COMMUNITY & ECONOMIC DEVELOPMENT DEPARTMENT

Planning Division

Negative Declaration

AGENDA ITEM NO.:

WARD: 3

1. **Case Number:** P15-0862 (General Plan Amendment), P15-0863 (Rezone), P15-0864 (Tentative Tract Map 36994), P15-0865 (Site Plan Review), P15-0866 (Design Review) and P16-0647 (Variance)

2. **Project Title:** Harris Farm Townhome Project

3. **Hearing Date:** November 3, 2016

4. **Lead Agency:** City of Riverside
   Community & Economic Development Department, Planning Division
   3900 Main Street, 3rd Floor
   Riverside, CA 92522

5. **Contact Person:** Gaby Adame, Assistant Planner
   Phone Number: (951) 826-5933, gadame@riversideca.gov

6. **Project Location:** The 2.96-net acre parcel of land is located at 4105 Jefferson Street, Riverside, CA 92504. It is located on the east side of Jefferson Street, approximately 462 feet south of California Avenue. The project site is identified as Assessor Parcel Number 222-130-025. It is further identified in a portion of the Riverside Land and Irrigation Company, Township 3 South and Range 5 West, San Bernardino Baseline and Meridian. The latitude and longitude is 33° 56' 33.88" North and 117° 25' 11.34" West.

7. **Project Applicant/Project Sponsor's Name and Address:**

   R.C. Hobbs Company, Inc.
   1110 East Chapman Avenue, Orange, CA 92866
   Attention: Jeff Moore, Vice President of Operations

8. **General Plan Designation:** The project site lies within the Public Facilities/Institutions land use designation as identified by the Land Use Element of the City of Riverside General Plan. A proposed land use designation of Medium-High Density Residential (MDHR) with a maximum density at 14.5 dwelling units per ac (du/acre) and a typical density at 12 du/acre is requested under the General Plan Amendment.

9. **Zoning:** The project site is zoned R-1-7000. A proposed classification of R-3-3000 (Multiple-Family Residential) with an Airport Protection Overlay (R-3-3000-AP-D) is requested under the Zone Change application.

10. **Description of Project:** (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)

General Plan Amendment No. P15-0862: to amend the land use designation from Public Facilities/Institutions (PF) to Medium-High Density Residential (MDHR) with a maximum density of 14.5 du/acre and a typical density of 12 du/acre) on the 2.96 net acre parcel. The project's proposed density is 12.2 dwelling units per acre.

Zone Change No. P15-0863: to change the zone classification from R-1-7000 to the proposed classification of R-3-3000 (Multiple-Family Residential) with an Airport Protection Overlay (R-3-3000-AP-D). The project site is located southeast, approximately 0.85 nautical miles/5,086.50 feet ground length, from the Riverside Municipal Airport. The site and applications fall under the purview of the County of Riverside Airport Land Use Commission and the Riverside Municipal Airport Compatibility Plan and that is why the Airport Protection Overlay is recommended for the site.

Tentative Tract Map No. P15-0864 (TTM 36994) proposes to one 2.96 net acre lot for condominium purposes. The map will provide for thirty-six (36) residential units, common drives, parking, recreational amenities and water detention basin.

Site Plan Review No. P15-0865: to allow for the establishment of gated community of thirty-six (36) residential units covering 1.09 acres (47,614 square feet), drive aisles and parking consisting of 0.67 acre (29,206 square feet) and 1.2 acres (52,327 square feet) of landscaping on the 2.96 net acre site.

Design Review No. P15-0866: to allow for the construction and development of thirty-six (36) residences, a community pool, a restroom/maintenance structure, a children's play area, a community garden area with raised beds and storage shed, seating, a trellis structure and a water detention basin to treat on site water flows together with an enhanced paved entry, perimeter walls and fencing, drive aisles and other appurtenant supporting infrastructure.

Variance No. P16-0647: to request a variance of Municipal Code Section 19.100.070D Additional Regulations for the R-3 and R-4 Zones, Distance Between Buildings from a minimum of 15 feet to a minimum of 8.5 feet.

PROJECT DESIGN

The project includes thirty-six (36) attached residential units within ten separate buildings. The ten residential buildings proposed as part of the development as each two-story with a maximum height of 29 feet, six inches. The residential buildings contain a mix of unit types with the exception of Building 1 adjacent to Jefferson Street that has four Plan 4 units. The characteristics of the four different floor plans are as follows:

PLAN	DESCRIPTION	NUMBER	AREA
1	3 BR/2½ BATH	7	1,456 S.F.
2	3 BR/2½ BATH	13	1,674 S.F.
3	4 BR/3 BATH	11	1,939 S.F.
4	3 BR/2½ BATH	5	1,993 S.F.

Parking

Per Riverside Municipal Code (RMC) Table 19.580.060 two parking spaces per unit shall have a private garage. Each residential unit includes an enclosed private two-car garage. Additionally, twenty open parking spaces will also be provided for residents and visiting guests.

Open Space

Per RMC Table 19.100.070, common and private open space shall be provided. Common usable open space per unit within an R-3-3000 Residential Zone shall be 500 square feet. Private open space is divided between ground floor and upper floor by unit with 120 square feet required on the ground floor level and 50 square feet provided on an upper story level. The applicant is providing 671 square feet of common open space. The private open space ranges from 134 square feet for Unit #4 to 1,304 square feet for Unit #24.

The applicant is providing 1.20 acres of the total site in landscape/recreational/open space uses. Open space amenities include an 24-foot by 35-foot swimming pool, a restroom and pool equipment storage building, play equipment structures, picnic tables, benches, a community garden area with raised beds and storage shed, and a trellis structure.

Vehicular access will be provided from one 37-foot driveway entry off of Jefferson Street. The travel lanes at the entry will be 16-feet in width. Access to the units will be from a new 25-foot private street that connects directly to Jefferson Street. The roadway will provide access to the interior of the project site.

The project will be gated and be surrounded with perimeter walls and fencing. The walls will be 6-feet in height along the northern, southern and eastern boundaries. Adjacent to Jefferson Street and Building #1, a 42-inch high vinyl picket fence will be erected. The pool area will be enclosed with 5-foot 6 inch high tube steel fencing. Individual units will have 5-foot 6 inch high vinyl fencing separating individual units.

Wet and dry utility connections would be made to existing facilities within Jefferson Street. There is an existing 12-inch sewer line in Jefferson Street to serve the project. A new proposed 8-inch project water line will connect to an existing line at Willow Avenue southerly of the subject parcel. The project will require the undergrounding of utilities along the project frontage.

Variance

A request to vary the regulation established under Municipal Code Section 19.100.070D Additional Regulations for the R-3 and R-4 Zones, Distance Between Buildings from a minimum of 15 feet to a minimum of 8.5 feet. The variance is necessary due to the conflict of applying a multiple-family residential design regulation to an attached single-family residential development. The variance requested is for all buildings with the exception of Building 1 and Building 10. The minimum building separation is 8.5 feet occurring between Buildings 2 and 3 and Buildings 8 and 9. The distance between Buildings 4 and 5 is 10.5 feet. The distance between Building 6 and 7 is approximately 11 feet. Generally, the Municipal Code allows projections into the required yards for features such as porches, platforms, or landings. They may project up to 3 feet into a required side or rear yard area. The utility closet feature is approximately 2 feet by 8 feet and can be deemed similar to the allowable projections.

PROJECT CONSTRUCTION

The project proposes to develop 36 attached residential dwelling units. On-site roads will occupy approximately 0.67 acres of the total site acreage. The project would include the demolition of an existing one-story single-family detached residential dwelling unit, with a subterranean basement located near Jefferson Street and ancillary structures including a wood-framed barn/wood shop and greenhouses. The existing residence is on a septic system which is located just north of the house. The septic system will be abandoned as part of this project. The project is anticipated to be built in one phase. Construction is expected to begin no earlier than January 2017 and be completed end of December 2017. Opening year is 2018.

11. **Surrounding land uses and setting: Briefly describe the project's surroundings:**

The project site is located within a predominately built-out and urbanized area along Jefferson Street in the Ramona Neighborhood of the city of Riverside. The project area consists of one parcel that is approximately 195.91 feet by 660.70 feet. The project has direct frontage to Jefferson Street. Topographically, the site is relatively flat with surface sheet flow draining towards the west and Jefferson Street at a rate of approximately 1%. Total relief on site is approximately 6 feet with the highest elevation located at the northeasterly end of the property at approximately 783 feet above mean sea level (amsl), and the lowest elevation located at the southwestern side of the property at approximately 777 feet amsl. Several mature trees are on site along with a vegetation debris pile located on the north eastern end of the property. Most of the site use to be a working farm land but has since been graded.

The surrounding developments are a combination of single-family residences, public facilities and institutional uses. The Welbrook Arlington, an Independent Living, Assisted Living, and Memory Care facility is directly to the north, and single-family residences surround the site to the west, east and south. Don Jones Park, a 5.78-acre neighborhood park, is approximately 700 feet south of the site on the east side of Jefferson Street. The Magnolia K-

8 Academy, a Springs Charter School, is approximately 450 feet south on the west side of Jefferson Street at Sycamore Avenue.

	Existing Land Use	General Plan Designation	Zoning Designation
Project Site	**Single Family Residential**	**PF – Public Facilities/ Institutions**	**R-1-7000 – Single Family Residential**
North	**Institutional**	**PF – Public Facilities/ Institutions**	**R-1-7000 – Single Family Residential**
East	**Single Family Residential**	**MDR – Medium Density Residential**	**R-1-7000 – Single Family Residential**
South	**Single-Family Residential**	**MDR – Medium Density Residential**	**R-1-7000 – Single Family Residential**
West	**Single Family Residential**	**MDR – Medium Density Residential**	**R-1-7000 – Single Family Residential**

12. **Other public agencies whose approval is required (e.g., permits, financial approval, or participation agreement.):**

The City of Riverside is the land use authority for this project requiring the following approvals:

- General Plan Amendment No. No. P15-0862: to amend the land use designation from Public Facilities/Institutions (PF) to Medium-High Density Residential (MDHR) with a maximum density of 14.5 du/acre and a typical density of 12 du/acre) on the 2.96 net acre parcel.
- Zone Change No. P15-0863: to change the zone classification from R-1-7000 to the proposed classification of R-3-3000 (Multiple-Family Residential) with an Airport Protection Overlay (R-3-3000-AP-D).
- Tentative Tract Map No.: P15-0864 (TTM 36994) proposes to one 2.96 net acre lot for condominium purposes. The map will provide for thirty-six (36) residential units, common drives, parking, recreational amenities and water detention basin.
- Site Plan Review No. P15-0865: to allow for the establishment of gated community of 36 townhomes, drive aisles, parking and landscaping/open space on the 2.96 net acre site.
- Design Review No. P15-0866: to allow for the construction and development of 36 residences, a community pool, a restroom/maintenance structure, a children's play area, a community garden area with raised beds and storage shed, seating, a trellis structure and a water detention basin to treat on site water flows together with an enhanced paved entry, perimeter walls and fencing, drive aisles and other appurtenant supporting infrastructure.
- Variance No. 16-0647: to request a variance of Municipal Code Section 19.100.070D Additional Regulations for the R-3 and R-4 Zones, Distance Between Buildings from a minimum of 15 feet to a minimum of 8.5 feet.

Although land use authority is provided by the City of Riverside, the project may be subject to additional permits and/or fees by other public agencies. A summary of these additional requirements are as follows:

Consistency review with the Riverside Municipal Airport Land Use Compatibility Plan as administered by the County of Riverside Airport Land Use Commission.

A PM-10 Plan for compliance with Rule 401, Dust Control for the South Coast Air Basin will be required from the South Coast Air Quality Management District (SCAQMD).

Standard permits through the State Water Resources Control Board for compliance with NPDES standards. These include the following: Construction Stormwater General Permit; Notice of Intent to Comply with Section

402 of the Clean Water Act, Construction Stormwater Pollution Prevention Plan (SWPPP); and Approval of O&M SWPPP.

The project will be subject to the regional Transportation Uniform Mitigation Fee (TUMF) as administered by the Western Riverside Council of Governments (WRCOG).

No federal agency permits or approvals were identified.

13. **Other Environmental Reviews and Resources Incorporated by Reference in this Review:**

California Emission Estimator Model (CalEEMod) ® Version 2013.2.2, *Summer, Winter and Annual Runs for Harris Farm Townhome Project*, August 23, 2016.

California Department of Conservation, Farmland Mapping and Monitoring Program of the California Resources Agency (http://www.conservation.ca.gov/dlrp/Pages/qh_maps.aspx) [Accessed August 1, 2016].

California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011- 2016*. Sacramento, California, May 2016.

California Department of Fish and Wildlife, California Regional Conservation Plans Map [Accessed August 2, 2016].

California Department of Forestry and Fire Protection and the USDA Forest Service, California Land Cover Mapping and Monitoring Program (LCMMP), Vegetation GIS files, Pacific Southwest Region, EvegTile51A__02_03_v2.2007 [Accessed August 2, 2016].

California Department of Toxic Substances Control, EnviroStor, <www.envirostor.dtsc.ca.gov/ public/search.asp> [Accessed August 1, 2016].

California Department of Toxic Substances Control, Hazardous Facilities Subject to Corrective Action. <www.calepa.ca.gov/SiteCleanup/CorteseList/SectionA.htm#Facilities> [Accessed August 1, 2016].

California Department of Transportation website identifying the California Scenic Highway Mapping System: Riverside County [Accessed on August 1, 2016].

California Department of Transportation, Division of Aeronautics website, California Public Use Airport list. [Accessed July 27, 2016]

California State Water Resources Control Board, GeoTracker, <geotracker.waterboards.ca.gov> [Accessed August 1, 2016].

California State Water Resources Control Board, List of Active CDO and CAO. <www.calepa.ca.gov/ SiteCleanup/CorteseList/CDOCAOList.xls> [Accessed August 1, 2016].

California State Water Resources Control Board, Sites Identified with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit. <www.calepa.ca.gov/SiteCleanup/CorteseList/ CurrentList.pdf> [Accessed August 1, 2016].

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City of Riverside *General Plan 2025 Final Programmatic Environmental Impact Report*, certified November 2007 and amended through Fourth Addendum – July 24, 2012, Resolution No. 22437

City of Riverside *Municipal Code*.

City of Riverside Website, www.riversideca.gov.

County of Riverside Airport Land Use Commission *Staff Report* dated November 12, 2015.

Flood Insurance Rate Maps (FIRM), Panel 06065C0710G, August 28, 2008.

GeoMat Testing Laboratories, Inc., *Basic Soil Infiltration Testing Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California*, July 27, 2015.

GeoMat Testing Laboratories, Inc., *Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California*, July 31, 2015.

Great!Schools Website, www.greatschools.org/school-district-boundaries-map/, accessed August 15, 2016.

JM Research and Consulting, *Cultural Resources Assessment for the Proposed Harris Farm Townhome Project 4105 Jefferson Street, Riverside, County of Riverside*, October 2015.

Kunzman Associates, Inc., *Interior Noise Assessment for Harris Farm Project*, September 30, 2015.

Kunzman Associates, Inc., *Exterior/Interior Noise Assessment for Harris Farm Project*, January 13, 2016..

Riverside County Transportation Commission (RCTC), *2011 Riverside County Congestion Management Program*, December 14, 2011.

Riverside Unified School District Website, www.rusdlink.org, accessed August 3, 2016.

Robin Environmental Management. *Phase I Environmental Assessment Report for 4105 Jefferson Street (APN 227-130-025) Riverside, CA 92504* dated July 24, 2015.

SDH & Associates, Inc., *Project Specific Preliminary Water Quality Management Plan for 4105 Jefferson Street*, Revised September 29, 2016.

South Coast Air Quality Management District (SCAQMD) CEQA Handbook, 1993.

UC Davis Soil Resource Laboratory, SoilWeb, http://casoilresource.lawr.ucdavis.edu/gmap/. Accessed August 1, 2016.

United States Fish & Wildlife Service, Environmental Conservation Online System.

United States Fish and Wildlife Service, National Wetlands Inventory, Wetlands Mapper.

Western Riverside County Regional Conservation Authority, *Conservation Summary Report Generator.*

14. **Acronyms**

AICUZ -	Air Installation Compatible Use Zone Study
AQMP -	Air Quality Management Plan
CEQA -	California Environmental Quality Act

CMP -	Congestion Management Plan
EIR -	Environmental Impact Report
EOP -	Emergency Operations Plan
FEMA -	Federal Emergency Management Agency
FPEIR -	GP 2025 Final Programmatic Environmental Impact Report
GIS -	Geographic Information System
GhG -	Green House Gas
GP 2025 -	General Plan 2025
IS -	Initial Study
LHMP -	Local Hazard Mitigation Plan
MSHCP -	Multiple-Species Habitat Conservation Plan
NCCP -	Natural Communities Conservation Plan
OEM -	Office of Emergency Services
OPR -	Office of Planning & Research, State
PEIR -	Program Environmental Impact Report
PW -	Public Works, Riverside
RCALUC -	Riverside County Airport Land Use Commission
RCALUCP -	Riverside County Airport Land Use Compatibility Plan
RCP -	Regional Comprehensive Plan
RCTC -	Riverside County Transportation Commission
RMC -	Riverside Municipal Code
RPD -	Riverside Police Department
RPU -	Riverside Public Utilities
RTIP -	Regional Transportation Improvement Plan
RTP -	Regional Transportation Plan
RUSD -	Riverside Unified School District
SCAG -	Southern California Association of Governments
SCAQMD -	South Coast Air Quality Management District
SCH -	State Clearinghouse
SKR-HCP -	Stephens’ Kangaroo Rat - Habitat Conservation Plan
SWPPP -	Storm Water Pollution Prevention Plan
USGS -	United States Geologic Survey
WQMP -	Water Quality Management Plan

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 & Forest 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 Service	☐ Recreation
☐ Transportation/Traffic	☐ Utilities/Service Systems	☐ Mandatory Findings of Significance

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation which reflects the independent judgment of the City of Riverside, it is recommended that:

The City of Riverside finds that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	☒
The City of Riverside finds 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.	☐
The City of Riverside finds that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	☐
The City of Riverside finds 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.	☐
The City of Riverside finds that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	☐

Signature _____ Date _____

Printed Name & Title _____ For City of Riverside

EVALUATION OF ENVIRONMENTAL IMPACTS:

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

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

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

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

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

   a. **Earlier Analysis Used.** Identify and state where they are available for review.
   b. **Impacts Adequately Addressed.** Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c. **Mitigation Measures.** For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measure which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

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

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

8) The explanation of each issue should identify:

   a. the significance criteria or threshold, if any, used to evaluate each question; and

   b. the mitigation measure identified, if any, to reduce the impact to less than significance.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
1. AESTHETICS. Would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐

1a. Response: ***(Source: General Plan 2025 Figure CCM-4 – Master Plan of Roadways, General Plan 2025 FPEIR Figure 5.1-1 – Scenic and Special Boulevards and Parkways, Table 5.1-A – Scenic and Special Boulevards, and Table 5.1-B – Scenic Parkways)***

Less Than Significant Impact. Scenic vistas can be impacted by development in two ways. First, a structure may be constructed that blocks the view of a vista. Second, the vista itself may be altered (i.e., development on a scenic hillside). The City of Riverside's General Plan Open Space and Conservation element states that Riverside's natural features provide a dramatic and varied topographic setting for the community. Scenic resources enhance the visual character of Riverside and provide distinguishing characteristics. The hillsides and ridgelines above Riverside offer scenic benefits to the community. They serve as landmarks and offer a sense of direction or orientation as people move around the City. The City has adopted policies to balance development interests with these broader community preservation objectives. Vista points can be found throughout the City both from urban areas toward the hills and from wilderness areas looking onto Riverside. Long- distance views of natural terrain and vegetation can be found throughout the La Sierra/Norco Hills, Sycamore Canyon Wilderness Park and Box Springs Park. The peaks of Box Springs Mountain, Mt. Rubidoux, Arlington Mountain, Alessandro Heights and the La Sierra/Norco Hills provide scenic view points of the City and the region.

The proposed project is located on a previously developed site, addressed as 4105 Jefferson Street, within an urbanized area visually dominated by residential and institutional land uses and surface street features. This site is not considered to be within or to comprise a portion of a scenic vista. Construction of the new buildings together with parking and accessory landscaping elements would have less than significant effect on a scenic vista. The proposed development is generally consistent in type and scale with the existing surrounding development. The proposed residential units will have a height in conformance with proposed development standards of the R-3-3000 zone so as to not impede or hinder a scenic view. Therefore, the project will result in a less than significant impact on any scenic vista.

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒

1b. Response: ***(Source: General Plan 2025 Figure CCM-4 – Master Plan of Roadways, General Plan 2025 FPEIR Figure 5.1-1 – Scenic and Special Boulevards, Parkways, Table 5.1-A – Scenic and Special Boulevards, Table 5.1-B – Scenic Parkways, the City's Urban Forest Tree Policy Manual, Title 20 – Cultural Resources, Title 19 – Article V – Chapter 19.100 – Residential Zones – R3 Zone, and*** **California Department of Transportation website identifying the California Scenic Highway Mapping System: Riverside County accessed on August 1, 2016.)**

No Impact. The project is not adjacent to a designated state scenic highway or eligible state scenic highway as identified on the California Scenic Highway Mapping System. Thus, the proposed project would not damage the integrity of existing visual resources or historic buildings located along a State Scenic Highway. No impact on scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway, would result. The project site is located in a previously developed, urbanized area, and contains no scenic resources. Therefore, no impact to scenic resources visible from a state scenic highway will occur.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐

1c. Response: ***(Source: General Plan 2025, General Plan 2025 FPEIR, Zoning Code, and Citywide Design and Sign Guidelines)***

Less Than Significant Impact. Development of the proposed project could result in a significant impact if it resulted in substantial degradation of the existing visual character or quality of the site and its surroundings. Degradation of visual character or quality is defined by substantial changes to the existing site appearance through construction of structures such that they are poorly designed or conflict with the site's existing surroundings.

Construction of the proposed project would result in short-term impacts to the existing visual character and quality of the area. Construction activities would require the use of equipment and storage of materials within the project site. However, construction activities are temporary and would not result in any permanent visual impact.

The proposed project consists of an infill project within an urbanized area completely surrounded by existing development. Construction of the proposed buildings on the previously developed site would alter the existing visual character of the site. Upon project completion, the proposed buildings would consist of 36 residential units and ancillary recreational structures. The project will not substantially degrade the surroundings, as the current residential development is maintained in accordance with City standards. Therefore, visual impacts to existing visual character of the site are less than significant and no mitigation is required.

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

1d. Response: ***(Source: General Plan 2025, General Plan 2025 FPEIR Figure 5.1-2 – Mount Palomar Lighting Area, Title 19 – Article VIII – Chapter 19.556 – Lighting, and Citywide Design and Sign Guidelines.)***

Less Than Significant Impact. Excessive or inappropriately directed lighting can adversely impact nighttime views by reducing the ability to see the night sky and stars. Glare can be caused from unshielded or misdirected lighting sources. Reflective surfaces (i.e., polished metal) can also cause glare. Impacts associated with glare range from simple nuisance to potentially dangerous situations (i.e., if glare is directed into the eyes of motorists).

The site is not within the Mount Palomar Lighting Area. There are lighting sources adjacent to this site, including freestanding street lights, light fixtures on buildings, pole-mounted lights, traffic signals and vehicle headlights. The proposed project includes interior drive aisles and security lighting and building interior lighting. However, only outdoor lighting could have any effect on neighboring land uses. Light spillover and glare will be prevented by standard development review, which requires conformance to the City's development standards in Chapter 19.590.070 of the City's Municipal Code regarding light placement, luminosity, and light shield. Adherence to the City's standard lighting control procedures would reduce any impact associated with new lighting to a less-than-significant level.

Sources of daytime glare are typically concentrated in commercial areas, and are often associated with retail uses.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

Glare results from development and associated parking areas that contain reflective materials such as glass, highly polished surfaces, and expanses of pavement. The proposed residential buildings would have a lap siding and a stucco finish, which are not surfaces that causes glare. While windows may contribute to glare impacts, they do not compose substantial square footage of the façade and are included as architectural treatments to enhance aesthetic quality. Given the minimal use of glare-inducing materials in the design of the proposed buildings, reflective glare impacts would be less than significant.

2. AGRICULTURE AND FOREST RESOURCES:

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information complied by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and the forest carbon measurement methodology provided in the Forest Protocols adopted by the California Air Resources Board. Would the project:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒

2a. Response: ***(Source: General Plan 2025 – Figure OS-2 – Agricultural Suitability,*** **California Department of Conservation,** ***Farmland Mapping and Monitoring Program of the California Resources Agency*** **(http://www.conservation.ca.gov/dlrp/Pages/qh_maps.aspx); and California Department of Forestry and Fire Protection and the USDA Forest Service. California Land Cover Mapping and Monitoring Program (LCMMP), Vegetation GIS files. Pacific Southwest Region. EvegTile51A__02_03_v2. 2007.)**

No Impact. The proposed project will be located in a fully developed urbanized area that does not contain agriculture or forest uses. A review of Figure OS-2 – Agricultural Suitability of the General Plan 2025 reveals that the project site is not designated as, and is not adjacent to or in proximity to any land classified as, Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The map of Important Farmland in California (2010) prepared by the Department of Conservation does not identify the project site as being Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. No Williamson Act contracts are active for the project site. The property is zoned R-1-7000 (Single-Family Residential). Although the project site has existing vacant land, it is not under active cultivation and has not been cultivated for a number of years based on aerial mapping. The project site is currently designated as Public Facilities/Institutions land use designation in the City of Riverside General Plan. RC Hobbs has submitted an application to amend the General Plan to designate the site R-3-3000 Multiple-Family Residential. Therefore, because the site has not been designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, there is no impact from the project on these types of farmland.

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

2b. Response: ***(Source: General Plan 2025 – Figure OS-3 - Williamson Act Preserves, General Plan 2025 FPEIR – Figure 5.2-4 – Proposed Zones Permitting Agricultural Uses, and Title 19)***

No Impact. A review of Figure 5.2-2 – Williamson Act Preserves of the General Plan 2025 FPEIR reveals that the project site is not located within an area that is affected by a Williamson Act Preserve or under a Williamson

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Act Contract. Moreover, the project site is not zoned for agricultural use and is not next to land zoned for agricultural use; therefore, the project will have **no impact** directly, indirectly or cumulatively.				
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) timberland (as defined in Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
2c. Response: ***(Source: GIS Map – Forest Data and*** **California Department of Forestry and Fire Protection and the USDA Forest Service. California Land Cover Mapping and Monitoring Program (LCMMP), Vegetation GIS files. Pacific Southwest Region. EvegTile51A__02_03_v2. 2007.)** **No Impact.** Public Resources Code Section 12220(g) identifies forest land as *land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.* The project site and surrounding properties are not currently being managed or used for forest land as identified in Public Resources Code Section 12220(g). The USDA Forest Service vegetation maps for the project site identify it as *urban* type, indicating that it is not capable of growing industrial wood tree species. The project site has already been developed with a residential use, with limited vegetation onsite. Therefore, development of this project will have no impact to any timberland zoning.				
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
2d. Response: ***(Source: GIS Map – Forest Data and*** **California Department of Forestry and Fire Protection and the USDA Forest Service. California Land Cover Mapping and Monitoring Program (LCMMP), Vegetation GIS files. Pacific Southwest Region. EvegTile51A__02_03_v2. 2007.)** **No Impact.** The project site was previously developed land with buildings with limited ornamental landscaping; thus, there will be no loss of forest land or conversion of forest land to non-forest use as a result of this project. No impact will occur.				
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?	☐	☐	☐	☒
2e. Response: (Source: General Plan – Figure OS-2 – ***Agricultural Suitability, Figure OS-3 – Williamson Act Preserves, Title 19 – Article V – Chapter 19.100 – Residential Zones – R3 Zone and GIS Map – Forest Data)*** **No Impact.** The project site is a previously developed site within an urban environment. The project is surrounded by other residential and institutional uses. The project would not encroach onto agricultural land and would not encourage the conversion of existing farmland to non-agricultural uses. None of the surrounding sites contain existing forest uses. Development of this project will not change the existing environment in a manner that will result in the conversion of forest land to a non-forest use. No impact will occur.				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
3. AIR QUALITY.				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐

3a. Response: ***(Source: South Coast Air Quality Management District's 2012 Air Quality Management Plan and Draft 2016 Air Quality Management Plan.)***

Less Than Significant Impact. The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and Regional Plans (CEQA Guidelines Section 15125). The regional plan that applies to the proposed project includes the SCAQMD 2012 Air Quality Management Plan (AQMP). Therefore, this section discusses any potential inconsistencies of the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards. If the decision-makers determine that the proposed project is inconsistent, the lead agency may consider project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

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

(2) Whether the project will exceed the assumptions in the AQMP in 2010 or increments based on the year of project buildout and phase.

Both of these criteria are evaluated in the following sections.

A. Criterion 1 - Increase in the Frequency or Severity of Violations

Based on the air quality modeling analysis, neither short-term construction, nor long-term operation of the proposed project will result in significant impacts based on the SCAQMD regional and local thresholds of significance. Therefore, the proposed project is not projected to contribute to the exceedance of any air pollutant concentration standards and is found to be consistent with the AQMP for the first criterion.

B. Criterion 2 - Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

the assumptions in the AQMP. The emphasis of this criterion is to insure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The Regional Comprehensive Plan and Guide (RCP&G) consists of three sections: Core Chapters, Ancillary Chapters, and Bridge Chapters. The Growth Management, Regional Mobility, Air Quality, Water Quality, and Hazardous Waste Management chapters constitute the Core Chapters of the document. These chapters currently respond directly to federal and state requirements placed on SCAG. Local governments are required to use these as the basis of their plans for purposes of consistency with applicable regional plans under CEQA. For this project, the City of Riverside General Plan Land Use and Urban Design Element defines the assumptions that are represented in the AQMP.

The project site is currently designated as Public Facilities/Institutions (PF) in the General Plan. The Public Facilities and Institutional Uses designation provides for schools, hospitals, libraries, utilities, the municipal airport and government institutions. Religious assembly and day care uses may be allowed within this designation. Specific sites for public/semipublic uses are subject to discretionary approval under the Zoning Ordinance. The maximum intensity of development is a floor-area ratio of 1.0.

The property has been in residential use since at least 1922. The City records do not indicate when the change was made to the PF designation. The proposed project is inconsistent with the current land use designation and would require a General Plan Amendment to Medium-High Density Residential (MDHR) with a maximum density at 14.5 du/acre and a rezone to R-3-3000 (Multiple-Family Residential) with an Airport Protection Overlay. Although the proposed project is currently inconsistent with the General Plan land use designation for the project site, the proposed project would be compatible with the adjacent residential land uses and would be in substantial compliance with the Land Use and Urban Design Element goals and policies. As such, once the General Plan Amendment and Rezone are approved, the proposed project would not result in an inconsistency with the current land use designation. Therefore, the proposed project is not anticipated to exceed the AQMP assumptions for the project site and is found to be consistent with the AQMP for the second criterion. Therefore, a less than significant impact will occur.

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐

3b. Response: ***(Source: General Plan 2025 FPEIR Table 5.3-B SCAQMD CEQA Regional Significance Thresholds, South Coast Air Quality Management District's 2012 AQMP, and CalEEMod 2013.2.2 Model.)***

Less Than Significant Impact. A project may have a significant impact if project related emissions would exceed federal, state, or regional standards or thresholds, or if project-related emissions would substantially contribute to existing or project air quality violations. The proposed Project is located within the South Coast Air Basin, where efforts to attain state and federal air quality standards are governed by the South Coast Air Quality Management District (SCAQMD). Both the State of California (State) and the Federal government have established health-based ambient air quality standards (AAQS) for seven air pollutants (known as 'criteria pollutants'). These pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter with a diameter of 10 microns or less (PM_{10}), fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$), and lead (Pb). The State has also established AAQS for additional pollutants. The AAQS are designed to protect the health and welfare of the populace within a reasonable margin of safety. Where the state and federal standards differ, California AAQS are more stringent than the national AAQS. Air pollution levels are measured at monitoring stations located throughout the air basin. Areas that are in nonattainment with respect to federal or state AAQS are required to prepare plans and implement measures that will bring the region into attainment. Discussion of potential impacts related to short-term construction

impacts and long-term area source and operational impacts are presented below.

Emissions

Construction Emissions

The California Emissions Estimator Model (CalEEMod) version 2013.2.2 was utilized to estimate emissions from the proposed construction activities. This model was prepared by SCAQMD for use on projects occurring within the South Coast basin and has been adopted by several other air districts within California. The model includes many default values which can be overridden to include site-specific data by the modeler, which requires appropriate documentation of the source. The model estimates the daily emissions for criteria pollutants and GHGs and has allowances for mitigation measures to be applied, if required.

The Project inputs for the model were estimated based on site drawings and project descriptions provided by RC Hobbs and their engineering consultant. Assumptions are documented in the model output and are discussed in the next section.

Table 3 B - 1 *Construction-Related Criteria Pollutants* shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds. Furthermore, minimum requirements for SCAQMD's Rule 403 include the application of the best available dust control measures to be used for all grading operations and include the application of water or other soil stabilizers in sufficient quantity to prevent the generation of visible dust plumes. Implementation of best available dust control measures were assumed in the model to include watering of the site's exposed area two times per day, which significantly reduced PM_{10} and $PM_{2.5}$ construction emissions. Therefore, none of SCAQMD's thresholds would be exceeded during demolition, grading and construction after dust control measures and typical BMPs for the control of emissions are implemented. Because the model assumed compliance with SCAQMD Rules for the control of criteria pollutants, Conditions of Approval for the project will include compliance with SCAQMD's Rule 403 as a general condition.

Table 3b-1 Construction-Related Criteria Pollutants

	Pollutant Emissions (pounds/day)					
Activity	**VOC**	**NOx**	**CO**	**SO2**	**PM10**	**PM2.5**
Demolition	2.72	28.55	20.87	0.02	1.70	1.51
Site Preparation	2.31	24.22	15.92	0.01	6.78	4.12
Grading	1.88	19.78	13.17	0.01	5.73	3.48
Building Construction	2.95	19.10	14.31	0.02	1.22	1.18
Paving	1.29	12.09	9.03	0.01	0.73	0.67
Architectural Coatings	70.28	2.18	1.86	2.9700e-003	0.17	0.17
SCQAMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	No	No	No	No	No	No

Source: CalEEMod Version 2013.2.2.

The greatest potential for toxic air contaminant emissions would be related to diesel particulate emissions associated with heavy equipment operations during construction of the proposed project. According to

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

SCAQMD's methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology.

Given the relatively limited number of heavy-duty construction equipment and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 70 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project.

Operational Emissions

The worst-case summer or winter emission rates from the CalEEMod model was used to determine operational emissions generated from the project and are shown in Table 3b-2, *Operational Regional Criteria Air Pollutant Emissions*.

Table 3b-2 Operational Regional Pollutant Emissions

	Pollutant Emissions (pounds/day)					
Activity	**ROGs**	**NOx**	**CO**	**SO2**	**PM10**	**PM2.5**
Area Sources[1]	1.90	0.03	2.99	1.6000e-004	0.01	0.01
Energy Usage[2]	0.02	0.18	0.79	1.2000e-003	0.05	0.01
Mobile Sources[3]	0.84	2.44	9.85	0.02	1.86	0.52
Total Emissions	**2.76**	**2.66**	**12.92**	**0.02**	**1.89**	**0.55**
SCQAMD Operational Thresholds	55	55	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No

Source: CalEEMod Version 2013.2.2.

Notes:

1. Area sources consist of emissions from consumer products, architectural coatings, hearths and landscaping equipment.
2. Energy usage consists of emissions from generation of electricity and on-site non-hearth gas usage.
3. Mobile sources consist of emissions from vehicles and road dust.

As shown in Table 3b-2, none of the emissions thresholds are exceeded during the operation of the project Therefore, air quality impacts associated with project operation would be less than significant.

According to *The California Almanac of Emissions and Air Quality 2013 Edition*, prepared by CARB, toxic air contaminants (TAC), specifically Particulate matter (PM) from diesel exhaust, results in about 80 percent of the outdoor cancer risk. Some chemicals in diesel exhaust, such as benzene and formaldehyde have been listed as carcinogens by State Proposition 65 and the Federal Hazardous Air Pollutants program. Due to the nominal number of diesel truck trips generated by the proposed 36-unit residential project, a less than significant toxic air

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
contaminant impact would occur during the on-going operations of the proposed project and no mitigation would be required.				
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)?	☐	☐	☒	☐

3c. Response: ***(Source: General Plan 2025 FPEIR Table 5.3-B SCAQMD CEQA Regional Significance Thresholds, South Coast Air Quality Management District's 2012 Air Quality Management Plan and CalEEMod 2013.2.2)***

Less Than Significant Impact. Cumulative short-term, construction-related emissions and long-term, operational emissions from the project will not contribute considerably to any potential cumulative air quality impact because short-term project and operational emissions will not exceed any SCAQMD daily threshold. As is required of the proposed project, other concurrent construction projects and operations in the region, they will be required to implement standard air quality regulations and mitigation pursuant to State CEQA requirements. Such measures include compliance with SCAQMD Rule 403, which requires daily watering to limit dust and particulate matter emissions. Impacts will be less than significant with standard conditions applied.

Air toxics from the construction and operation of the project are expected to be limited to fuel combustion, which is primarily vehicle exhaust. The most significant toxic air contaminant (TAC) emission related to construction and operation activities will be diesel exhaust particulate, which is anticipated to have the greatest potential effects on health risk. Diesel particulate matter has potential for long-term cancer risks only; it has no acute (short-term) cancer risk factors.

Construction is a temporary activity, and the potential incremental cancer risk from construction activities is very small. (Potential cancer risks are large only when there is a very long, continuous exposure, on the order of tens of years.) The incremental cancer risk that could be caused by construction activities is not expected to exceed the cancer risk significance thresholds. Likewise, the hazard indices are not expected to be exceeded.

The CalEEMod emissions estimates for on-site operations, including mobile emissions within the parking area, show that PM_{10} from combustion is 1.9 lbs/day. Thus, as with the construction, ongoing operations are not anticipated to have significant air toxic impacts.

d. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

3d. Response: ***(Source: General Plan 2025 FPEIR Table 5.3-B SCAQMD CEQA Regional Significance Thresholds, South Coast Air Quality Management District's 2012 Air Quality Management Plan, and CalEEMod 2013.2.2 Model).***

Less Than Significant Impact. Sensitive receptors are those segments of the population that are most susceptible to poor air quality such as children, the elderly, the sick, and athletes who perform outdoors. Land uses associated with sensitive receptors include residences, schools, playgrounds, childcare centers, outdoor athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The nearest land uses that considered *sensitive receptors* are the residential dwelling units located

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

adjacent to the project site on the south, east and west and the senior facility to the north. The proposed residential development will not generate toxic pollutant emissions because the proposed residential use is characterized as typical residential uses that do not produce such emissions. The proposed residential development, therefore, would have a less than significant impact on sensitive receptors relating to toxic pollutant emissions.

A carbon monoxide (CO) hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. CO hotspots have the potential for violation of state and federal CO standards at study area intersections, even if the broader Basin is in attainment for federal and state levels. In general, SCAQMD and the California Department of Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) recommend analyzing CO hotspots when a project has the potential to result in higher CO concentrations within the region and increase traffic congestion at an intersection operating at level of service (LOS) D or worse by more than two percent. There has been a decline in CO emissions over the past two decades even though vehicle miles traveled (VMT) on U.S. urban and rural roads have increased. Three major control programs have contributed to the reduced per vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection/maintenance programs. There are no designated CO hotspots in the immediate vicinity of the project. Impacts related to CO hotspots will be less than significant.

e. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

3e. Response: ***(Source:* CEQA Air Quality Handbook*)***

Less Than Significant Impact. According to the CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural operations, wastewater treatment plants, landfills, and certain industrial operations (such as manufacturing uses that produce chemicals, paper, etc.). Odors are typically associated with industrial projects involving the use of chemicals, solvents, petroleum products, and other strong-smelling elements used in manufacturing processes, as well as sewage treatment facilities and landfills. The proposed residential development does not include any of the above noted uses or process. The short-term construction sources may emit odors including the application of materials such as asphalt pavement, paints, and solvents and prom emissions from diesel equipment. However, SCAQMD Rule 1108 limits the amount of volatile organic compounds from asphalt paving; mandatory compliance with SCAQMD rules would ensure that no construction activities or materials would be included that would create a significant level of objectionable odors. Potential sources that may emit odors during the on-going operations of the proposed project would primarily occur from odor emissions from the trash storage areas. Pursuant of the City regulations, permanent trash enclosures that protect trash bins from rain as well as limit air circulation would be required for trash storage areas. In combination with the distance of the nearest receptors from the project site and through compliance with SCAQMD's Rule 402, no significant impact related to odors would occur during the on-going operations of the proposed project. Therefore, a less than significant odor impact would occur and no mitigation would be required.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
4. BIOLOGICAL RESOURCES. 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?	☐	☐	☒	☐

4a. Response: ***(Source: General Plan 2025 – Figure OS-6 – Stephen's Kangaroo Rat (SKR) Core Reserve and Other Habitat Conservation Plans (HCP), Figure OS-7 – MSHCP Cores and Linkages, Figure OS-8 – MSHCP Cell Areas, General Plan 2025 FPEIR Figure 5.4-2 – MSHCP Area Plans, Figure 5.4-4 - MSHCP Criteria Cells and Subunit Areas, Figure 5.4-6 – MSHCP Narrow Endemic Plant Species Survey Area, Figure 5.4-7 – MSHCP Criteria Area Species Survey Area, Figure 5.4-8 – MSHCP Burrowing Owl Survey Area,*** **United States Fish and Wildlife Service, National Wetlands Inventory, Wetlands Mapper; US Fish & Wildlife Services, Environmental Conservation Online System; and California Department of Fish and Wildlife, California Regional Conservation Plans Map)**

Less Than Significant Impact. The project site is located within an urban built-up area and is surrounded by existing development and a search of the MSHCP database and other appropriate databases identified no potential for candidate, sensitive or special status species, suitable habitat for such species on site, Federal Species of Concern, California Species of Special Concern, and California Species Animal or Plants on lists 1-4 of the California Native plant Society (CNPS) Inventory. Thus there is little chance that any Federally endangered, threatened, or rare species or their habitats could persist in this area. Therefore, a less than significant impact directly, indirectly and cumulatively will occur to federally endangered threatened, or rare species or their habitats.

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 U.S. Fish and Wildlife Service?	☐	☐	☐	☒

4b. Response: ***(Source: General Plan 2025 – Figure OS-6 – Stephen's Kangaroo Rat (SKR) Core Reserve and Other Habitat Conservation Plans (HCP), Figure OS-7 – MSHCP Cores and Linkages, Figure OS-8 – MSHCP Cell Areas, General Plan 2025 FPEIR Figure 5.4-2 – MSHCP Area Plans, Figure 5.4-4 - MSHCP Criteria Cells and Subunit Areas, Figure 5.4-6 – MSHCP Narrow Endemic Plant Species Survey Area, Figure 5.4-7 – MSHCP Criteria Area Species Survey Area, Figure 5.4-8 – MSHCP Burrowing Owl Survey Area, MSHCP Section 6.1.2 - Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools,*** **United States Fish and Wildlife Service, National Wetlands Inventory, Wetlands Mapper; US Fish & Wildlife Services, Environmental Conservation Online System; and California Department of Fish and Wildlife, California Regional Conservation Plans Map)**

No Impact. The project is located on a previously developed/improved site within an urbanized area where no riparian habitat or other sensitive natural community exists on site or within proximity to the project site. Therefore, the project will have no impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service directly, indirectly and cumulatively.

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act	☐	☐	☐	☒

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
(including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				

4c. Response: ***(Source: City of Riverside GIS/CADME USGS Quad Map Layer, and*** **United States Fish and Wildlife Service, National Wetlands Inventory, Wetlands Mapper).**

No Impact. The project is located within an urbanized area where no federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) exist on site or within proximity to the project site. The project site does not contain any discernible drainage courses, inundated areas, wetland vegetation, or hydric soils and thus does not include USACOE jurisdictional drainages or wetlands. Therefore, the proposed project would have no impact to federally protected wetlands as defined by Section 404 of the Clean Water Act directly, indirectly and cumulatively.

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?	☐	☐	☐	☒

4d. Response: ***(Source: MSHCP, General Plan 2025 –Figure OS-7 – MSHCP Cores and Linkage,*** **US Fish & Wildlife Services, Environmental Conservation Online System; and California Department of Fish and Wildlife, California Regional Conservation Plans Map.**

No Impact. The project site is currently partially developed and is surrounded by existing residential development and an institutional use, preventing the use of the project site and surrounding area as a wildlife corridor. The project site contains very limited ornamental vegetation, in the context of a completely urbanized setting located in the City of Riverside. There are no substantial vegetated areas or waterbodies located on-site. The project site is not located within any MSHCP Criteria Cells, Cores, or Linkages. The project site does not provide for the movement of any native resident or migratory fish or wildlife. No impact will occur.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐

4e. Response: ***(Source: MSHCP, Title 16 Section 16.72.040 – Establishing the Western Riverside County MSHCP Mitigation Fee, Title 16 Section 16.40.040 – Establishing a Threatened and Endangered Species Fees, and City of Riverside Urban Forest Tree Policy Manual.)***

Less Than Significant Impact. Any project within the City of Riverside's boundaries that proposes planting a street tree within a City right-of-way must follow the Urban Forest Tree Policy Manual. The Manual documents guidelines for the planting, pruning, preservation, and removal of all trees in City rights-of-way. The specifications in the Manual are based on national standards for tree care established by the International Society of Arboriculture, the National Arborists Association, and the American National Standards Institute. Any future project will be in compliance with the Tree Policy Manual when planting a tree within a City right-of-way, and therefore, impacts will be less than significant.

Implementation of the proposed project is subject to all applicable Federal, State, and local policies and regulations related to the protection of biological resources and tree preservation. In addition, the project is required to comply with Riverside Municipal Code Section 16.72.040 establishing the MSHCP mitigation fee and Section 16.40.040 establishing the Threatened and Endangered Species Fees.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

4f. Response: ***(Source: MSHCP, General Plan 2025 – Figure OS-6 – Stephen's Kangaroo Rat (SKR) Core Reserve and Other Habitat Conservation Plans (HCP), Stephens' Kangaroo Rat Habitat Conservation Plan and*** **California Department of Fish and Wildlife, California Regional Conservation Plans Map)**

No Impact. The project site is located on a previously developed/improved site within an urbanized area and will not impact an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan directly, indirectly and cumulatively. Therefore, the project will have no impact on the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

5. CULTURAL RESOURCES. Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5 of the CEQA Guidelines?	☐	☐	☒	☐

5a. Response: ***(Source: GP 2025 FPEIR Table 5.5-A Historical Districts and Neighborhood Conservation Areas, Appendix D, Title 20 of the Riverside Municipal Code, and*** **JM Research and Consulting,** ***Cultural Resources Assessment for the Proposed Harris Farm Townhome Project 4105 Jefferson Street, Riverside, County of Riverside,*** **October 2015.)**

Less Than Significant Impact. CEQA establishes that "a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (PRC §21084.1), and the California Public Resources Code further defines substantial adverse change as "demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired" (PRC §5020.1(q)).

A Cultural Resources Assessment was prepared and found that the former Harris Farm property lacks architectural distinction, historic association, and sufficient integrity. A hobby wall is unrelated to the former agricultural use of the property, and although it contains fragments of cultural material, its lack of context precludes its potential as an archaeological resource. Further, Native American consultation under SB 18 and AB 52 has not indicated interest in the cultural material in the hobby wall or provided evidence of the presence of, or potential for, Tribal Cultural Resources (TCRs). As the property is ineligible for designation at any level, it is not considered a historical resource under CEQA, and no adjacent properties are designated or appear eligible for designation. As no historical resources are likely to be affected by the proposed project, JMRC found no known potential for project-related impacts to the property, and no required mitigation measures or further treatment under CEQA are recommended.

b. Cause a substantial adverse change in the significance of an archeological resource pursuant to § 15064.5 of the CEQA Guidelines?	☐	☐	☒	☐

5b. Response: ***(Source: GP 2025 FPEIR Figure 5.5-1 - Archaeological Sensitivity and Figure 5.5-2 - Prehistoric Cultural Resources Sensitivity, Appendix D – Cultural Resources Study and*** **JM Research and Consulting,**

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

***Cultural Resources Assessment for the Proposed Harris Farm Townhome Project 4105 Jefferson Street, Riverside, County of Riverside*, October 2015.)**

Less Than Significant Impact. A Cultural Resources Assessment was prepared and found that the records search and the field survey did not identify any previously recorded archaeological resources within or adjacent to the project boundaries, and research conducted indicates that there is a low sensitivity for archaeological resources within the project boundaries. Several hardscape features were observed during the field survey as part of the overall property design, but are not considered archaeological in nature. A hobby wall is unrelated to the former agricultural use of the property, and although it contains fragments of cultural material, its lack of context precludes its potential as an archaeological resource. Further, Native American consultation under SB 18 and AB 52 has not indicated interest in the cultural material in the hobby wall or provided evidence of the presence of, or potential for, Tribal Cultural Resources (TCRs).

The property is a previously developed site in an urbanized area. The potential for uncovering such significant resources at the project site during construction activities is considered remote given that no such resources have been discovered during prior development activity within the area, and the fact that the site has been significantly disturbed in the past for construction of the existing structures. Only minor excavation will be necessary; therefore it is considered unlikely that archeological resources would be found. As no archaeological resources are likely to be affected by the proposed project, JMRC found no known potential for project-related impacts to the property, and no required mitigation measures or further treatment under CEQA are recommended. Although not required as mitigation measures based on the analysis and findings of this study, the following recommendations address additional cultural considerations:

<u>Hobby Wall</u>

Although the hobby wall is not considered a historic or archaeological resource under CEQA and has not been identified as a TCR or as containing cultural material of interest to local bands/tribes, the structure does contain fragmented artifacts and geological and paleontological specimens that may be of value to museum curators:

- Cultural material, including the metate and petroglyph fragments, can be offered to the Riverside Metropolitan Museum (RMM).
- Educational and exhibit materials, including exhibit quality garnets, tourmaline and lepidolite, and Navajo sandstone with Jurassic invertebrate tracks can be offered to the RMM.
- Sand spikes and concretions from Anza-Borrego could be offered to the RMM or to the Anza-Borrego Desert State Park (ABDSP) at Borrego Springs.
- Petrified wood, blocks of siliceous material, obsidian, geodes, similar lapidary material, and oyster fossils could be offered to museums and not-for-profit societies that provide educational instruction about fossils and/or lapidary arts. These include the Jurupa Mountain Discovery Center (JMDC), the Orange Belt Mineral Society (OBMS), the Mojave Desert Gem and Mineral Society (MDGMS), and others.

<u>Unexpected Finds</u>

Study findings indicate that the proposed project is not expected to impact any historic or prehistoric archaeological resources within native soils; however, ground-disturbing activities have the potential to reveal buried deposits. The identification of historic-period concrete irrigation structures indicates a slight possibility that other, unanticipated, historic period resources may be encountered. Although not required as a mitigation measure, the City should include a standard condition:

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

"Prior to the initiation of ground-disturbing activities, construction personnel shall be alerted to the possibility of buried cultural deposits. In the event unanticipated buried historic or prehistoric cultural materials are encountered, including sacred items, burial goods, and Native American cultural material, work in the immediate vicinity of the find shall cease and a qualified archaeologist shall be retained to assess the significance of the find and stop or divert construction excavation, as necessary. If the archaeologist finds cultural resources present that meet eligibility requirements for listing in the California Register of Historical Resources or the National Register of Historic Places, plans for consultation, treatment, evaluation, and mitigation of impacts will be developed. If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC."

In accordance with standard City procedures, a halt-work condition would be in place in the unlikely event that archaeological resources are discovered during construction. The contractor would be required to halt work in the immediate area of the find and to retain a professional archaeologist to examine the materials to determine whether they are a "unique archaeological resource" as defined in Section 21083.2(g) of the State CEQA Statutes. If this determination is positive, the scientifically consequential information must be fully recovered by the archaeologist consistent with standard City protocol.

c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

5c. Response: ***(Source: General Plan 2025 Policy HP-1.3)***

Less Than Significant Impact. The property is a previously developed site in an urbanized area. No known paleontological sites are documented. The potential for uncovering such significant resources at the project site during construction activities is considered remote given that no such resources have been discovered during prior development activity within the area, there are no unique geological resources on or near the project site, and the fact that the site has been significantly disturbed in the past for construction of the existing structures. Only minor excavation will be necessary; therefore it is considered unlikely that paleontological resources would be found.

In accordance with standard City procedures, a halt-work condition would be in place in the unlikely event that paleontological resources are discovered during construction. The contractor would be required to halt work in the immediate area of the find and to retain a professional paleontologist to examine the materials to determine whether they are a unique paleontological resource. If this determination is positive, the scientifically consequential information must be fully recovered by the paleontologist consistent with standard City protocol.

d. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

5d. Response: ***(Source: GP 2025 FPEIR Figure 5.5-1 - Archaeological Sensitivity and Figure 5.5-2 - Prehistoric Cultural Resources Sensitivity and*** **JM Research and Consulting,** ***Cultural Resources Assessment for the Proposed Harris Farm Townhome Project 4105 Jefferson Street, Riverside, County of Riverside,*** **October 2015.)**

Less Than Significant Impact. It is unlikely that human remains could be uncovered during grading operations, considering that the project site was previously disturbed during construction of the past structures. Nonetheless,

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

should suspected human remains be encountered in a location other than a dedicated cemetery, the steps and procedures specified in Health and Safety Code 7050.5, *State CEQA Guidelines* 15064.5(e), and Public Resources Code 5097.98 must be implemented. Specifically, in accordance with Public Resources Code (PRC) Section 5097.98, the Riverside County Coroner must be notified within 24 hours of the discovery of potentially human remains. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with PRC Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains within 48 hours of notification. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods within 24 hours of notification. Whenever the NAHC is unable to identify a MLD, or the MLD fails to make a recommendation, or the landowner or his or her authorized representative rejects the recommendation of the MLD and the mediation provided for in subdivision (k) of PRC Section 5097.94 fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall re-inter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance. Through this existing regulatory procedure, impacts to human remains would be avoided.

e. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074?	☐	☐	☐	☒

5e. Response: ***(Source:* JM Research and Consulting, *Cultural Resources Assessment for the Proposed Harris Farm Townhome Project 4105 Jefferson Street, Riverside, County of Riverside,* October 2015.)**

No Impact. The project would not cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074. A Sacred Lands Records Search with the Native American Heritage Commission (NAHC) followed by scoping with tribes and interested persons was conducted from October 2015 to February 2016 in partnership with City of Riverside Housing Project Coordinator, Shonda Herold, and in accordance with the requirements for Native American consultation under and SB 18, which was triggered by the proposed project's General Plan amendment and zone change requirements. This consultation also satisfied the requirements under AB 52 and the City of Riverside Consultant Requirements. All consultation with Native American groups regarding the project was conducted on a government-to-government basis.

Native American consultation conducted by the City of Riverside included email and letter correspondence as well as in-person meetings. Consulting tribes included the Gabrieleño and Morongo Bands of Mission Indians as well as the Pauma and Soboba Bands of Luiseno Indians. Communication centered on conducting a proper records search, archaeological/tribal monitoring during ground disturbing activity and the treatment of unexpected finds. No impact to tribal cultural resources will occur as a result of this project.

6. GEOLOGY AND SOILS. 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	☐	☐	☒	☐

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				

6i. Response: ***(Source: General Plan 2025 Figure PS-1 – Regional Fault Zones & General Plan 2025 FPEIR Appendix E – Geotechnical Report, and*** **GeoMat Testing Laboratories, Inc.,** ***Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,*** **July 31, 2015.*)***

Less Than Significant Impact. The project site is located in the highly seismic Southern California region within the influence of several fault systems. The subject property is located in the Peninsular Ranges Province of California (Perris Block portion). The closest of these major faults are the Chino Fault, an eastern branch of the Elsinore Fault Zone, and the San Jacinto Fault Zone. The subject site is located approximately midway between the two fault zones – approximately 12 miles to each. The site is seismically sensitive. Peak ground motions from earthquakes may be expected to reach 0.454g with a 10% probability of being exceeded in 50 years CGS website). However, the site does not lie within the boundaries of an Earthquake Fault Zone as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act.

Risks associated with surface rupture are low and there is no impact expected. However, because the project site is located in the seismically active Southern California, all habitable structures including single family home must be built to seismic standards established in the California Building Code (CBC). The CBC sets the standards in the State for the development of all buildings including residential buildings and sets requirements for structural design, plumbing and mechanical fixtures, fire and smoke protection, construction materials, interior finishes, and any other elements that make up construction of habitable structures. The City's Building and Safety Department is responsible for implementing not only the CBC but any additional code requirements that the City may have. Adherence to all code requirements for the construction of the 36 units and recreational structures will ensure that impacts associated with seismic activity are less than significant and no additional mitigation is required.

ii. Strong seismic ground shaking?	☐	☐	☒	☐

6ii. Response: ***(Source: General Plan 2025 FPEIR Appendix E – Geotechnical Report, and*** **GeoMat Testing Laboratories, Inc.,** ***Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,*** **July 31, 2015.*)***

Less Than Significant Impact. Although there are no known active surface faults within or adjacent to the site that will significantly impact the project, the project is located in a region with active earthquakes and strong seismic motion of those earthquakes could affect the project. The structures that are proposed to be constructed on the site will be required to meet and comply with all applicable city and State building codes to reduce seismic ground shaking at the site to less-than-significant.

iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐

6iii. Response: ***(Source: General Plan 2025 Figure PS-1 – Regional Fault Zones, Figure PS-2 – Liquefaction Zones, General Plan 2025 FPEIR Figure PS-3 – Soils with High Shrink-Swell Potential, Appendix E – Geotechnical Report, and*** **GeoMat Testing Laboratories, Inc.,** ***Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,*** **July 31, 2015.*))***

Less Than Significant Impact. Liquefaction is a mode of ground failure that results from the generation of high pore water pressures during earthquake ground shaking, causing loss of shear strength. Liquefaction is typically a hazard where loose sandy soils exist below groundwater. The California Geological Survey (CGS) has

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

designated certain areas within southern California as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table. The project site is mapped for potential liquefaction hazard by the CGS and the Riverside General Plan Public Safety Element. The potential for liquefaction and dynamic settlement has been evaluated as outlined in Chapter 6 of the California Division of Mines and Geology (DMC) Special Publication 117A ("Guidelines for Evaluating and Mitigating Seismic Hazards in California, 2008") and "Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigating Liquefaction in California, 1999". GeoMat Testing Laboratories, Inc. found that their analysis indicates that the inch total dynamic settlement is estimated at 0.45 during large earthquake episode. An estimated dynamic differential settlement of 1/2 to 2/3 of total settlement may be anticipated. The historical high ground water during a seismic event has been set at 20 feet below existing ground surface, gathered from a groundwater search dated from recent and back to 1955. Based on SCEC (1999) guidelines, a potential for loss of bearing capacity due to liquefaction is not expected at the site since there is not an upper potentially liquefiable layer at a depth shallower than the estimated depth where the induced vertical stress in the soil is less than 10% of the bearing pressure imposed by the proposed foundation systems. Furthermore, tied foundation systems are designed to dissipate structural loads. Therefore no loss of bearing capacity is expected for grade beams or lightly loaded slabs-on-grade.

In significant conformance with Youd, Hanson, and Bartlett (ASCE Geotechnical Jr. April 1995, and Lecture by Youd on July 7, 1999), no lateral spreading due to liquefaction is expected at this site due to the following reasons:

- Alluvial subsurface soils are essentially horizontally layered.
- There is not a free-face toward which liquefied soils could move laterally.
- No saturated liquefiable sand with values of N1 (60) <15 exist at the site. If loose clean sand exists between sampling intervals, their occurrence is expected to be thin and considered to be scattered or have minimal occurrence throughout the site, and cannot reasonably be connected to form a hypothetical "continuous" line of significant length that could reasonably be expected to "exit" on a slope or a free-face, or move significantly below the gentle slope of the site.

Although it is extremely difficult to predict the overall behavior of any site during seismic shaking, it is GeoMat's opinion that proper design of foundation per Code can substantially improve the structure's resistance to deformation. Incorporation of the recommended design measures of the preliminary soils report for compliance with the California Building Code regulations will ensure that impacts related to seismic-related ground failure, including liquefaction, are reduced to less than significant impact levels directly, indirectly and cumulatively.

iv. Landslides?	☐	☐	☐	☒

6iv. Response: ***(Source: General Plan 2025 FPEIR Figure 5.6-1 – Areas Underlain by Steep Slope, Appendix E – Geotechnical Report, Title 18 – Subdivision Code, Title 17 – Grading Code, and*** **GeoMat Testing Laboratories, Inc.,** ***Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,*** **July 31, 2015.*)***

No Impact. Structures built below or on slopes subject to failure or landslides may expose people and structures to harm. Topographically, the site is relatively flat. Total relief on site is approximately 6 feet with the highest elevation located at the northeasterly end of the property at approximately 783 feet above mean sea level (amsl), and the lowest elevation located at the southwestern side of the property at approximately 777 feet amsl. According to the GeoMat report, the site is not located in an Earthquake-Induced Landslide Zone. This indicates

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a low probability for landslides. The project report concluded that the site is not considered susceptible to static slope instability or seismically induced landslides. Grading and construction would be performed in compliance with State and local codes and the recommendations of the geotechnical report. There is no potential impact to future residents from landslides.				
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

6b. Response: ***(Source: General Plan 2025 FPEIR Figure 5.6-1 – Areas Underlain by Steep Slope, Figure 5.6-4 – Soils, Table 5.6-B – Soil Types, Title 18 – Subdivision Code, Title 17 – Grading Code,*** **GeoMat Testing Laboratories, Inc.,** ***Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,*** **July 31, 2015.*)*, and UC Davis Soil Resource Laboratory, SoilWeb, http://casoilresource.lawr.ucdavis.edu/gmap/, accessed August 1, 2016.)**

Less Than Significant Impact. Topsoil is used to cover surface areas for the establishment and maintenance of vegetation due to its high concentrations of organic matter and microorganisms. The native sub terrain of the site is comprised of Holocene to middle Pleistocene alluvial deposits according to GeoMat. The deposits are indurated, sandy, alluvial fan deposits. During project construction, fill materials will be overexcavated to reveal underlying soils within the building footprint area. The project has the potential to expose surficial soils to wind and water erosion during construction activities.

Wind erosion will be minimized through soil stabilization measures required by South Coast Air Quality Management District (SCAQMD) Rule 403 (Fugitive Dust), such as daily watering. Construction of the project will be required to have a PM_{10} Dust Control Plan to identify best management practices for the control fugitive dust. The intent of SCAQMD Rule 403 is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions. Elements of the Dust Control Plan may appear as notes on the grading plan that must be approved by the City prior to any site disturbance.

Water erosion will be prevented through the City's standard erosion control practices required pursuant to the California Building Code and the National Pollution Discharge Elimination System (NPDES), such as silt fencing or sandbags. Construction of the project will be required to have a Stormwater Pollution Prevention Plan (SWPPP). Any project involving grading of an area greater than one acre is required to apply for an NPDES permit from the Regional Water Quality Control Board (RWQCB). The project's SWPPP would identify typical best management practices specific towards fugitive dust and containment of sediment discharge and transport from the site. Once construction is completed, a Water Quality Management Plan (WQMP) must be implemented during the life of the project that includes best management practices (BMPs) specific towards maintenance of vegetative landscaping, drainage culverts/channels and drainage inlets. Following project construction, the site would be covered completely by paving, structures, and landscaping. Compliance with regulatory requirements of the RWQCB and of SCAQMD would ensure that impacts with regard to soil erosion or loss of topsoil are less than significant and no mitigation is required. In addition, with the erosion control standards for which all development activity must comply (Title 18), the Grading Code (Title 17) also requires the implementation of measures designed to minimize soil erosion. Compliance with State and Federal requirements as well as with Titles 18 and 17 will ensure that soil erosion or loss of topsoil will be less than significant impact directly, indirectly and cumulatively.

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	☐	☐	☒	☐

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
spreading, subsidence, liquefaction or collapse?				

6c. Response: ***(Source: General Plan 2025 Figure PS-1 – Regional Fault Zones, Figure PS-2 – Liquefaction Zones, General Plan 2025 FPEIR Figure PS-3 – Soils with High Shrink-Swell Potential, Figure 5.6-1 - Areas Underlain by Steep Slope, Figure 5.6-4 – Soils, Table 5.6-B – Soil Types, Appendix E – Geotechnical Report, and*** **GeoMat Testing Laboratories, Inc.,** ***Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,*** **July 31, 2015 and UC Davis Soil Resource Laboratory, SoilWeb, http://casoilresource.lawr.ucdavis.edu/gmap/, accessed August 1, 2016.)**

Less Than Significant Impact. Impacts related to liquefaction and landslides are discussed above in Section 6iii. Lateral spreading is the downslope movement of surface sediment due to liquefaction in a subsurface layer. The downslope movement is due to gravity and earthquake shaking combined. Such movement can occur on slope gradients of as little as one degree. Lateral spreading typically damages pipelines, utilities, bridges, and structures.

Lateral spreading of the ground surface during a seismic activity usually occurs along the weak shear zones within a liquefiable soil layer and has been observed to generally take place toward a free face (i.e. retaining wall, slope, or channel) and to lesser extent on ground surfaces with a very gentle slope. Due to the absence of any substantial change in grade or channel within or near the subject site, the potential for lateral spread occurring within the site is considered to be low. The project-specific soils investigation report concludes that site soils would be capable of supporting proposed structures after grading and compaction. The project site is classified as Buchenau loam, slightly saline-alkali, 0 to 2 percent slopes (BhA) and Hanford coarse sandy loam, 0 to 2 percent slopes (HcA). The project will require mass grading and a grading plan that identifies best grading practices for cut and fill, compaction and drainage that will be prepared prior to any site disturbance. The project is required to be constructed in accordance with the CBC and the requirements of the project soils investigation report. The CBC includes a requirement that any City-approved recommendations contained in the soil report be made conditions of the building permit. Based on the considerations of the project soil report, soils can be prepared to maintain stability sufficient to support the proposed project. The recommendations of the report will be implemented through the City's routine plan check and permitting processes. Impacts will be less than significant.

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?	☐	☐	☐	☒

6d. Response: ***(Source: General Plan 2025 FPEIR Figure 5.6-4 – Soils, Figure 5.6-4 – Soils, Table 5.6-B – Soil Types, Figure 5.6-5 – Soils with High Shrink-Swell Potential, Appendix E – Geotechnical Report, and California Building Code as adopted by the City of Riverside and set out in Title 16 of the Riverside Municipal Code,*** **GeoMat Testing Laboratories, Inc.,** ***Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,*** **July 31, 2015 and UC Davis Soil Resource Laboratory, SoilWeb, http://casoilresource.lawr.ucdavis.edu/gmap/, accessed August 1, 2016.)**

No Impact. The CBC requires special design considerations for foundations of structures built on soils with expansion indices greater than 20. The soil investigation report included testing of site soil samples within the proposed building footprint for expansion potential. Based on laboratory testing, the upper foundation soil is classified as very low in expansion potential. Therefore, there would be no impact.

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	☐	☐	☐	☒

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
water?				

6e. Response: ***(Source: General Plan 2025 FPEIR Figure 5.6-4 – Soils, Table 5.6-B – Soil Types,* GeoMat Testing Laboratories, Inc., *Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,* July 31, 2015 and GeoMat Testing Laboratories, Inc., *Basic Soil Infiltration Testing Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California,* July 27, 2015, and UC Davis Soil Resource Laboratory, SoilWeb, http://casoilresource.lawr.ucdavis.edu/gmap/, accessed August 1, 2016.)**

No Impact. The proposed project will be connected to the City of Riverside Public Work's sewer system and no septic system or any alternative wastewater treatment is proposed. Therefore, there will be no impact in terms of soil support for septic tanks.

7. GREENHOUSE GAS EMISSIONS. Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

7a. Response: ***(Source: CalEEMod 2013.2.2 Model)***

Less Than Significant Impact. GHG emissions for the project were quantified utilizing the California Emissions Estimator Model (CalEEMod) version 2013.2.2 to determine if the project could have a cumulatively considerable impact related to greenhouse gas emissions and summarized in Table 7a-1. The GHG emissions have been calculated for opening year 2017 without mitigation. The emissions inventory accounts for GHG emissions from construction activities and operational activities.

Operation emissions associated with the proposed residential project would include GHG emissions from mobile sources (transportation), energy, water use and treatment, waste disposal, and area sources. GHG emissions from electricity use are indirect GHG emissions from the energy (purchased energy) that is produced offsite. Area sources are owned or controlled by the project (e.g., natural gas combustion, boilers, and furnaces) and produced onsite. Construction activities are short term and cease to emit greenhouse gases upon completion, unlike operational emissions that are continuous year after year until operation of the use ceases. Because of this difference, SCAQMD recommends amortizing construction emissions over a 30-year operational lifetime. This normalizes construction emissions so that they can be grouped with operational emissions in order to generate a precise project-based GHG inventory.

Table 7a-1
Greenhouse Gas Emissions Inventory

Category	Greenhouse Gas Emissions (Metric Tons/Year)					
	Bio-CO2	NonBio-CO_2	Total CO_2	CH_4	N_2O	CO_2e
Area Sources	0.00	0.60	0.60	0.00	0.00	0.61
Energy Usage	0.00	145.14	145.14	0.00	0.00	145.58
Mobile Sources	0.00	338.10	338.10	0.01	0.00	338.37
Waste	3.36	0.00	3.36	0.19	0.00	7.53
Water	0.74	28.24	28.98	0.07	0.00	31.20

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

Construction	0.00	8.77	8.77	0.00	0.00	8.81
Total Emissions	**4.10**	**520.87**	**524.97**	**0.29**	**0.00**	**532.12**
Screening Threshold						**3,000**
Exceeds Threshold?						No

Source: CalEEMod Version 2013.2.2. Year 2017 emissions

Notes:
Area sources consist of GHG emissions from consumer products, architectural coatings, and landscape equipment.
Energy usage consists of GHG emissions from electricity and natural gas usage.
Mobile sources consist of GHG emissions from vehicles.
Solid waste includes the CO2 and CH4 emissions created from the solid waste placed in landfills.
Water includes GHG emissions from electricity used for transport of water and processing of wastewater.
Construction GHG emissions CO2e based on a 30 year amortization rate.

Table 7a-1 shows that the proposed project in year 2017 would generate approximately 532.12 metric tons of CO2e per year of GHG emissions. According to the thresholds of significance established above, a cumulative global climate change impact would not occur since the GHG emissions created from the on-going operations would not exceed the screening threshold of 3,000 metric tons per year of CO2e. No mitigation will be required.

The project is also subject to the requirements of the California Green Building Standards Code. On January 12, 2010, the State Building Standards Commission unanimously adopted updates to the California Green Building Standards Code, which went into effect on January 1, 2011. The Code is a comprehensive and uniform regulatory code for all residential, commercial and school buildings.

The California Green Building Standards Code does not prevent a local jurisdiction from adopting a more stringent code as state law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they provide a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. State building code provides the minimum standard that buildings need to meet in order to be certified for occupancy. Enforcement is generally through the local building official.

The California Green Building Standards Code (code section in parentheses) requires:

- Water Efficiency and Conservation [Indoor Water Use (4.303.1)]. Fixtures and fixture fittings reducing the overall use of potable water within the building by at least 20 percent shall be provided. The 20 percent reduction shall be demonstrated by one of the following methods:

  - Prescriptive Method: Showerheads (≤ 2.0 gpm @ 80 psi); Residential Lavatory Faucets (≤ 1.5 gpm @ 60 psi); Nonresidential Lavatory Faucets (≤.4 gpm @ 60 psi); Kitchen Faucets (≤ 1.8 gpm @ 60 psi); Toilets (≤ 1.28 gal/flush); and urinals (≤ 0.5 gal/flush).
  - Performance Method: Provide a calculation demonstrating a 20% reduction of indoor potable water using the baseline values set forth in Table 4.303.1. The calculation will be limited to the total water usage of showerheads, lavatory faucets, water closets and urinals within the dwelling.

- Water Efficiency and Conservation [Outdoor Water Use (4.304.1)]. Irrigation Controllers. Automatic irrigation system controllers for landscaping provided by the builder and installed at the time of final

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

inspection shall comply with the following:

- Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' watering needs as weather or soil conditions change.
- Weather-based controllers without integral rain sensors or communication systems that account for rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s).

- Construction Waste Reduction of at least 50 percent (4.408.1). Recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3 or 4.408.4; OR meet a more stringent local construction and demolition waste management ordinance. Documentation is required per Section 4.408.5. Exceptions:

  - Excavated soil and land-clearing debris.
  - Alternate waste reduction methods developed by working with local enforcing agencies if diversion or recycle facilities capable of compliance with this item do not exist or are not located reasonably close to the jobsite.
  - The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.

- Materials pollution control (4.504.1 – 4.504.6). Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring and particleboard.

- Installer and Special Inspector Qualifications (702.1-702.2). Mandatory special installer inspector qualifications for installation and inspection of energy systems (e.g., heat furnace, air conditioner, mechanical equipment).

Compliance with Green Building Standards and 2013 Title 24 Standards (which are approximately 25% more efficient than 2008 Title 24 Standards for residential buildings) will further reduce project-related greenhouse emissions.

b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

7b. **Response:** ***(Source: CalEEMod 2013.2.2 Model)***

No Impact. Riverside has adopted the 2013 edition of the California Building Code (Title 24), including the California Green Building Standards Code. The project would be subject to the California Green Building Standards Code, which requires new buildings to reduce water consumption, employ building commissioning to increase building system efficiencies for large buildings, divert construction waste from landfills, and install low pollutant-emitting finish materials. The project does not include any feature (i.e. substantially alter energy demands) that would interfere with implementation of these State and City codes and plans. The City of Riverside does not have any additional plans, policies, standards, or regulations related to climate change and GHG emissions. Also, no other government-adopted plans or regulatory programs in effect at this time have established a specific performance standard to reduce GHG emissions from a single building project. As the project's emissions fall well below the SCAQMD screening threshold of 3,000 metric tons per year of CO_2e for all land uses, and will comply with applicable Green Building Standards and City of Riverside's policies

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
regarding climate change, further analysis is not warranted. No mitigation is required.				
8. HAZARDS & HAZARDOUS MATERIALS. Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐

8a. Response: ***(Source: General Plan 2025 Public Safety Element, GP 2025 FPEIR, California Health and Safety Code, Title 49 of the Code of Federal Regulations, California Building Code, Riverside Fire Department EOP, 2002 and Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1, and OEM's Strategic Plan.)***

Less Than Significant Impact. The proposed 36-unit residential project could result in a significant hazard to the public if the project includes the routine transport, use, or disposal of hazardous materials or places housing near a facility which routinely transports, uses, or disposes of hazardous materials. The proposed project is located within a primarily residential area within the city. The routine use, transport, or disposal of hazardous materials is primarily associated with industrial uses which require such materials for manufacturing operations or produce hazardous wastes as by-products of production applications. The proposed project does not propose or facilitate any activity involving significant use, routine transport, or disposal of hazardous substances as part of the residential development of 36 townhomes.

During construction, there would be a minor level of transport, use, and disposal of hazardous materials and wastes that are typical of construction projects. This would include fuels and lubricants for construction machinery, coating materials, etc. This requirement would be spelled out in detail in the SWPPP that must be prepared by the applicant prior to any site disturbance. The SWPPP is discussed further in the next section (Hydrology and Water Quality). Routine construction control measures and best management practices for hazardous materials storage, application, waste disposal, accident prevention and clean-up, etc. would be sufficient to reduce potential impacts to a less than significant level.

With regard to project operation, a limited amount of widely used hazardous materials, including paints and other solvents, cleaners, and pesticides would be anticipated. The remnants of these and other products are disposed of as household hazardous waste (HHW) that includes used dead batteries, electronic wastes, and other wastes that are prohibited or discouraged from being disposed of at local landfills. Regular operation and cleaning of the residential structures would not result in significant impacts involving use, storage, transport or disposal of hazardous wastes and substances. Use of common household hazardous materials and their disposal does not present a substantial health risk to the community. Impacts associated with the routine transport, use of hazardous materials or wastes will be less than significant.

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?	☐	☐	☒	☐

8b. Response: ***(Source: General Plan 2025 Public Safety Element, GP 2025 FPEIR Tables 5.7 A – D, California Health and Safety Code, Title 49 of the Code of Federal Regulations, California Building Code, City of Riverside's EOP, 2002 and Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1, and OEM's Strategic Plan.)***

Less Than Significant Impact. Construction of the proposed 36-unit residential project will require the use and

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

transport of hazardous materials such as asphalt, paints, and other solvents. Construction activities could also produce hazardous wastes associated with the use of such products. Demolition of the existing structures and the new construction of proposed residential development require ordinary construction activities and will not require a substantial or uncommon amount of hazardous materials to complete. All hazardous materials are required to be utilized and transported in accordance with their labeling pursuant to federal and state law. Routine construction practices include good housekeeping measures to prevent/contain/clean-up spills and contamination from fuels, solvents, concrete wastes and other waste materials. During construction, BMPs would be required to be implemented by the City as well as standard construction controls and safety procedures that would avoid or minimize the potential for accidental release of these substances. Standard construction practices would be observed such that any materials released are appropriately contained and remediated as required by the Riverside Fire Department, the local Certified Unified Program Agency for hazardous materials in the region. With implementation of standard conditions, hazard to the public or the environment through reasonable foreseeable upset and accident condition involving the release of hazardous materials into the environment would be less than significant.

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐

8c. Response: ***(Source: General Plan 2025 Public Safety and Education Elements, GP 2025 FPEIR Table 5.7-D - CalARP RMP Facilities in the Project Area, Figure 5.13-2 – RUSD Boundaries, Table 5.13-D RUSD Schools, California Health and Safety Code, Title 49 of the Code of Federal Regulations, California Building Code.)***

Less than Significant Impact. There are three schools within one-half mile of the site. Ramona High School, approximately 0.42 miles to the southeast, at 7675 Magnolia Avenue, Jefferson Elementary School, approximately 0.22 miles to the north, at 4285 Jefferson Street and the Magnolia K-8 Academy Charter School at 4020 Jefferson Street, approximately 0.11 miles to the south. The project consists of the construction of 36 residential units and recreational structures which do not typically emit or generate hazardous materials. Therefore, the project would not result in significant impacts to schools due to hazardous materials handling or emissions and no mitigation is required.

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?	☐	☐	☐	☒

8d. Response: ***(Source: General Plan 2025 Figure PS-5 – Hazardous Waste Sites, GP 2025 FPEIR Tables 5.7-A – CERCLIS Facility Information, Figure 5.7-B – Regulated Facilities in TRI Information and 5.7-C – DTSC EnviroStor Database Listed Sites,*** **California Department of Toxic Substances Control. EnviroStor. <www.envirostor.dtsc.ca.gov/ public/search.asp>; California State Water Resources Control Board. GeoTracker. <geotracker.waterboards. ca.gov>; California State Water Resources Control Board. Sites Identified with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit. www.calepa.ca.gov/SiteCleanup/CorteseList/CurrentList.pdf; California State Water Resources Control Board. List of Active CDO and CAO. <www.calepa.ca.gov/SiteCleanup/CorteseList/CDOCAOList.xls>; California Department of Toxic Substances Control. Hazardous Facilities Subject to Corrective Action. www.calepa.ca.gov/SiteCleanup/CorteseList/SectionA.htm#Facilities and Robin Environmental Management.** ***Phase I Environmental Assessment Report for 4105 Jefferson Street (APN 227-130-025) Riverside, CA 92504*** **dated July 24, 2015.)**

No Impact. A review of known electronic database listings for possible hazardous waste generating

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
establishments in the vicinity of the subject property, as well as adjacent sites with known environmental concerns was conducted. Facilities were identified by county, state, or federal agencies that generate, store, or dispose of hazardous materials. The project is not located on the State of California Hazardous Waste and Substances Site List pursuant to Government Code Section 65962.5. California Department of Toxic Substances Control Envirostar database accessed August 1, 2016. The project would have no impact in this regard.				
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?	☐	☐	☒	☐

8e. Response: ***(Source: General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, RCALUCP,* County of Riverside Airport Land Use Commission *Staff Report* dated November 12, 2015, and California Department of Transportation, Division of Aeronautics website, California Public Use Airport list.)**

Less Than Significant Impact. The proposed project is located within Airport Compatibility Zone D as depicted on Figure 5.7-2 of the General Plan 2025 Program FPEIR for Riverside Municipal Airport as noted in the Riverside County Airport Land use Compatibility Plan (RCALUCP). The project was reviewed by the Airport Land Use Commission (ALUC) on November 12, 2015 to ensure that the project is consistent with the compatibility zone as well as in compliance with the land use standards in the RCALUP. The ALUC found that the site is located in Airport Compatibility Zone D of the Riverside Municipal Airport Influence Area. Compatibility Zone D allows residential densities at or above 5.0 dwelling units per acre.

The project proposes a total of 36 residential units on 2.96 acres for a density of 12.2 dwelling units per acre, which is consistent with the Zone D residential density criteria. The site is located outside the 55 dB (A) CNEL contour from Riverside Municipal Airport. Therefore, no special measures to mitigate aircraft noise are required at the site location. The project is located approximately 5,100 feet southeasterly of the southeasterly end of Runway 9-27 at Riverside Municipal Airport. The elevation of Runway 9-27 at its southeasterly terminus is 816 feet above mean sea level (AMSL). At the closest point of the site, structures with a top point elevation of 867 feet AMSL or greater would require notification to the Federal Aviation Administration (FAA) Obstruction Evaluation Service. Additionally, although the southerly end of Runway 16-34 is further from the site at approximately 8,540 feet, due to the substantially lower elevation of the southerly end of Runway 16-34 at 747.5 feet AMSL, this is analyzed as well. Based on the site distance and runway elevation, structures with a top point elevation of 832.9 feet AMSL or greater would require notification to the FAA Obstruction Evaluation Service. The project proposes a maximum pad elevation of 782.79 feet AMSL and a maximum building height of 29.5 feet for a maximum elevation of 812.29 feet AMSL. Therefore, review by the Federal Aviation Administration Obstruction Evaluation Service was not required for either Runway 9-27 or 16-34.

Compatibility Zone D requires that 10% of area within major projects (10 acres or larger) be set aside as open area that could potentially serve as emergency landing areas. Since the overall project size is less than 10 acres, the open area requirement is not applicable to this project. In conjunction with adoption of the General Plan 2025, the City of Riverside amended its zoning ordinance to provide for Airport Protection Overlay Zones within the Airport Influence Areas of airports for which Compatibility Zones based on the "A through E" system utilized in the 2004 Riverside County Airport Land Use Compatibility Plan have been established. While the land uses permitted by the proposed R-3-3,000 zone are consistent with a location in Compatibility Zone D, application of the Airport Protection Overlay Zone suffix is recommended in order to assure that the ultimate development will comply with Compatibility Zone D. This would further the objectives of promoting

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

the continued operations of Riverside Municipal Airport and maintaining public awareness of its proximity. The Airport Protection Overlay Zone suffix for Zone D would be applied to the parcel (R-3-3,000-AP-D).

The ALUC recommended the following conditions for the map and site plan:

1. Any outdoor lighting installed shall be hooded or shielded to prevent either the spillage of lumens or reflection into the sky.
2. The following uses shall be prohibited:

   (a) Any use which would direct a steady light or flashing light of red, white, green, or amber colors associated with airport operations toward an aircraft engaged in an initial straight climb following takeoff or toward an aircraft engaged in a straight final approach toward a landing at an airport, other than an FAA-approved navigational signal light or visual approach slope indicator.

   (b) Any use which would cause sunlight to be reflected towards an aircraft engaged in an initial straight climb following takeoff or towards an aircraft engaged in a straight final approach towards a landing at an airport.

   (c) Any use which would generate smoke or water vapor or which would attract large concentrations of birds, or which may otherwise affect safe air navigation within the area. (Such uses include landscaping utilizing water features, aquaculture, production of cereal grains, sunflower, and row crops, composting operations, trash transfer stations that are open on one or more sides, recycling centers containing putrescible wastes, construction and demolition debris facilities, fly ash disposal, and incinerators.)

   (d) Any use which would generate electrical interference that may be detrimental to the operation of aircraft and/or aircraft instrumentation.

3. The attached notice shall be given to all prospective purchasers and tenants of the property, and recorded as a deed notice.
4. Any new detention basins on the site shall be designed so as to provide for a maximum 48-hour detention period following the conclusion of the storm event for the design storm (may be less, but not more), and to remain totally dry between rainfalls. Vegetation in and around the detention basin(s) that would provide food or cover for bird species that would be incompatible with airport operations shall not be utilized in project landscaping.
5. During initial sales of properties within the proposed subdivision, pursuant to Riverside Municipal Airport Land Use Compatibility Plan Policy 2.4(a), large airport-related informational signs clearly depicting the proximity of the property to Riverside Municipal Airport and aircraft traffic patterns shall be installed in conspicuous locations and maintained by the developer.
6. The developer shall provide to prospective purchasers and/or tenants an informational brochure depicting the locations of aircraft flight patterns and describing the frequency of overflights, the typical altitudes of the aircraft, and the range of noise levels that can be expected from individual aircraft overflights. (A large-scale illustration of Exhibit RI-7, Compatibility Factors, will suffice).
7. Prior to recordation of the final map or building permit, whichever occurs first, the City of Riverside shall apply zoning incorporating the Airport Protection Overlay Zone (R-3-3,000-AP-D) to the site.

Because the project has been found to be consistent with the RCALUCP by the ALUC, impacts related to hazards from airports are less than significant impacts directly, indirectly and cumulatively.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

8f. Response: ***(Source: General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, RCALUCP* and California Department of Transportation, Division of Aeronautics website, California Public Use Airport list.)**

No Impact. Because the proposed project is not located within proximity of a private airstrip, and does not propose a private airstrip, the project will not expose people residing or working in the City to excessive noise levels related to a private airstrip and would have no impact directly, indirectly or cumulatively.

g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

8g. Response: ***(Source: GP 2025 FPEIR Chapter 7.5.7 – Hazards and Hazardous Materials, City of Riverside's EOP, 2002 and Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1, and OEM's Strategic Plan)***

Less Than Significant Impact. The project will be served by an existing, fully improved street, Jefferson Street. Project interior roads will be private. All streets have been designed to meet the Public Works and Fire Departments' specifications. As part of the project's construction, a temporary street closing will be necessary. Any street closing will be of short duration so as not to interfere or impede with any emergency response or evacuation plan. Therefore, the project will have a less than significant impact directly, indirectly and cumulatively to an emergency response or 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?	☐	☐	☒	☐

8h. Response: ***(Source: General Plan 2025 Figure PS-7 – Fire Hazard Areas, GIS Map Layer VHFSZ 2010, City of Riverside's EOP, 2002, http://intranet/Portal/uploads/Riv City EOP complete.pdf, Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1/Part 2 and OEM's Strategic Plan)***

Less Than Significant Impact. The project site is not located within a Very High Fire Severity Zone (VHFSZ). As a result, there are no special considerations required with respect to defensible space and clearing of vegetation adjacent to new structures. With strict adherence to the Building Code and local regulations, the project will have a less than significant impact directly, indirectly, and cumulatively on exposing people or structures to a significant risk of loss, injury or death involving wildland fires, including where wild lands are adjacent to urbanized areas.

9. HYDROLOGY AND WATER QUALITY. Would the project:				
a. Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐

9a. Response: ***(Source: GP 2025 FPEIR Table 5.8-A – Beneficial Uses Receiving Water and* SDH & Associates, Inc., *Project Specific Preliminary Water Quality Management Plan for 4105 Jefferson Street,* Revised**

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

September 29, 2016.)

Less Than Significant Impact. A project normally would have an impact on surface water quality if discharges associated with the project would create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code (CWC), or that cause regulatory standards to be violated as defined in the applicable National Pollutant Discharge Elimination System (NPDES) stormwater permit or Water Quality Control Plan for the receiving water body. For the purpose of this specific issue, a significant impact could occur if the project would discharge water that does not meet the quality standards of the agencies which regulate surface water quality and water discharge into stormwater drainage systems. Significant impacts could also occur if the project does not comply with all applicable regulations with regard to surface water quality as governed by the State Water Resources Control Board (SWRCB). These regulations include preparation of a Storm Water Quality Management Plan (SWQMP) to reduce potential post-construction water quality impacts.

Discharges into stormwater drains or channels from construction sites of one acre or larger are regulated by the General Permit for Storm Water Discharges Associated with Construction Activity issued by the State Water Quality Control Board. The General Permit was issued pursuant to National Pollutant Discharge Elimination System (NPDES) regulations of the Environmental Protection Agency (EPA), as authorized by the Clean Water Act. Compliance with the General Permit involves developing and implementing a Storm Water Pollution Prevention Plan (SWPPP) specifying best management practices (BMPs) that the project would use to minimize pollution of stormwater. The SWPPP BMPs would follow the guidelines set forth by the State Water Resources Control Board (SWRCB).

The project applicant will be required to comply with NPDES permit requirements through the preparation and implementation of a SWPPP for construction activities. The City's Public Works Director will review the application for compliance with applicable regulations and to ensure that no water quality standards or discharge requirements are violated. A Notice of Intent (NOI) to the Santa Ana RWQCB will be required who will issue a Waste Discharge Identification Number (WDID) for the project. Prior to obtaining any City-issued grading and/or construction permits, the developer/owner shall provide evidence of compliance with the general construction permit by providing a copy of the WDID to the city's Public Works/Engineering Department. Plans for stormwater treatment are required to meet City and regional standards. Given required compliance with existing laws, project impacts on water quality standards would be less than significant, and no additional mitigation is required.

The existing drainage condition/pattern is sheet flow across the site to Jefferson Street; this pattern will not be preserved. Instead, runoff will be collected and rerouted to onsite infiltration basins with an overflow to Jefferson Street. The project incorporates site design, source controls and treatment control BMPs. While this site has relatively unfavorable infiltration rates, the addition of amended soil in the infiltration basin areas is proposed. Infiltration/Percolation L/Os and other forms of natural drainage have been heavily incorporated into the design and are the sole source of storm water treatment for this site. In addition to the treatment control mentioned above, the applicant is proposing site design techniques and BMPs including minimizing urban runoff, minimizing the impervious footprint, and removing directly connected impervious areas. These techniques were obtained by maximizing permeable area, constructing to the minimum width and minimizing hardscape, whenever possible. These BMPs combined with compliance of existing statutes will have a less than significant impact directly, indirectly and cumulatively on to any water quality standards or waste discharge.

b. Substantially deplete groundwater supplies or interfere	☐	☐	☒	☐

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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)?				

9b. Response: ***(Source: General Plan 2025 Table PF-1 – RPU Projected Domestic Water Supply (AC-FT/YR), Table PF-2 – RPU Projected Water Demand, RPU Map of Water Supply Basins, and RPU Urban Water Management Plan)***

Less Than Significant Impact. If the project removed an existing groundwater recharge area or substantially reduced runoff that results in groundwater recharge, a potentially significant impact could occur. Groundwater was encountered at the site in exploratory borehole at 34 feet below ground surface. Least ground surface elevation at the site is approximately 777. Project-related grading would not reach these depths and no disturbance of groundwater is anticipated. The proposed building footprint areas and paved parking areas would increase impervious surface coverage on the site. As such, the total amount of infiltration on site would be decreased over existing conditions. Since this site is currently developed and is not managed for groundwater supplies, this change in infiltration would not have a significant effect on groundwater supplies or recharge.

The project would be required to comply with the City of Riverside Municipal Code, Chapter 19.570 for water efficient landscape requirements, which would lessen the project's demand for water resources. Also, finally, CBC Title 24 water efficiency measures require a demonstrated 20 percent reduction in the use of potable water. The project's landscaping plans include drought tolerant landscaping materials. Compliance with Title 24 and the City's Water Efficient Landscaping Ordinance will reduce the proposed project's impacts to groundwater supplies to a level of less than significant.

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?	☐	☐	☒	☐

9c. Response: ***(Source: Preliminary grading plan, and*** **SDH & Associates, Inc.*****, Project Specific Preliminary Water Quality Management Plan for 4105 Jefferson Street,*** **Revised September 29, 2016**.)

Less Than Significant Impact. Potentially significant impacts to the existing drainage pattern of the site or area could occur if development of the project results in substantial on- or off-site erosion or siltation. There are no streams cross the project site; thus, the project would not alter any stream course. This project is broken up into 20 Drainage Management Areas and 100% percent of stormwater runoff will be treated and contained on this site through infiltration BMPs.

• Areas 1A encompass the northwestern building's roof area to the northwest and drains to Area 2A via roof drains and surface flow. This runoff then flows to Area 5, a large 1,759 square foot bio-retention cell with an 18" amended soils layer (10 in/hr minimum infiltration rate) and a 12" gravel layer containing a 6" perforated pipe.
• Area 1B, 1C, 1D & 1E, the building roofs and hardscape along the northern property line will drain to area 2B, a large landscape area containing a series of vegetated swales which lead to a catch basin that ultimately drains to Area 5 - Bio-Retention Cell 2.
• Area 1F & 1J the building and roof area to the northeast drain to Area 2C, a large landscape which also routes runoff through a series of catch basins and vegetated swales to Area 4, a large 3,769 square foot bio-retention cell

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

with an 18" amended soils layer (10 in/hr minimum infiltration rate) and a 12" gravel layer containing a 6" perforated pipe.
• Area 1G, 1H & 1I, the building roofs along the southern property line drain to area 2C, a large landscape area containing a series of vegetated swales which lead to Area 4 - Bio-Retention Cell 1.
• Area 1K, the pool hardscape area and Area 2D a small landscape area adjacent to the pool bathroom will be routed via surface flow and area drains to Area 4 - Bio-retention Cell 1.
• Area 3A, the eastern portion of the private street and parking will surface flow to a catch basin and then routed to Area 5 and Areas 3B and 3C will be routed to Area 4.

A site drainage plan is required by the City of Riverside and would be reviewed by the City Engineer. The final grading and drainage plan would be approved by the City Engineer during plan check review. Erosion and siltation reduction measures would be implemented during construction consistent with an approved SWPPP, which will demonstrate compliance with the City's NPDES permit. At the completion of construction, the project would consist of impervious surfaces and landscaped areas, and would therefore not be prone to substantial erosion. No streams cross the project site; thus, the project would not alter any stream course. Impacts will be less than significant.

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?	☐	☐	☒	☐

9d. Response: ***(Source: Preliminary grading plan, and* SDH & Associates, Inc.*, Project Specific Preliminary Water Quality Management Plan for 4105 Jefferson Street,* Revised September 29, 2016.)**

Less Than Significant Impact. No streams traverse the project site; thus, the project would not result in the alteration of any stream course. During construction, the project applicant would be required to develop and implement a SWPPP as required by law; this would prevent polluted runoff from leaving the construction site.

The existing drainage condition/pattern is sheet flow across the site to Jefferson Street; this pattern will not be preserved. Instead, runoff will be collected and rerouted to onsite infiltration basins with an overflow to Jefferson Street. Proposed basin mitigates runoff volume, time of concentration and peak runoff as it is designed to retain the 100-year, 24-hour storm in the developed condition (1.00 ac ft.). With the basins, increased discharges to the City's existing storm drain system will not occur and will not impact local storm drain capacity. The project is not an industrial use and therefore will not result in substantial pollutant loading such that treatment control BMPs would be required to protect downstream water quality. Impacts will be less than significant.

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?	☐	☐	☒	☐

9e. Response: ***(Source: Preliminary Grading Plan, and* SDH & Associates, Inc.*, Project Specific Preliminary Water Quality Management Plan for 4105 Jefferson Street,* Revised September 29, 2016.)**

Less Than Significant Impact. The project is over one acre in size and is required to have coverage under the State's General Permit for Construction Activities (SWPPP). As stated in the Permit, during and after

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

construction, best management practices (BMPs) will be implemented to reduce/eliminate adverse water quality impacts resulting from development. Furthermore, the City has ensured that the proposed development does not cause adverse water quality impacts, pursuant to its Municipal Separate Storm System (MS4) permit through the project's WQMP.

The proposed development will increase the amount of impervious surface area in the City. This impervious area includes paved parking areas, sidewalks, roadways, and building rooftops; all sources of runoff that may carry pollutants and therefore has the potential to degrade water quality. This development has been required to prepare and implement a WQMP. Preliminary BMP's, in compliance with the WQMP, have been approved by Public Works. The purpose of this requirement is to insure treatment BMPs are installed/constructed as part of the project so that the pollutants generated by the project will be treated in perpetuity. Final BMP's shall be required prior to grading permit issuance.

Concerning exceeding capacity of the existing or planned stormwater drainage systems, the project has been reviewed by Public Works' staff to determine if this proposal will significantly increase the amount of runoff into the existing undersized storm drains. The Public Works Department has found the Draft Preliminary Water Quality Control Plan to be acceptable. Impacts will be less than significant.

f. Otherwise substantially degrade water quality?	☐	☐	☒	☐

9f. Response: ***(Source:*** **SDH & Associates, Inc.,** ***Project Specific Preliminary Water Quality Management Plan for 4105 Jefferson Street,*** **Revised September 29, 2016.)**

Less Than Significant Impact. The project proponent conducted a Preliminary Project Specific Water Quality Management Plan consistent with City of Riverside requirements. The project is over one are in size and is required to have coverage under the State's General Permit for Construction Activities (SWPPP). As stated in the Permit, during and after construction, best management practices (BMPs) will be implemented to reduce/eliminate adverse water quality impacts resulting from development. Furthermore, the City has ensured that the development does not cause adverse water quality impacts, pursuant to its Municipal Separate Storm System (MS4) permit through the project's WQMP.

The proposed development will increase the amount of impervious surface area in the City. This impervious area includes paved parking areas, sidewalks, roadways, and building rooftops; all sources of runoff that may carry pollutants and therefore has the potential to degrade water quality. This development has been required to prepare preliminary BMP's that have been reviewed and approved by Public Works. Final BMP's will be required prior to grading permit issuance. The purpose of this requirement is to insure treatment BMP's are installed/constructed as part of the project so that the pollutants generated by the project will be treated in perpetuity. Therefore, impacts related to degrading water quality are less than significant directly, indirectly and cumulatively.

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?	☐	☐	☐	☒

9g. Response: ***(Source: General Plan 2025 Figure PS-4 – Flood Hazard Areas, and FEMA Flood Hazard Maps*** **Flood Insurance Rate Maps (FIRM), Panel 06065C0710G, August 28, 2008*)***

No Impact. A review of National Flood Insurance Rate Map (Map Number 06065C C0710G Effective Date

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
August 28, 2008) and Figure 5.8-2 – Flood Hazard areas of the General Plan 2025 Program FPEIR, indicates that project site is located in a Zone X. This zone designates areas of 0.2 percent annual chance flood, areas of 1 percent annual chance flood with average depths of 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1 percent annual chance flood. There will be no impact caused by this project directly, indirectly or cumulatively as it will not place housing within a 100-year flood hazard area.				
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
9h. Response: ***(Source: General Plan 2025 Figure PS-4 – Flood Hazard Areas, and FEMA Flood Hazard Maps* Flood Insurance Rate Maps (FIRM), Panel 06065C0710G, August 28, 2008*)*** **No Impact.** The proposed project is not located within a 100-year floodplain, as mapped by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. The project site is identified as Zone X, defined by FEMA as areas outside the 0.2 percent annual chance floodplain. Therefore, no rising of a flood plain will occur.				
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?	☐	☐	☐	☒
9i. Response: ***(Source: General Plan 2025 Figure PS-4 – Flood Hazard Areas, and FEMA Flood Hazard Maps* Flood Insurance Rate Maps (FIRM), Panel 06065C0710G, August 28, 2008*)*** **No Impact.** The project site is not located within or near a flood hazard area as depicted on General Plan 2025 Program FPEIR Figure 5.8-2 – Flood Hazard Areas and the National Flood Insurance Rate Map (Map Number 06065C C0710G Effective Date August 28, 2008) or subject to dam inundation as depicted on General Plan 2025 Program FPEIR Figure 5.8-2 – Flood Hazard Areas. Therefore, the project will not place a structure within a flood hazard or dam inundation area that would 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 and therefore no impact directly, indirectly or cumulatively will occur.				
j. Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
9j. Response: ***(Source: GP 2025 FPEIR Chapter 7.5.8 – Hydrology and Water Quality and* GeoMat Testing Laboratories, Inc.*, Preliminary Soil Investigation Report, Single Family Residential Project, 4015 Jefferson Street, Riverside, California*, July 31, 2015.)*** **No Impact.** The proposed project site is not near a large body of water. Due to the project's inland location, the site would not be affected by tsunamis. The project is not located in an area subject to landslides and is located within an urbanized area surrounded by residential uses. No impacts related to seiche, tsunami, or mudflow would occur.				
10. LAND USE AND PLANNING: Would the project:				
a. Physically divide an established community?	☐	☐	☒	☐
10a. Response: ***(Source: General Plan 2025 Land Use and Urban Design Element, Project site plan, and City of Riverside GIS/CADME map layers)***				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Less Than Significant Impact. The project is an infill project currently served by fully improved public streets and other infrastructure and does not involve the creation of streets that could alter the existing surrounding pattern of development or an established community. The proposed project has been designed to be consistent with the fit into the pattern of development of the surrounding area providing adequate access, circulation and connectivity consistent with the General Plan 2025, and in compliance with the requirements of the Zoning and Subdivision Codes. Therefore, the project impacts related to the community are less than significant.				
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?	☐	☐	☒	☐

10b. Response: ***(Source: General Plan 2025, General Plan 2025 Figure LU-10 – Land Use Policy Map, Table LU-5 – Zoning/General Plan Consistency Matrix, Title 19 – Zoning Code, Title 18 – Subdivision Code, Title 7 – Noise Code, Title 17 – Grading Code, Title 20 – Cultural Resources Code, Title 16 – Buildings and Construction, Citywide Design and Sign Guidelines and*** **County of Riverside Airport Land Use Commission** ***Staff Report*** **dated November 12, 2015*)***

Less than Significant Impact. The project site is designated as PF – Public Facilities/Institutions in the City's General Plan. The project site's zoning is R-1-700 (Single-Family Residential). The proposed project involves development of 36 residential dwelling units and a public common area with a park, picnic area, pool, restroom/storage structure, and community garden. The proposed site is located on the east side of Jefferson Street with residential development in the vicinity. The proposed General Plan Amendment and Rezoning places approximately 2.96 net acres in the MHDR (Medium High Density Residential) General Plan designation and the R-3-3000 Zone.

Variance No. P16-0647 is a request to vary the regulations in Municipal Code Section 19.100.070D Additional Regulations for the R-3 and R-4 Zones, Distance Between Buildings from a minimum of 15 feet to a minimum of 8.5 feet. The variance is necessary due to the conflict of applying a multiple-family residential design regulation to an attached single-family residential development. The variance requested is for all buildings with the exception of Building 1 and Building 10. The minimum building separation is 8.5 feet occurring between Buildings 2 and 3 and Buildings 8 and 9. The distance between Buildings 4 and 5 is 10.5 feet. The distance between Building 6 and 7 is approximately 11 feet. Generally, the Municipal Code allows projections into the required yards for features such as porches, platforms, or landings. They may project up to 3 feet into a required side or rear yard area. The utility closet feature is approximately 2 feet by 8 feet and can be deemed similar to the allowable projections.

The proposed project is located within Airport Compatibility Zone D as depicted on Figure 5.7-2 of the General Plan 2025 Program FPEIR for Riverside Municipal Airport as noted in the Riverside County Airport Land use Compatibility Plan (RCALUCP). The project was reviewed by the Airport Land Use Commission (ALUC) on November 12, 2015 to ensure that the project is consistent with the compatibility zone as well as in compliance with the land use standards in the RCALUP. The project proposes a total of 36 residential units on 2.96 acres for a density of 12.2 dwelling units per acre, which is consistent with the Zone D residential density criteria. Compatibility Zone D requires that 10% of area within major projects (10 acres or larger) be set aside as open area that could potentially serve as emergency landing areas. Since the overall project size is less than 10 acres, the open area requirement is not applicable to this project. In conjunction with adoption of the General Plan 2025, the City of Riverside amended its zoning ordinance to provide for Airport Protection Overlay Zones within the Airport Influence Areas of airports for which Compatibility Zones based on the "A through E" system

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

utilized in the 2004 Riverside County Airport Land Use Compatibility Plan have been established. While the land uses permitted by the proposed R-3-3,000 zone are consistent with a location in Compatibility Zone D, application of the Airport Protection Overlay Zone suffix is recommended in order to assure that the ultimate development will comply with Compatibility Zone D. This would further the objectives of promoting the continued operations of Riverside Municipal Airport and maintaining public awareness of its proximity. The Airport Protection Overlay Zone suffix for Zone D would be applied to the parcel (R-3-3,000-AP-D). The proposed General Plan Amendment and Rezone are consistent with the General Plan 2025, Zoning Code, Subdivision Code and Grading Code Development Standards. The project is not a project of Statewide, Regional or Area wide Significance. As such, this project will have a less than significant impact directly, indirectly or cumulatively.

c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

10c. Response: ***(Source: General Plan 2025, General Plan 2025 – Figure LU-10 – Land Use Policy Map, Table LU-5 – Zoning/General Plan Consistency Matrix, Title 19 – Zoning Code, Title 18 – Subdivision Code, Title 7 – Noise Code, Title 17 – Grading Code, Title 20 – Cultural Resources Code, Title 16 – Buildings and Construction and Citywide Design and Sign Guidelines)***

No Impact. The project site is located on a previously developed/improved site within an urbanized area and will not impact an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan directly, indirectly and cumulatively. Therefore, the project will have no impact on the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

11. MINERAL RESOURCES. 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?	☐	☐	☐	☒

11a. Response: ***(Source: General Plan 2025 Figure – OS-1 – Mineral Resources)***

No Impact. The project does not involve extraction of mineral resources or grading activity. No mineral resources have been identified on the project site and there is no historical use of the site or surrounding area for mineral extraction purposes. The project site is not, nor is it adjacent to, a locally important mineral resource recovery site delineated in the General Plan 2025, specific plan or other land use plan. Therefore, the project will have no impact on mineral resources directly, indirectly or cumulatively.

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?	☐	☐	☐	☒

11b. Response: ***(Source: General Plan 2025 Figure – OS-1 – Mineral Resources)***

No Impact. The project site, located within a fully urbanized area of the City of Riverside, is surrounded by residential uses. The General Plan, Managing Our Land Supply chapter, describes the importance of conservation of significant mineral deposits. The project site and majority of the adjacent lands are located within an MRZ-3 zone, where the significance of mineral deposits cannot be determined. To the west of the site is an area designated as MRZ-2, areas where geologic data indicate that significant PCC-Grade

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
aggregate resources are present. These properties are fully developed with residential uses. Mineral production is not compatible with the project area due to urbanization and location of residential uses near the project site. Development would not result in the loss of a known mineral resource. No impact would occur.				
12. NOISE. 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?	☐	☐	☒	☐

12a. Response: ***(Source: General Plan Figure N-1 – 2003 Roadway Noise, Figure N-5 – 2025 Roadway Noise, Figure N-8 – Riverside and Flabob Airport Noise Contours, Figure N-10 – Noise/Land Use Noise Compatibility Criteria, FPEIR Table 5.11-I – Existing and Future Noise Contour Comparison, Table 5.11-E – Interior and Exterior Noise Standards, Appendix G – Noise Existing Conditions Report, Title 7 – Noise Code,*** **Kunzman Associates, Inc.,** ***Interior Noise Assessment for Harris Farm Project,*** **September 30, 2015 and Kunzman Associates, Inc.,** ***Exterior/Interior Noise Assessment for Harris Farm Project,*** **January 13, 2016.)**

Less Than Significant. An acoustical analysis was prepared for the project by Kunzman Associates, Inc. on January 13, 2016. The acoustical analysis concludes that the project did not have the potential to expose persons to or generate of noise levels in excess of standards established in the General Plan 2025 and Noise Code (Title 7). Units 1 thru 4 are located within the 65 dBA CNEL contour along Jefferson Street. The useable outdoor areas are located at the rear of the building (opposite side from Jefferson Street). The architectural layout design will reduce the noise level to 46.7 dBA CNEL. The level is below the City's 55 dBA CNEL limit and therefore no significant impact is anticipated. The daytime level will range between 42 to 45 dBA and the nighttime level will be 38 dBA, which is below the City's noise standards.

The building shell design was evaluated including the exterior/interior wall assembly design, the roof assembly and windows for the proposed project based on typical residential construction techniques. The interior noise level will be 39 dBA CNEL (when windows are closed) and typical building assembly construction techniques. The project will therefore comply with the City of Riverside's 45 dBA CNEL interior requirement. No further mitigation is required. Therefore, the impacts are considered less than significant.

Construction noise is considered a short-term impact and would be considered significant if construction activities are undertaken outside the allowable times as described by the City's Municipal Code Title 7 (Noise Control). Existing single-family detached residential dwelling units located to the south, west and east of the project site may be affected by short-term noise impacts associated the transport of workers, the movement of construction materials to and from the project site, ground clearing, excavation, grading, and building activities.

Project generated construction noise will vary 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. Grading is expected to produce the highest sustained construction noise levels. A likely worst-case construction noise scenario assuming the use of the projected equipment was calculated using the Federal Highway Administration's Roadway Construction Noise Model (RCNM) assuming the use of a grader, a dozer, and two (2) excavators, two (2) backhoes and a scrapper operating at 50 feet from the nearest sensitive receptor.

Assuming a usage factor of 40 percent for each piece of equipment, unmitigated noise levels at 50 feet would reach 90 dBA Leq and 92 dBA Lmax at the nearest residential structures. Noise levels for the other construction

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
phases would be lower and range between 85 to 87 dBA. This assessment assumes construction equipment is located at a distance of 50 feet from nearest residences. Staging of equipment will occur at distances further than 50 feet. The City has an exemption for construction which occurs during the allowable hours. Construction will follow the allowable hours and therefore the impact would be less than significant.				
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
12b. Response: ***(Source: General Plan Figure N-1 – 2003 Roadway Noise, Figure N-5 – 2025 Roadway Noise, Figure N-8 – Riverside and Flabob Airport Noise Contours, FPEIR Table 5.11-G – Vibration Source Levels For Construction Equipment, Appendix G – Noise Existing Conditions Report.)*** **Less Than Significant Impact.** Construction related activities although short term, are the most common source of groundborne noise and vibration that could affect occupants of neighboring uses. A temporary increase in noise and vibration levels may be noticed during project construction; however, these activities will be subject to compliance with the City's Noise Ordinance and a less than significant short-term impact will occur. Also, with the development and use for up to 36 dwelling units no long-term vibration impacts will occur.				
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
12c. Response: ***(Source: General Plan Figure N-1 – 2003 Roadway Noise, Figure N-5 – 2025 Roadway Noise, Figure N-8 – Riverside and Flabob Airport Noise Contours, Figure N-10 – Noise/Land Use Noise Compatibility Criteria, FPEIR Table 5.11-I – Existing and Future Noise Contour Comparison, Table 5.11-E – Interior and Exterior Noise Standards, Appendix G – Noise Existing Conditions Report, Title 7 – Noise Code,*** **Kunzman Associates, Inc.,** ***Interior Noise Assessment for Harris Farm Project,*** **September 30, 2015 and Kunzman Associates, Inc.,** ***Exterior/Interior Noise Assessment for Harris Farm Project,*** **January 13, 2016.)** **Less Than Significant Impact.** To determine whether the proposed project would result in a permanent increase in ambient noise levels, a noise study was prepared by Kunzman Associates, Inc. on January 13, 2016. The noise study concludes that permanent ambient noise levels in the project vicinity will not increase as a result of the project. Impacts related to a permanent increase in ambient noise levels will be less than significant directly, indirectly and cumulatively.				
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
12d. Response: ***(Source: FPEIR Table 5.11-J – Construction Equipment Noise Levels, Appendix G – Noise Existing Conditions Report*** **Kunzman Associates, Inc.,** ***Interior Noise Assessment for Harris Farm Project,*** **September 30, 2015 and Kunzman Associates, Inc.,** ***Exterior/Interior Noise Assessment for Harris Farm Project,*** **January 13, 2016.)** **Less Than Significant Impact.** The primary source of temporary or periodic noise associated with the proposed project is from construction activity and maintenance work. Construction noise typically involves the loudest common urban noise events associated with building demolition, grading, construction, large diesel engines, truck deliveries and hauling. Both the General Plan 2025 and Municipal Code Title 7 (Noise Code) limit construction activities to specific times and days of the week and during those specified times, construction activity is subject to the noise standards provided in the Title 7. Considering the short-term nature				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
of construction and the provisions of the Noise Code, the temporary and periodic increase in noise levels due to the construction which may result from the project are considered less than significant directly, indirectly and cumulatively.				
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?	☐	☐	☒	☐
12e. Response: ***(Source: General Plan 2025 Figure N-8 – Riverside and Flabob Airport Noise Contours, Figure N-10 – Noise/Land Use Noise Compatibility Criteria, RCALUCP,*** **County of Riverside Airport Land Use Commission *Staff Report* dated November 12, 2015.)** **Less Than Significant Impact.** Although the proposed project is located within the Riverside Municipal Airport Land Use Compatibility Plan Zone D, the proposed project is not located within any of the airport noise contour areas as depicted on Figures N-8 of the Noise Element of the General Plan 2025. The ALUC determined that site is located outside the 55 dB (A) CNEL contour from Riverside Municipal Airport. For this reason, the project would not expose people residing or working in the project area to excessive noise levels related to airport noise. Therefore, impacts will be less than significant directly, indirectly and cumulatively on 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?	☐	☐	☐	☒
12f. Response: ***(Source: General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, RCALUCP)*** **No Impact.** Per the GP 2025 Program FPEIR, there are no private airstrips within the City that would expose people working or residing in the City to excessive noise levels. Because the proposed project consists of development anticipated under the General Plan 2025, is not located within proximity of a private airstrip, and does not propose a private airstrip, the project will not expose people residing or working in the City to excessive noise levels related to a private airstrip and would have no impact directly, indirectly or cumulatively.				
13. POPULATION AND HOUSING. 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)?	☐	☐	☒	☐
13a. Response: ***(Source: General Plan 2025 Table LU-3 – Land Use Designations, FPEIR Table 5.12-A – SCAG Population and Households Forecast, Table 5.12-B – General Plan Population and Employment Projections–2025, Table 5.12-C – 2025 General Plan and SCAG Comparisons, Table 5.12-D - General Plan Housing Projections 2025, Capital Improvement Program and SCAG's RCP, RTP and*** **State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011- 2016*. Sacramento, California, May 2016)** **Less Than Significant Impact**. The project consists of a General Plan Amendment, Zone Change,				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Tentative Tract Map, Site Plan and Design Review to allow the development of 36 residential units on the 2.96-net acre site. Using the General Plan factor of 3.2 persons per household, the project would generate 115 new residents in the City. The project site is an infill project in an area where existing residential already exists. The 115 new residents would represent a less than one percent increase to the City's current population. Therefore, the proposed project would not induce substantial population growth in the area either by building a large number of new dwellings or by extending infrastructure into an area not previously served. The project is directly bringing jobs during construction. Project employment represents approximately less than one percent of the city's project growth which is not substantial and is within the employment growth assumptions for the city. Due to the urban nature of the City and surrounding area, this potential minimal increase in population is expected to be accommodated by existing housing in the City and neighboring communities. Impacts will be less than significant.				
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
13b. Response: ***(Source: CADME Land Use Layer ,*** **Less Than Significant Impact.** The project site is occupied with one single-family residence. This structure will be demolished and replaced with the proposed 36 dwelling units. Replacement housing will not need to be constructed elsewhere as the proposal will not result in the displacement of substantial numbers of existing housing. Impacts to housing will be less than significant.				
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
13c. Response: ***(Source: CADME Land Use Layer)*** **Less Than Significant Impact.** Displacement, in the context of housing, can generally be defined as persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence according to The Brookings Institute's *Handbook for Applying the Guiding Principles on Internal Displacement* published in 1999. There is one existing dwelling located on the project site, and therefore approximately 6 residents using the General Plan's factor of an average of 3.2 persons per household. The owners of the properties are in agreement with the proposed development requests. As such, there is no forced or obliged removal of persons, and therefore no displacement. Impacts to housing will be less than significant.				
14. PUBLIC SERVICES.				
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?	☐	☐	☒	☐
14a. Response: ***(Source: FPEIR Table 5.13-B – Fire Station Locations, Table 5.13-C – Riverside Fire Department Statistics and Ordinance 5948 § 1)***				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

Less Than Significant Impact. The project consists of 36 residential units and accessory structures. Adequate fire facilities and services are provided by Station #5 (Airport) located at 5883 Arlington Avenue, Riverside to serve this project. The Station is approximately 0.7 miles to the northwest and an approximate 2 minute drive time. The Station has a current operating apparatus of: one engine, one squad engine, and one command unit. Based on the project's close proximity to Station #5, service response goals for Riverside Fire Department in respect to the project location will be met. The project is a proposed infill site. Therefore, the project would not have a significant impact on fire response times and would not otherwise create a substantially greater need for fire protection services than already exists. No new or expanded fire protection facilities would be required as a result of this project. Impacts related to expansion of fire protection services will be less than significant.

b. Police protection?	☐	☐	☒	☐

14b. Response: ***(Source: General Plan 2025 Figure PS-8 – Neighborhood Policing Centers)***

Less Than Significant Impact. The project is an infill project of 36 residential units in an area that is primarily residential development. The Riverside Police Department is located at 4102 Orange Avenue in Downtown Riverside. The department consists of 555 persons including sworn officers and unsworn support staff. Based on a family of 3.2 persons in each home, the proposed project has the potential to increase the population of the City by 115 residents. Funding for services by the Department is derived from the City's General Fund, and state and federal grants. The proposed residential development will not result in any unique or more extensive crime problems that cannot be handled with the existing level of police resources. No new or expanded police facilities would need to be constructed as a result of this project. In addition, with implementation of General Plan 2025 policies, compliance with existing codes and standards and through Police Department practices; impacts related to expansion of police protection services will be less than significant.

c. Schools?	☐	☐	☒	☐

14c. Response: ***(Source: FPEIR Figure 5.13-2 – RUSD Boundaries, Table 5.13-D – RUSD, Table 5.13-G – Student Generation for RUSD and AUSD By Education Level, and*** **Great!Schools Website, www.greatschools.org/school-district-boundaries-map/, and Riverside Unified School District Website, www.rusdlink.org, accessed August 3, 2016.)**

Less Than Significant Impact. This project is located within the Riverside Unified School District's (RUSD) service area. Schools that would serve the site are Jefferson Elementary School, Sierra Middle School, and Ramona High School. Based on the estimated student generation rates provided by the RUSD, it is estimated that the project could generate 27 students in the RUSD. There would be 18 elementary aged children (0.5 x 36), 3 middle school students (0.09 x 36) and 6 high school students (0.17 x 36) generated by this proposed project. These students may or may not be totally new to the district; families may relocate to the proposed development from other parts of the district, merely shifting the student population from other areas of the District.

Pursuant to the Leroy F. Green School Facilities Act (AB 2926), the project proponent will be required to pay developer fees prior to the issuance of building permits. The RUSD charges a Level 1 Residential Developer Fee in the amount of $3.48 per square foot to mitigate for students generated from new residential developments. This fee will help support provision of school services for the community as a whole. According to AB 2926, payment of developer fees constitutes adequate mitigation for any project-related impacts to school facilities. Impacts to the school facilities will be less than significant.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Parks?	☐	☐	☒	☐

14d. Response: ***(Source: General Plan 2025 Figure PR-1 – Parks, Open Spaces and Trails, Table PR-4 – Park and Recreation Facilities, Parks Master Plan 2003, GP 2025 FPEIR Table 5.14-A – Park and Recreation Facility Types, and Table 5.14-C – Park and Recreation Facilities Funded in the Riverside Renaissance Initiative)***

Less Than Significant Impact. Demand for park and recreational facilities are generally the direct result of residential development. The project will contribute a total of 115 new residents. The project will be providing open space amenities including a pool, an outdoor dining space, multi-use open space areas and a community garden. Don Jones Park, a 5.78-acre neighborhood park, is approximately 700 feet south of the site on the east side of Jefferson Street. Additional open space and sports fields are available at Jefferson Elementary School and Ramona High School. No substantial demand for park and recreation facilities will result. With implementation of General Plan 2025 policies, compliance with existing codes and standards, and through Park, Recreation and Community Services practices, there will be less than significant impacts on the demand for additional park facilities or services either directly, indirectly or cumulatively.

f. Other public facilities?	☐	☐	☒	☐

14e. Response: ***(Source: General Plan 2025 Figure LU-8 – Community Facilities, FPEIR Figure 5.13-5 - Library Facilities, Figure 5.13-6 - Community Centers, Table 5.3-F – Riverside Community Centers, Table 5.13-H – Riverside Public Library Service Standards)***

Less Than Significant Impact. The proposed project, 36-unit residential use, will result in a limited population growth; however, will not require expansion of any other public services such as libraries or hospitals. The closest public library to the project site is the Arlington Branch, located at 9556 Magnolia Avenue, Riverside which is approximately 2.6 miles southwest of the site. The project is not anticipated to impact the libraries in the community because an increase in the population of up to 115 people would represent less than one percent of the City's estimated 2016 population. No substantial demand for other services or facilities will result. Impacts will be less than significant.

15. RECREATION.				
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?	☐	☐	☒	☐

15a. Response: ***(Source: General Plan 2025 Figure PR-1 – Parks, Open Spaces and Trails, Table PR-4 – Park and Recreation Facilities, Figure CCM-6 – Master plan of Trails and Bikeways, Parks Master Plan 2003, FPEIR Table 5.14-A – Park and Recreation Facility Types, and Table 5.14-C – Park and Recreation Facilities Funded in the Riverside Renaissance Initiative, Table 5.14-D – Inventory of Existing Community Centers, Riverside Municipal Code Chapter 16.60 - Local Park Development Fees, Bicycle Master Plan May 2007)***

Less Than Significant Impact. Implementation of the proposed 36-residential dwelling unit project would result in an increase in population of approximately 115 persons based on a family of 3.2 persons. Therefore, the demand for recreation facilities will grow. The proposed project will construct open space amenities including a swimming pool, an outdoor dining space; common open space areas, community garden and children's play area. These recreational facilities are part of the entire proposed project. The recreational facilities are anticipated to have a less than significant impact on the environment. This project will incrementally increase the use of some types of

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

recreational facilities in the city of Riverside.

The developer must pay development impact fees for the City's parks based on the number of dwelling units in the subdivision. Because of the relatively small size of the project site (2.96 acres) and its location within an area surrounded with residential uses. The proposed project will provide some recreation open space within the development that has potential to offset impacts on City parks. Also, the developer will pay Quimby fees to reduce impacts addition resident will have on community parks. The Quimby Act of 1975 requires cities to pass ordinances requiring that developers set aside land, donate conservation easements, or pay fees for park improvements. Revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities. The City's recreation department offers programs that can be used by residents for a fee (the cost is dependent on the type of class/program and length of the class/program). Therefore, the project's impact on the City's park and recreation facilities and programs would be less than significant and no mitigation is required.

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?	☐	☐	☒	☐

15b. Response: ***(Source: Project Site Plans)***

Less Than Significant Impact. The proposed project is 36-unit residential development and does include outdoor recreational facilities including community garden, children's play area and pool. It does not necessitate expansion of existing outdoor recreational facilities. Therefore, there will be no adverse physical effect on the environment caused by expansion or construction of outdoor recreational facilities. Impacts would not be considered significant.

16. TRANSPORTATION/TRAFFIC. Would the project result in:				
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance 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?	☐	☐	☒	☐

16a. Response: ***(Source: General Plan 2025 Figure CCM-4 – Master Plan of Roadways, FPEIR Figure 5.15-4 – Volume to Capacity (V/C) Ratio and Level of Service (LOS) (Typical 2025), Table 5.15-D – Existing and Future Trip Generation Estimates, Table 5.15-H – Existing and Typical Density Scenario Intersection Levels of Service, Table 5.15-I – Conceptual General Plan Intersection Improvement Recommendations, Table 5.15-J – Current Status of Roadways Projected to Operate at LOS E or F in 2025, Appendix H – Circulation Element Traffic Study and Traffic Study Appendix, SCAG's RTP, and*** **Riverside County Transportation Commission (RCTC)*****, 2011 Riverside County Congestion Management Program,*** **December 14, 2011.)**

Less than Significant Impact. The project trip generation is based upon rates obtained from the Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012. The proposed project is forecast to generate approximately 343 daily vehicle trips, 27 trips of which will occur during the morning peak hour and 36 trips of which will occur during the evening peak hour. Roadway capacity is adequate to accommodate the projected traffic volumes, of the proposed project. As determined by the City Traffic Engineer, the proposed

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
project will operate at with an acceptable LOS. Therefore, the increase in traffic in relation to the existing traffic load and capacity of the street system is less than significant directly, indirectly or cumulatively.				
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?	☐	☐	☐	☒
16b. Response: ***(Source: General Plan 2025 Figure CCM-4 – Master Plan of Roadways, FPEIR Figure 5.15-4 – Volume to Capacity (V/C) Ratio and Level of Service (LOS) (Typical 2025), Table 5.15-D – Existing and Future Trip Generation Estimates, Table 5.15-H – Existing and Typical Density Scenario Intersection Levels of Service, Table 5.15-I – Conceptual General Plan Intersection Improvement Recommendations, Table 5.15-J – Current Status of Roadways Projected to Operate at LOS E or F in 2025, Table 5.15.-K – Freeway Analysis Proposed General Plan, Appendix H – Circulation Element Traffic Study and Traffic Study Appendix, SCAG's RTP, and RCTC's2011 Congestion Management Plan)*** **No Impact.** The project site does not include a state highway or principal arterial within Riverside County's Congestion Management Program (CMP) and the project is consistent with the Transportation Demand Management/Air Quality components of the Program; therefore, there is no impact either directly, indirectly or cumulatively to the CMP.				
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?	☐	☐	☐	☒

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

16c. Response: ***(Source: General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, RCALUCP and*** **County of Riverside Airport Land Use Commission *Staff Report* dated November 12, 2015.)**

No Impact. The proposed project is located in Zone D of RCALUCP for Riverside Municipal Airport and has been to the Airport Land Use Commission (ALUC) for review and approval. The ALUC has conditioned the project to ensure greater compatibility and safety with the Riverside Municipal Airport. Although it is located within an airport influence area, the ALUC found that Compatibility Zone D allows residential densities at or above 5.0 dwelling units per acre. The project proposes a total of 36 residential units on 2.96 acres for a density of 12.2 dwelling units per acre, which is consistent with the Zone D residential density criteria.

The project is located approximately 5,100 feet southeasterly of the southeasterly end of Runway 9-27 at Riverside Municipal Airport. The elevation of Runway 9-27 at its southeasterly terminus is 816 feet above mean sea level (AMSL). At the closest point of the site, structures with a top point elevation of 867 feet AMSL or greater would require notification to the Federal Aviation Administration (FAA) Obstruction Evaluation Service. Additionally, although the southerly end of Runway 16-34 is further from the site at approximately 8,540 feet, due to the substantially lower elevation of the southerly end of Runway 16-34 at 747.5 feet AMSL, this is analyzed as well. Based on the site distance and runway elevation, structures with a top point elevation of 832.9 feet AMSL or greater would require notification to the FAA Obstruction Evaluation Service. The project proposes a maximum pad elevation of 782.79 feet AMSL and a maximum building height of 29.5 feet for a maximum elevation of 812.29 feet AMSL. Therefore, review by the Federal Aviation Administration Obstruction Evaluation Service was not required for either Runway 9-27 or 16-34. Compliance with these conditions will ensure that the project will not change air traffic patterns, increase air traffic levels or change the location of air traffic patterns. As such, this project will have a no impact directly, indirectly or cumulatively on air traffic patterns.

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

16d. Response: ***(Source: Project Site Plans)***

No Impact. A significant impact would occur if the proposed project substantially increased an existing hazardous design feature or introduced incompatible uses to the existing traffic pattern. Access to the project site is proposed via a private road from Jefferson Street. The design of the proposed project would comply with all applicable City regulations. Furthermore, the proposed project does not involve changes in the alignment of Jefferson Street which is adjacent to the project site. Where the project site meets Jefferson Street, the roadway is at grade with the project site. No line of sight issues will occur due to undulations in the road. Sight distance at the project access shall comply with standard California Department of Transportation and City of Riverside 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 applicant will be constructing roadway improvements along Jefferson Street including landscaping and parkway improvements in conjunction with development, as necessary. The project design will be in accordance with City standards and, therefore, there will be no impact cause by hazardous design features.

e. Result in inadequate emergency access?	☐	☐	☒	☐

16e. Response: ***(Source: California Department of Transportation Highway Design Manual, Municipal Code, and Fire Code.)***

Less Than Significant Impact. A significant impact would occur if the design of the proposed project would not

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
satisfy emergency access requirements of the Riverside Fire Department or in any other way threaten the ability of emergency vehicles to access and serve the project site or adjacent uses. The proposed project would not result in inadequate emergency access. As discussed above, access to the project site is proposed via a private roadway off Jefferson Street. The drive aisles are of sufficient width to provide access to fire and emergency vehicles and are consistent with the California Fire Code. All access features are subject to and must satisfy the City of Riverside and Riverside Fire Department design requirements. This project would not result in adverse impacts with regard to 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)?	☐	☐	☐	☒
16f. Response: ***(Source: FPEIR, General Plan 2025 Land Use and Urban Design, Circulation and Community Mobility and Education Elements, Bicycle Master Plan, School Safety Program – Walk Safe! – Drive Safe!)*** **No Impact.** The project, as designed, does not create conflicts with adopted policies, plans or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks). The project will be providing sidewalks along the project frontage to allow for connections to nearby schools and parks. As such, the project will have no impact directly, indirectly or cumulatively on adopted policies, plans, or programs supporting alternative transportation.				
17. UTILITIES AND SYSTEM SERVICES. Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
17a. Response: ***(Source: General Plan 2025 Figure PF-2 – Sewer Facilities Map, FPEIR Figure 5.16-5 – Sewer Service Areas, Table 5.16-K - Estimated Future Wastewater Generation for the City of Riverside's Sewer Service Area, Figure 5.8-1 – Watersheds, Wastewater Integrated Master Plan and Certified EIR)*** **Less Than Significant Impact.** All new development is required to comply with all provisions of the NPDES program and the City's Municipal Separate Sewer Permit (MS4), as enforced by the Regional Water Quality Control Board (RWQCB). The proposed project could affect Regional Water Quality Control Board treatment standards by increasing wastewater production, which would require expansion of existing facilities or construction of new facilities. Exceeding the RWQCB treatment standards could result in contamination of surface or ground waters with pollutants such as pathogens and nitrates. The addition of 36 residential homes would typically generate 360 gallons per day per household. This is based on a rule of thumb of water usage minus 10-15 percent for landscape irrigation. For this project 10 percent was used assuming that drought tolerant landscaping would be used in the tract. At 360 gpd, the new development would generate approximately 12,960 gpd of wastewater. Wastewater conveyed from the site would undergo treatment in accordance with applicable regulations, including the requirements of the RWQCB. Therefore, the proposed project would not exceed applicable wastewater treatment requirements of the RWQCB with respect to discharges to the sewer system or stormwater system within the City. Because the proposed project is required to adhere to the above regulations related to wastewater treatment the project will have a less than significant impact.				
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	☐	☐	☒	☐

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
environmental effects?				

17b. Response: ***(Source: General Plan 2025 Table PF-1 – RPU PROJECTED DOMESTIC WATER Supply (AC-FT/YR), Table PF-2 – RPU Projected Water Demand, RPU, FPEIR Table 5.16-G – General Plan Projected Water Demand for RPU Including Water Reliability for 2025, Table 5.16-K - Estimated Future Wastewater Generation for the City of Riverside's Sewer Service Area, Figure 5.16-4 – Water Facilities and Figure 5.16-6 – Sewer Infrastructure and Wastewater Integrated Master Plan and Certified EIR.)***

Less Than Significant Impact. The City operates its own municipal water supply and distribution system, which provides water service to much of the city of Riverside, including the project site. Sections 10910-10915 of the State Water Code require the preparation of a water supply assessment (WSA) demonstrating sufficient water supplies for any subdivision that involves the construction of more than 500 dwelling units, or the equivalent thereof. As the project is below the established thresholds, no WSA is required. Water supply and demand is discussed in more detail below; demand associated with the proposed project would not necessitate expansion of existing water facilities or require new facilities. The project would not alter or impact any existing water treatment facilities, and would not substantially increase demand so as to require expansion of existing or new facilities.

There is an existing 12-inch sewer line in Jefferson Street to serve the project. A new 8-inch project water line will connect to an existing line at Willow Avenue southerly of the subject parcel. Connections to local water and sewer mains would involve temporary and less than significant construction impacts that would occur in conjunction with other on-site improvements. No additional improvements are anticipated to either sewer lines or treatment facilities to serve the proposed project. Standard connection fees will address any incremental impacts of the proposed project. Therefore, the project will result in less than significant impacts as a result of new or expanded water and wastewater treatment facilities.

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?	☐	☐	☒	☐

17c. Response: ***(Source: FPEIR Figure 5.16-2 - Drainage Facilities)***

Less Than Significant Impact. Potentially significant impacts could occur as a result of this project if storm water runoff was increased to a level that would require construction of new storm drainage facilities. As discussed in the Hydrology section, the proposed project would not generate substantially increased runoff from the site. The site will be constructing on-site storm drains with connections to the existing system. The increase in stormwater flow would not lead to requiring the construction of new facilities or expansion of existing storm drainage facilities; this level can be accommodated by existing storm drainage facilities.

The existing drainage condition/pattern is sheet flow across the site to Jefferson Street; this pattern will not be preserved. Instead, runoff will be collected and rerouted to an onsite infiltration basin with an overflow to Jefferson Street. The project incorporates site design, source controls and treatment control BMPs. While this site has relatively unfavorable infiltration rates, the addition of amended soil in the infiltration basin area is proposed. Infiltration/Percolation L/Os and other forms of natural drainage have been heavily incorporated into the design and are the sole source of storm water treatment for this site. In addition to the treatment control mentioned above, the applicant is proposing site design techniques and BMPs including minimizing urban runoff, minimizing the impervious footprint, and removing directly connected impervious areas. These techniques were obtained by maximizing permeable area, constructing to the minimum width and minimizing hardscape, whenever possible.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A NPDES permit will be required for the proposed project, which requires adoption of appropriate Stormwater Pollution Prevention Plan (SWPPP) and implementation of Best Management Practices (BMPs). The proposed project's storm drainage system would include treatment methods, such as vegetated swales, to ensure the storm water would be cleaned and retained onsite to a level equal to or greater than the NPDES mandates. Implementation of BMPs would reduce pollutants in stormwater and urban runoff from the project site. The proposed storm drainage system, in combination with the SWPPP and BMPs, must be designed to the satisfaction of the City's Public Works Director and in conformance with all applicable permits and regulations. The project applicant/developer would be required to provide all necessary on-site infrastructure. Impacts would be less than significant, and no mitigation beyond compliance with existing laws is required.				
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
17d. Response: ***(Source: FPEIR Figure 5.16-3 – Water Service Areas, Figure 5.16-4 – Water Facilities, Table 5.16-E – RPU Projected Domestic Water Supply (AC-FT/YR, Table 5.16-F – Projected Water Demand, Table 5.16-G – General Plan Projected Water Demand for RPU including Water Reliability for 2025, RPU Master Plan)***				
Less Than Significant Impact. The project, with 36 residential units, would use approximately 14,400 gallons per day (gpd), estimating 400 gpd per household, or 5,256,000 gallons per year. The proposed project would generate a marginal increase in additional demand for water, relative to overall existing citywide demand. As the Urban Water Management Plan anticipates an overall increase in demand associated with development in the area over 2010 conditions, and the water demand for this project is within that demand assumption, impacts would be less than significant. There are sufficient water supplies in the City to meet the project's estimated water demand. The project would not substantially deplete water supplies, and the project would have a less than significant impact on entitled water supplies. The project would be required to comply with Chapter 19.570 (Water Efficient Landscaping) of the City of Riverside Municipal Code, which would lessen the project's demand for water resources. Also, CBC Title 24 water efficiency measures require a demonstrated 20 percent reduction in the use of potable water. The project's landscaping plans include drought tolerant landscaping materials. Compliance with Title 24 and the City's Water Conservation in Landscaping and Water Efficient Landscaping Ordinances will reduce the proposed project's impacts to groundwater supplies to a level of less than significant.				
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?	☐	☐	☐	☒
17e. Response: ***(Source: FPEIR Figure 5.16-5 - Sewer Service Areas, Figure 5.16-6 -Sewer Infrastructure, Table 5.16-K - Estimated Future Wastewater Generation for the City of Riverside's Sewer Service Area, and Wastewater Integrated Master Plan and Certified EIR)***				
No Impact. The project will not exceed wastewater treatment requirements of (Regional Water Quality Control Board). The project is consistent with the General Plan 2025 Typical Growth Scenario where future wastewater generation was determined to be adequate (see Table 5.16-K of the General Plan 2025 Final PEIR). Further, the current Wastewater Treatment Master Plan anticipates and provides for this type of project. Therefore, no impact to wastewater treatment directly, indirectly or cumulatively will occur.				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐

17f. Response: ***(Source: FPEIR Table 5.16-A – Existing Landfills and Table 5.16-M – Estimated Future Solid Waste Generation from the Planning Area)***

Less Than Significant Impact. Significant impacts could occur if the proposed project will exceed the existing permitted landfill capacity or violates federal, state, and local statutes and regulations.

Solid waste generated during construction and post construction will be managed by the applicant's contractor. A waste management plan will be developed with the General Contractor and appropriate third party recycling vendor for the project so that 50 percent of construction wastes are recycled or salvaged. All non-hazardous solid waste collected is taken to the Robert A. Nelson Transfer Station, which is owned by the County of Riverside and operated under a 20-year franchise by a private company. Waste is then transferred to the Badlands Landfill for disposal. The 36 homes that would be built would have solid waste service provided. The USEPA has estimated that in the United States, a typical person will generate 4.4 pounds of solid waste per day. Using the average of 3.2 persons per household for the 36 new homes, approximately 507 pounds per day would be generated. The USEPA has also estimated that approximately 1.53 pounds of every 4.4 pounds generated are recycled. The remaining solid waste would go to the landfill. The City of Riverside is committed to meeting the goals of SB 939 with regard to meeting the State's goal of 50 percent diversion of solid waste from landfills. In order to meet this goal and also continue to accommodate additional population growth in the region, cities counties and waste managers must increase the amount of source reduction, recycling and composting that can be done. Therefore this impact would be less than significant and no mitigation is required

g. Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

17g. Response: ***(Source: California Integrated Waste Management Board 2002 Landfill Facility Compliance Study)***

No Impact. The California Integrated Waste Management Act under the Public Resource Code requires that local jurisdictions divert at least 50% of all solid waste generated by January 1, 2000. The City is currently achieving a 60% diversion rate, well above State requirements. In addition, the California Green Building Code requires all developments to divert 50% of non-hazardous construction and demolition debris for all projects and 100% of excavated soil and land clearing debris for all non-residential projects beginning January 1, 2011. The proposed project must comply with the City's waste disposal requirements as well as the California Green Building Code and as such would not conflict with any Federal, State, or local regulations related to solid waste. Therefore, no impacts related to solid waste statutes will occur directly, indirectly or cumulatively.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
18. MANDATORY FINDINGS OF SIGNIFICANCE.				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or an endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐

18a. Response: ***(Source: General Plan 2025 – Figure OS-6 – Stephen's Kangaroo Rat (SKR) Core Reserve and Other Habitat Conservation Plans (HCP), Figure OS-7 – MSHCP Cores and Linkages, Figure OS-8 – MSHCP Cell Areas, General Plan 2025 FPEIR Figure 5.4-2 – MSHCP Area Plans, Figure 5.4-4 - MSHCP Criteria Cells and Subunit Areas, Figure 5.4-6 – MSHCP Narrow Endemic Plant Species Survey Area, Figure 5.4-7 – MSHCP Criteria Area Species Survey Area, Figure 5.4-8 – MSHCP Burrowing Owl Survey Area, MSHCP Section 6.1.2 - Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools, Figure 5.5-1 - Archaeological Sensitivity, Figure 5.5-2 - Prehistoric Cultural Resources Sensitivity, Appendix D, Title 20 of the Riverside Municipal Code, and*** **JM Research and Consulting,** ***Cultural Resources Assessment for the Proposed Harris Farm Townhome Project 4105 Jefferson Street, Riverside, County of Riverside,*** **October 2015.)**

Less Than Significant. The proposed project would not substantially impact any scenic vistas, scenic resources, or the visual character of the area, and would not result in excessive light or glare. The project site is located within an urbanized area with no natural habitat. The project would not significantly impact any sensitive plants, plant communities, fish, wildlife or habitat for any sensitive species. The environmental analysis concludes that impacts related to emissions of criteria pollutants and other air quality impacts will be less than significant. Impacts related to climate change and hydrology and water quality will be less than significant. Based on the preceding analysis of potential impacts in the responses, no evidence is presented that this project would degrade the quality of the environment. The City hereby finds that impacts related to degradation of the environment, biological resources, and cultural resources will be less than significant.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐

18b. Response: ***(Source: FPEIR Section 6 – Long-Term Effects/ Cumulative Impacts for the General Plan 2025 Program)***

Less Than Significant. Cumulative impacts can result from the interactions of environmental changes resulting from one proposed project with changes resulting from other past, present, and future projects that affect the same resources, utilities and infrastructure systems, public services, transportation network elements, air basin, watershed, or other physical conditions. Such impacts could be short-term and temporary, usually consisting of overlapping construction impacts, as well as long term, due to the permanent land use changes involved in the project.

The proposed development will generally result in less than significant environmental impacts as discussed herein. Short-term impacts related to noise will be less than significant and therefore will not contribute substantially to any other concurrent construction programs that may be occurring in the vicinity. Short-term

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
impacts related to pollutant emissions will be less than significant and will not exceed maximum thresholds. The proposed project would not significantly cumulatively affect the environment. Water supplies have been studied in the Urban Water Management Plan, and the above cumulative projects are consistent with UWMP level of development assumptions. Continued efforts towards water conservation, as required by State law, would reduce water demands; the project would result in a less than significant cumulative impact on water supply and other resources. The proposed project would not result in any significant traffic impacts to traffic or transportation. Based on the CalEEMod runs, air quality could be affected in the short-term during construction, but long-term cumulative effects will have a less than significant impact on air quality. Adherence to all conditions recommended, the cumulative impacts can be mitigated to less than significant levels.				
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐
18c. Response: ***(Source: FPEIR Section 5 – Environmental Impact Analysis for the General Plan 2025 Program)*** **Less Than Significant.** Based on the analysis of the proposed project's impacts in the responses, there is no indication that this project could result in substantial adverse effects on human beings. While there would be a variety of temporary adverse effects during construction related to noise and criteria pollutant emission these would be minimized to acceptable levels through implementation of routine construction control measures. Long-term effects would include increased vehicular traffic, traffic-related noise, periodic on-site operational noise, minor changes to on-site drainage, and changing of the visual character of the site. Projected emission levels would be below the thresholds of significance recommended by the South Coast Air Quality Management District. Project-related traffic would represent a small percentage increase in traffic volumes along nearby roadways and would have a less-than-significant impact on roadway noise levels. Based on the analysis in this Initial Study, the City finds that direct and indirect impacts to human beings will be less than significant.				
Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21080(c), 21080.1, 21080.3, 21082.1, 21083, 21083.3, 21093, 21094, 21151, Public Resources Code; Sundstrom v. County of Mendocino, 202 Cal.App.3d 296 (1988); Leonoff v. Monterey Board of Supervisors, 222 Cal.App.3d 1337 (1990).				

Appendices:

Appendix A:	Tentative Map, Utility Plan, Site Plan and Landscape Plans
Appendix B:	Architectural Submittal
Appendix C:	Air Quality/Greenhouse Gas Emissions Data
Appendix D:	Geology/Hydrology Information including Preliminary Soils Investigation, Soil Infiltration Testing, and Preliminary Water Quality Management Plan
Appendix E:	Phase I Environmental Site Assessment
Appendix F:	Noise Impact Assessments
Appendix G:	Cultural Resource Assessment (under separate cover)

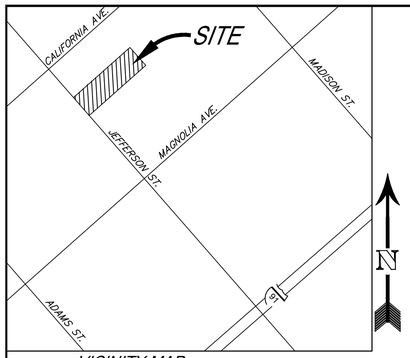
Appendix A

Tentative Map, Utility Plan, Site Plan and Landscape Plans

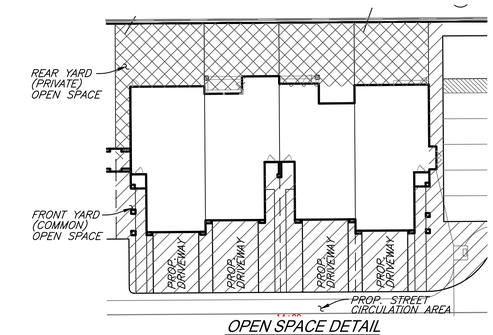
IN THE CITY RIVERSIDE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

TENTATIVE TRACT MAP NO. 36994
HARRIS FARM

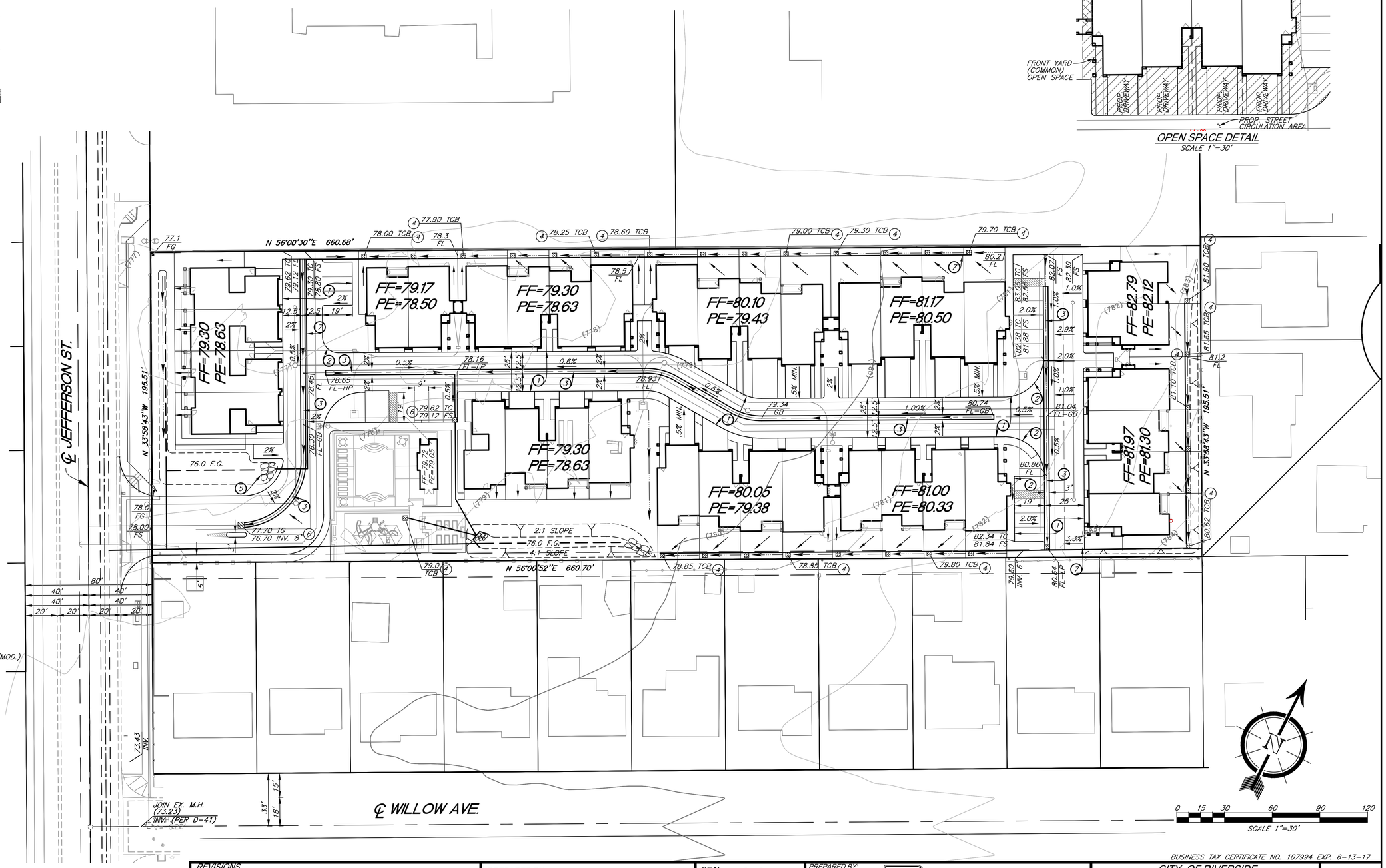
1 LOT CONDOMINIUM MAP - PAR 3 OF P.M. 13124
CITY OF RIVERSIDE, CA
SEPTEMBER 2016



VICINITY MAP
NOT TO SCALE
THOMAS GUIDE PAGE: 715 GRID: A7



OPEN SPACE DETAIL
SCALE 1"=30'



OWNER/APPLICANT

RC HOBBS COMPANY, INC.
1110 EAST CHAPMAN, STE. 201
ORANGE, CA 92866

ENGINEER

SDH & ASSOCIATES, INC
5225 CANYON CREST DRIVE 71439
RIVERSIDE, CA. 92507
VOICE: (951) 683-3691
FAX: (951) 788-2314

ASSESSOR'S PARCEL NO.

227-130-025

PROJECT INFO

AREA OF SITE = 129,062 S.F. (2.96 AC.)
NUMBER OF UNITS = 36
FOOTPRINT = 47,614 S.F.
STREETS = 29,206 S.F.
LANDSCAPE = 52,327 S.F.
NEW IMPERVIOUS AREA = 70,510 S.F.

GENERAL PLAN DESIGNATION

EXISTING – PUBLIC FACILITIES
PROPOSED – MEDIUM HIGH DENSITY RES.

ZONING

EXISTING – R-1-7000
PROPOSED – R-3-3000

SCHOOL DISTRICT

RIVERSIDE UNIFIED
SCHOOL DISTRICT

UTILITY PURVEYORS

WATER.....CITY OF RIVERSIDE
GAS.....SO. CALIF. GAS
ELECTRICAL.....CITY OF RIVERSIDE
TELEPHONE.....PACIFIC BELL
SEWER.....CITY OF RIVERSIDE
CABLE .....CHARTER COMM.

LEGAL DESCRIPTION

PARCEL 3 OF PARCEL MAP 13124
PMB 67/85

SOURCE OF TOPO

FIELD SURVEY BY RALSTON SURVEY
JULY 2015

CONSTRUCTION NOTES

1. CONSTRUCT 3" OVER 5" BASE PAVING
2. CONSTRUCT 6" CURB ONLY PER RIVERSIDE STD. 200 TYPE C2 (MOD.)
3. CONSTRUCT 3' WIDE RIBBON GUTTER
4. CONSTRUCT 6" YARD DRAIN
5. CONSTRUCT 6"–12" DIA RIP RAP PAD
6. CONSTRUCT 24" CATCH BASIN
7. STORM DRAIN
8. CONSTRUCT PCC SIDEWALK

LEGEND

T.B. – TOP OF BERM
F.G. – FINISHED GRADE
F.L. – FLOW LINE
H.P. – HIGH POINT
EXIST. – EXISTING
P.E. – PAD ELEVATION
G.B. – GRADE BREAK

TRACT BOUNDARY
CENTERLINE
CURB AND GUTTER
1280 EXISTING CONTOUR LINE
LOT LINE
SLOPE

SHEET INDEX

SHEET 1 – TENTATIVE TRACT MAP
SHEET 2 – UTILITY EXHIBIT
SHEET 3 – SITE PLAN

BUSINESS TAX CERTIFICATE NO. 107994 EXP. 6-13-17

REVISIONS

MARK	DESCRIPTION	BY	APPR	DATE

DESIGNED BY: S.J.S. DRAWN BY: S.J.S.
CHECKED BY: R.V.Z. PROJECT MANAGER: S.S.

PREPARED BY: DATE:

ROBERT C. VAN ZANTEN
R.C.E. NO.: 62325 EXP. 9-30-17

SEAL: REGISTERED PROFESSIONAL ENGINEER ROBERT C. VAN ZANTEN No. 62325 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

PREPARED BY:

SDH & ASSOCIATES INCORPORATED
SDH AND ASSOCIATES INC.
5225 CANYON CREST DRIVE 71439
Riverside, California 92507
TEL: (951) 683-3691 FAX (951) 788-2314

SCALE: 1"=30'
DATE: SEPTEMBER 2016

BENCHMARK

CITY OF RIVERSIDE

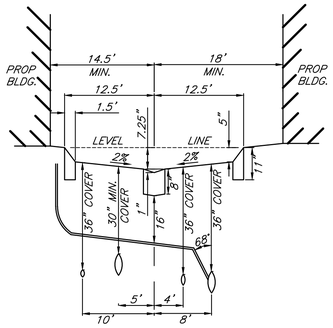
TTM 36994
HARRIS FARM

1 OF 3 SHEETS

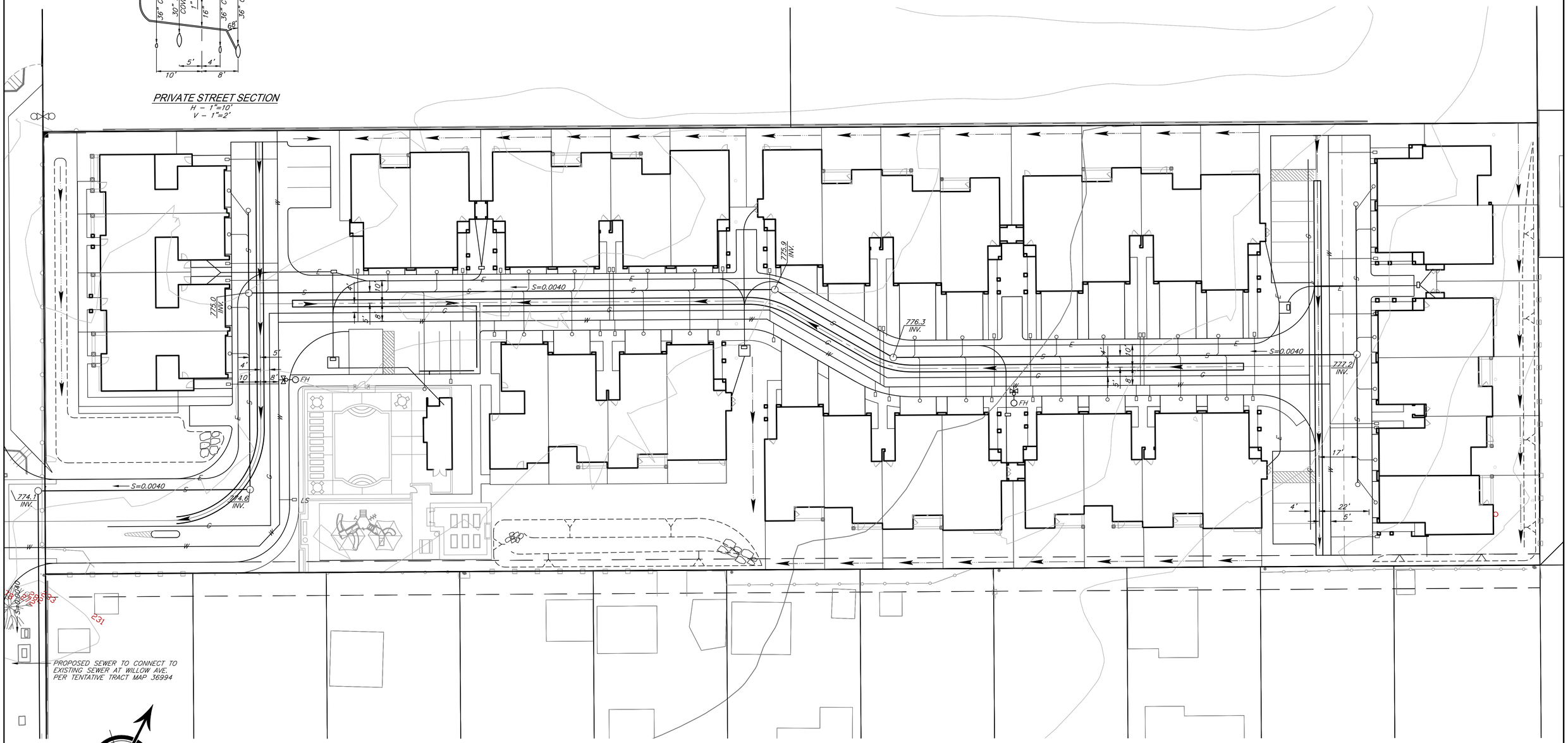
IN THE CITY RIVERSIDE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

UTILITY EXHIBIT
HARRIS FARM

1 LOT CONDOMINIUM MAP - PAR 3 OF P.M. 13124
CITY OF RIVERSIDE, CA
AUGUST 2016



PRIVATE STREET SECTION
H - 1"=10'
V - 1"=2'



LEGEND

SEWER MAIN	S
WATER MAIN	W
GAS LINE	G
ELECTRICAL	E
MANHOLE	○
CLEANOUT	○

0 10 20 40 60 80
SCALE 1"=20'

REVISIONS

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Riverside, California 92507
TEL: (951) 683-3691 FAX (951) 788-2314

SCALE: 1"=20'
DATE: AUGUST 2016

BENCHMARK

BUSINESS TAX CERTIFICATE NO. 107994 EXP. 6-13-17

CITY OF RIVERSIDE

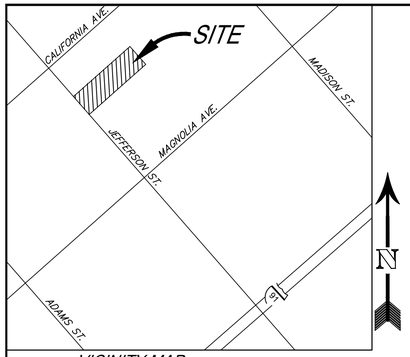
UTILITY EXHIBIT
HARRIS FARM

2 OF 3 SHEETS

IN THE CITY RIVERSIDE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

SITE PLAN
HARRIS FARM

1 LOT CONDOMINIUM MAP - PAR 3 OF P.M. 13124
CITY OF RIVERSIDE, CA
AUGUST 2016



VICINITY MAP
NOT TO SCALE
THOMAS GUIDE PAGE: 715 GRID: A7

OWNER/APPLICANT
RC HOBBS COMPANY, INC.
1110 EAST CHAPMAN, STE. 201
ORANGE, CA 92866

ENGINEER
SDH & ASSOCIATES, INC
5225 CANYON CREST DRIVE 71439
RIVERSIDE, CA. 92507
VOICE: (951) 683-3691
FAX: (951) 788-2314

ASSESSOR'S PARCEL NO.
227-130-025

PROJECT INFO
AREA OF SITE = 129,062 S.F. (2.96 AC.)
NUMBER OF UNITS = 36
FOOTPRINT = 47,614 S.F.
STREETS = 29,206 S.F.
LANDSCAPE = 52,327 S.F.
NEW IMPERVIOUS AREA = 70,510 S.F.
DENSITY OF UNITS = 12.2 D.U./ AC.

ZONING
EXISTING – R-1-7000
PROPOSED – R-3-3000

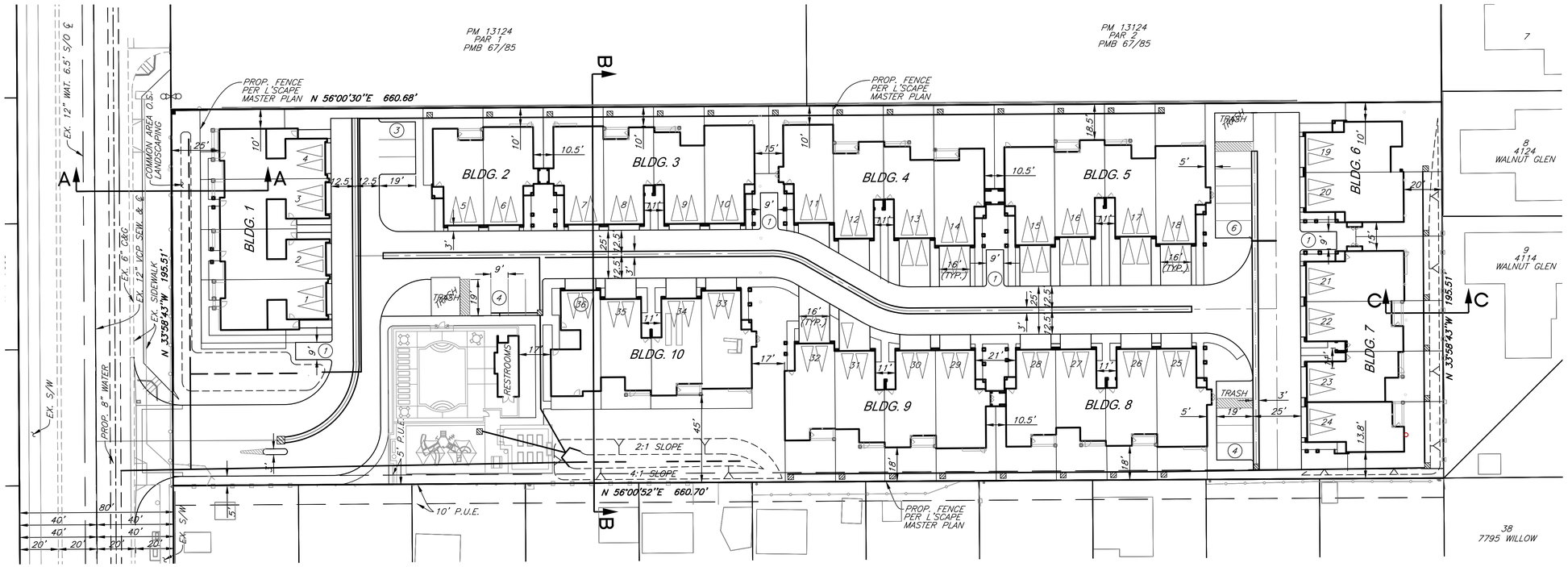
LEGAL DESCRIPTION
PARCEL 3 OF PARCEL MAP 13124
PMB 67/85

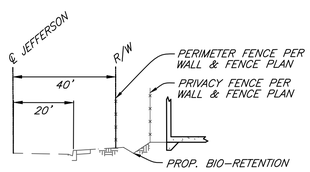
PARKING TABULATION

PARKING	REQUIRED	PROPOSED
COVERED	54	72
OPEN	18	36
TOTAL	72	108

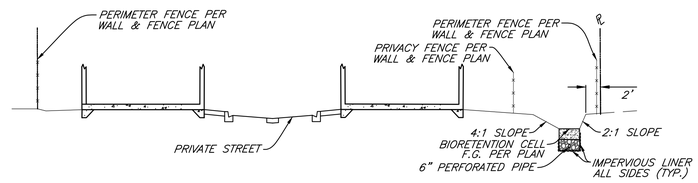
UNIT MATRIX

UNIT #	BLDG #	PLAN	BEDROOMS	PRIVATE O.S.	COMMON O.S.
1	1	4	3	272 S.F.	671 S.F.
2	1	4	3	150 S.F.	671 S.F.
3	1	4	3	159 S.F.	671 S.F.
4	1	4	3	134 S.F.	671 S.F.
5	2	2	3	561 S.F.	671 S.F.
6	2	3	4	428 S.F.	671 S.F.
7	3	3	4	425 S.F.	671 S.F.
8	3	2	3	356 S.F.	671 S.F.
9	3	1	3	435 S.F.	671 S.F.
10	3	3	4	522 S.F.	671 S.F.
11	4	3	4	508 S.F.	671 S.F.
12	4	2	3	570 S.F.	671 S.F.
13	4	1	3	464 S.F.	671 S.F.
14	4	2	3	906 S.F.	671 S.F.
15	5	3	4	801 S.F.	671 S.F.
16	5	2	3	567 S.F.	671 S.F.
17	5	1	3	650 S.F.	671 S.F.
18	5	3	4	570 S.F.	671 S.F.
19	6	2	3	1,118 S.F.	671 S.F.
20	6	3	4	848 S.F.	671 S.F.
21	7	3	4	847 S.F.	671 S.F.
22	7	2	3	619 S.F.	671 S.F.
23	7	1	3	697 S.F.	671 S.F.
24	7	2	3	1,304 S.F.	671 S.F.
25	8	3	4	446 S.F.	671 S.F.
26	8	2	3	545 S.F.	671 S.F.
27	8	1	3	626 S.F.	671 S.F.
28	8	2	3	746 S.F.	671 S.F.
29	9	3	4	645 S.F.	671 S.F.
30	9	2	3	553 S.F.	671 S.F.
31	9	1	3	609 S.F.	671 S.F.
32	9	2	3	646 S.F.	671 S.F.
33	10	3	4	268 S.F.	671 S.F.
34	10	2	3	264 S.F.	671 S.F.
35	10	1	3	336 S.F.	671 S.F.
36	10	4	3	203 S.F.	671 S.F.

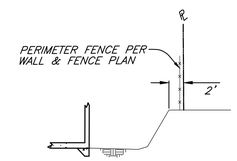




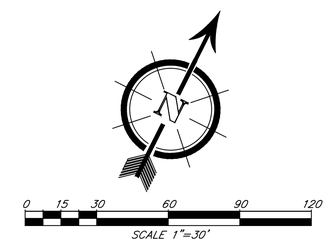
SECTION A-A
N.T.S.



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.



LEGEND
- TRACT BOUNDARY
- CENTERLINE
- CURB & GUTTER
- 1280 EX. CONTOUR LINE
- LOT LINE
- SLOPE

BUSINESS TAX CERTIFICATE NO. 107994 EXP. 6-13-17

REVISIONS

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TEL: (951) 683-3691 FAX (951) 788-2314

SCALE: 1" =30'
DATE: AUGUST 2016
BENCHMARK

CITY OF RIVERSIDE

SITE PLAN
HARRIS FARM

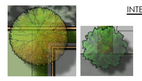
3 OF 3 SHEETS

PLANT PALETTE

BOTANICAL NAME	COMMON NAME	SPACING	SIZE	WATER USE
STREET TREES				
MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	40' O.C.	24" BOX	MEDIUM

ENTRY ACCENT TREE				
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	AS SHOWN	36" BOX	MEDIUM

ACCENT PALMS				
SYAGRUS ROMANZOFFIANUM	QUEEN PALM	AS SHOWN	12' B.T.H.	MEDIUM
WASHINGTONIA FILIFERA	CALIFORNIA FAN PALM	AS SHOWN	12' B.T.H.	LOW



INTERIOR STREET TREES				
MAGNOLIA "ST. MARY'S"	SOUTHERN MAGNOLIA	AS SHOWN	24" BOX	MEDIUM
PYRUS "CHANTICLEER"	CHANTICLEER PEAR	AS SHOWN	24" BOX	MEDIUM

COLUMNAR TREES				
PRUNUS CAROLINIANA	CAROLINA LAUREL CHERRY	AS SHOWN	15 GALLON	MEDIUM
LAURUS NOBILIS	BAY LAUREL	AS SHOWN	15 GALLON	MEDIUM

LANDSCAPE TREES				
CALLISTEMON VIMINALIS	WEEPING BOTTLEBRUSH	AS SHOWN	15 GALLON (MIN.)	MEDIUM
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	AS SHOWN	15 GALLON (MIN.)	MEDIUM
TRISTANIA CONFERTA	BRISBANE BOX	AS SHOWN	15 GALLON (MIN.)	MEDIUM

ACCENT TREES				
LAGERSTROEMIA INDICA	CRAPE MYRTLE	AS SHOWN	24" BOX	MEDIUM
PRUNUS C. "KRAUTER VESUVIUS"	PURPLE LEAF PLUM	AS SHOWN	24" BOX	MEDIUM

SHRUBS AND PERENNIALS				
AGAPANTHUS AFRICANUS	LILY-OF-THE-NILE	2' O.C.	1 GALLON	MEDIUM
ANIGOZANTHOS FLAVIDUS	KANGAROO PAW	2' O.C.	1 GALLON	MEDIUM
BULBINE FRUTESCENS	BULBINE	2' O.C.	1 GALLON	LOW
BUXUS JAPONICA	JAPANESE BOXWOOD	3' O.C.	5 GALLON	MEDIUM
CISTUS PURPUREUS	ROCKROSE	4' O.C.	5 GALLON	LOW
CALLISTEMON "LITTLE JOHN"	DWARF BOTTLE BRUSH	3' O.C.	5 GALLON	LOW
DIETES VEGETA	FORTNIGHT LILY	3' O.C.	5 GALLON	MEDIUM
ELAEGNUS PUNGENS	SILVERBERRY	4' O.C.	5 GALLON	LOW
HEMEROCALLIS HYBRID	DAYLILY	2' O.C.	1 GALLON	MEDIUM
HETEROMELES ARBUTIFOLIA	TOYON	4' O.C.	5 GALLON	LOW
LEUCOPHYLLUM F. 'GREEN CLOUD'	TEXAS RANGER	4' O.C.	5 GALLON	LOW
LIGUSTRUM TEXANUM	TEXAS PRIVET	4' O.C.	5 GALLON	MEDIUM
NANDINA "HARBOUR DWARF"	DWARF HEAVENLY BAMBOO	3' O.C.	5 GALLON	MEDIUM
PITTOSPORUM "VARIEGATA"	VARIEGATED MOCK ORANGE	4' O.C.	5 GALLON	MEDIUM
RHAPHIOLEPIS INDICA	INDIA HAWTHORN	4' O.C.	5 GALLON	MEDIUM
ROSA SPECIES	SHRUB ROSE	3' O.C.	5 GALLON	MEDIUM
ROSMARINUS "TUSCAN BLUE"	UPRIGHT ROSEMARY	3' O.C.	5 GALLON	LOW
SALVIA LEUCANTHA	MEXICAN SAGE	4' O.C.	5 GALLON	LOW
XYLOSMA CONGESTUM	SHINY LEAF XYLOSMA	4' O.C.	5 GALLON	MEDIUM
VINES				
CLYTOSTOMA CALLISTEGIGODES	VIOLET TRUMPET VINE	ON WALLS AND FENCES -	5 GALLON	MEDIUM
DISTICTUS BUCCINATORIA	BLOOD RED TRUMPET VINE	APPROX. 15' O.C.	5 GALLON	MEDIUM
PARTHENOCISSUS TRICUSPIDATA	BOSTON IVY		5 GALLON	MEDIUM

GROUNDCOVERS				
BACCHARIS P. 'PIGEON POINT'	DWARF COYOTE BRUSH	1 GALLON	3' O.C.	LOW
MYOPORUM 'PINK'	PINK MYOPORUM	FLATS	12" O.C.	MEDIUM
ROSMARINUS O. 'PROSTRATUS'	PROSTRATE ROSEMARY	FLATS	12" O.C.	LOW
ROSA 'FLOWER CARPET VARIETIES'	GROUNDCOVER ROSE	1 GALLON	2' O.C.	MEDIUM

ORNAMENTAL GRASSES				
HELICTOTRICHON SEMPERVIRENS	BLUE OAT GRASS	1 GALLON	2' O.C.	LOW
MUHLENBERGIA CAPILLARIS	PINK MUHLY	1 GALLON	2' O.C.	MEDIUM
MUHLENBERGIA RIGENS	DEER GRASS	1 GALLON	2' O.C.	LOW
PENNISETUM "LITTLE BUNNY"	DWARF FOUNTAIN GRASS	1 GALLON	2' O.C.	MEDIUM
PENNISETUM RUBRUM	RED FOUNTAIN GRASS	1 GALLON	2' O.C.	MEDIUM

BASIN				
CAREX PANSA	CALIF. MEADOW SEDGE	12" O.C.	LINERS	MEDIUM

NOTES:

1) PERMANENT AUTOMATIC IRRIGATION SYSTEMS SHALL BE INSTALLED ON ALL LANDSCAPED AREAS REQUIRING IRRIGATION. LOW WATER USE SYSTEMS SHALL BE IMPLEMENTED. IRRIGATION SYSTEM SHALL BE DESIGNED TO PREVENT OVER SPRAY ONTO WALKWAYS, PARKING AREAS, BUILDINGS AND FENCES.

2) ALL TREES SHALL BE MINIMUM DOUBLE-STAKED, WEAKER AND/OR SLOW-GROWING TREES SHALL BE STEEL-STAKED.

3) SLOPE BANKS FIVE FEET OR GREATER IN VERTICAL HEIGHT WITH SLOPES GREATER THAN OR EQUAL TO 3:1 TO BE LANDSCAPED AT A MINIMUM WITH AN APPROPRIATE GROUND COVER, ONE 15-GALLON OR LARGER SIZE TREE PER 600 SQUARE FEET OF SLOPE AREA, AND ONE 1-GALLON OR LARGER SHRUB FOR EACH 100 SQUARE FEET OF SLOPE AREA. SLOPE BANKS IN EXCESS OF EIGHT FEET IN VERTICAL HEIGHT WITH SLOPES GREATER OR EQUAL TO 2:1 SHALL ALSO BE PROVIDED WITH ONE 5-GALLON OR LARGER TREE PER 1,000 SQUARE FEET OF SLOPE AREA IN ADDITION TO THE ABOVE REQUIREMENTS.

4) ALL LANDSCAPE AREAS SHALL RECEIVE 3" DEPTH SHREDDED BARK MULCH

5) ALL UTILITIES SHALL BE SCREENED WITH APPROPRIATE PLANT MATERIAL

6) ALL PARKWAYS, LANDSCAPING, FENCING AND ON-SITE LIGHTING SHALL BE MAINTAINED BY THE PROPERTY OWNER.

7) ALL IRRIGATED AREAS TO HAVE MOISTURE SENSORS INSTALLED TO ENSURE PLANT MATERIAL SURVIVAL.

A COMBINATION OF TREES, SHRUBS, AND GROUND COVER SHALL BE INCORPORATED INTO LANDSCAPING PLANS. MINIMUM SIZES ARE AS FOLLOWS:
- TREES: 24-INCH BOX (15 GALLON SIZE ACCEPTABLE FOR SLOPES).
- SHRUBS: 5-GALLON, AND
- SHRUBS: 1-GALLON (PLANTED DENSELY TO ACHIEVE 100 PERCENT COVERAGE IN ONE YEAR).

8) DRIP SYSTEMS SHOULD BE USED IN ALL AREAS EXCEPT TURF IRRIGATION AND SMALL ORNAMENTAL PLANTING.

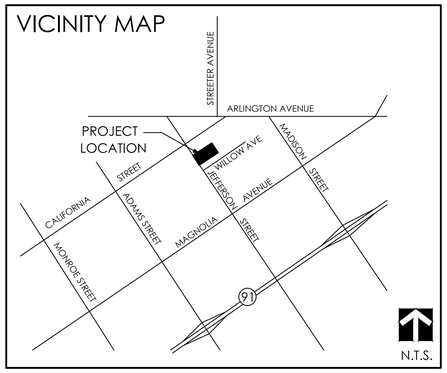
9) NATIVE AND DROUGHT TOLERANT PLANTS WILL BE INCORPORATED WHEREVER POSSIBLE.

10) THE APPLICANT INSURES THAT MATURE PLANTINGS WILL NOT INTERFERE WITH UTILITIES, ADJACENT SITE, EXISTING STRUCTURES AND TRAFFIC SIGHT LINES.

11) TREES SHALL BE PLANTED A MINIMUM OF 5' FROM EDGE OF DRIVEWAY, WATER METER, GAS METER OR SEWER LATERAL AND A MINIMUM OF 10' FROM UTILITY POLES AND FIRE HYDRANTS

NOTE:
SEE SHEET L-2 FOR REC. AREA ENLARGEMENT
SEE SHEET L-2 FOR FRONT YARD TYPICALS EXHIBIT
SEE SHEET L-3 FOR WALL AND FENCE LAYOUT
SEE SHEET L-3 FOR MAINTENANCE EXHIBIT

VICINITY MAP



L-1

LANDSCAPE MASTER PLAN

LANDSCAPE MASTER PLAN FOR:

HARRIS FARM

R.C. HOBBS COMPANY

0 20' 40' 80'

Scale: 1" = 20'

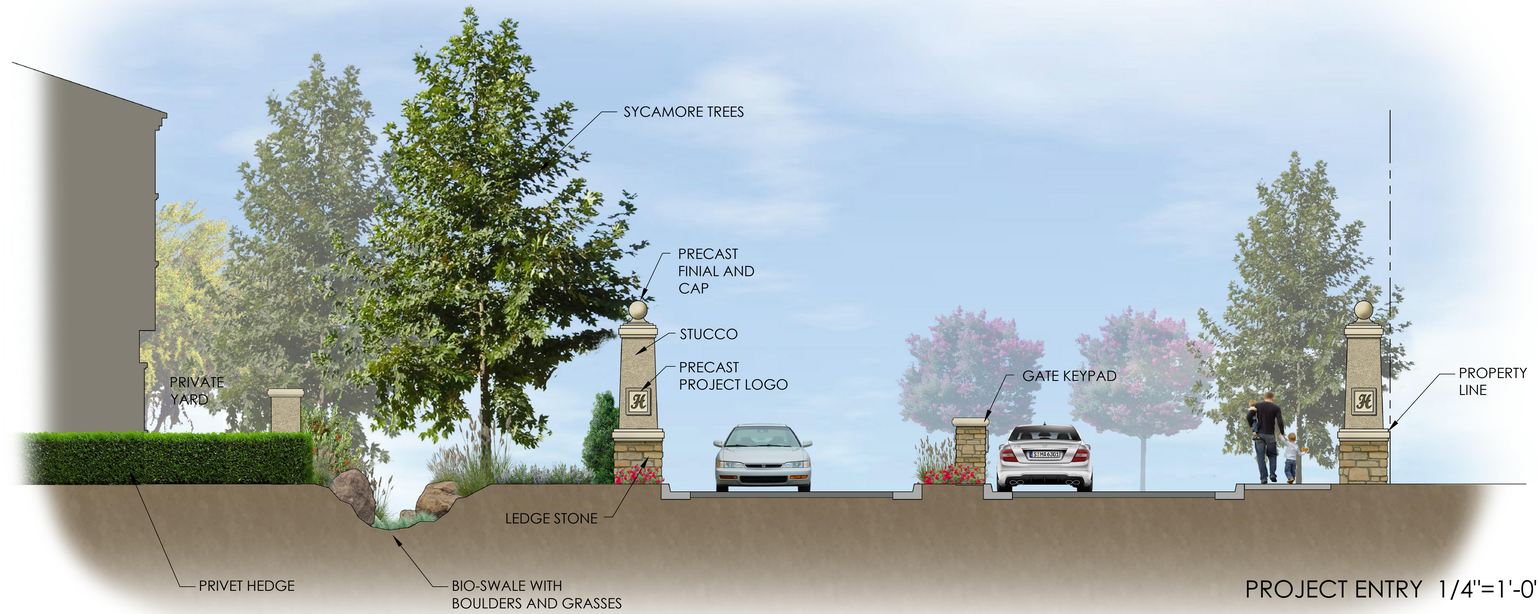
NORTH

RIVERSIDE, CALIFORNIA

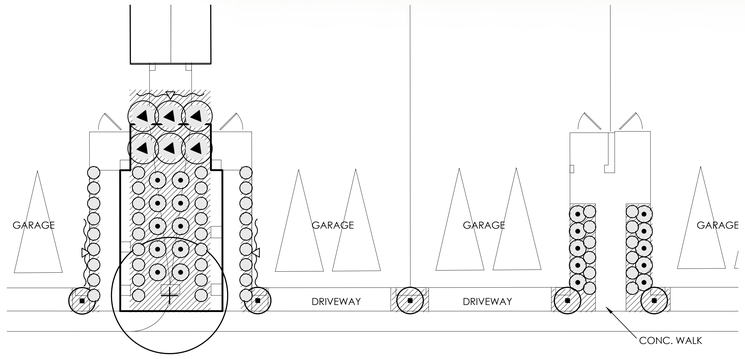
David NEAULT ASSOCIATES Inc.
951 | 296 | 3430
www.dnaassociates.com

09.21.16

RECREATION AREA 1/8"=1'-0"



PROJECT ENTRY 1/4"=1'-0"



FRONT YARD TYPICAL 1/8"=1'-0"

PLANT PALETTE - FRONT YARD TYPICAL

	BOTANICAL NAME	COMMON NAME	QUANTITY	SIZE	WATER USE
FRONT YARD TREES					
	PRUNUS CAROLINIANA LAURUS NOBILIS	CAROLINA LAUREL CHERRY BAY LAUREL	1 PER LOT	15 GALLON	MED LOW
	MAGNOLIA "ST. MARY'S" PYRUS "CHANTICLEER"	SOUTHERN MAGNOLIA CHANTICLEER PEAR	1 PER LOT OR (AS SPACE ALLOWS)	24" BOX	MED MED
SHRUBS					
	ELAEAGNUS PUNGENS RHAPHIOLEPIS "MAJESTIC BEAUTY"	SILVERBERRY INDIA HAWTHORN	4-6	5 GALLON	LOW MED
	DIETES VEGETA NANDINA "HARBOUR DWARF"	FORTNIGHT LILY DWARF HEAVENLY BAMBOO	6-10	5 GALLON 5 GALLON	MED MED
	AGAPANTHUS "GETTY WHITE" BULBINE FRUTESCENS	DWARF LILY OF THE NILE BULBINE	12-20	1 GALLON 1 GALLON	MED LOW
VINES					
	BIGNONIA CHERERE ERIOBOTRYA DEFLEXA	HAPPY WANDERER BRONZE LOQUAT	1-3	5 GALLON 5 GALLON	MED MED
GROUNDCOVERS					
	MYOPORUM "PUTAH CREEK" TRACHELOSPERMUM JASMINOIDES	MYOPORUM STAR JASMINE	AS NEEDED	FLATS @ 12" O.C.	MED MED

NOTES:

1) PERMANENT AUTOMATIC IRRIGATION SYSTEMS SHALL BE INSTALLED ON ALL LANDSCAPED AREAS REQUIRING IRRIGATION. LOW WATER USE SYSTEMS SHALL BE IMPLEMENTED. IRRIGATION SYSTEM SHALL BE DESIGNED TO PREVENT OVER SPRAY ONTO WALKWAYS, PARKING AREAS, BUILDINGS AND FENCES.

2) ALL TREES SHALL BE MINIMUM DOUBLE-STAKED. WEAKER AND/OR SLOW-GROWING TREES SHALL BE STEEL-STAKED.

3) ALL LANDSCAPE AREAS SHALL RECEIVE 3" DEPTH SHREDDED BARK MULCH

5) ALL UTILITIES SHALL BE SCREENED WITH APPROPRIATE PLANT MATERIAL

6) ALL PARKWAYS, LANDSCAPING, FENCING AND ON-SITE LIGHTING SHALL BE MAINTAINED BY THE PROPERTY OWNER.

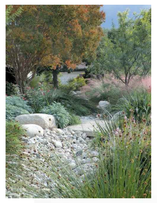
7) ALL IRRIGATED AREAS TO HAVE MOISTURE SENSORS INSTALLED TO ENSURE PLANT MATERIAL SURVIVAL.

8) DRIP SYSTEMS SHOULD BE USED IN ALL AREAS EXCEPT TURF.

9) THE APPLICANT INSURES THAT MATURE PLANTINGS WILL NOT INTERFERE WITH UTILITIES, ADJACENT SITE, EXISTING STRUCTURES AND TRAFFIC SIGHT LINES.

10) TREES AND SHRUBS SHALL BE PLACED A MINIMUM OF 5' FROM EDGE OF DRIVEWAY, WATER METER OR GAS METER AND SEWER LATERALS, A MINIMUM OF 10' FROM UTILITY POLES, AND A MINIMUM OF 8' FROM FIRE HYDRANTS.

PLAYGROUND EQUIPMENT



BIO-SWALE WITH BOULDERS AND GRASSES

CALIFORNIA FAN PALM

PRECAST FINIAL CAP

STUCCO

LEDGE STONE

CALIFORNIA SYCAMORE

LANDSCAPE MASTER PLAN FOR:

HARRIS FARM

R.C. HOBBS COMPANY

L-2

REC AREA ENLARGEMENT / FRONT YARD TYPICALS

RIVERSIDE, CALIFORNIA

David NEAULT ASSOCIATES Inc.
951 | 296 | 3430
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09.21.16

FENCE & WALL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	6' PERIMETER WALL - SPLIT FACE BLOCK - TAN	A
	5'-6" HIGH INTERIOR VINYL FENCE/GATES - WHITE	C/D
	5'-6" HIGH TUBE STEEL FENCE/GATES - BLACK	B
	MASONRY PILASTER - SPLIT FACE BLOCK - TAN	A

Riverside Municipal Code Section 19.570 Water Efficient Landscaping and Irrigation
Water Use Calculations
Harris Farm

These calculations comply with the required 50% water savings effective 6/1/2015

1 Maximum Annual Water Allowance (MAWA)

INPUT the total square footage of landscape = 26,364 S.F.
INPUT the Hist. ETo for the area = 56.4

MAWA = **61,624** cu ft / yr

2 Estimated Annual Water Use (EAWU)

Hydrozone # 1 **INPUT** Plant Factor = 0.8
INPUT square footage of hydrozone = 625
INPUT hydrozone irrigation efficiency = 0.71 *Spray - Turf*
EAWU = 3,292 cu ft / yr

Hydrozone # 2 0
INPUT square footage of hydrozone = 0
INPUT hydrozone irrigation efficiency = 1 *Mulch*
EAWU = 0 cu ft / yr

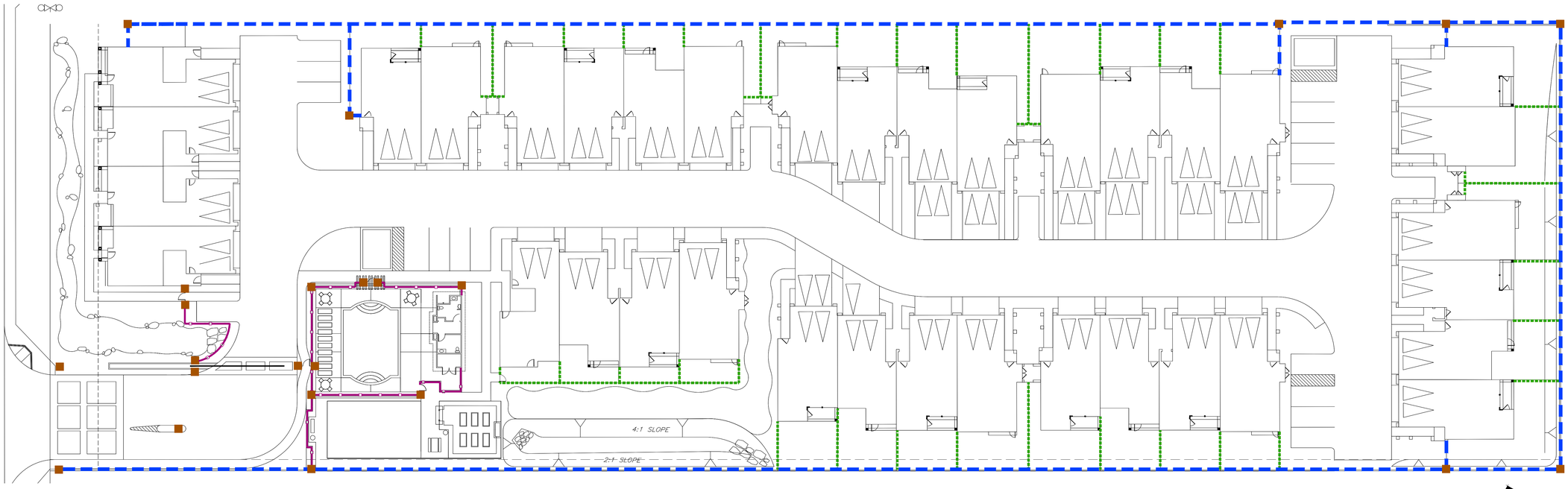
Hydrozone # 3 **INPUT** Plant Factor = 0.8
INPUT square footage of hydrozone = 0
INPUT hydrozone irrigation efficiency = 0.9 *drip turf*
EAWU = 0 cu ft / yr

Hydrozone # 4 **INPUT** Plant Factor = 0.4
INPUT square footage of hydrozone = 20,311
INPUT hydrozone irrigation efficiency = 0.9 *(drip)*
EAWU = 42,201 cu ft / yr

Hydrozone # 5 **INPUT** Plant Factor = 0.2
INPUT square footage of hydrozone = 5,428
INPUT hydrozone irrigation efficiency = 0.9 *(drip)*
EAWU = 5,639 cu ft / yr

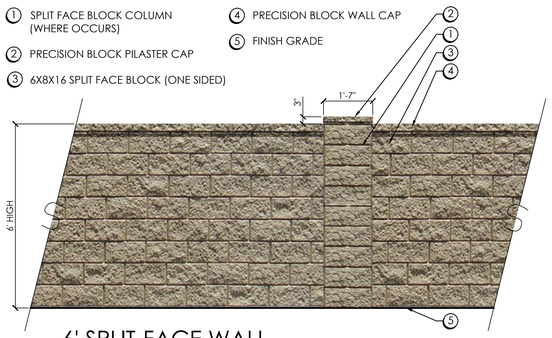
SubTotal EAWU = 51,132 cu ft / yr
Input Irrigation System Operation Factor 0.85
Total EAWU = **60,155**
MAWA - EAWU = **1,469** cu ft / yr
(this number must be positive)

PERCENTAGE OF WATER SAVED RELATIVE TO MAX. ALLOWED = 2%

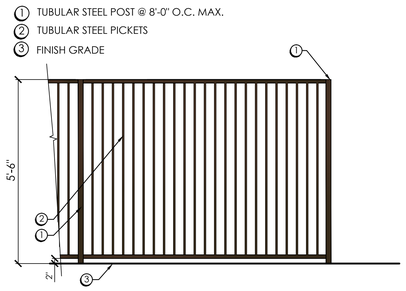


WALL AND FENCE PLAN

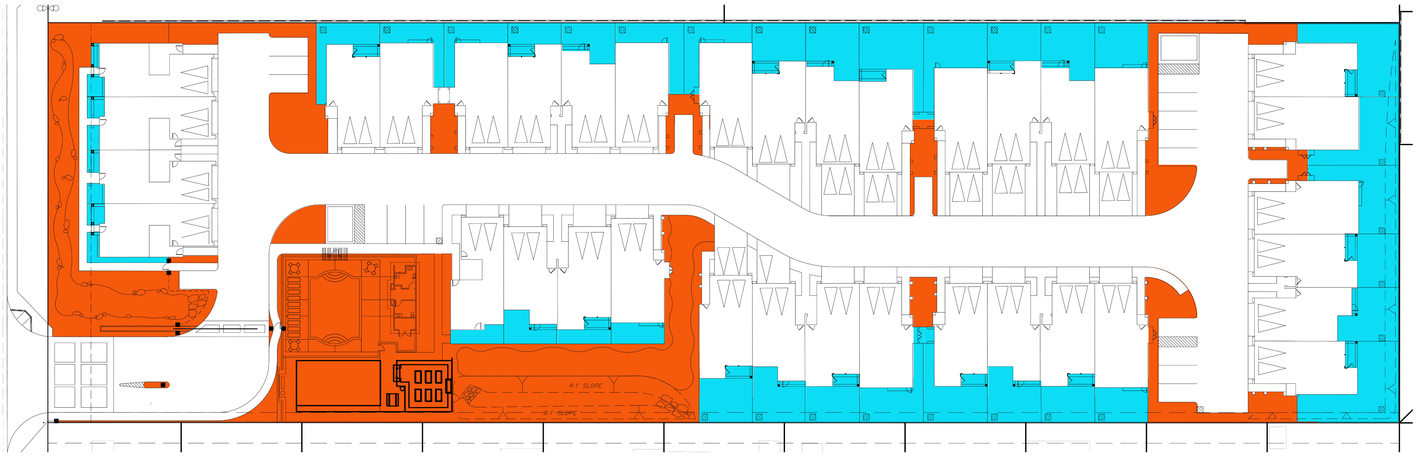
0 20' 40' 80'
Scale: 1" = 20'
NORTH



A 6' SPLIT-FACE WALL
1/2"=1'-0"



B 5'-6" TUBE STEEL FENCE
1/2"=1'-0"



MAINTENANCE AND OPEN SPACE EXHIBIT

0 30' 60' 120'
Scale: 1" = 30'
NORTH

MAINTENANCE LEGEND

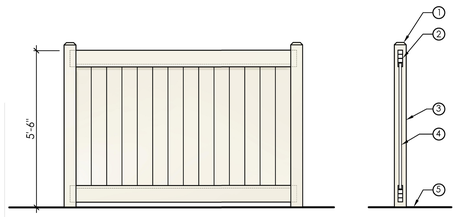
SYMBOL	DESCRIPTION
	PRIVATELY MAINTAINED
	HOMEOWNER ASSOCIATION MAINTAINED

OPEN SPACE LEGEND

PER OPEN SPACE CODE 19.100.070

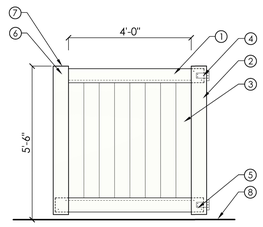
- TOTAL UNITS - 36
- TOTAL PRIVATE OPEN SPACE REQUIRED - 7,200 S.F. (200 S.F. / UNIT)
- TOTAL COMMON OPEN SPACE REQUIRED - 18,000 S.F. (500 S.F. / UNIT)

SYMBOL	DESCRIPTION
	PRIVATE OPEN SPACE REQUIRED: 7,200 S.F. PROVIDED: 19,897 S.F. (553 S.F. / UNIT) MINIMUM LOT SIZE - 260 S.F.
	COMMON OPEN SPACE REQUIRED: 18, 000 S.F. PROVIDED: 24,171 S.F. (671 S.F. / UNIT)



1 DOMED CAP
2 2" X 7" TOP & BOTTOM RAILS
3 5" X 5" VINYL POST
4 6" TONGUE & GROOVE
5 FINISH GRADE

C 5'-6" VINYL FENCE
1/2"=1'-0"



1 1-1/2" x 5-1/2" PVC TOP AND BOTTOM RAILS
2 2" X 6" VINYL UPRIGHT
3 1" X 6" T&G PVC BOARD
4 T-HINGE TOP AND BOTTOM
5 RIVETED ROUTED JOINT CONNECTION
6 LATCH
7 PLASTIC PLUG
8 FINISH GRADE

D 5'-6" VINYL GATE
1/2"=1'-0"

L-3
WALL AND FENCE PLAN / MAINTENANCE EXHIBIT

LANDSCAPE MASTER PLAN FOR:
HARRIS FARM
R.C. HOBBS COMPANY

RIVERSIDE, CALIFORNIA

David NEAULT ASSOCIATES Inc.
951 | 296 | 3430
www.dnassociates.com
09.21.16

Appendix B

Architectural Submittal

HARRIS FARM

A PROPOSED NEW TOWNHOME COMMUNITY

R.C. HOBBS CO.

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

INDEX

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A1.4 PLAN 4 - FLOOR PLANS
A1.5 BUILDING 1 - TYPE A FLOOR & ROOF PLANS
A1.6 BUILDING 1 - TYPE A EXTERIOR ELEVATIONS
A1.7 BUILDING 2 - TYPE B FLOOR PLANS & EXTERIOR ELEVATIONS
A1.8 BUILDING 3 - TYPE C FLOOR & ROOF PLANS
A1.9 BUILDING 3 - TYPE C EXTERIOR ELEVATIONS
A1.10 BUILDING 4 - TYPE D FLOOR & ROOF PLANS
A1.11 BUILDING 4 - TYPE D EXTERIOR ELEVATIONS
A1.12 BUILDING 5 - TYPE C - SIMILAR FLOOR & ROOF PLANS
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A1.16 POOL BATH BUILDING

HARRIS FARM
R.C. HOBBS CO.

COVER SHEET AND INDEX

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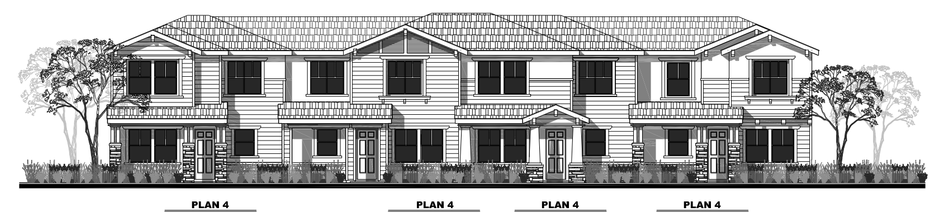
A0.0

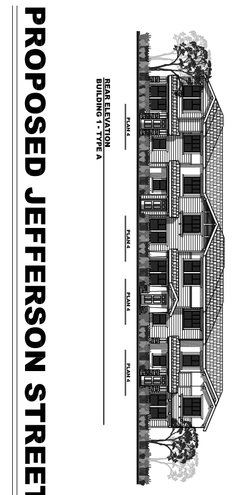
Of



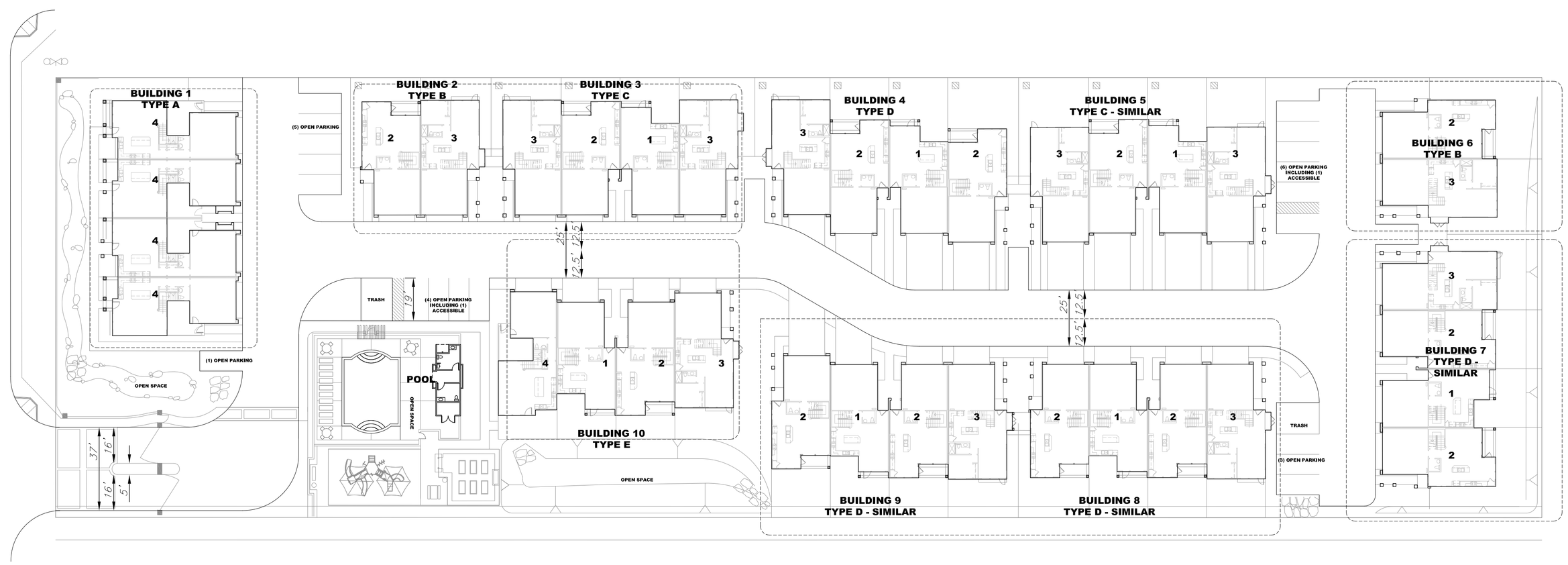
REAR ELEVATION
BUILDING 1 - TYPE A

PROPOSED JEFFERSON STREET VIEW

SCALE: 1/8"=1'-0"



PROPOSED JEFFERSON STREET VIEW



ARCHITECTURAL SITE PLAN

SCALE: 1/32"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

SITE PLAN
PROPOSED STREET VIEW

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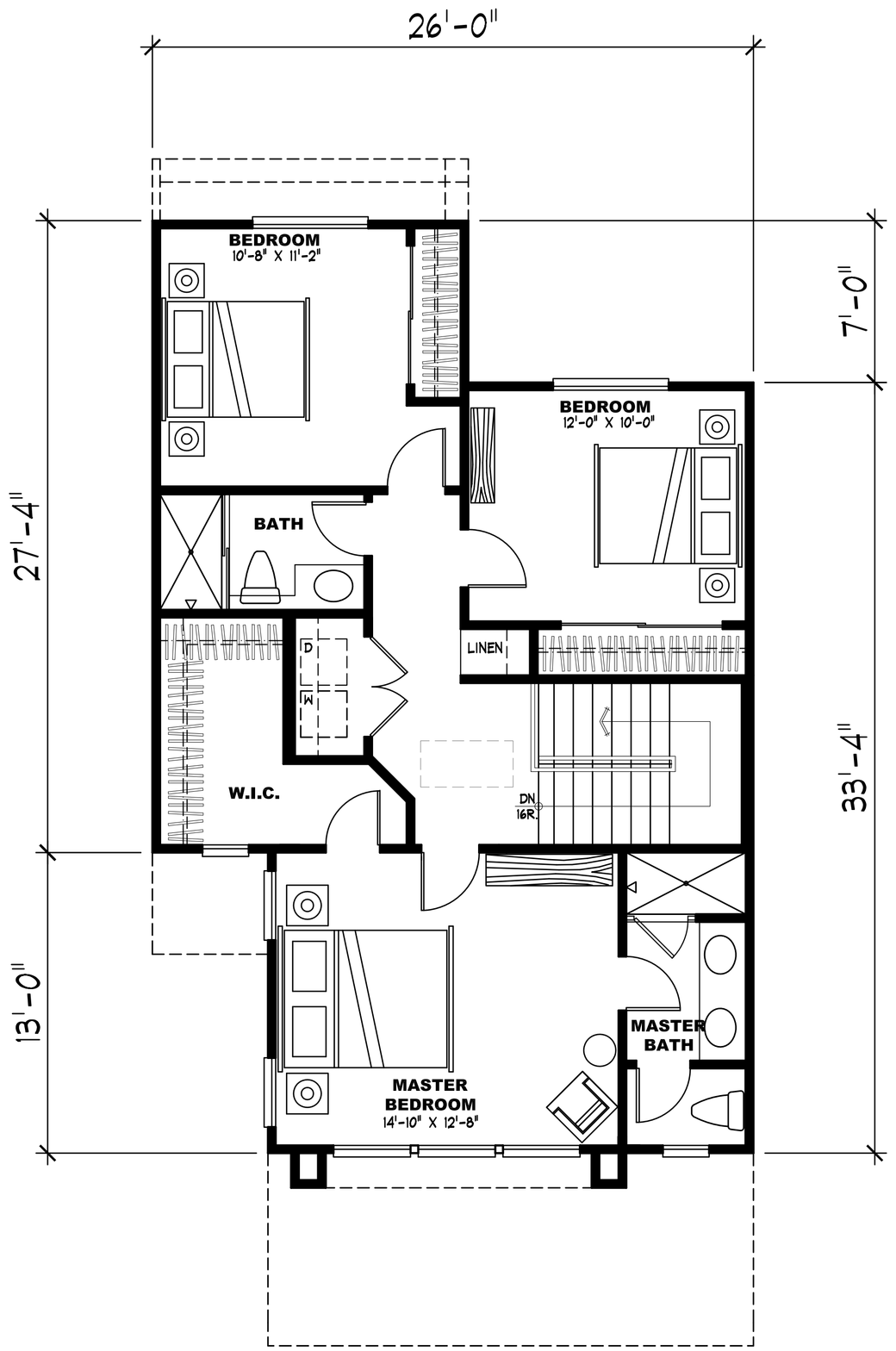
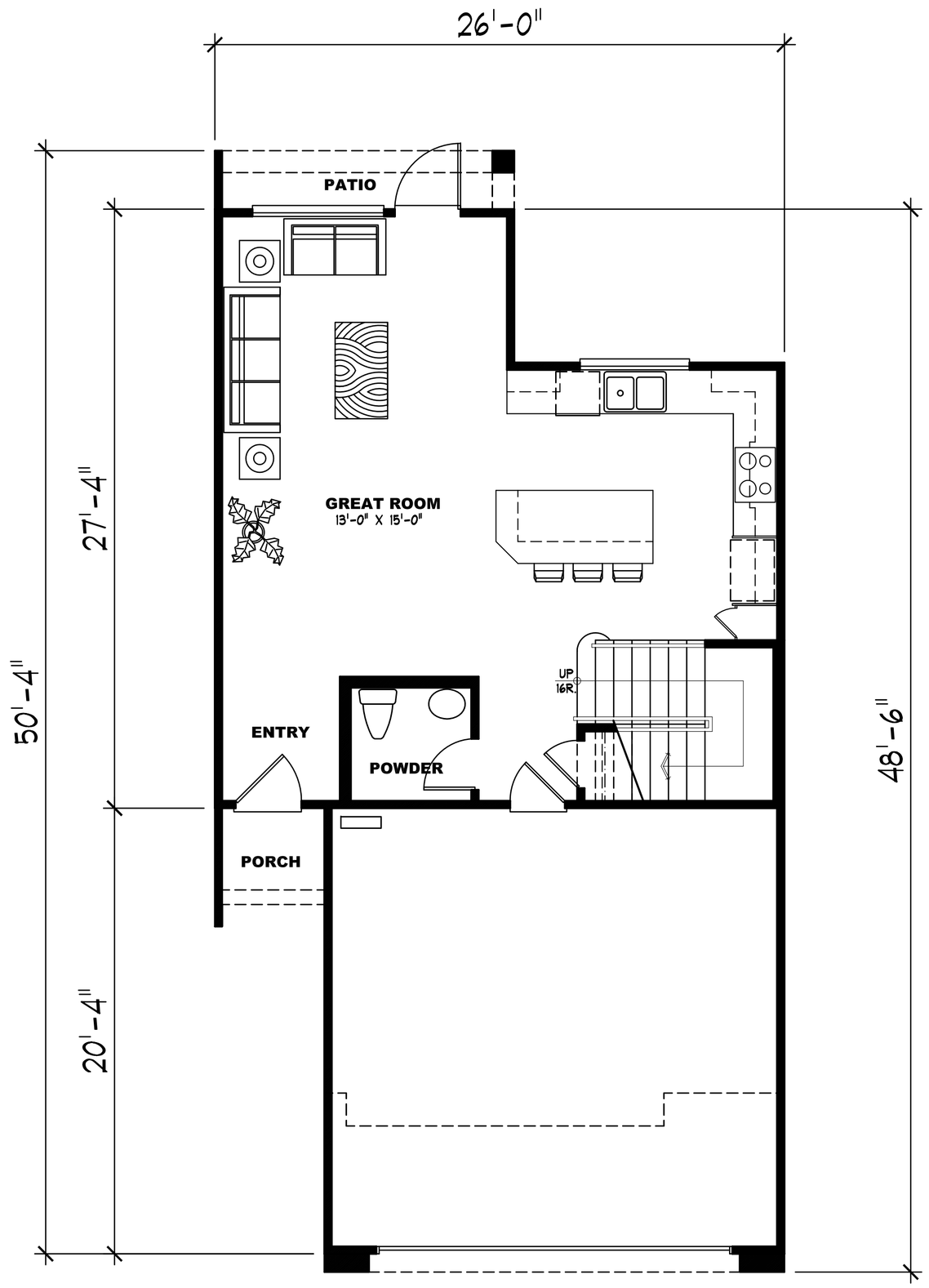


SECOND FLOOR PLAN



FIRST FLOOR PLAN

SQUARE FOOTAGE

FIRST FLOOR	624	SQ. FT.
SECOND FLOOR	832	SQ. FT.
TOTAL	1,456	SQ. FT.

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

PLAN 1
FLOOR PLANS

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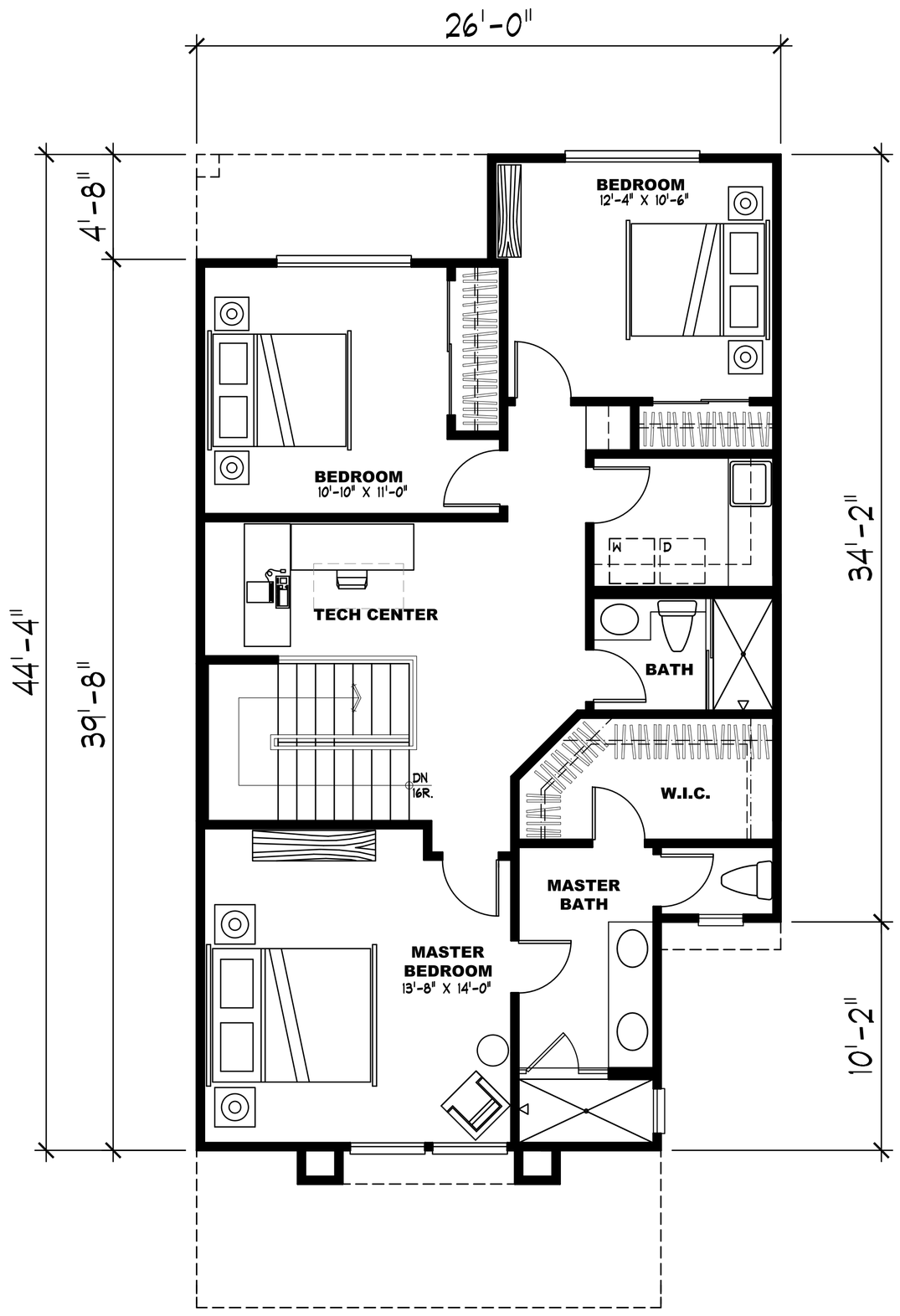

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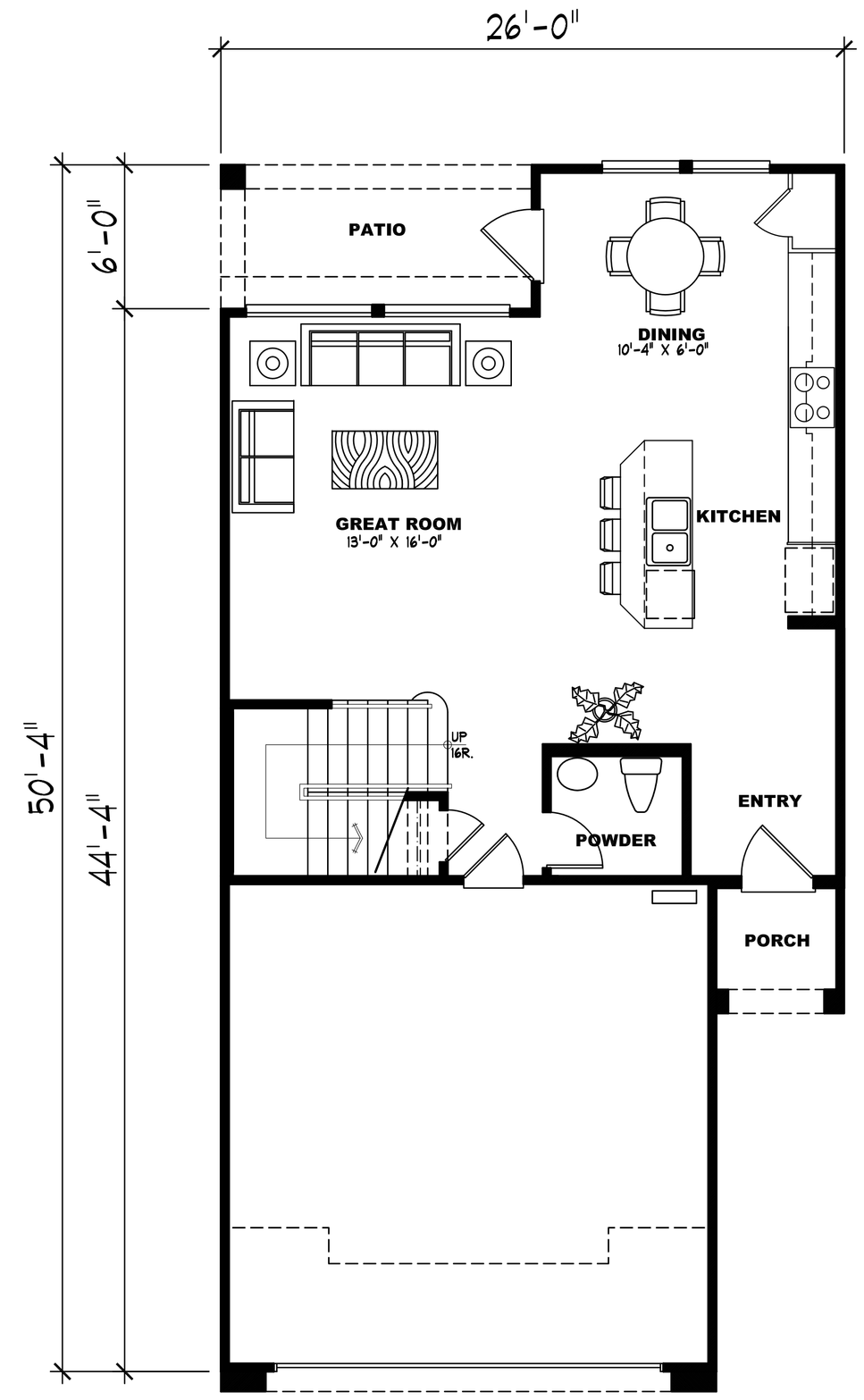

FIRST FLOOR PLAN

SQUARE FOOTAGE

FIRST FLOOR	703	SQ. FT.
SECOND FLOOR	971	SQ. FT.
TOTAL	1,674	SQ. FT.

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

PLAN 2
FLOOR PLANS

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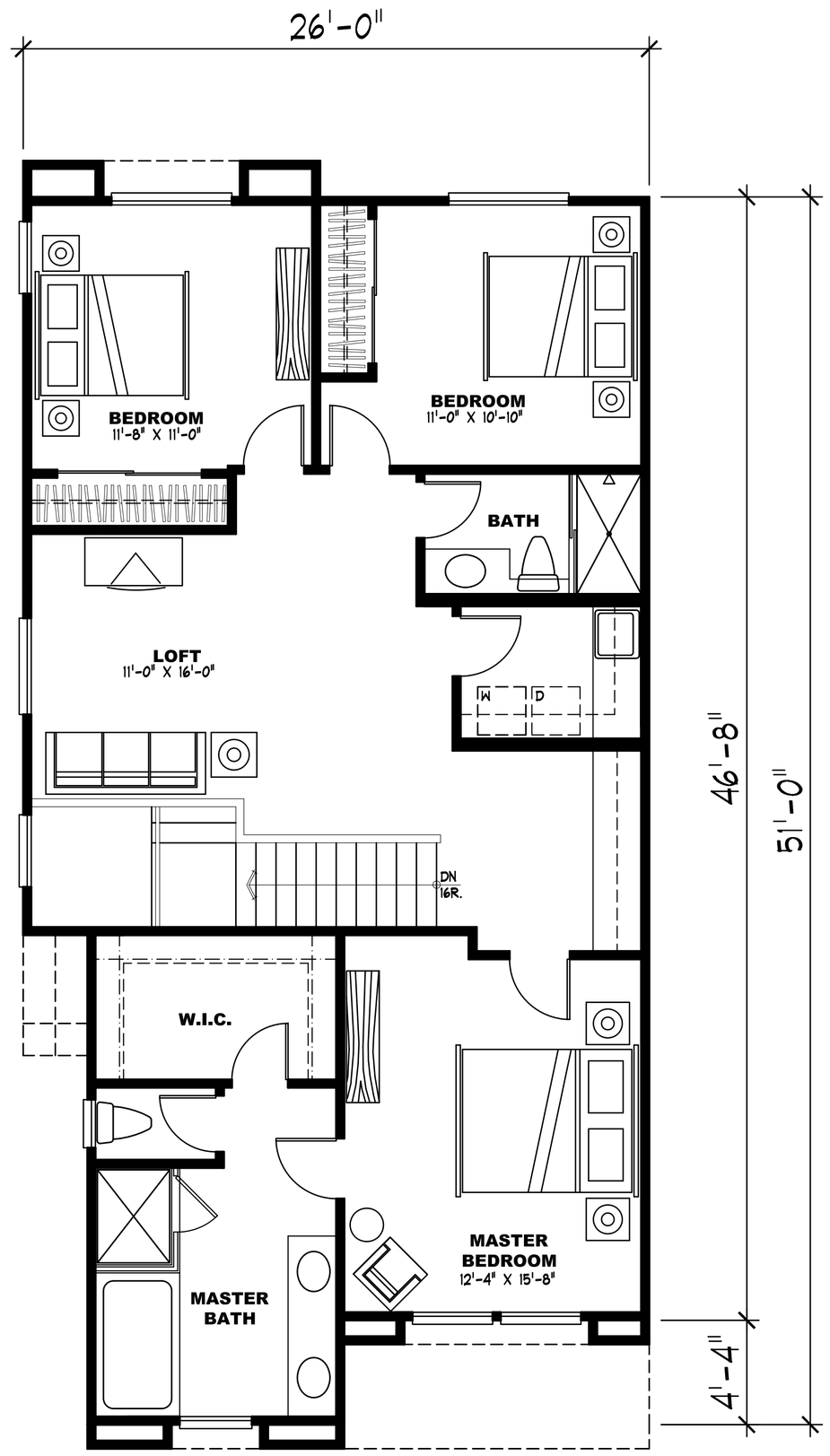
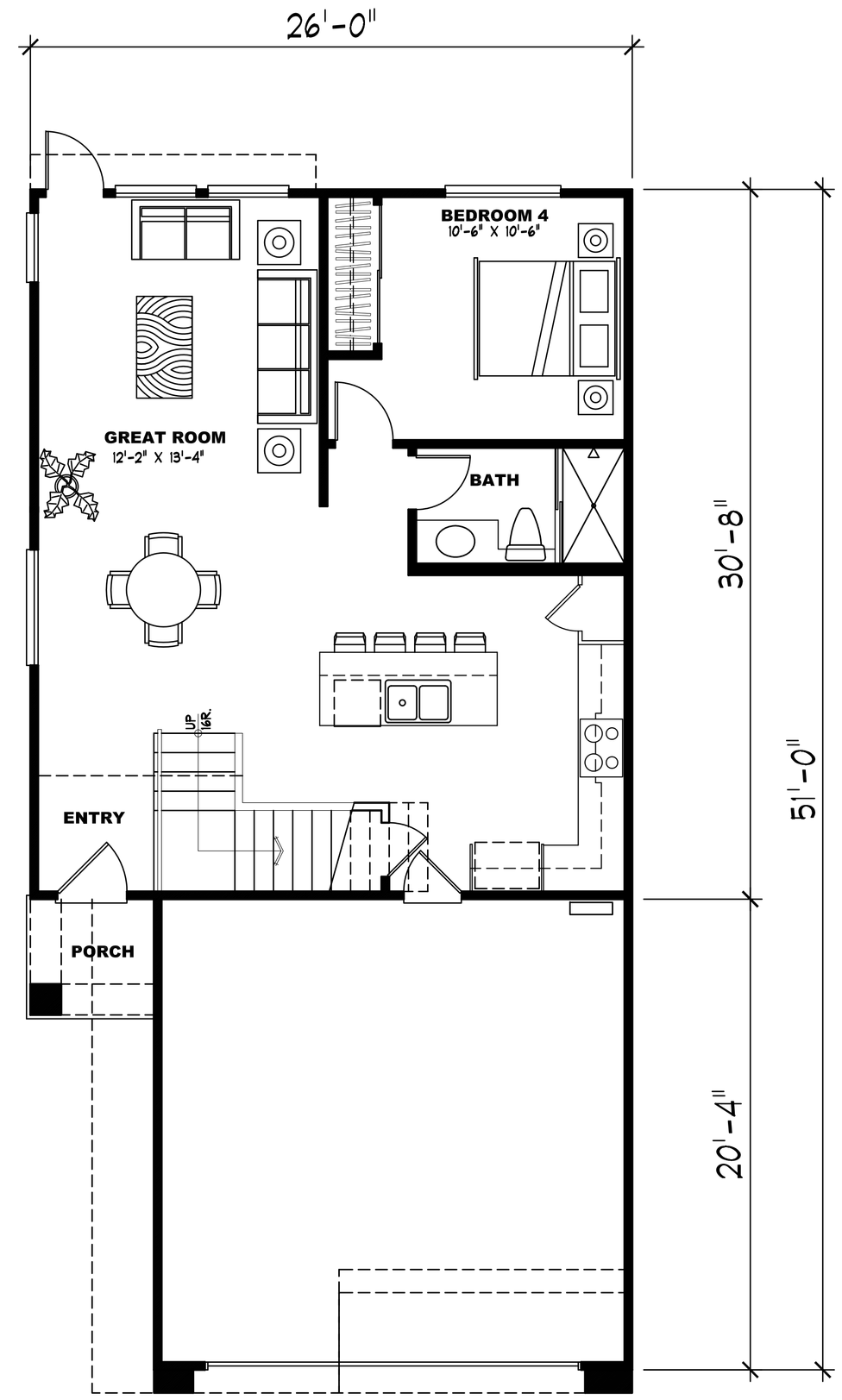


SECOND FLOOR PLAN



FIRST FLOOR PLAN

SQUARE FOOTAGE

FIRST FLOOR	797	SQ. FT.
SECOND FLOOR	1,142	SQ. FT.
TOTAL	1,939	SQ. FT.

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

PLAN 3
FLOOR PLANS

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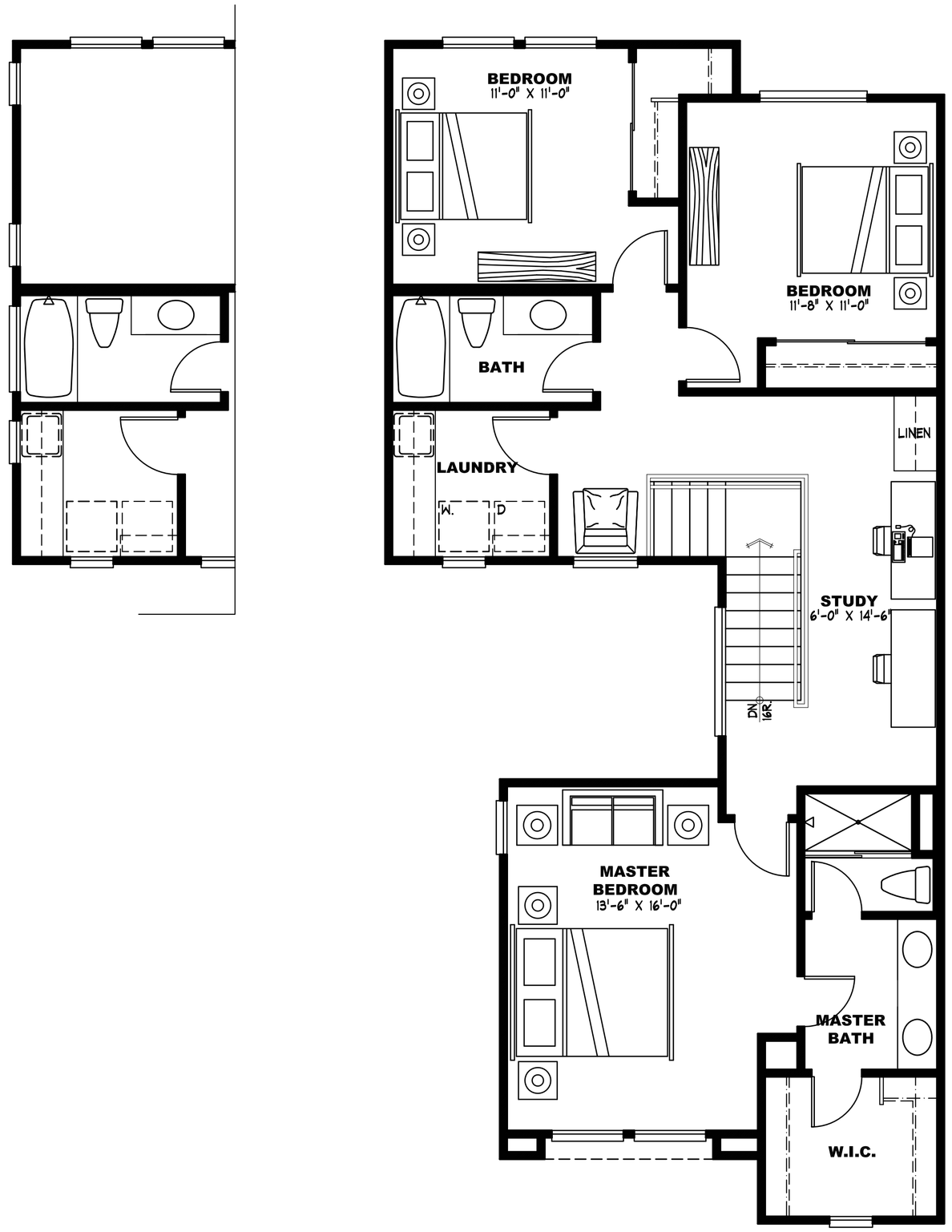
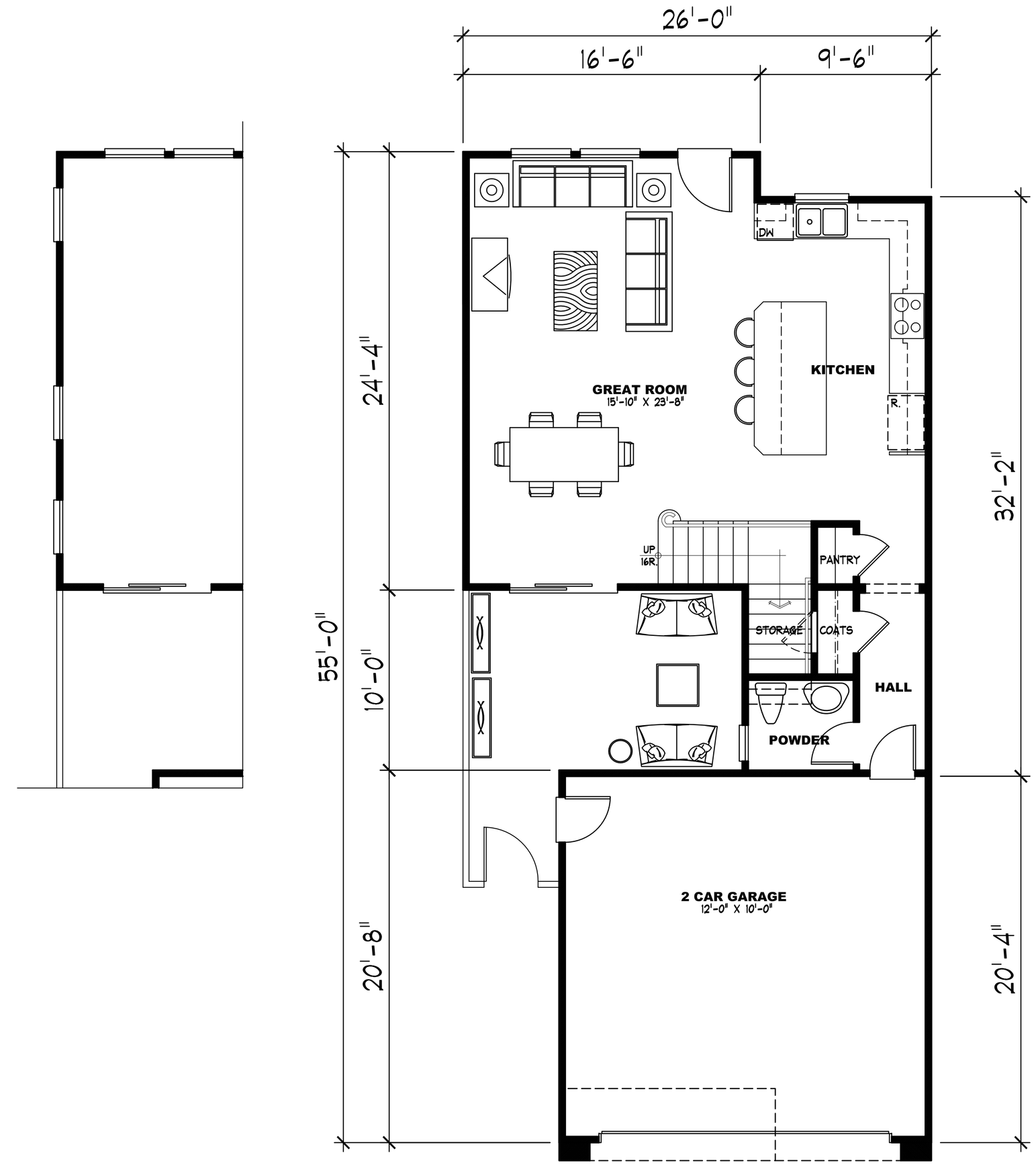


SECOND FLOOR PLAN



FIRST FLOOR PLAN

SQUARE FOOTAGE

FIRST FLOOR	717	SQ. FT.
SECOND FLOOR	1,042	SQ. FT.
TOTAL	1,759	SQ. FT.

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

PLAN 4
FLOOR PLANS

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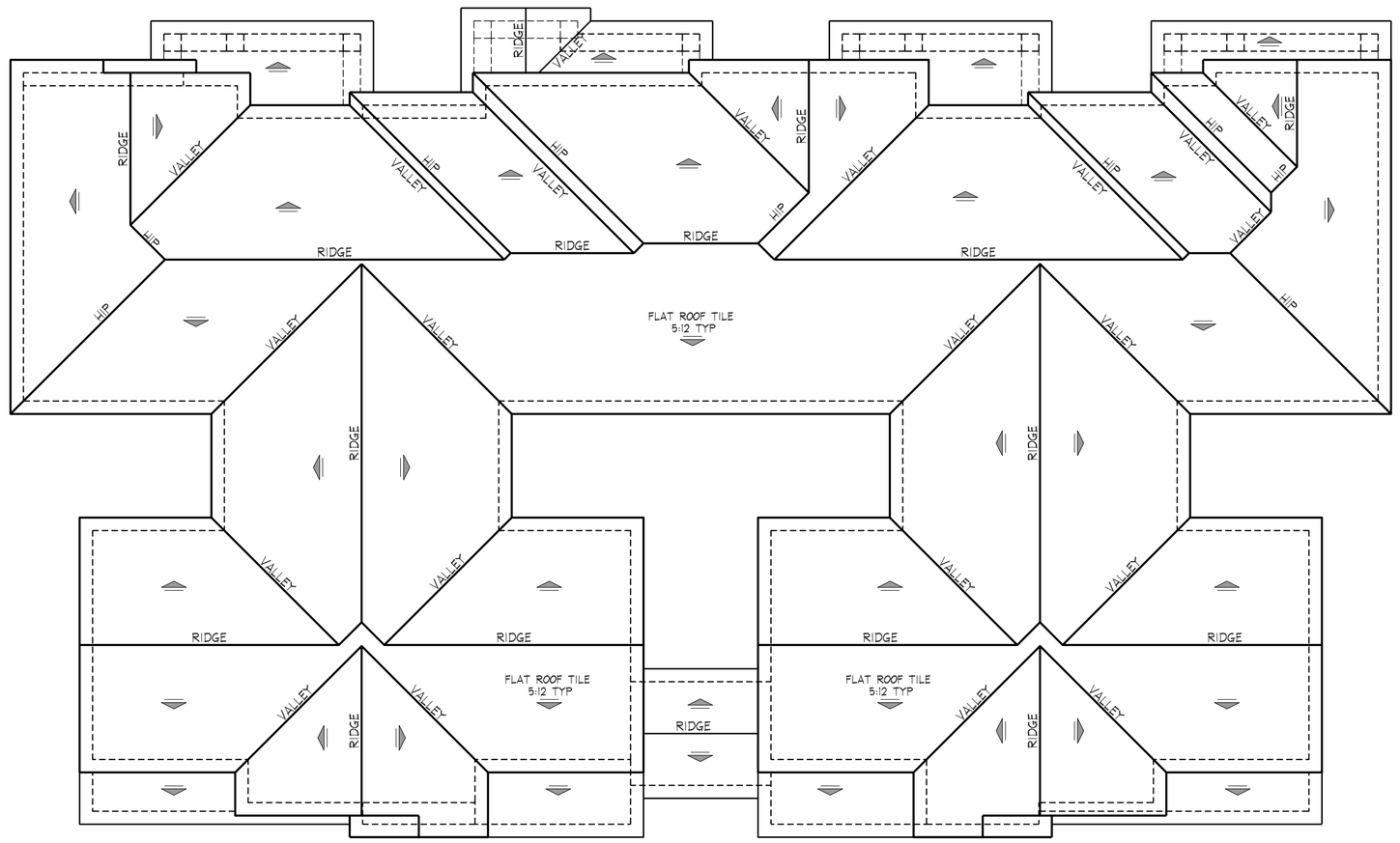
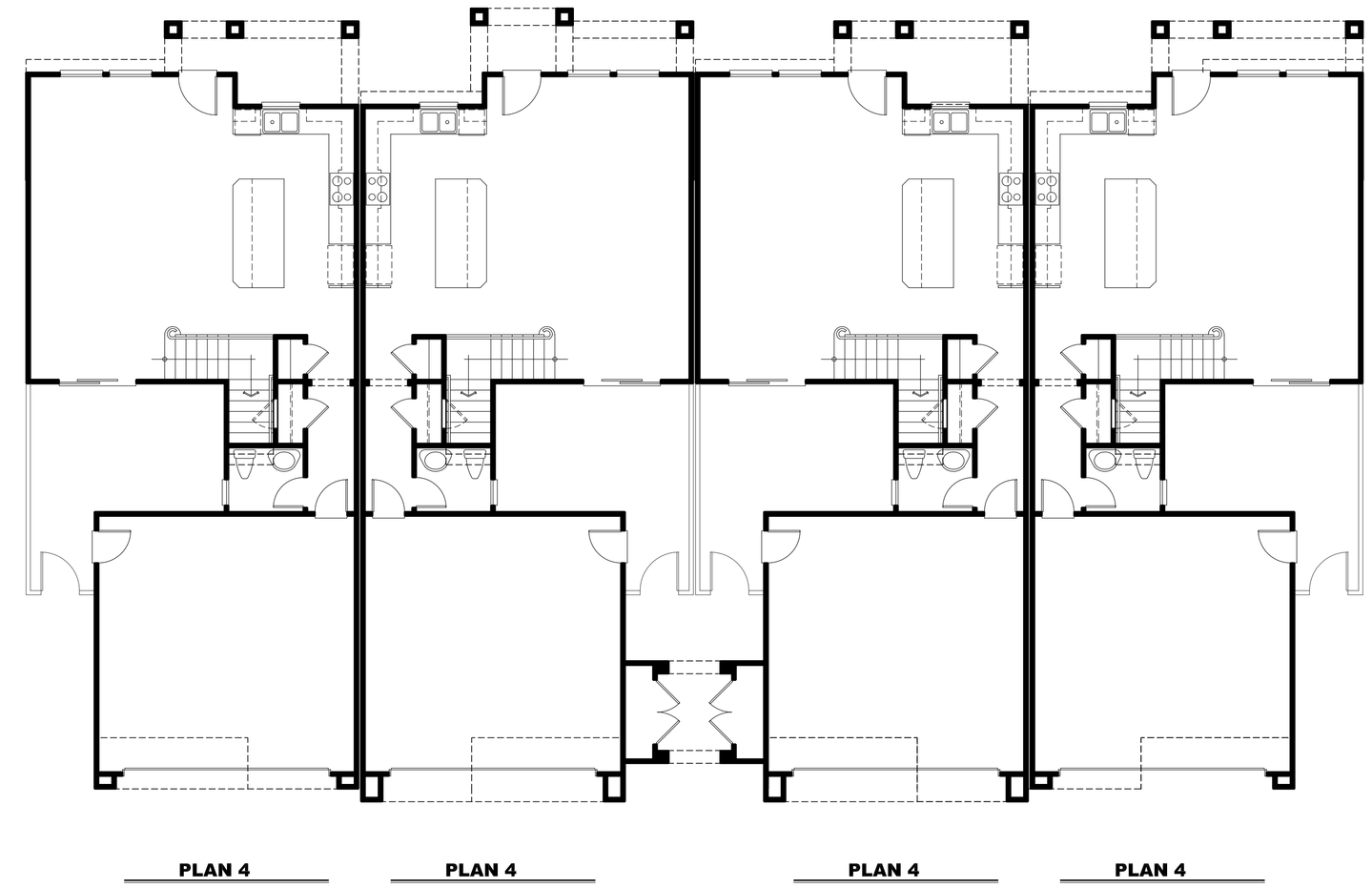


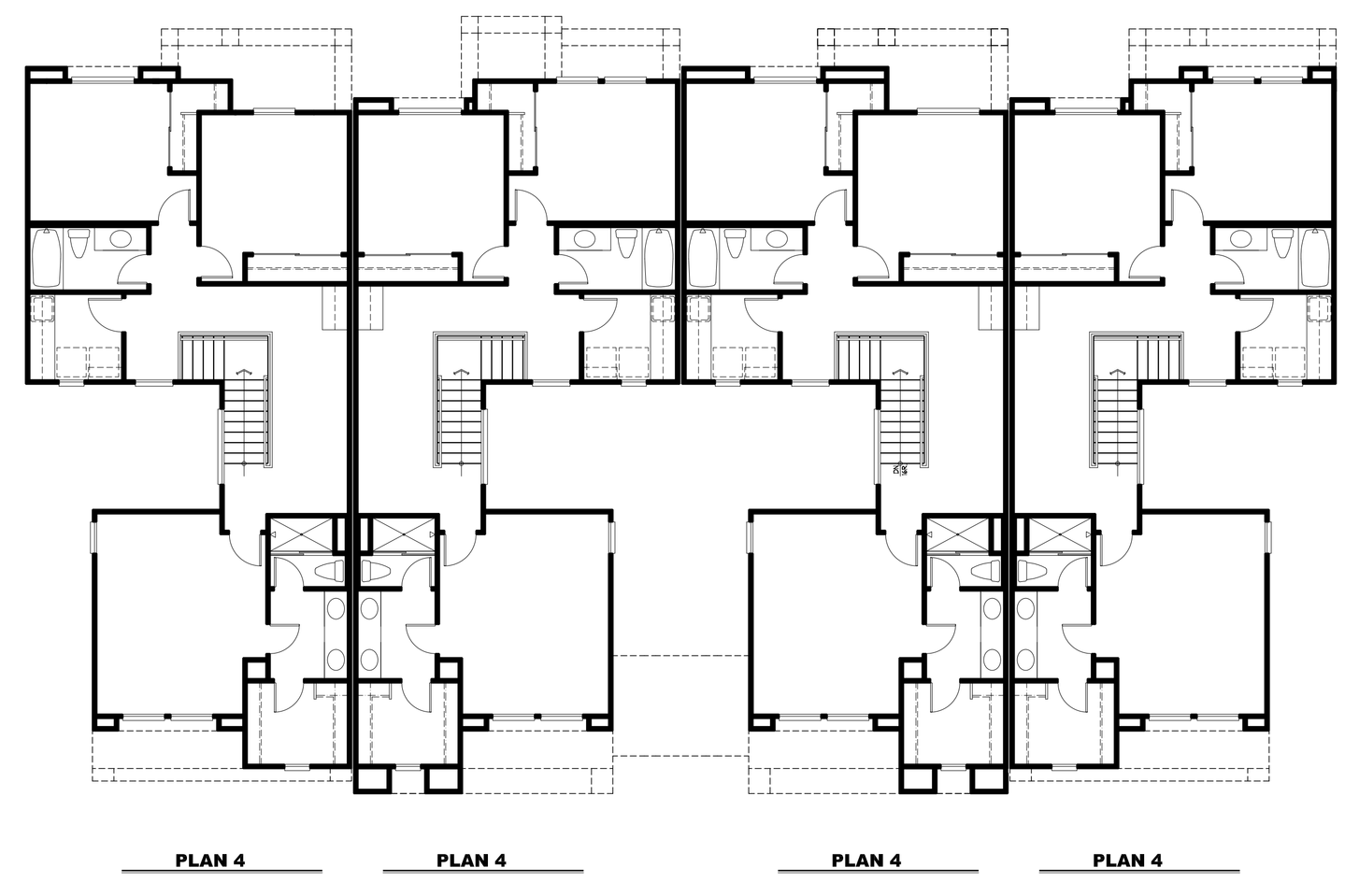
ROOF PLAN
BUILDING 1 - TYPE A

SCALE: 1/8"=1'-0"



FIRST FLOOR PLAN
BUILDING 1 - TYPE A

SCALE: 1/8"=1'-0"



SECOND FLOOR PLAN
BUILDING 1 - TYPE A

SCALE: 1/8"=1'-0"

HARRIS FARM

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HARRIS FARM
R.C. HOBBS CO.

BUILDING 1
TYPE A
FLOOR & ROOF PLANS

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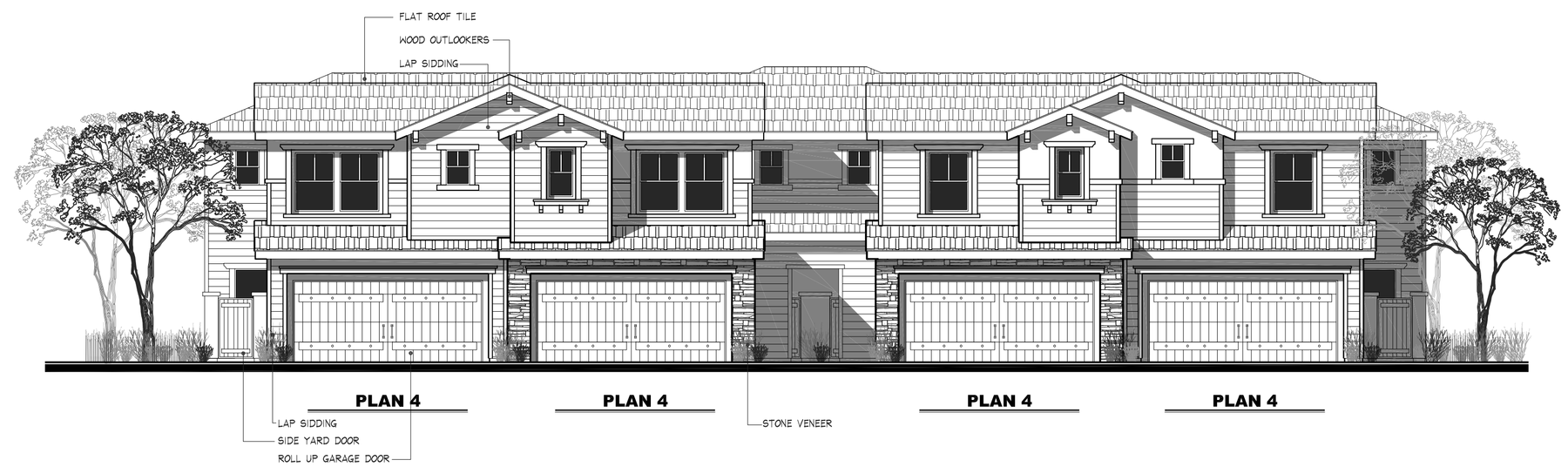
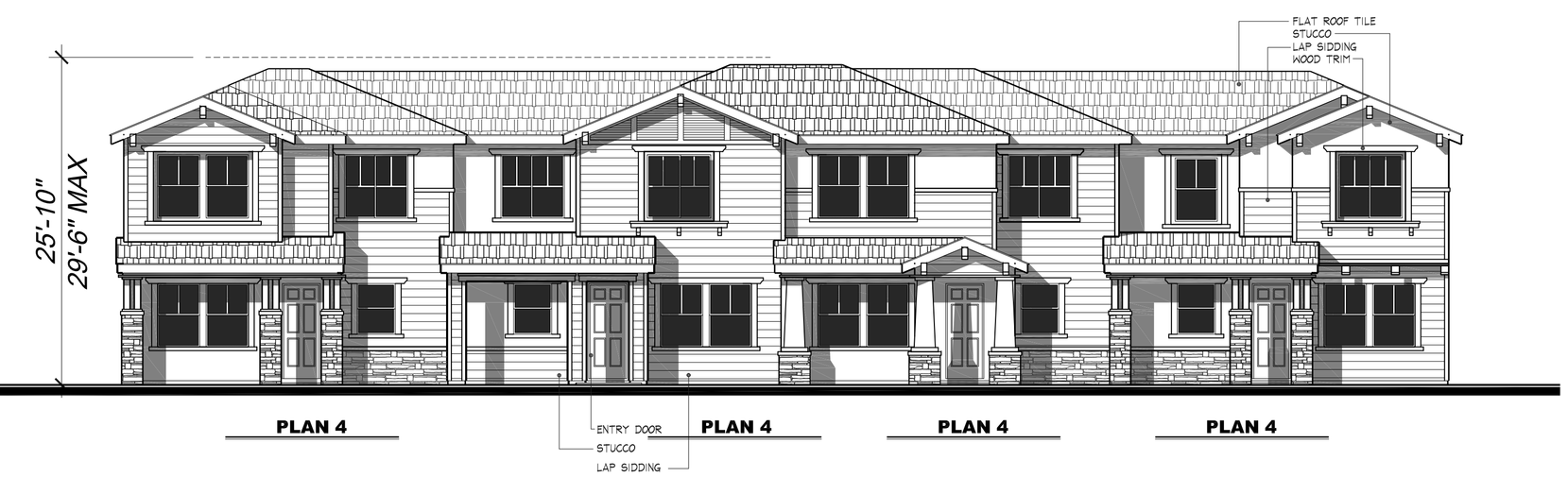


FRONT ELEVATION
BUILDING 1 - TYPE A

SCALE: 1/8"=1'-0"



REAR ELEVATION
BUILDING 1 - TYPE A

SCALE: 1/8"=1'-0"

PLAN 4

LEFT ELEVATION

SCALE: 1/8"=1'-0"

PLAN 4

RIGHT ELEVATION

SCALE: 1/8"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 1
TYPE A
EXTERIOR ELEVATIONS

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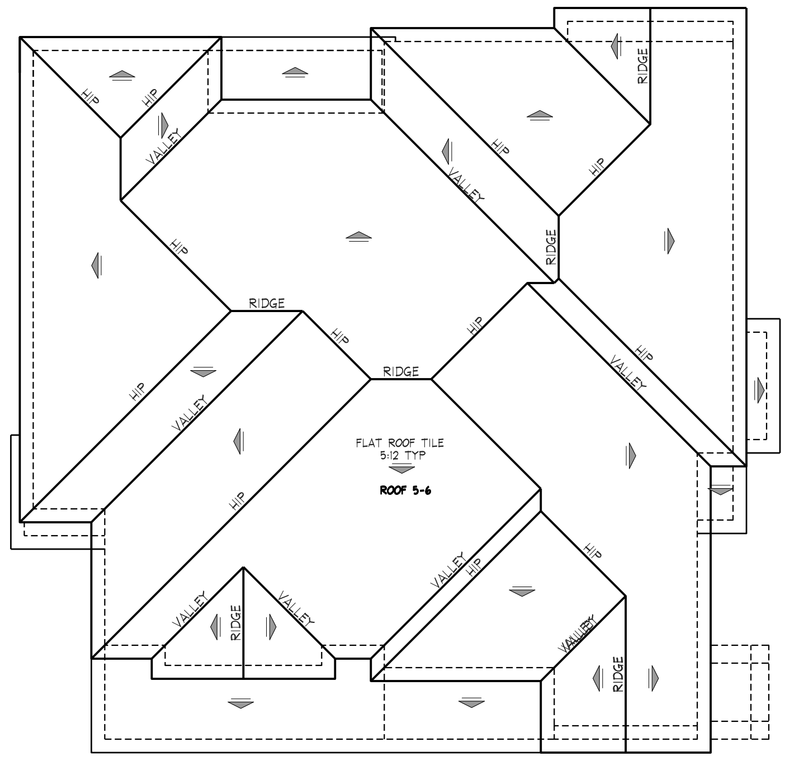
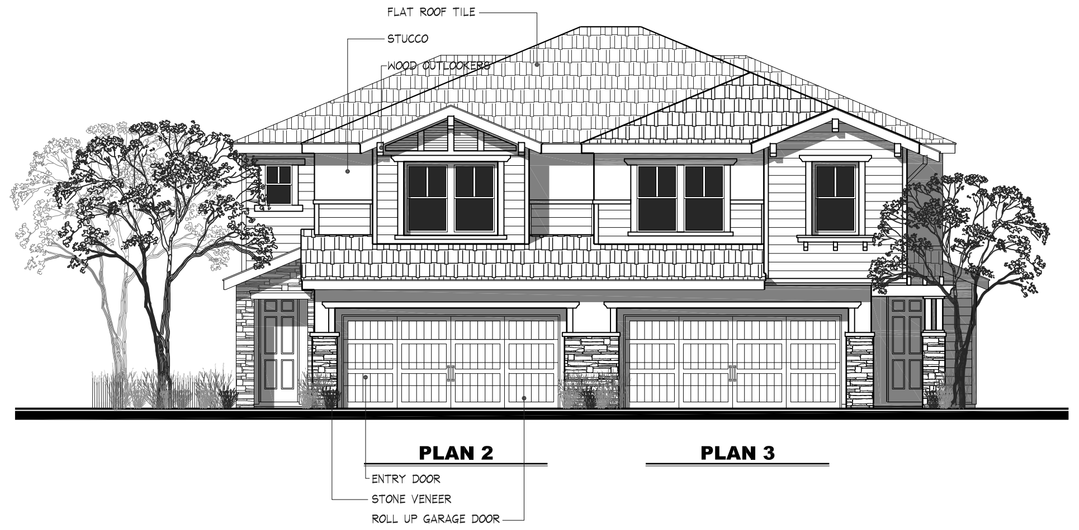
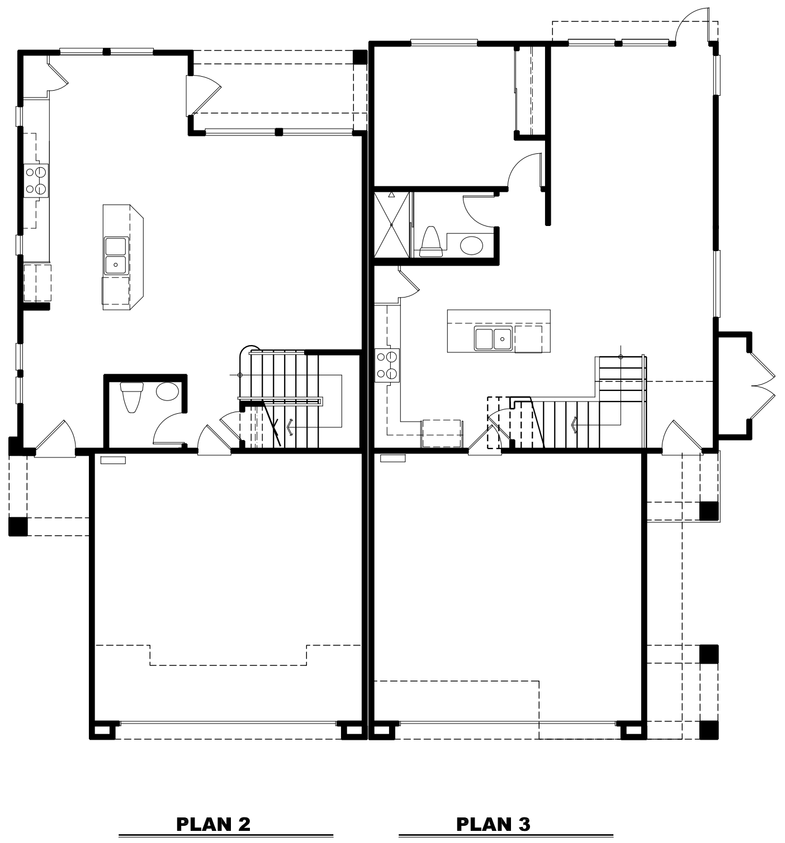


ROOF PLAN SCALE: 1/8"=1'-0"
BUILDING 2 & 6 - TYPE B



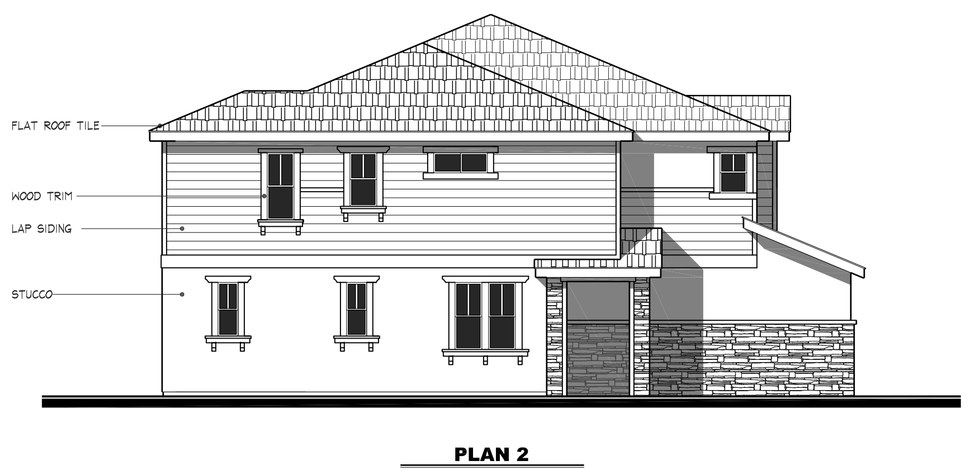
FRONT ELEVATION SCALE: 1/8"=1'-0"
BUILDING 2 & 6 - TYPE B

REAR ELEVATION - BUILDING 2 SCALE: 1/8"=1'-0"
BUILDING 2 & 6 - TYPE B

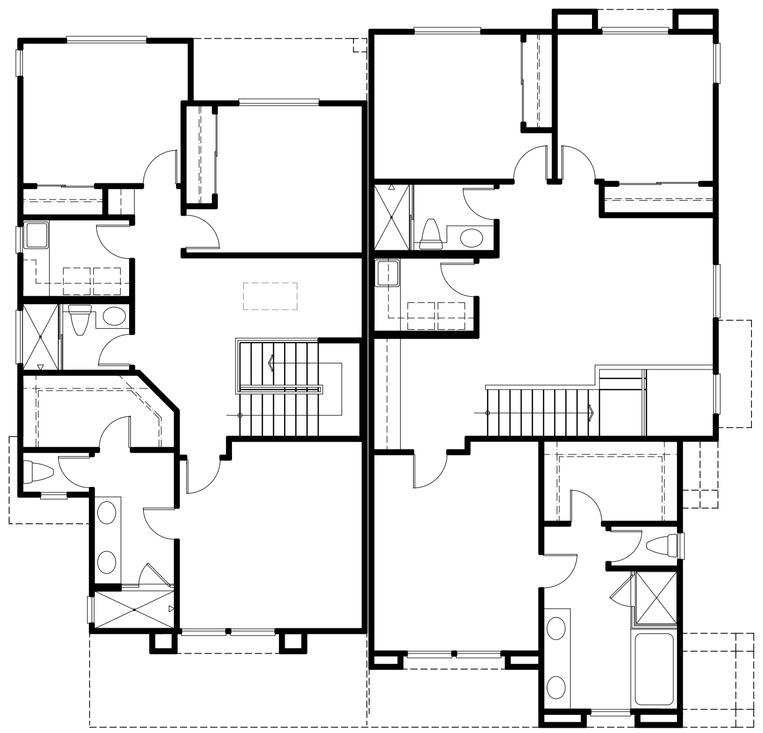


FIRST FLOOR PLAN SCALE: 1/8"=1'-0"
BUILDING 2 & 6 - TYPE B

RIGHT ELEVATION SCALE: 1/8"=1'-0"



LEFT ELEVATION SCALE: 1/8"=1'-0"



SECOND FLOOR PLAN SCALE: 1/8"=1'-0"
BUILDING 2 & 6- TYPE B

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 2 & 6 - TYPE B
FLOOR & ROOF PLANS
ELEVATIONS

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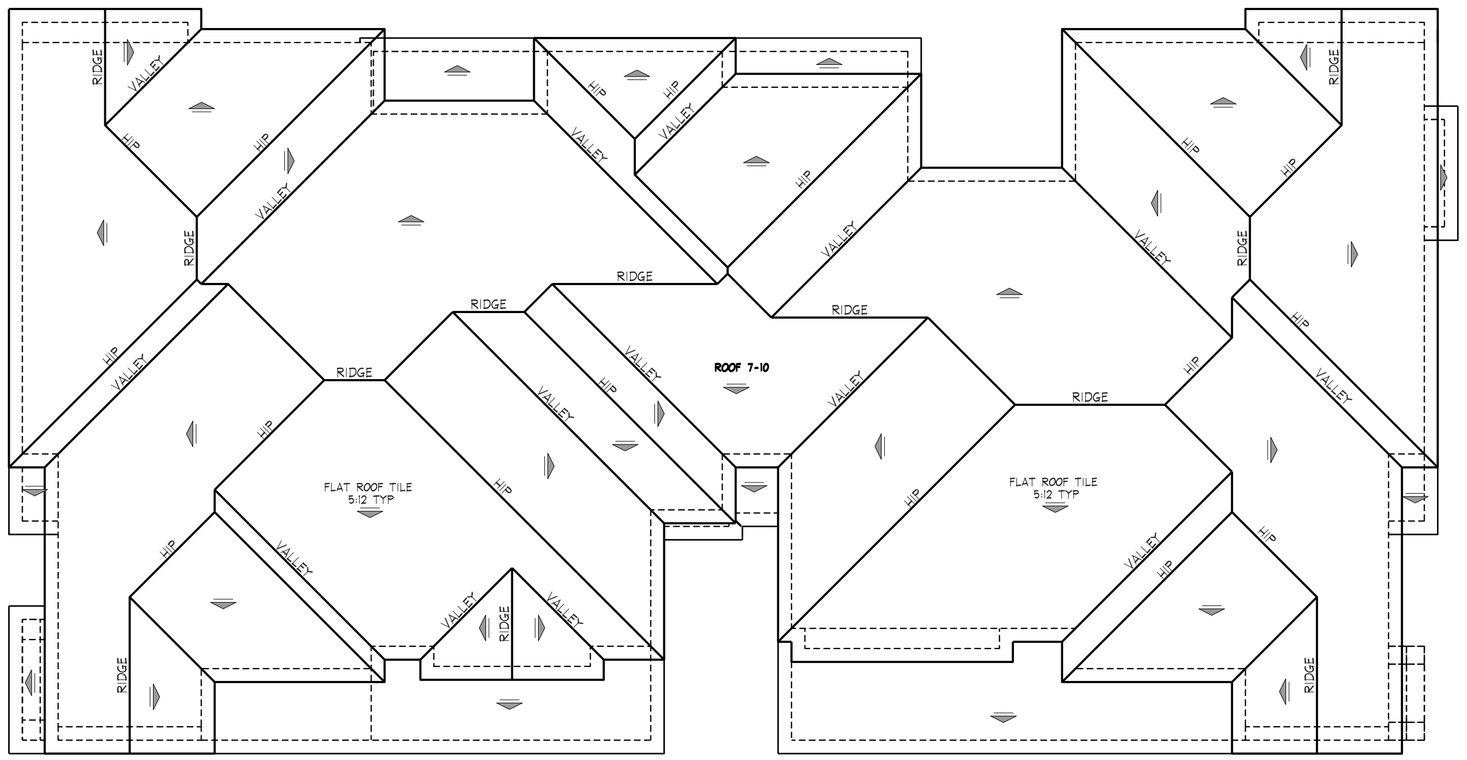
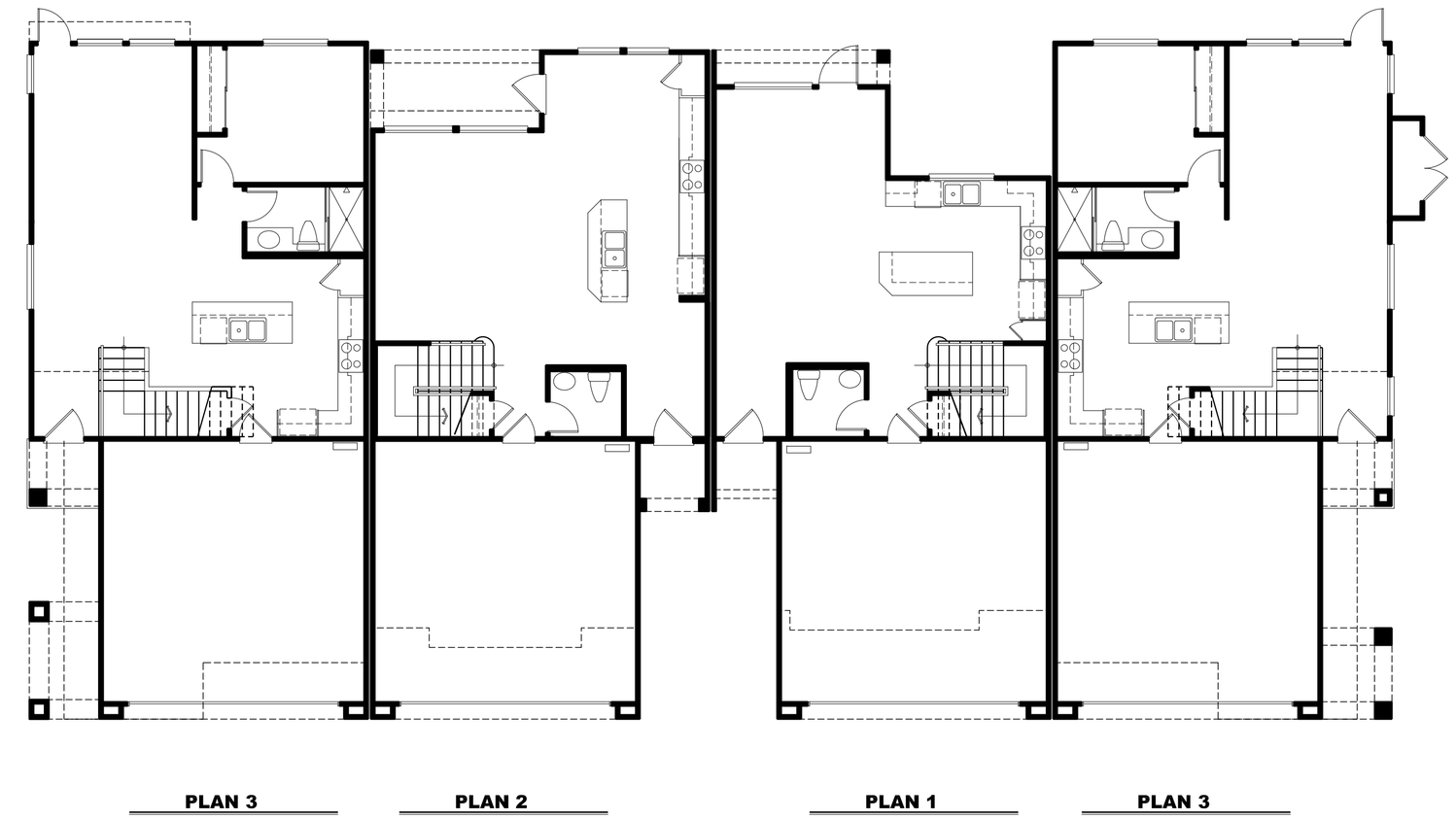


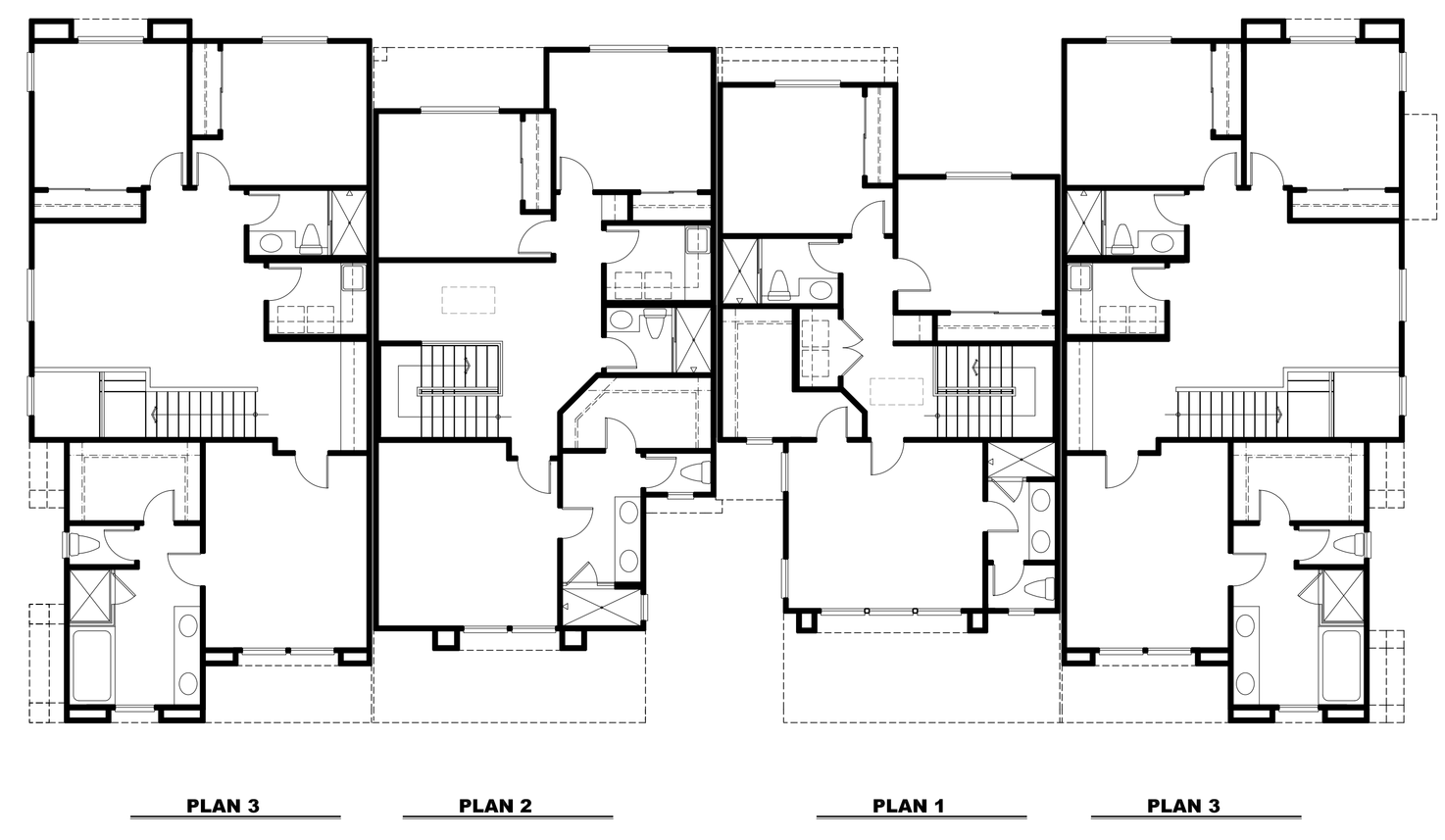
ROOF PLAN
BUILDING 3 - TYPE C

SCALE: 1/8"=1'-0"



FIRST FLOOR PLAN
BUILDING 3 - TYPE C

SCALE: 1/8"=1'-0"



SECOND FLOOR PLAN
BUILDING 3 - TYPE C

SCALE: 1/8"=1'-0"

HARRIS FARM

A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 3
TYPE C
FLOOR & ROOF PLANS

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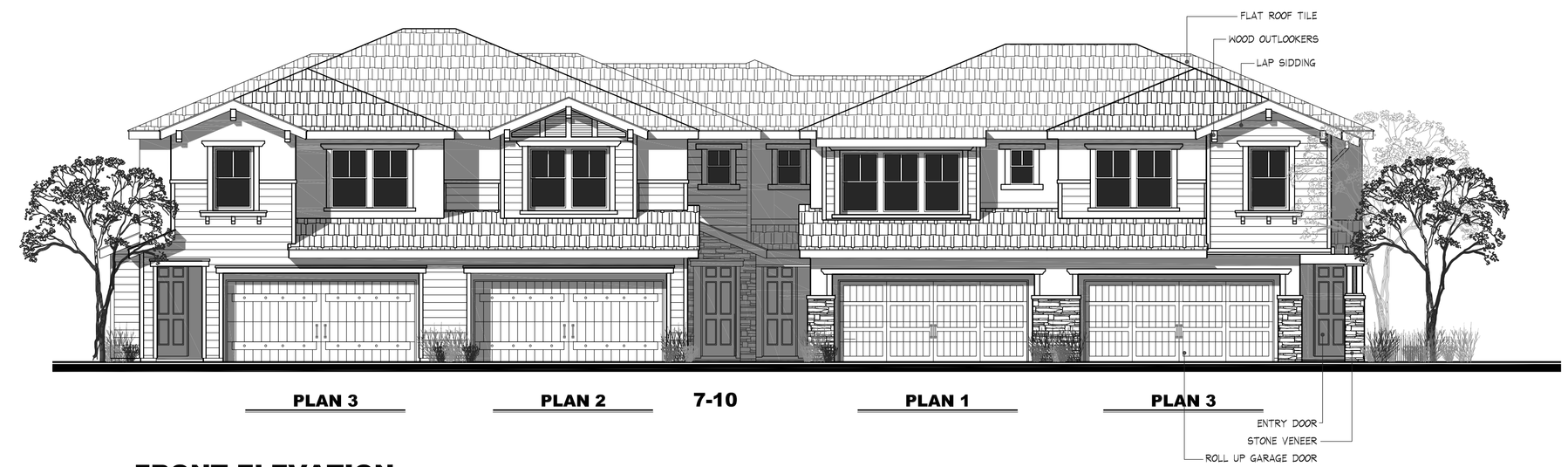

FRONT ELEVATION
BUILDING 3 - TYPE C

SCALE: 1/8"=1'-0"

REAR ELEVATION
BUILDING 3 - TYPE C

SCALE: 1/8"=1'-0"

RIGHT ELEVATION

SCALE: 1/8"=1'-0"

RIGHT ELEVATION

SCALE: 1/8"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 3
TYPE C
EXTERIOR ELEVATIONS

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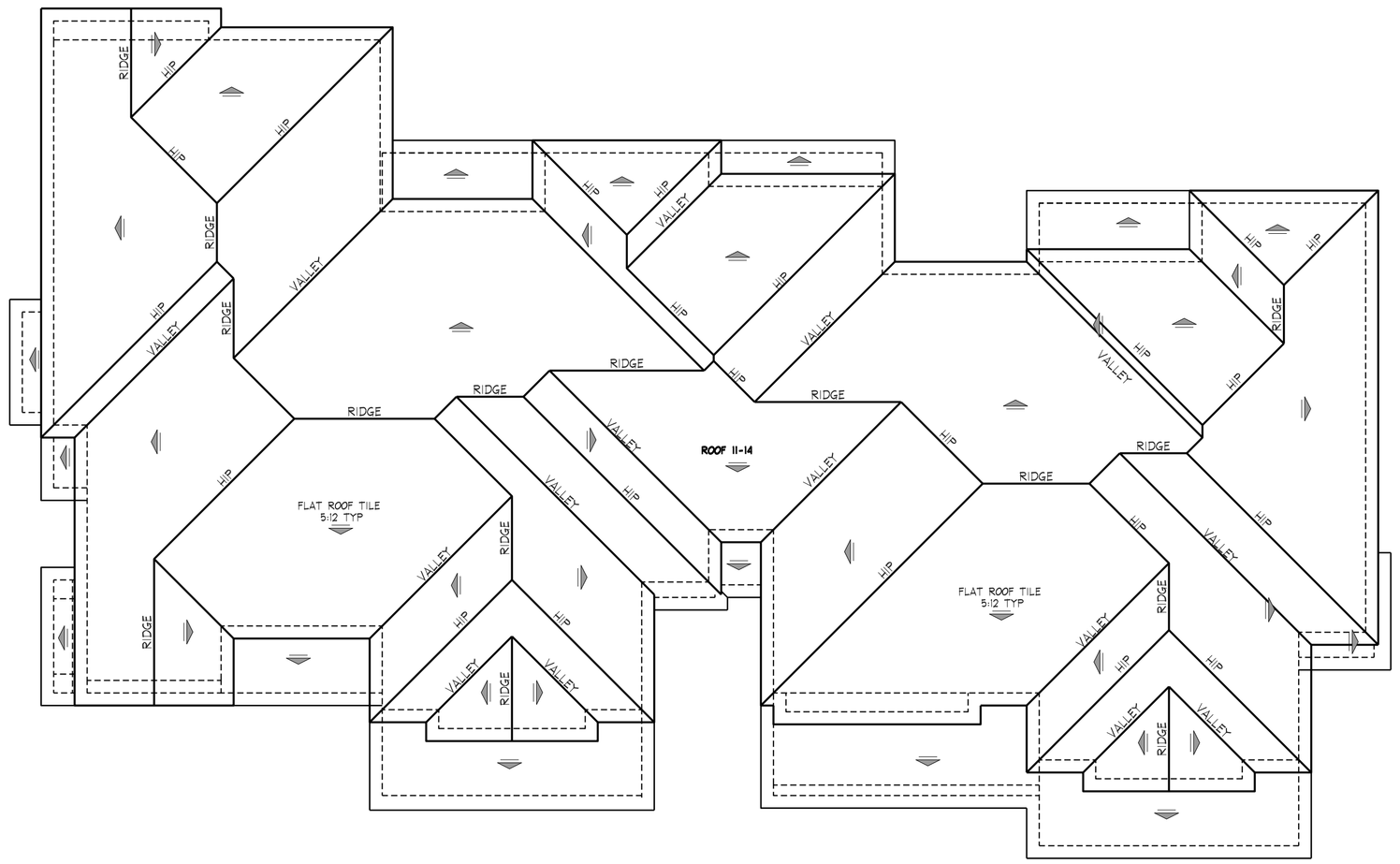
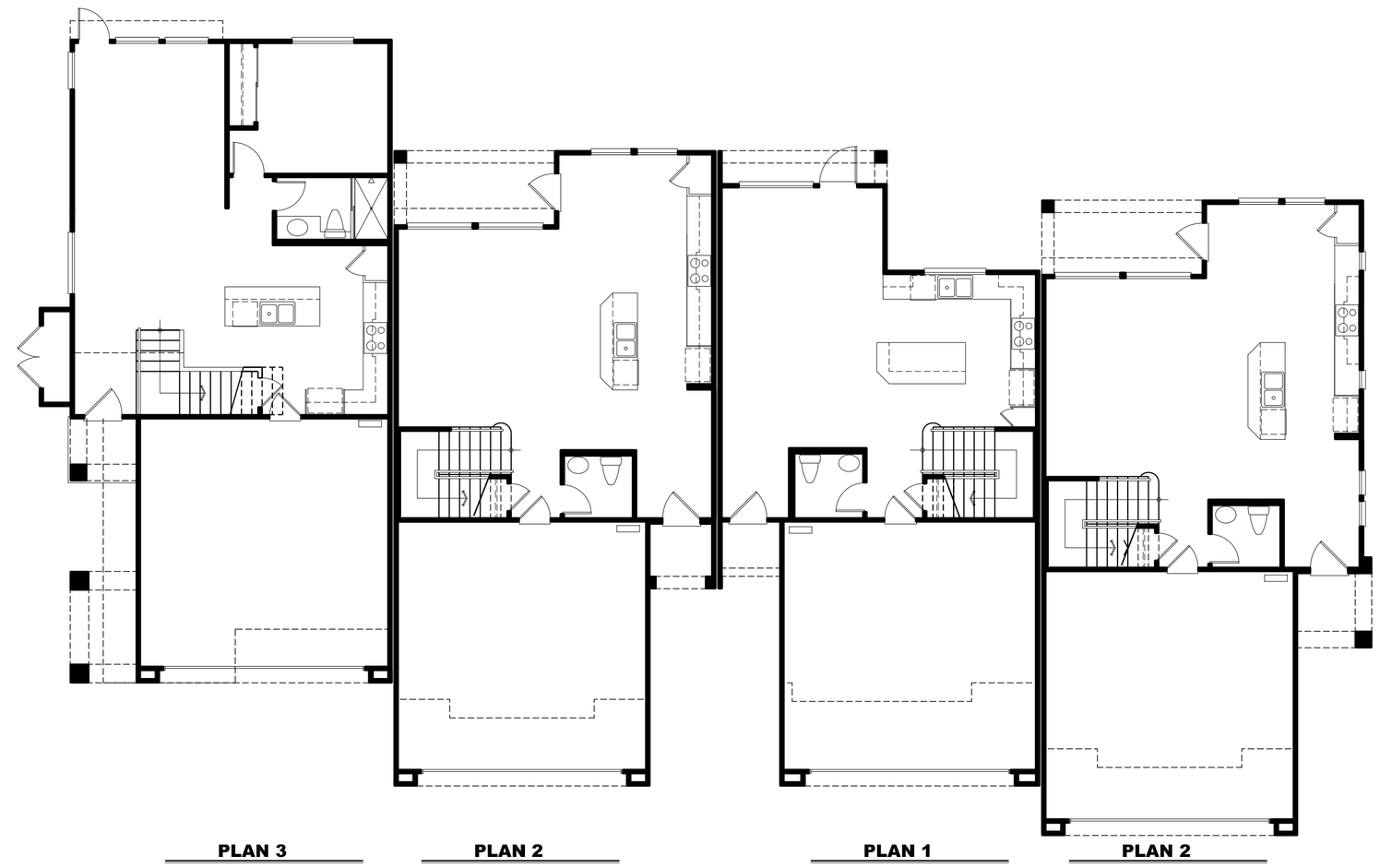
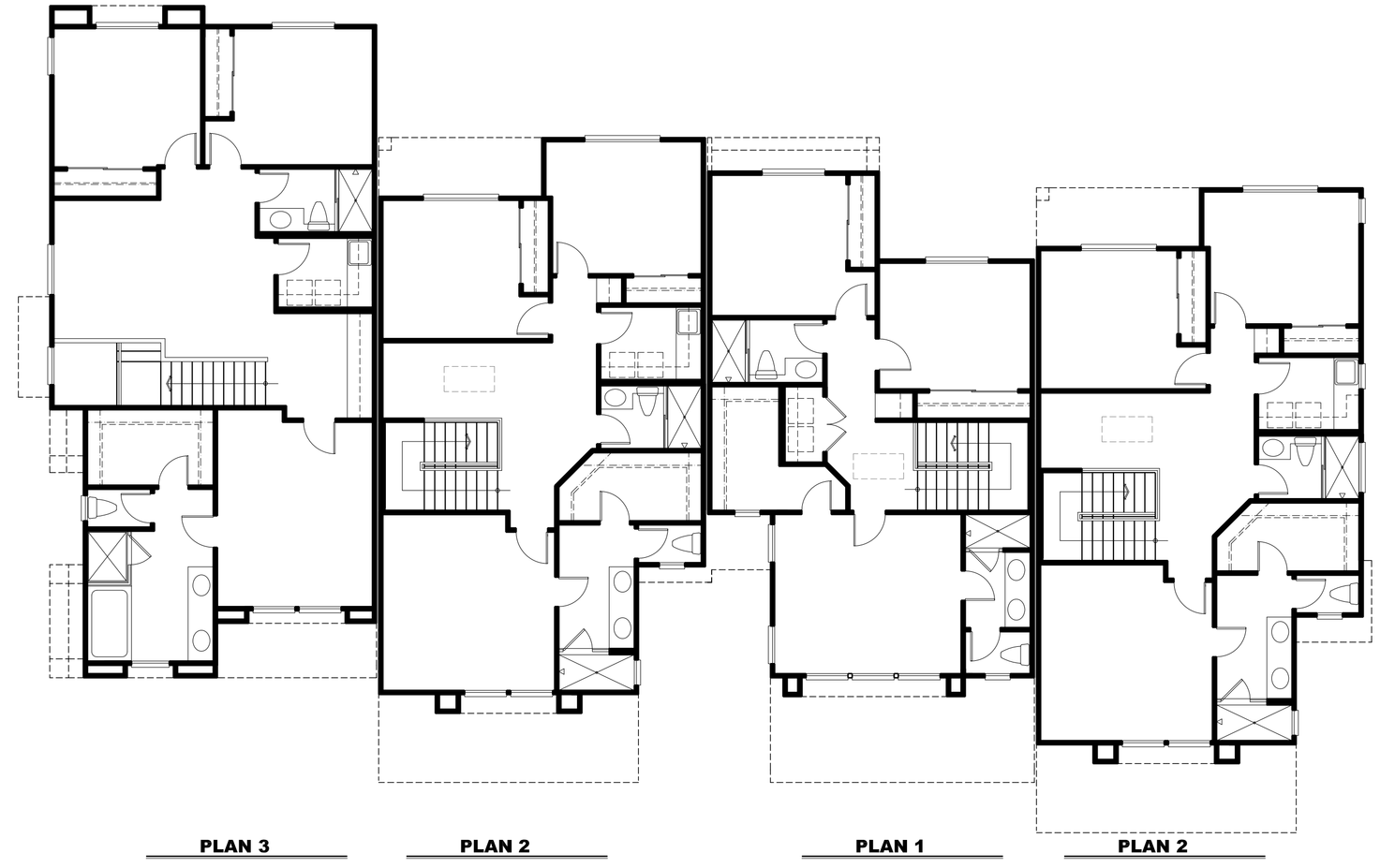


ROOF PLAN
BUILDING 4 - TYPE D
BUILDING 7, 8 & 9 - SIMILAR - TYPE D



FIRST FLOOR PLAN
BUILDING 4 - TYPE D
BUILDING 7, 8 & 9 - SIMILAR - TYPE D



SECOND FLOOR PLAN
BUILDING 4 - TYPE D
BUILDING 7, 8 & 9 - SIMILAR - TYPE D

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 4
BUILDING 7, 8 & 9 SIMILAR
TYPE D
FLOOR & ROOF PLANS

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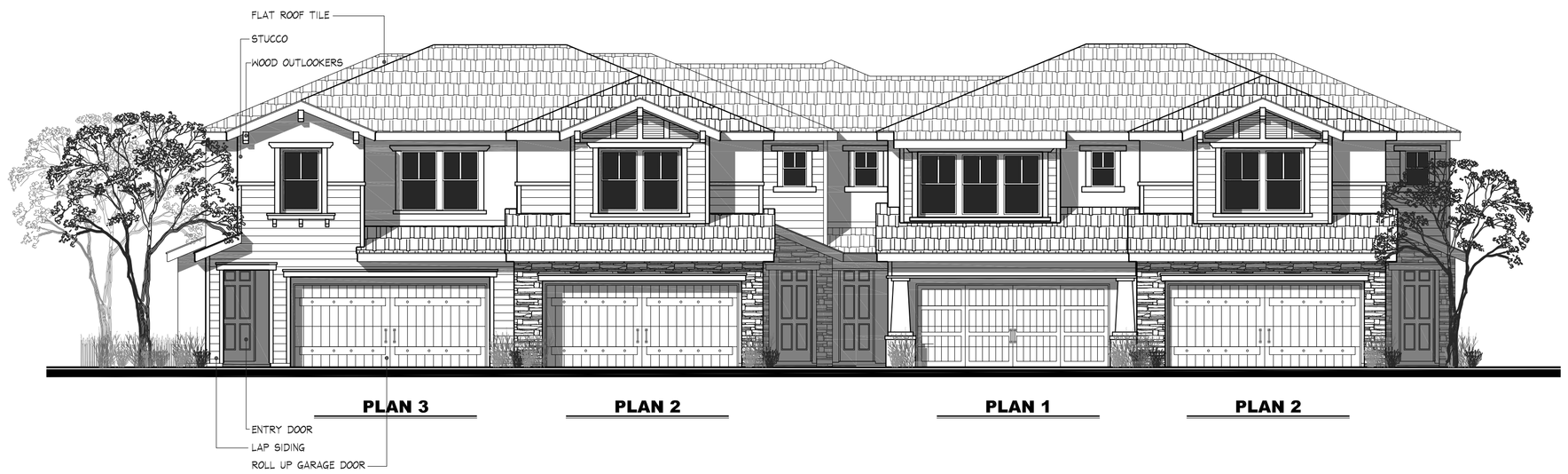

FRONT ELEVATION SCALE: 1/8"=1'-0"
BUILDING 4 - TYPE D
BUILDING 7, 8 & 9 - SIMILAR - TYPE D

REAR ELEVATION SCALE: 1/8"=1'-0"
BUILDING 4 - TYPE D
BUILDING 7, 8 & 9 - SIMILAR - TYPE D

LEFT ELEVATION SCALE: 1/8"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 4
BUILDING 7, 8 & 9 SIMILAR
TYPE D
EXTERIOR ELEVATIONS

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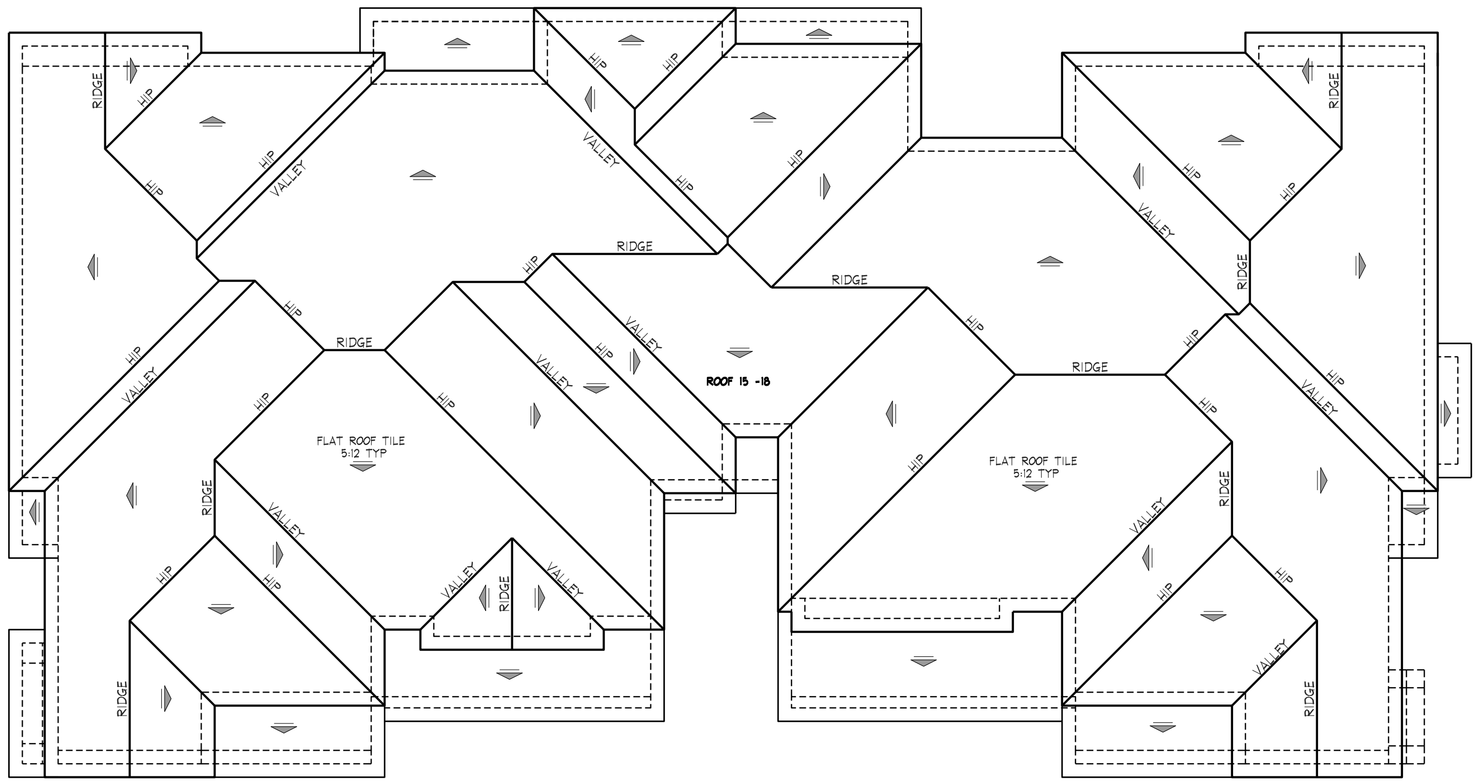
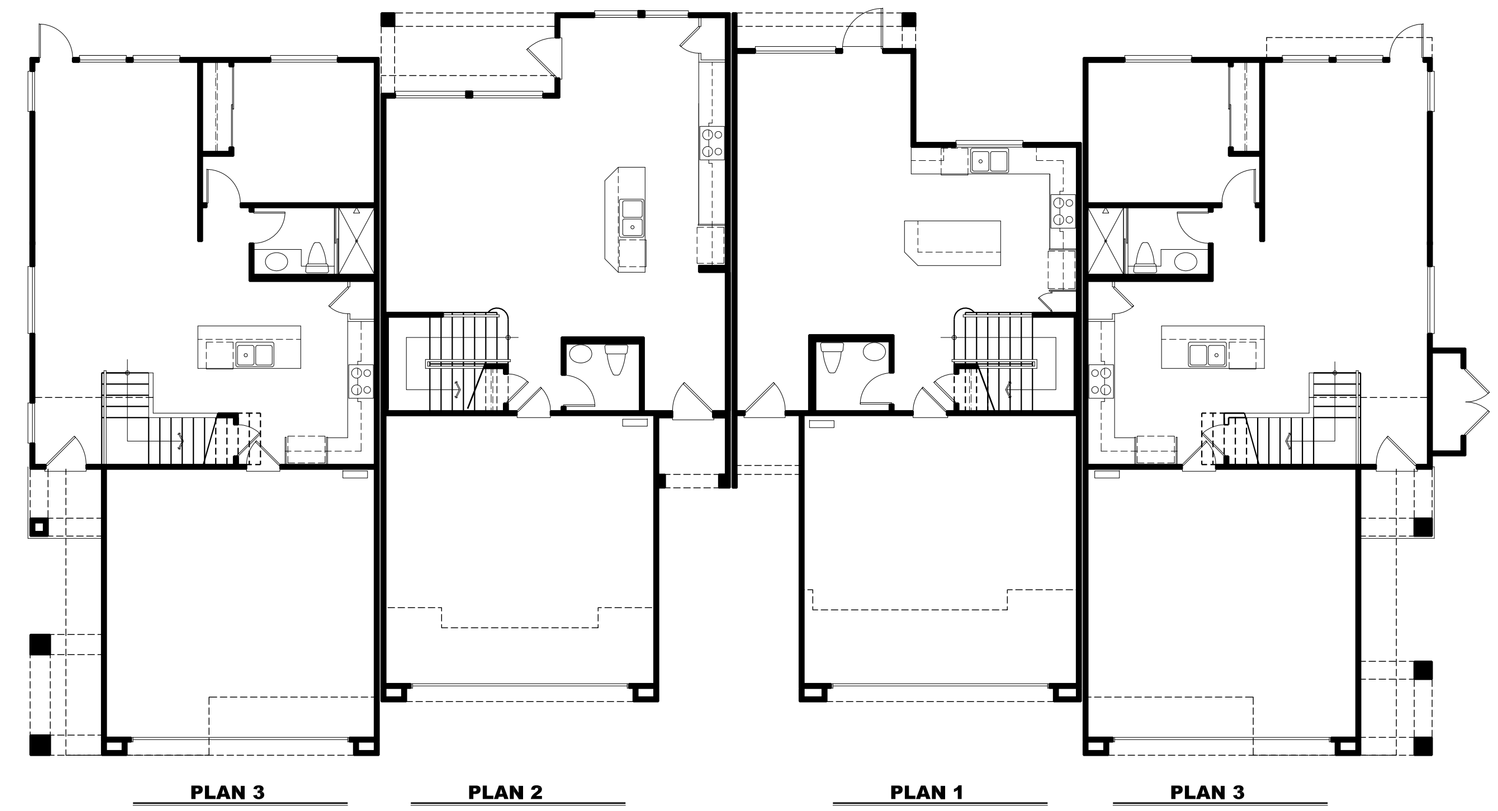


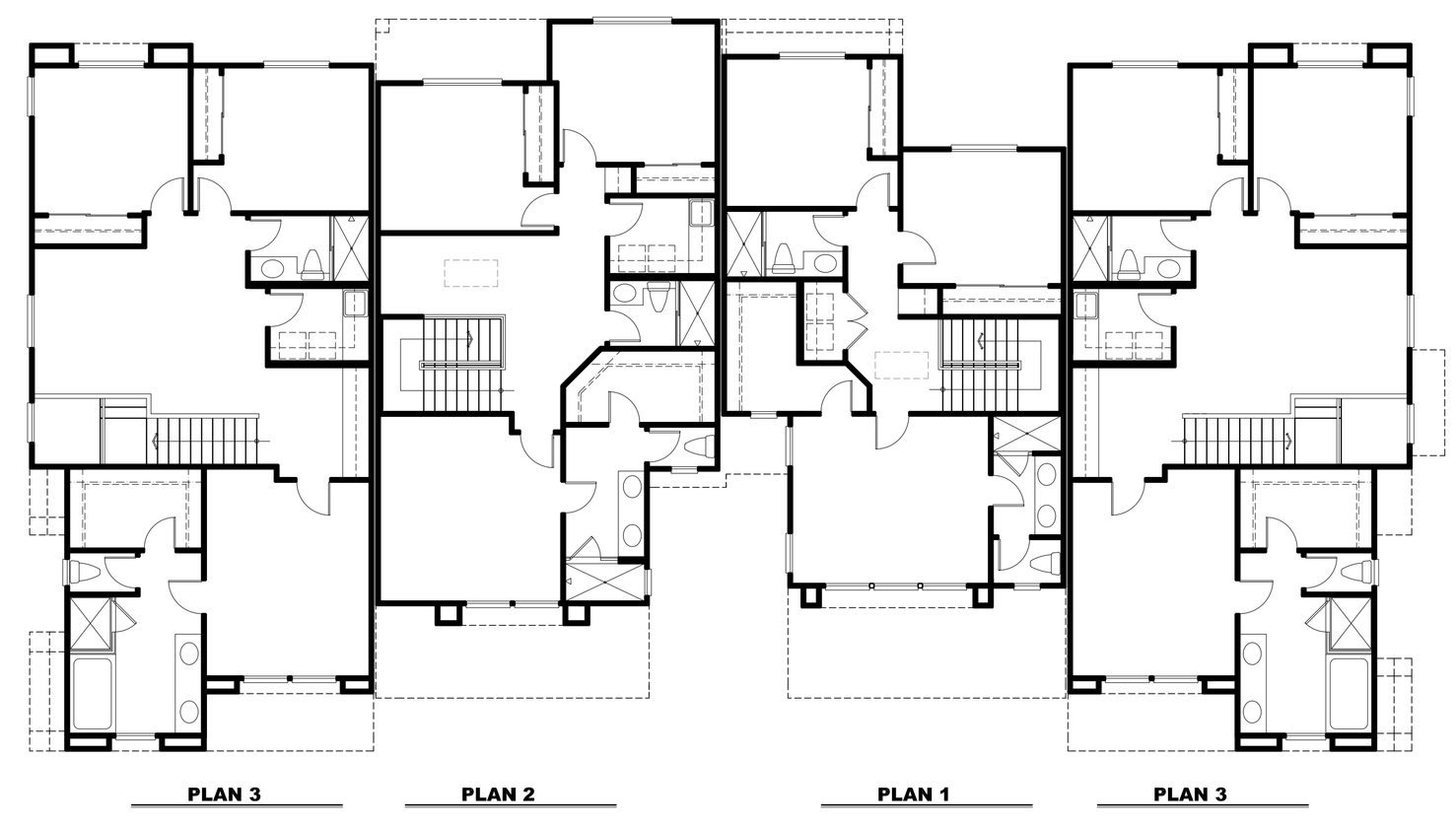
ROOF PLAN
BUILDING 5 - TYPE C - SIMILAR

SCALE: 1/8"=1'-0"



FIRST FLOOR PLAN
BUILDING 5 - TYPE C - SIMILAR

SCALE: 1/8"=1'-0"



SECOND FLOOR PLAN
BUILDING 5 - TYPE C - SIMILAR

SCALE: 1/8"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 5
TYPE C - SIMILAR
FLOOR & ROOF PLANS

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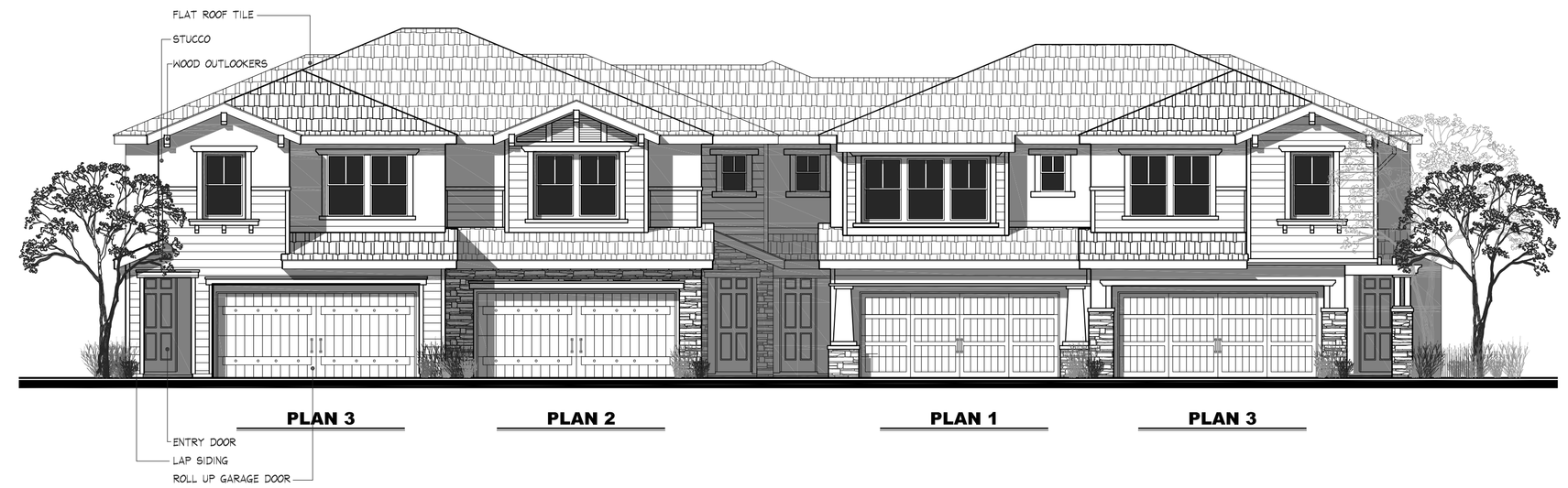
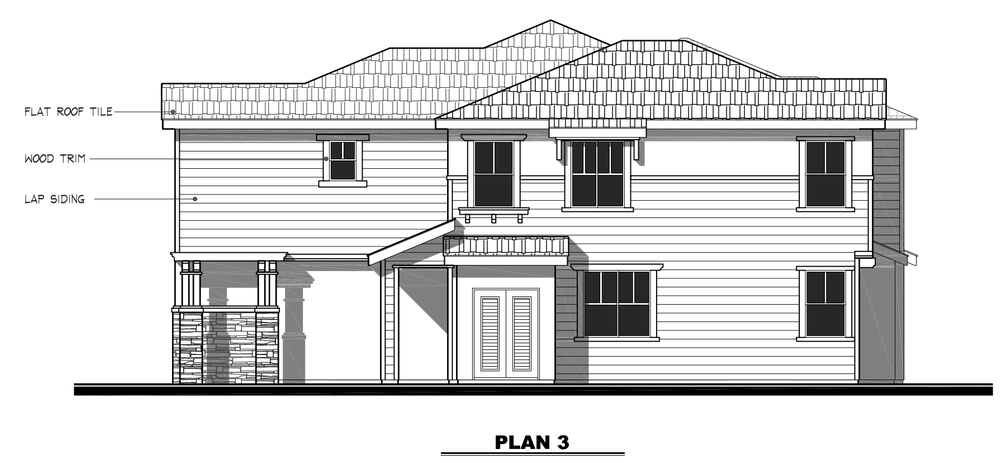


FRONT ELEVATION
BUILDING 5 - TYPE C - SIMILAR

SCALE: 1/8"=1'-0"

REAR ELEVATION
BUILDING 5 - TYPE C - SIMILAR

SCALE: 1/8"=1'-0"



RIGHT ELEVATION

SCALE: 1/8"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 5
TYPE C - SIMILAR
EXTERIOR ELEVATIONS

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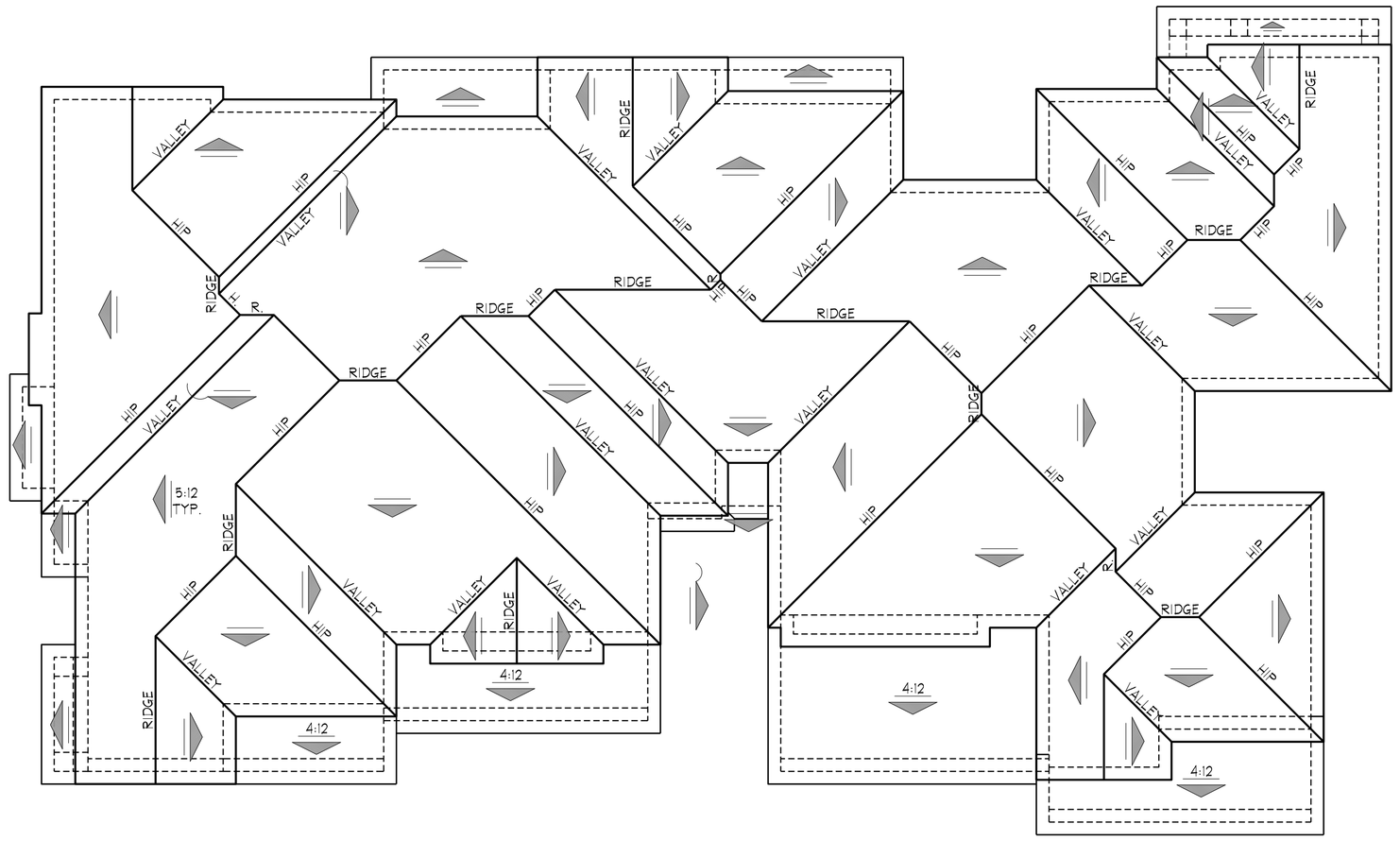
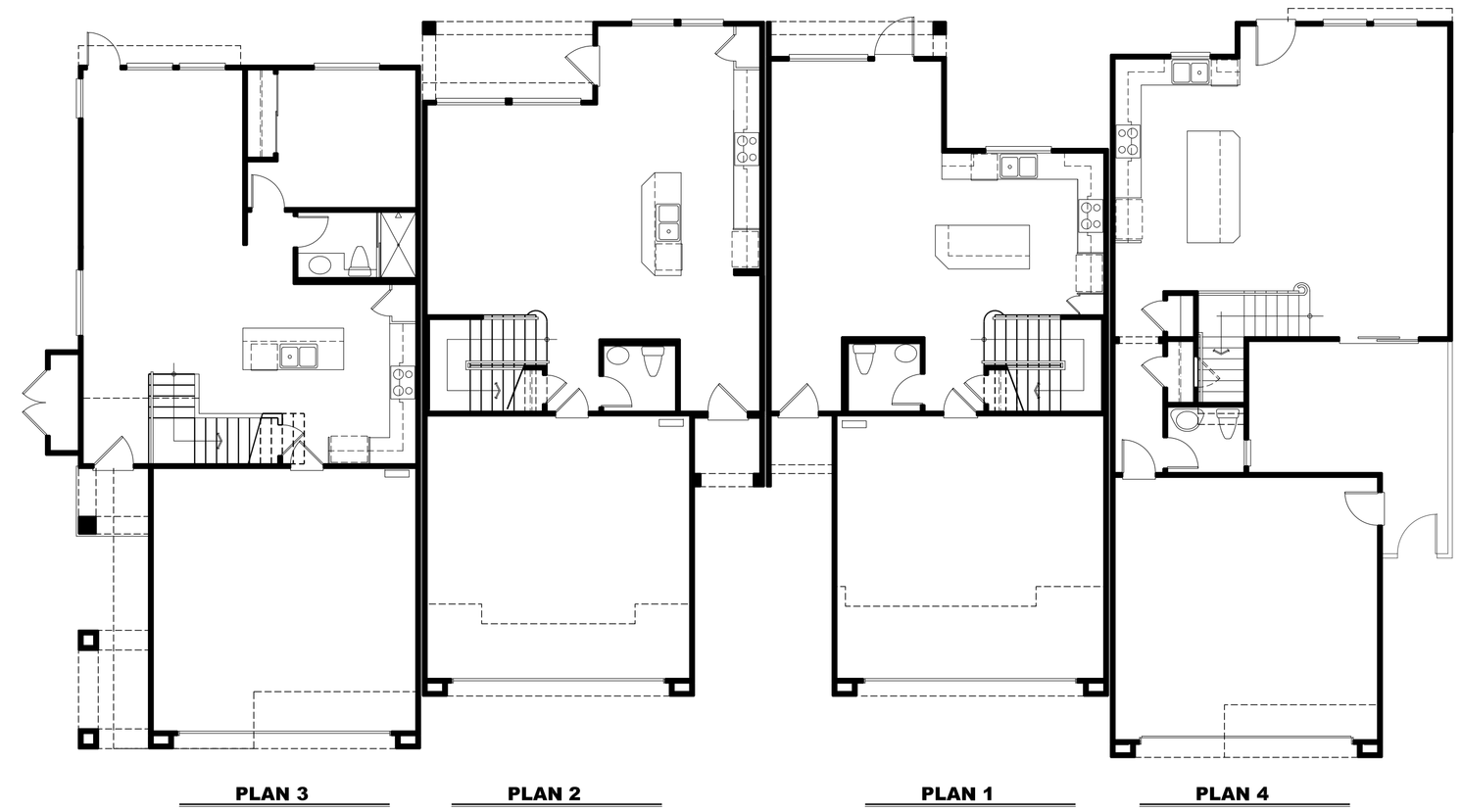


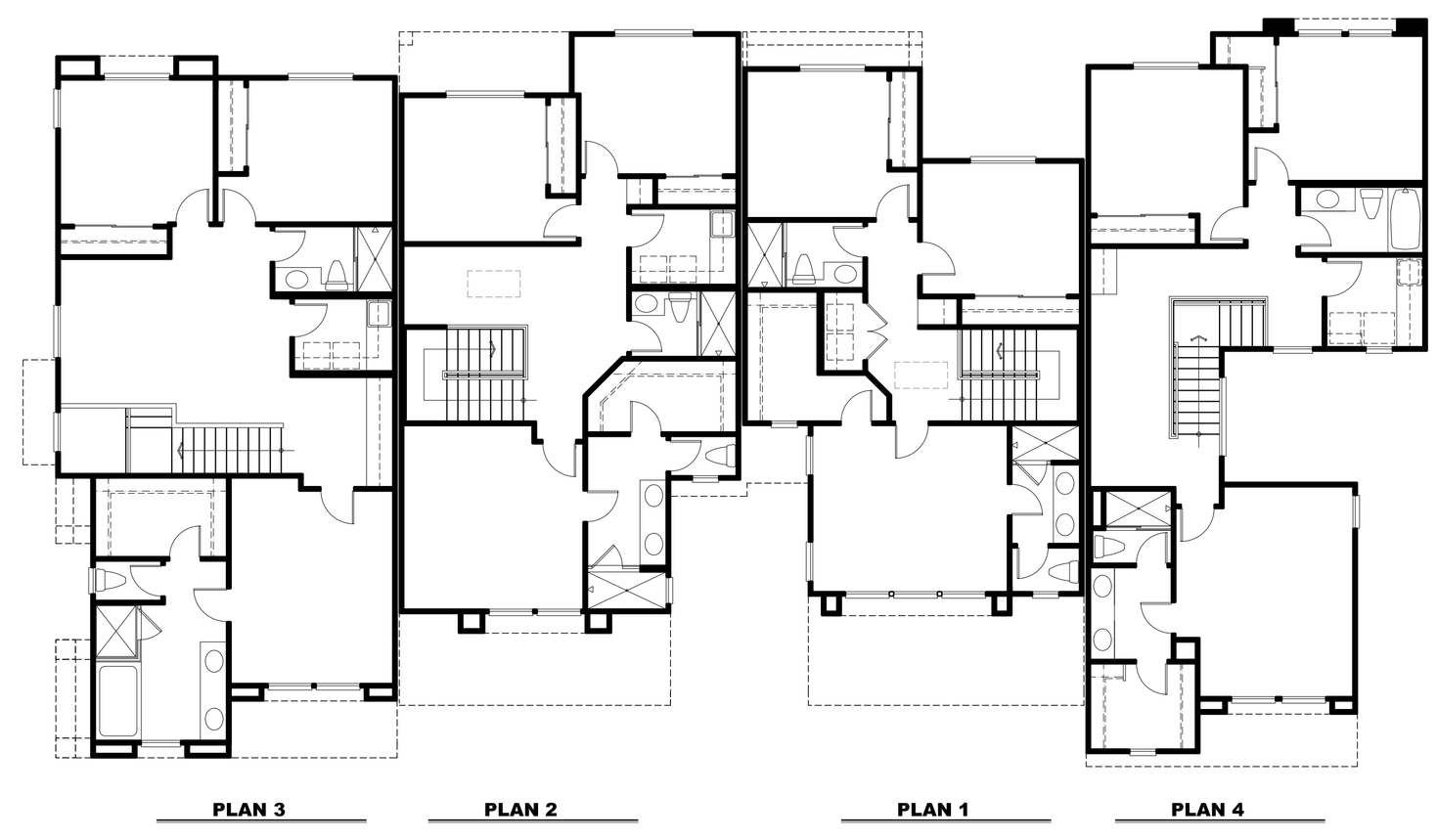
ROOF PLAN
BUILDING 10 - TYPE E

SCALE: 1/8"=1'-0"



FIRST FLOOR PLAN
BUILDING 10 - TYPE E

SCALE: 1/8"=1'-0"



SECOND FLOOR PLAN
BUILDING 10 - TYPE E

SCALE: 1/8"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 10
TYPE E
FLOOR & ROOF PLANS

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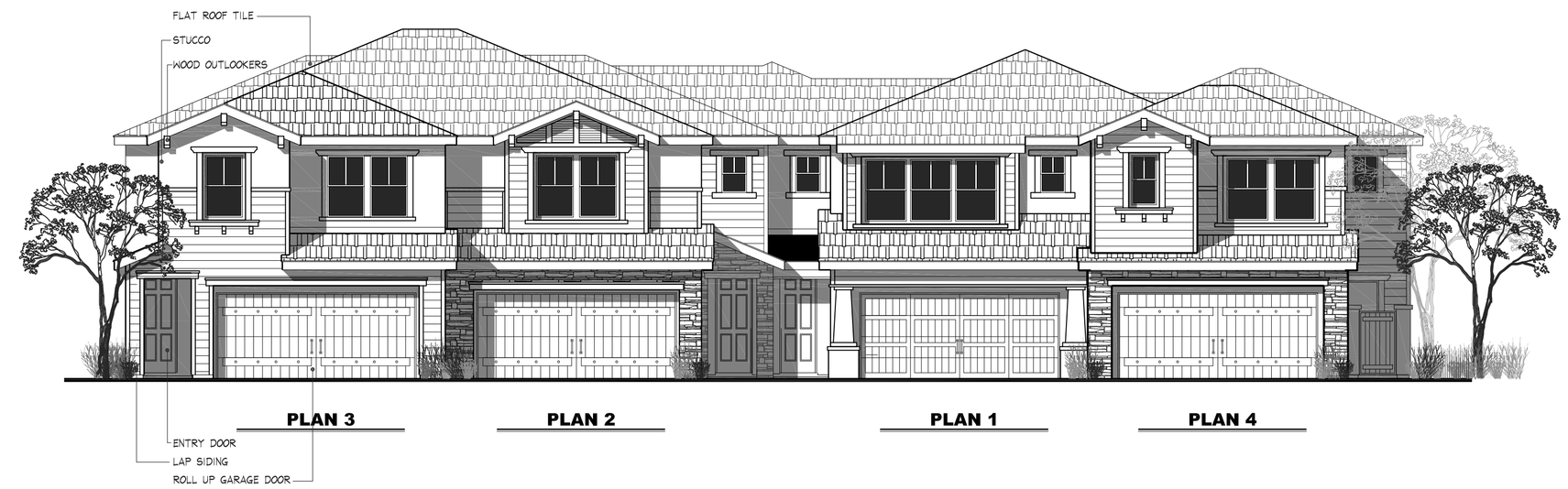

FRONT ELEVATION
BUILDING 10 - TYPE E

SCALE: 1/8"=1'-0"

REAR ELEVATION
BUILDING 10 - TYPE E

SCALE: 1/8"=1'-0"

RIGHT ELEVATION

SCALE: 1/8"=1'-0"

LEFT ELEVATION

SCALE: 1/8"=1'-0"

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

BUILDING 10
TYPE E
EXTERIOR ELEVATIONS

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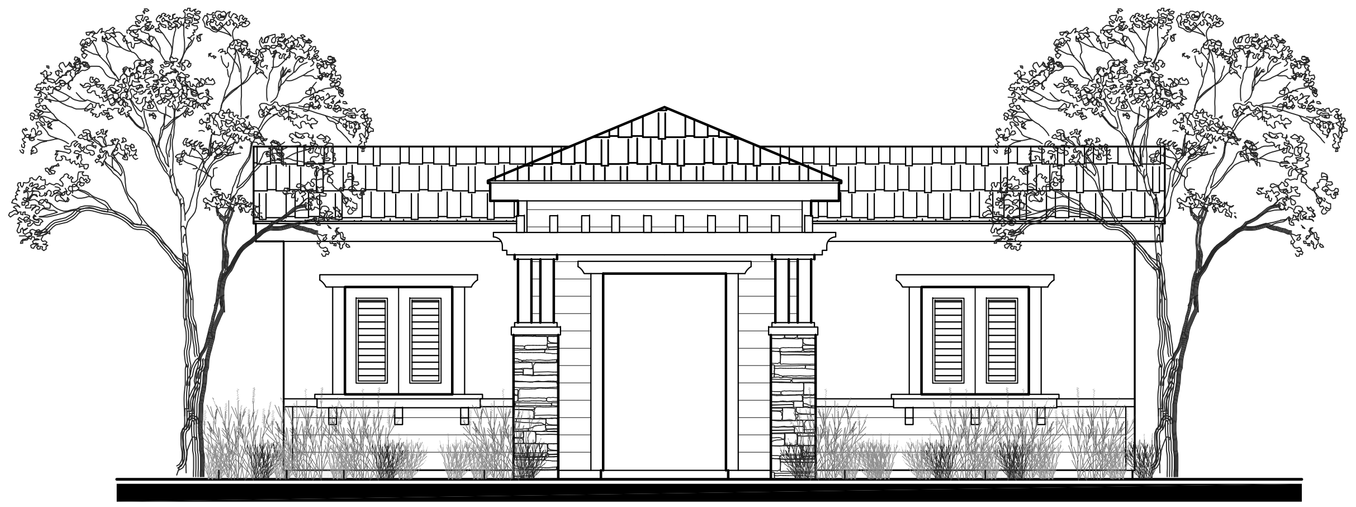
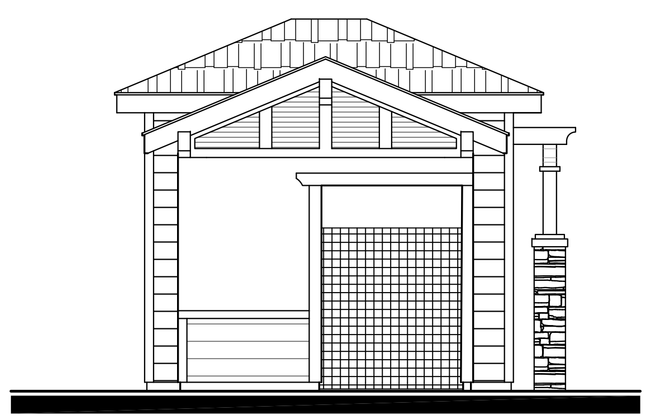
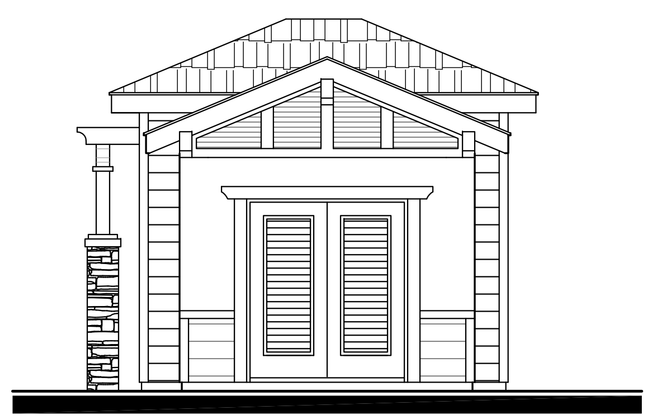


FRONT ELEVATION SCALE: 1/8"=1'-0"

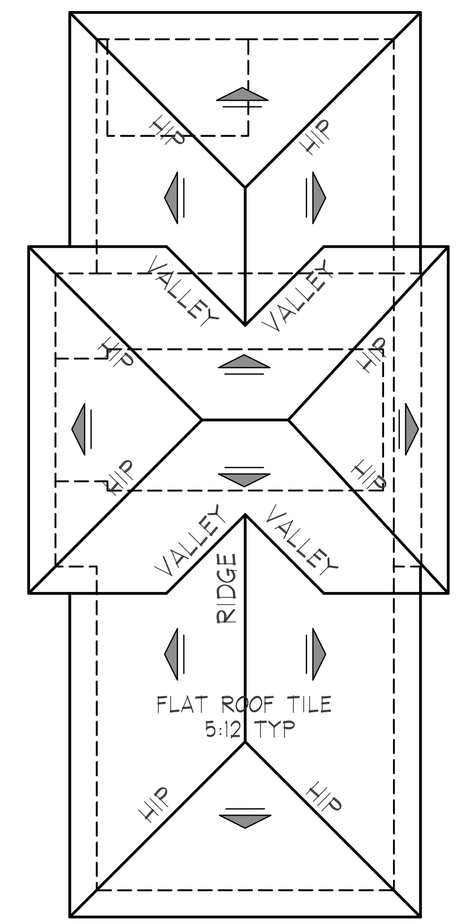
REAR ELEVATION SCALE: 1/8"=1'-0"



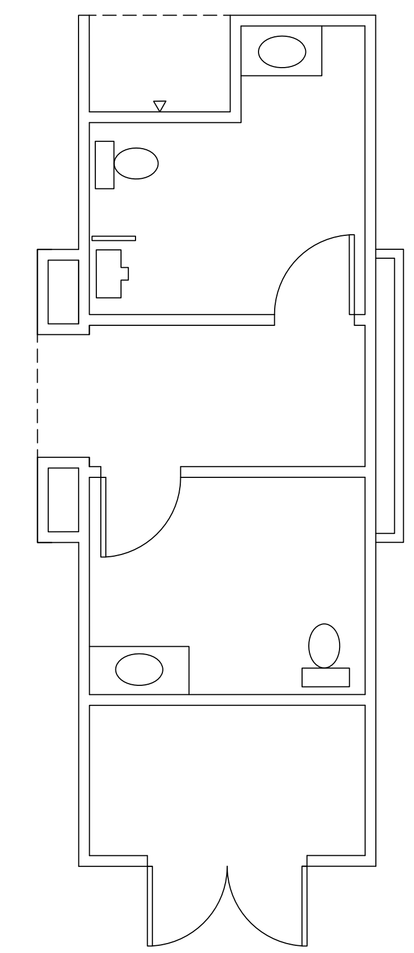
RIGHT ELEVATION SCALE: 1/8"=1'-0"



LEFT ELEVATION SCALE: 1/8"=1'-0"



ROOF PLAN SCALE: 1/8"=1'-0"
POOL BATH



FLOOR PLAN SCALE: 1/8"=1'-0"
POOL BATH
274 SQ. FT.

HARRIS FARM
A PROPOSED NEW TOWNHOME COMMUNITY

HARRIS FARM
R.C. HOBBS CO.

POOL BATH

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LAURA SCHLANGE
COLOR CONSULTANT
(949) 293-3716

R.C. HOBBS COMPANY

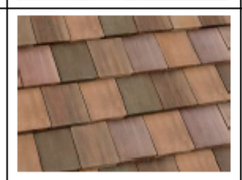
HARRIS FARM

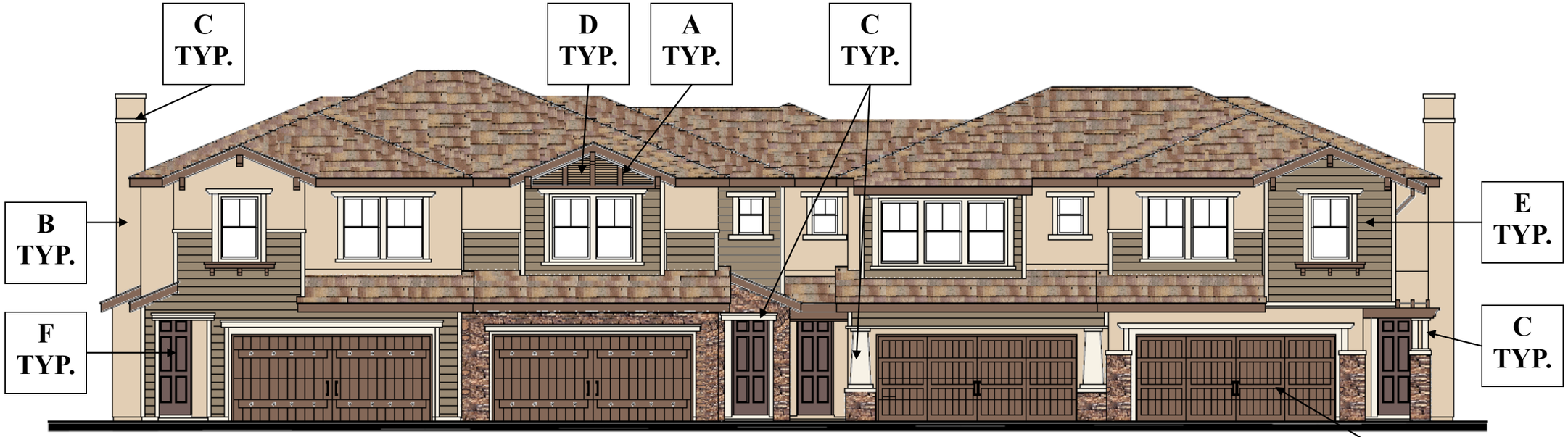
PRELIMINARY EXTERIOR COLOR SCHEDULE

PAINT: FZ: FRAZEE PAINT
ROOF: EAGLE ROOF TILE

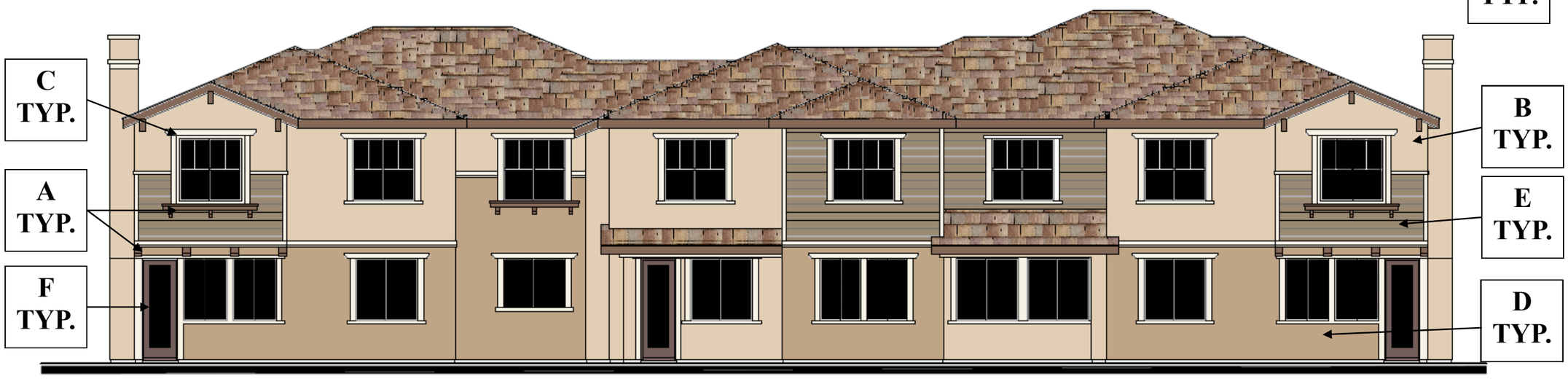
STUCCO: TBD
STONE: EL DORADO STONE

1 ISSUED FOR APPROVAL 9/24/15

	CODE	COLOR	SCHEME
WOOD FASCIA, TRIM, POT SHELVES, RAFTER TAILS & GARAGE DOORS	A		CL 2626A SHARP SWIG
STUCCO PAINT MATCH	B		CL 2732W GYPSUM
WOOD & STUCCO TRIM	C		CLW 1018W GRIZZLY CREEK
ACCENT STUCCO PAINT MATCH & WOOD ACCENT	D		CLC 1253D PUEBLO
SIDING	E		CL 2835D YANEZ
DOORS	F		CL 2516D DRUNKEN LIPS
STONE			SEQUOIA RUSTIC LEDGE (DRYSTACKED)
ROOF FLAT "SLATE" TILE			SCB 8826 AUGUSTA



FRONT ELEVATION



REAR ELEVATION

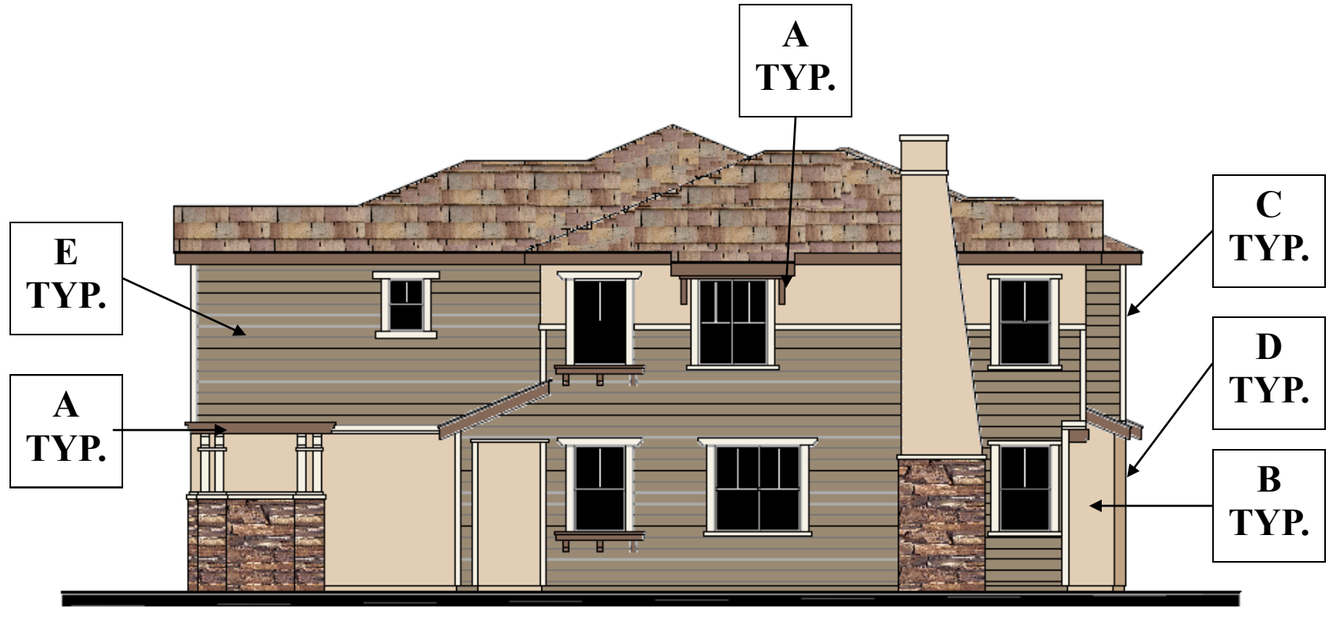
SCALE: 1/4"=1'-0'

HARRIS FARM

A PROPOSED NEW TOWNHOME COMMUNITY

R.C. HOBBS CO.

LSA Architecture



RIGHT ELEVATION

SCALE: 1/4"=1'-0"

LEFT ELEVATION

SCALE: 1/4"=1'-0"

HARRIS FARM

A PROPOSED NEW TOWNHOME COMMUNITY

R.C. HOBBS CO.

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Appendix C

Air Quality/Greenhouse Gas Emissions Data

Harris Farm Townhome Project

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	36.00	Dwelling Unit	1.09	47,614.00	115
Other Asphalt Surfaces	0.67	Acre	0.67	29,206.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2018
Utility Company	Riverside Public Utilities				
CO2 Intensity (lb/MWhr)	1325.65	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and Building Footprint Sqaure Footage from Civil Engineer.
Total site is 2.96 net acres with 1.09 acres of structures, 0.67 acres of asphalt drive aisles and 1.20 acres of landscaping.
Population based on 3.2 persons per household as identified in Riverside General Plan Housing Element.

Construction Phase - Construction estimates

Off-road Equipment - Equipment estimates.

Grading - Total site acreage is 2.96 net acres.

Demolition - Demolition of 858 square foot residence and outbuildings including a barn and greenhouses.

Woodstoves - As per SCAQMD Rule 455, no wood fireplaces are allowed in new developments.
The developer has elected to have no fireplaces within the units.

Operational Off-Road Equipment - None

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	15.00
tblConstructionPhase	NumDays	200.00	175.00
tblConstructionPhase	NumDays	20.00	19.00
tblConstructionPhase	NumDays	4.00	20.00
tblConstructionPhase	NumDays	10.00	16.00
tblConstructionPhase	NumDays	2.00	5.00
tblConstructionPhase	PhaseStartDate	3/4/2017	3/6/2017
tblConstructionPhase	PhaseStartDate	2/4/2017	2/6/2017
tblConstructionPhase	PhaseStartDate	11/4/2017	11/6/2017

tblConstructionPhase	PhaseStartDate	1/28/2017	1/30/2017
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	30.60	0.00
tblFireplaces	NumberNoFireplace	3.60	0.00
tblFireplaces	NumberWood	1.80	0.00
tblGrading	AcresOfGrading	7.50	2.96
tblGrading	AcresOfGrading	2.50	1.00
tblLandUse	LandUseSquareFeet	36,000.00	47,614.00
tblLandUse	LandUseSquareFeet	29,185.20	29,206.00
tblLandUse	LotAcreage	2.25	1.09
tblLandUse	Population	103.00	115.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblSequestration	NumberOfNewTrees	0.00	140.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblWoodstoves	NumberCatalytic	1.80	0.00
tblWoodstoves	NumberNoncatalytic	1.80	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	70.3131	26.7516	21.5473	0.0293	5.5709	1.6090	6.8783	2.9431	1.5048	4.1459	0.0000	2,662.0285	2,662.0285	0.6294	0.0000	2,675.2457
Total	**70.3131**	**26.7516**	**21.5473**	**0.0293**	**5.5709**	**1.6090**	**6.8783**	**2.9431**	**1.5048**	**4.1459**	**0.0000**	**2,662.0285**	**2,662.0285**	**0.6294**	**0.0000**	**2,675.2457**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	70.3131	26.7516	21.5473	0.0293	2.5561	1.6090	3.8635	1.3374	1.5048	2.5403	0.0000	2,662.0285	2,662.0285	0.6294	0.0000	2,675.2457
Total	**70.3131**	**26.7516**	**21.5473**	**0.0293**	**2.5561**	**1.6090**	**3.8635**	**1.3374**	**1.5048**	**2.5403**	**0.0000**	**2,662.0285**	**2,662.0285**	**0.6294**	**0.0000**	**2,675.2457**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**54.12**	**0.00**	**43.83**	**54.56**	**0.00**	**38.73**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593
Energy	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Mobile	0.8498	2.4859	10.0111	0.0280	1.8682	0.0384	1.9067	0.4992	0.0354	0.5346		2,308.9147	2,308.9147	0.0835		2,310.6689
Total	**2.7725**	**2.7079**	**13.0819**	**0.0293**	**1.8682**	**0.0699**	**1.9381**	**0.4992**	**0.0669**	**0.5660**	**0.0000**	**2,553.3599**	**2,553.3599**	**0.0934**	**4.3800e-003**	**2,556.6806**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593
Energy	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Mobile	0.8438	2.4424	9.8506	0.0274	1.8301	0.0377	1.8678	0.4890	0.0347	0.5237		2,262.9344	2,262.9344	0.0820		2,264.6556
Total	**2.7665**	**2.6644**	**12.9214**	**0.0288**	**1.8301**	**0.0691**	**1.8992**	**0.4890**	**0.0662**	**0.5552**	**0.0000**	**2,507.3796**	**2,507.3796**	**0.0918**	**4.3800e-003**	**2,510.6672**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.22**	**1.61**	**1.23**	**1.91**	**2.04**	**1.06**	**2.01**	**2.04**	**1.03**	**1.92**	**0.00**	**1.80**	**1.80**	**1.68**	**0.00**	**1.80**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/3/2017	1/27/2017	5	19	
2	Site Preparation	Site Preparation	1/30/2017	2/3/2017	5	5	
3	Grading	Grading	2/6/2017	3/3/2017	5	20	
4	Building Construction	Building Construction	3/6/2017	11/3/2017	5	175	
5	Paving	Paving	11/6/2017	11/27/2017	5	16	
6	Architectural Coating	Architectural Coating	11/28/2017	12/18/2017	5	15	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 2.96

Acres of Paving: 0

Residential Indoor: 96,418; Residential Outdoor: 32,139; Non-Residential Indoor: 43,809; Non-Residential Outdoor: 14,603 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	174	0.41
Paving	Pavers	1	6.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Paving	Paving Equipment	1	8.00	130	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	10.00	0.00	9.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	38.00	9.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1036	0.0000	0.1036	0.0157	0.0000	0.0157			0.0000			0.0000
Off-Road	2.7216	26.5855	20.8712	0.0245		1.6062	1.6062		1.5022	1.5022		2,457.4682	2,457.4682	0.6235		2,470.5620
Total	**2.7216**	**26.5855**	**20.8712**	**0.0245**	**0.1036**	**1.6062**	**1.7098**	**0.0157**	**1.5022**	**1.5179**		**2,457.4682**	**2,457.4682**	**0.6235**		**2,470.5620**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.6600e-003	0.1190	0.0881	3.5000e-004	8.2500e-003	1.8800e-003	0.0101	2.2600e-003	1.7300e-003	3.9900e-003		34.6241	34.6241	2.4000e-004		34.6292
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0375	0.0472	0.5880	1.4200e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		114.3934	114.3934	5.6300e-003		114.5116
Total	**0.0452**	**0.1662**	**0.6760**	**1.7700e-003**	**0.1200**	**2.7800e-003**	**0.1228**	**0.0319**	**2.5600e-003**	**0.0345**		**149.0174**	**149.0174**	**5.8700e-003**		**149.1408**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0466	0.0000	0.0466	7.0600e-003	0.0000	7.0600e-003			0.0000			0.0000
Off-Road	2.7216	26.5855	20.8712	0.0245		1.6062	1.6062		1.5022	1.5022	0.0000	2,457.4682	2,457.4682	0.6235		2,470.5620
Total	**2.7216**	**26.5855**	**20.8712**	**0.0245**	**0.0466**	**1.6062**	**1.6528**	**7.0600e-003**	**1.5022**	**1.5093**	**0.0000**	**2,457.4682**	**2,457.4682**	**0.6235**		**2,470.5620**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.6600e-003	0.1190	0.0881	3.5000e-004	8.2500e-003	1.8800e-003	0.0101	2.2600e-003	1.7300e-003	3.9900e-003		34.6241	34.6241	2.4000e-004		34.6292
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0375	0.0472	0.5880	1.4200e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		114.3934	114.3934	5.6300e-003		114.5116
Total	**0.0452**	**0.1662**	**0.6760**	**1.7700e-003**	**0.1200**	**2.7800e-003**	**0.1228**	**0.0319**	**2.5600e-003**	**0.0345**		**149.0174**	**149.0174**	**5.8700e-003**		**149.1408**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.4814	0.0000	5.4814	2.9194	0.0000	2.9194			0.0000			0.0000
Off-Road	2.3109	24.2288	15.9299	0.0171		1.3067	1.3067		1.2022	1.2022		1,752.1239	1,752.1239	0.5369		1,763.3977
Total	**2.3109**	**24.2288**	**15.9299**	**0.0171**	**5.4814**	**1.3067**	**6.7882**	**2.9194**	**1.2022**	**4.1216**		**1,752.1239**	**1,752.1239**	**0.5369**		**1,763.3977**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0300	0.0377	0.4704	1.1300e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		91.5147	91.5147	4.5000e-003		91.6093
Total	**0.0300**	**0.0377**	**0.4704**	**1.1300e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**91.5147**	**91.5147**	**4.5000e-003**		**91.6093**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4666	0.0000	2.4666	1.3137	0.0000	1.3137			0.0000			0.0000
Off-Road	2.3109	24.2288	15.9299	0.0171		1.3067	1.3067		1.2022	1.2022	0.0000	1,752.1239	1,752.1239	0.5369		1,763.3977
Total	**2.3109**	**24.2288**	**15.9299**	**0.0171**	**2.4666**	**1.3067**	**3.7734**	**1.3137**	**1.2022**	**2.5159**	**0.0000**	**1,752.1239**	**1,752.1239**	**0.5369**		**1,763.3977**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0300	0.0377	0.4704	1.1300e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		91.5147	91.5147	4.5000e-003		91.6093
Total	**0.0300**	**0.0377**	**0.4704**	**1.1300e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**91.5147**	**91.5147**	**4.5000e-003**		**91.6093**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.6735	0.0000	4.6735	2.4996	0.0000	2.4996			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808		1,439.1894	1,439.1894	0.4410		1,448.4496
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**4.6735**	**1.0661**	**5.7396**	**2.4996**	**0.9808**	**3.4805**		**1,439.1894**	**1,439.1894**	**0.4410**		**1,448.4496**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0300	0.0377	0.4704	1.1300e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		91.5147	91.5147	4.5000e-003		91.6093
Total	**0.0300**	**0.0377**	**0.4704**	**1.1300e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**91.5147**	**91.5147**	**4.5000e-003**		**91.6093**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.1031	0.0000	2.1031	1.1248	0.0000	1.1248			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808	0.0000	1,439.1894	1,439.1894	0.4410		1,448.4496
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**2.1031**	**1.0661**	**3.1692**	**1.1248**	**0.9808**	**2.1057**	**0.0000**	**1,439.1894**	**1,439.1894**	**0.4410**		**1,448.4496**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0300	0.0377	0.4704	1.1300e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		91.5147	91.5147	4.5000e-003		91.6093
Total	**0.0300**	**0.0377**	**0.4704**	**1.1300e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**91.5147**	**91.5147**	**4.5000e-003**		**91.6093**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823		2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**		**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0687	0.7073	0.8429	1.9500e-003	0.0563	0.0114	0.0677	0.0160	0.0105	0.0265		193.0477	193.0477	1.3500e-003		193.0761
Worker	0.1427	0.1792	2.2342	5.3800e-003	0.4248	3.4200e-003	0.4282	0.1127	3.1500e-003	0.1158		434.6947	434.6947	0.0214		435.1441
Total	**0.2113**	**0.8865**	**3.0772**	**7.3300e-003**	**0.4810**	**0.0148**	**0.4959**	**0.1287**	**0.0137**	**0.1423**		**627.7424**	**627.7424**	**0.0228**		**628.2202**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823	0.0000	2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**	**0.0000**	**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0687	0.7073	0.8429	1.9500e-003	0.0563	0.0114	0.0677	0.0160	0.0105	0.0265		193.0477	193.0477	1.3500e-003		193.0761
Worker	0.1427	0.1792	2.2342	5.3800e-003	0.4248	3.4200e-003	0.4282	0.1127	3.1500e-003	0.1158		434.6947	434.6947	0.0214		435.1441
Total	**0.2113**	**0.8865**	**3.0772**	**7.3300e-003**	**0.4810**	**0.0148**	**0.4959**	**0.1287**	**0.0137**	**0.1423**		**627.7424**	**627.7424**	**0.0228**		**628.2202**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755		1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.1097					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2954**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**		**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0488	0.0613	0.7644	1.8400e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		148.7114	148.7114	7.3200e-003		148.8651
Total	**0.0488**	**0.0613**	**0.7644**	**1.8400e-003**	**0.1453**	**1.1700e-003**	**0.1465**	**0.0385**	**1.0800e-003**	**0.0396**		**148.7114**	**148.7114**	**7.3200e-003**		**148.8651**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755	0.0000	1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.1097					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2954**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**	**0.0000**	**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0488	0.0613	0.7644	1.8400e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		148.7114	148.7114	7.3200e-003		148.8651
Total	**0.0488**	**0.0613**	**0.7644**	**1.8400e-003**	**0.1453**	**1.1700e-003**	**0.1465**	**0.0385**	**1.0800e-003**	**0.0396**		**148.7114**	**148.7114**	**7.3200e-003**		**148.8651**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.9508					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**70.2831**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0300	0.0377	0.4704	1.1300e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		91.5147	91.5147	4.5000e-003		91.6093
Total	**0.0300**	**0.0377**	**0.4704**	**1.1300e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**91.5147**	**91.5147**	**4.5000e-003**		**91.6093**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.9508					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**70.2831**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0300	0.0377	0.4704	1.1300e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		91.5147	91.5147	4.5000e-003		91.6093
Total	**0.0300**	**0.0377**	**0.4704**	**1.1300e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**91.5147**	**91.5147**	**4.5000e-003**		**91.6093**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8438	2.4424	9.8506	0.0274	1.8301	0.0377	1.8678	0.4890	0.0347	0.5237		2,262.9344	2,262.9344	0.0820		2,264.6556
Unmitigated	0.8498	2.4859	10.0111	0.0280	1.8682	0.0384	1.9067	0.4992	0.0354	0.5346		2,308.9147	2,308.9147	0.0835		2,310.6689

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	237.24	257.76	218.52	811,564	794,996
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	237.24	257.76	218.52	811,564	794,996

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.511172	0.060004	0.180590	0.138995	0.042398	0.006681	0.016070	0.032568	0.001938	0.002493	0.004370	0.000586	0.002135

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
NaturalGas Unmitigated	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2032.33	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Total		**0.0219**	**0.1873**	**0.0797**	**1.2000e-003**		**0.0151**	**0.0151**		**0.0151**	**0.0151**		**239.0972**	**239.0972**	**4.5800e-003**	**4.3800e-003**	**240.5523**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	2.03233	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0219**	**0.1873**	**0.0797**	**1.2000e-003**		**0.0151**	**0.0151**		**0.0151**	**0.0151**		**239.0972**	**239.0972**	**4.5800e-003**	**4.3800e-003**	**240.5523**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

No Hearths Installed

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593
Unmitigated	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5210					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0922	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163		5.3480	5.3480	5.3000e-003		5.4593
Total	**1.9007**	**0.0347**	**2.9911**	**1.6000e-004**		**0.0163**	**0.0163**		**0.0163**	**0.0163**	**0.0000**	**5.3480**	**5.3480**	**5.3000e-003**	**0.0000**	**5.4593**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5210					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0922	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163		5.3480	5.3480	5.3000e-003		5.4593
Total	**1.9007**	**0.0347**	**2.9911**	**1.6000e-004**		**0.0163**	**0.0163**		**0.0163**	**0.0163**	**0.0000**	**5.3480**	**5.3480**	**5.3000e-003**	**0.0000**	**5.4593**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Vegetation

Harris Farm Townhome Project

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	36.00	Dwelling Unit	1.09	47,614.00	115
Other Asphalt Surfaces	0.67	Acre	0.67	29,206.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2018
Utility Company	Riverside Public Utilities				
CO2 Intensity (lb/MWhr)	1325.65	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and Building Footprint Sqaure Footage from Civil Engineer.
Total site is 2.96 net acres with 1.09 acres of structures, 0.67 acres of asphalt drive aisles and 1.20 acres of landscaping.
Population based on 3.2 persons per household as identified in Riverside General Plan Housing Element.

Construction Phase - Construction estimates

Off-road Equipment - Equipment estimates.

Grading - Total site acreage is 2.96 net acres.

Demolition - Demolition of 858 square foot residence and outbuildings including a barn and greenhouses.

Woodstoves - As per SCAQMD Rule 455, no wood fireplaces are allowed in new developments.
The developer has elected to have no fireplaces within the units.

Operational Off-Road Equipment - None

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	15.00
tblConstructionPhase	NumDays	200.00	175.00
tblConstructionPhase	NumDays	20.00	19.00
tblConstructionPhase	NumDays	4.00	20.00
tblConstructionPhase	NumDays	10.00	16.00
tblConstructionPhase	NumDays	2.00	5.00
tblConstructionPhase	PhaseStartDate	3/4/2017	3/6/2017
tblConstructionPhase	PhaseStartDate	2/4/2017	2/6/2017
tblConstructionPhase	PhaseStartDate	11/4/2017	11/6/2017

tblConstructionPhase	PhaseStartDate	1/28/2017	1/30/2017
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	30.60	0.00
tblFireplaces	NumberNoFireplace	3.60	0.00
tblFireplaces	NumberWood	1.80	0.00
tblGrading	AcresOfGrading	7.50	2.96
tblGrading	AcresOfGrading	2.50	1.00
tblLandUse	LandUseSquareFeet	36,000.00	47,614.00
tblLandUse	LandUseSquareFeet	29,185.20	29,206.00
tblLandUse	LotAcreage	2.25	1.09
tblLandUse	Population	103.00	115.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblSequestration	NumberOfNewTrees	0.00	140.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblWoodstoves	NumberCatalytic	1.80	0.00
tblWoodstoves	NumberNoncatalytic	1.80	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	70.3137	26.7605	21.5126	0.0289	5.5709	1.6090	6.8783	2.9431	1.5048	4.1459	0.0000	2,633.3979	2,633.3979	0.6294	0.0000	2,646.6152
Total	**70.3137**	**26.7605**	**21.5126**	**0.0289**	**5.5709**	**1.6090**	**6.8783**	**2.9431**	**1.5048**	**4.1459**	**0.0000**	**2,633.3979**	**2,633.3979**	**0.6294**	**0.0000**	**2,646.6152**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	70.3137	26.7605	21.5126	0.0289	2.5561	1.6090	3.8635	1.3374	1.5048	2.5403	0.0000	2,633.3979	2,633.3979	0.6294	0.0000	2,646.6152
Total	**70.3137**	**26.7605**	**21.5126**	**0.0289**	**2.5561**	**1.6090**	**3.8635**	**1.3374**	**1.5048**	**2.5403**	**0.0000**	**2,633.3979**	**2,633.3979**	**0.6294**	**0.0000**	**2,646.6152**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**54.12**	**0.00**	**43.83**	**54.56**	**0.00**	**38.73**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593
Energy	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Mobile	0.8742	2.6127	9.8239	0.0266	1.8682	0.0385	1.9068	0.4992	0.0355	0.5347		2,198.5597	2,198.5597	0.0836		2,200.3155
Total	**2.7968**	**2.8347**	**12.8947**	**0.0279**	**1.8682**	**0.0700**	**1.9383**	**0.4992**	**0.0670**	**0.5662**	**0.0000**	**2,443.0049**	**2,443.0049**	**0.0935**	**4.3800e-003**	**2,446.3271**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593
Energy	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Mobile	0.8684	2.5667	9.6800	0.0261	1.8301	0.0378	1.8679	0.4890	0.0348	0.5238		2,154.7851	2,154.7851	0.0820		2,156.5078
Total	**2.7911**	**2.7887**	**12.7508**	**0.0274**	**1.8301**	**0.0693**	**1.8994**	**0.4890**	**0.0663**	**0.5553**	**0.0000**	**2,399.2303**	**2,399.2303**	**0.0919**	**4.3800e-003**	**2,402.5195**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.21**	**1.62**	**1.12**	**1.90**	**2.04**	**1.06**	**2.01**	**2.04**	**1.02**	**1.92**	**0.00**	**1.79**	**1.79**	**1.68**	**0.00**	**1.79**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/3/2017	1/27/2017	5	19	
2	Site Preparation	Site Preparation	1/30/2017	2/3/2017	5	5	
3	Grading	Grading	2/6/2017	3/3/2017	5	20	
4	Building Construction	Building Construction	3/6/2017	11/3/2017	5	175	
5	Paving	Paving	11/6/2017	11/27/2017	5	16	
6	Architectural Coating	Architectural Coating	11/28/2017	12/18/2017	5	15	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 2.96

Acres of Paving: 0

Residential Indoor: 96,418; Residential Outdoor: 32,139; Non-Residential Indoor: 43,809; Non-Residential Outdoor: 14,603 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	174	0.41
Paving	Pavers	1	6.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Paving	Paving Equipment	1	8.00	130	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	10.00	0.00	9.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	38.00	9.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1036	0.0000	0.1036	0.0157	0.0000	0.0157			0.0000			0.0000
Off-Road	2.7216	26.5855	20.8712	0.0245		1.6062	1.6062		1.5022	1.5022		2,457.4682	2,457.4682	0.6235		2,470.5620
Total	**2.7216**	**26.5855**	**20.8712**	**0.0245**	**0.1036**	**1.6062**	**1.7098**	**0.0157**	**1.5022**	**1.5179**		**2,457.4682**	**2,457.4682**	**0.6235**		**2,470.5620**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.0600e-003	0.1233	0.1016	3.5000e-004	8.2500e-003	1.8900e-003	0.0101	2.2600e-003	1.7400e-003	4.0000e-003		34.5417	34.5417	2.5000e-004		34.5469
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0382	0.0518	0.5398	1.3300e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		107.2861	107.2861	5.6300e-003		107.4043
Total	**0.0463**	**0.1751**	**0.6414**	**1.6800e-003**	**0.1200**	**2.7900e-003**	**0.1228**	**0.0319**	**2.5700e-003**	**0.0345**		**141.8277**	**141.8277**	**5.8800e-003**		**141.9512**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0466	0.0000	0.0466	7.0600e-003	0.0000	7.0600e-003			0.0000			0.0000
Off-Road	2.7216	26.5855	20.8712	0.0245		1.6062	1.6062		1.5022	1.5022	0.0000	2,457.4682	2,457.4682	0.6235		2,470.5620
Total	**2.7216**	**26.5855**	**20.8712**	**0.0245**	**0.0466**	**1.6062**	**1.6528**	**7.0600e-003**	**1.5022**	**1.5093**	**0.0000**	**2,457.4682**	**2,457.4682**	**0.6235**		**2,470.5620**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.0600e-003	0.1233	0.1016	3.5000e-004	8.2500e-003	1.8900e-003	0.0101	2.2600e-003	1.7400e-003	4.0000e-003		34.5417	34.5417	2.5000e-004		34.5469
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0382	0.0518	0.5398	1.3300e-003	0.1118	9.0000e-004	0.1127	0.0296	8.3000e-004	0.0305		107.2861	107.2861	5.6300e-003		107.4043
Total	**0.0463**	**0.1751**	**0.6414**	**1.6800e-003**	**0.1200**	**2.7900e-003**	**0.1228**	**0.0319**	**2.5700e-003**	**0.0345**		**141.8277**	**141.8277**	**5.8800e-003**		**141.9512**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.4814	0.0000	5.4814	2.9194	0.0000	2.9194			0.0000			0.0000
Off-Road	2.3109	24.2288	15.9299	0.0171		1.3067	1.3067		1.2022	1.2022		1,752.1239	1,752.1239	0.5369		1,763.3977
Total	**2.3109**	**24.2288**	**15.9299**	**0.0171**	**5.4814**	**1.3067**	**6.7882**	**2.9194**	**1.2022**	**4.1216**		**1,752.1239**	**1,752.1239**	**0.5369**		**1,763.3977**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0306	0.0414	0.4318	1.0600e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		85.8289	85.8289	4.5000e-003		85.9235
Total	**0.0306**	**0.0414**	**0.4318**	**1.0600e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**85.8289**	**85.8289**	**4.5000e-003**		**85.9235**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4666	0.0000	2.4666	1.3137	0.0000	1.3137			0.0000			0.0000
Off-Road	2.3109	24.2288	15.9299	0.0171		1.3067	1.3067		1.2022	1.2022	0.0000	1,752.1239	1,752.1239	0.5369		1,763.3977
Total	**2.3109**	**24.2288**	**15.9299**	**0.0171**	**2.4666**	**1.3067**	**3.7734**	**1.3137**	**1.2022**	**2.5159**	**0.0000**	**1,752.1239**	**1,752.1239**	**0.5369**		**1,763.3977**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0306	0.0414	0.4318	1.0600e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		85.8289	85.8289	4.5000e-003		85.9235
Total	**0.0306**	**0.0414**	**0.4318**	**1.0600e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**85.8289**	**85.8289**	**4.5000e-003**		**85.9235**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.6735	0.0000	4.6735	2.4996	0.0000	2.4996			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808		1,439.1894	1,439.1894	0.4410		1,448.4496
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**4.6735**	**1.0661**	**5.7396**	**2.4996**	**0.9808**	**3.4805**		**1,439.1894**	**1,439.1894**	**0.4410**		**1,448.4496**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0306	0.0414	0.4318	1.0600e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		85.8289	85.8289	4.5000e-003		85.9235
Total	**0.0306**	**0.0414**	**0.4318**	**1.0600e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**85.8289**	**85.8289**	**4.5000e-003**		**85.9235**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.1031	0.0000	2.1031	1.1248	0.0000	1.1248			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808	0.0000	1,439.1894	1,439.1894	0.4410		1,448.4496
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**2.1031**	**1.0661**	**3.1692**	**1.1248**	**0.9808**	**2.1057**	**0.0000**	**1,439.1894**	**1,439.1894**	**0.4410**		**1,448.4496**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0306	0.0414	0.4318	1.0600e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		85.8289	85.8289	4.5000e-003		85.9235
Total	**0.0306**	**0.0414**	**0.4318**	**1.0600e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**85.8289**	**85.8289**	**4.5000e-003**		**85.9235**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823		2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**		**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0750	0.7247	1.0215	1.9400e-003	0.0563	0.0115	0.0678	0.0160	0.0106	0.0266		191.4248	191.4248	1.4000e-003		191.4541
Worker	0.1453	0.1966	2.0512	5.0400e-003	0.4248	3.4200e-003	0.4282	0.1127	3.1500e-003	0.1158		407.6871	407.6871	0.0214		408.1365
Total	**0.2203**	**0.9213**	**3.0727**	**6.9800e-003**	**0.4810**	**0.0150**	**0.4960**	**0.1287**	**0.0138**	**0.1424**		**599.1119**	**599.1119**	**0.0228**		**599.5906**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823	0.0000	2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**	**0.0000**	**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0750	0.7247	1.0215	1.9400e-003	0.0563	0.0115	0.0678	0.0160	0.0106	0.0266		191.4248	191.4248	1.4000e-003		191.4541
Worker	0.1453	0.1966	2.0512	5.0400e-003	0.4248	3.4200e-003	0.4282	0.1127	3.1500e-003	0.1158		407.6871	407.6871	0.0214		408.1365
Total	**0.2203**	**0.9213**	**3.0727**	**6.9800e-003**	**0.4810**	**0.0150**	**0.4960**	**0.1287**	**0.0138**	**0.1424**		**599.1119**	**599.1119**	**0.0228**		**599.5906**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755		1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.1097					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2954**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**		**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0497	0.0673	0.7017	1.7200e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		139.4719	139.4719	7.3200e-003		139.6256
Total	**0.0497**	**0.0673**	**0.7017**	**1.7200e-003**	**0.1453**	**1.1700e-003**	**0.1465**	**0.0385**	**1.0800e-003**	**0.0396**		**139.4719**	**139.4719**	**7.3200e-003**		**139.6256**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755	0.0000	1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.1097					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2954**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**	**0.0000**	**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0497	0.0673	0.7017	1.7200e-003	0.1453	1.1700e-003	0.1465	0.0385	1.0800e-003	0.0396		139.4719	139.4719	7.3200e-003		139.6256
Total	**0.0497**	**0.0673**	**0.7017**	**1.7200e-003**	**0.1453**	**1.1700e-003**	**0.1465**	**0.0385**	**1.0800e-003**	**0.0396**		**139.4719**	**139.4719**	**7.3200e-003**		**139.6256**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.9508					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**70.2831**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0306	0.0414	0.4318	1.0600e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		85.8289	85.8289	4.5000e-003		85.9235
Total	**0.0306**	**0.0414**	**0.4318**	**1.0600e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**85.8289**	**85.8289**	**4.5000e-003**		**85.9235**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.9508					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**70.2831**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0306	0.0414	0.4318	1.0600e-003	0.0894	7.2000e-004	0.0901	0.0237	6.6000e-004	0.0244		85.8289	85.8289	4.5000e-003		85.9235
Total	**0.0306**	**0.0414**	**0.4318**	**1.0600e-003**	**0.0894**	**7.2000e-004**	**0.0901**	**0.0237**	**6.6000e-004**	**0.0244**		**85.8289**	**85.8289**	**4.5000e-003**		**85.9235**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8684	2.5667	9.6800	0.0261	1.8301	0.0378	1.8679	0.4890	0.0348	0.5238		2,154.7851	2,154.7851	0.0820		2,156.5078
Unmitigated	0.8742	2.6127	9.8239	0.0266	1.8682	0.0385	1.9068	0.4992	0.0355	0.5347		2,198.5597	2,198.5597	0.0836		2,200.3155

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	237.24	257.76	218.52	811,564	794,996
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	237.24	257.76	218.52	811,564	794,996

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.511172	0.060004	0.180590	0.138995	0.042398	0.006681	0.016070	0.032568	0.001938	0.002493	0.004370	0.000586	0.002135

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
NaturalGas Unmitigated	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2032.33	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Total		**0.0219**	**0.1873**	**0.0797**	**1.2000e-003**		**0.0151**	**0.0151**		**0.0151**	**0.0151**		**239.0972**	**239.0972**	**4.5800e-003**	**4.3800e-003**	**240.5523**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	2.03233	0.0219	0.1873	0.0797	1.2000e-003		0.0151	0.0151		0.0151	0.0151		239.0972	239.0972	4.5800e-003	4.3800e-003	240.5523
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0219**	**0.1873**	**0.0797**	**1.2000e-003**		**0.0151**	**0.0151**		**0.0151**	**0.0151**		**239.0972**	**239.0972**	**4.5800e-003**	**4.3800e-003**	**240.5523**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

No Hearths Installed

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593
Unmitigated	1.9007	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163	0.0000	5.3480	5.3480	5.3000e-003	0.0000	5.4593

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5210					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0922	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163		5.3480	5.3480	5.3000e-003		5.4593
Total	**1.9007**	**0.0347**	**2.9911**	**1.6000e-004**		**0.0163**	**0.0163**		**0.0163**	**0.0163**	**0.0000**	**5.3480**	**5.3480**	**5.3000e-003**	**0.0000**	**5.4593**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5210					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0922	0.0347	2.9911	1.6000e-004		0.0163	0.0163		0.0163	0.0163		5.3480	5.3480	5.3000e-003		5.4593
Total	**1.9007**	**0.0347**	**2.9911**	**1.6000e-004**		**0.0163**	**0.0163**		**0.0163**	**0.0163**	**0.0000**	**5.3480**	**5.3480**	**5.3000e-003**	**0.0000**	**5.4593**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Vegetation

Harris Farm Townhome Project

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	36.00	Dwelling Unit	1.09	47,614.00	115
Other Asphalt Surfaces	0.67	Acre	0.67	29,206.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2018
Utility Company	Riverside Public Utilities				
CO2 Intensity (lb/MWhr)	1325.65	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and Building Footprint Sqaure Footage from Civil Engineer.
Total site is 2.96 net acres with 1.09 acres of structures, 0.67 acres of asphalt drive aisles and 1.20 acres of landscaping.
Population based on 3.2 persons per household as identified in Riverside General Plan Housing Element.

Construction Phase - Construction estimates

Off-road Equipment - Equipment estimates.

Grading - Total site acreage is 2.96 net acres.

Demolition - Demolition of 858 square foot residence and outbuildings including a barn and greenhouses.

Woodstoves - As per SCAQMD Rule 455, no wood fireplaces are allowed in new developments.
The developer has elected to have no fireplaces within the units.

Operational Off-Road Equipment - None

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	15.00
tblConstructionPhase	NumDays	200.00	175.00
tblConstructionPhase	NumDays	20.00	19.00
tblConstructionPhase	NumDays	4.00	20.00
tblConstructionPhase	NumDays	10.00	16.00
tblConstructionPhase	NumDays	2.00	5.00
tblConstructionPhase	PhaseStartDate	3/4/2017	3/6/2017
tblConstructionPhase	PhaseStartDate	2/4/2017	2/6/2017
tblConstructionPhase	PhaseStartDate	11/4/2017	11/6/2017

tblConstructionPhase	PhaseStartDate	1/28/2017	1/30/2017
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	30.60	0.00
tblFireplaces	NumberNoFireplace	3.60	0.00
tblFireplaces	NumberWood	1.80	0.00
tblGrading	AcresOfGrading	7.50	2.96
tblGrading	AcresOfGrading	2.50	1.00
tblLandUse	LandUseSquareFeet	36,000.00	47,614.00
tblLandUse	LandUseSquareFeet	29,185.20	29,206.00
tblLandUse	LotAcreage	2.25	1.09
tblLandUse	Population	103.00	115.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblSequestration	NumberOfNewTrees	0.00	140.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblWoodstoves	NumberCatalytic	1.80	0.00
tblWoodstoves	NumberNoncatalytic	1.80	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.8662	2.3817	2.0000	3.1400e-003	0.1068	0.1450	0.2517	0.0446	0.1385	0.1831	0.0000	263.3643	263.3643	0.0496	0.0000	264.4061
Total	**0.8662**	**2.3817**	**2.0000**	**3.1400e-003**	**0.1068**	**0.1450**	**0.2517**	**0.0446**	**0.1385**	**0.1831**	**0.0000**	**263.3643**	**263.3643**	**0.0496**	**0.0000**	**264.4061**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.8662	2.3817	2.0000	3.1400e-003	0.0730	0.1450	0.2179	0.0267	0.1385	0.1652	0.0000	263.3640	263.3640	0.0496	0.0000	264.4058
Total	**0.8662**	**2.3817**	**2.0000**	**3.1400e-003**	**0.0730**	**0.1450**	**0.2179**	**0.0267**	**0.1385**	**0.1652**	**0.0000**	**263.3640**	**263.3640**	**0.0496**	**0.0000**	**264.4058**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**31.65**	**0.00**	**13.42**	**40.02**	**0.00**	**9.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3416	4.3400e-003	0.3739	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6065	0.6065	6.0000e-004	0.0000	0.6191
Energy	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7600e-003	2.7600e-003		2.7600e-003	2.7600e-003	0.0000	145.1467	145.1467	3.0700e-003	1.2000e-003	145.5842
Mobile	0.1396	0.4468	1.6647	4.5100e-003	0.3076	6.4400e-003	0.3140	0.0823	5.9400e-003	0.0883	0.0000	338.1062	338.1062	0.0127	0.0000	338.3729
Waste						0.0000	0.0000		0.0000	0.0000	3.3615	0.0000	3.3615	0.1987	0.0000	7.5334
Water						0.0000	0.0000		0.0000	0.0000	0.7441	28.2432	28.9873	0.0771	1.9300e-003	31.2044
Total	**0.4852**	**0.4854**	**2.0531**	**4.7500e-003**	**0.3076**	**0.0112**	**0.3188**	**0.0823**	**0.0107**	**0.0931**	**4.1057**	**512.1026**	**516.2082**	**0.2921**	**3.1300e-003**	**523.3140**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3416	4.3400e-003	0.3739	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6065	0.6065	6.0000e-004	0.0000	0.6191
Energy	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7600e-003	2.7600e-003		2.7600e-003	2.7600e-003	0.0000	141.9953	141.9953	3.0000e-003	1.1900e-003	142.4269
Mobile	0.1386	0.4390	1.6399	4.4200e-003	0.3013	6.3200e-003	0.3076	0.0806	5.8200e-003	0.0865	0.0000	331.3765	331.3765	0.0125	0.0000	331.6381
Waste						0.0000	0.0000		0.0000	0.0000	1.6808	0.0000	1.6808	0.0993	0.0000	3.7667
Water						0.0000	0.0000		0.0000	0.0000	0.5953	23.7466	24.3419	0.0617	1.5500e-003	26.1167
Total	**0.4842**	**0.4775**	**2.0283**	**4.6600e-003**	**0.3013**	**0.0111**	**0.3124**	**0.0806**	**0.0106**	**0.0913**	**2.2761**	**497.7248**	**500.0008**	**0.1770**	**2.7400e-003**	**504.5675**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.20**	**1.62**	**1.21**	**1.89**	**2.04**	**1.07**	**2.01**	**2.04**	**1.12**	**1.93**	**44.56**	**2.81**	**3.14**	**39.39**	**12.46**	**3.58**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	99.1200
Vegetation Land Change	0.0000
Total	**99.1200**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/3/2017	1/27/2017	5	19	
2	Site Preparation	Site Preparation	1/30/2017	2/3/2017	5	5	
3	Grading	Grading	2/6/2017	3/3/2017	5	20	
4	Building Construction	Building Construction	3/6/2017	11/3/2017	5	175	
5	Paving	Paving	11/6/2017	11/27/2017	5	16	
6	Architectural Coating	Architectural Coating	11/28/2017	12/18/2017	5	15	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 2.96

Acres of Paving: 0

Residential Indoor: 96,418; Residential Outdoor: 32,139; Non-Residential Indoor: 43,809; Non-Residential Outdoor: 14,603 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	174	0.41
Paving	Pavers	1	6.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Paving	Paving Equipment	1	8.00	130	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	10.00	0.00	9.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	38.00	9.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8000e-004	0.0000	9.8000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0259	0.2526	0.1983	2.3000e-004		0.0153	0.0153		0.0143	0.0143	0.0000	21.1791	21.1791	5.3700e-003	0.0000	21.2919
Total	**0.0259**	**0.2526**	**0.1983**	**2.3000e-004**	**9.8000e-004**	**0.0153**	**0.0162**	**1.5000e-004**	**0.0143**	**0.0144**	**0.0000**	**21.1791**	**21.1791**	**5.3700e-003**	**0.0000**	**21.2919**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-005	1.1900e-003	9.5000e-004	0.0000	8.0000e-005	2.0000e-005	1.0000e-004	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.2981	0.2981	0.0000	0.0000	0.2982
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	5.1000e-004	5.2600e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9390	0.9390	5.0000e-005	0.0000	0.9400
Total	**4.2000e-004**	**1.7000e-003**	**6.2100e-003**	**1.0000e-005**	**1.1200e-003**	**3.0000e-005**	**1.1500e-003**	**3.0000e-004**	**3.0000e-005**	**3.2000e-004**	**0.0000**	**1.2371**	**1.2371**	**5.0000e-005**	**0.0000**	**1.2382**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4000e-004	0.0000	4.4000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0259	0.2526	0.1983	2.3000e-004		0.0153	0.0153		0.0143	0.0143	0.0000	21.1791	21.1791	5.3700e-003	0.0000	21.2919
Total	**0.0259**	**0.2526**	**0.1983**	**2.3000e-004**	**4.4000e-004**	**0.0153**	**0.0157**	**7.0000e-005**	**0.0143**	**0.0143**	**0.0000**	**21.1791**	**21.1791**	**5.3700e-003**	**0.0000**	**21.2919**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-005	1.1900e-003	9.5000e-004	0.0000	8.0000e-005	2.0000e-005	1.0000e-004	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.2981	0.2981	0.0000	0.0000	0.2982
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	5.1000e-004	5.2600e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9390	0.9390	5.0000e-005	0.0000	0.9400
Total	**4.2000e-004**	**1.7000e-003**	**6.2100e-003**	**1.0000e-005**	**1.1200e-003**	**3.0000e-005**	**1.1500e-003**	**3.0000e-004**	**3.0000e-005**	**3.2000e-004**	**0.0000**	**1.2371**	**1.2371**	**5.0000e-005**	**0.0000**	**1.2382**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0137	0.0000	0.0137	7.3000e-003	0.0000	7.3000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7800e-003	0.0606	0.0398	4.0000e-005		3.2700e-003	3.2700e-003		3.0100e-003	3.0100e-003	0.0000	3.9738	3.9738	1.2200e-003	0.0000	3.9993
Total	**5.7800e-003**	**0.0606**	**0.0398**	**4.0000e-005**	**0.0137**	**3.2700e-003**	**0.0170**	**7.3000e-003**	**3.0100e-003**	**0.0103**	**0.0000**	**3.9738**	**3.9738**	**1.2200e-003**	**0.0000**	**3.9993**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	1.1000e-004	1.1100e-003	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1977	0.1977	1.0000e-005	0.0000	0.1979
Total	**7.0000e-005**	**1.1000e-004**	**1.1100e-003**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1977**	**0.1977**	**1.0000e-005**	**0.0000**	**0.1979**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.1700e-003	0.0000	6.1700e-003	3.2800e-003	0.0000	3.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7800e-003	0.0606	0.0398	4.0000e-005		3.2700e-003	3.2700e-003		3.0100e-003	3.0100e-003	0.0000	3.9738	3.9738	1.2200e-003	0.0000	3.9993
Total	**5.7800e-003**	**0.0606**	**0.0398**	**4.0000e-005**	**6.1700e-003**	**3.2700e-003**	**9.4400e-003**	**3.2800e-003**	**3.0100e-003**	**6.2900e-003**	**0.0000**	**3.9738**	**3.9738**	**1.2200e-003**	**0.0000**	**3.9993**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	1.1000e-004	1.1100e-003	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1977	0.1977	1.0000e-005	0.0000	0.1979
Total	**7.0000e-005**	**1.1000e-004**	**1.1100e-003**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1977**	**0.1977**	**1.0000e-005**	**0.0000**	**0.1979**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0467	0.0000	0.0467	0.0250	0.0000	0.0250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0188	0.1979	0.1318	1.4000e-004		0.0107	0.0107		9.8100e-003	9.8100e-003	0.0000	13.0561	13.0561	4.0000e-003	0.0000	13.1401
Total	**0.0188**	**0.1979**	**0.1318**	**1.4000e-004**	**0.0467**	**0.0107**	**0.0574**	**0.0250**	**9.8100e-003**	**0.0348**	**0.0000**	**13.0561**	**13.0561**	**4.0000e-003**	**0.0000**	**13.1401**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	4.3000e-004	4.4300e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7907	0.7907	4.0000e-005	0.0000	0.7916
Total	**2.9000e-004**	**4.3000e-004**	**4.4300e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.8000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7907**	**0.7907**	**4.0000e-005**	**0.0000**	**0.7916**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0210	0.0000	0.0210	0.0113	0.0000	0.0113	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0188	0.1979	0.1318	1.4000e-004		0.0107	0.0107		9.8100e-003	9.8100e-003	0.0000	13.0561	13.0561	4.0000e-003	0.0000	13.1401
Total	**0.0188**	**0.1979**	**0.1318**	**1.4000e-004**	**0.0210**	**0.0107**	**0.0317**	**0.0113**	**9.8100e-003**	**0.0211**	**0.0000**	**13.0561**	**13.0561**	**4.0000e-003**	**0.0000**	**13.1401**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	4.3000e-004	4.4300e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7907	0.7907	4.0000e-005	0.0000	0.7916
Total	**2.9000e-004**	**4.3000e-004**	**4.4300e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.8000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7907**	**0.7907**	**4.0000e-005**	**0.0000**	**0.7916**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2585	1.6720	1.2522	1.9200e-003		0.1072	0.1072		0.1035	0.1035	0.0000	161.4789	161.4789	0.0339	0.0000	162.1904
Total	**0.2585**	**1.6720**	**1.2522**	**1.9200e-003**		**0.1072**	**0.1072**		**0.1035**	**0.1035**	**0.0000**	**161.4789**	**161.4789**	**0.0339**	**0.0000**	**162.1904**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3900e-003	0.0647	0.0869	1.7000e-004	4.8500e-003	1.0000e-003	5.8500e-003	1.3800e-003	9.2000e-004	2.3100e-003	0.0000	15.2698	15.2698	1.1000e-004	0.0000	15.2721
Worker	0.0120	0.0177	0.1840	4.5000e-004	0.0365	3.0000e-004	0.0368	9.6900e-003	2.8000e-004	9.9600e-003	0.0000	32.8646	32.8646	1.7000e-003	0.0000	32.9003
Total	**0.0184**	**0.0824**	**0.2708**	**6.2000e-004**	**0.0413**	**1.3000e-003**	**0.0426**	**0.0111**	**1.2000e-003**	**0.0123**	**0.0000**	**48.1344**	**48.1344**	**1.8100e-003**	**0.0000**	**48.1724**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2585	1.6720	1.2522	1.9200e-003		0.1072	0.1072		0.1035	0.1035	0.0000	161.4787	161.4787	0.0339	0.0000	162.1902
Total	**0.2585**	**1.6720**	**1.2522**	**1.9200e-003**		**0.1072**	**0.1072**		**0.1035**	**0.1035**	**0.0000**	**161.4787**	**161.4787**	**0.0339**	**0.0000**	**162.1902**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3900e-003	0.0647	0.0869	1.7000e-004	4.8500e-003	1.0000e-003	5.8500e-003	1.3800e-003	9.2000e-004	2.3100e-003	0.0000	15.2698	15.2698	1.1000e-004	0.0000	15.2721
Worker	0.0120	0.0177	0.1840	4.5000e-004	0.0365	3.0000e-004	0.0368	9.6900e-003	2.8000e-004	9.9600e-003	0.0000	32.8646	32.8646	1.7000e-003	0.0000	32.9003
Total	**0.0184**	**0.0824**	**0.2708**	**6.2000e-004**	**0.0413**	**1.3000e-003**	**0.0426**	**0.0111**	**1.2000e-003**	**0.0123**	**0.0000**	**48.1344**	**48.1344**	**1.8100e-003**	**0.0000**	**48.1724**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.4900e-003	0.0968	0.0723	1.1000e-004		5.8700e-003	5.8700e-003		5.4000e-003	5.4000e-003	0.0000	9.7806	9.7806	2.9400e-003	0.0000	9.8424
Paving	8.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0104**	**0.0968**	**0.0723**	**1.1000e-004**		**5.8700e-003**	**5.8700e-003**		**5.4000e-003**	**5.4000e-003**	**0.0000**	**9.7806**	**9.7806**	**2.9400e-003**	**0.0000**	**9.8424**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	5.5000e-004	5.7500e-003	1.0000e-005	1.1400e-003	1.0000e-005	1.1500e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	1.0280	1.0280	5.0000e-005	0.0000	1.0291
Total	**3.7000e-004**	**5.5000e-004**	**5.7500e-003**	**1.0000e-005**	**1.1400e-003**	**1.0000e-005**	**1.1500e-003**	**3.0000e-004**	**1.0000e-005**	**3.1000e-004**	**0.0000**	**1.0280**	**1.0280**	**5.0000e-005**	**0.0000**	**1.0291**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.4900e-003	0.0968	0.0723	1.1000e-004		5.8700e-003	5.8700e-003		5.4000e-003	5.4000e-003	0.0000	9.7806	9.7806	2.9400e-003	0.0000	9.8424
Paving	8.8000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0104**	**0.0968**	**0.0723**	**1.1000e-004**		**5.8700e-003**	**5.8700e-003**		**5.4000e-003**	**5.4000e-003**	**0.0000**	**9.7806**	**9.7806**	**2.9400e-003**	**0.0000**	**9.8424**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	5.5000e-004	5.7500e-003	1.0000e-005	1.1400e-003	1.0000e-005	1.1500e-003	3.0000e-004	1.0000e-005	3.1000e-004	0.0000	1.0280	1.0280	5.0000e-005	0.0000	1.0291
Total	**3.7000e-004**	**5.5000e-004**	**5.7500e-003**	**1.0000e-005**	**1.1400e-003**	**1.0000e-005**	**1.1500e-003**	**3.0000e-004**	**1.0000e-005**	**3.1000e-004**	**0.0000**	**1.0280**	**1.0280**	**5.0000e-005**	**0.0000**	**1.0291**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5246					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4900e-003	0.0164	0.0140	2.0000e-005		1.3000e-003	1.3000e-003		1.3000e-003	1.3000e-003	0.0000	1.9149	1.9149	2.0000e-004	0.0000	1.9192
Total	**0.5271**	**0.0164**	**0.0140**	**2.0000e-005**		**1.3000e-003**	**1.3000e-003**		**1.3000e-003**	**1.3000e-003**	**0.0000**	**1.9149**	**1.9149**	**2.0000e-004**	**0.0000**	**1.9192**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.3200e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5931	0.5931	3.0000e-005	0.0000	0.5937
Total	**2.2000e-004**	**3.2000e-004**	**3.3200e-003**	**1.0000e-005**	**6.6000e-004**	**1.0000e-005**	**6.6000e-004**	**1.7000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5931**	**0.5931**	**3.0000e-005**	**0.0000**	**0.5937**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5246					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4900e-003	0.0164	0.0140	2.0000e-005		1.3000e-003	1.3000e-003		1.3000e-003	1.3000e-003	0.0000	1.9149	1.9149	2.0000e-004	0.0000	1.9192
Total	**0.5271**	**0.0164**	**0.0140**	**2.0000e-005**		**1.3000e-003**	**1.3000e-003**		**1.3000e-003**	**1.3000e-003**	**0.0000**	**1.9149**	**1.9149**	**2.0000e-004**	**0.0000**	**1.9192**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.3200e-003	1.0000e-005	6.6000e-004	1.0000e-005	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5931	0.5931	3.0000e-005	0.0000	0.5937
Total	**2.2000e-004**	**3.2000e-004**	**3.3200e-003**	**1.0000e-005**	**6.6000e-004**	**1.0000e-005**	**6.6000e-004**	**1.7000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5931**	**0.5931**	**3.0000e-005**	**0.0000**	**0.5937**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1386	0.4390	1.6399	4.4200e-003	0.3013	6.3200e-003	0.3076	0.0806	5.8200e-003	0.0865	0.0000	331.3765	331.3765	0.0125	0.0000	331.6381
Unmitigated	0.1396	0.4468	1.6647	4.5100e-003	0.3076	6.4400e-003	0.3140	0.0823	5.9400e-003	0.0883	0.0000	338.1062	338.1062	0.0127	0.0000	338.3729

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	237.24	257.76	218.52	811,564	794,996
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	237.24	257.76	218.52	811,564	794,996

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.511172	0.060004	0.180590	0.138995	0.042398	0.006681	0.016070	0.032568	0.001938	0.002493	0.004370	0.000586	0.002135

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	102.4101	102.4101	2.2400e-003	4.6000e-004	102.6008
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	105.5615	105.5615	2.3100e-003	4.8000e-004	105.7581
NaturalGas Mitigated	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7600e-003	2.7600e-003		2.7600e-003	2.7600e-003	0.0000	39.5852	39.5852	7.6000e-004	7.3000e-004	39.8261
NaturalGas Unmitigated	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7600e-003	2.7600e-003		2.7600e-003	2.7600e-003	0.0000	39.5852	39.5852	7.6000e-004	7.3000e-004	39.8261

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	741799	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7600e-003	2.7600e-003		2.7600e-003	2.7600e-003	0.0000	39.5852	39.5852	7.6000e-004	7.3000e-004	39.8261
Total		**4.0000e-003**	**0.0342**	**0.0146**	**2.2000e-004**		**2.7600e-003**	**2.7600e-003**		**2.7600e-003**	**2.7600e-003**	**0.0000**	**39.5852**	**39.5852**	**7.6000e-004**	**7.3000e-004**	**39.8261**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	741799	4.0000e-003	0.0342	0.0146	2.2000e-004		2.7600e-003	2.7600e-003		2.7600e-003	2.7600e-003	0.0000	39.5852	39.5852	7.6000e-004	7.3000e-004	39.8261
Total		**4.0000e-003**	**0.0342**	**0.0146**	**2.2000e-004**		**2.7600e-003**	**2.7600e-003**		**2.7600e-003**	**2.7600e-003**	**0.0000**	**39.5852**	**39.5852**	**7.6000e-004**	**7.3000e-004**	**39.8261**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	175554	105.5615	2.3100e-003	4.8000e-004	105.7581
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**105.5615**	**2.3100e-003**	**4.8000e-004**	**105.7581**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	170313	102.4101	2.2400e-003	4.6000e-004	102.6008
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**102.4101**	**2.2400e-003**	**4.6000e-004**	**102.6008**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

No Hearths Installed

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3416	4.3400e-003	0.3739	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6065	0.6065	6.0000e-004	0.0000	0.6191
Unmitigated	0.3416	4.3400e-003	0.3739	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6065	0.6065	6.0000e-004	0.0000	0.6191

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0525					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2776					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0115	4.3400e-003	0.3739	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6065	0.6065	6.0000e-004	0.0000	0.6191
Total	**0.3416**	**4.3400e-003**	**0.3739**	**2.0000e-005**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**	**0.0000**	**0.6065**	**0.6065**	**6.0000e-004**	**0.0000**	**0.6191**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0525					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2776					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0115	4.3400e-003	0.3739	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6065	0.6065	6.0000e-004	0.0000	0.6191
Total	**0.3416**	**4.3400e-003**	**0.3739**	**2.0000e-005**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**	**0.0000**	**0.6065**	**0.6065**	**6.0000e-004**	**0.0000**	**0.6191**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	24.3419	0.0617	1.5500e-003	26.1167
Unmitigated	28.9873	0.0771	1.9300e-003	31.2044

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	2.34554 / 1.47871	28.9873	0.0771	1.9300e-003	31.2044
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**28.9873**	**0.0771**	**1.9300e-003**	**31.2044**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	1.87644 / 1.35541	24.3419	0.0617	1.5500e-003	26.1167
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**24.3419**	**0.0617**	**1.5500e-003**	**26.1167**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.6808	0.0993	0.0000	3.7667
Unmitigated	3.3615	0.1987	0.0000	7.5334

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	16.56	3.3615	0.1987	0.0000	7.5334
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**3.3615**	**0.1987**	**0.0000**	**7.5334**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	8.28	1.6808	0.0993	0.0000	3.7667
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**1.6808**	**0.0993**	**0.0000**	**3.7667**

9.0 Operational Offroad

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

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	99.1200	0.0000	0.0000	99.1200

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Others	2 / 1.2	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

10.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	140	99.1200	0.0000	0.0000	99.1200
Total		**99.1200**	**0.0000**	**0.0000**	**99.1200**

Appendix D

Geology/Hydrology Information:

Preliminary Soils Investigation
Soil Infiltration Testing
Preliminary Water Quality Management Plan

GeoMat Testing Laboratories, Inc.

Soil Engineering, Environmental Engineering, Materials Testing, Geology

July 31, 2015

Project No. 15068-01

TO: RC Hobbs
1110 East Chapman Avenue
Suite 201
Orange, California 92866

ATTENTION: Mr. Jeff Moore

SUBJECT: Preliminary Soil Investigation Report, Single Family Residential Development, 4105 Jefferson Street, Riverside, California

Introduction

In accordance with your authorization, GeoMat Testing Laboratories, Inc. has conducted a preliminary soil investigation and liquefaction analysis for the subject site. Groundwater study or environmental site assessment is not part of this report. This report should be considered only preliminary in nature; its purpose is to determine the general foundation system for the structures described herein. The following presents a summary of our findings, conclusions, recommendations, and limitations of our work for the proposed construction.

If you should have any questions regarding this report, please do not hesitate to call our office. We appreciate this opportunity to be of service.

Submitted for GeoMat Testing Laboratories, Inc.

Haytham Nabilsi, GE 2375
Principal Engineer

Fred Schilling, CEG 2046
Engineering Geologist

Distribution: [3] Addressee

9980 Indiana Avenue ● Suite 14 ● Riverside ● California ● 92503 ● Phone (951) 688-5400 ● Fax (951) 688-5200
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ATTACHED MAPS AND APPENDICES

Figure 1	Site Location Map
Figure 2	Topographic Map, 1/100000
Figure 3	Topographic Map, 1/24000
Figure 4	Topographic Map, 1/6000
Figure 5	Site Aerial
Figure 6	California Setting
Figure 7	Regional Geologic Map
Figure 8	2010 Fault Activity Map
Figure 9	Geologic Map, Local
Plate 1	Exploratory Boring Location Map
Plate 2	Retaining Wall Drainage Detail
Appendix A	References
Appendix B	Geotechnical Boring Log
Appendix C	Laboratory Test Results
Appendix D	CBC Seismic Design Parameters
Appendix E	Liquefaction Analysis/Groundwater Data
Appendix F	General Earthwork and Grading Specifications

SCOPE OF WORK

- Review soils, seismic, groundwater data, and maps in our files.
- Exploration of the site at accessible location by means of a drill rig.
- Field engineer for logging, observe drilling resistance/caving.
- Sampling of select soils.
- Laboratory testing for classification, shear strength, expansion, and sulfate.
- Prepare CBC seismic design parameters.
- Preparation of a soil investigation report (3 copies) to include: Site preparation recommendations, Overexcavation depth, Allowable soil bearing value, Foundation recommendations, Slab-on-grade recommendations, Earth pressures, Grading specifications, Pavement design, Site Class, CBC seismic design parameters, and cement type.

SITE CONDITIONS AND PROPOSED DEVELOPMENT

Site Condition

The subject site is currently being occupied by a one-story single family residence, with a subterranean basement, and an old wood framed work shop. The existing residence is on a septic system which is located just north of the house. The work shop is about twenty feet in height and has a slab-on-grade.

Several mature trees were noted on site along with a vegetation debris pile located on the north eastern end of the property. Most of the site use to be a working farm land but has since been graded.

The site is just under three acres in size and has several mature trees onsite. Topographically the site is relatively flat with surface sheet flow draining towards Jefferson street at a rate of about 1%. Total relief on site is approximately 6 feet with the highest elevation located at the back end of the property (northeasterly end) at approximately 783 feet above mean sea level (amsl), and the lowest elevation located at the front end of the property (southwesterly end) at approximately 777 feet amsl.

Proposed Development

Based on discussions with the project civil engineer, the site is proposed for 36 single family homes and the associated streets, parking spaces, driveways, etc. The homes are assumed to be one or two story wood framed homes. We anticipate that the proposed structures are to be supported by a combination of isolated square and continuous wall type foundations, and concrete slabs-on-grade. We have not been provided with specific foundation loads. We anticipate however, that continuous wall loads will not exceed 2500 pounds per linear foot and isolated column loads of up to 25 kips.

SUMMARY OF GEOTECHNICAL FINDINGS

Subsurface Exploration

Three exploratory boreholes were drilled on July 25, 2015, to a maximum depth of 50 feet below existing ground surface utilizing a CME 45 equipped with 6-inch hollows stem augers. A field engineer from this office observed the drilling and prepared the boring logs. Stratification lines on the logs represent the approximate boundary between soil types, although the transitions may actually be gradual. Refer to Plate 1 for location of exploratory boreholes.

Relatively undisturbed samples were obtained with the California Ring Sampler (ASTM D 1587). This sampler has three inches external diameter, 2.5 inches inside diameter, and is lined with one inch high brass rings, with an inside diameter of 2.41-inches. The sample barrel is driven into the ground at the bottom of the boring with 140-pound hammer with a free fall of approximately 30-inches.

Sampler driving resistance, expressed as blows per six inches of penetration, is presented on the boring logs at the respective sampling depths. Ring samples were retained in close-fitting, moisture tight canisters for transport to our laboratory for testing.

Additional representative samples have been recovered with the SPT (Standard Penetration Test, ASTM D 1586) sampler. This sampler consists of steel driving shoe and tube that split longitudinally in half, and a coupling at the top. The coupling connects the sampler to the drill rod. The standard split tube has an inside diameter of 1 3/8-inch (1 ½ -inch inside diameter without liners) and an outside diameter of 2-inches. Unless noted otherwise, liners are usually not used.

The standard driving weight and free fall for this test is similar to California Ring Sampler. Blow counts required to drive the samplers 18-inches are recorded on the boring logs. The sum of the number of blows for the last 12 inches on an 18-inch penetration represents the SPT count. This data is shown on the boring logs when obtained in the field.

A bulk sample was also collected from the auger cuttings during drilling. The sample was collected in a plastic bag, tied, and tagged for the location and depth.

The geotechnical boring logs are presented in Appendix B and may include a description and classification of each stratum, sample locations, blow counts, groundwater conditions encountered during drilling, results from selected types of laboratory tests, and drilling information.

Subsurface Findings

The surficial units located within the project site are described below.

Fill. We understand that the site had been graded sometime in the past for drainage purposes. The fill is expected to be less than three feet toward the east end of the property and diminishing toward the west end. Fill is also associated the existing structures at the site.

Young Alluvial Fan. The southern portion of the property's surficial soil has been mapped by United States Geological Survey (USGS) as young alluvial fan deposits (Qyf). This material is unconsolidated and sandy.

Old Alluvial Fan. The northern portion of the property's surficial soil has been mapped by United States Geological Survey (USGS) as old alluvial fan deposits (Qof). This material is consolidated, indurated, hard, and clayey, silty, and sandy.

Physical and engineering characteristics of onsite material is as follows

Alluvium	Excavation	Compressibility	Use as Compacted Fill	Expansion	Erosion
Young	Easily	Low	Good	Very Low	Low
Old	Moderate	Very Low	Good	Low to Very Low	Low

Alluvium	Shear Strength	
	Phi	Cohesion
Young	31.7°	225 psf
Old	37.0°	332 psf

Laboratory Testing

Laboratory moisture, density, sieve analysis, Atterberg limits, direct shear, expansion index, and sulfate, performed for a selected sample obtained from the boreholes. The soil classification is in conformance with the Unified Soil Classifications System (USCS), as outlined in the Classification and Symbols Chart (Appendix B). A graphical presentation of the test results is presented in Appendix C.

Groundwater

Groundwater study is not within the scope of this work. Groundwater was encountered at the site in exploratory borehole at 34 feet below ground surface. Least ground surface elevation at the site is approximately 777.

Local highest historical groundwater elevations were researched using the following agencies:

1. Western Municipal Water District Well Measuring Program:

Well	Well Elev.	Depth to Water	Water Elev.	Date	Location
02S05W32Q	766.7	17.7	749	6/9/1998	2000' North
		17.8	748.9	5/24/1999	
		18.0	748.7	1/6/1999	
		19.2	747.5	12/14/1994	
		20.1	746.6	6/6/1994	
		20.8	745.9	1/6/1994	

2. State Department of Water Resources:

Well	Well Elev.	Depth to Water	Water Elev.	Date	Location
339320N1174420W001	755.0	12.8	742.2	4/25/2012	1.46 mile, southwest
339410N1173930W001	882.2	117.9	764.2	4/25/2012	2 mile east
339251N1174342W001	784.1	29.6	754.5	11/29/2012	1.45 mile southwest
339250N1174150W001	856.7	95.5	761.2	3/17/2015	1.2 miles south

3. USGS National Water Information Systems:

Well	Well Elev.	Depth to Water	Water Elev.	Date	Location
335732117252801	777.8	46.75	731.05	3/30/1984	1 mile, north
		48.0	729.8	1/1/1955	

4. USGS Groundwater Watch:
   No data available from USGS Groundwater Watch.

Groundwater data is attached rear of Appendix E.

The potential for rain or irrigation water locally seeping through from adjacent areas cannot be precluded. Our experience indicates that surface or near-surface groundwater conditions can develop in areas where groundwater conditions did not exist prior to site development, especially in areas where a substantial increase in surface water infiltration results from landscape irrigation and stormwater infiltration systems.

In addition, changes in local or regional water and management patterns, or both, can significantly raise the water table or create zones of perched water. We therefore recommend that landscape irrigation be kept to the minimum necessary to maintain plant vigor and any leaking pipes/sprinklers, etc. should be promptly repaired.

The depth to the groundwater may fluctuate with seasonal changes and from one year to the next. We have no way of predicting future groundwater levels or perched water due to increase in surface water infiltration from rainfall or from landscape irrigation. Subdrains, horizontal drains, toe drains, French drains, heel drains or other devices may be recommended in future for graded areas that exhibit nuisance water seepage, past evidence for shallow water, or areas with a potential for future shallow/surface water.

Excavation Characteristics

The subgrade soil appears to be moderately dense. Difficult excavation is not anticipated.

Temporary Excavations

General

All excavations must comply with applicable local, state, and federal safety regulations including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who should also be solely responsible for the means, methods, and sequencing of construction operations.

Safe Vertical Cut

Temporary un-surcharged excavations of 4 feet high may be made at a vertical gradient for short period of time. Soil will unravel if it becomes dry. Temporary un-surcharged excavations from 4 to 10 feet high may be trimmed at 1H:1V gradient.

In areas where soils with little or no binder are encountered, are expected, or where excavations are adjacent to existing structures, shoring or slot-cutting may be required.

Exposed condition during construction should be verified by the project geotechnical engineer. No excavations should take place without the direct supervision of the project geotechnical engineer. If slot cutting is permitted, the maximum width of slot cut should not exceed five feet.

All applicable requirements of the California Construction and general Industry Safety Orders, the Occupational Safety and Health Act, and current amendments, and the Construction safety Act should be met. Cuts should be observed during excavation by the project's geotechnical consultant. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

Precaution for Excavations

The Contractor should be aware that unsupported excavation depths should in no case exceed those specified in local, state, and/or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations).

Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Sloping the sides of temporary excavations should be required beyond the recommended safe cut where trench/excavation is expected to be left open for a long time or where trench/excavation is along foundation or where adjacent utilities exist or public right-of-way. Temporary excavation should not extend below a 1H:1V plane extending beyond and down from the bottom of the existing utility lines or structures.

Expansive Soil Characteristics

Based on laboratory testing, the upper foundation soils is classified as very low in expansion potential. This should be verified during construction to confirm the soil expansion potential.

Soil Corrosivity

Representative soil sample obtained from borehole cuttings was tested in the laboratory for soluble sulfate content. Based on the results, sulfate concentration is less than 600 ppm (0.06%) in the tested soil sample. Therefore we recommend Type II cement for all concrete in contact with earth material.

Collapsible Soil

Soil hydroconsolidation is a phenomenon that results in relatively rapid settlement of soil deposits due to addition of water. This generally occurs in soils having a loose particle structure cemented together with soluble minerals or with small quantities of clay. Water infiltration into such soils can break down the interparticle cementation, resulting in collapse of the soil structure. Collapsible soils are found primarily in Holocene alluvial fan deposits.

Natural soils above the water table at the site are young and old alluvial fan deposits of Holocene to middle Pleistocene age (see Figure 9). The old alluvium material is indurated, moderately dense to very dense (recorded average SPT blow count is 38). The potential for these soils to collapse is negligible. The younger alluvium was tested in the laboratory for in-place density (98 pcf) and Atterberg limit (LL=33). Based on NAVAC chart, Figure 5 Page 7.1-40, the material is considered non-collapsible.

Site Class

The proposed buildings conventional light frame construction, and a fundamental period of vibration of less than 0.5 seconds. Accordingly site specific evaluation to determine spectral acceleration for liquefiable soils is not required and therefore the structure need not be designed as if it is Seismic Site Class "F:" (exempt under ASCE 7 Section 20.3.1).

It is our opinion that structures should be designed in accordance with the current seismic building code as determined by the structural engineer. Considering the Spectral Response Acceleration at short period S_{DS} > 0.50g (CBC Table 1613.5.6(1), and the Spectral Response Acceleration at one second period S_{D1} >0.20g (CBC Table 1613.5.6(2), the subject site is located in an estimated Site Class "D" as outlined in CBC Table 1613.5.2.

Ground Motion And Seismic Design Parameters:

The peak ground acceleration (PGA) and 2013 CBC seismic design parameters are presented in Appendix D.

SUMMARY OF GEOLOGIC FINDINGS

Introduction

The item property is located in the low country, south flanking the Santa Ana River Valley and north adjacent to the 91 Freeway, southeast of the Riverside Airport. The intersection of the 91 and 60 freeways is approximately 2 ½ miles to the northeast.

Topographically, the location is nearly flat. The elevation is approximately 777 feet above sea level. Subordinate drainage channels are generally lacking. The overall slope is to the northwest. See attached topographic maps for further detail.

The following depicts the overall review of the setting and geology.

- Topographic map, ~1/100000,
- Topographic map, ~1/24000,
- Topographic map, ~1/6000
- Site Aerial,
- California Setting,
- Regional Geologic Map – Location relative to major Structural Blocks of the northeastern Peninsular Ranges,
- 2010 Fault Activity Map of California – local region,
- Geologic Map – local area,
- Ground Motion Page (CGS).

Regional Geologic Setting

The subject property is located in the Peninsular Ranges Province of California (Perris Block portion).

The Peninsular Ranges Province, generally, is noted for its pronounced, active, northwest-southeast oriented fault systems. However, the Perris Block portion, itself, is an outward exception to this rule.

The closest of these major faults are the Chino Fault, an eastern branch of the Elsinore Fault Zone, and the San Jacinto Fault Zone. The item site is located approximately midway between the two fault zones – approximately 12 miles to each. See Figures 7 and 8.

The site is seismically sensitive. Peak ground motions from earthquakes may be expected to reach 0.454g with a 10% probability of being exceeded in 50 years CGS website).

The formational units of the site area are Pleistocene and Holocene alluvial deposits. See attached geologic map, Figure 9.

Site Geology

The item property is located in valley country, south of the Santa Ana River drainage. See Figures 1 through 5 and Figure 9. The terrain is nearly flat. Local developments are light commercial and residential.

The native sub terrain of the site is comprised of Holocene to middle Pleistocene alluvial deposits. The deposits are indurated, sandy, alluvial fan deposits.

No faults are reported close to the item property. None were observed in the current work. No suspect markings were observed on aerial photographs.

Geologic Hazards

Active faults

The project site is located in the highly seismic Southern California region within the influence of several fault systems. However, the site does not lie within the boundaries of an Earthquake Fault Zone as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act.

Ground Shaking

Although there are no known active surface faults within or adjacent to the site that will significantly impact the project, the project is located in a region with active earthquakes and strong seismic motion of those earthquakes could affect the project. The structures that are proposed to be constructed on the site will be required to meet and comply with all applicable city and State building codes to reduce seismic ground shaking at the site to less-than-significant.

Surface Rupture Zones

The site is not within a currently established Earthquake Fault Zone for surface fault rupture hazards. Therefore, the potential for surface rupture is very low. It is probable that not all-active or potentially active faults in the region have been identified. Furthermore, seismic potential of the smaller and less notable faults is not sufficiently developed for assignment of maximum magnitudes and associated levels of ground shaking that might occur at the site due to these faults.

Tsunamis, Seiches

A tsunami is a series of long period waves generated in the ocean by a sudden displacement of large volumes of water. Causes of tsunamis include underwater earthquakes, volcanic eruptions, or offshore slope failures. The first order driving force for locally generated tsunamis offshore southern California is expected to be tectonic deformation from large earthquakes (Legg, *et al.,* 2002). The site is not located within the coastal area of the State of California, therefore, we consider the risk associated with tsunamis to be negligible.

A seiche is a run-up of water within a lake or embayment triggered by fault or landslide induced ground displacement. The site is not located near a body of water. Therefore, the potential of seiches affecting the site is considered very low.

Slope Stability

The site is flat and no slopes are proposed. Stability is not a hazard at the site.

Landslides

The site and the surrounding properties are flat and not prone to slope instability hazards, such as landslides. The project will not be impacted by a landslide or impact adjacent properties due to a project generated landslide.

Liquefaction

This site is mapped in a liquefaction hazard zone. The potential for liquefaction and dynamic settlement has been evaluated as outlined in Chapter 6 of the California Division of Mines and Geology (DMC) Special Publication 117A (“Guidelines for Evaluating and Mitigating Seismic Hazards in California, 2008”) and “Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigating Liquefaction in California, 1999”.

The design and construction recommendations presented below in this report include results of liquefaction and dynamic settlement evaluation. The analysis results are included in Appendix E.

The analysis indicates that the inch total dynamic settlement is estimated at 0.45 during large earthquake episode. An estimated dynamic differential settlement of 1/2 to 2/3 of total settlement may be anticipated. The historical high ground water during a seismic event has been set at 20 feet below existing ground surface, gathered from a groundwater search dated from recent and back to 1955, see data rear of Appendix E.

Based on SCEC (1999) guidelines, a potential for loss of bearing capacity due to liquefaction is not expected at the site since there is not an upper potentially liquefiable layer at a depth shallower than the estimated depth where the induced vertical stress in the soil is less than 10% of the bearing pressure imposed by the proposed foundation systems. Furthermore, tied foundation systems are designed to dissipate structural loads. Therefore no loss of bearing capacity is expected for grade beams or lightly loaded slabs-on-grade.

In significant conformance with Youd, Hanson, and Bartlett (ASCE Geotechnical Jr. April 1995, and Lecture by Youd on July 7, 1999), no lateral spreading due to liquefaction is expected at this site due to the following reasons:

- Alluvial subsurface soils are essentially horizontally layered.
- There is not a free-face toward which liquefied soils could move laterally.
- No saturated liquefiable sand with values of N1(60) <15 exist at the site, refer to Appendix E. If loose clean sand exists between sampling intervals, their occurrence is expected to be thin and considered to be scattered or have minimal occurrence throughout the site, and cannot reasonably be connected to form a hypothetical “continuous” line of significant length that could reasonably be expected to “exit” on a slope or a free-face, or move significantly below the gentle slope of the site.

Although it is extremely difficult to predict the overall behavior of any site during seismic shaking, it is our opinion that proper design of foundation per Code can substantially improve the structure’s resistance to deformation.

Please note that foundation design is under the purview of the structural engineer. All foundations should be designed by a qualified structural engineer in accordance with the CBC and the latest applicable building codes and structural considerations may govern.

CONCLUSIONS

- Existing basement, foundation, buried irrigation lines, roots, utility lines may be encountered throughout the project area.
- The onsite soils exclusive of fine grained soil and deleterious may be used as compacted fill materials.
- Based on soil classifications, the expansion potential of the near-surface soils at the site is expected to be very low. This would require verification for the building pad subsequent to completion of rough grading.
- The use of shallow foundation appears feasible for the proposed construction.
- The overall geologic situation of the item property is satisfactory for the use intended, providing are followed the recommendations of foundation design.
- The site is expected to be subject to moderate to strong ground shaking from a regional seismic event within the projected life of the proposed structure.
- Groundwater was encountered during a subsurface investigation at approximately 34 feet below ground surface. In addition to groundwater, the potential for rain or irrigation water moving along sandy soils and locally seeping through from adjacent and higher areas cannot be precluded. We therefore recommend that local landscape irrigation and landscape irrigation from surrounding areas be kept to the minimum necessary to maintain plant vigor and that any leaking pipes/sprinklers, etc. should be promptly repaired. We have no way of predicting depth to the groundwater which may fluctuate with seasonal changes and from one year to the next. Subdrains, horizontal drains or other devices may be recommended for areas that exhibit nuisance seepage.

RECOMMENDATIONS

Site Preparation

All grading should be performed in accordance with our General Earthwork and Grading Specifications presented in Appendix F except as modified within the text of this report.

All debris, abandoned utility lines, irrigation appurtenances, underground structures, deleterious materials, etc., should be removed and hauled offsite. Cavities created during site clearance should be backfilled in a controlled manner.

Fill and loose soil associated with previous site use should be traced and removed. Removal may be extended deeper if loose soil is encountered in work areas. Where possible, the lateral extent of excavated area should be at least 5 feet around all building pads.

Subsequent to site clearance, the exposed surfaces should be in competent native soil as follows:

Material	Location in Property*	Estimated Depth of Overexcavation*
Young Alluvium	Southern Half	At least 5 feet
Old Alluvium	Northern Half	At least 3 feet
**Refer to geologic Map, Figure 9* **Overexcavation below exiting grade or proposed grade, whichever is deeper*		

Actual depth of removal should be determined during rough grading by the soil engineer. Exposed surfaces should be scarified, heavily watered, and recompacted to at least 90 percent of the maximum dry density, as determined by ASTM D1557 Test Method; prior to placement of fill.

Compacted Fills/Imported Soils

Any soil to be placed as fill, whether presently onsite or import, should be approved by the soil engineer or his representative prior to their placement. All onsite soils to be used as fill should be cleansed of any roots, or other deleterious materials.

All fills should be placed in 6- to -8 inch loose lifts, thoroughly watered, or aerated to near optimum moisture content, mixed and compacted to at least 90 percent relative compaction. This is relative to the maximum dry density determined by ASTM D1557 Test Method.

Any imported soils should be sandy (preferably USCS "SM" or "SW", and very low in expansion potential) and approved by the soil engineer. The soil engineer or his representative should observe the placement of all fill and take sufficient tests to verify the moisture content and the uniformity and degree of compaction obtained.

Shrinkage/Subsidence

Based on laboratory test results, we estimate that shrinkage and subsidence of alluvial soils are as follows:

Material	Location	Estimated Shrinkage	Estimated Subsidence
Young Alluvium	Southern Half	16% (±3)	0.1’ (±0.05)
Old Alluvium	Northern Half	8% (±3)	0.05’ (±0.05)

Shrinkage is defined as the decrease in volume of soil upon removal and recompaction expressed as a percentage of the in-place volume. This shrinkage is exclusive of any losses due to removal of tree roots or any underground structures and is based on an average 92 percent relative compaction. An increase in relative compaction obtained would increase the shrinkage factor.

The estimated shrinkage and subsidence are not absolute values, and should therefore be used with caution. We recommend that an earthwork balance area should be designated to allow for variations in the indicated shrinkage and subsidence estimates.

Conventional Shallow Foundation

The use of shallow spread footings in firm native ground or compacted fill is feasible. A maximum allowable bearing value of 2000 psf is recommended for the following footing system.

- Depth of continuous and pad footings below natural and finish grade should be at least 18 inches.
- Footing reinforcement should be determined by the structural engineer; however, minimum reinforcement should be at least two No. 4 reinforcing bars, top and bottom.
- Expansion potential of foundation soils should be verified subsequent to footing excavation and before placement of footing material.
- The above recommended bearing value may be increased by one third for temporary (wind or seismic) loads.

Resistance to lateral footing will be provided by passive earth pressure and base friction. For footings bearing against compacted fill or firm native material, passive earth pressure may be considered to be developed at a rate of 220 psf per foot of depth to a maximum of 2000 psf. Base friction may be computed at 0.38 times the normal load. If passive earth pressure and friction are combined to provide required resistance to lateral forces, the value of the passive pressure should be reduced to two-thirds the value.

Foundations should be designed by a qualified structural engineer. Foundation design comes under the purview of the structural engineer. These recommendations should not preclude more restrictive structural requirements. The structural engineer should determine the actual footing sizes and reinforcement to resist vertical, horizontal, and uplift forces under static and seismic conditions. Reinforcement and size recommendations presented in this report are considered the minimum necessary for the soil conditions present at foundation level and are not intended to supersede the design of the project structural engineer or criteria of the governing agencies for the project.

Reinforcement and size recommendations presented in this report are considered the minimum necessary for the soil conditions present at foundation level and are not intended to supersede the design of the project structural engineer or criteria of the governing agencies for the project.

Retaining Walls

The following lateral earth pressures and soil parameters in conjunction with the above allowable soil bearing value for shallow foundation may be used for design of conventional retaining walls with free draining compacted backfills.

If passive earth pressure and friction are combined to provide required resistance to lateral forces, the value of the passive pressure should be reduced to two-thirds the following recommendations.

Active Earth Pressure with level backfill (P_a)	37 psf (EFP) drained, yielding
At Rest Pressure (P_0)	55 psf (EFP), drained, non-yielding (part of building wall)
Passive Earth Pressure (P_p)	220 psf (EFP), drained, maximum of 2000 psf
Horizontal Coefficient of Friction (μ)	0.38
Unit Soil Weight (γ_t)	110 pcf

All retaining walls and block wall footings should be founded in competent or compacted soil. We recommend drainage for retaining walls to be provided in accordance with the attached Plate 2. Drainage pipes and ditches should be connected to an approved drainage device. Maximum precautions should be taken when placing drainage materials and during backfilling. Wall backfill should be properly compacted to at least 90 percent relative compaction. Back-cut distance behind the top of wall should be at least 18 inches or other practical distance to facilitate compaction.

Total Settlement

Onsite soils below foundation depth have relatively high strengths and will not be subject to significant stress increases from the foundations of the new structure. Therefore estimated total long-term static and seismic settlement between similarly loaded adjacent foundation systems should not exceed one inch. The structures should be designed to tolerate a differential settlement on the order of 1/2-inch.

Interior Concrete Flatwork

Interior slabs-on-grade may be at least four inches thick, reinforced with at least No 4 bars at 12-inches on-center both ways, properly centered in mid thickness of slabs. Slab-on-grades should be underlain with four inches of sand. If moisture intrusion is objectionable, the concrete slab should be provided by a 10-mil Visqueen moisture barrier placed and sealed over the sand. This slab recommendation meets California Green Residential Code.

Slab-on-grade thickness and reinforcement should be evaluated by the structural engineer and designed in compliance with applicable codes. Excess soils generated from foundation excavations should not be placed on any building pads without proper moisture and compaction. All slab subgrades should be verified to be saturated to a depth of 12 inches prior to placement of slab building materials. Moisture content should be tested in the field by the soil engineer. Slabs subgrade should be kept moist and the surface should not be allowed to desiccate.

The addition of fiber mesh in the concrete and careful control of water/cement ratios may lessen the potential for slab cracking. In hot or windy weather, the contractor must take appropriate curing precautions after the placement of concrete.

The use of mechanically compacted low slump concrete (not exceeding 4 inches at the time of placement) is recommended. We recommend that a slipsheet (or equivalent) be utilized if grouted tiles or other crack sensitive flooring (such as marble tiles) is planned directly on concrete slabs.

Soil Type

All excavations follow the regulations established by Occupational Safety and Health Administration (OSHA). In accordance with OSHA, the surficial soil is Soil Type “B”.

Site Drainage

Positive drainage should be provided and maintained for the life of the project around the perimeter of all structures and all foundations toward streets or approved drainage devices to minimize water infiltrating into the underlying natural and engineered fill soils, and prevent erosion from slopes.

In addition, finish subgrade adjacent to exterior footings should be sloped down (at least 2%) and away to facilitate surface drainage. Roof drainage should be collected and directed away from foundations via nonerosive devices. Water, either natural or by irrigation, should not be permitted to pond or saturate the foundation soils or slopes.

Planter areas and large trees adjacent to the foundations are not recommended. All planters should be provided with drainage devices. Location of drainage device should be in accordance with the design civil engineers drainage and erosion control recommendations.

The owner should be made aware of the potential problems, which may develop when drainage is altered through construction of walls and other devices. Ponded water, leaking irrigation systems, over watering or other conditions which could lead to ground saturation should be avoided. Surface and subsurface runoff from adjacent properties should be controlled. Area drainage collection should be directed toward the existing street through approved drainage devices. All drainage devices should be properly maintained.

Trench Backfill

All utility trenches and retaining wall backfills should be mechanically compacted to the minimum requirements of at least 90 percent relative compaction. Onsite soils derived from trench excavations can be used as trench backfill except for deleterious materials. Soils with sand equivalent greater than 30 may be utilized for pipe bedding and shading. Pipe bedding should be required to provide uniform support for piping. Excavated material from footing trenches should not be placed in slab-on-grade areas unless properly compacted and tested.

Tentative Asphalt Pavement

On the basis of classifications of onsite soils, an assumed Traffic Indices, and estimated R-value of 25, the minimum recommended pavement thickness is as follows:

Location	Traffic Index	Minimum Recommended Pavement Section
Auto Parking	4.0	2.5” AC over 5.0” Class 2 Base
Truck Drives	5.0	2.5” AC over 7.5” Class 2 Base

The upper twelve inches of pavement subgrade should be scarified, watered and compacted to at least 90 percent of the maximum density as determined by ASTM D1557 test method. Aggregate base should be compacted to at least 95 percent of the maximum density as determined by ASTM D1557 test method.

Final pavement design recommendations should be based on laboratory test results of representative pavement subgrade soils upon the completion of rough grading.

Tentative Concrete Pavement

For auto stalls a 4 inch concrete over 4 inches of Class2 aggregate base is recommended. For the driveway a 5 inches of concrete over 4 inches Class 2 aggregate base is recommended. Pavement subgrade overlain with aggregate base should be saturated to a depth of 12 inches and compacted to at least 90 percent relative compaction. Saturated subgrade should be tested for moisture by the soil engineer. Aggregate base should be compacted to at least 95 percent relative compaction.

Concrete pavement should be air entrained Portland Cement Concrete Pavement and must have a minimum 28-day flexural strength of 570 psi (compressive strength of approximately 4000 psi).

No reinforcing is necessary. Joint design and spacing should be in accordance with ACI recommendations. Construction joints should contain dowels or be tongue and grooved to provide load transfer. Tie bars are recommended on the joints adjacent to unsupported edges. Maximum joint spacing in feet should not exceed 2 to 3 times the thickness in inches. Joint sealing with a quality silicone sealer is recommended to prevent water from entering the subgrade allowing pumping and loss of support.

Proper subgrade preparation and joint sealing will reduce (but not eliminate) the potential for slab movements (thus cracking) on native soils. Frequent jointing will reduce uncontrolled cracking and increase the efficiency of aggregate interlock joint transfer.

Trash Enclosure

The trash enclosure slab should consist of a minimum 4 inches concrete over a minimum 4 inches of compacted Class 2 aggregate base. At a minimum, the trash enclosure slab should be reinforced with #4 rebars (both ways) at 12-inch center-to-center spacing. The required slab thickness and reinforcement should be designed by the project structural engineer. Shrinkage control and construction joints should be considered by the trash enclosure slab designer.

Based on our previous experience, there is a tendency for early pavement damage in front of the trash enclosure area, where heavy wheel loads are concentrated in the same location. To enhance the durability of this paved area and reduce maintenance costs, a concrete stress apron consisting of a minimum 8 inches concrete over a minimum 12 inches of compacted Class 2 aggregate base. Concrete pavement should be air entrained Portland Cement Concrete Pavement and must have a minimum 28-day flexural strength of 570 psi (compressive strength of approximately 4000 psi). At a minimum, the concrete apron pavement should be reinforced with #4 rebar (both ways) at 12-inch center-to-center spacing. Shrinkage control and construction joints should be considered by the PCC pavement designer.

The apron should be installed to cover the front of the enclosure and extend out an additional 8 feet minimum from the enclosure opening. The aggregate base should be placed in thin lifts in a manner to prevent segregation; uniformly moisture conditioned to near optimum moisture content, and compacted to at least 95 percent relative compaction to provide a smooth, unyielding surface. The upper 12 inches of subgrade under the concrete stress apron should be saturated, tested for saturation, and re-compacted to at least 90 percent relative compaction.

We Should be Retained for Plan Reviews

The recommendations provided in this report are based on preliminary information and subsurface conditions as interpreted from limited exploratory trenches at the site. We should be retained to review final grading and foundation plans to revise our conclusions and recommendations, as necessary. Our conclusions and recommendations should be reviewed and verified during site grading, and revised accordingly if exposed geotechnical conditions vary from our preliminary findings and interpretations.

Additional Observation and/or Testing

GeoMat Testing Laboratories, Inc. should observe and/or test at the following stages of construction.

- During overexcavation and backfills.
- Following footing excavation and prior to placement of footing materials.
- During wetting of slab subgrade and prior to placement of slab materials.
- During all trench backfill.
- When any unusual conditions are encountered.

Final Report of Compaction During Grading

A final report of compaction control should be prepared subsequent to the completion of grading. The report should include a summary of work performed, laboratory test results, and the results and locations of field density tests performed during grading.

Geotechnical Risk

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned.

The engineering recommendations presented in the preceding sections constitute GeoMat Testing Laboratories professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and GeoMat Testing Laboratories experience in working with these conditions.

Limitation Of Investigation

This report was prepared for the exclusive use of the owner and project team. The use by others, or for the purposes other than intended, is at the user's sole risk. Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable Geotechnical Engineers practicing in this or similar locations within the limitations of scope, schedule, and budget. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The field and laboratory test data are believed representative of the site; however, soil conditions can vary significantly. As in most projects, conditions revealed during construction may be at variance with preliminary findings. If this condition occurs, the possible variations must be evaluated by the Project Geotechnical Engineer and adjusted as required or alternate design recommended.

This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the addition and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractor carry out such recommendations in the field.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for other than our own personnel on the site; therefore, the safety of others is the responsibility of the contractor. The contractor should notify the owner if he considers any of the recommended actions presented herein to be unsafe.

The findings, conclusions, and recommendations presented herein are based on our understanding of the project and on subsurface conditions observed during our site work, and are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In additions, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In additions, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge.

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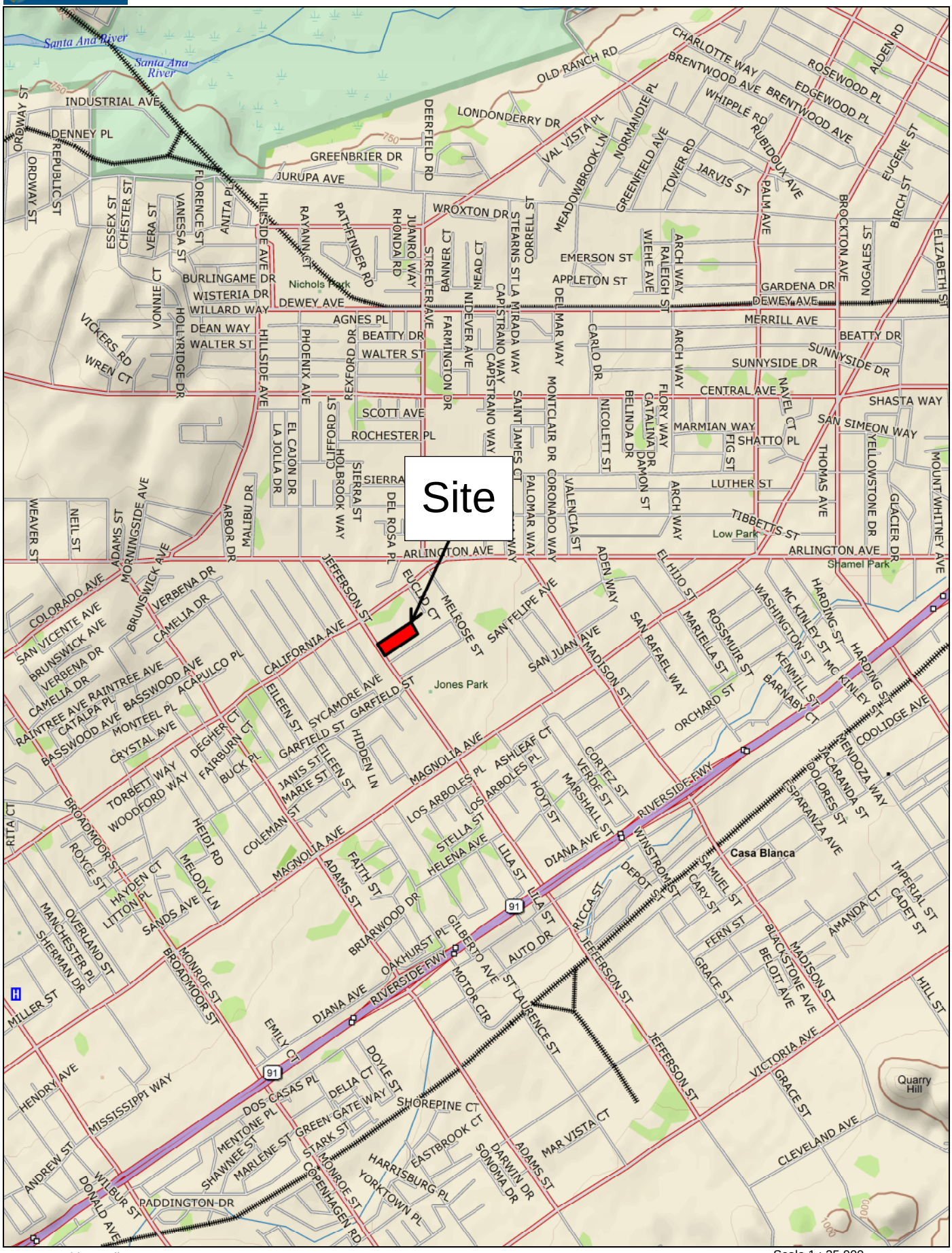

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TN

MN (12.0°E)

Figure 1

Scale 1 : 25,000

0 600 1200 1800 2400 3000 ft

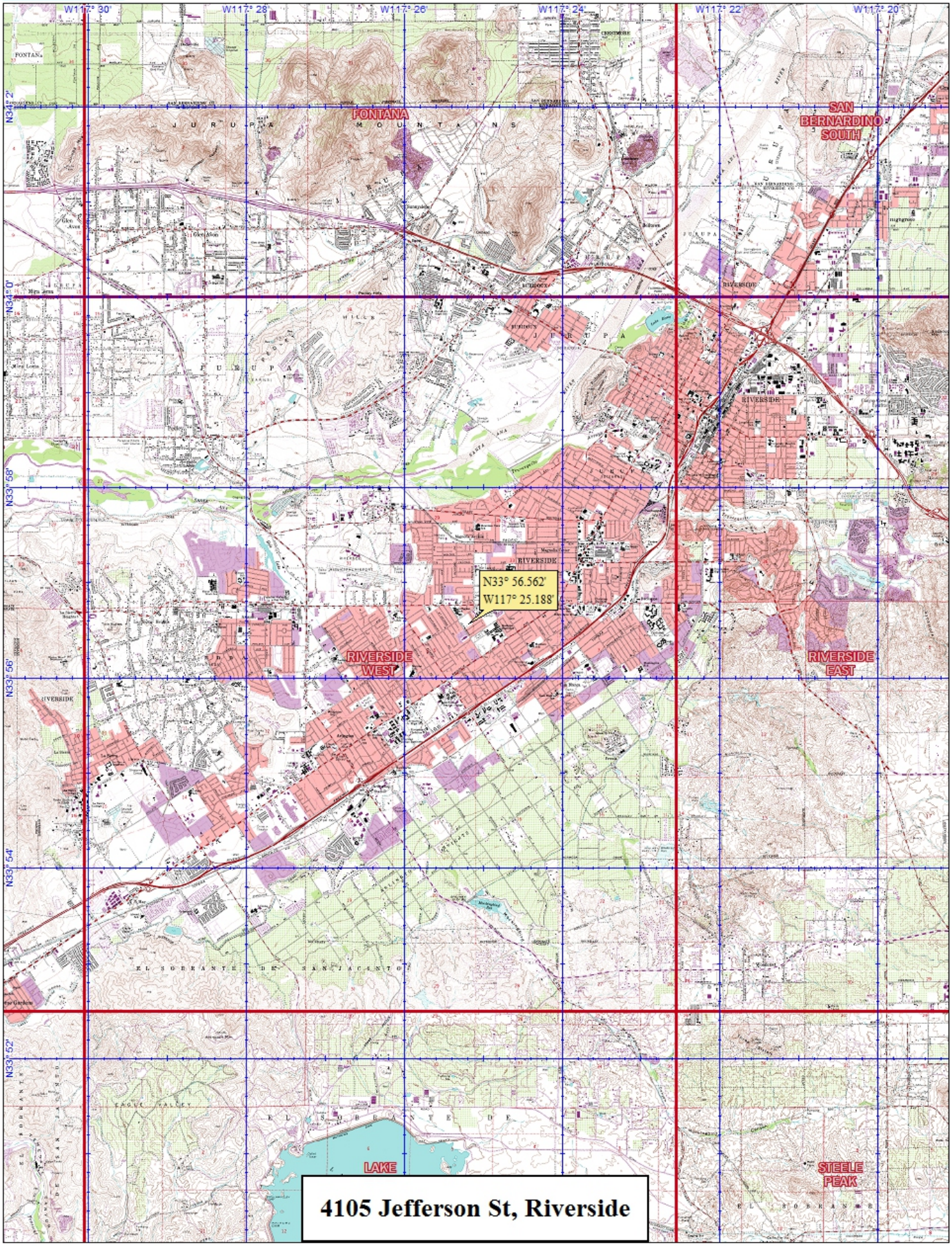
0 200 400 600 800 1000 m

1" = 2,083.3 ft

Data Zoom 13-0

DeLORME

XMap® 7



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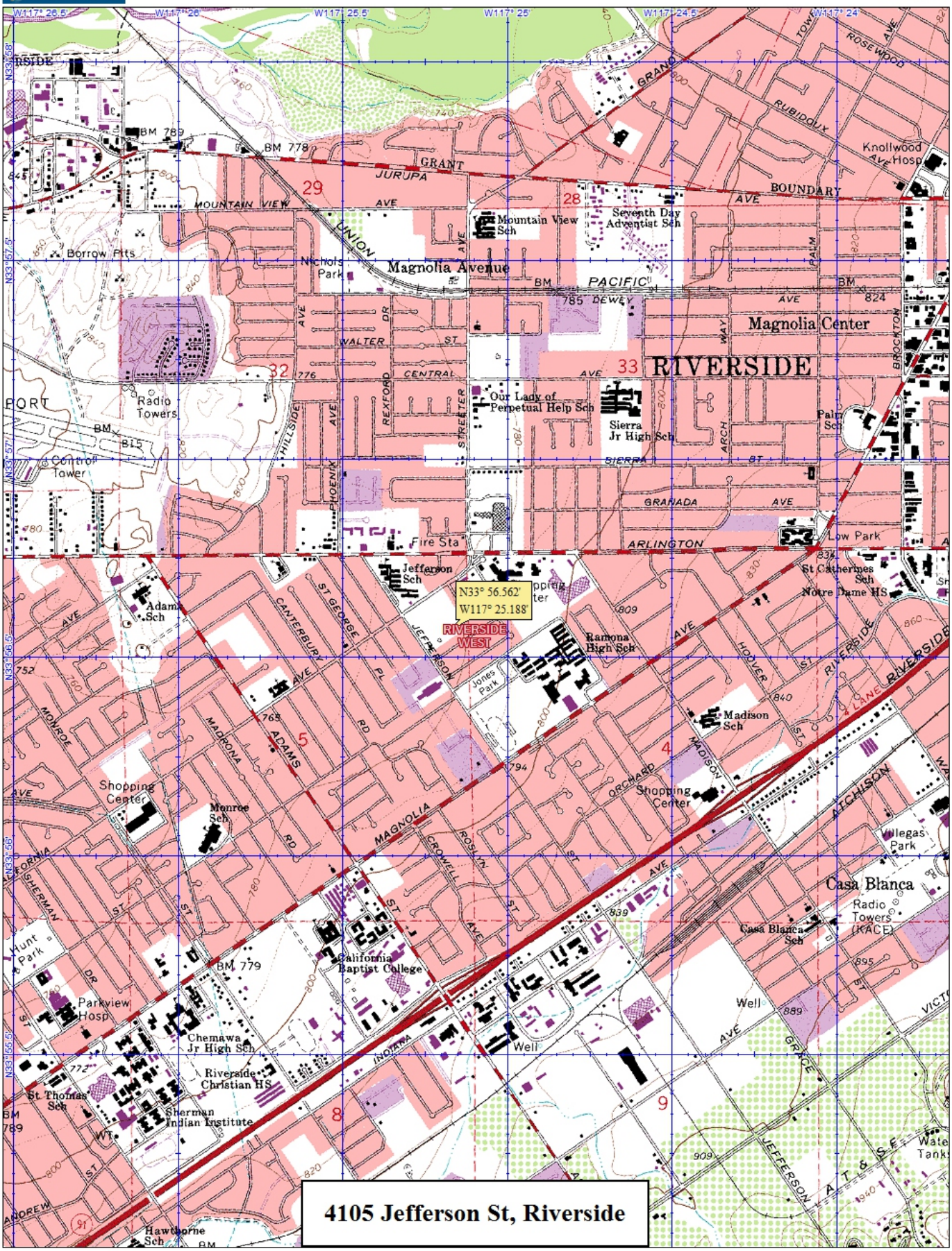
MN (12.0° E)

Figure 2

0 ½ 1 1½ 2 2½ mi

Data Zoom 11-0



4105 Jefferson St, Riverside

Data use subject to license.

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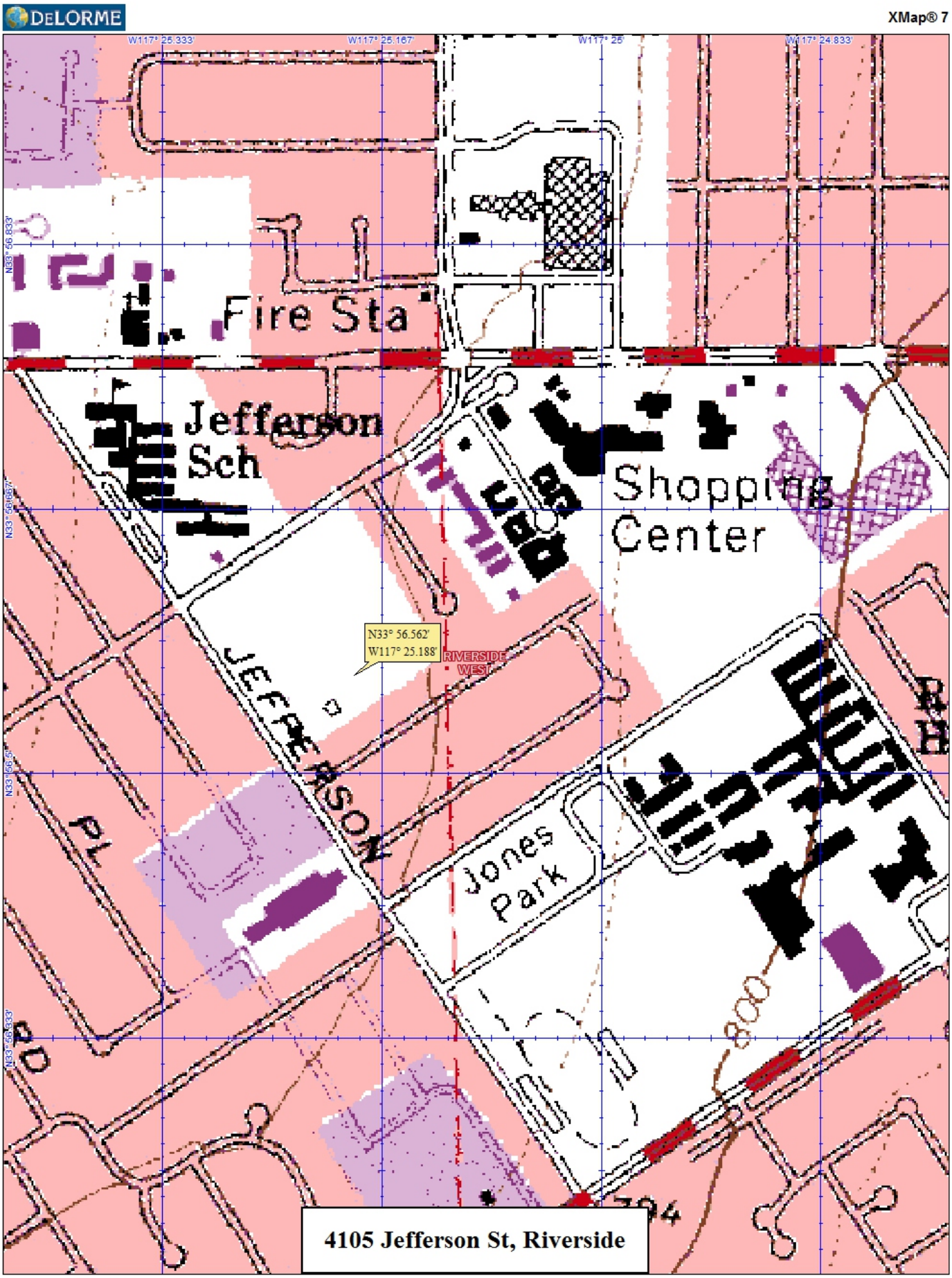
Figure 3

MN (12.0° E)

0 600 1200 1800 2400 3000 3600 ft

Data Zoom 13-1



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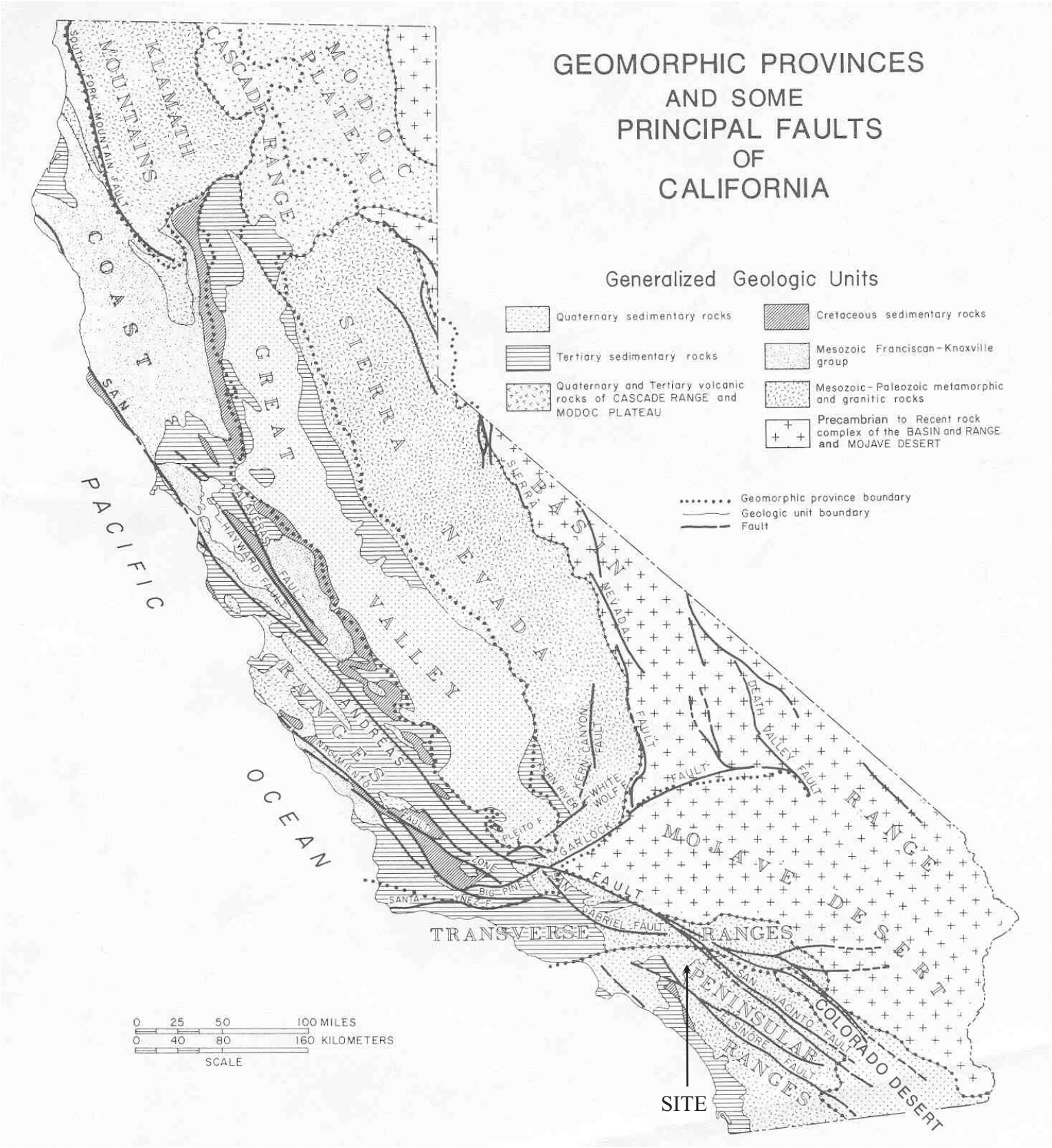
MN (12.0° E)

Figure 4

0 180 360 540 720 900 ft

Data Zoom 15-1

Site Aerial



CALIFORNIA SETTING

Figure 6

SOURCE: CDMG., Note 36.

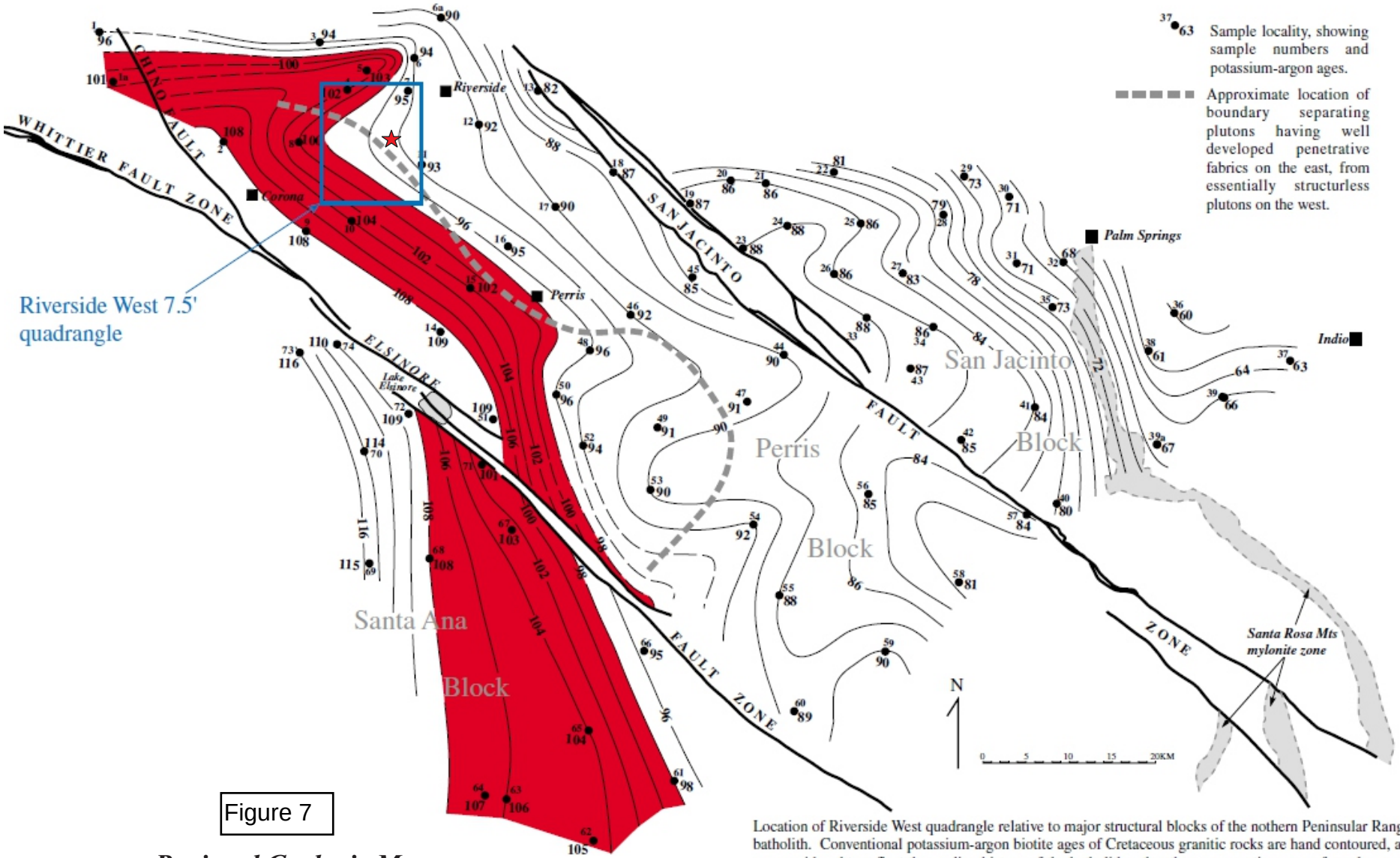
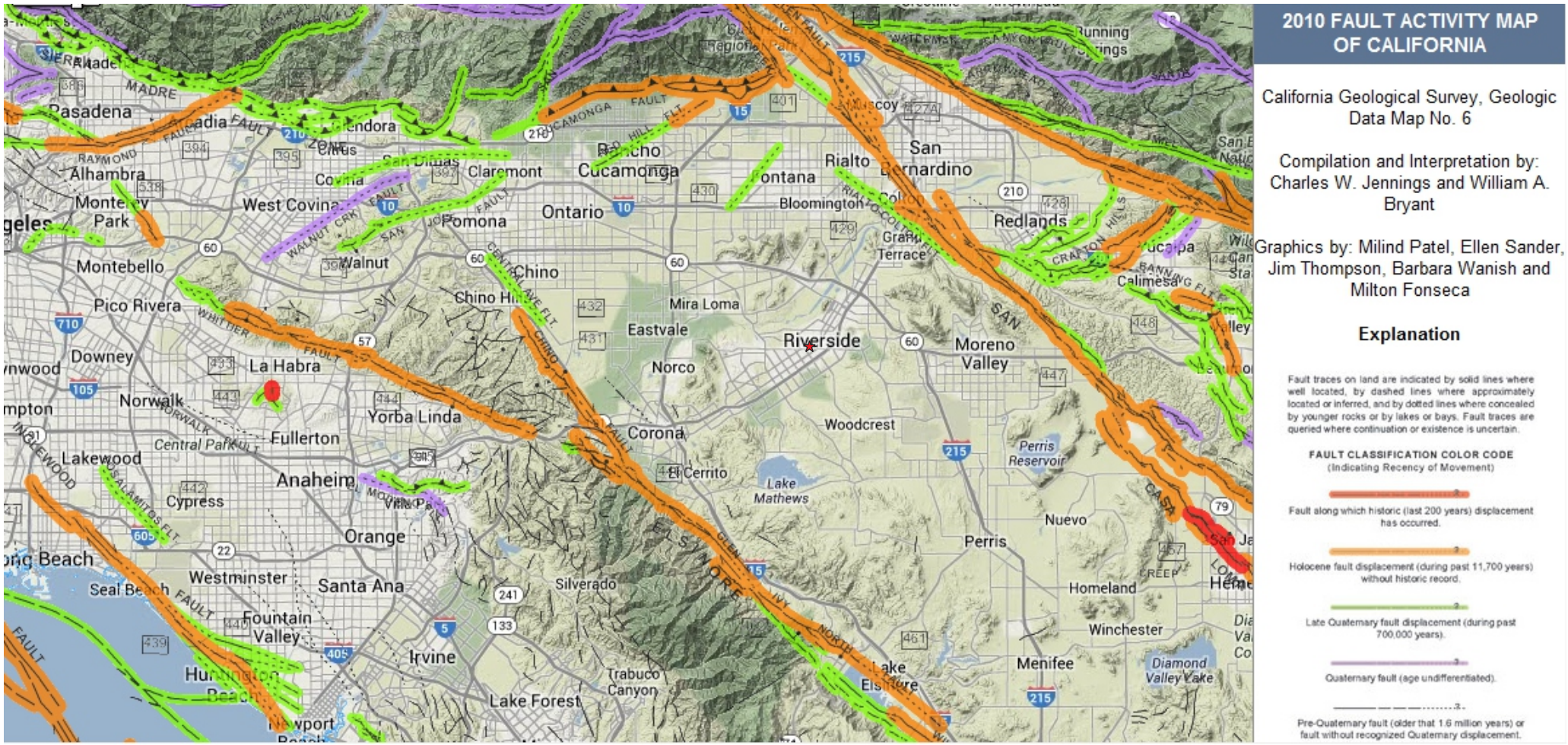


Figure 7

Regional Geologic Map

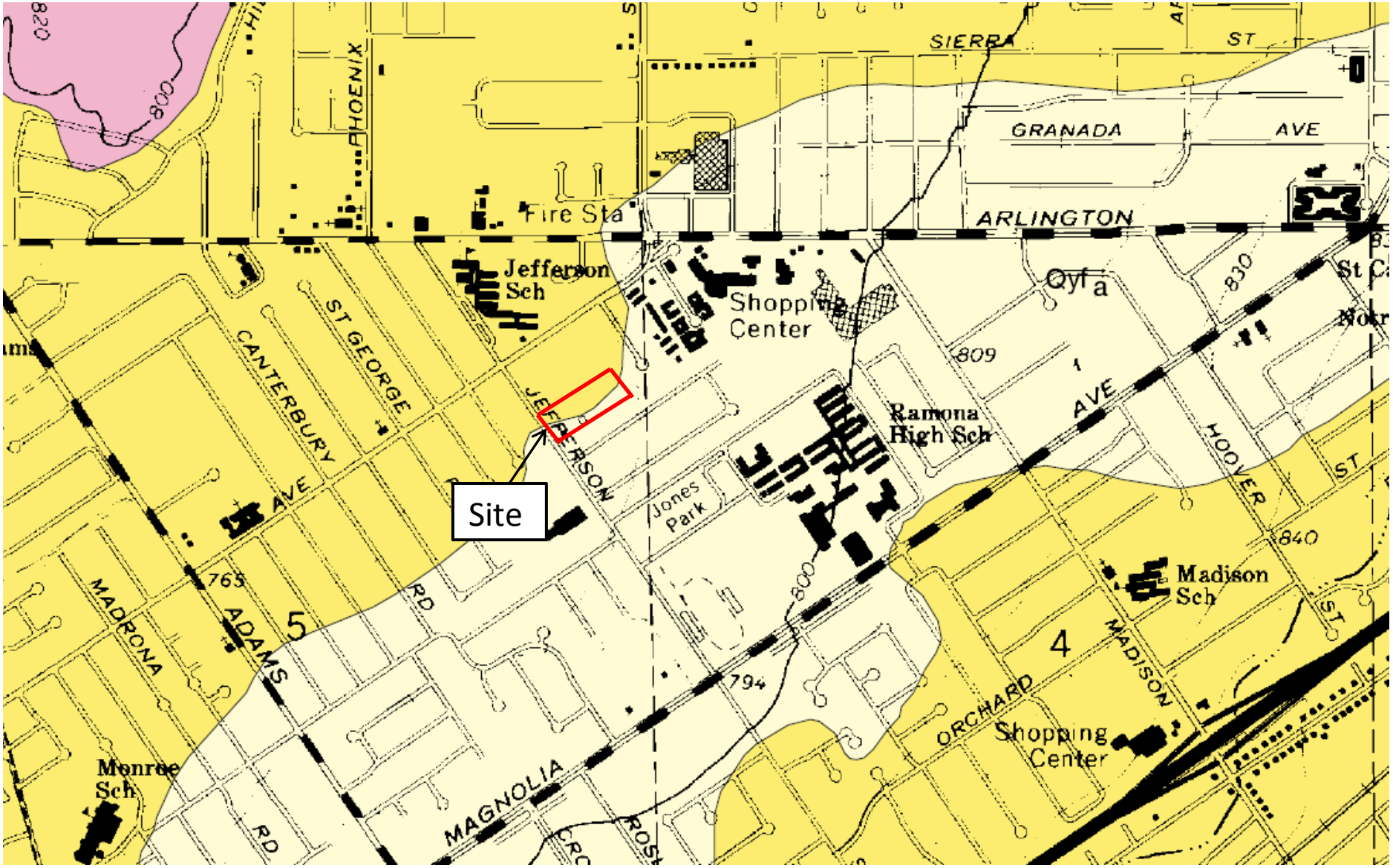
Site ★

Location of Riverside West quadrangle relative to major structural blocks of the nothern Peninsular Ranges batholith. Conventional potassium-argon biotite ages of Cretaceous granitic rocks are hand contoured, and are considered to reflect the cooling history of the batholith rather than representing ages of emplacement. Contouring of ages in each of the three structural blocks separated by the Elsinore and San Jacinto fault zones, was done independently of ages in adjacent blocks. Red band shows offset of 98 to 108 contours across Elsinore fault zone. Faults as shown are simplified from Rogers, 1965.



Site: ~4105 Jefferson St, Riverside ★

Figure 8



0 500 1000

Approximate Scale (ft)

EXPLANATION

- Qof: Old Alluvial Fan Deposits
- Qyfa: Young Alluvial Fan Deposits
- Kqu: Cretaceous, granitic rock

Geologic Map

4105 Jefferson Street
Riverside, California

Date:	07/31/2015
Project No.:	15068-01
Figure:	9

geomat

Base Map: Geologic Map of the Riverside West7.5' Quadrangles, Morton and Cox, Version 1.0

0 50 100

Approximate Scale (ft)

EXPLANATION

Approximate Location of Exploratory Borehole

Approximate Location of Infiltration Test

Exploratory Boring/Infiltration Test Location Map

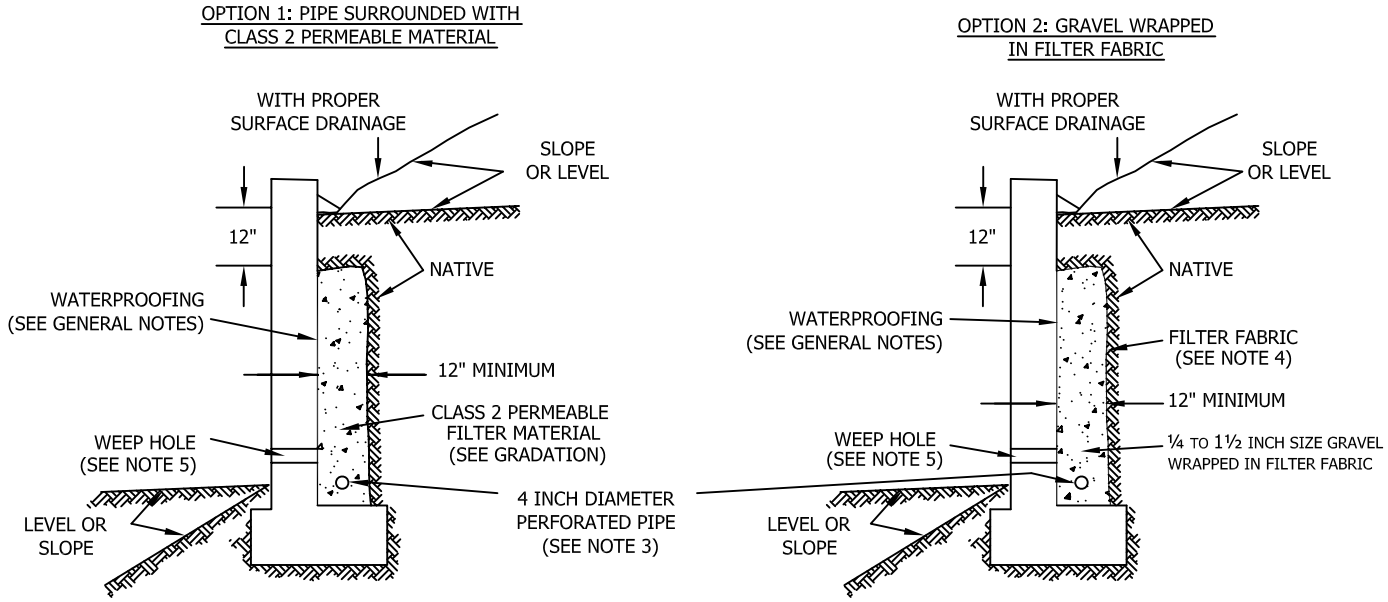
RC Hobbs – 4105 Jefferson Street
City of Riverside, California

Date:	07/28/2015
Project No.:	15068-01
Plate:	1

geomat

Base Map: Google Earth 2015

SUBDRAIN OPTIONS AND BACKFILL WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50



Class 2 Filter Permeable Material Gradation
Per Caltrans Specifications

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

GENERAL NOTES:

* Waterproofing should be provided where moisture nuisance problem through the wall is undesirable.
* Water proofing of the walls is not under purview of the geotechnical engineer
* All drains should have a gradient of 1 percent minimum
*Outlet portion of the subdrain should have a 4-inch diameter solid pipe discharged into a suitable disposal area designed by the project engineer. The subdrain pipe should be accessible for maintenance (rodding)
*Other subdrain backfill options are subject to the review by the geotechnical engineer and modification of design parameters.

Notes:
1) Sand should have a sand equivalent of 30 or greater and may be densified by water jetting.
2) 1 Cu. ft. per ft. of 1/4- to 1 1/2-inch size gravel wrapped in filter fabric
3) Pipe type should be ASTM D1527 Acrylonitrile Butadiene Styrene (ABS) SDR35 or ASTM D1785 Polyvinyl Chloride plastic (PVC), Schedule 40, Armco A2000 PVC, or approved equivalent. Pipe should be installed with perforations down. Perforations should be 3/8 inch in diameter placed at the ends of a 120-degree arc in two rows at 3-inch on center (staggered)
4) Filter fabric should be Mirafi 140NC or approved equivalent.
5) Weephole should be 3-inch minimum diameter and provided at 10-foot maximum intervals. If exposure is permitted, weepholes should be located 12 inches above finished grade. If exposure is not permitted such as for a wall adjacent to a sidewalk/curb, a pipe under the sidewalk to be discharged through the curb face or equivalent should be provided. For a basement-type wall, a proper subdrain outlet system should be provided.
6) Retaining wall plans should be reviewed and approved by the geotechnical engineer.
7) Walls over six feet in height are subject to a special review by the geotechnical engineer and modifications to the above requirements.

RETAINING WALL BACKFILL AND SUBDRAIN DETAIL

WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50

Plate 2

Appendix A

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Appendix B

GENERAL NOTES

DRILLING NOTES

WATER LEVEL MEASUREMENTS

Water levels indicated on the boring logs are levels measured in the borings at the times indicated. In permeable materials, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels is not possible with only short-term observations.

WATER LEVEL OBSERVATION DESIGNATION

W.D.	While Drilling
A.B.	After Boring
B.C.R.	Before Casing Removal
A.C.R.	After Casing Removal
24 hr.	Water level taken approximately 24 hrs. after boring completion

DRILLING AND SAMPLING SYMBOLS

AS	Auger Sample
CS	Continuous Sampler
DB	Diamond Bit -NX unless otherwise noted
HA	Hand Auger
HS	Hollow Stem Auger
PA	Power Auger
RB	Rock Bit
SS*	Split-Barrel
ST	Shelby Tube - 2" (51mm) unless otherwise noted
WB	Wash Bore
CR	Calfornia Ring Sampler 3" O.D., Lined with 2.5"X1" Rings

*The Standard Penetration Test is conducted in conjunction with the split-barrel sampling procedure. The "N" value corresponds to the number of blows required to drive the last 1 foot (0.3m) of an 18 in. (0.46m) long, 2 in. (51mm) O.D. split-barrel sampler with a 140 lb. (63.5 kg) hammer falling a distance of 30 in. (0.76m). The Standard Penetration Test is carried out according to ASTM D-1586. (See "N" Value below.)

SOIL PROPERTIES & DESCRIPTIONS

TEXTURE

PARTICLE	SIZE	
Clay	< 0.002 mm	(< 0.002 mm)
Silt	< #200 Sieve	(0.075 mm)
Sand	#4 to #200 Sieve	(4.75 to 0.075 mm)
Gravel	3 in. to #4 Sieve	(75 mm to 4.75 mm)
Cobbles	12 in. to 3 in.	(300 mm to 75 mm)
Boulders	> 12 in.	(300 mm)

COMPOSITION

SAND & GRAVEL

Description	% by Dry Weight
trace	< 15
with	15 - 29
modifer	> 30

FINES

Description	% by Dry Weight
trace	< 5
with	5 - 12
modifier	> 12

Soil descriptions are based on the Unified Soil Classification System (USCS) as outlined in ASTM Designations D-2487 and D-2488. The USCS group symbol shown on the boring logs correspond to the group names listed below. The description includes soil constituents, consistency, relative density, color and other appropriate descriptive terms. Geologic description of bedrock, when encountered, also is shown in the description column.

GROUP SYMBOL	GROUP NAME	GROUP SYMBOL	GROUP NAME
GW	Well Graded Gravel	CL	Lean Clay
GP	Poorly Graded Gravel	ML	Silt
GM	Silty Gravel	OL	Organic Clay or Silt
GC	Clayey Gravel	CH	Fat Clay
SW	Well Graded Sand	MH	Elastic Silt
SP	Poorly Graded Sand	OH	Organic Clay or Silt
SM	Silty Sand	PT	Peat
SC	Clayey Sand	CL-CH	Lean to Fat Clay

COHESIVE SOILS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (Qu) (psf)	(kPa)
Very Soft	< 500	(< 24)
Soft	500 - 1000	(24 - 48)
Medium	1001 - 2000	(48 - 96)
Stiff	2001 - 4000	(96 - 192)
Very Stiff	4001 - 8000	(192 - 383)
Hard	> 8001	(> 383)

PLASTICITY Description	Liquid Limit (%)
Lean	< 45%
Lean to Fat	45 to 49%
Fat	≥ 50%

Cohessive Soils Consistenacy	"N" value
Very Soft	<2
Soft	2-4
Medium	4-8
Stiff (Firm)	8-15
Very Stiff (Very Firm)	15-30
Hard	>30

COHESIONLESS SOILS

RELATIVE DENSITY	"N" VALUE*
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	≥ 50

BEDROCK PROPERTIES & DESCRIPTIONS

ROCK QUALITY DESIGNATION (RQD**)

DESCRIPTION OF ROCK QUALITY	RQD (%)
Very Poor	0 - 25
Poor	25 - 50
Fair	50 - 75
Good	75 - 90
Excellent	90 - 100

**RQD is defined as the total length of sound core pieces, 4 inches (102mm) or greater in length, expressed as a percentage of the total length cored. RQD provides an indication of the integrity of the rock mass and relative extent of seams and bedding planes.

DEGREE OF WEATHERING

Slightly Weathered	Slight decomposition of parent material in joints and seams.
Weathered	Well-developed and decomposed joints and seams.
Highly Weathered	Rock highly decomposed, may be extremely broken.

SOLUTION AND VOID CONDITIONS

Solid	Contains no voids.
Vuggy	Containing small pits or cavities < 1/2" (13mm).
Porous	Containing numerous voids which may be interconnected.
Cavernous	Containing cavities, sometimes quite large.

When classification of rock materials has been estimated from disturbed samples, core samples and petrographic analysis may reveal other rock types.

HARDNESS & DEGREE OF CEMENTATION

LIMESTONE

Hard	Difficult to scratch with knife.
Moderately Hard	Can scratch with knife but not with fingernail.
Soft	Can be scratched with fingernail.

SHALE

Hard	Can scratch with knife but not with fingernail.
Moderately Hard	Can be scratched with fingernail.
Soft	Can be molded easily with fingers.

SANDSTONE

Well Cemented	Capable of scratching a knife blade.
Cemented	Can be scratched with knife.
Poorly Cemented	Can be broken apart easily with fingers.

BEDDING CHARACTERISTICS

TERM	THICKNESS (inches)	THICKNESS (mm)
Very Thick Bedded	> 36	> 915
Thick Bedded	12 - 36	305 - 915
Medium Bedded	4 - 12	102 - 305
Thin Bedded	1 - 4	25 - 102
Very Thin Bedded	0.4 - 1	10 - 25
Laminated	0.1 - 0.4	2.5 - 10
Thinly Laminated	< 0.1	< 2.5

Bedding Planes	Planes dividing the individual layers, beds or strata of rocks.
Joint	Fracture in rock, generally more or less vertical or transverse to the bedding.
Seam	Applies to bedding plane with an unspecified degree of weathering.

BORHOLE LOG — BH-1

Sheet	1 OF 3		
Date	7/25/2015		
Project No.	15068-01	Drilling Co.	GeoMat
Project	RC Hobbs-Jefferson	Sampler	Cal Mod. And SPT
Client	RC Hobbs	Method	Hollow Stem
Location	4105 Jefferson Street, Riverside, Ca.	Hammer Type	140 lb
Coodinate		Surface Elev.	
Notes		Total Depth	50'

Type/Symbol	Casing	Split Spoon	Ring Sampler	Cutting
I.D.		S	R	C
O.D.				
Length				
Hammer Wt.				
Hammer Fall				

Date	Time	Water Depth (ft)	Casing Size (in)	Casing Depth (ft)	Hole Depth (ft)	Symbol
7/25/2015		34				

Depth Below Surface (ft)	Elevation (ft)	Graphic	Soil Sample Type	Number	Symbol	Depth	Blows 0-152.4 mm	152.4-304.8 mm	304.8-457.2 mm	N-Value	N60	(N1)60	VISUAL MATERIAL CLASSIFICATION AND REMARKS	Moisture (%)	Dry Density (pcf)	Test
1													**LEAN CLAY WITH SAND (CL)**			
2													Red-brown, fine grained, moist			
3			R				7	11	15	17			indurated, very firm	12	98	
4													LL = 33%, PL = 20%			
5																
6													**SANDY SILT (ML)**			
7													gray silt, moist			
8													% Passing No. 200 Sieve = 79			
9													LL = 30%, PL = 27%			
10			R				22	50/5"		53			hard	9		
11													sample disturbed			
12																
13																
14																
15			S				9	24	29	53			**LEAN CLAY w/SAND (CL)**	16		
16													olive-tan clay, moist			
17													% Passing No. 200 Sieve = 75			
18													LL = 37%, PL = 24%			
19													becoming dificult to drill			
20			S				9	7	11	18			very firm	21		
21													% Passing No. 200 Sieve = 83			
22													LL = 40%, PL = 20%			
23																
24																
25			S				4	7	11	18			**SILT (ML)**	28		

CONTINUED ON NEXT PAGE

The stratification lines represent the approximate boundary lines between soil and rock types. In-situ, the transition may be gradual.

BORHOLE LOG — BH-1

Sheet	2 OF 3		
Date	7/25/2015		
Project No.	15068-01	Drilling Co.	GeoMat
Project	RC Hobbs-Jefferson	Rig	Cal Mod. And SPT
Client	RC Hobbs	Drill Method	Hollow Stem
Location	4105 Jefferson Street, Riverside, Ca.	Hammer Type	140 lb
Coodinate		Surface Elev.	
Notes		Total Depth	50'

Type/Symbol	Casing	Split Spoon	Ring Sampler	Cutting	Date	Time	Water Depth (ft)	Casing Size (in)	Casing Depth (ft)	Hole Depth (ft)	Symbol
I.D.		S	R	C							
O.D.					7/25/2015		40				
Length											
Hammer Wt.											
Hammer Fall											

Depth Below Surface (ft)	Elevation (ft)	Graphic	Soil Sample Type	Number	Symbol	Depth	Blows 0-152.4 mm	152.4-304.8 mm	304.8-457.2 mm	N-Value	N60	(N1)60	VISUAL MATERIAL CLASSIFICATION AND REMARKS	Moisture (%)	Dry Density (pcf)	Test
26													**SILT (ML)**			
27													gray fine grained sand, very firm			
28													% Passing No. 200 Sieve = 100			
29													LL = 35%, PL = 26%			
30			S				9	11	15	26			**CALYEY SAND/SANDY CLAY (SC/CL)**			
31													orange and gray sand gray clay			
32													medium dense/very firm			
33																
34													GROUNDWATER @ 34 FEET			
35			S				10	11	13	25			**POORLY GRADED SAND w/SILT (SP-SM)**	16		
36													gray sand, very moist			
37													% Passing No. 200 sieve=12			
38													medium dense			
39																
40			S				10	10	10	20			**FAT CLAY w/SAND (CH)**	34		
41													brown fat clay			
42													% Passing No. 200 Sieve = 85			
43													LL = 55%, PL = 22%			
44																
45			S				9	11	11	22			very firm			
46																
47													LL = 55%, PL = 26%			
48																
49																
50			S				10	12	13	25			very firm			

CONTINUED ON NEXT PAGE

The stratification lines represent the approximate boundary lines between soil and rock types. In-situ, the transition may be gradual.

BORHOLE LOG — BH-2

Sheet	3 OF 3		
Date	7/25/2015		
Project No.	15068-01	Drilling Co.	GeoMat
Project	RC Hobbs-Jefferson	Rig	Cal Mod. And SPT
Client	RC Hobbs	Drill Method	Hollow Stem
Location	4105 Jefferson Street, Riverside, Ca.	Hammer Type	140 lb
Coodinate		Surface Elev.	
Notes		Total Depth	15'

Type/Symbol	Casing	Split Spoon	Ring Sampler	Cutting
I.D.		S	R	C
O.D.				
Length				
Hammer Wt.				
Hammer Fall				

Date	Time	Water Depth (ft)	Casing Size (in)	Casing Depth (ft)	Hole Depth (ft)	Symbol
7/25/2015		no seepage				

Depth Below Surface (ft)	Elevation (ft)	Graphic	Soil Sample Type	Number	Symbol	Depth	Blows 0-152.4 mm	152.4-304.8 mm	304.8-457.2 mm	N-Value	N60	(N1)60	VISUAL MATERIAL CLASSIFICATION AND REMARKS	Moisture (%)	Dry Density (pcf)	Test
1													**LEAN CLAY WITH SAND (CL)**			
2													Red-brown, fine grained, moist			
3																
4																
5			R				12	16	27	28			very firm	12	116	
6																
7													**SANDY SILT (ML)**			
8													gray silt, moist			
9													indurated			
10			R				10	29	50	68			hard, ring sample disturbed	8		
11									/4"				Caliche >20%			
12																
13																
14																
15			S				7	10	10	20			**LEAN CLAY w/SAND (CL)**			
16													olive-tan and brown clay, moist			
17													very firm			
18																
19																
20																
21																
22																
23																
24																
25																
25																

The stratification lines represent the approximate boundary lines between soil and rock types. In-situ, the transition may be gradual.

BORHOLE LOG

BH-3

Sheet	1 OF 1		
Date	7/25/2015		
Project No.	15068-01	Drilling Co.	GeoMat
Project	RC Hobbs-Jefferson	Sampler	Cal Mod. And SPT
Client	RC Hobbs	Method	Hollow Stem
Location	4105 Jefferson Street, Riverside, Ca.	Hammer Type	140 lb
Coodinate		Surface Elev.	
Notes		Total Depth	15'

Type/Symbol	Casing	Split Spoon	Ring Sampler	Cutting
I.D.		S	R	C
O.D.				
Length				
Hammer Wt.				
Hammer Fall				

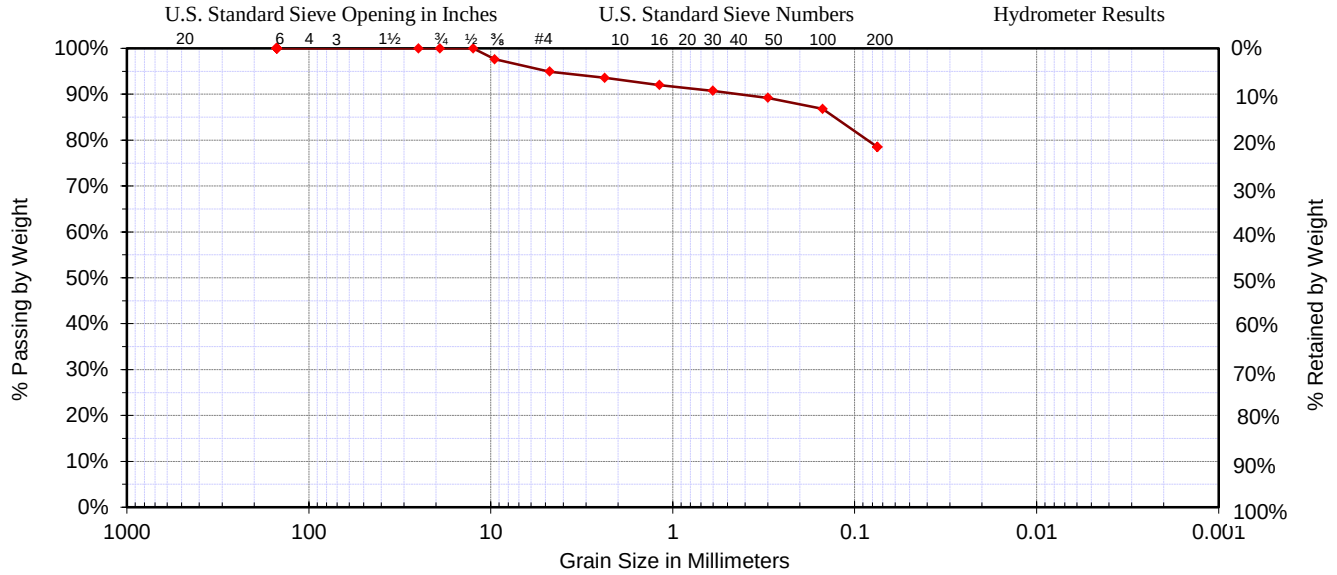
Date	Time	Water Depth (ft)	Casing Size (in)	Casing Depth (ft)	Hole Depth (ft)	Symbol
7/25/2015		no seepage				

Depth Below Surface (ft)	Elevation (ft)	Graphic	Soil Sample Type	Number	Symbol	Depth	Blows 0-152.4 mm	152.4-304.8 mm	304.8-457.2 mm	N-Value	N60	(N1)60	VISUAL MATERIAL CLASSIFICATION AND REMARKS	Moisture (%)	Dry Density (pcf)	Test
0													**CALYEY SAND/SANDY CLAY (SC/CL)**			
1													Red-brown, fine grained, moist			
2													indurated, hard			
3																
4																
5			R				13	33	50/5"	60			very dense/hard	14	112	
6																
7													**SILT (ML)**			
8													Light brown silt/sandy silt, fine graind, slightly cohesive			
9													Caliche >20%			
10			S				7	13	13	26			very firm			
11																
12																
13																
14																
15			S				10	12	13	25			**SILTY SAND (SM)**			
16													Light brown, fine grained, Caliche >20%			
17													% Passing No. 200 sieve= 46			
18																
19																
20																
21																
22																
23																
24																
25																

The stratification lines represent the approximate boundary lines between soil and rock types. In-situ, the transition may be gradual.

Appendix C

LABORATORY TEST RESULTS



Cobbles	Gravels		Sands			Silts	Clays
	Coarse	Fine	Coarse	Medium	Fine		

Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	ML, Silt with Sand	5.09%
Sample ID:	B-1	D_{60} =	0.06		% Sand
Source:	SPT	C_C =	1.50	**Specifications**	16.41%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	0.30		78.50%
Boring #:	B-1	Plastic Limit=	0.27	Fineness Modulus	Sample Moisture
Depth:	10'	Plasticity Index=	0.03	0.55	**9.1%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	94.9%	94.9%		
4.00"	100.00		100.0%			#8	2.360	93.6%	93.6%		
3.00"	75.00		100.0%			#10	2.000		93.1%		
2.50"	63.00		100.0%			#16	1.180	92.0%	92.0%		
2.00"	50.00		100.0%			#20	0.850		91.3%		
1.75"	45.00		100.0%			#30	0.600	90.8%	90.8%		
1.50"	37.50		100.0%			#40	0.425		89.8%		
1.25"	31.50		100.0%			#50	0.300	89.2%	89.2%		
1.00"	25.00	100.0%	100.0%			#60	0.250		88.4%		
7/8"	22.40		100.0%			#80	0.180		87.3%		
3/4"	19.00	100.0%	100.0%			#100	0.150	86.8%	86.8%		
5/8"	16.00		100.0%			#140	0.106		81.9%		
1/2"	12.50	100.0%	100.0%			#170	0.090		80.2%		
3/8"	9.50	97.6%	97.6%			#200	0.075	78.5%	78.5%		
1/4"	6.30		95.8%			#270	0.053				
#4	4.75	94.9%	94.9%								

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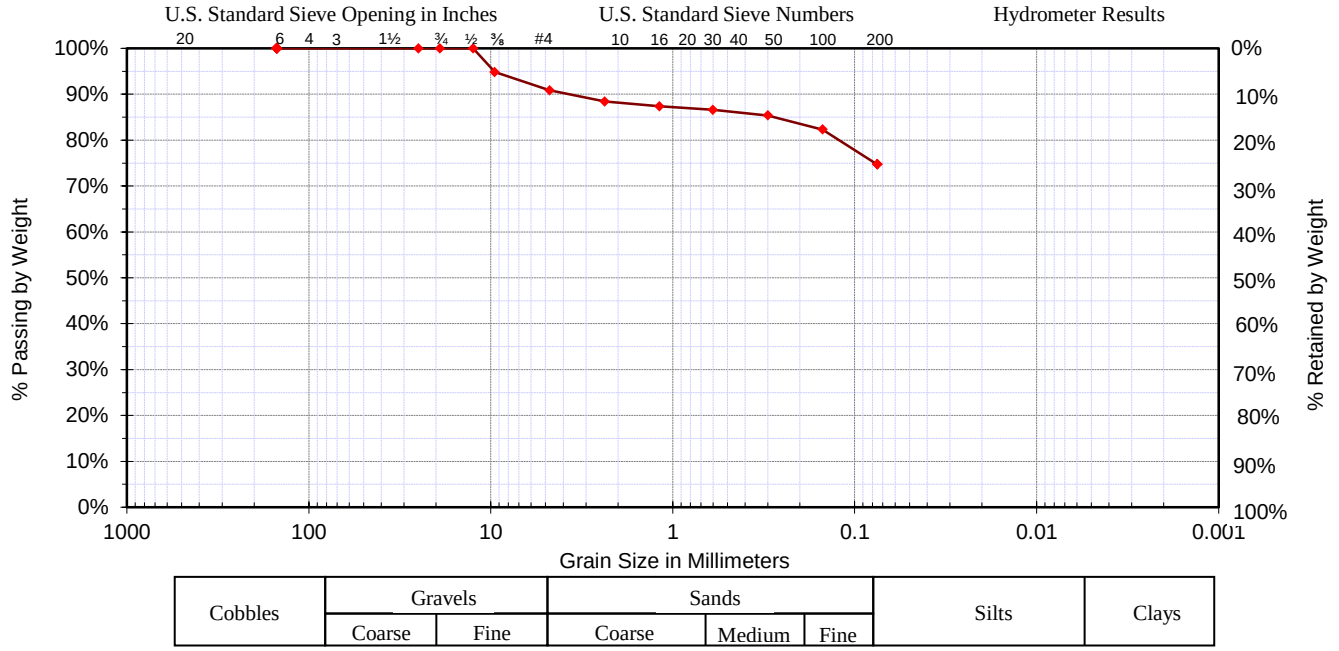
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	CL, Lean Clay with Sand	9.15%
Sample ID:	B-1	D_{60} =	0.06		% Sand
Source:	SPT	C_C =	1.50	**Specifications**	16.16%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	0.37		74.70%
Boring #:	B-1	Plastic Limit=	0.23	Fineness Modulus	Sample Moisture
Depth:	15'	Plasticity Index=	0.14	0.84	**15.7%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	90.9%	90.9%		
4.00"	100.00		100.0%			#8	2.360	88.4%	88.4%		
3.00"	75.00		100.0%			#10	2.000		88.1%		
2.50"	63.00		100.0%			#16	1.180	87.3%	87.3%		
2.00"	50.00		100.0%			#20	0.850		86.9%		
1.75"	45.00		100.0%			#30	0.600	86.6%	86.6%		
1.50"	37.50		100.0%			#40	0.425		85.9%		
1.25"	31.50		100.0%			#50	0.300	85.4%	85.4%		
1.00"	25.00	100.0%	100.0%			#60	0.250		84.3%		
7/8"	22.40		100.0%			#80	0.180		82.9%		
3/4"	19.00	100.0%	100.0%			#100	0.150	82.3%	82.3%		
5/8"	16.00		100.0%			#140	0.106		77.8%		
1/2"	12.50	100.0%	100.0%			#170	0.090		76.2%		
3/8"	9.50	94.8%	94.8%			#200	0.075	74.7%	74.7%		
1/4"	6.30		92.1%			#270	0.053				
#4	4.75	90.9%	90.9%								

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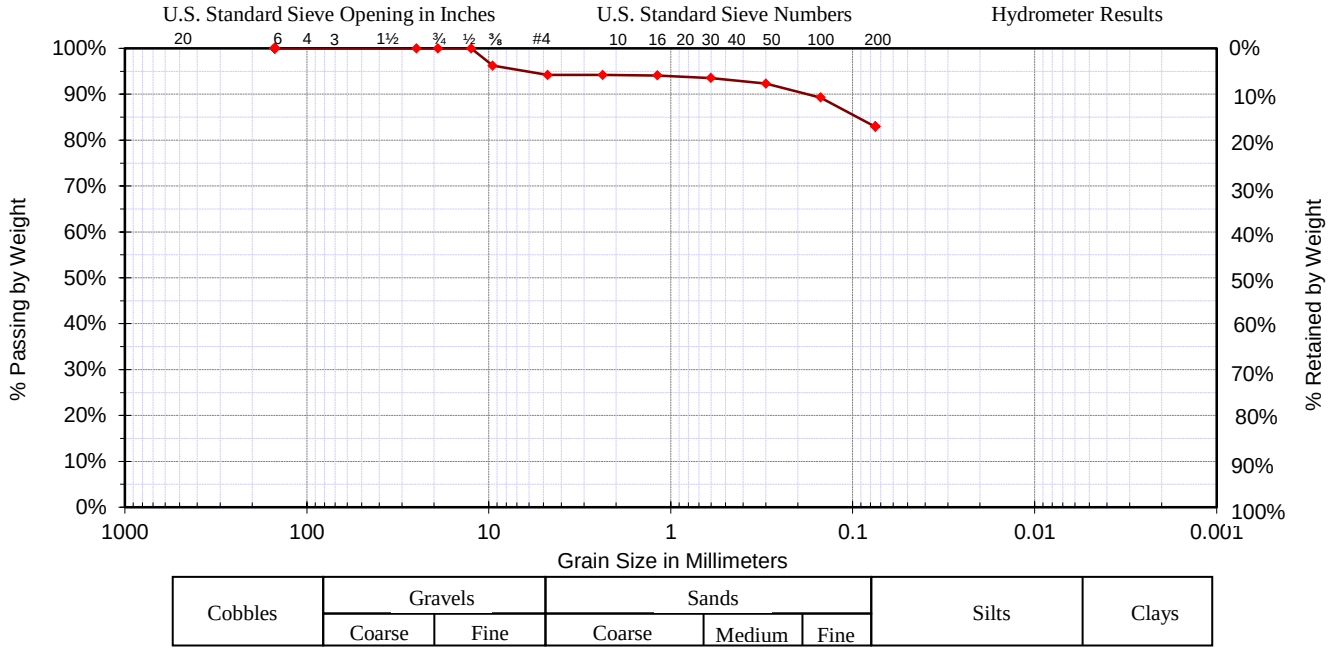
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	CL, Lean Clay with Sand	5.80%
Sample ID:	B-1	D_{60} =	0.05		% Sand
Source:	SPT	C_C =	1.50	**Specifications**	11.27%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	n/a		82.92%
Boring #:	B-1	Plastic Limit=	0.20	Fineness Modulus	Sample Moisture
Depth:	20'	Plasticity Index=	n/a	0.46	**21.2%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	94.2%	94.2%		
4.00"	100.00		100.0%			#8	2.360	94.2%	94.2%		
3.00"	75.00		100.0%			#10	2.000		94.2%		
2.50"	63.00		100.0%			#16	1.180	94.1%	94.1%		
2.00"	50.00		100.0%			#20	0.850		93.8%		
1.75"	45.00		100.0%			#30	0.600	93.5%	93.5%		
1.50"	37.50		100.0%			#40	0.425		92.8%		
1.25"	31.50		100.0%			#50	0.300	92.3%	92.3%		
1.00"	25.00	100.0%	100.0%			#60	0.250		91.3%		
7/8"	22.40		100.0%			#80	0.180		89.9%		
3/4"	19.00	100.0%	100.0%			#100	0.150	89.3%	89.3%		
5/8"	16.00		100.0%			#140	0.106		85.6%		
1/2"	12.50	100.0%	100.0%			#170	0.090		84.2%		
3/8"	9.50	96.2%	96.2%			#200	0.075	82.9%	82.9%		
1/4"	6.30		94.9%			#270	0.053				
#4	4.75	94.2%	94.2%								

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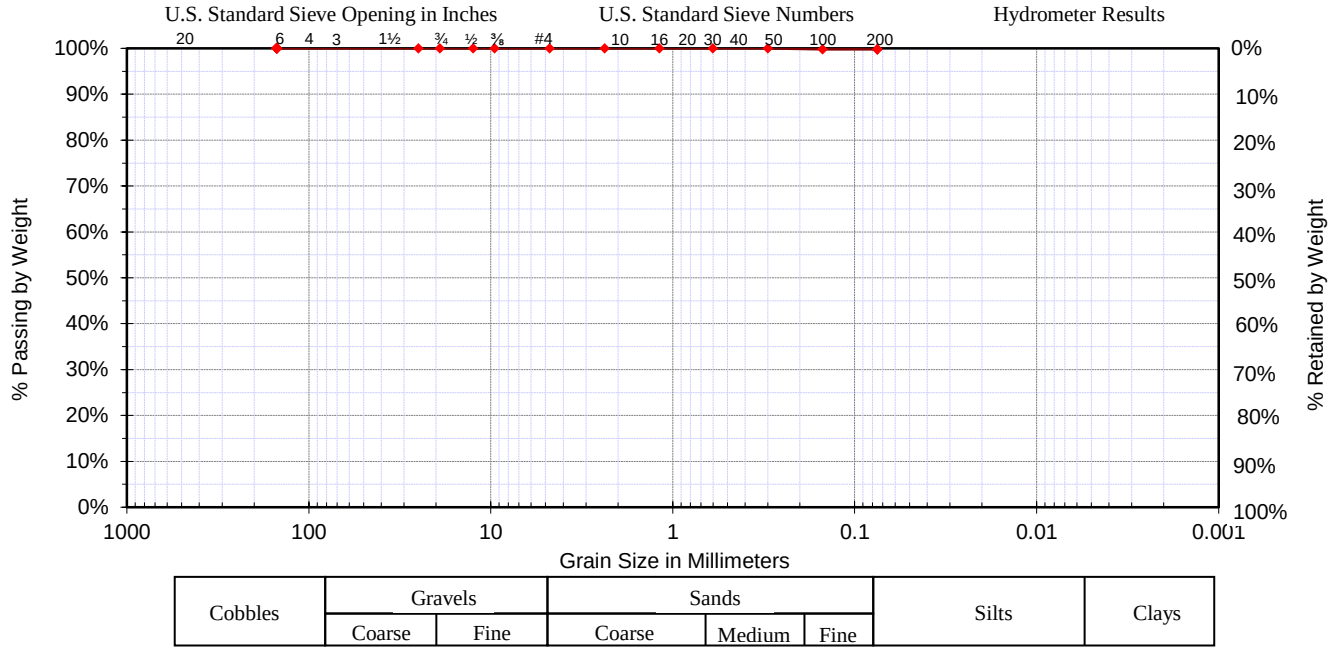
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.02	ML, Silt	0.00%
Sample ID:	B-1	D_{60} =	0.05		% Sand
Source:	SPT	C_C =	1.50	**Specifications**	0.22%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	0.35		99.78%
Boring #:	B-1	Plastic Limit=	0.26	Fineness Modulus	Sample Moisture
Depth:	25'	Plasticity Index=	0.09	0.00	**28.3%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	100.0%	100.0%		
4.00"	100.00		100.0%			#8	2.360	100.0%	100.0%		
3.00"	75.00		100.0%			#10	2.000		100.0%		
2.50"	63.00		100.0%			#16	1.180	100.0%	100.0%		
2.00"	50.00		100.0%			#20	0.850		100.0%		
1.75"	45.00		100.0%			#30	0.600	100.0%	100.0%		
1.50"	37.50		100.0%			#40	0.425		100.0%		
1.25"	31.50		100.0%			#50	0.300	100.0%	100.0%		
1.00"	25.00	100.0%	100.0%			#60	0.250		99.9%		
7/8"	22.40		100.0%			#80	0.180		99.8%		
3/4"	19.00	100.0%	100.0%			#100	0.150	99.8%	99.8%		
5/8"	16.00		100.0%			#140	0.106		99.8%		
1/2"	12.50	100.0%	100.0%			#170	0.090		99.8%		
3/8"	9.50	100.0%	100.0%			#200	0.075	99.8%	99.8%		
1/4"	6.30		100.0%			#270	0.053				
#4	4.75	100.0%	100.0%								

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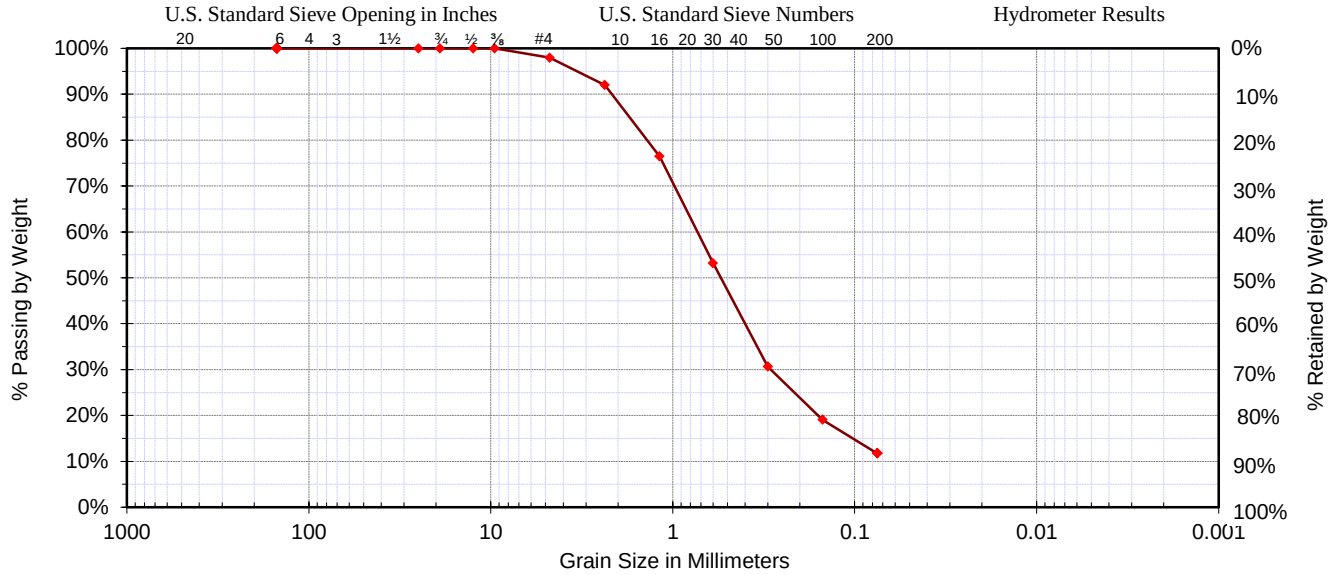
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.06	**Classification**	% Gravel
Sample #:		D_{30} =	0.29	SW-SC, Well-graded Sand with Silty Clay	2.04%
Sample ID:	B-1	D_{60} =	0.77		% Sand
Source:	SPT	C_C =	1.73	**Specifications**	86.23%
Project:	RC Hobbs-Jefferson	C_U =	12.04	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	n/a		11.74%
Boring #:	B-1	Plastic Limit=	n/a	Fineness Modulus	Sample Moisture
Depth:	35'	Plasticity Index=	n/a	2.31	**15.9%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	98.0%	98.0%		
4.00"	100.00		100.0%			#8	2.360	92.0%	92.0%		
3.00"	75.00		100.0%			#10	2.000		87.3%		
2.50"	63.00		100.0%			#16	1.180	76.5%	76.5%		
2.00"	50.00		100.0%			#20	0.850		63.2%		
1.75"	45.00		100.0%			#30	0.600	53.2%	53.2%		
1.50"	37.50		100.0%			#40	0.425		40.0%		
1.25"	31.50		100.0%			#50	0.300	30.6%	30.6%		
1.00"	25.00	100.0%	100.0%			#60	0.250		26.8%		
7/8"	22.40		100.0%			#80	0.180		21.4%		
3/4"	19.00	100.0%	100.0%			#100	0.150	19.0%	19.0%		
5/8"	16.00		100.0%			#140	0.106		14.8%		
1/2"	12.50	100.0%	100.0%			#170	0.090		13.2%		
3/8"	9.50	100.0%	100.0%			#200	0.075	11.7%	11.7%		
1/4"	6.30		98.6%			#270	0.053				
#4	4.75	98.0%	98.0%								

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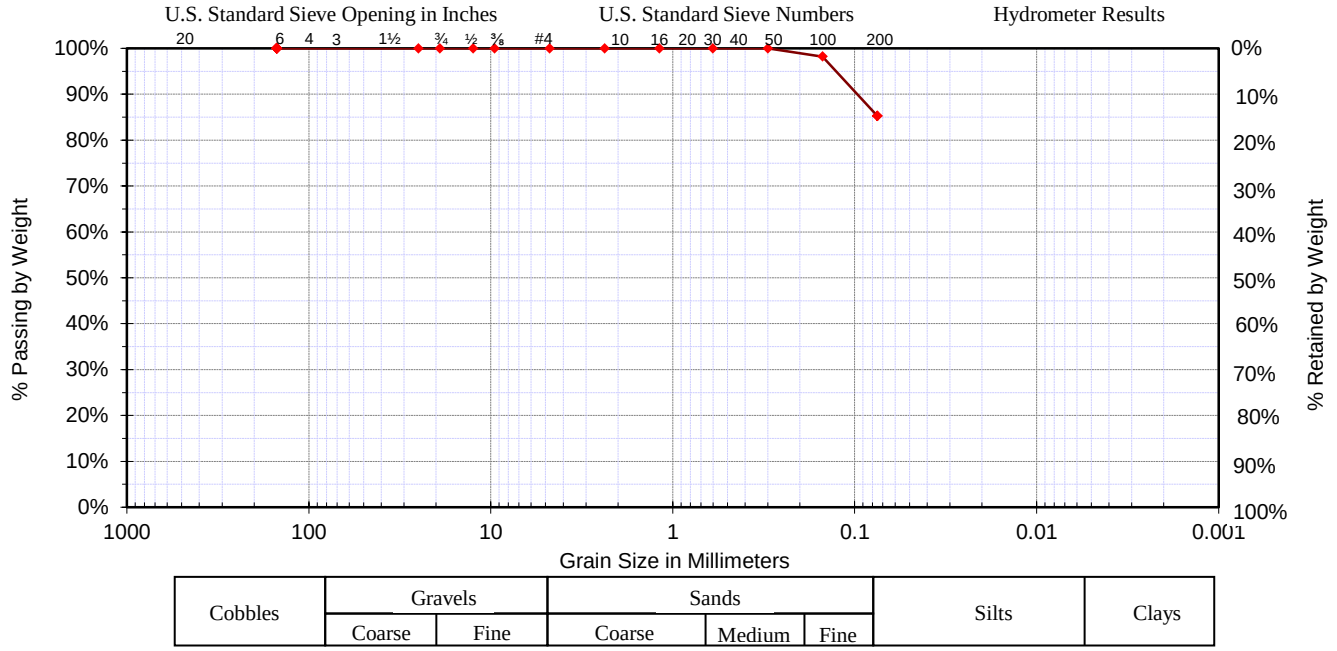
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	CH, Fat Clay	0.00%
Sample ID:	B-1	D_{60} =	0.05		% Sand
Source:	SPT	C_C =	1.50	**Specifications**	14.73%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	0.53		85.27%
Boring #:	B-1	Plastic Limit=	0.22	Fineness Modulus	Sample Moisture
Depth:	40'	Plasticity Index=	0.32	0.02	**33.7%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	100.0%	100.0%		
4.00"	100.00		100.0%			#8	2.360	100.0%	100.0%		
3.00"	75.00		100.0%			#10	2.000		100.0%		
2.50"	63.00		100.0%			#16	1.180	100.0%	100.0%		
2.00"	50.00		100.0%			#20	0.850		100.0%		
1.75"	45.00		100.0%			#30	0.600	100.0%	100.0%		
1.50"	37.50		100.0%			#40	0.425		100.0%		
1.25"	31.50		100.0%			#50	0.300	100.0%	100.0%		
1.00"	25.00	100.0%	100.0%			#60	0.250		99.4%		
7/8"	22.40		100.0%			#80	0.180		98.6%		
3/4"	19.00	100.0%	100.0%			#100	0.150	98.2%	98.2%		
5/8"	16.00		100.0%			#140	0.106		90.6%		
1/2"	12.50	100.0%	100.0%			#170	0.090		87.9%		
3/8"	9.50	100.0%	100.0%			#200	0.075	85.3%	85.3%		
1/4"	6.30		100.0%			#270	0.053				
#4	4.75	100.0%	100.0%								

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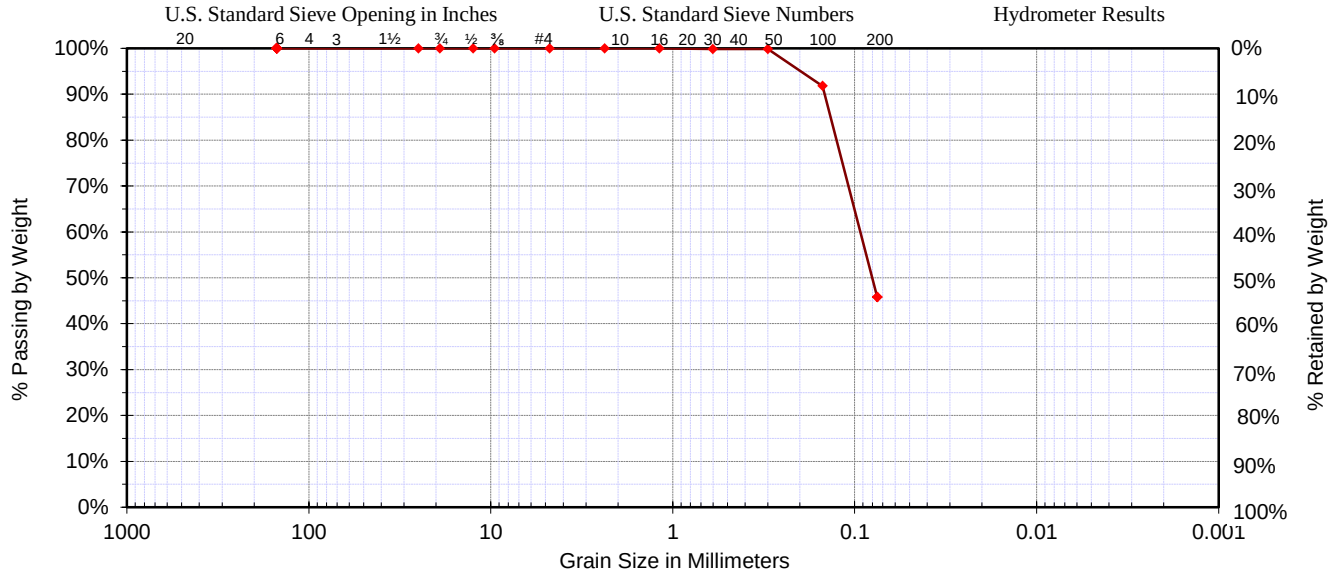
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.02	**Classification**	% Gravel
Sample #:		D_{30} =	0.05	SM, Silty Sand	0.00%
Sample ID:	B-3	D_{60} =	0.10		% Sand
Source:	SPT	C_C =	1.50	**Specifications**	54.25%
Project:	RC Hobbs-Jefferson	C_U =	5.99	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	n/a		45.75%
Boring #:	B-3	Plastic Limit=	n/a	Fineness Modulus	Sample Moisture
Depth:	15'	Plasticity Index=	n/a	0.08	**5.8%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	100.0%	100.0%		
4.00"	100.00		100.0%			#8	2.360	100.0%	100.0%		
3.00"	75.00		100.0%			#10	2.000		100.0%		
2.50"	63.00		100.0%			#16	1.180	100.0%	100.0%		
2.00"	50.00		100.0%			#20	0.850		99.9%		
1.75"	45.00		100.0%			#30	0.600	99.9%	99.9%		
1.50"	37.50		100.0%			#40	0.425		99.9%		
1.25"	31.50		100.0%			#50	0.300	99.9%	99.9%		
1.00"	25.00	100.0%	100.0%			#60	0.250		97.2%		
7/8"	22.40		100.0%			#80	0.180		93.4%		
3/4"	19.00	100.0%	100.0%			#100	0.150	91.8%	91.8%		
5/8"	16.00		100.0%			#140	0.106		64.8%		
1/2"	12.50	100.0%	100.0%			#170	0.090		55.0%		
3/8"	9.50	100.0%	100.0%			#200	0.075	45.8%	45.8%		
1/4"	6.30		100.0%			#270	0.053				
#4	4.75	100.0%	100.0%								

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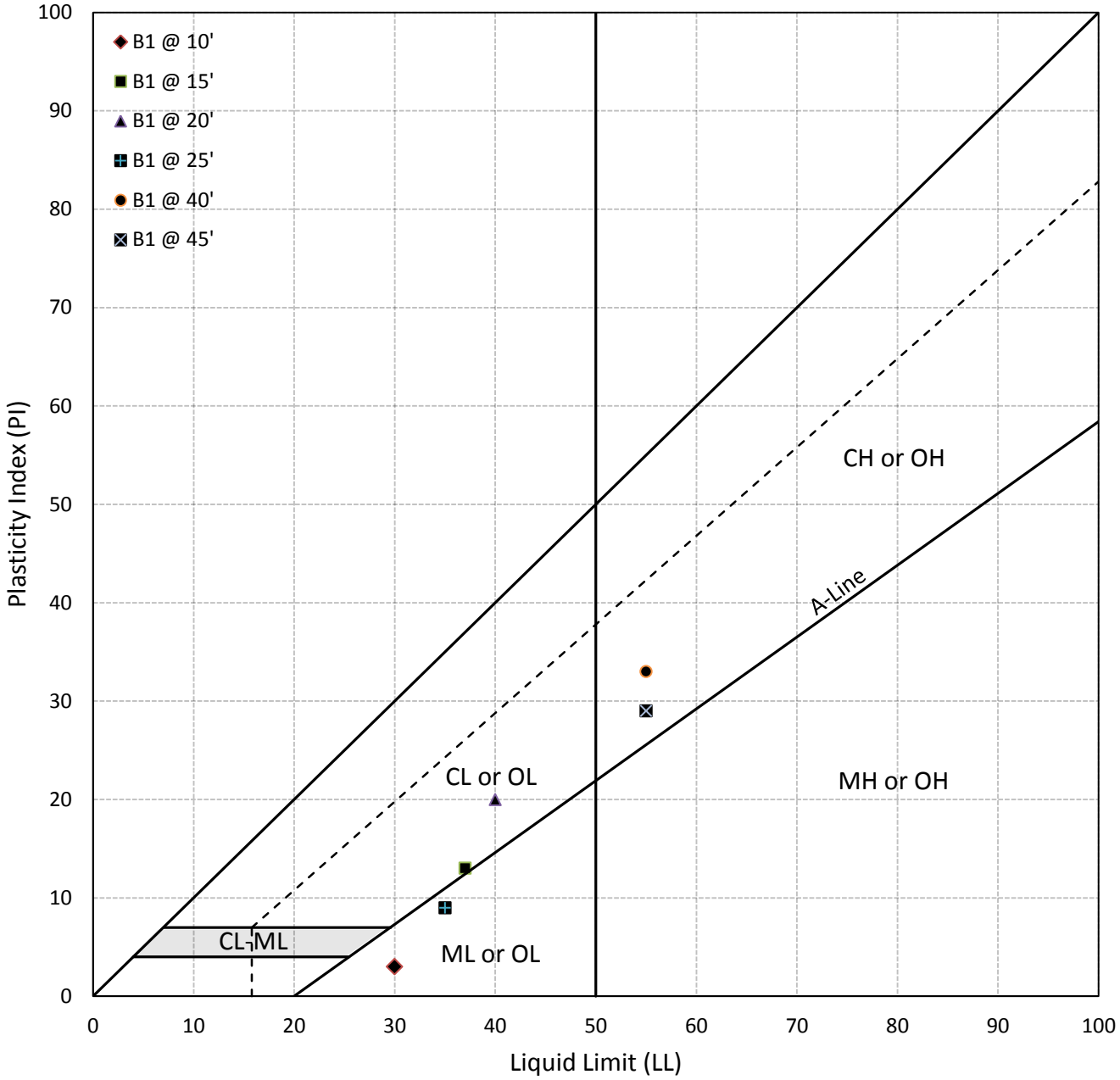
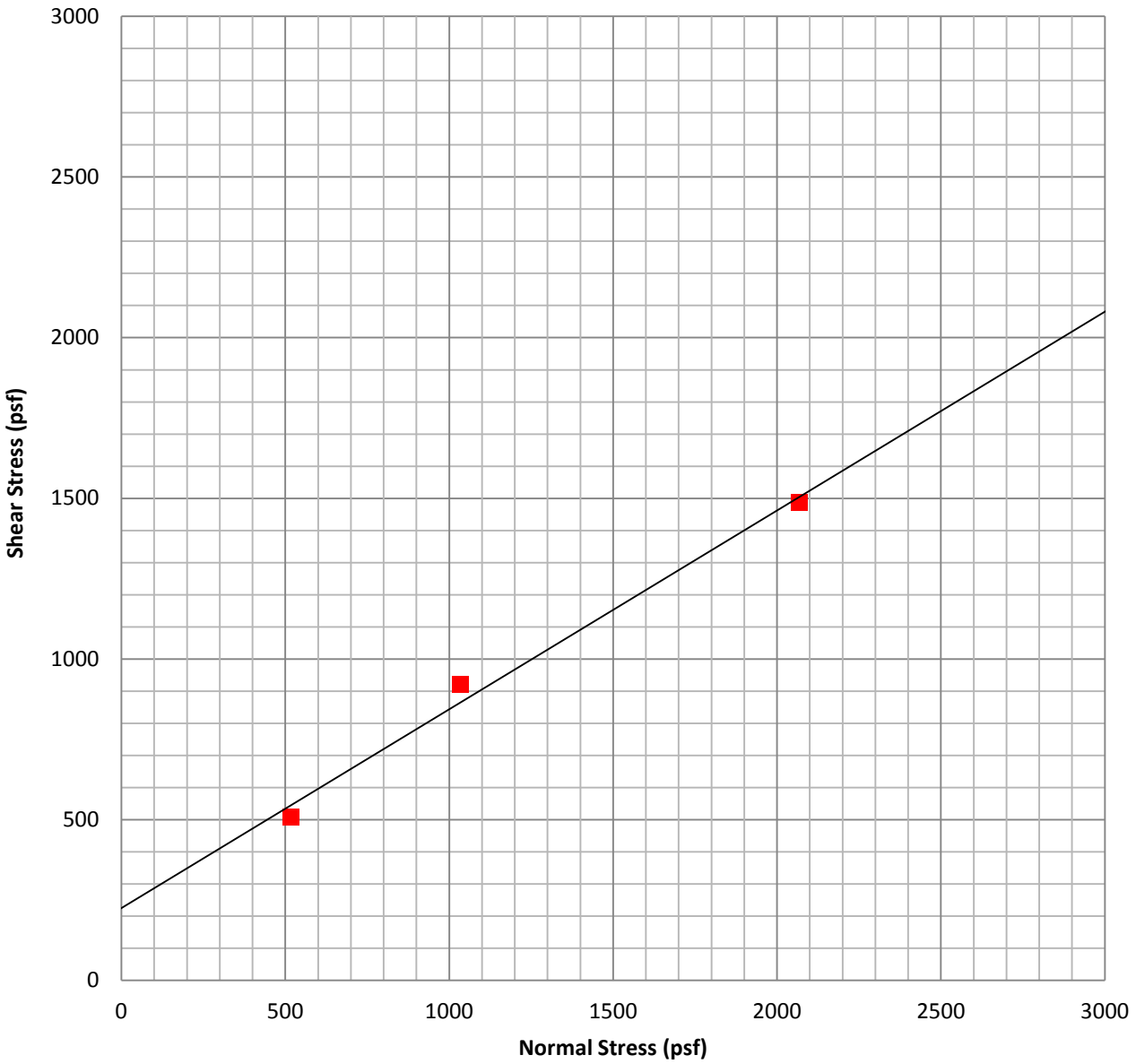
PLASTICITY CHART



LEGEND	CLASSIFICATION	ATTERBERG LIMITS TEST RESULTS LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)
B1 @ 10'	Gray Silt with Sand	30	27	3
B1 @ 15'	Olive-Tan Lean Clay with Sand	37	24	13
B1 @ 20'	Brown Lean Clay with Sand	40	20	20
B1 @ 25'	Brown Silt	35	26	9
B1 @ 40'	Brown Fat Clay	55	22	33
B1 @ 45'	Brown Fat Clay	55	26	29

DIRECT SHEAR TEST RESULTS



Sample	Symbol	Description	Soil Type [USCS]	Shear Strength	Friction Angle, ϕ [degrees]	Cohesion, c [psf]
B-1 @ 3'	—■—	Clayey Sand	SC	Ultimate	31.7	225

Sample Moisture [%]	Saturated Moisture [%]	Dry Unit Weight [pcf]
12.1	27.8	98.2
ASTM D-3080		

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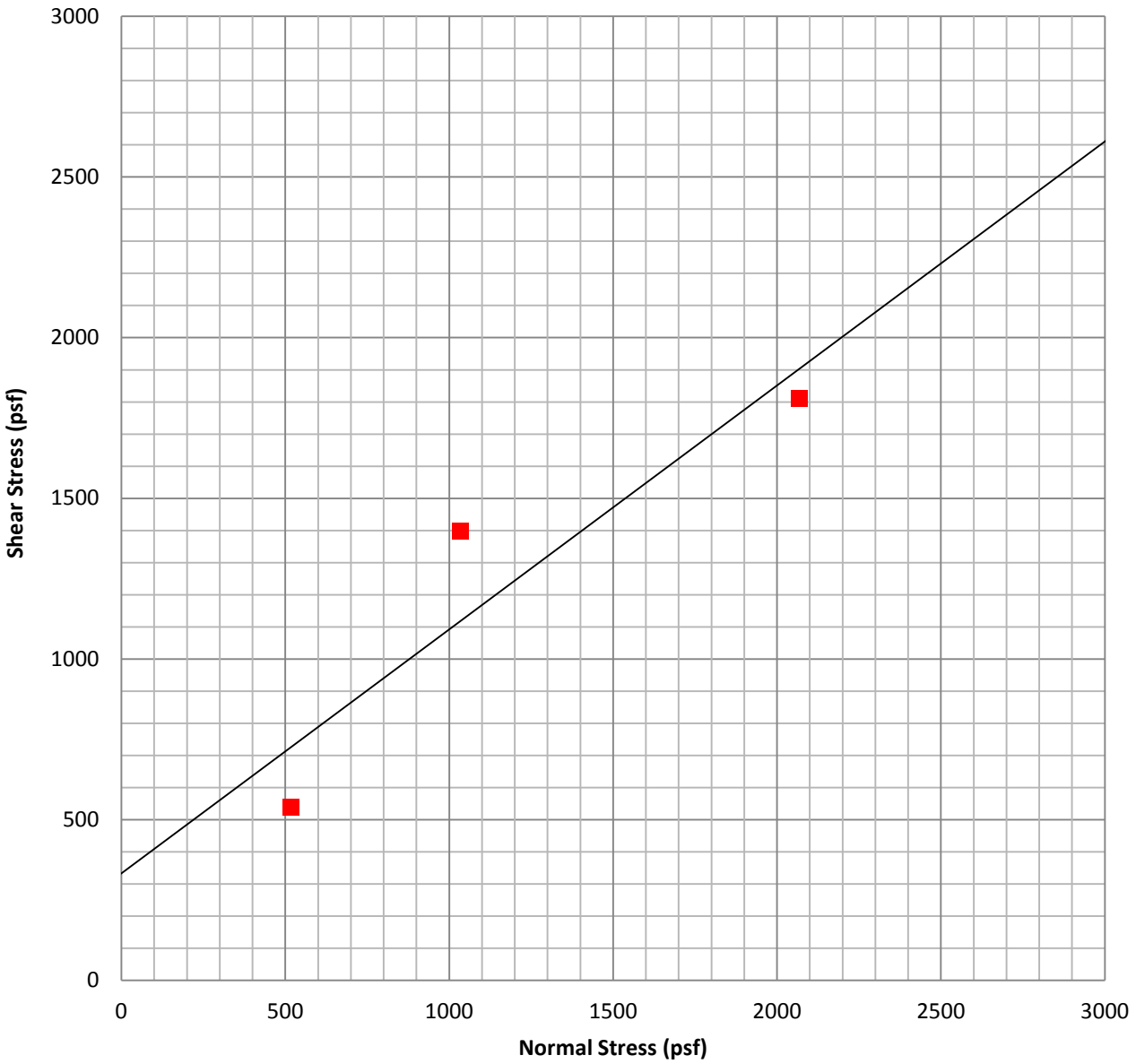
DIRECT SHEAR TEST RESULTS



Sample	Symbol	Description	Soil Type [USCS]	Shear Strength	Friction Angle, ϕ [degrees]	Cohesion, c [psf]
B-2 @ 5'	—■—	Clayey Sand	SC	Ultimate	37.2	332

Sample Moisture [%]	Saturated Moisture [%]	Dry Unit Weight [pcf]
11.6	20.8	116.0
ASTM D-3080		

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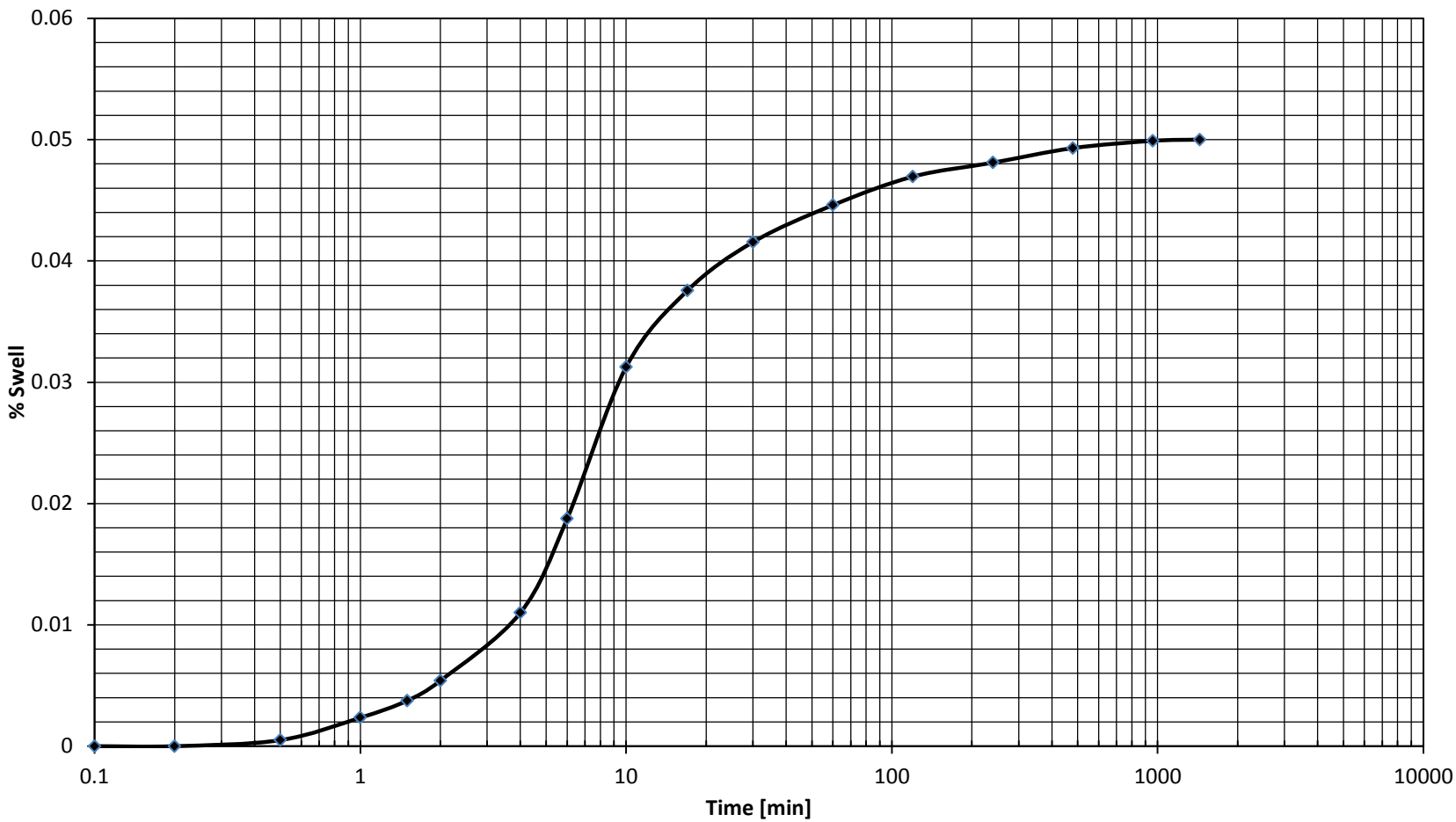

Classification of Potential Expansion of Soils Using Expansion Index, EI	Expansion Index, EI	0 to 20	21 to 50	51 to 90	91 to 130	>130
	Potential Expansion	Very Low	Low	Medium	High	Very High

Sample	Compacted Moisture	Compacted Dry Density	Final Moisture	Expansion Index	Expansion Classification
B-1 @ 0-3'	9.7%	101.8	24.1%	5	Very Low

Project Name:	4105 Jefferson St., Riverside	Expansion Index: ASTM D 4829
Project No.:	15068-01	

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GeoMat Testing Laboratories, Inc.

Soil Engineering, Environmental Engineering, Materials Testing, Geology

SOLUBLE SULFATEAND CHLORIDE TEST RESULTS

Project Name	RC Hobbs – Jefferson Street	**Test Date**	7/30/2015
Project No.	15068-01	**Date Sampled**	6/25/2015
Project Location	4105 Jefferson Street,Riverside, California	**Sampled By**	AM
Location in Structure	B1@ 0-3'	**Sample Type**	Bulk
Sampled Classification	SC	**Tested By**	AM

TESTING INFORMATION

Sample weight before drying	Not Recorded
Sample weight after drying	Not Recorded
Sample Weight Passing No. 10 Sieve	100 grams
Moisture	N/A

Location	Mixing Ratio	Dilution Factor	Sulfate Reading (ppm)	Sulfate Content (ppm)	Sulfate Content (%)
B1	3	1	200	600	0.060
			Average		

Chloride Reading (ppm)	Chloride Content (ppm)	Chloride Content (%)
Average		

pH	
Average	

ACI 318-05 Table 4.3.1 Requirements for Concrete Exposed to Sulfate-Containing Solutions

Sulfate Exposure	Water-Soluble Sulfate (SO_4) In Soil, % by Mass	Sulfate (SO_4) In Water ppm	Cement Type	Maximum w/cm by Mass	Minimum Design Compressive Strength fc, MPa (psi)
Negligible	< 0.10	< 150	No Special Type	--	--
Moderate (see water)	0.10 to 0.20	150 to 1500	II IP(MS), IS(MS), P(MS), I(PM)(MS), I(SM)(MS)	0.50	28 (4000)
Severe	0.20 to 2.00	1500 to 10,000	V	0.45	31 (4500)
Very Severe	> 2.00	>10,000	V + pozz	0.45	31 (4500)

Caltrans classifies a site as corrosive to structural concrete as an area where soil and/or water contains >500pp chloride, >2000ppm sulfate, or has a pH <5.5. A minimum resistivity of less than 1000 ohm-cm indicates the potential for corrosive environment requiring testing for the above criteria.

The 2007 CBC Section 1904A references ACI 318 for material selection and mix design for reinforced concrete dependant on the onsite corrosion potential, soluble chloride content, and soluble sulfate content in soil

Comments: Sec 4.3 of ACI 318 (2005) Soil environment is detrimental to concrete if it has soluble sulfate >1000ppm and/or pH<5.5. Soil environment is corrosive to reinforcement and steel pipes if Chloride ion >500ppm or pH <4.0.

The information in this form is not intended for corrosion engineering design. If corrosion is critical, a corrosion specialist should be contacted to provide further recommendations.

Signature Date

Print Name Title

9980 Indiana Avenue ● Suite 14 ● Riverside ● California ● 92503 ● Phone (951) 688-5400 ● Fax (951) 688-5200
www.geomatlabs.com, contact: e-mail: geomatlabs@sbcglobal.net

Appendix D

USGS Design Maps Detailed Report

ASCE 7-10 Standard (33.9428°N, 117.4197°W)

Site Class D – "Stiff Soil", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1] S_S = 1.500 g

From Figure 22-2 [2] S_1 = 0.600 g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content w ≥ 40%, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk–Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4–1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_S = 1.500 g, F_a = 1.000

Table 11.4–2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1–s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.600 g, F_v = 1.500

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 1.500 = 1.500$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.500 \times 0.600 = 0.900$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

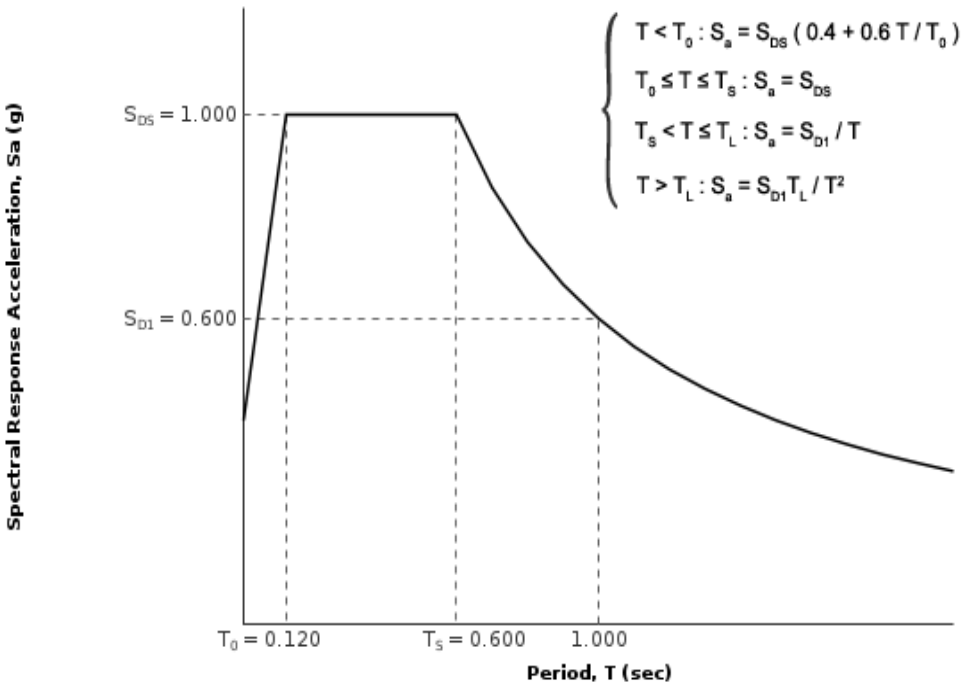
Equation (11.4–3): $S_{DS} = ⅔\ S_{MS} = ⅔ \times 1.500 = 1.000$ g

Equation (11.4–4): $S_{D1} = ⅔\ S_{M1} = ⅔ \times 0.900 = 0.600$ g

Section 11.4.5 — Design Response Spectrum

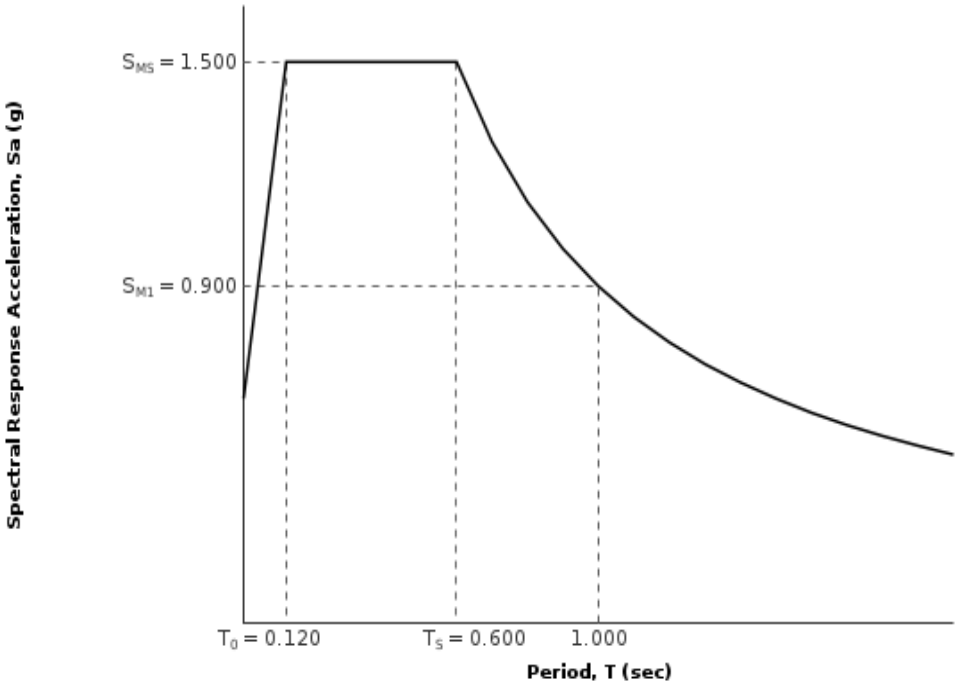
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.500

Equation (11.8–1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.500 = 0.5$ g

Table 11.8–1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.500 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 1.108

From Figure 22-18 [6] C_{R1} = 1.074

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 1.000 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.600 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

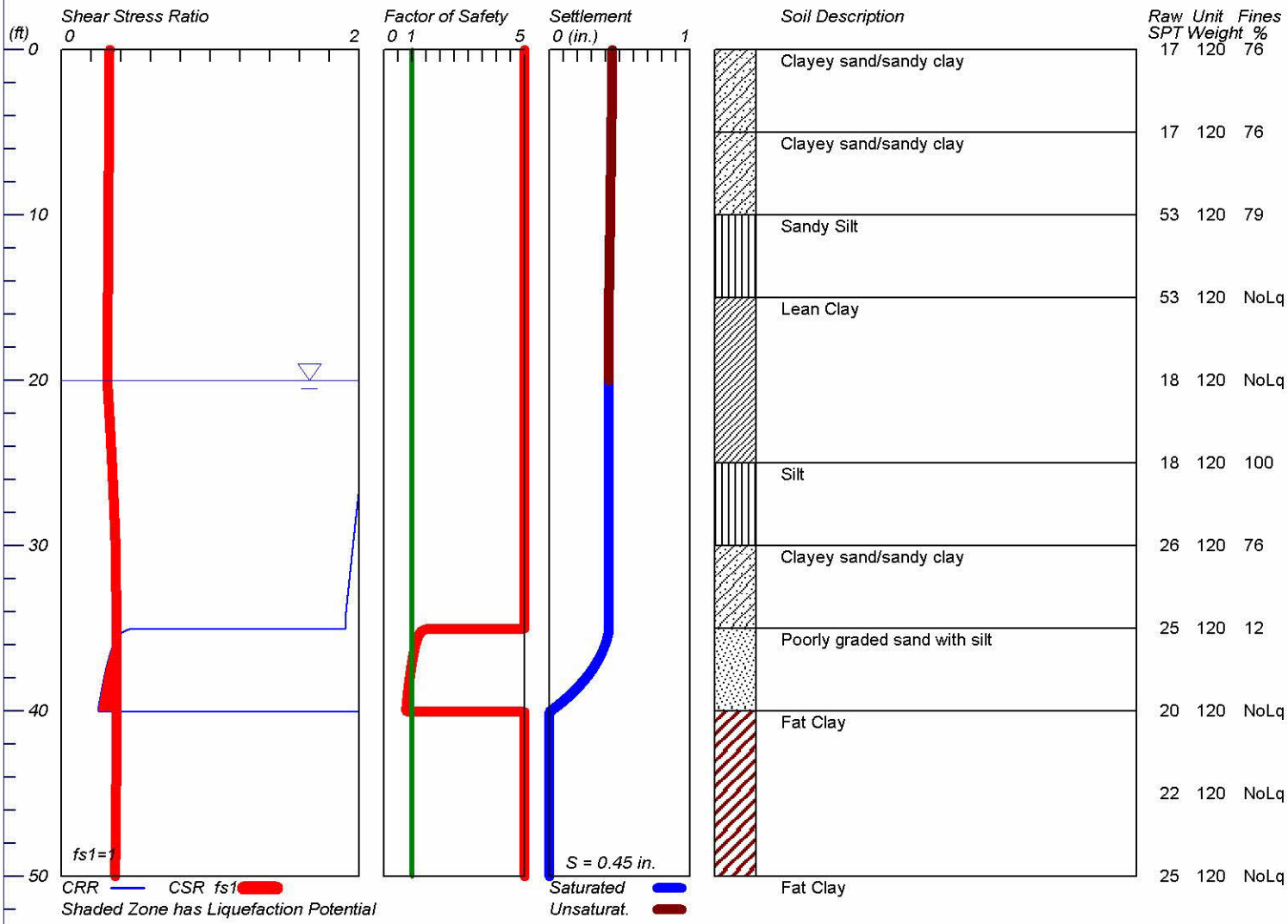
Appendix E

LIQUEFACTION ANALYSIS

4105Jefferson Street, Riverside

Hole No.=B-1 Water Depth=20 ft

Magnitude=7
Acceleration=0.5g



LiquefyPro CivilTech Software USA www.civiltech.com

15068-01

GeoMat Testing Laboratories, Inc.

LIQUEFACTION ANALYSIS CALCULATION SHEET -- SUMMARY

Title: 4105Jefferson Street, Riverside
Subtitle: 15068-01

Input Data:
Surface Elev.=
Hole No.=B-1
Depth of Hole=50.0 ft
Water Table during Earthquake= 20.0 ft
Water Table during In-Situ Testing= 34.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.0

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, = 1.30
7. Borehole Diameter, = 1.05
8. Sampling Method, = 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	17.0	120.0	76.0
5.0	17.0	120.0	76.0
10.0	53.0	120.0	79.0
15.0	53.0	120.0	NoLiq
20.0	18.0	120.0	NoLiq
25.0	18.0	120.0	100.0
30.0	26.0	120.0	76.0
35.0	25.0	120.0	12.0
40.0	20.0	120.0	NoLiq
45.0	22.0	120.0	NoLiq
50.0	25.0	120.0	NoLiq

Output Results:
Settlement of Saturated Sands=0.43 in.
Settlement of Unsaturated Sands=0.02 in.
Total Settlement of Saturated and Unsaturated Sands=0.45 in.
Differential Settlement=0.224 to 0.296 in.

Depth ft	CRRv	CSRm	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.32	5.00	0.43	0.02	0.45
1.00	2.00	0.32	5.00	0.43	0.02	0.45
2.00	2.00	0.32	5.00	0.43	0.02	0.45
3.00	2.00	0.32	5.00	0.43	0.02	0.45
4.00	2.00	0.32	5.00	0.43	0.02	0.44
5.00	2.00	0.32	5.00	0.43	0.02	0.44
6.00	2.00	0.32	5.00	0.43	0.02	0.44
7.00	2.00	0.32	5.00	0.43	0.01	0.44
8.00	2.00	0.32	5.00	0.43	0.01	0.44
9.00	2.00	0.32	5.00	0.43	0.01	0.44
10.00	2.00	0.32	5.00	0.43	0.01	0.43
11.00	2.00	0.32	5.00	0.43	0.01	0.43
12.00	2.00	0.32	5.00	0.43	0.01	0.43
13.00	2.00	0.32	5.00	0.43	0.00	0.43
14.00	2.00	0.31	5.00	0.43	0.00	0.43
15.00	2.00	0.31	5.00	0.43	0.00	0.43
16.00	2.00	0.31	5.00	0.43	0.00	0.43
17.00	2.00	0.31	5.00	0.43	0.00	0.43
18.00	2.00	0.31	5.00	0.43	0.00	0.43
19.00	2.00	0.31	5.00	0.43	0.00	0.43
20.00	2.00	0.31	5.00	0.43	0.00	0.43
21.00	2.00	0.32	5.00	0.43	0.00	0.43
22.00	2.00	0.32	5.00	0.43	0.00	0.43
23.00	2.00	0.33	5.00	0.43	0.00	0.43
24.00	2.00	0.34	5.00	0.43	0.00	0.43
25.00	2.00	0.34	5.00	0.43	0.00	0.43
26.00	2.01	0.35	5.00	0.43	0.00	0.43
27.00	2.00	0.35	5.00	0.43	0.00	0.43
28.00	1.98	0.36	5.00	0.43	0.00	0.43
29.00	1.97	0.36	5.00	0.43	0.00	0.43
30.00	1.96	0.37	5.00	0.43	0.00	0.43
31.00	1.95	0.37	5.00	0.43	0.00	0.43
32.00	1.94	0.37	5.00	0.43	0.00	0.43
33.00	1.92	0.37	5.00	0.43	0.00	0.43
34.00	1.91	0.37	5.00	0.43	0.00	0.43
35.00	1.91	0.37	5.00	0.43	0.00	0.43
36.00	0.35	0.37	1.12	0.40	0.00	0.40
37.00	0.31	0.37	1.01	0.34	0.00	0.34
38.00	0.29	0.37	0.92*	0.26	0.00	0.26
39.00	0.27	0.37	0.85*	0.15	0.00	0.15
40.00	0.25	0.37	0.79*	0.01	0.00	0.01
41.00	2.00	0.37	5.00	0.00	0.00	0.00
42.00	2.00	0.37	5.00	0.00	0.00	0.00
43.00	2.00	0.37	5.00	0.00	0.00	0.00
44.00	2.00	0.37	5.00	0.00	0.00	0.00
45.00	2.00	0.37	5.00	0.00	0.00	0.00
46.00	2.00	0.37	5.00	0.00	0.00	0.00
47.00	2.00	0.37	5.00	0.00	0.00	0.00
48.00	2.00	0.37	5.00	0.00	0.00	0.00
49.00	2.00	0.36	5.00	0.00	0.00	0.00
50.00	2.00	0.36	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRv	Cyclic resistance ratio from soils
CSRm	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRv/CSRm
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS CALCULATION SHEET -- DETAIL

Title: 4105Jefferson Street, Riverside
Subtitle: 15068-01

Input Data:
Surface Elev.=
Hole No.=B-1
Depth of Hole=50.0 ft
Water Table during Earthquake= 20.0 ft
Water Table during In-Situ Testing= 34.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.0

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, = 1.30
7. Borehole Diameter, = 1.05
8. Sampling Method, = 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.0	17.0	120.0	76.0
5.0	17.0	120.0	76.0
10.0	53.0	120.0	79.0
15.0	53.0	120.0	NoLiq
20.0	18.0	120.0	NoLiq
25.0	18.0	120.0	100.0
30.0	26.0	120.0	76.0
35.0	25.0	120.0	12.0
40.0	20.0	120.0	NoLiq
45.0	22.0	120.0	NoLiq
50.0	25.0	120.0	NoLiq

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=1.00 ft

CSR Calculation:

Depth ft	gamma pcf	sigma tsf	gamma' pcf	sigma' tsf	rd	CSR	fs1	CSRfs *fs1
0.00	120.0	0.000	120.0	0.000	1.00	0.32	1.0	0.32
1.00	120.0	0.060	120.0	0.060	1.00	0.32	1.0	0.32
2.00	120.0	0.120	120.0	0.120	1.00	0.32	1.0	0.32
3.00	120.0	0.180	120.0	0.180	0.99	0.32	1.0	0.32
4.00	120.0	0.240	120.0	0.240	0.99	0.32	1.0	0.32
5.00	120.0	0.300	120.0	0.300	0.99	0.32	1.0	0.32
6.00	120.0	0.360	120.0	0.360	0.99	0.32	1.0	0.32
7.00	120.0	0.420	120.0	0.420	0.98	0.32	1.0	0.32
8.00	120.0	0.480	120.0	0.480	0.98	0.32	1.0	0.32
9.00	120.0	0.540	120.0	0.540	0.98	0.32	1.0	0.32
10.00	120.0	0.600	120.0	0.600	0.98	0.32	1.0	0.32
11.00	120.0	0.660	120.0	0.660	0.97	0.32	1.0	0.32
12.00	120.0	0.720	120.0	0.720	0.97	0.32	1.0	0.32
13.00	120.0	0.780	120.0	0.780	0.97	0.32	1.0	0.32
14.00	120.0	0.840	120.0	0.840	0.97	0.31	1.0	0.31
15.00	120.0	0.900	120.0	0.900	0.97	0.31	1.0	0.31
16.00	120.0	0.960	120.0	0.960	0.96	0.31	1.0	0.31
17.00	120.0	1.020	120.0	1.020	0.96	0.31	1.0	0.31
18.00	120.0	1.080	120.0	1.080	0.96	0.31	1.0	0.31
19.00	120.0	1.140	120.0	1.140	0.96	0.31	1.0	0.31
20.00	120.0	1.200	120.0	1.200	0.95	0.31	1.0	0.31
21.00	120.0	1.260	57.6	1.230	0.95	0.32	1.0	0.32
22.00	120.0	1.320	57.6	1.259	0.95	0.32	1.0	0.32
23.00	120.0	1.380	57.6	1.288	0.95	0.33	1.0	0.33
24.00	120.0	1.440	57.6	1.317	0.94	0.34	1.0	0.34
25.00	120.0	1.500	57.6	1.346	0.94	0.34	1.0	0.34
26.00	120.0	1.560	57.6	1.374	0.94	0.35	1.0	0.35
27.00	120.0	1.620	57.6	1.403	0.94	0.35	1.0	0.35
28.00	120.0	1.680	57.6	1.432	0.93	0.36	1.0	0.36
29.00	120.0	1.740	57.6	1.461	0.93	0.36	1.0	0.36
30.00	120.0	1.800	57.6	1.490	0.93	0.37	1.0	0.37
31.00	120.0	1.860	57.6	1.518	0.92	0.37	1.0	0.37
32.00	120.0	1.920	57.6	1.547	0.91	0.37	1.0	0.37
33.00	120.0	1.980	57.6	1.576	0.91	0.37	1.0	0.37
34.00	120.0	2.040	57.6	1.605	0.90	0.37	1.0	0.37
35.00	120.0	2.100	57.6	1.634	0.89	0.37	1.0	0.37
36.00	120.0	2.160	57.6	1.662	0.88	0.37	1.0	0.37
37.00	120.0	2.220	57.6	1.691	0.87	0.37	1.0	0.37
38.00	120.0	2.280	57.6	1.720	0.86	0.37	1.0	0.37
39.00	120.0	2.340	57.6	1.749	0.86	0.37	1.0	0.37
40.00	120.0	2.400	57.6	1.778	0.85	0.37	1.0	0.37
41.00	120.0	2.460	57.6	1.806	0.84	0.37	1.0	0.37
42.00	120.0	2.520	57.6	1.835	0.83	0.37	1.0	0.37
43.00	120.0	2.580	57.6	1.864	0.82	0.37	1.0	0.37
44.00	120.0	2.640	57.6	1.893	0.82	0.37	1.0	0.37
45.00	120.0	2.700	57.6	1.922	0.81	0.37	1.0	0.37
46.00	120.0	2.760	57.6	1.950	0.80	0.37	1.0	0.37
47.00	120.0	2.820	57.6	1.979	0.79	0.37	1.0	0.37
48.00	120.0	2.880	57.6	2.008	0.78	0.37	1.0	0.37
49.00	120.0	2.940	57.6	2.037	0.78	0.36	1.0	0.36
50.00	120.0	3.000	57.6	2.066	0.77	0.36	1.0	0.36

CSR is based on water table at 20.0 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' tsf	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	17.00	1.64	0.75	0.000	1.70	35.50	76.00	7.20	42.70	2.00
1.00	17.00	1.64	0.75	0.060	1.70	35.50	76.00	7.20	42.70	2.00
2.00	17.00	1.64	0.75	0.120	1.70	35.50	76.00	7.20	42.70	2.00
3.00	17.00	1.64	0.75	0.180	1.70	35.50	76.00	7.20	42.70	2.00
4.00	17.00	1.64	0.75	0.240	1.70	35.50	76.00	7.20	42.70	2.00
5.00	17.00	1.64	0.75	0.300	1.70	35.50	76.00	7.20	42.70	2.00
6.00	24.20	1.64	0.75	0.360	1.67	49.55	76.60	7.20	56.75	2.00
7.00	31.40	1.64	0.75	0.420	1.54	59.52	77.20	7.20	66.72	2.00
8.00	38.60	1.64	0.75	0.480	1.44	68.44	77.80	7.20	75.64	2.00
9.00	45.80	1.64	0.85	0.540	1.36	86.78	78.40	7.20	93.98	2.00
10.00	53.00	1.64	0.85	0.600	1.29	95.26	79.00	7.20	102.46	2.00
11.00	53.00	1.64	0.85	0.660	1.23	90.83	79.00	7.20	98.03	2.00
12.00	53.00	1.64	0.85	0.720	1.18	86.96	79.00	7.20	94.16	2.00
13.00	53.00	1.64	0.85	0.780	1.13	83.55	79.00	7.20	90.75	2.00
14.00	53.00	1.64	0.85	0.840	1.09	80.51	79.00	7.20	87.71	2.00
15.00	53.00	1.64	0.95	0.900	1.05	86.93	NoLiq	7.20	94.13	2.00
16.00	46.00	1.64	0.95	0.960	1.02	73.06	NoLiq	7.20	80.26	2.00
17.00	39.00	1.64	0.95	1.020	0.99	60.09	NoLiq	7.20	67.29	2.00
18.00	32.00	1.64	0.95	1.080	0.96	47.92	NoLiq	7.20	55.12	2.00
19.00	25.00	1.64	0.95	1.140	0.94	36.44	NoLiq	7.20	43.64	2.00
20.00	18.00	1.64	0.95	1.200	0.91	25.57	NoLiq	7.20	32.77	2.00
21.00	18.00	1.64	0.95	1.260	0.89	24.95	NoLiq	7.20	32.15	2.00
22.00	18.00	1.64	0.95	1.320	0.87	24.38	NoLiq	7.20	31.58	2.00
23.00	18.00	1.64	0.95	1.380	0.85	23.84	NoLiq	7.20	31.04	2.00
24.00	18.00	1.64	0.95	1.440	0.83	23.34	NoLiq	7.20	30.54	2.00
25.00	18.00	1.64	0.95	1.500	0.82	22.87	NoLiq	7.20	30.07	0.48
26.00	19.60	1.64	0.95	1.560	0.80	24.42	95.20	7.20	31.62	2.00
27.00	21.20	1.64	0.95	1.620	0.79	25.92	90.40	7.20	33.12	2.00
28.00	22.80	1.64	1.00	1.680	0.77	28.81	85.60	7.20	36.01	2.00
29.00	24.40	1.64	1.00	1.740	0.76	30.30	80.80	7.20	37.50	2.00
30.00	26.00	1.64	1.00	1.800	0.75	31.74	76.00	7.20	38.94	2.00
31.00	25.80	1.64	1.00	1.860	0.73	30.99	63.20	7.20	38.19	2.00
32.00	25.60	1.64	1.00	1.920	0.72	30.26	50.40	7.20	37.46	2.00
33.00	25.40	1.64	1.00	1.980	0.71	29.57	37.60	7.20	36.77	2.00
34.00	25.20	1.64	1.00	2.040	0.70	28.90	24.80	4.75	33.65	2.00
35.00	25.00	1.64	1.00	2.070	0.69	28.46	12.00	1.68	30.14	2.00
36.00	24.00	1.64	1.00	2.099	0.69	27.13	12.00	1.68	28.81	0.37
37.00	23.00	1.64	1.00	2.128	0.69	25.83	12.00	1.68	27.51	0.33
38.00	22.00	1.64	1.00	2.157	0.68	24.54	12.00	1.68	26.22	0.30
39.00	21.00	1.64	1.00	2.186	0.68	23.27	12.00	1.68	24.95	0.28
40.00	20.00	1.64	1.00	2.214	0.67	22.02	12.00	1.68	23.70	0.26
41.00	20.40	1.64	1.00	2.243	0.67	22.31	NoLiq	7.20	29.51	0.40
42.00	20.80	1.64	1.00	2.272	0.66	22.60	NoLiq	7.20	29.80	0.43
43.00	21.20	1.64	1.00	2.301	0.66	22.89	NoLiq	7.20	30.09	0.49
44.00	21.60	1.64	1.00	2.330	0.66	23.18	NoLiq	7.20	30.38	2.00
45.00	22.00	1.64	1.00	2.358	0.65	23.47	NoLiq	7.20	30.67	2.00
46.00	22.60	1.64	1.00	2.387	0.65	23.96	NoLiq	7.20	31.16	2.00
47.00	23.20	1.64	1.00	2.416	0.64	24.45	NoLiq	7.20	31.65	2.00
48.00	23.80	1.64	1.00	2.445	0.64	24.93	NoLiq	7.20	32.13	2.00
49.00	24.40	1.64	1.00	2.474	0.64	25.41	NoLiq	7.20	32.61	2.00
50.00	25.00	1.64	1.00	2.502	0.63	25.89	NoLiq	7.20	33.09	2.00

CRR is based on water table at 34.0 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.0:

Depth ft	sigC' tsf	CRR7.5 tsf	Ksigma	CRRv tsf	CSRfs tsf	MSF	CSRm tsf	F.S. CRRv/CSRm
0.00	0.00	2.00	1.00	2.00	0.32	1.19	0.27	5.00
1.00	0.04	2.00	1.00	2.00	0.32	1.19	0.27	5.00
2.00	0.08	2.00	1.00	2.00	0.32	1.19	0.27	5.00
3.00	0.12	2.00	1.00	2.00	0.32	1.19	0.27	5.00
4.00	0.16	2.00	1.00	2.00	0.32	1.19	0.27	5.00
5.00	0.20	2.00	1.00	2.00	0.32	1.19	0.27	5.00
6.00	0.23	2.00	1.00	2.00	0.32	1.19	0.27	5.00
7.00	0.27	2.00	1.00	2.00	0.32	1.19	0.27	5.00
8.00	0.31	2.00	1.00	2.00	0.32	1.19	0.27	5.00
9.00	0.35	2.00	1.00	2.00	0.32	1.19	0.27	5.00
10.00	0.39	2.00	1.00	2.00	0.32	1.19	0.27	5.00
11.00	0.43	2.00	1.00	2.00	0.32	1.19	0.27	5.00
12.00	0.47	2.00	1.00	2.00	0.32	1.19	0.26	5.00
13.00	0.51	2.00	1.00	2.00	0.32	1.19	0.26	5.00
14.00	0.55	2.00	1.00	2.00	0.31	1.19	0.26	5.00
15.00	0.59	2.00	1.00	2.00	0.31	1.19	0.26	5.00 ^
16.00	0.62	2.00	1.00	2.00	0.31	1.19	0.26	5.00 ^
17.00	0.66	2.00	1.00	2.00	0.31	1.19	0.26	5.00 ^
18.00	0.70	2.00	1.00	2.00	0.31	1.19	0.26	5.00 ^
19.00	0.74	2.00	1.00	2.00	0.31	1.19	0.26	5.00 ^
20.00	0.78	2.00	1.00	2.00	0.31	1.19	0.26	5.00 ^
21.00	0.82	2.00	1.00	2.00	0.32	1.19	0.27	5.00 ^
22.00	0.86	2.00	1.00	2.00	0.32	1.19	0.27	5.00 ^
23.00	0.90	2.00	1.00	2.00	0.33	1.19	0.28	5.00 ^
24.00	0.94	2.00	1.00	2.00	0.34	1.19	0.28	5.00 ^
25.00	0.98	0.48	1.00	2.00	0.34	1.19	0.29	5.00 ^
26.00	1.01	2.00	1.00	2.01	0.35	1.19	0.29	5.00
27.00	1.05	2.00	1.00	2.00	0.35	1.19	0.29	5.00
28.00	1.09	2.00	0.99	1.98	0.36	1.19	0.30	5.00
29.00	1.13	2.00	0.99	1.97	0.36	1.19	0.30	5.00
30.00	1.17	2.00	0.98	1.96	0.37	1.19	0.31	5.00
31.00	1.21	2.00	0.97	1.95	0.37	1.19	0.31	5.00
32.00	1.25	2.00	0.97	1.94	0.37	1.19	0.31	5.00
33.00	1.29	2.00	0.96	1.92	0.37	1.19	0.31	5.00
34.00	1.33	2.00	0.96	1.91	0.37	1.19	0.31	5.00
35.00	1.35	2.00	0.95	1.91	0.37	1.19	0.31	5.00
36.00	1.36	0.37	0.95	0.35	0.37	1.19	0.31	1.12
37.00	1.38	0.33	0.95	0.31	0.37	1.19	0.31	1.01
38.00	1.40	0.30	0.95	0.29	0.37	1.19	0.31	0.92 *
39.00	1.42	0.28	0.94	0.27	0.37	1.19	0.31	0.85 *
40.00	1.44	0.26	0.94	0.25	0.37	1.19	0.31	0.79 *
41.00	1.46	0.40	0.94	2.00	0.37	1.19	0.31	5.00 ^
42.00	1.48	0.43	0.94	2.00	0.37	1.19	0.31	5.00 ^
43.00	1.50	0.49	0.93	2.00	0.37	1.19	0.31	5.00 ^
44.00	1.51	2.00	0.93	2.00	0.37	1.19	0.31	5.00 ^
45.00	1.53	2.00	0.93	2.00	0.37	1.19	0.31	5.00 ^
46.00	1.55	2.00	0.93	2.00	0.37	1.19	0.31	5.00 ^
47.00	1.57	2.00	0.92	2.00	0.37	1.19	0.31	5.00 ^
48.00	1.59	2.00	0.92	2.00	0.37	1.19	0.31	5.00 ^
49.00	1.61	2.00	0.92	2.00	0.36	1.19	0.30	5.00 ^
50.00	1.63	2.00	0.92	2.00	0.36	1.19	0.30	5.00 ^

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 tsf	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	42.70	76.0	0.00	42.70
1.00	-	-	-	42.70	76.0	0.00	42.70
2.00	-	-	-	42.70	76.0	0.00	42.70
3.00	-	-	-	42.70	76.0	0.00	42.70
4.00	-	-	-	42.70	76.0	0.00	42.70
5.00	-	-	-	42.70	76.0	0.00	42.70
6.00	-	-	-	56.75	76.6	0.00	56.75
7.00	-	-	-	66.72	77.2	0.00	66.72
8.00	-	-	-	75.64	77.8	0.00	75.64
9.00	-	-	-	93.98	78.4	0.00	93.98
10.00	-	-	-	100.00	79.0	0.00	100.00
11.00	-	-	-	98.03	79.0	0.00	98.03
12.00	-	-	-	94.16	79.0	0.00	94.16
13.00	-	-	-	90.75	79.0	0.00	90.75
14.00	-	-	-	87.71	79.0	0.00	87.71
15.00	-	-	-	94.13	NoLiq	0.00	94.13
16.00	-	-	-	80.26	NoLiq	0.00	80.26
17.00	-	-	-	67.29	NoLiq	0.00	67.29
18.00	-	-	-	55.12	NoLiq	0.00	55.12
19.00	-	-	-	43.64	NoLiq	0.00	43.64
20.00	-	-	-	32.77	NoLiq	0.00	32.77
21.00	-	-	-	32.15	NoLiq	0.00	32.15
22.00	-	-	-	31.58	NoLiq	0.00	31.58
23.00	-	-	-	31.04	NoLiq	0.00	31.04
24.00	-	-	-	30.54	NoLiq	0.00	30.54
25.00	-	-	-	30.07	NoLiq	0.00	30.07
26.00	-	-	-	31.62	95.2	0.00	31.62
27.00	-	-	-	33.12	90.4	0.00	33.12
28.00	-	-	-	36.01	85.6	0.00	36.01
29.00	-	-	-	37.50	80.8	0.00	37.50
30.00	-	-	-	38.94	76.0	0.00	38.94
31.00	-	-	-	38.19	63.2	0.00	38.19
32.00	-	-	-	37.46	50.4	0.00	37.46
33.00	-	-	-	36.77	37.6	0.00	36.77
34.00	-	-	-	33.65	24.8	0.00	33.65
35.00	-	-	-	30.14	12.0	0.00	30.14
36.00	-	-	-	28.81	12.0	0.00	28.81
37.00	-	-	-	27.51	12.0	0.00	27.51
38.00	-	-	-	26.22	12.0	0.00	26.22
39.00	-	-	-	24.95	12.0	0.00	24.95
40.00	-	-	-	23.70	12.0	0.00	23.70
41.00	-	-	-	29.51	NoLiq	0.00	29.51
42.00	-	-	-	29.80	NoLiq	0.00	29.80
43.00	-	-	-	30.09	NoLiq	0.00	30.09
44.00	-	-	-	30.38	NoLiq	0.00	30.38
45.00	-	-	-	30.67	NoLiq	0.00	30.67
46.00	-	-	-	31.16	NoLiq	0.00	31.16
47.00	-	-	-	31.65	NoLiq	0.00	31.65
48.00	-	-	-	32.13	NoLiq	0.00	32.13
49.00	-	-	-	32.61	NoLiq	0.00	32.61
50.00	-	-	-	33.09	NoLiq	0.00	33.09

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine*

Depth ft	CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
49.95	0.30	5.00	NoLiq	33.06	97.43	0.000	0.0E0	0.000	0.000
49.00	0.30	5.00	NoLiq	32.61	96.28	0.000	0.0E0	0.000	0.000
48.00	0.31	5.00	NoLiq	32.13	95.09	0.000	0.0E0	0.000	0.000
47.00	0.31	5.00	NoLiq	31.65	93.91	0.000	0.0E0	0.000	0.000
46.00	0.31	5.00	NoLiq	31.16	92.74	0.000	0.0E0	0.000	0.000
45.00	0.31	5.00	NoLiq	30.67	91.58	0.000	0.0E0	0.000	0.000
44.00	0.31	5.00	NoLiq	30.38	90.92	0.000	0.0E0	0.000	0.000
43.00	0.31	5.00	NoLiq	30.09	90.27	0.000	0.0E0	0.000	0.000
42.00	0.31	5.00	NoLiq	29.80	89.61	0.000	0.0E0	0.000	0.000
41.00	0.31	5.00	NoLiq	29.51	88.96	0.000	0.0E0	0.000	0.000
40.00	0.31	0.79	12.0	23.70	77.26	1.360	8.2E-3	0.008	0.008
39.00	0.31	0.85	12.0	24.95	79.62	1.048	6.3E-3	0.143	0.152
38.00	0.31	0.92	12.0	26.22	82.09	0.798	4.8E-3	0.109	0.261
37.00	0.31	1.01	12.0	27.51	84.68	0.555	3.3E-3	0.080	0.341
36.00	0.31	1.12	12.0	28.81	87.44	0.358	2.1E-3	0.054	0.395
35.00	0.31	5.00	12.0	30.14	90.37	0.000	0.0E0	0.030	0.425
34.00	0.31	5.00	24.8	33.65	98.97	0.000	0.0E0	0.000	0.425
33.00	0.31	5.00	37.6	36.77	100.00	0.000	0.0E0	0.000	0.425
32.00	0.31	5.00	50.4	37.46	100.00	0.000	0.0E0	0.000	0.425
31.00	0.31	5.00	63.2	38.19	100.00	0.000	0.0E0	0.000	0.425
30.00	0.31	5.00	76.0	38.94	100.00	0.000	0.0E0	0.000	0.425
29.00	0.30	5.00	80.8	37.50	100.00	0.000	0.0E0	0.000	0.425
28.00	0.30	5.00	85.6	36.01	100.00	0.000	0.0E0	0.000	0.425
27.00	0.29	5.00	90.4	33.12	97.57	0.000	0.0E0	0.000	0.425
26.00	0.29	5.00	95.2	31.62	93.84	0.000	0.0E0	0.000	0.425
25.00	0.29	5.00	NoLiq	30.07	90.21	0.000	0.0E0	0.000	0.425
24.00	0.28	5.00	NoLiq	30.54	91.29	0.000	0.0E0	0.000	0.425
23.00	0.28	5.00	NoLiq	31.04	92.46	0.000	0.0E0	0.000	0.425
22.00	0.27	5.00	NoLiq	31.58	93.74	0.000	0.0E0	0.000	0.425
21.00	0.27	5.00	NoLiq	32.15	95.14	0.000	0.0E0	0.000	0.425
20.05	0.26	5.00	NoLiq	32.74	96.60	0.000	0.0E0	0.000	0.425

Settlement of Saturated Sands=0.425 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth ft	sigma' tsf	sigC' tsf	(N1)60s	CSRfs	Gmax tsf	g*Ge/Gm	g_eff	ec7.5 %	Cec	ec %	dsz in.	dsp in.	S in.
20.00	1.20	0.78	32.77	0.31	1262.5	2.9E-4	0.0559	0.0276	0.93	0.0256	0.00E0	0.000	0.000
19.00	1.14	0.74	43.64	0.31	1353.6	2.6E-4	0.0589	0.0186	0.93	0.0173	0.00E0	0.000	0.000
18.00	1.08	0.70	55.12	0.31	1424.1	2.4E-4	0.0460	0.0145	0.93	0.0135	0.00E0	0.000	0.000
17.00	1.02	0.66	67.29	0.31	1479.0	2.2E-4	0.0379	0.0120	0.93	0.0111	0.00E0	0.000	0.000
16.00	0.96	0.62	80.26	0.31	1521.6	2.0E-4	0.0324	0.0103	0.93	0.0095	0.00E0	0.000	0.000
15.00	0.90	0.59	94.13	0.31	1553.6	1.8E-4	0.0284	0.0090	0.93	0.0083	0.00E0	0.000	0.000
14.00	0.84	0.55	87.71	0.31	1466.1	1.8E-4	0.0280	0.0089	0.93	0.0082	9.87E-5	0.002	0.002
13.00	0.78	0.51	90.75	0.32	1428.9	1.7E-4	0.0262	0.0083	0.93	0.0077	9.24E-5	0.002	0.004
12.00	0.72	0.47	94.16	0.32	1389.8	1.6E-4	0.0245	0.0077	0.93	0.0072	8.63E-5	0.002	0.006
11.00	0.66	0.43	98.03	0.32	1348.6	1.5E-4	0.0228	0.0072	0.93	0.0067	8.04E-5	0.002	0.007
10.00	0.60	0.39	100.00	0.32	1294.3	1.5E-4	0.0214	0.0068	0.93	0.0063	7.55E-5	0.002	0.009
9.00	0.54	0.35	93.98	0.32	1202.8	1.4E-4	0.0207	0.0065	0.93	0.0061	7.29E-5	0.001	0.010
8.00	0.48	0.31	75.64	0.32	1054.9	1.5E-4	0.0254	0.0080	0.93	0.0075	8.95E-5	0.002	0.012
7.00	0.42	0.27	66.72	0.32	946.4	1.4E-4	0.0247	0.0078	0.93	0.0072	8.69E-5	0.002	0.014
6.00	0.36	0.23	56.75	0.32	830.2	1.4E-4	0.0240	0.0076	0.93	0.0071	8.47E-5	0.002	0.016
5.00	0.30	0.20	42.70	0.32	689.4	1.4E-4	0.0242	0.0077	0.93	0.0071	8.53E-5	0.002	0.017
4.00	0.24	0.16	42.70	0.32	616.6	1.3E-4	0.0211	0.0067	0.93	0.0062	7.44E-5	0.002	0.019
3.00	0.18	0.12	42.70	0.32	534.0	1.1E-4	0.0227	0.0072	0.93	0.0067	7.99E-5	0.002	0.021
2.00	0.12	0.08	42.70	0.32	436.0	8.9E-5	0.0165	0.0052	0.93	0.0049	5.83E-5	0.001	0.022
1.00	0.06	0.04	42.70	0.32	308.3	6.3E-5	0.0100	0.0032	0.93	0.0029	3.51E-5	0.001	0.023
0.00	0.00	0.00	42.70	0.32	4.0	8.2E-7	0.0010	0.0003	0.93	0.0003	3.58E-6	0.000	0.023

Settlement of Unsaturated Sands=0.023 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=0.449 in.
Differential Settlement=0.224 to 0.296 in.

Units	Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT)
fs	Friction from CPT testing
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [tsf]
sigma'	Effective vertical stress [tsf]
sigC'	Effective confining pressure [tsf]
rd	Stress reduction coefficient
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksigma	Overburden stress correction factor for CRR7.5
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksigma
F.S.	Calculated factor of safety against liquefaction F.S.=CRRv/CSRm
User	User request factor of safety, which may apply to CSR
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1, fs1=1 or User, defined in #9 of Advanced page
MSF	Magnitude scaling factor for CSR
CSRm	After magnitude scaling correction CSRm=CSRfs/MSF
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

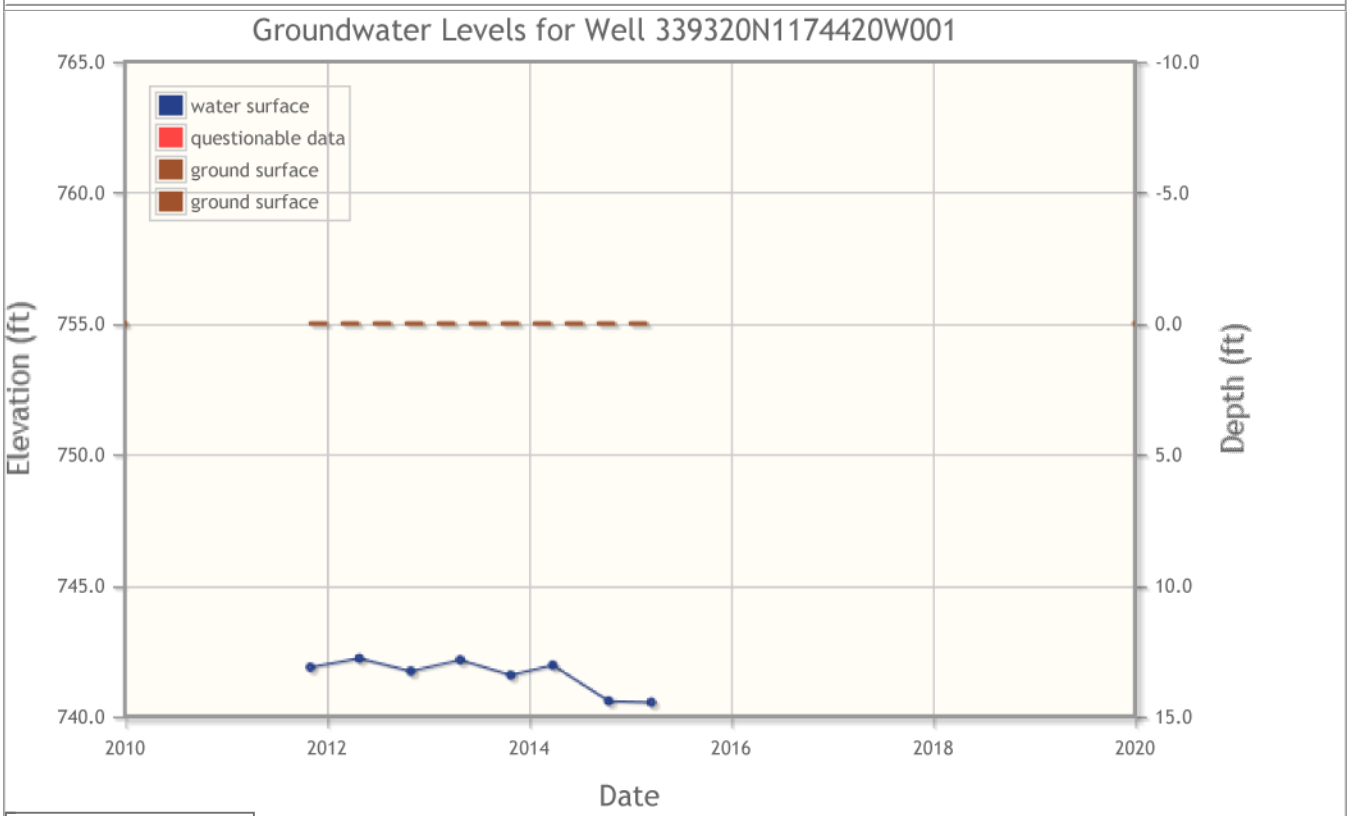
References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for
Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth
International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center,
Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

Groundwater Levels for Station 339320N1174420W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.

Station Data **Recent Groundwater Level Data** Historical Groundwater Level Data



Download CSV File

Date	RPE	GSE	RPWS	WSE	GS to...	Msmt Code	CASGEM Msmt	Agency
10/31/2011 00:00	755.540	755.000	13.66	741.88	13.12		Y	5122
04/25/2012 12:00	755.540	755.000	13.32	742.22	12.78		Y	5122
10/29/2012 00:00	755.540	755.000	13.81	741.73	13.27		Y	5122
04/25/2013 00:00	755.540	755.000	13.38	742.16	12.84		Y	5122
10/25/2013 00:00	755.540	755.000	13.96	741.58	13.42		Y	5122
03/25/2014 10:10	755.540	755.000	13.58	741.96	13.04		Y	5122
10/14/2014 09:55	755.540	755.000	14.95	740.59	14.41		Y	5122
03/16/2015 15:35	755.540	755.000	15	740.54	14.46		Y	5122

All elevation and depth measurements are in feet. The vertical datum for recent measurements is NAVD88.

Groundwater Levels for Station 339410N1173930W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.

Station Data **Recent Groundwater Level Data** Historical Groundwater Level Data

Download CSV File

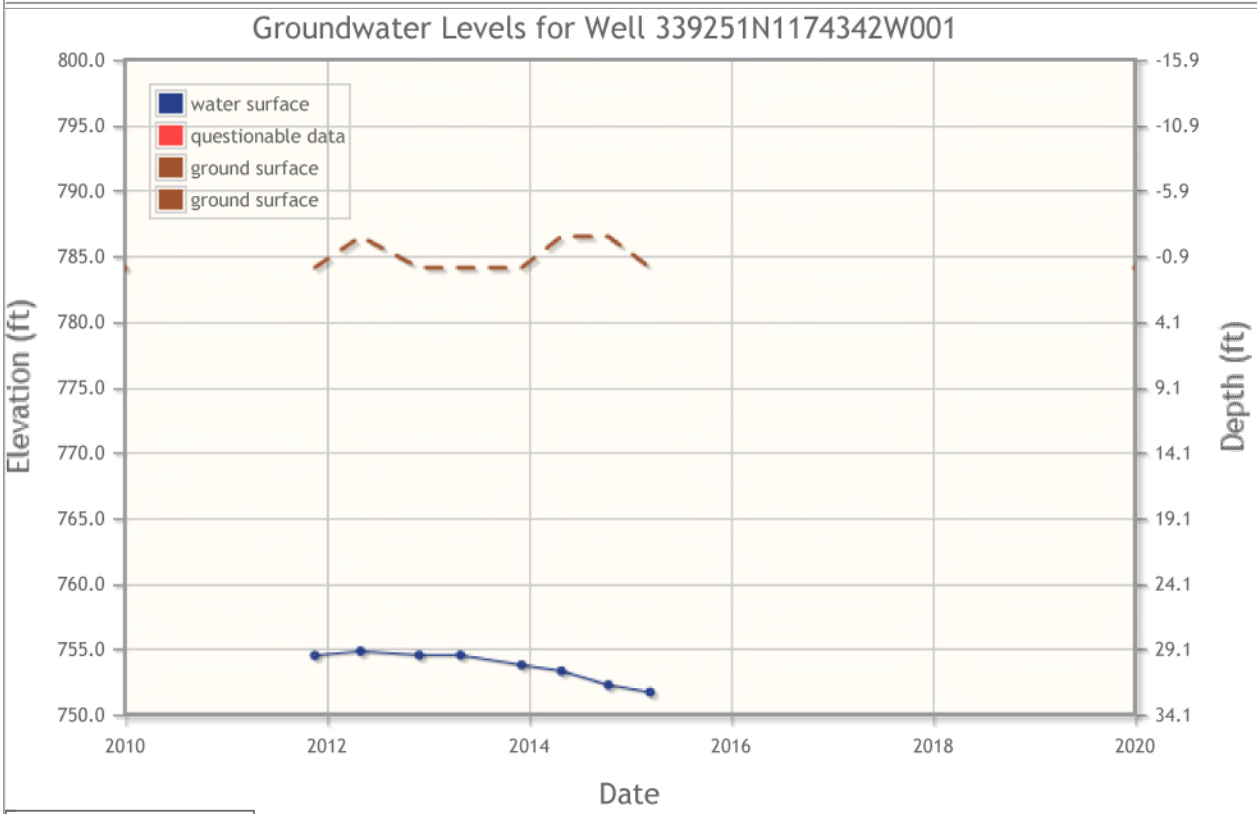
Date	RPE	GSE	RPWS	WSE	GS to...	Msmt Code	CASGEM Msmt	Agency
10/31/2011 00:00	882.160	882.160	118.39	763.77	118.39		Y	5122
04/25/2012 12:00	882.160	882.160	117.93	764.23	117.93		Y	5122
10/29/2012 00:00	882.160	882.160	118.44	763.72	118.44		Y	5122
04/25/2013 00:00	882.160	882.160	119	763.16	119		Y	5122
10/25/2013 00:00	882.160	882.160	119.88	762.28	119.88		Y	5122
03/23/2014 12:00	882.160	882.160	120.41	761.75	120.41		Y	5122
10/14/2014 11:05	882.160	882.160	121.52	760.64	121.52		Y	5122
03/17/2015 13:55	882.160	882.160	122.07	760.09	122.07		Y	5122

All elevation and depth measurements are in feet. The vertical datum for recent measurements is NAVD88.

Groundwater Levels for Station 339251N1174342W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.

Station Data **Recent Groundwater Level Data** Historical Groundwater Level Data



Download CSV File

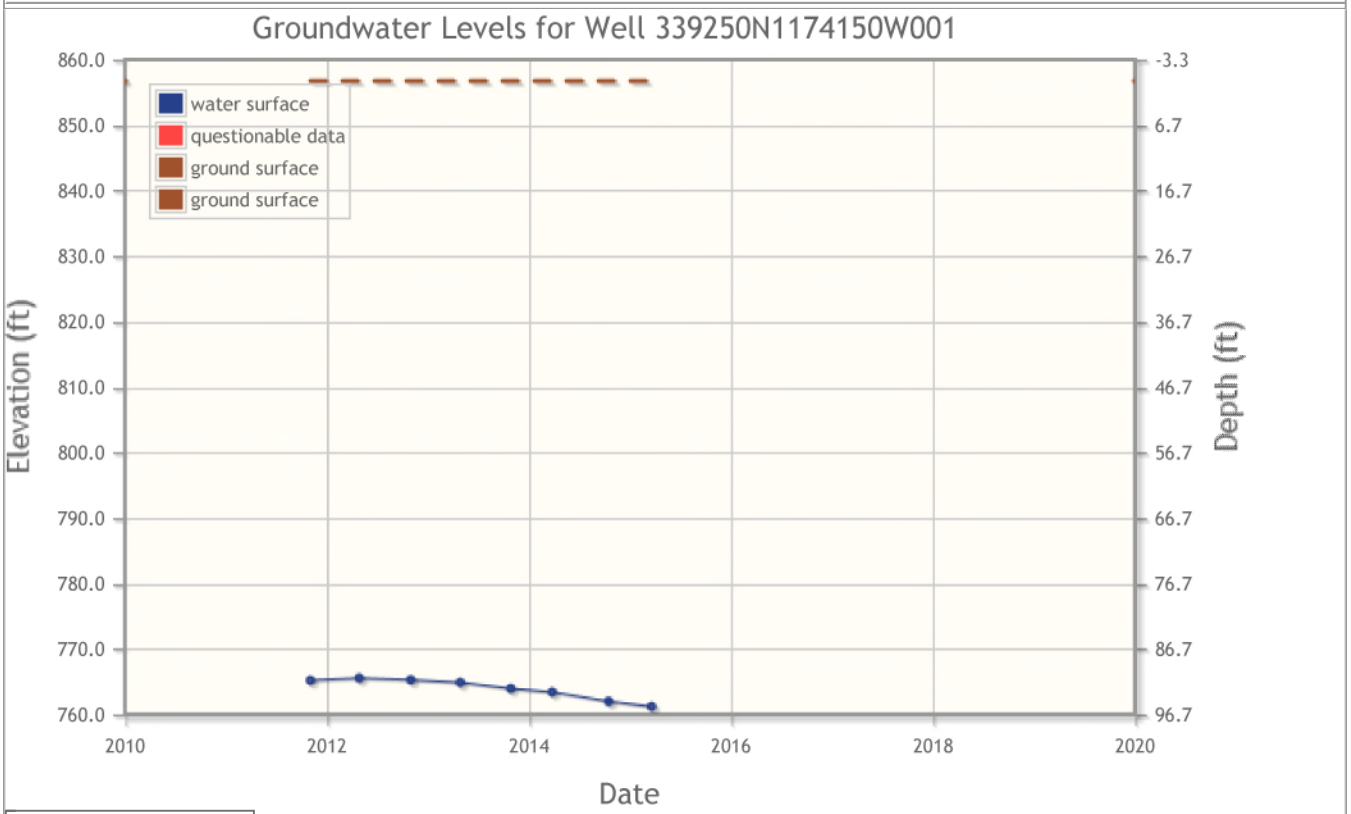
Date	RPE	GSE	RPWS	WSE	GS to...	Msmt Code	CASGEM Msmt	Agency
11/17/2011 00:00	786.130	784.120	31.62	754.51	29.61		Y	5122
04/30/2012 13:20	786.130	786.500	31.3	754.83	31.67		Y	5122
11/29/2012 00:00	786.130	784.120	31.6	754.53	29.59		Y	5122
04/26/2013 00:00	786.130	784.120	31.6	754.53	29.59		Y	5122
12/04/2013 00:00	786.130	784.120	32.35	753.78	30.34		Y	5122
04/26/2014 12:00	786.130	786.500	32.81	753.32	33.18		Y	5122
10/13/2014 13:09	786.130	786.500	33.88	752.25	34.25		Y	5122
03/12/2015 12:00	786.130	784.120	34.43	751.7	32.42		Y	5122

All elevation and depth measurements are in feet. The vertical datum for recent measurements is NAVD88.

Groundwater Levels for Station 339250N1174150W001

Data for your selected well is shown in the tabbed interface below. To view data managed in the updated WDL tables, including data collected under the CASGEM program, click the "Recent Groundwater Level Data" tab. To view data stored in the former WDL tables, click the "Historical Groundwater Level Data" tab. To download the data in CSV format, click the "Download CSV File" button on the respective tab. Please note that the vertical datum for "recent" measurements is NAVD88, while the vertical datum for "historical" measurements is NGVD29. To change your well selection criteria, click the "Perform a New Well Search" button.

Station Data **Recent Groundwater Level Data** Historical Groundwater Level Data



Download CSV File

Date	RPE	GSE	RPWS	WSE	GS to...	Msmt Code	CASGEM Msmt	Agency
10/31/2011 00:00	858.700	856.740	93.49	765.21	91.53		Y	5122
04/25/2012 12:00	858.700	856.740	93.14	765.56	91.18		Y	5122
10/29/2012 00:00	858.700	856.740	93.41	765.29	91.45		Y	5122
04/25/2013 00:00	858.700	856.740	93.81	764.89	91.85		Y	5122
10/25/2013 00:00	858.700	856.740	94.74	763.96	92.78		Y	5122
03/23/2014 12:00	858.700	856.740	95.28	763.42	93.32		Y	5122
10/14/2014 10:35	858.700	856.740	96.7	762	94.74		Y	5122
03/17/2015 14:10	858.700	856.740	97.49	761.21	95.53		Y	5122

All elevation and depth measurements are in feet. The vertical datum for recent measurements is NAVD88.

Click to hideNews Bulletins

- July 9, 2015 - The NWIS Mapper is back online
- Try our new Mobile-friendly water data site from your mobile device!
- Full News

Groundwater levels for California

Search Results -- 1 sites found

Agency code = usgs
site_no list =
- 335732117252801

Minimum number of levels = 1
Save file of selected sites to local disk for future upload

USGS 335732117252801 002S005W32B001S

Riverside County, California
Latitude 33°57'32", Longitude 117°25'28" NAD27
Land-surface elevation 777.80 feet above NGVD29
The depth of the well is 110 feet below land surface.
The depth of the hole is 110 feet below land surface.
This well is completed in the California Coastal Basin aquifers (N100CACSTL) national aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period

Date	Time	? Water-level date-time accuracy	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	? Water-level accuracy	? Status	? Method of measurement	? Measuring agency	? Source of measurem
1955-01-01		Y	48.00			2		R		
1963-12-06		D	49.30			2		U		
1964-04-09		D	49.30			2		U		
1964-11-23		D	49.70			2		U		
1965-03-23		D	49.50			2		U		
1965-04-30		D	49.30			2		U		
1965-12-06		D	48.90			2		U		
1966-04-20		D	47.90			2		U		
1966-12-21		D	47.50			2		U		
1967-05-16		D	47.20			2		U		
1967-12-22		D	47.50			2		U		
1968-05-01		D	51.50			2		U		
1969-01-16		D	49.00			2		U		
1969-05-12		D	51.60			2		U		
1969-12-01		D	50.20			2		U		
1970-04-21		D	50.50			2		U		
1970-12-11		D	50.50			2		U		
1972-01-21		D	50.60			2		U		
1972-12-05		D	52.60			2		U		

Date	Time	? Water-level date-time accuracy	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	? Water-level accuracy	? Status	? Method of measurement	? Measuring agency	? Source of measurem
1974-12-20		D	50.80			2		U		
1975-05-08		D	50.70			2		U		
1975-12-17		D	51.60			2		U		
1977-01-21		D	49.90			2		U		
1977-05-11		D	50.00			2		U		
1978-01-20		D	49.70			2		U		
1978-05-19		D	49.20			2		U		
1978-12-01		D	48.90			2		U		
1979-05-09		D	48.80			2		U		
1979-12-17		D	48.40			2		U		
1980-06-10		D	47.70			2		U		
1980-12-18		D	50.00			2		U		
1981-04-27		D	47.05			2		U		
1981-12-28		D	47.17			2		U		
1982-12-20		D	47.0			1		R		
1983-05-19		D	46.7			1		R		
1983-12-22		D	46.80			2		R		
1984-03-30		D	46.75			2		R		
1984-12-20		D	47.00			2		R		

Explanation

Section	Code	Description
Water-level date-time accuracy	D	Date is accurate to the Day
Water-level date-time accuracy	Y	Date is accurate to the Year
Water-level accuracy	1	Water level accuracy to nearest tenth of a foot
Water-level accuracy	2	Water level accuracy to nearest hundredth of a foot
Status		The reported water-level measurement represents a static level
Method of measurement	R	Reported, method not known.
Method of measurement	U	Unknown
Measuring agency		Not determined
Source of measurement	U	Source is unknown.
Water-level approval status	A	Approved for publication -- Processing and review completed.

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

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U.S. Department of the Interior | U.S. Geological Survey
Title: Groundwater for California: Water Levels
URL: http://nwis.waterdata.usgs.gov/ca/nwis/gwlevels?

Page Contact Information: California Water Data Maintainer
Page Last Modified: 2015-07-29 18:03:51 EDT
0.43 0.4 nadww02

WELL	Date	Row No.
02S/05W-32Q	1993-1999	2426
	2000-2015	2443

DEPTH (ft)	DATE
17.70	6/9/1998
17.75	5/24/1999
18.00	1/6/1999
18.30	5/12/00
18.3	12/29/1999
18.75	5/7/1997
18.90	12/12/1996
18.90	2/26/1996
19.05	1/24/01
19.08	6/19/01
19.10	5/23/1995
19.15	4/11/07
19.15	5/11/06
19.20	12/14/1994
19.30	12/14/06
19.35	6/3/05
19.5	11/11/05
19.82	11/27/01
19.89	4/19/08
19.92	5/16/03
19.98	11/29/07
20.10	1/6/1998
20.10	6/6/1994
20.13	5/9/02
20.30	5/7/1996
20.67	12/19/02
20.80	1/6/1994
20.81	4/18/09
20.86	12/15/03
20.91	11/22/08
21.12	11/22/04
21.50	4/25/10
21.90	11/24/09
21.94	4/29/11
22.22	4/29/12
22.58	4/29/13
22.58	11/24/10
22.65	1/1/04
22.67	12/18/12
23.31	12/4/13
23.52	4/29/14
23.95	5/10/04
24.41	11/24/14
24.6	4/16/15

PROJECT	WATER WELL DATA FROM WMWD		
4105 Jefferson Street City of Riverside, California	Date:	07/28/2015	geomat
	Project No.:	15068-01	
	Plate:		

Appendix F

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SLOPE MAINTENANCE IX

Landscape Plants IX

Irrigation IX

Maintenance IX

Repairs X

TRENCH BACKFILL X

STATUS OF GRADING X

GENERAL

The guidelines contained herein and the standard details attached hereto represent this firm's standard recommendation for grading and other associated operations on construction projects. These guidelines should be considered a portion of the project specifications.
All plates attached hereto shall be considered as part of these guidelines.
The Contractor should not vary from these guidelines without prior recommendation by the Geotechnical Consultant and the approval of the Client or his authorized representative. Recommendation by the Geotechnical Consultant and/or Client should not be considered to preclude requirements for the approval by the controlling agency prior to the execution of any changes.
These Standard Grading Guidelines and Standard Details may be modified and/or superseded by recommendations contained in the text of the preliminary Geotechnical Report and/or subsequent reports.
If disputes arise out of the interpretation of these grading guidelines or standard details, the Geotechnical Consultant shall provide the governing interpretation.

DEFINITION OF TERMS

ALLUVIUM
Unconsolidated soil deposits resulting from flow of water, including sediments deposited in river beds, canyons, flood plains, lakes, fans and estuaries.
AS-GRADED (AS-BUILT): The surface and subsurface conditions at completion of grading.
BACKCUT: A temporary construction slope at the rear of earth retaining structures such as buttresses, shear keys, stabilization fills or retaining walls.
BACKDRAIN: Generally a pipe and gravel or similar drainage system placed behind earth retaining structures such buttresses, stabilization fills, and retaining walls.
BEDROCK: Relatively undisturbed formational rock, more or less solid, either at the surface or beneath superficial deposits of soil.
BENCH: A relatively level step and near vertical rise excavated into sloping ground on which fill is to be placed.
BORROW (Import): Any fill material hauled to the project site from off-site areas.
BUTTRESS FILL::A fill mass, the configuration of which is designed by engineering calculations to retain slope conditions containing adverse geologic features. A buttress is generally specified by minimum key width and depth and by maximum backcut angle. A buttress normally contains a back-drainage system.
CIVIL ENGINEER: The Registered Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topographic conditions.
CLIENT: The Developer or his authorized representative who is chiefly in charge of the project. He shall have the responsibility of reviewing the findings and recommendations made by the Geotechnical Consultant and shall authorize the Contractor and/or other consultants to perform work and/or provide services.
COLLUVIUM: Generally loose deposits usually found near the base of slopes and brought there chiefly by gravity through slow continuous downhill creep (also see Slope Wash).
COMPACTION : Densification of man-placed fill by mechanical means.
CONTRACTOR – A person or company under contract or otherwise retained by the Client to perform demolition, grading and other site improvements.
DEBRIS: All products of clearing, grubbing, demolition, and contaminated soil materials unsuitable for reuse as compacted fill, and/or any other material so designated by the Geotechnical Consultant.
ENGINEERING GEOLOGIST: A Geologist holding a valid certificate of registration in the specialty of Engineering Geology.
ENGINEERED FILL: A fill of which the Geotechnical Consultant or his representative, during grading, has made sufficient tests to enable him to conclude that the fill has been placed in substantial compliance with the recommendations of the Geotechnical Consultant and the governing agency requirements.
EROSION: The wearing away of ground surface as a result of the movement of wind, water, and/or ice.
EXCAVATION: The mechanical removal of earth materials.
EXISTING GRADE: The ground surface configuration prior to grading.
FILL: Any deposits of soil, rock, soil-rock blends or other similar materials placed by man.
FINISH GRADE: The ground surface configuration at which time the surface elevations conform to the approved plan.

GEOFABRIC: Any engineering textile utilized in geotechnical applications including subgrade stabilization and filtering.
GEOLOGIST: A representative of the Geotechnical Consultant educated and trained in the field of geology.
GEOTECHNICAL CONSULTANT: The Geotechnical Engineering and Engineering Geology consulting firm retained to provide technical services for the project. For the purpose of these specifications, observations by the Geotechnical Consultant include observations by the Soil Engineer, Geotechnical Engineer, Engineering Geologist and those performed by persons employed by and responsible to the Geotechnical Consultants.
GEOTECHNICAL ENGINEER: A licensed Geotechnical Engineer or Civil Engineer who applies scientific methods, engineering principles and professional experience to the acquisition, interpretation and use of knowledge of materials of the earth's crust for the evaluation of engineering problems. Geotechnical Engineering encompasses many of the engineering aspects of soil mechanics, rock mechanics, geology, geophysics, hydrology and related sciences.
GRADING: Any operation consisting of excavation, filling or combinations thereof and associated operations.
LANDSIDE DEBRIS: Material, generally porous and of low density, produced from instability of natural or man-made slopes.
MAXIMUM DENSITY: Standard laboratory test for maximum dry unit weight. Unless otherwise specified, the maximum dry unity weight shall be determined in accordance with ASTM Method of Test D 1557-91.
OPTIMUM MOISTURE – Soil moisture content at the test maximum density.
RELATIVE COMPACTION: The degree of compaction (expressed as a percentage) of dry unit weight of a material as compared to the maximum dry unit weight of the material.
ROUGH GRADE: The ground surface configuration at which time the surface elevations approximately conform to the approved plan.
SITE: The particular parcel of land where grading is being performed.
SHEAR KEY: Similar to buttress, however, it is generally constructed by excavating a slot within a natural slope, in order to stabilize the upper portion of the slope without grading encroaching into the lower portion of the slope.
SLOPE: An inclined ground surface, the steepness of which is generally specified as a ration of horizontal:vertical (e.g., 2:1)
SLOPE WASH: Soil and/or rock material that has been transported down a slope by action of gravity assisted by runoff water not confined by channels (also see Colluvium).
SOIL: Naturally occurring deposits of sand, silt, clay, etc., or combinations thereof.
SOIL ENGINEER: Licensed Geotechnical Engineer or Civil Engineer experienced in soil mechanics (also see Geotechnical Engineer).
STABILIZATION FILL: A fill mass, the configuration of which is typically related to slope height and specified by the standards of practice for enhancing the stability of locally adverse conditions. A stabilization fill is normally specified by minimum key width and depth and by maximum backcut angle. A stabilization fill may or may not have a backdrainage system specified.
SUBDRAIN: Generally a pipe and gravel or similar drainage system placed beneath a fill in the alignment of canyons or formed drainage channels.
SLOUGH: Loose, non-compacted fill material generated during grading operations.
TAILINGS: Non-engineered fill which accumulates on or adjacent to equipment haul-roads.
TERRACE: Relatively level step constructed in the face of a graded slope surface for drainage control and maintenance purposes.
TOPSOIL: The presumable fertile upper zone of soil, which is usually darker in color and loose.
WINDROW: A string of large rocks buried within engineered fill in accordance with guidelines set forth by the Geotechnical Consultant.

OBLIGATIONS OF PARTIES

The Geotechnical Consultant should provide observation and testing services and should make evaluations in order to advise the Client on Geotechnical matters. The Geotechnical Consultant should report his findings and recommendations to the Client or his authorized representative.
The client should be chiefly responsible for all aspects of the project. He or his authorized representative has the responsibility of reviewing the findings and recommendations of the Geotechnical Consultant. He shall authorize or cause to have authorized the Contractor and/or other consultants to perform work and/or provide services.

During grading the Client or his authorized representative should remain on-site or should remain reasonably accessible to all concerned parties in order to make decisions necessary to maintain the flow of the project.
The Contractor should be responsible for the safety of the project and satisfactory completion of all grading and other associated operations on construction projects, including but not limited to, earthwork in accordance with the project plans, specifications and controlling agency requirements. During grading, the Contractor or his authorized representative should remain on-site. Overnight and on days off, the Contractor should remain accessible.

SITE PREPARATION

The Client, prior to any site preparation or grading, should arrange and attend a meeting among the Grading Contractor, the Design Engineer, the Geotechnical Consultant, representatives of the appropriate governing authorities as well as any other concerned parties. All parties should be given at least 48 hours notice.
Clearing and grubbing should consist of the removal of vegetation such as brush, grass, woods, stumps, trees, roots of trees and otherwise deleterious natural materials from the areas to be graded. Clearing and grubbing should extend to the outside of all proposed excavation and fill areas.
Demolition should include removal of buildings, structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, mining shafts, tunnels, etc.) and man-made surface and subsurface improvements from the areas to be graded. Demolition of utilities should include proper capping and/or re-routing pipelines at the project perimeter and cutoff and capping of wells in accordance with the requirements of the governing authorities and the recommendations of the Geotechnical Consultant at the time of the demolition.
Trees, plants or man-made improvements not planned to be removed or demolished should be protected by the Contractor from damage or injury.
Debris generated during clearing, grubbing and/or demolition operations should be wasted from areas to be graded and disposed off-site. Clearing, grubbing and demolition operations should be performed under the observation of the Geotechnical Consultant.
The Client or Contractor should obtain the required approvals for the controlling authorities for the project prior, during and/or after demolition, site preparation and removals, etc. The appropriate approvals should be obtained prior to proceeding with grading operations.

SITE PROTECTION

Protection of the site during the period of grading should be the responsibility of the Contractor. Unless other provisions are made in writing and agreed upon among the concerned parties, completion of a portion of the project should not be considered to preclude that portion or adjacent areas from the requirements for site protection until such time as the entire project is complete as identified by the Geotechnical Consultant, the Client and the regulating agencies.
The Contractor should be responsible for the stability of all temporary excavations. Recommendations by the Geotechnical Consultant pertaining to temporary excavations (e.g., backcuts) are made in consideration of stability of the completed project and therefore, should not be considered to preclude the responsibilities of the Contractor. Recommendations by the Geotechnical Consultant should not be considered to preclude more restrictive requirements by the regulating agencies.
Precautions should be taken during the performance of site clearing, excavations and grading to protect the work site from flooding, ponding, or inundation by poor or improper surface drainage. Temporary provisions should be made during the rainy season to adequately direct surface drainage away from and off the work site. Where low areas can not be avoided, pumps should be kept on hand to continually remove water during periods of rainfall.
During periods of rainfall, plastic sheeting should be kept reasonably accessible to prevent unprotected slopes from becoming saturated. Where necessary during periods of rainfall, the Contractor should install check-dams de-silting basins, rip-rap, sandbags or other devices or methods necessary to control erosion and provide safe conditions.
During periods of rainfall, the Geotechnical Consultant should be kept informed by the Contractor as to the nature of remedial or preventative work being performed (e.g., pumping, placement of sandbags or plastic sheeting, other labor, dozing, etc.).

Following periods of rainfall, the Contractor should contact the Geotechnical Consultant and arrange a walk-over of the site in order to visually assess rain related damage. The Geotechnical Consultant may also recommend excavations and testing in order to aid in his assessments. At the request of the Geotechnical Consultant, the Contractor shall make excavations in order to evaluate the extent of rain related damage.
Rain-related damage should be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress and other adverse conditions identified by the Geotechnical Consultant. Soil adversely affected should be classified as Unsuitable Materials and should be subject to overexcavation and replaced with compacted fill or other remedial grading as recommended by the Geotechnical Consultant.
Relatively level areas, where saturated soils and/or erosion gullies exist to depths greater then 1 foot, should be overexcavated to unaffected, competent material. Where less than 1 foot in depth, unsuitable materials may be processed in-place to achieve near optimum moisture conditions, then thoroughly recompacted in accordance with the applicable specifications. If the desired results are not achieved, the affected materials should be overexcavated then replaced in accordance with the applicable specifications.
In slope areas, where saturated soil and/or erosion gullies exist to depths of greater than 1 foot, should be over-excavated to unaffected, competent material. Where affected materials exist to depths of 1 foot or less below proposed finished grade, remedial grading by moisture conditioning in-place, followed by thorough recompaction in accordance with the applicable grading guidelines herein may be attempted. If the desired results are not achieved, all affected materials should be overexcavated and replaced as compacted fill in accordance with the slope repair recommendations herein. As field conditions dictate, other slope repair procedures may be recommended by the Geotechnical Consultant.

EXCAVATIONS

UNSUITABLE MATERIALS:
Materials which are unsuitable should be excavated under observation and recommendations of the Geotechnical Consultant. Unsuitable materials include, but may not be limited to dry, loose, soft, wet, organic compressible natural soils and fractured, weathered, soft, bedrock and nonengineered or otherwise deleterious fill materials.
Materials identified by the Geotechnical Consultant as unsatisfactory due to its moisture conditions should be overexcavated, watered or dried, as needed, and thoroughly blended to uniform near optimum moisture condition (per Moisture guidelines presented herein) prior to placement as compacted fill.

CUT SLOPES:
Unless otherwise recommended by the Geotechnical Consultant and approved by the regulating agencies, permanent cut slopes should not be steeper than 2:1 (horizontal:vertical).
If excavations for cut slopes expose loose, cohesionless, significantly fractured or otherwise suitable material, overexcavation and replacement of the unsuitable materials with a compacted stabilization fill should be accomplished as recommended by the Geotechnical Consultant. Unless otherwise specified by the Geotechnical Consultant, stabilization fill construction should conform to the requirements of the Standard Details.
The Geotechnical Consultant should review cut slopes during excavation. The Geotechnical Consultant should be notified by the contractor prior to beginning slope excavations.
If during the course of grading, adverse or potentially adverse geotechnical conditions are encountered which were not anticipated in the preliminary report, the Geotechnical Consultant should explore, analyze and make recommendations to treat these problems.
When cuts slopes are made in the direction of the prevailing drainage, a non-erodible diversion swale (brow ditch) should be provided at the top-of-cut.

PAD AREAS:
All lot pad areas, including side yard terraces, above stabilization fills or buttresses should be over-excavated to provide for a minimum of 3-feet (refer to Standard Details) of compacted fill over the entire pad area. Pad areas with both fill and cut materials exposed and pad areas containing both very shallow (less than 3-feet) and deeper fill should be over- thickness (refer to Standard Details).
Cut areas exposing significantly varying material types should also be overexcavated to provide for at least a 3-foot thick compacted fill blanket. Geotechnical conditions may require greater depth of overexcavation. The actual depth should be delineated by the Geotechnical Consultant during grading.

For pad areas created above cut or natural slopes, positive drainage should be established away from the top-of-slope. This may be accomplished utilizing a berm and/or an appropriate pad gradient. A gradient in soil areas away from the top-of-slope of 2 percent or greater is recommended.

COMPACTED FILL

All fill materials should be compacted as specified below or by other methods specifically recommended by the Geotechnical Consultant. Unless otherwise specified, the minimum degree of compaction (relative compaction) should be 90 percent of the laboratory maximum density.

PLACEMENT

Prior to placement of compacted fill, the Contractor should request a review by the Geotechnical Consultant of the exposed ground surface. Unless otherwise recommended, the exposed ground surface should then be scarified (6-inches minimum), watered or dried as needed, thoroughly blended to achieve near optimum moisture conditions, then thoroughly compacted to a minimum of 90 percent of the maximum density. The review by the Geotechnical Consultants should not be considered to preclude requirements of inspection and approval by the governing agency.

Compacted fill should be placed in thin horizontal lifts not exceeding 8-inches in loose thickness prior to compaction. Each lift should be watered or dried as needed, thoroughly blended to achieve near optimum moisture conditions then thoroughly compacted by mechanical methods to a minimum of 90 percent of laboratory maximum dry density. Each lift should be treated in a like manner until the desired finished grades are achieved.

The Contractor should have suitable and sufficient mechanical compaction equipment and watering apparatus on the job site to handle the amount of fill being placed in consideration of moisture retention properties of the materials. If necessary, excavation equipment should be “shut down” temporarily in order to permit proper compaction of fills. Earth moving equipment should only be considered a supplement and not substituted for conventional compaction equipment.

When placing fill in horizontal lifts adjacent to areas sloping steeper than 5:1 (horizontal:vertical), horizontal keys and vertical benches should be excavated into the adjacent slope area. Keying and benching should be sufficient to provide at least 6-foot wide benches and minimum of 4-feet of vertical bench height within the firm natural ground, firm bedrock or engineered compacted fill. No compacted fill should be placed in an area subsequent to keying and benching until the area has been reviewed by the Geotechnical Consultant. Material generated by the benching operation should be moved sufficiently away from the bench area to allow for the recommended review of the horizontal bench prior to placement of fill. Typical keying and benching details have been included within the accompanying Standard Details.

Within a single fill area where grading procedures dictate two or more separate fills, temporary slopes (false slopes) may be created. When placing fill adjacent to a false slope, benching should be conducted in the same manner as above described. At least a 3-foot vertical bench should be established within the firm core of adjacent approved compacted fill prior to placement of additional fill. Benching should proceed in at least 3-foot vertical increments until the desired finished grades are achieved.

Fill should be tested for compliance with the recommended relative compaction and moisture conditions. Field density testing should conform to ASTM Method of Testing D 1556-64, D 2922-78 and/or D2937-71. Tests should be provided for about every 2 vertical feet or 1,000 cubic yards of fill placed. Actual test intervals may vary as field conditions dictate. Fill found not to be in conformance with the grading recommendations should be removed or otherwise handled as recommended by the Geotechnical Consultant.

The Contractor should assist the Geotechnical Consultant and/or his representative by digging test pits for removal determinations and/or for testing compacted fill.

As recommended by the Geotechnical Consultant, the Contractor should “shutdown” or remove any grading equipment from an area being tested.

The Geotechnical Consultant should maintain a plan with estimated locations of field tests. Unless the client provides for actual surveying of test locations, by the Geotechnical Consultant should only be considered rough estimates and should not be utilized for the purpose of preparing cross sections showing test locations or in any case for the purpose of after-the-fact evaluating of the sequence of fill placement.

MOISTURE

For field testing purposes, “near optimum” moisture will vary with material type and other factors including compaction procedures. “Near optimum” may be specifically recommended in Preliminary Investigation Reports and/or may be evaluated during grading.

Prior to placement of additional compacted fill following an overnight or other grading delay, the exposed surface of previously compacted fill should be processed by scarification, watered or dried as needed, thoroughly blended to near-optimum moisture conditions, then recompacted to a minimum of 90 percent of laboratory maximum dry density. Where wet or other dry or other unsuitable materials exist to depths of greater than one foot, the unsuitable materials should be overexcavated.

Following a period of flooding, rainfall or overwatering by other means, no additional fill should be placed until damage assessments have been made and remedial grading performed as described herein.

FILL MATERIAL

Excavated on-site materials which are acceptable to the Geotechnical Consultant may be utilized as compacted fill, provided trash, vegetation and other deleterious materials are removed prior to placement.

Where import materials are required for use on-site, the Geotechnical Consultant should be notified at least 72 hours in advance of importing, in order to sample and test materials from proposed borrow sites. No import materials should be delivered for use on-site without prior sampling and testing by Geotechnical Consultant.

Where oversized rock or similar irreducible material is generated during grading, it is recommended, where practical, to waste such material off-site or on-site in areas designated as “nonstructural rock disposal areas”. Rock placed in disposal areas should be placed with sufficient fines to fill voids. The rock should be compacted in lifts to an unyielding condition. The disposal area should be covered with at least 3-feet of compacted fill, which is free of oversized material. The upper 3-feet should be placed in accordance with the guidelines for compacted fill herein.

Rocks 3 inches in maximum dimension and smaller may be utilized within the compacted fill, provided they are placed in such a manner that nesting of the rock in avoided. Fill should be placed and thoroughly compacted over and around all rock. The amount of rock should not exceed 40 percent by dry weight passing the $^{3}/_{4}$-inch sieve size. The 3-inch and 40 percent recommendations herein may vary as field conditions dictate.

During the course of grading operations, rocks or similar irreducible materials greater than 3-inch maximum dimension (oversized material) may be generated. These rocks should not be placed within the compacted fill unless placed as recommended by the Geotechnical Consultant.

Where rocks or similar irreducible materials of greater that 3-inches but less than 4-feet of maximum dimension are generated during grading, or otherwise desired to be placed within an engineered fill, special handling in accordance with the accompanying Standard Details is recommended. Rocks greater than 4 feet should be broken down or disposed off-site. Rocks up to 4-feet maximum dimension should be placed below the upper 10-feet of any fill and should not be closer than 20-feet to any slope face. These recommendations could vary as locations of improvements dictate. Where practical, oversized material should not be placed below areas where structures of deep utilities are proposes.

Oversized material should be placed in windrows on a clean, overexcavated or unyielding compacted fill or firm natural ground surface. Select native or imported granular soil (S.E. 30 or higher) should be placed and thoroughly flooded over and around all windrowed rock, such that voids are filled. Windrows of oversized material should be staggered so that successive strata of oversized material are not in the same vertical plane.

It may be possible to dispose of individual larger rock as field conditions dictate and as recommended by the Geotechnical Consultant at time of placement.

Material that is considered unsuitable by the Geotechnical Consultant should not be utilized in the compacted fill.

During grading operations, placing and mixing the materials from the cut and/or borrow areas may result in soil mixtures which possess unique physical properties. Testing may be required of samples obtained directly from the fill areas in order to verify conformance with the specifications. Processing of these additional samples may take two or more working days. The Contractor may elect to move the operation to other areas within the project, or may continue placing compacted fill pending laboratory and field test results. Should he elect the second alternative, fill placed is done so at the Contractor’s risk.

Any fill placed in areas not previously reviewed and evaluated by the Geotechnical Consultant, and/or in other areas, without prior notification to the Geotechnical Consultant may require removal and recompaction at the Contractor's expense. Determination of overexcavations should be made upon review of field conditions by the Geotechnical Consultant.

FILL SLOPES

Unless otherwise recommended by the Geotechnical Consultant and approved by the regulating agencies, permanent fill slopes should not be steeper than 2:1 (horizontal to vertical).

Except as specifically recommended otherwise or as otherwise provided for in these grading guidelines (Reference Fill Materials), compacted fill slopes should be overbuilt and cut back to grade, exposing the firm, compacted fill inner core. The actual amount of overbuilding may vary as field conditions dictate. If the desired results are not achieved, the existing slopes should be overexcavated and reconstructed under the guidelines of the Geotechnical Consultant. The degree of overbuilding shall be increased until the desired compacted slope surface condition is achieved. Care should be taken by the Contractor to provide thorough mechanical compaction to the outer edge of the overbuilt slope surface.

Although no construction procedure produces a slope free from risk of future movement, overfilling and cutting back of slope to a compacted inner core is, given no other constraints, the most desirable procedure. Other constraints, however, must often be considered. These constraints may include property line situations, access, the critical nature of the development, and cost. Where such constraints are identified, slope face compaction may be attempted by conventional construction procedures including backrolling techniques upon specific recommendations by the Geotechnical Consultant.

As a second best alternative for slopes of 2:1 (horizontal to vertical) or flatter, slope construction may be attempted as outlined herein. Fill placement should proceed in thin lifts, (i.e., 6 to 8 inch loose thickness). Each lift should be moisture conditioned and thoroughly compacted. The desired moisture condition should be maintained and/or reestablished, where necessary, during the period between successive lifts. Selected lifts should be tested to ascertain that desired compaction is being achieved. Care should be taken to extend compactive effort to the outer edge of the slope. Each lift should extend horizontally to the desired finished slope surface or more as needed to ultimately establish desired grades. Grade during construction should not be allowed to roll off at the edge of the slope. It may be helpful to elevate slightly the outer edge of the slope. Slough resulting from the placement of individual lifts should not be allowed to drift down over previous lifts. At intervals not exceeding 4-feet in vertical slope height or the capability of available equipment, whichever is less, fill slopes should be thoroughly backrolled utilizing a conventional sheepsfoot-type roller. Care should be taken to maintain the desired moisture conditions and/or reestablishing same as needed prior to backrolling. Upon achieving final grade, the slopes should again be moisture conditioned and thoroughly backrolled. The use of a side-boom roller will probably be necessary and vibratory methods are strongly recommended. Without delay, so as to avoid (if possible) further moisture conditioning, the slopes should then be grid-rolled to achieve a relatively smooth surface and uniformly compact condition.

In order to monitor slope construction procedures, moisture and density tests will be taken at regular intervals. Failure to achieve the desired results will likely result in a recommendation by the Geotechnical Consultant to overexcavate the slope surfaces followed by reconstruction of the slopes utilizing overfilling and cutting back procedures and/or further attempt at the conventional backrolling approach. Other recommendations may also be provided which would be commensurate with field conditions.

Where placement of fill above a natural slope or above a cut slope is proposed, the fill slope configuration as presented in the accompanying standard Details should be adopted.

For pad areas above fill slopes, positive drainage should be established away from the top-of-slope. This may be accomplished utilizing a berm and pad gradients of at least 2-percent in soil area.

OFF-SITE FILL

Off-site fill should be treated in the same manner as recommended in these specifications for site preparation, excavation, drains, compaction, etc.

Off-site canyon fill should be placed in preparation for future additional fill, as shown in the accompanying Standard Details.

Off-site fill subdrains temporarily terminated (up canyon) should be surveyed for future relocation and connection.

DRAINAGE

Canyon sub-drain systems specified by the Geotechnical Consultant should be installed in accordance with the Standard Details.
Typical sub-drains for compacted fill buttresses, slope stabilization or sidehill masses, should be installed in accordance with the specifications of the accompanying Standard Details.
Roof, pad and slope drainage should be directed away from slopes and areas of structures to suitable disposal areas via non-erodible devices (i.e., gutters, downspouts, concrete swales).
For drainage over soil areas immediately away from structures (i.e., within 4-feet), a minimum of 4 percent gradient should be maintained. Pad drainage of at least 2 percent should be maintained over soil areas. Pad drainage may be reduced to at least 1 percent for projects where no slopes exist, either natural or man-made, or greater than 10-feet in height and where no slopes are planned, either natural or man-made, steeper than 2:1 (horizontal to vertical slope ratio).
Drainage patterns established at the time of fine grading should be maintained throughout the life of the project. Property owners should be made aware that altering drainage patterns can be detrimental to slope stability and foundation performance.

STAKING

In all fill areas, the fill should be compacted prior to the placement of the stakes. This particularly is important on fill slopes. Slope stakes should not be placed until the slope is thoroughly compacted (backrolled). If stakes must be placed prior to the completion of compaction procedures, it must be recognized that they will be removed and/or demolished at such time as compaction procedures resume.
In order to allow for remedial grading operations, which could include overexcavations or slope stabilization, appropriate staking offsets should be provided. For finished slope and stabilization backcut areas, we recommend at least 10-feet setback from proposed toes and tops-of-cut.

SLOPE MAINTENANCE LANDSCAPE PLANTS

In order to enhance superficial slope stability, slope planting should be accomplished at the completion of grading. Slope planting should consist of deep-rooting vegetation requiring little watering. Plants native to the Southern California area and plants relative to native plants are generally desirable. Plants native to other semiarid and arid areas may also be appropriate. A Landscape Architect would be the best party to consult regarding actual types of plants and planting configuration.

IRRIGATION

Irrigation pipes should be anchored to slope faces, not placed in trenches excavated into slope faces.
Slope irrigation should be minimized. If automatic timing devices are utilized on irrigation systems, provisions should be made for interrupting normal irrigation during periods of rainfall.
Though not a requirement, consideration should be give to the installation of near-surface moisture monitoring control devices. Such devices can aid in the maintenance of relatively uniform and reasonably constant moisture conditions.
Property owners should be made aware that overwatering of slopes is detrimental to slope stability.

MAINTENANCE

Periodic inspections of landscaped slope areas should be planned and appropriate measures should be taken to control weeds and enhance growth of the landscape plants. Some areas may require occasional replanting and/or reseeding.
Terrace drains and downdrains should be periodically inspected and maintained free of debris. Damage to drainage improvements should be repaired immediately.
Property owners should be made aware that burrowing animals can be detrimental to slope stability. A preventative program should be established to control burrowing animals.
As a precautionary measure, plastic sheeting should be readily available, or kept on hand, to protect all slope areas from saturation by periods of heavy or prolonged rainfall. This measure is strongly recommended, beginning with the period of time prior to landscape planting.

REPAIRS

If slope failures occur, the Geotechnical Consultant should be contacted for a field review of site conditions and development of recommendations for evaluation and repair.

If slope failure occurs as a result of exposure to periods of heavy rainfall, the failure areas and currently unaffected areas should be covered with plastic sheeting to protect against additional saturation.

In the accompanying Standard Details, appropriate repair procedures are illustrated for superficial slope failures (i.e., occurring typically within the outer 1 foot to 3 feet of a slope face).

TRENCH BACKFILL

Utility trench backfill should, unless otherwise recommended, be compacted by mechanical means. Unless otherwise recommended, the degree of compaction should be a minimum of 95 percent of the laboratory maximum density.

Approved granular material (sand equivalent greater than 30) should be used to bed and backfill utilities to a depth of at least 1 foot over the pipe. This backfill should be uniformly watered, compacted and/or wheel-rolled from the surface to a firm condition for pipe support.

The remainder of the backfill shall be typical on-site soil or imported soil which should be placed in lifts not exceeding 8 inches in thickness, watered or aerated to at least 3 percent above the optimum moisture content, and mechanically compacted to at least 95 percent of maximum dry density (based on ASTM D1557).

Backfill of exterior and interior trenches extending below a 1:1 projection from the outer edge of foundations should be mechanically compacted to a minimum of 95 percent of the laboratory maximum density.

Within slab areas, but outside the influence of foundations, trenches up to 1 foot wide and 2 feet deep may be backfilled with sand and consolidated by uniformly watering or by mechanical means. If on-site materials are utilized, they should be wheel-rolled, tamped or otherwise compacted to a firm condition. For minor interior trenches, density testing may be deleted or spot testing may be elected if deemed necessary, based on review of back-fill operations during construction.

If utility contractors indicate that it is undesirable to use compaction equipment in close proximity to a buried conduit, the Contractor may elect the utilization of light weight compaction equipment and/or shading of the conduit with clean, granular material, which should be thoroughly jetted in-place above the conduit, prior to initiating mechanical compaction procedures. Other methods of utility trench compaction may also be appropriate, upon review by the Geotechnical Consultant at the time of construction.

In cases where clean granular materials are proposed for use in lieu of native materials or where flooding or jetting is proposed, the procedures should be considered subject to review by the Geotechnical Consultant.

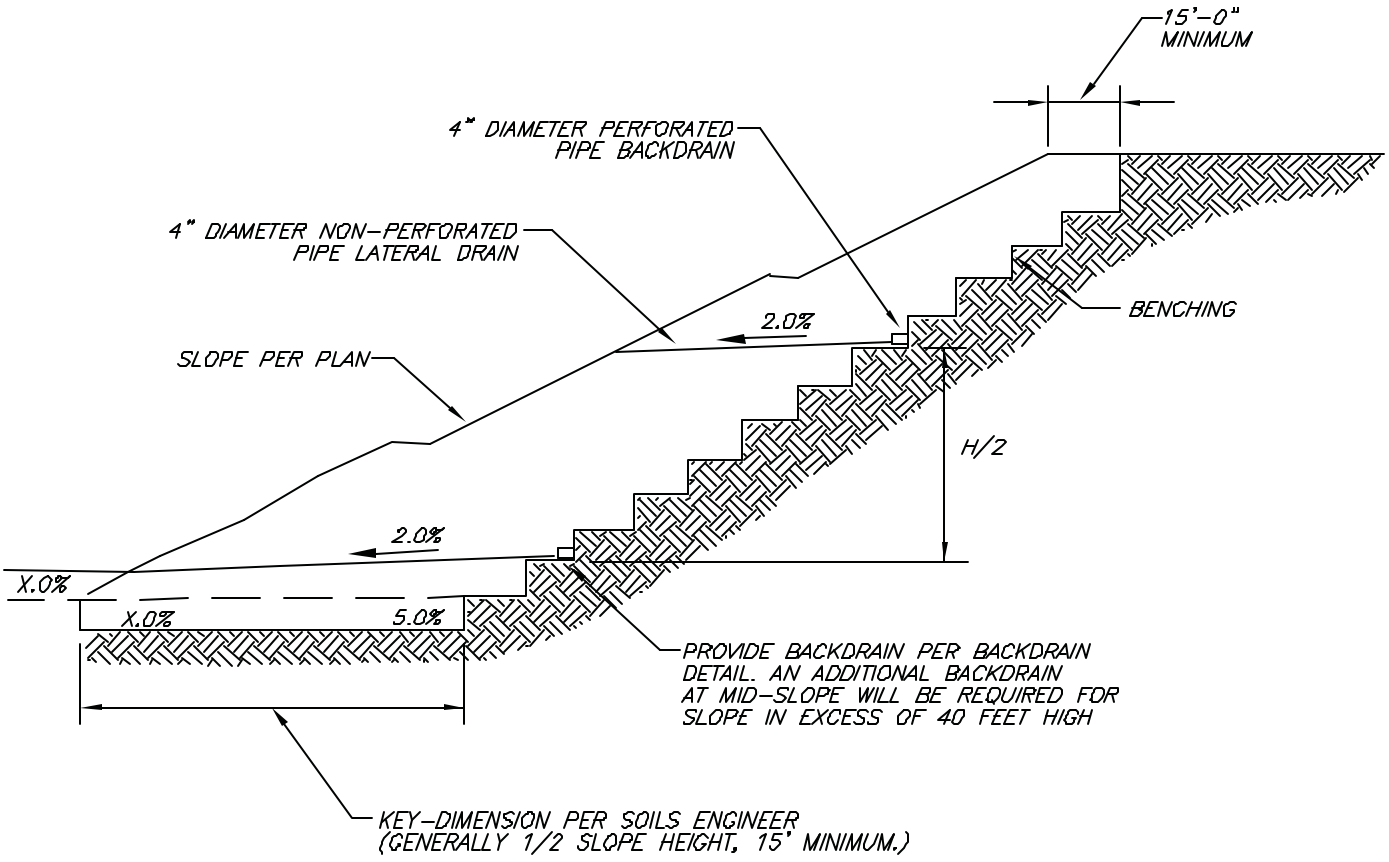
Clean Granular backfill and/or bedding are not recommended in slope areas unless provisions are made for a drainage system to mitigate the potential build-up of seepage forces.

STATUS OF GRADING

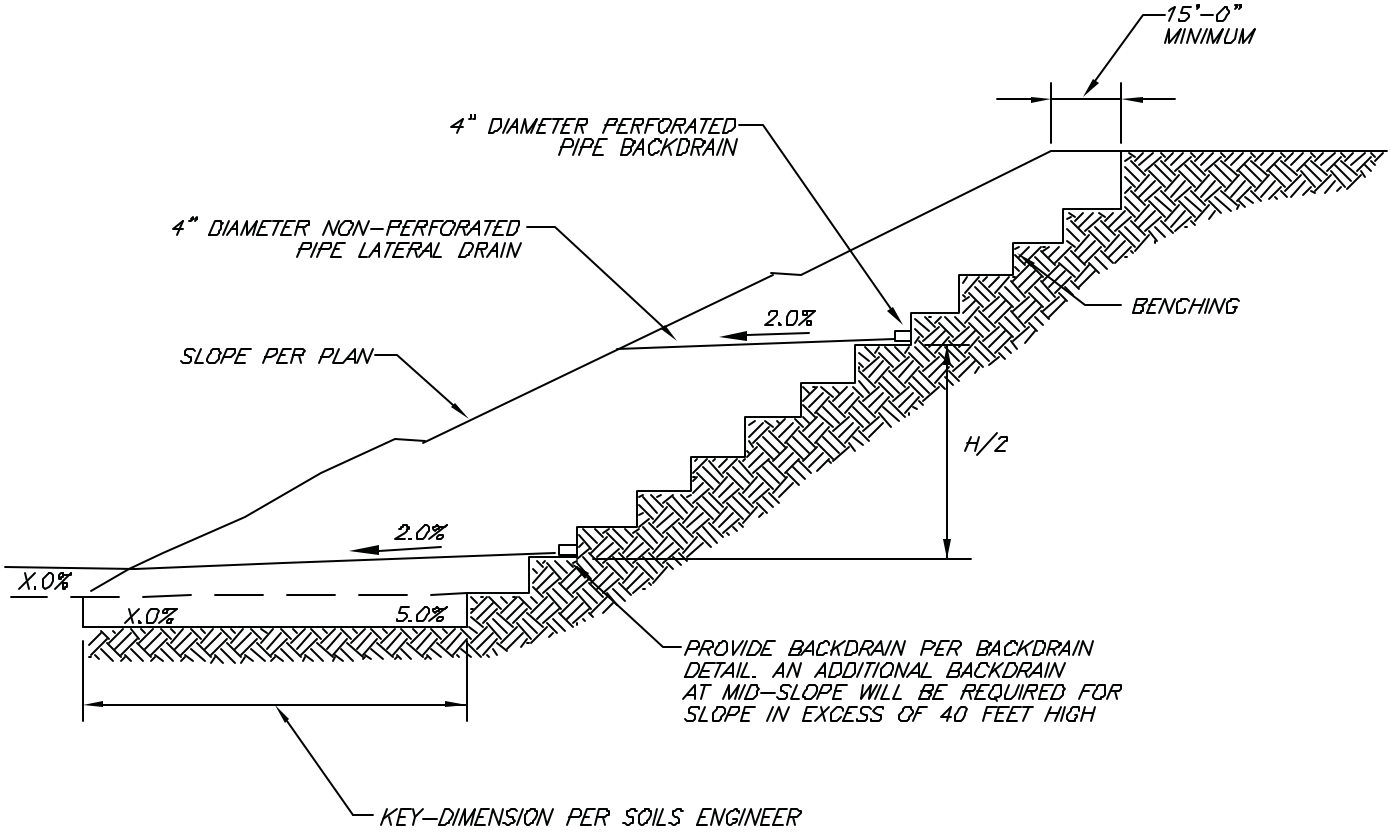
Prior to proceeding with any grading operation, the Geotechnical Consultant should be notified at least two working days in advance in order to schedule the necessary observation and testing services.

Prior to any significant expansion of cut back in the grading operation, the Geotechnical Consultant should be provided with adequate notice (i.e., two days) in order to make appropriate adjustments in observation and testing services.

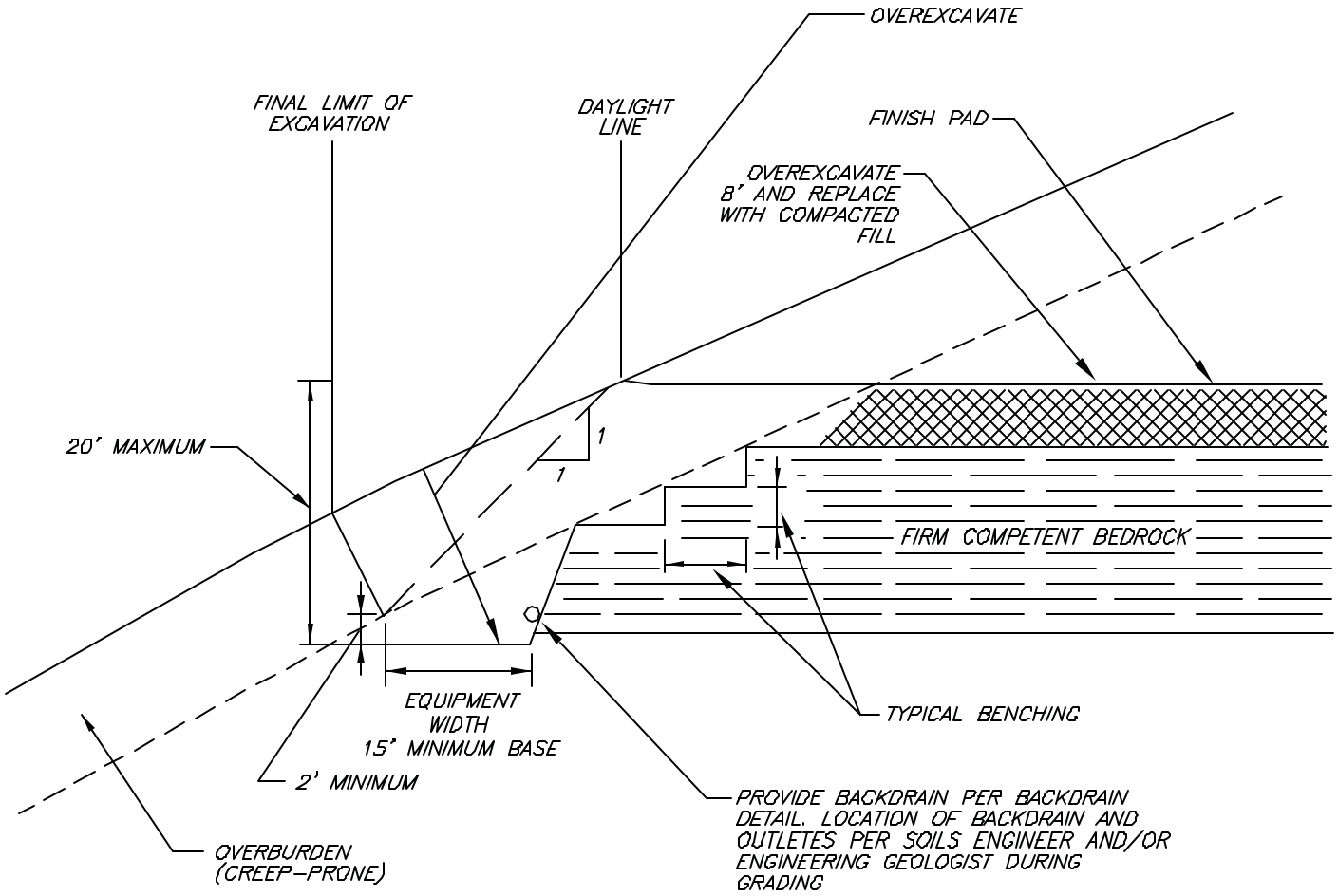
Following completion of grading operations and/or between phases of a grading operation, the Geotechnical Consultant should be provided with at least two working days notice in advance of commencement of additional grading operations.



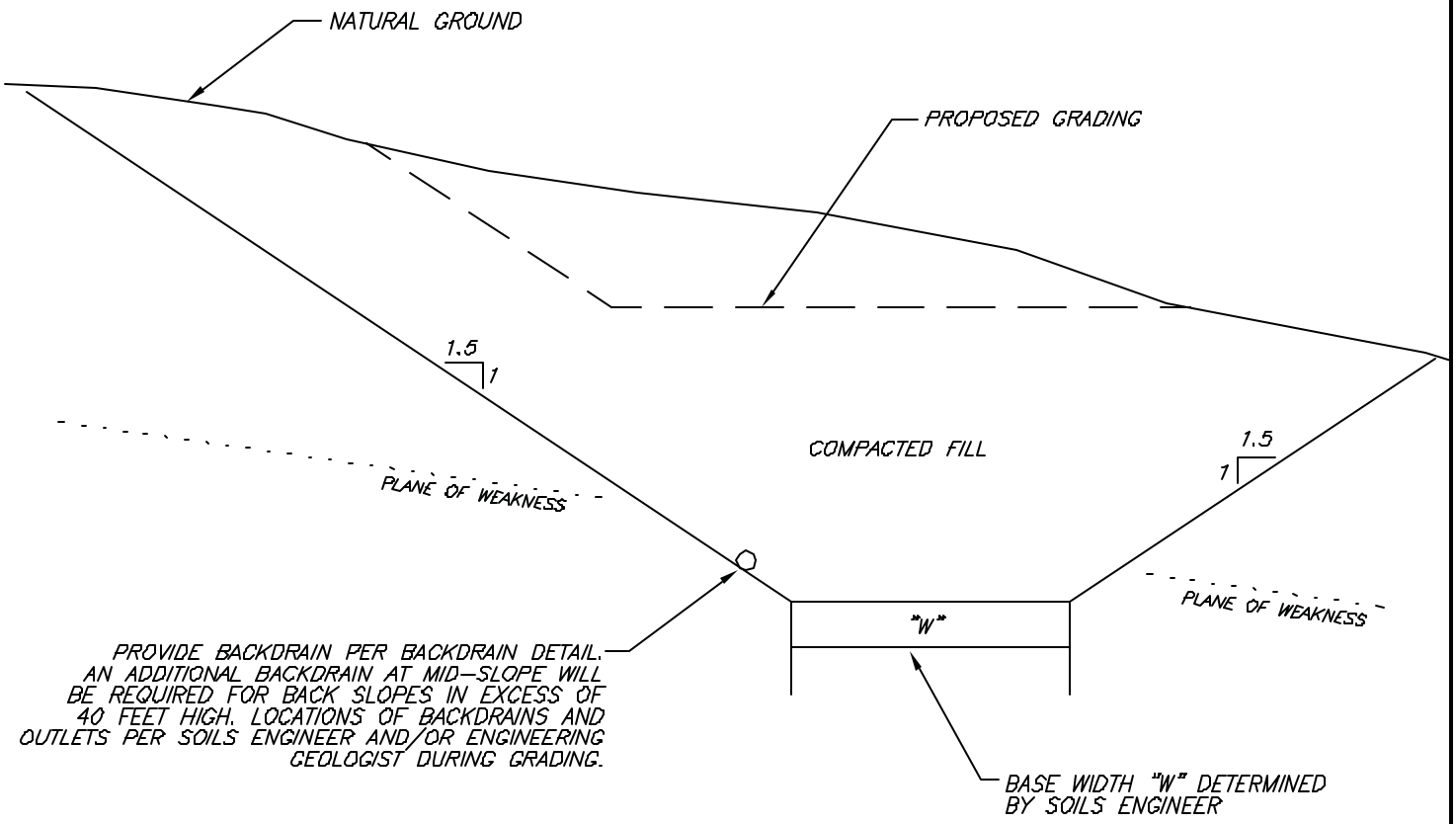
TYPICAL STABILIZATION FILL DETAIL



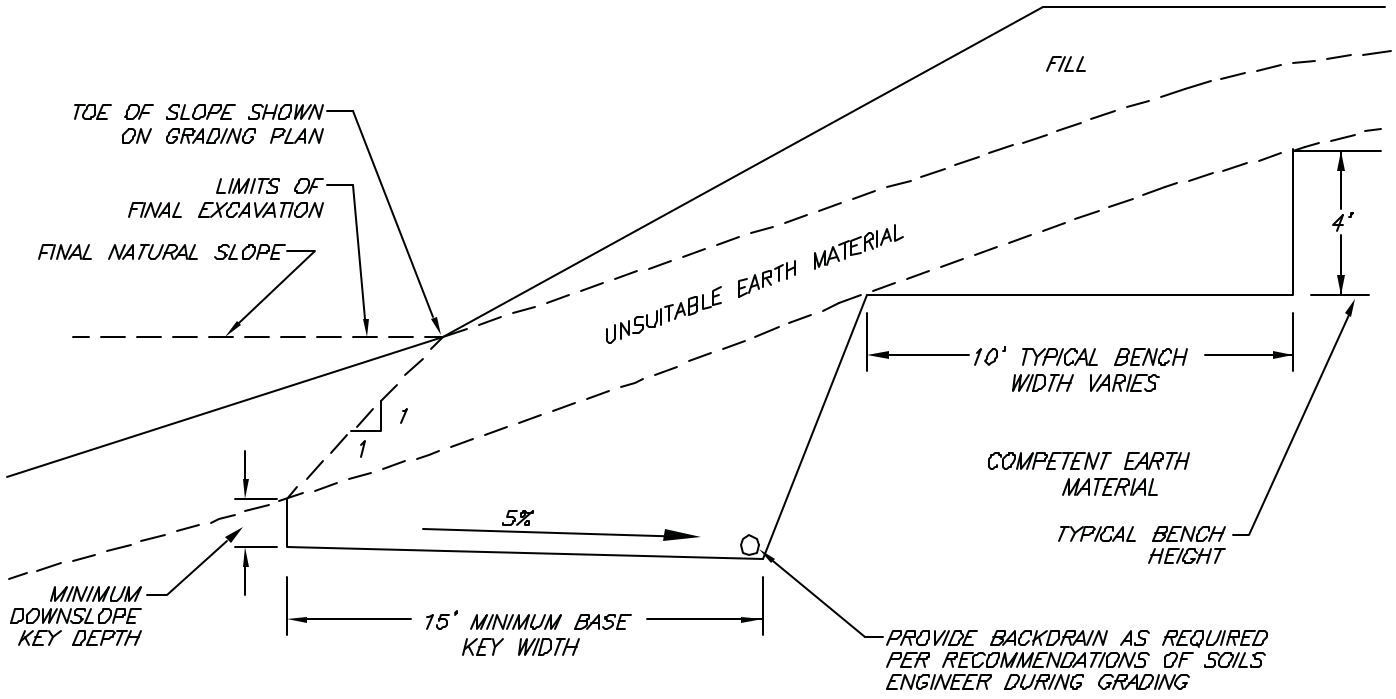
TYPICAL BUTTRESS FILL DETAIL



DAYLIGHT SHEAR KEY DETAIL

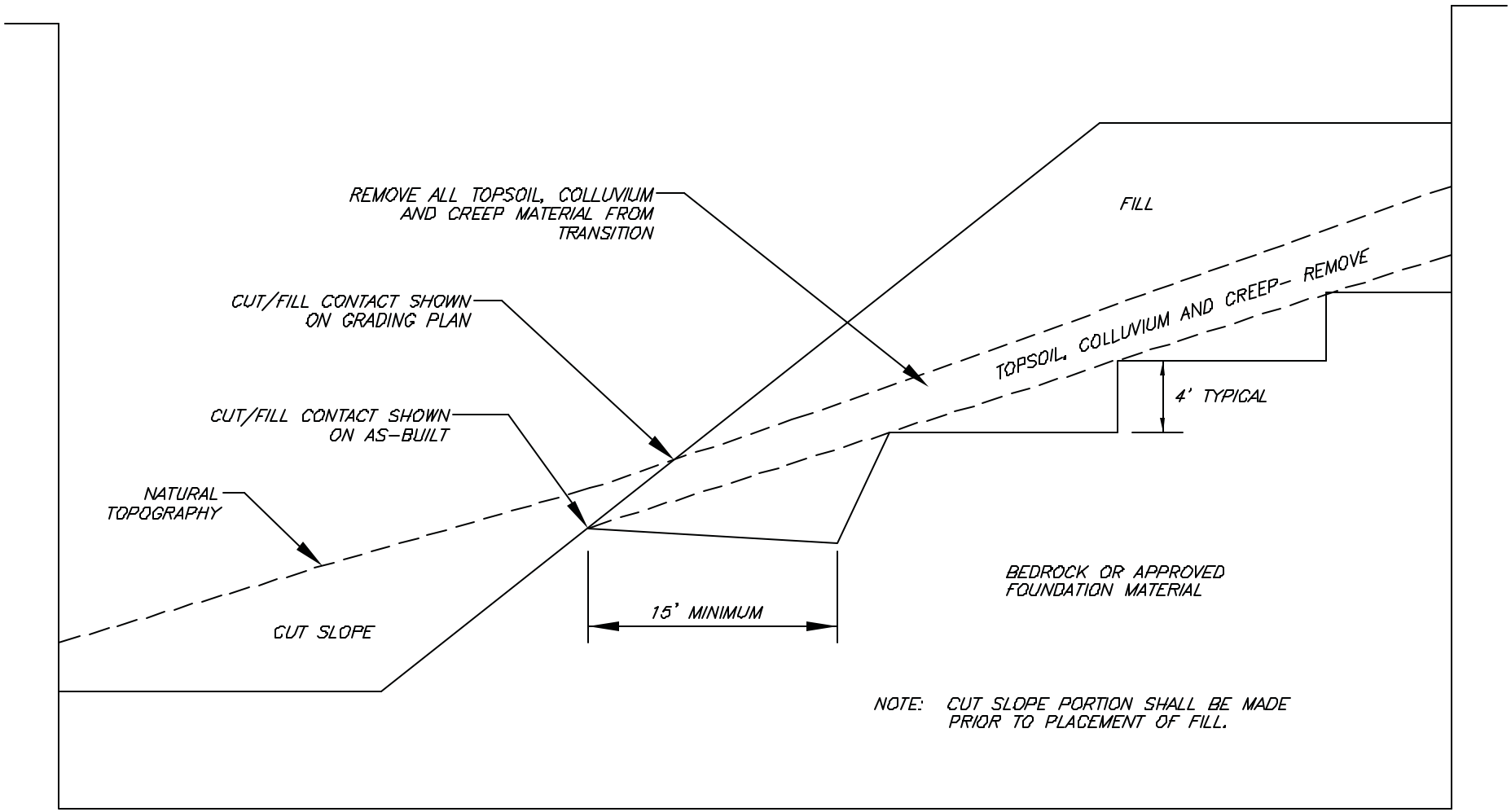


TYPICAL SHEAR KEY DETAIL

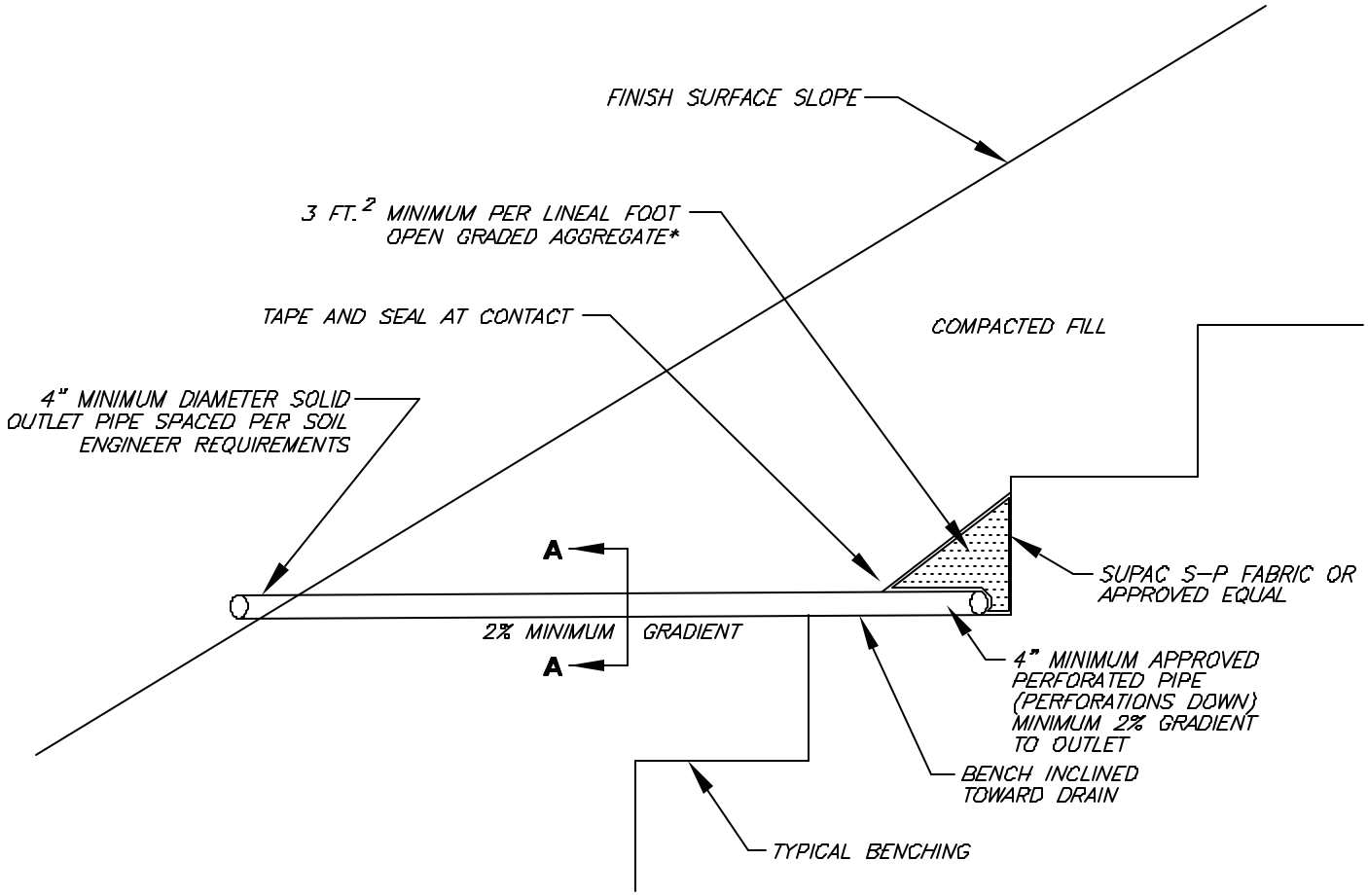


WHERE NATURAL SLOPE IS 5:1 OR LESS, BENCHING IS NOT NECESSARY, HOWEVER, FILL IS NOT TO BE PLACED ON COMPRESSIBLE OR UNSUITABLE MATERIAL.

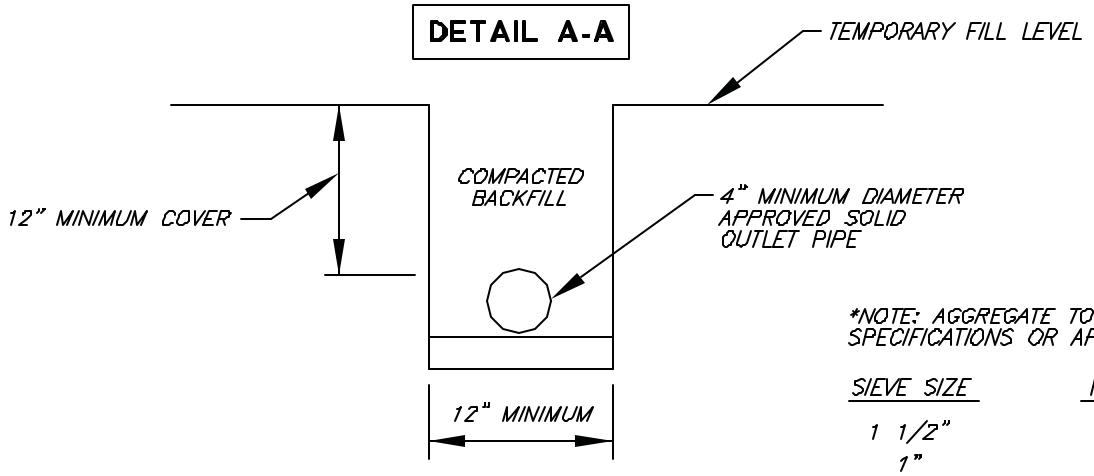
FILL SLOPE ABOVE NATURAL GROUND DETAIL



FILL SLOPE ABOVE CUT SLOPE DETAIL



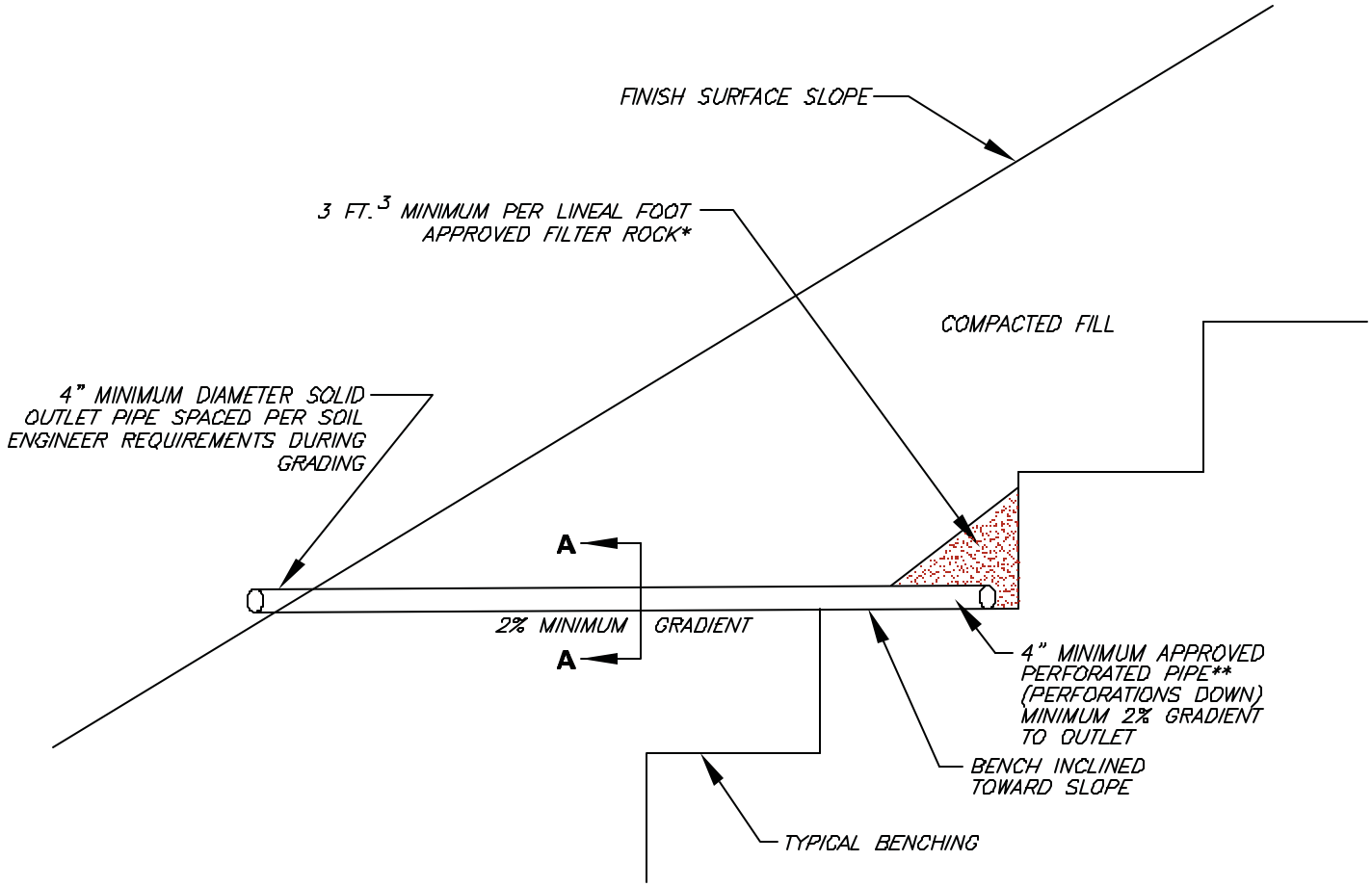
DETAIL A-A



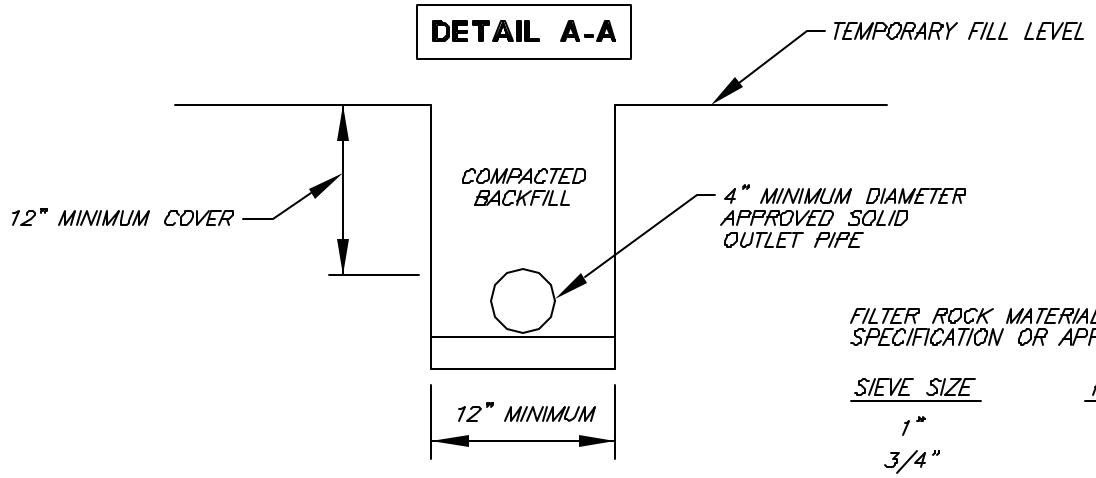
*NOTE: AGGREGATE TO MEET FOLLOWING SPECIFICATIONS OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE PASSING
1 1/2"	100
1"	5-40
3/4"	0-17
3/8"	0-7
NO. 200	0-3

BACKDRAIN DETAIL (GEOFABRIC)



DETAIL A-A



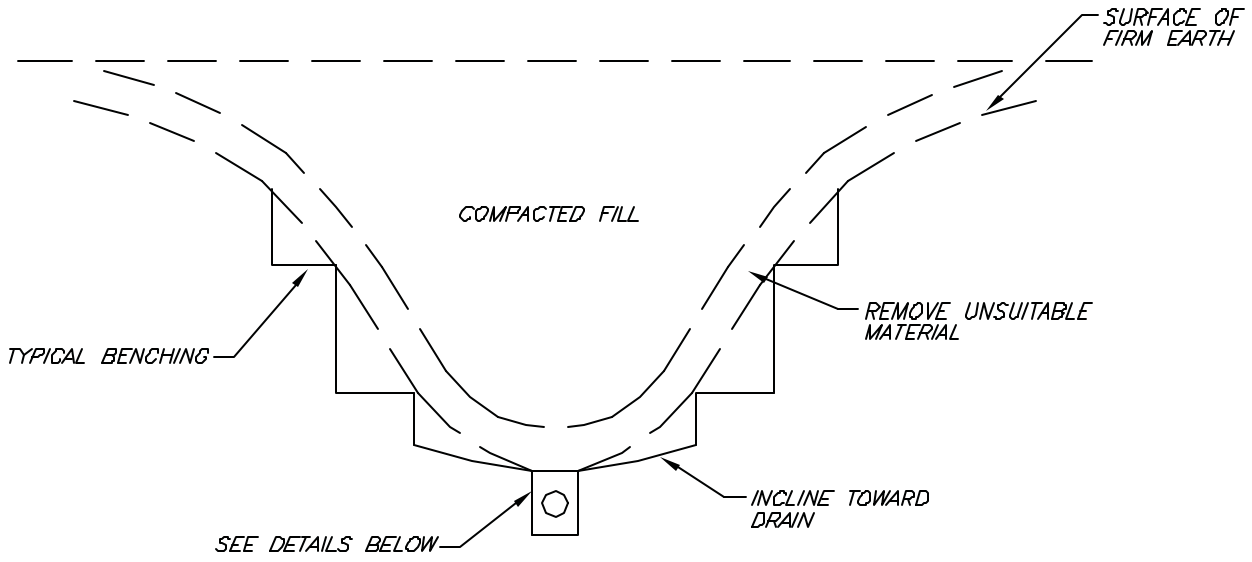
FILTER ROCK MATERIAL TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE
1"	100
3/4"	90–100
3/8"	40–100
NO. 4	25–40
NO. 30	5–15
NO. 50	0–7
NO. 200	0–3

**APPROVED PIPE TYPE:

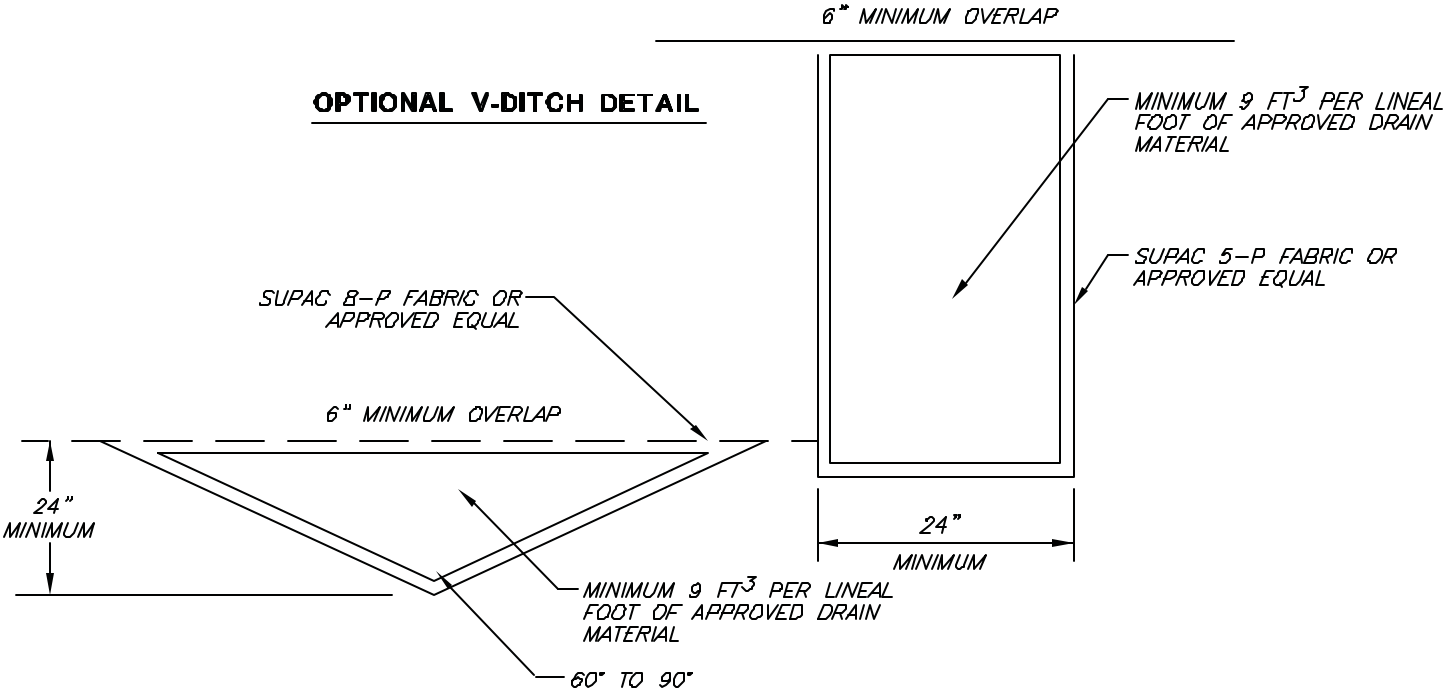
SCHEDULE 40 POLYVINYL CHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 PSI.

TYPICAL BACKDRAIN DETAIL



TRENCH DETAIL

OPTIONAL V-DITCH DETAIL



DRAIN MATERIAL TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUAL:

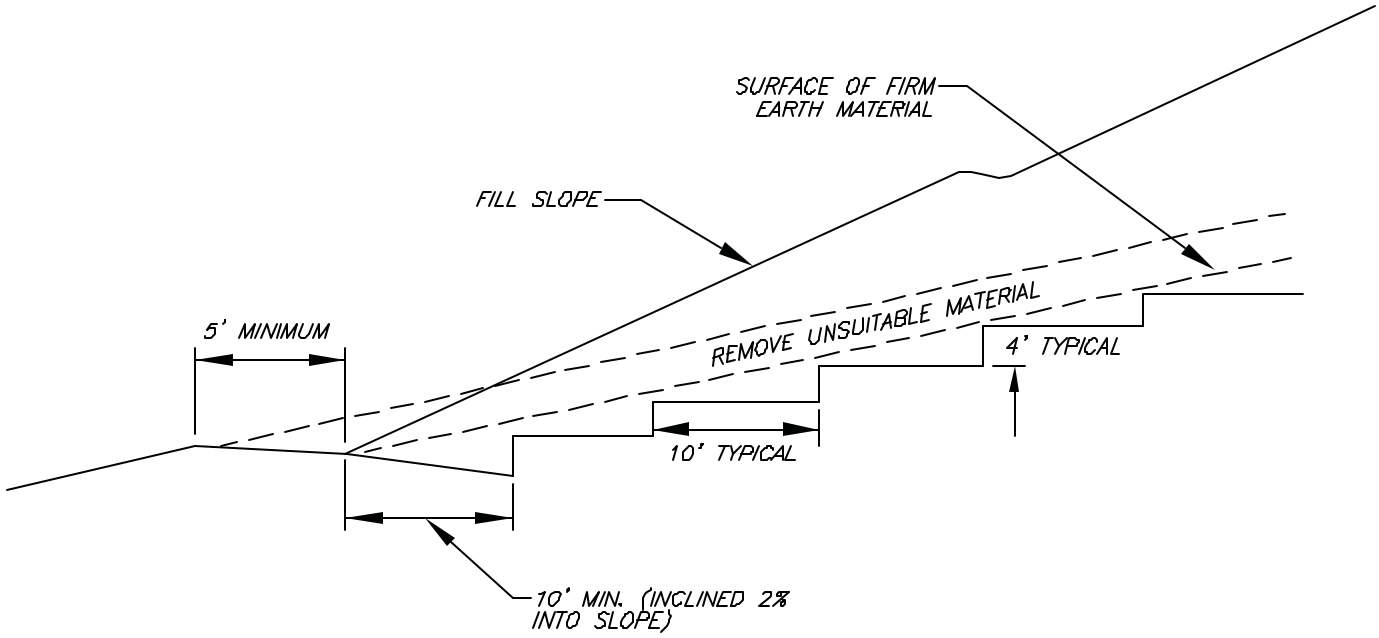
SIEVE SIZE	PERCENTAGE PASSING
1-1/2"	88-100
1"	5-40
3/4"	0-17
3/8"	0-7
NO.:200	0-3

ADD MINIMUM 4" DIAMETER APPROVED PERFORATED PIPE WHEN GRADIENT IS LESS THAN 2%

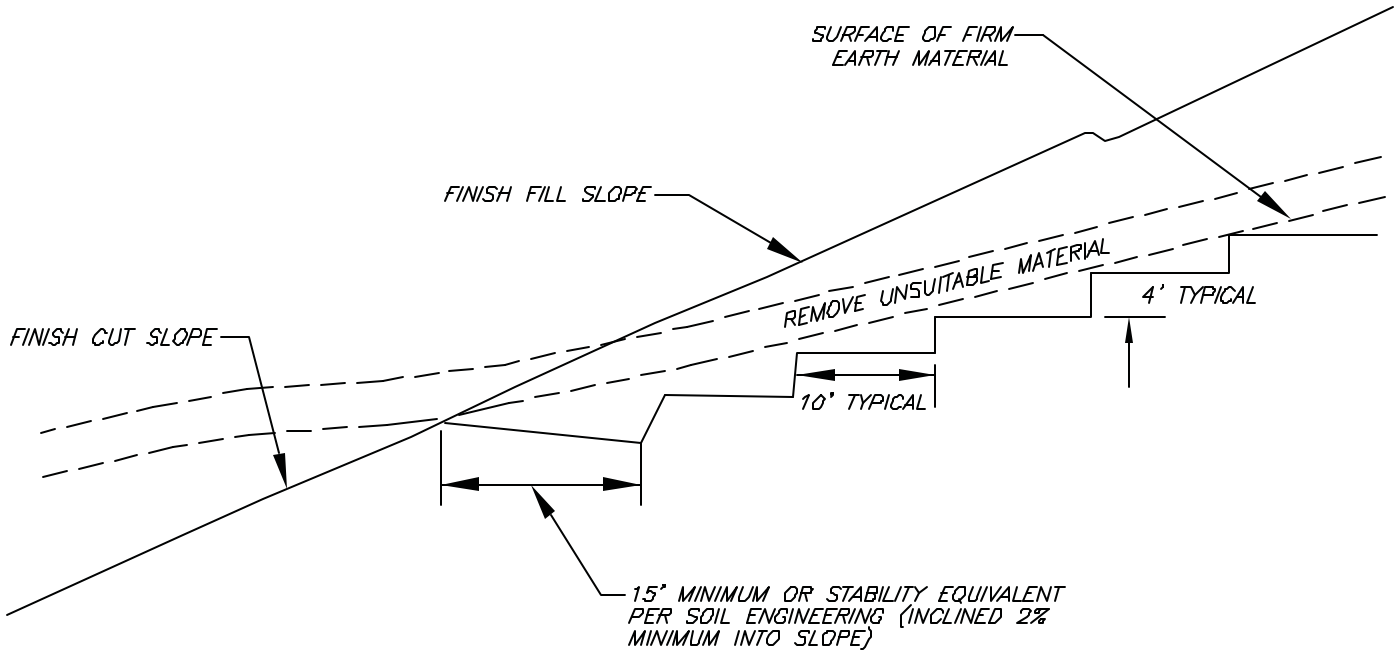
APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYL-CHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 psi.

GEOFABRIC SUBDRAIN DETAIL

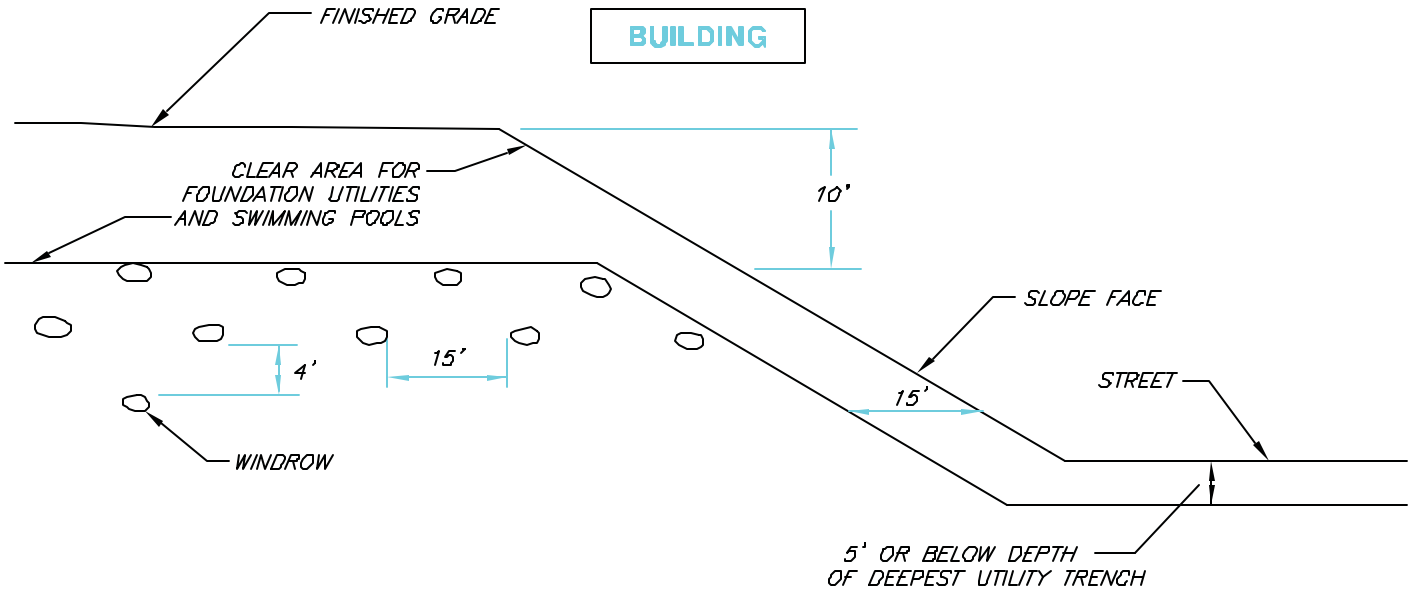
BENCHING FILL OVER NATURAL



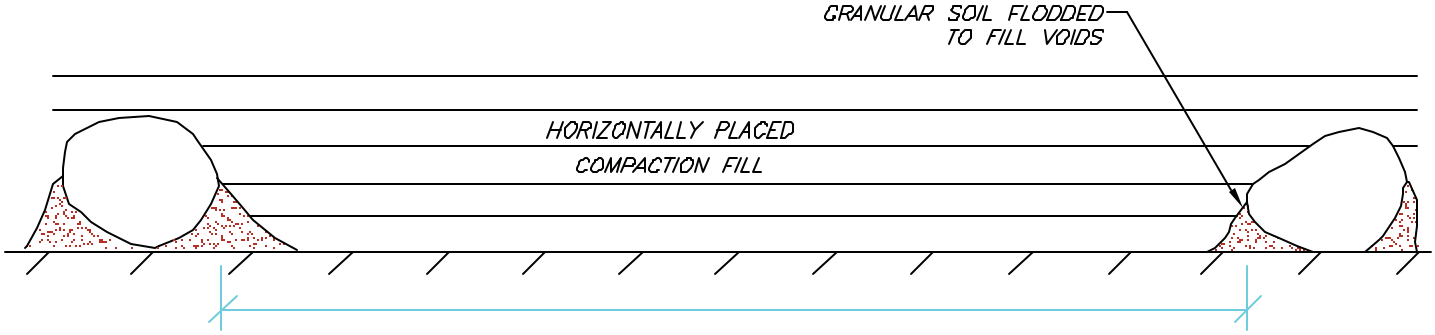
BENCHING FILL OVER CUT



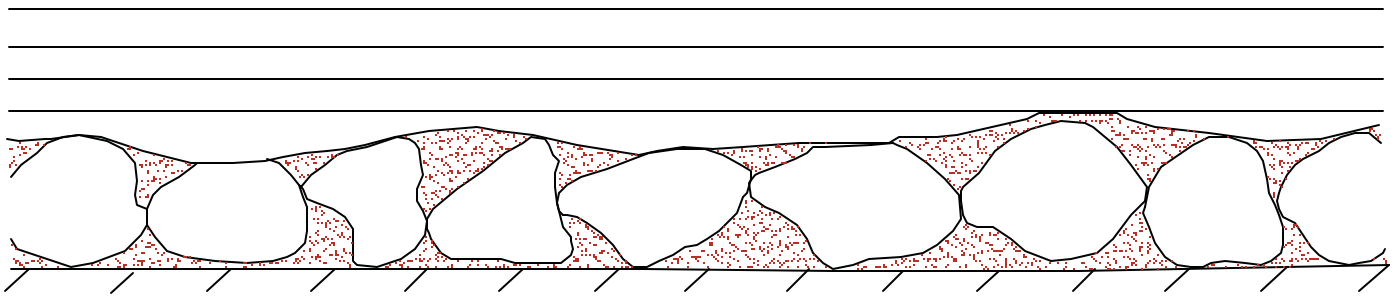
BENCHING FOR COMPACTED FILL DETAIL



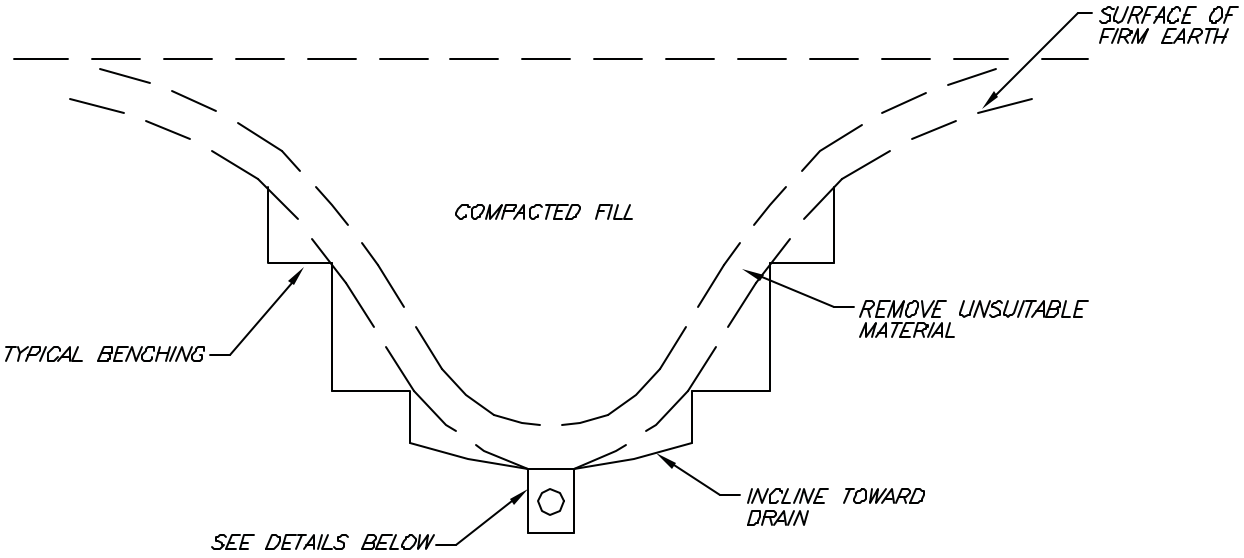
TYPICAL WINDROW DETAIL (EDGE VIEW)



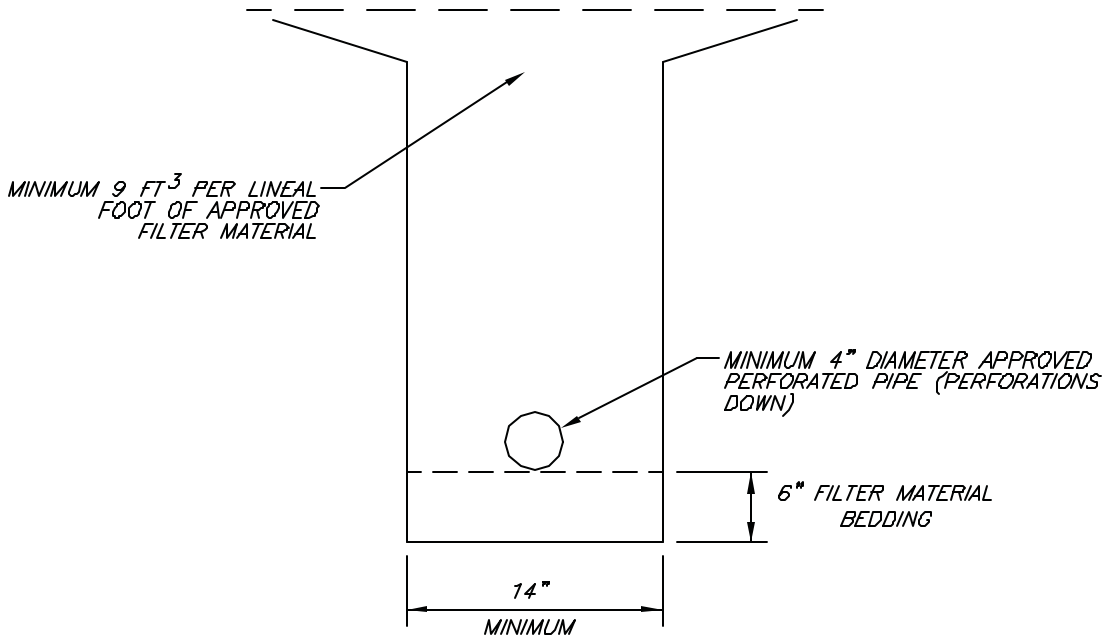
PROFILE VIEW



ROCK DISPOSAL DETAIL



TRENCH DETAIL



FILTER MATERIAL TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUAL:

SIEVE SIZE	PERCENTAGE
1"	100
3/4"	90–100
3/8"	40–100
NO. 4	25–40
NO. 30	5–15
NO. 50	0–7
NO. 200	0–3

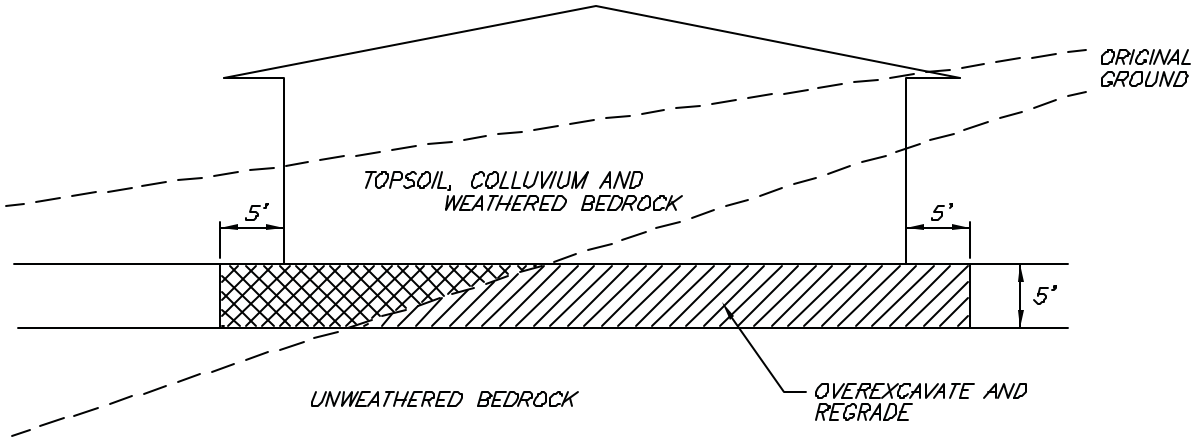
APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYL-CHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 psi.

PIPE DIAMETER TO MEET THE FOLLOWING CRITERIA. SUBJECT TO FIELD REVIEW BASED ON ACTUAL GEOTECHNICAL CONDITIONS ENCOUNTERED DURING GRADING.

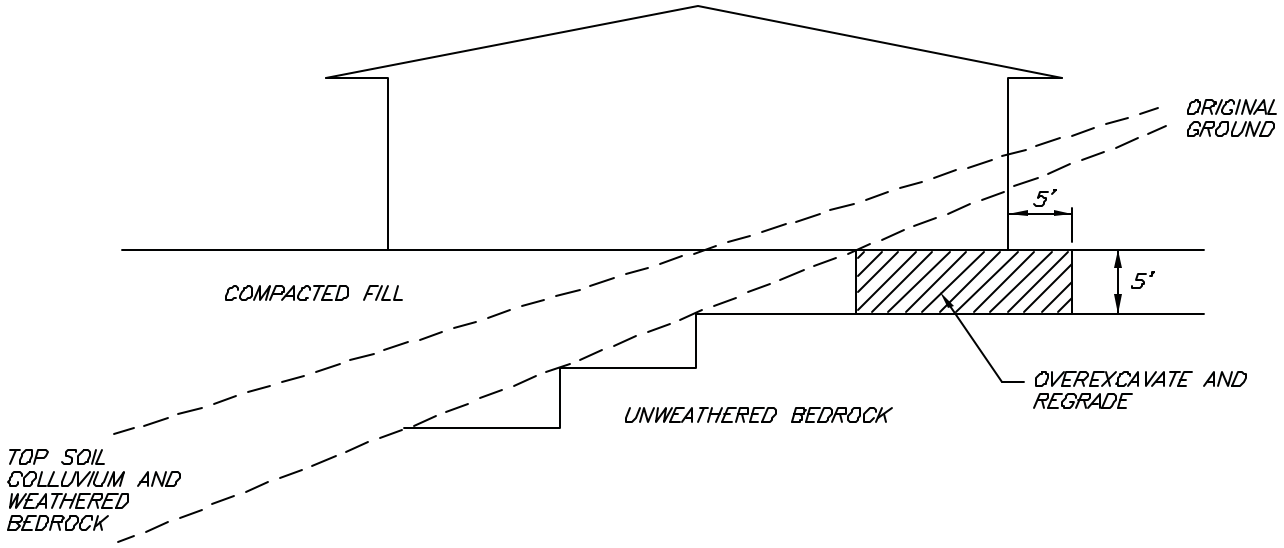
LENGTH OF RUN	PIPE DIAMETER
UPPER 500'	4"
NEXT 1000'	6"
> 1500'	8"

TYPICAL CANYON SUBDRAIN DETAIL

CUT LOT



CUT/FILL LOT (TRANSITION)



TRANSITION LOT DETAIL

GeoMat Testing Laboratories, Inc.

Soil Engineering, Environmental Engineering, Materials Testing, Geology

July 27, 2015

Project No. 15049-02

TO: RC Hobbs
1110 East Chapman Avenue
Suite 201
Orange, California 92866

ATTENTION: Mr. Jeff Moore

SUBJECT: Basic Soil Infiltration Testing Report, Single Family Residential Project, 4105 Jefferson Street, Riverside, California

Introduction

This report provides a summary of the geotechnical engineering services conducted to support evaluation of the feasibility of infiltration at the subject site. The purpose of our services was to complete four insitu infiltration tests utilizing percolation testing procedure in boreholes to evaluate the feasibility of infiltration for disposal of stormwater runoff following the falling head method.

Scope of Services

GeoMat Testing Laboratories, Inc. was retained to provide geotechnical engineering services to support the project. Our scope of work consisted of the following specific tasks:

1) Drill deep exploratory boreholes.

2) Complete four infiltration tests at the site utilizing the shallow boring percolation testing per Riverside County Environmental Health Department procedures. The tests were completed in general accordance with the falling head method.

3) Complete laboratory gradation analysis and testing of selected soil sample.

4) Complete data analysis.

5) Preparation of this report summarizing our findings, conclusions, and recommendations. The report includes:

- Site plan showing the location of exploratory borehole and infiltration tests.
- Summary of site conditions observed at the testing locations.
- Results of the laboratory testing.
- Discussion of the results of insitu infiltration testing.
- A discussion of the surficial soil and anticipated groundwater conditions at the site.
- Evaluation of the feasibility of infiltration.
- Recommendations for infiltration facility.

Existing Site Conditions

The subject site is currently being occupied by a one-story single family residence with a subterranean basement and a old wood framed work shop. The existing residence is on a septic system which is located just north of the house. The work shop is about two-stories in height and has a slab-on-grade. Several mature trees were noted on site along with a vegetation debris pile located on the north eastern end of the property.

The site is just under three acres in size. Topographically the site is relatively flat with surface sheet flow draining towards Jefferson street at a rate of about 1%. Total relief on site is approximately 6 feet with the highest elevation located at the back end of the property (northeasterly end) at approximately 783 feet above mean sea level (amsl), and the lowest elevation located at the front end of the property (southwesterly end) at approximately 777 feet amsl.

Groundwater

Groundwater study is not within the scope of this work. Groundwater was encountered at the site in exploratory borehole at 34 feet below ground surface. Least ground surface elevation at the site is approximately 777.

Local highest historical groundwater elevations were researched using the following agencies:

1. Western Municipal Water District Well Measuring Program:

Well	Well Elev.	Depth to Water	Water Elev.	Date	Location
02S05W32Q	766.7	17.7	749	6/9/1998	2000' North
		17.8	748.9	5/24/1999	
		18.0	748.7	1/6/1999	
		19.2	747.5	12/14/1994	
		20.1	746.6	6/6/1994	
		20.8	745.9	1/6/1994	

2. State Department of Water Resources:

Well	Well Elev.	Depth to Water	Water Elev.	Date	Location
339320N1174420W001	755.0	12.8	742.2	4/25/2012	1.46 mile, southwest
339410N1173930W001	882.2	117.9	764.2	4/25/2012	2 mile east
339251N1174342W001	784.1	29.6	754.5	11/29/2012	1.45 mile southwest
339250N1174150W001	856.7	95.5	761.2	3/17/2015	1.2 miles south

3. USGS National Water Information Systems:

Well	Well Elev.	Depth to Water	Water Elev.	Date	Location
335732117252801	777.8	46.75	731.05	3/30/1984	1 mile, north
		48.0	729.8	1/1/1955	

4. USGS Groundwater Watch:
   No data available from USGS Groundwater Watch.

The potential for rain or irrigation water locally seeping through from adjacent areas cannot be precluded. Our experience indicates that surface or near-surface groundwater conditions can develop in areas where groundwater conditions did not exist prior to site development, especially in areas where a substantial increase in surface water infiltration results from landscape irrigation and stormwater infiltration systems.

In addition, changes in local or regional water and management patterns, or both, can significantly raise the water table or create zones of perched water. We therefore recommend that landscape irrigation be kept to the minimum necessary to maintain plant vigor and any leaking pipes/sprinklers, etc. should be promptly repaired.

The depth to the groundwater may fluctuate with seasonal changes and from one year to the next. We have no way of predicting future groundwater levels or perched water due to increase in surface water infiltration from rainfall or from landscape irrigation. Subdrains, horizontal drains, toe drains, French drains, heel drains or other devices may be recommended in future for graded areas that exhibit nuisance water seepage, past evidence for shallow water, or areas with a potential for future shallow/surface water.

Exploratory Boreholes

Three deep exploratory boreholes were drilled on July 25, 2015 to a maximum depth of 50 feet below ground surface. The boreholes were drilled utilizing a CME 45 drill rig equipped with 6 inch hollow stem augers. A field engineer from this office observed the drilling and prepared the boring logs. Borehole B-3 was the closest in location to the proposed infiltration facility. Only the log of this borehole is included with this report.

Soil Sampling and Laboratory Testing

Bulk soil samples were obtained from the bottom of percolation holes for laboratory classification. Laboratory sieve analysis was performed for the collected soil samples. The soil classifications are in conformance with the Unified Soil Classifications System (USCS), as outlined in the Classification and Symbols Chart (Appendix B).

A summary of our laboratory testing is presented in Appendix C. Based on laboratory testing the onsite soil near the surface is classified as clayey sand/sandy clay (USCS “SC/CL”).

Percolation Testing Method

The four test holes were drilled with a mobile drill rig. A 3-inch-diameter perforated PVC casing wrapped with filter fabric was placed in the borehole. Pea gravel was placed below and around the pipe for stability of the borehole.

The boreholes were presoaked prior to the percolation testing. Presoaking was conducted using five gallon water bottles.

Infiltration testing was conducted the next day after presoaking. Testing was conducted for six hours with readings taken 30 minutes apart from a fixed reference point. The measurements were taken by filling up the test hole with water and allowing the water to percolate. The drop of water level was recorded every 30 minutes. A wrist watch was used to record the time measurements.

Infiltration Test Results

Infiltration tests were conducted at depths ranged from 43 to 60 inches below ground surface. The following summarizes the result of the infiltration feasibility study.

Test No.	Depth Below Surface	Percolation Rate (in/hr)	Adjusted Infiltration Rate (in/hr)	% Passing No. 200 Sieve
P-1	48”	1.6	0.2	78
P-2	60””	3.9	0.4	76
P-3	43”	2.8	0.3	82
P-4	44”	1.3	0.1	74

The percolation rate is the rate in horizontal and vertical direction. This rate is adjusted using Porchet Method for horizontal water infiltration. Refer to Appendix D for test results.

A safety factor should be applied to this rate by the design engineer. Safety factor discussion is in the following paragraph.

Factors of Safety

Long-term infiltration rates may be reduced significantly by factors such as soil variability and inaccuracy in the infiltration rate measurement. The correction factor for site variability is between 3 and 10.

Safety factors for operating the system, maintenance, siltation, biofouling, etc. should also be considered by the design civil engineer at his discretion. Minimum safety factor required by the County of Riverside for tests conducted when deep exploratory borehole has been drilled at the site is 3.

Conclusions/Recommendations

- Based on the infiltration rate at the performed infiltration test locations, no significant infiltration should be expected to occur within the proposed below grade stormwater infiltration system. This recommendation assumes that the bottom of the infiltration system will be located within the alluvial fine grained soil observed at the test locations. Should this system be located in a different soil type, the infiltration characteristics will be different than those observed during the infiltration testing. The infiltration rate recommended above is based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rate.

- The planned infiltration system should extend vertically into native soil.

- Infiltration water should not be allowed to saturate pavement and concrete structures subgrade soils. If infiltration facility is to be located in pavement areas, the aggregate base for the pavement should be of sufficient thickness, ie. 3 feet, compacted in six inch layers to at least 95 percent relative compaction. For concrete structures, we recommend, as a minimum, to setback the infiltration facility in accordance with the following table. Stricter setbacks may be enforced by governing agency.

- Filter fabric should be used whenever aggregates are placed against native soils.

- Please note that soils in infiltration areas should not be subject to compaction during construction.

- The proposed system by the civil engineer should be constructed and maintained in accordance with manufacturer guidelines.

An important consideration for infiltration facilities is that, during construction, great care must be taken not to reduce the infiltrative capacity of the soil in the facility through compaction by heavy equipment or by using the infiltration area as a sediment trap.

Infiltration facilities should be constructed late in the site development after soils (that might erode and clog the units) have been stabilized, or should be protected (by flagging) until site work is completed.

Infiltration facilities should be sited with the following guidelines:

INFILTRATION FACILITY SETBACKS	
Setback From	Distance
Property Lines and Public Right of Way	5 feet
Foundations	15 feet or within a 1:1 plane drawn up from the bottom of foundation
Slopes	H/2, 5 feet minimum (H: is slope height)
Private drinking water wells	100 feet

Ferrous metal pipes should be protected from potential corrosion by bituminous coating, etc. We recommend that all utility pipes be nonmetallic and/or corrosion resistant. Recommendations should be verified by soluble sulfate and corrosion testing of soil samples obtained from specific locations during construction.

If applicable, four to six inch diameter observation well(s), with locking cap, extending vertically into the system's bottom is suggested as an observation point. Observation well(s) should be checked regularly and after large storm event. Once performance stabilizes, frequency of monitoring may be reduced.

GeoMat Testing Laboratories should observe the basin excavation. Additional laboratory testing including but not limited to grain size analysis, sand equivalent, sulfate content, etc should be conducted during construction.

Use of this Report

This report was prepared for the exclusive use of the addressee and his consultants for specific application to the proposed site. The use by others, or for the purposes other than intended, is at the user's sole risk.

The findings, conclusions, and recommendations presented herein are based on our understanding of the project and on subsurface conditions observed during our site work. Within the limitations of scope, schedule, and budget, the conclusions and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering principals and practices in the area at the time the report was prepared. We make no other warranty either expressed or implied.

We appreciate this opportunity to provide geotechnical services on this project and look forward to assisting the Project Team as the design progresses. If you have any questions or comments regarding the information contained in this report, or if we may be of further services, please call us at (951) 688-5400.

Submitted for GeoMat Testing Laboratories, Inc.

Haytham Nabilsi, GE 2375
Principal Engineer

Art Martinez
Project Engineer

Distribution: [3] Addressee

Attachments:

Figure 1	Site Location Map
Plate 1	Infiltration Test Location Map
Appendix A	References
Appendix B	Exploratory Borehole Logs
Appendix C	Laboratory Test Results
Appendix D	Infiltration Data/Graph

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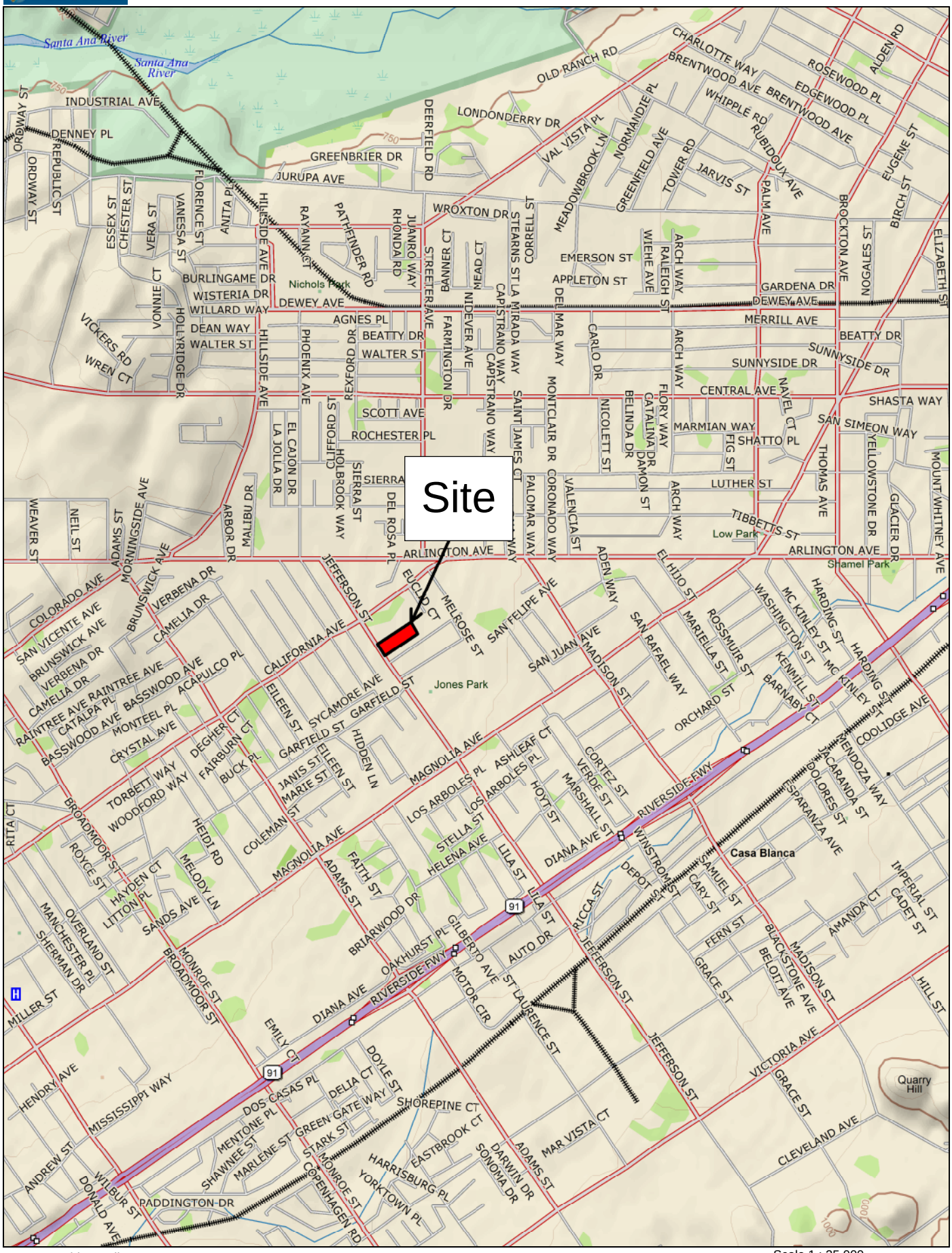

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TN

MN (12.0°E)

Figure 1

Scale 1 : 25,000

0 600 1200 1800 2400 3000 ft

0 200 400 600 800 1000 m

1" = 2,083.3 ft

Data Zoom 13-0

0 50 100

Approximate Scale (ft)

EXPLANATION

Approximate Location of Exploratory Borehole

Approximate Location of Infiltration Test

Exploratory Boring/Infiltration Test Location Map

RC Hobbs- Jefferson Site
City of Riverside, California

Date:	07/28/2015
Project No.:	15068-01
Plate:	1

geomat

Base Map: Armstrong & Brooks Consulting Engineers' "Green River Road Widening, DEM-1B.3"

Appendix A

REFERENCES

Site conceptual design provided by client.

Riverside County Parcel Report for APN 227-130-025.

Riverside County, Stormwater Quality Best Management Practice, Design Handbook, July 21, 2006

Riverside County, Design handbook for Low Impact Development Best management Pactices, September 2011.

Riverside County, Water Quality Management Plan For Urban Runoff, Santa Ana River Region, Santa Margarita River Region, September 17, 2004

California Stormwater Quality Association, Stormwater Best Management Practice, Handbook, Jan. 2003.

California Department of Transportation, Stormwater Quality Handbook, Project Training and Design Guide, Sacramento, 2000.

California Department of Transportation, Stormwater Quality Handbook, Project Planning and Design Guide, Sacramento, 2005.

Federal Highway Administration, Urban Design Drainage Manual, Washington DC, 1996

Massmann, JW, Butchart, and S Stolar, Infiltration Characteristics, Performance, and Design of Stormwater Facilities, Final Research Report, Research Project TI 803, Task 12, Washington DOT 2003.

Soilvision Systems, A Knowledge-Based Soils Database, Murray Fredlund, Canada, 2004.

US Environmental Protection Agency, Storm water Technology Fact Sheet, Infiltration Trench, EPA 832-F-99-019, 1999.

California Stormwater Quality Association (QASCA), California Stormwater BMP Handbook, Infiltration Trench, TC-10 Design Considerations

BMP Handbook, Part B, Planning Activities, Stormwater Mitigation Measures, Watershed Protection Division, City of Los Angeles.

Appendix B

GENERAL NOTES

DRILLING NOTES

WATER LEVEL MEASUREMENTS

Water levels indicated on the boring logs are levels measured in the borings at the times indicated. In permeable materials, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels is not possible with only short-term observations.

WATER LEVEL OBSERVATION DESIGNATION

W.D.	While Drilling
A.B.	After Boring
B.C.R.	Before Casing Removal
A.C.R.	After Casing Removal
24 hr.	Water level taken approximately 24 hrs. after boring completion

DRILLING AND SAMPLING SYMBOLS

AS	Auger Sample
CS	Continuous Sampler
DB	Diamond Bit -NX unless otherwise noted
HA	Hand Auger
HS	Hollow Stem Auger
PA	Power Auger
RB	Rock Bit
SS*	Split-Barrel
ST	Shelby Tube - 2" (51mm) unless otherwise noted
WB	Wash Bore
CR	Calfornia Ring Sampler 3" O.D., Lined with 2.5"X1" Rings

*The Standard Penetration Test is conducted in conjunction with the split-barrel sampling procedure. The "N" value corresponds to the number of blows required to drive the last 1 foot (0.3m) of an 18 in. (0.46m) long, 2 in. (51mm) O.D. split-barrel sampler with a 140 lb. (63.5 kg) hammer falling a distance of 30 in. (0.76m). The Standard Penetration Test is carried out according to ASTM D-1586. (See "N" Value below.)

SOIL PROPERTIES & DESCRIPTIONS

TEXTURE

PARTICLE	SIZE	
Clay	< 0.002 mm	(< 0.002 mm)
Silt	< #200 Sieve	(0.075 mm)
Sand	#4 to #200 Sieve	(4.75 to 0.075 mm)
Gravel	3 in. to #4 Sieve	(75 mm to 4.75 mm)
Cobbles	12 in. to 3 in.	(300 mm to 75 mm)
Boulders	> 12 in.	(300 mm)

COMPOSITION

SAND & GRAVEL

Description	% by Dry Weight
trace	< 15
with	15 - 29
modifer	> 30

FINES

Description	% by Dry Weight
trace	< 5
with	5 - 12
modifier	> 12

Soil descriptions are based on the Unified Soil Classification System (USCS) as outlined in ASTM Designations D-2487 and D-2488. The USCS group symbol shown on the boring logs correspond to the group names listed below. The description includes soil constituents, consistency, relative density, color and other appropriate descriptive terms. Geologic description of bedrock, when encountered, also is shown in the description column.

GROUP SYMBOL	GROUP NAME	GROUP SYMBOL	GROUP NAME
GW	Well Graded Gravel	CL	Lean Clay
GP	Poorly Graded Gravel	ML	Silt
GM	Silty Gravel	OL	Organic Clay or Silt
GC	Clayey Gravel	CH	Fat Clay
SW	Well Graded Sand	MH	Elastic Silt
SP	Poorly Graded Sand	OH	Organic Clay or Silt
SM	Silty Sand	PT	Peat
SC	Clayey Sand	CL-CH	Lean to Fat Clay

COHESIVE SOILS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH (Qu) (psf)	(kPa)
Very Soft	< 500	(< 24)
Soft	500 - 1000	(24 - 48)
Medium	1001 - 2000	(48 - 96)
Stiff	2001 - 4000	(96 - 192)
Very Stiff	4001 - 8000	(192 - 383)
Hard	> 8001	(> 383)

PLASTICITY Description	Liquid Limit (%)
Lean	< 45%
Lean to Fat	45 to 49%
Fat	≥ 50%

Cohessive Soils Consistenacy	"N" value
Very Soft	<2
Soft	2-4
Medium	4-8
Stiff (Firm)	8-15
Very Stiff (Very Firm)	15-30
Hard	>30

COHESIONLESS SOILS

RELATIVE DENSITY	"N" VALUE*
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	≥ 50

BEDROCK PROPERTIES & DESCRIPTIONS

ROCK QUALITY DESIGNATION (RQD**)

DESCRIPTION OF ROCK QUALITY	RQD (%)
Very Poor	0 - 25
Poor	25 - 50
Fair	50 - 75
Good	75 - 90
Excellent	90 - 100

**RQD is defined as the total length of sound core pieces, 4 inches (102mm) or greater in length, expressed as a percentage of the total length cored. RQD provides an indication of the integrity of the rock mass and relative extent of seams and bedding planes.

DEGREE OF WEATHERING

Slightly Weathered	Slight decomposition of parent material in joints and seams.
Weathered	Well-developed and decomposed joints and seams.
Highly Weathered	Rock highly decomposed, may be extremely broken.

SOLUTION AND VOID CONDITIONS

Solid	Contains no voids.
Vuggy	Containing small pits or cavities < 1/2" (13mm).
Porous	Containing numerous voids which may be interconnected.
Cavernous	Containing cavities, sometimes quite large.

When classification of rock materials has been estimated from disturbed samples, core samples and petrographic analysis may reveal other rock types.

HARDNESS & DEGREE OF CEMENTATION

LIMESTONE

Hard	Difficult to scratch with knife.
Moderately Hard	Can scratch with knife but not with fingernail.
Soft	Can be scratched with fingernail.

SHALE

Hard	Can scratch with knife but not with fingernail.
Moderately Hard	Can be scratched with fingernail.
Soft	Can be molded easily with fingers.

SANDSTONE

Well Cemented	Capable of scratching a knife blade.
Cemented	Can be scratched with knife.
Poorly Cemented	Can be broken apart easily with fingers.

BEDDING CHARACTERISTICS

TERM	THICKNESS (inches)	THICKNESS (mm)
Very Thick Bedded	> 36	> 915
Thick Bedded	12 - 36	305 - 915
Medium Bedded	4 - 12	102 - 305
Thin Bedded	1 - 4	25 - 102
Very Thin Bedded	0.4 - 1	10 - 25
Laminated	0.1 - 0.4	2.5 - 10
Thinly Laminated	< 0.1	< 2.5

Bedding Planes	Planes dividing the individual layers, beds or strata of rocks.
Joint	Fracture in rock, generally more or less vertical or transverse to the bedding.
Seam	Applies to bedding plane with an unspecified degree of weathering.

BORHOLE LOG — BH-3

Sheet	1 OF 1		
Date	7/25/2015		
Project No.	15068-01	Drilling Co.	GeoMat
Project	RC Hobbs-Jefferson	Sampler	Cal Mod. And SPT
Client	RC Hobbs	Method	Hollow Stem
Location	4105 Jefferson Street, Riverside, Ca.	Hammer Type	140 lb
Coodinate		Surface Elev.	
Notes		Total Depth	15'

Type/Symbol	Casing	Split Spoon	Ring Sampler	Cutting
I.D.		S	R	C
O.D.				
Length				
Hammer Wt.				
Hammer Fall				

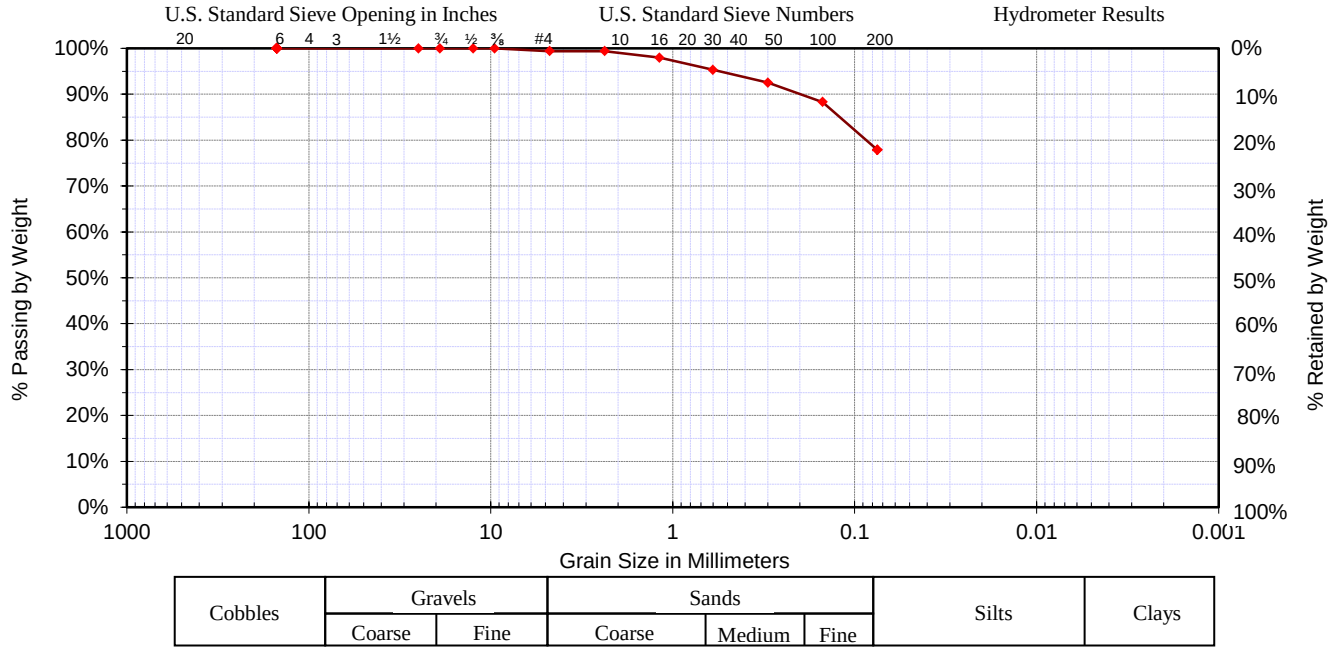
Date	Time	Water Depth (ft)	Casing Size (in)	Casing Depth (ft)	Hole Depth (ft)	Symbol
7/25/2015		no seepage				

Depth Below Surface (ft)	Elevation (ft)	Graphic	Soil Sample Type	Number	Symbol	Depth	Blows 0-152.4 mm	152.4-304.8 mm	304.8-457.2 mm	N-Value	N60	(N1)60	VISUAL MATERIAL CLASSIFICATION AND REMARKS	Moisture (%)	Dry Density (pcf)	Test
0													**CALYEY SAND/SANDY CLAY (SC/CL)**			
1													Red-brown, fine grained, moist			
2													indurated, hard			
3																
4																
5			R				13	33	50/5"	60			very dense	14	112	
6																
7													**SILT (ML)**			
8													Light brown silt/sandy silt, fine graind, slightly cohesive			
9													Caliche >20%			
10			S				7	13	13	26			very firm			
11																
12																
13																
14																
15			S				10	12	13	25			**SILTY SAND (SM)**			
16													Light brown, fine grained, Caliche >20%			
17													% Passing No. 200 sieve= 46			
18																
19																
20																
21																
22																
23																
24																
25																

The stratification lines represent the approximate boundary lines between soil and rock types. In-situ, the transition may be gradual.

Appendix C

LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	#N/A	0.62%
Sample ID:	P-1	D_{60} =	0.06		% Sand
Source:	Bulk	C_C =	1.50	**Specifications**	21.50%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	n/a		77.88%
Boring #:	P-1	Plastic Limit=	n/a	Fineness Modulus	Sample Moisture
Depth:	48"	Plasticity Index=	n/a	0.27	**9.7%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	99.4%	99.4%		
4.00"	100.00		100.0%			#8	2.360	99.4%	99.4%		
3.00"	75.00		100.0%			#10	2.000		98.9%		
2.50"	63.00		100.0%			#16	1.180	98.0%	98.0%		
2.00"	50.00		100.0%			#20	0.850		96.5%		
1.75"	45.00		100.0%			#30	0.600	95.3%	95.3%		
1.50"	37.50		100.0%			#40	0.425		93.7%		
1.25"	31.50		100.0%			#50	0.300	92.5%	92.5%		
1.00"	25.00	100.0%	100.0%			#60	0.250		91.1%		
7/8"	22.40		100.0%			#80	0.180		89.2%		
3/4"	19.00	100.0%	100.0%			#100	0.150	88.3%	88.3%		
5/8"	16.00		100.0%			#140	0.106		82.2%		
1/2"	12.50	100.0%	100.0%			#170	0.090		80.0%		
3/8"	9.50	100.0%	100.0%			#200	0.075	77.9%	77.9%		
1/4"	6.30		99.6%			#270	0.053				
#4	4.75	99.4%	99.4%								

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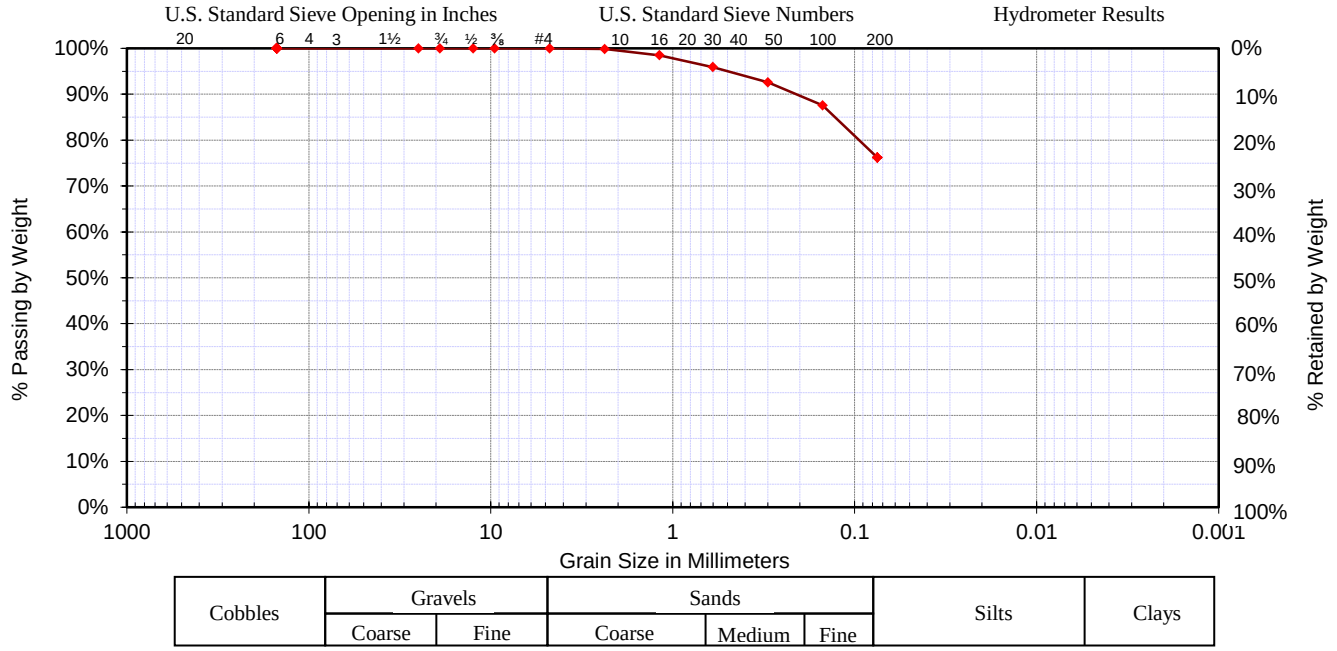
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	#N/A	0.00%
Sample ID:	P-2	D_{60} =	0.06		% Sand
Source:	Bulk	C_C =	1.50	**Specifications**	23.79%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	n/a		76.21%
Boring #:	P-2	Plastic Limit=	n/a	Fineness Modulus	Sample Moisture
Depth:	60"	Plasticity Index=	n/a	0.26	**8.8%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	100.0%	100.0%		
4.00"	100.00		100.0%			#8	2.360	99.8%	99.8%		
3.00"	75.00		100.0%			#10	2.000		99.4%		
2.50"	63.00		100.0%			#16	1.180	98.5%	98.5%		
2.00"	50.00		100.0%			#20	0.850		97.0%		
1.75"	45.00		100.0%			#30	0.600	95.9%	95.9%		
1.50"	37.50		100.0%			#40	0.425		94.0%		
1.25"	31.50		100.0%			#50	0.300	92.6%	92.6%		
1.00"	25.00	100.0%	100.0%			#60	0.250		90.9%		
7/8"	22.40		100.0%			#80	0.180		88.6%		
3/4"	19.00	100.0%	100.0%			#100	0.150	87.6%	87.6%		
5/8"	16.00		100.0%			#140	0.106		80.9%		
1/2"	12.50	100.0%	100.0%			#170	0.090		78.5%		
3/8"	9.50	100.0%	100.0%			#200	0.075	76.2%	76.2%		
1/4"	6.30		100.0%			#270	0.053				
#4	4.75	100.0%	100.0%								

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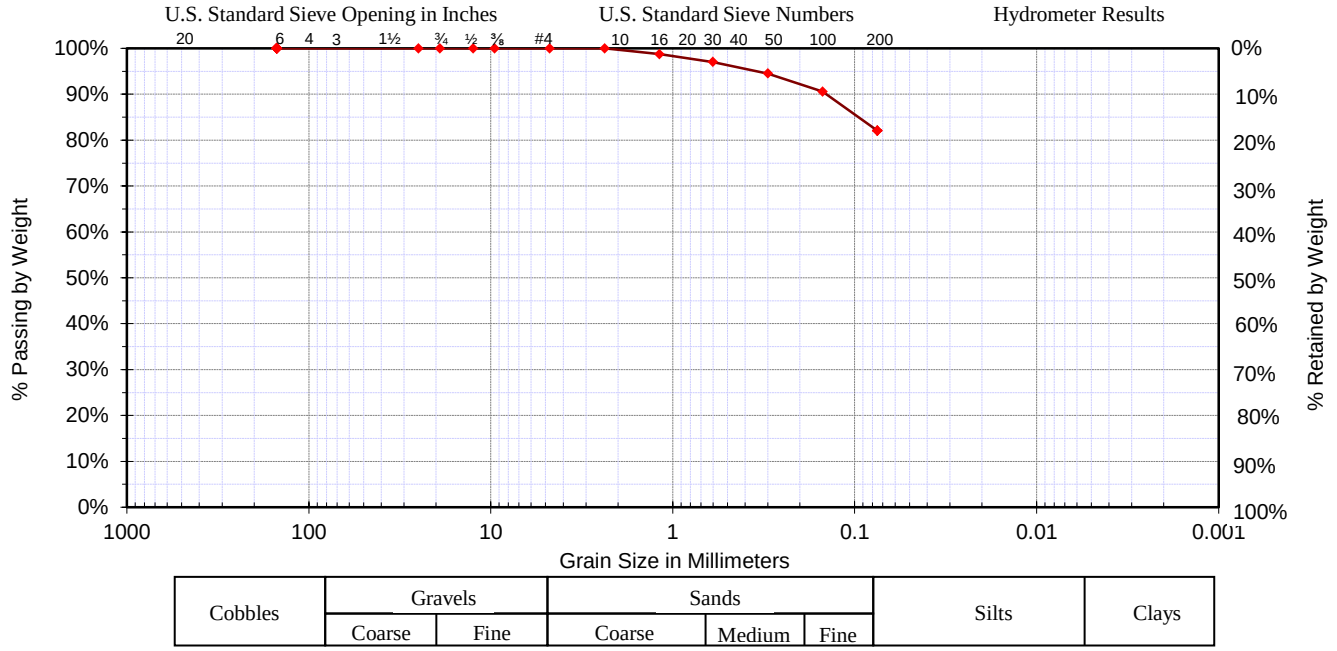
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	#N/A	0.00%
Sample ID:	P-3	D_{60} =	0.05		% Sand
Source:	Bulk	C_C =	1.50	**Specifications**	17.92%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	n/a		82.08%
Boring #:	P-3	Plastic Limit=	n/a	Fineness Modulus	Sample Moisture
Depth:	48"	Plasticity Index=	n/a	0.19	**11.3%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	100.0%	100.0%		
4.00"	100.00		100.0%			#8	2.360	100.0%	100.0%		
3.00"	75.00		100.0%			#10	2.000		99.6%		
2.50"	63.00		100.0%			#16	1.180	98.7%	98.7%		
2.00"	50.00		100.0%			#20	0.850		97.8%		
1.75"	45.00		100.0%			#30	0.600	97.0%	97.0%		
1.50"	37.50		100.0%			#40	0.425		95.5%		
1.25"	31.50		100.0%			#50	0.300	94.5%	94.5%		
1.00"	25.00	100.0%	100.0%			#60	0.250		93.2%		
7/8"	22.40		100.0%			#80	0.180		91.4%		
3/4"	19.00	100.0%	100.0%			#100	0.150	90.6%	90.6%		
5/8"	16.00		100.0%			#140	0.106		85.6%		
1/2"	12.50	100.0%	100.0%			#170	0.090		83.8%		
3/8"	9.50	100.0%	100.0%			#200	0.075	82.1%	82.1%		
1/4"	6.30		100.0%			#270	0.053				
#4	4.75	100.0%	100.0%								

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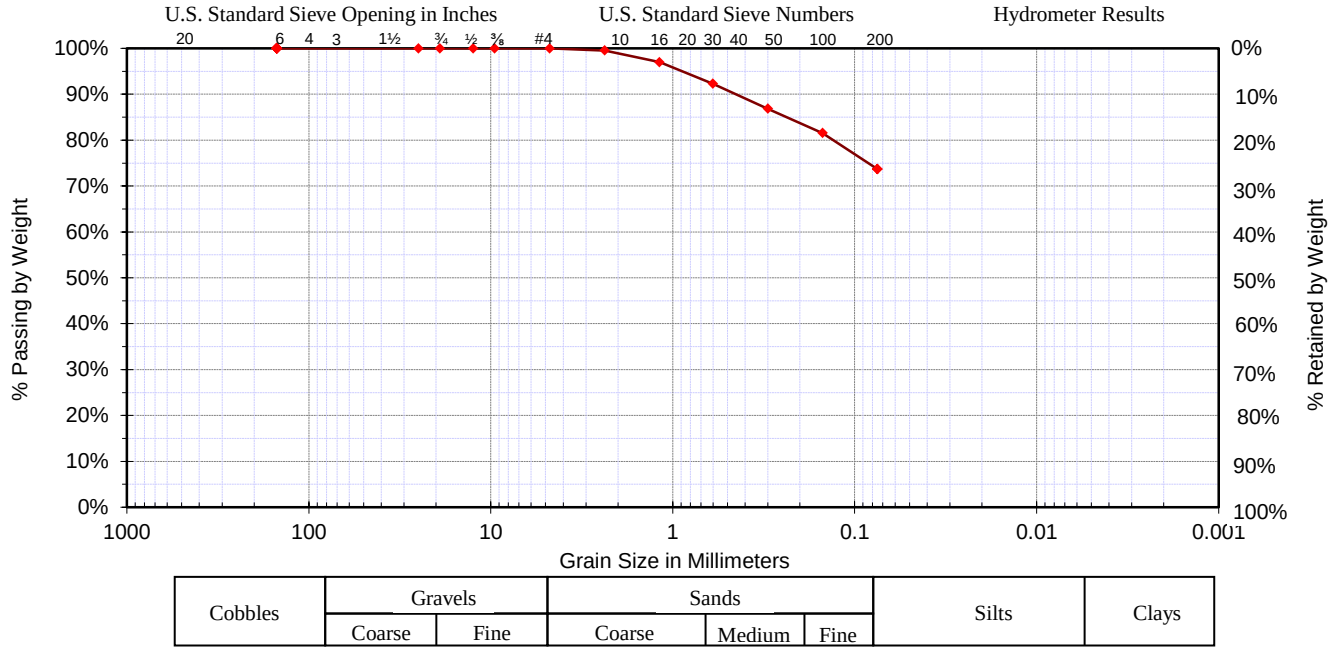
LABORATORY TEST RESULTS



Date :	07/25/15	D_{10} =	0.01	**Classification**	% Gravel
Sample #:		D_{30} =	0.03	#N/A	0.00%
Sample ID:	P-4	D_{60} =	0.06		% Sand
Source:	Bulk	C_C =	1.50	**Specifications**	26.32%
Project:	RC Hobbs-Jefferson	C_U =	6.00	custom specs 1	% Silt & Clay
Location:	4105 Jefferson Street, Riverside	Liquid Limit=	n/a		73.68%
Boring #:	P-4	Plastic Limit=	n/a	Fineness Modulus	Sample Moisture
Depth:	44"	Plasticity Index=	n/a	0.43	**10.7%**

Coarse Section Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	**Fines Section** Sieve Size US	Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
6.00"	150.00		100.0%			#4	4.750	100.0%	100.0%		
4.00"	100.00		100.0%			#8	2.360	99.5%	99.5%		
3.00"	75.00		100.0%			#10	2.000		98.8%		
2.50"	63.00		100.0%			#16	1.180	97.0%	97.0%		
2.00"	50.00		100.0%			#20	0.850		94.3%		
1.75"	45.00		100.0%			#30	0.600	92.3%	92.3%		
1.50"	37.50		100.0%			#40	0.425		89.1%		
1.25"	31.50		100.0%			#50	0.300	86.8%	86.8%		
1.00"	25.00	100.0%	100.0%			#60	0.250		85.1%		
7/8"	22.40		100.0%			#80	0.180		82.6%		
3/4"	19.00	100.0%	100.0%			#100	0.150	81.5%	81.5%		
5/8"	16.00		100.0%			#140	0.106		76.9%		
1/2"	12.50	100.0%	100.0%			#170	0.090		75.2%		
3/8"	9.50	100.0%	100.0%			#200	0.075	73.7%	73.7%		
1/4"	6.30		100.0%			#270	0.053				
#4	4.75	100.0%	100.0%								

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Appendix D

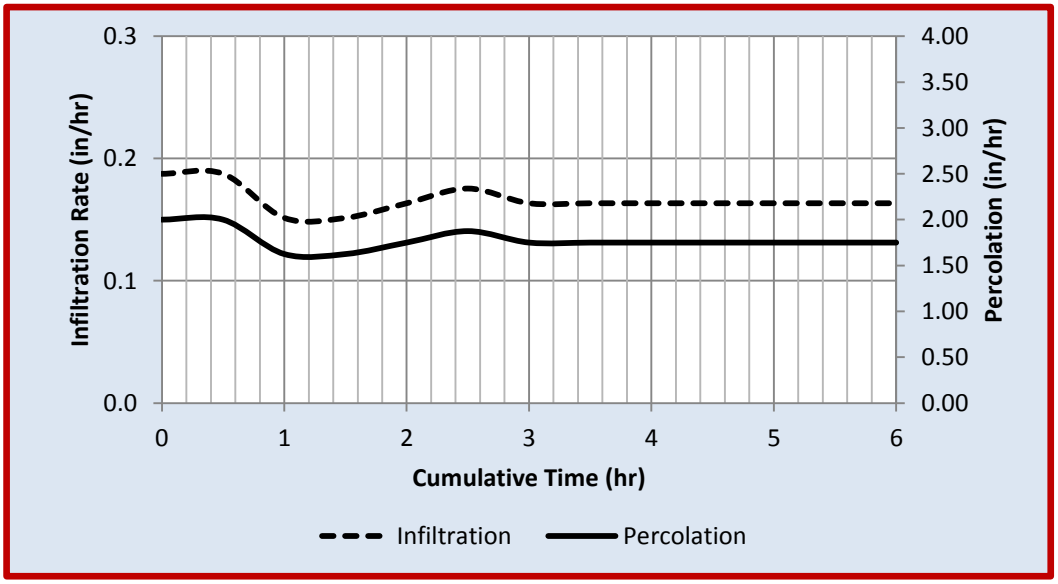
PERCOLATION TEST - P-1

Project No.	15068-01	Project Name	RC HOBBS-Jefferson Ave		
Proj. Location	4105 Jefferson Ave Riverside CA				
Drilling Date	7/25/2015	Soak Date	7/27/2015	Soak Method	5 gallons
Testing Date	7/28/2015	Borehole Size (in)	6	Test Depth (in)	48

CRITERIA	TIME	TIME INTERVAL (min)	D_0, INITIAL DEPTH TO WATER (in)	D_f, FINAL DEPTH TO WATER (in)	ΔH, WATER DROP (in)	AVERAGE WETTED DEPTH (in)	PERC RATE (min/in)	PERC RATE (in/hr)	CORECTED* INFILTRATION RATE (in/hr)
Sandy Soil Criteria									
Percolation Test Data	0:00:00	0:30:00	33	34	1	14.5	30.0	2.0	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.8125	0.8125	14.59375	36.9	1.6	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.8125	0.8125	14.59375	36.9	1.6	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.9375	0.9375	14.53125	32.0	1.9	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							
	0:00:00	0:30:00	33	33.875	0.875	14.5625	34.3	1.8	0.2
	0:30:00	30.00							

*Porchet Method

Cumulative Time (hr)	Percolation (in/hr)	Infiltration (in/hr
0	2.00	0.2
0.50	2.00	0.2
1.00	1.63	0.2
1.50	1.63	0.2
2.00	1.75	0.2
2.50	1.88	0.2
3.00	1.75	0.2
3.50	1.75	0.2
4.00	1.75	0.2
4.50	1.75	0.2
5.00	1.75	0.2
5.50	1.75	0.2
6.00	1.75	0.2



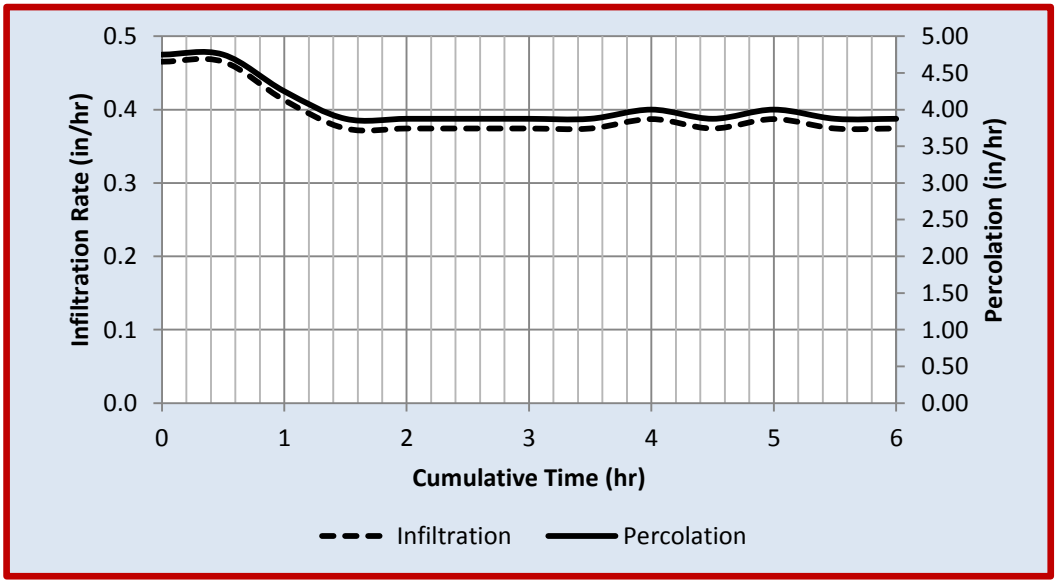
PERCOLATION TEST - P-2

Project No.	15068-01	Project Name	RC HOBBS-Jefferson Ave		
Proj. Location	4105 Jefferson Ave Riverside CA				
Drilling Date	7/25/2015	Soak Date	7/27/2015	Soak Method	5 gallons
Testing Date	7/28/2015	Borehole Size (in)	6	Test Depth (in)	60

CRITERIA	TIME	TIME INTERVAL (min)	D_0, INITIAL DEPTH TO WATER (in)	D_f, FINAL DEPTH TO WATER (in)	ΔH, WATER DROP (in)	AVERAGE WETTED DEPTH (in)	PERC RATE (min/in)	PERC RATE (in/hr)	CORECTED* INFILTRATION RATE (in/hr)
Sandy Soil Criteria									
Percolation Test Data	0:00:00	0:30:00	45	47.375	2.375	13.8125	12.6	4.8	0.5
	0:30:00	30.00							
	0:00:00	0:30:00	45	47.125	2.125	13.9375	14.1	4.3	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	47	2	14	15.0	4.0	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	47	2	14	15.0	4.0	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	45	46.9375	1.9375	14.03125	15.5	3.9	0.4
	0:30:00	30.00							

*Porchet Method

Cumulative Time (hr)	Percolation (in/hr)	Infiltration (in/hr
0	4.75	0.5
0.50	4.75	0.5
1.00	4.25	0.4
1.50	3.88	0.4
2.00	3.88	0.4
2.50	3.88	0.4
3.00	3.88	0.4
3.50	3.88	0.4
4.00	4.00	0.4
4.50	3.88	0.4
5.00	4.00	0.4
5.50	3.88	0.4
6.00	3.88	0.4



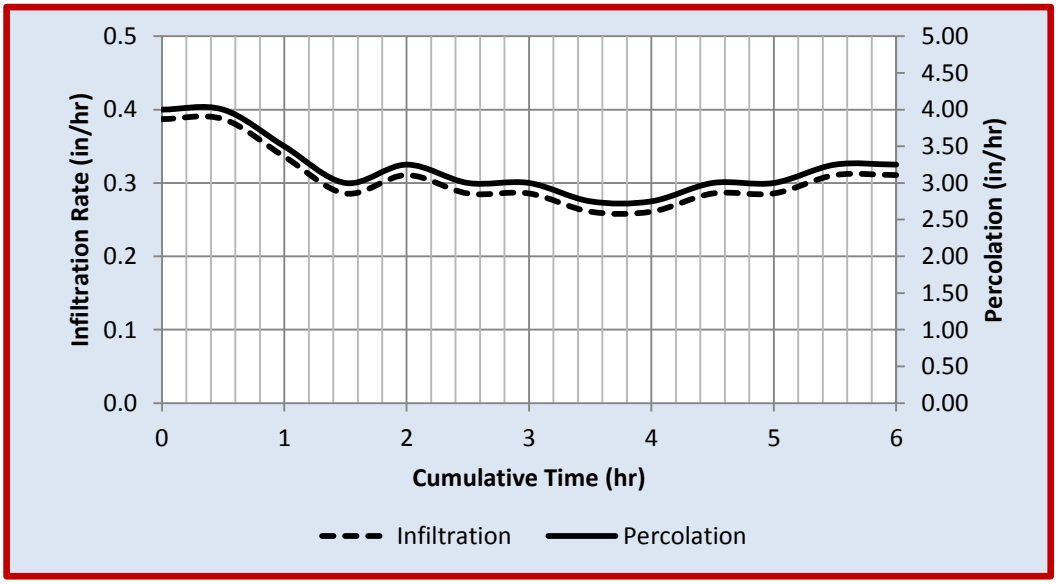
PERCOLATION TEST - P-3

Project No.	15068-01	Project Name	RC HOBBS-Jefferson Ave		
Proj. Location	4105 Jefferson Ave Riverside CA				
Drilling Date	7/25/2015	Soak Date	7/27/2015	Soak Method	5 gallons
Testing Date	7/28/2015	Borehole Size (in)	6	Test Depth (in)	43

CRITERIA	TIME	TIME INTERVAL (min)	D_0, INITIAL DEPTH TO WATER (in)	D_f, FINAL DEPTH TO WATER (in)	ΔH, WATER DROP (in)	AVERAGE WETTED DEPTH (in)	PERC RATE (min/in)	PERC RATE (in/hr)	CORECTED* INFILTRATION RATE (in/hr)
Sandy Soil Criteria									
Percolation Test Data	0:00:00	0:30:00	28	30	2	14	15.0	4.0	0.4
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.75	1.75	14.125	17.1	3.5	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.5	1.5	14.25	20.0	3.0	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.625	1.625	14.1875	18.5	3.3	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.5	1.5	14.25	20.0	3.0	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.5	1.5	14.25	20.0	3.0	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.375	1.375	14.3125	21.8	2.8	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.375	1.375	14.3125	21.8	2.8	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.5	1.5	14.25	20.0	3.0	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.5	1.5	14.25	20.0	3.0	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.625	1.625	14.1875	18.5	3.3	0.3
	0:30:00	30.00							
	0:00:00	0:30:00	28	29.625	1.625	14.1875	18.5	3.3	0.3
	0:30:00	30.00							

*Porchet Method

Cumulative Time (hr)	Percolation (in/hr)	Infiltration (in/hr
0	4.00	0.4
0.50	4.00	0.4
1.00	3.50	0.3
1.50	3.00	0.3
2.00	3.25	0.3
2.50	3.00	0.3
3.00	3.00	0.3
3.50	2.75	0.3
4.00	2.75	0.3
4.50	3.00	0.3
5.00	3.00	0.3
5.50	3.25	0.3
6.00	3.25	0.3



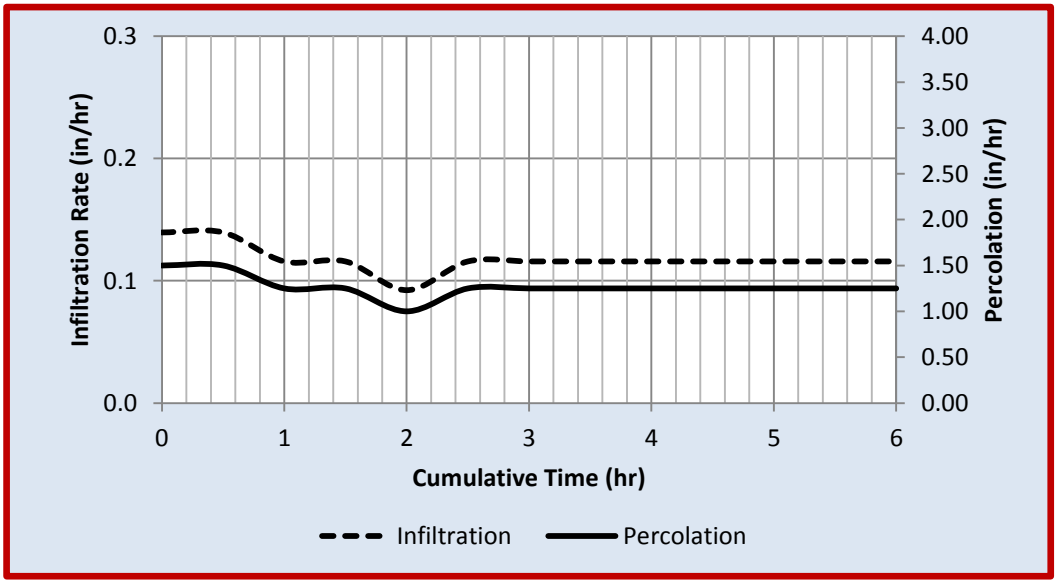
PERCOLATION TEST - P-4

Project No.	15068-01	Project Name	RC HOBBS-Jefferson Ave		
Proj. Location	4105 Jefferson Ave Riverside CA				
Drilling Date	7/25/2015	Soak Date	7/27/2015	Soak Method	5 gallons
Testing Date	7/28/2015	Borehole Size (in)	6	Test Depth (in)	44

CRITERIA	TIME	TIME INTERVAL (min)	D_0, INITIAL DEPTH TO WATER (in)	D_f, FINAL DEPTH TO WATER (in)	ΔH, WATER DROP (in)	AVERAGE WETTED DEPTH (in)	PERC RATE (min/in)	PERC RATE (in/hr)	CORECTED* INFILTRATION RATE (in/hr)
Sandy Soil Criteria									
Percolation Test Data	0:00:00	0:30:00	29	29.75	0.75	14.625	40.0	1.5	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.5	0.5	14.75	60.0	1.0	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							
	0:00:00	0:30:00	29	29.625	0.625	14.6875	48.0	1.3	0.1
	0:30:00	30.00							

*Porchet Method

Cumulative Time (hr)	Percolation (in/hr)	Infiltration (in/hr
0	1.50	0.1
0.50	1.50	0.1
1.00	1.25	0.1
1.50	1.25	0.1
2.00	1.00	0.1
2.50	1.25	0.1
3.00	1.25	0.1
3.50	1.25	0.1
4.00	1.25	0.1
4.50	1.25	0.1
5.00	1.25	0.1
5.50	1.25	0.1
6.00	1.25	0.1



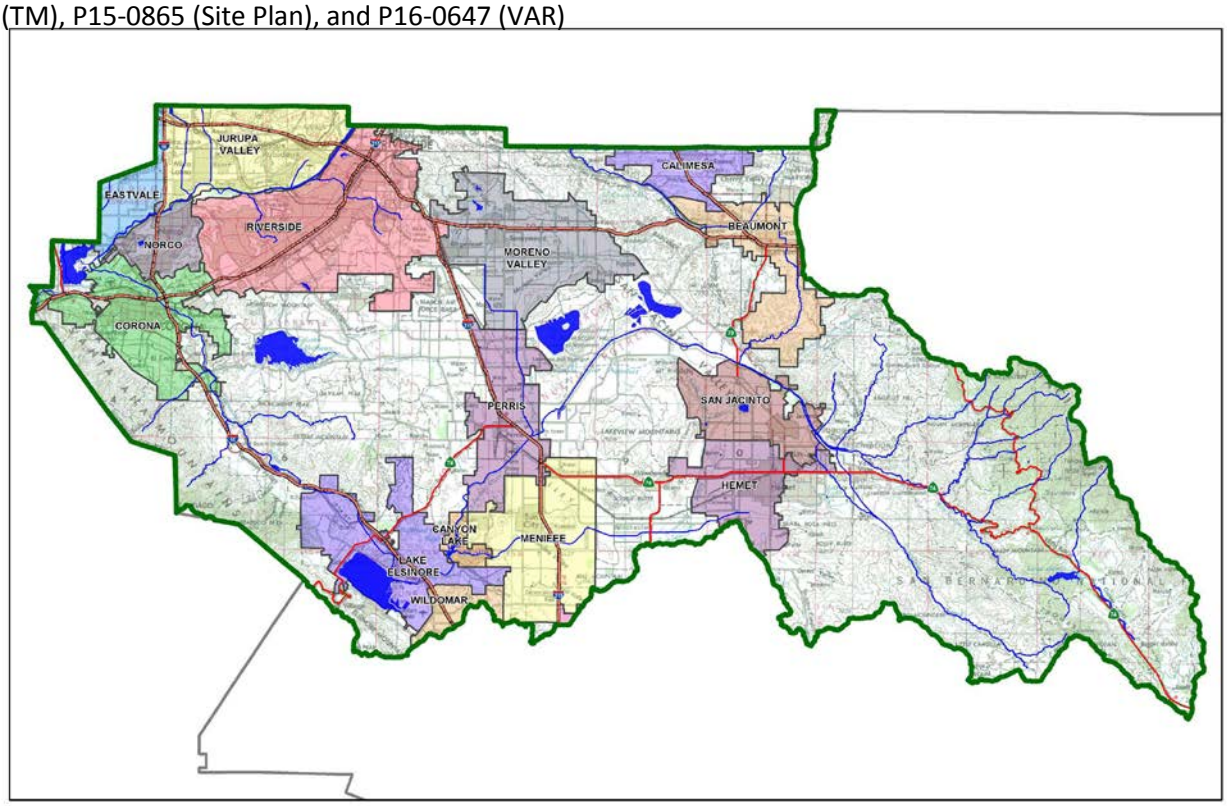
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: 4105 Jefferson St.

Public Works No: _____

Design Review/Case No: P15-0866 (DR) in association with P15-0862 (GPA), P15-0863 (RZ), P15-0864 (TM), P15-0865 (Site Plan), and P16-0647 (VAR)



☒ **Preliminary**
☐ **Final**

Original Date Prepared: September 2015

Revision Date(s): February 2016, September 2016

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

Contact Information:

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Prepared by:
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Riverside, Ca 92507
(951) 683-3691

OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for RC Hobbs, Inc. by SDH & Associates, Inc. for 4105 Jefferson Street.

This WQMP is intended to comply with the requirements of the City of Riverside for the design review of a Multi-Family Residential development yielding approximately 35 units (approximately 12/acre), which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Riverside Water Quality Ordinance (Municipal Code Section 14.12.315).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Jeff Moore

Owner's Signature

9/29/16

Date

JEFF MOORE

Owner's Printed Name

Vice President Operations

Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Tory R Walker

Preparer's Signature

9/29/16

Date

TORY R WALKER

Preparer's Printed Name

Preparer's Title/Position

Preparer's Licensure:

No. 45005
Exp. 3/31/18
CIVIL

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Section A: Project and Site Information

This project proposes 10 apartment buildings with 36 units, a private street and parking, pool and "tot-lot" area. The site will be treated by a series of vegetated swales and two large bio-retention areas.

PROJECT INFORMATION	
Type of Project:	Residential
Planning/Zoning Area:	R-1-7000
Community Name:	Arlington Heights
Development Name:	4105 Jefferson St.
PROJECT LOCATION	
Latitude & Longitude (DMS): 33°56'44"N - 117°25'12"W	
Project Watershed and Sub-Watershed:	
Watershed: Santa Ana Hyd. Unit, Region 8	
Sub-Watershed: Hole Lake	
APN(s): 227-130-025	
Map Book and Page No.: Page 715 Portion of Grids B2, C2, B3 & C3	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Residential
Proposed or Potential SIC Code(s)	1522
Area of Impervious Project Footprint (SF)	86,204
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	86,204
Does the project consist of offsite road improvements?	☐ Y ☒ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	0
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	See Appendix 3
What is the Water Quality Design Storm Depth for the project?	0.54

A.1 Maps and Site Plans

Appendix 1 includes a map of the local vicinity and existing site as well as the WQMP Site Plan, which includes the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets and Overflows
- Source Control BMPs
- Buildings, Rooflines and Downspouts
- Impervious Surfaces
- Standard Labeling

A.2 Identify Receiving Waters

In order of upstream to downstream, the receiving waters that this project is tributary to are as follows:

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Anza Channel	None	MUN, AGR, IND, PROC, AGR, GWR, REC1, REC2, WARM, WILD, RARE, SPWN	
Hole Lake	None	MUN, AGR, IND, PROC, AGR, GWR, REC1, REC2, WARM, WILD, RARE, SPWN	
Santa Ana River, Reach 3	Pathogens, lead, copper	AGR, GWR, REC1, REC2, WARM, WILD, RARE, SPWN	
Prado Park Lake	Nutrients, pathogens	REC1, REC2, WARM, WILD, RARE	
Santa Ana River, Reach 2	Indicator Bacteria	AGR, GWR, REC1, REC2, WARM, WILD, RARE	
Santa Ana River, Reach 1	Pathogens	REC1, REC2, WARM, WILD	

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N

Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* City of Riverside Grading Permit City of Riverside Building Permit	☒ Y	☐ N

Section B: Optimize Site Utilization (LID Principles)

Site Optimization

Does the project identify and preserve existing drainage patterns? If so, how? If not, why?

The existing drainage condition/pattern is sheet flow across the site to Jefferson Street; this pattern will not be preserved. Instead, runoff will be collected and rerouted to two onsite bio-retention cells.

Does the project identify and protect existing vegetation? If so, how? If not, why?

There are few sparse trees remaining from the existing residence. These will not be preserved, however the planting of drought tolerant vegetation is proposed for this project.

Does the project identify and preserve natural infiltration capacity? If so, how? If not, why?

While this site has relatively unfavorable infiltration rates, the addition two bio-retention areas with engineered soil with favorable infiltration rates and treatment properties is proposed.

Does the project identify and minimize impervious area? If so, how? If not, why?

Impervious areas are only used where absolutely necessary (ie. Buildings, parking and walking areas). There is no hardscape proposed in the landscape areas. For further detail please refer to the attached site map and calculations

Does the project identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

All runoff is routed to a pervious, landscaped area where it will infiltrate into the ground. This site is designed to contain 100% of the runoff generated by an 85TH percentile storm event.

Section C: Delineate Drainage Management Areas (DMAs)

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
Area 1A	Mixed Surface	5944	Type 'D'
Area 1B	Mixed Surface	2469	Type 'D'
Area 1C	Mixed Surface	4941	Type 'D'
Area 1D	Mixed Surface	5348	Type 'D'
Area 1E	Mixed Surface	5464	Type 'D'
Area 1F	Mixed Surface	2702	Type 'D'
Area 1G	Mixed Surface	5543	Type 'D'
Area 1H	Mixed Surface	5827	Type 'D'
Area 1I	Mixed Surface	5312	Type 'D'
Area 1J	Mixed Surface	5266	Type 'D'
Area 1K	Roof & Driveway	5472	Type 'D'
Area 2A	Ornamental Landscaping	3968	Type 'D'
Area 2B	Ornamental Landscaping	10747	Type 'D'
Area 2C	Ornamental Landscaping	19293	Type 'D'
Area 2D	Ornamental Landscaping	1021	Type 'D'
Area 3A	Asphalt	8993	Type 'D'
Area 3B	Asphalt	19226	Type 'D'
Area 3C	Asphalt	6702	Type 'D'
Area 4	Ornamental Landscaping	2297	Type 'D'
Area 5	Ornamental Landscaping	2527	Type 'D'

[1] *Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
Area 1A	Mixed Surface
Area 1B	Mixed Surface
Area 1C	Mixed Surface
Area 1D	Mixed Surface
Area 1E	Mixed Surface
Area 1F	Mixed Surface
Area 1G	Mixed Surface
Area 1H	Mixed Surface
Area 1I	Mixed Surface
Area 1J	Mixed Surface
Area 1K	Concrete
Area 2A	Ornamental Landscaping
Area 2B	Ornamental Landscaping
Area 2C	Ornamental Landscaping
Area 2D	Ornamental Landscaping
Area 3A	Asphalt
Area 3B	Asphalt
Area 3C	Asphalt
Area 4	Ornamental Landscaping
Area 5	Ornamental Landscaping

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (ref: Chapter 2.4.4 of the WQMP Guidance Document)? ☐ Y ☒ N

Geotechnical Report

A Geotechnical Report is required by the City of Riverside to confirm present and past site characteristics that may affect the use of Infiltration BMPs, see Appendix 3.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: All DMA's affected – bio-retention proposed		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

D.2 Harvest and Use Assessment

The following conditions apply*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☒Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the City of Riverside).

☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. (Harvest and Use BMPs are still encouraged, but are not required as the Design Capture Volume will be infiltrated or evapotranspired.)

This project does not meet the requirements for Harvest and Use BMPs therefore Bio-Retention is proposed.

Irrigation Use Feasibility

Step 1: *Total Area of Irrigated Landscape*: 52,327 sf

Type of Landscaping (Conservation Design or Active Turf): Mixed

Step 2: *Total Area of Impervious Surfaces:* 70,510

Step 3: *The Project EIATIA factor*: 0.53

Step 4: *Minimum required irrigated area*: 0.45 ac/ac

Step 5:

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
31,737 sf	52,327 sf

Toilet Use Feasibility

Step 1: *Projected Number of Daily Toilet Users:* 90

Project Type: Residential

Step 2: *Total Area of Impervious Surfaces:* 70,510 sf

Step 3: *The Project TUTIA factor:* 93

Step 4: *Minimum number of toilet users:* 150

Step 5:

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
150	90

Other Non-Potable Use Feasibility

None

Step 1: *Average Daily Demand:* N/A

Step 2: *Total Area of Impervious Surfaces:* N/A

Step 3: *The Project factor:* N/A

Step 4: *Minimum required use:* N/A

Step 5:

Minimum required non-potable use (Step 4)	Projected average daily use (Step 1)
N/A	N/A

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

For the project, the following applies:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4.

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5.

D.4 Feasibility Assessment Summaries

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
Area 1A	☐	☐	☒	☐	☐
Area 1B	☐	☐	☒	☐	☐
Area 1C	☐	☐	☒	☐	☐
Area 1D	☐	☐	☒	☐	☐
Area 1E	☐	☐	☒	☐	☐
Area 1F	☐	☐	☒	☐	☐
Area 1G	☐	☐	☒	☐	☐
Area 1H	☐	☐	☒	☐	☐
Area 1I	☐	☐	☒	☐	☐
Area 1J	☐	☐	☒	☐	☐
Area 2A	☐	☐	☒	☐	☐
Area 2B	☐	☐	☒	☐	☐
Area 2C	☐	☐	☒	☐	☐
Area 2D	☐	☐	☒	☐	☐
Area 3A	☐	☐	☒	☐	☐
Area 3B	☐	☐	☒	☐	☐
Area 3C	☐	☐	☒	☐	☐
Area 4	☐	☐	☒	☐	☐
Area 5	☐	☐	☒	☐	☐

LID BMPs are feasible for every drainage management area on this site. To reduce urban runoff, this site will maximize permeable areas by incorporating landscape areas with native planting and minimizing the use of hardscape and decorative paving in landscape areas. The project proposes two large bio-retention areas to treat all DMAs on this site. Maintenance of the BMPs will be performed during regular landscape maintenance so as to be kept free of trash, debris and silt.

D.5 LID BMP Sizing

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Area 5 – Bio-Retention Cell 2*		
	[A]		[B]	[C]	[A] x [C]			
Area 1A	5944	Mixed Surface Types	1.0	0.89	5302	*Roof & Driveway*		
Area 1B	2469	Mixed Surface Types	1.0	0.89	2202	*Roof*		
Area 1C	4941	Mixed Surface Types	1.0	0.89	4407	*Roof*		
Area 1D	5348	Mixed Surface Types	1.0	0.89	4770	*Roof*		
Area 1E	5464	Mixed Surface Types	1.0	0.89	4874	*Roof*		
Area 2A	3968	Ornamental Landscaping	0.1	0.11	438	*Landscape Area*		
Area 2B	10747	Ornamental Landscaping	0.1	0.11	1187	*Landscape Area*		
Area 3A	8993	Concrete or Asphalt			8022	*Street & Parking*		
Area 5	2527	Ornamental Landscaping	0.1	0.11	279	*Bio-Retention Cell 2*		
						Design Storm Depth (in)	**Design Capture Volume, V_{BMP} (cubic feet)**	**Proposed Volume on Plans (cubic feet)**
	A_T = Σ[A] = **50401**				Σ= [D] = **31482.3**	[E] = **0.54**	[F] = [D]x[E] = **1416.7**	[G] = **1915**

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Area 4 – Bio-Retention Cell 1*		
	[A]		[B]	[C]	[A] x [C]			
Area 1F	2702	Mixed Surface Types	1	0.89	2410	*Roof & Driveway*		
Area 1G	5543	Mixed Surface Types	1	0.89	4944	*Roof & Driveway*		
Area 1H	5827	Mixed Surface Types	1	0.89	5198	*Roof & Driveway*		
Area 1I	5312	Mixed Surface Types	1	0.89	4738	*Roof & Driveway*		
Area 1J	5266	Mixed Surface Types	1	0.89	4697	*Roof & Driveway*		
Area 1K	5472	Mixed Surface Types	1	0.89	4881	*Roof & Driveway*		
Area 2C	19293	Ornamental Landscaping	0.1	0.11	2131	*Landscape Area*		
Area 2D	1021	Ornamental Landscaping	0.1	0.11	113	*Landscape Area*		
Area 3B	19226	Concrete or Asphalt	1	0.89	17150	*Street & Parking*		
Area 3C	6702	Concrete or Asphalt	1	0.89	5978	*Street & Parking*		
Area 4	2297	Ornamental Landscaping	0.1	0.11	254	*Bio-Retention Cell 1*		
						Design Storm Depth (in)	**Design Capture Volume, V_{BMP} (cubic feet)**	**Proposed Volume on Plans (cubic feet)**
	A_T = Σ[A] = **78661**				Σ= [D] = **52494.3**	[E] = **0.54**	[F] = [D]x[E] = **2362.2**	[G] = **2737**

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Regional Board). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Regional Board and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

This project is broken up into 20 Drainage Management Areas and 100% percent of stormwater runoff will be treated and contained on this site through infiltration BMPs.

- Areas 1A encompasses the northwestern building's roof area to the northwest and drains to Area 2A via roof drains and surface flow. This runoff then flows to Area 5, a large 1,759 sqaure foot bio-retention cell with an 18" amended soils layer (10 in/hr minimum infiltration rate) and a 12" gravel layer containing a 6" perforated pipe.

- Area 1B, 1C, 1D & 1E, the building roofs and hardscape along the northern property line will drain to area 2B, a large landscape area containing a series of vegetated swales which lead to a catch basin that ultimately drains to Area 5 – Bio-Retention Cell 2.

- Area 1F & 1J the building and roof area to the northeast drain to Area 2C, a large landscape which also routes runoff through a series of catch basins and vegetated swales to Area 4, a large 3,769 sqaure foot bio-retention cell with an 18" amended soils layer (10 in/hr minimum infiltration rate) and a 12" gravel layer containing a 6" perforated pipe.

- Area 1G, 1H & 1I, the building roofs along the southern property line drain to area 2C, a large landscape area containing a series of vegetated swales which lead to Area 4 – Bio-Retention Cell 1.

- Area 1K, the pool hardscape area and Area 2D a small landscape area adjacent to the pool bathroom will be routed via surface flow and area drains to Area 4 – Bio-retention Cell 1

- Area 3A, the eastern portion of the private street and parking will surface flow to a catch basin and then routed to Area 5 and Areas 3B and 3C will be routed to Area 4.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The City of Riverside has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the City of Riverside

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	18	11.5	36%
Volume (Cubic Feet)	2,772	10,719	74%
Note: In the Post Development Condition, all runoff will be retained onsite, therefore the number above does not reflect the quantity of runoff which is being discharged.			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (Prado Dam & Santa Ana River) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

All downstream flows are conveyed through engineered and regularly maintained concrete pipes or channels and ultimately discharge to the Santa Ana River, which is an adequate sump. For more information, please reference City of Riverside Storm Drain drawings D-41, D-13, D-10, D-25, D-2, D-1, D-7, and D-294.

F.2 HCOC Mitigation

As an alternative to the HCOC Exemption Criteria above, HCOC criteria is considered mitigated if the project meets one of the following conditions, as indicated:

☐ Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

☐ The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

☐ Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

☒ None of the above

Section G: Source Control BMPs

Potential Sources of Runoff Pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
Refuse Areas	Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run- on and show locations of berms to prevent runoff from the area.	Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site.
Landscape/ Outdoor Pesticide Use	Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. Show self-retaining landscape areas, if any. Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. (See Landscape plan) Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
Plazas, Sidewalks, and Parking Lots		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain

Section H: Construction Plan Checklist

Table H.1 Construction Plan Cross-reference

BMP ID	Description	Corresponding Plan	Approximate Coordinates
Area 4 Bio-Retention Cell 1	Depth of Amended Soil = 18 in. Depth of Gravel = 18 in. Footprint = 2297 ft^2 6" Perforated Pipe	BMP Site Plan	33°56'23.5"N -117°25'06"W
Area 5 Bio-Retention Cell 2	Depth of Amended Soil = 18 in. Depth of Gravel = 18 in. Footprint = 1,915 ft^2 6" Perforated Pipe	BMP Site Plan	33°56'32"N -117°25'14"W

Section I: Operation, Maintenance and Funding

As required by the City of Riverside, the following are Operation, Maintenance and Funding details are provided as summarized:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance.

See Appendix 9 for a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on site, and an agreement assigning responsibility for maintenance and providing for inspections and certification.

Maintenance Mechanism: Home Owners Association & Covenant and Agreement with the City of Riverside

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

An Operation and Maintenance Plan and Maintenance Mechanism is included in Appendix 9. Educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP are included in Appendix 10.

Appendix 1: Maps and Site Plans

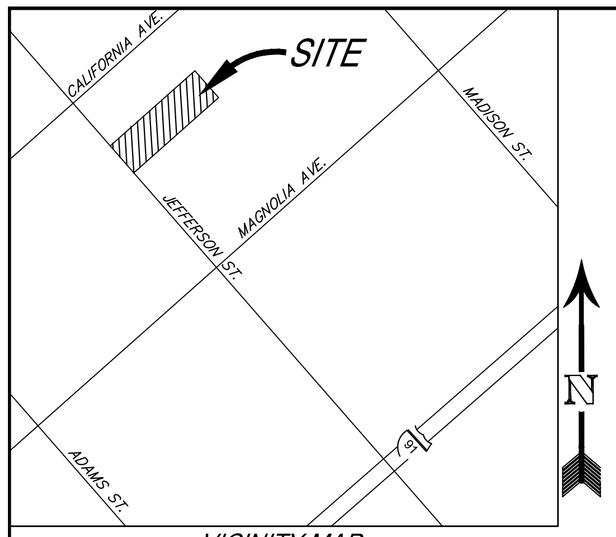
Location Map, WQMP Site Plan and Receiving Waters Map

Appendix 2: Construction Plans

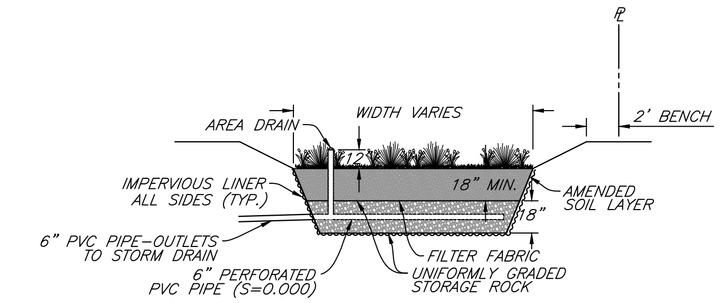
Grading and Drainage Plans

IN THE CITY RIVERSIDE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

TENTATIVE TRACT MAP NO. 36994
BMP SITE PLAN



VICINITY MAP
NOT TO SCALE
THOMAS GUIDE PAGE: 715
GRIDS: B2, C2, B3 & C3



BIO-RETENTION CELL
NOT TO SCALE

OWNER/APPLICANT

RC HOBBS COMPANY, INC.
1110 EAST CHAPMAN, STE. 201
ORANGE, CA 92866

ENGINEER

SDH & ASSOCIATES, INC
5225 CANYON CREST DRIVE 71439
RIVERSIDE, CA. 92507
VOICE: (951) 683-3691
FAX: (951) 788-2314

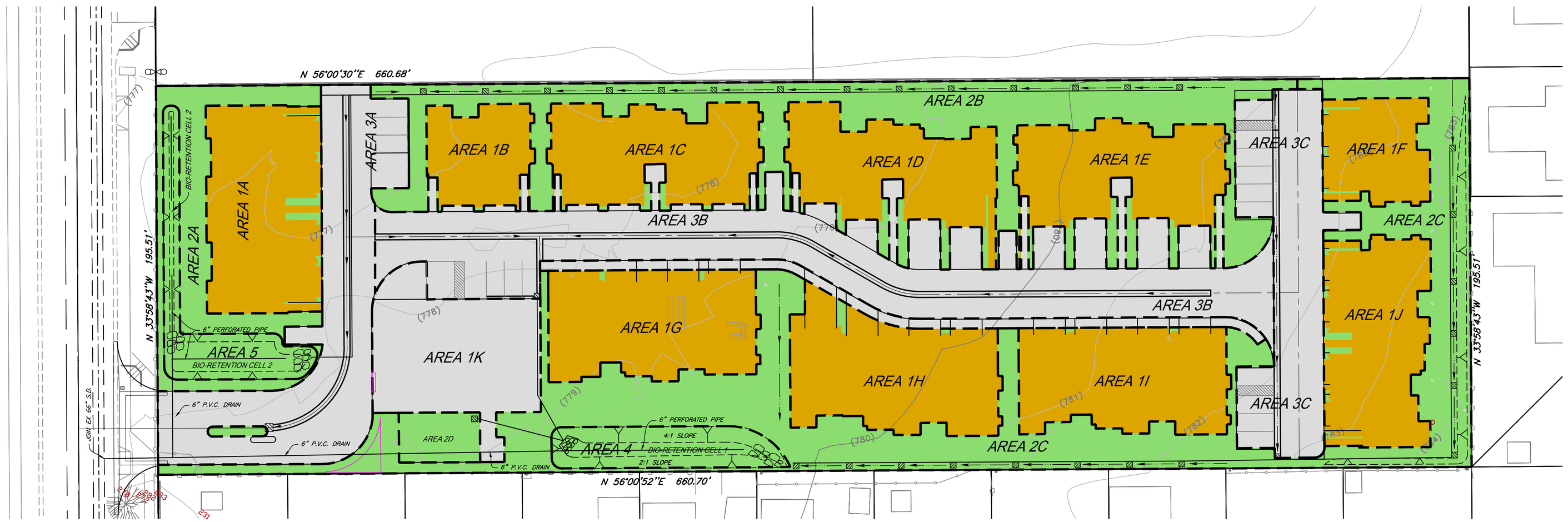
ASSESSOR'S PARCEL NO.

227-130-025

PROJECT INFO

AREA OF SITE = 129,062 S.F. (2.96 AC.)
ROOFS = 47,614 S.F.
STREETS = 29,206 S.F.
LANDSCAPE = 52,327 S.F.

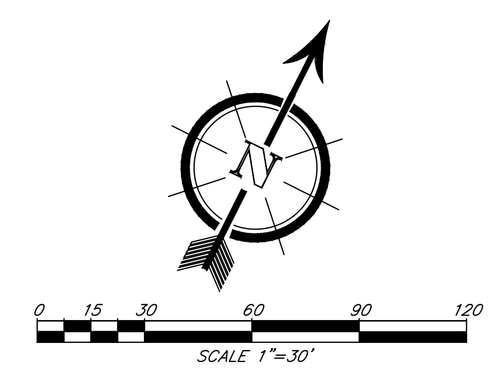
59.5% IMPERVIOUS
40.5% PERVIOUS



LEGEND

T.B.	-	TOP OF BERM
F.G.	-	FINISHED GRADE
F.L.	-	FLOW LINE
H.P.	-	HIGH POINT
EXIST.	-	EXISTING
P.E.	-	PAD ELEVATION
G.B.	-	GRADE BREAK

DRAINAGE MANAGEMENT AREA
TRACT BOUNDARY
CENTERLINE
CURB AND GUTTER
1280 — EXISTING CONTOUR LINE
LOT LINE
SLOPE
LANDSCAPE/PERVIOUS AREA
CONCRETE/IMPERVIOUS AREA
MIXED IMPERVIOUS



PREPARED BY:

SDH & ASSOCIATES INCORPORATED

SDH AND ASSOCIATES INC.
5225 CANYON CREST DRIVE 71439
Riverside, California 92507
TEL: (951) 683-3691 FAX (951) 788-2314

SCALE: 1"=30'

DATE: SEPT. 2016

BENCHMARK

CITY OF RIVERSIDE

TTM 36994
BMP SITE PLAN

1 OF 1 SHEETS

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	SDH & ASSOCIATES INC.	Date	9/1/2015
Designed by	DANE SOMMERS	Case No	
Company Project Number/Name	4105 JEFFERSON STREET		

BMP Identification

BMP NAME / ID: AREA 4 -Bio-Retention Cell 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.54 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
AREA 1F	*2702*	*Mixed Surface Types*	*1*	*0.89*	*2410.2*			
AREA 1G	*5543*	*Mixed Surface Types*	*1*	*0.89*	*4944.4*			
AREA 1H	*5,827*	*Mixed Surface Types*	*1*	*0.89*	*5197.7*			
AREA 1I	*5,312*	*Mixed Surface Types*	*1*	*0.89*	*4738.3*			
AREA 1J	*5266*	*Mixed Surface Types*	*1*	*0.89*	*4697.3*			
AREA 1K	*5472*	*Mixed Surface Types*	*1*	*0.89*	*4881*			
AREA 2C	*19293*	*Ornamental Landscaping*	*0.1*	*0.11*	*2131.1*			
AREA 2D	*1021*	*Ornamental Landscaping*	*0.1*	*0.11*	*112.8*			
AREA 3B	*19226*	*Concrete or Asphalt*	*1*	*0.89*	*17149.6*			
AREA 3C	*6702*	*Concrete or Asphalt*	*1*	*0.89*	*5978.2*			
AREA 4	*2297*	*Ornamental Landscaping*	*0.1*	*0.11*	*253.7*			
	78661	***Total***			**52494.3**	**0.54**	***2362.2***	***2737***

Notes:

Bioretention Facility - Design Procedure	BMP ID Area 4	Legend:	Required Entries Calculated Cells

Company Name:	SDH & Associates, Inc.	Date:	2/17/2016
Designed by:	Dane Sommers	County/City Case No.:	P15-0866

Design Volume

Enter the area tributary to this feature	A_T=	1.8	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	2,362	ft^3

Type of Bioretention Facility Design

- (●) Side slopes required (parallel to parking spaces or adjacent to walkways)
- ( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	1.5	ft
Top Width of Bioretention Facility, excluding curb	w_T =	21.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.32	ft
Minimum Surface Area, A_m $A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	1,794	ft^2
Proposed Surface Area	A=	2,297	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	Varies	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.6	%
6" Check Dam Spacing		0	feet
Describe Vegetation:		Shrubs	

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}
(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	SDH & ASSOCIATES INC.	Date	9/1/2015
Designed by	DANE SOMMERS	Case No	
Company Project Number/Name	4105 JEFFERSON STREET		

BMP Identification

BMP NAME / ID: AREA 5 - Bio-Retention Cell 2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.54 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V_{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
AREA 1A	5944	Mixed Surface Types	1	0.89	5302			
AREA 1B	2469	Mixed Surface Types	1	0.89	2202.3			
AREA 1C	4941	Mixed Surface Types	1	0.89	4407.4			
AREA 1D	5348	Mixed Surface Types	1	0.89	4770.4			
AREA 1E	5464	Mixed Surface Types	1	0.89	4873.9			
AREA 2A	3968	Ornamental Landscaping	0.1	0.11	438.3			
AREA 2B	10747	Ornamental Landscaping	0.1	0.11	1187.1			
AREA 3A	8993	Concrete or Asphalt	1	0.89	8021.8			
AREA 5	2527	Ornamental Landscaping	0.1	0.11	279.1			
	50401	Total			31482.3	0.54	1416.7	1915

Notes:

Bioretention Facility - Design Procedure	BMP ID: Area 5	Legend:	Required Entries / Calculated Cells
Company Name:	SDH & Associates, Inc.	Date:	2/17/2016
Designed by:	Dane Sommers	County/City Case No.:	P15-0866

Design Volume

Enter the area tributary to this feature	A_T=	0.9	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	1,417	ft^3

Type of Bioretention Facility Design

- (●) Side slopes required (parallel to parking spaces or adjacent to walkways)
- ( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	1.5	ft
Top Width of Bioretention Facility, excluding curb	w_T =	12.5	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.29	ft
Minimum Surface Area, A_m $A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	1,096	ft^2
Proposed Surface Area	A=	2,527	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.6	%
6" Check Dam Spacing		0	feet
Describe Vegetation:		Shrubs	

Notes: Top width value average was used and bio-retention cell is an irregular shape

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

Not Applicable, all downstream conveyances are engineered and regularly maintained.

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	18	11.5	36%
Volume (Cubic Feet)	2,772	10,719	74%

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

Appendix 10: Educational Materials

Appendix of Included Materials

- *SC-10 – Non-Stormwater Discharges*
- *SC-41 – Building & Grounds Maintenance*
- *SC-43 – Parking/Storage Area Maintenance*
- *SD-10 – Site Design and Landscape Planning*
- *SD-11 – Roof Runoff Controls*
- *SD-12 – Efficient Irrigation*
- *SD-32 – Trash Storage Areas*
- *TC-32 – Bio-Retention Cell*

Appendix E

Phase I Environmental Site Assessment

PHASE I
ENVIRONMENTAL ASSESSMENT REPORT

JULY 24, 2015

4105 JEFFERSON STREET (APN 227-130-025)
RIVERSIDE, CA 92504

PREPARED FOR

R.C. HOBBS CO, INC.
1110 EAST CHAPMAN AVE, SUITE 201
ORANGE, CA 92866

PREPARED BY

ROBIN ENVIRONMENTAL MANAGEMENT (REM)
1015 VIA ROMALES
SAN DIMAS, CA 91773
(909) 592-3833

PROJECT NO. 241915

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APPENDIX D GOVERNMENT RECORDS SEARCH DATABASE

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1. INTRODUCTION

1.1 Objective

This report summarizes the results of a Phase I Environmental Site Assessment of the subject property performed by Robin Environmental Management (REM) in July 2015. The purpose of this Environmental Site Assessment is to evaluate the potential for environmental concerns or liabilities due to past and/or current land use practices at the subject site or from nearby properties. This assessment included in this report is solely targeted for CERCLA (Superfund) liability and the "innocent landowner defense", to permit user to satisfy one of the requirements to qualify for the innocent landowner defense to CERCLA liability, by conducting all appropriate inquiries to identify recognized environmental conditions (REC's).

1.2 Scope of Work

- Visual investigation of the property to obtain information regarding obvious visual signs of adverse environmental conditions, contamination, hazardous material usage, storage and handling on and in the adjoining sites (only up to one parcel next to the subject property) of the subject property

- Visual survey of the adjoining land uses (only up to one parcel next to the subject property) and determination of any current nearby operations which may potentially impact the subject site

- Government document search of records compiled by various government agencies for on site or nearby operations (past and present) to aid in the identification of any potential contamination sources

- Review of reasonably available historical information such as building permit records from local agency, historical topographic maps, if available, to identify any potential past on-site operation which may have environmental implications

2. PROPERTY DESCRIPTION

2.1 Geographical Description of Property

The subject site at 4105 Jefferson Street (APN 227-130-025) is a roughly ENE-WSW trending rectangular-shaped 2.96 acre lot located on the eastern block of (the generally NNW-SSE trending) Jefferson Street between California Avenue to the north and Willow Ave to the south within a residential zoning area in the city of Riverside, California as shown in Figure 1 (Site Photos), Figure 2 (Site Location Map), and Figure 3 (Recent Aerial Photograph Showing Site and Its Vicinity General Layout).

2.2 General Description of the Subject Property

The subject site at 4105 Jefferson Street (APN 227-130-025) is a roughly ENE-WSW trending rectangular-shaped 2.96 acre lot located on the eastern block of (the generally NNW-SSE trending) Jefferson Street between California Avenue to the north and Willow Ave to the south in the city of Riverside, California. The subject property consists mainly of a single-story roughly ENE-WSW rectangular single-family dwelling (SFD) near the southwestern corner of the site; a roughly NNW-SSE trending rectangular barn-like structure (used mainly for tool/furniture storage) in the west-central section of the southern portion of the site; and mainly unpaved yard for remaining portions of the site. No pits, ponds, swamps, or lagoons were observed on the subject property. No apparently significant surface staining was observed on the unpaved/unpaved out-door areas and the building areas of the site.

2.3 Present Tenants and Business Operation

During the site inspection conducted on July 14, 2015, residence occupied the site. Current site operations generally do not involve using/generating significant quantities of hazardous materials/wastes.

2.4 Past Tenants and Business Operation

Methods of researching historic use of ownership of the subject property employed by REM are as follows:

- City Building Permit Record
- Historic Aerial Photograph Records

- Historic Topographic Map Record

2.4.1 City Building Permit Record

Building permit record (included as Appendix B) for the site available at the City of Riverside Building Dept. (CRBD) indicated that the site was first developed into its current residential setting (with SFD near the southwestern corner of the site constructed) in 1922.

2.4.2 Historic Aerial Photo Records

Historic aerial photo records for the site area included in Appendix C revealed that, from prior to 1948 to at least 1967, the western half of the site was generally with its current setting; and the eastern half of the site was for agricultural usage. From prior to 1994 on, the site has been generally with its current setting.

2.4.3 Historic Topographic Map Record

1975 topographic map for the site area also included in Appendix C indicated that the site was generally with its current setting in that year.

2.4.4 Site Development/Occupancy History

Historic site usage data listed above reveal the following development/occupancy history of the subject site:

1922 – The western half of the site was generally developed into its current setting
Prior to 1948 to the 1960's - The western half of the site was generally with its current setting; and the eastern half of the site was for agricultural usage
The 1970's on – The site has been generally with its current setting

2.5 Regional Physical Setting

The subject property's physical locations were researched employing a United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle (Quad) Map relevant to the subject property. The USGS 7.5 Minute Quad Map has an approximate scale of 1 inch to 2,000 feet, and shows physical features with environmental significance such as wetlands, water bodies, roadways, mines, and buildings. Please refer Figure 2 in Appendix A.

The physical and natural features illustrated on the Quad Map served as areas of visual emphasis when conducting the site inspection of the subject property. The USGS 7.5 Minute Quad Map was used as the only Standard Physical Setting Source, and is sufficient as a single reference. The surface elevation of the subject site ranges from approximately 775 feet above Mean Sea Level at its western end to approximately 780 feet above Mean Sea Level at its eastern end; and exhibits a topographic down gradient generally towards west-southwest.

2.6 Hydrogeological Information

The subject site is located within the Arlington Groundwater Sub-Basin of the Upper Santa Ana River Groundwater Basin. General hydrogeology information for the Santa Ana River Groundwater Basin can be found in the California Department of Water Resources Bulletin 15 (1955), "Santa Ana River Investigation". Based on the above reference, the Arlington Groundwater Sub-Basin is a broad alluvium-filled valley bounded by the Riverside Groundwater Sub-Basin to the northeast, Box Spring Mountains to the southeast, Temescal Groundwater Sub-Basin to the southwest, and La Sierra Hills to the northwest. The alluvial fill within the valley is generally more than several hundred feet thick.

The principal confined aquifer of the Arlington Groundwater Sub-Basin lie at depths greater than 100 feet, but groundwater has also been found to occur within 30 to 40 feet below the ground surface. Water in this shallow water zone is of limited use owing to low yields, typically less than 25 gallons per minute (gpm), and is of poor quality. This zone is generally termed the "perched" or the "semi-perched groundwater. According to information obtained from the Riverside County Flood Control District, the depth to the "perched" or "semi-perched" groundwater (i.e., first-encountered groundwater) underneath the subject site is approximately 35 feet and exhibits a general flow direction towards west.

2.7 Historical Hazardous Substance Usage

2.7.1 Records search sources

REM's field engineer contacted the following public agencies to find any records of former/ current operation of underground storage tank (UST) of gasoline or any other hazardous substances on the subject site premise:

- City of Riverside Building Department
- Regional Water Quality Control Board – Santa Ana Region (RWQCB-SA)

No records were found in reference to historical usage or handling of Underground Storage Tank (UST) on the subject property.

2.7.2 List and quantities of the hazardous materials

List and quantities of the hazardous materials previously or presently used, disposed, treated, stored, or generated at the subject property were searched and assessed. During the site inspection, the use, storage, and generation of significant quantity of hazardous materials was not observed.

REM staff also searched the State Department of Toxic Substances Control (DTSC)-compiled records website for all documented hazardous wastes disposal activities throughout California in the past at http://hwts.dtsc.ca.gov/report_list.cfm for the site address and found no records.

2.7.3 Permits

All present and past records of permits, licenses, registrations, certificates of environmental relation were searched. No equipment requiring environmentally related licensing was observed. Thus, no permits or registrations were necessary for the operation of subject business.

REM staff searched the South Coast Air Quality Management District (SCAQMD)-compiled Facility INformation Detail (FIND) database at www.aqmd.gov/webappl/fim/defualt.htm for the site address and found no SCAQMD permit records for the site.

2.7.4 Violation or non-compliance notice

No violation or notice of non-compliance was issued with the present environmental regulations, according to the findings of our environmental assessment on the subject property.

2.7.5 Regulatory database record research

According to the conducted government records search (see Section 5.0), the subject property was not recognized being listed on the following environmental regulatory database record research (NETR database): NPL, RCRA-TSD, CERCLIS, NFRAP, RCRA-G, ERNS, CORRACTS, CORTESE, CALSITES, LUST, UST, and SWF.

2.7.6 Environmental lien records

Under current environment regulation, government agency may place an environmental lien on the property with known contamination and no cleanup/mitigation activities apparently intended being conducted by the site owner upon the agency issued the cleanup enforcement order. The conducted government records search shows that there are no environmental liens placed by the federal environmental agency under CERCLA regulations for the subject site. REM staff searched the California State Department of Toxic Substances website EnviroStor data search and found no environmental liens were placed by the State environmental agency for the subject site. City of Riverside records also show that there are no environmental liens placed by the local environmental agency for the subject site.

3. PROPERTY RECONNAISSANCE

REM's environmental assessor/geologist performed the field survey of the subject site and adjacent properties on July 14, 2015. A site location map and a recent aerial photograph showing the site and its vicinity general layout are included as Figures 2 and 3, respectively.

3.1 Air Quality - Indoor and Visible Emissions

No unusual smells, obnoxious odors, or visual emissions were observed during the inspection of the subject property. Neither air emission stacks nor paint booth were present, thus no pertinent permits were searched for the previous records of violation history.

3.2 Asbestos-Containing Material (ACM)

Asbestos-containing building materials are normally found in the following items. REM inspected such materials as to the visual conditions and locations; however the actual sampling analysis is beyond the contracted scope of work, thus not included in the report.

Potential asbestos-containing building materials in general:

- floor tile and associated mastic adhesive underneath the floor tile,
- carpet mastic,
- linoleum sheeting and associated backing material or leveling compound,
- drywall joint compound or mud product,
- plaster compound,
- acoustic ceiling texture,
- ceiling tile and associated mastic adhesive,
- window putty or glazing,
- roofing material (shingle, cap-sheet, etc.),
- roofing penetration mastic,
- transite panel or flue pipe,
- fire-proofing material,
- pipe insulation or wrapping, etc.

As discussed in section 2.4, it can be concluded that the currently on-site SFD was constructed in 1922 prior to the year when friable ACM's for commercial use was banned by federal government in 1978. Thus, if the building was built prior to 1978, the said building

materials are assumed as suspicious asbestos-containing materials (ACM's).

However, though building was built after 1978, comprehensive asbestos survey can find asbestos fiber in the subject building to any degree. In such cases, even if asbestos-containing material might be present at the site, so long as they would be in an undisturbed state without disturbances or dismantlement, such ACM's do not pose an immediate health risk to building occupants. Local Building & Safety Department and appropriate Air Quality Management District (AQMD) require all possible asbestos-containing materials (ACM's) to be identified and removed in the case of renovation or demolition of existing structure which might disturb or dismantle the suspicious ACM's.

If it is found that asbestos is contained within subject building materials through comprehensive asbestos survey, the implementation of an Asbestos Operations and Maintenance Program shall be developed, in order to assure the safety of occupants who may be exposed to potential asbestos hazards.

An AHERA Certified Inspector or a State of California Certified Asbestos Consultant can perform the asbestos survey involving bulk sampling. NIST/NVLAP accredited laboratory using Polarized Light Microscopy with Dispersion Station (PLM/DS) in accordance with the Environmental Protection Agency (EPA) "Interim Method of the Determination of Asbestos in Bulk Insulation Samples" (EPA-600-M4-82-020).

3.3 Lead-Based Paint (LBP)

As discussed in section 2.4, it can be concluded that the currently on-site SFD was constructed in 1922 prior to the year of 1978 when lead-based paint in exterior and interior coating for commercial use was banned by federal government. Due to the dangers of lead poisoning, the Consumer Product Safety Commission banned the sale of lead-based paint (LBP), defined as containing more than 0.06% lead by weight, to consumers, and the use of LBP in residences and other areas where consumers have direct access to painted surfaces. Effective June 3, 1993, the Lead in Construction Standard codified in 29 CFR (Code of Federal Regulations) 1926.62 applies to sources or potential sources of lead exposure present in an "employment-related" context.

The trigger mechanism for application of the standard is an activity that, by its inherent nature, may cause exposure to lead. Therefore, within the context of regulatory compliance for OSHA (Occupation Safety and Health Agency), the subject property did not appear to require further response to suspect lead-based paint as no on-site activity by its inherent

nature would cause exposure to lead.

However, prior to renovation, demolition, or any activity that will cause a disturbance of any suspect lead-based paint, sampling to determine lead content is recommended.

In 1978, the federal government banned the use of lead-based paint in residential applications; however, usage in general industry continued at a decreased rate to the present. Lead-based paint presents a hazard through inhalation or ingestion of paint chips or vapor fumes. The greatest cumulative health threat is to young children, and for this reason the Department of Housing and Urban Development (HUD) has promulgated lead standards and survey requirements for buildings affected by HUD funding. This HUD regulation represents the only federal requirement for lead-based paint, hazard management applicable to privately owned structures.

3.4 Polychlorinated Biphenyl (PCB's)

Prior to 1978, PCBs were commonly used in dielectric fluids in transformers, capacitors, and light ballasts due to their desirable thermal characteristics, and hydraulic fluid compactor. Due to their demonstrated toxicity and persistence in the environment, PCB manufacturing in the United States was discontinued.

Pole- and pad-mounted transformers were found in the vicinity of the subject site buildings, appearing in good condition without any sign of leakage. No PCB-containing hydraulic fluid trash compactor was discovered on the site premise.

3.5 Underground Storage Tank (UST)

The visual inspection of the subject site revealed no evidence of surface or above ground features (e.g., fill pipe, vent pipes, fill connections, concrete pads, saw cuts, sumps, spill containment device, leak detection device, etc.) normally associated with underground storage tanks (UST's).

3.6 Aboveground Storage Tank

REM's field officer performed the visual inspection of the subject site to find evidence of surface or above ground (e.g., fill pipe, vent pipes, fill connections, concrete pads, saw cuts, concrete pad, drains in vicinity, etc.) features normally associated with aboveground storage tanks (AST's). Visual observation also includes the inspection to identify any surface markings indicating the existence of aboveground product pipelines. No evidence on the

presence of any on-site aboveground storage tank was identified.

3.7 Fuel Islands

The visual inspection of the subject site revealed no evidence of fuel islands or dispensers either in operation or abandoned.

3.8 Hydraulic Hoist Unit

The visual inspection of the subject site revealed no presence of underground hydraulic hoist units within the subject site premise.

3.9 Hazardous Materials/Petroleum Products Storage & Handling

Other than aboveground propane tank discussed in Section 3.6, except some containers for household maintenance chemicals, no containers storing automotive or industrial batteries, pesticides, paints or chemicals seemingly exhibiting toxic hazards were identified present at the time of site inspection. No significant oil or chemical staining was noticed present around any containers. No major spills, leakage, or staining were observed throughout the overall building areas and outdoor grounds.

3.10 Other Containers

No other containers indicating any sign of environmental concern were observed during the site inspection.

3.11 Hazardous Waste Treatment, Storage, Disposal (TSD)

No storage, treatment, or disposal of hazardous waste was found during the site investigation. No severely improper waste stream processing or disposal practices were observed on the subject property.

3.12 Distress Vegetation

Planters and vegetation in the vicinity of and within the subject site were found well maintained on bare soil or within separate planters in relatively good appearance with no sign of chemical stress or unnatural appearance.

3.13 Stockpiled Soils

REM's site inspection did not reveal any evidence of stockpiled soils on the ground of subject property.

3.14 Wastewater Treatment Unit / Clarifier

There is a septic tank present to the north of the site SFD.

Storm water drainage system in the close proximity of the subject area did not identify any abnormal accumulation of petroleum or chemical run-off or foreign materials. No unusual blockage of the storm-water control system was observed during the site visual investigation on the outdoor parking lot or surface areas. REM recommends no additional investigation on described storm-water systems at the subject property.

3.15 Solid Waste Disposal

No improper activities of treatment or disposal of hazardous, medical, or toxic wastes are performed on the subject site. Concrete/asphalt pavement surfaces appeared to serve as impermeable structure where no major cracks or crevices were found in the areas of waste disposal and handling, if any.

3.16 Wells

REM's site walk-through did not discover any irrigation wells, injection wells, abandoned wells, groundwater-monitoring wells, dry wells, septic wells oil wells, gas wells, domestic water wells, other-monitoring wells on the subject premises.

3.17 Underground Pipelines

REM's site inspection did not reveal any evidence of underground pipelines beneath the ground of subject property, other than public utility lines such as sewer, power, and electric lines, for which public "dig-alert" service would easily identify upon 48-hour telephone notice in advance.

3.18 Boilers & HVAC Systems

The subject site dwelling's water heater and HVAC system is comprised of boiler and radiators, while the primary fuel source is utilized from natural gas, electricity. No UST fuel or

petroleum product stored in tank is used for said heater and HVAC operation.

3.19 Visual Indication of Spills, Leakage, Staining

REM's site inspection did not reveal any evidence of on-site or off-site spills, leakages, or staining significant enough to pose immediate environmental concern onto the subject property. No significantly stained catch basins, drip pads, or sumps were observed. There were no major spills around surface drains, pipes, gutters, spouts, or tubes, if any, at the time of site investigation.

3.20 Soil Staining or Surface Staining on Unpaved/Natural Lands

No staining or surface staining on the bare soil or unpaved lands were identified during the site investigation.

3.21 Pits, Ponds, Lagoons

No visible evidence of wetlands such as pits, ponds, lagoons, or any other water bodies, was observed within the subject property's boundary lines.

3.22 Herbicides/Pesticides

Based on information presented in Section 2.4, from prior to 1948 to the 1960's, the eastern half of the site was for agricultural usage. According to REM's past experience with subsurface investigations conducted on land with agricultural usage, typical pesticide concentrations detected in soil samples pose no significant risk, i.e., a risk that results in one excess cancer risk in an exposed population of 1,000,000 for commercial, industrial, and residential exposures.

3.23 Radon

Radon sources can be found from earth and rock beneath building structures, well water, and building materials themselves. Though there is no immediate health effect, it is believed to account for approximately 10% of lung cancer deaths in the United States. Estimated national average is 1.5 picocuries per liter of air, however, levels as high as 200 picocuries per liter in some commercial buildings can be found. USEPA and California Department of Health Services' Radon Survey Interim Results report shows different U.S. regions according

to general geological and climate information, where Region 9 includes Imperial, Los Angeles, Orange, Riverside, San Bernardino and San Diego Counties.

According to the California EPA, Los Angeles and Riverside County is classified as a “Zone 2” county having a predicted average screening level between 2-4 picocuries per liter of air. Orange and San Diego County is under Zone 3, having the level less than 2 picocuries/L, and Ventura County as Zone 1 has the level greater than 4 picocuries/L.

If a property region reportedly has radon concentration below 4 picocuries per liter of air in 99.5% of homes within the region, then, it is not likely impacted by the presence of radon gas, considering EPA action limit of 4 picocuries per liter of air volume. REM is not contracted to perform the testing of radon level on the subject property, thus the delineation of radon level is beyond the scope of the service covered in this report.

4. NEIGHBORING PROPERTIES

4.1 Adjacent/Adjoining Businesses

For the scope of this assessment, properties are defined and categorized based upon their physical proximity to the subject property. An adjoining property is any real estate property whose border is contiguous or partially contiguous with the subject properties, or that would be if the properties were not separated by a roadway, street, public thoroughfare, river, or stream.

Adjoining properties are as follows:

North: By Welbrook Senior Living Arlington living care facility (7858 California Avenue)

East: By residences

South: By residences

West: Immediately by Jefferson Street, and then by residences

4.2 Historical Hazardous Substance Usage in Neighboring Properties

REM's field engineer contacted the following public agencies to find any records of former operation of Underground Storage Tank (UST) of gasoline or any other hazardous substances in the vicinity of the subject site premise:

- California Regional Water Quality Control Board – Santa Ana Region
- California Dept. of Toxic Substances Control

No locations in the immediate adjacency of the subject site were found to pose any environmental threat to the subject property, based upon the data obtained via NETR governmental records search database and the conducted agency records search.

5. GOVERNMENT RECORDS SEARCH AND POTENTIAL OFF-SITE CONTAMINATION SOURCES

5.1 Historical Background and Scope of Coverage

Since the early 1970s, environmental agencies have been tracking the compliance of many facilities with the various laws that have been promulgated to halt the pollution of air, land and water. More recently, records have been maintained documenting spills of hazardous materials and the locations of known waste sites or regulated waste handling facilities. The following sections summarizes REM's review of database search of available records at the local, state and federal level and highlights the approximate location of such sites with respect to the subject property.

The conducted government record search was performed to aid:

1) Identification of facilities, located within a one-mile radius of the subject property, which might pose a potential threat to the subsurface environment at the subject property; and

2) Identification of any environmental violation notices associated with activities conducted at the subject property itself. The following lists were reviewed for sites within one mile of the property:

5.2 Database Sources

A. Federal Sources

- United States Environmental Protection Agency (U.S. EPA), Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
- U.S. EPA, National Priority List (NPL)
- Resource Conservation and Recovery Act (RCRA) Federal TSD Facilities
- Federal Emergency Response Notification System (ERNS)
- CERCLA Site Enforcement Tracking System
- RCRA Violators List (CORRACTS)
- U.S. EPA Federal Enforcement Docket
- Toxic Release Inventory System (TRIS)

- No Further Remedial Action Planned (NFRAP)

The CERCLIS is the EPA compilation of sites for which the EPA has evidence of, or is investigating, a release or threatened release, of hazardous substances which may be subject to review in accordance with the terms and conditions of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (Superfund Act). Sites to be included are identified primarily by the reporting requirements of hazardous substances including degreasing solvents, oily waste, acid solutions, alkaline solutions, and heavy metal solutions, Treatment, Storage and Disposal (TSD) facilities and releases larger than specific Reportable Quantities (RQ), established by EPA.

An NPL site is an uncontrolled or abandoned hazardous waste site identified for priority remedial action under Superfund Program. Such prioritized sites with significant risk to human health and the environment receive remedial funding under the Comprehensive Environmental Response Conservation and Liability Act (CERCLA). RCRA generator/TSD list is a compilation of hazardous waste generating facilities which have obtained an identification number from EPA.

ERNS database is a national computer database used to store information on unauthorized release of oil and hazardous substances. The program is a cooperative effort of the Environmental Protection Agency, the Department of Transportation Research and Special Program Administration's National Transportation System Center and the National Response Center. There are primarily five Federal statues that requires release reporting: CERCLA Section 103; the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304; the Clean Water Act of 1972 (CWA) Section 311(b)(3); and the Hazardous Material Transportation Act of 1974 (HMTA) Section 1808 (b).

RCRA Violators List (CORRACTS): The Resource Conservation and Recovery Act of 1976 provides for "Cradle to Grave" regulation of hazardous wastes. RCRA requires regulation of hazardous waste generators, transporters, and TSD sites. Evaluation to potential violations, ranging from manifest requirements to hazardous waste discharges, is typically conducted by the US EPA. This database is also known as Corrective Action Report (CORRACTS).

Toxic Release Inventory System (TRIS): TRIS compiles database for a property having had a release of chemical compound, whose listing reflects permitted air releases rather than a release to soil or groundwater.

B. California State Sources

- State of California Office of Planning and Research (CORTESE), the State of California equivalent of CERCLIS
- Leaking Underground Storage Tanks (LUST)
- Solid Waste Information System (SWIS)
- Annual Work Plan (previously known as Bond Expenditure Plan), the State of California equivalent of NPL
- California Historical Abandoned Site Survey Program (CALSITES)

CALSITES: The Historical Abandoned Site Survey (HASS) Program, formerly the California Abandoned Sites Program Information System – ASPIS, identified certain potential hazardous waste sites. The identification of these sites was generally not made via sampling and site characterization, but as a result of file searches and windshield surveys.

No Further Action sites are also on the CALSITE list which has been marked for no further action by the California Environmental Protection Agency, Department of Toxic Substance Control (DTSC) in accordance with California Health & Safety Code.

CORTESE: This database is a consolidation of information from various sources. It is maintained by the State Office of Planning and Research and lists potential and confirmed hazardous waste or substances sites.

LUST(s): The Leaking Underground Storage Tanks (LUST) Information System is maintained by the State Water Resource Board pursuant to California Health & Safety Code.

SWIS (Solid Waste Information System): As legislated under Solid Waste Management and Resource Recovery Act of 1972, the California Waste Management Board maintains list of certain facilities, i.e. Active solid waste disposal sites, Inactive or Closed solid waste disposal sites and Transfer facilities.

AW (Annual Work Plan previously known as Bond Expenditure Plan): The California Health & Safety code requires the California EPA to develop a site-specific expenditure plan as the basis for an appropriation of California Hazardous Substance Cleanup Bond Act of 1984 funds. The Agency is also required to update annually and report any significant adjustments to the Legislature on an ongoing basis. The plan identifies California hazardous waste sites targeted for cleanup by responsible parties, the California and the Federal Environmental Protection Agency over the next coming years.

C. Regional Sources

- LUST - Regional
- Toxic Releases (NT)
- Toxic Pits (TPC)
- California Regional Water Resources Control Board, Solid Waste Assessment Test (SWAT)
- Well Investigation Program

NT (Toxic Releases): The California Regional Water Quality Control Boards or local Department of Health & Safety Services keeps track of toxic releases to the environment. These lists are known as Unauthorized Releases, Spill, Leaks, Investigation and Cleanups, Non-Tank Releases, Toxic List or similar, depending on the local agency

TPC (Toxic Pits): The Toxic Pits Cleanup Act places strict limitations on the discharge of liquid hazardous wastes into surface impoundment, toxic ponds, pits and lagoons. Regional Water Quality Control Boards are required to inspect all surface impoundments annually; in addition, every facility was required to file a Hydrogeological Assessment Report. Recent legislation allows the Department of Health Services to exempt facilities that closed

on or before December 31, 1985, if a showing is made that no significant environmental risk remains.

SWAT (Solid Waste Assessment Test): This program requires that disposal sites with more than 50,000 cubic yards of waste provide sufficient information to the regional water quality control board to determine whether or not the site has discharged hazardous substances which will impact the environment. Site operators are required to file Solid Waste Assessment Test reports on a staggered basis. Operators submit water quality tests to the Regional Water Quality Control Board, describing surface and groundwater quality and supply; and the geology within 1 mile of the site. Air quality tests are submitted to the local Air Quality Management District or Air Pollution Control District.

D. Other Sources

- RCRA-Generator
- RCRA-TSD Facilities
- SWLF (Solid Waste Landfill)
- Water Wells (USGS)

RCRA-G: The EPA regulates generators of hazardous material through the Resource Conservation and Recovery Act (RCRA). All hazardous waste generators are required to notify EPA of their existence by submitting the Federal Notification of Regulated Waste Activity Form or a State equivalent form. The notification form provides basic identification information and specific waste activities.

RCRA-D: The EPA regulates the treatment, storage and disposal of hazardous material through the Resource Conservation and Recovery Act (RCRA). All hazardous waste TSD facilities are required to notify EPA of their existence by submitting the Federal Notification of Regulated Waste Activity Form or a State equivalent form.

SWLF: The California Waste Information system database consists of both open as well closed and inactive solid waste disposal facilities and transfer stations pursuant to the Solid Waste Management and Resource Recovery Act of 1972. Generally the California Integrated Waste Management Board learns of locations of disposal facilities through permit applications and from local enforcement agencies.

Water Wells: The Groundwater Site Inventory (GWSI) database was provided by the United States Geological Survey (USGS), which contains information over 1,000,000 wells and other groundwater which the USGS has studied, used or otherwise had reason to document through the course of research.

5.3 Case Study References

A. Case-Closure

If sites are listed on the California Leaking Underground Storage Tank (LUST) database with a "case closed (no further remedial actions required)" status, it shall be interpreted as follows. The identified contamination at such sites was mitigated to a degree that the governing agency believed that these sites do not pose apparent concern/threat to the subsurface

environment of the neighboring area.

B. Lawrence Livermore National Laboratory Reports on LUFT's

According to Lawrence Livermore National Laboratory / University of California Reports on Leaking Underground Fuel Tanks (LUFT's), approximately ninety percent of dissolved petroleum products are found less than 280 feet in distance from the origination source, and most of these plumes are either stable or decreasing in distance. And seventy percent of the plume is in shallow groundwater less than 25 feet below the ground surface.

C. Groundwater Flow Gradient

Environmentally-concerned sites located not directly at the up-gradient from the subject site can be deleted from anticipated target sites, since contamination from identified sites is unlikely to migrate along the groundwater flow direction to affect the subsurface environment underneath the subject site (Section 2.6 – Hydrogeologic Setting).

5.4 Potential Source of Contamination

Sites identified on referenced agency listing within the one-mile radius from the subject property are tabulated in the Appendix D of this Report. As shown in Appendix D, there are no Leaking Underground Storage Tank (LUST)/Spills sites or other sites within the vicinity (< 1/4 mile) of the referenced subject property being targeted as potential environmental concern.

5.5 UST, Disposal Sites, and Generators

As also summarized in Appendix D, there are three sites listed on RCRA-GEN small quantity hazardous waste generator database and one site listed on permitted UST database compiled by the State Water Resources Control Board, located within 1/4-mile radius of the subject site. Upon reviewing the information regarding the said facilities obtained via computer search, the conclusion was drawn that the subsurface environment at the subject site is not likely to have been impacted by operations of the said facilities.

6. DISCUSSIONS AND CONCLUSIONS

- The subject site at 4105 Jefferson Street (APN 227-130-025) is a roughly ENE-WSW trending rectangular-shaped 2.96 acre lot located on the eastern block of (the generally NNW-SSE trending) Jefferson Street between California Avenue to the north and Willow Ave to the south in the city of Riverside, California. The subject property consists mainly of a single-story roughly ENE-WSW rectangular single-family dwelling (SFD) near the southwestern corner of the site; a roughly NNW-SSE trending rectangular barn-like structure (used mainly for tool/furniture storage) in the west-central section of the southern portion of the site; and mainly unpaved yard for remaining portions of the site. No pits, ponds, swamps, or lagoons were observed on the subject property. No apparently significant surface staining was observed on the unpaved/unpaved out-door areas and the building areas of the site.

  During the site inspection conducted on July 14, 2015, residence occupied the site. Current site operations generally do not involve using/generating significant quantities of hazardous materials/wastes.

- Various historic sources listed in Section 2.4 reveal the following development/ occupancy history for the subject site:

  1922 – The western half of the site was generally developed into its current setting
  Prior to 1948 to the 1960's - The western half of the site was generally with its current setting; and the eastern half of the site was for agricultural usage
  The 1970's on – The site has been generally with its current setting

  As presented, from prior 1948 to the 1960's, the western half of the site was for agricultural usage. According to REM's past experience with subsurface investigations conducted on land with agricultural usage, typical pesticide concentrations detected in soil samples pose no significant risk, i.e., a risk that results in one excess cancer risk in an exposed population of 1,000,000 for commercial, industrial, and residential exposures.

- According to the conducted government records search (see Section 5.0), the subject property was not recognized being listed on the following environmental regulatory database record research (NETR database): NPL, RCRA-TSD, CERCLIS, NFRAP, RCRA-G, ERNS, CORRACTS, CORTESE, CALSITES, LUST, UST, and SWF.

- The conducted government records search also revealed that there are no Leaking Underground Storage Tank (LUST)/Spills sites or other sites within the immediate vicinity (< 1/8 mile) of the referenced subject property being targeted as potential environmental concern.

- In conclusion, we have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E-1527-13 of 4105 Jefferson Street, Riverside, CA, the property. As a result of the site reconnaissance, review of federal, state, local reported environmental information regarding the said facilities obtained via computer search, this assessment identified no evidence of recognized environmental conditions, by practices at the subject property and its immediate neighbors that could significantly impact the subject property. No Phase II subsurface investigation is recommended for the subject site.

7. LIMITATIONS AND CERTIFICATION STAMP

The opinion expressed herein is based on the information collected during our study, our present understanding of the site conditions and our professional judgment in light of such information at the time of preparation of this opinion. The report is a professional opinion work, and no warranty is either expressed, implied or made as to the conclusions, advice and recommendations offered in this report. Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable Engineers and Geologists practicing in this or similar localities.

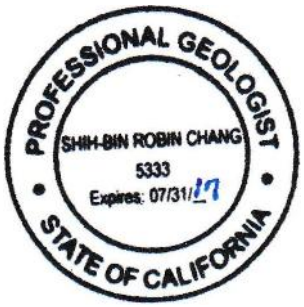
The findings, conclusions and recommendations in this report are considered valid as of the present date. However, changes in the conditions of the property can occur with the passage of time, due to natural process or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standard may occur. REM is not responsible for conditions found at or beneath the subject property or adjacent properties. Accordingly, portions of this report may be invalidated wholly or partially by the changes beyond our control.

This report is prepared for the exclusive use of the client, and opinions/recommendations contained in this report apply only to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated.

Report Prepared by:
ROBIN ENVIRONMENTAL MANAGEMENT

Robin Chang

Robin Chang, Ph.D., P.G.
Project Manager



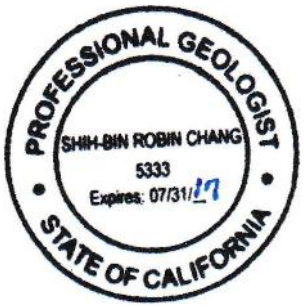
8. QUALIFICATION STATEMENT FOR PERSONNEL CONDUCTING THE PHASE I ASSESSMENT

Since Robin Chang, the personnel conducting the Phase I Environmental assessment is a California State Registered Professional Geologist, Robin Chang declares that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Sec. 312.10 of 40 CFR. I have the specific qualifications based on education, training, experience, and license to assess a property of the nature, history, and setting of the subject property. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

ROBIN ENVIRONMENTAL MANAGEMENT

Robin Chang

Robin Chang, Ph.D., P.G.
Project Manager



APPENDICES

APPENDIX A

FIGURES & PHOTOS

FIGURE 1

SITE PHOTOS

Photo 1

Site frontage (west side) view (facing south-southeast)

Photo 2

Site SFD near the southwestern corner of the site (facing west)

Photo 3

The western portion of the site to the north of the site with cover for septic tank tubing indicated by arrow (facing north-northwest)

Photo 4

Roughly NNW-SSE trending rectangular barn-like structure (used mainly for tool/furniture storage) in the west-central section of the southern portion of the site (facing southwest)

Photo 5
Typical interior view of barn-like structure shown on Photo 4

Photo 6
Viewing approximate the eastern half of the site (facing east-northeast)

Photo 7

Welbrook Senior Living Arlington living care facility (7858 California Avenue) to the north of the site (facing northeast)

Photo 8

The eastern end of the site and residences to the east of the site (facing south-southeast)

Photo 9

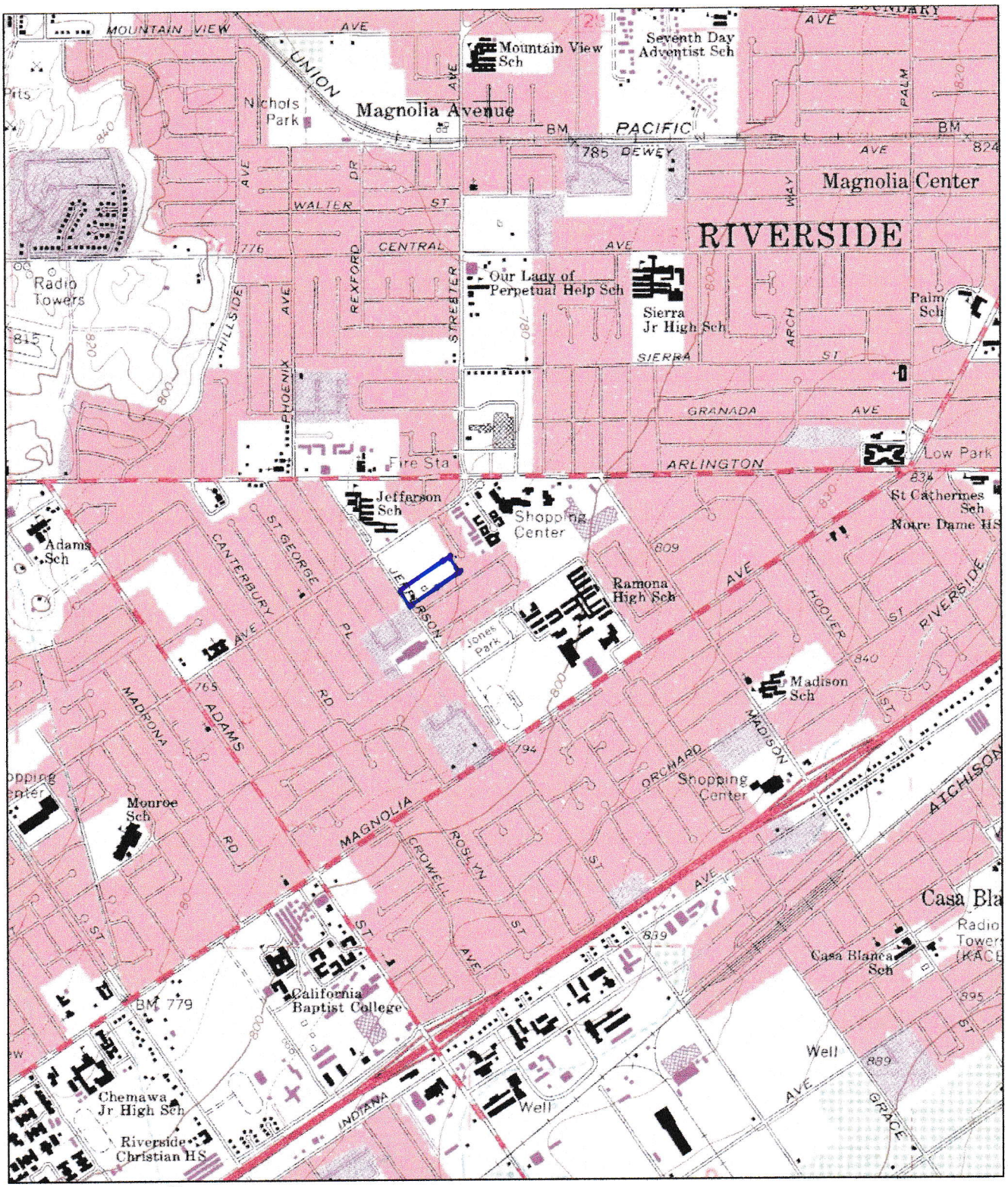
Residences to the south of the site (facing east-northeast)

Photo 10

Residences, across Jefferson Street, to the west of the site (facing south-southwest)

FIGURE 2

SITE LOCATION MAP



N

0 0.5 Mi

0 2000 Ft

Map provided by MyTopo.com

FIGURE 3

RECENT AERIAL PHOTOGRAPH SHOWING SITE AND ITS VICINITY GENERAL LAYOUT

California
ES Jefferson
4105 Jefferson St,
Riverside, CA 92504
Jefferson St
Jefferson St
Jefferson St
Willow Ave
Willow
50 feet
20 m
© 2013 HERE © 2013 Microsoft Corporation

APPENDIX B

CRBD BUILDING PERMIT RECORD

APPLICATION FOR BUILDING PERMIT

City of Riverside
CALIFORNIA

DATE 7-13-22

JOB ADDRESS ~~174 N~~ 4105 Jefferson

LEGAL DESCRIPTION

DESCRIPTION OF WORK

- [x] NEW BLDG.
- [ ] TERMITE
- [ ] ALTERATION
- [ ] DEMOLISH
- [ ] ROOFING
- [ ] SWIM POOL
- [ ] OTHER

5 rm

USE OF BUILDING Fr Rec

OWNER
NAME BA Simmons
ADDRESS
CITY PHONE

ARCH.
NAME
ADDRESS LIC. NO.
CITY PHONE

ENG'R.
NAME
ADDRESS LIC. NO.
CITY PHONE

CONTRACTOR
NAME Edwardo
ADDRESS
CITY PHONE
STATE LIC. CITY LIC.

VALUATION OF JOB: $ 2,500.00

The applicant agrees that if this permit is granted, all City Ordinances and State Laws regulating building construction will be complied with. All workmen on the job will be covered by workmen's compensation insurance in accordance with State Laws.

Signature of Applicant

This application does not include Electric, Heating, Plumbing, or other necessary permits.

Permits expire in 60 days if work is not started.

PLANS CKD BY ____ CODE'NS APPVD BY ____ APPLIC. APPVD BY ____

NO. BLDGS. NOW ON LOT	USE OF BLDGS. NOW ON LOT		
NO. FAM.	SIZE BLDG. - SQ. FT.		USE ZONE
STORIES 1	OCCUPANCY	TYPE CONST.	FIRE ZONE
FRONT S.B.	RIGHT S.B.	LEFT S.B.	REAR S.B.

PLAN CHK 01-9-441	$
PERMIT FEE 01-9-222	$
STORM DRAIN 09-9-481	$
AC. FEE 09-9-482	$
	$
TOTAL	$

UTILITIES WILL NOT BE PROVIDED UNTIL AFTER FINAL INSPECTION.

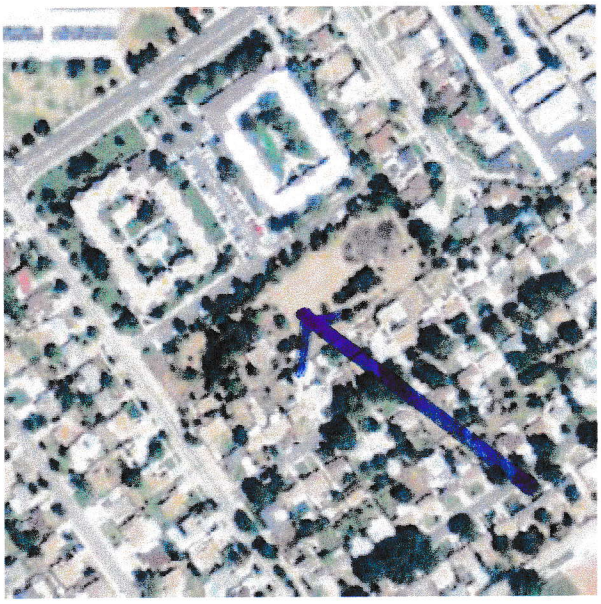
Form No. 302-13R1

B- 5137

APPENDIX C

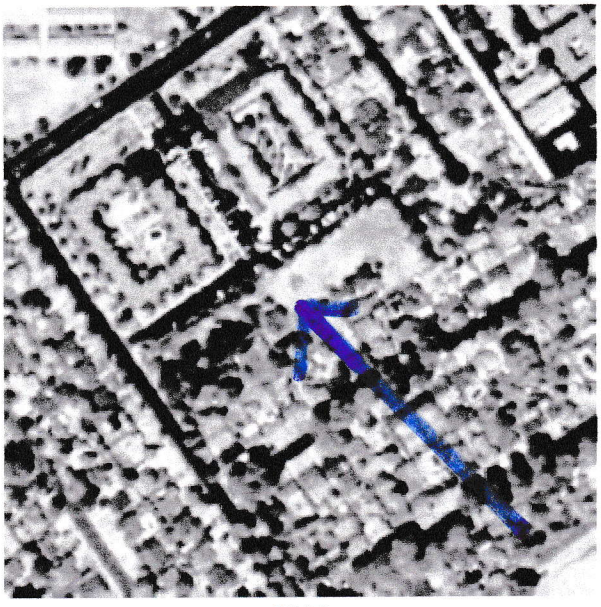
HISTORIC AERIAL PHOTO/TOPOGRAPHIC MAP RECORDS

Aerial Views

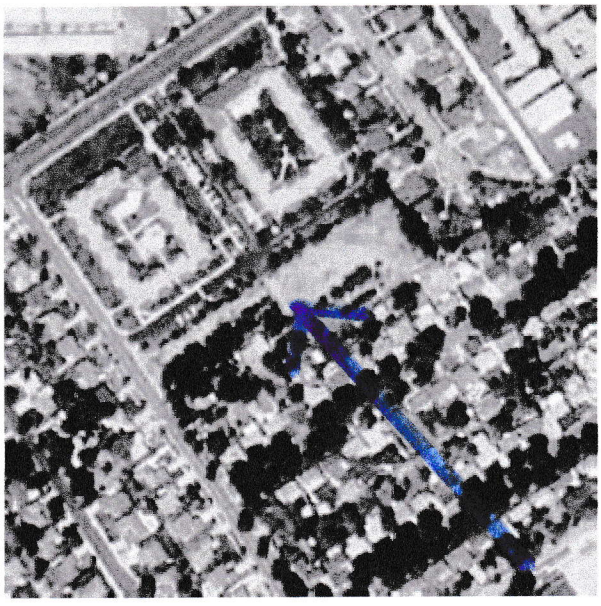


2012

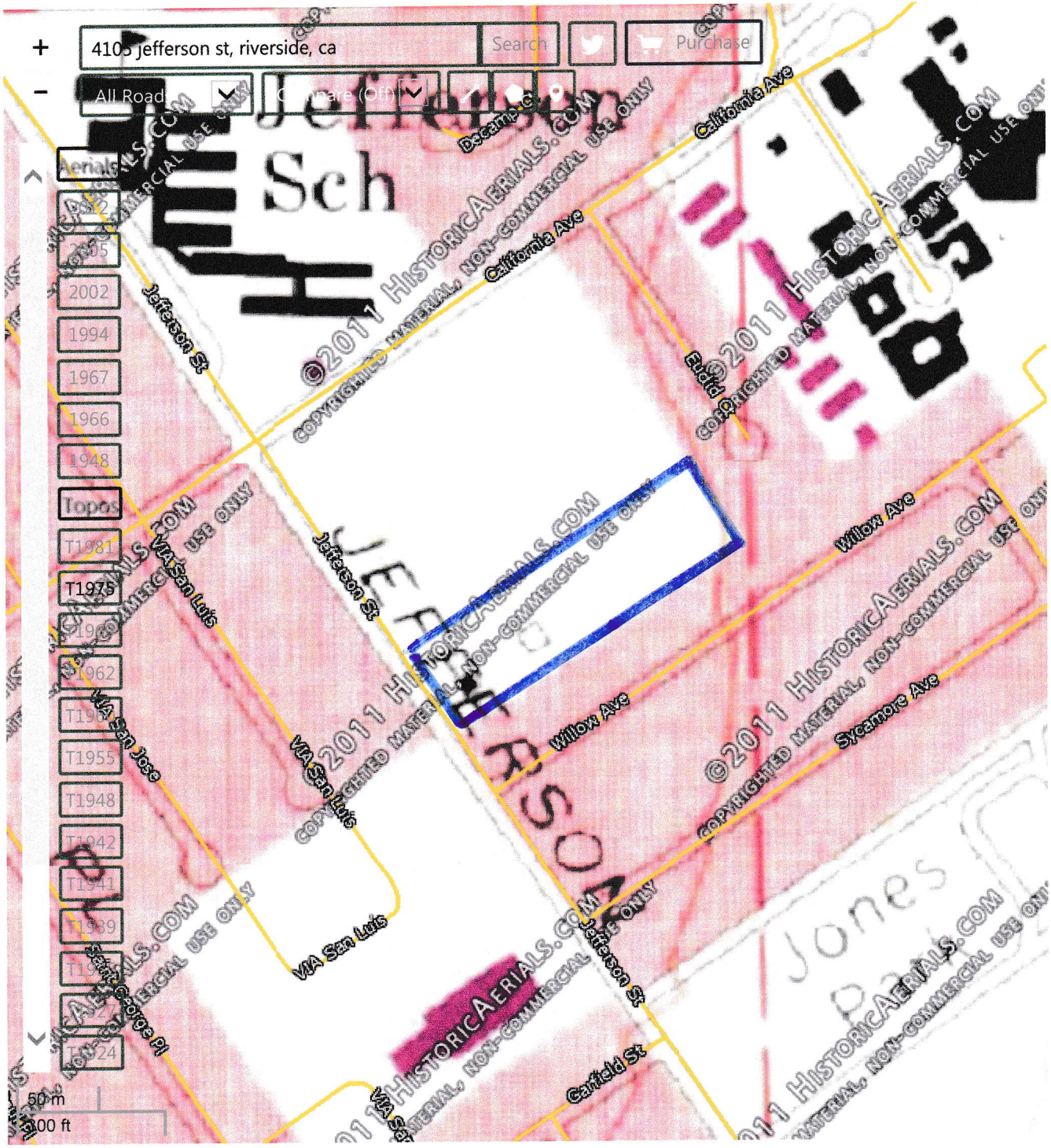
2005



2002



1994



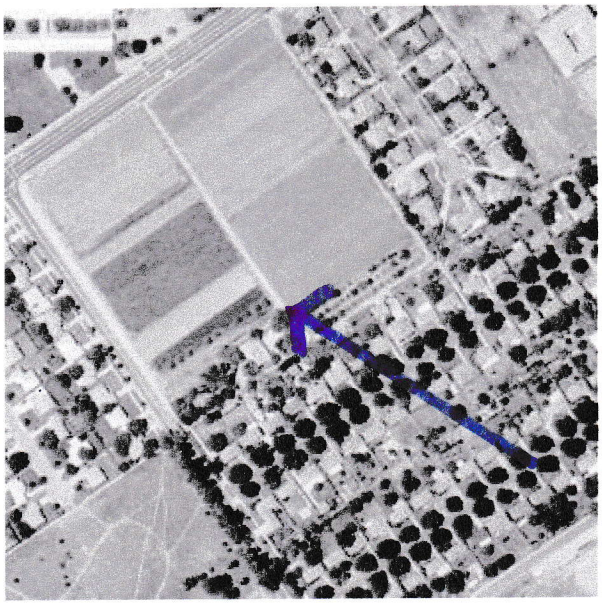
New Additions

- Nassau, New York (2006)
- Fairfield, Connecticut (2006)
- Onondaga, New York (2006)
- Madison, New York (2006)
- Orange, New York (2006)
- Kings, New York (2006)
- Kings, New York (2006)
- Jefferson, New York (2006)
- Bronx, New York (2006)
- New York, New York (2006)

Discussions

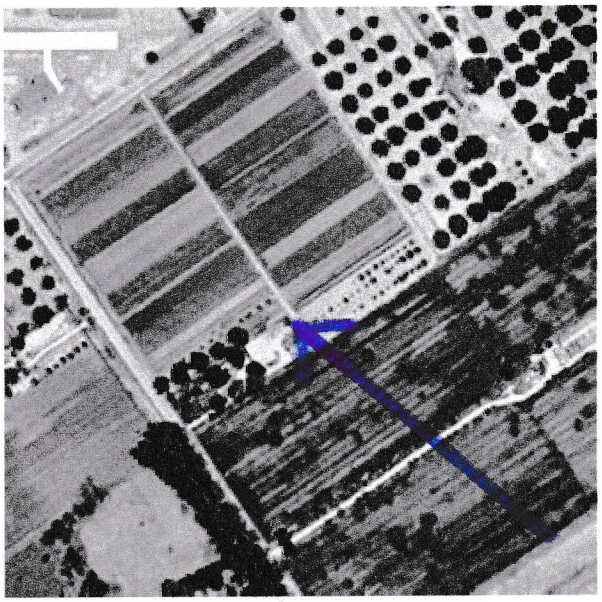
- Is there a way to just pay one flat rate fee for all maps concerne
- How can we improve HistoricAerials.com?
- use of imagery for tracing?
- Comparison Swipe Download
- Streets

Aerial Views



1967

1966



1948

APPENDIX D

GOVERNMENT RECORDS SEARCH DATABASE

4105 JEFFERSON ST, RIVERSIDE, CA
Prepared for: REM

Friday, July 24, 2015

Environmental Radius Report

2055 E. Rio Salado Pkwy
Tempe, AZ 85381
480-967-6752

Summary

Aerial Views 2012, 2005, 2002, 1994, 1967, 1966, 1948

	< 1/4	1/4 - 1/2	1/2 - 1
National Priorities List (NPL)			
CERCLIS List			
CERCLIS NFRAP			
RCRA CORRACTS Facilities			
RCRA non-CORRACTS TSD Facilities			
Federal Institutional Control / Engineering Control Registry			
Emergency Response Notification System (ERNS)			1
US Toxic Release Inventory			
US RCRA Generators (CESQG, SQG, LQG)	3	2	11
US ACRES (Brownfields)			
US NPDES			
US Air Facility System (AIRS / AFS)			
CA Registered Underground Storage Tanks	1		4
CA Leaking Underground Storage Tanks		2	6
CA CERCLIS Equivalent			
CA NPL Equivalent			
CA Hazardous Waste Sites			
CA Activity Use Restrictions			
CA Spills, Leaks, Investigations, and Cleanups		3	7
CA Solid Waste Landfills			
CA Oil and Gas Wells			
CA Voluntary Cleanup Sites			

Aerial Views

2012

2005

2002

1994

Aerial Views

1967

1966

1948

National Priorities List (NPL)

This database returned no results for your area.

The Superfund Program, administered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is an EPA Program to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. The NPL (National Priorities List) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. The boundaries of an NPL site are not tied to the boundaries of the property on which a facility is located. The release may be contained with a single property's boundaries or may extend across property boundaries onto other properties. The boundaries can, and often do change as further information on the extent and degree of contamination is obtained.

CERCLIS List

This database returned no results for your area.

The United States Environmental Protection Agency (EPA) investigates known or suspected uncontrolled or abandoned hazardous substance facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA maintains a comprehensive list of these facilities in a database known as the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). These sites have either been investigated or are currently under investigation by the EPA for release or threatened release of hazardous substances. Once a site is placed in CERCLIS, it may be subjected to several levels of review and evaluation and ultimately placed on the National Priority List (NPL).

CERCLIS sites designated as "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an intitial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund Action or NPL consideration.

CERCLIS NFRAP

This database returned no results for your area.

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" NFRAP have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the site being placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.
EPA has removed these NFRAP sites from CERCLIS to lift unintended barriers to the redevelopment of these properties. This policy change is part of EPA"s Brownfields Redevelopment Program to help cities, states, private investors and affected citizens promote economic redevelopment of unproductive urban sites.

RCRA CORRACTS Facilities

This database returned no results for your area.

The United States Environmental Protection Agency (EPA) regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA). The EPA maintains the Corrective Action Report (CORRACTS) database of Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action." A "corrective action order" is issued pursuant to RCRA Section 3008(h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility"s boundary and can be required regardless of when the release occurred, even if it predated RCRA.

RCRA non-CORRACTS TSD Facilities

This database returned no results for your area.

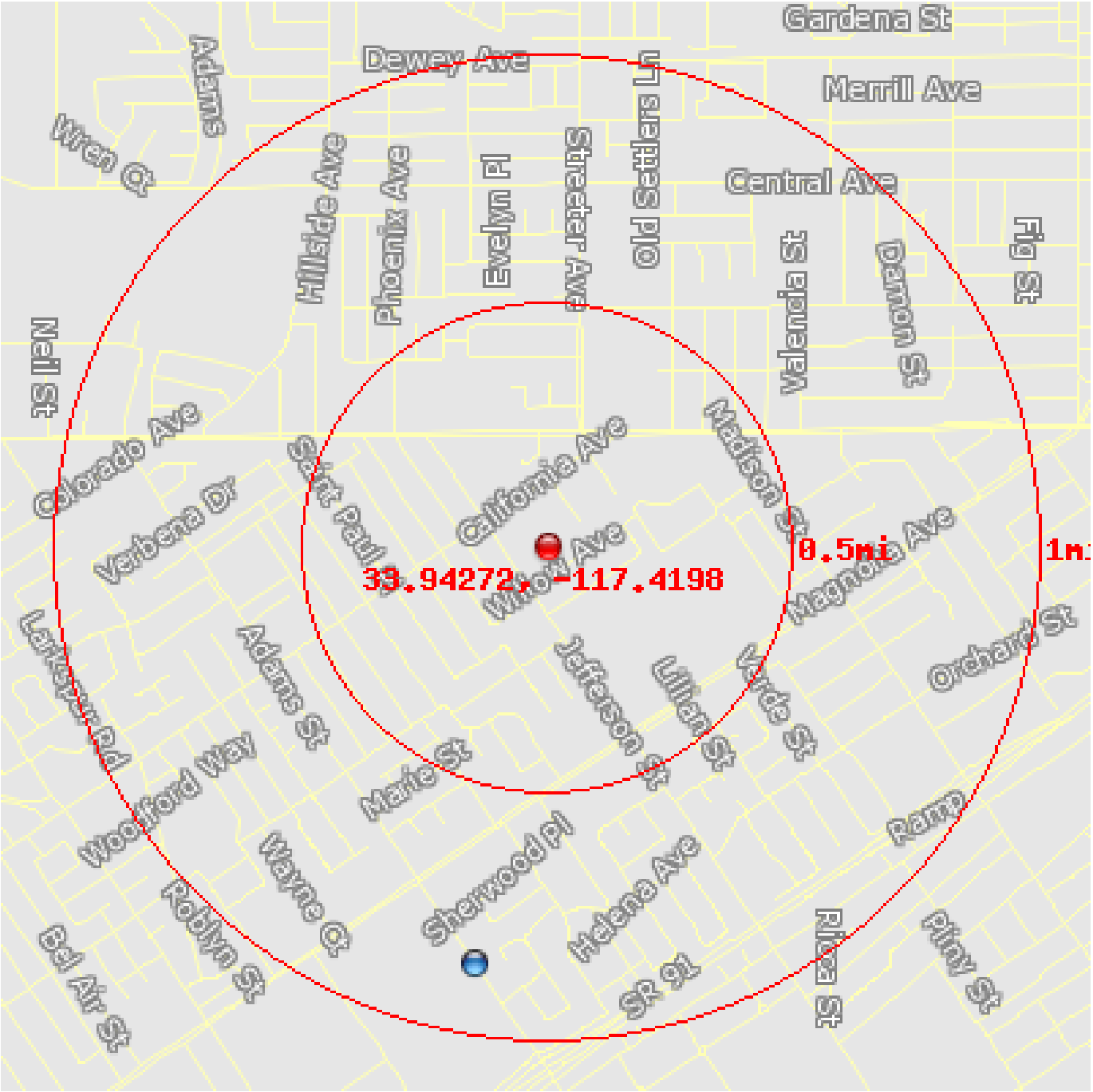
The United States Environmental Protection Agency (EPA) regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA). The EPA"s RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilites database is a compilation by the EPA of facilities that report generation, storage, transportation, treatment, or disposal of hazardous waste. RCRA Permitted Treatment, Storage, Disposal Facilities (RCRA-TSD) are facilities which treat, store and/or dispose of hazardous waste.

Federal Institutional Control / Engineering Control Registry

This database returned no results for your area.

Federal Institutional Control / Engineering Control Registry

Emergency Response Notification System (ERNS)



This database returned 1 results for your area.

The Emergency Response Notification System (ERNS) is a national computer database used to store information on unauthorized releases of oil and hazardous substances. The program is a cooperative effort of the Environmental Protection Agency, the Department of Transportation Research and Special Program Administration"s John Volpe National Transportation System Center and the National Response Center. There are primarily five Federal statutes that require release reporting: the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) section 103; the Superfund Amendments and Reauthorization Act(SARA) Title III Section 304; the Clean Water Act of 1972(CWA) section 311(b)(3); and the Hazardous Material Transportation Act of 1974(HMTA section 1808(b).

Emergency Response Notification System (ERNS)

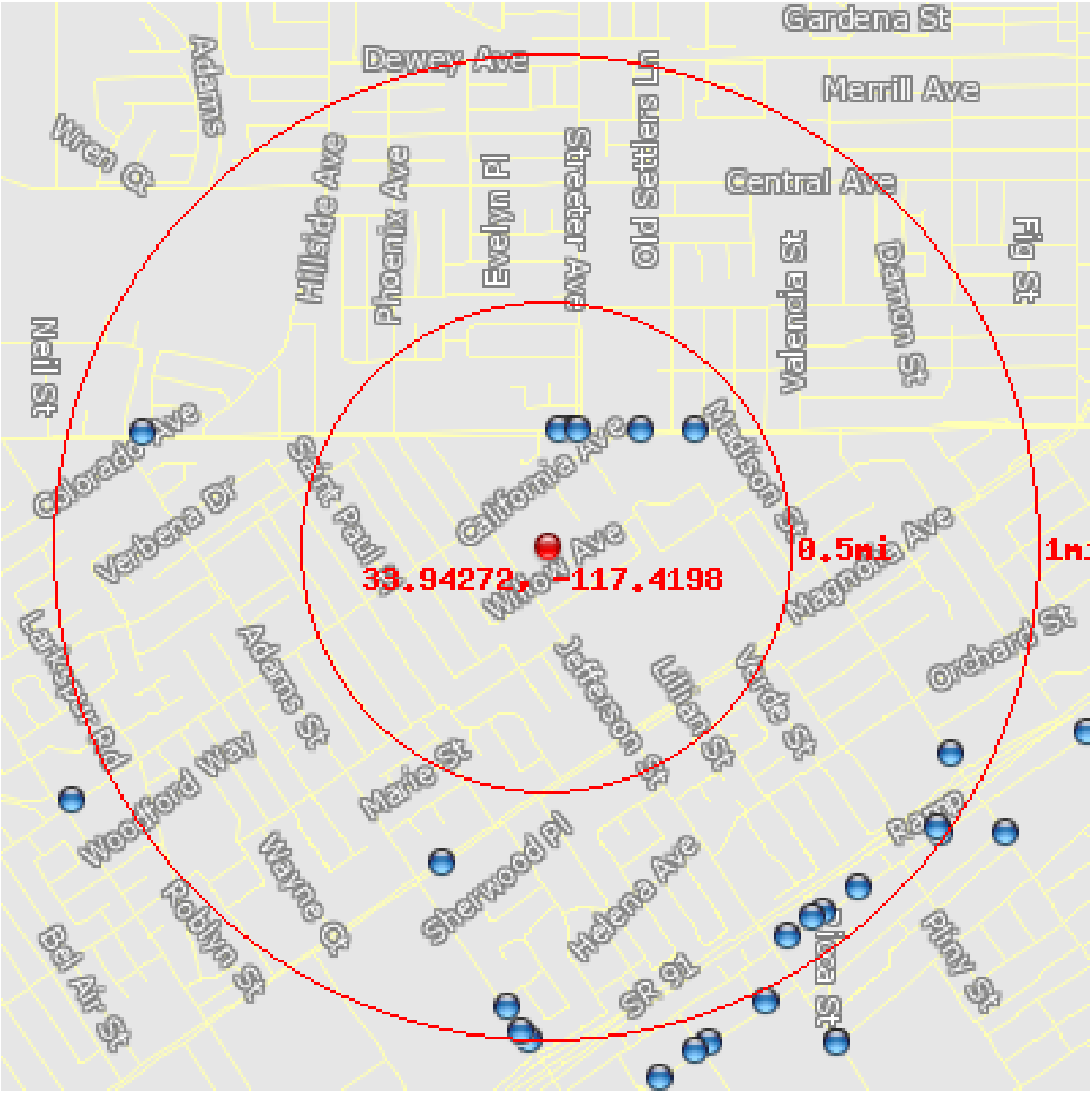
Location	33.93049, -117.4222
Distance to site	4523 ft / 0.86 mi S
Incident	CALLER IS REPORTING THEIR WAS A TRESPASSER THAT WAS STRUCK BY A FREIGHT TRAIN AT A GRADE CROSSING.
Incident Date	3/1/2011 12:15
Incident location	M/P 14.7
Year Reported	2011
Address	ADAMS STREET
City	ARLINGTON
State	CA
County	RIVERSIDE

US Toxic Release Inventory

This database returned no results for your area.

The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. TRI reporters for all reporting years are provided in the file.

US RCRA Generators (CESQG, SQG, LQG)



This database returned 16 results for your area.

The United States Environmental Protection Agency (EPA) regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA). EPA maintains a database of facilities, which generate hazardous waste or treat, store, and/or dispose of hazardous wastes.

Conditionally Exempt Small Quantity Generators (CESQG) generate 100 kilograms or less per month of hazardous waste, or 1 kilogram or less per month of acutely hazardous waste.

Small Quantity Generators (SQG) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Large Quantity Generators (LQG) generate 1,000 kilograms per month or more of hazardous waste, or more than 1 kilogram per month of acutely hazardous waste.

US RCRA Generators (CESQG, SQG, LQG)

Location	33.94606, -117.4194
Distance to site	1228 ft / 0.23 mi N
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002735247*
EPA Identifier	110002735247
Primary Name	JONES DRY CLEANERS
Address	5335 ARLINGTON AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	HWTS-DATAMART, RCRAINFO
Program Interests	SQG, STATE MASTER
Updated On	08-AUG-10
Recorded On	01-MAR-00
Program ID	CAD981640071

Location	33.94606, -117.419
Distance to site	1247 ft / 0.24 mi N
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110012542971*
EPA Identifier	110012542971
Primary Name	CHEVRON STATION NO 93673
Address	5305 ARLINGTON AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	925042502
Programs	HWTS-DATAMART, RCRAINFO
Program Interests	SQG, STATE MASTER
Updated On	26-JAN-12
Recorded On	29-AUG-02
Program ID	CAR000122515

US RCRA Generators (CESQG, SQG, LQG)

Location	33.94606, -117.4186
Distance to site	1270 ft / 0.24 mi N
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002809550*
EPA Identifier	110002809550
Primary Name	STEADY PEDALER BICYCLES
Address	5300 ARLINGTON AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	RCRAINFO
Program Interests	SQG
Updated On	05-AUG-10
Recorded On	01-MAR-00
Program ID	CAD982428617

Location	33.94608, -117.4164
Distance to site	1596 ft / 0.3 mi NE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002735498*
EPA Identifier	110002735498
Primary Name	USA #1 PHOTO
Address	5222-D ARLINGTON AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504-2662
Programs	RCRAINFO
Program Interests	SQG
Updated On	05-AUG-10
Recorded On	01-MAR-00
Program ID	CAD981640543

US RCRA Generators (CESQG, SQG, LQG)

Location	33.9461, -117.4145
Distance to site	2019 ft / 0.38 mi NE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110012259171*
EPA Identifier	110012259171
Primary Name	SCHER TIRE #13
Address	5110 ARLINGTON AVENUE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504-2603
Programs	RCRAINFO, UORS
Program Interests	SQG, STATE MASTER
Updated On	26-JAN-12
Recorded On	01-MAR-00
Program ID	CAR000088203

Location	33.93341, -117.4235
Distance to site	3570 ft / 0.68 mi S
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110054822894*
EPA Identifier	110054822894
Primary Name	CVS PHARMACY NO 9849
Address	8280 MAGNOLIA AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	RCRAINFO
Program Interests	LQG
Updated On	28-MAR-14
Recorded On	30-JAN-13
Program ID	CAR000231753

US RCRA Generators (CESQG, SQG, LQG)

Location	33.94595, -117.434
Distance to site	4442 ft / 0.84 mi W
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110044804254*
EPA Identifier	110044804254
Primary Name	SHELL OIL PRODUCTS US SAP 173637
Address	5995 ARLINGTON AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	RCRAINFO
Program Interests	SQG
Updated On	28-MAR-14
Recorded On	27-JAN-12
Program ID	CAR000222851

Location	33.93657, -117.4055
Distance to site	4888 ft / 0.93 mi SE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110037381133*
EPA Identifier	110037381133
Primary Name	EXXONMOBIL OIL CORP 10197
Address	3480 MADISON ST
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	BR, RCRAINFO
Program Interests	HAZARDOUS WASTE BIENNIAL REPORTER, LQG
Updated On	26-JAN-12
Recorded On	15-DEC-08
Program ID	CAR000193292

US RCRA Generators (CESQG, SQG, LQG)

Location	33.93178, -117.4103
Distance to site	4915 ft / 0.93 mi SE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002718293*
EPA Identifier	110002718293
Primary Name	SKIP FORDYCE MOTORCYCLES
Address	7840 INDIANA AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
NAICS Codes	441221
Programs	HWTS-DATAMART, RCRAINFO
Program Interests	SQG, STATE MASTER
Updated On	08-AUG-10
Recorded On	01-MAR-00
NAICS Descriptions	MOTORCYCLE DEALERS.
Program ID	CAD981571847

Location	33.93126, -117.4113
Distance to site	4920 ft / 0.93 mi SE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002621887*
EPA Identifier	110002621887
Primary Name	TOYOTA OF RIVERSIDE
Address	7870 INDIANA AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	HWTS-DATAMART, RCRAINFO, UORS
Program Interests	SQG, STATE MASTER
Updated On	26-JAN-12
Recorded On	01-MAR-00
Program ID	CA0000971036

US RCRA Generators (CESQG, SQG, LQG)

Location	33.93196, -117.41
Distance to site	4922 ft / 0.93 mi SE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002809006*
EPA Identifier	110002809006
Primary Name	INLAND EMPIRE VOLVO
Address	7750 INDIANA AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	RCRAINFO
Program Interests	SQG
Updated On	08-AUG-10
Recorded On	01-MAR-00
Program ID	CAD982416760

Location	33.92918, -117.4212
Distance to site	4958 ft / 0.94 mi S
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002724972*
EPA Identifier	110002724972
Primary Name	HIGHLANDER CLEANERS
Address	3566 ADAMS
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504-3356
Programs	RCRAINFO
Program Interests	SQG
Updated On	06-AUG-10
Recorded On	01-MAR-00
Program ID	CAD981615487

US RCRA Generators (CESQG, SQG, LQG)

Location	33.93271, -117.4087
Distance to site	4964 ft / 0.94 mi SE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002808953*
EPA Identifier	110002808953
Primary Name	DAVES AUTOMOTIVE
Address	7740 INDIANA AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	RCRAINFO
Program Interests	SQG
Updated On	08-AUG-10
Recorded On	01-MAR-00
Program ID	CAD982416653

Location	33.93443, -117.4059
Distance to site	5178 ft / 0.98 mi SE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002660647*
EPA Identifier	110002660647
Primary Name	MAGNOLIA RADIATOR SERVICE
Address	7572 INIANA AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
NAICS Codes	811118
Programs	HWTS-DATAMART, RCRAINFO
Program Interests	SQG, STATE MASTER
Updated On	05-AUG-10
Recorded On	01-MAR-00
NAICS Descriptions	OTHER AUTOMOTIVE MECHANICAL AND ELECTRICAL REPAIR AND MAINTENANCE.
Program ID	CAD081809337

US RCRA Generators (CESQG, SQG, LQG)

Location	33.9285, -117.4206
Distance to site	5195 ft / 0.98 mi S
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110059767783*
EPA Identifier	110059767783
Primary Name	HARBOR FREIGHT TOOLS USA INC
Address	3530 ADAMS ST
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	RCRAINFO
Program Interests	SQG
Recorded On	30-JUN-14
Program ID	CAR000246504

Location	33.93431, -117.4059
Distance to site	5220 ft / 0.99 mi SE
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110002730206*
EPA Identifier	110002730206
Primary Name	ALL AMERICAN & IMPORT AUTO
Address	7580 INDIANA AVE
City	RIVERSIDE
County	RIVERSIDE
State	CA
Zipcode	92504
Programs	RCRAINFO
Program Interests	SQG
Updated On	08-AUG-10
Recorded On	01-MAR-00
Program ID	CAD981628753

US ACRES (Brownfields)

This database returned no results for your area.

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. The Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an online database for Brownfields Grantees to electronically submit data directly to The United States Environmental Protection Agency (EPA)

US NPDES

This database returned no results for your area.

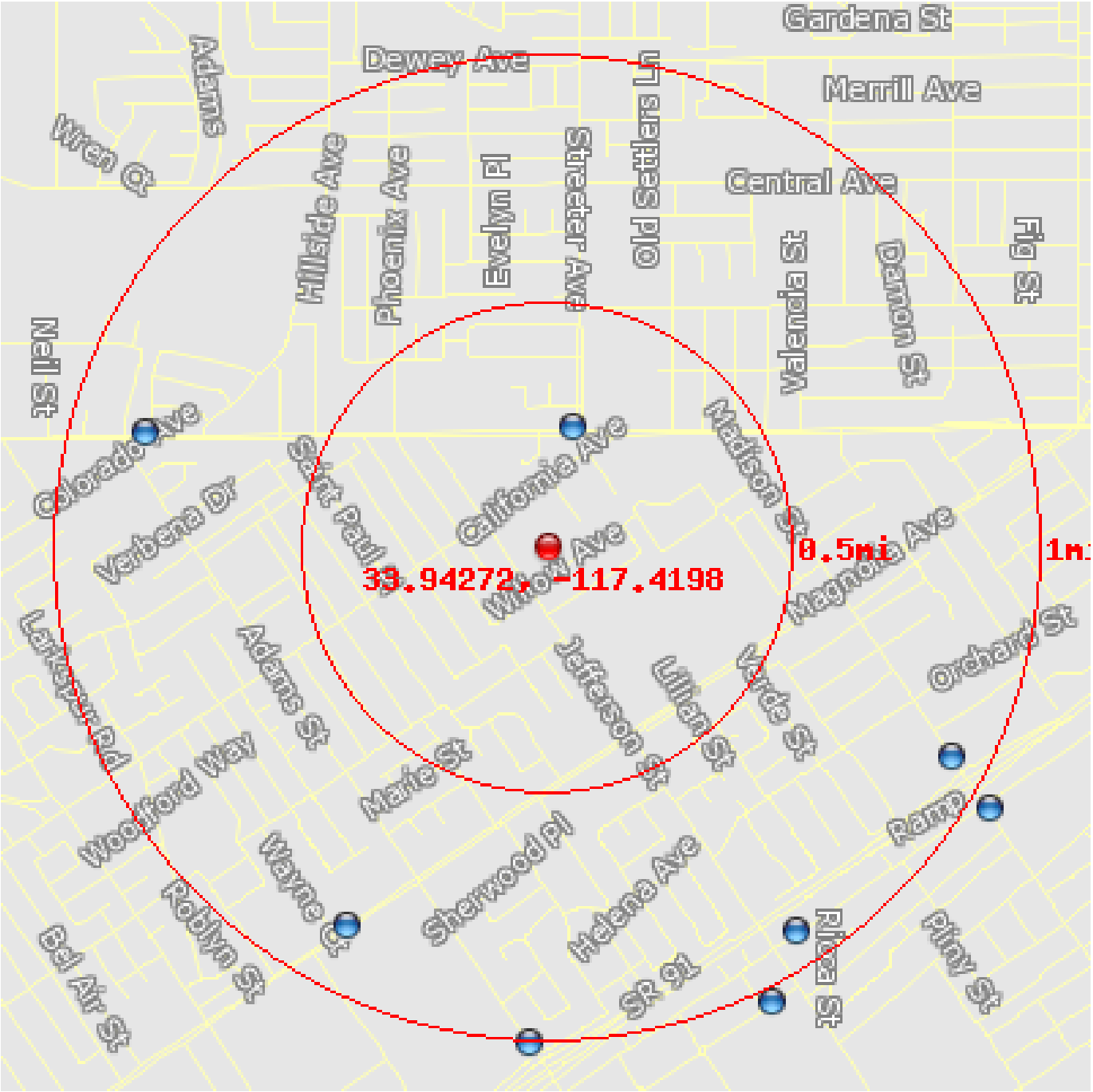
The NPDES module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

US Air Facility System (AIRS / AFS)

This database returned no results for your area.

The Air Facility System (AIRS / AFS) contains compliance and permit data for stationary sources of air pollution (such as electric power plants, steel mills, factories, and universities) regulated by EPA, state and local air pollution agencies. The information in AFS is used by the states to prepare State Implementation Plans (SIPs) and to track the compliance status of point sources with various regulatory programs under Clean Air Act.

CA Registered Underground Storage Tanks



This database returned 5 results for your area.

Underground storage tanks containing hazardous or petroleum substances are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The State Water Resources Control Board"s GeoTracker database provides the list of permitted Underground Storage Tanks (UST).

CA Registered Underground Storage Tanks

Location	33.94615, -117.4188
Distance to site	1288 ft / 0.24 mi N
Site Name	CHEVRON #93673
Permitting Agency	RIVERSIDE COUNTY
Address	5305 ARLINGTON AVE.
City	Riverside
Zip	92504
County	Riverside

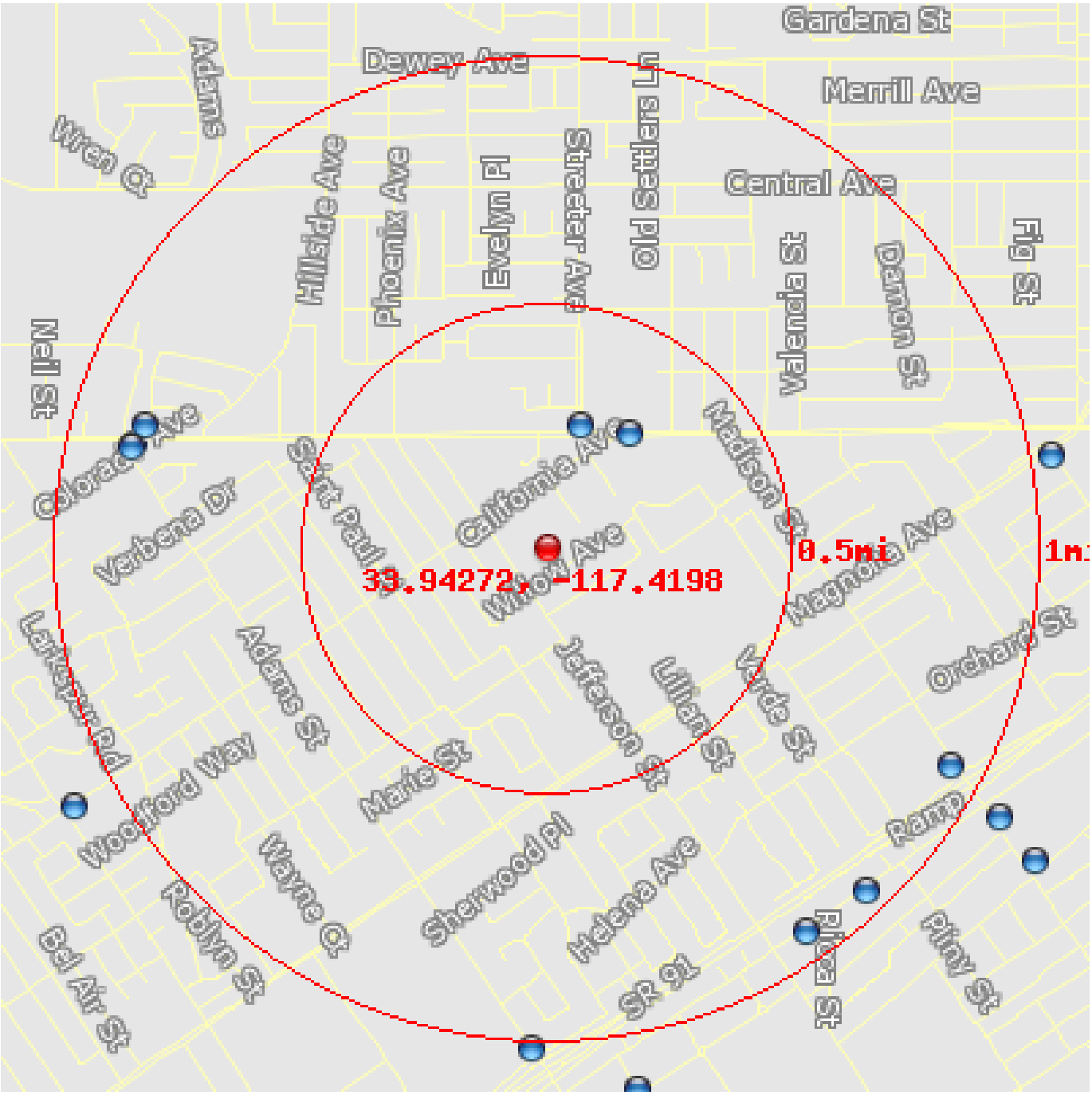
Location	33.94595, -117.434
Distance to site	4437 ft / 0.84 mi W
Site Name	RAPID GAS #37
Permitting Agency	RIVERSIDE COUNTY
Address	6020 ARLINGTON AVE.
City	Riverside
Zip	92504
County	Riverside

Location	33.93155, -117.4268
Distance to site	4588 ft / 0.87 mi SW
Site Name	CALIFORNIA BAPTIST COLLEGE
Permitting Agency	RIVERSIDE COUNTY
Address	8432 MAGNOLIA AVE
City	Riverside
Zip	92504
County	Riverside

Location	33.93653, -117.4055
Distance to site	4892 ft / 0.93 mi SE
Site Name	MOBIL STATION #18-182
Permitting Agency	RIVERSIDE COUNTY
Address	3480 MADISON ST
City	Riverside
Zip	92504
County	Riverside

Location	33.93145, -117.4109
Distance to site	4913 ft / 0.93 mi SE
Site Name	TOYOTA OF RIVERSIDE
Permitting Agency	RIVERSIDE COUNTY
Address	7870 INDIANA AVE
City	Riverside
Zip	92504
County	Riverside

CA Leaking Underground Storage Tanks



This database returned 8 results for your area.

Information on Leaking underground storage tanks containing hazardous or petroleum substances is maintained in the State Water Resources Control Board"s GeoTracker database.

CA Leaking Underground Storage Tanks

Location	33.94619, -117.4186
Distance to site	1324 ft / 0.25 mi N
Site Name	Chevron #3673 (CHEVRON #93673)
Site Street Number	5305
Site Street Name	ARLINGTON AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	2002-05-14
Lead Agency	SANTA ANA RWQCB (REGION 8)
Local Agency	RIVERSIDE COUNTY LOP
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

Location	33.94598, -117.4168
Distance to site	1504 ft / 0.28 mi NE
Site Name	SEARS Retail
Site Street Number	5261
Site Street Name	ARLINGTON AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	2003-06-25
Lead Agency	SANTA ANA RWQCB (REGION 8)
Local Agency	RIVERSIDE COUNTY LOP
File Location	Regional Board
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

CA Leaking Underground Storage Tanks

Location	33.94621, -117.4339
Distance to site	4461 ft / 0.84 mi W
Site Name	FORMER SHELL #5995
Site Street Number	5995
Site Street Name	ARLINGTON AVENUE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Site Assessment
Status Date	2008-06-17
Lead Agency	SANTA ANA RWQCB (REGION 8)
Local Agency	RIVERSIDE COUNTY LOP
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

Location	33.94568, -117.4343
Distance to site	4519 ft / 0.86 mi W
Site Name	UNITED OIL COMPANY STATION #37
Site Street Number	6020
Site Street Name	ARLINGTON AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Remediation
Status Date	2008-02-04
Lead Agency	SANTA ANA RWQCB (REGION 8)
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

Location	33.94561, -117.4344
Distance to site	4545 ft / 0.86 mi W
Site Name	E-Z SERVE SERVICE STATION
Site Street Number	6050
Site Street Name	ARLINGTON AVENUE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Site Assessment
Status Date	2004-03-25
Lead Agency	SANTA ANA RWQCB (REGION 8)
Contaminant	Other Solvent or Non-Petroleum Hydrocarbon
Contaminated Medium	Other Groundwater (uses other than drinking water)

CA Leaking Underground Storage Tanks

Location	33.93627, -117.4055
Distance to site	4923 ft / 0.93 mi SE
Site Name	MOBIL #18-182
Site Street Number	3480
Site Street Name	MADISON ST
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Remediation
Status Date	2008-09-03
Lead Agency	RIVERSIDE COUNTY LOP
Local Agency	RIVERSIDE COUNTY LOP
File Location	Local Agency
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

Location	33.93141, -117.4106
Distance to site	4988 ft / 0.94 mi SE
Site Name	BMW OF RIVERSIDE
Site Street Number	7850
Site Street Name	INDIANA AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	2003-03-28
Lead Agency	RIVERSIDE COUNTY LOP
Local Agency	RIVERSIDE COUNTY LOP
File Location	Local Agency Warehouse
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

CA Leaking Underground Storage Tanks

Location	33.93258, -117.4085
Distance to site	5042 ft / 0.95 mi SE
Site Name	DAVE'S AUTO
Site Street Number	7740
Site Street Name	INDIANA AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	1998-06-19
Lead Agency	RIVERSIDE COUNTY LOP
Local Agency	RIVERSIDE COUNTY LOP
File Location	Local Agency Warehouse
Contaminant	Gasoline
Contaminated Medium	Soil

CA CERCLIS Equivalent

This database returned no results for your area.

The Department of Toxic Substances Controls (DTSC) Site Mitigation and Brownfields Reuse Program (SMBRP) EnviroStor database identifies CERCLIS equivalent sites as "State Response". These are sites known or suspected to contain uncontrolled or abandoned hazardous substance facilities.

CA NPL Equivalent

This database returned no results for your area.

The Department of Toxic Substances Controls (DTSC) Site Mitigation and Brownfields Reuse Program (SMBRP) EnviroStor database identifies sites on the National Priority List (NPL). This is the equivalent of the Federal NPL identifying facilities and study areas with known contamination that are given priority for remedial action.

CA Hazardous Waste Sites

This database returned no results for your area.

The Department of Toxic Substances Controls (DTSC) Site Mitigation and Brownfields Reuse Program (SMBRP) EnviroStor database identifies Hazardous Waste Sites. These include...

All hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code.

All land designated as hazardous waste property or border zone property pursuant to Article 11 (commencing with Section 25220) of Chapter 6.5 of Division 20 of the Health and Safety Code.

All information received by the Department of Toxic Substances Control pursuant to Section 25242 of the Health and Safety Code on hazardous waste disposals on public land.

All sites listed pursuant to Section 25356 of the Health and Safety Code.

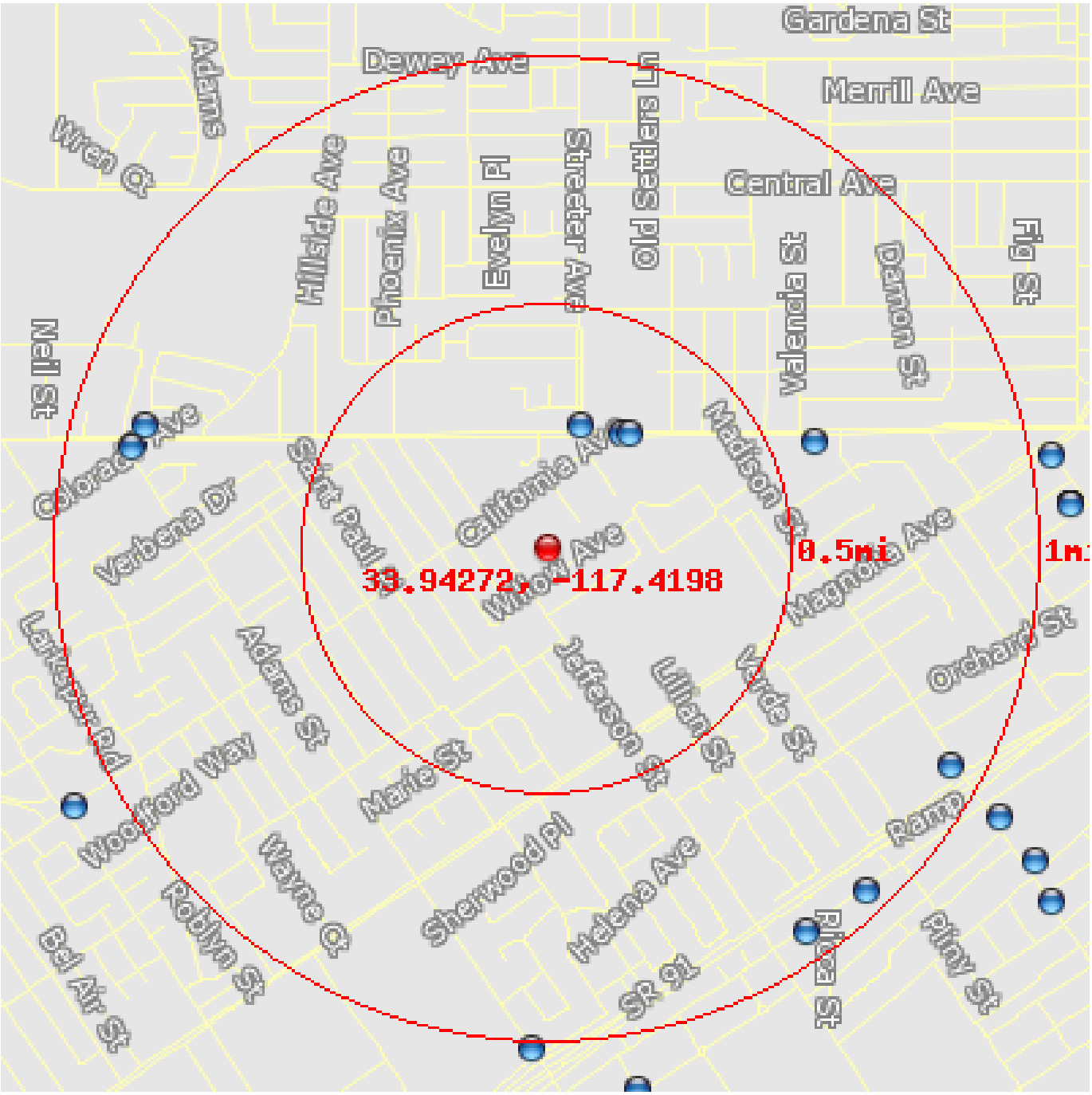
All sites included in the Abandoned Site Assessment Program.

CA Activity Use Restrictions

This database returned no results for your area.

Activity and Use Limitations (AULs), also known as Environmental Land-Use Controls (LUCs) – An AUL is a restriction, covenant or notice concerning the use of real property, which is imposed on real property. AULs and LUCs are further categorized as Institutional Controls (ICs) and Engineering Controls (ECs). An IC is a legal or regulatory restriction on the use of a property, limiting the use of groundwater and excavations or preventing such businesses as day care centers or schools on the property. An EC involves physical means of restricting site access or use in order to prevent the spreading or exposure of a contaminant. Frequently implemented engineering controls include requiring black top on the surface, building of structures to prevent exposure or even notices to the public that are posted on the grounds warning of contaminants.

CA Spills, Leaks, Investigations, and Cleanups



This database returned 10 results for your area.

The Spills, Leaks, Investigation & Cleanup (SLIC) Program is responsible for site investigation and corrective action involving sites not overseen by the Underground Tank Program and the Well Investigation Program. This program is not restricted to particular pollutants or environments; rather, the program covers all types of pollutants (such as solvents, petroleum fuels, and heavy metals) and all environments (including surface and water, groundwater, and the vadose zone). Upon confirming that an unauthorized discharge is polluting or threatens to pollute regional water bodies, the Regional Board oversees site investigation and corrective action. Statutory authority for the program is derived from the California Water Code, Division 7, Section 13304. Guidelines for site investigation and remediation are promulgated in State Board Resolution No. 92-49 entitled Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304.

CA Spills, Leaks, Investigations, and Cleanups

Location	33.94619, -117.4186
Distance to site	1324 ft / 0.25 mi N
Site Name	Chevron #3673 (CHEVRON #93673)
Site Street Number	5305
Site Street Name	ARLINGTON AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	2002-05-14
Lead Agency	SANTA ANA RWQCB (REGION 8)
Local Agency	RIVERSIDE COUNTY LOP
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

Location	33.94602, -117.4172
Distance to site	1450 ft / 0.27 mi NE
Site Name	CROWN CLEANERS, HARDMAN CENTER
Site Street Number	5190
Site Street Name	ARLINGTON AVENUE
Site City	RIVERSIDE
Site State	CA
Site County	Riverside
Status	Completed - Case Closed
Status Date	2003-07-01
Lead Agency	SANTA ANA RWQCB (REGION 8)

Location	33.94598, -117.4168
Distance to site	1504 ft / 0.28 mi NE
Site Name	SEARS Retail
Site Street Number	5261
Site Street Name	ARLINGTON AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	2003-06-25
Lead Agency	SANTA ANA RWQCB (REGION 8)
Local Agency	RIVERSIDE COUNTY LOP
File Location	Regional Board
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

CA Spills, Leaks, Investigations, and Cleanups

Location	33.94575, -117.4103
Distance to site	3083 ft / 0.58 mi E
Site Name	March Air Reserve Base - March Air Reserve Base
Site Street Name	Graber Street
Site City	MARCH ARB
Site State	CA
Site Zip	92518
Site County	Riverside
Status	Completed - Case Closed
Status Date	2000-10-10
Lead Agency	SANTA ANA RWQCB (REGION 8)
Local Agency	RIVERSIDE COUNTY LOP
Contaminant	Gasoline
Contaminated Medium	Soil

Location	33.94621, -117.4339
Distance to site	4461 ft / 0.84 mi W
Site Name	FORMER SHELL #5995
Site Street Number	5995
Site Street Name	ARLINGTON AVENUE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Site Assessment
Status Date	2008-06-17
Lead Agency	SANTA ANA RWQCB (REGION 8)
Local Agency	RIVERSIDE COUNTY LOP
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

Location	33.94568, -117.4343
Distance to site	4519 ft / 0.86 mi W
Site Name	UNITED OIL COMPANY STATION #37
Site Street Number	6020
Site Street Name	ARLINGTON AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Remediation
Status Date	2008-02-04
Lead Agency	SANTA ANA RWQCB (REGION 8)
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

CA Spills, Leaks, Investigations, and Cleanups

Location	33.94561, -117.4344
Distance to site	4545 ft / 0.86 mi W
Site Name	E-Z SERVE SERVICE STATION
Site Street Number	6050
Site Street Name	ARLINGTON AVENUE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Site Assessment
Status Date	2004-03-25
Lead Agency	SANTA ANA RWQCB (REGION 8)
Contaminant	Other Solvent or Non-Petroleum Hydrocarbon
Contaminated Medium	Other Groundwater (uses other than drinking water)

Location	33.93627, -117.4055
Distance to site	4923 ft / 0.93 mi SE
Site Name	MOBIL #18-182
Site Street Number	3480
Site Street Name	MADISON ST
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Open - Remediation
Status Date	2008-09-03
Lead Agency	RIVERSIDE COUNTY LOP
Local Agency	RIVERSIDE COUNTY LOP
File Location	Local Agency
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

CA Spills, Leaks, Investigations, and Cleanups

Location	33.93141, -117.4106
Distance to site	4988 ft / 0.94 mi SE
Site Name	BMW OF RIVERSIDE
Site Street Number	7850
Site Street Name	INDIANA AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	2003-03-28
Lead Agency	RIVERSIDE COUNTY LOP
Local Agency	RIVERSIDE COUNTY LOP
File Location	Local Agency Warehouse
Contaminant	Gasoline
Contaminated Medium	Aquifer used for drinking water supply

Location	33.93258, -117.4085
Distance to site	5042 ft / 0.95 mi SE
Site Name	DAVE'S AUTO
Site Street Number	7740
Site Street Name	INDIANA AVE
Site City	RIVERSIDE
Site State	CA
Site Zip	92504
Site County	Riverside
Status	Completed - Case Closed
Status Date	1998-06-19
Lead Agency	RIVERSIDE COUNTY LOP
Local Agency	RIVERSIDE COUNTY LOP
File Location	Local Agency Warehouse
Contaminant	Gasoline
Contaminated Medium	Soil

CA Solid Waste Landfills

This database returned no results for your area.

The Solid Waste Landfill List (SWLF) database is provided by the California Solid Waste Information System (SWIS) and consists of both open as well as closed inactive solid waste disposal facilities and transfer stations pursuant to the Solid Waste Management and Resource Recovery Act of 1972.

CA Oil and Gas Wells

This database returned no results for your area.

The California Department of Conservation, Division of Oil, Gas and Thermal Resources (DOGGR) was created to serve the needs of the state, local governments, and industry by regulating statewide oil and gas activities with uniform laws and regulations. The DOGGR supervises the drilling, operation, maintenance, and plugging and abandonment of onshore and offshore oil, gas, and geothermal wells, preventing damage to: (1) life, health, property, and natural resources; (2) underground and surface waters suitable for irrigation or domestic use; and (3) oil, gas and geothermal reservoirs.

CA Voluntary Cleanup Sites

This database returned no results for your area.

The Department of Toxic Substances Controls (DTSC) Site Mitigation and Brownfields Reuse Program (SMBRP) EnviroStor database identifies Voluntary Cleanup sites. These sites include low threat level properties with confirmed or unconfirmed releases. The responsible parties have requested that DTSC oversee investigation and/or cleanup activities and agreed to offset DTSC expenses.

Appendix F

Noise Impact Assessments

KUNZMAN ASSOCIATES, INC.

HARRIS RANCH
(TENTATIVE TRACT MAP NO. 36694)

INTERIOR NOISE ASSESSMENT

September 30, 2015

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

September 30, 2015

Mr. Jeff Moore, Vice President of Construction
R.C. HOBBS COMPANY, INC.
1110 East Chapman Avenue, Suite 201
Orange, CA 92866

Dear Mr. Moore:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide this interior noise assessment for the proposed Harris Ranch (Tentative Tract Map No. 36694) project. The project site is located on the north side of Jefferson Street (between California Avenue and Willow Avenue) in the City of Riverside. The project proposes to construct 36 townhome condominium dwelling units on 2.96 acres.

This interior noise assessment evaluates the estimated sound transmission class (STC) and Outdoor-Indoor Sound Transmission Class (OITC) for the project, estimates the interior noise level for habitable rooms and compares the results to the applicable City of Riverside's noise standards. Figure 1 and Figure 2 demonstrate the proposed project location map and site plan, respectively.

STATE AND LOCAL ACOUSTICAL REQUIREMENTS

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable and clearly unacceptable.

Noise insulation design standards for multi-family residences have been established by the State of California Uniform Building Code (UBC) Appendix Chapter 12, Division II and by the Title 24 noise insulation standards of the California Administrative Code. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise

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WWW.TRAFFIC-ENGINEER.COM

standards throughout the city or on a case-by-case basis, if deemed necessary. In brief, the Title 24 noise standards require the following for multi-family attached residential dwelling units:

1. Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.
2. Floor-ceiling assembly designs must provide for a minimum impact insulation class (IIC) of 50, based on lab tests. Field tested assemblies must provide a minimum FIIC of 45.
3. Entry doors from interior corridors must provide an STC of 26 or more.
4. Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.
5. Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

Thus, the interior limit is 45 dBA CNEL between dwelling units and from exterior noise sources to interior living spaces. In addition, to provide a reasonable expectation that this standard can be met under normal conditions, the design of party walls and floor/ceiling assemblies for multi-family attached residential dwelling units must be based on laboratory tested assemblies that test at a sound transmission class of 50 STC, or better.

Per the City of Riverside's preliminary comments the following outlines the noise requirements as outlined by the City:

> *Units #1 through 4 are located within the 65 dBA CNEL contour for Jefferson Street. The noise analysis must demonstrate that construction techniques reduce exterior levels down to an acceptable 45 dBA CNEL.*

Therefore, the project must demonstrate compliance to a 45 dBA CNEL interior noise standard.

PROCEDURE/METHODOLOGY

The Insul8.0 acoustical modeling software was used to determine the estimated interior noise level by assessing the sound transmission class (STC) rating for proposed building design (e.g., 7/8" stucco, ship lap siding, 2" x 4" wood studs, 1/2" gypsum wall board (GWB), filled with 3.5" insulation). STC is used to define a partition's ability to block sound. The project site is located within the 65 dBA CNEL contour of Jefferson Avenue and therefore this assessment assumes a 65 dBA CNEL exterior noise level.

FINDINGS

The Insul8.0 calculation outputs for the various assembly designs and the estimated outdoor to indoor sound transmission are located in Appendix A. The building shell design was evaluated including the exterior/interior wall assembly design, the roof assembly and windows for the proposed project based on typical residential construction techniques.

Exterior/Interior Wall Assembly
The following outlines the estimated construction for the exterior/interior wall assembly (outside to inside): 7/8" stucco and/or 5/8" ship-lap hardie backer style over 2" x 4" wood studs, filled with 3.5 insulation in cavity, and 1/2" GWB, resulting in an STC rating of 47.

Windows and Sliding Glass Doors
A specific window type has yet to be determined for the project however, a minimum dual pane, low-e vinyl window with an STC-28 was assumed for this assessment.

Roof Assembly
The following outlines the estimated construction for the roof assembly (outside to inside): concrete flat roof tiles, constructed over 5/8" sheathing, trusses with a minimum height of 8" and increasing with the slope of roof, filled with a minimum 3.5" insulation and 1/2" GWB (ceiling), resulting in an STC rating of 46. Figure 3 details the rear elevation for the proposed project.

Demising Wall (Common Wall Assembly)
Per Title 24 building requirements, common wall assemblies separating two (2) dwelling units shall have a minimum STC 50 or higher. The following outlines a common wall assembly design which achieves an STC 55 (see Appendix A for calculations): double studded 2" x 6" wall or 2" x 4" wall, separated by a 1" or 2" gap, with 1-layer of 5/8" gypsum wall board (GWB) on each side and batt insulation. It should be noted that there many other single and double studded wall types that can achieve an STC 50 rating or higher.

Special care must be taken to ensure each partition is acoustically sealed by using either proper acoustical sealant or U.L. approved fire sealant (depending on the partition). The elimination of airborne noise leakage is equally as critical as noise control. A crack, which represents only one (1) or two (2) percent open area in the total wall surface, will transmit a large percentage of the noise energy incident upon the wall.

Any crack, gap, or hole will allow sound to flank and penetrate the partition. Seal between the seams of adjacent gypsum wall board (GWB) with Green GlueTM (or other glue with similar properties). For example, gluing the end and side edges of each adjacent board to each other will stop sound penetration. Tape all GWB. Caulk all perimeter gaps with special non-hardening, non-shrinking, non skinning acoustical caulking. Isolate perimeters of common walls from ceilings. Fill in perimeters (i.e., 1/8-in-wide clearance) with either non-hardening, non-shrinking, non-skinning acoustical caulking or U.L. approved fire sealant. Please note that any dual layers of GWB should be staggered, and outlets on demising walls should be acoustically treated as demonstrated on Figure 4.

CONCLUSION

Interior noise level projections were calculated based on a 65 dBA CNEL exterior noise level assumption. The interior noise level will be 39 dBA CNEL (when windows are closed) based on an exterior 65 dBA CNEL and typical building assembly construction techniques as outlined above. The project will therefore comply with the City of Riverside's 45 dBA CNEL interior requirement. No further mitigation is required.

Mr. Jeff Moore, Vice President of Construction
R.C. HOBBS COMPANY, INC.
September 30, 2015

Kunzman Associates, Inc. is pleased to provide this interior noise assessment for the proposed Harris Ranch (Tentative Tract Map No. 36994) project. If you have questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Respectfully submitted,

KUNZMAN ASSOCIATES, INC.

Mike Dickerson

Mike Dickerson, INCE
Senior Associate

#6290

Figure 1
Project Location Map

6290/1

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 2
Site Plan

6290/2

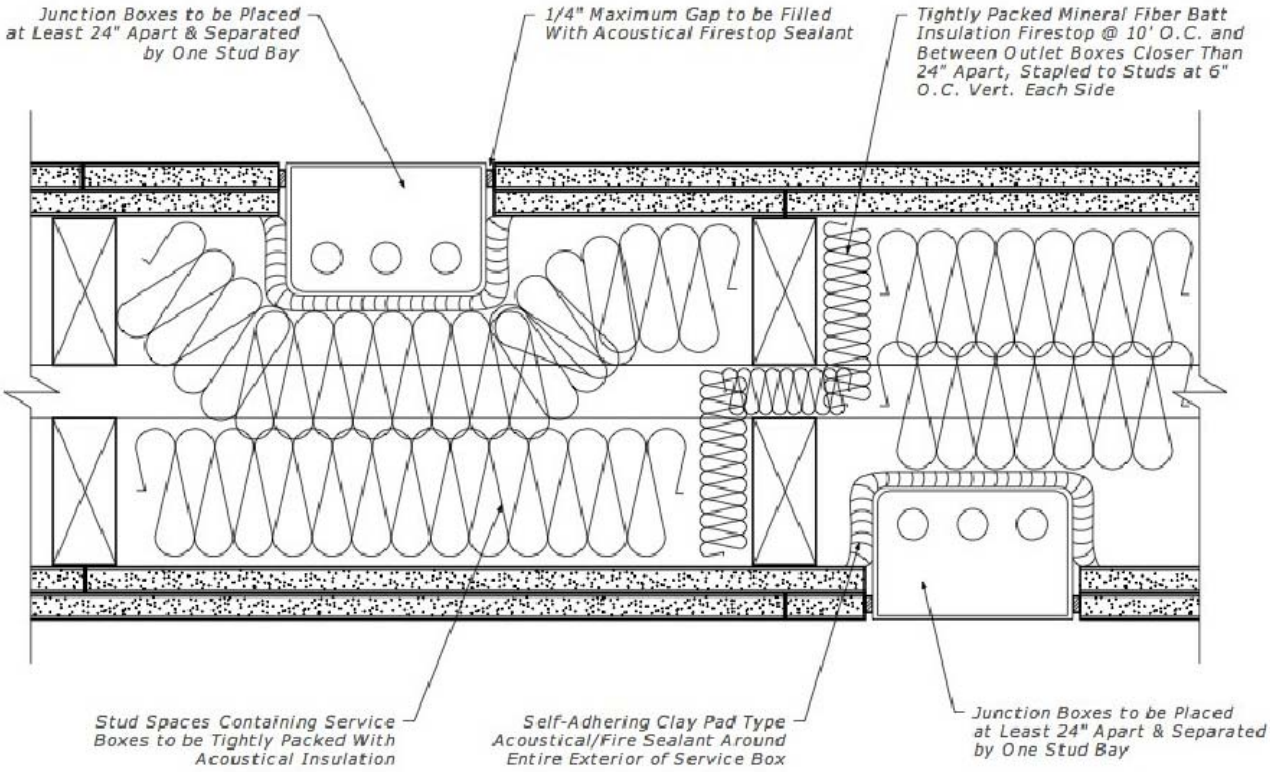
KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 3
Project Rear Elevation

6290/3

Figure 4
Acoustic Wall Treatments



JUNCTION BOX AT DOUBLE STUD PARTY WALL

scale: 3"=1'-0" 003

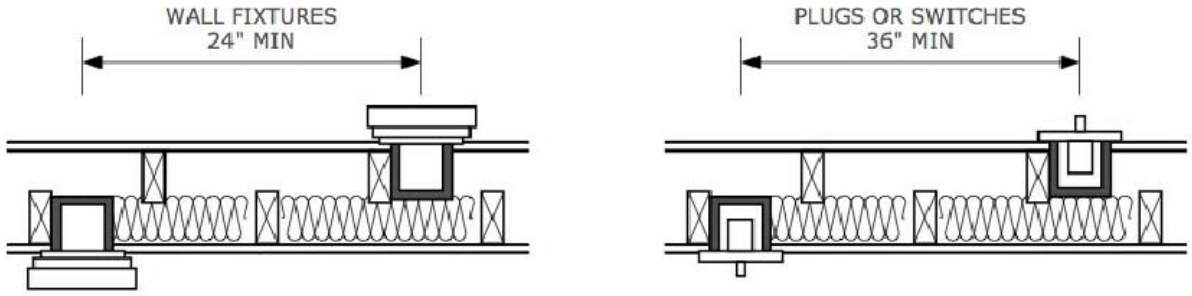
NOTES:

1- APPROVED SERVICE BOXES, ACOUSTICALLY TREATED AS SHOWN, SHALL BE INSTALLED AT ALL SERVICE OPENINGS INCLUDING LOW VOLTAGE. WHERE SERVICE BOXES MUST BE PLACED CLOSER THAN 24" DUE TO UNIT LAYOUT, BOXES MUST BE SEPARATED BY AT LEAST ONE PAIR OF STUDS AND TIGHTLY PACKED INSULATION.

2- PLUG ALL UNUSED KNOCK-OUTS IN OUTLET BOXES WITH KNOCK-OUT CAPS.

3- DRILL OUT ALL STUDS. NO NOTCHING IS ALLOWED.

4- ALL OUTLET BOXES SHALL BE STEEL.



JUNCTION BOX AT STAGGARD STUD PARTY WALL

NTS 004

6290/4

APPENDIX A

STC/OITC CALCULATIONS OUTPUT

Sound Insulation Prediction (v8.0.7)

Program copyright Marshall Day Acoustics 2015

- Key No. 2319

Margin of error is generally within STC +/- 3 dB

Job Name:Harris Ranch

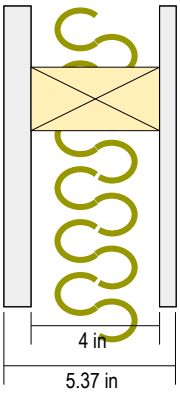
Job No.:6290 Page No.:

Date: 30 Sep 15 Initials:MD

File Name: Exterior Wall-STC47.ixl

Notes:

Exterior/Interior Wall Assembly



STC 47

OITC 34

System description

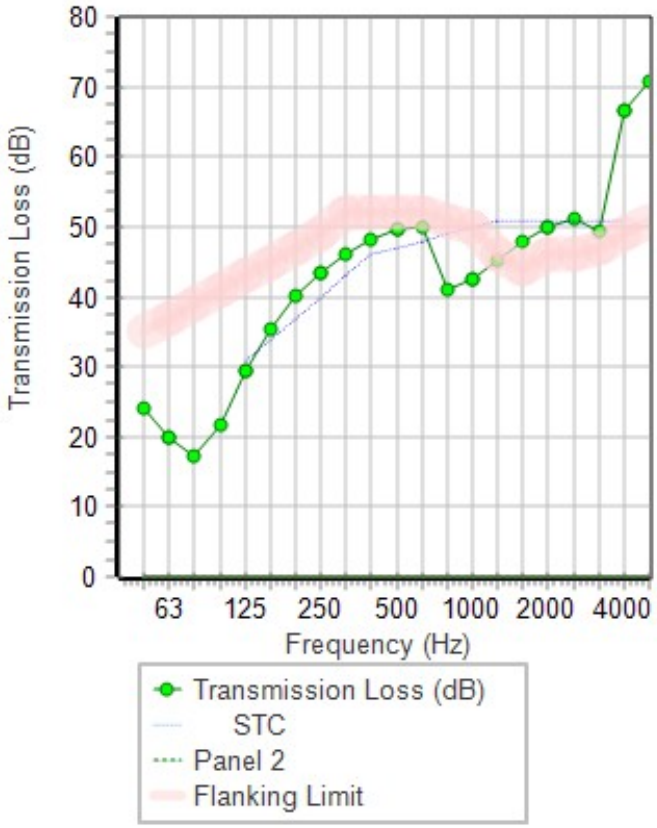
Panel 1 : 1 x 0.87 in -Coat Plaster (sand:gypsum =3:1) (ρ:137.3 lbs/ft3,E:5.3psi*10^6,η:0.04)

Cavity: Timber stud: Stud spacing 24 in , Infill Fibreglass (10kg/m3) Thickness 2 in (ρ:10 lbs/ft3, Rf:4000 Pa.s/m2)
Panel 2 + 1 x 0.50 in Gypsum Board (ρ:40.02 lbs/ft3,E:0.24psi*10^6,η:0.01)

Mass-air-mass resonant frequency =63 Hz

frequency (Hz)	TL(dB)	TL(dB)
50	24	
63	20	20
80	17	
100	22	
125	29	26
160	36	
200	40	
250	44	43
315	46	
400	48	
500	50	49
630	50	
800	41	
1000	43	43
1250	45	
1600	48	
2000	50	49
2500	51	
3150	49	
4000	67	54
5000	71	

Panel Size 8.9x13 ft; Mass 11.8 lb/ft2



Sound Insulation Prediction (v8.0.7)

Program copyright Marshall Day Acoustics 2015

- Key No. 2319

Margin of error is generally within STC +/- 3 dB

Job Name:Harris Ranch

Job No.:6290 Page No.:

Date: 30 Sep 15 Initials:MD

File Name: Window-STC28.ixl

Notes:

Glass/Windows

STC 28

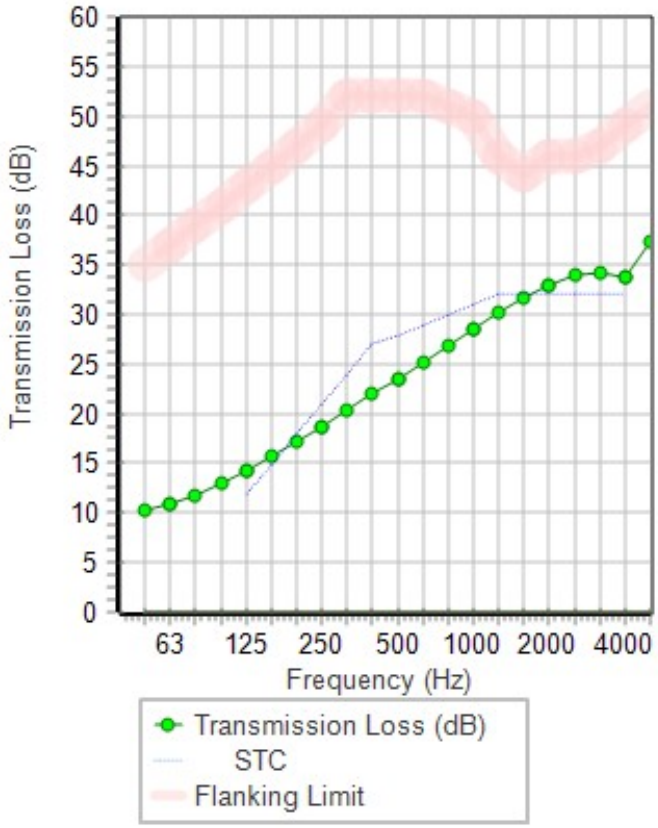
OITC 22

System description

+ 1 x 0.14 in Laminated Glass (generic PVB-0.015 in) (ρ:151.7 lbs/ft3,E:6.7psi*10^6,η:0.08)

frequency (Hz)	TL(dB)	TL(dB)
50	10	
63	11	11
80	12	
100	13	
125	14	14
160	16	
200	17	
250	19	19
315	20	
400	22	
500	24	23
630	25	
800	27	
1000	29	28
1250	30	
1600	32	
2000	33	33
2500	34	
3150	34	
4000	34	35
5000	37	

Panel Size 8.9x13 ft; Mass 4.7 lb/ft2

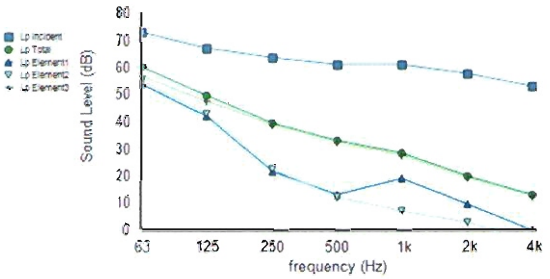


Sound Insulation Prediction (v8.0.7)

According to EN12354/3

Title :Harris Ranch Interior Noise Assessment

Comments :



Date: 30 Sep 15 Initials:MD

File Name: Interior Assessment.inz

	Octave Band Centre Frequency (Hz)							Overall dBA
Source	63	125	250	500	1k	2k	4k	
Incident sound level (freefield)	73	67	63	61	61	58	53	65
Path								
Element 1 ,Exterior Wall STL	-20	-26	-43	-49	-43	-49	-54	
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [108 ft2]	10	10	10	10	10	10	10	
Element sound level contribution	54	42	21	13	19	9.4	-0.37	30
Element 2 ,Roof STL	-19	-25	-42	-50	-55	-56	-57	
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [108 ft2]	10	10	10	10	10	10	10	
Element sound level contribution	55	43	22	12	6.6	2.4	-3.4	31
Element 3 ,Window STL	-11	-14	-19	-23	-28	-33	-35	
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [25 ft2]	4	4	4	4	4	4	4	
Element sound level contribution	56	47	39	32	27	19	12	37
Receiver								
Room volume (-10Log V) [1766 ft3]	-17	-17	-17	-17	-17	-17	-17	
Reveberation time (s)	0 5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10Log T)	-3	-3	-3	-3	-3	-3	-3	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	60	49	39	33	28	20	13	39

Sound Insulation Prediction (v8.0.7)

Program copyright Marshall Day Acoustics 2015

- Key No. 2319

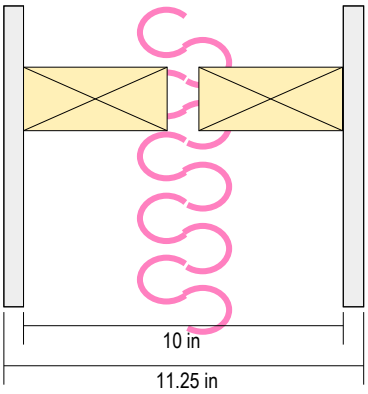
Margin of error is generally within STC +/- 3 dB

Job Name:

Job No.: Page No.: Notes:

Date: 30 Sep 15 Initials:

File Name: Demising Wall-STC-55.ixl



STC 55

OITC 39

System description

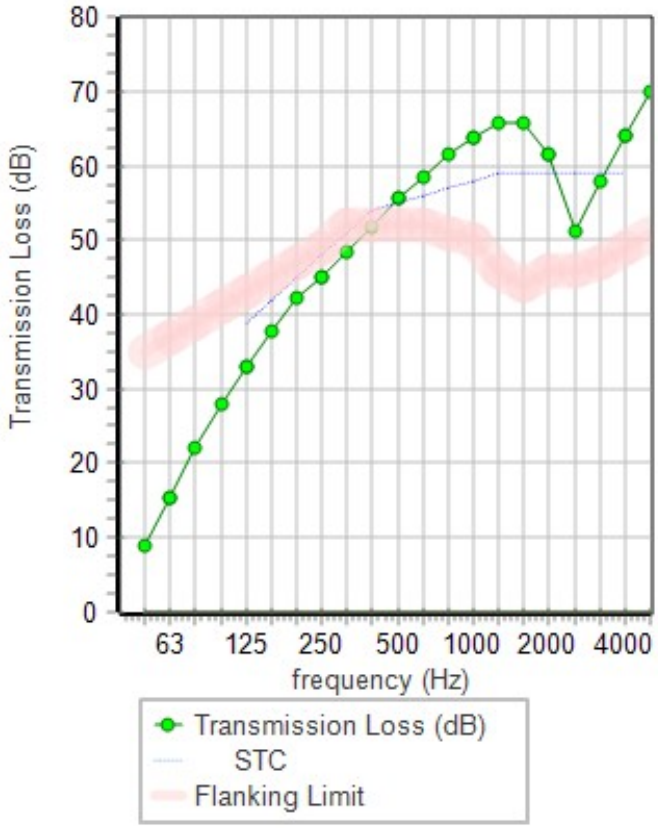
Panel 1 : 1 x 0.63 in Type X Gypsum Board (ρ:43.08 lbs/ft3,E:0.27psi*10^6,η:0.01)

Cavity: Double timber stud: Stud spacing 16 in , Infill fiberglass (0.6 lb/ft3) Thickness 3 in (ρ:10 lbs/ft3, Rf:3500 Pa.s/m2)
Panel 2 + 1 x 0.63 in Type X Gypsum Board (ρ:43.08 lbs/ft3,E:0.27psi*10^6,η:0.01)

Mass-air-mass resonant frequency =44 Hz

frequency (Hz)	TL(dB)	TL(dB)
50	9	
63	15	13
80	22	
100	28	
125	33	31
160	38	
200	42	
250	45	44
315	48	
400	52	
500	56	54
630	59	
800	61	
1000	64	63
1250	66	
1600	66	
2000	62	55
2500	51	
3150	58	
4000	64	62
5000	70	

Panel Size 8.9x13 ft; Mass 4.7 lb/ft2



Kunzman Associates, Inc.

OVER 35 YEARS OF EXCELLENT SERVICE

1111 Town & Country Road, Suite 34
Orange, California 92868
(714) 973-8383

www.traffic-engineer.com

January 13, 2016

Mr. Jeff Moore, Vice President of Construction
R.C. HOBBS COMPANY, INC.
1110 East Chapman Avenue, Suite 201
Orange, CA 92866

Dear Mr. Moore:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide this exterior/interior noise assessment for the proposed Harris Farm (Tentative Tract Map No. 36994) project. The project site is located on the north side of Jefferson Street (between California Avenue and Willow Avenue) in the City of Riverside. The project proposes to construct 36 townhome condominium dwelling units on 2.96 acres.

The exterior noise assessment evaluates the outdoor noise levels at Units 1 thru 4 and compares the result to the applicable City's noise standard.

This interior noise assessment evaluates the estimated sound transmission class (STC) and Outdoor-Indoor Sound Transmission Class (OITC) for the project, estimates the interior noise level for habitable rooms and compares the results to the applicable City of Riverside's noise standards. Figure 1 and Figure 2 demonstrate the proposed project location map and site plan, respectively.

STATE AND LOCAL ACOUSTICAL REQUIREMENTS

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable and clearly unacceptable.

Noise insulation design standards for multi-family residences have been established by the State of California Uniform Building Code (UBC) Appendix Chapter 12, Division II and by the Title 24 noise insulation standards of the California Administrative Code. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis, if deemed necessary. In brief, the Title 24 noise standards require the following for multi-family attached residential dwelling units:

1. Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.
2. Floor-ceiling assembly designs must provide for a minimum impact insulation class (IIC) of 50, based on lab tests. Field tested assemblies must provide a minimum FIIC of 45.
3. Entry doors from interior corridors must provide an STC of 26 or more.
4. Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.
5. Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

Thus, the interior limit is 45 dBA CNEL between dwelling units and from exterior noise sources to interior living spaces. In addition, to provide a reasonable expectation that this standard can be met under normal conditions, the design of party walls and floor/ceiling assemblies for multi-family attached residential dwelling units must be based on laboratory tested assemblies that test at a sound transmission class of 50 STC, or better.

Per the City of Riverside's preliminary comments the following outlines the noise requirements as outlined by the City:

> *Units #1 through 4 are located within the 65 dBA CNEL contour for Jefferson Street. The noise analysis must demonstrate that outdoor areas do not exceed 55 dBA CNEL and construction techniques reduce interior levels down to an acceptable 45 dBA CNEL.*

Therefore, the project must demonstrate compliance to a 55 dBA exterior standard for useable outdoor areas and 45 dBA CNEL interior noise standard.

PROCEDURE/METHODOLOGY

Traffic noise calculations and reductions were calculated 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, site conditions (hard or soft surface) and building height. Traffic data was obtained from the City's 2025 buildout volumes. Calculation outputs are located in Appendix A.

The Insul8.0 acoustical modeling software was used to determine the estimated interior noise level by assessing the sound transmission class (STC) rating for proposed building design (e.g., 7/8" stucco, ship

lap siding, 2” x 4” wood studs, 1/2” gypsum wall board (GWB), filled with 3.5” insulation). STC is used to define a partition’s ability to block sound. The Insul8.0 calculation outputs for the various assembly designs and the estimated outdoor to indoor sound transmission are located in Appendix B.

FINDINGS

Exterior Results

Units 1 thru 4 are located within the 65 dBA CNEL contour along Jefferson Street. The useable outdoor areas are located at the rear of the building (opposite side from Jefferson Street). The architectural layout design will reduce the noise level to 46.7 dBA CNEL. The level is below the City’s 55 dBA CNEL limit and therefore no significant impact is anticipated.

The daytime level will range between 42 to 45 dBA and the nighttime level will be 38 dBA, which is below the City’s noise standards.

Interior Results

The building shell design was evaluated including the exterior/interior wall assembly design, the roof assembly and windows for the proposed project based on typical residential construction techniques.

Exterior/Interior Wall Assembly

The following outlines the estimated construction for the exterior/interior wall assembly (outside to inside): 7/8” stucco and/or 5/8” ship-lap hardie backer style over 2” x 4” wood studs, filled with 3.5 insulation in cavity, and 1/2" GWB, resulting in an STC rating of 47.

Windows and Sliding Glass Doors

A specific window type has yet to be determined for the project however, a minimum dual pane, low-e vinyl window with an STC-28 was assumed for this assessment.

Roof Assembly

The following outlines the estimated construction for the roof assembly (outside to inside): concrete flat roof tiles, constructed over 5/8” sheathing, trusses with a minimum height of 8” and increasing with the slope of roof, filled with a minimum 3.5” insulation and 1/2” GWB (ceiling), resulting in an STC rating of 46.

Demising Wall (Common Wall Assembly)

Per Title 24 building requirements, common wall assemblies separating two (2) dwelling units shall have a minimum STC 50 or higher. The following outlines a common wall assembly design which achieves an STC 55 (see Appendix A for calculations): double studded 2" x 6" wall or 2" x 4" wall, separated by a 1" or 2” gap, with 1-layer of 5/8” gypsum wall board (GWB) on each side and batt insulation. It should be noted that there many other single and double studded wall types that can achieve an STC 50 rating or higher.

Special care must be taken to ensure each partition is acoustically sealed by using either proper acoustical sealant or U.L. approved fire sealant (depending on the partition). The elimination of airborne noise leakage is equally as critical as noise control. A crack, which represents only one (1) or

two (2) percent open area in the total wall surface, will transmit a large percentage of the noise energy incident upon the wall.

Any crack, gap, or hole will allow sound to flank and penetrate the partition. Seal between the seams of adjacent gypsum wall board (GWB) with Green GlueTM (or other glue with similar properties). For example, gluing the end and side edges of each adjacent board to each other will stop sound penetration. Tape all GWB. Caulk all perimeter gaps with special non-hardening, non-shrinking, non skinning acoustical caulking. Isolate perimeters of common walls from ceilings. Fill in perimeters (i.e., 1/8-in-wide clearance) with either non-hardening, non-shrinking, non-skinning acoustical caulking or U.L. approved fire sealant. Please note that any dual layers of GWB should be staggered, and outlets on demising walls should be acoustically treated as demonstrated on Figure 4.

CONCLUSION

As discussed above, outdoor levels at Units 1 thru 4 (outdoor useable areas) will be below the City's exterior noise criteria of 55 dBA CNEL. All other useable outdoor areas will be further shielded from the architectural layout design and will be below the City's noise criteria. The interior noise level will be 39 dBA CNEL (when windows are closed) and typical building assembly construction techniques as outlined above. The project will therefore comply with the City of Riverside's 45 dBA CNEL interior requirement. No further mitigation is required.

Kunzman Associates, Inc. is pleased to provide this interior noise assessment for the proposed Harris Farm (Tentative Tract Map No. 36994) project. If you have questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Respectfully submitted,

KUNZMAN ASSOCIATES, INC.

Mike Dickerson

Mike Dickerson, INCE
Senior Associate

#6290

Figure 1
Project Location Map

6290/1

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 2
Site Plan

APPENDIX A

TRAFFIC NOISE WORKSHEETS

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT:	HARRIS FARM (TENTATIVE TRACT MAP NO. 36994) NOISE ANALYSIS	JOB #:	6290
ROADWAY:	JEFFERSON STREET	DATE:	12-Jan-16
LOCATION:	UNITS 1 THRU 4 (OUTDOOR AREA)	ENGINEER:	M. DICKERSON

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	10,000	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIST :	15	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	1,000	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		85
DIST C/L TO WALL =		50
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		35
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	25.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.9742
MEDIUM TRUCKS	0.848	0.049	0.103	0.0184
HEAVY TRUCKS	0.865	0.027	0.108	0.0074

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	94.83	- -
MEDIUM TRUCKS	4.0	94.02	- -
HEAVY TRUCKS	8.0	92.59	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.1	61.2	59.4	53.4	62.0	62.6
MEDIUM TRUCKS	54.8	53.3	47.0	45.4	53.9	54.1
HEAVY TRUCKS	55.8	54.4	45.3	46.6	54.9	55.1
NOISE LEVELS (dBA)	64.3	62.5	59.8	54.7	63.3	63.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	45.8	43.9	42.1	36.1	44.7	45.3
MEDIUM TRUCKS	37.9	36.4	30.1	28.5	37.0	37.2
HEAVY TRUCKS	39.7	38.3	29.2	30.5	38.8	39.0
NOISE LEVELS (dBA)	47.3	45.5	42.7	37.6	46.2	46.7

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	20	64	203	642
LDN	18	57	181	573

APPENDIX B

STC/OITC CALCULATIONS OUTPUT

Sound Insulation Prediction (v8.0.7)

Program copyright Marshall Day Acoustics 2015

- Key No. 2319

Margin of error is generally within STC +/- 3 dB

Job Name:Harris Ranch

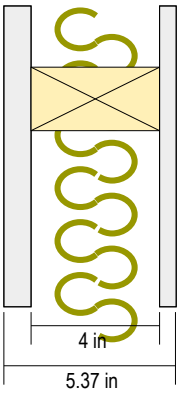
Job No.:6290 Page No.:

Date: 30 Sep 15 Initials:MD

File Name: Exterior Wall-STC47.ixl

Notes:

Exterior/Interior Wall Assembly



STC 47

OITC 34

System description

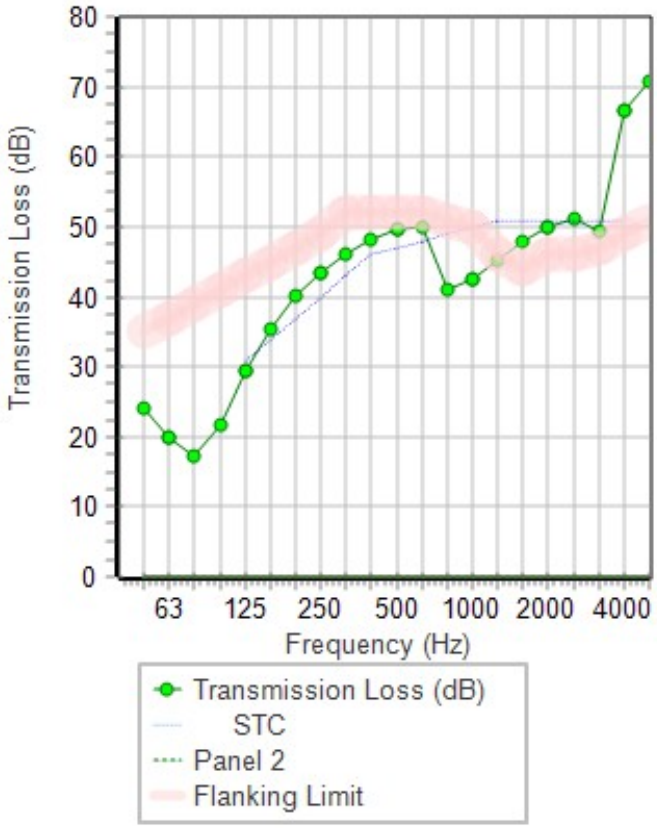
Panel 1 : 1 x 0.87 in -Coat Plaster (sand:gypsum =3:1) (ρ:137.3 lbs/ft3,E:5.3psi*10^6,η:0.04)

Cavity: Timber stud: Stud spacing 24 in , Infill Fibreglass (10kg/m3) Thickness 2 in (ρ:10 lbs/ft3, Rf:4000 Pa.s/m2)
Panel 2 + 1 x 0.50 in Gypsum Board (ρ:40.02 lbs/ft3,E:0.24psi*10^6,η:0.01)

Mass-air-mass resonant frequency =63 Hz

frequency (Hz)	TL(dB)	TL(dB)
50	24	
63	20	20
80	17	
100	22	
125	29	26
160	36	
200	40	
250	44	43
315	46	
400	48	
500	50	49
630	50	
800	41	
1000	43	43
1250	45	
1600	48	
2000	50	49
2500	51	
3150	49	
4000	67	54
5000	71	

Panel Size 8.9x13 ft; Mass 11.8 lb/ft2



Sound Insulation Prediction (v8.0.7)

Program copyright Marshall Day Acoustics 2015

- Key No. 2319

Margin of error is generally within STC +/- 3 dB

Job Name:Harris Ranch

Job No.:6290 Page No.:

Date: 30 Sep 15 Initials:MD

File Name: Window-STC28.ixl

Notes:

Glass/Windows

STC 28

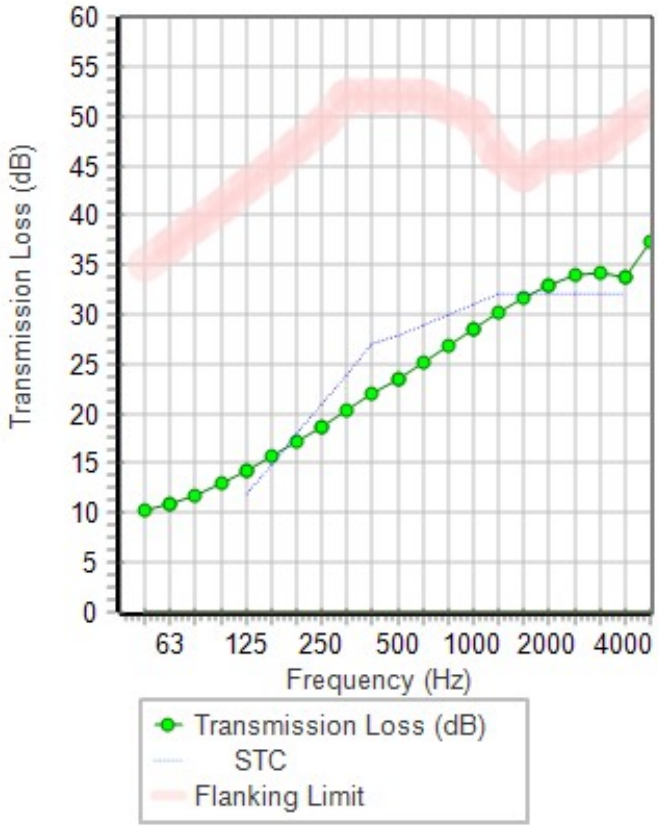
OITC 22

System description

+ 1 x 0.14 in Laminated Glass (generic PVB-0.015 in) (ρ:151.7 lbs/ft3,E:6.7psi*10^6,η:0.08)

frequency (Hz)	TL(dB)	TL(dB)
50	10	
63	11	11
80	12	
100	13	
125	14	14
160	16	
200	17	
250	19	19
315	20	
400	22	
500	24	23
630	25	
800	27	
1000	29	28
1250	30	
1600	32	
2000	33	33
2500	34	
3150	34	
4000	34	35
5000	37	

Panel Size 8.9x13 ft; Mass 4.7 lb/ft2

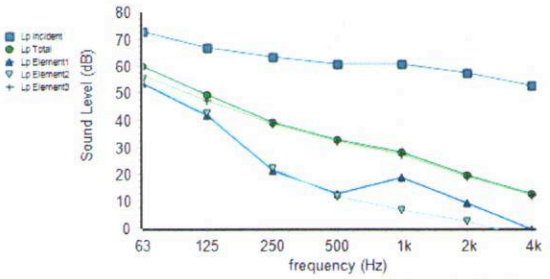


Sound Insulation Prediction (v8.0.7)

According to EN12354/3

Title :Harris Ranch Interior Noise Assessment

Comments :



Date: 30 Sep 15 Initials:MD

File Name: Interior Assessment.inz

	Octave Band Centre Frequency (Hz)							Overall dBA
Source	63	125	250	500	1k	2k	4k	
Incident sound level (freefield)	73	67	63	61	61	58	53	65
Path								
Element 1 ,Exterior Wall STL	-20	-26	-43	-49	-43	-49	-54	
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [108 ft2]	10	10	10	10	10	10	10	
Element sound level contribution	54	42	21	13	19	9.4	-0.37	30
Element 2 ,Roof STL	-19	-25	-42	-50	-55	-56	-57	
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [108 ft2]	10	10	10	10	10	10	10	
Element sound level contribution	55	43	22	12	6.6	2.4	-3.4	31
Element 3 ,Window STL	-11	-14	-19	-23	-28	-33	-35	
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [25 ft2]	4	4	4	4	4	4	4	
Element sound level contribution	56	47	39	32	27	19	12	37
Receiver								
Room volume (-10Log V) [1766 ft3]	-17	-17	-17	-17	-17	-17	-17	
Reveberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10Log T)	-3	-3	-3	-3	-3	-3	-3	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	60	49	39	33	28	20	13	39

Sound Insulation Prediction (v8.0.7)

Program copyright Marshall Day Acoustics 2015

- Key No. 2319

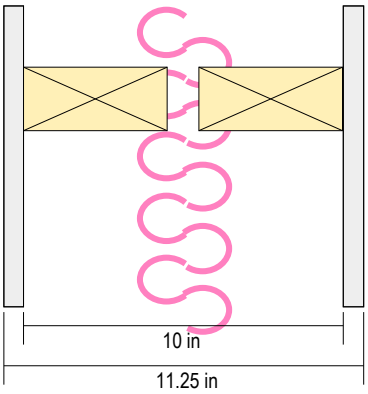
Margin of error is generally within STC +/- 3 dB

Job Name:

Job No.: Page No.: Notes:

Date: 30 Sep 15 Initials:

File Name: Demising Wall-STC-55.ixl



STC 55

OITC 39

System description

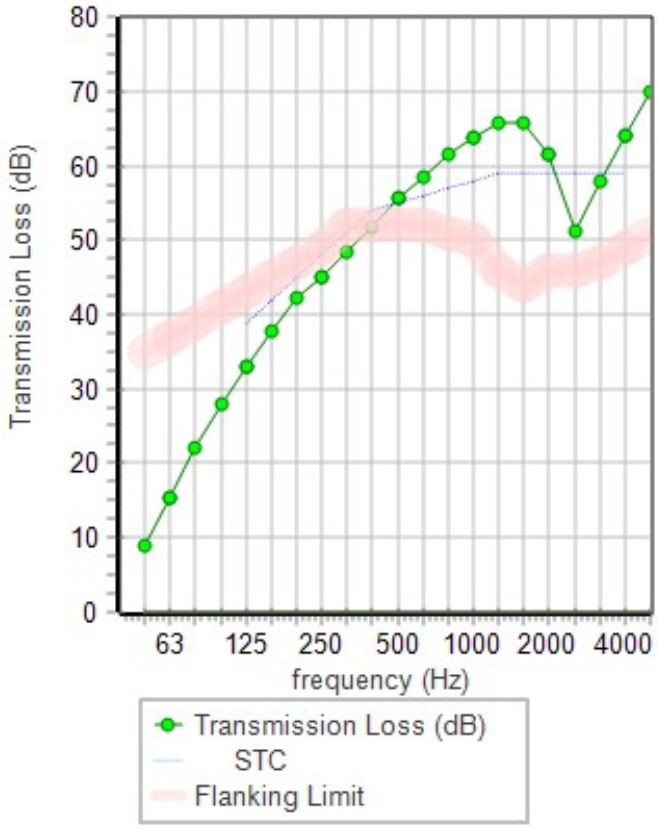
Panel 1 : 1 x 0.63 in Type X Gypsum Board (ρ:43.08 lbs/ft3,E:0.27psi*10^6,η:0.01)

Cavity: Double timber stud: Stud spacing 16 in , Infill fiberglass (0.6 lb/ft3) Thickness 3 in (ρ:10 lbs/ft3, Rf:3500 Pa.s/m2)
Panel 2 + 1 x 0.63 in Type X Gypsum Board (ρ:43.08 lbs/ft3,E:0.27psi*10^6,η:0.01)

Mass-air-mass resonant frequency =44 Hz

frequency (Hz)	TL(dB)	TL(dB)
50	9	
63	15	13
80	22	
100	28	
125	33	31
160	38	
200	42	
250	45	44
315	48	
400	52	
500	56	54
630	59	
800	61	
1000	64	63
1250	66	
1600	66	
2000	62	55
2500	51	
3150	58	
4000	64	62
5000	70	

Panel Size 8.9x13 ft; Mass 4.7 lb/ft2



Appendix G

Cultural Resource Assessment (under separate cover)