equipment with high transfer efficiency, such as high volume, low pressure (HVLP) spray method, or manual coating applications such as paint brush, hand roller, trowel, dauber, rag, or sponge.
    b. The contractor shall utilize water-based or low VOC coating of 100 g/l of VOC (allowing approximately 31,500 square feet painted per day) to 250 g/l of VOC (allowing approximately 12,950 square feet painted per day). The following measures shall also be implemented:
        - Use Super-Compliant VOC paints whenever possible.
        - If feasible, avoid painting during peak smog season: July, August, and September.
        - Recycle leftover paint. Take any left-over paint to a household hazardous waste center; do not mix leftover water-based and oil-based paints.
        - Keep lids closed on all paint containers when not in use to prevent VOC emissions and excessive odors.
        - For water-based paints, clean up with water only. Whenever possible, do not rinse the clean-up water down the drain or pour it directly into the ground or the storm drain. Set aside the can of clean-up water and take it to a hazardous waste center (www.cleanup.org).
        - Recycle the empty paint can.
        - Look for non-solvent containing stripping products.
        - Use Compliant Low-VOC cleaning solvents to clean paint application equipment.
        - Keep all paint and solvent laden rags in sealed containers to prevent VOC emissions.

23. The applicant shall work with Waste Management to follow a debris management plan to divert the material from landfills by the use of separate recycling bins (e.g., wood, concrete, steel, aggregate, glass) during demolition and construction to minimize waste and promote recycling and reuse of the materials.

Project Mitigation

24. Mitigation Measure BIO-1. Nesting Birds - Trees adjacent to the site may provide nesting habitat to raptors and other birds observed using the site and surrounding areas. Ground-nesting bird species may nest throughout the project site. It is recommended that construction activities be scheduled outside of the avian nesting season (February 15–August 15). If construction must occur during the nesting season, a nesting bird survey will be conducted within 3 days prior to the beginning of construction activities. If nesting birds are found within the project area or adjacent areas (within 150 feet of disturbed habitat or within 250 feet of riparian habitat), project activities including vegetation clearing and encroachment by heavy equipment would not occur until it is verified by a qualified biologist that young have fledged the nest(s) and nesting is completed.

25. Mitigation Measure BIO-2. Burrowing Owls. Although no burrowing owls or burrowing owl sign (e.g., whitewash, pellets, scat, tracks, and/or feathers) were observed during the 2012 focused surveys, this species has a potential to subsequently occupy any suitable burrows within the site. Per the currently accepted protocol, a take-avoidance survey should be conducted no more than 14 days prior to the initiation of ground disturbance and a final survey should be conducted within 24 hours prior to ground disturbance to determine if the burrowing owl has subsequently occupied the development area. If surveys determine that burrowing owls occupy the site, a burrowing owl mitigation plan will be prepared, subject to approval by the California Department of Fish and Wildlife (CDFW).

26. Mitigation Measure CUL-1. Because of the high sensitivity of the project site for subsurface archaeological remains, archaeological monitoring shall be required during all earth-moving activities and shall be conducted by a qualified archaeologist. Should cultural materials more than 50 years old be discovered, they shall be field recorded and evaluated. Should substantial cultural deposits be encountered, all ground-disturbing activities shall cease in the area of the discovery and a qualified archaeologist shall be retained to evaluate the significance of the finding and determine the appropriate course of action. Appropriate salvage operation requirements shall be followed. Site records or site record updates (as appropriate) incorporating the artifacts encountered during monitoring, shall be prepared and submitted to the Archaeological Information Center as a permanent record of the discovery (as appropriate). A report that documents the methods and results of the monitoring program, including an itemized inventory of recovered artifacts and a detailed artifact analysis, shall be prepared upon completion of the fieldwork. This report shall include an interpretation of the cultural activities represented by the archaeological remains and a discussion of the significance of all recovered cultural material. Collected artifacts shall be cleaned, identified, catalogued, analyzed, and prepared for curation at an appropriate repository with permanent retrievable storage that would allow for additional research in the future.

27. Mitigation Measure CUL-2. On-site monitoring shall be coordinated with local Native American groups who request to participate, including requests for government to government consultation.

28. Mitigation Measure CUL-3. A paleontologist shall monitor site grading activities with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate reposition, and file a report with the City Planning Department documenting any paleontological resources that are found during site grading. A paleontological mitigation monitoring program shall be developed in accordance with the provisions of CEQA as well as the proposed guidelines of the Society of Vertebrate Paleontology and shall include, but not be limited to, the following:

    - Monitoring of excavations that will exceed five feet in depth in the Project Area by a qualified paleontologic monitor. Paleontologic monitors should be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments that re likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens.
    - Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.
    - Identification and curation of specimens into a museum respository with permanent retrievable storage. The paleontologist should have a written repository agreement in hand prior to the initiation of mitigation activities.
    - Preparation of a report of findings with and appended itemized inventory of specimens. The report an inventory, when submitted to the appropriate Lead Agency, would` signify completion of the program to mitigate impacts on paleontological resources.

29. Mitigation Measure CUL-4. As part of normal field procedures, if suspected human remains are encountered during site activity, all work in the area shall cease and the San Bernardino County Coroner's Office will be contacted immediately.

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31. Mitigation Measure HAZ-1. All miscellaneous vehicles, maintenance equipment and materials (i.e., fertilizer, lubricants, grease, waste-oil, gasoline), construction/irrigation materials, miscellaneous stockpiled debris, storage tanks, smudge pots, and 5-gallon buckets, shall be removed off-site and properly

disposed of at an approved landfill facility. Once removed, a visual inspection of the areas beneath the removed materials shall be performed. Any stained soils observed underneath the removed materials should be sampled. Result of the sampling (if necessary) shall indicate the level of remediation efforts that may be required.

32. Mitigation Measure HAZ-2. During site grading, soil sampling shall occur throughout the project site, to determine if pesticide concentrations exceed established regulatory requirements. If concentrations are found to be at excessive levels, the applicant/developer shall notify the Loma Linda City Engineer and identify proper handling procedures (if any) that may be required.

33. Mitigation Measure HAZ-3. Should construction require dewatering activities, or should groundwater be encountered during construction, a qualified hazardous materials consultant with Phase II and Phase III experience shall review groundwater documents regarding regional groundwater quality and determine what additional (if any) investigations and research may be required. Should groundwater be encountered, the Loma Linda City Engineer should be notified immediately and appraised of site conditions and informed of all follow-up investigation.

34. Mitigation Measure HAZ-4. Any water wells encountered during site grading and construction shall be property removed and abandoned pursuant to the latest procedures required by the local agency with closure responsibilities for the wells. Any associated equipment (i.e., diesel fuel tank, concrete, piping, and associated materials) shall be removed off-site and properly disposed of at a permitted landfill. A visual inspection of the areas beneath the removed materials (if any) shall be performed to determine what (if any) remedial measures may be necessary.

35. Mitigation Measure HAZ-5. If unknown wastes or suspect materials are discovered during construction by the contractor, which he/she believes may involve hazardous waste/materials, the contractor shall:

- Immediately stop work in the vicinity of the suspected contaminant, removing workers and the public from the area;
- Notify the Project Engineer of the implementing Agency;
- Secure the areas directed by the Project Engineer; and
- Notify the implementing agency's Hazardous Waste/Materials Coordinator.

36. The applicant shall implement SCAQMD Rule 403 and standard construction practices during all operations capable of generating fugitive dust, which will include but not be limited to the use of best available control measures and reasonably available control measures.

37. The operator shall comply with all existing and future CARB and SCAQMD regulations related to diesel-fueled trucks, which may include among others: (1) meeting more stringent emission standards; (2) retrofitting existing engines with particulate traps; (3) use of low sulfur fuel; and (4) use of alternative fuels or equipment.

Landscaping and Lighting

38. The applicant shall submit three sets of the final landscape plan prepared by a state licensed Landscape Architect, subject to approval by the Community Development Department, and by the Public Works Department for landscaping in the public right-of-way.

39. Final landscape and irrigation plans shall be in substantial conformance with the approved conceptual landscape plan and these conditions of approval. Any and all fencing, including the "green screen," shall be illustrated on the final landscape plan.

40. Landscape plans shall depict the utility laterals, concrete improvements, and tree locations. Any modifications to the landscape plans shall be reviewed and approved by the Public Works and Community Development Departments prior to issuance of permits.

41. The applicant, property owner, and/or business operator shall maintain the property and landscaping in a clean and orderly manner and all dead and dying plants shall be replaced with similar or equivalent type and size of vegetation.

42. Prior to issuance of grading permits, the applicant shall submit a photometric plan and final lighting plan to City staff showing the exact locations of light poles and the proposed orientation and shielding of the fixtures to prevent glare onto adjacent properties.

FIRE DEPARTMENT

43. All construction shall meet the requirements of the editions of the 2010 California Building Code (CBC) and the 2010 California Fire Code (CFC)/International Fire Code (IFC) as adopted and amended by the City of Loma Linda and legally in effect at the time of issuance of building permit.

44. Pursuant to UFC Section 901.4.4, as amended in Loma Linda Municipal Code (LLMC) Section 15.28.150, building address numerals shall be a minimum of eight (8) inches, affixed to the building so as to be visible from the street, and electrically illuminated during the hours of darkness.

45. Fire Department Impact Fees shall be assessed according to the rate legally in effect at the time of building permit issuance. Pursuant to LLMC Chapter 3.28,

plan check and inspection fees shall be collected at the rates established by the City manager's Executive Order.

46. The applicant shall meet the Fire Departments requirements regarding emergency access to the site. The site circulation shall meet the performance requirements of all emergency vehicles.

47. Prior to the issuance of building permits, the applicant/developer shall submit a Utility Improvement Plan showing the location of fire hydrants for review and approval by the Fire Department, and provided the following information: (a) The applicant shall provide a fire hydrant at each point of entry; and (b) Provide Fuel 13 sprinkler protection.

48. The project shall meet all required access radii with clearance notes into and around the entire project.

49. The applicant shall provide the Fire Department with 24 hour access to the site via Knox Boxes or other means as approved by the Fire Marshal

PUBLIC WORKS DEPARTMENT

50. The developer shall submit an engineered grading plan for the proposed project. The precise grading plan for the project shall be approved by the City of Loma Linda prior to issuance of any Building Permit(s).

51. All public improvement plans shall be submitted to the City of Loma Linda Public Works Department for review and approval.

52. The applicant/developer shall submit a grading plan, preliminary soils report, storm water pollution prevention plan (SWPPP), water quality management plan (WQMP) and hydrology/hydraulic study to the City of Loma Linda Public Works Department for review and approval.

53. The applicant/developer shall comply with the requirements of the National Pollution Discharge Elimination System (NPDES) permit program. Prior to issuance of grading permits, the applicant shall submit to the City Engineer a Notice of Intent (NOI) to comply with obtaining coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Storm Water Permit from the State Water Resources Control Board. Evidence that this has been obtained (i.e., a copy of the Waste Dischargers Identification Number) shall be submitted to the City Engineer for coverage under the NPDES General Construction Permit.

54. All utilities shall be underground. As appropriate, the applicant/developer shall bond for any undergrounding of utilities that is deferred until after occupancy.

55. The applicant/developer shall install or bond for all off-site improvements.

56. Any damage to existing improvements or streets as a result of this project shall be repaired by the applicant/developer to the satisfaction of the Loma Linda City Engineer.

57. The applicant shall submit and obtain Public Works Department approval of an erosion control plan to minimize potential increases in erosion and sediment transport during short term construction and long term operational activity. Place erosion control measures prior to issuance of building permits. An erosion control deposit will be required prior to recordation of final map or issuance of grading permits whichever occurs first.

58. The applicant shall submit a preliminary soils report with the Public Works Department prior to issuance of grading permits.

59. The Applicant shall submit a hydrologic report for the subject development to determine storm runoff quantities contributing to the site and determine building pad elevations.

60. The Applicant shall pay appropriate fees for plan check, inspection, GIS map plan update, microfilming and storage of maps and plans, and other required fees.

61. City of Loma Linda to be the sewer purveyor. Sewage connection shall be to City of Loma Linda.

62. City of Loma Linda to be water purveyor.

63. The Applicant shall pay for the relocation of any power poles or other existing public utilities as necessary.

64. Water mains shall be sized and installed as shown on approved utility plans for domestic service to the development. Submit plans for review and approval.

65. Service lines from the main and the water meters shall be installed in accordance with City of Loma Linda standards.

66. The project shall comply with the Low Impact Development (LID) Principles and LID Best Management Practices (BMPs) for Southern California.

67. The applicant/developer shall comply with City adopted policies regarding the reduction of construction and demolition (C&D) materials.

68. All waste to be disposed of in accordance with local, state and federal regulations. The contractor to contract with a local waste hauler or ensure that

waste containers are emptied weekly. Waste containers cannot be washed out on-site.

The applicant has read and understands the project Conditions of Approval and agrees to implement as stated herein.

Applicant signature	Date
Owner signature	

End of Conditions

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Minutes City of Loma Linda

Community Development

Planning Commission

Regular Meeting of February 5, 2014

A regular meeting of the Planning Commission was called to order by Chairman Nichols at 7:00 p.m., Wednesday, February 5, 2014, in the City Council Chambers, 25541 Barton Road, Loma Linda, California.

Commissioners Present:	John Nichols, Chairman Miguel Rojas, Vice Chairman Carolyn Palmieri (arrived at 7:05 p.m.) Ryan Gallant
Commissioners Absent:	Nikan Khatibi
Staff Present:	Konrad Bolowich, Assistant City Manager Richard Holdaway, City Attorney Guillermo Arreola, Associate Planner

Chairman Nichols led the Pledge of Allegiance. No items were added or deleted; no public participation comments were offered upon invitation of the Chairman.

PC 14-06 – SPECIFIC PLAN AMENDMENT NO. 13-037, ZONE CHANGE (ZC) NO. 14-011, PRECISE PLAN OF DESIGN (PPD) NO. 14-012, CONDITIONAL USE PERMIT (CUP) NO. 13-028_, VARIANCE NO. 13-054_, TENTATIVE PARCEL MAP NO._13-038 – A PROPOSAL TO AMEND THE EAST VALLEY CORRIDOR SPECIFIC PLAN FROM EVC-SINGLE FAMILY RESIDENTIALTO ACCOMMODATE THE CONSTRUCTION OF A 46,718 SQUARE FOOT MARKETPLACE WITH CONVENIENCE STORE, GAS STATION, CAR WASH, AND SEPARATE COMMERCIAL BUILDING PAD, AND A 75-FOOT HIGH FREESTANDING SIGN, ON 1.07 ACRES OF LAND LOCATED AT THE CORNER OF MOUNTAIN VIEW AVENUE, INTERSTATE 10 (I-10), AND ROSEWOOD AVENUE

Chairman Nichols introduced the item and opened the Public Hearing. Associate Planner Arreola presented the staff report into evidence, indicating the proposed project encompassed a convenience store, gasoline service, automated car wash and separate commercial building pad. There would be no alcohol sales. Included were various requests – a Specific Plan Amendment and Zone Change to change the site designation from East Valley Corridor Single Family Residential to East Valley Corridor General Commercial; a Precise Plan of Design and CUP for the operation of the gasoline service station and free-standing sign; a variance to allow the free-standing sign and to increase the height from 40' to 75' and a reduction in the interior property landscaping requirements; and a tentative parcel map to consolidate from 6 to 2 lots. The underlying General Plan designation is commercial, which includes all the residential properties to the south up to Redlands Blvd. The applicant, consultant and traffic engineer were available to address concerns of the Commission.

Questions and concerns from Commissioners included:

- Due to the size of the requested sign in relation to the lot size, perhaps a Master Sign Plan be contemplated, allowing the sign to be utilized by future businesses in that area;
- That the requested landscape Variance to allow for the use of a smaller percentage of interior property line landscaping did not reduce the overall landscaping required;

- Confirming the requested Zone Change would allow the gas station, thereby eliminating the need for the Conditional Use Permit;
- Concern that the approval of the Sign Variance would prompt requests from other businesses;
- Groundcover indicated as gravel, perhaps some thought be given to some other drought-resistant plant options similar to the Barton Road median;
- Some landscaping in the proposed median versus strictly hardscape as it is a gateway to the City and should make more of an impact;
- Concern about traffic circulation, the right turn only from Rosewood onto Mountain View Avenue created the need for a U-turn at the Mountain View Avenue and Business Center Drive traffic signal and the left turn lane from northbound Mountain View Avenue traffic onto Rosewood;
- Delineated pedestrian access to the project at the southeast corner of the project as pictured in the proposed plans directed pedestrians into the vehicle travel path; that perhaps moving that accented pedestrian access to the north of the Mountain View Avenue driveway delineating the pedestrian path of travel directly to the convenience store portion of the project;
- Pad for future development and landscaping/parking concerns.
- Leakage from the gas tanks getting into the water supply at the City well site adjacent to the project.
- Lights from cars exiting onto Rosewood after dark and the headlights shining into the homes across the street.

Applicant and staff responded:

- Potential for sign to have space for future development; amendment of Conditional Use Permit would come before the Commission for review and approval. The purpose of the variance is to find conditions unique to this site; one of those being the close proximity to the off-ramp.
- Overall amount of landscaping is not reduced, just distributed throughout the site.
- Groundcover is crushed gravel, with number of shrubs and brush. It would be difficult to put plants instead of crushed gravel; applicant agreeable to use of drought-resistant groundcover.
- The Zone Change changes the zoning to match the existing General Plan, and would thus require a conditional use permit per the East Valley Corridor Specific Plan.
- Left turn pocket from Mountain View Avenue to Rosewood was reviewed and approved by the Public Works Department pursuant to the traffic study.
- Applicant was agreeable to move the delineated pedestrian access to north of Mountain View Avenue access nearer to the convenience store.
- Pad for future development would include additional parking and landscaping upon development.
- The double-wall fiberglass gas tanks almost never have any leaks and even the smallest amount of leakage from the gas tanks is detected immediately, the station is shut down and appropriate agencies are notified. In addition, the City wells pull from the deepest aquifers and, theoretically, if a leak were to happen, would be in the top layer and not work its way to the very bottom layer.
- The headlights from the exit on to Rosewood would be directed for a very short time between the houses across the street, not directly into either one.

Mr. Marwan Alabassi, project applicant, introduced Dan Haskins and Steve Ritchey, project engineers. He indicated that while the freeway sign seems large, to attract vehicles from the I-10 freeway, the height is necessary and he welcomes the opportunity for the sign to accommodate future businesses. He is agreeable to the landscape changes to drought resistant groundcover. The lack of landscape in the median was a requirement of the City. The right-turn only from Rosewood on to Mountain View Avenue was the only viable option. The signal at Mountain View Avenue and Business Center Drive allows for a U-turn and is supported by the traffic study. The U-turn at Business Center Drive was for vehicles only, tanker

trucks would use an already approved truck route along Redlands Boulevard to either California Street or Anderson street to return to the freeway. Discussion ensued between the applicant and Commissioners regarding issues outlined above.

Mr. Alabassi continued, providing a brief background of the project that started with the purchase of the parcels in 2006 and a number of obstacles overcome over the ensuing 7 years. His team has worked with City staff, taking the original design through several revisions to what was presented this evening. He has a construction company and owns several shopping centers and gas stations that are doing well. His hope was to get a recommendation for approval for the project from the Planning Commission.

Chairman Nichols invited comment from the public.

Steve Rice, 10413 Spade Dr., Loma Linda addressed the Planning Commission and indicated his concerns were with the increased traffic and the possibility of vehicles using Spade Drive to Sun Avenue as an alternative route back to Mountain View Avenue. It has been a quiet neighborhood, with children playing and he was concerned for the safety of the existing residents.

Mr. Alabassi indicated a willingness to install left-turn only signage at the exit on to Rosewood to help address the concerns expressed by Mr. Rice.

Dick Wiley addressed the Planning Commission regarding possible future traffic increasing from Norton (the closed Air Force base to the north) and the Amazon Warehouse, left turn access to and from the project and the proposed median.

Chairman Nichols summarized discussion thus far:

- Consideration of participation in a master sign plan for the freeway sign in conjunction of development on adjacent parcels as an integrated center;
- Modifying landscaping to include drought resistant groundcover instead of gravel;
- Moving pedestrian link from the corner to walkway leading to the convenience store, balanced on the south of Mountain View Avenue driveway;
- Consideration of low maintenance landscape in the median;
- Bring back a design that shows the traffic patterns;
- Interior landscaping at the pad for future development in the interim;

Associate Planner Arreola asked for clarification from the applicant as to the anticipated use of the future pad; was it to be demolished or left “as is” until future development?

Applicant responded that the pad currently has one house and his intent is to leave the house, cleaned and remodeled for use as a construction office. He is willing to increase the proposed landscaping. He is also willing to demolish the house if it becomes necessary.

Project Engineer Dan Haskins, Land Engineering Consultants, addressed the Commission. Due to time constraints and pressures put on the development over time, the applicant would like to get a vote tonight, whether to recommend approval or denial and would be willing to accept the additional conditions regarding landscaping; Public Works and Staff again review the intersection of Mountain View Avenue and Rosewood to make sure it complies with the traffic impact study and meets Caltrans Division of Highway Standards for turning movements as it is not an ideal intersection.

Commissioner Rojas stated that he would prefer to see the revised plans prior to recommending approval. City Attorney indicated that the project will go to City Council for further review. Staff can work with the applicant to incorporate Planning Commission recommendations to present for City Council

consideration. Conditions that have been discussed can be added and the project could move forward to City Council.

> Motion by Nichols to recommend approval of staff recommendation of Specific Plan Amendment 13-037, Zone Change 14-011, Precise Plan of Design 14-012, Conditional Use Permit 13-028, Variance 13-054 and Tentative Parcel Map 13-038 with the added conditions as noted above.
>
> Motion died for lack of a second.
>
> Motion by Nichols to continue the Public Hearing Specific Plan Amendment 13-037, Zone Change 14-011, Precise Plan of Design 14-012, Conditional Use Permit 13-028, Variance 13-054 and Tentative Parcel Map 13-038 to the March 5th Planning Commission meeting with applicant to address the concerns of the Commission.

Applicant requested that the project not be continued.

City Attorney commented that the applicant has the right to appeal not only a decision, but to also appeal an action to continue the item. The Planning Commission can move to not approve and that can be appealed to the City Council at that point. The Commission also has the right to continue the item if it believes there is a legitimate basis for a continuance, that some modification or changes brought forward would be worth considering that may lead to an approval rather than delaying the denial.

> Motion on the floor seconded by Rojas, and failed. Palmieri and Gallant opposed, Khatibi absent.
>
> Motion by Nichols to deny the project.

City Attorney suggested a modification to consider forwarding to City Council with a recommendation that it not be approved. He also indicated that the traffic issues, median landscaping and funds to maintain are policy decisions for City Council.

> **Motion by Palmieri, seconded by Rojas to forward the project to the City Council with the recommendation that the project not be approved and carried. Nichols opposed, Khatibi absent.**

City Attorney and Assistant City Manager Bolowich indicated that staff would work with the applicant to address the issues brought forward by the Planning Commission.

Commissioner Palmieri indicated that she appreciated the efforts that have gone into the project and the applicant's willingness to work with staff; the problems that need solving she believes are beyond the purview of the Planning Commission and need to be addressed at the City Council level.

REPORTS BY PLANNING COMMISSIONERS

Vice Chairman Rojas asked about the building currently under construction at the Centerpoint property and that it looked significantly different from what was approved. Assistant City Manager responded that the only changes were minor and amounted to a change in location of the doors. Approved was a large, single tenant building with a second building to the west with 7 or 8 shops which is not yet under construction, but is in the plan check process. A Wal-Mart Neighborhood Market will occupy the large

tenant space and for the shops adjacent, it was his understanding that discussions are underway with Subway, Starbucks and Native Foods.

REPORTS BY STAFF

None.

The meeting adjourned at 9:10 p.m.

Minutes approved at the meeting of _____.

_____
Barbara Nicholson
Deputy City Clerk