City of Brentwood
Community Development Department

THE CITY OF
BRENTWOOD
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Sand Creek Sports Complex Project

Initial Study/Mitigated Negative Declaration

May 2024

Prepared by

RANEY
PLANNING & MANAGEMENT, INC.
25 years
1501 Sports Drive, Suite A, Sacramento, CA 95834

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APPENDICES:

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

May 2024

A. PROJECT SUMMARY

1.	Project Title:	Sand Creek Sports Complex Project
2.	Lead Agency Name and Address:	City of Brentwood Community Development Department 150 City Park Way Brentwood, CA 94513
3.	Contact Person and Phone Number:	Erik Nolthenius Planning Manager (925) 516-5137
4.	Project Location:	Intersection of Sand Creek Road and Fairview Avenue Brentwood, CA APNs 019-110-030, 019-110-032, and 019-110-046
5.	Project Sponsor's Name and Address:	City of Brentwood Parks and Recreation Department 150 City Park Way Brentwood, CA 94513
6.	Existing General Plan Designation:	Public Facility (PF) Park (P)
7.	Existing Zoning Designation:	Public Facility (PF) Planned Development (PD-6)
8.	Required Approvals from Other Public Agencies:	East Contra Costa County Habitat Conservancy Contra Costa County Flood Control and Water Conservation District

9. Surrounding Land Uses and Setting:

The 33.72-acre project site is located at the intersection of Sand Creek Road and Fairview Avenue in the City of Brentwood, and is identified by Accessor's Parcel Numbers (APNs) 019-110-030, 019-110-032, and 019-110-046. APNs 019-110-032 and 019-110-046 consist of the eastern portion of the project site, which is undeveloped, is regularly disced, and consists of ruderal vegetation; APN 019-110-030 consists of the Lower Sand Creek Basin. Surrounding existing land uses include Sand Creek, the Sand Creek Trail, undeveloped land, and single-family residences to the north; single-family residences to the east; single-family residences and a church/daycare to the south; and an apartment complex and single-family residences to the west. The City of Brentwood designates the Lower Sand Creek Basin portion of the site as Public Facility (PF) and the rest of the site is designated as Park (P). The Lower Sand Creek Basin portion of the site is zoned Public Facility (PF) and the rest of the project site is zoned Planned Development (PD-6).

10. Project Description Summary:

The Sand Creek Sports Complex Project (proposed project) would be developed in two phases, hereafter referred to as Phase 1 and Phase 2. Phase 1 would include the development of three multi-use sports fields with artificial turf, as well as spectator amenities such as bleachers, a food truck parking area, picnic tables, shade structures, seating, public restrooms, and drinking fountains. Phase 1 of the proposed project would also include the development of children's play areas, a basketball court, a multi-sport court, and pump tracks. Phase 1 would be lit by 18 lighting poles ranging in height from 50 to 90 feet tall, including eight lighting poles situated around the three multi-use sports fields. As part of Phase 2 of the proposed project, the Lower Sand Creek Basin would be used to accommodate two additional unlit multi-use sports fields and recreational trails. A total of 437 parking stalls would be included, and site access would be provided from Sand Creek Road to the south.

11. Status of Native American Consultation Pursuant to Public Resources Code Section 21080.3.1:

In compliance with Assembly Bill (AB) 52 (Public Resources Code [PRC] Section 21080.3.1), on March 6, 2024, the City provided formal notification letters to the Amah Mutsun Tribal Band of Mission San Juan Bautista, Chicken Ranch Rancheria of Me-Wuk Indians, Guidiville Indian Rancheria, Indian Canyon Mutsun Band of Costanoan, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area, Nashville Enterprise Miwok-Maidu-Nishinam Tribe, North Valley Yokuts Tribe, Ohlone Indian Tribe, Tule River Indian Tribe, Wilton Rancheria, Wuksache Indian/Eshom Valley Band, and the Confederated Villages of Lisjan. Requests to consult were not received during the required consultation period.

B. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is "Less-than-significant with Mitigation" as indicated by the checklist on the following pages.

☐ **Aesthetics**
✖ **Biological Resources**
✖ **Geology and Soils**
✖ **Hydrology and Water Quality**
✖ **Noise**
☐ **Recreation**
☐ **Utilities and Service Systems**

☐ **Agriculture and Forest Resources**
✖ **Cultural Resources**
☐ **Greenhouse Gas Emissions**
☐ **Land Use and Planning**
☐ **Population and Housing**
✖ **Transportation**
☐ **Wildfire**

☐ **Air Quality**
☐ **Energy**
✖ **Hazards and Hazardous Materials**
☐ **Mineral Resources**
☐ **Public Services**
✖ **Tribal Cultural Resources**
☐ **Mandatory Findings of Significance**

C. SOURCES

The following documents are referenced information sources used for the purposes of this Initial Study/Mitigated Negative Declaration (IS/MND):

1. Bargas Environmental Consulting, LLC. *Biological Resources Assessment: Brentwood Sand Creek Sports Complex*. January 2024.
2. Bargas Environmental Consulting, LLC. *Application Form and Planning Survey Report*. November 30, 2023.
3. Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.
4. California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* November 2017.
5. California Building Standards Commission. *California Green Building Standards Code*. 2022.
6. California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/dlrp/ciff/. Accessed July 2023.
7. California Department of Forestry and Fire Protection. *FHSZ Viewer.* Available at: https://egis.fire.ca.gov/FHSZ/. Accessed July 2023.
8. California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary Details: Keller Canyon Landfill (07-AA-0032)*. Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/4407?siteID=228. Accessed July 2023.
9. California Department of Transportation. *California Scenic Highway System Map*. Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed July 2023.
10. California Environmental Protection Agency. *Cortese List Data Resources*. Available at: https://calepa.ca.gov/sitecleanup/corteselist/. Accessed July 2023.
11. California Geologic Survey. *Seismic Hazard Zone Report for the Brentwood 7.5-Minute Quadrangle, Contra Costa County, California.* 2018.
12. California Geological Survey. *Earthquake Zones of Required Investigation*. Available at: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed July 2023.
13. City of Brentwood. *2020 Urban Water Management Plan*. June 2021, revised December 2021.
14. City of Brentwood. *City of Brentwood General Plan.* Adopted July 2014.
15. City of Brentwood. *Public Draft Environmental Impact Report for the 2014 Brentwood General Plan Update.* April 2014.
16. Contra Costa County Transportation Authority. *2018 Countywide Bicycle and Pedestrian Plan*. July 2018.
17. Contra Costa County Clean Water Program. *Stormwater C.3 Guidebook.* December 23, 2022.
18. Contra Costa County Fire Protection District. *Station Address.* Available at: https://cccfpd.org/station-address/. Accessed July 2023.
19. Contra Costa County Flood Control District. *Contra Costa County Formed Drainage Areas.* February 7, 2008.
20. Contra Costa County. *Upper and Lower Sand Creek Basin Expansion Project Initial Study/Mitigated Negative Declaration*. September 13, 2010.
21. Department of Toxic Substances Control. *Hazardous Waste and Substances Site List (Cortese).* Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed July 2023.

22. East Contra Costa County Habitat Conservation Plan Association. *Final East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan.* October 2006.
23. Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0353F.* Effective June 16, 2009.
24. Federal Transit Administration. *Transit Noise and Vibration Assessment Guidelines*. May 2006.
25. Federal Highway Administration. *Roadway Construction Noise Model User's Guide*. January 2006.
26. Fehr & Peers. *Draft Transportation Impact Assessment Sand Creek Sports Complex Site*. December 2023.
27. H.T. Harvey & Associates. *East Contra Costa County Habitat Conservation Plan – Assessment of Plan Effects on CEQA Species.* February 17, 2015.
28. Musco Sports Lighting, LLC. *Sand Creek Soccer*. April 14, 2023.
29. Saxelby Acoustics, LLC. *Environmental Noise Assessment: Sand Creek Sports Complex.* January 12, 2024.
30. Tom Origer & Associates. *Cultural Resources Study for the Sand Creek Sports Complex Project.* May 30, 2023.
31. United States Department of Agriculture. *Web Soil Survey.* Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed July 2023.

D. DETERMINATION

On the basis of this initial study:

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

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

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

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

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

______________________	______________________
Signature	Date
Erik Nolthenius, Planning Manager	City of Brentwood
Printed Name	For

E. BACKGROUND AND INTRODUCTION

This IS/MND identifies and analyzes the potential environmental impacts of the proposed project. The information and analysis presented in this document is organized in accordance with the order of the California Environmental Quality Act (CEQA) checklist in Appendix G of the CEQA Guidelines. Where the analysis provided in this document identifies potentially significant environmental effects of the project, mitigation measures are prescribed.

The mitigation measures prescribed for environmental effects described in this IS/MND would be implemented in conjunction with the project, as required by CEQA. The City would adopt findings and a Mitigation Monitoring/Reporting Program for the project in conjunction with approval of the project.

On July 22, 2014, the City of Brentwood City Council adopted a comprehensive update to the City's General Plan[1] and certified an associated Environmental Impact Report (EIR).[2] The General Plan EIR analyzed the potential impacts associated with full buildout of the General Plan Land Use Diagram. Per Section 15152 of the CEQA Guidelines, a project that is consistent with the General Plan and zoning designations of the City may tier from the analysis contained in the General Plan EIR, incorporating by reference the general discussions from the broader EIR. The proposed project would be consistent with the General Plan and zoning designations for the project site; therefore, in accordance with Section 15152 of the CEQA Guidelines, the analysis within this IS/MND will rely on analysis included in the General Plan EIR, as applicable.

In addition, project-specific technical reports have been prepared for the proposed project and form the basis of several technical sections of this IS/MND. Technical reports used in the preparation of this IS/MND are attached as appendices, and/or available upon request at the City of Brentwood Community Development Department.

A CEQA review of developing the Lower Sand Creek Basin (LSCB) for flood protection purposes has already been completed by the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD) in the Upper and Lower Sand Creek Basin Expansion Project Initial Study/Mitigated Negative Declaration (Basin IS/MND), published on September 13, 2010.[3] As such, disturbance of the LSCB has already been analyzed in the Basin IS/MND, and this IS/MND shall hereby incorporate by reference all analysis of the Basin IS/MND, pursuant to CEQA Guidelines Section 15150. However, operation of the LSCB as part of the proposed recreational facility is analyzed, as appropriate.

F. PROJECT DESCRIPTION

The following provides a description of the project site's current location and setting, as well as the proposed project components and the discretionary actions required for the project.

Project Location and Setting

The 33.72-acre project site consists of three parcels identified by APNs 019-110-030, 019-110-032, and 019-110-046, located at the intersection of Sand Creek Road and Fairview Avenue in the City of Brentwood (see Figure 1 and Figure 2).

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[1] City of Brentwood. *City of Brentwood General Plan.* Adopted July 2014.

[2] City of Brentwood. *2014 Brentwood General Plan Draft Environmental Impact Report.* April 2014.

[3] Contra Costa County. *Upper and Lower Sand Creek Basin Expansion Project Initial Study/Mitigated Negative Declaration*. September 13, 2010.

Figure 1
Regional Project Location

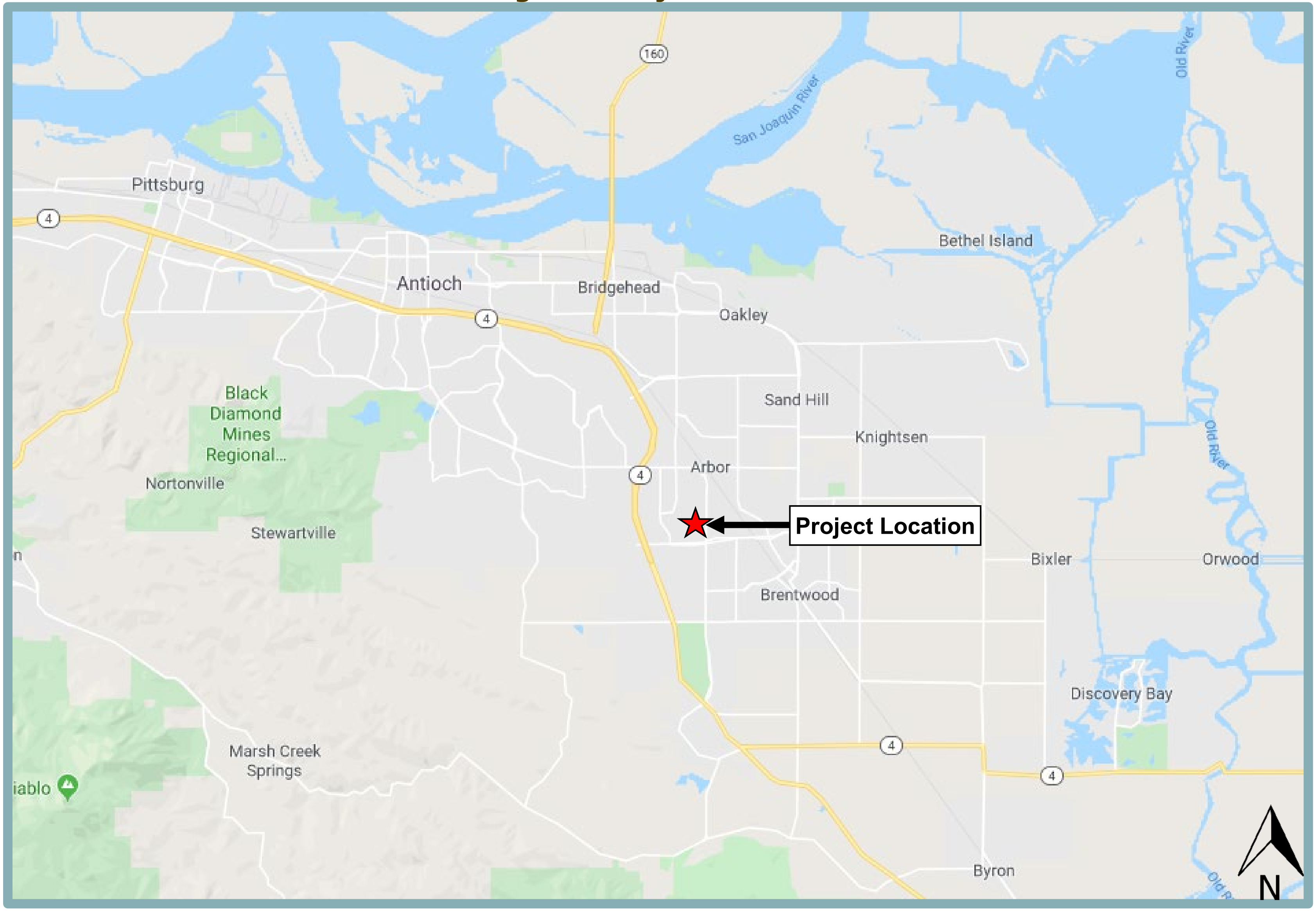

Figure 2
Project Site Boundaries

The eastern portion of the project site is vacant, undeveloped, regularly disced, and consists of ruderal vegetation, and the western portion of the project site is developed with the LSCB. Surrounding existing land uses include Sand Creek, the Sand Creek Trail, undeveloped land, and single-family residences to the north; single-family residences to the east; single-family residences and a church/daycare to the south; and an apartment complex, and single-family residences to the west. The City of Brentwood designates the LSCB portion of the site as PF and the rest of the site is designated as P. The LSCB portion of the site is zoned PF and the rest of the project site is zoned PD-6.

Project Components

The project would be constructed in two phases: Phase 1 and Phase 2. Phase 1 of the proposed project would include the development of a Sports Complex composed of three multi-use sports fields, associated amenities, and additional recreational facilities, as well as the installation of a traffic signal at the intersection of Sand Creek Road and Linden Street (see Figure 3). Phase 2 of the proposed project would include the use of the 19.24-acre LSCB as two additional natural turf sports fields, as well as the development of recreational trails (see Figure 4).

The proposed recreational facilities and off-site improvements, as well as the associated lighting and landscaping, access, circulation, parking, utilities, and construction and phasing are each discussed in further detail below.

Recreational Facilities

As discussed above, the proposed project would be constructed in two phases, Phase 1 and Phase 2. However, Phase 1 of the proposed project would be further phased into Phase 1A and Phase 1B, which are discussed below.

Phase 1A

Phase 1A of the proposed project would include development of the following:

- Clearing, grubbing, and grading of approximately 698,250 square feet (sf);
- Drainage and utility improvements;
- Concrete pathways;
- Construction of one 75 x 120 yard and two 70 x 110 yard artificial turf fields, including striping, with Musco sports lighting, bleachers, shade structures at bleachers, and fencing, netting, and gates;
- Restroom, storage, and staff building;
- Food truck area;
- Irrigation;
- Traffic signal at the Sand Creek Road/Linden Street intersection;
- Electrical infrastructure for pathway lights, buildings, parking lot lighting, electric vehicle chargers, multi-sport courts, surveillance and sound systems, and traffic signal at Linden Street;
- Various amenities including bike racks, park signage, drinking fountains, trash and recycling receptacles;
- Parking lot (partial with 270 space asphalt lot);
- Picnic areas south of Fields 2 and 3; and
- Maintenance area/storage yard.

Figure 3
Phase 1 Plan

Figure 4
Conceptual Phase 2 Plan

Phase 1B

Phase 1B of the proposed project would include development of the following:

- Additional restroom building;
- Picnic areas;
- Convert aggregate base overflow parking lot to asphalt;
- Multi-use hardcourt sport courts (pickleball, futsal, roller hockey, basketball, volleyball, etc.);
- Additional irrigation and landscaping;
- Additional shade elements;
- Playground;
- Pump track;
- Exercise area;
- Warm up areas;
- Game tables; and
- Mutt mitt stations.

As shown in Figure 3, the three sports fields proposed to be developed as part of Phase 1 of the project would be located generally in the center of the northern portion of the project site, with the additional recreational facilities surrounding the fields to the north, east, and south.

Phase 2

As shown in Figure 4, the LSCB would be used as two additional 75 x 120 yard natural turf sports fields. It is noted that, for the purposes of this analysis, the development of the LSCB analyzed in the Basin IS/MND is assumed to be complete prior to the currently proposed project. As such, development of Phase 2 of the proposed project is anticipated to include the placement of sod for the two proposed natural turf sports fields and installation of recreational trails; grading within the LSCB is not proposed as part of the project.

Discussion of the hours of operation and attendance capacity of the proposed recreational facilities are included below.

Hours of Operation

The common areas of the proposed project, including the playground, multi-sport courts, pump track, and picnic areas would generally be open from dawn to dusk as weather permits. The lighted fields would be available for permitted, scheduled use only, and would be overseen by City of Brentwood Parks and Recreation Department staff.

Attendance Capacity

The sports fields would serve local sports groups, as well as facilitate regional tournaments. Fields would be rented out individually; some rentals would be recurring reservations, while others would be reserved for tournaments and events. During general field use such as practices and league games, 50 people are estimated to be on-site per field, with visitor potential of 250 people when all five fields are in use. Overall capacity of the Sports Complex would be greater as spectators and visitors would have the ability to utilize the other amenities and features on site at the Complex. The Sports Complex would be available for scheduled use Monday through Sunday from 6:00 AM to 11:00 PM, as all park facility lighting shall be turned off by 11:00 PM except by permit and for security or emergency lighting, as approved by the Director pursuant to Section 7.02.110 of the Brentwood Municipal Code.

Maximum occupancy would occur during tournament play. The average number of players on the field during game play, varying by age/skill levels, would be 10 players for each team, with a total of 20 active players on each field. When accounting for benches and coaches, a field could support 30 people using the fields at any given time, not including spectators. With parents, siblings, and other spectators, a total of 50 people could be on a field each game. With five full fields proposed for development, each of which could be used as two smaller fields, it is conservatively assumed that 550 people could be present at any one time. It is estimated that six to 12 tournaments could occur per year, with the majority of tournaments being scheduled on Saturdays and Sundays between 6:00 AM and 11:00 PM.

In tournament conditions, additional teams and spectators would be present on-site who would not be playing, but would be waiting for the start of their next game or leaving their previously completed game. This additional group of people is assumed to be approximately 50 percent of the total participants and spectators engaged in play described above, which would be an additional 275 people. Therefore, the total number of participants and spectators on-site at any one time is estimated to be 875 for larger tournaments.

Other uses of the facility, including multi-use sport courts, pump track, and group picnic areas, would have potential to add an additional 175 users in the Sports Complex at any given time from dawn to dusk. Therefore, the maximum estimated users at any given time would be a total of 1,000 users.

Off-Site Improvements

The proposed project would include the development of a new traffic signal located at the intersection of Sand Creek Road and Linden Street. As discussed below, the new traffic signal would be developed at a new driveway allowing ingress and egress to and from the project site. In addition, the proposed project would include improvements to the Sand Creek Trail north of the project site, including planting restoration and the addition of bike racks, seating, and picnic tables.

Lighting and Landscaping

The proposed project would include the installation of eight poles for sports field lighting along the three artificial turf sports fields. Each pole would be 50 to 90 feet tall and would be designed for downcast lighting. Ten additional lighting poles would be installed in the multi-use sport courts, parking lots, pump track, play area, buildings such as restrooms, and egress pathways.

Standard formal landscaping would be installed throughout the entire Phase 1 portion of the project. Trees would line the parking lot for shade and on-site areas subject to C.3 requirements related to stormwater control, as discussed further below, would be landscaped pursuant to Contra Costa County regulations. In addition, a variety of shrubs and trees would be planted throughout the project site.

Access, Circulation, and Parking

Ingress and egress to the project site would be provided by two driveways connected to Sand Creek Road. The eastern driveway would be located at the intersection of Sand Creek Road and Linden Street, and would include the development of a new traffic signal to allow for both ingress and egress. The western driveway would allow entrance from, and right-turn-only exit to, Sand Creek Road. The project site would also be accessible to bicyclists and pedestrians from the existing Sand Creek Trail to the north of the project site, and bike lanes are present on Sand

Creek Road, along the site's southern boundary. In addition, a bus stop is located on the site's southern frontage, west of Linden Street.

The proposed project would include the development of an asphalt parking lot with 437 parking stalls in the southern portion of the project site. The parking lot would include nine Americans With Disabilities Act (ADA)-accessible stalls and 22 stalls with electrical vehicle (EV) charging capabilities. As discussed in above, Phase 1 of the proposed project would be developed in two sub-phases; Phase 1A would be constructed with approximately 270 parking stalls, including seven ADA-accessible stalls and the 22 stalls with EV charging capabilities. Until Phase 1B is constructed, the remaining area designated for parking would be used an aggregate base lot with approximately 203 spaces. An estimated 70 cars per field used would be present on-site during league play, and an estimated 90 cars per field used would be present on-site during tournaments. In addition, an estimated 12 cars could be present on-site for each multi-sport court in use.

Utilities

The project site is located near the intersection of Fairview Avenue and Sand Creek Road where existing water, sewer and recycled water utilities are available to connect. An eight-inch sewer lateral with appurtenances (fittings, cleanout, etc.) would be constructed to serve on-site facilities and would connect with a new sanitary sewer manhole placed on the existing eight-inch sewer main near the Sand Creek Road and Linden Street intersection, south of the project site. A six-inch potable water service line with appurtenances (valves, fittings, etc.) would be constructed to serve on-site facilities and would connect with the existing eight-inch water main near the Sand Creek Road and Linden Street intersection. The proposed project would also connect to an existing recycled water service lateral located near the Sand Creek Road and Linden Street intersection to water on-site landscaping.

The project site would be developed with on-site stormwater facilities to provide water quality treatment of on-site stormwater runoff. The project site would be divided into multiple drainage management areas (DMAs) consisting of self-treating or self-retaining pervious surfaces, including the proposed sports fields. On-site impervious areas, including parking lots and restrooms, would be designed to drain towards nearby bio-retention areas within the aforementioned DMAs. Treated stormwater would then by conveyed through an on-site drainage system to connect to an existing 18-inch storm drain lateral in Sand Creek Road.

The proposed project would connect to an existing fiber optics line available in Sand Creek Road to serve the on-site facilities.

Discretionary Actions

The proposed project would require the following approvals from the City of Brentwood:

- Adoption of the IS/MND;
- Approval of a Mitigation Monitoring and Reporting Program;
- Approval of construction documents and award of contract; and
- Approval of design review, per Brentwood Municipal Code Section 17.360.004.

G. ENVIRONMENTAL CHECKLIST

The following checklist contains the environmental checklist form presented in Appendix G of the CEQA Guidelines. The checklist form is used to describe the impacts of the proposed project. A discussion follows each environmental issue identified in the checklist. For this checklist, the following designations are used:

Potentially Significant Impact: An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared.

Less-Than-Significant with Mitigation Incorporated: An impact that requires mitigation to reduce the impact to a less-than-significant level.

Less-Than-Significant Impact: Any impact that would not be considered significant under CEQA relative to existing standards.

No Impact: The project would not have any impact.

I. AESTHETICS.

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

Discussion

a,b. Examples of typical scenic vistas include mountain ranges, ridgelines, or bodies of water as viewed from a highway, public space, or other area designated for the express purpose of viewing and sightseeing. The topography of the City's planning area is characterized by the relatively flat terrain of the Central Valley, with gently sloping hills in the western and southwestern portion of the area approaching the foothills of the Diablo Range.

The General Plan does not specifically identify any scenic vistas within the City. In addition, according to the California Scenic Highway Mapping System, the project site is not located within the vicinity of an officially designated State Scenic Highway.[4] The project site is located approximately 3,200 feet east of State Route (SR) 4, which is listed as an eligible State Scenic Highway; however, SR 4 is not officially designated. In addition, given the site's distance from SR 4 and the intervening development, the site cannot be seen from the SR 4 viewshed. Furthermore, the proposed project is consistent with the site's current land use and zoning designations. Therefore, buildout of the site has been previously considered by the City, and the proposed project would be consistent with the surrounding existing uses.

Based on the above, development of the proposed project would not have a substantial adverse effect on a scenic vista and would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway. Thus, a ***less-than-significant*** impact would occur.

c. Although the project site is currently undeveloped, the project site is located in an urbanized area. As such, the following discussion focuses on project consistency with applicable zoning and other regulations governing scenic quality.

The project site is zoned PF and PD-6. Pursuant to Chapter 17.360, parks are an allowable use within the PF zone, and Chapter 17.456 of the City's Municipal Code states that parks and playgrounds are a permitted use in the PD-6 zone. Additionally, Section 17.456.003 establishes that recreational uses in the PD-6 zone are required to have a minimum lot

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[4] California Department of Transportation. California Scenic Highway System Map. Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed July 2023.

size of five acres. Therefore, the proposed project would be consistent with the applicable zoning regulations regarding scenic quality. Thus, the proposed project would not conflict with applicable zoning and other regulations governing scenic quality, and a ***less-than-significant*** impact would occur.

d. As noted previously, the project site is mostly surrounded by existing residential development, with undeveloped land to the north. As such, sources of light and glare are already present within the project vicinity. Nonetheless, the Phase 1 portion of the project site is currently vacant and undeveloped, and the existing development of the LSCB within the Phase 2 portion of the project site does not include lighting. As such, development of the proposed project would increase the amount of light within the project site from sources including, but not limited to, light poles used to illuminate the playing fields and recreational areas, headlights from cars entering and exiting the site, and exterior light fixtures.

An Illumination Summary for the proposed project, included as Appendix A to this IS/MND, demonstrates the number, type, height, and level of illumination of all outdoor lighting fixtures associated with the proposed project.[5] As shown in Figure 5, a total of 18 lighting poles, ranging in height from 50 to 90 feet tall, would be placed throughout the Phase 1 area of the proposed project; the LSCB portion of the project site would not be developed with lighting. According to the Illumination Summary, the proposed Sports Complex would be lit with Total Light Control (TLC) LED lighting fixtures that are designed to shield light and minimize bleed of light onto adjacent uses. According to the Illumination Summary, the maximum off-site footcandle values at the nearest residences would be less than 0.1. As such, light from on-site uses would only minimally extend to the nearest single-family residences, approximately 200 feet to the south. Overall, the Illumination Summary prepared for the project demonstrates compliance with all applicable standards established in the City’s General Plan and Municipal Code.

Furthermore, the proposed project would be subject to design and site plan development review process, as established in Section 17.456.005(C) for the Brentwood Municipal Code. Compliance with such would help to ensure that the light and glare created by the proposed project would be consistent with the levels of light and glare currently emitted in the surrounding developed environment. In addition, the proposed project would be required to comply with Section 7.02.110 of the City’s Municipal Code, which requires all park facility lighting to be turned off by 11:00 PM except by permit and for security or emergency lighting, as approved by the Director.

Therefore, implementation of the proposed project would result in a ***less-than-significant*** impact with respect to creating a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

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[5] Musco Sports Lighting, LLC. *Sand Creek Soccer*. April 14, 2023.

Figure 5
Illumination Equipment Layout

Pole location(s) + dimensions are relative to 0,0 reference point(s) ⊗

Sand Creek Soccer
Brentwood,CA

EQUIPMENT LAYOUT

INCLUDES:
- Multipurpose 1
- Multipurpose 2
- Pickleball
- Soccer 1
- Soccer 2
- Soccer 3

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
8	P1-P2 P5-P10	50'	-	50'	TLC-LED-550	2
2	P3-P4	50'	-	50'	TLC-LED-550	4
1	S1	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	3 9
1	S2	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	4 5
1	S3	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	3/5* 3
1	S9	90'	-	90'	TLC-LED-1500	9
1	S11	70'	-	70' 70'	TLC-LED-1500 TLC-LED-1200	3 1
3	S12 S5-S6	70'	-	70' 70'	TLC-LED-1200 TLC-LED-1500	1 3
18	TOTALS					81

* This structure utilizes a back-to-back mounting configuration

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Driver (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-550	3.2	3.0	2.8	2.4	1.9	-	1.4
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6

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II. AGRICULTURE AND FOREST RESOURCES. *Would the project:*		Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b.	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c.	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d.	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

Discussion

a,e. Currently, the eastern portion of the project site is vacant, undeveloped, regularly disced, and consists of ruderal vegetation, and the western portion of the project site is developed with the LSCB. According to the California Department of Conservation Important Farmland Finder, the project site is identified as Farmland of Local Importance.[6] As such, although the project site is designated as Farmland, the project site does not contain, and is not located adjacent to, Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. In addition, the City's General Plan designates the project site as PF and P, and is not proposed for agricultural use. Therefore, the proposed project's impacts would be ***less-than-significant***.

b. The project site is currently zoned PF and PD-6 and has been anticipated for development with the LSCB and recreational uses by the City. In addition, the project site is not subject to a Williamson Act contract. Therefore, the proposed project would not conflict with existing zoning for agricultural use, or a Williamson Act contract, and ***no impact*** would occur.

c,d. The project site is not considered forest land (as defined in PRC Section 12220[g]), timberland (as defined by PRC Section 4526), and is not zoned Timberland Production (as defined by Government Code Section 51104[g]). As noted above, the project site is currently zoned PF and PD-6. Therefore, the proposed project would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production, and the project would not otherwise result in the loss of forest land or conversion of forest land to non-forest use. Thus, ***no impact*** would occur.

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[6] California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/dlrp/ciff/. Accessed July 2023.

III. AIR QUALITY. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Discussion

a,b. The City of Brentwood is located in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The SFBAAB area is currently designated as a nonattainment area for State and federal ozone, State and federal fine particulate matter 2.5 microns in diameter ($PM_{2.5}$), and State respirable particulate matter 10 microns in diameter (PM_{10}) ambient air quality standards (AAQS). The SFBAAB is designated attainment or unclassified for all other AAQS. It should be noted that on January 9, 2013, the U.S. Environmental Protection Agency (USEPA) issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ federal AAQS. Nonetheless, the Bay Area must continue to be designated as nonattainment for the federal $PM_{2.5}$ AAQS until such time as the BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and the USEPA approves the proposed redesignation. The USEPA has not yet approved a request for redesignation of the SFBAAB; therefore, the SFBAAB remains in nonattainment for 24-hour $PM_{2.5}$.

In compliance with regulations, due to the nonattainment designations of the area, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions through regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The most recent federal ozone plan is the 2001 Ozone Attainment Plan, which was adopted on October 24, 2001 and approved by the California Air Resources Board (CARB) on November 1, 2001. The plan was submitted to the USEPA on November 30, 2001 for review and approval. The most recent State ozone plan is the 2017 Clean Air Plan, adopted on April 19, 2017. The 2017 Clean Air Plan was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, toxic air contaminants (TACs), and greenhouse gases (GHGs). Although a plan for achieving the State PM_{10} standard is not required, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2017 Clean Air Plan. The control strategy serves as the backbone of the BAAQMD's current PM control program.

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures to be implemented in the region to attain the State and federal AAQS within the SFBAAB. Adopted BAAQMD rules and regulations, as well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans. For development projects, BAAQMD establishes significance thresholds for emissions of the ozone precursors reactive organic gases (ROG) and oxides of nitrogen (NO_X), as well as for PM_{10}, and $PM_{2.5}$, expressed in pounds per day (lbs/day) and tons per year (tons/yr). The thresholds are listed in Table 1. Thus, by exceeding the BAAQMD's mass emission thresholds for construction and operational emissions of ROG, NO_X, or PM_{10}, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts.

Table 1
BAAQMD Thresholds of Significance

	Construction	Operational	
Pollutant	**Average Daily Emissions (lbs/day)**	**Average Daily Emissions (lbs/day)**	**Maximum Annual Emissions (tons/year)**
ROG	54	54	10
NOx	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10

Source: BAAQMD, CEQA Guidelines, April 2023.

Particulate matter can be split into two categories: fugitive and exhaust. The BAAQMD thresholds of significance for exhaust are presented in Table 1. It should be noted that BAAQMD does not maintain quantitative thresholds for fugitive emissions of PM_{10} or $PM_{2.5}$, rather, BAAQMD requires all projects within the district's jurisdiction to implement Basic Construction Mitigation Measures (BCMMs) related to dust suppression.

Construction and operational emissions of both phases of the proposed project were quantified using the California Emissions Estimator Model (CalEEMod) web-based software version 2022 – a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including construction data, trip generation rates, vehicle mix, trip length, average speed, etc. Where project-specific information is available, such information should be applied in the model.

The proposed project's modeling assumed the following:

- Construction would commence in October 2024 and take place over approximately two years; and
- Trip generation rates were updated to be consistent with the project-specific Transportation Impact Assessment prepared by Fehr & Peers.[7]

The proposed project's estimated emissions associated with construction and operations are provided below. All CalEEMod results are included as Appendix B to this IS/MND.

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[7] Fehr & Peers. *Draft Transportation Impact Assessment Sand Creek Sports Complex Site*. December 2023.

Construction Emissions

According to the CalEEMod results, the proposed project would result in maximum unmitigated construction criteria air pollutant emissions as shown in Table 2. As shown in the table, the proposed project's maximum unmitigated construction emissions would be below the applicable thresholds of significance.

Table 2
Maximum Unmitigated Construction Emissions (lbs/day)

Pollutant	Proposed Project Emissions	Threshold of Significance	Exceeds Threshold?
ROG	4.91	54	**NO**
NO_X	46.5	54	**NO**
PM_{10} (exhaust)	1.97	82	**NO**
$PM_{2.5}$ (exhaust)	1.82	54	**NO**

Source: CalEEMod, April 2024 (see Appendix B).

All projects within the jurisdiction of the BAAQMD are required to implement all of the following BAAQMD's BCMMs:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
7. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
8. Unpaved roads provided access to the sites located 100 feet or further from a paved road shall be treated with a six- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.
9. Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

The proposed project's required implementation of the BAAQMD's BCMMs listed above for the project's construction activities would help to minimize construction-related emissions. Because the proposed project would be below the applicable thresholds of significance for construction emissions, project construction would not result in a significant air quality impact.

Operational Emissions

According to the CalEEMod results, the proposed project would result in maximum unmitigated operational criteria air pollutant emissions as shown in Table 3. As shown in the table, the proposed project's operational emissions would be below the applicable thresholds of significance. As such, the proposed project would not result in a significant air quality impact during operations.

Table 3
Maximum Unmitigated Operational Emissions

Pollutant	Proposed Project Emissions		Threshold of Significance		Exceeds Threshold?
	lbs/day	tons/yr	lbs/day	tons/yr	
ROG	19.8	1.19	54	10	**NO**
NO_X	5.47	0.33	54	10	**NO**
PM_{10} (exhaust)	0.03	<0.005	82	15	**NO**
$PM_{2.5}$ (exhaust)	0.03	<0.005	54	10	**NO**

Source: CalEEMod, April 2024 (see Appendix B).

Cumulative Emissions

Past, present and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By nature, air pollution is largely a cumulative impact. A single project is not sufficient in size to, by itself, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. The thresholds of significance presented in Table 1 represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If a project exceeds the significance thresholds presented in Table 1, the proposed project's emissions would be cumulatively considerable, resulting in significant adverse cumulative air quality impacts to the region's existing air quality conditions. Because the proposed project would result in emissions below the applicable thresholds of significance, the project would not be expected to result in a cumulatively considerable contribution to the region's existing air quality conditions.

Consistency with the 2017 Clean Air Plan

An additional measure for determining whether a project is consistent with an air quality plan is to determine whether the proposed project is consistent with the growth assumptions incorporated into the air quality plan and, thus, whether the project could interfere with the region's ability to comply with federal and State AAQS. The development of the 2017 Clean Air Plan is based, in part, on the General Plan land use designations of the various cities and counties that constitute the SFBAAB. The City of Brentwood General Plan was adopted in 2014, prior to adoption of the 2017 Clean Air Plan, and, thus, the buildout of the City of Brentwood according to the General Plan land use designations was generally anticipated within the 2017 Clean Air Plan. The General Plan designates the project site as P and PF and the site is zoned as PD-6 and PF. As discussed throughout this IS/MND, the proposed project would be consistent with the site's land use and zoning designations. As such, the proposed project would be consistent with the General Plan and, thus, consistent with the growth assumptions of the 2017 Clean Air Plan. Therefore, the proposed project would not conflict with or obstruct implementation of an air quality plan.

Conclusion

As stated previously, the applicable regional air quality plans include the 2001 Ozone Attainment Plan and the 2017 Clean Air Plan. According to BAAQMD, if a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the air quality plans. Because the proposed project would result in emissions below the applicable thresholds of significance and would generally be consistent with the applicable policies and growth assumptions of the 2017 Clean Air Plan, the proposed project would not be considered to conflict with or obstruct implementation of regional air quality plans. In addition, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State AAQS. Thus, a ***less-than-significant*** impact would result.

c. Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. Sensitive receptors are typically defined as facilities where sensitive receptor population groups (i.e., children, the elderly, the acutely ill, and the chronically ill) are likely to be located. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics. In the vicinity of the project site, sensitive receptors include the residences surrounding the project site, as well as the church/daycare to the south; the nearest existing residence is located adjacent to the project site's western boundary.

The major pollutant concentrations of concern are localized carbon monoxide (CO) emissions and TAC emissions, which are addressed in further detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. High levels of localized CO concentrations are only expected where background levels are high, and traffic volumes and congestion levels are high. Emissions of CO are of potential concern, as the pollutant is a toxic gas that results from the incomplete combustion of carbon-containing fuels such as gasoline or wood. CO emissions are particularly related to traffic levels.

In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, the BAAQMD has established screening criteria for localized CO emissions. According to BAAQMD, a proposed project would result in a less-than-significant impact related to localized CO emission concentrations if all of the following conditions are true for the project:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;

- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

As indicated in the Transportation Impact Assessment (TIA) prepared for the project by Fehr & Peers (Appendix C),[8] the proposed project would not conflict with the level of service (LOS) standards set forth under the City of Brentwood General Plan and Contra Costa Transportation Authority (CCTA) Congestion Management Program. According to the TIA, during the Cumulative Plus Project scenario, neither the intersection of Sand Creek Road and Linden Street nor the Sand Creek Road and Fairview Avenue intersection would experience traffic volumes in excess of 44,000 vehicles per hour. Furthermore, the adjacent roadways are not located in an area where vertical or horizontal atmospheric mixing is substantially limited, such as a tunnel or freeway overpass. Therefore, based on the BAAQMD's screening criteria for localized CO emissions, the proposed project would not be expected to result in substantial levels of localized CO at surrounding intersections or generate localized concentrations of CO that would exceed standards or cause health hazards.

TAC Emissions

Another category of environmental concern is TACs. The CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) provides recommended setback distances for sensitive land uses from major sources of TACs, including, but not limited to, freeways and high traffic roads, distribution centers, and rail yards. The CARB has identified diesel particulate matter (DPM) from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Health risks associated with TACs are a function of both the concentration of emissions and the duration of exposure, where the higher the concentration and/or the longer the period of time that a sensitive receptor is exposed to pollutant concentrations would correlate to a higher health risk.

The proposed project would not involve any land uses or operations that would be considered major sources of TACs, including DPM. As such, the project would not generate any substantial pollutant concentrations during operations.

Short-term, construction-related activities could result in the generation of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. However, construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. Health risks are typically associated with exposure to high concentrations of TACs over extended periods of time (e.g., 30 years or greater), whereas the construction period associated with Phase 1A of the proposed project, which would be the most emissions-intensive phase of construction, would likely be limited to approximately two years. The construction period of subsequent phases of the proposed project would be equal to or less than two years, and, thus, would result in fewer TAC emissions than is anticipated for buildout of Phase 1A.

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[8] Fehr & Peers. *Draft Transportation Impact Assessment Sand Creek Sports Complex Site*. December 2023.

All construction equipment and operation thereof would be regulated per the CARB In-Use Off-Road Diesel Vehicle Regulation, which is intended to help reduce emissions associated with off-road diesel vehicles and equipment, including DPM. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. In addition, construction equipment would operate intermittently throughout the day and only on portions of the site at a time.

Because construction equipment on-site would not operate for long periods of time and would be used at varying locations within the site, associated emissions of DPM would not occur at the same location (or be evenly spread throughout the entire project site) for long periods of time. Due to the temporary nature of construction and the relatively short duration of potential exposure to associated emissions, the potential for any one sensitive receptor in the area to be exposed to concentrations of pollutants for a substantially extended period of time would be low. Therefore, construction associated with the proposed project would not be expected to expose any sensitive receptors to substantial pollutant concentrations.

Conclusion

Based on the above, the proposed project would not expose any sensitive receptors to substantial concentrations of localized CO or TACs during construction or operation. Therefore, the proposed project would result in a ***less-than-significant*** impact related to the exposure of sensitive receptors to substantial pollutant concentrations.

d. Emissions such as those leading to odor have the potential to adversely affect people. Emissions of principal concern include emissions leading to odors, emission that have the potential to cause dust, or emissions considered to constitute air pollutants. Air pollutants have been discussed in sections “a” through “c” above. Therefore, the following discussion focuses on emissions of odors and dust.

Pursuant to the BAAQMD CEQA Guidelines, odors are generally regarded as an annoyance rather than a health hazard.[9] Manifestations of a person’s reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The presence of an odor impact is dependent on a number of variables including: the nature of the odor source; the frequency of odor generation; the intensity of odor; the distance of odor source to sensitive receptors; wind direction; and sensitivity of the receptor.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantitative analysis to determine the presence of a significant odor impact is difficult. Typical odor-generating land uses include, but are not limited to, wastewater treatment plants, landfills, and composting facilities. The proposed project would not introduce any such land uses.

Construction activities often include diesel-fueled equipment and heavy-duty trucks, which could create odors associated with diesel fumes that may be considered objectionable. However, the construction phase is temporary in nature and construction of Phase 1A, which would be the most emissions-intensive phase of construction, would only occur over

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[9] Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines.* April 2023.

approximately two years. While the timing of future phases is currently unknown, the phases of the project would not happen concurrently, and subsequent development would occur over fewer than two years. As such, odors associated with future phases of the proposed project would be less intense than those anticipated for Phase 1A. In addition, hours of operation for construction equipment would be restricted to daytime hours Monday through Friday (and until 5:30 PM with the written approval of the City Engineer) pursuant to Section 9.32.050 of the City of Brentwood Municipal Code. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. The aforementioned regulations would help to minimize emissions, including emissions leading to odors. Accordingly, substantial objectionable odors would not be expected to occur during construction activities.

As noted previously, all projects under the jurisdiction of BAAQMD are required to implement the BAAQMD's BCMMs. The BCMMs would act to reduce construction-related dust by ensuring that haul trucks with loose material are covered, reducing vehicle dirt track-out, and limiting vehicle speeds within the improvement area, among other methods, which would ensure that construction of the proposed project does not result in substantial emissions of dust. Following construction, the entire improvement area would be either paved or landscaped. Thus, project operations would not generate significant amounts of dust that would adversely affect a substantial number of people.

For the aforementioned reasons, construction and operation of the proposed project would not result in emissions (such as those leading to odors) adversely affecting a substantial number of people, and a ***less-than-significant*** impact would result.

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

Discussion

a,f. The following discussion is based primarily on a Biological Resources Assessment (BRA) (see Appendix D)[10] and an Application Form and Planning Survey Report (PSR) (see Appendix E)[11] prepared for the proposed project by Bargas Environmental Consulting, LLC (Bargas).

Although the project site is currently undeveloped, according to the BRA, the project site is comprised of disturbed habitat consisting of plowed fields comprised of Mediterranean grasses and forbs, including foxtail barley (*Hordeum murinum*), Italian rye grass (*Festuca perennis*), Italian thistle (*Carduus tenuiflorus*), and wild radish (*Raphanus raphanistrum*). The project site does not contain any trees. According to the PSR, the project site is mapped as Grassland in the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCC HCP/NCCP) Fee Zone Maps.

Special-status species include plant and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal and State Endangered Species Acts. Both acts afford protection to listed and proposed species. In addition, the California Department of Fish and Wildlife (CDFW) Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of

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[10] Bargas Environmental Consulting, LLC. *Biological Resources Assessment: Brentwood Sand Creek Sports Complex*. January 2024.

[11] Bargas Environmental Consulting, LLC. *Application Form and Planning Survey Report*. November 30, 2023.

Conservation Concern, sensitive species included in USFWS Recovery Plans, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally do not have special legal status, they are given special consideration under CEQA. In addition to regulations for special-status species, most birds in the U.S., including non-status species, are protected by the Migratory Bird Treaty Act (MBTA) of 1918. Under the MBTA, destroying active nests, eggs, and young is illegal. In addition, plant species on California Native Plant Society (CNPS) Lists 1 and 2 are considered special-status plant species and are protected under CEQA.

A search of the California Natural Diversity Database (CNDDB) was conducted in order to identify special-status plant and wildlife species that may occur at or near the project site. The intent of the database review was to identify documented occurrences of special-status species in the vicinity of the project area, to determine their locations relative to the project site, and to evaluate whether the site meets the habitat requirements of such species. Based on the results of the CNDDB search, several special-status plant and wildlife species are known to occur within the project region. However, due to past site disturbance, the majority of species are not expected to occur on-site due to lack of suitable habitat(s).

The project site is located within the boundaries of the ECCC HCP/NCCP, which is intended to provide an effective framework to protect natural resources in the County, including special-status species. In February 2015, the East Contra Costa County Habitat Conservancy prepared an ECCC HCP/NCCP Assessment of Plan Effects on CEQA Species.[12] The purpose of the assessment was to provide a programmatic, cumulative CEQA effects analysis for CEQA species not covered by the HCP/NCCP. The 2015 ECCC HCP/NCCP Assessment of Plan Effects on CEQA Species concluded that mitigation measures required in the ECCC HCP/NCCP also provide mitigation for non-covered species; therefore, projects consistent with the ECCC HCP/NCCP would have a less-than-significant impact on other potential special-status species.

According to the 2015 ECCC HCP/NCCP Assessment of Plan Effects on CEQA Species, for all but two of the potential special-status species addressed (Lime Ridge navarretia [*Navarretia gowenii*] and the Lime Ridge eriastrum [*Eriastrum ertterae]*), impacts would be less than significant under CEQA. Because of uncertainty regarding the distribution of the Lime Ridge navarretia and the Lime Ridge eriastrum, the 2015 ECCC HCP/NCCP Assessment of Plan Effects on CEQA Species concluded that a potentially significant impact could occur related to the two aforementioned species. Bargas did not identify any known occurrences of Lime Ridge navarretia or Lime Ridge eriastrum within the project site or immediate vicinity. Therefore, implementation of the proposed project would not impact the species. As discussed in further detail below, the proposed project would be required to comply with the ECCC HCP/NCCP. As such, based on the conclusions of the 2015 ECCC HCP/NCCP Assessment of Plan Effects on CEQA Species and the absence of the Lime Ridge navarretia and Lime Ridge eriatrum in the vicinity of the project site, the proposed project would have a less-than-significant impact on any potential special-status wildlife and plant species not covered by the ECCC HCP/NCCP.

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[12] H.T. Harvey & Associates. *East Contra Costa County Habitat Conservation Plan – Assessment of Plan Effects on CEQA Species*. February 17, 2015.

Special-Status Plants

Special-status plants generally occur in relatively undisturbed areas within vegetation communities such as vernal pools, marshes and swamps, chenopod scrub, seasonal wetlands, riparian scrub, chaparral, alkali playa, dunes, and areas with unusual soil characteristics.

Based on the CNDDB search conducted for the project area, a total of ten special-status plant species are known to occur within the general vicinity of the project site. However, based on the results of the site survey conducted by Bargas on July 25, 2023 for the project site, special-status plant species have not been observed on the project site. Moreover, the project site has been disced and mowed periodically for years, and, thus, is not suitable habitat for any special-status plant species known to occur in the region. Therefore, Bargas concluded that impacts to special-status plant species would not occur as a result of the proposed project.

Special-Status Wildlife

Based on the CNDDB search conducted for the project area, a total of 17 special-status wildlife species are known to occur within the vicinity of the project site. The BRA determined that the project site contains low quality habitat for 15 of the identified special-status species. The BRA determined that western burrowing owl is the only species with a moderate potential to occur on-site. In addition, the BRA concluded that giant garter snake and nesting birds protected under the MBTA could occur on-site.

It is noted that milkweed, the host plant for the Monarch butterfly, has the potential to occur on-site. However, milkweed was not observed during the site survey conducted by Bargas, and the BRA states that as long as the project site is regularly plowed until construction is completed, milkweed would not occur on-site, and, thus, Monarch butterfly would also be absent from the project site. Because the project site is regularly disked, the project site would not have the potential to contain Monarch butterfly habitat.

Western Burrowing Owl

The western burrowing owl is a California Species of Special Concern. Burrowing owl habitat is usually found in annual and perennial grasslands, characterized by low-growing vegetation. The primary habitat requirement for western burrowing owls is small mammal burrows that the species uses for nesting. Typically, the species uses abandoned ground squirrel burrows, but western burrowing owls have been known to dig burrows in softer soils. In urban areas, western burrowing owls may use pipes, culverts, and piles of material as artificial burrows. Western burrowing owls breed semi-colonially from March through August.

The project site is located within the identified range of western burrowing owl, and CNDDB has recorded occurrences of the species within the project site. Furthermore, Bargas observed an empty burrow in the north side of the project site, where mounds of dirt have been piled. Although the individual burrow was not confirmed to be active and is not surrounded by additional burrows, and although the project site consists of disked and disturbed grasses, because suitable habitat for western burrowing owl may exist on the project site, pre-construction surveys for burrowing owls would be required by the ECCC HCP/NCCP to confirm presence or absence of the species. If burrowing owls are present on or near the project site, the proposed project could result in an adverse impact to the species.

Giant Garter Snake

The giant garter snake is a covered species by the ECCC HCP/NCCP that historically occupied the Sacramento and San Joaquin valleys. However, the species' current range has been reduced. Primarily associated with marshes and sloughs, giant garter snake is active from mid-March until October. Giant garter snake forages for fish and amphibians primarily in and along streams. The species is diurnal and often basks on emergent vegetation. At night, giant garter snake takes refuge in mammal burrows, crevices, and other small holes.

The project site lacks foraging habitat for giant garter snake, which implies that the species is unlikely to occur on-site. However, Sand Creek, which may support the species, is located approximately 200 feet from the project site. As such, pre-construction surveys for giant garter snake would be required by the ECCC HCP/NCCP to confirm presence or absence of the species. If giant garter snake is present on or near the project site, the proposed project could result in an adverse impact to the species.

Nesting Raptors and Migratory Birds

Due to the lack of on-site trees, raptors and migratory birds protected by the MBTA would not establish nests on-site. However, the potential exists for such species to establish nests in existing trees in the project vicinity and/or forage on-site. Construction activities that adversely affect the nesting success of raptors and migratory birds (i.e., lead to the abandonment of active nests) or result in mortality of individual birds constitute a violation of State and federal laws. Thus, in the event that such species occur in the project site vicinity during the breeding season, or are foraging on-site, project construction activities could result in an adverse effect to species protected under the MBTA.

ECCC HCP/NCCP Requirements

Procedures for pre-construction surveys, best management practices, and construction monitoring, as well as Applicable Avoidance and Minimization Measures (AMMs) for species covered by the ECCC HCP/NCCP are outlined in Section 6.3.3 Surveys for Construction Monitoring and Section 6.4.3 Species-Level Measures of the ECCCHCP/NCCP.[13] The project would be required to comply with all applicable ECCC HCP/NCCP requirements, including conducting pre-construction surveys prior to ground disturbance activities to establish whether nests or burrows of western burrowing owl are occupied. If nests or burrows are occupied, the project would be required to comply with the minimization requirements and construction monitoring in the ECCC HCP/NCCP. In compliance with the ECCC HCP/NCCP, the project would also be required to follow AMMs if nests are located within 500 feet of the project site.

All birds covered by the ECCC HCP/NCCP are also considered migratory birds and subject to the prohibitions of the MBTA. Therefore, actions conducted under the ECCC HCP/NCCP comply with the provisions of the MBTA. Because the project would comply with all ECCC HCP/NCCP requirements, the project would also comply with the provisions of the MBTA.

Furthermore, the proposed project would be subject to pay all applicable fees according to the Fee Zone Map of the ECCC HCP/NCCP prior to construction. Payment would be

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[13] East Contra Costa County Habitat Conservation Plan Association. *Final East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan.* October 2006.

required for the appropriate fees based on the applicable fee calculator at the time of development.

Conclusion

Based on the above, western burrowing owl, giant garter snake, and nesting birds protected under the MBTA have the potential to occur on-site. However, the project would comply with ECCC HCP/NCCP requirements, and pre-construction surveys would be required for the foregoing species. Without compliance with all applicable ECCC HCP/NCCP requirements, the proposed project could have an adverse effect, either directly or through habitat modifications, on species identified as special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Consistent with the applicable ECCC HCP/NCCP AMMs, implementation of the following mitigation measures would reduce the above potential impact to a ***less-than-significant*** level.

IV-1. *Prior to the issuance of grading or construction permits for the project site, an application and obtain coverage under the ECCC HCP/NCCP shall be submitted to the East Contra Costa County Conservancy. Obtaining coverage shall include payment of the applicable ECCC HCP/NCCP per acre fee in effect for Zone I in compliance with Section 16.168.070 of the Brentwood Municipal Code. The contractor shall receive a Certificate of Coverage from the City of Brentwood and submit a construction monitoring report to the ECCC Habitat Conservancy for review and approval. The Certificate of Coverage will confirm the fee has been received, that other ECCC HCP/NCCP requirements have been met or will be performed, and will authorize take of covered species.*

Western Burrowing Owl

IV-2(a). *Prior to any ground disturbance related to covered activities, a USFWS/CDFW-approved biologist shall conduct a preconstruction survey in areas identified in the planning surveys completed for the proposed project as having potential burrowing owl habitat. The preconstruction surveys shall establish the presence or absence of western burrowing owl and/or habitat features and evaluate use by owls, in accordance with CDFW survey guidelines.*

On areas where activities are proposed, the biologist shall survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. Adjacent parcels under different land ownership shall not be surveyed. Surveys shall take place near sunrise or sunset, in accordance with CDFW guidelines. All burrows or burrowing owls shall be identified and mapped. Surveys shall take place, at most, 30 days prior to construction. During the breeding season (February 1 to August 31), surveys shall document whether burrowing owls are nesting in or directly adjacent to disturbance areas. During the nonbreeding season (September 1 to January 31), surveys shall document *whether burrowing owls are using habitat in or directly adjacent to any disturbance area. Survey results shall be valid only for the season (breeding or nonbreeding) during which the survey is conducted. A report detailing the methodology and results of the survey shall be submitted for review and approval to the City of Brentwood Community Development Department.*

IV-2(b). *If burrowing owls are found during the breeding season (February 1 to August 31), in accordance with the CDFW's Staff Report on Burrowing Owl Mitigation, the contractor shall avoid all nest sites that could be disturbed by project construction during the remainder of the breeding season or while the nest is occupied by adults or young. Avoidance shall include establishment of a non-disturbance buffer zone (as described below). Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation or that the juveniles from the occupied burrows have fledged. During the nonbreeding season (September 1 to January 31), the contractor shall avoid the owls and the burrows they are using, if possible. Avoidance shall include the establishment of a buffer zone (as described below).*

During the breeding season, buffer zones of at least 250 feet in which construction activities cannot occur shall be established around each occupied burrow (nest site). Buffer zones of 160 feet shall be established around each burrow being used during the nonbreeding season. The buffers shall be delineated by highly visible, temporary construction fencing.

If occupied burrows for burrowing owls are not avoided, passive relocation shall be implemented. Owls shall be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. The doors shall be in place for 48 hours, prior to excavation. The project area shall be monitored daily for one week to confirm that the owl has abandoned the burrow. Whenever possible, burrows shall be excavated using hand tools and refilled to prevent reoccupation. Plastic tubing or a similar structure shall be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow. A report detailing compliance with the provisions established herein shall be submitted for review and approval to the City of Brentwood Community Development Department.

Giant Garter Snake

IV-3(a). *Prior to any ground disturbance related to covered activities, a USFWS/CDFW–approved biologist shall conduct a preconstruction survey in areas identified in the planning surveys as having suitable garter snake habitat and 200 feet of adjacent uplands, measured from the outer edge of each bank. The surveys shall delineate suitable habitat and document any sightings of giant garter snake.*

IV-3(b). To the maximum extent practicable, impacts on giant garter snake habitat as a result of covered activities shall be avoided. If feasible, in areas near construction activities, a buffer of 200 feet from suitable habitat shall be delineated within which vegetation disturbance or use of heavy equipment is prohibited.

If impacts on giant garter snake habitat as a result of covered activities are not avoided, the following measures shall be implemented. These measures are based on USFWS's Standard Avoidance and Minimization Measures during Construction Activities in Giant Garter Snake Habitat (U.S. Fish and Wildlife Service 1999).

- *Limit construction activity that disturbs habitat to the period between May 1 and September 30. This is the active period for giant garter snake, and direct mortality is minimized because snakes are more likely to independently move away from disturbed area. If activities are necessary in giant garter snake habitat between October 1 and April 30, the USFWS Sacramento Field Office shall be contacted to determine if additional measures beyond those described below are necessary to minimize and avoid take.*
- *In areas where construction is to take place, dewater all irrigation ditches, canals or other aquatic habitat between April 15 and September 30 to remove habitat of garter snakes. Dewatered areas must remain dry, with no puddled water remaining, for at least 15 consecutive days prior to the excavation or filling of that habitat. If a site cannot be completely dewatered, netting and salvage of prey items may be necessary.*

IV-3(c). If suitable habitat for giant garter snake cannot be avoided between October 1 and April 30 the USFWS Sacramento Field Office shall be contacted to determine if additional measures beyond those described below are necessary, and the following actions will be performed. A USFWS-approved biologist shall conduct a construction survey no more than 24 hours before construction in suitable habitat and shall be on site during construction activities in potential aquatic and upland habitat to ensure that individuals of giant garter snake encountered during construction will be avoided. The biologist shall provide USFWS with a field report form documenting the monitoring efforts within 24 hours of commencement of construction activities. The monitor shall be available thereafter. If a snake is encountered during construction activities, the monitor shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities should be allowed to move away from the construction area on their own. Only personnel with a USFWS recovery permit pursuant to Section 10(a)(1)(A) of the ESA will have the authority to capture and/or relocate giant garter snakes that are encountered in the construction area. The project area will be reinspected whenever a lapse in construction activity of 2 weeks or more has occurred.

To ensure that construction equipment and personnel do not affect nearby aquatic habitat for giant garter snake outside construction areas, silt *fencing shall be erected to clearly define the aquatic habitat to be avoided; restrict working areas, spoils, and equipment storage and other project activities to areas outside of aquatic or wetland habitat; and maintain water quality and limit construction runoff into wetland areas through the use of fiber bales, filter fences, vegetation buffer strips, or other appropriate methods.*

Fill or construction debris may be used by giant garter snakes as over-wintering sites. Therefore, upon completion of construction activities, any temporary fill or construction debris must be removed from the site.

Construction personnel shall be trained to avoid harming giant garter snakes. A qualified biologist approved by USFWS will inform all construction personnel about the life history of giant garter snakes; the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas such as rice fields to giant garter snakes; and the terms and conditions of the Plan related to avoiding and minimizing impacts on giant garter snake

Migratory Birds

IV-4(a). *Prior to any ground disturbance related to covered activities during the nesting season (March 15-September 15), a qualified biologist shall conduct a preconstruction survey no more than 30 days prior to construction in order to establish whether occupied migratory bird and/or raptor nests are located within 250 feet of the project site. A written summary of the survey results shall be submitted to the City of Brentwood Community Development Department. If occupied nests occur on-site or within 250 feet of the project site, then Mitigation Measure IV-4(b) shall be implemented. If occupied nests are not found, further mitigation is not necessary.*

IV-4(b). *During the nesting season (March 15-September 15), covered activities within 250 feet of occupied nests or nests under construction shall be prohibited to prevent nest abandonment. If site-specific conditions, or the nature of the covered activity (e.g., dense vegetation, limited activities) indicate that a smaller buffer could be used, the City of Brentwood may coordinate with CDFW/USFWS to determine the appropriate buffer size. If young fledge prior to September 15, covered activities can proceed normally.*

b,c. Riparian habitats are described as the land and vegetation that is situated along the bank of a stream or river. Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year. Vernal pools are seasonal depressional wetlands that are covered by shallow water for variable periods from winter to spring, but may be completely dry for most of the summer and fall. Vernal pools range in size from small puddles to shallow lakes, and are usually found in gently sloping plains of grasslands.

According to the BRA prepared for the proposed project, jurisdictional Waters of the U.S. or wetlands of any type are not present within the Phase 1 portion of the project site.

Although the Basin IS/MND determined that the Phase 2 portion of the project site contained approximately 1.03 acres of seasonal wetlands, the Basin IS/MND concluded that implementation of mitigation would reduce impacts to wetlands to a less-than-significant level. Because the LSCB has already been developed, the proposed project would not result in any additional impacts upon riparian habitats or wetlands within the Phase 2 portion of the project site.

In addition, although Sand Creek is located north of the project site boundary, the Creek would be fully avoided during project construction. The project site is comprised of disturbed habitat consisting of plowed fields. Therefore, impacts related to having a substantial adverse effect on a riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS would be less than significant. In addition, the project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Thus, a ***less-than-significant*** impact would occur.

d. Habitat loss, fragmentation, and degradation have the potential to alter the use and viability of wildlife movement corridors (i.e., linear habitats that naturally connect and provide passage between two or more otherwise distinct larger habitats or habitat fragments). The suitability of a habitat as a wildlife movement corridor is related to, among other factors, the habitat corridor’s dimensions (length and width), topography, vegetation, exposure to human influence, and the species in question.

As discussed previously, the project site is generally surrounded by existing development. Due to the disturbed nature of the project site, the potential for use of the site as a wildlife corridor or native wildlife nursery site is limited. Although Sand Creek may currently serve as a limited migration corridor for wildlife, the proposed project would be adequately set back from the Creek such that disturbance would not occur. In addition, compliance with the ECCC HCP/NCCP requirements discussed above would ensure that the proposed project would not interfere with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites. Therefore, a ***less-than-significant*** impact would occur.

e. The project site does not contain any trees, and project buildout would not require the removal of any trees. Therefore, the proposed project would not conflict with local policies or ordinances protecting biological resources, and a ***less-than-significant*** impact would occur.

V. CULTURAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☒	☐
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries.	☐	☒	☐	☐

Discussion

The following discussion is based primarily on a Cultural Resources Study was prepared for the proposed project by Tom Origer & Associates (Origer). [14]

a. A records search of the California Historic Resources Information System (CHRIS) was performed by the Northwest Information Center (NWIC) for cultural resource site records and survey reports within the project area on April 20, 2023. The records search indicated that cultural resources have not been documented within the project area, or within one mile of the project site.

As part of the Cultural Resources Study conducted for the project area, Origer conducted a site survey of the Phase 1 portion of the project site on May 18, 2023. The site survey consisted of a surface examination and the excavation of four auger holes to a depth of 150 centimeters. Origer did not encounter any resources that would be eligible for California Register of Historical Resources (CRHR) listing. In addition, according to a CHRIS search and field survey conducted for the Phase 2 portion of the project site as part of the Basin IS/MND, evidence of historical resources was not discovered within the LSCB. Therefore, the proposed project and off-site improvements would not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5, and a ***less-than-significant*** impact would occur.

b,c. As discussed above, the CHRIS search conducted for the Cultural Resources Study indicated that cultural resources have not been documented within the project area. In addition, the site visit conducted on April 20, 2023 did not identify any previously unrecorded archeological resources within the Phase 1 portion of the project site. According to Origer, the project site has already been subject to multiple cultural resource surveys which did not detect cultural resources on-site or within a half-mile of the project site. Origer determined that the majority of the project site has only a moderate potential for buried archeological site indicators. However, the portion of the project site located within approximately 500 feet of Sand Creek was determined to have a high potential for buried archeological site indicators due to the high potential for such areas to have been subject to past human occupation.

Based on the CHRIS search conducted for the LSCB, the Basin IS/MND determined that cultural resources have not been documented within the Phase 2 area of the project site. Furthermore, the Phase 2 area of the project site was subject to grading activities during the development of the LSCB. Any previously unknown cultural resources would have

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[14] Tom Origer & Associates. *Cultural Resources Study for the Sand Creek Sports Complex Project.* May 30, 2023.

been encountered during such activities; thus, cultural resources are unlikely to be present within the LSCB.

Considering that unknown archaeological resources, including human remains and/or historic resources, have the potential to exist within the Phase 1 area of the project site, ground-disturbing activity related to project construction could encounter such resources. Therefore, the proposed project and off-site improvements could cause a substantial adverse change in the significance of a historic or archaeological resource pursuant to CEQA Guidelines Section 15064.5 and/or disturb human remains, including those interred outside of dedicated cemeteries during construction. Thus, impacts could be considered ***potentially significant***.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact related to Phase 1 of the proposed project to a *less-than-significant* level.

V-1. *Prior to grading permit issuance, the plans shall include a note requiring that a qualified archaeologist conduct a Cultural Resources Worker Environmental Awareness Program (WEAP) training for all personnel involved in ground-disturbing, site preparation construction activities on the project site prior to construction and ground-disturbing activities. The training shall include basic information about the types of artifacts that might be encountered during construction activities, and procedures to follow in the event of a discovery. The training shall be provided for any additional personnel added to the project even after the initiation of construction and ground disturbing activities.*

V-2. *During construction, if historic and/or cultural resources are encountered during site grading or other site work, all such work shall be halted immediately within 100 feet and the contractor shall immediately notify the Community Development Department of the discovery. In such case, a qualified archaeological monitor shall be retained by the contractor, at its own expense, and shall evaluate any potentially important discovery. Significance determinations shall be measured in terms of criteria for inclusion on the California Register of Historical Resources (Title 14 CCR, §4852[a]), and the definition of tribal cultural resources set forth in Public Resources Code Section 21074. The archaeologist shall be required to submit to the Community Development Department for review and approval a report of the findings and method of curation or protection of the resources. Comments on the report shall be submitted by the Native American tribes within 30 days of receipt of the report. Further grading or site work within the area of discovery shall not be allowed until the preceding work has occurred.*

V-3. *During construction, if human remains, or remains that are potentially human, are found during construction, a professional archeologist shall ensure reasonable protection measures are taken to protect the discovery from disturbance. The archaeologist shall notify the Contra Costa County Coroner (per §7050.5 of the State Health and Safety Code). The provisions of §7050.5 of the California Health and Safety Code, §5097.98 of the California Public Resources Code, and Assembly Bill 2641 will be implemented. If the Coroner determines the remains are Native American* *and not the result of a crime scene, then the Coroner will notify the Native American Heritage Commission (NAHC), which then will designate a Native American Most Likely Descendant (MLD) for the project (§5097.98 of the Public Resources Code). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the project contractor does not agree with the recommendations of the MLD, the NAHC can mediate (§5097.94 of the Public Resources Code). If an agreement is not reached, the qualified archaeologist or MLD must rebury the remains where they will not be further disturbed (§5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate Information Center, using an open space or conservation zoning designation or easement, or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.*

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

Discussion

a,b The main forms of available energy supply are electricity, natural gas, and oil. A description of the California Green Building Standards Code and the Building Energy Efficiency Standards, with which the proposed project would be required to comply, as well as discussions regarding the proposed project's potential effects related to energy demand during construction and operations are provided below.

California Green Building Standards Code

The 2022 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11) is a portion of the California Building Standards Code (CBSC), which became effective on January 1, 2023.[15] The purpose of the CAL Green Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The CBSC standards regulate the method of use, properties, performance, types of materials used in construction, alteration repair, improvement and rehabilitation of a structure or improvement to property. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California. Requirements of the CALGreen Code include, but are not limited to, the following measures:

- Compliance with relevant regulations related to future installation of electric vehicle (EV) charging infrastructure in residential and non-residential structures;
- Indoor water use consumption is reduced through the establishment of maximum fixture water use rates;
- Outdoor landscaping must comply with the California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), or a local ordinance, whichever is more stringent, to reduce outdoor water use;
- Diversion of 65 percent of construction and demolition waste from landfills;
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board; and
- For some single-family and low-rise residential structures developed after January 1, 2020, mandatory on-site solar energy systems capable of producing 100 percent of the electricity demand created by the residence(s). Certain residential developments, such as developments that are subject to substantial shading, rendering the use of on-site solar photovoltaic systems infeasible, may be exempted from the foregoing requirement on a case-by-case basis.

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[15] California Building Standards Commission. *California Green Building Standards Code*. 2022.

Building Energy Efficiency Standards

The 2022 Building Energy Efficiency Standards is a portion of the CBSC, which expands upon energy-efficiency measures from the 2019 Building Energy Efficiency Standards, went into effect starting January 1, 2023. The 2022 standards provide for additional efficiency improvements beyond the 2019 standards. The proposed project would be subject to all relevant provisions of the most recent update of the CBSC, including the Building Energy Efficiency Standards. Adherence to the most recent CALGreen Code and Building Energy Efficiency Standards would ensure that the proposed structures and facilities would consume energy efficiently.

Construction Energy Use

The proposed project would require site preparation, grading, building construction, architectural coating, and paving. The construction phase would require energy for the manufacture and transportation of building materials, preparation of the site (e.g., site preparation and grading), and the actual construction of the building. Petroleum-based fuels such as diesel fuel and gasoline would be the primary sources of energy for these tasks.

The types of on-site equipment used during construction of the proposed project could include gasoline- and diesel-powered construction and transportation equipment, including trucks, bulldozers, frontend loaders, forklifts, and cranes. Other equipment could include construction lighting, field services (office trailers), and electrically driven equipment such as pumps and other tools. Policy N 1-15 of the Noise Element requires construction activities to comply with standard best practices as outlined in Action N 1E. Action N 1E states, in part, that construction activities are limited to 7:00 AM to 6:00 PM Monday-Friday and 8:00 AM to 5:00 PM on Saturday; construction is prohibited on Sundays and City holidays. As on-site construction activities would be restricted to the aforementioned hours, use of construction lighting is anticipated to be minimal. Singlewide mobile office trailers, which are commonly used in construction staging areas, generally range in size from 160 sf to 720 sf. A typical 720-sf office trailer would consume approximately 22,456 kWh during the 22-month construction phase for Phase 1A of the proposed project.

All construction equipment and operation thereof would be regulated per the CARB In-Use Off-Road Diesel Vehicle Regulation, which is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. The In-Use Off-Road Diesel Vehicle Regulation would subsequently help to improve fuel efficiency and reduce GHG emissions by requiring construction vehicles to become cleaner through the use of renewable energy resources. Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to reduce demand on oil and emissions associated with construction.

The CARB has prepared the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan),[16] which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix B of the 2017 Scoping Plan includes examples of local actions (municipal code changes,

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[16] California Air Resources Board. *The 2017 Climate Change Scoping Plan Update.* November 2017.

zoning changes, policy directions, and mitigation measures) that would support the State's climate goals. The examples provided include, but are not limited to, enforcing idling time restrictions for construction vehicles, utilizing existing grid power for electric energy rather than operating temporary gasoline/diesel-powered generators, and increasing use of electric and renewable fuel-powered construction equipment. The In-Use Off-Road Diesel Vehicle Regulation described above, with which the proposed project must comply, would be consistent with the intention of the 2017 Scoping Plan and the recommended actions included in Appendix B of the 2017 Scoping Plan.

Based on the above, the temporary increase in energy use occurring during construction of the proposed project would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, the proposed project would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand.

The proposed project would also be required to comply with CCR Title 13, Sections 2449(d)(3) and 2485, which limits idling from both on-road and off-road diesel-powered equipment. Thus, it is anticipated that construction of the proposed project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing energy use or increasing the use of renewable energy.

Operational Energy Use

Following implementation of the proposed project, PG&E would provide electricity to the project site. Energy use associated with operation of the proposed project would consist of electricity required for lighting of the sports fields and recreation areas, as well as electricity use associated with operation of the on-site amenities. However, electricity supplied to the project by PG&E would comply with the State's Renewable Portfolio Standard (RPS), which requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 and to 60 percent by 2030. Thus, a portion of the energy that would be consumed by the roadway in the future would originate from renewable sources.

With regard to transportation energy use, the project site is located adjacent Sand Creek Road, which provides access to SR 4. SR 4 is approximately 3,200 feet west of the project site, and, as a result, the proposed project would be in proximity to a regional route of travel. The existing transportation facilities in the area would provide future visitors and employees associated with the proposed project with access to public transportation, thus, further reducing fuel consumption demand. For example, the existing bus stop located on the site's southern frontage, west of Linden Street, would allow for convenient public transportation to the site, and bicycle and pedestrian access would be provided to the Sand Creek Trail north of the project site. Therefore, operational-related transportation fuel consumption would not result in a significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources.

Conclusion

Based on the above, construction and operation of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Thus, a ***less-than-significant*** impact would occur.

VII. GEOLOGY AND SOILS.

Would the project:

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

Discussion

ai-ii. According to the City of Brentwood General Plan EIR, the City's planning area does not contain any active or potentially active faults. The nearest active faults are the Greenville Fault and the Concord-Green Valley Fault, located approximately nine miles and 15 miles from the project site, respectively. Known active or potentially active faults do not exist on the project site. In addition, the project site is not located within a State-designated Alquist-Priolo Fault Zone.[17] Thus, the potential for fault rupture risk at the project site is relatively low.

An earthquake of moderate to high magnitude generated by the above faults could cause considerable ground shaking at the project site. It is noted that Phase 2 of the proposed project would not involve grading activities or the construction of structures; additionally, impacts related to seismic hazards due to development of the LSCB were addressed and dismissed in the Basin IS/MND. The analysis included herein assumes that development of the LSCB has been completed in compliance with the requirements included in the Basin IS/MND. Therefore, Phase 2 is not anticipated to result in any impacts related to seismic hazards, and, as a result, further discussion of Phase 2 is not included herein.

However, Phase 1 of the proposed project would be subject to all applicable regulations within the CBSC and Chapter 15.04 (Building Code) of the City's Municipal Code, which provides standards to protect property and public safety by regulating the design and

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[17] California Geologic Survey. *Seismic Hazard Zone Report for the Brentwood 7.5-Minute Quadrangle, Contra Costa County, California.* 2018.

construction of foundations, building frames, and other building elements. It is also noted that the site is relatively flat and landslides would not pose a hazard to on-site structures or future residents. However, a ***potentially significant*** impact would occur related to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides if the aforementioned regulations are not implemented during development of Phase 1 of the proposed project.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact related to Phase 1 of the proposed project to a ***less-than-significant*** level.

VII-1. *All project buildings shall be designed in conformance with the current edition of the California Building Code (CBC).*

VII-2. *Prior to grading permit issuance and approval of foundation plans, the contractor shall submit a final geotechnical evaluation of the project site that analyzes soil stability including soil expansion, and the potential for lateral spreading, subsidence, liquefaction or collapse. The report shall identify any on site soil and seismic hazards and provide design recommendations for onsite soil and seismic conditions. The geotechnical evaluation and all grading and foundation plans shall be reviewed and approved by the Director of Public Works/City Engineer, Chief Building Official, and a qualified Geotechnical Engineer to ensure that all geotechnical recommendations specified in the geotechnical report are properly incorporated and utilized in the project design in order to adhere to all geotechnical requirements contained in the California Building Code.*

aiii,aiv.
c. The proposed project's potential effects related to liquefaction, landslides, lateral spreading, and subsidence/settlement are discussed in detail below.

Liquefaction

Liquefaction is a phenomenon in which saturated, cohesionless soils are subject to a temporary total loss of shear strength due to pore pressure build-up associated with seismic events. According to the California Geological Survey (CGS) and the Basin IS/MND, the project site is located within a liquefaction zone. As such, the proposed project could be subject to surface disruption.

Landslides

Seismically-induced landslides are triggered by earthquake ground shaking. The risk of landslides is greatest in the late winter when groundwater levels are highest and hillside colluvium is saturated. The Seismic Hazards Mapping Act (SHMA) of 1990 (PRC, Chapter 7.8, Section 2690-2699.6) directs the CGS to identify and map areas prone to earthquake-induced landslides. According to the CGS, the project site is not located within a Seismic Hazard Zone associated with earthquake-induced landslides.[18] Additionally, the project site does not feature varying degrees of slope commonly associated with areas at risk for

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[18] California Geological Survey. *Earthquake Zones of Required Investigation*. Available at: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed July 2023.

earthquake-induced landslides. Therefore, it is determined that landslides do not pose a risk to the proposed project.

Lateral Spreading

Lateral spreading is a phenomenon, commonly associated with liquefaction, in which a soil mass moves towards a free face, such as an excavation or road cut, or down a gentle slope. As previously discussed, the site has the potential for liquefaction. However, because the project site is relatively level and free faces do not exist in the project vicinity, the potential for lateral spread is low.

Subsidence/Settlement

Differential settlement is defined as the vertical difference in settlement between adjacent foundation supports or across a horizontal distance of 30 feet, whichever is less. A majority of the estimated elastic settlement is expected to occur during construction as the foundation is loaded or fill/backfill is placed. According to the U.S. Department of Agriculture's Web Soil Survey, the project site has a low potential for subsidence or settlement.[19]

Conclusion

Based on the above, the proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides, lateral spreading, or subsidence. However, on-site soils could be subject to liquefaction. It is noted that Phase 2 of the proposed project would not involve ground-disturbing activities or construction of structures, and the Basin IS/MND concluded that impacts related to the foregoing factors due to development of the LSCB would be less than significant; this analysis assumes that work analyzed in the Basin IS/MND has been completed in compliance with the requirements therein. As such, Phase 2 would not result in impacts related to liquefaction. Nonetheless, without further investigation of on-site soils, Phase 1 of the proposed project could result in impacts related to liquefaction. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact related to Phase 1 of the proposed project to a ***less-than-significant*** level.

VII-3. *Implement Mitigation Measure VII-2.*

b. Issues related to erosion and degradation of water quality during construction are discussed in Section X, Hydrology and Water Quality, of this IS/MND, under question 'a'. As noted therein, a Storm Water Pollution Prevention Plan (SWPPP) for the site would be required. A SWPPP describes best management practices (BMPs) to control or minimize pollutants from entering stormwater and addresses both grading/erosion impacts and non-point source pollution impacts of the development project, including post-construction impacts. The City of Brentwood requires all development projects to use BMPs to treat runoff. Thus, the proposed project would not result in substantial soil erosion or the loss of topsoil. However, if BMPs are not implemented to treat runoff, a ***potentially significant*** impact would occur.

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[19] United States Department of Agriculture. *Web Soil Survey.* Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed July 2023.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a ***less-than-significant*** level.

VII-4. Prior to grading permit issuance, the contractor shall submit a final grading plan to the Director of Public Works/City Engineer for review and approval.

VII-5. Prior to grading permit issuance, the contractor shall submit an erosion control plan to the Director of Public Works/City Engineer for review and approval. The plan shall identify protective measures to be taken during construction, supplemental measures to be taken during the rainy season, the sequenced timing of grading and construction, and subsequent revegetation and landscaping work to ensure water quality in creeks and tributaries in the General Plan Area is not degraded from its present level. All protective measures shall be shown on the grading plans and specify the entity responsible for completing and/or monitoring the measure and include the circumstances and/or timing for implementation.

VII-6. Grading, soil disturbance, or compaction shall not occur during periods of rain or on ground that contains freestanding water. Soil that has been soaked and wetted by rain or any other cause shall not be compacted until completely drained and until the moisture content is within the limit approved by a Soils Engineer. Approval by a Soils Engineer shall be obtained prior to the continuance of grading operations. Confirmation of this approval shall be provided to the Public Works Department prior to commencement of grading.

d. Expansive soils shrink/swell when subjected to moisture fluctuations, which can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Specifically, such soils shrink and harden when dried and expand and soften when wetted. If structures are underlain by expansive soils, foundation systems must be capable of withstanding the potential damaging movements of the soil. According to the U.S. Department of Agriculture's Web Soil Survey, the project site consists of 54 percent Capay clay and 46 percent Sycamore silty clay loam.[20] While Sycamore silty clay loam has a shrink-swell rating of 0.5, which is considered moderate, Capay clay has a shrink-swell rating of 1.0, which is considered severe. Therefore, the proposed project could be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code, and in the absence of proper mitigation, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a ***less-than-significant*** level.

VII-7. Implement Mitigation Measure VII-2.

e. The proposed project would connect to the City's existing sewer infrastructure, and, thus, would not require the use of septic systems. Therefore, ***no impact*** would occur related to having soils incapable of adequately supporting the use of septic tanks or alternative

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[20] United States Department of Agriculture. *Web Soil Survey.* Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed July 2023.

wastewater disposal systems where sewers are not available for the disposal of wastewater.

f. The City's General Plan indicates that known paleontological resources do not exist within the City planning area. However, development allowed under the General Plan could result in the discovery and disturbance of previously unknown or undiscovered paleontological resources. Geologic formations, including the Upper Cretaceous marine sedimentary rocks and various Quaternary subunits, that have a moderate to high potential for paleontological resources, are present throughout many areas of the City. The City's General Plan EIR concluded that with implementation of Action COS 6e, which requires all new development projects to comply with procedures upon discovery of unique paleontological resources, impacts related to disturbance of paleontological resources would be less than significant.

As noted in the City's General Plan EIR, the majority of the City is underlain by Quaternary Marine/Alluvium, which contains mostly nonmarine unconsolidated alluvium, lake, playa, and terrace deposits. Such soil types are not considered unique geologic features and are common within the geographic area of the City. Furthermore, the City's General Plan does not note the existence of any unique geologic features within the City. Consequently, implementation of the proposed project would not be anticipated to have the potential to result in direct or indirect destruction of unique geologic features.

Phase 2 of the proposed project would not include ground-disturbing activities, and impacts upon unique geologic features and paleontological resources within the LSCB were analyzed and dismissed in the Basin IS/MND. With regard to Phase 1, although the proposed project would not have the potential to result in the destruction of unique geologic features, previously unknown paleontological resources could exist within the project site. Thus, ground-disturbing activity, such as grading, trenching, or excavating associated with implementation of the Phase 1 of the proposed project, could have the potential to disturb or destroy such resources. Therefore, the proposed project could result in the direct or indirect destruction of a unique paleontological resource, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact related to Phase 1 of the proposed project to a ***less-than-significant*** level.

VII-8. *Should construction or grading activities result in the discovery of unique paleontological resources, all work within 100 feet of the discovery shall cease. The Community Development Department shall be notified, and the resources shall be examined by a qualified archaeologist, paleontologist, or historian, at the contractor's expense, for the purpose of recording, protecting, or curating the discovery as appropriate. The archaeologist, paleontologist, or historian shall submit to the Community Development Department for review and approval a report of the findings and method of curation or protection of the resources. Work may only resume in the area of discovery when the preceding work has occurred. The language of this mitigation shall be included via notation on the project improvement plans.*

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

a,b. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Construction of the proposed project and off-site improvements would cumulatively contribute to increases of GHG emissions. Estimated GHG emissions attributable to future development would be primarily associated with increases of carbon dioxide (CO_2) and, to a lesser extent, other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O) associated with area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste. The primary source of GHG emissions for the project would be mobile source emissions. The common unit of measurement for GHG is expressed in terms of annual metric tons of CO_2 equivalents ($MTCO_2e$/yr).

The proposed project is located within the jurisdictional boundaries of BAAQMD. The most recent BAAQMD Air Quality Guidelines were released in April 2023.[21] The updated GHG thresholds address more recent climate change legislation, including Senate Bill (SB) 32, and provide qualitative thresholds related to Buildings and Transportation.

Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. Neither the City nor BAAQMD has an adopted threshold of significance for construction-related GHG emissions and does not require quantification. Nonetheless, the proposed project's construction GHG emissions, have been estimated using CalEEMod, as discussed in Section III, Air Quality, of this IS/MND (see Appendix B). Based on the modeling results, construction of the proposed project would result in total unmitigated GHG emissions of 300 $MTCO_2e$ over the entire construction period.

Potential impacts related to operational GHG emissions resulting from implementation of the proposed project and off-site improvements are considered in comparison with BAAQMD's adopted thresholds of significance below.

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[21] Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.

BAAQMD Thresholds of Significance

The BAAQMD's adopted thresholds of significance for GHG emissions are qualitative, and address recent climate change legislation, including SB 32. According to the new thresholds of significance, a project must either include specific project design elements (e.g., exclude use of natural gas, achieve a specific reduction in project-generated vehicle miles traveled (VMT) below the regional average) or be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).[22] The City of Brentwood has not prepared a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b). Therefore, according to the BAAQMD's new requirements, in order to find a less-than-significant GHG impact, the proposed project must include, at a minimum, the following project design elements:

1. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development);
2. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines;
3. The project will achieve a reduction in project-generated VMT below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted SB 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA; and
4. The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

In order to be consistent with the first criterion, the proposed project would be required to include all electric appliances and plumbing. The 2022 Building Energy Efficiency Standards requires that new development be built electric-ready. The proposed project would be built in accordance with the aforementioned standards, and the project would not be designed to include natural gas. Thus, the proposed project would not conflict with the first criterion.

Regarding the second criterion, as discussed in Section VI, Energy, of this IS/MND, the proposed project would comply with all applicable federal, State, and local regulations regarding energy use during both project construction and project operations. Therefore, as discussed therein, the proposed project would not result in any wasteful, inefficient, or unnecessary energy usage.

With respect to the third criterion, as discussed in Section XVII, Transportation, of this IS/MND, the Countywide VMT per service population was calculated to be 29.3. Therefore, the impact threshold of 15 percent below the Countywide VMT per service population equates to 24.9. The project is projected to generate a VMT per service population of 17.2, which is below the aforementioned impact threshold. Therefore, the project would achieve a 15 percent reduction in project-generated VMT below the regional average consistent with the current version of the California Climate Change Scoping Plan.

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[22] Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.

With respect to the fourth criterion, the proposed project would be subject to the non-residential standards set forth in Section 5.106.5.3 of the CALGreen Code. Pursuant to Section 5.106.5.3, the proposed project would include 22 EV parking spaces. Compliance with the aforementioned CalGreen Code requirement would be sufficient to comply with the Tier 2 CALGreen standards, as required by BAAQMD.

Conclusion

Based on the above, because the proposed project would be compliant with the criteria under State CEQA Guidelines Section 15183.5(b), the proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Therefore, a ***less-than-significant*** impact would occur.

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

Discussion

a. Recreational developments are not typically associated with the routine transport, use, disposal, or generation of substantial amounts of hazardous materials. On-site maintenance may involve the use of common household cleaning products, fertilizers, and herbicides, any of which could contain potentially hazardous chemicals; however, such products would be expected to be used in accordance with label instructions. Due to the regulations governing use of such products and the amount anticipated to be used on the site, routine use of such products would not represent a substantial risk to public health or the environment. Therefore, the project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Construction activities associated with implementation of the proposed project and off-site improvements would involve the use of heavy equipment, which would contain fuels and oils, and various other products such as concrete, paints, and adhesives. The project contractor is required to comply with all California Health and Safety Codes and local county ordinances regulating the handling, storage, and transportation of hazardous and toxic materials. Pursuant to California Health and Safety Code Section 25510(a), except as provided in subdivision (b),[23] the handler or an employee, authorized representative, agent, or designee of a handler, shall, upon discovery, immediately report any release or threatened release of a hazardous material to the unified program agency (in the case of the proposed project, the Contra Costa County Environmental Health Division [CCCEHD])

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[23] Subdivision (a) does not apply to a person engaged in the transportation of a hazardous material on a highway that is subject to, and in compliance with, the requirements of Sections 2453 and 23112.5 of the Vehicle Code.

in accordance with the regulations adopted pursuant to Section 25510(a). The handler or an employee, authorized representative, agent, or designee of the handler shall provide all State, city, or county fire or public health or safety personnel and emergency response personnel with access to the handler's facilities. In the case of the proposed project, the contractors are required to notify the CCCEHD in the event of an accidental release of a hazardous material, who would then monitor the conditions and recommend appropriate remediation measures.

Based on the above, the proposed project would not create a significant hazard to the public or the environment through the routine handling, transport, use, or disposal of hazardous materials. Therefore, a ***less-than-significant*** impact would occur.

b. Construction activities associated with the proposed project would involve the use of heavy equipment, which would contain fuels and oils, and various other products such as concrete, paints, and adhesives. Small quantities of potentially toxic substances (e.g., petroleum and other chemicals used to operate and maintain construction equipment) would be used at the project site and transported to and from the site during construction. Similarly, operation of the proposed project would include the use of equipment which could use small quantities of potentially toxic substances. However, the project would be required to comply with all California Health and Safety Codes and local ordinances regulating the handling, storage, and transportation of hazardous and toxic materials. Thus, construction of the proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.

A review of Google Earth aerial photographs of the project site shows that the project site was used for agricultural purposes around 1939. As a result, the potential exists for organochlorine and arsenic pesticide residues to be present within surficial soils. If such materials are present in on-site soils, a potential health hazard could occur during project construction.

Based on the above, the proposed project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment during construction activities. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a ***less-than-significant*** level.

IX-1. *In conjunction with the approval of any improvement plans associated with development of the project site, the project contractor shall prepare a soil assessment with surficial soil samples to determine the presence of pesticides. If pesticide concentrations higher than the allowable threshold, as defined by the Department of Toxic Substances Control, are detected, the assessment shall include appropriate measures to address the contaminated soil, including, but not limited to, removal and disposal of the contaminated soil in accordance with federal, State, and local regulations or soil remediation to an acceptable total threshold limit concentration (TTLC) level pursuant to applicable State and federal regulations. The soil* *assessment and recommended measures shall be reviewed and approved by the City's Community Development Department.*

c. The project site is not located within a quarter mile of any existing or proposed schools. The nearest school is the Loma Vista Elementary School, located approximately 0.3-mile southwest of the site. Therefore, the proposed project would have ***no impact*** related to hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d. The Cal-EPA has compiled a list of data resources that provide information regarding the facilities or sites identified as meeting the "Cortese List" requirements, pursuant to Government Code 65962.5. The components of the Cortese List include the Department of Toxic Substances Control (DTSC) Hazardous Waste and Substances Site List, the list of leaking underground storage tank (UST) sites from the SWRCB's GeoTracker database, the list of solid waste disposal sites identified by the SWRCB, and the list of active Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO) from the State Water Resources Control Board (SWRCB). The project site is not included on the DTSC Hazardous Waste and Substances Site List,[24] or the list of solid waste disposal sites.[25] In addition, the project site is not included on the list of leaking UST sites from the SWRCB's GeoTracker database, or the list of active CDO and CAO from the SWRCB. Thus, the proposed project would not create a significant hazard to the public or the environment, and a ***less-than-significant*** impact would occur.

e. The nearest public airport to the site is Byron Airport, which is located approximately 9 miles southeast of the site. In addition, a private airfield (Funny Farm Airfield) is located approximately 4.3 miles east of the project site. As such, the project site is not located within two miles of any public airports, and does not fall within an airport land use plan area. Therefore, ***no impact*** would occur related to the project being located within an airport land use plan or within two miles of a public airport or public use airport, thereby resulting in a safety hazard or excessive noise for people residing or working in the project area.

f. During construction of the proposed project and off-site improvements, all construction equipment would be staged on-site so as to prevent obstruction of local and regional travel routes in the City that could be used as evacuation routes during emergency events. While the proposed project would include the installation of a traffic signal at the intersection of Sand Creek Road and Linden Street, the project would not substantially alter existing circulation systems in the surrounding area. As a result, the project would have a ***less-than-significant*** impact with respect to impairing the implementation of or physically interfering with an adopted emergency response plan or emergency evacuation plan.

g. Issues related to wildfire hazards are discussed in Section XX, Wildfire, of this IS/MND. As noted therein, areas at risk for wildland fires are typically in or on the edge of undeveloped areas with large amounts of combustible vegetation. The project site is surrounded by existing development to the west and south, and is not located within an area where wildland fires typically occur. In addition, the proposed project would not include the construction of structures or infrastructure that would result in an increased

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[24] Department of Toxic Substances Control. *Hazardous Waste and Substances Site List (Cortese).* Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed July 2023.

[25] CalEPA. *Cortese List Data Resources*. Available at: https://calepa.ca.gov/sitecleanup/corteselist/. Accessed July 2023.

hazard due to wildfires. According to the California Department of Forestry and Fire Protection (CAL FIRE), the project site is not located within a Very High Fire Hazard Severity Zone.[26] Therefore, the proposed project would not expose people or structures to the risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands, and a ***less-than-significant*** impact would occur.

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[26] California Department of Forestry and Fire Protection. *FHSZ Viewer.* Available at: https://egis.fire.ca.gov/FHSZ/. Accessed July 2023.

X. HYDROLOGY AND WATER QUALITY.

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

Discussion

a. During the early stages of construction activities, topsoil would be exposed due to grading and excavation of the Phase 1 area of the project site. After grading and prior to overlaying the ground surface with impervious surfaces and structures, the potential exists for wind and water erosion to discharge sediment and/or urban pollutants into stormwater runoff, which could adversely affect water quality.

The SWRCB regulates stormwater discharges associated with construction activities where clearing, grading, or excavation results in a land disturbance of one or more acres. Both phases of the proposed project would disturb more than one acre of land, and, therefore, the proposed construction activities would be subject to applicable SWRCB regulations. Performance Standard NDCC-13 of the City's National Pollutant Discharge Elimination System (NPDES) permit requires applicants to show proof of coverage under the State's General Construction Permit prior to receipt of any construction permits. The State's General Construction Permit requires a SWPPP to be prepared for the site. A SWPPP describes BMPs to control or minimize pollutants from entering stormwater and must address both grading/erosion impacts and non-point source pollution impacts of the development project, including post-construction impacts. The City of Brentwood requires all development projects to use BMPs to treat runoff.

Following completion of the proposed recreational development, the site would be largely covered with pervious surfaces, with some areas covered in impervious surfaces where topsoil would no longer be exposed. Additionally, the majority of on-site pervious surfaces would be overlain with artificial turf; thus, topsoil would not be exposed. As such, the potential for impacts to water quality would be reduced. In addition, as discussed in further detail below, the proposed project would include the development of storm drainage utilities and would direct flows to the existing storm drain lateral on Sand Creek Road.

Based on the above, the proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. However, should a SWPPP not be prepared and the BMPs included therein not implemented, a ***potentially significant*** impact would occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a ***less-than-significant*** level.

X-1. *Prior to issuance of grading permits, the contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP). The Developer shall file the Notice of Intent (NOI) and associated fee to the SWRCB. The SWPPP shall serve as the framework for identification, assignment, and implementation of BMPs. The contractor shall implement BMPs to reduce pollutants in stormwater discharges consistent with the requirements established in 15.52.60(F): Erosion and Sediment Control of the City's Municipal Code. The SWPPP shall be submitted to the Director of Public Works/City Engineer for review and approval and shall remain on the project site during all phases of construction. Following implementation of the SWPPP, the contractor shall subsequently demonstrate the SWPPP's effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in stormwater discharges to the maximum extent practicable.*

X-2. *Prior to the completion of construction, the contractor shall prepare and submit, for the City's review, an acceptable Stormwater Control Operation and Maintenance Plan. In addition, prior to the sale, transfer, or permanent occupancy of the site, the contractor shall be responsible for paying for the long-term maintenance of treatment facilities, and executing a Stormwater Management Facilities Operation and Maintenance Agreement and Right of Entry in the form provided by the City of Brentwood. The contractor shall accept the responsibility for maintenance of stormwater management facilities until such responsibility is transferred to another entity.*

The contractor shall submit a draft Stormwater Facilities and Maintenance Plan, including detailed maintenance requirements and a maintenance schedule for the review and approval by the Director of Public Works/City Engineer. Typical routine maintenance consists of the following:

- *Limit the use of fertilizers and/or pesticides. Mosquito larvicides shall be applied only when absolutely necessary.*
- *Replace and amend plants and soils as necessary to insure the planters are effective and attractive. Plants must remain healthy and trimmed if overgrown. Soils must be maintained to efficiently filter the storm water.*

- *Visually inspect for ponding water to ensure that filtration is occurring.*
- *After all major storm events, remove bubble-up risers for obstructions and remove if necessary.*
- *Continue general landscape maintenance, including pruning and cleanup throughout the year.*
- *Irrigate throughout the dry season. Irrigation shall be provided with sufficient quantity and frequency to allow plants to thrive.*
- *Excavate, clean and or replace filter media (sand, gravel, topsoil) to insure adequate infiltration rate (annually or as needed).*

X-3. *Design of both the on-site drainage facilities shall meet with the approval of both the Director of Public Works/City Engineer and the Contra Costa County Flood Control and Water Conservation District prior to the issuance of grading permits.*

X-4. *Contra Costa County Flood Control and Water Conservation District drainage fees for the Drainage Area shall be paid prior to issuance of grading permits to the satisfaction of the Director of Public Works/City Engineer.*

X-5. *The contractor shall ensure that the project site shall drain into a street, public drain, or approved private drain, in such a manner that un-drained depressions shall not occur. Satisfaction of this measure shall be subject to the approval of the Director of Public Works/City Engineer.*

X-6. *The construction plans shall indicate roof drains emptying into a pipe leading to the project bioswale areas for the review and approval of the Director of Public Works/City Engineer prior to the issuance of building permits.*

X-7. *The improvement plans shall indicate concentrated drainage flows not crossing sidewalks or driveways for the review and approval of the Director of Public Works/City Engineer prior to the issuance of grading permits.*

b,e. Water supplies for the project site are supplied by the City of Brentwood. According to the City's 2020 Urban Water Management Plan (UWMP), the City's current water supply consists of both surface water from the Delta and groundwater that is pumped from the East Contra Costa (ECC) Subbasin underlying the City through nine wells within the service area, five of which are active.[27] While the portions of the 33.72-acre project site would be paved with impervious surfaces, the majority of the site would consist of multi-use sports fields that would remain permeable. Only minimal impervious surfaces, in the form of a paved walking path, would be developed within the Phase 2 portion of the project site, which consists of the LSCB, and, thus, would allow for groundwater recharge. In addition, the ECC Subbasin has a total surface area of approximately 168 square miles; therefore, the groundwater basin within which the project site is located would be recharged from many sources over a large area. Except for seasonal variations resulting from recharge and pumping, the General Plan EIR anticipates the City will pump a relatively stable amount of groundwater through the year 2045. Therefore, any new

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[27] City of Brentwood. *2020 Urban Water Management Plan*. June 2021, revised December 2021.

impervious surfaces associated with the project would not interfere substantially with groundwater recharge within the ECC Subbasin.

Given that the proposed project is consistent with the site's current land use and zoning designations, recreational development of the project site has generally been anticipated by the City. As such, the project would not result in increased use of groundwater supplies beyond what has been anticipated by the City and accounted for in the UWMP. Additionally, the proposed project would be subject to the specific regulations on water use imposed by the UWMP. Furthermore, water use resulting from the proposed project would primarily be associated with irrigation of the natural turf fields and on-site landscaping. The proposed project would also comply with the Model Water Efficient Landscape Ordinance (MWELO), as adopted by reference in Brentwood Municipal Code chapter 17.630, through the use of recycled water to irrigate on-site landscaping and the integration of low water use plants.

Therefore, the proposed project would result in a ***less-than-significant*** impact with respect to substantially decreasing groundwater supplies or interfering substantially with groundwater recharge such that the project would impede sustainable groundwater management of the basin. In addition, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

ci-iii. All municipalities within Contra Costa County are required to develop more restrictive surface water control standards for new development projects as part of the renewal of the Countywide NPDES permit. Known as the "C.3 Standards," new development and redevelopment projects that create or replace 5,000 or more square feet of impervious surface area must contain and treat stormwater runoff from the site. Phase 2 of the project site would not include the development of 5,000 or more square feet of impervious surface area, and, thus, would not be subject to C.3 regulations. However, Phase 1 of the proposed project would result in a total disturbance area of 14.48 acres (630,749 sf); while the proposed sports fields would be comprised of synthetic turf overlaying pervious soils, approximately 356,000 sf of the project site would be developed with impervious surfaces. Because Phase 1 of the proposed project would create more than 5,000 sf of impervious surface area, Phase 1 of the proposed project would be considered a C.3 regulated project and is required to include appropriate site design measures, source controls, and hydraulically-sized stormwater treatment measures. In addition, the project site is within Drainage Area 30c, and would be required to pay the applicable CCCFCWCD drainage fees.[28]

Phase 2 of the proposed project would be located within the existing LSCB, which is, itself, a stormwater treatment facility. The on-site stormwater treatment facilities developed as part of Phase 1 of the proposed project would incorporate the most recent Stormwater C.3 Guidebook and Contra Costa Clean Water Program requirements,[29] as well as all applicable City stormwater requirements. The Phase 1 portion of the project site would be divided into multiple DMAs consisting of self-treating or self-retaining pervious surfaces, including the proposed sports fields. On-site impervious areas, including parking lots and restrooms, would be designed to drain towards nearby bio-retention areas within the aforementioned DMAs. Treated stormwater would then be conveyed through an on-site

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[28] Contra Costa County Flood Control District. *Contra Costa County Formed Drainage Areas.* February 7, 2008.

[29] Contra Costa County Clean Water Program. *Stormwater C.3 Guidebook.* December 23, 2022.

drainage system to connect to an existing 18-inch storm drain lateral on Sand Creek Road. The bio-retention basins would be sized to provide for adequate treatment and management of all stormwater runoff. Furthermore, because the proposed project is consistent with the site's current General Plan land use designation, the surrounding infrastructure has been designed and built to accommodate stormwater runoff associated with the proposed project, in addition to stormwater flows associated with existing development in the area.

Through the stormwater control measures proposed as part of the project, Phase 1 of the proposed project would adequately manage the stormwater runoff from the project site. However, the proposed bio-retention basins would need to be maintained properly to ensure long-term proper functioning of the on-site stormwater management system. A long-term maintenance plan is needed to ensure that all proposed stormwater treatment BMPs function properly. Should the proposed water quality treatment facilities within the Phase 1 portion of the project not be maintained properly, a ***potentially significant*** impact could occur with respect to substantially altering the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion, siltation, or flooding on- or off-site, creating or contributing runoff water that would exceed the capacity of existing or planned stormwater drainage systems, or providing substantial additional sources of polluted runoff.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact related to Phase 1 of the proposed project to a ***less-than-significant*** level.

X-8. Implement Mitigation Measures X-1 through X-7.

civ,d. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 06013C0353F, effective June 16, 2009, the project site is entirely located within Zone X.[30] FEMA defines Zone X as an area located outside of the 100-year year floodplain. Therefore, the proposed project would not include any development within a Special Flood Hazard Area, and would not impede or redirect flood flows.

Tsunamis are defined as sea waves created by undersea fault movement. A tsunami poses little danger away from shorelines; however, when it reaches the shoreline, a high swell of water breaks and washes inland with great force. Waves may reach 50 feet in height on unprotected coasts. Historic records of the Bay Area used by one study indicate that nineteen tsunamis were recorded in San Francisco Bay during the period of 1868-1968. Maximum wave height recorded at the Golden Gate tide gauge (where wave heights peak) was 7.4 feet. The available data indicate a standard decrease of original wave height from the Golden Gate to about half original wave height on the shoreline near Richmond, and to nil at the head of the Carquinez Strait. As Brentwood is several miles inland from the Carquinez Strait, the project site is not exposed to flooding risks from tsunamis and adverse impacts would not result.

A seiche is a long-wavelength, large-scale wave action set up in a closed body of water such as a lake or reservoir, whose destructive capacity is not as great as that of tsunamis. Seiches are known to have occurred during earthquakes, but none have been recorded

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[30] Federal Emergency Management Agency. *Flood Insurance Rate Map 06013C0353F*. Effective June 16, 2009.

in the Bay Area. In addition, the project is not located near a closed body of water. Therefore, the proposed project is not anticipated to be impacted by seiches in the future.

Based on the above, the proposed project would not pose a risk related to the release of pollutants due to project inundation due to flooding, tsunami, or seiche, and a ***less-than-significant*** impact would occur.

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

Discussion

a. A project risks dividing an established community if the project would introduce infrastructure or alter land use so as to change the land use conditions in the surrounding community, or isolate an existing land use. Surrounding existing land uses include Sand Creek, the Sand Creek Trail, undeveloped land, and single-family residences to the north; single-family residences to the east; single-family residences and a church/daycare to the south; and an apartment complex, and single-family residences to the west. The Phase 1 portion of the project site is currently undeveloped and the Phase 2 portion of the project site is developed with the LSCB. As such, the proposed project would not divide an established community. In addition, the proposed project is consistent with the project site's General Plan land use and zoning designations. As such, buildout of the project site with recreational uses has generally been anticipated by the City. Therefore, the proposed project would have ***no impact.***

b. As discussed throughout this IS/MND, the proposed project would not conflict with any land use plan, policy, or regulations adopted for the purpose of avoiding or mitigating an environmental effect because development of the project site would comply with all standards set in the City of Brentwood General Plan and General Plan EIR, as well as the City's noise standards, applicable SWRCB regulations related to stormwater, and ECCC HCP/NCCP standards. The P and PF General Plan land use designations include existing and future park and recreation facilities of varying size, function, and location to serve the community. In addition, as discussed throughout this IS/MND, the proposed project would not result in any significant environmental effects that cannot be mitigated to a less-than-significant level by the mitigation measures provided herein. The proposed project would not change the land uses surrounding the project site, nor would the proposed project conflict with the purposes of the land use and zoning designations of the project area. Therefore, the proposed project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigation an environmental effect, and a ***less-than-significant*** impact would occur.

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

Discussion

a,b. According to the City's General Plan EIR, within the City limits, documented mineral resources include sand, gravel, coal, oil, and gas.[31] Sediments throughout most of the City consist of young alluvial deposits. Historically, large amounts of sand were mined from the dune sands of the northern portion of the City; however, competition from sand and gravel pits in the Tracy and Livermore areas caused a gradual decline in production. As of January 1, 2013, three aggregate mines exist within Contra Costa County: the Byron Plant, Clayton Quarry, and Clayton Mine. In addition, Figure 3.6-6 in the 2014 Brentwood General Plan Update EIR does not show any existing active oil or gas wells on the project site. None of the three mines are located within the City of Brentwood planning area, and, thus, would not be adversely affected by the proposed project. Therefore, ***no impact*** to mineral resources would occur as a result of development of the project.

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[31] City of Brentwood. *2014 Brentwood General Plan Draft Environmental Impact Report.* April 2014.

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

Discussion

a. The following discussion is based primarily on information from an Environmental Noise Assessment (ENA) prepared for the proposed project by Saxelby Acoustics, LLC (Saxelby) (Appendix F).[32] The following sections present information regarding sensitive noise receptors in proximity to the project site, the existing noise environment, and the potential for the proposed project to result in impacts during project construction and operation. The following terms are referenced in the sections below:

- Decibel (dB): A unit of sound energy intensity. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels. All references to decibels (dB) in this report will be A-weighted unless noted otherwise.
- Day-Night Average Level (L_{dn}): The average sound level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours.
- Equivalent Sound Level (L_{eq}): The average sound level over a given time-period.
- Maximum Sound Level (L_{max}): The maximum sound level over a given time-period.

Sensitive Noise Receptors

Some land uses are considered more sensitive to noise than others, and, thus, are referred to as sensitive noise receptors. Land uses often associated with sensitive noise receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise. In the vicinity of the project site, noise sensitive receptors include the single-family residences located to the north, west, and south, as well as the multi-family residences located to the southwest, with the nearest existing residence being located along the western and southwestern border of the project site.

Existing Noise Environment

In order to quantify the existing ambient noise environment in the project vicinity, Saxelby conducted continuous noise level measurements at two locations on the project site, as shown in Figure 6.

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[32] Saxelby Acoustics, LLC. *Environmental Noise Assessment: Sand Creek Sports Complex.* January 12, 2024.

Figure 6
Noise Measurement Sites

The ambient noise environment in the project vicinity is primarily defined by traffic noise along Sand Creek Road, as well as other local roadways. Table 4 below provides a summary of the noise measurement results.

Table 4
Existing Ambient Noise Levels in the Project Vicinity

Site	Date	L_{dn}	Daytime L_{eq}	Daytime L_{50}	Daytime L_{max}	Nighttime L_{eq}	Nighttime L_{50}	Nighttime L_{max}
LT-1: Western Project Boundary	5/27/23	60	61	45	75	43	38	56
	5/28/23	52	52	42	73	42	39	57
	5/29/23	52	50	44	70	44	40	59
LT-2: Northeastern Project Boundary	5/27/23	55	51	48	67	48	43	64
	5/28/23	54	51	47	69	47	44	62
	5/29/23	56	52	48	69	49	45	65

Notes:
- All values shown in dBA
- Daytime hours: 7:00 AM to 10:00 PM
- Nighttime Hours: 10:00 PM to 7:00 AM

Source: Saxelby Acoustics, 2024.

Standards of Significance

Both the City's Municipal Code and General Plan include regulations related to the generation of noise. With regard to temporary construction noise, Policy N 1-15 of the Noise Element requires construction activities to comply with standard best practices as outlined in Action N 1E. Action N 1E states, in part, that construction activities are limited to 7:00 AM to 6:00 PM Monday-Friday and 8:00 AM to 5:00 PM on Saturday; construction is prohibited on Sundays and City holidays. In addition, Saxelby used the California Department of Transportation (Caltrans) standards of significance to evaluate increases in the noise environment due to construction noise; Caltrans defines a significant increase due to noise as an increase of 12 dBA over existing ambient noise levels.

The Noise Element of the City's General Plan establishes a land use compatibility criterion of 60 dB L_{dn} or less within outdoor activity areas of residential land uses impacted by transportation noise sources (e.g. traffic noise). General Plan Policy N I-2 requires that new development and infrastructure projects be consistent with the Land Use Compatibility for Community Noise Environments standards (reproduced in Table 5 below) to ensure acceptable noise levels for existing and future development. Furthermore, General Plan Policy N1-13 requires stationary (non-transportation) noise sources to be below 55 L_{eq} during daytime hours, and 45 L_{eq} during nighttime hours at residential land uses.

In addition to the noise level standards described above, the City also provides the following criteria to determine the significance of transportation noise impacts:

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a 5.0 dB L_{dn} increase in roadway noise levels would be considered significant;
- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a 3.0 dB L_{dn} increase in roadway noise levels would be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a 1.5 dB L_{dn} increase in roadway noise levels would be considered significant.

Table 5
Land Use Compatibility for Exterior Noise Environment (L_{dn})

Land Use	Normally Acceptable	Conditionally Acceptable	Unacceptable
Single-Family Residential	≤60	60-75	>75
Multi-Family Residential, Hotels, and Motels	≤65	65-75	>75
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	≤65	65-80	>80
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches	≤65	65-75	>75
Office Buildings, Business Commercial, and Professional	≤67	70-80	>77
Industrial	≤70	70-80	>80

Source: City of Brentwood General Plan (Table N-1), July 2014.

Impact Analysis

The following sections provide an analysis of potential noise impacts associated with construction and operation of the proposed project.

Construction Noise

During the construction phases of the proposed project, heavy-duty equipment would be used for grading, excavation, paving, and building construction, which would result in temporary noise level increases while in operation. Noise levels would vary depending on the type of equipment used, how the equipment is operated, and how well the equipment is maintained. In addition, noise exposure at any single point outside the project site would vary depending on the proximity of construction activities to that point. Standard construction equipment, such as graders, backhoes, loaders, and haul trucks would be used on-site.

Table 6 shows maximum noise levels associated with typical construction equipment. Based on the table, activities involved in typical construction would generate maximum noise levels ranging from 76 to 90 dB L_{max} at a distance of 50 feet. The closest noise-sensitive receptor to the proposed project site would be located in the vicinity of LT-2 in Figure 6, approximately 440 feet northeast of the acoustic center of construction activity, where multiple pieces of heavy construction equipment would potentially operate at the project site.

Table 6
Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Federal Highway Administration, Roadway Construction Noise Model User's Guide, January 2006.

According to the ENA, the maximum construction noise levels at the nearest sensitive receptor would be up to 71 dBA. The average daytime maximum noise level in the vicinity of the sensitive receptors, as measured at LT-2, was measured to be 67 dBA. Therefore, pursuant to the Caltrans standards of significance of criteria defined above, because construction activities would not result in an increase of greater than 12 dBA over existing ambient noise levels, a significant impact related to construction noise would not occur.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Pursuant to Action N 1E of the General Plan, construction activities are limited to 7:00 AM to 6:00 PM Monday-Friday and 8:00 AM to 5:00 PM on Saturday; construction is prohibited on Sundays and City holidays. Without compliance with the aforementioned regulations, a potentially significant impact could occur.

Project Operational Noise

Operations associated with the proposed development would generate noise primarily associated with vehicle traffic along the local roadways as well as stationary sources at the project site. Such noise sources are discussed in the sections below.

Traffic Noise

As discussed above, the City considers that a significant impact would occur where existing traffic noise levels are less than 60 dBA L_{dn} at the outdoor activity areas of noise-sensitive uses and project-related traffic would result in a 5.0 dBA increase in the roadway noise levels. Where existing traffic noise levels range between 60 dBA and 65 dBA L_{dn} at the outdoor activity areas of noise-sensitive uses, a 3.0 dBA increase in roadway noise levels would be considered significant. Finally, where existing traffic noise levels are greater than 65 dBA L_{dn} at the outdoor activity areas of noise-sensitive uses, a 1.5 dBA increase in roadway noise levels would be considered significant.

In order to asses noise impacts due to project-related traffic increases on the local roadway network, Saxelby predicted traffic noise levels at sensitive receptors for existing and future, as well as project and no-project conditions. Existing and cumulative traffic noise levels were calculated using the Federal Highway Administration Highway Traffic

Noise Prediction Model (FHWA RD-77-108) and project-generated traffic was calculated using the project trip generation volumes provided for the proposed project by Fehr & Peers (Appendix C).[33] The modeled traffic noise levels at the nearest sensitive receptor along each roadway segment in the project area under existing and cumulative conditions are presented in Table 7 and Table 8, respectively.

Table 7
Predicted Traffic Noise Level and Project-Related Traffic Noise Level Increases

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing No Project	Existing + Project	Change
Sand Creek Road	East of Linden Street	52.0	52.1	0.1
Sand Creek Road	West of Linden Street	60.6	60.7	0.1
Fairview Avenue	North of Sand Creek Road	57.8	57.8	0.0
Sand Creek Road	East of Fairview Avenue	61.0	61.1	0.1
Fairview Avenue	South of Sand Creek Road	56.0	56.1	0.1
Sand Creek Road	West of Western Project Driveway	59.1	59.2	0.1

Source: Saxelby Acoustics, 2024.

Table 8
Cumulative Traffic Noise Level and Project-Related Traffic Noise Level Increases

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Cumulative No Project	Cumulative + Project	Change
Sand Creek Road	East of Linden Street	53.4	53.4	0.0
Sand Creek Road	West of Linden Street	62.0	62.1	0.1
Fairview Avenue	North of Sand Creek Road	58.8	58.9	0.1
Sand Creek Road	East of Fairview Avenue	62.4	62.5	0.1
Fairview Avenue	South of Sand Creek Road	57.1	57.1	0.0
Sand Creek Road	West of Western Project Driveway	60.5	60.6	0.1

Source: Saxelby Acoustics, 2024.

As shown in the tables above, under both existing and cumulative conditions, the proposed project would result in a maximum traffic noise level increase of 0.1 dBA. Because the applicable minimum significance threshold is an increase of 1.5 dBA in roadway noise levels, project related traffic would not result in a substantial permanent increase in noise levels, and the impact would be less than significant.

On-Site Noise Sources

The primary new noise sources associated with implementation of the project would consist of outdoor recreational noise associated with the proposed sports complex and parking lot traffic circulation. The ENA calculated operational noise based on the

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[33] Fehr & Peers. *Draft Transportation Impact Assessment Sand Creek Sports Complex Site*. December 2023.

assumption that noise-generating operations would occur during daytime (7:00 AM to 10:00 PM) hours only. It should be noted that morning activities, such as tournament preparation, would be anticipated to begin as early as 6:00 AM; however, noise-generating operations, especially tournaments, would not begin prior to 7:00 AM. Similarly, noise-generating operations, such as on-site tournaments, would end at or before 10:00 PM, on-site lights would stay on until 11:00 PM to allow visitors to leave the site safely. The following is a list of additional assumptions for each operational component of the proposed project used for the noise modeling based on data from similar operations:

- **Multi-Use Fields**: The proposed synthetic turf multi-use field has the capability to hold either three full-sized soccer fields, six small kid's soccer fields, three lacrosse fields, or softball practice areas. Phase 2 of the project would add two more full-size soccer fields for a total of five. The loudest L_{eq} and L_{max} values are expected to occur during soccer tournaments utilizing the full sized fields. Based upon measurements taken at various facilities, soccer tournament games produced noise levels up to 58 dBA L_{eq} and 76 dBA L_{max} at 200 feet as measured from the center of the field to sidelines opposite of spectators. The multi-use fields were modeled as operating concurrently during a peak hour.
- **Tennis Courts**: Tennis courts are expected to produce noise levels of up to 52 dBA L_{eq} and 62 dBA L_{max} at a distance of 50 feet from the center of the court.
- **Pickleball Courts**: Pickleball gameplay is expected to produce noise levels of approximately 61 dBA L_{eq} at 25 feet from the edge of the end of a single court and 56 dBA L_{eq} at 25 feet from the edge of the side of a single court. Maximum (L_{max}) noise levels for a typical pickleball game were found to be 81 dBA at 25 feet.
- **Multi-Use Courts**: The proposed multi-use hard courts are expected to be used for pickleball, futsal, roller hockey, basketball, and volleyball. Saxelby conservatively assumed typical noise levels similar to pickleball gameplay and that gameplay could occur continuously at this noise level on all courts during a peak hour of activity.
- **Play Area**: Recreational activity in the play area would be expected to produce noise levels of approximately 55 dBA L_{eq} and 67 dBA L_{max} at 50 feet as measured from the center of the playground area.
- **On-Site Circulation**: The project is projected to generate up to 580 trips in the evening peak hour, two of which could be heavy trucks. Parking lot movements are predicted to generate a sound exposure level (SEL) of 71 dBA SEL at 50 feet for cars and 85 dBA SEL at 50 feet for trucks.

Using the assumptions established above and in accordance with applicable standards, Saxelby calculated the maximum noise levels at the nearest sensitive receptors resulting from operation of the proposed project. Figure 7 shows the maximum noise levels resulting from operation of only Phase 1 of the proposed project, and Figure 8 shows the maximum noise levels resulting from operation of both Phase 1 and Phase 2 of the project.

Based on the City's noise level standards presented above and the existing ambient noise levels summarized in Table 4, a significant impact would occur if the proposed project would generate noise levels greater than 55 dBA L_{eq} and 70 dBA L_{max} at the sensitive receptors to the west, and 55 dBA L_{eq} and 67 dBA L_{max} at the receptors to the east.

Figure 7
Phase 1 Maximum Noise Levels (dBA L_{max})

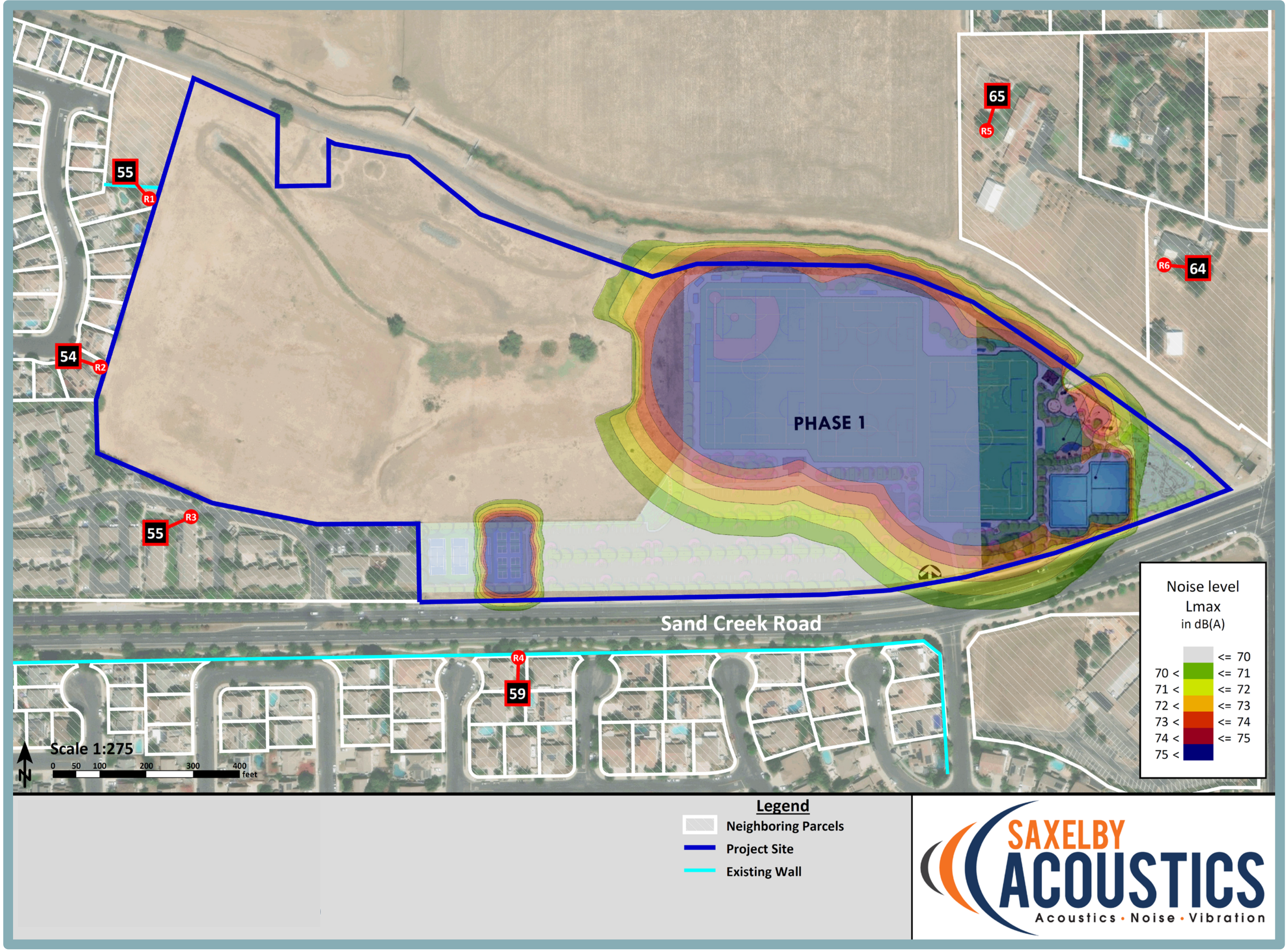
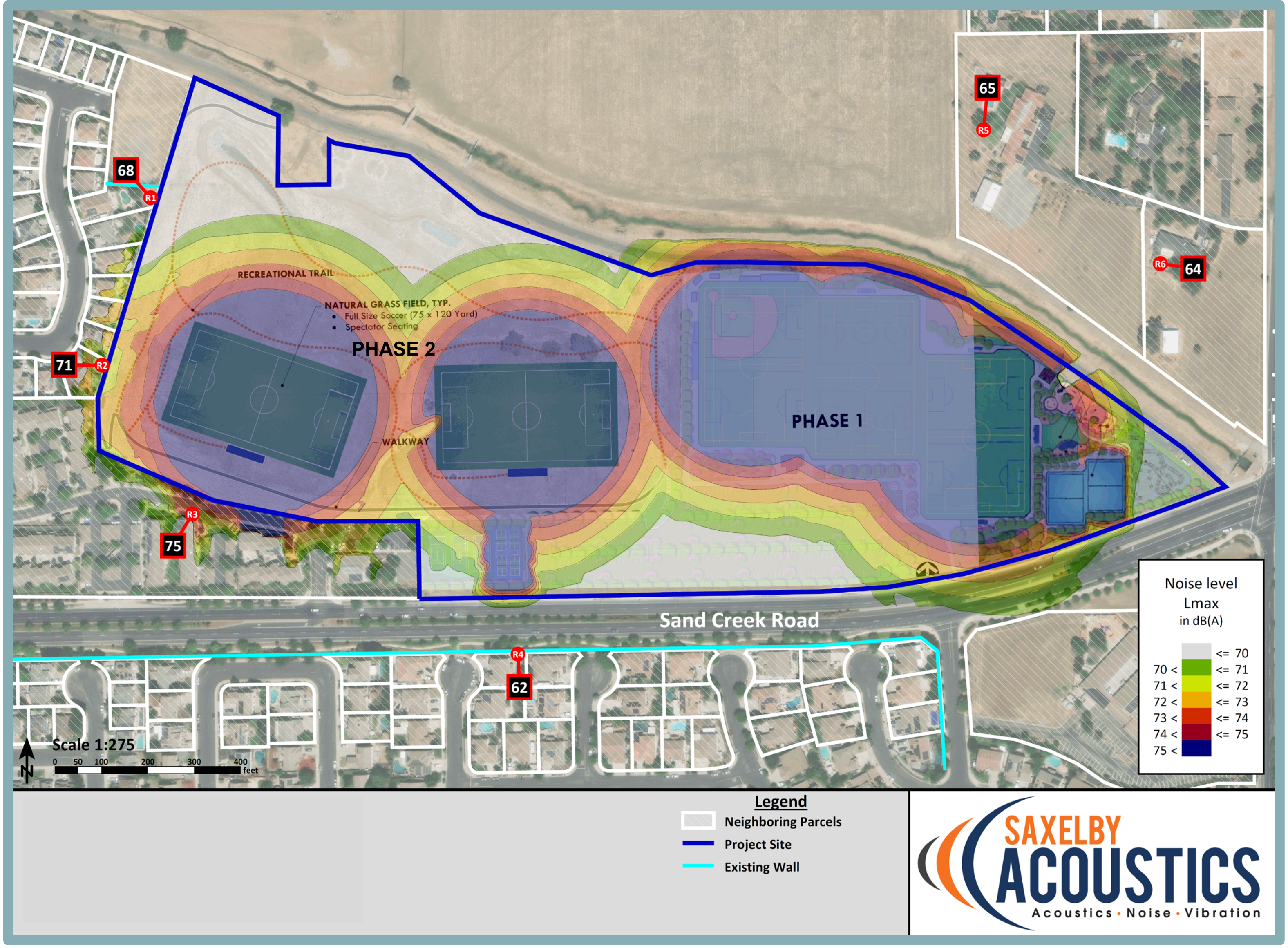


Figure 8
Phase 1 and Phase 2 Maximum Noise Levels (dBA L_{max})



As shown in Figure 7, Phase 1 of the proposed project would expose nearby residences to noise levels between 55 to 59 dBA L_{max} at the receptors to the west and up to 65 dBA L_{max} at the receptors to the east. As such, operations of Phase 1 of the proposed project would generate noise levels below the applicable threshold of 67 dBA L_{max}, and a less-than-significant impact would occur.

However, as shown in Figure 8, operation of Phase 1 and Phase 2 of the project are predicted to expose nearby residences to noise levels up to 65 dBA L_{max} at receptors to the east and 75 dBA L_{max} at receptors to the west. Such noise levels would exceed the adjusted noise standard of 70 dBA L_{max} at the residences to the west. In order to reduce noise levels at the existing residences to the west of the project site, Saxelby recommends the installation of a sound wall. Figure 9 shows the required location of the sound barrier and Table 9 summarizes the noise levels resulting from full buildout of the proposed project with the sound barrier incorporated.

Table 9
Phase 1 and Phase 2 Noise Levels with Noise Barrier (dBA)

Receptor[1]	Project L_{eq}/L_{max}	Ambient L_{eq}/L_{max}	Ambient Plus Project L_{eq}	Increase to Ambient L_{eq}	Increase Threshold L_{eq}	Complies with Standards?
1	46/64	50/70	51.5	1.5	>3.0	Yes
2	47/66	50/70	51.8	1.8	>3.0	Yes
3	50/69	50/70	53.0	3.0	>3.0	Yes
4	48/62	50/70	52.1	2.1	>3.0	Yes
5	49/65	52/67	53.8	1.8	>3.0	Yes
6	48/64	52/67	53.5	1.5	>3.0	Yes

Note: Receptor numbers correspond to those shown in Figure 9.

Source: Saxelby Acoustics, 2024.

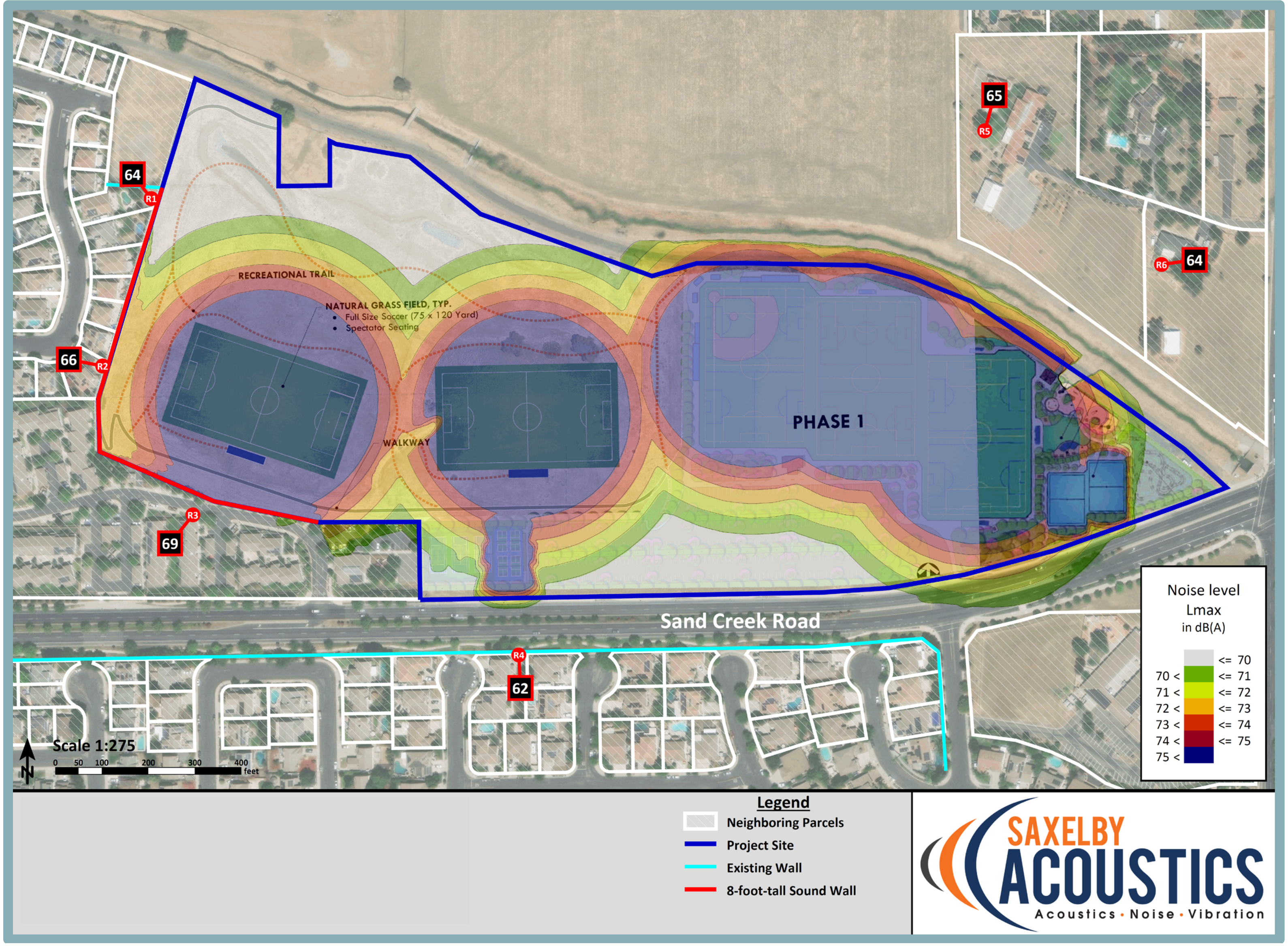
As shown in Table 9, following incorporation of a sound barrier into the project design, noise levels associated with operation of both Phase 1 and Phase 2 of the proposed project would be reduced below the applicable thresholds.

Conclusion

Although compliance with the City's standards on new noise-sensitive receptors is not a CEQA consideration, it is noted that Saxelby concluded that the proposed recreational activity areas are predicted to be exposed to exterior transportation noise levels of up to approximately 63 dBA L_{dn}, which is below the 65 dBA limit for outdoor sports and recreation areas established by the City of Brentwood.

However, as described above, should the project not comply with the noise regulations discussed above during construction activities, or should the proposed project not include the construction of a sound barrier along the western corner of the project site the proposed project could result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies, and a ***potentially significant*** impact could occur.

Figure 9
Phase 1 and Phase 2 Noise Levels with Noise Barrier (dBA L_{max})



Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a ***less-than-significant*** level.

XIII-1. *Construction activities shall be limited to 7:00 AM to 6:00 PM Monday-Friday and 8:00 AM to 5:00 PM on Saturday. Construction shall be prohibited on Sundays and City holidays. These criteria shall be included in the grading plan. Exceptions to allow expanded construction activities shall be reviewed on a case-by-case basis as determined by the Chief Building Official and/or City Engineer, and shall not be allowed on any date or time that would violate the City's applicable noise standards.*

XIII-2. *The project contractor shall ensure that the following construction noise BMPs are met on-site during all phases of construction:*

- *All equipment driven by internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., arc welders, air compressors) shall be equipped with shrouds and noise- control features that are readily available for that type of equipment.*
- *All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.*
- *The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.*
- *At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.*
- *Unnecessary idling of internal combustion engines shall be prohibited.*
- *Construction staging areas shall be established at locations that would create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.*
- *Construction site and access road speed limits shall be established and enforced during the construction period.*
- *The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.*
- *Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.*
- *The construction contractor shall designate a "noise disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise*

complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

Construction noise BMPs shall be included in the grading plan for review and approval by the Community Development Director prior to grading permit issuance.

XIII-3. *Prior to Improvement Plan approval, the Improvement Plans for Phase 2 of the proposed project shall indicate that development of Phase 2 includes construction of an eight-foot-tall barrier at the western and southwestern boundaries of the project site, as shown in Figure 9 of the IS/MND prepared for the proposed project. The barrier height shall be relative to the residential building pads or the soccer field elevation, whichever is greater. Nose barrier walls shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of the foregoing materials that achieve the required total height. Inclusion of the foregoing requirements on the Phase 2 Improvement Plans shall be subject to review and approval by the Community Development Director.*

b. Similar to noise, vibration involves a source, a transmission path, and a receiver. However, noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception of the vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration is measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of peak particle velocities (PPV) in inches per second (in/sec). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of PPV. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. According to the vibration level thresholds developed by Caltrans, the threshold for architectural damage to structures is 0.20 in/sec PPV and continuous vibrations of 0.10 in/sec PPV, or greater, would likely cause annoyance to sensitive receptors.

The proposed project would not involve any uses or operations that would generate substantial groundborne vibration. The primary vibration-generating activities associated with the proposed project would occur during grading, placement of underground utilities, and construction of the proposed on-site structures and recreational amenities. Table 10 below shows the typical vibration levels produced by construction equipment. As shown therein, construction vibration levels anticipated for the project are less than the 0.2 in/sec PPV threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located further than 26 feet from typical construction activities. As such, construction vibrations at the nearby sensitive receptors are not predicted to exceed acceptable levels. In addition, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

Table 10
Vibration Levels for Various Construction Equipment

Type of Equipment	PPV at 25 feet (inches/second)	PPV at 50 feet (inches/second)	PPV at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (<0.20 at 26 feet)	0.074	0.026

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

Based on the above, the proposed project would not expose people to or generate excessive groundborne vibration or groundborne noise levels, and a ***less-than-significant*** impact would occur.

c. The nearest public airport to the site is Byron Airport, which is located approximately 10 miles southeast of the site. In addition, a private airfield (Funny Farm Airfield) is located approximately four miles east of the project site. The project site is not covered by an existing airport land use plan. Given that the project site is not located within two miles of a public or private airport, the proposed project would not expose people residing or working in the project area to excessive noise levels associated with airports. Thus, ***no impact*** would occur.

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

Discussion

a. The proposed project would include the development of a Sports Complex, which would not result in direct population growth. Furthermore, the project site has been anticipated for recreational development. Although operation of the proposed project would require employees, even if all employees were new to the region, such an increase in population would not be substantial. As such, the proposed project would not result in indirect population growth due to generating a need for a workforce that would be housed within the City. Therefore, the proposed project would not induce substantial unplanned population growth either directly or indirectly, and a ***less-than-significant*** impact would occur.

b. The proposed project would not result in the destruction of any permanent or temporary residences because the Phase 1 portion of the project site is currently vacant and undeveloped, and the Phase 2 area consists of the LSCB. As such, the proposed project would not displace a substantial number of existing housing or people and would not necessitate the construction of replacement housing elsewhere. Therefore, ***no impact*** would occur.

XV. 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:	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?	☐	☐	✖	☐
b. Police protection?	☐	☐	✖	☐
c. Schools?	☐	☐	✖	☐
d. Parks?	☐	☐	✖	☐
e. Other Public Facilities?	☐	☐	✖	☐

Discussion

a-c,e. The Contra Costa County Fire Protection District (CCCFPD) provides fire protection services to the City. The CCCFPD operates out of 36 fire stations located throughout the jurisdictional area.[34] The project site is located approximately 2.7 miles from the nearest fire station, located at 201 John Muir Parkway. The proposed project would adhere to Chapter 15.06, the Fire Code, of the City's Municipal Code. Chapter 15.06 requires the proposed project to adhere to all fire protection codes established by the CCCFPD, which would reduce the risk of fire at the project site, and, thus, reduce potential for the project to increase demand for fire protection services. In addition, the proposed project would provide emergency vehicle access for the CCCFPD and police to the site from Sand Creek Roads through two driveways.

The proposed project would be serviced by the Brentwood Police Department, located at 9100 Brentwood Boulevard. The General Plan includes a goal to maintain a ratio of 1.5 to 2.5 sworn officers per 1,000 residents.[35] Because the proposed project would not result in an increase in population, the project would not affect the City's existing ratio of sworn officers to residents.

As discussed above, the proposed project would not induce population growth, and, thus, would not significantly increase demand for schools or other public facilities. Furthermore, any small increase in demand resulting from buildout of the proposed project could be accommodated by the existing facilities. In addition, as discussed above in greater detail, the proposed project is consistent with the site's General Plan land use and zoning designations. As such, buildout of the site, including associated demand on fire and police facilities, has been anticipated by the City and analyzed in the General Plan EIR.

Based on the above, the proposed project would have a ***less-than-significant*** impact related to the need for new or physically altered fire protection, police protection, school facilities, or other public facilities, the construction of which could cause significant environmental impacts.

d. Parks and recreation services within the City are provided by the City's Parks and Recreation Department. Further discussion of impacts upon parks and recreation services

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[34] Contra Costa County Fire Protection District. *Station Address.* Available at: https://cccfpd.org/station-address/. Accessed July 2023.

[35] City of Brentwood. *General Plan Update* [pg. 3-5]. July 2014.

can be found in Section XVI, Recreation, of this IS/MND. As described therein, the proposed project almost entirely consists of recreational uses, and is consistent with the site's General Plan land use and zoning designations. As such, buildout of the site has been anticipated by the City and analyzed in the General Plan EIR, and a ***less-than-significant*** impact would occur.

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

Discussion

a,b. The proposed project consists of the development of five multi-use sports fields and other recreational facilities including a playground, multi-use sports courts, a pump track, and game tables. As such, rather than increase the use of existing recreational facilities such that physical deterioration of the facilities would occur, the proposed project would offer an alternative to the existing facilities available in the City. In addition, the proposed project would contribute towards Policy CSF 2-2 of the City's General Plan, which establishes a standard of five acres of community or neighborhood recreational or park facility per 1,000 residents to ensure adequate recreational open space for the community. Furthermore, the physical effects on the environment resulting from project buildout are evaluated throughout this IS/MND. Therefore, a ***less-than-significant*** impact would occur.

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

Discussion

a. The law has changed with respect to how transportation-related impacts may be addressed under CEQA. Previously, lead agencies used a performance metric entitled 'level of service' (LOS) to assess the significance of such impacts, with greater levels of congestion considered to be more significant than lesser levels. Enacted as part of SB 743 (2013), Public Resources Code Section 21099(b)(1), directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Secretary of the Natural Resources Agency for certification and adoption proposed CEQA Guidelines addressing "criteria for determining the significance of transportation impacts of projects within transit priority areas. Those criteria shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses."

Pursuant to SB 743, the Natural Resources Agency promulgated CEQA Guidelines Section 15064.3 in late 2018. SB 743 became effective in early 2019. Subdivision (a) of that section provides that "[g]enerally, vehicle miles traveled is the most appropriate measure of transportation impacts. For the purposes of this section, 'vehicle miles traveled' (VMT) refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding roadway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact."[36]

Please refer to Question 'b' for a discussion of VMT.

Pedestrian, Bicycle, and Transit Facilities

The proposed project's potential impacts related to pedestrian, bicycle, and transit facilities are discussed below. The following discussion is based primarily on a TIA prepared for the project by Fehr & Peers (Appendix C).[37]

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[36] Subdivision (b)(2) of Section 15064.3 ("transportation projects") provides that "[t]ransportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152."

[37] Fehr & Peers. *Draft Transportation Impact Assessment Sand Creek Sports Complex Site*. December 2023.

Bicycle Facilities

Pedestrian facilities generally include sidewalks, crosswalks, and pedestrian signals. Roadways in the City of Brentwood that have been developed to their ultimate width generally provide sidewalks on both sides of the street. In addition, the City of Brentwood currently includes 19 miles of Class I bicycle paths and 63 miles of other bike lanes.

The City has developed bicycle and pedestrian trail facilities across the City. Other local agencies have likewise contributed to such infrastructure. The Sand Creek Trail is a Class I multiuse trail that runs parallel to the project site's northern border and extends from SR 4 in the west to Minnesota Avenue in the east. Class II bike lanes run along both sides of Sand Creek Road and Fairview Avenue in the project vicinity. Class II and Class III bike facilities are proposed on multiple other roadways in the expanded project vicinity, as described in the 2018 Contra Costa County Bicycle and Pedestrian Plan.[38] Overall, existing bicycle facilities provide connectivity between the project site and nearby destinations.

Section 17.620.013 of the City's Municipal Code requires that any public or semipublic facility must provide a total number of bicycle parking spaces equivalent to five percent of the total vehicle parking spaces in the lot. While Phase 1B of the proposed project would include the development of a pump track which would include bicycle parking spaces, the total number of on-site bicycle parking spaces has not yet been determined. At full buildout, the proposed project would include 437 vehicle parking spaces. As such, the proposed project will incorporate a minimum of 22 bicycle parking spaces, pursuant to Section 17.620.013 of the City's Municipal Code.

Overall, bicycle access to the project site is considered adequate and would not result in any significant impacts to existing or proposed bicycle facilities.

Pedestrian Facilities

The street network within the project vicinity provides a fairly complete network of sidewalks and pedestrian accommodations. Sidewalks exist on both sides of the surrounding roadways, including Sand Creek Road, Linden Street, and Fairview Avenue. Crosswalks and pedestrian push-button actuated signals are provided at the nearby intersection of Sand Creek Road and Fairview Avenue. Pedestrian access to the project site would be provided from sidewalks on the foregoing streets, as well as from the Sand Creek Trail.

Pursuant to General Plan Policy CIR 2-3, new development within the City of Brentwood is required to construct on-site sidewalks, paths, and trails consistent with the City's parks, trails, and recreation goals and policies and the Contra Costa County Countywide Bicycle and Pedestrian Plan. Additionally, General Plan Policies CIR 2-1 and 2-2 require new development within the City to incorporate sidewalks and enhanced pedestrian crossing facilities, and incorporate bicycle facilities on new collector and arterial streets in order to establish and maintain a system of interconnected bicycle and pedestrian system facilities consistent with the Countywide Bicycle and Pedestrian Plan.

The proposed project includes improvements to the Sand Creek Trail north of the project site, including planting restoration and the addition of bike racks, seating, and picnic tables. In addition, the proposed project would include the development of a new traffic

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[38] Contra Coast County Transportation Authority. *2018 Countywide Bicycle and Pedestrian Plan*. July 2018.

signal located at the intersection of Sand Creek Road and Linden Street. The new traffic signal would be developed at a new driveway allowing ingress and egress to and from the project site. Although final design plans have not been completed for the signalized intersection, the currently available site plan does not show crosswalks or other pedestrian improvements at the Sand Creek Road/Linden Street intersection. Project construction would create a need for pedestrians to cross Sand Creek Road at Linden Street intersection. According to the TIA, the absence of pedestrian improvements at the Sand Creek Road/Linden Street intersection could result in a safety hazard.

Transit Facilities

Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point, and Pittsburg. In addition to the regular transit service to the project area, Tri Delta Transit provides dial-a-ride door-to-door service within Eastern Contra Costa County for people with disabilities and senior citizens. Currently, 15 routes operate on weekdays, with five routes operating on weekends. Two routes, Route 385 and Route 395, serve the project area. Route 385 runs between the Antioch Bay Area Rapid Transit (BART) Station and the Brentwood Park & Ride, operating on weekdays only with one-hour headways from 6:00 AM to 6:00 PM. In the project vicinity, Route 385 operates along Sand Creek Road with a stop adjacent to the project site at the intersection of Sand Creek Road and Fairview Avenue. Route 395 runs between the Antioch BART Station and the Streets of Brentwood Mall, operating on weekdays and weekends with one-hour headways from 9:00 AM to 8:00 PM. Route 395 operates along Sand Creek Road with a stop at the Streets of Brentwood Mall, approximately 0.5-mile west of the project site.

A project is considered to have a significant impact on transit if the project conflicts with existing transit facilities, or is expected to generate additional transit trips beyond the capacity of the existing transit system. The project site is located adjacent to an existing bus stop, and does not proposed any features which could conflict with existing or planned transit facilities. In addition, the TIA determined that the proposed project would not result in increases in ridership on local or regional transit facilities that would exceed the capacity of existing bus services. Therefore, the TIA concluded that transit access to the project site is adequate and would not result in any significant impacts to the nearby transit network.

Conclusion

Based on the above and the TIA prepared for the project, the proposed project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, and bicycle facilities. However, the TIA determined that the absence of pedestrian improvements at the Sand Creek Road/Linden Street intersection could result in a safety hazard. Without the development of such improvements, the proposed project could conflict with a program, plan, ordinance, or policy addressing the circulation system, including pedestrian facilities, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a ***less-than-significant*** level.

XVII-1. Prior to Improvement Plan approval, the Improvement Plans shall indicate that as part of the project's installation of a traffic signal at the Sand Creek Road/Linden Street intersection, crosswalks and pedestrian actuated signal heads shall be installed on all four approaches.

b. Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Pursuant to Section 15064.3, analysis of VMT attributable to a project is the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Although the City of Brentwood has not yet established any standards or thresholds regarding VMT, Section 15064.3(b) of the CEQA Guidelines defines the criteria for analyzing transportation impacts. In addition, VMT methodology and implementation guidelines were adopted by the Contra Costa Transportation Authority (CCTA) in July 2020.

The TIA prepared for the proposed project by Fehr & Peers evaluated the project-related VMT using the adopted CCTA VMT methodology. As discussed above, the City of Brentwood has not yet established any standards or thresholds regarding VMT, thus CCTA standards were used. The Governor's OPR Technical Advisory also provides guidance for implementing VMT as a metric for determining the transportation impact for land use projects.

The CCTA guidelines include a screening process that describes five scenarios in which a project would be exempted from a VMT analysis requirement: 1) projects exempt from CEQA analysis, 2) small projects, 3) local serving projects, 4) projects in transit priority areas, and 5) projects in low VMT areas. It should be noted that even if a project satisfies one or more of the screening criteria, lead agencies may still require a VMT analysis if evidence exists that the project has characteristics that might lead to a significant amount of VMT. During weekdays, the proposed project would primarily draw users and customers from a relatively small geographic area that would lead to short-distance trips and trips that are linked to other destinations; as such, the TIA determined that the project is a local-serving use on weekdays, and, thus, meets the established screening criteria related to VMT. Therefore, based on both CCTA and OPR guidance, the proposed project can be assumed to have a less than significant impact related to VMT during a typical weekday.

However, because the proposed project would host regional tournaments on weekends, and vehicle trips will be drawn from a broader regional geography, the project is considered a regional-serving use on weekends. Based on CCTA guidance, the applicable significance standard for a regional-serving use is as follows: Regional-Serving Projects should use the metric of total study area VMT and should define a VMT study area over which to evaluate that metric. The project generated VMT constitutes a significant impact if the baseline project generated total VMT per service population is higher than 85 percent of the existing countywide average total VMT per service population.

In order to assess the VMT per service population of the proposed project, the TIA compiled the following data: daily trip generation of regional tournament events, automobile occupancy of vehicles traveling to regional tournament events, and trip length of vehicles traveling to regional tournament events.

Estimates of trip generation on weekends when the site hosts regional tournaments of maximum attendance were calculated using the anticipated levels of attendance, automobile occupancy, and peak periods of arrival and departure. The proposed project is anticipated to host six to 12 regional tournaments per year. The weekend daily trip generation and automobile occupancy of vehicles traveling to regional tournament events is presented in Table 11, below. As shown therein, a total of 6,265 daily trips, with 580 total vehicle trips during the peak hour, are expected on a weekday when a regional tournament is hosted on-site.

Table 11
Weekend Regional Tournament Vehicle Trip Generation Estimates

Use	Maximum Attendees[1]	Average Vehicle Occupancy[2]	Daily[3]	Peak Hour		
				In	Out	Total
Soccer Complex	550	2.5	4,753	220	220	440
Other Uses	175		1,512	70	70	140
Total Project Trips	--		**6,265**	**290**	**290**	**580**

Notes:

1. Maximum attendees calculated assuming a five-field complex, which includes 550 people associated with the proposed soccer fields leaving the site and entering the site in a given hour. Also assumes full complex fills and empties in single peak hour.
2. Average Vehicle Occupancy assumption from *Federal Highway Administration Managing Travel for Planned Special Events – Event Operations Planning (2017)*.
3. Daily trips calculated based on peak hour generation using the proportion between weekend peak-hour and daily generation rates (ITE land use category 488 – Soccer Complex).

Source: Fehr & Peers, 2023.

In addition to the weekend daily trip generation and average vehicle occupancy data presented above, Fehr & Peers gathered trip length data from weekend summer regional tournaments at facilities similar to the proposed project. The TIA determined that the average one-way trip length to a regional tournament event at facilities similar to the proposed project was approximately 21.5 miles. Using the foregoing information, Fehr & Peers calculated project-generated VMT per service population. In addition, using the CCTA Travel Demand Model for 2023 baseline conditions, the countywide VMT per service population was assessed, as well as the relevant CEQA significance threshold of 85 percent of the countywide average. A comparison of project-generated VMT to the applicable threshold is presented in Table 12, below.

Table 12
Weekend Tournament VMT Assessment

Countywide VMT per Service Population	85 Percent of the Countywide VMT per Service Population	Project VMT per Service Population
29.3	24.9	17.2

Source: Fehr & Peers, 2023.

As illustrated in Table 12, the proposed project's weekend tournament VMT per service population would be 17.2, which is less than 24.9, the applicable CEQA significance threshold of 85 percent of the countywide average. Therefore, based on CCTA significance thresholds, the project would produce a less-than-significant impact on VMT.

As such, the proposed project would be consistent with CEQA Guidelines Section 15064.3(b)(2), a ***less-than-significant*** impact would occur.

c,d. Site access would be provided by two new access points on Sand Creek Road. The main full movement access point at the intersection of Sand Creek Road and Linden Street would be signalized as part of the proposed project. The other proposed driveway, located in the southwestern portion of the project site, would include stop control on the project's approach and would only permit right turn in/right turn out movements. In addition to the existing sidewalks and bike lanes on Sand Creek Road and Fairview Avenue, the complex would be accessible to bicyclists and pedestrians from Sand Creek Trail to the north.

The TIA determined that the proposed unsignalized driveway currently meets the necessary sign distance for driveways pursuant to the requirements of the California Department of Transportation's (Caltrans) *Highway Design Manual*, and, thus, development of such would not increase on-site vehicle hazards. In addition, although the exact width of access points and internal roadways has not yet been determined, the proposed circulation system would be designed consistent with applicable City of Brentwood design standards and would provide adequate width and turn radii at and along the two proposed driveways and parking aisles to allow for two-way circulation, including circulation of larger vehicles such as emergency trucks, garbage trucks, and delivery trucks. As such, the TIA determined that based on the current design of the two new access points, which would provide emergency vehicle access to the project site, and given compliance with required roadway design standards, adequate emergency vehicle access would be provided at the project site.

Based on the above, the proposed project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), and would not result in inadequate emergency access. Therefore, a ***less-than-significant*** impact would occur.

XVIII. TRIBAL CULTURAL RESOURCES. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).	☐	☒	☐	☐
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Discussion

a,b. As discussed in Section V, Cultural Resources, of this IS/MND, the Cultural Resources Study prepared for the proposed project included a record search of the NWIC. Origer determined that known cultural resources are not present within the Phase 1 portion of the project site. A pedestrian survey was also conducted by Origer and did not identify any indications of such resources. In addition, the Basin IS/MND determined that such resources are not present within the Phase 2 portion of the project site

In compliance with AB 52 (PRC Section 21080.3.1), on March 6, 2024, the City provided formal notification letters to the Amah Mutsun Tribal Band of Mission San Juan Bautista, Chicken Ranch Rancheria of Me-Wuk Indians, Guidiville Indian Rancheria, Indian Canyon Mutsun Band of Costanoan, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area, Nashville Enterprise Miwok-Maidu-Nishinam Tribe, North Valley Yokuts Tribe, Ohlone Indian Tribe, Tule River Indian Tribe, Wilton Rancheria, Wuksache Indian/Eshom Valley Band, and the Confederated Villages of Lisjan. Requests to consult were not received during the required consultation period.

Based on the history of disturbance at the entire project site as a result of past agricultural uses and the development of the LSCB within the Phase 2 area of the site, as well as the lack of identified tribal cultural resources at the site, known tribal cultural resources are not expected to occur within the site. Furthermore, the Phase 2 area of the project site was subject to grading activities during the development of the LSCB. Any previously unknown tribal cultural resources would have been encountered during such activities; thus, tribal cultural resources are unlikely to be present within the LSCB. Nevertheless, the possibility exists that development of Phase 1 of the proposed project and off-site improvements could result in a substantial adverse change in the significance of a tribal cultural resource if previously unknown tribal cultural resources are uncovered during grading or other ground-disturbing activities. Thus, a ***potentially significant*** impact to tribal cultural resources could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact related to Phase 1 of the proposed project to a ***less-than-significant*** level.

XVIII-1. Implement Mitigation Measures V-1, V-2, and V-3.

XVIII-2. If tribal cultural resources are discovered during project-related construction activities, all ground disturbances within a minimum of 50 feet of the find shall be halted until a qualified professional archaeologist can evaluate the discovery. The archaeologist shall examine the resources, assess their significance, and recommend appropriate procedures to the lead agency to either further investigate or mitigate adverse impacts. If the find is determined by the lead agency in consultation with the Native American tribe traditionally and culturally affiliated with the geographic area of the project site to be a tribal cultural resource and the discovered archaeological resource cannot be avoided, then applicable mitigation measures for the resource shall be discussed with the geographically affiliated tribe. Applicable mitigation measures that also take into account the cultural values and meaning of the discovered tribal cultural resource, including confidentiality if requested by the tribe, shall be completed (e.g., preservation in place, data recovery program pursuant to Public Resources Code §21083.2[i]). During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project site.

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

Discussion

a-c. Water supply, wastewater treatment, stormwater drainage, electric power, natural gas, and telecommunications facilities necessary to serve the proposed project are described in the following sections.

Water Supply

The primary source of raw water supply to the City of Brentwood is provided by the Sacramento/San Joaquin Rivers Delta, and is then treated at the City of Brentwood Water Treatment Plant. Buildout of the City's planning area, including the project site, is accounted for in the City's Urban Water Management Plan, which provides a detailed analysis of the City's water distribution system. The City also has an adopted Capital Improvement Program (CIP) that includes improvements necessary to provide safe and reliable water delivery throughout the City based on projected growth and associated increases in demand on the City's distribution system.

A six-inch potable water service line with appurtenances (valves, fittings, etc.) would be constructed to serve on-site facilities and would connect with the existing eight-inch water main near the Sand Creek Road and Linden Street intersection with a four-way valve cluster with a water meter at the right-of-way line. In compliance with General Plan Policy IF 2-6, which encourages the use of City-provided recycled water for landscaping irrigation within City parks to offset the use of potable water, the proposed project would also connect to an existing recycled water service lateral located near the Sand Creek Road and Linden Street intersection to serve on-site facilities.

According to the City's 2020 UWMP, adequate water supplies would be available to accommodate buildout of the City under normal year, single year, and multiple-dry year demand scenarios.[39] As the proposed project is consistent with the site's zoning and land use designations, buildout of the project site with recreational uses was considered in the City's UWMP, the City's growth projections, and the associated water demand projections which were determined to be 26 million gallons per day in 2040. Therefore, the proposed project would not require or result in the relocation or construction of new or expanded off-site water facilities, the construction or relocation of which could cause significant environmental effects, and sufficient water supplies would be available to serve the proposed project and reasonably foreseeable future development during normal, dry, and multiple dry years.

Wastewater Conveyance and Treatment

The Public Works Department's Wastewater Division operates and maintains the City's Wastewater Treatment Plant (WWTP), a tertiary treatment plant that provides recycled water for a variety of landscape and industrial uses. According the City of Brentwood General Plan Update EIR,[40] the WWTP has an average dry weather flow capacity of 5 million gallons per day (mgd) and was designed to be expandable to an average dry weather flow capacity of 10 mgd. The WWTP is also currently being expanded to accommodate an average dry weather flow capacity of 6.4 mgd. The expansion is expected to be completed in Spring 2025.[41] After being treated, wastewater is normally discharged into Marsh Creek or recycled for irrigation.

The recreational uses associated with the proposed project are not anticipated to generate a substantial amount of wastewater. In addition, the proposed project is consistent with the site's General Plan land use and zoning designations. As such, buildout of the site has been anticipated and impacts to wastewater systems has been previously analyzed in the General Plan EIR. Because adequate long-term wastewater treatment capacity is available to serve full build-out of the project, the project would not require or result in the relocation or construction of new or expanded off-site wastewater facilities, the construction or relocation of which could cause significant environmental effects. In addition, adequate wastewater treatment capacity is available to serve the project's projected demand in addition to the provider's existing commitments.

Stormwater Drainage

As discussed previously, development of the Phase 2 portion of the project site with the LSCB was previously analyzed in the Basin IS/MND; this analysis assumes that all activity analyzed in the Basin IS/MND has been completed in compliance with the requirements included therein. However, the Phase 1 area of the project site is currently undeveloped, vacant land consisting primarily of disced vegetation. Although a large portion of the project site would remain permeable, completion of the proposed project would increase site runoff due to the introduction of impervious surfaces to the site. As discussed in further detail in Section X, Hydrology and Water Quality, of this IS/MND, the proposed project has several options for the storm drain runoff. Two existing 18-inch storm drain laterals are available on Sand Creek Road which discharge into the City's storm drain collection system, and one 18-inch storm drain lateral is available onsite near the existing access road which discharges into Sand Creek. Phase 1 of the proposed project shall be designed to distribute on-site storm drain runoff by connecting to these laterals. All such on-site

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[39] City of Brentwood. *2020 Urban Water Management Plan*. June 2021, revised December 2021.

[40] City of Brentwood. *Public Draft Environmental Impact Report for the 2014 Brentwood General Plan Update.* April 2014.

[41] City of Brentwood. *2020 Urban Water Management Plan*. June 2021, revised December 2021.

stormwater infrastructure would be designed in compliance with all City stormwater requirements. Therefore, the proposed project would not generate runoff in excess of the City's existing stormwater system's capacity.

Electric Power, Natural Gas, and Telecommunications

The proposed project would include new connections to existing electric power and telecommunications facilities located in the project vicinity, and would not include the development of natural gas facilities. Thus, substantial expansion of off-site utilities would not be required to serve the proposed residential development, and associated environmental effects would not occur.

Conclusion

Based on the above, the proposed project would not require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. In addition, sufficient water supplies would be available to serve the project and adequate wastewater treatment capacity is available to serve the project's projected demand in addition to the provider's existing commitments. Thus, a ***less-than-significant*** impact would occur.

d,e. The City of Brentwood provides solid waste collection, disposal, recycling, and yard waste services to the City, including the project site. Solid waste and recyclables from the City are taken to the Solid Waste Transfer Station located at 2301 Elkins Way, in the northeastern area of the City. Solid waste is transferred from the Transfer Station to the Keller Canyon Landfill in Pittsburg. Keller Canyon Landfill covers 2,600 acres of land; 244 acres are permitted for disposal. Keller Canyon Landfill currently handles 2,500 tons of waste per day, although the permit for the site allows up to 3,500 tons of waste per day to be managed at the facility. According to the California Department of Resources Recycling and Recovery (CalRecycle), the Keller Canyon Landfill has a remaining capacity of 63,408,410 cubic yards (CY) out of a total permitted capacity of 75,018,280 CY, or 85 percent remaining capacity.[42] Furthermore, pursuant to the CALGreen Code, at least 65 percent diversion of construction waste is required for projects permitted after January 1, 2017. Because the project would only create a temporary increase in the amount of waste during construction activities, the proposed project would not result in a significant impact related to solid waste generation during construction.

In addition, given the proposed project is consistent with the site's General Plan land use and zoning designations, solid waste associated with operations of the proposed project has been anticipated by the City.

Based on the above, the proposed project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals and would comply with federal, State, and local management and reduction statutes and regulations related to solid waste. Therefore, a ***less-than-significant*** impact would occur.

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[42] California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary Details: Keller Canyon Landfill (07-AA-0032)*. Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/4407?siteID=228. Accessed July 2023.

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

Discussion

a-d. State Responsibility Areas (SRAs) do not occur within the vicinity of the Brentwood Planning Area. According to the CAL FIRE, the project site is not located within a Very High Fire Hazard Severity Zone (FHSZ).[43] Only a few communities within Contra Costa County have portions categorized as a "Very High" FHSZ by CalFire. This CEQA topic only applies to areas within a SRA or Very High FHSZ; therefore, the proposed project would result in a ***less-than-significant*** impact related to substantial risk or hazards related to wildfires.

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[43] California Department of Forestry and Fire Protection. *FHSZ Viewer.* Available at: https://egis.fire.ca.gov/FHSZ/. Accessed July 2023.

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

Discussion

a. As discussed in Section IV, Biological Resources, of this IS/MND, while a limited potential exists for special-status species to occur on-site, compliance with the ECCC HCP/NCCP and implementation of Mitigation Measures IV-2 through IV-4 would ensure that any impacts related to special-status species would be reduced to a less-than-significant level. The project site does not contain any known historic or prehistoric resources. Thus, implementation of the proposed project is not anticipated to have the potential to result in impacts related to historic or prehistoric resources. Nevertheless, Mitigation Measures V-1 through V-3 would ensure that in the event that prehistoric resources are discovered within the project site, such resources would be protected in compliance with the requirements of CEQA and other State standards.

Considering the above, the proposed project would not degrade the quality of the environment, substantially reduce or impact the habitat of fish or wildlife species, cause fish or wildlife populations to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Therefore, a ***less-than-significant*** impact would occur.

b. The proposed project, in conjunction with other development within the City of Brentwood, could incrementally contribute to cumulative impacts in the area. However, as demonstrated in this IS/MND, all potential environmental impacts that could occur as a result of project implementation would be reduced to a less-than-significant level through compliance with the mitigation measures included in this IS/MND, as well as applicable General Plan policies, Municipal Code requirements, and other applicable local and State regulations.

Therefore, when viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, development of the proposed project would not result in a cumulatively considerable contribution to cumulative impacts in the City of

Brentwood, and the project's incremental contribution to cumulative impacts would be ***less than significant***.

c. As described in this IS/MND, the proposed project would comply with all applicable General Plan policies, Municipal Code requirements, other applicable local and State regulations, in addition to the mitigation measures included herein. In addition, the proposed project is consistent with the project site land use and zoning designations, and thus substantial effects on human being is not anticipated to result from implementation of the project. As discussed in Section III, Air Quality, Section VII, Geology and Soils, Section IX, Hazards and Hazardous Materials, Section X, Hydrology and Water Quality, and Section XIII, Noise, of this IS/MND, construction activities and operational activities may result in a potentially significant impact. However, mitigation measures are included to reduce any potential impacts to a less-than-significant level. Therefore, the proposed project would result in a ***less-than-significant*** impact.

APPENDIX A

ILLUMINATION SUMMARY

Sand Creek Soccer

Brentwood,CA

Lighting System

Pole / Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
P1-P2	50'	50'	2	TLC-LED-550	1.08 kW	D
P3	50'	50'	2	TLC-LED-550	1.08 kW	D
		50'	2	TLC-LED-550	1.08 kW	E
P4	50'	50'	2	TLC-LED-550	1.08 kW	E
		50'	2	TLC-LED-550	1.08 kW	D
P5-P6	50'	50'	2	TLC-LED-550	1.08 kW	E
P7-P10	50'	50'	2	TLC-LED-550	1.08 kW	F
S1	90'	90'	5	TLC-LED-1200	5.85 kW	A
		90'	4	TLC-LED-1200	4.68 kW	B
		90'	2	TLC-LED-1500	2.82 kW	B
		90'	1	TLC-LED-1500	1.41 kW	A
S2	90'	90'	3	TLC-LED-1200	3.51 kW	A
		90'	2	TLC-LED-1200	2.34 kW	B
		90'	2	TLC-LED-1500	2.82 kW	B
		90'	2	TLC-LED-1500	2.82 kW	A
S3	90'	90'	3	TLC-LED-1200	3.51 kW	B
		90'	5	TLC-LED-1500	7.05 kW	C
		90'	3	TLC-LED-1500	4.23 kW	B
S5-S6	70'	70'	1	TLC-LED-1200	1.17 kW	A
		70'	3	TLC-LED-1500	4.23 kW	A
S9	90'	90'	5	TLC-LED-1500	7.05 kW	C
		90'	4	TLC-LED-1500	5.64 kW	B
S11-S12	70'	70'	1	TLC-LED-1200	1.17 kW	C
		70'	3	TLC-LED-1500	4.23 kW	C
18			***81***		***88.29 kW***	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Soccer	24.39 kW	19
B	Soccer 2	26.04 kW	20
C	Soccer 3	24.9 kW	18
D	Multipurpose 1	4.32 kW	8
E	Multipurpose 2	4.32 kW	8
F	Pickleball	4.32 kW	8

Fixture Type Summary

Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1200	LED 5700K - 75 CRI	1170W	150,000	>120,000	>120,000	>120,000	21
TLC-LED-550	LED 5700K - 75 CRI	540W	67,000	>120,000	>120,000	>120,000	24
TLC-LED-1500	LED 5700K - 75 CRI	1410W	181,000	>120,000	>120,000	>120,000	36

Single Luminaire Amperage Draw Chart

Driver (.90 min power factor)	Max Line Amperage Per Luminaire						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-550	3.2	3.0	2.8	2.4	1.9	-	1.4
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Multipurpose 1	Horizontal Illuminance	34.6	29	43	1.49	1.19	D	8
Multipurpose 2	Horizontal Illuminance	32.5	26	38	1.48	1.25	E	8
Pickleball	Horizontal Illuminance	34.8	28	47	1.71	1.24	F	8
Roadway Spill	Horizontal	0.03	0	0.50	0.00		A,B,C,D,E, F	81
Roadway Spill	Max Candela (by Fixture)	981	12.9	8569	662.94	75.86	A,B,C,D,E, F	81

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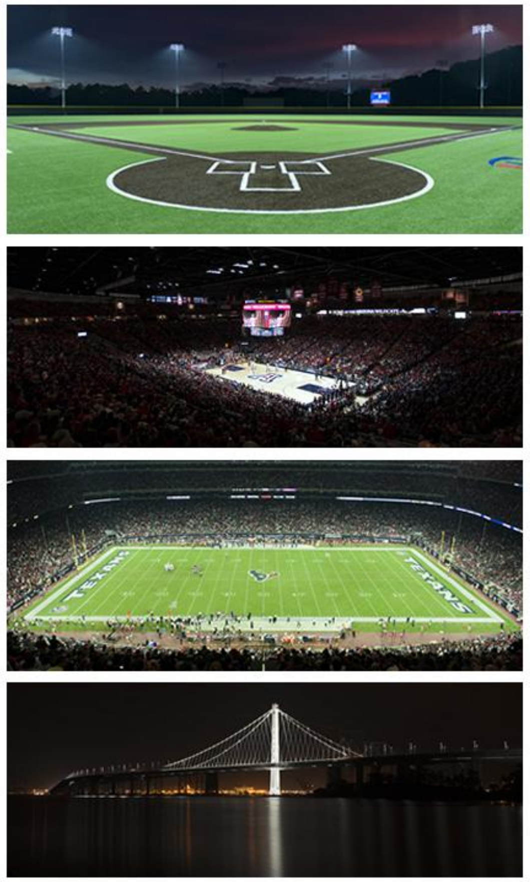
From Hometown to Professional



We Make It Happen.

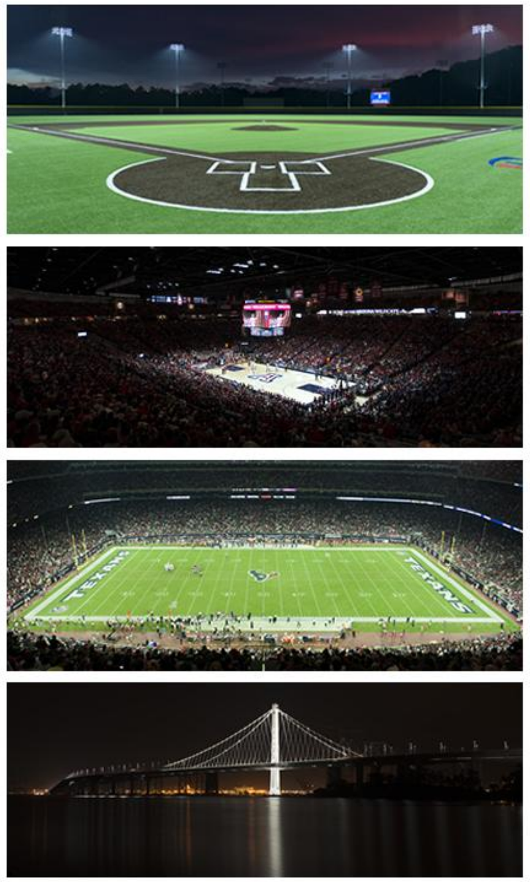
Sand Creek Soccer

Brentwood,CA

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Roadway Spill	Max Vertical Illuminance Metric	0.07	0	0.91	0.00		A,B,C,D,E, F	81
Soccer 1	Horizontal Illuminance	31.3	27	39	1.45	1.16	A	19
Soccer 2	Horizontal Illuminance	30.8	26	36	1.39	1.18	B	20
Soccer 3	Horizontal Illuminance	31.6	26	38	1.46	1.22	C	18

From Hometown to Professional



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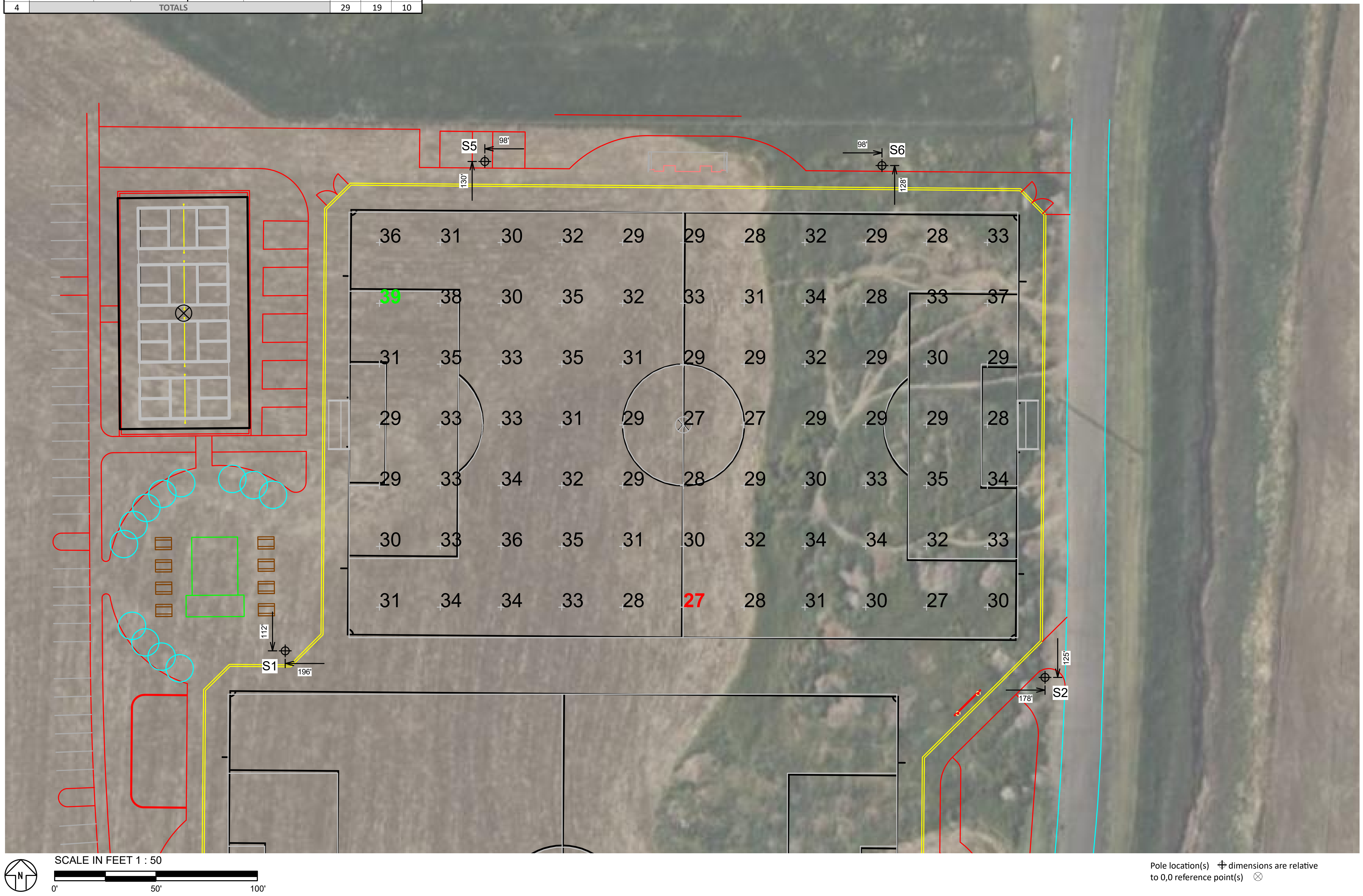
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
1	S1	90'	-	90'	TLC-LED-1500	3	1	2
				90'	TLC-LED-1200	9	5	4
1	S2	90'	-	90'	TLC-LED-1500	4	2	2
				90'	TLC-LED-1200	5	3	2
2	S5-S6	70'	-	70'	TLC-LED-1200	1	1	0
				70'	TLC-LED-1500	3	3	0
4	TOTALS					29	19	10



36	31	30	32	29	29	28	32	29	28	33
39	38	30	35	32	33	31	34	28	33	37
31	35	33	35	31	29	29	32	29	30	29
29	33	33	31	29	27	27	29	29	29	28
29	33	34	32	29	28	29	30	33	35	34
30	33	36	35	31	30	32	34	34	32	33
31	34	34	33	28	27	28	31	30	27	30

Pole location(s) ⌖ dimensions are relative
to 0,0 reference point(s) ⊗

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Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	**Soccer 1**
Size:	330' x 210'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES	
	Entire Grid
Guaranteed Average:	**30**
Scan Average:	31.32
Maximum:	39
Minimum:	27
Avg / Min:	1.18
Guaranteed Max / Min:	**2.5**
Max / Min:	1.45
UG (adjacent pts):	1.27
CU:	0.69
No. of Points:	77
LUMINAIRE INFORMATION	
Applied Circuits:	A
No. of Luminaires:	**19**
Total Load:	24.39 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

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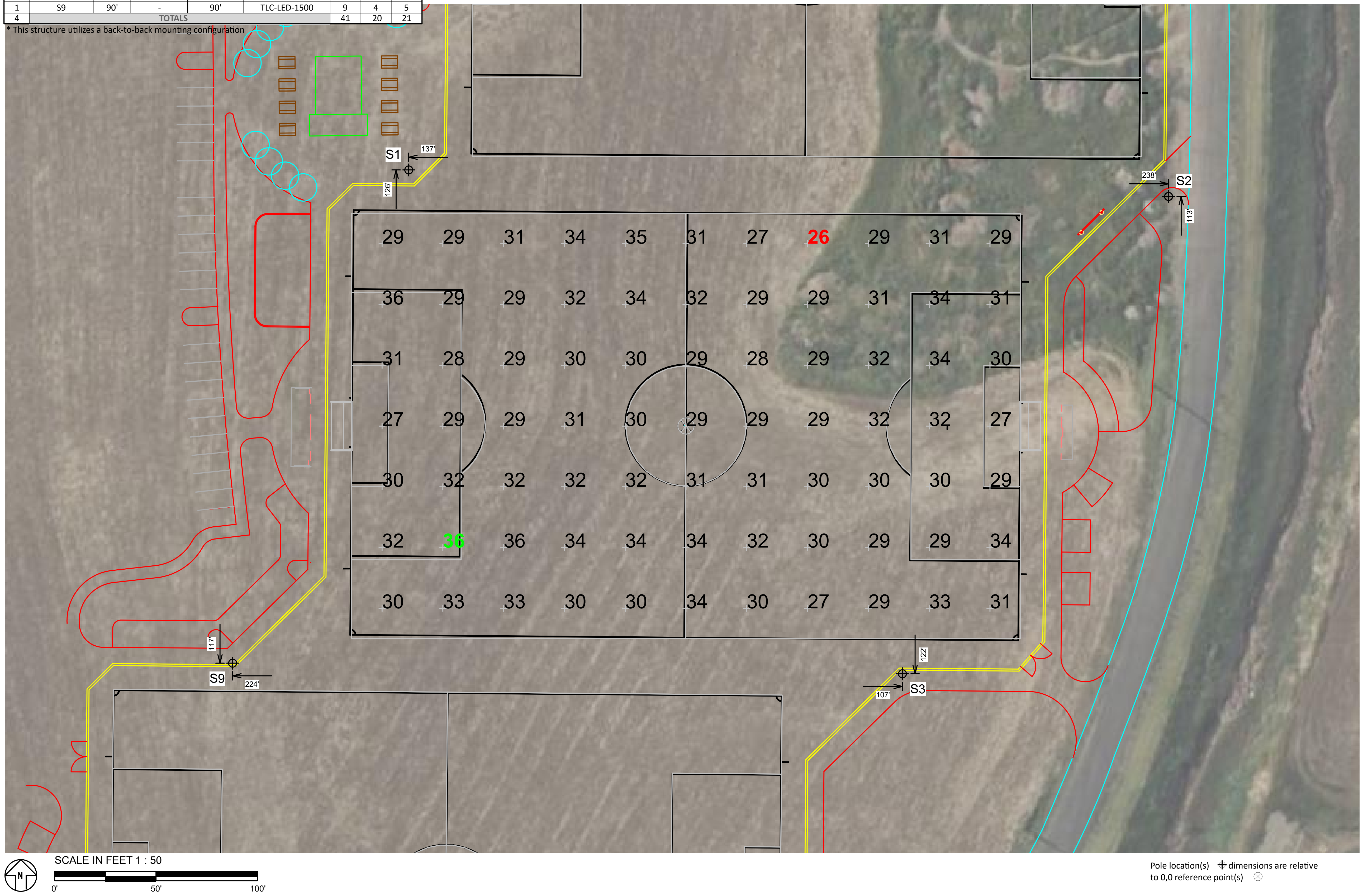
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
1	S1	90'	-	90'	TLC-LED-1500	3	2	1
				90'	TLC-LED-1200	9	4	5
1	S2	90'	-	90'	TLC-LED-1500	4	2	2
				90'	TLC-LED-1200	5	2	3
1	S3	90'	-	90'	TLC-LED-1500	3/5*	3	5
				90'	TLC-LED-1200	3	3	0
1	S9	90'	-	90'	TLC-LED-1500	9	4	5
4	TOTALS					41	20	21

* This structure utilizes a back-to-back mounting configuration



29	29	31	34	35	31	27	26	29	31	29
36	29	29	32	34	32	29	29	31	34	31
31	28	29	30	30	29	28	29	32	34	30
27	29	29	31	30	29	29	29	32	32	27
30	32	32	32	32	31	31	30	30	30	29
32	36	36	34	34	34	32	30	29	29	34
30	33	33	30	30	34	30	27	29	33	31

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	Soccer 2
Size:	330' x 210'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES	
	Entire Grid
Guaranteed Average:	**30**
Scan Average:	30.75
Maximum:	36
Minimum:	26
Avg / Min:	1.18
Guaranteed Max / Min:	**2.5**
Max / Min:	1.39
UG (adjacent pts):	1.23
CU:	0.64
No. of Points:	77
LUMINAIRE INFORMATION	
Applied Circuits:	B
No. of Luminaires:	**20**
Total Load:	26.04 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

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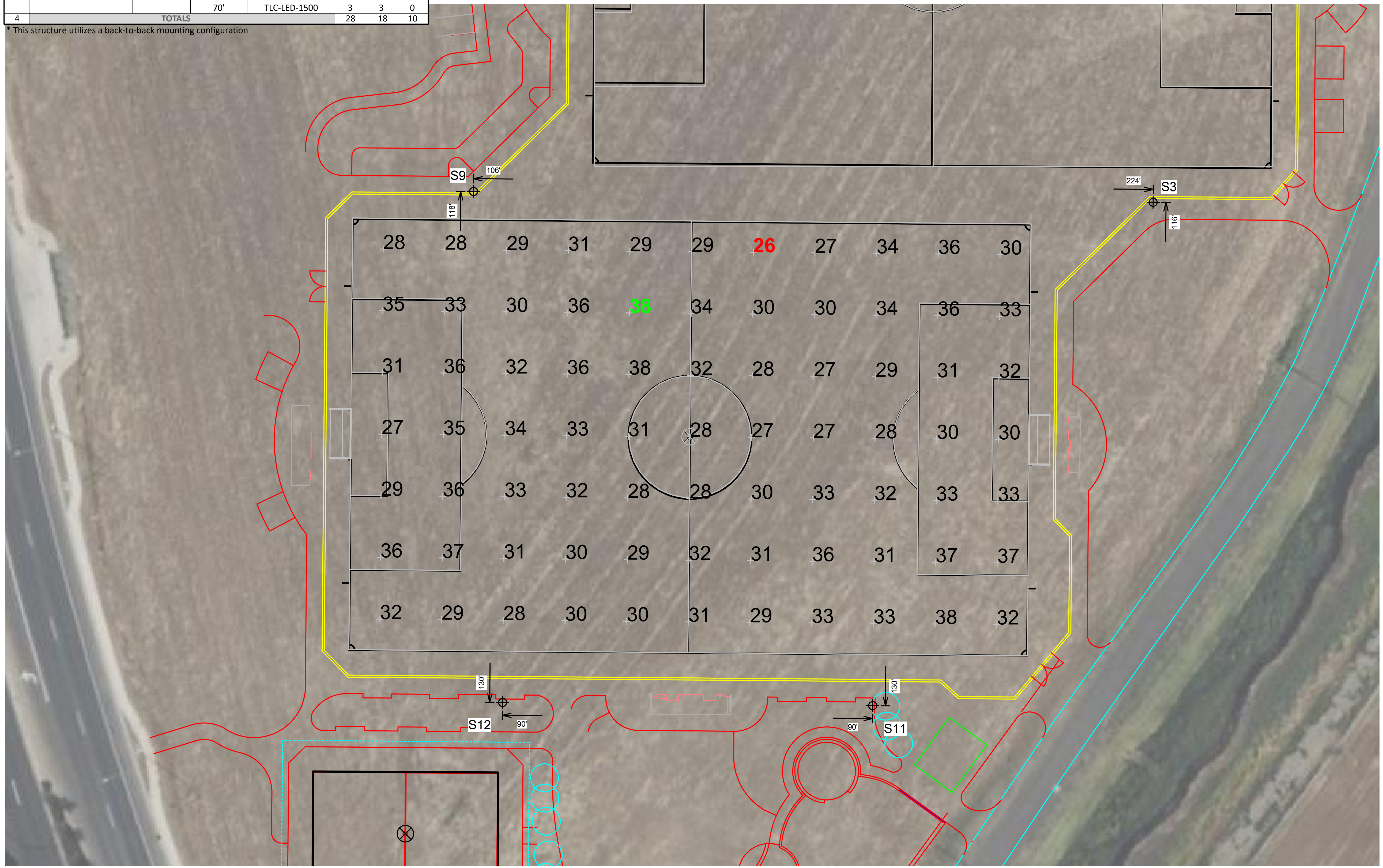
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
1	S3	90'	-	90'	TLC-LED-1500	3/5*	5	3
				90'	TLC-LED-1200	3	0	3
1	S9	90'	-	90'	TLC-LED-1500	9	5	4
1	S11	70'	-	70'	TLC-LED-1500	3	3	0
				70'	TLC-LED-1200	1	1	0
1	S12	70'	-	70'	TLC-LED-1200	1	1	0
				70'	TLC-LED-1500	3	3	0
4	TOTALS					28	18	10

* This structure utilizes a back-to-back mounting configuration



28	28	29	31	29	29	26	27	34	36	30
35	33	30	36	38	34	30	30	34	36	33
31	36	32	36	38	32	28	27	29	31	32
27	35	34	33	31	28	27	27	28	30	30
29	36	33	32	28	28	30	33	32	33	33
36	37	31	30	29	32	31	36	31	37	37
32	29	28	30	30	31	29	33	33	38	32

SCALE IN FEET 1 : 50

0' 50' 100'

Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

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Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	Soccer 3
Size:	330' x 210'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	31.63
Maximum:	38
Minimum:	26
Avg / Min:	1.21
Guaranteed Max / Min:	**2.5**
Max / Min:	1.46
UG (adjacent pts):	1.33
CU:	0.68
No. of Points:	77

LUMINAIRE INFORMATION

Applied Circuits:	C
No. of Luminaires:	**18**
Total Load:	24.9 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

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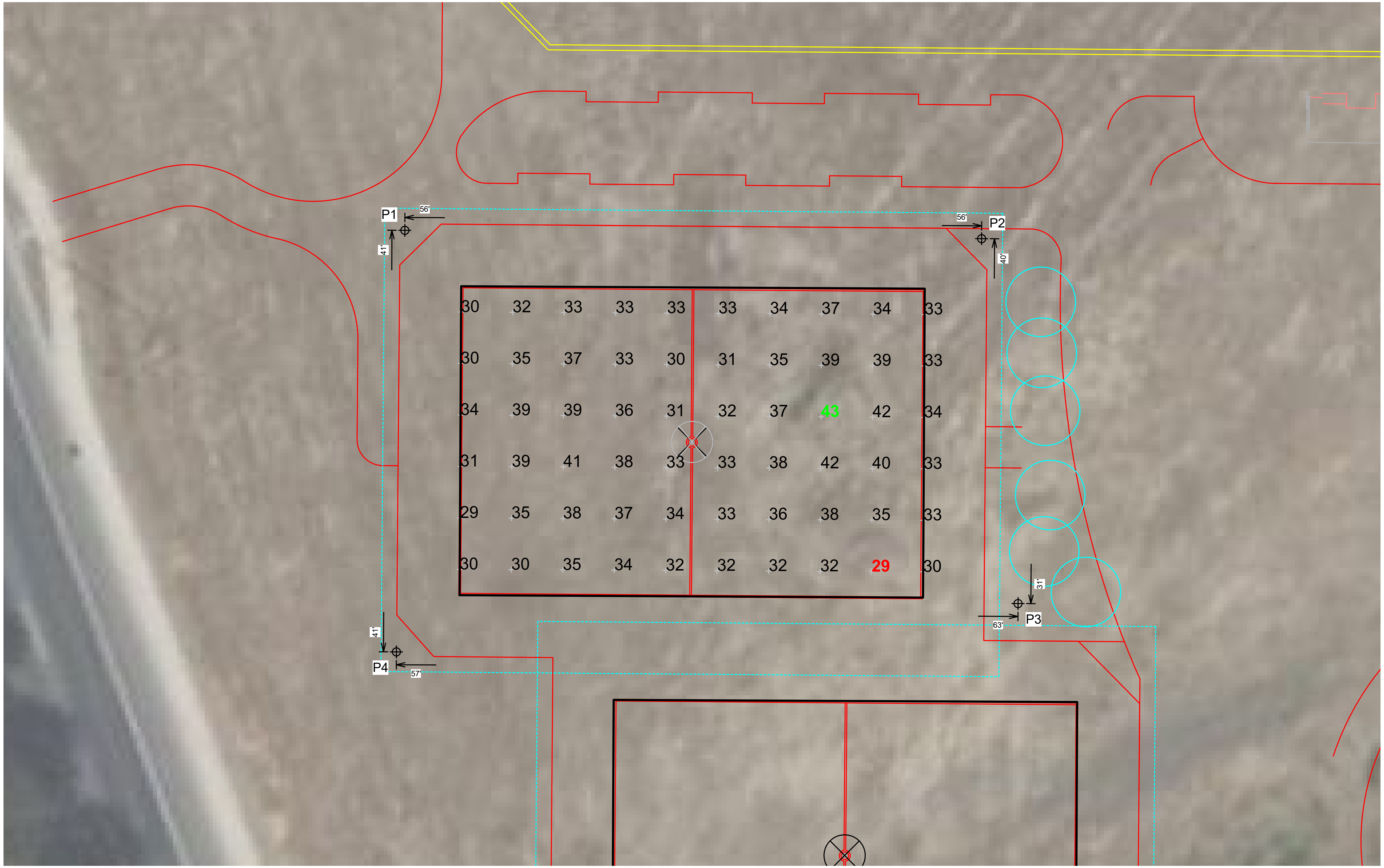
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	P1-P2	50'	-	50'	TLC-LED-550	2	2	0
2	P3-P4	50'	-	50'	TLC-LED-550	4	2	2
4	TOTALS					12	8	4



30	32	33	33	33	33	34	37	34	33
30	35	37	33	30	31	35	39	39	33
34	39	39	36	31	32	37	43	42	34
31	39	41	38	33	33	38	42	40	33
29	35	38	37	34	33	36	38	35	33
30	30	35	34	32	32	32	32	29	30

SCALE IN FEET 1 : 20

0' 20' 40'

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Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	**Multipurpose 1**
Size:	90' x 60'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	**34.56**
Maximum:	43
Minimum:	29
Avg / Min:	1.19
Max / Min:	**1.49**
UG (adjacent pts):	1.26
CU:	0.42
No. of Points:	60

LUMINAIRE INFORMATION

Applied Circuits:	D
No. of Luminaires:	**8**
Total Load:	4.32 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

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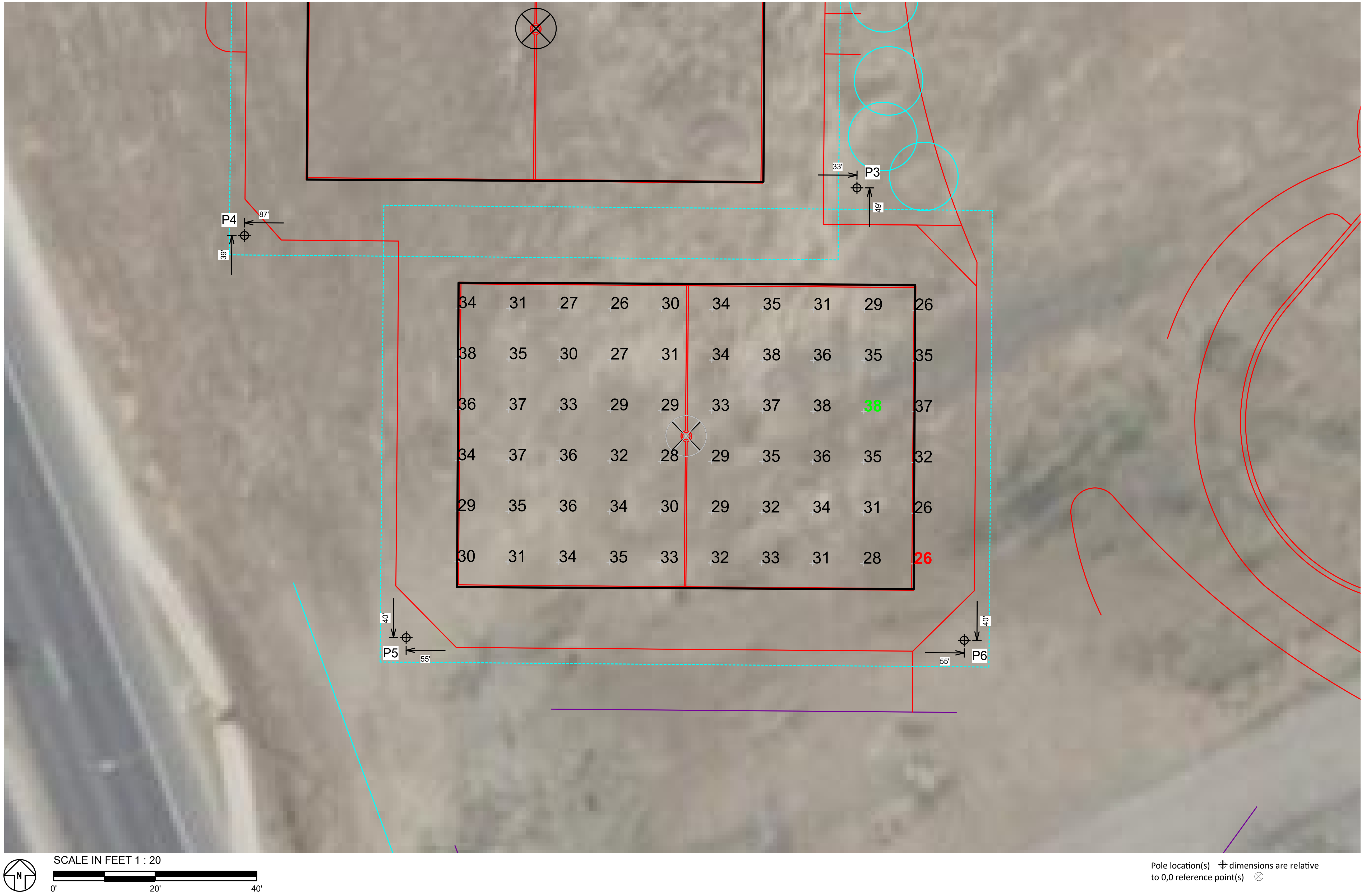
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	P3-P4	50'	-	50'	TLC-LED-550	4	2	2
2	P5-P6	50'	-	50'	TLC-LED-550	2	2	0
4	TOTALS					12	8	4



34	31	27	26	30	34	35	31	29	26
38	35	30	27	31	34	38	36	35	35
36	37	33	29	29	33	37	38	38	37
34	37	36	32	28	29	35	36	35	32
29	35	36	34	30	29	32	34	31	26
30	31	34	35	33	32	33	31	28	26

Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

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Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	**Multipurpose 2**
Size:	90' x 60'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	**32.52**
Maximum:	38
Minimum:	26
Avg / Min:	1.25
Max / Min:	**1.48**
UG (adjacent pts):	1.34
CU:	0.39
No. of Points:	60

LUMINAIRE INFORMATION

Applied Circuits:	E
No. of Luminaires:	**8**
Total Load:	4.32 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	P7-P10	50'	-	50'	TLC-LED-550	2	2	0
4	TOTALS					8	8	0

Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	**Pickleball**
Size:	114' x 64'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	**34.83**
Maximum:	47
Minimum:	28
Avg / Min:	1.26
Max / Min:	**1.71**
UG (adjacent pts):	1.34
CU:	0.51
No. of Points:	72

LUMINAIRE INFORMATION

Applied Circuits:	F
No. of Luminaires:	**8**
Total Load:	4.32 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

28	30	30	30	30	28
31	36	39	39	36	32
32	40	44	44	39	32
34	39	41	41	39	35
32	33	32	32	34	33
31	30	28	28	30	31
33	33	30	30	32	32
36	38	37	37	38	35
36	43	46	46	43	36
31	40	47	47	40	30
31	36	40	39	35	30
29	29	30	30	29	28

SCALE IN FEET 1 : 20

0' 20' 40'

Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
8	P1-P2 P5-P10	50'	-	50'	TLC-LED-550	2	2	0
2	P3-P4	50'	-	50'	TLC-LED-550	4	4	0
1	S1	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	3 9	3 9	0 0
1	S2	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	4 5	4 5	0 0
1	S3	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	3/5* 3	8 3	0 0
3	S5-S6, S12	70'	-	70' 70'	TLC-LED-1200 TLC-LED-1500	1 3	1 3	0 0
1	S9	90'	-	90'	TLC-LED-1500	9	9	0
1	S11	70'	-	70' 70'	TLC-LED-1500 TLC-LED-1200	3 1	3 1	0 0
18	TOTALS					81	81	0

* This structure utilizes a back-to-back mounting configuration

Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	**Roadway Spill**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	0.0341
Maximum:	0.50
Minimum:	0.00
No. of Points:	44

LUMINAIRE INFORMATION

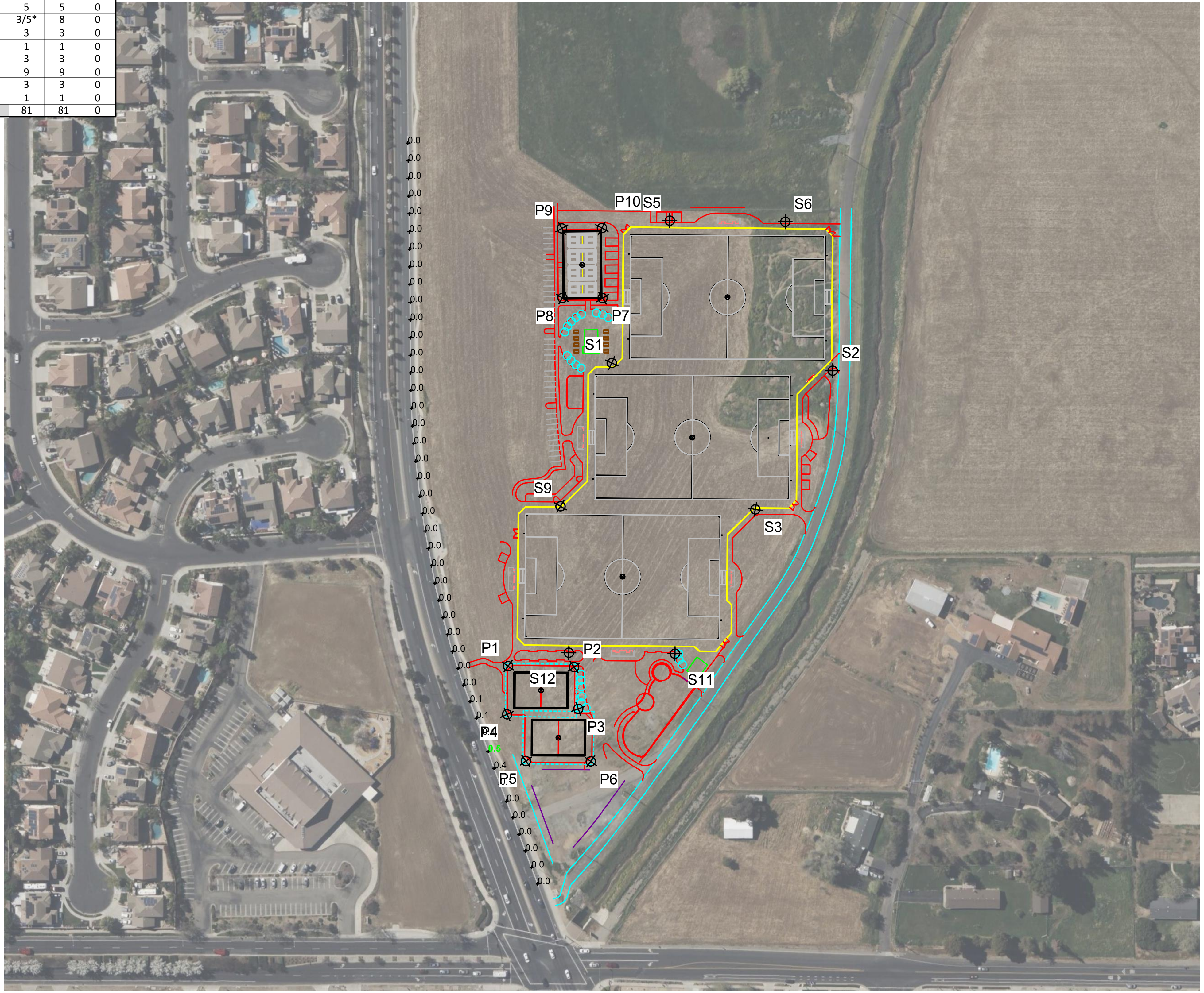
Applied Circuits:	A, B, C, D, E, F
No. of Luminaires:	**81**
Total Load:	88.29 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

SCALE IN FEET 1 : 200

0' 200' 400'

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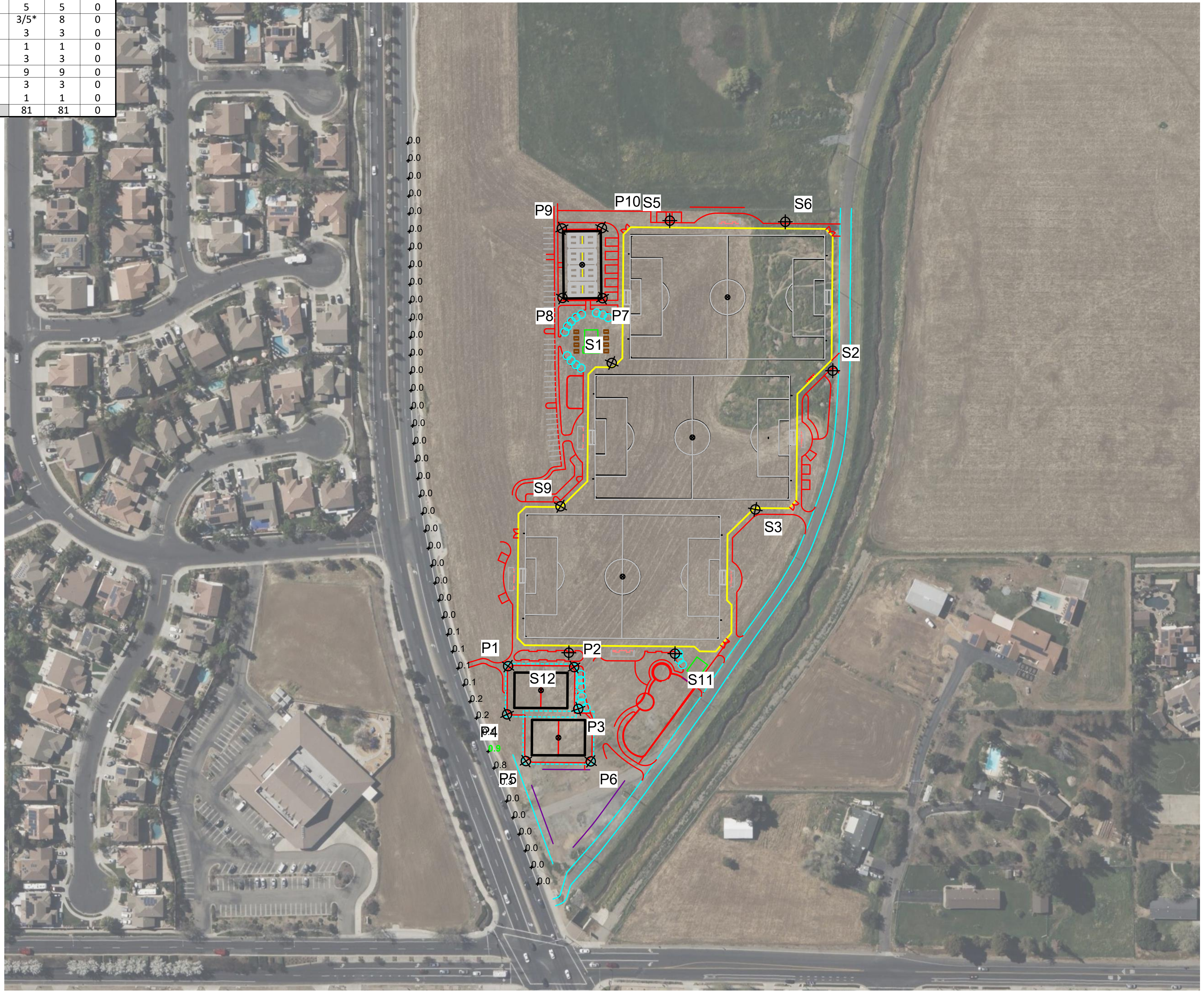
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
8	P1-P2 P5-P10	50'	-	50'	TLC-LED-550	2	2	0
2	P3-P4	50'	-	50'	TLC-LED-550	4	4	0
1	S1	90'	-	90'	TLC-LED-1500	3	3	0
				90'	TLC-LED-1200	9	9	0
1	S2	90'	-	90'	TLC-LED-1500	4	4	0
				90'	TLC-LED-1200	5	5	0
1	S3	90'	-	90'	TLC-LED-1500	3/5*	8	0
				90'	TLC-LED-1200	3	3	0
3	S5-S6, S12	70'	-	70'	TLC-LED-1200	1	1	0
				70'	TLC-LED-1500	3	3	0
1	S9	90'	-	90'	TLC-LED-1500	9	9	0
1	S11	70'	-	70'	TLC-LED-1500	3	3	0
				70'	TLC-LED-1200	1	1	0
18	TOTALS					81	81	0

* This structure utilizes a back-to-back mounting configuration



Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	**Roadway Spill**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAX VERTICAL FOOTCANDLES

	Entire Grid
Scan Average:	0.0749
Maximum:	0.91
Minimum:	0.00
No. of Points:	44

LUMINAIRE INFORMATION

Applied Circuits:	A, B, C, D, E, F
No. of Luminaires:	**81**
Total Load:	88.29 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ✛ dimensions are relative to 0,0 reference point(s) ⊗

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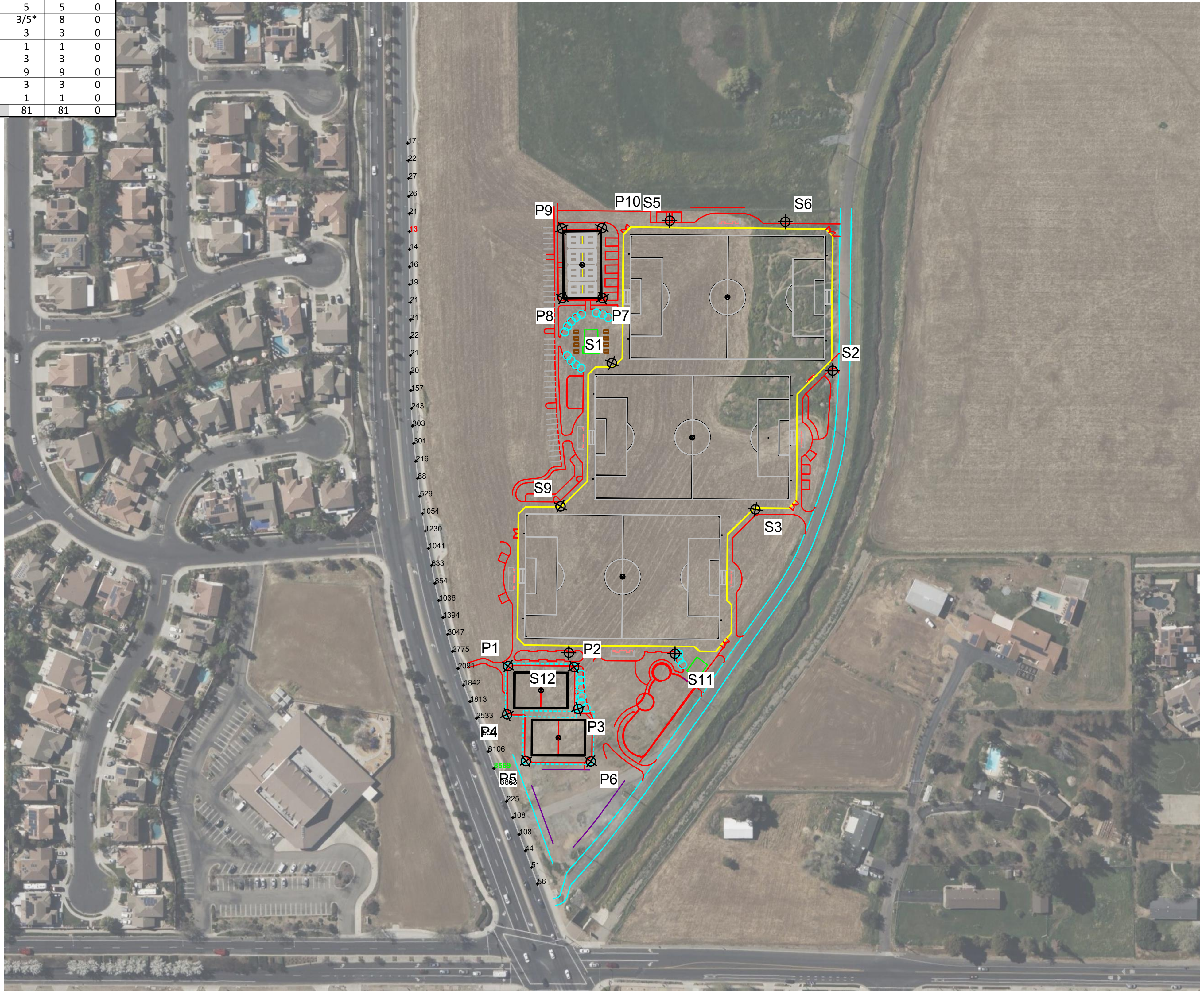
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
8	P1-P2 P5-P10	50'	-	50'	TLC-LED-550	2	2	0
2	P3-P4	50'	-	50'	TLC-LED-550	4	4	0
1	S1	90'	-	90'	TLC-LED-1500	3	3	0
				90'	TLC-LED-1200	9	9	0
1	S2	90'	-	90'	TLC-LED-1500	4	4	0
				90'	TLC-LED-1200	5	5	0
1	S3	90'	-	90'	TLC-LED-1500	3/5*	8	0
				90'	TLC-LED-1200	3	3	0
3	S5-S6, S12	70'	-	70'	TLC-LED-1200	1	1	0
				70'	TLC-LED-1500	3	3	0
1	S9	90'	-	90'	TLC-LED-1500	9	9	0
1	S11	70'	-	70'	TLC-LED-1500	3	3	0
				70'	TLC-LED-1200	1	1	0
18	TOTALS					81	81	0

* This structure utilizes a back-to-back mounting configuration



SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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Sand Creek Soccer

Brentwood,CA

GRID SUMMARY

Name:	**Roadway Spill**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

CANDELA (PER FIXTURE)

	Entire Grid
Scan Average:	980.9286
Maximum:	8568.53
Minimum:	12.93
No. of Points:	44

LUMINAIRE INFORMATION

Applied Circuits:	A, B, C, D, E, F
No. of Luminaires:	**81**
Total Load:	88.29 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

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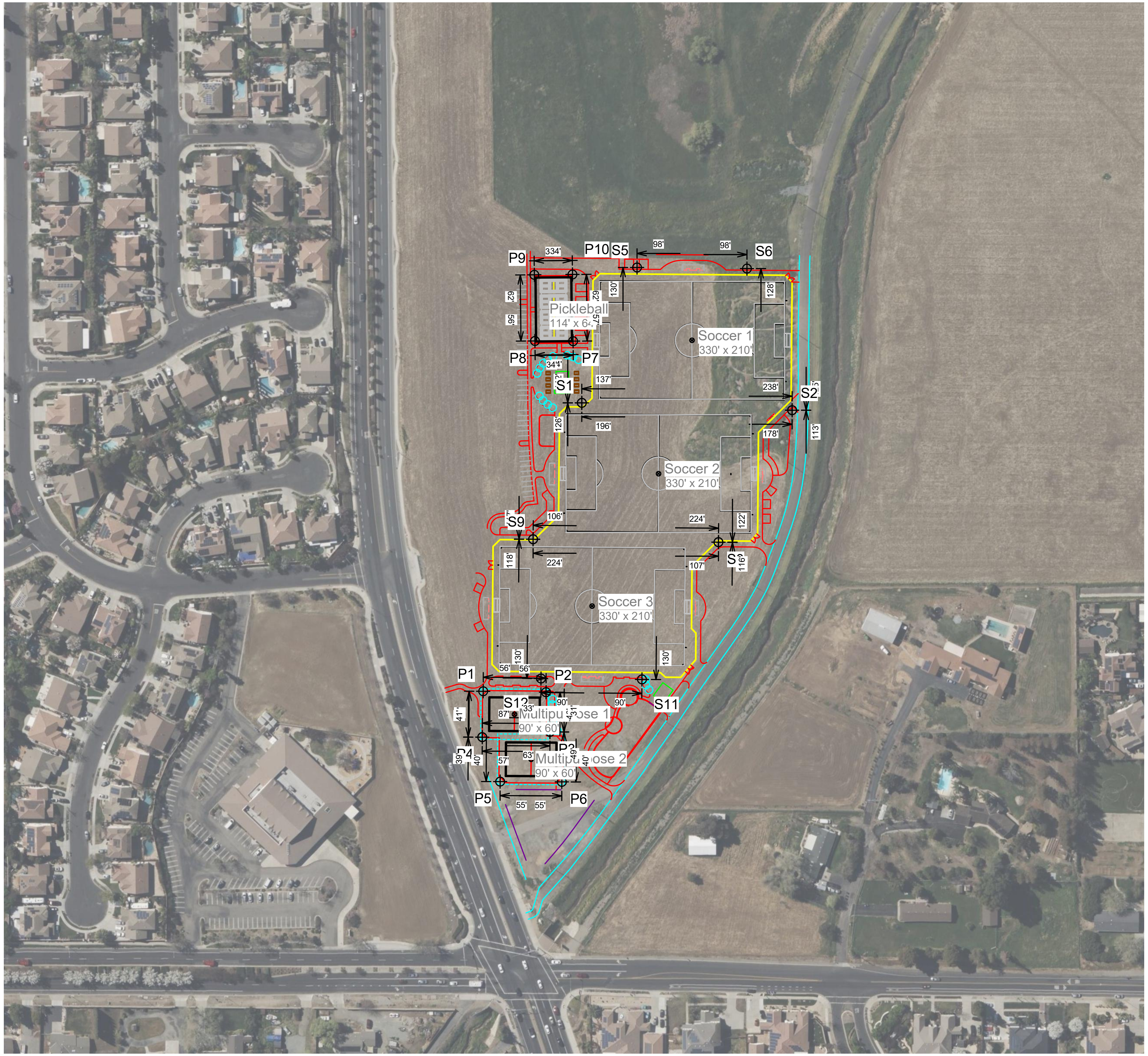

Sand Creek Soccer

Brentwood,CA

EQUIPMENT LAYOUT

INCLUDES:

- Multipurpose 1
- Multipurpose 2
- Pickleball
- Soccer 1
- Soccer 2
- Soccer 3

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
8	P1-P2 P5-P10	50'	-	50'	TLC-LED-550	2
2	P3-P4	50'	-	50'	TLC-LED-550	4
1	S1	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	3 9
1	S2	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	4 5
1	S3	90'	-	90' 90'	TLC-LED-1500 TLC-LED-1200	3/5* 3
1	S9	90'	-	90'	TLC-LED-1500	9
1	S11	70'	-	70' 70'	TLC-LED-1500 TLC-LED-1200	3 1
3	S12 S5-S6	70'	-	70' 70'	TLC-LED-1200 TLC-LED-1500	1 3
18	TOTALS					81

* This structure utilizes a back-to-back mounting configuration

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Driver (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-550	3.2	3.0	2.8	2.4	1.9	-	1.4
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6

SCALE IN FEET 1 : 200

0' 200' 400'

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Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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EQUIPMENT LAYOUT

APPENDIX B

AIR QUALITY AND GREENHOUSE GAS EMISSIONS MODELING RESULTS

Sand Creek Sports Complex Custom Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Sand Creek Sports Complex
Construction Start Date	6/1/2024
Operational Year	2026
Lead Agency	City of Brentwood
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.00
Precipitation (days)	20.6
Location	37.94450337799999, -121.72667184242526
County	Contra Costa
City	Brentwood
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1302
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

1.2. Land Use Types

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

City Park	12.1	Acre	12.1	0.00	381,600	381,600	—	The landscaped area conservatively includes all five sports fields
Parking Lot	437	Space	3.93	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.41	3.71	36.0	33.7	0.06	1.60	19.8	21.4	1.47	10.1	11.6	—	6,778	6,778	0.27	0.06	0.76	6,803
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.60	1.49	12.1	14.3	0.03	0.53	0.12	0.53	0.49	0.03	0.49	—	2,531	2,531	0.10	0.02	0.01	2,540
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.09	1.00	8.65	10.1	0.02	0.38	2.25	2.63	0.35	1.01	1.36	—	1,808	1,808	0.07	0.01	0.08	1,814
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.20	0.18	1.58	1.85	< 0.005	0.07	0.41	0.48	0.06	0.18	0.25	—	299	299	0.01	< 0.005	0.01	300

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	3.71	36.0	33.7	0.06	1.60	19.8	21.4	1.47	10.1	11.6	—	6,778	6,778	0.27	0.06	0.76	6,803
2025	1.50	1.40	11.3	14.2	0.03	0.46	0.00	0.46	0.42	0.00	0.42	—	2,531	2,531	0.10	0.02	0.00	2,540
2026	1.43	1.34	10.7	14.1	0.03	0.40	0.00	0.40	0.37	0.00	0.37	—	2,531	2,531	0.10	0.02	0.00	2,539
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.60	1.49	12.1	14.3	0.03	0.53	0.12	0.53	0.49	0.03	0.49	—	2,531	2,531	0.10	0.02	0.01	2,540
2025	1.50	1.40	11.3	14.2	0.03	0.46	0.00	0.46	0.42	0.00	0.42	—	2,531	2,531	0.10	0.02	0.00	2,540
2026	1.43	1.34	10.7	14.1	0.03	0.40	0.00	0.40	0.37	0.00	0.37	—	2,531	2,531	0.10	0.02	0.00	2,539
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.09	0.96	8.65	8.64	0.02	0.38	2.25	2.63	0.35	1.01	1.36	—	1,642	1,642	0.07	0.01	0.08	1,648
2025	1.07	1.00	8.09	10.1	0.02	0.33	0.00	0.33	0.30	0.00	0.30	—	1,808	1,808	0.07	0.01	0.00	1,814
2026	0.73	0.69	5.49	7.23	0.01	0.21	0.00	0.21	0.19	0.00	0.19	—	1,296	1,296	0.05	0.01	0.00	1,301
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.20	0.18	1.58	1.58	< 0.005	0.07	0.41	0.48	0.06	0.18	0.25	—	272	272	0.01	< 0.005	0.01	273
2025	0.20	0.18	1.48	1.85	< 0.005	0.06	0.00	0.06	0.06	0.00	0.06	—	299	299	0.01	< 0.005	0.00	300
2026	0.13	0.13	1.00	1.32	< 0.005	0.04	0.00	0.04	0.03	0.00	0.03	—	215	215	0.01	< 0.005	0.00	215

2.4. Operations Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	22.5	21.7	11.2	116	0.24	0.17	21.0	21.2	0.16	5.33	5.49	0.56	24,351	24,351	1.45	1.12	84.5	24,807
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	21.2	20.2	13.3	117	0.22	0.17	21.0	21.2	0.16	5.33	5.49	0.56	22,749	22,750	1.73	1.25	2.19	23,169
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.44	7.31	4.40	39.0	0.08	0.06	7.35	7.41	0.06	1.86	1.92	0.56	8,197	8,197	0.62	0.43	12.9	8,352
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.36	1.33	0.80	7.12	0.01	0.01	1.34	1.35	0.01	0.34	0.35	0.09	1,357	1,357	0.10	0.07	2.14	1,383

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	22.5	21.4	11.2	116	0.24	0.17	21.0	21.2	0.16	5.33	5.49	—	24,239	24,239	1.37	1.12	84.5	24,692
Area	0.00	0.30	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	83.9	83.9	0.01	< 0.005	—	84.7
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	27.9	27.9	< 0.005	< 0.005	—	28.2
Waste	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.96
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	22.5	21.7	11.2	116	0.24	0.17	21.0	21.2	0.16	5.33	5.49	0.56	24,351	24,351	1.45	1.12	84.5	24,807
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	21.2	19.9	13.3	117	0.22	0.17	21.0	21.2	0.16	5.33	5.49	—	22,637	22,637	1.66	1.25	2.19	23,054

Area	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	83.9	83.9	0.01	< 0.005	—	84.7
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	27.9	27.9	< 0.005	< 0.005	—	28.2
Waste	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.96
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	21.2	20.2	13.3	117	0.22	0.17	21.0	21.2	0.16	5.33	5.49	0.56	22,749	22,750	1.73	1.25	2.19	23,169
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	7.44	7.00	4.40	39.0	0.08	0.06	7.35	7.41	0.06	1.86	1.92	—	8,085	8,085	0.54	0.42	12.9	8,238
Area	0.00	0.30	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	83.9	83.9	0.01	< 0.005	—	84.7
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	27.9	27.9	< 0.005	< 0.005	—	28.2
Waste	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.96
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	7.44	7.31	4.40	39.0	0.08	0.06	7.35	7.41	0.06	1.86	1.92	0.56	8,197	8,197	0.62	0.43	12.9	8,352
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.36	1.28	0.80	7.12	0.01	0.01	1.34	1.35	0.01	0.34	0.35	—	1,339	1,339	0.09	0.07	2.14	1,364
Area	0.00	0.06	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	13.9	13.9	< 0.005	< 0.005	—	14.0
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	4.62	4.62	< 0.005	< 0.005	—	4.67
Waste	—	—	—	—	—	—	—	—	—	—	—	0.09	0.00	0.09	0.01	0.00	—	0.32
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	1.36	1.33	0.80	7.12	0.01	0.01	1.34	1.35	0.01	0.34	0.35	0.09	1,357	1,357	0.10	0.07	2.14	1,383

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movemen	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	0.20	1.97	1.80	< 0.005	0.09	—	0.09	0.08	—	0.08	—	290	290	0.01	< 0.005	—	291
Dust From Material Movemen	—	—	—	—	—	—	1.08	1.08	—	0.55	0.55	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.04	0.36	0.33	< 0.005	0.02	—	0.02	0.01	—	0.01	—	48.0	48.0	< 0.005	< 0.005	—	48.2
Dust From Material Movemen	—	—	—	—	—	—	0.20	0.20	—	0.10	0.10	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.79	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	157	157	< 0.005	0.01	0.66	160
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.97	7.97	< 0.005	< 0.005	0.02	8.09
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.32	1.32	< 0.005	< 0.005	< 0.005	1.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movemen	—	—	—	—	—	—	9.20	9.20	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.52	0.43	4.23	3.72	0.01	0.18	—	0.18	0.16	—	0.16	—	813	813	0.03	0.01	—	816
Dust From Material Movemen	—	—	—	—	—	—	1.13	1.13	—	0.45	0.45	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.08	0.77	0.68	< 0.005	0.03	—	0.03	0.03	—	0.03	—	135	135	0.01	< 0.005	—	135
Dust From Material Movemen	—	—	—	—	—	—	0.21	0.21	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.05	0.90	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	180	180	< 0.005	0.01	0.76	183

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	20.5	20.5	< 0.005	< 0.005	0.04	20.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.39	3.39	< 0.005	< 0.005	0.01	3.44
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.20	0.17	1.58	1.85	< 0.005	0.07	—	0.07	0.06	—	0.06	—	338	338	0.01	< 0.005	—	339
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.29	0.34	< 0.005	0.01	—	0.01	0.01	—	0.01	—	55.9	55.9	< 0.005	< 0.005	—	56.1
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.96	0.80	7.46	9.31	0.02	0.31	—	0.31	0.28	—	0.28	—	1,713	1,713	0.07	0.01	—	1,719
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.36	1.70	< 0.005	0.06	—	0.06	0.05	—	0.05	—	284	284	0.01	< 0.005	—	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	0.55	5.03	6.62	0.01	0.19	—	0.19	0.18	—	0.18	—	1,224	1,224	0.05	0.01	—	1,229
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.92	1.21	< 0.005	0.04	—	0.04	0.03	—	0.03	—	203	203	0.01	< 0.005	—	203
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.08	0.75	0.96	< 0.005	0.04	—	0.04	0.03	—	0.03	—	145	145	0.01	< 0.005	—	145
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.14	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.04	0.68	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	135	135	< 0.005	< 0.005	0.57	137
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	< 0.005	0.01	0.01	125
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.0	12.0	< 0.005	< 0.005	0.02	12.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.98	1.98	< 0.005	< 0.005	< 0.005	2.01

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	0.91	1.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.10	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.2	15.2	< 0.005	< 0.005	—	15.2
Architectural Coatings	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.51	2.51	< 0.005	< 0.005	—	2.52

Architect Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.63	0.81	< 0.005	0.02	—	0.02	0.02	—	0.02	—	95.4	95.4	< 0.005	< 0.005	—	95.7
Architectural Coatings	—	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.12	0.15	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.8	15.8	< 0.005	< 0.005	—	15.8
Architectural Coatings	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Architectural Coating (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.06	0.46	0.61	< 0.005	0.01	—	0.01	0.01	—	0.01	—	71.8	71.8	< 0.005	< 0.005	—	72.1
Architectural Coatings	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.9	11.9	< 0.005	< 0.005	—	11.9
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	22.5	21.4	11.2	116	0.24	0.17	21.0	21.2	0.16	5.33	5.49	—	24,239	24,239	1.37	1.12	84.5	24,692
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	22.5	21.4	11.2	116	0.24	0.17	21.0	21.2	0.16	5.33	5.49	—	24,239	24,239	1.37	1.12	84.5	24,692
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	21.2	19.9	13.3	117	0.22	0.17	21.0	21.2	0.16	5.33	5.49	—	22,637	22,637	1.66	1.25	2.19	23,054
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	21.2	19.9	13.3	117	0.22	0.17	21.0	21.2	0.16	5.33	5.49	—	22,637	22,637	1.66	1.25	2.19	23,054
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	1.36	1.28	0.80	7.12	0.01	0.01	1.34	1.35	0.01	0.34	0.35	—	1,339	1,339	0.09	0.07	2.14	1,364
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.36	1.28	0.80	7.12	0.01	0.01	1.34	1.35	0.01	0.34	0.35	—	1,339	1,339	0.09	0.07	2.14	1,364

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	83.9	83.9	0.01	< 0.005	—	84.7
Total	—	—	—	—	—	—	—	—	—	—	—	—	83.9	83.9	0.01	< 0.005	—	84.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	83.9	83.9	0.01	< 0.005	—	84.7
Total	—	—	—	—	—	—	—	—	—	—	—	—	83.9	83.9	0.01	< 0.005	—	84.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	13.9	13.9	< 0.005	< 0.005	—	14.0
Total	—	—	—	—	—	—	—	—	—	—	—	—	13.9	13.9	< 0.005	< 0.005	—	14.0

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.30	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consum Products	—	0.28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.06	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	27.9	27.9	< 0.005	< 0.005	—	28.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	27.9	27.9	< 0.005	< 0.005	—	28.2

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	27.9	27.9	< 0.005	< 0.005	—	28.2
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	27.9	27.9	< 0.005	< 0.005	—	28.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	4.62	4.62	< 0.005	< 0.005	—	4.67
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	4.62	4.62	< 0.005	< 0.005	—	4.67

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.96
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.96
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.96
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.96
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.09	0.00	0.09	0.01	0.00	—	0.32
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.09	0.00	0.09	0.01	0.00	—	0.32

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

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

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Remove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	6/1/2024	6/28/2024	5.00	20.0	—
Grading	Grading	7/1/2024	8/30/2024	5.00	45.0	—
Building Construction	Building Construction	10/21/2024	9/18/2026	5.00	500	—
Paving	Paving	9/2/2024	10/18/2024	5.00	35.0	—
Architectural Coating	Architectural Coating	11/4/2024	10/2/2026	5.00	500	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36

Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	0.00	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	0.00	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT

Architectural Coating	—	—	—	—
Architectural Coating	Worker	0.00	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	3,675	1,225	10,279

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	30.0	0.00	—
Grading	—	—	135	0.00	—
Paving	0.00	0.00	0.00	0.00	3.93

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
City Park	0.00	0%
Parking Lot	3.93	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	204	0.03	< 0.005
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
City Park	602	6,265	6,265	810,295	2,860	29,767	29,767	3,849,899
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	3,675	1,225	10,279

5.10.3. Landscape Equipment

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

5.11. Operational Energy Consumption

5.11.1. Unmitigated

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

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
City Park	0.00	204	0.0330	0.0040	0.00
Parking Lot	150,078	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
City Park	0.00	10,121,004
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
City Park	1.04	—
Parking Lot	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

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

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

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

5.16.2. Process Boilers

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

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

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

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Demolition is not required. Based on typical construction practices, architectural coating assumed to start two weeks after the start of building construction and last for the same number of days.
Operations: Vehicle Data	The trip rates have been updated based on a project-specific Transportation Analysis.

APPENDIX C

TRANSPORTATION IMPACT ASSESSMENT

Prepared by
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100 Pringle Avenue
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Walnut Creek, CA 94596

December 2023

Draft

Transportation Impact Assessment

Sand Creek Sports Complex Site

Prepared for:
The City of Brentwood and
Raney Planning and Mangement

DRAFT

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WC23-3990

FEHR PEERS

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1. Introduction

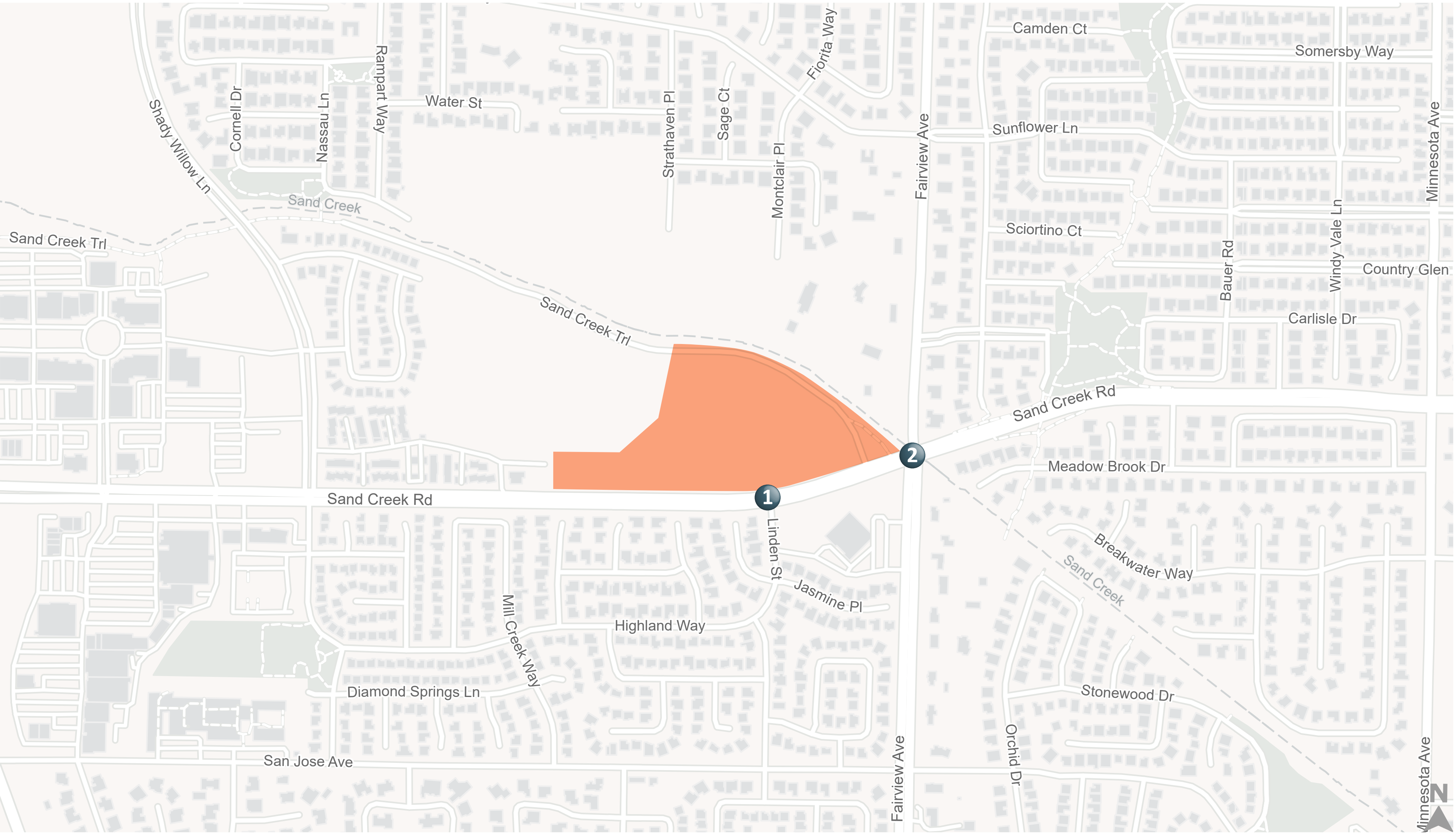
This report presents the analysis and findings of the Draft Transportation Impact Assessment (TIA) prepared for the proposed Sand Creek Sports Complex project in the City of Brentwood, California. This section discusses the TIA's purpose, analysis locations and scenarios, analysis methods, criteria used to identify significant impacts, and report organization.

The study's purpose is to evaluate the potential transportation impacts of the Sand Creek Sports Complex project. The California Environmental Quality Act (CEQA) Guidelines were updated in 2020 per Senate Bill 743 (SB 743) to require the use of VMT to evaluate a project's environmental effect on the transportation system. The passage of SB 743 includes the elimination of automobile delay, LOS, and other similar measures of vehicular capacity or traffic congestion as a basis for determining a project's significant impacts to the transportation system. However, lead agencies may elect to utilize LOS for informational purposes or non-CEQA analysis. This report summarizes the project's effect on VMT for CEQA purposes and LOS analysis for informational/non-CEQA analysis to ensure consistency with the goals of the City of Brentwood's *General Plan* (City of Brentwood, Adopted July 2014).

Project Description

The currently undeveloped project site is situated in the northwest corner of the Sand Creek Road and Fairview Avenue intersection, as shown on **Figure 1**. The current proposal seeks to build a new sports complex that would initially include three lighted, artificial turf fields as well as additional amenities such as pickleball courts, multi-use sport courts, a playground, and a pump track, among other amenities. A later expansion of the complex would include two artificial turf fields on the western portion of the site. This TIA evaluates the transportation related effects of buildout of the entire project, including both phases. A conceptual project site plan for Phase 1 of the sports complex is shown in **Figure 2A** while Phase 2 is shown on **Figure 2B**. All vehicular access to the site would be provided via Sand Creek Road. The project would install a new traffic signal at the intersection of Linden Street and Sand Creek Road, which would be the site's primary access point.

The sports fields will serve local sports groups and facilitate regional tournaments. Fields will be rented out individually; some rentals would be recurring reservations, while others would be reserved for tournaments and events. Approximately six regional tournaments, with a maximum attendance of 550 people, will occur per year. Most tournaments would be scheduled on Saturdays and Sundays between 8 AM and 10 PM.



🟧	Project Site
#	Study Intersection

Figure 1

Project Site and Study Intersections

WC23-3990_1_StudyArea

SYNTHETIC TURF MULTI-USE FIELD
- 5' Tall Chain Link Fence
- 22' Netting on the Top of 8' Chain Link Fence at Critical Area
- Double Maintenance Gate & Single Pedestrian Gate
- Drinking Fountains
- Bleacher w/ Shade

FIELD#1
- (1) Full Size Soccer Field (75 x 120 Yard)
- (2) Soccer Fields - U12 (55 x 75 Yard)
- (1) Lacrosse - Unified (60 x 120 Yard)

FIELD #2
- (1) Full Size Soccer Field (70x110 Yard)
- (2) Soccer Fields - U12 (50 x 70 Yard)
- (1) Lacrosse - Unified (60 x 110 Yard)
- Practice Baseball/Softball

FIELD #3
- (1) Full Size Soccer Field (70x110 Yard)
- (2) Soccer Fields - U10 (45 x 65 Yard)
- (1) Lacrosse - Unified (60 x 110 Yard)
- Practice Baseball/Softball

ENTRY PLAZA
- Restroom Building
- Wood/Metal Arbor
- Seating with Shade Tree
- Team Picture Stage Area
- Park Signage Wall
- Shade Structure
- Group Picnic and BBQ Area

FOOD TRUCK ACCESS/PARKING

PAVED PARKING LOT (Total 270 stalls)
- Shade Trees
- 4' Wide Pedestrian Walkway
- 5' Wide Striped Pedestrian Crossing
- Stormwater Treatment Areas

COMPACTED AGGREGATE OVERFLOW PARKING LOT

BID ALT. #1: SYNTHETIC TURF WARM-UP AREA & PICNIC AREA
- Synthetic Turf Warm-Up Area
- Picnic Tables w/ Shade Trees
- Planting

BID ALT. #1: PARK ENTRY PLANTING
- Park Signage
- Specimen Trees
- Flora Display
- Seating
- Stormwater Treatment Area

ROUGH GRADING & HYDROSEED AT FUTURE DEVELOPMENT AREA, TYP.

TRASH ENCLOSURE

BID ALT. #3: MAINTENANCE OFFICE AREA
- Building
- Storage Yard with Fence & Gate
- Trees

BID ALT. #1: PLANTING AT PARKING LOT ALONG SAND CREEK ROAD
- Shade Trees
- Stormwater Treatment Area

PARKING LOT EGRESS WITH PIPE GATE, TYP.

TRAFFIC SIGNAL, TYP.

Site Plan Source: Verde Design Inc.

Figure 2A

Project Site Plan Phase 1

Site Plan Source: Verde Design Inc.

Figure 2B

Project Site Plan Phase 2

WC23-3990_2B_SitePlanPh2

Analysis Locations and Scenarios

Potential project violations of the City's established level of service policies at study area roadway facilities were determined by measuring the effect project traffic would have on intersections in the vicinity of the project site during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods. As shown on **Figure 1**, the following intersections were selected based on a review of the project location, estimates of the added traffic from the project, consultation with City staff, and locations of planned roadways in the area:

1. Sand Creek Road at Linden Street
2. Sand Creek Road at Fairview Avenue

The following scenarios were evaluated:

- ***Existing*** – Existing (2023) conditions based on recent traffic counts.
- ***Existing with Project*** – Existing (2023) conditions with project-related traffic.
- ***Cumulative*** – Forecast year 2040 without project traffic conditions based on the CCTA Travel Model, reflecting buildout of the City's General Plan.
- ***Cumulative with Project*** – Cumulative (2040) conditions with project-related traffic.

Analysis Methods

The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined, ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F.

Signalized Intersections

Traffic conditions at signalized intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6th Edition* (HCM 6th) for vehicles. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay is summarized in **Table 1**.

Table 1: Signalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: *Highway Capacity Manual 6th Edition (Transportation Research Board).*

Unsignalized Intersections

For unsignalized (all-way stop-controlled and side street stop-controlled) intersections, the HCM 6th method for unsignalized intersections was used. With this method, operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 2** summarizes the relationship between LOS and delay for unsignalized intersections. At side street stop-controlled intersections, the delay is calculated for each stop-controlled movement, the left turn movement from the major street, as well as the intersection average. The intersection average delay and highest movement/approach delay are reported for side street stop-controlled intersections.

Table 2: Unsignalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic, delays where intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual 6th Edition (Transportation Research Board).*

Significance Criteria – Environmental Impacts

For this study, based on the updated Appendix G of the State of California's Environmental Checklist Form, a significant transportation related impact could occur if the project would

A. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including roadway, transit, bicycle, and pedestrian facilities.
B. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). Specifically, cause substantial additional VMT per capita, per service population, or other appropriate efficiency measure.
C. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
D. Result in inadequate emergency access.

Regulatory Setting

In addition to the environmental significance standards described above, the City of Brentwood has established policies related to roadway levels of service. These policies are described in the City's General Plan and other regional policy documents. As part of the City of Brentwood's 2014 Adopted General Plan, the following are the Routes of Regional Significance identified within the study area by the *East County Action Plan for Routes of Regional Significance*.

1. Fairview Avenue (suburban arterial)
2. Sand Creek Road (suburban arterial)

These routes must maintain the Multimodal Transportation Service Objective (MTSO) set forth by the *East County Action Plan,* produced by the TRANSPLAN Committee and Contra Costa Transportation Authority (CCTA). The General Plan and East County Action Plan outlines the following:

- For freeway Multimodal Transportation Service Objectives, the delay index should not exceed 2.5 during the peak hour. HOV lane utilization should exceed 600 vehicles per lane in the peak direction during the peak hour. This applies to SR 4 freeway segments.
- For signalized **suburban arterial routes**, intersection levels of service should be maintained at LOS D or better.
- For non-signalized **rural roads**, roadway levels of service should be maintained at LOS D or better.

Other policies from the 2014 Adopted General Plan include the following:

> ***Policy CIR I-5:*** Maintain LOS D or better operation at intersections within Brentwood that are not on designated Routes of Regional Significance, and LOS E or better operation at intersections in the Downtown Specific Plan area. At unsignalized intersections, levels of service shall be determined for both controlled movements and for the overall intersection. Controlled movements operating at LOS E or LOS F are allowable if the intersection is projected to operate at

> LOS C or better overall, and/or if the "Peak Hour" signal warrant outlined in the CA *Manual on Uniform Traffic Control Devices* remains unmet.
>
> ***Policy CIR I-6:*** Intersections may be exempted from the LOS standards established in Policy CIR I-5 in cases where the City Council finds that the infrastructure improvements needed to maintain vehicle LOS (such as roadway or intersection widening) would be in conflict with goals of improving multimodal circulation or would lead to other potentially adverse environmental impacts. For those locations where the City allows a reduced motor vehicle LOS or queuing standard, additional multimodal improvements may be required in order to reduce impacts to mobility.

The following thresholds will be considered in the evaluation of the project from a transportation perspective:

1. Would the operations of a signalized study intersection decline from LOS D (an average delay of 55 seconds for signalized intersections) or better to LOS E or F, based on the HCM 2010 LOS method with the addition of project traffic;
2. Would the project deteriorate already unacceptable (LOS E or F) operations at a signalized intersection by adding traffic;
3. Would the operations of an unsignalized study intersection decline from an acceptable level to an unacceptable level with the addition of project traffic, and would the installation of a traffic signal at an unsignalized intersection, based on the *Manual on Uniform Traffic Control Devices* (MUTCD) Peak Hour Signal Warrant (Warrant 3), be warranted;
4. Would the project increase traffic volumes on a street beyond the expected capacity limits and would the increase in traffic be noticeable to existing residents;
5. Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks;
6. Would the project substantially increase traffic hazards to motor vehicles, bicycles, or pedestrians due to a design feature (e.g., sharp curves or dangerous intersections) that does not comply with Caltrans design standards or incompatible uses (e.g., farm equipment);
7. Would construction traffic from the project have a significant, though temporary, impact on the environment, or would project construction substantially affect traffic flow and circulation, parking, and pedestrian safety;
8. Would the project fundamentally conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle routes); or
9. Would the project generate parking demand that is inconsistent with adopted municipal code requirements or otherwise cause parking deficiencies that impact uses outside the project area.

Report Organization

This report is divided into eight chapters as described below:

- **Chapter 1 – Introduction** discusses the purpose and organization of the report.
- **Chapter 2 – Existing Conditions** describes the transportation system in the project vicinity, including the surrounding roadway network, morning and evening peak hour intersection turning movement volumes, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- **Chapter 3 – Project Characteristics** presents relevant project information, such as the project components and project trip generation, distribution, and assignment.
- **Chapter 4 – Existing with Project Traffic Conditions** addresses the existing conditions with the project and discusses project vehicular impacts.
- **Chapter 5 – Cumulative Traffic Conditions** addresses the cumulative conditions without and with the project and discusses project vehicular impacts.
- **Chapter 6 – Environmental Assessment** discusses the project's potential impacts regarding transportation related environmental topics, including vehicle miles traveled, pedestrian facilities, bicycle facilities, transit facilities, emergency vehicle access, and hazards.
- **Chapter 7 – Site Plan Review** discusses the operations and review of the project's proposed site plan, including an assessment of the adequacy of the proposed parking supply.
- **Chapter 8 – Summary of Findings** provides a summary of the report's findings and recommendations.

2. Existing Conditions

This chapter describes transportation facilities in the study area, including the surrounding roadway network, and transit, pedestrian, and bicycle facilities in the vicinity of the project site. Existing intersection operations are also described.

Roadway System

The currently undeveloped project site is located on the north side of Sand Creek Road, west of Fairview Avenue. Brentwood is in eastern Contra Costa County, adjacent to the cities of Antioch and Oakley, located northwest and north, respectively. Land uses surrounding the project site are primarily residential. Regional access to the site is provided by State Route 4. Local access to the site is provided by Sand Creek Road and Fairview Avenue. The following roadways provide access to the site and are most likely to experience direct transportation impacts, if any, from the proposed project.

State Route 4 (SR 4) is an east-west freeway, connecting eastern Contra Costa County with the San Francisco Bay Area and California's Central Valley. In eastern Contra Costa County, SR 4 currently provides four travel lanes in each direction west of State Route 160; three travel lanes in each direction from State Route 160 to Laurel Road; two travel lanes in each direction from Laurel Road to Balfour Road; and a single travel lane in each direction from Balfour Road through Brentwood and beyond. State Route 4 is a designated Route of Regional Significance.

Sand Creek Road is an east-west local roadway that runs along the southern boundary of the site. The roadway currently provides two travel lanes in each direction, plus turn pockets at intersections. The roadway has a posted speed limit of 45 miles per hour (mph). The roadway provides direct access to the site. The street has Class II bicycle facilities and continuous sidewalks in both directions. A connection to the Sand Creek Trail is provided west of the signal-controlled intersection at Fairview Avenue.

Fairview Avenue is a north-south roadway located east of the project site. The roadway provides two travel lanes in both directions, plus turn pockets at intersections. The roadway has a posted speed limit of 45 mph south of Sand Creek Road and 35 mph north of Sand Creek Road. The street has Class II bicycle facilities and continuous sidewalks in both directions.

Linden Street is a north-south residential roadway located south of the project site. The roadway has one travel lane in each direction and a posted speed limit of 25 mph. The street has continuous sidewalks on both sides of the road and does not have designated bicycle facilities.

Existing Pedestrian and Bicycle Facilities

Pedestrian facilities in the study area include sidewalks, crosswalks, and pedestrian signals. The street network within the study are provides a fairly complete network of sidewalks and pedestrian accommodations, including Sand Creek Road, Linden Street, and Fairview Avenue. At signalized intersections in the area, crosswalks and pedestrian push-button actuated signals are provided. Bicycle facilities include the following:

- **Bike paths (Class I)** – Bike paths provide a separate right-of-way and are designated for the exclusive use of people riding bicycles and walking with minimal cross-flow traffic. Such paths can be well situated along creeks, canals, and rail lines. Class I bikeways can also offer opportunities not provided by the road system by serving as both recreational areas and/or desirable commuter routes.
- **Bike lanes (Class II)** – Bike lanes provide designated street space for bicyclists, typically adjacent to the outer vehicle travel lanes. Bike lanes include special lane markings, pavement legends, and signage. Bike lanes may be enhanced with painted buffers between vehicle lanes and/or parking, and green paint at conflict zones (such as driveways or intersections).
- **Bike routes (Class III)** – Bike routes provide enhanced mixed-traffic conditions for bicyclists through signage, striping, and/or traffic calming treatments, and offer continuity to a bikeway network. Bike routes are typically designated along gaps between bike trails or bike lanes, or along low-volume, low-speed streets.
- **Separated Bikeway (Class IV)** – Separated bikeways, also referred to as cycle tracks or protected bikeways, are facilities for the exclusive use of bicycles which are physically separated from vehicle traffic. Separated bikeways were recently adopted by Caltrans in 2015. Types of separation may include, but are not limited to, grade separation, flexible posts, physical barriers, or on-street parking.

The City of Brentwood currently has 19 miles of Class I bicycle paths and 63 miles of other bike lanes. In the immediate study area, there are Class II bike lanes along Sand Creek Road and Fairview Avenue. The Sand Creek Trail is a Class I facility bordering the project site to the north. It extends from SR 4 in the west to Minnesota Avenue in the east.

Existing Transit Service

Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point and Pittsburg.

Currently, 15 routes operate on weekdays, with five routes operating on weekends. Two routes currently serve the area near the project site—Route 385 and Route 395. In the project's vicinity, Route 385 operates along Sand Creek Road with a stop adjacent to the site at Sand Creek Road and Fairview Avenue. Route 395 runs along Sand Creek Road with a stop at the Streets of Brentwood Mall, 0.5 miles west of the project site.

Route 385 operates on weekdays only with one-hour headways from 6:00 AM to 6:00 PM. The services run between the Antioch BART Station and the Brentwood Park n Ride.

Route 395 operates on weekdays and weekends with one-hour headways from 9:00 AM to 8:00 PM. The service runs between the Antioch BART Station and the Streets of Brentwood Mall.

Existing Traffic Counts

Weekday morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak period intersection turning movement counts were collected at the study intersections, including separate counts of pedestrians and bicyclists, in May 2023. Counts were collected on a clear weather day when local schools were in session. Peak hour intersection volumes are summarized in **Figure 3** along with existing lane configurations and traffic controls. The morning peak period is typically between 7:45 and 8:45 AM while the afternoon peak hour is typically from 4:30 to 5:30 PM. The traffic count data collection worksheets are provided in **Appendix A**.

Signal timing data was collected from the City of Brentwood. Field observations took place to confirm existing signal timing, traffic patterns, queue lengths, lane geometries, bicycle facilities, and pedestrian facilities at the study locations to inform the existing baseline conditions.

Existing Operations Assessment

Intersection Operations

Existing operations were evaluated using the methods described in Section 1 for the weekday AM and PM peak hours at the study intersections. The results of this assessment are summarized in **Table 3**. The analysis was based on the volumes, lane configurations, and traffic control presented in **Figure 3**. Observed peak hour factors[1] were used at all intersections for the existing analysis. Pedestrian and bicycle activity was also factored into the analysis. Detailed intersection LOS calculation worksheets are presented in **Appendix B**. As shown, all signalized and unsignalized study intersections currently operate within the overall level of service standards set by the City of Brentwood and CCTA.

Signal Warrants

To assess the need for signalization of stop-controlled intersections, the *Manual of Uniform Traffic Control Devices* (MUTCD) (Federal Highway Administration, 2009) presents nine signal warrants. The Peak Hour Volume Warrant was used in this study as a supplemental analysis tool to assess operations at

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[1] The peak hour factor is the relationship between the peak 15-minute flow rate and the full hourly volume: PHF = Hourly volume / (4 x (volume during the peak 15 minutes of flow)). The analysis level of served is based on peak rates of flow occurring within the peak hour because substantial short term fluctuations typically occurring during an hour.

unsignalized intersections.[2] The existing unsignalized study intersection at Sand Creek Road and Linden Street does not currently meet traffic signal warrants. Signal warrant worksheets are presented in **Appendix C**.

Table 3: Existing Conditions Peak Hour Intersection LOS Summary

Intersection		Control[1]	Peak Hour	Delay[2, 3]	LOS
1	Sand Creek Road/Linden Street	SSSC	AM PM	1.8 (38.3) 0.6 (29.3)	A (E) A (D)
2	Sand Creek Road/Fairview Avenue	Signal	AM PM	28.1 24.8	C C

Notes: **Bold** text indicates potentially unacceptable intersection operations.

1. Signal = Signalized intersection; SSSC = Side street stop-controlled intersections; traffic on the main street does not stop while traffic on the side street is controlled by a stop sign.
2. Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2023.

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[2] Unsignalized intersection warrant analysis is intended to examine the general correlation between existing conditions and the need to install new traffic signals. Existing peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the MUTCD and associated State guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The responsible State or local agency should undertake regular monitoring of actual traffic conditions and accident data and conduct a timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

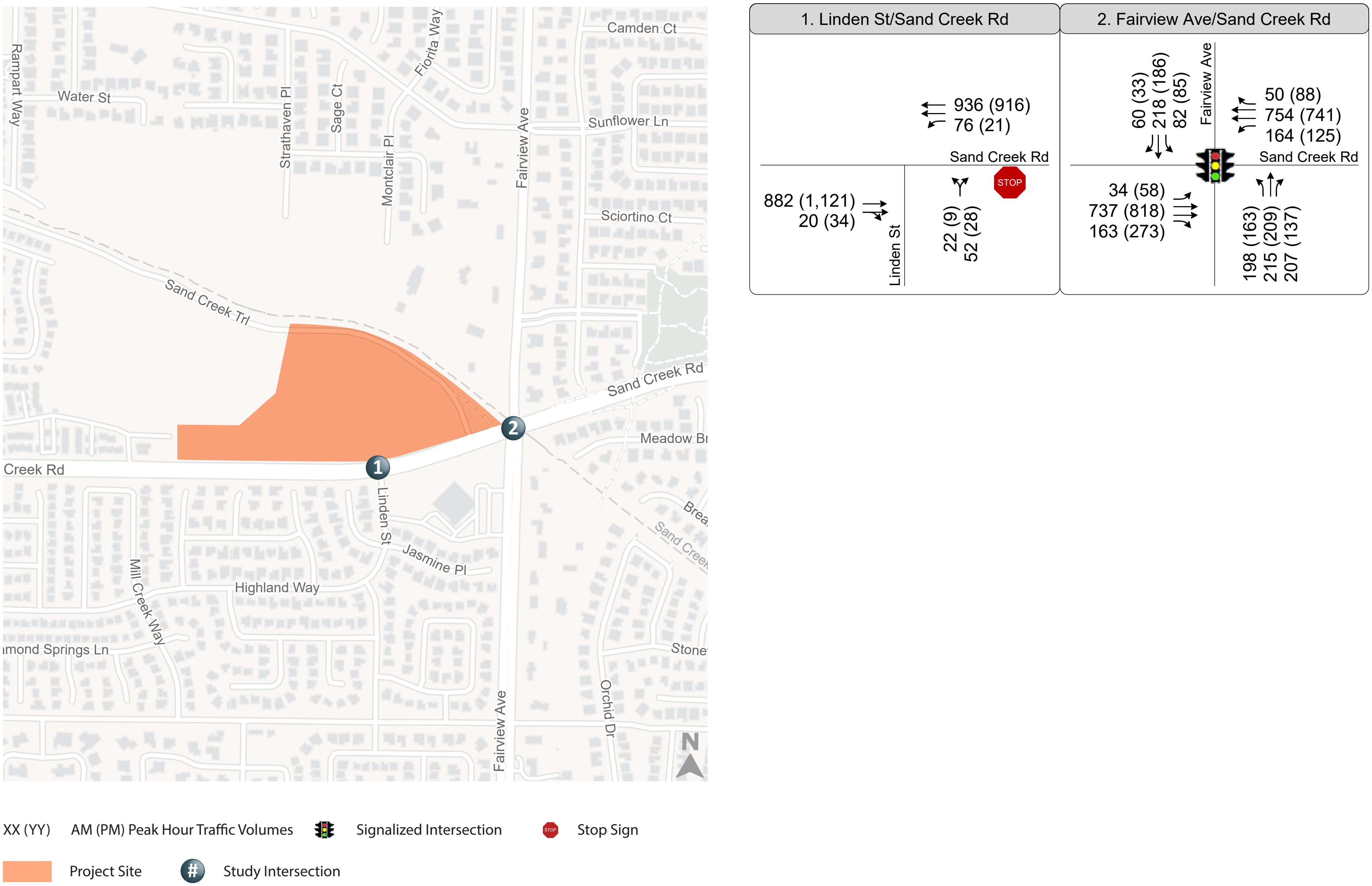


Figure 3

Existing Peak Hour Intersection Volumes, Lane Configurations and Traffic Controls

3. Project Characteristics

This chapter provides an overview of the proposed project's components and addresses the expected project trip generation, distribution, and assignment characteristics, allowing for an evaluation of project impacts on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the site was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

Project Description

The Sand Creek Sports Complex project seeks to build a new sports complex that would initially include three lighted, artificial turf fields as well as additional amenities such as pickleball courts, multi-use sport courts, a playground, and a pump track, among other amenities. A later expansion of the complex would include two artificial turf fields on the western portion of the site. This TIA evaluates the transportation related effects of buildout of the entire project, including both phases. A conceptual project site plan for Phase 1 of the sports complex is shown in **Figure 2A** while Phase 2 is shown on **Figure 2B**. All vehicular access to the site would be provided via Sand Creek Road. The project would install a new traffic signal at the intersection of Linden Street and Sand Creek Road which would be the site's primary access point.

The sports fields will serve local sports groups and facilitate regional tournaments. Fields will be rented out individually; some rentals would be recurring reservations, while others would be reserved for tournaments and events. During general weekday field use such as practices and league games, 50 people are expected to be on site per field, with a total visitor potential of 250 people when all 5 fields are in use. During general weekday conditions, the complex will be used for practices and games that run from 4 PM to 9 PM.

Approximately six regional tournaments, with a maximum attendance of 550 people, will occur per year. Most tournaments would be scheduled on Saturdays and Sundays between 8 AM and 10 PM. In tournament conditions, there will be additional teams and spectators on-site that will not be playing, as they will be awaiting the start of their next game or leaving a completed game. This additional group of people is expected to be 50% of the total participants and spectators engaged in the play described above (275). Therefore, the total number of participants and spectators on site at any one time may be 825 for tournament soccer games. Other uses of the facility, including pickleball, multi-use sport courts, pump track, and group picnic areas have potential to add another 175 users in the complex at any given time from dawn to dusk.

Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Weekday estimates were created for the daily condition and for the peak one-hour period during the morning and evening peaks when traffic volumes generated by the project are expected to be highest. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition) for weekdays and weekends, as presented in **Table 4** and **Table 5**, respectively. The weekday trip generation is based on rates from the ITE Manual's land use code 488 "Soccer Complex," and other applicable uses, which describe the types of activities expected on site.

The proposed project (five turf fields and additional amenities) is expected to generate approximately 602 daily weekday trips including 19 morning peak hour and 115 evening peak hour trips, as summarized in **Table 4**. Trip generation estimates for the sports complex were divided into several relevant land uses to represent the various uses included in the proposed project.

Estimates of trip generation on weekends when the site hosts regional tournaments of maximum attendance were calculated using the anticipated levels of attendance, automobile occupancy, and peak periods of arrival and departure. As previously mentioned, the site expects to host up to six regional tournaments per year. The results of these weekend trip generation calculations are presented in **Table 5**. As presented in **Table 5**, a total of 6,265 daily trips with 590 total vehicle trips during the peak hour are expected on a weekend day when a regional tournament is hosted.

The intersection level of service analysis focuses on operations during the weekday morning and evening peak hours, which represent typical operating conditions. The assessment of project effects on VMT are calculated both for a typical weekday condition and for a weekend tournament day.

Table 4: Vehicle Trip Generation Estimates, Weekday

Use	Size	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Soccer Complex[1]	5 Fields	357	3	2	5	54	28	82
Tennis Courts[2]	3 Courts	91	3	2	5	6	7	13
Pump Track[2]	2 Court Equivalents	61	2	1	3	4	4	8
Activity Courts[2]	3 Court Equivalents	91	3	2	5	6	7	13
Public Park[3]	7.88 Acres	6	0	0	0	1	0	1
Total Project Trips		***602***	*11*	*8*	***19***	*70*	*45*	***115***

1. ITE land use category 488 – Soccer Complex (Adj Streets, 7-9A; 4-6P):
   Daily: (T) = 71.33 (X)
   AM Peak Hour: T = 0.99(X); Enter = 61%; Exit = 39%
   PM Peak Hour: T = 16.43(X); Enter = 66%; Exit = 34%
2. ITE land use category 490 – Tennis Court (Adj Streets, 7-9A; 4-6P):
   Daily: (T) = 30.32 (X)
   AM Peak Hour: T = 1.60(X); Enter = 50%; Exit = 50%

PM Peak Hour: T = 4.21(X); Enter = 50%; Exit = 50%
Notes: ITE does not include land uses for Activity Courts and Pump Tracks. Trip generation rates for these land uses are assumed to be equivalent to Tennis Courts. ITE does not include the AM Peak Hour equation for land use category 490, so the equation was interpolated to be 38% of the PM Peak Hour.

3. ITE land use category 411 – Public Park (Adj Streets, 7-9A; 4-6P):
   Daily: (T) = 0.78 (X)
   AM Peak Hour: T = 0.02(X); Enter = 59%; Exit = 41%
   PM Peak Hour: T = 0.11(X); Enter = 55%; Exit = 45%

Source: *Trip Generation Manual* (11th Edition), ITE, 2021; Fehr & Peers, 2023.

Table 5: Vehicle Trip Generation Estimates, Weekend (Regional Tournament)

Use	Maximum Attendees[1]	Average Vehicle Occupancy[2]	Daily[3]	Peak Hour[4]		
				In	Out	Total
Soccer Complex	550	2.5	4,753	220	220	440
Other Uses	175		1,512	70	70	140
Total Project Trips			**6,265**	**290**	**290**	**580**

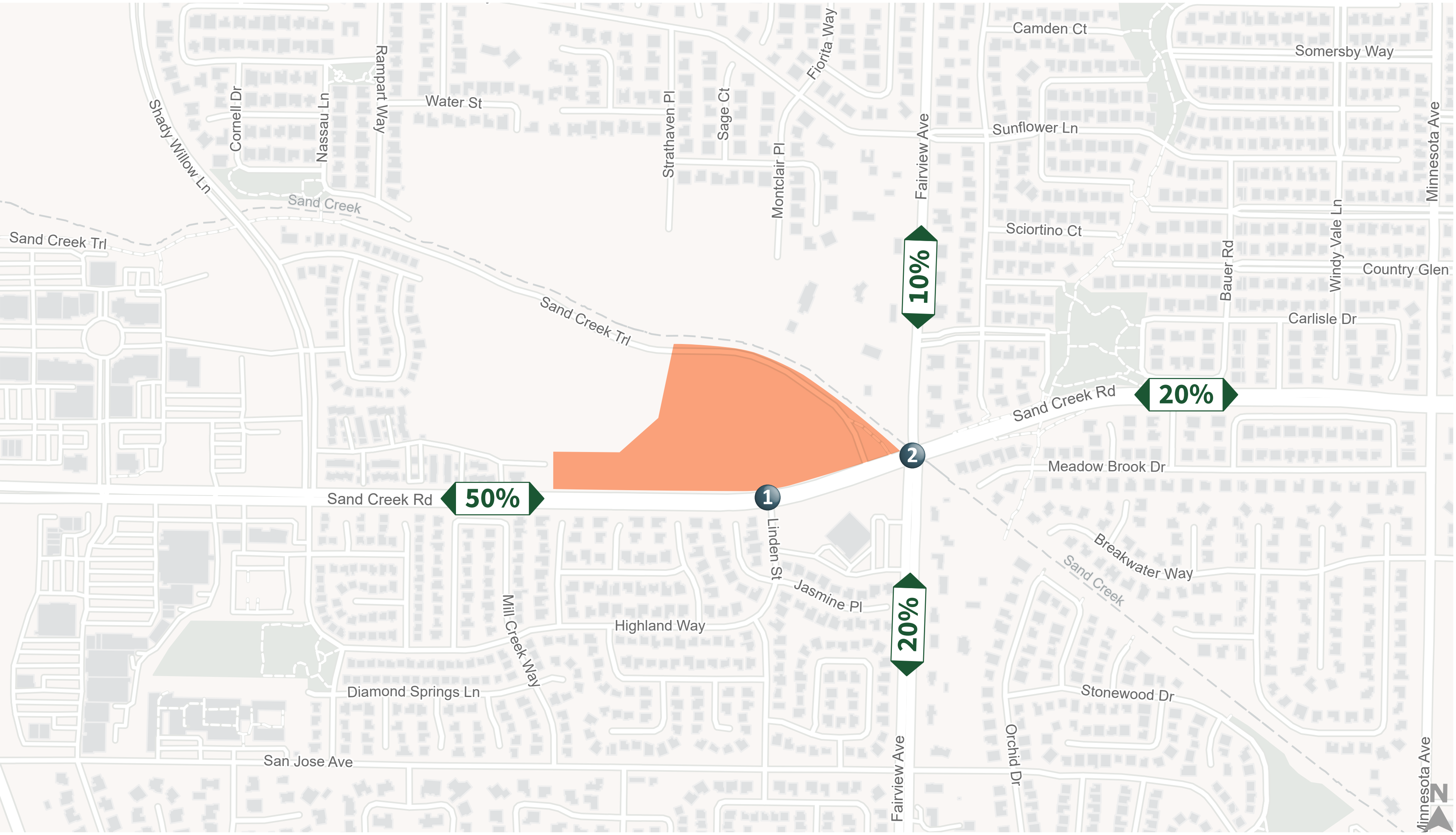
1. Maximum attendance assuming a five-field complex, which includes 550 active participants. Assumes full complex fills and empties in single peak hour.
2. Average Vehicle Occupancy assumption from *Federal Highway Administration (FHWA) Managing Travel for Planned Special Events – Event Operations Planning (2017)*
3. Daily trips calculated based on peak hour generation using the proportion between weekend peak-hour and daily generation rates (ITE land use category 488 – Soccer Complex)
4. Peak Hour: T = Maximum Attendees / Average Vehicle Occupancy; Enter = 50%; Exit = 50%

Source: *Trip Generation Manual* (11th Edition), ITE, 2021; Fehr & Peers, 2023.

Project Trip Distribution and Assignment

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of project trip distribution were developed based on access to important links in the roadway network, such as State Route 4. A select zone analysis from the CCTA's Travel Demand Model was also performed as an input to the project's trip distribution. Project distribution percentages are presented in **Figure 4**.

Project trips were then assigned to the roadway network based on the directions of approach and departure, as shown in **Figure 5**.

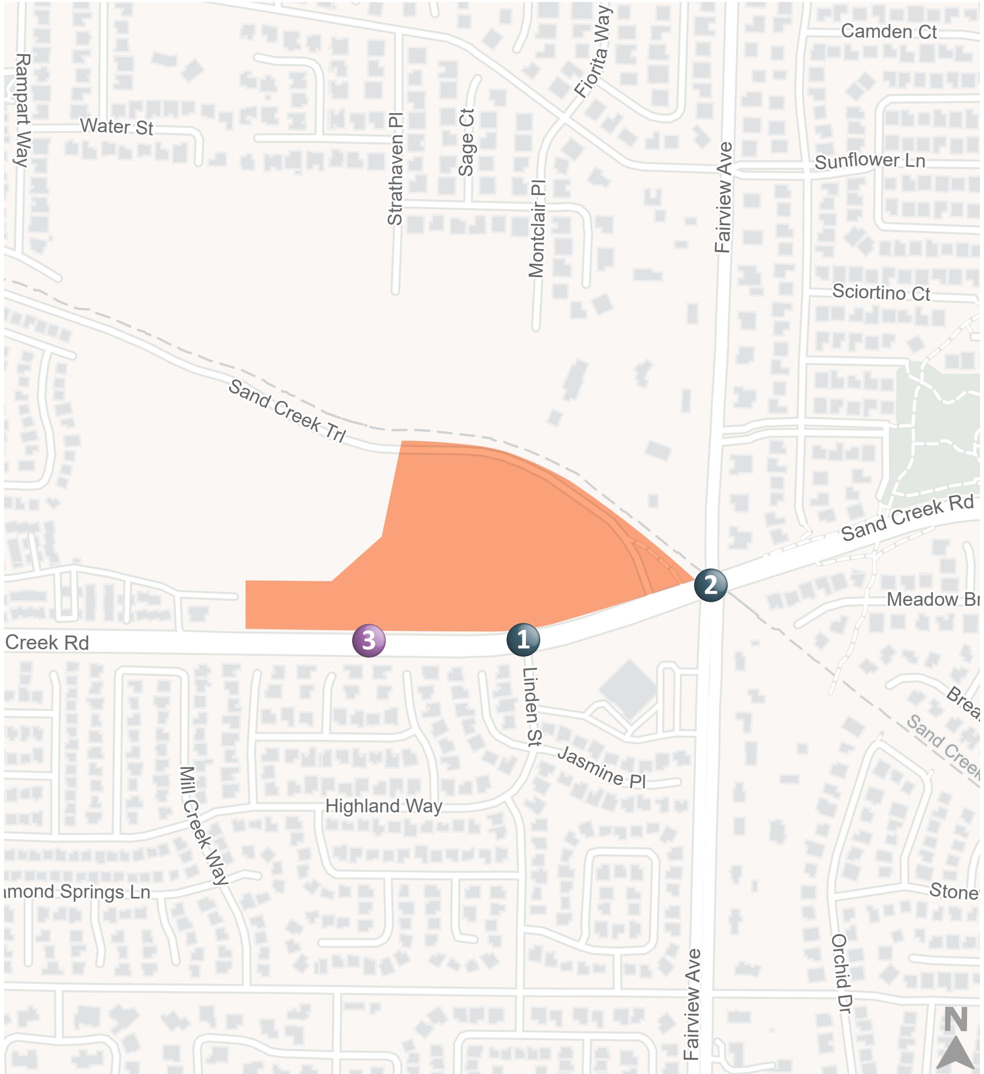


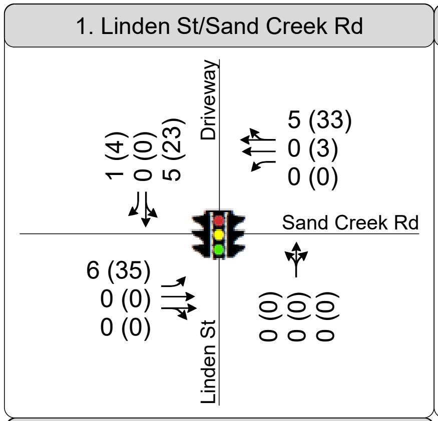
🟧 Project Site   # Study Intersection   XX% Project Trip Distribution

Figure 4

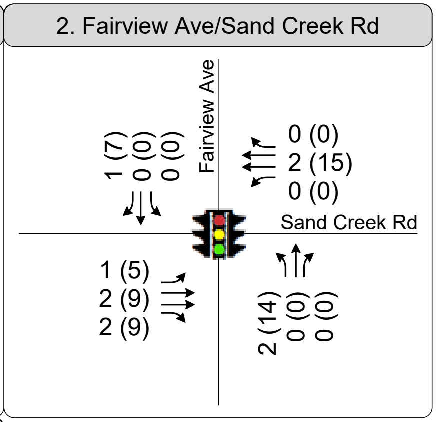
Project Trip Distribution

WC23-3990_4_TripDistro

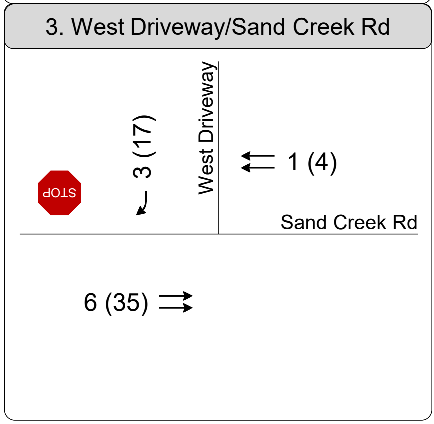




1. Linden St/Sand Creek Rd



2. Fairview Ave/Sand Creek Rd



3. West Driveway/Sand Creek Rd

XX (YY) AM (PM) Peak Hour Traffic Volumes

🚦 Signalized Intersection

🛑 Stop Sign

🟧 Project Site

\# Study Intersection

\# Project Driveway

Figure 5

Project Trip Assignment

4. Existing with Project Conditions

This section evaluates the effects of the proposed project on the existing roadway network.

Existing With Project Traffic Volumes

The project traffic volumes on **Figure 5** were added to the existing traffic volumes from **Figure 3** to estimate the Existing with Project traffic volumes, as shown on **Figure 6**. The intersection of Sand Creek Road and Linden Street would be signalized as part of the proposed project.

Analysis of Existing with Project Conditions

Intersection Operations

Existing with Project intersection operations were evaluated using the methods described in Section 1. The Existing with Project analysis results are presented in **Table 6**, based on the traffic volumes presented in **Figure 6**. In the existing baseline condition, all study intersections operate within the City's overall level of service standard.

The addition of project traffic would increase delay at the study intersections. However, it would not result in operations at intersections worsening to deficient service levels.

Signal Warrants

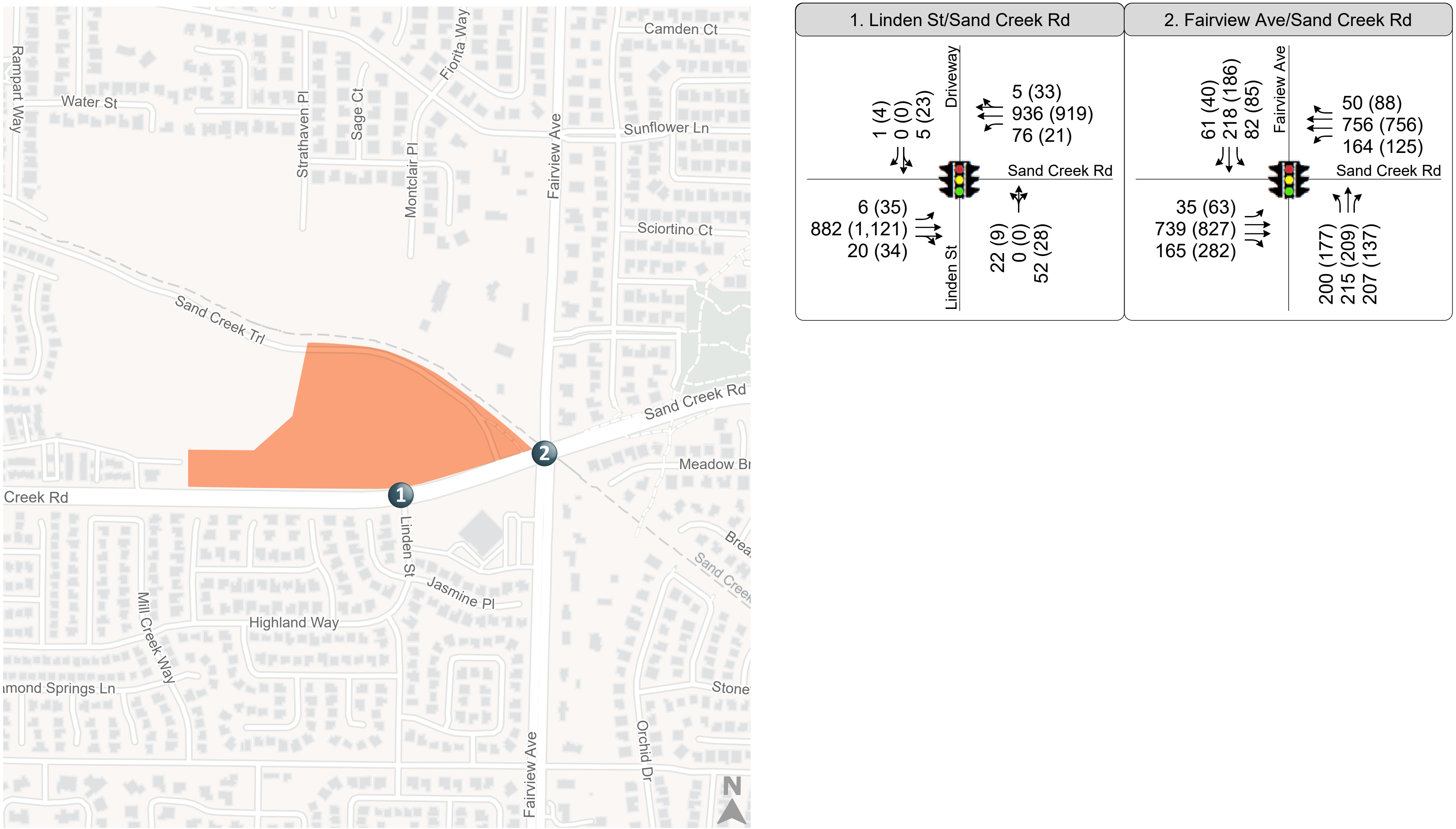
To assess the need for signalization of stop-controlled intersections, the *Manual of Uniform Traffic Control* (MUTCD) (Federal Highway Administration, 2009) presents nine signal warrants. The Peak Hour Volume Warrant was used in this study as a supplemental analysis tool to assess operations at unsignalized intersections. The signal warrant is not met for either study intersection with the addition of project traffic for AM or PM weekday peak conditions. However, the signal warrant would be met at the Sand Creek Road and Linden Street intersection with the addition of project traffic under weekend peak conditions.

Table 6: Existing with Project Conditions Peak Hour Intersection LOS Summary

Intersection		Control[1]	Peak Hour	Existing Conditions		Existing with Project Conditions	
				Delay[2, 3]	LOS	Delay[2, 3]	LOS
1	Sand Creek Road/ Linden Street	Signal	AM	1.8 (38.3)	A (E)	3.5	A
			PM	0.6 (29.3)	A (D)	3.8	A
2	Sand Creek Road/ Fairview Avenue	Signal	AM	28.1	C	28.3	C
			PM	24.8	C	25.1	C

1. Signal = Signalized intersection; SSSC = Side street stop-controlled intersections; traffic on the main street does not stop while traffic on the side street is controlled by a stop sign.
2. Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2023.



XX (YY) AM (PM) Peak Hour Traffic Volumes 🚦 Signalized Intersection

🟧 Project Site ● Study Intersection

Figure 6

Existing Plus Project Peak Hour Intersection Volumes, Lane Configurations and Traffic Controls

5. Cumulative Traffic Conditions

This section discusses Cumulative traffic conditions both without and with the project. The future conditions analysis considers development within the City of Brentwood as described in the Brentwood General Plan EIR and supplemented by a check of traffic forecasts for the study area in the 2040 Contra Costa County Travel Demand Model.

Cumulative Traffic Forecasts

To assess future growth with planned development in the City of Brentwood and surrounding communities, several sources of data were reviewed, including the Contra Costa County Travel Demand Model (CCTA Model) and future projections from the City of Brentwood General Plan EIR (April 2014). Growth rates from these sources, primarily the CCTA travel demand model, were used to develop Cumulative baseline traffic forecasts at the study intersections. The resulting Cumulative without Project forecasts are presented on **Figure 7**, which are representative of predicted conditions in 2040. The project volumes from **Figure 5** were added to the Cumulative without Project traffic volumes to represent Cumulative with Project conditions, as presented on **Figure 8**.

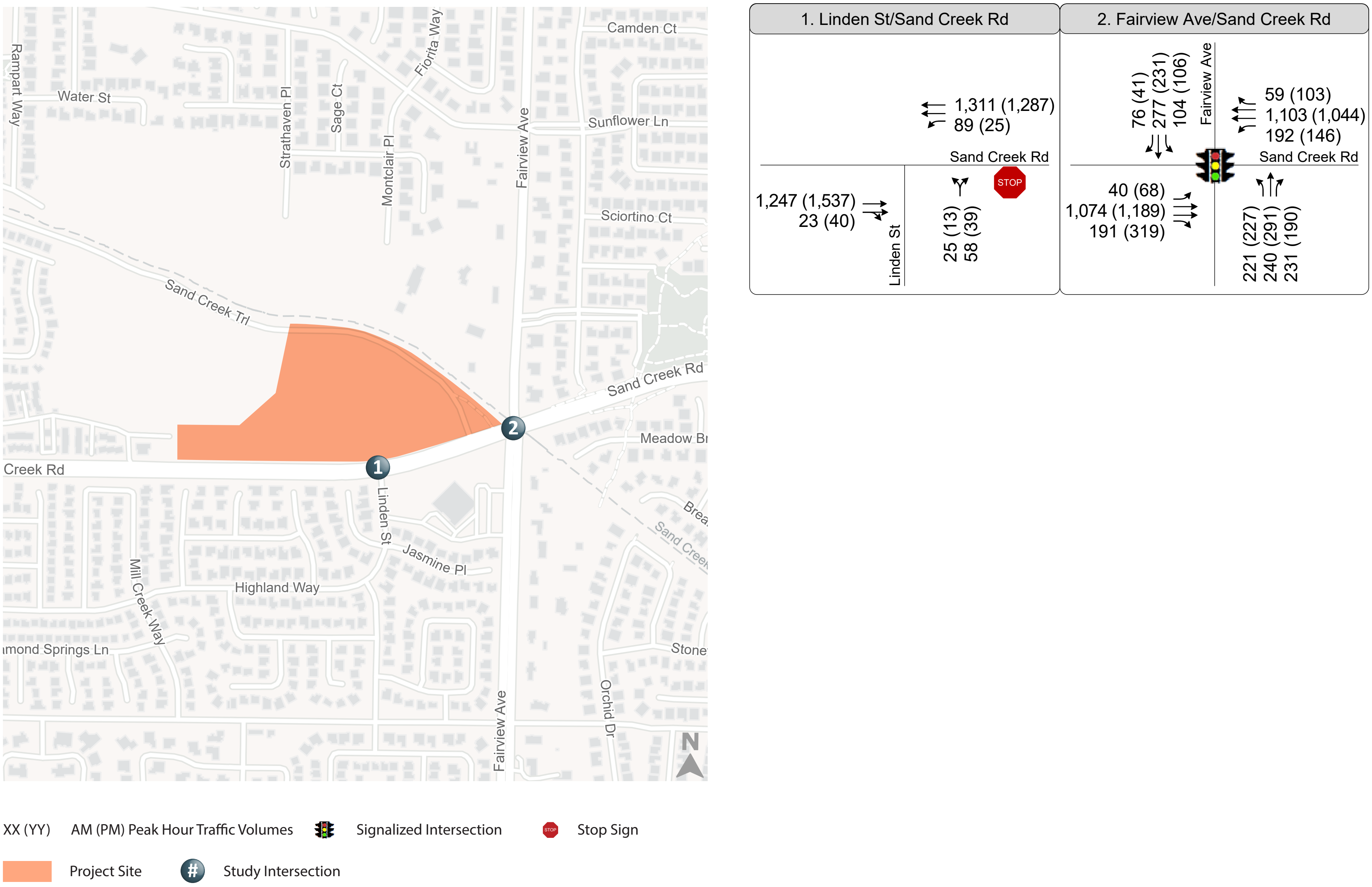


Figure 7

Cumulative Peak Hour Intersection Volumes, Lane Configurations and Traffic Controls

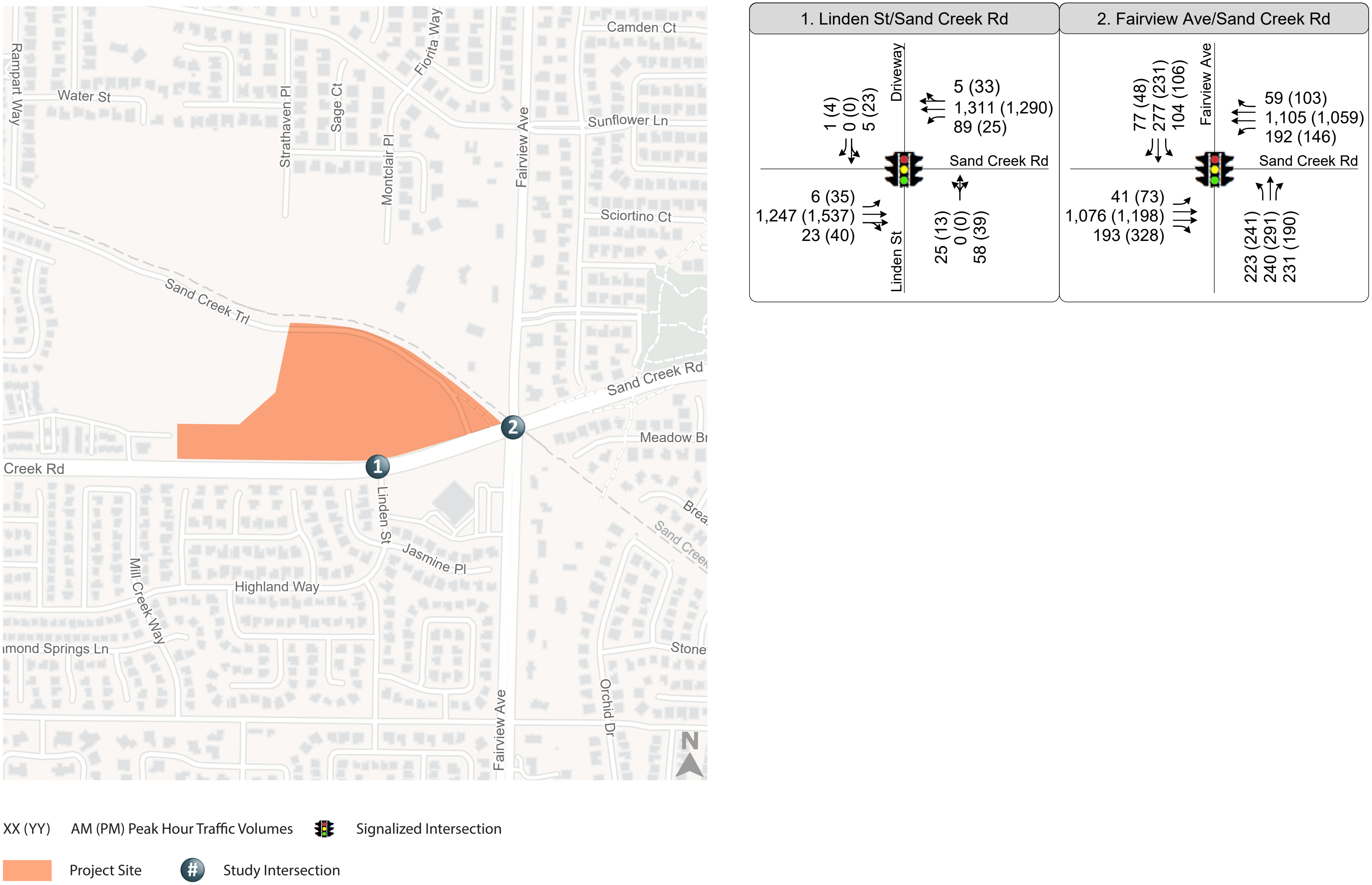


Figure 8

Cumulative Plus Project Peak Hour Intersection Volumes, Lane Configurations and Traffic Controls

Analysis of Cumulative Conditions

Intersection Operations

Cumulative without and with project conditions were evaluated using the methods described in Section 1. For the analysis of cumulative conditions, peak hour factors were left unchanged from the analysis of existing conditions; however, signal timings were optimized to accommodate changes in traffic volumes as the City of Brentwood regularly reviews traffic signal timings and adjusts to better accommodate travel patterns. The analysis results are presented in **Table 7**.

In both the cumulative baseline and with project conditions, neither of the study intersections are projected to operate at deficient service levels. Traffic generated by the proposed project would slightly increase delay at the Sand Creek Road/Fairview Avenue intersection.

Table 7: Cumulative Conditions Peak Hour Intersection LOS Summary

Intersection		Control[1]	Peak Hour	Cumulative Without Project		Cumulative With Project	
				Delay[2, 3]	LOS	Delay[2, 3]	LOS
1	Sand Creek Road/Linden Street	SSSC	AM PM	9.3 (294.2) 2.6 (136.7)	A (F) A (F)	3.4 3.9	A A
2	Sand Creek Road/Fairview Avenue	Signal	AM PM	42.4 37.8	D D	42.7 39.8	D D

Notes: **Bold** text indicates potentially unacceptable intersection operations. ***Bold Italics*** indicates potential significant impact.

1. Signal = Signalized intersection; SSSC = Side Street stop-controlled intersections; traffic on the main street does not stop while traffic on the side street is controlled by a stop sign.
2. Average intersection delay is calculated for all signalized intersections using the HCM 6th method for vehicles.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses

Source: Fehr & Peers, 2023.

6. Environmental Assessment

This section presents the results of the assessment of the project's potential impacts regarding transportation related environmental topics including vehicle miles traveled, pedestrian facilities, bicycle facilities, transit facilities, emergency vehicle access, and hazards.

Vehicle Miles Traveled

On September 27, 2013, Senate Bill (SB) 743 was signed into law. The California state legislature found that with the adoption of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the State had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled, and thereby contribute to the reduction of greenhouse gas emissions as required by the California Global Warming Solutions Act of 2006 (Assembly Bill 32). In December 2018, the Governor's Office of Planning and Research (OPR) finalized new CEQA guidelines (CEQA Guidelines section 15064.3), that identify vehicle-miles traveled (VMT) as the most appropriate criteria to evaluate a project's transportation impacts.

The implementation of SB 743 eliminated the use of criteria such as auto delay, level of service, and similar measures of vehicle capacity of traffic congestion as the basis for determining significant impacts as part of CEQA compliance. Instead, the SB 743 VMT criteria promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and diversification of land uses.

In November 2017, OPR released a technical advisory outlining recommendations regarding the assessment of VMT, proposed thresholds of significance, and potential mitigation measures for lead agencies to use while implementing the required changes contained in SB 743. Also in November 2017, OPR released the proposed text for Section 15064.3, "Determining the Significance of Transportation Impacts," which summarized the criteria for analyzing transportation impacts for land use projects and transportation projects and directs lead agencies to "choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household, or in any other measure." OPR recommends a per service population threshold should be adopted in most instances, and that a 15% reduction below that of existing development would be a reasonable threshold.

On July 15, 2020, the Contra Costa Transportation Authority (CCTA) adopted criteria, standards, and thresholds for the assessment of VMT (CCTA, *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program*, July 15, 2020). The methods and thresholds adopted by CCTA follow the guidance and recommendations of OPR pertaining to the implementation of SB 743. Since the City of Brentwood has not formally adopted VMT criteria, standards, or thresholds at the time this report was prepared, this assessment follows current OPR and CCTA guidance related to VMT.

CCTA VMT Guidelines

The CCTA's guidance related to VMT impacts and thresholds is described below:

- Residential Projects should use the home-based VMT per capita metric to evaluate their project generated VMT estimates. The project generated home-based VMT per resident constitutes a significant impact if it is higher than 85% of the home-based VMT per resident in the subject municipality or unincorporated authority subregion (for areas outside of municipalities), or 85% of the existing countywide average home-based VMT per resident, whichever is less stringent.
- Employment-Generating Projects should use the home-work VMT per worker metric for their project generated VMT estimates. The project generated home-work VMT per worker constitutes a significant impact if it is higher than 85% of the home-work VMT per worker in the subject municipality or unincorporated authority subregion (for areas outside of municipalities), or 85% of the existing Bay Area region-wide average home-work VMT per worker, whichever is less stringent.
- Regional-Serving Projects should use the metric of total study area VMT and should define a VMT study area over which to evaluate that metric. The project generated VMT constitutes a significant impact if the baseline project generated total VMT per service population is higher than 85% of the existing countywide average total VMT per service population.
- Other Uses and Projects need to be analyzed using a methodology developed by the lead agency specifically for the project, taking into account the specific methodologies and thresholds identified in *Approval of the Vehicle Miles Traveled Analysis Methodology for Land Use Projects in the Growth Management Program,* CCTA, July 15, 2020.
- Mixed-Use Projects may be analyzed using a combination of techniques.

CCTA guidance defines the following criteria that lead agencies can apply to screen projects out of conducting project-level VMT analysis:

- CEQA Exemption – Any project that is exempt from CEQA is not required to conduct a VMT analysis.
- Small projects – Small projects can be presumed to cause a less-than-significant VMT impact. Small projects are defined as having 10,000 square feet or less of non-residential space or 20 residential units or less, or otherwise generating less than 836 VMT per day.
- Local-Serving Uses – Projects that consist of Local-Serving Uses can generally be presumed to have a less-than-significant impact absent substantial evidence to the contrary, since these types of projects will primarily draw users and customers from a relatively small geographic area that will lead to short-distance trips and trips that are linked to other destinations.
- Projects Located in Transit Priority Areas (TPAs) – Projects located within a TPA can be presumed to have a less-than-significant impact absent substantial evidence to the contrary.
- Projects Located in Low VMT Areas – Residential and employment-generating projects located within a low VMT-generating area can be presumed to have a less-than-significant impact absent substantial evidence to the contrary. A Low VMT area is defined as follows:

  - For housing projects: Cities, towns, and unincorporated portions within Contra Costa that have existing home-based VMT per capita that is 85% or less of the existing countywide average.
  - For employment-generating projects: Cities, towns, and unincorporated portions within Contra Costa that have existing home-work VMT per worker that is 85% or less of the existing regional average.

Project VMT Assessment

Based on the guidance published by both CCTA and OPR, the project can be assumed to have a less than significant impact related to VMT during a typical weekday. On weekdays, the project is a local-serving use and meets the established screening criteria related to VMT. Projects that consist of Local-Serving Uses can generally be presumed to have a less-than-significant impact absent substantial evidence to the contrary, since these types of projects will primarily draw users and customers from a relatively small geographic area that will lead to short-distance trips and trips that are linked to other destinations.

However, on weekends when the project hosts regional tournaments, the project does not satisfy the established screening criteria as it will be drawing trips from a broader regional geography. As a regional-serving use the applicable significance standard is as follows:

- Regional-Serving Projects should use the metric of total study area VMT and should define a VMT study area over which to evaluate that metric. The project generated VMT constitutes a significant impact if the baseline project generated total VMT per service population is higher than 85% of the existing countywide average total VMT per service population.

To assess the project’s VMT per service population, the following data were used:

- Daily trip generation of regional tournament events
- Automobile occupancy of vehicles traveling to regional tournament events
- Trip length of vehicles traveling to regional tournament events

The weekend daily trip generation and automobile occupancy of vehicles traveling to regional tournament events was previously assessed and presented in **Table 5**.

StreetLight “big” data collected at similar analogous regional sports facilities was assembled to estimate average trip lengths associated with these uses. StreetLight is a data vendor that uses anonymized and aggregated location data from global positioning systems (GPS) and mobile devices such as cellphones. This data provides a variety of useful information including trip origin and destination zones as well as trip lengths. Specifically, trip length data was obtained during weekend summer regional tournaments at the following two locations:

- Mistlin Sports Park, 1201 East River Road, Ripon, CA
- Twin Creeks Sports Complex, 969 East Caribbean Drive, Sunnyvale, CA

Both complexes host regionally attended youth sports events like those that would be held at the proposed project site. The average one-way trip length to a regional tournament event at these facilities was approximately 21.5 miles.

Table 8 presents the results of the VMT assessment for a weekend regional tournament at the facility, incorporating the data described above. Using the CCTA Travel Demand Model for 2023 baseline conditions, the countywide VMT per service population was assessed, as well as the relevant CEQA significance threshold of 85% of the countywide average.

Table 8: Weekend Tournament Vehicle Miles Traveled Assessment (VMT)

Countywide VMT/Service Population[1]	85% Countywide VMT/Service Population	Project VMT/Service Population[2]
29.3	24.9	17.2

1. From CCTA Regional Travel Demand Model (2023 Baseline).
2. (Weekend Daily Trip Generation x Trip Length)/# of Attendees.

Source: Fehr & Peers, 2023.

As illustrated in **Table 8**, the project's weekend tournament VMT per service population of 17.2 is less than 85% of the countywide average (24.9). While vehicles may make longer journeys to events at the facility, the number of people in the average vehicle results in a project VMT per service population which is lower than the applicable standard.

Pedestrian System Impacts

The project would create a significant impact related to the pedestrian system if any of the following criteria are met:

- The project design would not provide or would eliminate adequate pedestrian connectivity to the area circulation system, or
- The project design would create hazardous conditions for pedestrians, or
- The project conflicts with existing or planned pedestrian facilities.

Pedestrians can access the project from sidewalks on Sand Creek Road, Linden Street, and Fairview Avenue or via Sand Creek Trail. Pedestrian crosswalks and actuated pedestrian signal heads are provided at the Fairview Avenue/Sand Creek Road intersection.

The project would install a new traffic signal at the intersection of Sand Creek Road/Linden Street. While design plans have not yet been prepared for this installation, the project's conceptual site plan does not show crosswalks or other pedestrian improvements at this intersection. With project construction, there will be a need for pedestrians to cross Sand Creek Road at this location, which in the absence of improvements could pose a safety hazard.

Mitigation Measure TRANS-1: Provide Crosswalks and Pedestrian Signal Heads at Sand Creek Road/Linden Street Intersection

As part of the project's installation of a traffic signal at the Sand Creek Road/Linden Street intersection, crosswalks and pedestrian actuated signal heads shall be installed on all four approaches.

Significance after Mitigation: Less-than-Significant.

Bicycle System Impacts

The project would create a significant impact related to the bicycle system if any of the following criteria are met:

- The project design would not provide or would eliminate adequate bicycle connectivity to the area circulation system; or
- The project design would create hazardous conditions for bicyclists; or
- The project conflicts with existing or planned bicycle facilities.

There are several designated bicycle facilities in the study area in the form of Class II bike lanes on neighboring streets and the Class I separated Sand Creek Trail. Bicycles are not prohibited from utilizing any of the roadways in the vicinity of the project site. The project does not conflict with any existing or planned bicycle facilities. The project does not propose features that would be hazardous to bicycle travel.

The current site plans do not show designated bicycle parking. The City of Brentwood's Municipal Code (Section 17.620.013) requires a minimum number of bicycle parking spaces equal to five percent of the total number of off-street vehicle parking spaces. The following improvements relative to bicycle facilities are recommended.

Improvement Recommendation #1 – Provide Secure Bicycle Parking – provide an adequate amount of secured on-site bicycle parking. While the City Code requires a minimum of 14 bicycle parking spaces (five percent of the 270 vehicle spaces included in the initial phase of the project), a secure bicycle parking corral with the capacity to accommodate 50 bicycles is recommended.

Improvement Recommendation #2 – Bike Path Safety – the following recommendations are provided for improving bike circulation:

- Install signage, markings, and striping at the junction of Sand Creek Trail and Sand Creek Road consistent with guidance from the *Manual on Uniform Traffic Control Devices* including the following signs, and others as appropriate:
    - End Bike Route
    - Stop
    - Bike Route
    - No Motor Vehicles

Transit System Impacts

The project would create a significant impact related to transit service if either of the following criteria are met:

- The project generates a substantial increase in transit riders that cannot be adequately served by existing transit services; or,
- The project conflicts with existing or planned transit facilities.

As described in Section 2, the project site is served by local Tri Delta Transit bus routes. These bus lines provide connections to the Bay Area's regional transit system via links to the Antioch BART Station. Bus stops for Route 385 are located adjacent to the site at the intersection of Sand Creek Road and Fairview Avenue, and Route 395 has stops west of the site at the Streets of Brentwood Mall.

The project proposes no features which conflict with existing or planned transit services. The project is not expected to result in increases in ridership on local or regional transit facilities that would exceed their capacity. Significant adverse project impacts related to transit were not identified.

Emergency Vehicle Access Impacts

The project would create a significant impact related to emergency vehicle access if the following criterion is met:

- The project incorporates design features that limit or result in inadequate emergency vehicle access.

Several factors determine whether a project has sufficient access for emergency vehicles, including the following:

1. Number of access points (both public and emergency access only)
2. Width of access points
3. Width of internal roadways

Emergency vehicle access to the project site would be provided via the two proposed vehicle access points on Sand Creek Road. The exact width of access points and internal roadways is not specified on the current site plan and further review by the City and Fire Department is recommended. The project design does not appear to pose any features that would limit emergency vehicle access to the site, and significant adverse project impacts related to emergency vehicle access were not identified.

> **Improvement Recommendation #3** – Fire Marshall Site Plan Review – site plans for both the interim and ultimate build out project designs shall be reviewed and approved by the local Fire Marshall to verify adequate emergency vehicle access in accordance with state and local requirements.

Hazards

To be compliant with the California Department of Transportation's (Caltrans) *Highway Design Manual*, the proposed unsignalized project right-in/right-out driveway on Sand Creek Road must have a sight distance, or length of roadway visible to drivers, equal to the roadway's design speed (5 mph higher than the speed limit) multiplied by a 7.5 second left turn time gap multiplied again by a constant of 1.47. In this case, with a design speed of 50 mph on Sand Creek Road, the necessary sight distance for driveways is 551.25 feet. The project's proposed driveway currently meets this requirement.

> **Improvement Recommendation #4** – The final site plan for the project should be analyzed by the project's Civil Engineer to ensure that adequate sight distance is maintained at all driveways. No objects (landscaping, monument signs, etc.) greater than three feet in height should be allowed within the sight distance triangles at driveway intersections. Review available speed survey information from the City and adjust required sight distance if necessary.

7. Site Plan Review

This section provides a review of site access, internal circulation, and parking based on the site plan presented on Figure 2A and Figure 2B. The currently undeveloped project site is located on the northwest corner of Sand Creek Road and Fairview Avenue, as shown on Figure 1. The project would build a new sports complex that would include five lighted, artificial turf fields as well as additional amenities such as pickleball courts, multi-use sport courts, a playground, and a pump track, among other amenities.

Site Access and Circulation

Vehicular access to the site would be provided by two new access points on Sand Creek Road. The main full movement access point at the intersection of Sand Creek Road and Linden Street will be signalized as part of the proposed project. The other driveway will have stop control on the project's approach and only permit right turn in/right turn out movements. In addition to the sidewalks and bike lanes on Sand Creek Road and Fairview Avenue, the complex will be accessible to bicyclists and pedestrians from Sand Creek Trail.

The parking lot will be located on the complex's southern side along Sand Creek Road. The lot provides 439 90-degree angled parking spaces that would allow visitors to park and access the complex's various amenities.

Parking

The City of Brentwood's Municipal Code (Section 17.620 Off Street Parking) does not include parking requirements for any uses proposed as part of the project. The project's anticipated demand for off-street parking was calculated using rates from the Institute of Transportation Engineer's *Parking Generation Manual, 5th Edition*. This manual provides a collection of parking demand data observations made throughout the United States by land use type. **Table 9** presents a summary of the forecast parking demand of the proposed uses based on ITE data. Based on ITE data, the mix of land uses included in the project would require 336 parking spots

Table 9: ITE Project Off-Street Parking Demand

Land Use	Size	Parking Demand/Unit	Parking Demand
Soccer Complex	5 Fields	62.12	311
Tennis Courts	3 Courts	2.67	8
Pump Track	2 Court Equivalents		5
Activity Courts	3 Court Equivalents		8
Public Park	7.88 Acres	0.47	4
TOTAL PARKING DEMAND			**336**

Source: ITE *Parking Generation Manual*, 5th Edition, 2018

The project's proposed supply of 439 off street parking spaces would satisfy the anticipated parking demand.

8. Summary of Findings

This report presents the analysis and findings of the Transportation Impact Assessment (TIA) prepared for the proposed Sand Creek Sports Complex located in the City of Brentwood, California. The project proposes a new sports complex located northwest of the Sand Creek Road/Fairview Avenue intersection. Vehicle access to the site would be provided via two driveways on Sand Creek Road. The project was found to generate approximately 602 daily vehicle trips with roughly 19 trips occurring during the morning peak hour and approximately 115 occurring in the afternoon peak hour. Per City of Brentwood requirements, traffic operations were assessed at two intersections surrounding the project site providing key points of access. Intersection operations were evaluated under Existing and Cumulative conditions both with and without project traffic. Project generated traffic was not found to result in violations of the City's level of service policies.

The project's effects on vehicle miles traveled, pedestrian facilities, bicycle facilities, transit facilities, emergency vehicle access, hazards, and parking were assessed. The project was not found to result in significant adverse impacts related to VMT, bicycle facilities, transit facilities, emergency vehicle access, or hazards. A potentially significant impact was identified related to the lack of pedestrian crossing facilities at the Sand Creek Road/Linden Street intersection. The following mitigation measure was developed that would reduce that impact to a less than significant level.

> **Mitigation Measure TRANS-1: Provide Crosswalks and Pedestrian Signal Heads at Sand Creek Road/Linden Street Intersection**
>
> As part of the project's installation of a traffic signal at the Sand Creek Road/Linden Street intersection, crosswalks, and pedestrian actuated signal heads shall be installed on all four approaches.
>
> **Significance after Mitigation:** Less-than-Significant.

In addition to this mitigation measure, the following recommendations were made to provide for adequate and efficient operations across all modes of travel.

> **<u>Improvement Recommendation #1</u>** – Site Plan Operations – the following recommendations are provided for improving site circulation:

- Install signage at the junction of the Sand Creek Trail with Sand Creek Road consistent with guidance from the *Manual on Uniform Traffic Control Devices* including the following signs, and others as appropriate:
    - End Bike Route
    - Stop
    - Bike Route
    - No Motor Vehicles

Improvement Recommendation #2 – Provide Secure Bicycle Parking – provide an adequate amount of secured on-site bicycle parking. While the City Code requires a minimum of 14 bicycle parking spaces (five percent of the 270 vehicle spaces included in the initial phase of the project), a secure bicycle parking corral with the capacity to accommodate 50 bicycles is recommended.

Improvement Recommendation #3 – Fire Marshall Site Plan Review – site plans for both the interim and ultimate build out project designs shall be reviewed and approved by the local Fire Marshall to verify adequate emergency vehicle access in accordance with state and local requirements.

Improvement Recommendation #4 – The final site plan for the project should be analyzed by the project's Civil Engineer to ensure that adequate sight distance is maintained at all driveways. No objects (landscaping, monument signs, etc.) greater than three feet in height should be allowed within the sight distance triangles at driveway intersections. Review available speed survey information from the City and adjust required sight distance if necessary.

Appendix A:
Traffic Counts

National Data & Surveying Services Intersection Turning Movement Count

Location: Fairview Ave & Sand Creek Rd
City: Brentwood
Control: Signalized

Project ID: 23-080161-002
Date: 5/16/2023

Data - Totals

NS/EW Streets:	Fairview Ave				Fairview Ave				Sand Creek Rd				Sand Creek Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	1	0	1	1	1	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	27	14	14	1	10	12	9	0	3	51	12	0	16	89	4	0	262
7:15 AM	25	10	20	3	9	21	15	0	1	105	18	0	33	102	7	1	370
7:30 AM	44	27	32	0	8	58	10	0	2	132	23	0	52	143	12	0	543
7:45 AM	35	40	36	4	16	80	15	0	2	200	46	0	55	190	11	0	730
8:00 AM	42	45	55	3	24	52	18	0	5	216	53	0	46	203	7	0	769
8:15 AM	56	59	55	3	25	46	14	0	17	188	39	0	37	166	15	0	720
8:30 AM	58	71	61	0	17	40	13	0	10	135	25	0	26	199	17	0	672
8:45 AM	43	32	37	1	14	25	16	0	8	135	23	0	30	119	15	0	498
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	330	298	310	15	123	334	110	0	48	1162	239	0	295	1211	88	1	4564
APPROACH %'s :	34.63%	31.27%	32.53%	1.57%	21.69%	58.91%	19.40%	0.00%	3.31%	80.19%	16.49%	0.00%	18.50%	75.92%	5.52%	0.06%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	191	215	207	10	82	218	60	0	34	739	163	0	164	758	50	0	2891
PEAK HR FACTOR :	0.823	0.757	0.848	0.625	0.820	0.681	0.833	0.000	0.500	0.855	0.769	0.000	0.745	0.933	0.735	0.000	0.940
	0.820				0.811				0.854				0.949				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	1	0	1	1	1	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	43	45	45	1	29	51	4	0	12	211	69	2	28	153	13	0	706
4:15 PM	36	49	44	2	24	59	11	0	8	176	72	0	26	157	25	0	689
4:30 PM	42	48	34	1	23	47	7	0	18	196	83	0	28	170	23	0	720
4:45 PM	40	49	38	1	25	47	9	0	15	198	67	0	28	158	18	0	693
5:00 PM	41	56	35	1	20	38	10	0	7	226	67	1	28	218	23	0	771
5:15 PM	36	56	30	3	17	54	7	0	17	199	56	0	41	198	24	0	738
5:30 PM	45	51	20	4	12	49	11	0	8	153	69	0	29	154	17	2	624
5:45 PM	37	55	29	4	24	51	11	0	10	175	62	0	23	125	14	0	620
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	320	409	275	17	174	396	70	0	95	1534	545	3	231	1333	157	2	5561
APPROACH %'s :	31.34%	40.06%	26.93%	1.67%	27.19%	61.88%	10.94%	0.00%	4.36%	70.46%	25.03%	0.14%	13.41%	77.37%	9.11%	0.12%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	159	209	137	6	85	186	33	0	57	819	273	1	125	744	88	0	2922
PEAK HR FACTOR :	0.946	0.933	0.901	0.500	0.850	0.861	0.825	0.000	0.792	0.906	0.822	0.250	0.762	0.853	0.917	0.000	0.947
	0.961				0.938				0.955				0.889				

National Data & Surveying Services Intersection Turning Movement Count

Location: Fairview Ave & Sand Creak Rd
City: Brentwood
Control: Signalized

Project ID: 23-080161-002
Date: 5/16/2023

Data - Bikes

NS/EW Streets:	Fairview Ave				Fairview Ave				Sand Creak Rd				Sand Creak Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	1	0	1	1	1	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3
8:15 AM	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3
8:30 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	2	3	0	1	0	0	0	1	0	3	0	1	0	0	0	14
APPROACH %'s :	37.50%	25.00%	37.50%	0.00%	100.00%	0.00%	0.00%	0.00%	25.00%	0.00%	75.00%	0.00%	100.00%	0.00%	0.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	2	1	1	0	1	0	0	0	1	0	2	0	1	0	0	0	9
PEAK HR FACTOR :	0.250	0.250	0.250	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.750
	0.500				0.250				0.375				0.250				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	1	0	1	1	1	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
5:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	2	1	0	0	5
5:45 PM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	4
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	3	0	0	0	3	0	0	0	1	2	0	3	2	0	0	14
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	33.33%	66.67%	0.00%	60.00%	40.00%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	2	0	0	0	0	0	0	0	0	2	0	1	0	0	0	5
PEAK HR FACTOR :	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.417
	0.500								0.250				0.250				

National Data & Surveying Services Intersection Turning Movement Count

Location: Fairview Ave & Sand Creak Rd
City: Brentwood

Project ID: 23-080161-002
Date: 5/16/2023

Data - Pedestrians (Crosswalks)

NS/EW Streets:	Fairview Ave		Fairview Ave		Sand Creak Rd		Sand Creak Rd		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	1	0	0	0	0	0	0	0	1
7:15 AM	1	0	0	0	0	0	0	0	1
7:30 AM	1	0	1	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	1	0	1	0	0	0	0	0	2
8:15 AM	1	0	1	0	0	0	1	0	3
8:30 AM	2	0	1	1	0	0	0	0	4
8:45 AM	0	1	2	0	0	0	0	2	5
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	7	1	6	1	0	0	1	2	18
APPROACH %'s :	87.50%	12.50%	85.71%	14.29%			33.33%	66.67%	
PEAK HR :	**07:45 AM - 08:45 AM**								TOTAL
PEAK HR VOL :	4	0	3	1	0	0	1	0	9
PEAK HR FACTOR :	0.500		0.750	0.250			0.250		0.563
	0.500		0.500				0.250		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	1	0	1	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	1
5:00 PM	2	0	0	0	0	0	2	0	4
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	4	0	0	0	0	4	8
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	2	1	5	0	1	0	2	4	15
APPROACH %'s :	66.67%	33.33%	100.00%	0.00%	100.00%	0.00%	33.33%	66.67%	
PEAK HR :	**04:30 PM - 05:30 PM**								TOTAL
PEAK HR VOL :	2	1	0	0	0	0	2	0	5
PEAK HR FACTOR :	0.250	0.250					0.250		0.313
	0.375						0.250		

Prepared by National Data & Surveying Services

Fairview Ave & Sand Creak Rd

Peak Hour Turning Movement Count

ID: 23-080161-002
City: Brentwood

Day: Tuesday
Date: 5/16/2023

PEAK HOURS	07:45 AM - 08:45 AM NONE 04:30 PM - 05:30 PM
COUNT PERIODS	7:00 AM - 09:00 AM NONE 4:00 PM - 06:00 PM

Fairview Ave

SOUTHBOUND

AM	60	218	82	0	299	AM
NOON	0	0	0	0	0	NOON
PM	33	186	85	0	354	PM
	1	1	1	0		

Sand Creek Rd

EASTBOUND

AM	NOON	PM	
1009	0	937	⇦
0	0	1	0
34	0	57	1
739	0	819	2
163	0	273	1
AM	NOON	PM	

CONTROL

Signalized

TEV	2891	0	2922
	AM	NOON	PM
PHF	0.94		0.95

Sand Creak Rd

WESTBOUND

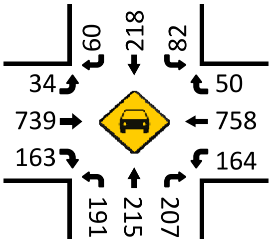
	PM	NOON	AM
1	88	0	50
2	744	0	758
1	125	0	164
0	0	0	0
⇨	1041	0	1028
	PM	NOON	AM

		0	1	1	1	
PM	590	6	159	209	137	PM
NOON	0	0	0	0	0	NOON
AM	555	10	191	215	207	AM

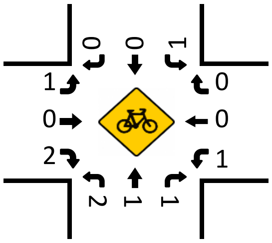
NORTHBOUND

Fairview Ave

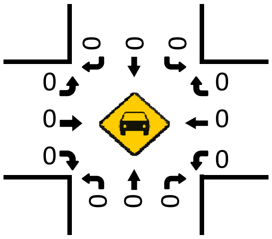
Totals (AM)



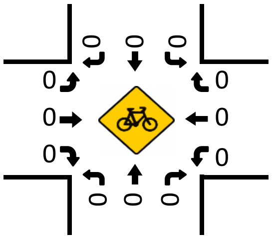
Total Bikes (AM)



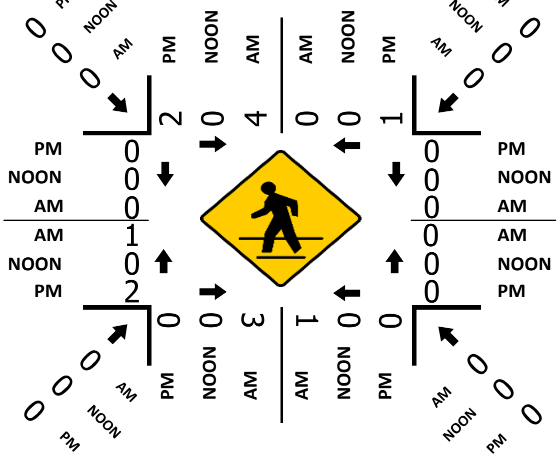
Totals (NOON)



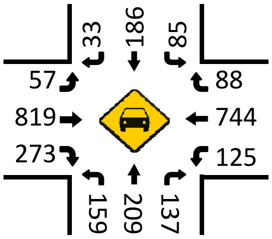
Total Bikes (NOON)



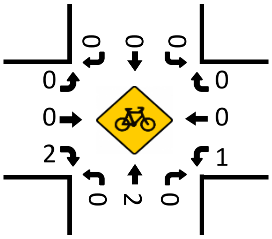
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: Linden St & Sand Creek Rd
City: Brentwood
Control: 1-Way Stop(NB)

Project ID: 23-080161-001
Date: 5/16/2023

Data - Totals

NS/EW Streets:	Linden St				Linden St				Sand Creek Rd				Sand Creek Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	0	2	0	0	0	0	0	0	67	1	0	3	118	0	0	194
7:15 AM	0	0	4	0	0	0	0	0	0	117	2	0	2	144	0	0	269
7:30 AM	8	0	8	0	0	0	0	0	0	151	3	0	8	187	0	0	365
7:45 AM	8	0	6	0	0	0	0	0	0	243	3	0	26	206	0	1	493
8:00 AM	3	0	21	0	0	0	0	0	0	248	4	0	31	237	0	1	545
8:15 AM	6	0	15	0	0	0	0	0	0	229	8	0	9	229	0	1	497
8:30 AM	5	0	10	0	0	0	0	0	0	159	5	0	7	258	0	0	444
8:45 AM	2	0	2	0	0	0	0	0	0	164	3	0	3	179	0	0	353
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	35	0	68	0	0	0	0	0	0	1378	29	0	89	1558	0	3	3160
APPROACH %'s :	33.98%	0.00%	66.02%	0.00%					0.00%	97.94%	2.06%	0.00%	5.39%	94.42%	0.00%	0.18%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	22	0	52	0	0	0	0	0	0	879	20	0	73	930	0	3	1979
PEAK HR FACTOR :	0.688	0.000	0.619	0.000	0.000	0.000	0.000	0.000	0.000	0.886	0.625	0.000	0.589	0.901	0.000	0.750	0.908
	0.771								0.892				0.935				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	1	0	0	0	0	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	0	10	0	0	0	0	0	0	283	5	0	5	197	0	0	501
4:15 PM	7	0	8	0	0	0	0	0	0	250	3	0	10	194	0	0	472
4:30 PM	2	0	4	0	0	0	0	0	0	291	9	0	4	215	0	0	525
4:45 PM	1	0	5	0	0	0	0	0	0	284	9	0	7	200	0	0	506
5:00 PM	5	0	11	0	0	0	0	0	0	287	7	0	6	264	0	0	580
5:15 PM	1	0	8	0	0	0	0	0	0	258	9	0	4	233	0	0	513
5:30 PM	3	0	9	0	0	0	0	0	0	228	15	0	6	208	0	0	469
5:45 PM	4	0	7	0	0	0	0	0	0	237	8	0	5	168	0	0	429
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	24	0	62	0	0	0	0	0	0	2118	65	0	47	1679	0	0	3995
APPROACH %'s :	27.91%	0.00%	72.09%	0.00%					0.00%	97.02%	2.98%	0.00%	2.72%	97.28%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	9	0	28	0	0	0	0	0	0	1120	34	0	21	912	0	0	2124
PEAK HR FACTOR :	0.450	0.000	0.636	0.000	0.000	0.000	0.000	0.000	0.000	0.962	0.944	0.000	0.750	0.864	0.000	0.000	0.916
	0.578								0.962				0.864				

National Data & Surveying Services Intersection Turning Movement Count

Location: Linden St & Sand Creek Rd
City: Brentwood
Control: 1-Way Stop(NB)

Project ID: 23-080161-001
Date: 5/16/2023

Data - Bikes

NS/EW Streets:	Linden St				Linden St				Sand Creek Rd				Sand Creek Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0	0	6
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.250	0.000	0.000	0.500
									0.375				0.250				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	3
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

National Data & Surveying Services Intersection Turning Movement Count

Location: Linden St & Sand Creek Rd
City: Brentwood
Project ID: 23-080161-001
Date: 5/16/2023

Data - Pedestrians (Crosswalks)

NS/EW Streets:	Linden St		Linden St		Sand Creek Rd		Sand Creek Rd		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	1	0	0	0	0	1
7:15 AM	0	0	1	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	1	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	3	2	0	0	0	0	5
APPROACH %'s :			60.00%	40.00%					
PEAK HR :	**07:45 AM - 08:45 AM**								TOTAL
PEAK HR VOL :	0	0	2	1	0	0	0	0	3
PEAK HR FACTOR :			0.250	0.250					0.250
			0.250						

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	**04:30 PM - 05:30 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

Linden St & Sand Creek Rd

Peak Hour Turning Movement Count

ID: 23-080161-001
City: Brentwood

Day: Tuesday
Date: 5/16/2023

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	4:00 PM - 06:00 PM

Linden St — SOUTHBOUND

	↲	↓	↳	⟲	⇧
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
	0	0	0	0	

Sand Creek Rd — EASTBOUND

	AM	NOON	PM	
⇦	952	0	921	
⟲	0	0	0	0
↰	0	0	0	1
→	879	0	1120	2
↴	20	0	34	0

Sand Creek Rd — WESTBOUND

		PM	NOON	AM
0	↰	0	0	0
2	←	912	0	930
1	↲	21	0	73
0	⟲	0	0	3
	⇨	1148	0	934

CONTROL

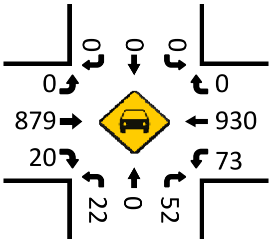
1-Way Stop(NB)

	AM	NOON	PM
TEV	1979	0	2124
PHF	0.91		0.92

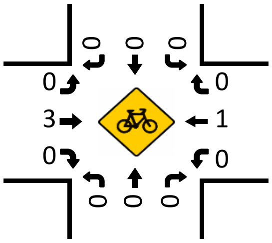
Linden St — NORTHBOUND

		0	0	1	0
	⇩	⟲	↰	↑	↱
PM	55	0	9	0	28
NOON	0	0	0	0	0
AM	93	0	22	0	52

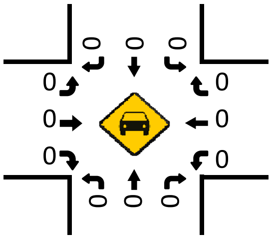
Totals (AM)



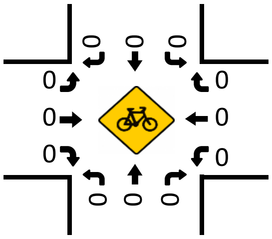
Total Bikes (AM)



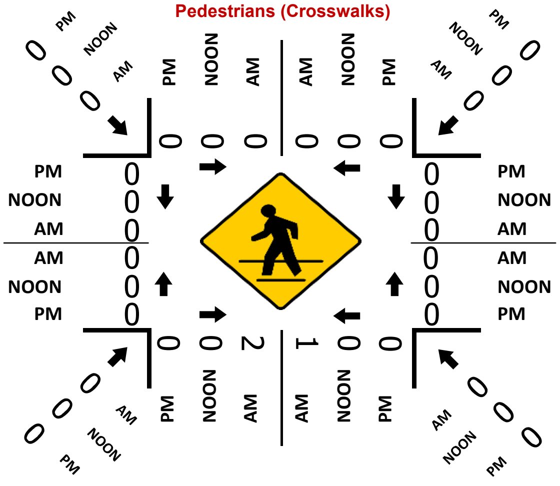
Totals (NOON)



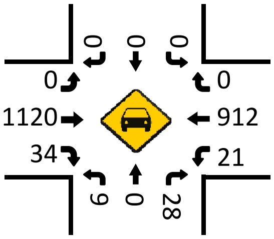
Total Bikes (NOON)



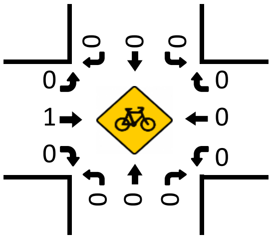
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Appendix B:
LOS Calculation Worksheets

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	Y	
Traffic Vol, veh/h	882	20	76	936	22	52
Future Vol, veh/h	882	20	76	936	22	52
Conflicting Peds, #/hr	0	3	3	0	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	160	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	969	22	84	1029	24	57

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	994	0	1669	502
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	-	-	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	686	-	86	512
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	459	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	684	-	75	509
Mov Cap-2 Maneuver	-	-	-	-	75	-
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	401	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	38.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	187	-	-	684	-
HCM Lane V/C Ratio	0.435	-	-	0.122	-
HCM Control Delay (s)	38.3	-	-	11	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	2	-	-	0.4	-

2: Fairview Ave & Sand Creek Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	34	737	163	164	754	50	198	215	207	82	218	60
Future Volume (veh/h)	34	737	163	164	754	50	198	215	207	82	218	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	784	58	174	802	23	211	229	63	87	232	13
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	59	1184	526	210	1484	659	249	438	364	163	347	292
Arrive On Green	0.03	0.34	0.34	0.12	0.42	0.42	0.14	0.24	0.24	0.09	0.19	0.19
Sat Flow, veh/h	1767	3526	1565	1767	3526	1565	1767	1856	1544	1767	1856	1560
Grp Volume(v), veh/h	36	784	58	174	802	23	211	229	63	87	232	13
Grp Sat Flow(s),veh/h/ln	1767	1763	1565	1767	1763	1565	1767	1856	1544	1767	1856	1560
Q Serve(g_s), s	1.7	16.4	2.2	8.3	14.8	0.7	10.1	9.3	2.8	4.1	10.1	0.6
Cycle Q Clear(g_c), s	1.7	16.4	2.2	8.3	14.8	0.7	10.1	9.3	2.8	4.1	10.1	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	1184	526	210	1484	659	249	438	364	163	347	292
V/C Ratio(X)	0.61	0.66	0.11	0.83	0.54	0.03	0.85	0.52	0.17	0.53	0.67	0.04
Avail Cap(c_a), veh/h	306	1629	723	306	1792	795	510	922	767	306	686	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	24.6	19.8	37.3	18.8	14.7	36.3	28.8	26.3	37.5	32.7	28.8
Incr Delay (d2), s/veh	3.7	1.4	0.2	7.9	0.7	0.0	3.0	2.1	0.5	1.0	4.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.5	0.8	3.9	5.5	0.2	4.3	4.1	1.0	1.8	4.8	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	25.9	20.0	45.2	19.4	14.8	39.3	30.9	26.8	38.5	37.4	29.0
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	D	C
Approach Vol, veh/h		878			999			503			332	
Approach Delay, s/veh		26.3			23.8			33.9			37.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	34.6	16.2	21.5	6.9	41.9	12.0	25.7
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	10.3	18.4	12.1	12.1	3.7	16.8	6.1	11.3
Green Ext Time (p_c), s	0.1	9.4	0.2	2.3	0.0	10.5	0.1	3.0

Intersection Summary			
HCM 6th Ctrl Delay			28.1
HCM 6th LOS			C

Notes

User approved ignoring U-Turning movement.

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	↰↱	
Traffic Vol, veh/h	1121	34	21	916	9	28
Future Vol, veh/h	1121	34	21	916	9	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	160	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1218	37	23	996	10	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1255	0	1781	628
Stage 1	-	-	-	-	1237	-
Stage 2	-	-	-	-	544	-
Critical Hdwy	-	-	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	545	-	72	423
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	543	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	545	-	69	423
Mov Cap-2 Maneuver	-	-	-	-	69	-
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	520	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	29.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	188	-	-	545	-
HCM Lane V/C Ratio	0.214	-	-	0.042	-
HCM Control Delay (s)	29.3	-	-	11.9	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

2: Fairview Ave & Sand Creek Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	58	818	273	125	741	88	163	209	137	85	186	33
Future Volume (veh/h)	58	818	273	125	741	88	163	209	137	85	186	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	61	861	107	132	780	39	172	220	36	89	196	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	82	1311	584	166	1478	657	211	363	302	179	328	276
Arrive On Green	0.05	0.37	0.37	0.09	0.42	0.42	0.12	0.20	0.20	0.10	0.18	0.18
Sat Flow, veh/h	1767	3526	1570	1767	3526	1567	1767	1856	1545	1767	1856	1559
Grp Volume(v), veh/h	61	861	107	132	780	39	172	220	36	89	196	7
Grp Sat Flow(s),veh/h/ln	1767	1763	1570	1767	1763	1567	1767	1856	1545	1767	1856	1559
Q Serve(g_s), s	2.7	16.1	3.6	5.8	13.1	1.2	7.5	8.6	1.5	3.8	7.7	0.3
Cycle Q Clear(g_c), s	2.7	16.1	3.6	5.8	13.1	1.2	7.5	8.6	1.5	3.8	7.7	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	82	1311	584	166	1478	657	211	363	302	179	328	276
V/C Ratio(X)	0.74	0.66	0.18	0.79	0.53	0.06	0.81	0.61	0.12	0.50	0.60	0.03
Avail Cap(c_a), veh/h	335	1782	794	335	1960	871	558	1008	840	335	750	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	20.7	16.8	35.1	17.1	13.7	34.0	29.1	26.2	33.7	30.0	26.9
Incr Delay (d2), s/veh	4.8	1.2	0.3	3.3	0.6	0.1	2.9	3.5	0.4	0.8	3.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	6.1	1.2	2.5	4.7	0.4	3.2	3.9	0.6	1.6	3.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	21.9	17.1	38.4	17.8	13.8	36.8	32.5	26.6	34.5	33.7	27.0
LnGrp LOS	D	C	B	D	B	B	D	C	C	C	C	C
Approach Vol, veh/h		1029			951			428			292	
Approach Delay, s/veh		22.6			20.5			33.8			33.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	34.9	13.5	19.3	7.7	38.7	12.0	20.8
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	7.8	18.1	9.5	9.7	4.7	15.1	5.8	10.6
Green Ext Time (p_c), s	0.1	10.8	0.2	2.0	0.0	10.6	0.1	2.7

Intersection Summary	
HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

1: Linden St & Sand Creek Rd

Existing PP AM

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑			✥			↰	↱
Traffic Volume (veh/h)	6	882	20	76	936	5	22	0	52	5	0	1
Future Volume (veh/h)	6	882	20	76	936	5	22	0	52	5	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	7	969	19	84	1029	5	24	0	5	5	0	0
Peak Hour Factor	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	509	1997	39	524	2032	10	323	0	11	363	0	66
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.04	0.00	0.04	0.04	0.00	0.00
Sat Flow, veh/h	541	3535	69	565	3598	17	1201	0	250	1541	0	1572
Grp Volume(v), veh/h	7	483	505	84	504	530	29	0	0	5	0	0
Grp Sat Flow(s),veh/h/ln	541	1763	1841	565	1763	1852	1452	0	0	1541	0	1572
Q Serve(g_s), s	0.2	4.0	4.0	2.5	4.2	4.2	0.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.4	4.0	4.0	6.5	4.2	4.2	0.5	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.01	0.83		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	509	996	1040	524	996	1046	333	0	0	363	0	66
V/C Ratio(X)	0.01	0.49	0.49	0.16	0.51	0.51	0.09	0.00	0.00	0.01	0.00	0.00
Avail Cap(c_a), veh/h	1210	3280	3426	1256	3280	3447	1159	0	0	1159	0	975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.5	3.2	3.2	5.1	3.2	3.2	11.3	0.0	0.0	11.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.6	3.3	3.3	5.2	3.4	3.3	11.5	0.0	0.0	11.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		995			1118			29			5	
Approach Delay, s/veh		3.3			3.5			11.5			11.2	
Approach LOS		A			A			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	19.2	5.0	19.2	5.0
Change Period (Y+Rc), s	5.5	4.0	5.5	4.0
Max Green Setting (Gmax), s	45.0	15.0	45.0	15.0
Max Q Clear Time (g_c+I1), s	6.4	2.1	8.5	2.5
Green Ext Time (p_c), s	3.9	0.0	4.9	0.1

Intersection Summary	
HCM 6th Ctrl Delay	3.5
HCM 6th LOS	A

HCM 6th Signalized Intersection Summary
2: Fairview Ave & Sand Creek Rd

Sand Creek Sports Complex
Existing PP AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	35	739	165	164	756	50	200	215	207	82	218	61
Future Volume (veh/h)	35	739	165	164	756	50	200	215	207	82	218	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	37	786	58	174	804	22	213	229	64	87	232	13
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	60	1184	526	209	1482	658	251	440	366	163	347	292
Arrive On Green	0.03	0.34	0.34	0.12	0.42	0.42	0.14	0.24	0.24	0.09	0.19	0.19
Sat Flow, veh/h	1767	3526	1565	1767	3526	1565	1767	1856	1544	1767	1856	1560
Grp Volume(v), veh/h	37	786	58	174	804	22	213	229	64	87	232	13
Grp Sat Flow(s),veh/h/ln	1767	1763	1565	1767	1763	1565	1767	1856	1544	1767	1856	1560
Q Serve(g_s), s	1.8	16.6	2.2	8.4	14.9	0.7	10.2	9.3	2.9	4.1	10.1	0.6
Cycle Q Clear(g_c), s	1.8	16.6	2.2	8.4	14.9	0.7	10.2	9.3	2.9	4.1	10.1	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	1184	526	209	1482	658	251	440	366	163	347	292
V/C Ratio(X)	0.62	0.66	0.11	0.83	0.54	0.03	0.85	0.52	0.17	0.53	0.67	0.04
Avail Cap(c_a), veh/h	305	1623	721	305	1785	792	508	918	764	305	683	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	24.7	19.9	37.4	18.9	14.8	36.3	28.8	26.4	37.7	32.8	29.0
Incr Delay (d2), s/veh	3.8	1.4	0.2	8.0	0.7	0.0	3.1	2.0	0.5	1.0	4.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.5	0.8	3.9	5.6	0.2	4.4	4.1	1.0	1.8	4.8	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	26.0	20.1	45.5	19.6	14.8	39.4	30.9	26.9	38.7	37.5	29.1
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	D	C
Approach Vol, veh/h		881			1000			506			332	
Approach Delay, s/veh		26.5			24.0			34.0			37.5	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	34.7	16.4	21.6	7.0	42.0	12.0	25.9
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	10.4	18.6	12.2	12.1	3.8	16.9	6.1	11.3
Green Ext Time (p_c), s	0.1	9.4	0.2	2.3	0.0	10.5	0.1	3.0

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑			✥			↰	↱
Traffic Volume (veh/h)	35	1121	34	21	919	33	9	0	28	23	0	4
Future Volume (veh/h)	35	1121	34	21	919	33	9	0	28	23	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	38	1218	34	23	999	32	10	0	0	25	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	509	1962	55	444	1954	63	367	0	0	363	0	68
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.04	0.00	0.00	0.04	0.00	0.00
Sat Flow, veh/h	543	3501	98	440	3487	112	1539	0	0	1452	0	1572
Grp Volume(v), veh/h	38	613	639	23	505	526	10	0	0	25	0	0
Grp Sat Flow(s),veh/h/ln	543	1763	1836	440	1763	1835	1539	0	0	1452	0	1572
Q Serve(g_s), s	1.1	5.6	5.6	0.9	4.2	4.2	0.0	0.0	0.0	0.3	0.0	0.0
Cycle Q Clear(g_c), s	5.3	5.6	5.6	6.5	4.2	4.2	0.1	0.0	0.0	0.4	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.06	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	509	988	1029	444	988	1028	367	0	0	363	0	68
V/C Ratio(X)	0.07	0.62	0.62	0.05	0.51	0.51	0.03	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	1223	3309	3446	1023	3309	3445	1186	0	0	1182	0	984
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.9	3.6	3.6	5.8	3.2	3.2	11.0	0.0	0.0	11.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.2	0.0	0.2	0.1	0.1	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.9	3.8	3.8	5.8	3.4	3.4	11.1	0.0	0.0	11.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		1290			1054			10			25	
Approach Delay, s/veh		3.8			3.4			11.1			11.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.9		5.0		18.9		5.0				
Change Period (Y+Rc), s		5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s		45.0		15.0		45.0		15.0				
Max Q Clear Time (g_c+I1), s		7.6		2.4		8.5		2.1				
Green Ext Time (p_c), s		5.8		0.1		4.3		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			3.8
HCM 6th LOS			A

HCM 6th Signalized Intersection Summary
2: Fairview Ave & Sand Creek Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	63	827	282	125	756	88	177	209	137	85	186	40
Future Volume (veh/h)	63	827	282	125	756	88	177	209	137	85	186	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	871	106	132	796	38	186	220	38	89	196	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	85	1318	587	166	1479	657	226	362	302	178	311	262
Arrive On Green	0.05	0.37	0.37	0.09	0.42	0.42	0.13	0.20	0.20	0.10	0.17	0.17
Sat Flow, veh/h	1767	3526	1570	1767	3526	1567	1767	1856	1545	1767	1856	1558
Grp Volume(v), veh/h	66	871	106	132	796	38	186	220	38	89	196	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1570	1767	1763	1567	1767	1856	1545	1767	1856	1558
Q Serve(g_s), s	2.9	16.3	3.6	5.8	13.5	1.1	8.2	8.6	1.6	3.8	7.8	0.3
Cycle Q Clear(g_c), s	2.9	16.3	3.6	5.8	13.5	1.1	8.2	8.6	1.6	3.8	7.8	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	1318	587	166	1479	657	226	362	302	178	311	262
V/C Ratio(X)	0.77	0.66	0.18	0.80	0.54	0.06	0.82	0.61	0.13	0.50	0.63	0.03
Avail Cap(c_a), veh/h	333	1773	790	333	1950	867	556	1003	836	333	747	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	20.7	16.7	35.3	17.3	13.7	33.8	29.2	26.4	33.9	30.8	27.7
Incr Delay (d2), s/veh	5.5	1.2	0.3	3.3	0.7	0.1	2.8	3.5	0.4	0.8	4.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.2	1.2	2.5	4.9	0.4	3.4	3.9	0.6	1.6	3.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	21.9	17.0	38.5	18.0	13.8	36.6	32.7	26.8	34.7	35.2	27.8
LnGrp LOS	D	C	B	D	B	B	D	C	C	C	D	C
Approach Vol, veh/h		1043			966			444			293	
Approach Delay, s/veh		22.8			20.6			33.8			34.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	35.2	14.2	18.6	7.8	38.9	12.0	20.8
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	7.8	18.3	10.2	9.8	4.9	15.5	5.8	10.6
Green Ext Time (p_c), s	0.1	10.8	0.2	2.0	0.0	10.8	0.1	2.7

Intersection Summary	
HCM 6th Ctrl Delay	25.1
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

Intersection	
Int Delay, s/veh	9.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	↰↱	
Traffic Vol, veh/h	1247	23	89	1311	25	58
Future Vol, veh/h	1247	23	89	1311	25	58
Conflicting Peds, #/hr	0	3	3	0	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	160	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1370	25	98	1441	27	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1398	0	2306	704
Stage 1	-	-	-	-	1386	-
Stage 2	-	-	-	-	920	-
Critical Hdwy	-	-	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	480	-	32	377
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	346	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	479	-	~ 25	375
Mov Cap-2 Maneuver	-	-	-	-	~ 25	-
Stage 1	-	-	-	-	194	-
Stage 2	-	-	-	-	274	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	294.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	72	-	-	479	-
HCM Lane V/C Ratio	1.267	-	-	0.204	-
HCM Control Delay (s)	294.2	-	-	14.4	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	7.2	-	-	0.8	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
2: Fairview Ave & Sand Creek Rd

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	40	1074	191	192	1103	59	221	240	231	104	277	76
Future Volume (veh/h)	40	1074	191	192	1103	59	221	240	231	104	277	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	43	1143	97	204	1173	26	235	255	68	111	295	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	58	1235	549	231	1581	702	265	506	421	141	376	316
Arrive On Green	0.03	0.35	0.35	0.13	0.45	0.45	0.15	0.27	0.27	0.08	0.20	0.20
Sat Flow, veh/h	1767	3526	1566	1767	3526	1565	1767	1856	1546	1767	1856	1561
Grp Volume(v), veh/h	43	1143	97	204	1173	26	235	255	68	111	295	17
Grp Sat Flow(s),veh/h/ln	1767	1763	1566	1767	1763	1565	1767	1856	1546	1767	1856	1561
Q Serve(g_s), s	2.7	35.2	4.8	12.8	31.1	1.1	14.7	13.1	3.8	7.0	17.0	1.0
Cycle Q Clear(g_c), s	2.7	35.2	4.8	12.8	31.1	1.1	14.7	13.1	3.8	7.0	17.0	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	58	1235	549	231	1581	702	265	506	421	141	376	316
V/C Ratio(X)	0.74	0.93	0.18	0.88	0.74	0.04	0.89	0.50	0.16	0.79	0.78	0.05
Avail Cap(c_a), veh/h	234	1247	554	234	1581	702	391	706	588	234	525	442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.2	35.3	25.4	48.3	25.8	17.5	47.1	34.7	31.3	51.1	42.7	36.3
Incr Delay (d2), s/veh	6.8	12.1	0.3	28.7	2.3	0.0	11.7	1.7	0.4	3.6	8.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	16.3	1.8	7.3	12.6	0.4	7.1	5.9	1.4	3.2	8.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	47.4	25.8	76.9	28.1	17.5	58.8	36.3	31.7	54.7	51.2	36.5
LnGrp LOS	E	D	C	E	C	B	E	D	C	D	D	D
Approach Vol, veh/h		1283			1403			558			423	
Approach Delay, s/veh		46.2			35.0			45.2			51.5	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.8	45.1	20.9	28.2	7.7	56.2	13.0	36.1
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	14.8	37.2	16.7	19.0	4.7	33.1	9.0	15.1
Green Ext Time (p_c), s	0.0	2.3	0.2	2.4	0.0	8.0	0.1	3.2

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.

HCM 6th TWSC
1: Linden St & Sand Creek Rd

07/17/2023

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱		↰	↑↑	↰↱	
Traffic Vol, veh/h	1537	40	25	1287	13	39
Future Vol, veh/h	1537	40	25	1287	13	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	160	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1671	43	27	1399	14	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1714	0	2447	857
Stage 1	-	-	-	-	1693	-
Stage 2	-	-	-	-	754	-
Critical Hdwy	-	-	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	362	-	25	299
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	362	-	23	299
Mov Cap-2 Maneuver	-	-	-	-	23	-
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	391	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	136.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	75	-	-	362	-
HCM Lane V/C Ratio	0.754	-	-	0.075	-
HCM Control Delay (s)	136.7	-	-	15.8	-
HCM Lane LOS	F	-	-	C	-
HCM 95th %tile Q(veh)	3.6	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	68	1189	319	146	1044	103	227	291	190	106	231	41
Future Volume (veh/h)	68	1189	319	146	1044	103	227	291	190	106	231	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	72	1252	181	154	1099	44	239	306	52	112	243	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	93	1349	601	184	1531	681	271	464	387	145	331	278
Arrive On Green	0.05	0.38	0.38	0.10	0.43	0.43	0.15	0.25	0.25	0.08	0.18	0.18
Sat Flow, veh/h	1767	3526	1570	1767	3526	1567	1767	1856	1547	1767	1856	1559
Grp Volume(v), veh/h	72	1252	181	154	1099	44	239	306	52	112	243	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1570	1767	1763	1567	1767	1856	1547	1767	1856	1559
Q Serve(g_s), s	4.2	35.3	8.4	8.9	26.6	1.7	13.7	15.4	2.7	6.4	12.8	0.4
Cycle Q Clear(g_c), s	4.2	35.3	8.4	8.9	26.6	1.7	13.7	15.4	2.7	6.4	12.8	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	93	1349	601	184	1531	681	271	464	387	145	331	278
V/C Ratio(X)	0.78	0.93	0.30	0.84	0.72	0.06	0.88	0.66	0.13	0.77	0.73	0.03
Avail Cap(c_a), veh/h	255	1358	605	255	1531	681	426	769	641	255	572	481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	30.7	22.4	45.6	24.1	17.1	43.0	34.9	30.2	46.7	40.3	35.2
Incr Delay (d2), s/veh	5.2	11.6	0.6	11.6	2.0	0.1	8.2	3.4	0.3	3.3	6.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	16.0	3.0	4.3	10.6	0.6	6.4	7.1	1.0	2.9	6.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.8	42.3	23.0	57.3	26.2	17.2	51.2	38.3	30.5	50.0	46.9	35.3
LnGrp LOS	D	D	C	E	C	B	D	D	C	D	D	D
Approach Vol, veh/h		1505			1297			597			363	
Approach Delay, s/veh		40.5			29.6			42.8			47.6	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	45.2	19.9	23.8	9.4	50.6	12.5	31.3
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	10.9	37.3	15.7	14.8	6.2	28.6	8.4	17.4
Green Ext Time (p_c), s	0.1	2.4	0.2	2.2	0.0	10.2	0.1	3.7

Intersection Summary	
HCM 6th Ctrl Delay	37.8
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary
1: Linden St & Sand Creek Rd

09/26/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑			✥			↰↑	↱
Traffic Volume (veh/h)	6	1247	23	89	1311	5	25	0	58	5	0	1
Future Volume (veh/h)	6	1247	23	89	1311	5	25	0	58	5	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	7	1370	23	98	1441	5	27	0	7	5	0	0
Peak Hour Factor	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	379	2418	41	392	2457	9	238	0	13	277	0	71
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.05	0.00	0.05	0.05	0.00	0.00
Sat Flow, veh/h	366	3546	60	385	3604	13	1154	0	299	1559	0	1572
Grp Volume(v), veh/h	7	681	712	98	705	741	34	0	0	5	0	0
Grp Sat Flow(s),veh/h/ln	366	1763	1843	385	1763	1853	1453	0	0	1559	0	1572
Q Serve(g_s), s	0.4	7.0	7.0	6.2	7.4	7.4	0.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.7	7.0	7.0	13.1	7.4	7.4	0.8	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.01	0.79		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	379	1202	1257	392	1202	1264	251	0	0	277	0	71
V/C Ratio(X)	0.02	0.57	0.57	0.25	0.59	0.59	0.14	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	602	2280	2384	627	2280	2397	804	0	0	809	0	678
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.0	2.9	2.9	6.3	2.9	2.9	16.2	0.0	0.0	15.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.2	0.1	0.2	0.2	0.5	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.2	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.0	3.0	3.0	6.4	3.1	3.1	16.7	0.0	0.0	16.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		1400			1544			34			5	
Approach Delay, s/veh		3.0			3.3			16.7			16.0	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.2		5.6		29.2		5.6				
Change Period (Y+Rc), s		5.5		4.0		5.5		4.0				
Max Green Setting (Gmax), s		45.0		15.0		45.0		15.0				
Max Q Clear Time (g_c+I1), s		9.7		2.1		15.1		2.8				
Green Ext Time (p_c), s		6.5		0.0		8.5		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			3.4
HCM 6th LOS			A

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	41	1076	193	192	1105	59	223	240	231	104	277	77
Future Volume (veh/h)	41	1076	193	192	1105	59	223	240	231	104	277	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	44	1145	98	204	1176	26	237	255	69	111	295	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	58	1234	548	231	1578	701	267	507	423	141	376	316
Arrive On Green	0.03	0.35	0.35	0.13	0.45	0.45	0.15	0.27	0.27	0.08	0.20	0.20
Sat Flow, veh/h	1767	3526	1566	1767	3526	1565	1767	1856	1546	1767	1856	1561
Grp Volume(v), veh/h	44	1145	98	204	1176	26	237	255	69	111	295	17
Grp Sat Flow(s),veh/h/ln	1767	1763	1566	1767	1763	1565	1767	1856	1546	1767	1856	1561
Q Serve(g_s), s	2.8	35.4	4.9	12.9	31.3	1.1	14.9	13.1	3.8	7.0	17.1	1.0
Cycle Q Clear(g_c), s	2.8	35.4	4.9	12.9	31.3	1.1	14.9	13.1	3.8	7.0	17.1	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	58	1234	548	231	1578	701	267	507	423	141	376	316
V/C Ratio(X)	0.75	0.93	0.18	0.88	0.75	0.04	0.89	0.50	0.16	0.79	0.79	0.05
Avail Cap(c_a), veh/h	234	1245	553	234	1578	701	390	704	587	234	524	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	35.5	25.5	48.4	25.9	17.6	47.2	34.7	31.3	51.2	42.9	36.4
Incr Delay (d2), s/veh	7.1	12.4	0.3	28.8	2.4	0.0	12.1	1.6	0.4	3.6	8.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	16.4	1.8	7.3	12.7	0.4	7.2	5.9	1.4	3.2	8.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	47.9	25.9	77.2	28.3	17.6	59.3	36.3	31.7	54.8	51.4	36.6
LnGrp LOS	E	D	C	E	C	B	E	D	C	D	D	D
Approach Vol, veh/h		1287			1406			561			423	
Approach Delay, s/veh		46.7			35.2			45.5			51.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.8	45.1	21.1	28.2	7.7	56.2	13.0	36.3
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	14.9	37.4	16.9	19.1	4.8	33.3	9.0	15.1
Green Ext Time (p_c), s	0.0	2.2	0.2	2.4	0.0	7.9	0.1	3.3

Intersection Summary			
HCM 6th Ctrl Delay			42.7
HCM 6th LOS			D

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary

1: Linden St & Sand Creek Rd

09/26/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑			✥			↰	↱
Traffic Volume (veh/h)	35	1537	40	25	1290	33	13	0	39	23	0	4
Future Volume (veh/h)	35	1537	40	25	1290	33	13	0	39	23	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	38	1671	41	27	1402	34	14	0	7	25	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	378	2332	57	317	2334	57	233	0	27	293	0	82
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.05	0.00	0.05	0.05	0.00	0.00
Sat Flow, veh/h	369	3515	86	283	3518	85	1031	0	515	1477	0	1572
Grp Volume(v), veh/h	38	836	876	27	702	734	21	0	0	25	0	0
Grp Sat Flow(s),veh/h/ln	369	1763	1838	283	1763	1840	1546	0	0	1477	0	1572
Q Serve(g_s), s	2.1	10.1	10.2	2.3	7.4	7.5	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	9.6	10.1	10.2	12.5	7.4	7.5	0.4	0.0	0.0	0.5	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.05	0.67		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	378	1169	1219	317	1169	1221	260	0	0	293	0	82
V/C Ratio(X)	0.10	0.71	0.72	0.09	0.60	0.60	0.08	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	631	2377	2478	510	2377	2481	837	0	0	848	0	707
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.8	3.6	3.6	7.6	3.1	3.1	15.2	0.0	0.0	15.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.2	0.2	0.3	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.9	3.9	3.9	7.7	3.3	3.3	15.5	0.0	0.0	15.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		1750			1463			21			25	
Approach Delay, s/veh		4.0			3.4			15.5			15.5	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.6		5.7		27.6		5.7
Change Period (Y+Rc), s		5.5		4.0		5.5		4.0
Max Green Setting (Gmax), s		45.0		15.0		45.0		15.0
Max Q Clear Time (g_c+I1), s		12.2		2.5		14.5		2.4
Green Ext Time (p_c), s		9.9		0.1		7.3		0.1

Intersection Summary			
HCM 6th Ctrl Delay			3.9
HCM 6th LOS			A

HCM 6th Signalized Intersection Summary
2: Fairview Ave & Sand Creek Rd

09/26/2023

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	73	1198	328	146	1059	103	241	291	190	106	231	48
Future Volume (veh/h)	73	1198	328	146	1059	103	241	291	190	106	231	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	77	1261	185	154	1115	43	254	306	54	112	243	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	99	1333	594	184	1503	668	286	478	399	144	330	277
Arrive On Green	0.06	0.38	0.38	0.10	0.43	0.43	0.16	0.26	0.26	0.08	0.18	0.18
Sat Flow, veh/h	1767	3526	1570	1767	3526	1567	1767	1856	1547	1767	1856	1559
Grp Volume(v), veh/h	77	1261	185	154	1115	43	254	306	54	112	243	10
Grp Sat Flow(s),veh/h/ln	1767	1763	1570	1767	1763	1567	1767	1856	1547	1767	1856	1559
Q Serve(g_s), s	4.5	36.5	8.8	9.0	28.0	1.7	14.8	15.4	2.8	6.6	13.1	0.6
Cycle Q Clear(g_c), s	4.5	36.5	8.8	9.0	28.0	1.7	14.8	15.4	2.8	6.6	13.1	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	1333	594	184	1503	668	286	478	399	144	330	277
V/C Ratio(X)	0.78	0.95	0.31	0.84	0.74	0.06	0.89	0.64	0.14	0.78	0.74	0.04
Avail Cap(c_a), veh/h	251	1338	596	251	1503	668	419	757	631	251	563	473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	31.7	23.1	46.4	25.4	17.8	43.3	34.8	30.1	47.5	41.0	35.9
Incr Delay (d2), s/veh	5.0	14.1	0.6	12.4	2.4	0.1	11.3	3.0	0.3	3.3	6.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	17.0	3.2	4.5	11.3	0.6	7.1	7.1	1.1	3.0	6.5	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.1	45.8	23.7	58.8	27.8	17.9	54.6	37.8	30.4	50.8	47.7	36.0
LnGrp LOS	D	D	C	E	C	B	D	D	C	D	D	D
Approach Vol, veh/h		1523			1312			614			365	
Approach Delay, s/veh		43.5			31.1			44.1			48.3	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	45.4	21.0	24.0	9.9	50.4	12.6	32.5
Change Period (Y+Rc), s	4.0	5.5	4.0	5.3	4.0	5.5	4.0	5.3
Max Green Setting (Gmax), s	15.0	40.0	25.0	32.0	15.0	44.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	11.0	38.5	16.8	15.1	6.5	30.0	8.6	17.4
Green Ext Time (p_c), s	0.1	1.3	0.2	2.2	0.0	9.6	0.1	3.7

Intersection Summary	
HCM 6th Ctrl Delay	39.8
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.

Appendix C:
Signal Warrant Worksheets

FEHR & PEERS

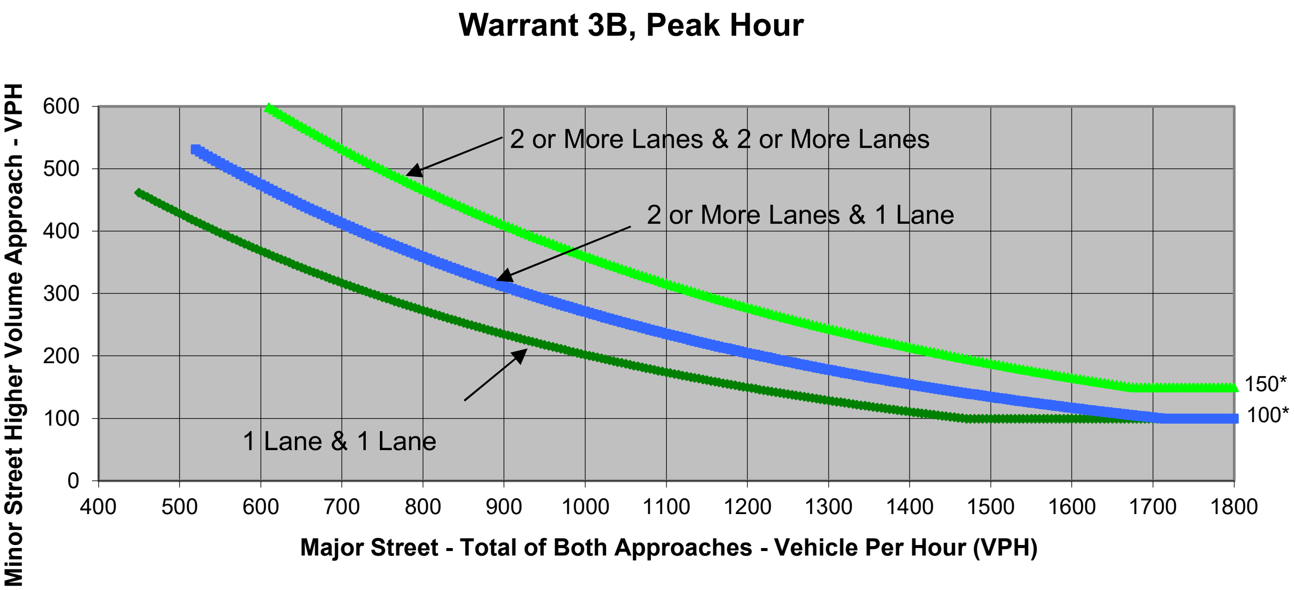
			Project	Sand Creek Sports Complex
Major Street	Sand Creek Road		Scenario	Existing Plus Project
Minor Street	Linden Street		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	22	3	5	76
Through	0	0	882	936
Right	52	1	20	5
Total	74	4	907	1,017

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Sand Creek Road	**Minor Street** Linden Street	**Warrant Met**
Number of Approach Lanes	**3**	**1**	**NO**
Traffic Volume (VPH) *	**1,924**	**74**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

		Project	Sand Creek Sports Complex
Major Street	Sand Creek Road	Scenario	Existing Plus Project
Minor Street	Linden Street	Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	22	3	5	76
Through	0	0	882	936
Right	52	1	20	5
Total	74	4	907	1,017

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	3.5
Approach with Worst Case Delay	WB
Total Vehicles on Approach	1,017

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**1**	**74**	**2,002**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

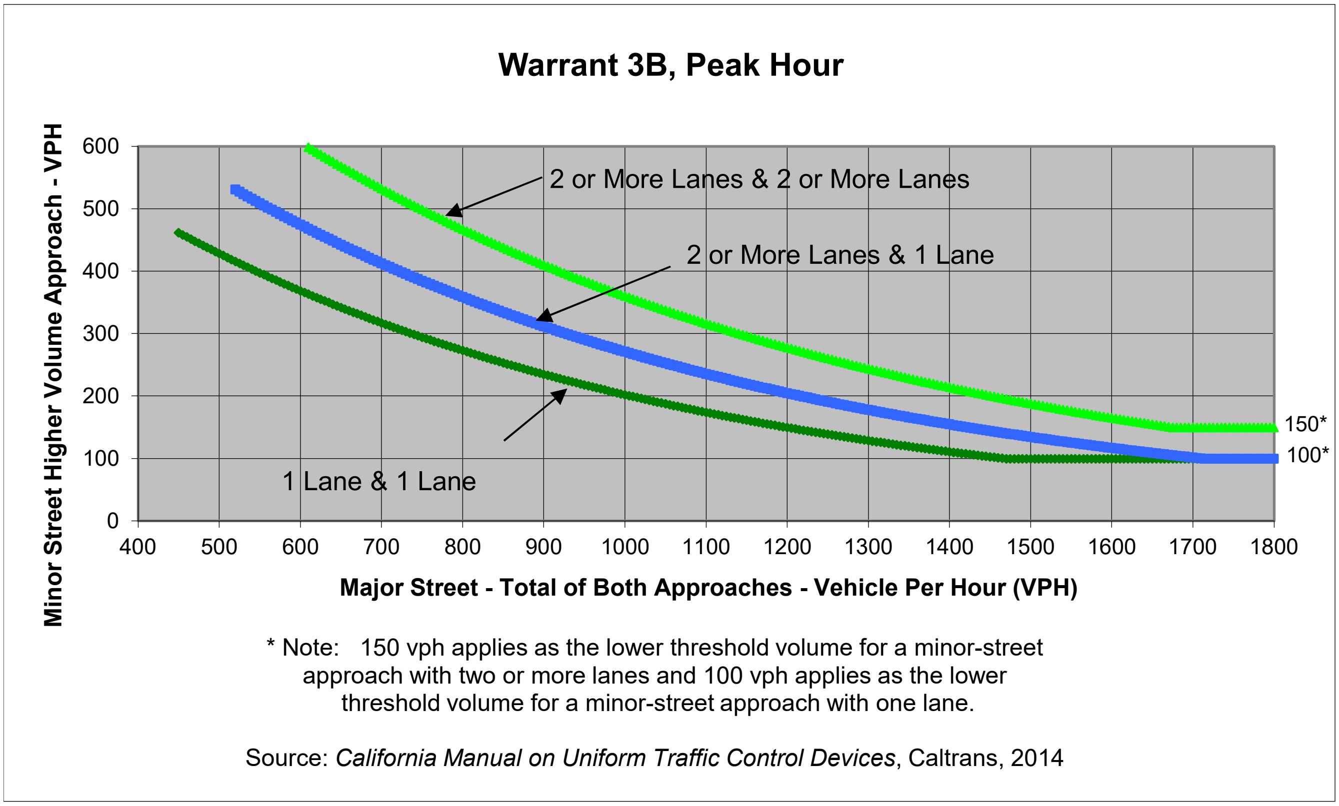
Major Street	Sand Creek Road	Project	Sand Creek Sports Complex
Minor Street	Linden Street	Scenario	Existing Plus Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	6	17	25	21
Through	0	0	1,121	916
Right	28	4	34	25
Total	34	21	1,180	962

Major Street Direction

	North/South
x	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Sand Creek Road	**Minor Street** Linden Street	**Warrant Met**
Number of Approach Lanes	**3**	**1**	**NO**
Traffic Volume (VPH) *	**2,142**	**34**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR & PEERS

Major Street	Sand Creek Road	Project	Sand Creek Sports Complex
Minor Street	Linden Street	Scenario	Existing Plus Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	6	17	25	21
Through	0	0	1,121	916
Right	28	4	34	25
Total	34	21	1,180	962

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	3.7
Approach with Worst Case Delay	WB
Total Vehicles on Approach	962

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Plus Project	**1**	**34**	**2,197**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

100 Pringle Avenue | Suite 600
Walnut Creek, CA 94596
www.fehrandpeers.com

APPENDIX D

BIOLOGICAL RESOURCES ASSESSMENT

Biological Resources Assessment

Brentwood Sand Creek Sports Complex

City of Brentwood, Contra Costa County, California

Prepared For: Raney Planning & Management
Inc. 1501 Sports Drive
Suite A Sacramento, CA 95834

Report Date: January 2024

BARGAS

Sacramento Valley ▰ Inland Empire ▰ Greater Los Angeles ▰ San Diego
www.Bargas.com

Project Team

Report Author(s):	William Ramirez-Watson
Field Surveyor(s):	Dustin Baumbach, Jinnah Benn
GIS:	William Ramirez-Watson
Project Manager:	Dustin Baumbach
Review Teams:	Anthony Hartman, Jinnah Benn, Linda Nations

Recommended Citation: Bargas. 2024. Biological Resources Assessment –Brentwood Sand Creek Sports Complex, the City of Brentwood, Contra Costa County, California. Prepared for Raney Planning & Management. January 2024.

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1 Introduction

Bargas Environmental Consulting, LLC (Bargas) has prepared this Biological Resources Assessment (hereafter, Assessment) on behalf of Raney Planning & Management (Applicant) for the Brentwood Sand Creek Sports Complex (Project) located in Brentwood, Contra Costa County. This Assessment analyzes the potential for special status endangered, threatened, and sensitive species and their habitats to occur within the Biological Survey Area.

1.1 Summary of Findings

The Biological Survey Area includes potential habitat for one special-status wildlife species (Burrowing Owl; *Athene cunicularia*; California Species of Special Concern [SSC]). No aquatic resources or other sensitive habitats were observed within the Biological Survey Area.

1.2 Project Location

The proposed Project is approximately 14.48 acres located at the northwest corner of Sand Creek Road and Fairview Avenue, Brentwood, Contra Costa County, California (APN 019-110-032 and 019-110-046). The site is generally located in Section 11, Township 1 North, Range 2 East of the U.S. Geological Survey's (USGS) 7.5-*Brentwood* quadrangle. The approximate center point of the Project site is 37.945°, -121.727° (WGS84). The location of the Project is shown in **Figure 1**.

1.3 Project Description

The project proposes to construct two or three full-size, lighted sports fields (soccer/multi-use to be determined, preferably with artificial turf), parking lot, restrooms, storage building, picnic areas, and other amenities such as pickleball courts, outdoor exercise equipment, playground, shade elements, and more.

1.4 Definitions

The following definitions for areas will be followed throughout this report:

- **Project site:** The Project site is defined as the 14.48 acres being analyzed for Project entitlements.
- **Biological Study Area:** The Biological Study Area (Study Area) is defined as the 14.48-acre area within which biological resources were fully analyzed.
- **Regional Study Area:** The Regional Study Area is defined as the Project site and a 3-mile buffer. The Regional Study Area was used as the basis for determining special-status biological resource records for consideration in this report.

A map depicting these areas is provided as **Figure 2.**

Source: ESRI ArcGIS Online Basemap - World Topographic Map, World Street Map

Public Land Survey System (PLSS):
Mount Diablo Meridian,Township 1N, Range 2E, Section 11

USGS Quad(s): Brentwood (2016)

Watershed: San Joaquin Delta (18040003)

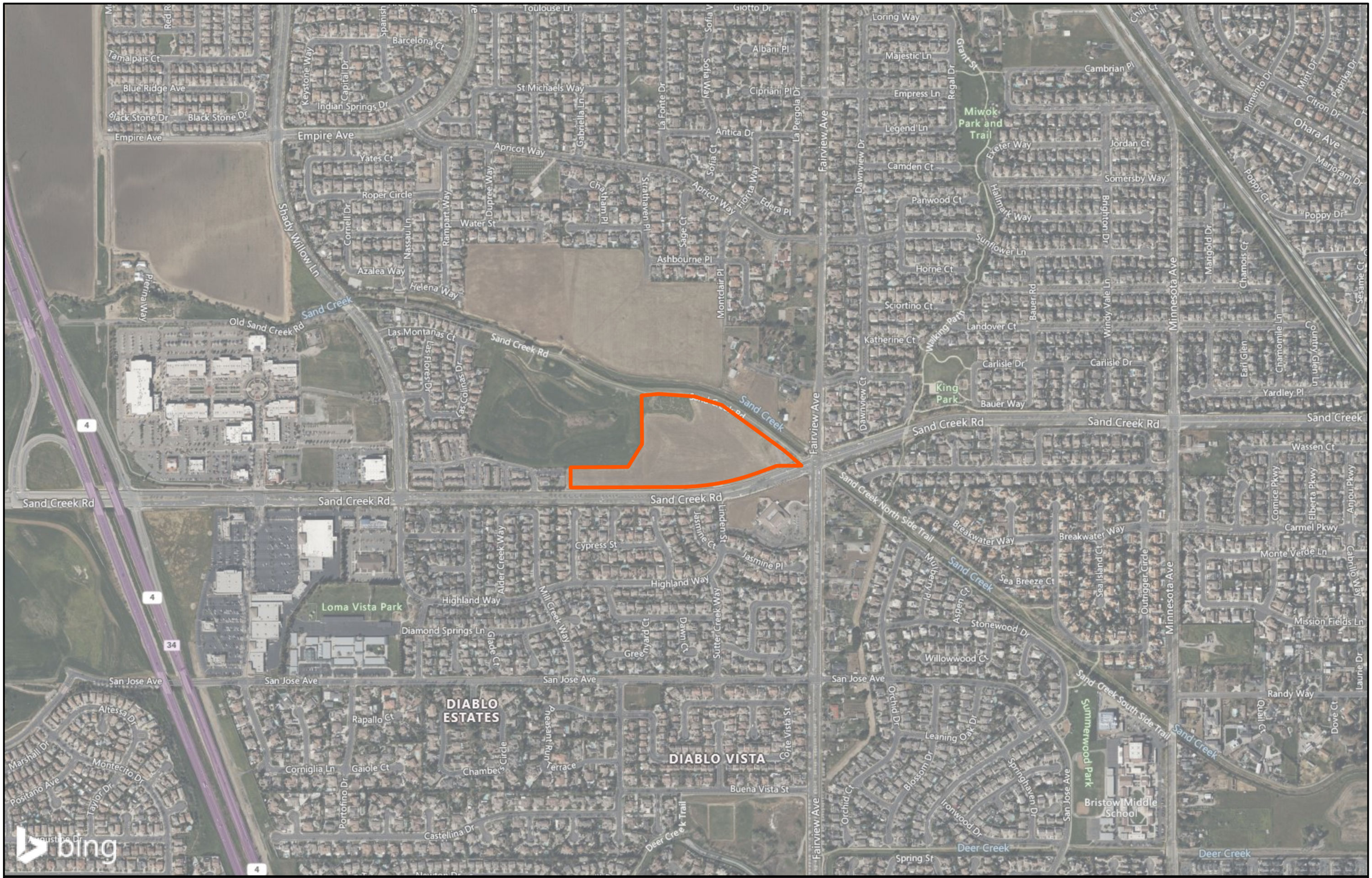
Project Site Coordinates: -121.727°W 37.945°N

BARGAS
Environmental Consulting

Figure 1
Project Site and Vicinity

Sand Creek Sports Complex

Map Created: 8/17/2023, Created By: William Ramirez-Watson, Map Revised: N/A, Bargas Project Number: 1773-23



Source: Bing Maps Hybrid

N

0 500 1,000 Feet

1 inch = 1,000 feet

BARGAS
Environmental Consulting

▭ Study Area (14.48 acres)

Figure 2
Study Area

Sand Creek Sports Complex

Map Created: 8/17/2023, Created By: William Ramirez-Watson, Map Revised: N/A, Bargas Project Number: 1773-23

2 Regulatory Setting

2.1 Federal

2.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) is the federal government's primary regulation protecting rare and declining plant and wildlife species. FESA is jointly implemented by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS, addressing marine resources only). FESA protects species using the following status designations:

- A federally **endangered** species is a species of invertebrate, plant, or wildlife formally listed by the USFWS under FESA as facing extinction throughout all or a significant portion of its geographic range.
- A federally **threatened** species is one formally listed by the USFWS as likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
- A **proposed** threatened or endangered species is one officially proposed by the USFWS for addition to the federal threatened or endangered species list.
- **Candidate** species are "plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under FESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities."

"Take" of a federally endangered or threatened species or its habitat is prohibited by federal law without a special permit. The term "take," under FESA, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Harm" is defined by the USFWS to encompass "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering" (50 CFR § 17.3).

Section 10(a)(1)(B) of the FESA allows for take of a threatened or endangered species incidental to development activities once a Habitat Conservation Plan (HCP) has been prepared to the satisfaction of the USFWS and a Section 10(a) incidental take permit has been issued to an applicant. For federal projects (including those involving federal funding), Section 7 of the FESA allows for consultation between the affected agency and the USFWS to determine what measures may be necessary to compensate for the incidental take of a listed species. A federal project is any project that is proposed by a federal agency or is at least partially funded or authorized by a federal agency. Additionally, if the listed species or its habitat occurs in a portion of the project subject to federal jurisdiction (such as waters of the United States by the United States Army Corps of Engineers [USACE] under Section 404 of the Clean Water Act [CWA]), then consultation under Section 7 of the FESA is usually permissible and may be required.

FESA also requires the USFWS to consider whether there are areas of habitat essential to conservation for each listed species. **Critical habitat** designations protect these areas, including habitat that is currently unoccupied but may be essential to the recovery of a species. An area is designated as critical habitat after the USFWS publishes a proposed federal regulation in the Federal Register and then receives and considers public comments on the proposal. The final boundaries of critical habitat are officially designated when published in the Federal Register.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) is a federal law governing the taking, killing, possession, transportation, and importation of various birds, their eggs, parts, and nests. The take of any number of a bird species listed as protected on any one of four treaty lists is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over utilization. The MBTA also prohibits taking, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, certain bird species, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11).

2.1.3 Clean Water Act of the United States

The regulatory setting with regards to aquatic resources is framed by current enabling legislation and case law. Under Section 404 of the CWA, the USACE regulates the discharge of dredged and fill materials into “waters of the U.S.” Jurisdictional waters of the U.S. include “territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; tributaries; lakes and ponds, and impoundments of jurisdictional waters; and adjacent wetlands” (33 Code of Federal Regulations [CFR] § 328.3). Certain waters of the U.S. are considered “special aquatic sites” because they are generally recognized as having ecological value; such sites include sanctuaries and refuges, wetlands, mudflats, vegetated shallows, and riffle and pool complexes (40 CFR § 230). Special aquatic sites are defined by the U.S. Environmental Protection Agency (USEPA) and may be afforded additional consideration in a project’s permit process. The USACE also regulates navigable waters under Section 10 of the Rivers and Harbors Act of 1899. Navigable waters are defined as “… those waters of the U.S. that… are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce” (33 CFR § 322.2). Projects that place fill in jurisdictional wetlands and non-wetland waters of the U.S. require a permit from the USACE under Section 404 of the CWA. The USACE issues nationwide permits for specific types of activities with minimal individual or cumulative adverse environmental impacts. Individual permits are required for large and/or complex projects or projects that exceed the impact threshold for nationwide permits. Recent federal rulemaking has modified how the USACE defines certain waters of the U.S. The most pertinent rules are summarized below.

The USEPA published a revised definition of "waters of the United States" on December 7, 2021 in response to President Biden’s Executive Order 13990 (86 Federal Register 7037) and after Pascua Yaqui Tribe v. EPA in which the U.S. District Court of the District of Arizona "vacated and remanded" the Navigable Waters Protection Rule (86 Federal Register 69372). The proposed revision was published in the Federal Register on January 18, 2023 and took effect on March 20, 2023. Due to ongoing litigation, the agencies are interpreting “waters of the United States” consistent with pre-2015 regulations and the Supreme Court cases of Rapanos v. United States and Carabell v. United States (USEPA 2008), meaning the USACE will assert jurisdiction over traditional navigable waters (TNW) and the following types of features determined to have "significant nexus" to a TNW:

1. wetlands adjacent to TNWs,

2. non-navigable tributaries of TNWs that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally, and
3. wetlands that directly abut non-navigable tributaries of TNWs.

2.2 State of California

2.2.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) is a public disclosure process codified by California Public Resources Code 21000, requiring decision-makers to analyze the environmental impacts of a project, disclose those impacts to the public, and mitigate environmental impacts to the extent feasible. The state or local lead agency provides an evaluation of project effects on biological resources; determining the significance of those effects is guided by Appendix G of the CEQA Guidelines (AEP 2023). These evaluations must consider direct effects on a biological resource within the Study Area itself, indirect effects on adjacent resources, and cumulative effects within a larger area or region. Effects can be locally important but not significant according to CEQA if they would not substantially affect the regional population of the biological resource. Significant adverse impacts on biological resources would include the following:

- Substantial adverse effects on any species identified as candidate, sensitive, or special status in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife (CDFW) or the USFWS (these effects could be either direct or indirect [via habitat modification]);
- Substantial adverse impacts to species designated by the CDFW as SSC;
- Substantial adverse effects on riparian habitat or other sensitive habitat identified in local or regional plans, policies, or regulations or by CDFW and USFWS;
- Substantial adverse effects on federally protected wetlands defined under Section 404 of the CWA (these effects include direct removal, filling, or hydrologic interruption of marshes, vernal pools, coastal wetlands, or other wetland types);
- Substantial interference with movements of native resident or migratory fish or wildlife species population, or with use of native wildlife nursery sites;
- Conflicts with local policies or ordinances protecting biological resources (e.g., tree preservation policies); and;
- Conflict with provisions of an adopted HCP, Natural Community Conservation Plan (NCCP), or another approved local, regional, or state habitat conservation plan.

2.2.2 California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the take of state-listed threatened and endangered species. Under CESA, state agencies are required to consult with CDFW when preparing CEQA documents. Under CESA, CDFW is responsible for maintaining a list of rare, threatened, and endangered species designated under state law (California Fish and Game Code [CFGC] § 2070-2079). CDFW also maintains lists of candidate species, SSC, and fully-protected species. Candidate species are those taxa that have been formally recognized by the

CDFW and are under review for addition to the state threatened and endangered list. Species of special concern are those taxa that are considered sensitive, and this list serves as a “watch list.” The CDFW can authorize “take” if an incidental take permit is issued by the Secretary of the Interior or of Commerce in compliance with FESA, or if the director of the CDFW issues a permit under Section 2080 in those cases where it is demonstrated that the impacts are minimized and mitigated.

2.2.3 California Fish and Game Code

Section 1600 et seq. – Lake and Streambed Alteration Agreement. Section 1600 provides provisions for protecting riparian systems, including the bed, banks, and riparian habitat of lakes, seasonal and perennial streams, and rivers. This section requires an applicant to notify CDFW and obtain a Lake and Streambed Alteration Agreement (LSAA) if their project would divert or obstruct the natural flow of any river, stream, or lake; change the bed, channel, or bank of any river, stream, or lake; use material from any river, stream, or lake; or deposit or dispose of material into any river, stream, or lake.

Section 2050 et seq. – California Endangered Species Act. CESA establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA is administered by CDFW and prohibits the take of any species that the California Fish and Game Commission determines to be a threatened or endangered species. CESA also mandates that “state agencies should not approve projects as proposed which would jeopardize the continued existence of any endangered species or threatened species” if reasonable and prudent alternatives are available that would avoid jeopardy. CDFW administers CESA and authorizes take through CFGC 2081 Incidental Take Permits or through Section 2080.1. (For species also listed under FESA, consistency determination is with a USFWS Biological Opinion).

Section 3511 – Fully Protected Species. The legislature of the State of California designated certain species as “fully protected” prior to the creation of CESA. Section 3511 states that “fully protected” birds, or parts thereof, may not be taken or possessed at any time. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, mammals, amphibians and reptiles, and birds. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA.

Sections 3503, 3503.5, 3505, 3513 — Birds. These CFGC sections protect all birds, including birds of prey and all nongame birds, as well as their eggs and nests, for species that are not already listed as fully protected and that occur naturally within the state. Sections 3503 and 3503.5 of the CFGC stipulate the following regarding eggs and nests: Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by CFGC or any regulation made pursuant thereto; and Section 3503.5 states that is it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by CFGC or any regulation adopted pursuant thereto. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

2.2.4 California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (GFGC § 1900-1913) affords the CDFW Commission the authority to designate native plants as endangered or rare and protect them from “take.” The California Native Plant Society (CNPS) maintains a list of sensitive plant species native to California and assigns each a rank in the California Rare Plant Rank (CRPR) system defined below:

- List 1A: Plants presumed extirpated in California and either rare or extinct elsewhere;
- List 1B: Plants are rare, threatened, or endangered in California and elsewhere;
- List 2A: Plants presumed extirpated in California, but more common elsewhere;
- List 2B: Plant are rare, threatened, or endangered in California, but more common elsewhere;
- List 3: Plants about which more information is needed (on a review list);
- List 4: Plants of limited distribution (on a watch list).

This list is further defined as described below:

- 0.1: Seriously threatened in California, meaning there is a high degree (over 80% of occurrences) and immediacy of threat;
- 0.2: Moderately threatened in California, meaning there is a moderate degree (20-80% of occurrences) and immediacy of threat;
- 0.3: Not very threatened in California, meaning there is a low degree (less than 20% of occurrences) and immediacy of threat.

All plants on Lists 1 and 2 meet the standards for state listing under the CEQA Guidelines (14 CCR § 15380). CNPS recommends that plants on Lists 3 and 4 be evaluated for consideration under CEQA.

2.2.5 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 established the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB), collectively referred to as the Water Boards, and authorized them to provide oversight for water rights and water quality. It uses the National Pollutant Discharge Elimination System (NPDES) to monitor point source discharges into the waters of the State to prevent water quality degradation. It also protects wetlands, surface waters, and groundwater from both point and nonpoint sources of pollution.

2.2.6 State Wetland Definition and Procedures

The SWRCB adopted the “State Wetland Definition and Procedures for Discharges or Fill Material to Waters of the State” in 2019 and completed revisions to this set of procedures in 2021 (SWRCB 2021). Four major elements are included in these procedures as described below, in addition to procedures for the submittal, review and approval of CWA Section 401 permits not described in this report.

1. Wetland definition:

An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration such saturation is sufficient to cause anaerobic conditions in the upper substrate; and 3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

2. Framework for determining waters of the state:

Waters of the state are broadly defined by the Porter-Cologne Water Quality Control Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The 2021 procedures expand upon this definition to clearly include natural wetlands, wetlands created by modification of a surface water of the state, and artificial wetlands meeting specific criteria.

The criteria for an artificial wetland include wetlands created for agency-approved compensatory mitigation; those identified in a water quality control plan; and those greater than or equal to one acre in size unless they are constructed and maintained for wastewater treatment or disposal, sediment settling, stormwater permitting program pollutant or runoff management, surface water treatment, agricultural crop irrigation or stock watering, fire suppression, industrial processing and cooling, active surface mining, log storage, recycled water management, maximizing groundwater recharge, or rice paddies.

3. Wetland delineation procedures:

USACE-defined procedures for aquatic resources delineation (USACE 1987; USACE 2008, USACE 2010) used to assess the presence or absence of hydrophytic vegetation, hydric soils, and wetland hydrology are required by the SWRCB to delineate waters of the state, with one modification being that "the lack of vegetation does not preclude the determination of such an area that meets the definition of wetland."

2.3 Local Policies and Ordinances

2.3.1 East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan

The Study Area falls within the Urban Limit Line (ULL) as defined in the East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (ECCC HCP/NCCP). This HCP/NCCP gives authorization for limited take and conservation guidance for 28 listed species. The plan provides avoidance and mitigation measures for projects that occur near HCP/NCCP preserves as well as guidance on developer fees based on acreage and landcover type to fund conservation.

3 Methods

This Assessment is informed by data from a desktop analysis of the literature and numerous resource databases, as well as field surveys. The methods used to complete these surveys and desktop analyses are described below.

3.1 Desktop Review

Prior to conducting field surveys, Bargas conducted an initial review of literature and data sources to characterize biological conditions and to compile records of sensitive biological resources that could potentially occur in the Study Area. The methods used for this analysis are described below.

3.1.1 Biological Setting

The biological setting includes terrain, hydrology, soils, land uses, and other features that support or inhibit biological resources in an area. To better understand the biological setting of the project, the following resources were reviewed in detail:

- USFWS's *National Wetlands Inventory* to determine if surface waters and wetlands have been mapped on, or adjacent to, the Study Area.
- USGS's *National Hydrography Dataset* to determine if hydrological features have been mapped on, or adjacent to, the l Study Area.
- U.S. Department of Agriculture's National Resource Conservation Service *Web Soil Survey* to map and describe soil(s) within the Study Area.
- Google Earth Pro aerial map images of the Study Area, including historical aerial images.

3.1.2 Special Status Species & Habitats

Bargas has created a well-defined list of habitats and species that could reasonably be expected to occur within the Study Area. The following describes how the list of potentially occurring special status biological resources was assembled.

3.1.2.1 Data Sources

Species and habitat occurrences were queried from the following resources:

- USFWS's *Information for Planning and Consultation* portal (IPaC) for a list of federally listed species and designated critical habitat recommended for impact analysis consideration, based on an upload of the Study Area limits.
- CDFW's *California Natural Diversity Database* (CNDDB) for special status species and habitat records within the Regional Study Area.
- CNPS's *Inventory of Rare and Endangered Plants* for a list of special status plant species occurrences within the USGS 7.5-minute quadrangles that overlap the Regional Study Area.

3.1.2.2 Special Status Designations Considered

A variety of agencies and respected non-profit organizations assess the conservation status of plant and wildlife species; however, not all are applicable to this Assessment. The following special status designations were considered when determining special status species to be discussed in this Assessment:

- **Federal Status:** Species listed as **Endangered (FE)** or **Threatened (FT)**, as well as species **Proposed as Endangered (FPE)**, **Proposed as Threatened (FPT)**, **Proposed for Delisting (FPD)**, and **Candidates (FC)** for listing under the FESA.
- **California Status:** Species listed as **Endangered (CE)** or **Threatened (CT)**, as well as species that are **Candidates** for **Endangered (CCE)** status, **Threatened (CCT)** status, or **Delisting (CCD)** under the California Endangered Species Act. Also considered are species listed as **Fully Protected (FP)** and **Species of Special Concern (SSC)**.
- **CNPS Status:** All California Rare Plant Ranks (CRPR) maintained by the CNPS *Inventory of Rare and Endangered Plants*.
- **Vegetation Communities:** All vegetation communities mapped by the CNDDB.

3.1.3 Occurrence Potential

Following the desktop review, field surveys, and habitat analyses, Bargas assessed the potential for the occurrence of special status species in the Study Area. Biological conditions (vegetation communities, wildlife habitats, disturbances, etc.) and the habitat and life cycle requirements of special status species identified for analysis in the desktop review were considered. “Recent” occurrences are defined as observed within the past 30 years. Based on these considerations, species were assigned to the following categories:

- **Present:** Species is known to occur in Study Area based on recent surveys, CNDDB (within 30 years), or other records.
- **High**: Species with known recent recorded occurrences/populations near the Study Area and highly suitable habitat occurs within the Study Area. Highly suitable habitat includes all necessary elements to support the species (e.g., elevation, hydrology, soils, cover, habitat type, food resources).
- **Moderate.** Species with known recent recorded occurrences/populations near the Study Area; however, habitat within the Study Area has been moderately disturbed, fragmented, or is small in extent. Moderately suitable habitat includes several elements to support the species (e.g., elevation, hydrology, soils, cover, habitat type, food resources). Furthermore, moderately suitable habitat may also be located at the edge of the species’ range, or there are no reported occurrences nearby.
- **Low**. Species with few known recent recorded occurrences/populations near the Study Area and habitat within the Study Area is highly disturbed or extremely limited. A low potential is assigned to annual or perennial plant species that may have been detectable during a focused survey in the appropriate blooming period but was not found; however, small populations or scattered individuals are still considered to have a low potential to occur. Additionally, species for which poor-quality habitat may support the species within the Study Area, but the reported extant range is far outside the Study Area and/or any species observations would anticipate being migratory (i.e., not likely to reproduce within the Study Area).
- **Presumed Absent/No Potential**. Focused surveys were conducted and the species was not detected, or the species was found in the desktop review but suitable habitat (soil, vegetation, elevational range) was not found in the Study Area, or the Study Area is not within the known geographic range of the species.

The potential for bird species were further distinguished into those that may: 1) nest within or near the Study Area; 2) forage within or near the Study Area; and/or 3) occur on or near the Study Area only as transients during migratory flights or other dispersal events.

3.2 Field Surveys

A field assessment was conducted for the Biological Survey Area on July 25, 2023. Meandering transects were walked on foot throughout the entire Biological Survey Area. Habitat types were documented, and plant and wildlife species were recorded. Areas that were determined to be potential habitat for a special-status species were further assessed for suitability.

Survey dates, times, personnel, and weather conditions are summarized in **Table 1** below.

Table 1. Survey Summary Table

Date	**Biologist(s)**	**Time**	**Start Conditions**			**End Conditions**		
			Temp	**Clouds**	**Wind**	**Temp**	**Clouds**	**Wind**
July 25, 2023	Dustin Baumbach, Jinnah Benn	1400 - 1430	90°F	Mostly Clear	Calm, out of the East	93°F	Clear	Calm, out of the East

3.3 Habitat Analysis

Habitat suitability was analyzed *in situ* during the site field survey and via satellite imagery during the desktop analysis.

3.4 Taxonomy and Nomenclature

Every effort was made to use naming standards that are recognized by the scientific community, with the understanding that – for many wildlife groups – scientists may not always agree on a standard source. Because of this, some common names used in this report may not be the same as those used by the underlying data sources for species records. Bargas maintains a yearly-updated reference species list which uses the following taxonomic sources:

- **Birds** – American Ornithological Society Check-list and Supplements (AOS 1998).
- **Mammals** – The reference list in the CDFW's California Wildlife Habitat Relationship (CWHR) System database (CDFW 2014), with updates based on the American Society of Mammologists, Mammal Diversity Database (2020).
- **Reptiles and Amphibians** – The technical website californiaherps.com, which is regularly updated based on the latest taxonomic literature.
- **Fish** – American Fisheries Society publication, *Common and Scientific Names of Fishes from the United States, Canada, and Mexico, 7th edition* (AFS 2013)
- **Invertebrates** – No naming standard was identified that was current and applicable to freshwater and terrestrial invertebrates. Names used by the underlying data sources when a species was first identified were retained.
- **Plants** – The Jepson eFlora database (Jepson Flora Project 2021)

4 Results

This section discusses in detail what is known about biological resources in the Study Area based on information from the field survey, 76 CNDDB records, 7 CNPS records, 11 IPaC records, and one critical habitat determination in the Regional Study Area. A list of plant species observed within the Survey Area is included in **Appendix A** and a list of wildlife species observed is included in **Appendix B.**

4.1 Biological Setting

The Regional Study Area is located in a suburban residential area in the city of Brentwood, CA. The area is near the San Joaquin River Delta and the Diablo Range.

4.2 Soils

Two soil types were mapped within the Study Area using the Soil Survey Geographic Database (NRCS 2023). They include Capay clay, 0 to 3 percent slopes, Major Land Resource Area (MLRA) 17 (CaA); and Sycamore silty clay loam, clay substratum (Sp). CaA comprises 7.48 acres in the Study Area. CaA soil profile is 0 to 51 inches: clay, and 51 to 72 inches: silty clay loam. SP comprises 7.0 acres in the Study Area. The SP soil profile is 0 to 15 inches: silty clay loam, 15 to 40 inches: silt loam, and 40 to 60 inches: clay.

A map depicting the soils present as **Figure 3**

Source: Bing Maps Hybrid, NCRS Soils Data (10/2021)

N

0 150 300 Feet

1 inch =300 feet

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▭	Study Area
▭	Surrounding SSURGO Soils
▨	CaA—Capay clay, 0 to 3 percent slopes, MLRA 17
▨	Sp—Sycamore silty clay loam, clay substratum

Figure 3
Soils Map

Sand Creek Sports Complex

Map Created: 9/8/2023, Map Revised: N/A, Bargas Project Number: 1773-23

4.3 Habitats

The entire Study Area is classified as disturbed habitat. The habitat type is described below.

4.3.1 Critical Wildlife Habitat

The Study Area falls within the jurisdictional boundaries for the Delta smelt (*Hypomesus transpacificus;* FT; SE), which is threatened under the ESA and endangered under the CESA. The USFWS has designated this area as critical habitat; however, Delta smelt is only found in aquatic habitats below the high tide line. The Study Area does not contain aquatic habitat and therefore does not support Delta smelt.

4.3.2 Disturbed

The entire Study Area (14.48 acres) is comprised of disturbed habitat consisting of plowed fields.

4.4 Vegetation Communities

4.4.1 Extant Vegetation Communities

The vegetation community within the Study Area is comprised of Mediterranean grasses and forbs including, but not limited to, Foxtail barley (*Hordeum murinum*), Italian rye grass (*Festuca perennis*), Italian thistle (C*arduus tenuiflorus*), and Wild radish (*Raphanus raphanistrum*).

4.4.2 Sensitive Vegetation Communities

No sensitive vegetation communities were mapped by the CNDDB within the Regional Study Area.

4.5 Special Status Species

4.5.1 Special Status Plants

The desktop review determined that 10 plant taxa with special status had been documented as occurring within the Regional Study Area.

4.5.1.1 Taxa With No Potential for Occurrence

All 10 special status plant taxa from desktop analysis were determined to have **No** potential for occurrence in the Study Area.

Bolander's Water-Hemlock
Apiaceae > Cicuta maculata var. bolanderi
FESA: None, CESA: None, CRPR 2B.1

California Endemic:	False
Growth Habit:	perennial herb blooms Jul-Sep
Habitat Requirements:	Marshes and swamps at elevations ranging from 0 to 655 feet.
Inclusion Source(s):	CNPS
CNDDB Records:	0
Nearest CNDDB Record:	None

Habitat Present: Not Present
Soils Present: Unknown
Determination Reason: The Study Area lacks the tidal salt marsh habitat necessary to support *Cicuta maculata var. bolanderi*

Suisun Marsh Aster

Asteraceae > Symphyotrichum lentum
FESA: None, CESA: None, CRPR 1B.2

California Endemic: True
Growth Habit: perennial rhizomatous herb blooms (Apr) May-Nov
Habitat Requirements: Marshes and swamps at elevations ranging from 0 to 10 feet.
Inclusion Source(s): CNPS
CNDDB Records: 0
Nearest CNDDB Record: None
Habitat Present: Not Present
Soils Present: Unknown
Determination Reason: The Study Area lacks suitable wetland habitat to support Symphyotrichum lentum.

Big Tarplant

Asteraceae > Blepharizonia plumosa
FESA: None, CESA: None, CRPR 1B.1

California Endemic: True
Growth Habit: annual herb blooms Jul-Oct
Habitat Requirements: Valley and foothill grassland at elevations ranging from 100 to 1,655 feet.
Microhabitat: Clay (usually)
Inclusion Source(s): CNPS
CNDDB Records: 0
Nearest CNDDB Record: None
Habitat Present: Not Present
Soils Present: Unknown
Determination Reason: The Study Area is not within the elevation range for *Bleparizonia plumosa.* Additionally, the Study Area exceeds the species tolerance for accumulated temperature.

Brewer's Western Flax

Linaceae > Hesperolinon breweri
FESA: None, CESA: None, CRPR 1B.2

California Endemic: True
Growth Habit: annual herb blooms May-Jul
Habitat Requirements: Chaparral, Cismontane woodland, Valley and foothill grassland at elevations ranging from 100 to 3100 feet.
Microhabitat: Serpentine (usually)
Inclusion Source(s): CNDDB, CNPS

CNDDB Records:	1
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Not Present
Soils Present:	Unknown
Determination Reason:	*Hesperolinon breweri* grows mostly on sloped habitats, which is missing from the Study Area. The Study Area has a warmer average than the species tolerance. The area also receives less precipitation than the plant tolerance.

Antioch Dunes Evening-Primrose

Onagraceae > Oenothera deltoides ssp. howellii

FESA: Federal Endangered, CESA: California Endangered, CRPR 1B.1

California Endemic:	True
Growth Habit:	perennial herb blooms Mar-Sep
Habitat Requirements:	Inland dunes at elevations ranging from 0 to 100 feet.
Inclusion Source(s):	CNDDB, CNPS
CNDDB Records:	1
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Not Present
Soils Present:	No
Determination Reason:	The Study Area lacks the sand dune habitat necessary to support this species. This plant is only known to be found at Antioch Dunes National Wildlife Refuge.

Showy Golden Madia

Asteraceae > Madia radiata

FESA: None, CESA: None, CRPR 1B.1

California Endemic:	True
Growth Habit:	annual herb blooms Mar-May
Habitat Requirements:	Cismontane woodland, Valley and Foothill Grassland at elevations ranging from 80 to 3,985 feet.
Inclusion Source(s):	CNDDB
CNDDB Records:	1
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Not Present
Soils Present:	Unknown
Determination Reason:	*Madia radiata* is endemic to the area however it is presumed extirpated. The CNDDB record shows the nearest record dates to 1941. Additionally, the Study Area is lower in elevation than the species tolerance.

Caper-fruited Tropidocarpum

Brassicaceae > Tropidocarpum capparideum

FESA: None, CESA: None, CRPR 1B.1

California Endemic:	True

Growth Habit:	annual herb blooms Mar-Apr
Habitat Requirements:	Valley and Foothill Grassland at elevations ranging from 5 to 1,495 feet.
Inclusion Source(s):	CNPS
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Not Present
Soils Present:	Unknown
Determination Reason:	Tropidocarpum capparideum was last seen in 1957. It is likely extirpated from the area.

San Joaquin Spearscale

Chenopodiaceae > Extriplex joaquinana
FESA: None, CESA: None, CRPR 1B.2

California Endemic:	True
Growth Habit:	Annual herb blooms Apr-Oct
Habitat Requirements:	Chenopod scrub, Meadows and Seeps, Playas, Valley and Foothill Grassland at elevations ranging from 5 to 2,740 feet.
Microhabitat:	Alkaline
Inclusion Source(s):	CNDDB, CNPS
CNDDB Records:	4
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Not Present
Soils Present:	Unknown
Determination Reason:	The Study Area lacks the soil conditions necessary to support *Extriplex joaquinana.*

Brittlescale

Chenopodiaceae > Atriplex depressa
FESA: None, CESA: None, CRPR 1B.2

California Endemic:	True
Growth Habit:	Annual herb blooms Apr-Oct
Habitat Requirements:	Chenopod scrub, Meadows and Seeps, Playas, Valley and Foothill Grassland, Vernal pools at elevations ranging from 5 to 1,050 feet.
Microhabitat:	Alkaline, Clay
Inclusion Source(s):	CNDDB
CNDDB Records:	2
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Not Present
Soils Present:	Unknown
Determination Reason:	*Atriplex depressa* is unlikely to occur due to regular human disturbance on the Project site.

Stinkbells

Liliaceae > Fritillaria agrestis

FESA: None, CESA: None, CRPR 4.2

California Endemic:	True
Growth Habit:	Perennial bulbiferous herb blooms Mar-Jun
Habitat Requirements:	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland at elevations ranging from 35 to 5,100 feet.
Microhabitat:	Clay, Serpentinite (sometimes)
Inclusion Source(s):	CNDDB
CNDDB Records:	1
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Not Present
Soils Present:	Unknown
Determination Reason:	The Study Area is at a lower elevation than *Fritillaria agrestis* is able tolerate and is unlikely to be present.

4.5.2 Special Status Wildlife

The desktop review determined that 16 wildlife taxa with special status had been documented as occurring within the Regional Study Area. These taxa and their occurrence potential are summarized below.

4.5.2.1 *Taxa With Moderate Potential for Occurrence*

The following one special status wildlife taxa from desktop analysis were determined to have **Moderate** potential for occurrence in the Study Area:

Burrowing Owl

Strigidae > *Athene cunicularia*

California Species of Special Concern

Life History:	A yearlong resident of open, dry grassland and desert habitats, and in grass, forb, and open shrub stages of Pinyon-Juniper and Ponderosa Pine habitats. Formerly common in appropriate habitats throughout the state, excluding the humid northwest coastal forests and high mountains. Numbers markedly reduced in recent decades. Present on the larger offshore islands. Found as high as 1600 meters (5,300 feet) in Lassen County. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	CNDDB
CNDDB Records:	35
Nearest CNDDB Record:	Overlaps
Habitat Present:	Medium Quality

Determination Reason:	Burrowing Owls are able to utilize disturbed open fields for sheltering and nesting. The Study Area is a disturbed open field with at least one burrow and low tufts of vegetation considered suitable this species.

4.5.2.2 Taxa With Low Potential for Occurrence

The following nine special status wildlife taxa from desktop analysis were determined to have **Low** potential for occurrence in the Study Area.

Monarch - California Overwintering Population

Nymphalidae > *Danaus plexippus*

Federal Candidate

Life History:	The iconic black and orange Monarch butterfly is known for its astonishing long-distance annual migration and reliance on milkweed as its obligate larval host plant. Though genetically similar, there are two subpopulations of Monarchs in North America, with the eastern population overwintering in Mexico and breeding in the midwestern states, and the western population overwintering in coastal California and fanning out across the west from Arizona to Idaho. Both North American migratory populations have declined over the past twenty years due to a suite of interrelated factors including habitat loss in breeding and overwintering sites, habitat degradation, disease, pesticide exposure, and climate change. Recently the western population has experienced dramatic swings, for a low of less than 2,000 in 2020-21 to over 200,000 in 2021-22. While it is unclear which of the many factors are driving these dynamics, insect population commonly fluctuate from year to year. Though more research is needed, a stable population for western monarchs is likely closer to the historic averages in the 1980s, which are estimated to have ranged between one to four million overwintering butterflies. *Source:* *https://wildlife.ca.gov/Conservation/Invertebrates/Monarch-Butterfly*
Inclusion Source(s):	IPaC
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Low Quality
Determination Reason:	*Danaus plexippus* may use the Study Area for transit; however, milkweed has not been documented within the Study Area. The Study area has the potential to support two of six milkweed species that host caterpillars of *Asclepias californica* and *Asclepias eriocarpa* but is unlikely to occur since the Study Area is ploughed on a regular basis. There are portions on the northern section of the Study Area however that did not show signs of ploughing during the survey and could support milkweed if no disturbance occurs.

California Red-legged Frog

Ranidae > *Rana draytonii*

Federal Threatened; California Species of Special Concern

Life History:	The California Red-legged Frog inhabits quiet pools of streams, marshes, and occasionally ponds. Occurs along the Coast Ranges from Mendocino County south and in portions of the Sierra Nevada and Cascades Ranges, usually below 1200 meters (3,936 feet). This species was once a subspecies of Rana aurora, then known as the Red-legged Frog, and has been elevated to species-level status. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	CNDDB
CNDDB Records:	1
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Low Quality
Determination Reason:	California Red-legged frog favors calm flowing water with vegetation cover. The site lacks this type of habitat.

California Tiger Salamander

Ambystomatidae > *Ambystoma californiense*

Federal Endangered; California Endangered

Life History:	Most commonly found in Annual Grassland habitat, but also occurs in the grassy understory of Valley-Foothill Hardwood habitats, and uncommonly along stream courses in Valley-Foothill Riparian habitats. The species occurs from near Petaluma, Sonoma County, east through the Central Valley to Yolo and Sacramento counties and south to Tulare County; and from the vicinity of San Francisco Bay south to Santa Barbara County. They occur at elevations from 3 meters up to 1054 meters (3,200 feet). *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	CNDDB; IPaC
CNDDB Records:	4
Nearest CNDDB Record:	1 to 3 Miles
Habitat Present:	Low Quality
Determination Reason:	California Tiger Salamander is able to utilize open fields during the non-breeding season. However, recent plowing of the Study Area combined with the lack of vegetation presents low quality habitat.

Northern Legless Lizard

Anniellidae > *Anniella pulchra*

California Species of Special Concern

Life History:	This secretive, fossorial lizard is common in suitable habitats in the Coast Ranges from the vicinity of Antioch, Contra Costa County south to Ventura County. Legless lizards are of spotty occurrence throughout the rest of their range, which includes the floor of the San Joaquin Valley from San Joaquin County south, the west slope of the southern Sierra, the Tehachapi Mountains west of the desert, and the mountains of southern California. The specific identity of some populations within this range is unknown. Elevation is from near sea level to about 1800 meters (6,000 feet) in the Sierra. Common in several habitats but especially in Coastal Dune, Valley-Foothill, Chaparral, and Coastal Scrub types. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	CNDDB
CNDDB Records:	1
Nearest CNDDB Record:	< 1 Mile
Habitat Present:	Low Quality
Determination Reason:	Northern Legless lizards prefer moist, sandy soil with a cover of leaf litter. The site lacks this type of substrate.

Swainson's Hawk

Accipitridae > *Buteo swainsoni*

California Threatened

Life History:	Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, and Antelope Valley. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. In southern California, now mostly limited to spring and fall transient. Formerly abundant in California with wider breeding range. Decline resulted in part from loss of nesting habitat. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	CNDDB
CNDDB Records:	3
Nearest CNDDB Record:	< 1 Mile
Habitat Present:	Low Quality
Determination Reason:	Study Area is unsuitable for nesting as there are no structures to build nests on.

White-tailed Kite

Accipitridae > *Elanus leucurus*

California Fully Protected

Life History: Common to uncommon, yearlong resident in coastal and valley lowlands; rarely found away from agricultural areas. Inhabits herbaceous and open stages of most habitats mostly in cismontane California. Has extended range and increased numbers in recent decades. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. California Wildlife Habitat Relationship (CWHR) System version 9.0 personal computer program. Sacramento, CA.*

Inclusion Source(s): CNDDB

CNDDB Records: 1

Nearest CNDDB Record: 1 to 3 Miles

Habitat Present: Low Quality

Determination Reason: White-tailed kite is a year-round resident of the Central Valley and could utilize the open field for foraging; however, the field is disturbed (ploughed regularly and there is a lack of suitable nesting structures for them within the Study Area. This species may use the Study Area for foraging or transit.

American Badger

Mustelidae > *Taxidea taxus*

California Species of Special Concern

Life History: Uncommon, permanent resident found throughout most of the state, except in the northern North Coast area. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*

Inclusion Source(s): CNDDB

CNDDB Records: 1

Nearest CNDDB Record: 1 to 3 Miles

Habitat Present: Low Quality

Determination Reason: The American badger is able to utilize barren fields as habitat but require large continuous tracts of land to support them. The Study Area may be utilized by this species for transit.

Giant Garter Snake

Natricidae > *Thamnophis gigas*

California Threatened, Federally Threatened

Life History: Historically occupied the Sacramento and Jan Joaquin valleys, but current range is much reduced. Primarily associated with marshes and sloughs. Snakes are active from mid-March until October. Giant garter snakes forage for fish and amphibians and amphibian larvae primarily in and along streams. They are diurnal and often bask on emergent vegetation

	such as cattails and tules. At night they take refuge at night in mammal burrows, crevices and other small holes.
Inclusion Source(s):	ECCC HCP
CNDDB Records:	
Nearest CNDDB Record:	N/A
Habitat Present:	Low Quality
Determination Reason:	The Survey Area is within 200 feet of Sand Creek (a direct tributary to the San Joaquin River). While no foraging habitat is within the Survey Area, the giant garter snake could utilize the unploughed portions of the site for refuge at night. Source: *California Wildlife Habitat Relationships System. California Interagency Wildlife Task Group. CWHR version 9.0 personal computer program. Sacramento, CA.*

San Joaquin Kit Fox

Canidae > *Vulpes macrotis mutica*

Federal Endangered; California Threatened

Life History:	The San Joaquin Kit Fox (*Vulpes macrotis mutica*) is the smallest fox in North America, with an average body length of 20 inches and weight of about 5 pounds. Kit Foxes start breeding when they are one year old. In the fall, females begin to clean and enlarge their pupping dens. The foxes mate between December and March. Females give birth to two to six pups in February or March. The Kit Fox's range in the San Joaquin Valley extends from southern Kern County north to Contra Costa, Alameda, and San Joaquin counties on the western side of the valley; and to the La Grange area of Stanislaus County on the eastern side of the valley. The Kit Fox's range also includes valleys along the Coast Range including the Panoche and Cuyama valleys and the Carrizo Plain in San Luis Obispo County. Threats include habitat modification and destruction, energy development, drought, disease or pathogens, rodenticides, and predation.
Inclusion Source(s):	IPaC
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Low Quality
Determination Reason:	The San Joaquin Kit Fox needs a home range of about 1,000 acres in addition to soft sandy soils for dens, and neither of these conditions are present in Study Area. The Study Area could be accessed by fox via the adjacent creek and used for foraging as part of a greater home range.

4.5.2.3 Taxa With No Potential for Occurrence

The following seven special status wildlife taxa from desktop analysis were determined to have **No** potential for occurrence in the Study Area.

Conservancy Fairy Shrimp

Branchinectidae > *Branchinecta conservatio*

Federal Endangered

Life History: Conservancy fairy shrimp are located in vernal pool ecosystems primarily in the Central Valley of California from Tehama County to Merced County, with a small population in Ventura County's interior coast ranges. Their habitat is large, turbid freshwater vernal pools (playa pools) that are located in grassland, rural, or wetland communities. They eat algae, bacteria, protozoa, rotifers, and plant and animal waste. Conservancy fairy shrimp populations face threats such as habitat loss and fragmentation, grazing, invasive plants, climate change and drought, and pesticides. Source: https://www.fws.gov/species/conservancy-fairy-shrimp-branchinecta-conservatio

Inclusion Source(s): IPaC

CNDDB Records: 0

Nearest CNDDB Record: None

Habitat Present: Not Present

Determination Reason: The Study Area was heavily plowed during the time of the survey. No wetlands (suitable habitat) were observed within the Study Area. This species therefore has no potential to occur.

Vernal Pool Fairy Shrimp

Branchinectidae > *Branchinecta lynchi*

Federal Threatened

Life History: The Vernal pool fairy shrimp inhabits ephemeral pools with clear to tea-colored water. This species has been most commonly observed in grass or mud-bottomed swales, earth sump, or basalt flow depression pools in unplowed grasslands. The Vernal pool fairy shrimp has been collected from early December to early May. The water in pools inhabited by this species has a pH averaging 7.0, and low TDS, conductivity, alkalinity, and chloride. Although the Vernal pool fairy shrimp is found at a number of sites, it is not abundant at any of them. It often occurs with other fairy shrimp species, but is never the numerically dominant one. Source: https://www.govinfo.gov/content/pkg/FR-1992-05-08/pdf/FR-1992-05-08.pdf#page=76

Inclusion Source(s): CNDDB; IPaC

CNDDB Records: 2

Nearest CNDDB Record: 1 to 3 Miles

Habitat Present: Not Present

Determination Reason: Field was heavily plowed during the time of the survey. Habitat to support Vernal pool fairy shrimp is not present in the Study Area.

Vernal Pool Tadpole Shrimp

Triopsidae > *Lepidurus packardi*

Federal Endangered

Life History:	Vernal pool tadpole shrimp inhabits vernal pools and swales containing clear to highly turbid water. The Vernal pool tadpole shrimp is found at 14 vernal pool complexes in the Sacramento Valley from the Vina Plains in Butte County south of the Sacramento area in Sacramento County and west to the Jepson Prairie region of Solano County. The pools inhabited by the Vernal pool tadpole shrimp range in size from five square meters (16.4 square feet) in the Mather Air Force Base area of Sacramento County to the 38 hectare (89 acre) Olcott Lake at Jepson Prairie. The pools at Jepson Prairie and Vina Plains have a neutral pH, and very low conductivity, TDS, and alkalinity. These pools are most commonly located in grass-bottomed swales of unplowed grasslands in old alluvial soils underlain by hardpan, or in mud-bottomed pools containing highly turbid water. All pools known to be inhabited by this species are filled by winter and spring rains and may last until June. Source: https://www.govinfo.gov/content/pkg/FR-1992-05-08/pdf/FR-1992-05-08.pdf#page=76
Inclusion Source(s):	IPaC
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Not Present
Determination Reason:	Field was heavily plowed during the time of the survey. Habitat to support conservancy fairy shrimp not present in the Study Area.

Valley Elderberry Longhorn Beetle

Cerambycidae > *Desmocerus californicus dimorphus*

Federal Threatened

Life History:	Valley elderberry longhorn beetle is a medium-sized beetle that is endemic to the Central Valley of California. The beetle is found only in association with its host plant, elderberry (Sambucus spp.) and originally occurred in elderberry thickets in moist valley oak woodland along the margins of the Sacramento and San Joaquin Rivers in the Central Valley of California. The habitat of this insect has now largely disappeared throughout much of its former range due to agricultural conversion, levee construction, and stream channelization. The clearing of undergrowth (including elderberry) and planting of lawns has resulted in further habitat degradation. Source: https://ecos.fws.gov/ecp/species/7850
Inclusion Source(s):	IPaC
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Not Present
Determination Reason:	*Desmocerus californicus dimorphus* utilizes riparian corridors and riverine habitat with elderberry thickets. This habitat is not present at the Study Area.

Foothill Yellow-legged Frog

Ranidae > *Rana boylii*
California Endangered; California Species of Special Concern

Life History:	The Foothill yellow-legged frog occurs in the Coast Ranges from the Oregon border south to the Transverse Mountains in Los Angeles County, in most of northern California west of the Cascade crest, and along the western flank of the Sierra Nevada south to Kern County. Livezey reported an isolated population in San Joaquin County, on the floor of the Central Valley. Isolated populations are also known from the mountains of Los Angeles County. Its elevation range extends from near sea level to 1940 m (6,370 feet) in the Sierra Nevada. The Foothill yellow-legged frog is found in or near rocky streams in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	IPaC
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Not Present
Determination Reason:	*Rana boylii* occurs in rocky streams which are not present within the Study Area.

Alameda Striped Racer

Colubridae > *Coluber lateralis euryxanthus*
Federal Threatened; California Threatened

Life History:	Occurs only in a small area on the east side of the San Francisco Bay in Contra Costa and Alameda counties, and parts of San Joaquin and Santa Clara Counties. Differs from the more widespread California Striped Racer subspecies in having wider side stripes with more orange coloring, a darker black back, no distinct spotting under the head and neck, no dark line across the scale at the end of the nose, and an uninterrupted light stripe from the nose to the eye. Found in open areas in canyons, rocky hillsides, chaparral scrublands, open woodlands, pond edges, stream courses. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	IPaC
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Not Present
Determination Reason:	*Coluber lateralis euryxanthus, now Masticophis lateralis euryxanthus*, lives in oak woodlands, oak savannah, and coastal chaparral. This habitat type is not present at the Study Area.

California Condor

Cathartidae > *Gymnogyps californianus*

Federal Endangered; California Endangered; California Fully Protected

Life History:	Endangered, permanent resident of the semi-arid, rugged mountain ranges surrounding the southern San Joaquin Valley, including the Coast Ranges from Santa Clara County south to Los Angeles County, the Transverse Ranges, Tehachapi Mountains, and southern Sierra Nevada. Forages over wide areas of open rangelands, roosts on cliffs and in large trees and snags. Occurs mostly between sea-level and 2700 meters (0-9,000 feet), and nests from 610-1372 meters (2,000-6,500 feet). Nonbreeding individuals move north to Kern and Tulare Counties in April, often returning south in September to winter in Tehachapi Mountains, Mount Pinos, and Ventura and Santa Barbara Counties. Total population in early 1980s was estimated to be fewer than 20, and declining. Occurrence in the wild now in question. Two U.S. Forest Service sanctuaries set aside within the Los Padres National Forest, primarily for nesting and roosting protection. *Source: California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.*
Inclusion Source(s):	IPaC
CNDDB Records:	0
Nearest CNDDB Record:	None
Habitat Present:	Not Present
Determination Reason:	The closest know population is in Big Sur. The Study Area does not provide cliff habitat. It is unlikely for this species to be present at the Study Area.

4.6 Other Considerations

4.6.1 Wildlife Movement

There is potential for terrestrial wildlife movement through the Study Area. The Study Area is surrounded by a residential area and roads; however, Sand Creek runs adjacent to the Study Area and connects to upland habitat in Black Diamond Mines Regional Preserve. Birds may also use the area to connect to other habitats.

4.6.2 Nesting Birds

The potential for nesting birds in the Study Area is low. There are few available nesting structures such as trees or bushes. However, there is some potential for ground nesting birds such as the burrowing owl (*Athene cunicularia)*.

5 Conclusions and Recommendations

5.1 Special-status Plant Species

No suitable habitat for special-status plant species is present within the Study Area. No special-status plants were observed during the site Assessment.

5.2 Special Status Wildlife Species

The Survey Area has low quality habitat for the following nine species: Monarch Butterfly (if milkweed is present), California red-legged frog, California tiger salamander, northern legless lizard, white-tailed kite, Swainson's hawk, giant garter snake, American badger, and San Joaquin kit fox. No breeding, nesting, and/or foraging habitat for the above listed species occurs within the Survey Area. Therefore, if the Survey Area continues to be disturbed by regular plowing, no further studies are needed.

The Survey Area has potential moderate habitat for one species: burrowing owl.

5.2.1 Monarch Butterfly

Though not covered by the ECCC HCP, the Monarch butterfly is a federal Candidate species. Milkweed (host plant for the Monarch butterfly) has potential to occur within the Study Area. A plant survey during the appropriate bloom period for milkweed (June – September) is recommended prior to construction to determine if potential habitat for the Monarch butterfly occurs within the Study Area. Regular plowing within the Study Area would prevent the establishment of milkweed eliminating the need for a preconstruction survey. Portions of the northern section of the Study Area along Old Sand Creek Road were not plowed at the time of the survey visit and may support milkweed if left undisturbed. If milkweed is found within the Project site during the plant survey, species-specific surveys should be conducted for the Monarch butterfly.

5.2.2 Burrowing Owl

An empty burrow was observed on the north side of the Biological Survey Area where mounds of dirt have been piled. This is an individual burrow that was not confirmed to be active and is not surrounded by additional burrows. Burrowing owl tend to use areas with a high density of surrounding burrows. According to the ECCC HCP Chapter 6, if the proposed project can't fully avoid impacts to burrowing owl habitat, preconstruction surveys conducted in accordance with CDFG survey guidelines are required. If a nesting burrowing owl is found during the breeding season (February 1 – August 31), the following avoidance, minimization, and construction monitoring measures are required per the ECCC HCP:

- Avoid all nest sites that could be disturbed by project construction for the duration of the breeding season (February 1 – August 31) or while the nest is occupied by adults or young. Avoidance includes establishment of a 250 foot no work buffer zone around nests.
- Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation or that the juveniles from the occupied burrows have fledged.

If possible, during the nonbreeding season (September 1 – January 31), owls and any occupied burrows should be avoided with the establishment of a 160 foot no work buffer zone. If avoidance is not possible, relocation may be implemented. Owls may be excluded from burrows within the immediate work area and a 160-foot buffer zone, by installing one-way doors.

5.2.3 Giant Garter Snake

Giant garter snakes (GGS) are unlikely to occur on-site due to lack of foraging habitat; however, the Project site is within 200 feet of Sand Creek that may support GGS. Though no occurrence records of GGS are within the Regional Study Area, it is covered by the ECCC HCP. Per the HCP, preconstruction surveys are to be conducted if suitable habitat is present. Preconstruction surveys should therefore be conducted in areas identified in the planning surveys as having suitable garter snake habitat and 200 feet of adjacent uplands, measured from the outer edge of the bank. The purpose of the survey is to delineate suitable habitat and document any sightings of the snake. In addition, the following Avoidance and Minimization Requirements should be adhered to if GGS are observed or if suitable habitat for the species is discovered during the survey:

- If feasible, a 200-foot no-disturbance buffer should be established from the edge of the stream.
- If disturbance within the 200-foot buffer cannot be avoided, the measures as outlined in the ECCC HCP should be followed. Specifically, construction activity that disturbs habitat to the period between May 1 and September 30 should be limited.

5.2.4 Swainson’s Hawk

Although Swainson’s hawk is a covered species under the ECCC HCP, no tall trees are present on the project site to support breeding or nesting. Therefore, no avoidance, minimization, or mitigation measures are required for this species.

5.2.5 San Joaquin Kit Fox

Although the San Joaquin Kit Fox is covered under the ECCC HCP, no breeding habitat or dens were observed on the Project Site. Additionally, the Project site is heavily disturbed by routine plowing that would prevent occurrence of any suitable breeding or denning habitat. Therefore, no avoidance, minimization, or mitigation measures are required for this species.

5.3 Nesting Birds

The Survey Area has potential nesting habitat for ground nesting birds in a small unplowed area in the northern portion of the site. In addition, habitat for other ground nesting birds covered by MBTA surrounds the Project site in the form of gravel shoulders and pullout areas. Additionally, potential raptor nesting habitat may be within 500 feet of the Project site. A nesting bird survey should therefore be conducted within the Project site and a 500-foot buffer prior to the start of construction activities to identify any potential nests protected by the Migratory Bird Treaty Act.

6 Literature Cited

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USEPA. 2008. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United Station. United States Environmental Protection Agency, p. 13.

Appendix A. Floral & Faunal Compendia

The following plants and wildlife were observed during the July 25, 2023 survey:

Plants

Common Name	**Scientific Name**	**Family**	**Major Clade**	**Nativity**
Italian Thistle	*Carduus tenuiflorus*	Asteraceae	Eudicots	Naturalized
Yellow Star Thistle	*Centaurea solstitialis*	Asteraceae	Eudicots	Naturalized
Prickly Lettuce	*Lactuca serriola*	Asteraceae	Eudicots	Naturalized
Black Mustard	*Brassica nigra*	Brassicaceae	Eudicots	Naturalized
Wild Radish	*Raphanus raphanistrum*	Brassicaceae	Eudicots	Naturalized
Field Bindweed	*Convolvulus arvensis*	Convolvulaceae	Eudicots	Naturalized
Doveweed, Turkey-Mullein	*Croton setiger*	Euphorbiaceae	Eudicots	Native
Puncture Vine	*Tribulus terrestris*	Zygophyllaceae	Eudicots	Naturalized
Palm tree	*Washingtonia ssp.*	Arecaceae	Monocots	Naturalized
Wild Oat	*Avena fatua*	Poaceae	Monocots	Naturalized
Italian Rye Grass	*Festuca perennis*	Poaceae	Monocots	Naturalized
Wall Barley	*Hordeum murinum*	Poaceae	Monocots	Naturalized

Wildlife

Common Name	**Scientific Name**	**Family**	**Introduced/Endemic**
Red-Tailed Hawk	*Buteo jamaicensis*	Accipitridae	Native

Appendix B. Special Status Biological Resource Summary

The research conducted for this report included a desktop review of numerous resource databases in order to determine a list of special status biological resources, including 10 plant taxa and 17 wildlife taxa to be analyzed for potential occurrence. The result of this analysis is summarized in the tables below. Table column definitions:

- **Common Name:** The most widely-accepted English common name for the taxon.
- **Scientific Name:** The most widely-accepted scientific name for the taxon.
- **Source(s):** The desktop review source(s) that contained this taxon.
- **Legal Status:** The legal protected status of the taxon. These terms are described in detail in the Methods section of this report.
- **Habitat:** The quality of the habitat in the Study Area for supporting the taxon. Classification of habitats is described in detail in the Methods section of this report.
- **Soils:** The suitability of soils in the Study Area to support the taxon, if known. Classification of soils is described in detail in the Methods section of this report.
- **Potential:** The potential for the taxon to be found in the Study Area. Ranking of potential is described in detail in the Methods section of this report.

Plants

Common Name	Scientific Name	Source(s)	Legal Status	Habitat	Soils	Potential
Bolander's Water-Hemlock	*Cicuta maculata var. bolanderi*	CNPS	CRPR 2B.1	Not Present	No	None
Big Tarplant	*Blepharizonia plumosa*	CNPS	CRPR 1B.1	Not Present	Yes	None
Showy Golden Madia	*Madia radiata*	CNDDB	CRPR 1B.1	Not Present	Unknown	None
Suisun Marsh Aster	*Symphyotrichum lentum*	CNPS	CRPR 1B.2	Not Present	No	None
Caper-fruited Tropidocarpum	*Tropidocarpum capparideum*	CNPS	CRPR 1B.1	Not Present	Unknown	None
San Joaquin Spearscale	*Extriplex joaquinana*	CNDDB; CNPS	CRPR 1B.2	Not Present	Yes	None
Brittlescale	*Atriplex depressa*	CNDDB	CRPR 1B.2	Not Present	Yes	None
Brewer's Western Flax	*Hesperolinon breweri*	CNDDB; CNPS	CRPR 1B.2	Not Present	No	None

Common Name	Scientific Name	Source(s)	Legal Status	Habitat	Soils	Potential
Antioch Dunes Evening-Primrose	*Oenothera deltoides ssp. howellii*	CNDDB; CNPS	FE; CE; CRPR 1B.1	Not Present	No	None
Stinkbells	*Fritillaria agrestis*	CNDDB	CRPR 4.2	Not Present	Yes	None

Wildlife

Common Name	Scientific Name	Source(s)	Legal Status	Habitat	Potential
Conservancy Fairy Shrimp	*Branchinecta conservatio*	IPaC	FE	Not Present	None
Vernal Pool Fairy Shrimp	*Branchinecta lynchi*	CNDDB; IPaC	FE	Not Present	None
Vernal Pool Tadpole Shrimp	*Lepidurus packardi*	IPaC	FE	Not Present	None
Valley Elderberry Longhorn Beetle	*Desmocerus californicus dimorphus*	IPaC	FE	Not Present	None
Monarch	*Danaus plexippus*	IPaC	FC	Low Quality	Low
Foothill Yellow-legged Frog	*Rana boylii*	IPaC	CE; CSSC	Not Present	None
California Red-legged Frog	*Rana draytonii*	CNDDB	FT; CSSC	Low Quality	Low
California Tiger Salamander	*Ambystoma californiense*	CNDDB; IPaC	FE; CE	Low Quality	Low
Northern Legless Lizard	*Anniella pulchra*	CNDDB	CSSC	Low Quality	Low
Alameda Striped Racer	*Coluber lateralis euryxanthus*	IPaC	FT; CT	Not Present	None
California Condor	*Gymnogyps californianus*	IPaC	FE; CE; CFP	Not Present	None
White-tailed Kite	*Elanus leucurus*	CNDDB	CFP	Low Quality	Low

Common Name	**Scientific Name**	**Source(s)**	**Legal Status**	**Habitat**	**Potential**
Swainson's Hawk	*Buteo swainsoni*	CNDDB	CT	Low Quality	Low
Burrowing Owl	*Athene cunicularia*	CNDDB	CSSC	Medium Quality	Moderate
San Joaquin Kit Fox	*Vulpes macrotis mutica*	IPaC	FE; CT	Low Quality	Low
American Badger	*Taxidea taxus*	CNDDB	CSSC	Low Quality	Low
Giant Garter Snake	*Thamnophis gigas*	ECCC HCP	FT; CT	Low Quality	Low

Appendix C. Site Photographs

Photo 1. An Overview of the Study Area, Facing Southeast

Photo 2. Burrow on the North Side of the Study Area, Facing South

Photo 3. Potential Burrowing Owl Habitat in the Study Area, Facing East

Photo 4. View of Plowed Area in the Study Area, Facing South

Photo 5. Potential Burrowing Owl Habitat, Facing west

Photo 6. Open Plowed Field in the Study Area, Facing West

Photo 7. View of Plowed Field in the Study Area along Sand Creek Road, Facing Southwest

Photo 8. Northwest view of Plowed Field in the Study Area, Facing Northwest

APPENDIX E

APPLICATION FORM AND PLANNING SURVEY REPORT

Application Form and Planning Survey Report

To Comply With and Receive Permit Coverage Under The East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan

Please complete this application to apply for take authorization under the state and federal East Contra Costa County HCP/NCCP incidental take permits. The East Contra Costa County Habitat Conservancy ("Conservancy") or local jurisdiction (City of Brentwood, City of Clayton, City of Oakley, City of Pittsburg, and Contra Costa County) may request more information in order to deem the application complete.

I. PROJECT OVERVIEW

PROJECT INFORMATION

PROJECT NAME: Brentwood Sand Creek Sports Complex

PROJECT TYPE: ☐ Residential ☒ Commercial ☐ Transportation ☐ Utility ☐ Other

PROJECT DESCRIPTION (BRIEF): Project proposes to construct two or three full-size, lighted sports fields, parking lot, restrooms, storage building, picnic areas, and other amenities such as pickleball courts, outdoor exercise equipment, playground, shade elements, and more.

PROJECT ADDRESS/LOCATION: Northwest corner of Sand Creek Road and Fairview Avenue, Brentwood, Contra Costa County, California

PARCEL/PROJECT SIZE (ACRES): 14.48 acres

PROJECT APN(S): 019-110-032 and 019-110-046

APPLICATION SUBMITTAL DATE:

FINAL PSR DATE: (City/County/Conservancy use)

LEAD PLANNER: Raney Planning & Management, Inc.

JURISDICTION: ☒ City of Brentwood ☐ City of Clayton ☐ City of Oakley ☐ City of Pittsburg
☐ Contra Costa County ☐ Participating Special Entity*

*Participating Special Entities are organizations not subject to the authority of a local jurisdiction. Such organizations may include school districts, irrigation districts, transportation agencies, local park districts, geological hazard abatement districts, or other utilities or special districts that own land or provide public services.

DEVELOPMENT FEE ZONE: ☒ Zone I ☐ Zone II ☐ Zone III ☐ Zone IV

See figure 9-1 of the HCP/NCCP at www.cocohcp.org for a generalized development fee zone map. Detailed development fee zone maps by jurisdiction are available from the jurisdiction.

PROJECT APPLICANT INFORMATION

APPLICANT'S NAME: Raney Planning & Management, Inc.

AUTHORIZED AGENT'S NAME AND TITLE: Rod Stinson

PHONE NO.: 9163726100

APPLICANT'S E-MAIL: rods@raneymanagement.com

MAILING ADDRESS: Inc. 1501 Sports Drive, Suite A Sacramento, CA 95834

BIOLOGIST INFORMATION[1]

BIOLOGICAL/ENVIRONMENTAL FIRM:

CONTACT NAME AND TITLE:

PHONE NO.:

CONTACT'S E-MAIL:

MAILING ADDRESS:

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[1] A USFWS/CDFW-approved biologist (project-specific) is required to conduct the surveys. Please submit biologist(s) approval request to the Conservancy.

II. PROJECT DETAILS

Please complete and/or provide the following attachments:

1) **Project Description**
Attach as **Attachment A: Project Description**. Provide a detailed written description that concisely and completely describes the project and location. Include the following information:
    - All activities proposed for the site or project, including roads utilized, construction staging areas, and the installation of underground facilities, to ensure the entire project is covered by the HCP/NCCP permit
    - Proposed construction dates, including details on construction phases, if applicable
    - Reference a City/County application number for the project, if applicable
    - General Best Management Practices, if applicable
    - If the project will have temporary impacts, please provide a restoration plan describing how the site will be restored to pre-project conditions, including revegetation seed mixes or plantings and timing

2) **Project Vicinity Map**
Provide a project vicinity map. Attach as **Figure 1** in **Attachment B: Figures**.

3) **Project Site Plans**
Provide any project site plans for the project. Attach as **Figure 2** in **Attachment B: Figures**.

4) **CEQA Document**
Indicate the status of CEQA documents prepared for the project. Provide additional comments below table if necessary.

Type of Document	Status	Date Completed
☐ Initial Study		
☐ Notice of Preparation		
☐ Draft EIR		
☐ Final EIR		
☐ Notice of Categorical Exemption		
☐ Notice of Statutory Exemption		
☐ Other (describe)		

To be provided by Raney

III. EXISTING CONDITIONS AND IMPACTS

Please complete and/or provide the following attachments:

1) **Field-Verified Land Cover Map**[2]
Attach a field-verified land cover map in **Attachment B: Figures** and label as **Figure 3**. The map should contain all land cover types present on-site overlaid on aerial/satellite imagery. Map colors for the land cover types should conform to the HCP/NCCP (see *Figure 3-3: Landcover in the Inventory Area* for land cover type legend).

2) **Photographs of the Project Site**
Attach representative photos of the project site in **Attachment B: Figures** and label as **Figure 4**. Please provide captions for each photo.

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[2] For PSEs and city or county public works projects, please also identify permanent and temporary impact areas by overlaying crosshatching (permanent impacts) and hatching (temporary impacts) on the land cover map.

3) Land Cover Types and Impacts and Supplemental Tables

- For all terrestrial land cover types please provide calculations to the nearest **hundredth of an acre (0.01)**. For aquatic land cover types please provide calculations to the nearest **thousandth of an acre (0.001)**.
- **Permanent Impacts** are broadly defined in the ECCC HCP/NCCP to include all areas removed from an undeveloped or habitat-providing state and includes land in the same parcel or project that is not developed, graded, physically altered, or directly affected in any way but is isolated from natural areas by the covered activity. Unless such undeveloped land is dedicated to the Preserve System or is a deed-restricted creek setback, the development mitigation fee will apply (if proposed, would require Conservancy approval).
- **Temporary Impacts** are broadly defined in the ECCC HCP/NCCP as any impact on vegetation or habitat that does not result in permanent habitat removal (i.e. vegetation can eventually recover).
- If **wetland (riparian woodland/scrub, wetland, or aquatic)** land cover types are present on the parcel but will not be impacted please discuss in the following section 4) Jurisdictional Wetlands and Waters. Wetland impact fees will only be charged if wetland features are impacted. However, development fees will apply to the entire parcel.
- **Stream** land cover type is considered a linear feature where impacts are calculated based on length impacted. The acreage within a stream, below Top of Bank (TOB), must be assigned to the adjacent land cover type(s). Insert area of impact to stream below TOB in parentheses after the Land Cover acreage number (e.g., Riparian Woodland/Scrub: 10 (0.036) – where 10 is the total impacted acreage including 0.036 acre, which is the acreage within stream TOB). Complete following supplemental **Stream Feature Detail** table to provide information for linear feet.
- **Total Impacts** acreage should be the total parcel acreage (development project) or project footprint acreage (rural infrastructure or utility project).

Table 1: Land Cover Types and Impacts

			Proposed for HCP/NCCP Dedication on the Parcel (Requires Conservancy Approval)	
Land Cover Type	**Permanent Impacts**	**Temporary Impacts**	*Stream Setback*	*Preserve System Dedication*
Grassland				
Annual Grassland	14.48			
Alkali Grassland				
Ruderal				
Shrubland				
Chaparral and Scrub				
Woodland				
Oak Savannah				
Oak Woodland				
Riparian				
Riparian Woodland/Scrub				
Wetland				
Permanent Wetland				
Seasonal Wetland				
Alkali Wetland				
Aquatic				
Aquatic (Reservoir/Open Water)				
Slough/Channel				
Pond				
Stream (in linear feet)	-	-	-	-
Irrigated Agriculture				
Pasture				
Cropland				
Orchard				
Vineyard				
Other				
Nonnative woodland				
Wind turbines				
Developed (not counted toward Fees)				
Urban				
Aqueduct				
Turf				
Landfill				
TOTAL IMPACTS	14.48			

Identify any uncommon vegetation and uncommon landscape features[3]:

Supplemental to Table 1: Uncommon Vegetation and Landscape Features

	Permanent Impacts	Temporary Impacts
Uncommon Grassland Alliances		
Purple Needlegrass Grassland		
Blue Wildrye Grassland		
Creeping Ryegrass Grassland		
Wildflower Fields		
Squirreltail Grassland		
One-sided Bluegrass Grassland		
Serpentine Bunchgrass Grassland		
Saltgrass Grassland		
Alkali Sacaton Bunchgrass Grassland		
☐ Other		
Uncommon Landscape Features		
Rock Outcrops		
Caves		
Springs and seeps		
Scalds		
Sand Deposits		
☐ Mines[4]		
☐ Buildings (bat roosts)[3]		
☐ Potential nest sites (trees or cliffs)[3]		

Please provide details of impacts to stream features:

Stream Name:

Watershed:

Supplemental to Table 1: Stream Feature Detail[5]

Stream Width	Stream Type[6]	Permanent Impacts (linear feet)[7]	Temporary Impacts (linear feet)[7]
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		
☐ ≤ 25 feet wide ☐ > 25 feet wide	☐ Perennial ☐ Intermittent ☐ Ephemeral, 3rd or higher order ☐ Ephemeral, 1st or 2nd order		

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[3] These acreages are for Conservancy tracking purposes. Impacts to these uncommon vegetation and landscape features should be accounted for within the land cover types in Table 1 (e.g., x acres of purple needlegrass in this supplemental table should be accounted for within annual grassland in Table 1).

[4] Insert amount/number, not acreage. Provide additional information on these features in Attachment A: Project Description.

[5] Use more than 1 row as necessary to describe impacts to streams on site.

[6] See glossary (Appendix A) for definition of stream type and order.

[7] Stream length is measured along stream centerline, based on length of impact to any part of the stream channel, TOB to TOB.

4) Summary of Land Cover Types

Please provide a written summary of descriptions for land cover types found on site including characteristic vegetation.

The entire Study Area (14.48 acres) is classified as disturbed habitat consisting of plowed fields. The vegetation community within the Study Area is comprised of Mediterranean grasses and forbs including, but not limited to, Foxtail barley (*Hordeum murinum*), Italian rye grass (*Festuca perennis*), Italian thistle (*Carduus tenuiflorus*), and Wild radish (*Raphanus raphanistrum*). No sensitive vegetation communities were mapped by the CNDDB within the Regional Study Area. Figure 9-1 of the HCP/NCCP classified the land as grassland. It should be noted, however, that recent plowing events have taken place (see photographs attached at the end of this application).

5) Jurisdictional Wetlands and Waters

If wetlands and waters are present on the project site, project proponents must conduct a delineation of jurisdictional wetlands and waters. Jurisdictional wetlands and waters are defined on pages 1-18 and 1-19 of the ECCC HCP/NCCP as the following land cover types: permanent wetland, seasonal wetland, alkali wetland, aquatic, pond, slough/channel, and stream. It should be noted that these features differ for federal and state jurisdictions. If you have identified any of these land cover types in Table 1, complete the section below.

a) Attach the wetland delineation report as **Attachment E: Wetland Delineation.** If a wetland delineation has not been completed, please explain below in section 4c.

b) Please check the following permits the project may require. Please submit copies of these permits to the Conservancy prior to the start of construction:

☐ CWA Section 404 Permit[8]
☐ CWA Section 401 Water Quality Certification
☐ Waste Discharge Requirements
☐ Lake and Streambed Alteration Agreement

c) Provide any additional information on impacts to jurisdictional wetland and waters below, including status of the permit(s):

No aquatic resources are within the Study Area.

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[8] The USACE Sacramento District issued a Regional General Permit 1 (RGP) related to ECCC HCP/NCCP covered activities. The RGP is designed to streamline wetland permitting in the entire ECCC HCP/NCCP Plan Area by coordinating the avoidance, minimization, and mitigation measures in the Plan with the Corps' wetland permitting requirement. Applicants seeking authorization under this RGP shall notify the Corps in accordance with RGP general condition number 18 (Notification).

6) Species-Specific Planning Survey Requirements

Based on the land cover types found on-site and identified in Table 1, check the applicable boxes in Table 2a.

Table 2a. Species –Specific Planning Survey Requirements

Land Cover Type in Project Area	Required Survey Species	Habitat Element in Project Area	Planning Survey Requirement[9]	Info in HCP
☒ Grasslands, oak savannah, agriculture, or ruderal	☐ San Joaquin kit fox	Assumed if within modeled range of species	If within modeled range of species, identify and map potential breeding or denning habitat within the project site and a 250-ft radius around the project footprint.	pp. 6-37 to 6-38
	☒ Western burrowing owl	Assumed	Identify and map potential breeding habitat within the project site and a 500-ft radius around the project footprint. Please note the HCP requires buffers for occupied burrows. Surveys may need to encompass an area larger than the project footprint.	pp. 6-39 to 6-41
☐ Aquatic (ponds, wetlands, streams, sloughs, channels, and marshes)	☐ Giant garter snake	Aquatic habitat accessible from the San Joaquin River	Identify and map potential habitat.	pp. 6-43 to 6-45
	☐ California tiger salamander	Ponds and wetlands Vernal pools Reservoirs Small lakes	Identify and map potential breeding habitat. Document habitat quality and features. Provide the Conservancy with photo-documentation and report.	pp. 6-45
	☐ California red-legged frog	Slow-moving streams, ponds and wetlands	Identify and map potential breeding habitat. Document habitat quality and features. Provide the Conservancy with photo-documentation and report.	p. 6-46
	☐ Covered shrimp	Seasonal wetlands Vernal pools Sandstone rock outcrops Sandstone depressions	Identify and map potential habitat. Please note the HCP requires a 50 foot non-disturbance buffer from seasonal wetlands that may be occupied by covered shrimp. Surveys may need to encompass an area larger than the project footprint.	pp. 6-46 to 6-48
☒ Any	☐ Townsend's big-eared bat	Rock formations with caves Mines Abandoned buildings outside urban area	Map and document potential breeding or roosting habitat.	pp. 6-36 to 6-37
	☒ Swainson's hawk	Potential nest sites within 1,000 feet of project	Inspect large trees for presence of nest sites. Document and map.	pp. 6-41 to 6-43
	☒ Golden Eagle	Potential nest sites with ½ mile of project	Inspect large trees for presence of nest sites. Document and map.	pp. 6-38 to 6-39

Surveys for all covered species must be conducted by a qualified biologist (USFWS/CDFW project-specific approved). Please submit biologist approval request to the East Contra Costa County Habitat Conservancy.
Surveys for all covered species must be conducted according to the respective USFWS or CDFW survey protocols, as identified in Chapter 6.4.3 in the HCP/NCCP.

7) Planning Survey Species Habitat Maps

Provide Planning Survey Species Habitat Maps as required in Table 2a, attach as **Figure 5** in **Attachment B: Figures**.

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[9] The planning survey requirements in this table are not comprehensive. Please refer to Chapter 6.4.3 in the ECCC HCP/NCCP for more detail.

8) Results of Species Specific Surveys

Provide a written summary describing the results of the planning surveys. Please discuss the location, quantity, and quality of suitable habitat for specified covered wildlife species on the project site.

Species specific surveys not conducted. Desktop analysis of the literature and numerous resource databases were conducted as well as a field survey on July 25, 2023 by Bargas Environmental Consulting biologists Dr. Dustin Baumbach and Jinnah Benn. Desktop review included tools such as USFWS's National Wetlands Inventory, USGS's National Hydrography Dataset, US Department of Agriculture's National Resource Conservation Service Web Soil Survey, and Google Earth Pro aerial maps. Species and habitat occurrences within the Regional Study Area were queried from USFWS's Information for Planning and Consultation portal (IPaC), CDFW's California Natural Diversity Database (CNDDB), and CNPS's Inventory of Rare and Endangered Plants. The Regional Study Area is defined as the Project site and a 3-mile buffer. The Regional Study Area was used as the basis for determining special-status biological resource records for consideration of the Biological Resource Assessment.

Habitat types were documented, and plant and wildlife species were recorded. Areas that were determined to be potential habitat for special-status species were further assessed for suitability. Habitat suitability was analyzed in situ during the site field survey and via satellite imagery during desktop analysis.

Burrowing owls can utilize disturbed open fields for sheltering and nesting. The Study Area is a disturbed open field with at least one burrow and low tufts of vegetation considered suitable for this species and was determined to have a moderate potential for occurrence.

California Red-legged Frog favors calm flowing water with vegetation cover, both of which are not present in the Study Area. California Tiger Salamander can utilize open fields during the non-breeding season. However, recent plowing of the Study Area combined with the lack of vegetation presents low quality habitat. Both species were determined to have to have low potential for occurrence.

San Joaquin Kit Fox needs a home range of about 1,000 acres in addition to soft sandy soils for dens and neither of these conditions are present in the Study Area. The Study Area could be accessed by fox via the adjacent creek and used for foraging as part of a greater home range however the Study Area is not suitable for kit fox dens.

Swainson's Hawk could use the Study Area for transit or foraging. However, the Study Area is unsuitable for nesting as there are not structures to nest on, therefore biologists determined there was low potential for Swainson's Hawk to forage on the project site. Suitable nesting trees for Swainson's Hawk do occur within 1,000 feet of the Study Area and Suitable nesting trees for Golden Eagle also occur within 0.5 mile of the Study Area.

Desktop review did not find any occurrences or evidence of Golden Eagle, Covered Shrimp, Giant garter snake, or Townsend's big-eared bat in or around the Regional Study Area.

9) Covered and No-Take Plants

Please check the applicable boxes in Table 2b based on the land cover types found in the project area. If suitable land cover types are present on site, surveys must be conducted using approved CDFW/USFWS methods during the appropriate season for identification of covered and no-take species (see page 6-9 of the ECCC HCP/NCCP). Reference populations of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant species is visible and detectable at the time surveys are conducted. <u>In order to complete all the necessary covered and no-take plant surveys, spring, summer, and fall surveys may be required.</u>

Table 2b. Covered and No-Take Plant Species

Plant Species	Covered (C) or No-Take (N)	Associated Land Cover Type	Typical Habitat or Physical Conditions, if Known	Typical Blooming Period	Suitable Land Cover Type Present
Adobe navarretia (*Navarretia nigelliformis* ssp. *radians*) [a]	C	Annual Grassland	Generally found on clay barrens in Annual Grassland [b]	Apr–Jun	☐ Yes ☒ No
Alkali milkvetch (*Astragalus tener* ssp. *tener*)	N	Alkali grassland Alkali wetland Annual grassland Seasonal wetland	Generally found in vernally moist habitat in soils with a slight to strongly elevated pH	Mar–Jun	☐ Yes ☒ No
Big tarplant (*Blepharizonia plumosa*)	C	Annual grassland	Elevation below 1500 feet [d] most often on Altamont Series or Complex soils	Jul–Oct	☐ Yes ☒ No
Brewer's dwarf flax (*Hesperolinon breweri*)	C	Annual grassland Chaparral and scrub Oak savanna Oak woodland	Generally, restricted to grassland areas within a 500+ buffer from oak woodland and/or chaparral/scrub [d]	May–Jul	☐ Yes ☒ No
Brittlescale (*Atriplex depressa*)	C	Alkali grassland Alkali wetland	Restricted to soils of the Pescadero or Solano soil series; generally found in southeastern region of plan area [d]	May–Oct	☐ Yes ☒ No
Caper-fruited tropidocarpum (*Tropidocarpum capparideum)*	N	Alkali grassland		Mar–Apr	☐ Yes ☒ No
Contra Costa goldfields (*Lasthenia conjugens*)	N	Alkali grassland Alkali wetland Annual grassland Seasonal wetland	Generally found in vernal pools	Mar–Jun	☐ Yes ☒ No
Diablo Helianthella (*Helianthella castanea*)	C	Chaparral and scrub Oak savanna Oak woodland	Elevations generally above 650 feet [d]	Mar–Jun	☐ Yes ☒ No
Diamond-petaled poppy (*Eschscholzia rhombipetala*)	N	Annual grassland		Mar–Apr	☐ Yes ☒ No
Large-flowered fiddleneck (*Amsinckia grandiflora*)	N	Annual grassland	Generally on clay soil	Apr–May	☐ Yes ☒ No
Mount Diablo buckwheat (*Eriogonum truncatum*)	N	Annual grassland Chaparral and scrub	Ecotone of grassland and chaparral/scrub	Apr–Sep	☐ Yes ☒ No
Mount Diablo fairy-lantern (*Calochortus pulchellus*)	C	Annual grassland Chaparral and scrub Oak savanna Oak woodland	Elevations generally between 650 and 2,600[d]	Apr–Jun	☐ Yes ☒ No
Mount Diablo Manzanita (*Arctostaphylos auriculata*)	C	Chaparral and scrub	Elevations generally between 700 and 1,860 feet; restricted to the eastern and northern flanks of Mt. Diablo [d] and the vicinity of Black Diamond Mines	Jan–Mar	☐ Yes ☒ No
Recurved larkspur (*Delphinium recurvatum*)	C	Alkali grassland Alkali wetland		Mar–Jun	☐ Yes ☒ No
Round-leaved filaree (*California macrophylla*) [c]	C	Annual grassland		Mar–May	☐ Yes ☒ No
San Joaquin spearscale (*Extriplex joaquiniana*) [e]	C	Alkali grassland Alkali wetland		Apr–Oct	☐ Yes ☒ No
Showy madia (*Madia radiata*)	C	Annual grassland Oak savanna Oak woodland	Primarily occupies open grassland or grassland on edge of oak woodland	Mar–May	☐ Yes ☒ No

[a] The species *Navarretia nigelliformis* subsp. *nigelliformis* is no longer considered to occur within Contra Costa County based on specimen annotations at the UC and Jepson Herbaria at the University of California Berkeley as well as the opinions of experts in the genus. This taxon is now recognized as *Navarretia nigelliformis* subsp. *radians.* Any subspecies of *Navarretia nigelliformis* encountered as a part of botanical surveys in support of a PSR should be considered as covered under this HCP/NCCP.

[b] Habitat for the *Navarretia nigelliformis* subspecies that occurs within the inventory are is inaccurately described in the HCP/NCCP as vernal pools. The entity within the Inventory generally occupies clay barrens within Annual Grassland habitat, which is an upland habitat type.

[c] From California Native Plant Society. 2007. *Inventory of Rare and Endangered Plants* (online edition, v7-07d). Sacramento, CA. Species may be identifiable outside of the typical blooming period; a professional botanist shall determine if a covered or no take plant occurs on the project site. Reference population of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant is visible and detectable at the time surveys are conducted.

[d] See Species Profiles in Appendix D of the Final HCP/NCCP. Reference populations of covered and no-take plants should be visited, where possible, prior to conducting surveys to confirm that the plant species is visible and detectable at the time surveys are conducted.

[e] In the recent update to the Jepson eflora (JFP 2013) *Atriplex joaquinana* has been circumscribed and segregated into a new genus called *Extriplex* based on the work of Elizabeth Zacharias and Bruce Baldwin (2010). The etymology of the genus *Extriplex* means, "beyond or outside Atriplex".

10) Results of Covered and No-Take Plant Species

Provide a written summary describing the results of the planning surveys conducted as required in Table 2b. Describe the methods used to survey the site for all covered and no-take plants, including the dates and times of all surveys conducted (see Tables 3-8 and 6-5 of the ECCC HCP/NCCP for covered and no-take plants), including reference populations visited prior to conducting surveys.

If any covered or no-take plant species were found, include the following information in the results summary:

- Description and number of occurrences and their rough population size.
- Description of the "health" of each occurrence, as defined on pages 5-49 and 5-50 of the HCP/NCCP.
- A map of all the occurrences.
- Justification of surveying time window, if outside of the plant's blooming period.
- The CNDDB form(s) submitted to CDFW (if this is a new occurrence).
- A description of the anticipated impacts that the covered activity will have on the occurrence and how the project will avoid impacts to all covered and no-take plant species. If impacts to covered plant species cannot be avoided and plants will be removed by covered activity, the Conservancy must be notified and has the option to salvage the covered plants. All projects must demonstrate avoidance of all six no-take plants (see table 6-5 of the HCP/NCCP).

Desktop review determined that 10 plant taxa with special status had been documented as occurring within the Regional Study Area, four of which were included on the Covered and No-Take Plant Species list. These included Big tarplant (*Blepharizonia plumosa*), Brittlescale (*Atriplex depressa*), Caper-fruited tropidocarpum (*Tropidocarpum capparideum*), and San Joaquin spearscale (*Etriplex joaquiniana*). Of these and the Covered and No-Take Plant Species, all species have no potential for occurrence in the Study Area.

IV. SPECIES-SPECIFIC AVOIDANCE AND MINIMIZATION REQUIREMENTS

Please complete and/or provide the following attachments:

1) **Species-Specific Avoidance and Minimization for Selected Covered Wildlife**
Complete the following table and check the applicable box for covered species determined by the planning surveys.

Table 3. Summary of Applicable Preconstruction Surveys, Avoidance and Minimization, and Construction Monitoring Requirements[10]

Species	Preconstruction Survey Requirements	Avoidance and Minimization Requirements	Construction Monitoring Required	Info in HCP
☐ San Joaquin kit fox	• On project footprint and 250-ft radius, map all dens (>5 in. diameter) and determine status • Provide written survey results to USFWS within 5 working days after surveying	• Monitor dens • Destroy unoccupied dens • Discourage use of occupied (non-natal) dens	• Establish exclusion zones (>50 ft for potential dens, and >100 ft for known dens) • Notify USFWS of occupied natal dens	pp. 6-37 to 6-38
☒ Western burrowing owl	• On project footprint and 500-ft radius, identify and map all owls and burrows, and determine status • Document use of habitat (e.g. breeding, foraging)	• Avoid occupied nests during breeding season (Feb-Sep) • Avoid occupied burrows during nonbreeding season (Sep – Feb) • Install one-way doors in occupied burrow (if avoidance not possible) • Monitor burrows with doors installed	• Establish buffer zones (250 ft around nests) • Establish buffer zones (160 ft around burrows)	pp. 6-39 to 6-41
☐ Giant garter snake	• Delineate aquatic habitat up to 200 ft from water's edge on each side • Document any occurrences	• Limit construction to Oct-May • Dewater habitat April 15 – Sep 30 prior to construction • Minimize clearing for construction	• Delineate 200 ft buffer around potential habitat near construction • Provide field report on monitoring efforts • Stop construction activities if snake is encountered; allow snake to passively relocate • Remove temporary fill or debris from construction site • Mandatory training for construction personnel	pp. 6-43 to 6-45
☐ California tiger salamander	• Provide written notification to USFWS and CDFW regarding timing of construction and likelihood of occurrence on site	• Allow agency staff to translocate species, if requested	• None	p. 6-45
☐ California red-legged frog	• Provide written notification to USFWS and CDFW regarding timing of construction and likelihood of occurrence on site	• Allow agency staff to translocate species, if requested	• None	p. 6-46
☐ Covered shrimp	• Establish presence/absence • Document and evaluate use of all habitat features (e.g. vernal pools, rock outcrops)	• Establish buffer near construction activities • Prohibit incompatible activities	• Establish buffer around outer edge of all hydric vegetation associated with habitat (50 ft or immediate watershed, whichever is larger) • Mandatory training for construction personnel	pp. 6-46 to 6-48
☐ Townsend's big-eared bat	• Establish presence/absence • Determine if potential sites were recently occupied (guano)	• Seal hibernacula before Nov • Seal nursery sites before April • Delay construction near occupied sites until hibernation or nursery seasons are over	• None	pp. 6-36 to 6-37
☐ Swainson's hawk	• Determine whether potential nests are occupied	• No construction within 1,000 ft of occupied nests within breeding season (March 15 - Sep 15) • If necessary, remove active nest tree after nesting season to prevent occupancy in second year.	• Establish 1,000 ft buffer around active nest and monitor compliance (no activity within established buffer)	pp. 6-41 to 6-43
☐ Golden Eagle	• Establish presence/absence of nesting eagles	• No construction within ½ mile near active nests (most activity late Jan – Aug)	• Establish ½ mile buffer around active nest and monitor compliance with buffer	pp. 6-38 to 6-39

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[10] The requirements in this table are not comprehensive; they are detailed in the next section on the following page.

2) Required Preconstruction Surveys, Avoidance and Minimization, and Construction Monitoring

All preconstruction surveys shall be conducted in accordance with the requirements set forth in Section 6.4.3, Species-Level Measures, and Table 6-1 of the ECCC HCP/NCCP. Detailed descriptions of preconstruction surveys, avoidance and minimization, and construction monitoring applicable to each of the wildlife species in Table 3 are located below. Please remove the species-specific measures that do not apply to your project (highlight entire section and delete).

WESTERN BURROWING OWL

Preconstruction Surveys

Prior to any ground disturbance related to covered activities, a USFWS/CDFW- approved biologist will conduct a preconstruction survey in areas identified in the planning surveys as having potential burrowing owl habitat. The surveys will establish the presence or absence of western burrowing owl and/or habitat features and evaluate use by owls in accordance with CDFW survey guidelines (California Department of Fish and Game 1995).

On the parcel where the activity is proposed, the biologist will survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. Adjacent parcels under different land ownership will not be surveyed. Surveys should take place near sunrise or sunset in accordance with CDFW guidelines. All burrows or burrowing owls will be identified and mapped. Surveys will take place no more than 30 days prior to construction. During the breeding season (February 1– August 31), surveys will document whether burrowing owls are nesting in or directly adjacent to disturbance areas. During the nonbreeding season (September 1–January 31), surveys will document whether burrowing owls are using habitat in or directly adjacent to any disturbance area. Survey results will be valid only for the season (breeding or nonbreeding) during which the survey is conducted.

Avoidance and Minimization and Construction Monitoring

This measure incorporates avoidance and minimization guidelines from CDFW's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 1995).

If burrowing owls are found during the breeding season (February 1 – August 31), the project proponent will avoid all nest sites that could be disturbed by project construction during the remainder of the breeding season or while the nest is occupied by adults or young. Avoidance will include establishment of a non-disturbance buffer zone (described below). Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation or that the juveniles from the occupied burrows have fledged. During the nonbreeding season (September 1 – January 31), the project proponent should avoid the owls and the burrows they are using, if possible. Avoidance will include the establishment of a buffer zone (described below).

During the breeding season, buffer zones of at least 250 feet in which no construction activities can occur will be established around each occupied burrow (nest site). Buffer zones of 160 feet will be established around each burrow being used during the nonbreeding season. The buffers will be delineated by highly visible, temporary construction fencing.

If occupied burrows for burrowing owls are not avoided, passive relocation will be implemented. Owls should be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors should be in place for 48 hours prior to excavation. The project area should be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation (California Department of Fish and Game 1995). Plastic tubing or a similar structure should be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.

SWAINSON'S HAWK

Preconstruction Survey

Prior to any ground disturbance related to covered activities that occurs during the nesting season (March 15–September 15), a qualified biologist will conduct a preconstruction survey no more than 1 month prior to construction to establish whether Swainson's hawk nests within 1,000 feet of the project site are occupied. If potentially occupied nests within 1,000 feet are off the project site, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the project site. If nests are occupied, minimization measures and construction monitoring are required (see below).

Avoidance and Minimization and Construction Monitoring

During the nesting season (March 15–September 15), covered activities within 1,000 feet of occupied nests or nests under construction will be prohibited to prevent nest abandonment. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be used, the Implementing Entity will coordinate with CDFW/USFWS to determine the appropriate buffer size.

If young fledge prior to September 15, covered activities can proceed normally. If the active nest site is shielded from view and noise from the project site by other development, topography, or other features, the project applicant can apply to the Implementing Entity for a waiver of this avoidance measure. Any waiver must also be approved by USFWS and CDFW. While the nest is occupied, activities outside the buffer can take place.

All active nest trees will be preserved on site, if feasible. Nest trees, including non-native trees, lost to covered activities will be mitigated by the project proponent according to the requirements below.

Mitigation for Loss of Nest Trees

The loss of non-riparian Swainson's hawk nest trees will be mitigated by the project proponent by:

- If feasible on-site, planting 15 saplings for every tree lost with the objective of having at least 5 mature trees established for every tree lost according to the requirements listed below.

  AND either

  1) Pay the Implementing Entity an additional fee to purchase, plant, maintain, and monitor 15 saplings on the HCP/NCCP Preserve System for every tree lost according to the requirements listed below, OR
  2) The project proponent will plant, maintain, and monitor 15 saplings for every tree lost at a site to be approved by the Implementing Entity (e.g., within an HCP/NCCP Preserve or existing open space linked to HCP/NCCP preserves), according to the requirements listed below.

The following requirements will be met for all planting options:

- Tree survival shall be monitored at least annually for 5 years, then every other year until year 12. All trees lost during the first 5 years will be replaced. Success will be reached at the end of 12 years if at least 5 trees per tree lost survive without supplemental irrigation or protection from herbivory. Trees must also survive for at least three years without irrigation.
- Irrigation and fencing to protect from deer and other herbivores may be needed for the first several years to ensure maximum tree survival.
- Native trees suitable for this site should be planted. When site conditions permit, a variety of native trees will be planted for each tree lost to provide trees with different growth rates, maturation, and life span, and to provide a variety of tree canopy structures for Swainson's hawk. This variety will help to ensure that nest trees will be available in the short term (5-10 years for cottonwoods and willows) and in the long term (e.g., Valley oak, sycamore). This will also minimize the temporal loss of nest trees.
- Riparian woodland restoration conducted as a result of covered activities (i.e., loss of riparian woodland) can be used to offset the nest tree planting requirement above, if the nest trees are riparian species.
- Whenever feasible and when site conditions permit, trees should be planted in clumps together or with existing trees to provide larger areas of suitable nesting habitat and to create a natural buffer between nest trees and adjacent development (if plantings occur on the development site).
- Whenever feasible, plantings on the site should occur closest to suitable foraging habitat outside the UDA.
- Trees planted in the HCP/NCCP preserves or other approved offsite location will occur within the known range of Swainson's hawk in the inventory area and as close as possible to high-quality foraging habitat.

GOLDEN EAGLE

Preconstruction Survey

Prior to implementation of covered activities, a qualified biologist will conduct a preconstruction survey to establish whether nests of golden eagles are occupied (see Section 6.3.1, *Planning Surveys*). If nests are occupied, minimization requirements and construction monitoring will be required.

Avoidance and Minimization

Covered activities will be prohibited within 0.5 mile of active nests. Nests can be built and active at almost any time of the year, although mating and egg incubation occurs late January through August, with peak activity in March through July. If site-specific conditions or the nature of the covered activity (e.g., steep topography, dense vegetation, limited activities) indicate that a smaller buffer could be appropriate or that a larger buffer should be implemented, the Implementing Entity will coordinate with CDFW/USFWS to determine the appropriate buffer size.

Construction Monitoring

Construction monitoring will focus on ensuring that no covered activities occur within the buffer zone established around an active nest. Although no known golden eagle nest sites occur within or near the ULL, covered activities inside and outside of the Preserve System have the potential to disturb golden eagle nest sites. Construction monitoring will ensure that direct effects to golden eagles are minimized.

GIANT GARTER SNAKE

Preconstruction Surveys

Prior to any ground disturbance related to covered activities, a USFWS/CDFW– approved biologist will conduct a preconstruction survey in areas identified in the planning surveys as having suitable garter snake habitat and 200 feet of adjacent uplands, measured from the outer edge of each bank. The surveys will delineate suitable habitat and document any sightings of giant garter snake.

Avoidance and Minimization Requirements

To the maximum extent practicable, impacts on giant garter snake habitat as a result of covered activities will be avoided. If feasible, in areas near construction activities, a buffer of 200 feet from suitable habitat will be delineated within which vegetation disturbance or use of heavy equipment is prohibited.

If impacts on giant garter snake habitat as a result of covered activities are not avoided, the following measures will be implemented. These measures are based on USFWS's *Standard Avoidance and Minimization Measures during Construction Activities in Giant Garter Snake Habitat* (U.S. Fish and Wildlife Service 1999).

- Limit construction activity that disturbs habitat to the period between May 1 and September 30. This is the active period for giant garter snake, and direct mortality is minimized because snakes are more likely to independently move away from disturbed area. If activities are necessary in giant garter snake habitat between October 1 and April 30, the USFWS Sacramento Field Office will be contacted to determine if additional measures beyond those described below are necessary to minimize and avoid take.
- In areas where construction is to take place, dewater all irrigation ditches, canals or other aquatic habitat between April 15 and September 30 to remove habitat of garter snakes. Dewatered areas must remain dry, with no puddled water remaining, for at least 15 consecutive days prior to the excavation or filling of that habitat. If a site cannot be completely dewatered, netting and salvage of prey items may be necessary.

Construction Monitoring

If suitable habitat for giant garter snake cannot be avoided between October 1 and April 30 the USFWS Sacramento Field Office will be contacted to determine if additional measures beyond those described below are necessary, and the following actions will be performed. A USFWS-approved biologist will conduct a construction survey no more than 24 hours before construction in suitable habitat and will be on site during construction activities in potential aquatic and upland habitat to ensure that individuals of giant garter snake encountered during construction will be avoided. The biologist will provide USFWS with a field report form documenting the monitoring efforts within 24 hours of commencement of construction activities. The monitor will be available thereafter. If a snake is encountered during construction activities, the monitor will have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities should be allowed to move away from the construction area on their own. Only personnel with a USFWS recovery permit pursuant to Section 10(a)(1)(A) of the ESA will have the authority to capture and/or relocate giant garter snakes that are encountered in the construction area. The project area will be reinspected whenever a lapse in construction activity of 2 weeks or more has occurred.

To ensure that construction equipment and personnel do not affect nearby aquatic habitat for giant garter snake outside construction areas, silt fencing will be erected to clearly define the aquatic habitat to be avoided; restrict working areas, spoils, and equipment storage and other project activities to areas outside of aquatic or wetland habitat; and maintain water quality and limit construction runoff into wetland areas through the use of fiber bales, filter fences, vegetation buffer strips, or other appropriate methods.

Fill or construction debris may be used by giant garter snakes as over-wintering sites. Therefore, upon completion of construction activities, any temporary fill or construction debris must be removed from the site.

Construction personnel will be trained to avoid harming giant garter snakes. A qualified biologist approved by USFWS will inform all construction personnel about the life history of giant garter snakes; the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas such as rice fields to giant garter snakes; and the terms and conditions of the Plan related to avoiding and minimizing impacts on giant garter snake.

3) Construction Monitoring Plan

Before implementing a covered activity, the applicant will develop and submit a construction monitoring plan to the planning department of the local land use jurisdiction and the East Contra Costa County Habitat Conservancy for review and approval. Elements of a brief construction monitoring plan will include the following:

- Results of planning and preconstruction surveys.[11]
- Description of avoidance and minimization measures to be implemented, including a description of project-specific refinements to the measures or additional measures not included in the HCP/NCCP.
- Description of monitoring activities, including monitoring frequency and duration, and specific activities to be monitored.
- Description of the onsite authority of the construction monitor to modify implementation of the activity.

☒ Check box to acknowledge this requirement.

---

[11] If the preconstruction surveys do not trigger construction monitoring, results of preconstruction surveys should still be submitted to the local jurisdiction and the East Contra Costa County Habitat Conservancy.

V. SPECIFIC CONDITIONS ON COVERED ACTIVITIES

1) Check off the HCP conservation measures that apply to the project.

APPLIES TO ALL PROJECTS

☒ **Conservation Measure 1.11. Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species, or Migratory Birds.** This conservation measure applies to all projects. All projects will avoid all impacts on extremely rare plants and fully protected species listed in Table 6-5 of the ECCC HCP/NCCP. See HCP pp. 6-23 to 6-25, and Table 6-5.

APPLIES TO PROJECTS THAT IMPACT COVERED PLANT SPECIES

☐ **Conservation Measure 3.10. Plant Salvage when Impacts are Unavoidable.** This condition applies to projects that cannot avoid impacts on covered plants and help protect covered plants by prescribing salvage whenever avoidance of impacts is not feasible. Project proponents wishing to remove populations of covered plants must notify the Conservancy of their construction schedule to allow the Conservancy the option of salvaging the populations. See HCP pp. 6-48 to 6-50.

APPLIES TO PROJECTS THAT INCLUDE ARE ADJACENT TO STREAMS, PONDS, OR WETLANDS

☒ **Conservation Measure 2.12. Wetland, Pond, and Stream Avoidance and Minimization.** All projects will implement measures described in the HCP to avoid and minimize impacts on wetlands, ponds, streams, and riparian woodland/scrub. See HCP pp. 6-33 to 6-35.

APPLIES TO NEW DEVELOPMENT PROJECTS

☒ **Conservation Measure 1.10. Maintain Hydrologic Conditions and Minimize Erosion.** All new development must avoid or minimize direct and indirect impacts on local hydrological conditions and erosion by incorporating the applicable Provision C.3 Amendments of the Contra Costa County Clean Water Program's (CCCCWP's) amended NPDES Permit (order no. R2-2003-0022; permit no. CAS002912). The overall goal of this measure is to ensure that new development covered under the HCP has no or minimal adverse effects on downstream fisheries to avoid take of fish listed under ESA or CESA. See HCP pp. 6-21 to 6-22.

APPLIES TO NEW DEVELOPMENT PROJECTS THAT INCLUDE OR ARE ADJACENT TO STREAMS, PONDS, OR WETLANDS

☒ **Conservation Measure 1.7. Establish Stream Setbacks.** A stream setback will be applied to all development projects covered by the HCP according to the stream types listed in Table 6-2 of the HCP. See HCP pp. 6-15 to 6-18 and Table 6-2.

APPLIES TO NEW DEVELOPMENT PROJECTS ADJACENT TO EXISTING PUBLIC OPEN SPACE, HCP PRESERVES, OR LIKELY HCP ACQUISITION SITES

☐ **Conservation Measure 1.6. Minimize Development Footprint Adjacent to Open Space.** Project applicants are encouraged to minimize their development footprint and set aside portions of their land to contribute to the HCP Preserve System. Land set aside that contributes to the HCP biological goals and objectives may be credited against development fees. See HCP pages 6-14 to 6-15.

☐ **Conservation Measure 1.8. Establish Fuel Management Buffer to Protect Preserves and Property.** Buffer zones will provide a buffer between development and wildlands that allows adequate fuel management to minimize the risk of wildlife damage to property or to the preserve. The minimum buffer zone for new development is 100 feet. See HCP pages 6-18 to 6-19.

☐ **Conservation Measure 1.9. Incorporate Urban-Wildlife Interface Design Elements.** These projects will incorporate design elements at the urban-wildlife interface to minimize the indirect impacts of development on the adjacent preserve. See HCP pp. 6-20 to 6-21.

APPLIES TO ROAD MAINTENANCE PROJECTS OUTSIDE THE UDA

☐ **Conservation Measure 1.12. Implement Best Management Practices for Rural Road Maintenance.** Road maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways, spreading invasive weeds, and disturbing breeding wildlife. In order to avoid and minimize these impacts, BMPs described in the HCP will be used where appropriate and feasible. See HCP pp. 6-25 to 6-26.

APPLIES TO NEW ROADS OR ROAD IMPROVEMENTS OUTSIDE THE UDA

☐ **Conservation Measure 1.14. Design Requirements for Covered Roads Outside the Urban Development Area (UDA).** New roads or road improvements outside the UDA have impacts on many covered species far beyond the direct impacts of their project footprints. To minimize the impacts of new, expanded, and improved roads in agricultural and natural areas of the inventory area, road and bridge construction projects will adopt siting, design, and construction requirements described in the HCP and listed in Table 6-6. See HCP pp. 6-27 to 6-33 and Table 6-6.

APPLIES TO FLOOD CONTROL MAINTENANCE ACTIVITIES

☐ **Conservation Measure 1.13. Implement Best Management Practices for Flood Control Facility Maintenance.** Flood control maintenance activities have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways and disturbing breeding wildlife. In order to avoid and minimize these impacts, BMPs described in the HCP will be used where appropriate and feasible. See HCP pp. 6-26 to 6-27.

2) **For all checked conservation measures, describe how the project will comply with each measure. Attach as Attachment C: Project Compliance to HCP Conditions.**

VI. MITIGATION MEASURES

1) **Mitigation Fee Calculator(s)**
Complete and attach the fee calculator (use permanent and/or temporary impact fee calculator as appropriate), and attach as **Attachment D: Fee Calculator(s)**.

2) **Briefly describe the amount of fees to be paid and when applicant plans to submit payment.**

The 2023 Development Fee is $19,871.91/acre in Fee Zone 1. With the project at 14.48 acres, the fee comes out to $287,745.26. The applicant will pay the fee to the City of Brentwood at the time the first construction permits are issued.

ATTACHMENT A: PROJECT DESCRIPTION

ATTACHMENT B: FIGURES

Source: ESRI ArcGIS Online Basemap - World Topographic Map, World Street Map

Public Land Survey System (PLSS):
Mount Diablo Meridian,Township 1N, Range 2E, Section 11

USGS Quad(s): Brentwood (2016)

Watershed: San Joaquin Delta (18040003)

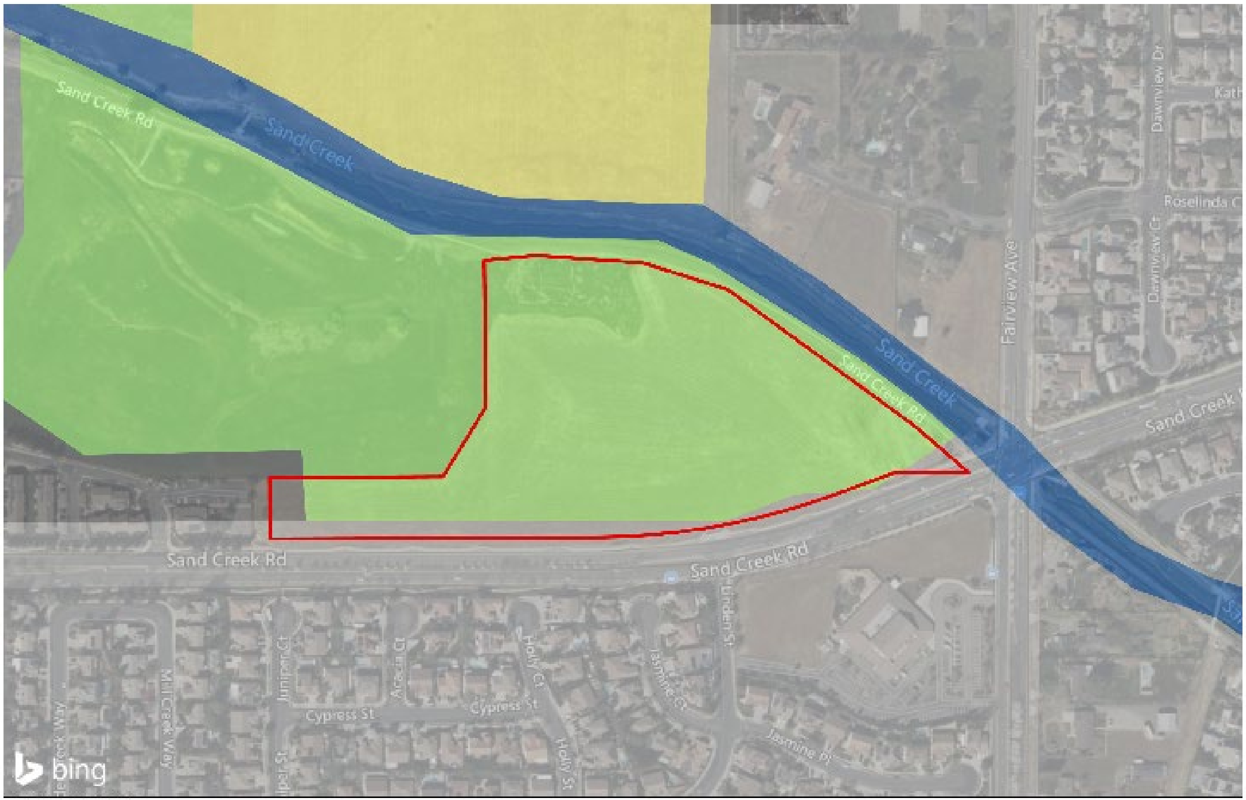
Project Site Coordinates: -121.727°W 37.945°N

Figure 1
Project Site and Vicinity

Sand Creek Sports Complex

Map Created: 8/17/2023, Created By: William Ramirez-Watson, Map Revised: N/A, Bargas Project Number: 1773-23

Figure 2: Site Plans



Source: Bing Maps Hybrid

BARGAS
Environmental Consulting

🟥 Study Area (14.48 acres)

Land Cover

- 🟦 Aquatic
- 🟨 Cropland
- 🟩 Grassland
- ⬜ Urban
- ⬛ Future Urban

Figure 3
Field verified land cover

Sand Creek Sports Complex

Map Created: 11/28/2023, Created By: William Ramirez-Weber, Map Revised: N/A, Bargas Project Number: 1773-23

Figure 4: Site Photos

Photo 1. An Overview of the Study Area, Facing Southeast

Photo 2. Burrow on the North Side of the Study Area, Facing South

Photo 3. Potential Burrowing Owl Habitat in the Study Area, Facing East

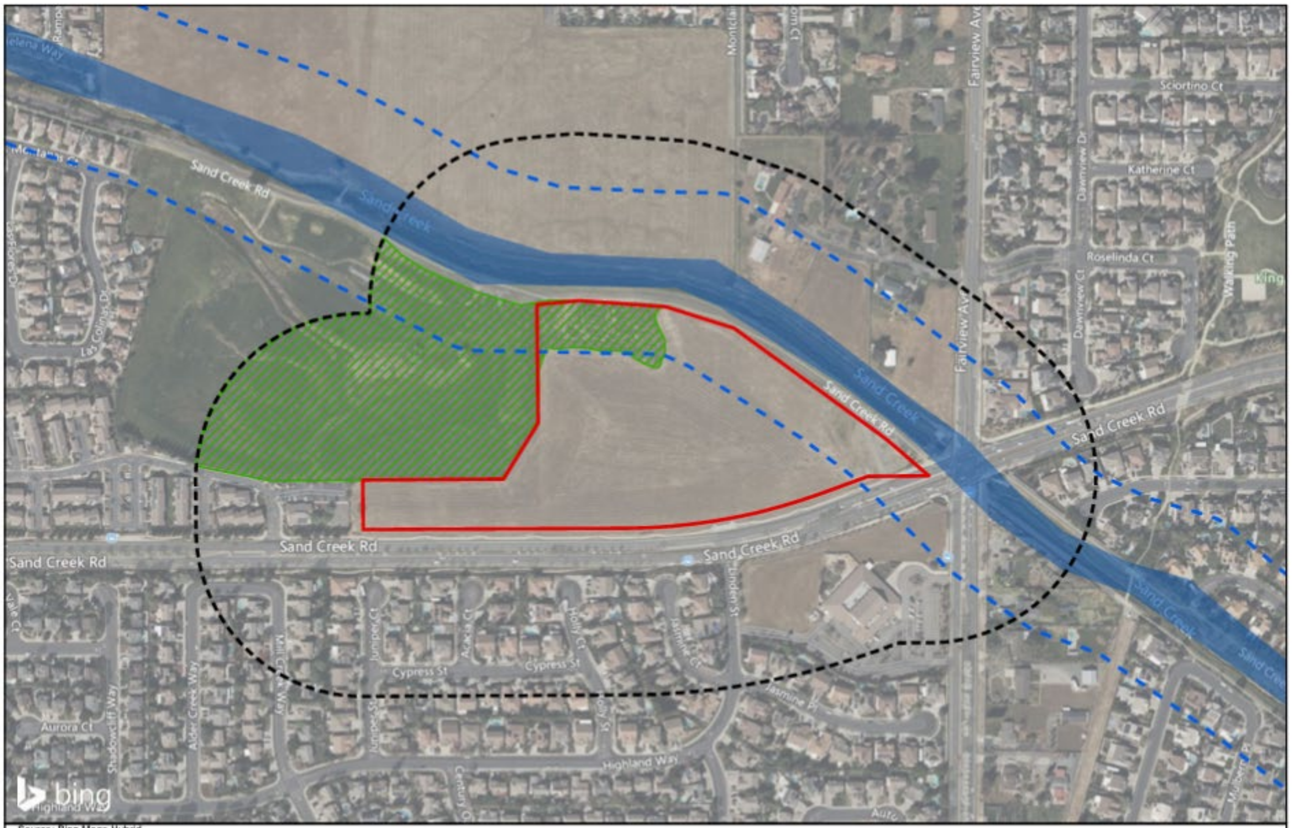
Photo 4. View of Plowed Area in the Study Area, Facing South

Photo 5. Potential Burrowing Owl Habitat, Facing west

Photo 6. Open Plowed Field in the Study Area, Facing West

Photo 7. View of Plowed Field in the Study Area along Sand Creek Road, Facing Southwest

Photo 8. Northwest view of Plowed Field in the Study Area, Facing Northwest



Source: Bing Maps Hybrid

0 150 300 Feet

BARGAS Environmental Consulting

- 🟥 Study Area (14.48 acres)
- ▢ 500 ft-Buffer from Proposed Project Disturbance
- 🟦 Low Potential Giant Garter Snake Habitat
- ▢ 200-foot Buffer from Low Potential Giant Garter Snake Habitat
- ▨ Potential Burrowing Owl Habitat

Figure 5
Species Habitat Map

Sand Creek Sports Complex

Map Created: 11/29/2023, Created By: William Ramirez-Watson, Map Revised: N/A, Bargas Project Number: 1773-23

ATTACHMENT C: PROJECT COMPLIANCE TO HCP CONDITIONS

Project Compliance to HCP Conditions

1. **Conservation Measure 1.11. Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species, or Migratory Birds.** This conservation measure applies to all projects. All projects will avoid all impacts on extremely rare plants and fully protected species listed in Table 6-5 of the ECCC HCP/NCCP. See HCP pp. 6-23 to 6-25, and Table 6-5.
    a. Avoiding direct impacts on extremely rare plants, fully protected wildlife species, or migratory birds. No extremely rare plants are found were found to exist on the Project Site. Fully Protected species include white-tailed kite, peregrine falcon, golden eagle, and ringtail. Only White-tailed Kite was found to have a moderate potential of occurrence on the site. Project activities will avoid any take of these species as defined under the California Fish and Game Code. Project activities will not disturb or destroy nests of these nests or of other birds.
    All birds covered by the Plan (tricolored blackbird, western burrowing owl, golden eagle, and Swainson's hawk) are also considered migratory birds and subject to the prohibitions of the Migratory Bird Treaty Act (MBTA). Actions conducted under the Plan must comply with the Provisions of the MBTA and avoid killing or possessing covered migratory birds, their young, nests, feathers, or eggs.
2. **Conservation Measure 1.10. Maintain Hydrologic Conditions and Minimize Erosion.** All new development must avoid or minimize direct and indirect impacts on local hydrological conditions and erosion by incorporating the applicable Provision C.3 Amendments of the Contra Costa County Clean Water Program's (CCCCWP's) amended NPDES Permit (order no. R2-2003-0022; permit no. CAS002912). The overall goal of this measure is to ensure that new development covered under the HCP has no or minimal adverse effects on downstream fisheries to avoid take of fish listed under ESA or CESA. See HCP pp. 6-21 to 6-22.
    a. New project and its planners will develop stormwater treatment controls, implement a verification program for treatment controls to ensure that all installed controls are being appropriately operated and maintained, control peak runoff flows and volumes by means of creation and implementation of a Hydrograph Modification Management Plan subject to Provision requirements, provide compensatory mitigation to the appropriate jurisdiction (City of Brentwood) for projects where meeting Provision requirements are physically impractical, and limit the use of stormwater controls that function primarily as infiltration devices in order to protect groundwater quality and local stream hydrograph.

ATTACHMENT D:FEE CALCULATOR

ECCC HCP/NCCP 2023+A1:I41 Fee Calculator Worksheet

Permanent Impacts

PROJECT APPLICANT: Raney Planning & Management, Inc.
PROJECT NAME: Brentwood Sand Creek Sports Complex
APN(s): 019-110-032 and 019-110-046
JURISDICTION: City of Brentwood
DATE: November 28, 2023

DEVELOPMENT FEE

See appropriate ordinance or HCP/NCCP Figure 9-1 to determine Fee Zone

	PERMANENT IMPACTS (ACRES)		**2023 FEE/ACRE** *subject to change* [1]		
Fee Zone 1	14.48	x	$19,871.91	=	$287,745.26
Fee Zone 2		x	$39,743.83	=	$0.00
Fee Zone 3		x	$9,935.96	=	$0.00
Fee Zone 4[2]		x	$29,807.87	=	$0.00
			Development Fee Total	=	**$287,745.26**

WETLAND MITIGATION FEE

Impacts to riparian/scrub, wetlands, ponds, aquatic, and slough/channel are charged both a wetland mitigation fee and a development fee. Please also include these impact acres to development fee above.[3]

	PERMANENT IMPACTS (ACRES)		**2023 FEE/ACRE** *subject to change* [1]		
Riparian woodland / scrub		x	$111,060.40	=	$0.00
Perennial Wetland		x	$170,908.06	=	$0.00
Seasonal Wetland		x	$401,479.18	=	$0.00
Alkali Wetland		x	$405,871.63	=	$0.00
Ponds		x	$221,421.23	=	$0.00
Aquatic (open water)		x	$110,711.14	=	$0.00
Slough / Channel		x	$156,815.09	=	$0.00

STREAMS	**PERMANENT IMPACTS (LINEAR FEET)**		**2023 FEE/LINEAR FT** *subject to change* [1]		
Streams 25 feet wide or less		x	$580.00	=	$0.00
Streams greater than 25 feet wide		x	$869.47	=	$0.00
			Wetland Mitigation Fee Total	=	**$0.00**

FEE REDUCTION[4]

Development Fee reduction for land in lieu of fee	=	
Development Fee reduction (up to 33%) for permanent assessments	=	
Wetland Mitigation Fee reduction for wetland restoration/creation performed by applicant	=	
Reduction Total	=	**$0.00**

FINAL FEE CALCULATION

Development Fee Total		$287,745.26
Wetland Mitigation Fee Total	+	$0.00
Mitigation Fee Subtotal	=	**$287,745.26**
Contribution to Recovery[5]	+	
TOTAL AMOUNT TO BE PAID	=	**$287,745.26**

APPENDIX F

ENVIRONMENTAL NOISE ASSESSMENT

Environmental Noise Assessment

Sand Creek Sports Complex

City of Brentwood, California

January 12, 2024

Project #230505

Prepared for:

Raney Planning & Management, Inc.
1501 Sports Drive, Suite A
Sacramento, CA 95834

Prepared by:

Saxelby Acoustics LLC

Luke Saxelby
12004
Expires January 31, 2027

Luke Saxelby, INCE Bd. Cert.
Principal Consultant
Board Certified, Institute of Noise Control Engineering (INCE)

(916) 760-8821
www.SaxNoise.com | Luke@SaxNoise.com
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

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INTRODUCTION

The Sand Creek Sports Complex project is located in the City of Brentwood, California. The project will be constructed in two phases. Phase 1, which will develop the eastern portion of the project site, will include three large sports fields, tennis courts, pickleball courts, multiuse sports courts, a playground, and the project parking lot. Phase 2 will add two new soccer fields and a walking trail to the western portion of the project site. Sensitive receptors in the vicinity of the project site include single and multifamily residences west, south, and east of the project site.

Figure 1 shows the project site plan. **Figure 2** shows an aerial photo of the project site.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

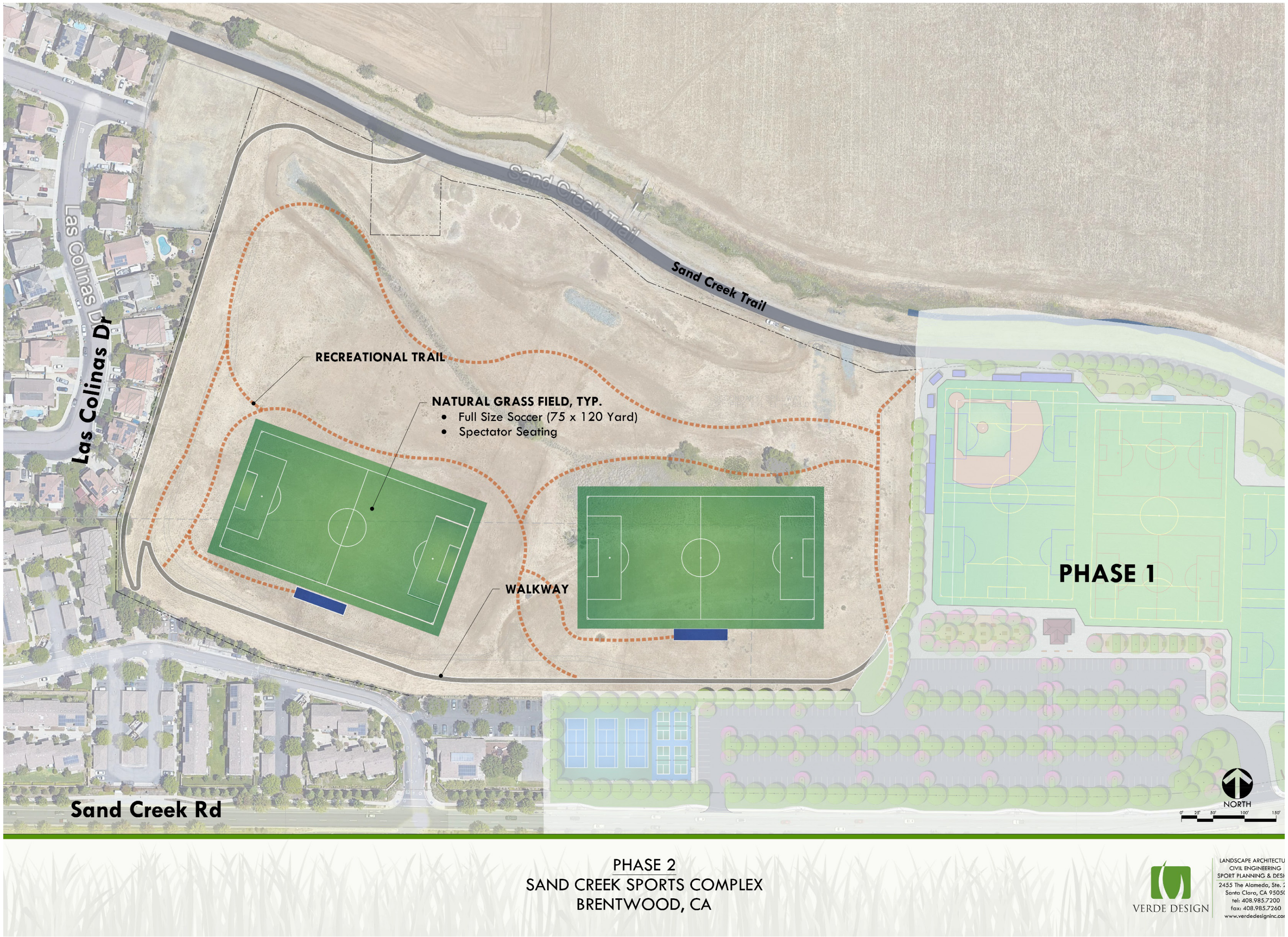
Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.

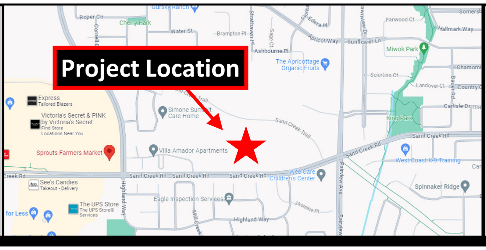


Sand Creek Sports Complex

City of Brentwood, California

Figure 1

Project Site Plan



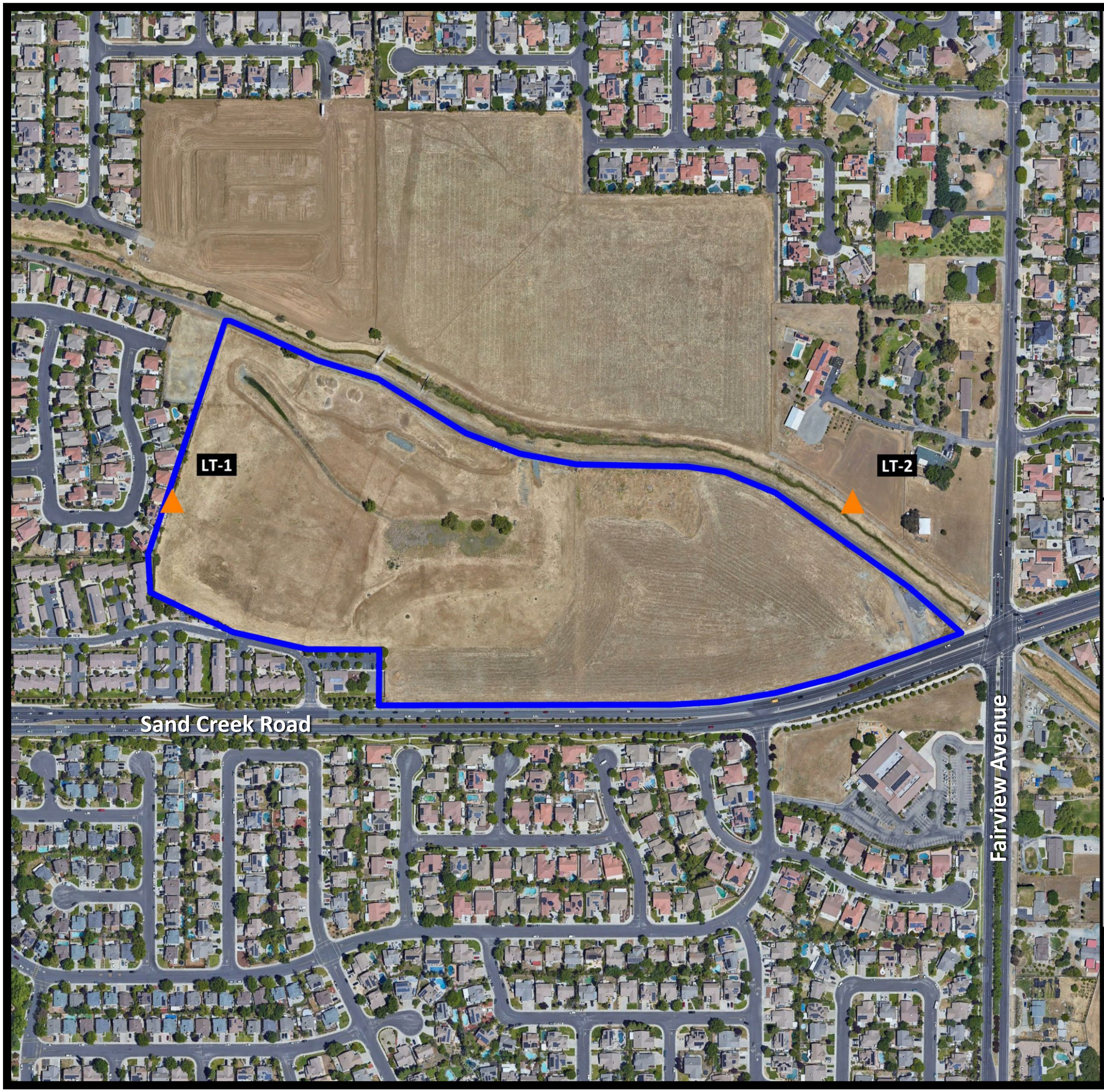
SAXELBY ACOUSTICS
Acoustics • Noise • Vibration

Sand Creek Sports Complex

City of Brentwood, California

Figure 2

Noise Measurement Sites



Legend

▭ Project Site

▲ Noise Measurement Site - Long Term

0 ft 250 ft 500 ft 750 ft

Projection: Mercator / GOOGLE / meters
Rev. Date: 01/09/2024

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Acoustics · Noise · Vibration

The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60-dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

TABLE 1: TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regards to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE AND VIBRATION ENVIRONMENTS

EXISTING NOISE RECEPTORS

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise-sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses to the west, south, and north of the project site and multifamily residential uses to the southwest of the project site.

EXISTING GENERAL AMBIENT NOISE LEVELS

To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hr.) noise level measurements at two locations on the project site. Noise measurement locations are shown on **Figure 2**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Larson Davis Laboratories (LDL) model 812 and 820 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with a CAL 200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

Location	Date	L_{dn}	Daytime L_{eq}	Daytime L_{50}	Daytime L_{max}	Nighttime L_{eq}	Nighttime L_{50}	Nighttime L_{max}
LT-1: Western Project Boundary	5/27/23	60	61	45	75	43	38	56
	5/28/23	52	52	42	73	42	39	57
	5/29/23	52	50	44	70	44	40	59
LT-2: Northeastern Project Boundary	5/27/23	55	51	48	67	48	43	64
	5/28/23	54	51	47	69	47	44	62
	5/29/23	56	52	48	69	49	45	65

Notes:

- *All values shown in dBA*
- *Daytime hours: 7:00 a.m. to 10:00 p.m.*
- *Nighttime Hours: 10:00 p.m. to 7:00 a.m.*
- *Source: Saxelby Acoustics 2023*

FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for existing and future, project and no-project conditions.

Existing and Cumulative noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (Fehr & Peers 2023). Truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing and Cumulative conditions which would result from the project are provided in terms of L_{dn}.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations, sensitive receptors may not receive full shielding from noise barriers or may be located at distances which vary from the assumed calculation distance.

Tables 3 and 4 summarize the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area. **Appendix C** provides the complete inputs and results of the FHWA traffic modeling.

TABLE 3: PREDICTED TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Existing No Project	Existing + Project	Change
Sand Creek Road	East of Linden St.	52.0	52.1	0.1
Sand Creek Road	West of Linden St.	60.6	60.7	0.1
Fairview Ave	North of Sand Creek Rd.	57.8	57.8	0.0
Sand Creek Road	East of Fairvew Ave.	61.0	61.1	0.1
Fairview Ave	South of Sand Creek Rd.	56.0	56.1	0.1
Sand Creek Road	West of West Prj. Dwy	59.1	59.2	0.1

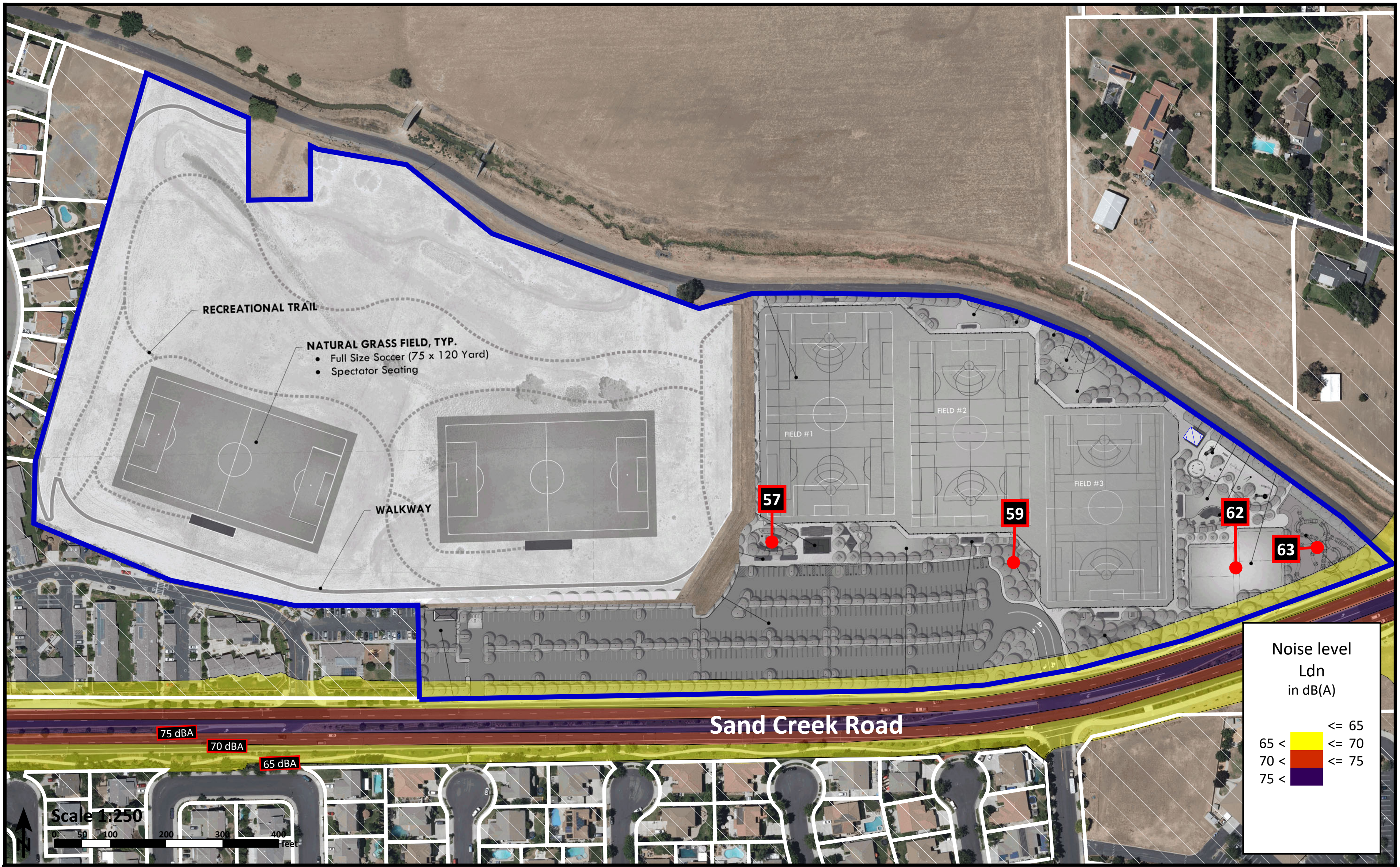
TABLE 4: CUMULATIVE TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Predicted Exterior Noise Level (dBA L_{dn}) at Closest Sensitive Receptors		
		Cumulative No Project	Cumulative + Project	Change
Sand Creek Road	East of Linden St.	53.4	53.4	0.0
Sand Creek Road	West of Linden St.	62.0	62.1	0.1
Fairview Ave	North of Sand Creek Rd.	58.8	58.9	0.1
Sand Creek Road	East of Fairvew Ave.	62.4	62.5	0.1
Fairview Ave	South of Sand Creek Rd.	57.1	57.1	0.0
Sand Creek Road	West of West Prj. Dwy	60.5	60.6	0.1

Based upon the **Tables 3 and 4** data, the proposed project is predicted to result in a maximum traffic noise level increase of 0.1 dBA.

EVALUATION OF FUTURE TRANSPORTATION NOISE ON PROJECT SITE

Saxelby Acoustics used the SoundPLAN noise model to calculate traffic noise levels at the proposed residential uses due to traffic on Sand Creek Road. Inputs to the SoundPLAN noise model include topography, existing structures, roadway elevations, and the proposed building pad elevations. Sand Creek Road was estimated to increase by +1.4 dBA based upon project traffic increases provided by the project traffic engineer (Fehr & Peers). The results of this analysis are shown graphically on **Figure 3**.



Sand Creek Sports Complex

City of Brentwood, California

Figure 3
Transportation Noise Levels (dB(A), Ldn)

Legend

- ▨ Proposed Building
- ☐ Neighboring Parcels
- ▬ Project Site
- ● Outdoor Area Noise Level

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EVALUATION OF PROJECT OPERATIONAL NOISE ON EXISTING SENSITIVE RECEPTORS

Outdoor recreational noise associated with the proposed athletic amenities and parking lot traffic circulation are considered to be the primary noise sources for this project. The following is a list of assumptions used for the noise modeling. Project operational noise is assumed to occur during daytime (7:00 am. to 10:00 p.m.) hours only. The data used is based upon Saxelby Acoustics data from similar operations.

Multi-Use Fields:	The proposed synthetic turf multi-use field has the capability to hold either three full-sized soccer fields, six small kid's soccer fields, three lacrosse fields, or softball practice areas. Phase 2 of the project would add two more soccer fields for a total of five. The loudest L_{eq} and L_{max} values are expected to occur during soccer tournaments utilizing the full sized fields. Based upon measurements taken at various facilities, soccer tournament games produced noise levels up to 58 dBA L_{eq} and 76 dBA L_{max} at 200 feet as measured from the center of the field to sidelines opposite of spectators. The multi-use fields were modeled as operating concurrently during a peak hour.
Tennis Courts:	Tennis Courts are expected to produce noise levels of up to 52 dBA L_{eq} and 62 dBA L_{max} at a distance of 50 feet from the center of the court.
Pickleball Courts:	Pickleball gameplay is expected to produce noise levels of approximately 61 dBA L_{eq} at 25 feet from the edge of the end of a single court and 56 dBA L_{eq} at 25 feet from the edge of the side of a single court. Maximum (L_{max}) noise levels for a typical pickleball game were found to be 81 dBA at 25 feet. [1]
Multi-Use Courts:	The proposed multi-use hard courts are expected to be used for pickleball, futsal, roller hockey, basketball, and volleyball. Saxelby Acoustics conservatively assumed typical noise levels similar to pickleball gameplay. Saxelby Acoustics assumed that gameplay could occur continuously at this noise level on all courts during a peak hour of activity.
Play Area:	Recreational activity in center of playground area at 55 dBA L_{eq} and 67 dBA L_{max} at 50 feet. Saxelby Acoustics data.
On-Site Circulation:	The project is projected to generate up to 580 trips in the evening peak hour (Fehr & Peers 2023). It was assumed that two of these trips could be heavy trucks. Parking lot movements are predicted to generate a sound exposure level (SEL) of 71 dBA SEL at 50 feet for cars and 85 dBA SEL at 50 feet for trucks. Saxelby Acoustics data.

Saxelby Acoustics used the SoundPLAN noise prediction model. Inputs to the model included sound power levels for the proposed amenities, existing and proposed buildings, terrain type, and locations of sensitive receptors. These predictions are made in accordance with International Organization for Standardization (ISO) standard 9613-2:1996 (Acoustics – Attenuation of sound during propagation outdoors). ISO 9613 is the most commonly used method for calculating exterior noise propagation. **Figure 4** shows the maximum noise levels resulting from operation of Phase 1 of the project. **Figure 5** shows the maximum noise levels resulting from operation of Phase 1 and Phase 2 of the project.

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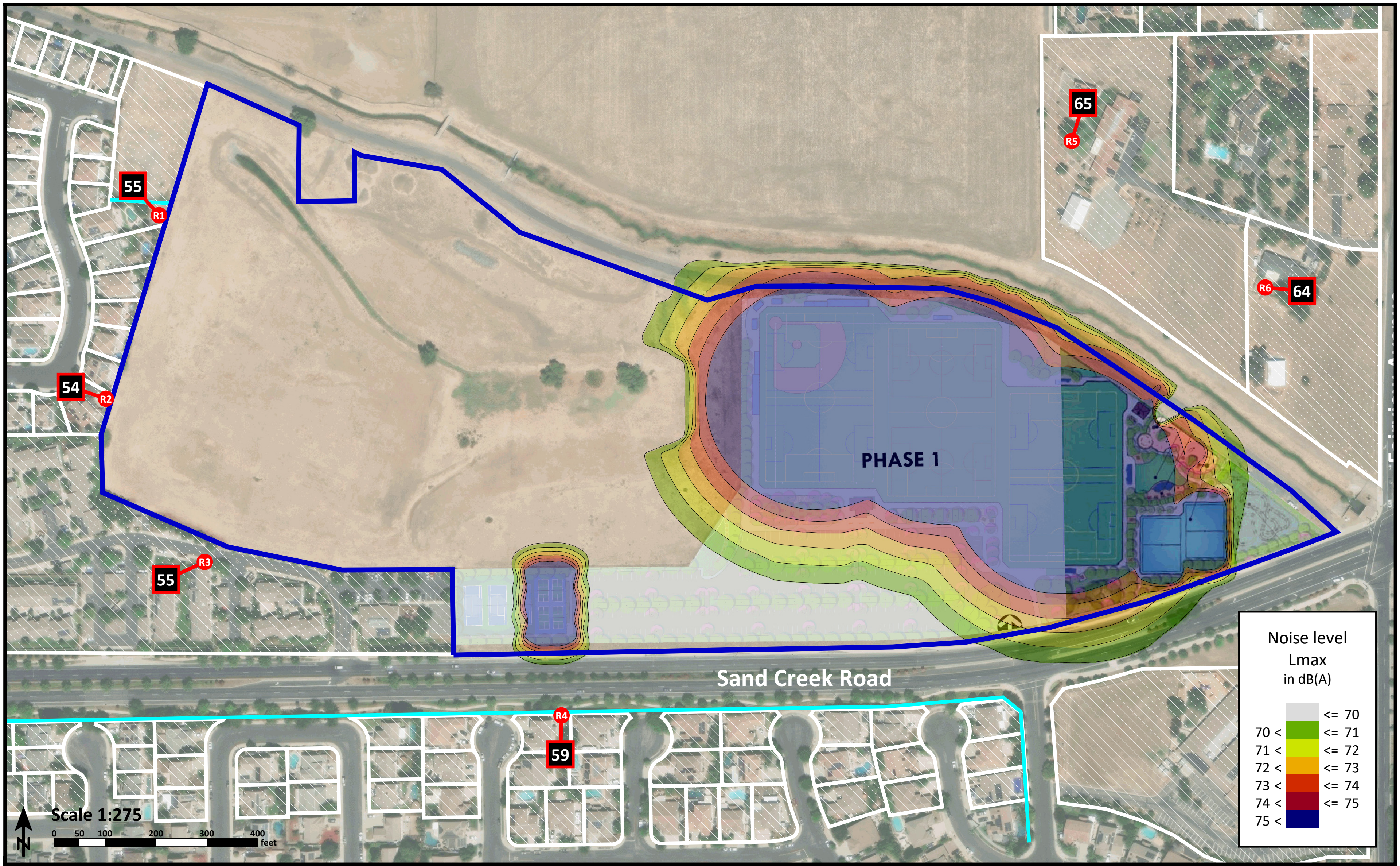
[1] Data was collected using Fast meter response.



Sand Creek Sports Complex

City of Brentwood, California

Figure 4
Phase 1 Maximum Noise Levels (dB(A) Lmax)

Legend

▨ Neighboring Parcels

— Project Site

— Existing Wall

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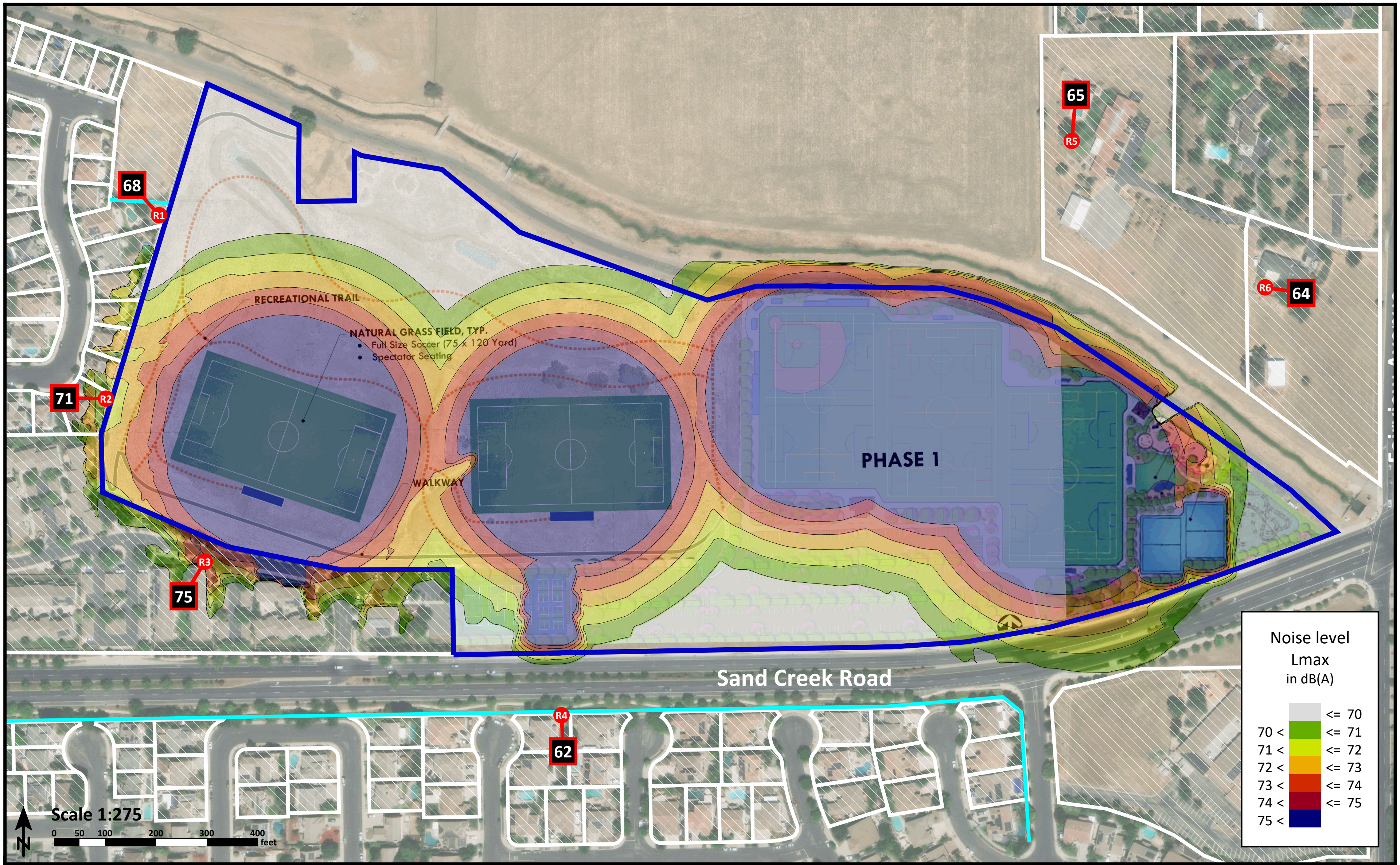

Sand Creek Sports Complex

City of Brentwood, California

Figure 5
Phase 1 & 2 Maximum Noise Levels (dB(A) Lmax)

Legend

▨ Neighboring Parcels
━ Project Site
━ Existing Wall

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CONSTRUCTION NOISE ENVIRONMENT

During the construction of the proposed project, noise from construction activities would temporarily add to the noise environment in the project vicinity. As shown in **Table 5**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

TABLE 5: CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dBA at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. **Table 6** shows the typical vibration levels produced by construction equipment.

TABLE 6: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

REGULATORY CONTEXT

FEDERAL

There are no federal regulations related to noise that apply to the Proposed Project.

STATE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA standards are discussed more below under the Thresholds of Significance section.

State Building Code, Title 24, Part 2 of the State of California Code of Regulations

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations, establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses, and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB L_{dn} or CNEL in any habitable room. Title 24 also mandates that for structures containing noise-sensitive uses to be located where the L_{dn} or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

LOCAL

City of Brentwood General Plan

Policies

Policy N 1-2: Require development and infrastructure projects to be consistent with the Land Use Compatibility for Community Noise Environments standards indicated in **Figure 5** to ensure acceptable noise levels for existing and future development.

Policy N 1-5: Periodically review and update, as necessary, Chapter 9.32 (Noise Regulations) of the Brentwood Municipal Code in order to address issues such as excessive noise from commercial, industrial, and other noise generating land uses, as well as vehicle noise, to the extent allowed by State law.

Policy N 1-7: For projects that are required by the California Environmental Quality Act (CEQA) to analyze noise impacts, the following criteria shall be used to determine the significance of those impacts:

Stationary and Non-Transportation Noise Sources

- A significant impact will occur if the project results in an exceedance of the noise level standards contained in this element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater.

Transportation Noise Sources

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB L_{dn} increase in roadway noise levels will be considered significant.

Policy N 1-13 Ensure that new development does not result in indoor noise levels exceeding 45 dBA L_{dn} for residential uses.

TABLE 7: STATIONARY (NON-TRANSPORTATION) NOISE STANDARDS (TABLE N-2)

Land Use Receiving the Noise	Hourly Noise-Level Descriptor	Exterior Noise-Level Standard (dBA)	
		Daytime (7am-10pm)	Nighttime (10pm-7am)
Residential	L_{eq}	55	45
	L_{max}	70	65

Notes:

a) The residential standards apply to all properties that are zoned for residential use. The exterior noise level standard is to be applied at the property line of the receiving land use or at a designated outdoor activity area (at the discretion of the Community Development Director) of the new development. For mixed-use projects, the exterior noise level standard may be waived (at the discretion of the Community Development Director) if the project does not include a designated activity area and mitigation of property line noise is not practical. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The City can impose standards that are more restrictive than specified above based upon determination of existing low ambient noise levels.

b) Each of the noise levels specified above shall be lowered by 5 dBA for tonal noises characterized by a whine, screech, or hum, noises consisting primarily of speech or music, or recurring impulsive noises. In no case shall mitigation be required to a level that is less than existing ambient noise levels, as determined through measurements conducted during the same operational period as the subject noise source.

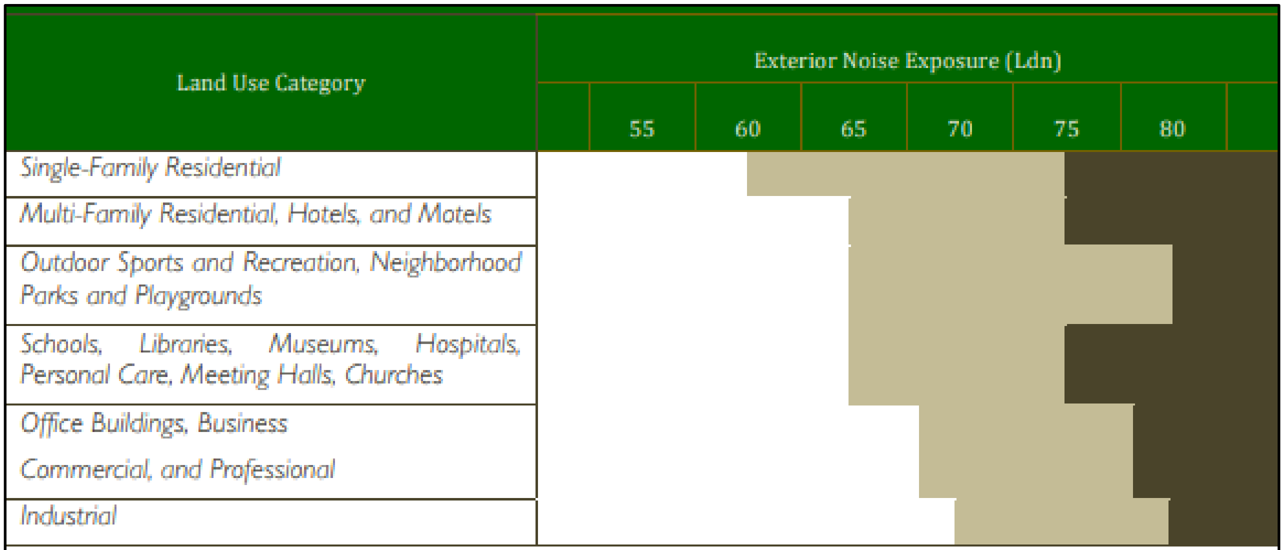
c) In situations where the existing noise level exceeds the noise levels indicated in the above table, any new noise source must include mitigation that reduces the noise level of the noise source to the existing level plus 3 dB.

d) Exterior noise exposure level not exceeding 65 dB L_{dn} is allowed along the State Route 4 corridor, the Union Pacific Railroad corridor, and arterial roadways.

Action N 1e: During the environmental review process, determine if proposed construction will constitute a significant impact on nearby residents and, if necessary, require mitigation measures in addition to the standard best practice controls. Suggested best practices for control of construction noise include:

1. Construction period shall be less than 12 months;
2. Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited to between the hours of 7:00 am and 6:00 pm on weekdays, and between 8:00 am and 5:00 pm on Saturdays. No construction shall occur on Sundays or City holidays;
3. All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment;
4. The construction contractor shall utilize “quiet” models of air compressors and other stationary noise sources where technology exists;
5. At all times during project grading and construction, stationary noise generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences;
6. Unnecessary idling of internal combustion engines shall be prohibited;
7. Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible;
8. The required construction-related noise mitigation plan shall also specify that haul truck deliveries are subject to the same hours specified for construction equipment;
9. Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing; and
10. The construction contractor shall designate a “noise disturbance coordinator” who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

TABLE 8: BRENTWOOD LAND USE COMPATIBILITY TABLE



Land Use Category	Exterior Noise Exposure (Ldn)					
	55	60	65	70	75	80
Single-Family Residential	☐	▨	▨	▨	■	■
Multi-Family Residential, Hotels, and Motels	☐	☐	▨	▨	■	■
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	☐	☐	▨	▨	▨	■
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches	☐	☐	▨	▨	■	■
Office Buildings, Business Commercial, and Professional	☐	☐	☐	▨	▨	■
Industrial	☐	☐	☐	▨	▨	■

☐	**NORMALLY ACCEPTABLE** *Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements*
▨	**CONDITIONALLY ACCEPTABLE** *Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design*
■	**UNACCEPTABLE** *New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies*

CRITERIA FOR ACCEPTABLE VIBRATION

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 9**, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

Table 9 indicates that the threshold for architectural damage to structures is 0.20 in/sec p.p.v. A threshold of 0.20 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

TABLE 9: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/second	in/second		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Transportation Related Earthborne Vibrations. Caltrans. TAV-02-01-R9601. February 20, 2002.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. Significance criteria for noise impacts are drawn from CEQA Guidelines Appendix G (Items XI [a-c]).

Would the project:

a. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b. Generate excessive groundborne vibration or groundborne noise levels?

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project is not located within two miles of a public or private airport, therefore item "c" is not discussed any further in this study.

Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases

The City of Brentwood defines a significant increase as the following:

Stationary and Non-Transportation Noise Sources

- A significant impact will occur if the project results in an exceedance of the noise level standards contained in this element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater.

Transportation Noise Sources

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB L_{dn} increase in roadway noise levels will be considered significant.

Temporary Construction Noise Impacts

With temporary noise impacts (construction), identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, and the absolute change in decibel levels. Per the City of Brentwood Municipal Code, construction activities operating outside the hours of 7:00 am and 6:00 pm on weekdays, and between 8:00 am and 5:00 pm on Saturdays are prohibited.

The City has not adopted any formal standard for evaluating temporary construction noise which occurs within allowable hours. For short-term noise associated with Project construction, Saxelby Acoustics recommends use of the Caltrans increase criteria of 12 dBA (Caltrans Traffic Noise Protocol, 2020), applied to existing residential receptors in the project vicinity. This level of increase is approximately equivalent to a doubling of sound energy and has been the standard of significance for Caltrans projects at the state level for many years. Application of this standard to construction activities is considered reasonable considering the temporary nature of construction activities.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

Impact 1: Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Traffic Noise Increases at Off-Site Receptors

The City of Brentwood specifies criteria to determine the significance of traffic noise impacts. Where existing traffic noise levels are greater than 65 dB L_{dn}, a +1.5 dB L_{dn} increase in roadway noise levels will be considered significant. According to **Tables 3 and 4**, the maximum increase is traffic noise at the nearest sensitive receptor is predicted to be 0.1 dBA. Because this is less than the minimum significance threshold of +1.5 dBA, impacts resulting from increased traffic noise would be considered ***less-than-significant***, and no mitigation is required.

Operational Noise at Existing Sensitive Receptors

The City of Brentwood noise level standards require that new projects in the vicinity of existing sensitive receptors generate noise levels no greater than 55 dBA L_{eq} and 70 dBA L_{max} during daytime (7:00 a.m. to 10:00 p.m.) hours. For noise sources characterized by a whine, screech, or hum, such as noises consisting primarily of speech or music, or recurring impulsive noises shall have the average and maximum noise standard lowered to 50 dBA, L_{eq} and 65 dBA, L_{max}. However, the City's General Plan states that a project shall not be required to mitigate to noise levels which are below the measured ambient. **Table 2** shows the measured ambient noise levels at sensitive receptors adjacent to the project site. Based upon these values, the project should not generate noise levels greater than 55 dBA L_{eq} and 70 dBA L_{max} at the receptors to the west, and 55 dBA L_{eq} and 67 dBA L_{eq} at the receptors to the east.

As shown on **Figure 4**, Phase 1 of the project is predicted to expose nearby residences to noise levels up to 65 dBA L_{max} at receptors to the east and 55-59 dBA L_{max} at receptors to the west. This would comply with the adjusted standard of 67 dBA L_{max} and requires no mitigation.

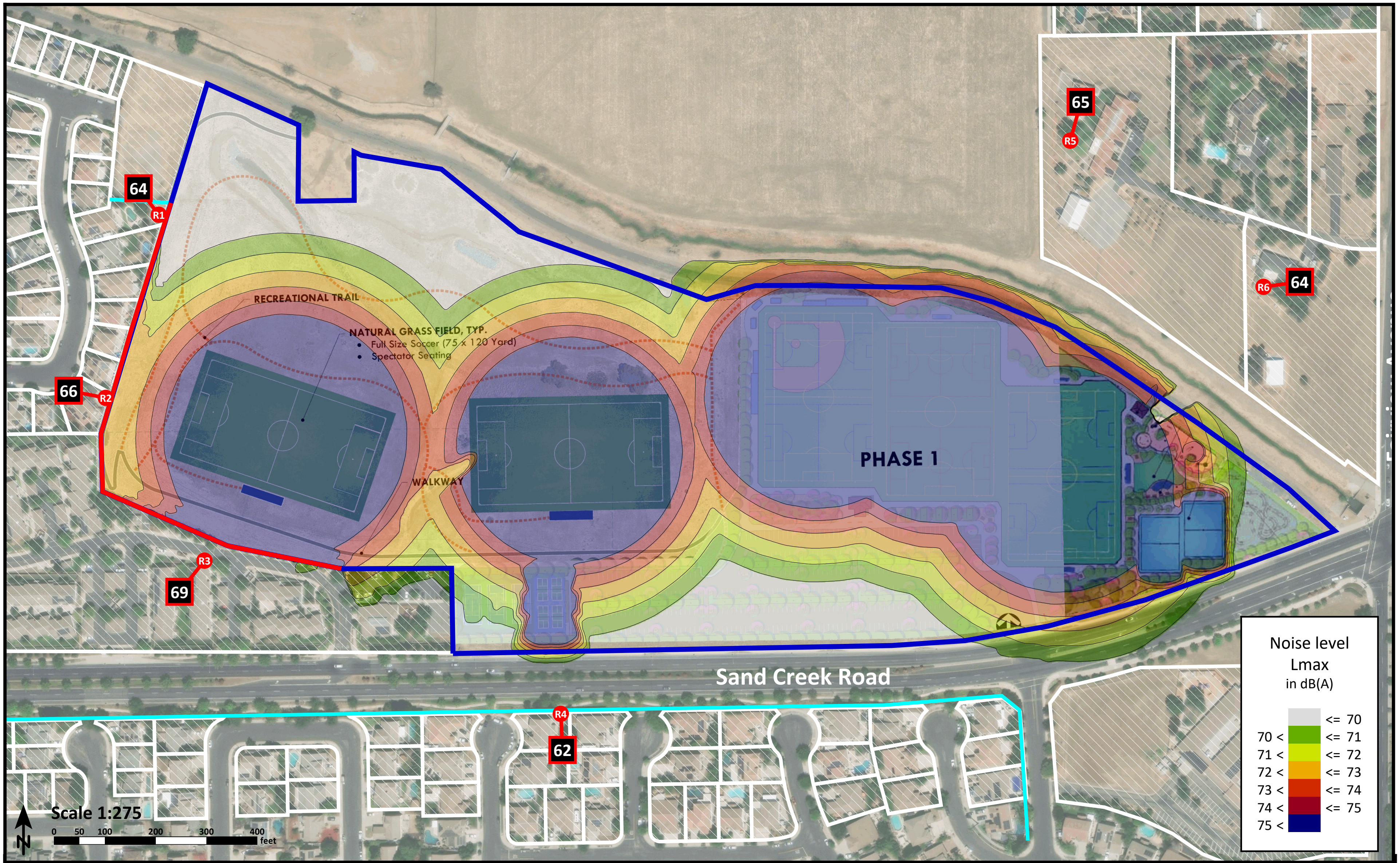
As shown on **Figure 5**, Phase 1 and Phase 2 of the project are predicted to expose nearby residences to noise levels up to 65 dBA L_{max} at receptors to the east and 75 dBA L_{max} at receptors to the west. This would exceed the adjusted noise standard of 70 dBA L_{max} at the residences to the west. Therefore, this would be considered a ***potentially significant*** impact. Saxelby Acoustics recommends mitigation measure 1(a) which specifies the construction of a sound wall to reduce noise levels.

Figure 6 shows the required location of the sound barrier. **Table 10** below shows the assessment of all applicable noise levels with a noise barrier.

TABLE 10: PROJECT NOISE LEVELS WITH PHASE 2 NOISE BARRIER

Receptor	Project L_{eq}/L_{max}	Ambient L_{eq}/L_{max}	Increase to Ambient L_{eq}	Increase Threshold L_{eq}	Complies with Standards?
1	46/64	50/70	1.5	3.0	Yes
2	47 /66	50/70	1.8	3.0	Yes
3	50/69	50/70	3.0	3.0	Yes
4	48/62	50/70	2.1	3.0	Yes
5	49/65	52/67	1.8	3.0	Yes
6	48/64	52/67	1.5	3.0	Yes

Notes: All noise levels in the above table are shown in dBA.



Sand Creek Sports Complex

City of Brentwood, California

Figure 6
Phase 1 & 2 Maximum Noise Levels with Mitigation (dB(A) Lmax)

Legend

▨ Neighboring Parcels
▬ Project Site
▬ Existing Wall
▬ 8-foot-tall Sound Wall

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Construction Noise

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. As indicated in **Table 5,** activities involved in construction would generate maximum noise levels ranging from 76 to 90 dBA L_{max} at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours.

Caltrans defines a significant increase due to noise as an increase of 12 dBA over existing ambient noise levels; Saxelby Acoustics used this criterion to evaluate increases due to construction noise associated with the project. As shown in **Table 5**, construction equipment is predicted to generate noise levels of up to 90 dBA L_{max} at 50 feet. Construction noise is evaluated as occurring at the center of the site to represent average noise levels generated over the duration of construction across the project site. The nearest residential uses are located approximately 440 feet as measured from the center of the project site. At this distance, maximum construction noise levels would be up to 71 dBA. The average daytime maximum noise level in the vicinity of the sensitive receptors was measured to be 67 dBA. Therefore, project construction would not cause an increase of greater than 12 dBA over existing ambient noise levels.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration and would occur during daytime hours.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered ***potentially significant***. Mitigation measure 1(b) would reduce construction noise impacts to ***less-than-significant***.

Transportation Noise on Project Site (Non-CEQA Issue)

Exterior Transportation Noise

Compliance with City's standards on new noise-sensitive receptors is not a CEQA consideration. However, this information is provided here so that a determination can be made regarding the ability of the proposed project to meet the requirements of the City of Brentwood for exterior noise levels at new sensitive uses proposed under the project.

As shown on **Figure 3**, several of the proposed outdoor activity areas are predicted to be exposed to exterior transportation noise levels up to approximately 63 dBA L_{dn}. This would meet the 65 dBA limit for outdoor sports and recreation areas established by the City of Brentwood. Therefore, no additional noise control measures would be required.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

1(a) *Phase 2 of the project must include the construction of an 8-foot-tall barrier at the western and southwestern boundaries of the project site as shown on **Figure 6**. The barrier height shall be relative to the residential building pads or the soccer field elevation, whichever is greater.* Noise barrier walls shall be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials that achieve the required total height. Wood is not recommended due to eventual warping and degradation of acoustical performance. These requirements shall be included in the improvement plans prior to their approval by the City's Public Works Department.

1(b) *Construction activities shall be limited to the hours set forth below:*

Monday-Friday 7:00 AM to 6:00 PM
Saturday 8:00 AM to 5:00 PM

Construction shall be prohibited on Sundays and City holidays. These criteria shall be included in the grading plan submitted by the applicant/developer for review and approval of the Community Development Director prior to issuance of grading permits. Exceptions to allow expanded construction activities shall be reviewed on a case-by-case basis as determined by the Chief Building Official and/or City Engineer.

The project contractor shall ensure that the following construction noise BMPs are met on-site during all phases of construction:

- *All equipment driven by internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., arc welders, air compressors) shall be equipped with shrouds and noise- control features that are readily available for that type of equipment.*
- *All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.*
- *The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.*
- *At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.*
- *Unnecessary idling of internal combustion engines shall be prohibited.*
- *Construction staging areas shall be established at locations that would create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.*
- *Construction site and access road speed limits shall be established and enforced during the construction period.*

- *The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.*
- *Project-related public address or music systems shall not be audible at any adjacent receptor.*
- *Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.*
- *The construction contractor shall designate a "noise disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.*

Construction noise BMPs shall be included in the grading plan submitted by the developer for review and approval by the Community Development Director prior to grading permit issuance.

Impact 2: Would the project generate excessive groundborne vibration or groundborne noise levels?

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The **Table 6** data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located further than 26 feet from typical construction activities. At distances greater than 26 feet construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

This is a **less-than-significant** impact and no mitigation is required.

Impact 3: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

There are no airports within two miles of the project vicinity. Therefore, this impact is not applicable to the proposed project.

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Appendix A: Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
ASTC	Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.
DNL	See definition of Ldn.
IIC	Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
NIC	Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.
NNIC	Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
RT60	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
SPC	Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

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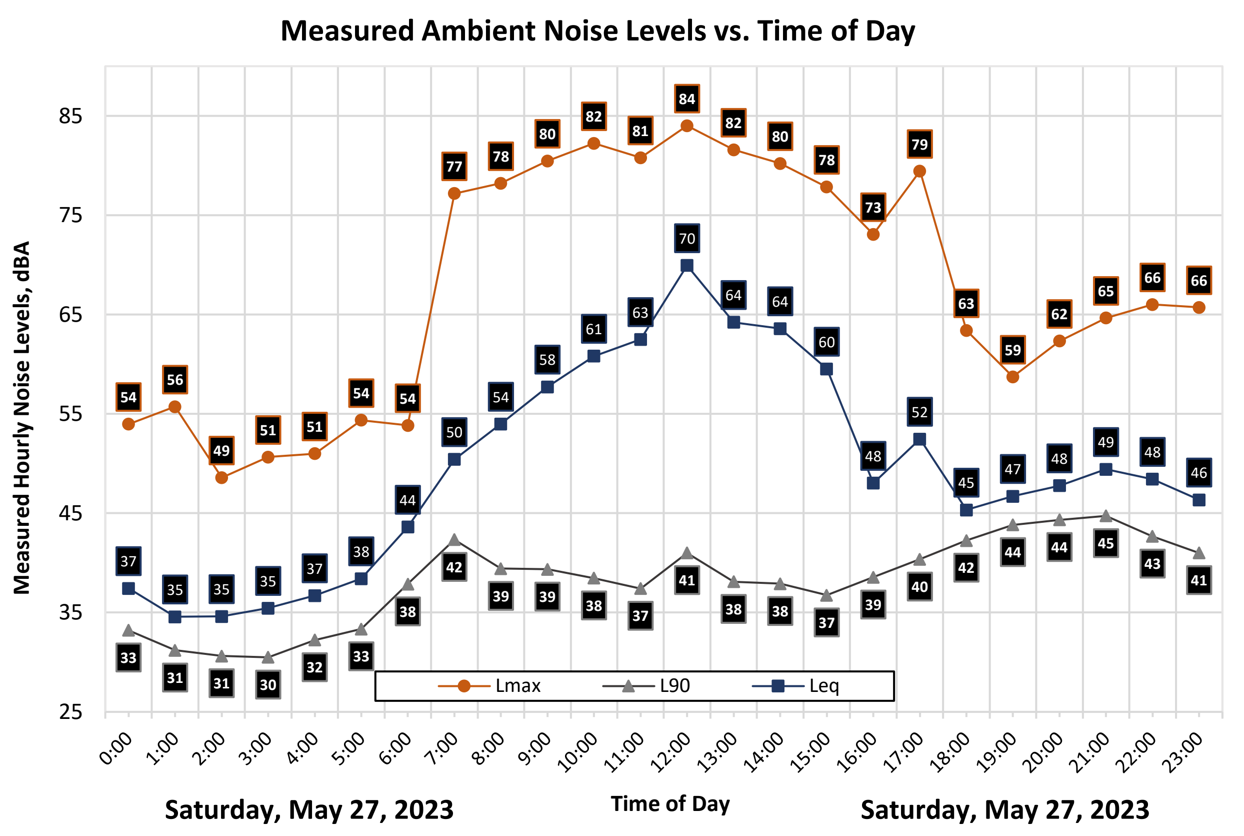
Appendix B: Continuous and Short-Term Ambient Noise Measurement Results

Appendix B1a: Continuous Noise Monitoring Results

Site: LT-1
Project: Sand Creek Sports Complex
Location: Western Project Boundary
Coordinates: (37.9453865, -121.7321768)
Meter: LDL 812-2
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Saturday, May 27, 2023	0:00	37	54	36	33
Saturday, May 27, 2023	1:00	35	56	33	31
Saturday, May 27, 2023	2:00	35	49	33	31
Saturday, May 27, 2023	3:00	35	51	33	30
Saturday, May 27, 2023	4:00	37	51	35	32
Saturday, May 27, 2023	5:00	38	54	37	33
Saturday, May 27, 2023	6:00	44	54	42	38
Saturday, May 27, 2023	7:00	50	77	46	42
Saturday, May 27, 2023	8:00	54	78	41	39
Saturday, May 27, 2023	9:00	58	80	41	39
Saturday, May 27, 2023	10:00	61	82	41	38
Saturday, May 27, 2023	11:00	63	81	40	37
Saturday, May 27, 2023	12:00	70	84	66	41
Saturday, May 27, 2023	13:00	64	82	45	38
Saturday, May 27, 2023	14:00	64	80	42	38
Saturday, May 27, 2023	15:00	60	78	41	37
Saturday, May 27, 2023	16:00	48	73	42	39
Saturday, May 27, 2023	17:00	52	79	43	40
Saturday, May 27, 2023	18:00	45	63	44	42
Saturday, May 27, 2023	19:00	47	59	46	44
Saturday, May 27, 2023	20:00	48	62	47	44
Saturday, May 27, 2023	21:00	49	65	48	45
Saturday, May 27, 2023	22:00	48	66	46	43
Saturday, May 27, 2023	23:00	46	66	44	41

Statistics	Leq	Lmax	L50	L90
Day Average	61	75	45	40
Night Average	43	56	38	35
Day Low	45	59	40	37
Day High	70	84	66	45
Night Low	35	49	33	30
Night High	48	66	46	43
Ldn	60	Day %		99
CNEL	60	Night %		1



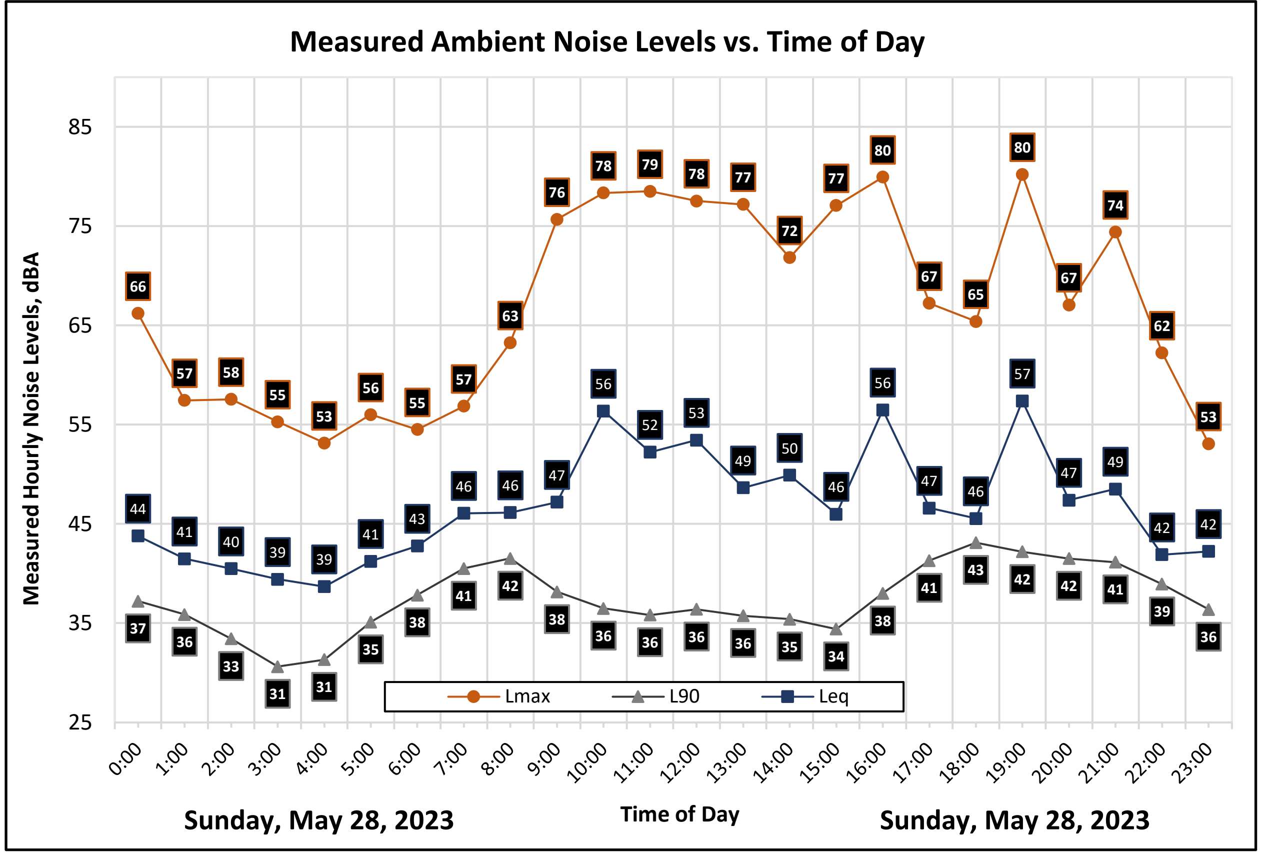
Appendix B1b: Continuous Noise Monitoring Results

Site: LT-1
Project: Sand Creek Sports Complex
Location: Western Project Boundary
Coordinates: (37.9453865, -121.7321768)

Meter: LDL 812-2
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Sunday, May 28, 2023	0:00	44	66	40	37
Sunday, May 28, 2023	1:00	41	57	40	36
Sunday, May 28, 2023	2:00	40	58	37	33
Sunday, May 28, 2023	3:00	39	55	36	31
Sunday, May 28, 2023	4:00	39	53	36	31
Sunday, May 28, 2023	5:00	41	56	39	35
Sunday, May 28, 2023	6:00	43	55	41	38
Sunday, May 28, 2023	7:00	46	57	45	41
Sunday, May 28, 2023	8:00	46	63	44	42
Sunday, May 28, 2023	9:00	47	76	40	38
Sunday, May 28, 2023	10:00	56	78	39	36
Sunday, May 28, 2023	11:00	52	79	39	36
Sunday, May 28, 2023	12:00	53	78	39	36
Sunday, May 28, 2023	13:00	49	77	38	36
Sunday, May 28, 2023	14:00	50	72	39	35
Sunday, May 28, 2023	15:00	46	77	38	34
Sunday, May 28, 2023	16:00	56	80	43	38
Sunday, May 28, 2023	17:00	47	67	44	41
Sunday, May 28, 2023	18:00	46	65	45	43
Sunday, May 28, 2023	19:00	57	80	44	42
Sunday, May 28, 2023	20:00	47	67	44	42
Sunday, May 28, 2023	21:00	49	74	44	41
Sunday, May 28, 2023	22:00	42	62	41	39
Sunday, May 28, 2023	23:00	42	53	40	36

Statistics	Leq	Lmax	L50	L90
Day Average	52	73	42	39
Night Average	42	57	39	35
Day Low	46	57	38	34
Day High	57	80	45	43
Night Low	39	53	36	31
Night High	44	66	41	39
Ldn	52	Day %		95
CNEL	53	Night %		5


Measured Ambient Noise Levels vs. Time of Day

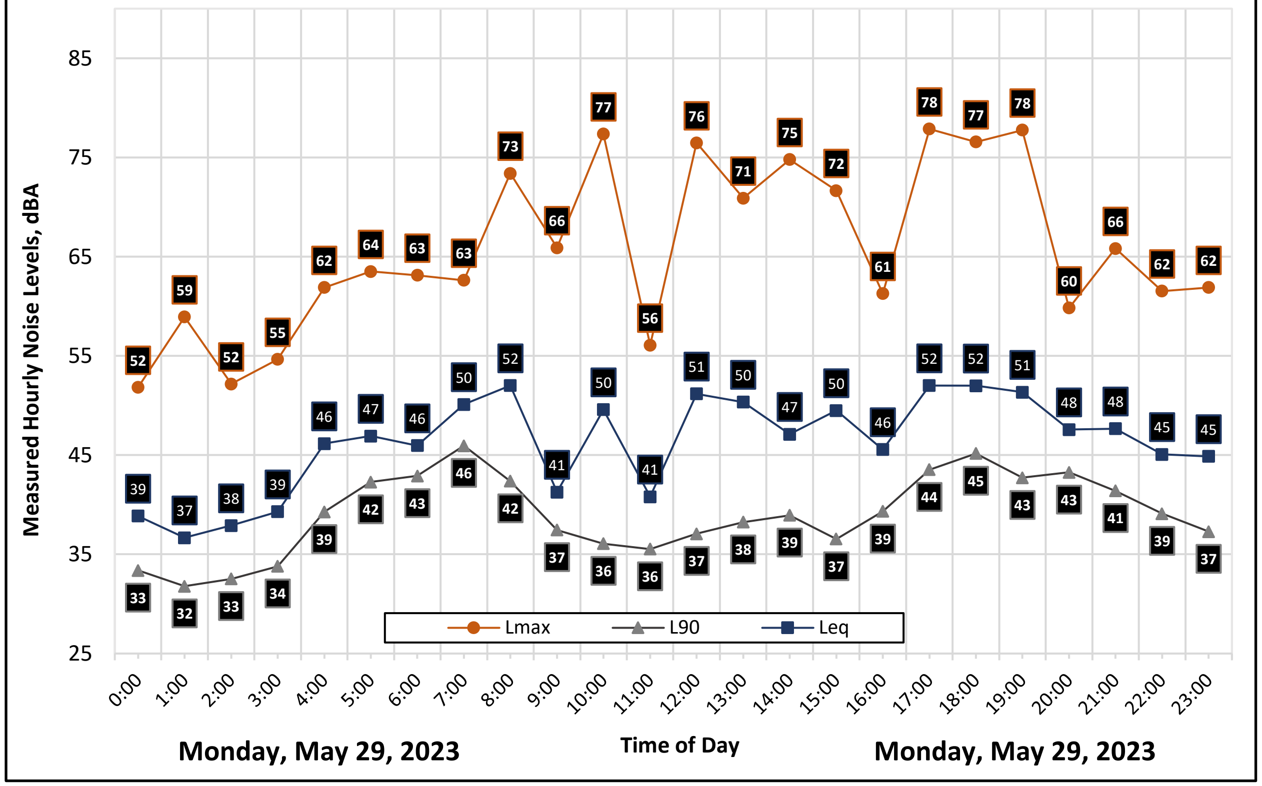
Appendix B1c: Continuous Noise Monitoring Results

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Monday, May 29, 2023	0:00	39	52	37	33
Monday, May 29, 2023	1:00	37	59	35	32
Monday, May 29, 2023	2:00	38	52	35	33
Monday, May 29, 2023	3:00	39	55	37	34
Monday, May 29, 2023	4:00	46	62	44	39
Monday, May 29, 2023	5:00	47	64	45	42
Monday, May 29, 2023	6:00	46	63	45	43
Monday, May 29, 2023	7:00	50	63	49	46
Monday, May 29, 2023	8:00	52	73	49	42
Monday, May 29, 2023	9:00	41	66	40	37
Monday, May 29, 2023	10:00	50	77	39	36
Monday, May 29, 2023	11:00	41	56	38	36
Monday, May 29, 2023	12:00	51	76	40	37
Monday, May 29, 2023	13:00	50	71	41	38
Monday, May 29, 2023	14:00	47	75	42	39
Monday, May 29, 2023	15:00	50	72	40	37
Monday, May 29, 2023	16:00	46	61	44	39
Monday, May 29, 2023	17:00	52	78	46	44
Monday, May 29, 2023	18:00	52	77	48	45
Monday, May 29, 2023	19:00	51	78	45	43
Monday, May 29, 2023	20:00	48	60	46	43
Monday, May 29, 2023	21:00	48	66	46	41
Monday, May 29, 2023	22:00	45	62	43	39
Monday, May 29, 2023	23:00	45	62	42	37

Statistics	Leq	Lmax	L50	L90
Day Average	50	70	44	40
Night Average	44	59	40	37
Day Low	41	56	38	36
Day High	52	78	49	46
Night Low	37	52	35	32
Night High	47	64	45	43
Ldn	52	Day %		86
CNEL	52	Night %		14

Site: LT-1
Project: Sand Creek Sports Complex
Location: Western Project Boundary
Coordinates: (37.9453865, -121.7321768)
Meter: LDL 812-2
Calibrator: CAL200

Measured Ambient Noise Levels vs. Time of Day

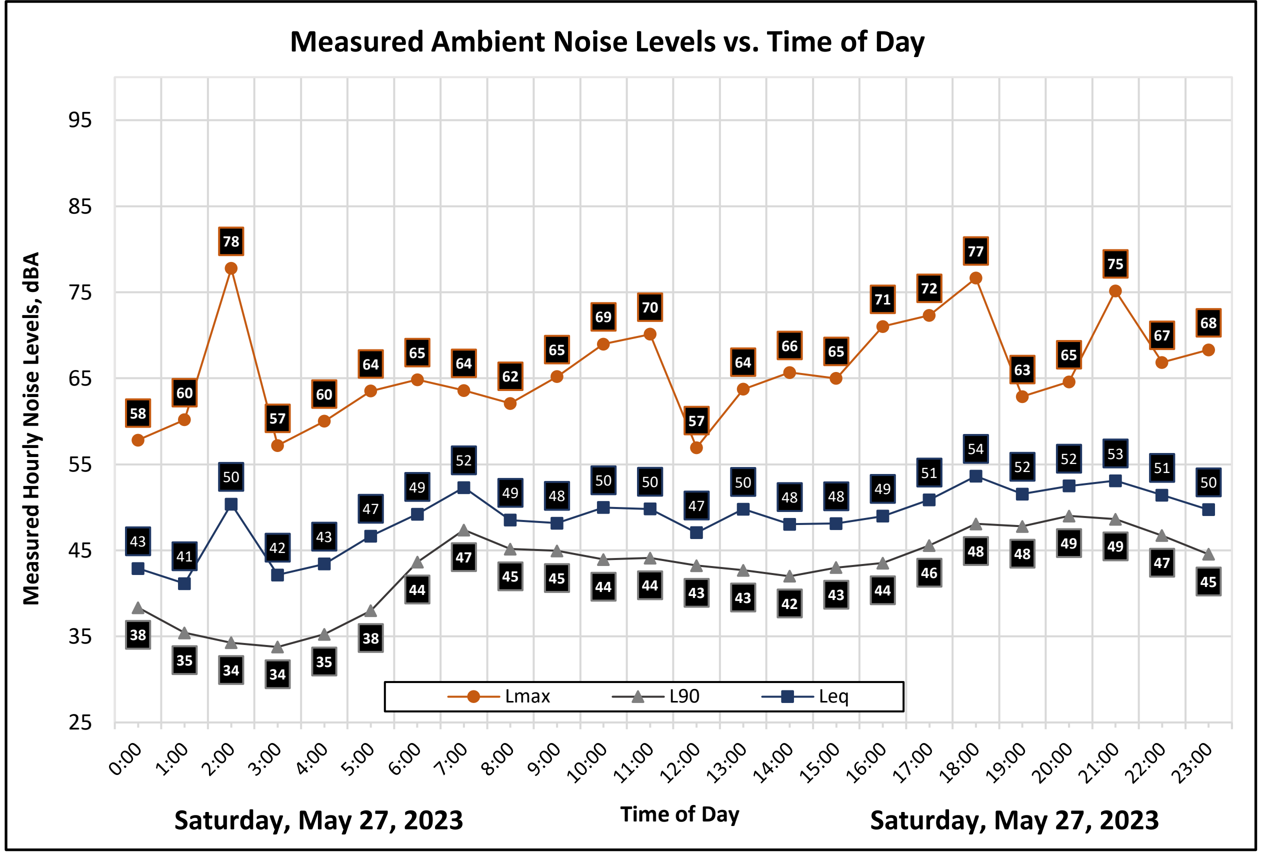


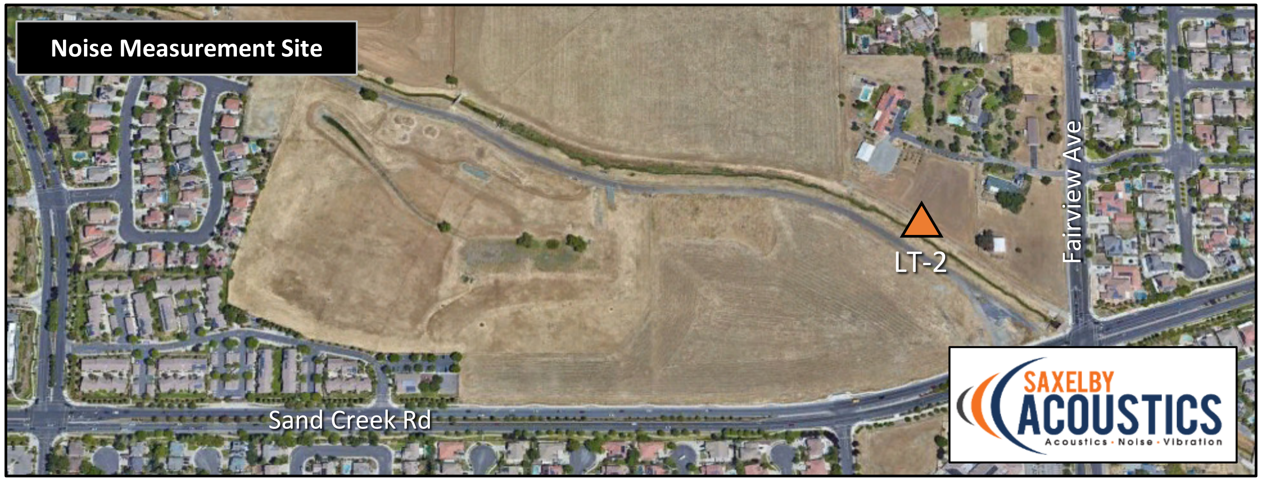
Appendix B2a: Continuous Noise Monitoring Results

Site: LT-2
Project: Sand Creek Sports Complex
Location: Eastern Project Boundary
Coordinates: (37.9453799, -121.7250931)
Meter: LDL 820-6
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Saturday, May 27, 2023	0:00	43	58	42	38
Saturday, May 27, 2023	1:00	41	60	39	35
Saturday, May 27, 2023	2:00	50	78	39	34
Saturday, May 27, 2023	3:00	42	57	38	34
Saturday, May 27, 2023	4:00	43	60	40	35
Saturday, May 27, 2023	5:00	47	64	44	38
Saturday, May 27, 2023	6:00	49	65	48	44
Saturday, May 27, 2023	7:00	52	64	51	47
Saturday, May 27, 2023	8:00	49	62	47	45
Saturday, May 27, 2023	9:00	48	65	47	45
Saturday, May 27, 2023	10:00	50	69	46	44
Saturday, May 27, 2023	11:00	50	70	49	44
Saturday, May 27, 2023	12:00	47	57	46	43
Saturday, May 27, 2023	13:00	50	64	46	43
Saturday, May 27, 2023	14:00	48	66	45	42
Saturday, May 27, 2023	15:00	48	65	46	43
Saturday, May 27, 2023	16:00	49	71	46	44
Saturday, May 27, 2023	17:00	51	72	48	46
Saturday, May 27, 2023	18:00	54	77	52	48
Saturday, May 27, 2023	19:00	52	63	51	48
Saturday, May 27, 2023	20:00	52	65	52	49
Saturday, May 27, 2023	21:00	53	75	52	49
Saturday, May 27, 2023	22:00	51	67	50	47
Saturday, May 27, 2023	23:00	50	68	48	45

Statistics	Leq	Lmax	L50	L90
Day Average	51	67	48	45
Night Average	48	64	43	39
Day Low	47	57	45	42
Day High	54	77	52	49
Night Low	41	57	38	0
Night High	51	78	50	47
Ldn	55	Day %		76
CNEL	55	Night %		24





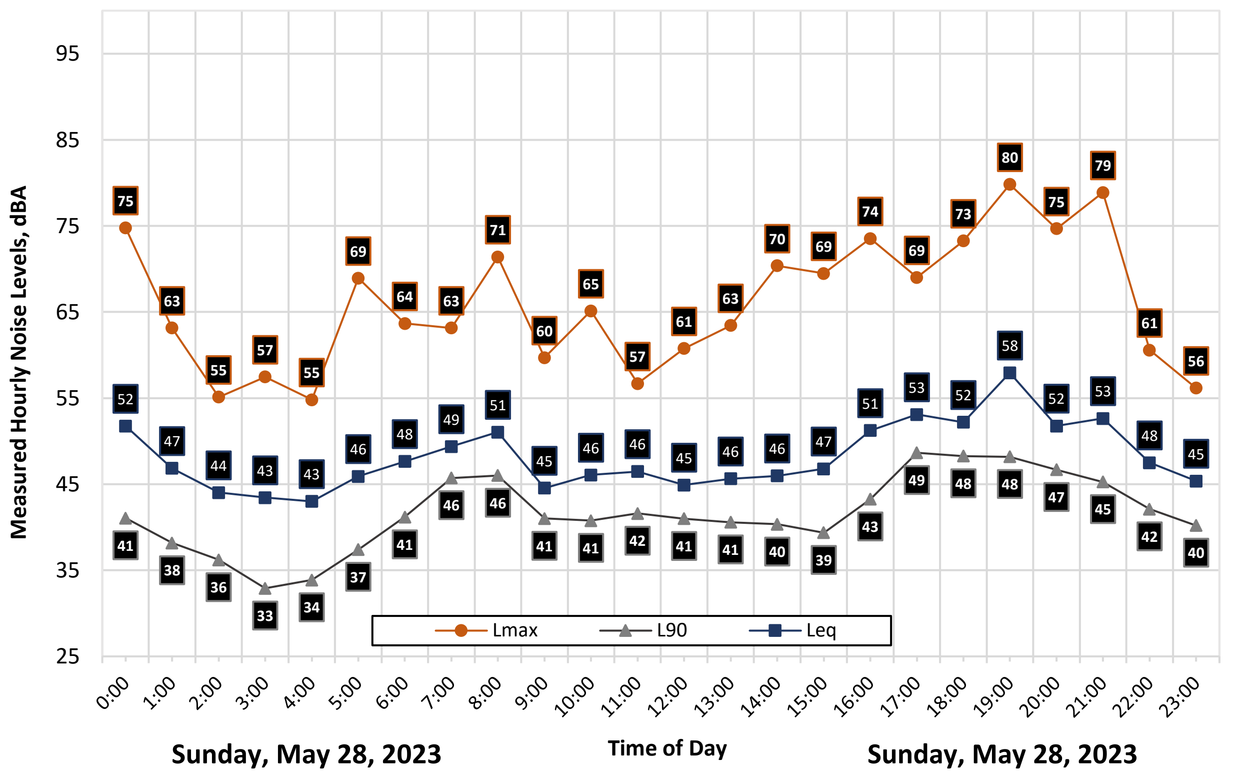
Appendix B2a: Continuous Noise Monitoring Results

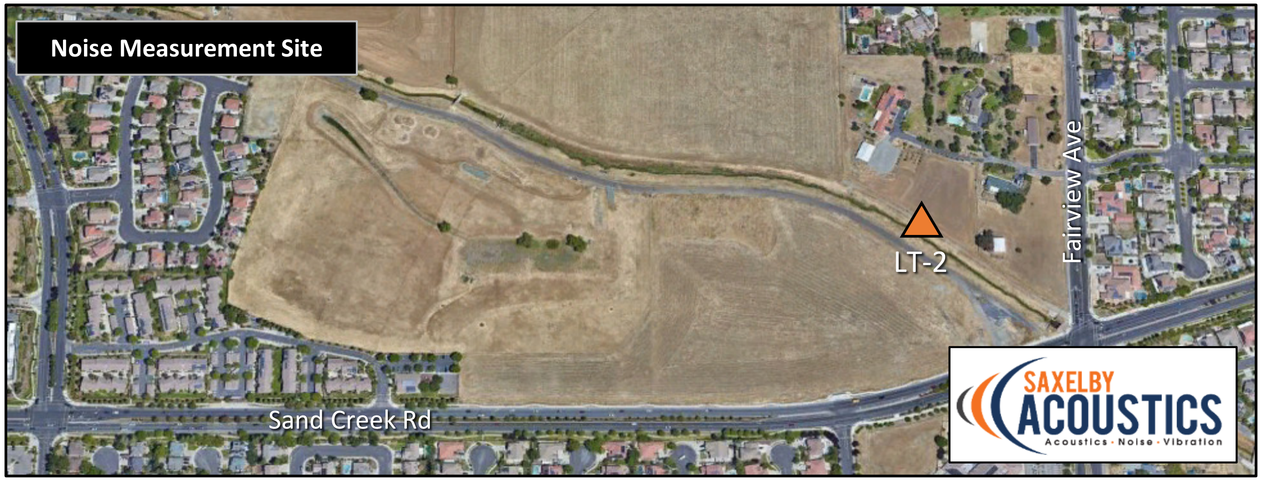
Site: LT-2
Project: Sand Creek Sports Complex
Location: Eastern Project Boundary
Coordinates: (37.9453799, -121.7250931)
Meter: LDL 820-6
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Sunday, May 28, 2023	0:00	52	75	47	41
Sunday, May 28, 2023	1:00	47	63	45	38
Sunday, May 28, 2023	2:00	44	55	42	36
Sunday, May 28, 2023	3:00	43	57	40	33
Sunday, May 28, 2023	4:00	43	55	40	34
Sunday, May 28, 2023	5:00	46	69	43	37
Sunday, May 28, 2023	6:00	48	64	46	41
Sunday, May 28, 2023	7:00	49	63	48	46
Sunday, May 28, 2023	8:00	51	71	49	46
Sunday, May 28, 2023	9:00	45	60	44	41
Sunday, May 28, 2023	10:00	46	65	44	41
Sunday, May 28, 2023	11:00	46	57	44	42
Sunday, May 28, 2023	12:00	45	61	44	41
Sunday, May 28, 2023	13:00	46	63	43	41
Sunday, May 28, 2023	14:00	46	70	43	40
Sunday, May 28, 2023	15:00	47	69	43	39
Sunday, May 28, 2023	16:00	51	74	49	43
Sunday, May 28, 2023	17:00	53	69	52	49
Sunday, May 28, 2023	18:00	52	73	51	48
Sunday, May 28, 2023	19:00	58	80	52	48
Sunday, May 28, 2023	20:00	52	75	50	47
Sunday, May 28, 2023	21:00	53	79	49	45
Sunday, May 28, 2023	22:00	48	61	47	42
Sunday, May 28, 2023	23:00	45	56	44	40

Statistics	Leq	Lmax	L50	L90
Day Average	51	69	47	44
Night Average	47	62	44	38
Day Low	45	57	43	39
Day High	58	80	52	49
Night Low	43	55	40	0
Night High	52	75	47	42
Ldn	54	Day %		81
CNEL	56	Night %		19

Measured Ambient Noise Levels vs. Time of Day



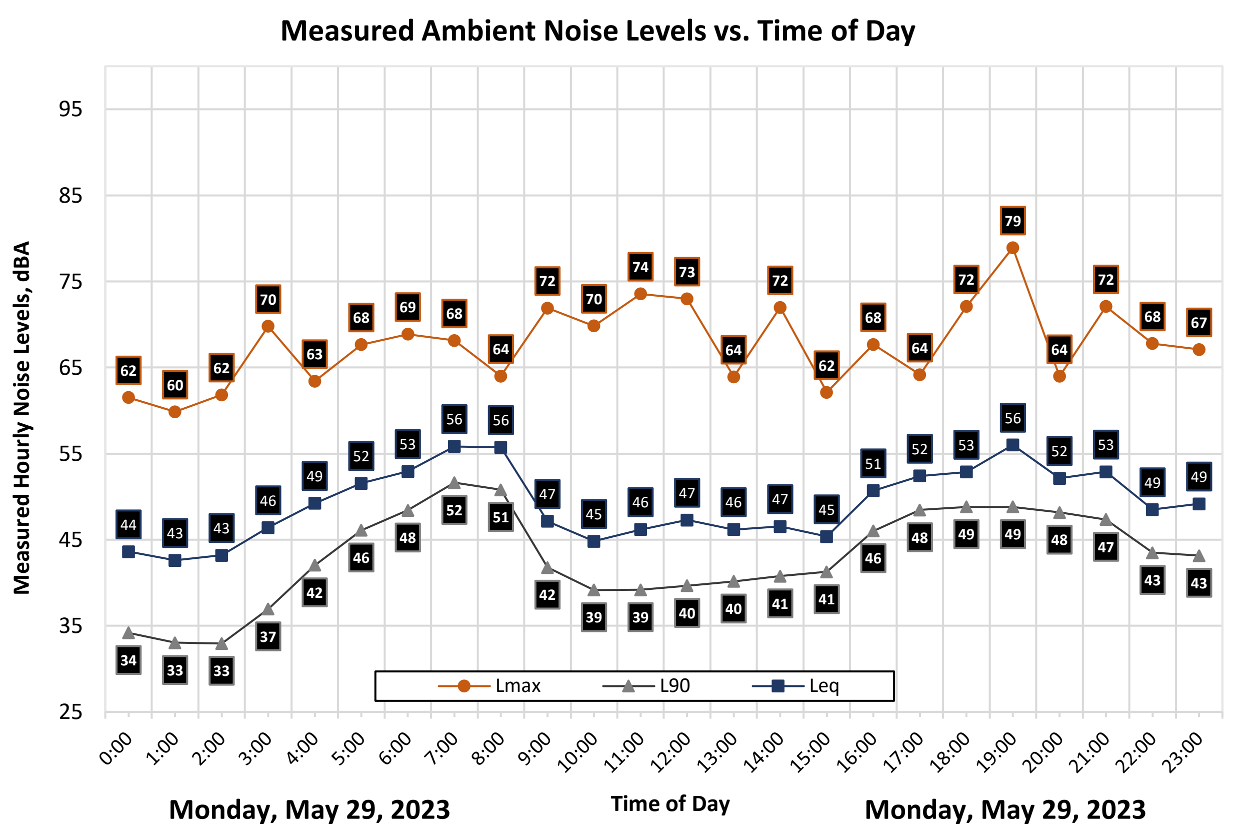


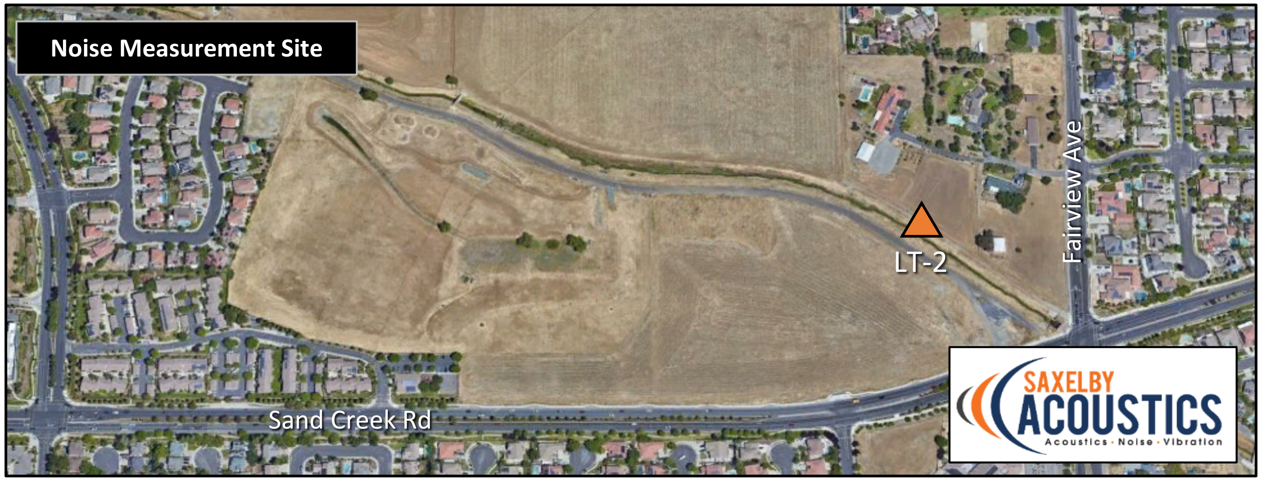
Appendix B2a: Continuous Noise Monitoring Results

Site: LT-2
Project: Sand Creek Sports Complex
Location: Eastern Project Boundary
Coordinates: (37.9453799, -121.7250931)
Meter: LDL 820-6
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Monday, May 29, 2023	0:00	44	62	41	34
Monday, May 29, 2023	1:00	43	60	38	33
Monday, May 29, 2023	2:00	43	62	40	33
Monday, May 29, 2023	3:00	46	70	42	37
Monday, May 29, 2023	4:00	49	63	48	42
Monday, May 29, 2023	5:00	52	68	50	46
Monday, May 29, 2023	6:00	53	69	52	48
Monday, May 29, 2023	7:00	56	68	55	52
Monday, May 29, 2023	8:00	56	64	55	51
Monday, May 29, 2023	9:00	47	72	45	42
Monday, May 29, 2023	10:00	45	70	42	39
Monday, May 29, 2023	11:00	46	74	42	39
Monday, May 29, 2023	12:00	47	73	43	40
Monday, May 29, 2023	13:00	46	64	43	40
Monday, May 29, 2023	14:00	47	72	44	41
Monday, May 29, 2023	15:00	45	62	44	41
Monday, May 29, 2023	16:00	51	68	49	46
Monday, May 29, 2023	17:00	52	64	52	48
Monday, May 29, 2023	18:00	53	72	51	49
Monday, May 29, 2023	19:00	56	79	52	49
Monday, May 29, 2023	20:00	52	64	51	48
Monday, May 29, 2023	21:00	53	72	50	47
Monday, May 29, 2023	22:00	49	68	47	43
Monday, May 29, 2023	23:00	49	67	47	43

Statistics	Leq	Lmax	L50	L90
Day Average	52	69	48	45
Night Average	49	65	45	40
Day Low	45	62	42	39
Day High	56	79	55	52
Night Low	43	60	38	0
Night High	53	70	52	48
Ldn	56	Day %		77
CNEL	57	Night %		23





Appendix C: Traffic Noise Calculation Inputs and Results

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 230505
Description: Sand Creek Sports Complex - Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
												60 dBA	65 dBA	70 dBA	
1	Sand Creek Road	East of Linden St.	20,800	93	0	7	1.0%	1.0%	45	300	-5	188	87	41	52.0
2	Sand Creek Road	West of Linden St.	20,860	93	0	7	1.0%	1.0%	45	80	-5	189	88	41	60.6
3	Fairview Ave	North of Sand Creek Rd.	10,930	93	0	7	1.0%	1.0%	35	115	0	82	38	18	57.8
4	Sand Creek Road	East of Fairvew Ave.	20,860	93	0	7	1.0%	1.0%	45	75	-5	189	88	41	61.0
5	Fairview Ave	South of Sand Creek Rd.	6,590	93	0	7	1.0%	1.0%	45	75	-5	87	41	19	56.0
6	Sand Creek Road	West of West Prj. Dwy	20,800	93	0	7	1.0%	1.0%	45	100	-5	188	87	41	59.1

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 230505
Description: Sand Creek Sports Complex - Existing Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

												Contours (ft.) - No Offset			
Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	60 dBA	65 dBA	70 dBA	Level, dBA
1	Sand Creek Road	East of Linden St.	21,220	93	0	7	1.0%	1.0%	45	300	-5	191	89	41	52.1
2	Sand Creek Road	West of Linden St.	21,450	93	0	7	1.0%	1.0%	45	80	-5	192	89	41	60.7
3	Fairview Ave	North of Sand Creek Rd.	11,160	93	0	7	1.0%	1.0%	35	115	0	83	38	18	57.8
4	Sand Creek Road	East of Fairvew Ave.	21,450	93	0	7	1.0%	1.0%	45	75	-5	192	89	41	61.1
5	Fairview Ave	South of Sand Creek Rd.	6,710	93	0	7	1.0%	1.0%	45	75	-5	89	41	19	56.1
6	Sand Creek Road	West of West Prj. Dwy	21,220	93	0	7	1.0%	1.0%	45	100	-5	191	89	41	59.2

Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 230505
Description: Sand Creek Sports Complex - Cumulative
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset			Level, dBA
												60 dBA	65 dBA	70 dBA	
1	Sand Creek Road	East of Linden St.	28,770	93	0	7	1.0%	1.0%	45	300	-5	234	108	50	53.4
2	Sand Creek Road	West of Linden St.	28,880	93	0	7	1.0%	1.0%	45	80	-5	234	109	50	62.0
3	Fairview Ave	North of Sand Creek Rd.	14,040	93	0	7	1.0%	1.0%	35	115	0	96	45	21	58.8
4	Sand Creek Road	East of Fairvew Ave.	28,880	93	0	7	1.0%	1.0%	45	75	-5	234	109	50	62.4
5	Fairview Ave	South of Sand Creek Rd.	8,400	93	0	7	1.0%	1.0%	45	75	-5	103	48	22	57.1
6	Sand Creek Road	West of West Prj. Dwy	28,770	93	0	7	1.0%	1.0%	45	100	-5	234	108	50	60.5

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 230505
Description: Sand Creek Sports Complex - Cumulative Plus Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

												Contours (ft.) - No Offset			
Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	60 dBA	65 dBA	70 dBA	Level, dBA
1	Sand Creek Road	East of Linden St.	29,190	93	0	7	1.0%	1.0%	45	300	-5	236	110	51	53.4
2	Sand Creek Road	West of Linden St.	29,470	93	0	7	1.0%	1.0%	45	80	-5	237	110	51	62.1
3	Fairview Ave	North of Sand Creek Rd.	14,270	93	0	7	1.0%	1.0%	35	115	0	97	45	21	58.9
4	Sand Creek Road	East of Fairvew Ave.	29,470	93	0	7	1.0%	1.0%	45	75	-5	237	110	51	62.5
5	Fairview Ave	South of Sand Creek Rd.	8,520	93	0	7	1.0%	1.0%	45	75	-5	104	48	22	57.1
6	Sand Creek Road	West of West Prj. Dwy	29,190	93	0	7	1.0%	1.0%	45	100	-5	236	110	51	60.6