# General Plan and Rancho Bernardo Community Plan Consistency Analysis

| Goal/Policy | Consistency Analysis |
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| **General Plan** | |
| ***Land Use and Community Planning Element*** | |
| Goal: A sustainable land use pattern that helps the city meet the needs of current and future generations, while helping advance climate goals | **Consistent.** The project would develop 122 multi-family residential units. The mix of 2- and 4-bedroom units, the project contributes to the variety of housing in the area and provides for a range of affordability based on unit type and size. The project would also provide 13 deed-restricted affordable units, which would provide affordable housing opportunities. |
| LU-A.7 Establish a mix of uses within village areas, or individual projects within village areas, to promote walking/rolling, biking, and transit usage and support progress towards climate goals and greenhouse gas emission reductions. | **Consistent.** The project would accommodate a residential development within an established urban area that is served by existing infrastructure and transportation networks. |
| LU-C.3 Increase the city's supply of land designated for various residential densities as community plans are prepared, updated, or amended. | **Consistent.** The project includes a General Plan Amendment (GPA), Community Plan Amendment (CPA), and Rezone to redesignate the site from commercial to residential uses, which would increase the supply of land designated for residential uses. |
| LU-C.4 Ensure efficient use of remaining land available for residential development and redevelopment by requiring that new development meet the density minimums of applicable plan designations. | **Consistent.** The project proposes to modify the site's land use designation to Medium Density Residential, which includes a density range between 14-29 dwelling units per acre (du/ac). The project would be developed at a density of 22.2 du/ac, which would exceed the density minimums of the applicable land use designations with implementation of the GPA, CPA, and Rezone. |
| LU-D.1 Require a General Plan and community plan amendment for proposals that involve: a change in community plan adopted land use or density/ intensity range; a change in the adopted community plan development phasing schedule; or a change in plan policies, maps, and diagrams. (Note: state law mandates that General Plan and community plan amendments are not to be required for projects utilizing state mandated housing density bonuses.) | **Consistent.** The project would involve a change in land use, and consistent with this policy, the project includes a General Plan Amendment (GPA) from Commercial employment, Retail and Service to Residential, and Community Plan Amendment (CPA)to designate the site from Specialized Commercial to Medium Density Residential. |
| LU-D.2 Evaluate the public facilities needs associated with any amendment and identify additional investments needed to serve any new development. | **Consistent.** As detailed in the LU-D-1 consistency analysis above, the project includes a General Plan Amendment (GPA) and Community Plan Amendment (CPA) to |

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| | designate the site for residential uses. The public facilities needs were evaluated as part of the City's review of the project, which determined compliance with SDMC Section 142.0640 requiring payment of development impact fees would ensure that the project would contribute to available funds for public facilities improvements. |
| LU-D.3 Evaluate privately-proposed plan amendments through the plan amendment initiation process and present the proposal to the Planning Commission or City Council for consideration. | **Consistent.** The project includes a General Plan Amendment (GPA), Community Plan Amendment (CPA), and Rezone to designate the site for residential uses. The project was evaluated through the plan amendment initiation process approved on August 29, 2024, and the proposal would be presented to the Planning Commission and City Council as part of the approval process. |
| LU-H.1.e Provide affordable housing opportunities within the community to help offset the displacement of the existing population | **Consistent.** The project would develop 122 multi-family residential units and would provide 13 deed-restricted affordable units, which would provide affordable housing opportunities. The project would not displace any existing population, as none exists onsite. |
| LU-H.2 Provide affordable housing throughout the city, especially in high resource areas and in proximity to transit and walking/rolling and biking infrastructure | **Consistent.** The project would develop 122 multi-family residential units, including 13 deed-restricted affordable units, which would provide affordable housing opportunities in proximity to transit and pedestrian infrastructure. |
| LU-H.3 Provide a variety of housing types and sizes with varying levels of affordability in residential and village developments. | **Consistent.** The project would develop 122 multi-family residential units. With the proposed mix of 2- and 4-bedroom units, the project contributes to the variety of housing in the area and provides for a range of affordability based on unit type and size. The project would also provide 13 deed-restricted affordable units, which would provide affordable housing opportunities. |
| ***Mobility Element*** | |
| Policy ME-B.4. Provide safe, convenient, and adequate short- and long-term bicycle parking facilities and other bicycle amenities for employment, retail, multifamily housing, schools and colleges, and transit facility uses. a. Continue to require bicycle parking in commercial and multiple unit residential zones. | **Consistent.** Per Footnote 5 of SDMC Section 142.0525(a), Table 142-05C, bicycle racks are not required for a dwelling unit with a garage accessible only by the residents of the dwelling unit. Each unit will have a garage only accessible to residents; therefore, bicycle racks are not required. However, the project would provide five bicycle racks and a bicycle repair |

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| b. Provide bicycle facilities and amenities to help reduce the number of vehicle trips | station on-site as Vehicle Miles Traveled (VMT) Reduction Measures per Appendix T of the Land Development Code to comply with the Mobility Choices Regulation requirements to help reduce the number of vehicle trips. |
| **Urban Design Element** | |
| UD-A.4 Use sustainable building methods in accordance with the sustainable development policies in the Conservation Element. | **Consistent.** The project would comply with Title 24 and the Climate Action Plan (CAP) Consistency Regulation requirements, which address sustainable development. Furthermore, as detailed below, the project would also be consistent with the Conservation Element sustainability policies. The project would also incorporate sustainable building and site design by designing buildings that meet requirements set by CALGreen and the California Green Building Standards Code. |
| UD-A.7 Design buildings that contribute to San Diego's needs for homes, jobs, services, amenities, and public spaces while establishing a positive sense of community identity. a. Relate building design to San Diego's unique climate and topography. b. Encourage designs that are sensitive to the scale, form, rhythm, proportions, and materials and create transitions between older and newer buildings. c. Provide architectural features that establish and define a building's appeal and contribute to placemaking within the community. d. Encourage the use of materials and finishes that reinforce a sense of quality and permanence. e. Design buildings to provide design variation that avoid blank walls fronting streets, paths, parks, and public spaces. This would include not only building walls, but fencing. f. Design buildings frontages to add interest to the streetscape and enhance the pedestrian experience. For example, walls could protrude, recess, or change in color, height or texture to provide visual interest. g. Design building wall planes to have shadow relief, where pop-outs, offsetting planes, overhangs and recessed doorways are used to provide visual interest at the pedestrian level. h. Design rear elevations of buildings to be as well-detailed and visually interesting as the front elevation, if they will be visible from a | **Consistent.** The project would contribute to San Diego's needs for homes consistent with community identity. The project incorporates architectural features including articulation, varied materials, and design features such as balconies and modulation to create visual interest and compatibility with surrounding development. The project would generally implement design standards similar to residential developments in the Rancho Bernardo Community Plan area, including Spanish-influenced architectural styles proposed for the project buildings. The project proposes a variety of materials and finishes along project frontage with Bernardo Plaza Court and interior streets, and a total of nine building types are proposed in order to implement variety and visual interest across the project site. Design variation across buildings includes changes in color and texture, varied balcony and doorway locations across building types and locations, and a variety of rooflines and roof types. The overall project design prioritizes the pedestrian experience and provides variety and amenities at the pedestrian scale. |

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| public right-of-way or accessible public place or street.<br>i. Acknowledge the positive aspects of nearby existing buildings by incorporating compatible features in new developments. j. Maximize natural ventilation, sunlight, and views. k. Provide convenient, safe, well-marked, and attractive pedestrian connections from the public street to building entrances. l. Design roofs to be visually appealing when visible from public vantage points and public rights-of-way. | |
| Policy UD-A.8. Create street frontages with architectural and landscape interest to provide visual appeal to the streetscape and enhance the pedestrian experience. a. Locate buildings on the site so that they reinforce street frontages. b. Relate buildings to existing and planned adjacent uses. c. Ensure that building entries are prominent, visible, and well-located. d. Maintain existing setback patterns, except where community plans call for a change to the existing pattern. e. Minimize the visual impact of garages, parking and parking portals to the pedestrian and street façades. | **Consistent.** The project includes street trees and landscaping along the street frontage to enhance the pedestrian experience. The buildings adjacent to Bernardo Plaza Court are oriented to reinforce street frontages. The setbacks would comply with the City's Municipal Code regulation requirements, except in locations where a waiver is requested for setbacks. The project would request waivers for reduction of minimum front yard requirements, increase of maximum retaining wall height requirements, and removal of loading space requirements. These requested waivers would not result in any secondary significant environmental impacts, considering that components of the project waivers were evaluated in the project-specific environmental analysis. Parking and garages are oriented away from the street frontage. |
| Policy UD-A.10. Landscape materials and design should enhance structures, create and define public and private spaces, and provide shade, aesthetic appeal, and environmental benefits. a. Maximize the planting of new trees, street trees and other plants for their shading, air quality, and livability benefits. (See also Conversation Element, Policies CE-A.11, CE-A.12, and Section J). b. Use water conservation through the use of drought-tolerant landscape, porous materials, and reclaimed water where available. c. Use landscape to support storm water management goals for filtration, percolation and erosion control. e. Landscape materials and design should complement and build upon the existing character of the neighborhood. h. Shade paved areas, especially | **Consistent.** The project's landscape plan includes the planting of 122 trees to fulfill the Climate Action Plan's premises tree requirements. In addition, the project provides six street trees which will provide over 50% shade for the Throughway Area, fulfilling the CAP shading requirements.<br><br>This site would utilize reclaimed water. An automatic, water-efficient irrigation system shall be provided to establish and maintain landscaping. Irrigation shall conform to the standards of the city-wide landscape regulation requirements and the City of San Diego Land Development Manual Landscape Standards and all other landscape related city and regional standards. Irrigation system will be |

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| parking lots. i. Demarcate public, semi-public/private, and private spaces clearly through the use of landscape, walls, fences, gates, pavement treatment, signs, and other methods to denote boundaries and/or buffers. j. Use landscaped walkways to direct people to proper entrances and away from private areas. | operated within the State's Maximum Allowed Water Allowance (MAWA) in conformance with California's Model Water Efficient Landscape Ordinance (MWELO).<br><br>Shading of parking lots has been provided by canopy-form trees consistent with Vehicular Use Area requirements.<br><br>Landscaping would include native, native-friendly, drought-tolerant, and low water demand plant material.<br><br>The landscaping plan includes the planting of large canopy-form trees, as well as smaller accent trees, to reinforce a unique aesthetic on the project site; define project entries; demarcate public, semi-public, and private spaces; and identify public access points. |
| Policy UD-A.15. Provide lighting from a variety of sources at appropriate intensities and qualities for safety. a. Provide pedestrian-scaled lighting for pedestrian circulation and visibility. b. Use effective lighting for vehicular traffic while not overwhelming the quality of pedestrian lighting. c. Use lighting to convey a sense of safety while minimizing glare and contrast. d. Use vandal-resistant light fixtures that complement the neighborhood and character. e. Focus lighting to eliminate spill-over so that lighting is directed, and only the intended use is illuminated. | **Consistent.** The project includes pedestrian-scale lighting at the entry to each dwelling unit designed to enhance safety while minimizing glare and spillover in accordance with SDMC Section 142.0740 regulating outdoor lighting standards. |
| Policy UD-A.19. Incorporate Crime Prevention Through Environmental Design (CPTED) measures, as necessary, to reduce incidences of fear and crime, and design safer environments. a. Design projects to encourage visible space and "eyes on the street" security that will serve as a means to discourage and deter crime through the location of physical features, activities and people to maximize visibility. b. Define clear boundaries between public, semipublic/private, and private spaces. c. Promote regulations, programs, and practices that result in the proper maintenance of the measures employed for CPTED surveillance, access control, and territoriality. d. | **Consistent.** The Project would include on-site lighting and is designed to include "eyes on the street" security for the buildings adjacent to Bernardo Plaza Court. Furthermore, the Project's buildings would define a clear boundary between the public right-of-way and the private on-site residences. |

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| Consider pedestrian scale lighting and indirect techniques to provide adequate security but not glare and flood-light conditions. | |
| Policy UD-C.1.a. Design new construction to respect the pedestrian orientation of neighborhoods | **Consistent.** The project is designed to respect the pedestrian orientation of Bernardo Plaza Court. Project buildings adjacent to Bernardo Plaza Court are oriented in a north-south direction consistent with Bernardo Plaza Court, and the project contains pedestrian pathways that are complementary to the pedestrian pathway along Bernardo Plaza Court. The project walking path provides additional connectivity to the pedestrian pathway of the surrounding neighborhood. |
| Policy UD-C.2. Achieve a mix of housing types within developments. | **Consistent.** The project would develop 122 multi-family residential units. With the mix of 2- and 4-bedroom units, the project contributes to the variety of housing in the area and provides for a range of affordability based on unit type and size. The project would also provide 13 deed-restricted affordable units, which would provide affordable housing opportunities. |
| Policy UD-B.4. Create street frontages with building and landscape interest that promote walkability a. Locate buildings on the site so that they reinforce street frontages. b. Relate buildings to existing and planned adjacent uses. c. Provide ground level entries and ensure that building entries are prominent and visible. d. Maintain existing setback patterns, except where community plans call for redevelopment to change the existing pattern. e. Locate transparent features such as porches, stoops, balconies, and windows facing the street to promote a sense of community. f. Encourage side- and rear-loaded garages. Where not possible, reduce the prominence of the garage through architectural features and varying planes. g. Minimize the number of curb-cuts along residential streets. | **Consistent.** The project includes street trees and landscaping along the street frontage to enhance the pedestrian experience and promote walkability. The buildings adjacent to Bernardo Plaza Court are oriented to reinforce street frontages by including ground-level entries. The setbacks would comply with the City's Municipal Code regulation requirements, except in locations where a waiver is requested. Where a waiver is requested for front yard setback requirements, building entries would remain prominent and visible, and the reduced setback would not result in significant visual blockages. The project's setbacks, including the request for a front yard setback waiver, would generally maintain setback patterns across the project site and would be consistent with Policy UD-B.4. Parking and garages are oriented away from the street frontage. Features including balconies and windows would face the street and the buildings would have rear-loaded garages. |
| Policy UD-C.8. Provide useable open space for play, recreation, and social or cultural activities in multiple home as well as single-family | **Consistent.** The project incorporates common open space and private balconies/decks to optimize usable open space consistent with City |

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| projects. a. Design attractive recreational facilities, common facilities, and open space that can be easily accessed by everyone in the development it services. b. Design outdoor space as "outdoor rooms" and avoid undifferentiated, empty spaces. c. Locate small parks and play areas in central accessible locations. | requirements. A walking path is proposed to provide access to open spaces on the site. |
| ***Public Facilities, Services, and Safety Element*** | |
| Policy PF-B.4. Require development proposals to fully address impacts to public facilities and services: a. Identify the demand for public facilities and services resulting from new development. b. Identify specific improvements and financing which would be provided by the project, including but not limited to sewer, water, storm drain, solid waste, fire, police, libraries, parks, open space, and transportation projects. c. Subject projects, to exactions that are reasonably related and in rough proportionality to the impacts resulting from the proposed development. d. Provide public facilities and services to assure that current levels of service are maintained or improved by new development within a reasonable time period. | **Consistent.** The project is located within an urbanized area of Rancho Bernardo that is currently served by existing public facilities, utilities, roadway infrastructure, and nearby commercial services. The project's demand for public services was considered through the City review process and the project would be required to comply with SDMC Section 142.0640 requiring payment of development impact fees, which would ensure that the project would contribute to available funds for public facilities improvements. |
| Policy PF-G.1. Ensure that all storm water conveyance systems, structures, and maintenance practices are consistent with Federal Clean Water Act and California Regional Water Quality Control Board NPDES Permit standards. | **Consistent.** The project would ensure compliance with applicable standards through permit conditions, including approval of the project's drainage systems by the City Engineer and implementation of BMPs in compliance with SDMC Grading Regulations. The project would adhere to the City's Stormwater Standards Manual, as well as the NPDES permit standards through adherence to the City's Grading Ordinance and the NPDES Construction General Permit. |
| Policy PF-G.2. Install infrastructure that, where feasible, includes components to capture, minimize, and prevent pollutants in urban runoff from reaching receiving waters and our potable water supplies. | **Consistent.** Under existing conditions, the project site is developed with commercial office buildings and an associated parking lot, with flows draining in a southeast direction to two inlets on the eastern side of the site. Proposed site conditions would generally follow existing conditions, with surface flow collected in modular wetland unit curb inlets throughout the project site and routed through a proposed storm drain to a detention vault in the |

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| | southeastern area of the project site. The project would be required to implement storm water best management practices (BMPs) to ensure pollutants are adequately captured. Runoff flow from the project site would generally match or decrease that of the existing development on-site. All runoff from the site would be controlled, including run off rates and pollutants in accordance with SDMC, prior to discharge. |
| Policy PF-G.5. Identify and implement BMPs for projects that repair, replace, extend, or otherwise affect the stormwater conveyance system. These projects should also include design considerations for maintenance, inspection, and, as applicable, water quality monitoring. | **Consistent.** Under existing conditions, the project site is developed with commercial office buildings and an associated parking lot, with flows draining in a southeast direction to two inlets on the eastern side of the site. Proposed site conditions would generally follow existing conditions, with surface flow collected in modular wetland unit curb inlets throughout the project site and routed through a proposed storm drain to a detention vault in the southeastern area of the project site. The project would be required to implement storm water BMPs to ensure pollutants are adequately captured. |
| Policy PF-I.2. Maximize waste reduction and diversion (see also Conservation Element, Policy CEA.9). a. Conveniently locate facilities and informational guidelines to encourage waste reduction, diversion, and recycling practices. f. Reduce and recycle construction and demolition (C&D) debris to the extent feasible. | **Consistent.** A Waste Management Plan (T&B Planning, 2025) was prepared for the project and the project would be conditioned to comply with it. The project has been designed to implement and adhere to all city ordinances and regulation requirements with regards to waste management.<br><br>In addition to refuse and recycling bins, the project would provide organic waste bins. Information, including the types of recyclable and organic materials accepted would be distributed to all occupants annually.<br><br>In accordance with State and City diversion targets the project would divert a minimum of 75 percent of construction waste from disposal in landfills. |
| Policy PF-Q.1. Protect public health and safety through the application of effective seismic, geologic, and structural considerations. a. Ensure that current and future community planning and other specific land use planning | **Consistent.** A site-specific Geotechnical Report was prepared for the project (SA Geotechnical, 2024). As determined therein, the project would not result in the exposure of people or structures to geologic hazards such as |

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| studies continue to include consideration of seismic and other geologic hazards. This information should be disclosed, when applicable, in the CEQA document accompanying a discretionary action. c. Require the submission of geologic and seismic reports, as well as soils engineering reports, in relation to applications for land development permits whenever seismic or geologic problems are suspected. g. Adhere to state laws pertaining to seismic and geologic hazards. | earthquakes, landslides, mudslides, ground failure, or similar hazards. |
| ***Conservation Element*** | |
| Policy CE-A.11. Implement sustainable landscape design and maintenance. | **Consistent.** The project's landscape plan includes the planting of 122 trees, including six street trees. The landscaping plan includes the planting of large canopy form trees, consistent with the Climate Action Plan Consistency Regulation (SDMC Section 143.1410) requirements.<br><br>Landscaping would include native, native-friendly, drought-tolerant, and low water demand plant material which would implement sustainable landscape design and maintenance.<br><br>This site would utilize reclaimed water. An automatic, water-efficient irrigation system shall be provided to establish and maintain landscaping. Irrigation shall conform to the standards of the city-wide landscape regulation requirements and the City of San Diego Land Development Manual Landscape Standards. Irrigation will be operated within the MAWA in conformance with California's MWELO. |
| CE-A.13. Plant trees (consistent with habitat and water conservation policies) for their many environmental benefits, including natural carbon sequestration. | **Consistent.** The project's landscape plan includes the planting of 122 premises trees, including six street trees. The landscaping plan includes the planting of canopy form trees, consistent with Climate Action Plan (CAP) Consistency Regulation requirements. In addition, the project will provide 6 street trees to provide over 50% shade over the Throughway Area, consistent with CAP Consistency Regulation requirements. |

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| | Landscaping would include native, native-friendly, drought-tolerant, and low water demand plant material which would implement sustainable landscape design and maintenance. |
| CE-F.4. Preserve and plant trees, and plants that are consistent with habitat and water conservation policies and that absorb carbon dioxide and pollutants | **Consistent.** The project's landscape plan includes the planting of 122 premises trees and six street trees consistent with the Climate Action Plan consistency requirements.<br><br>Landscaping would include native, native-friendly, drought-tolerant, and low water demand plant material which would implement sustainable landscape design and maintenance.<br><br>This site would utilize reclaimed water. An automatic, water-efficient irrigation system shall be provided to establish and maintain landscaping. Irrigation shall conform to the standards of the city-wide landscape regulations and the City of San Diego Land Development Manual Landscape Standards. Irrigation will be operated within the MAWA in conformance with California's MWELO. |
| ***Noise Element*** | |
| Policy NE-A.2. Assure the appropriateness of proposed developments relative to existing and future noise levels by consulting the guidelines for noise-compatible land use (shown on Table NE-3) to minimize the effects on noise-sensitive land uses. | **Consistent.** A site-specific Noise Study (Ldn Consulting, 2026) was prepared for the project. The project site is surrounded by existing commercial development. The project's proposed residential uses would be noise-compatible with the surrounding land uses. |
| Policy NE-A.3. Limit future residential and other noise-sensitive land uses in areas exposed to high levels of noise. | **Consistent.** A site-specific Noise Study (Ldn Consulting, 2026) was prepared for the project. The location of the project would not cause residential land uses to be exposed to high levels of noise. |
| Policy NE-A.4. Require an acoustical study consistent with Acoustical Study Guidelines (Table NE-4) for proposed developments in areas where the existing or future noise level exceeds or would exceed the "compatible" noise level thresholds as indicated on the Land Use–- Noise Compatibility Guidelines (Table NE-3), so that noise mitigation measures can be included in the project design to meet the noise guidelines. | **Consistent.** A site-specific Noise Study (Ldn Consulting, 2026) was prepared for the project. The project would incorporate noise attenuation measures (i.e., dual-pane windows and mechanical ventilation) to ensure noise levels comply with applicable standards, as a standard requirement of CBC Title 24 prior to building permit issuance. |

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| Policy NE-I.1. Require noise attenuation measures to reduce the noise to an acceptable noise level for proposed developments to ensure an acceptable interior noise level, as appropriate, in accordance with California's noise insulation standards (CCR Title 24) and Airport Land Use Compatibly Plans | **Consistent.** The project would incorporate noise attenuation measures (i.e., dual-pane windows and mechanical ventilation) to ensure interior noise levels comply with applicable standards. Ultimately, the project would be required to comply with the CBC Title 24 noise requirements prior to building permit issuance. |
| Policy NE-I.2. Apply CCR Title 24 noise attenuation measures requirements to reduce the noise to an acceptable noise level for proposed single-family, mobile homes, senior housing, and all other types of residential uses not addressed by CCR Title 24 to ensure an acceptable interior noise level, as appropriate. | **Consistent.** The project would be required to comply with the applicable provisions of CBC Title 24 and includes noise attenuation measures (i.e., dual-pane windows and mechanical ventilation) to ensure noise levels comply with applicable standards. |
| ***Housing Element*** | |
| Goal: Ensure the provision of sufficient housing for all income groups to accommodate San Diego's anticipated share of regional growth over the next housing element cycle, 2013-2020, in a manner consistent with the development pattern of the Sustainable Communities Strategy (SCS), that will help meet regional GHG targets by improving transportation and land use coordination and jobs/housing balance, creating more transit-oriented, compact and walkable communities, providing more housing capacity for all income levels, and protecting resource areas. | **Consistent.** The project would develop 122 multi-family residential units. With the mix of 2- and 4-bedroom units, the project contributes to the variety of housing in the area and provides for a range of affordability based on unit type and size. The project would also provide 13 deed-restricted affordable units, which would provide affordable housing. |
| HE-I.2. Encourage mixed-income developments accessible to lower income residents citywide and especially in high opportunity and resource-rich areas. | **Consistent.** The project would provide 13 deed-restricted affordable units to households making up to 100% of the AMI in a High Resource area as identified by the California Tax Credit Allocation Committee (CTCAC) Opportunity Area Map. |
| HE-O.2. Encourage new housing that relies on and supports transit use and environmentally sustainable patterns of movement. | **Consistent.** The project is located in a Transit Priority Area and Sustainable Development Area, which are areas encouraged for future housing due to their proximity to existing transit networks. The project also includes bicycle parking and an on-site bicycle repair station. The Project is located approximately 0.13-mile from the nearest bus stop located at Rancho Bernardo Road and Bernardo Center Drive. |

| Rancho Bernardo Community Plan | |
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| Residential Objective: To encourage a housing inventory consisting of a wide variety of housing types and prices. | **Consistent.** The project would provide 2- and 4-bedroom multi-family townhome units which would contribute to the existing variety of housing in the area. The project also provides for a range of affordability, both by the provision of a variety of unit sizes and by providing 13 deed-restricted affordable units. |
| Residential Objective: To maintain the existing quality and character of Rancho Bernardo in all new development. | **Consistent.** The project would be designed to comply with RM-2-5 development standards and would incorporate landscaping and compatible architectural design to ensure compatibility with surrounding development and maintain the existing community character. |
| Residential Objective: To create and maintain a residential community adequately served by public facilities, commercial and industrial establishments and a balanced transportation system. | **Consistent.** The project is located within an urbanized area of Rancho Bernardo that is currently served by existing public facilities, utilities, roadway infrastructure, and nearby commercial services. The project would be adequately served by public facilities and would contribute to a balanced community consistent with this objective. |
| Residential Objective: To encourage innovative housing design and siting, to provide reasonable land utilization and at the same time optimize the usable open space within the density limitations proposed in the Plan. | **Consistent.** The project would provide reasonable land utilization through the proposed site design by siting the proposed residential units in a configuration that efficiently balances density while incorporating common open space, private balconies/decks to optimize usable open space consistent with City requirements. |
| Residential Objective: To encourage residential design which will provide optimum interior and outdoor privacy and protection or screening from external noise. | **Consistent.** The project includes siting considerations landscaping and dual pane windows to provide privacy and minimize external noise. Additionally, the project would comply with City's noise standards for residential development. |
| Transportation Objective: To ensure that project approvals are conditioned upon provision of noise mitigation measures to achieve compatibility with existing and projected land uses. | **Consistent.** The project would be required to comply with standard Title 24 noise requirements prior to building permit issuance, and would incorporate noise attenuation measures (i.e., dual pane windows and mechanical ventilation) to ensure compatibility with surrounding land uses and to ensure the project would reduce interior noise below the City's noise standards for residential development. |

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| Open Space, Parks, and Recreation Objective: To establish an open space system that provides linkage between various elements of the community. Such linkages should facilitate pedestrian, bicycle and golf cart movement between recreational facilities, commercial centers, neighborhoods, schools and parks. | **Consistent.** The project would include approximately 9,000 sq ft of common space open area that will include a play structure, bicycle rack, bicycle repair station, and a walking trail around the perimeter of the project. |

## REFERENCES


| Cited As | Citation |
| --- | --- |
| (Ldn Consulting, 2026) | Ldn Consulting, Inc. 2026. *Noise Study*. March 23,2026. |
| (SA Geotechnical, 2024) | SA Geotechnical, Inc. 2024. *Geotechnical Exploration, Due Diligence Study and Preliminary Design Recommendations, Proposed Rancho Bernardo Townhomes, Bernardo Plaza Court, Assessor Parcel Number 274-781-14-00, City of San Diego, California*. February 21, 2024. |
| (T&B Planning, 2025) | T&B Planning, Inc. 2025. *Preliminary Waste Management Plan for the City View Project*. July 29, 2025. |

**Reference 1 (Ldn Consulting, 2026)**

# NOISE STUDY

## City View Townhomes
## Residential Development
## San Diego CA

**City Project No.: PRJ-1123397**

**Prepared For:**

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**March 23, 2026**

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## GLOSSARY OF TERMS

**Sound Pressure Level (SPL):** a ratio of one sound pressure to a reference pressure ($L_{ref}$) of 20 µPa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by 20 log ($L/L_{ref}$).

**A-weighted Sound Pressure Level (dBA):** Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

**Minimum Sound Level ($L_{min}$):** Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

**Maximum Sound Level ($L_{max}$):** Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

**Equivalent sound level ($L_{eq}$):** the true equivalent sound level measured over the run time. Leq is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

**Day Night Sound Level (LDN)**: Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "Penalty" for nighttime noise. Typically, LDN's are measured using A weighting.

**Community Noise Exposure Level (CNEL)**: The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

**Octave Band**: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

**Third-Octave Band**: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

**Response Time (F, S,I)**: The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

## EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts to and from the proposed residential project. The proposed City View Townhomes Residential Development is located on an approximate 5.5-acre project site in the City of San Diego CA. The site is located adjacent to Interstate 15 to the east, west of Bernardo Center Drive, and north along Bernardo Plaza Court in the Rancho Bernardo Community Plan Area of the City of San Diego. The City View Townhomes Residential project seeks a Community Plan Amendment (CPA) and rezone that would allow up to 160 multi-family residential uses. The Proposed Project is the development of 3-story multi-family townhomes consisting of 122 units.

Construction Noise Levels

*Community Plan Amendment Project*

Construction of the Community Plan Amendment must meet the City's Noise Ordinance (City of San Diego Municipal Code 59.5.0404). Therefore, construction noise will be less than significant.

*Proposed Project*

During the site preparation and grading the equipment will be spread out over the project site from distances near the occupied property to distances of more than 100-feet. Based upon the calculations of the noise levels when construction equipment is located near the property line the average noise levels are anticipated not to exceed the 75 dBA 12-hour standard and no impacts will occur and no mitigation measures are required.

Construction Vibration

The nearest vibration-sensitive uses are the existing commercial uses located 100 feet or more from the proposed construction. The average vibration levels that would be experienced at the nearest vibration sensitive land uses from temporary construction activities. The FTA has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for vibration induced structural damage is 0.20 in/sec for the peak particle velocity (PPV). Project construction activities would result in PPV levels below the FTA's criteria for vibration induced structural damage. Therefore, Project construction activities would not result in vibration induced structural damage to commercial buildings near the demolition and construction areas. The FTA criterion for infrequent vibration induced annoyance is 83 Vibration Velocity (VdB) for the commercial uses. Construction activities would generate levels of vibration that would not exceed the FTA criteria for nuisance for nearby commercial uses. Therefore, vibration impacts would be less than significant.

Onsite Transportation Related Noise Levels

*Community Plan Amendment Project*

CEQA does not require any analysis for the environment onto the project site. The Community Plan Amendment Project will be designed to conform to the City's Noise Element requiring noise levels to be below the City's 65 dBA CNEL Noise compatibility threshold at a minimum of 75% of the private use areas without attenuation measures. Therefore, noise will be less than significant.

*Proposed Project*

The results of this analysis indicate that future vehicle noise from Interstate 15 and Rancho Bernardo Road is the principal source of community noise that could impact the site. The Project is proposing ground floor patios and upper floor balconies to provide the private use area. Based upon the findings, the outdoor use areas were determined to be below the City's 65 dBA CNEL Noise compatibility threshold at a minimum of 75% of the private use areas without attenuation measures.

The City of San Diego as part of its noise guidelines also states, consistent with Title 24 of the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. The City of San Diego's Noise Compatibility Guidelines require interior noise levels in residential structures to be reduced to 45 dBA CNEL.

Standard building construction will provide a noise reduction of approximately 10-15 dBA with a windows open condition (Source: Federal Highway Administration Highway Traffic Noise Analysis and Abatement Policy and Guidance). An interior noise level reduction of 21-26 dBA CNEL is needed for the proposed residential units located along the western and northern property lines and a noise level reduction of 19-22 dBA CNEL is needed for the residential units set further back. Based on the preliminary architectural plans, to meet the 45 dBA CNEL interior noise standard, a minimum STC 33-35 rated dual pane windows and mechanical ventilation would be needed to achieve the necessary interior noise reductions to meet the City's standard for the residential units along the western and northern property line. A minimum STC 30-33 rated assemblies and mechanical ventilation would be needed to achieve the interior noise reductions for the second row of residential units set further back. The remainder units would require a minimum STC 28. Once the final architectural plans are prepared, the proposed project site will require an interior noise study be prepared prior to the issuance of building permits to determine the detailed components to reduce interior noise to 45 dBA CNEL.

Offsite Project Related Transportation Noise Levels

*Community Plan Amendment Project*

The project will not create a direct impact of more than 3 dBA CNEL on any roadway segment and no cumulative noise increase of 3 dBA CNEL or more were found. Therefore, off-site traffic noise will be less than significant.

*Proposed Project*

The project will not create a direct impact of more than 3 dBA CNEL on any roadway segment and no cumulative noise increase of 3 dBA CNEL or more were found. Therefore, the proposed project's direct and cumulative contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

Operational Noise Levels

*Community Plan Amendment Project*

A review of the Community Plan Amendment indicates that noise sources such as the pad mounted mechanical ventilation systems (HVAC) are the primary source of stationary noise. Noise levels generated by the operations of the Community Plan Amendment must meet the City's noise level thresholds at the nearest property lines (City of San Diego Municipal Code 59.5.0404). Therefore, operational noise will be less than significant.

*Proposed Project*

Based upon the property line noise levels determined, none of the proposed noise sources directly or cumulatively exceeds the most restrictive nighttime property line standards at the shared property lines. Therefore, the proposed developments related operational noise levels comply with the noise standards at the property lines. All other property lines are located further from the proposed HVAC units and the resulting noise levels would also be below the property line thresholds. No Impacts are anticipated and no mitigation is required.

# 1.0 PROJECT INTRODUCTION

## 1.1 Purpose of this Study

The purpose of this Noise study is to determine noise impacts, if any, to the Project from off-site sources (i.e. traffic along Interstate 15). Should impacts be determined, the intent of this study would be to recommend suitable mitigation measures to reduce impacts to below a level of significance.

## 1.2 Project Location

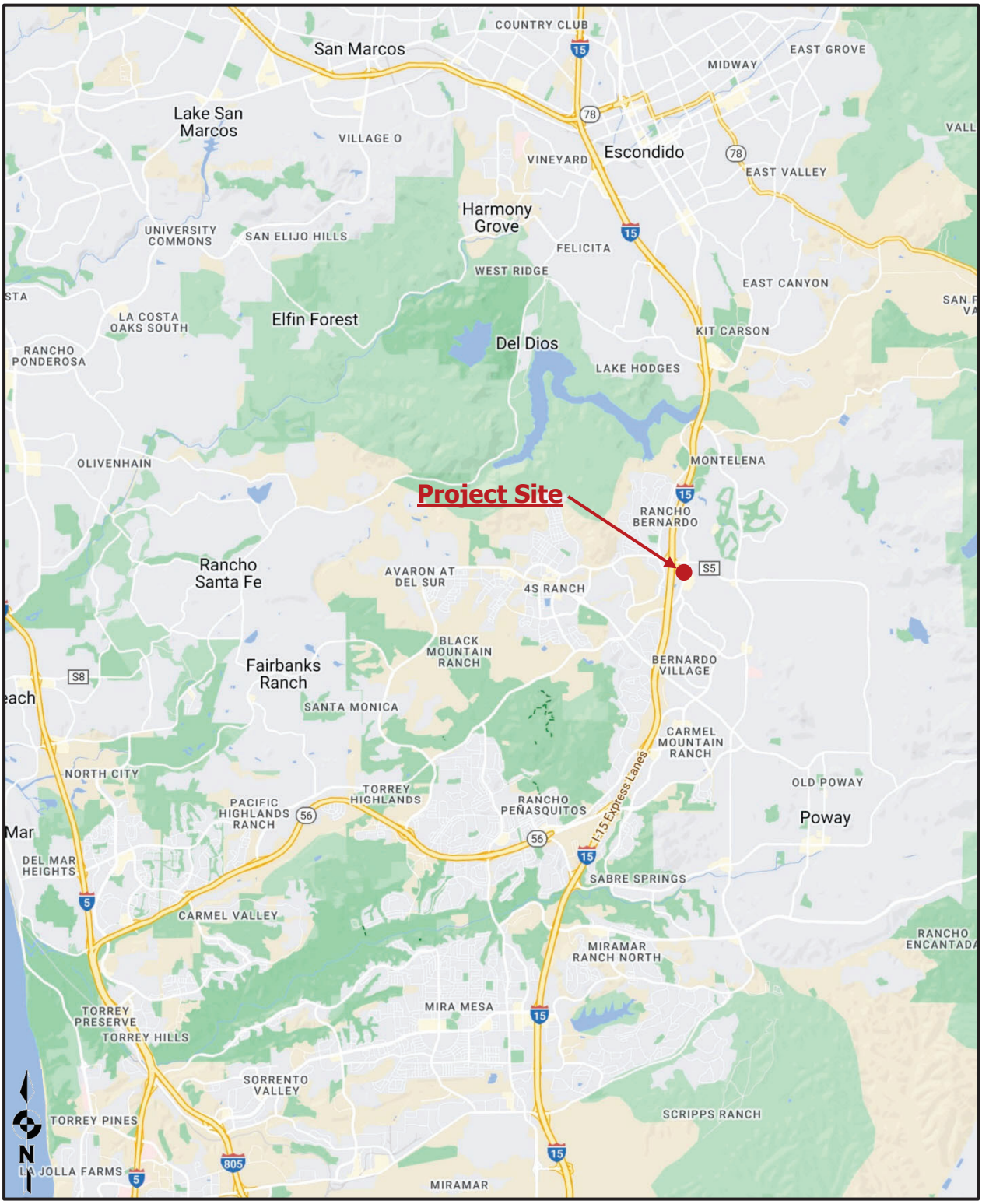
The proposed Development is located on a 5.5-acre site (APN 274-781-14-00) within the Rancho Bernardo Community Planning area in the City of San Diego CA. The site is located adjacent to Interstate 15 to the east, west of Bernardo Center Drive, and north along Bernardo Plaza Court in the Rancho Bernardo Community Plan Area of the City of San Diego. Access to the site area is from Bernardo Plaza Court. A general development vicinity map is shown in Figure 1-A of this report.

## 1.3 Project Description

The parcel is currently developed as a business center and consists of a multi-structured office building with parking and landscaping with an estimated size of 75,000 square feet of commercial office space and is referred to in this report as "Existing Development". The Proposed Project seeks a Community Plan Amendment (CPA) and rezone to change the land use designation from Special Commercial (CC-2-3) to Medium Density Residential (RM-2-5). The CPA and rezone would allow up to 160 multi-family residential units and is referred to in this report as "CPA Buildout". The proposed Project includes the development of 122 all electric multi-family residential units and is referred to as "Project". Also, since the CPA Buildout is based on allowable units rather than a site-specific plan, no development plans have been prepared.

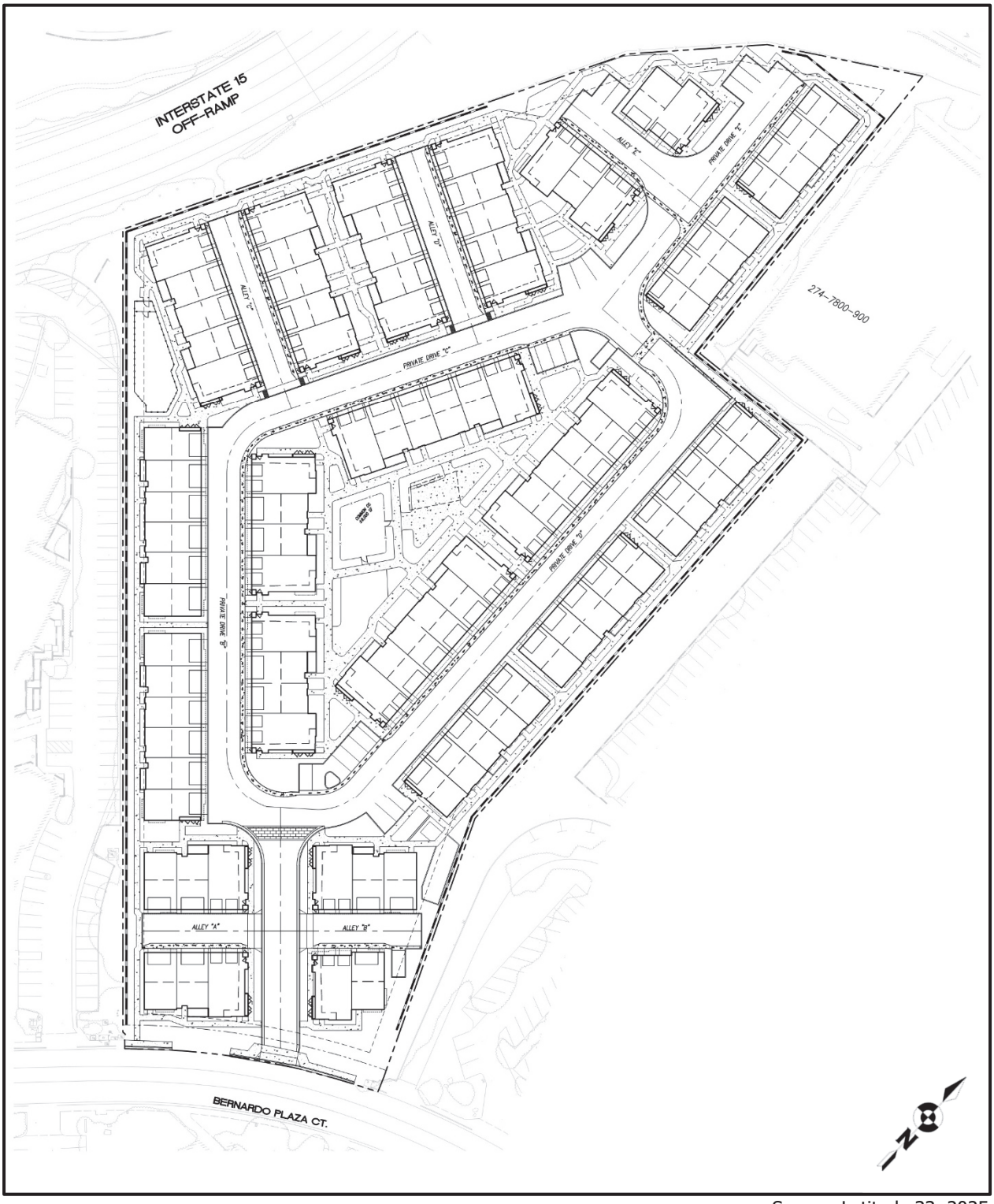
The proposed CPA Buildout and Project would demolish all existing structures within the existing development and then construct the homes. The Project site plan is shown in Figure 1-B.

## Figure 1-A: Project Vicinity Map




Source: Google Maps, 2025

## Figure 1-B: Project Site Plan




Source: Latitude 33, 2025

## 2.0 REGULATORY FRAMEWORK

### 2.1 State of California

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services.

### 2.2 Municipal Code

Construction Noise

Division 4 of Article 9.5 of the City of San Diego Municipal Code addresses the limits of disturbing or offensive construction noise. The Municipal Code states that with the exception of an emergency, it should be unlawful to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12–hour period from 7:00 a.m. to 7:00 p.m.

Operational Noise

The generation of noise from certain types of land uses could cause potential land use incompatibility. A project which would generate noise levels at the property line which exceed Section 59.5.0401 of the City's Municipal Code is considered potentially significant, as identified in Table 2-1 on the following page.

Section 59.5.0401 of the Noise Ordinance sets a more restrictive operational exterior noise limit for multi-family residential uses of 55 dBA Leq for daytime hours of 7 a.m. to 7 p.m., 50 dBA Leq during the noise sensitive nighttime hours of 7 p.m. to 10 p.m., and 45 dBA Leq during the noise sensitive nighttime hours of 10 p.m. to 7 a.m. For commercial zoned property the City Noise Ordinance applies an operational property line noise limit of 60 dBA Leq for daytime and nighttime hours of 7 a.m. to 10 p.m. and 55 dBA Leq during the noise sensitive nighttime hours of 10 p.m. to 7 a.m.

The sound level limit at a location on a property line boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Project components will only operate during the daytime hours but a few may operate during nighttime or early morning hours and therefore the most conservative approach is to apply the nighttime standard at the property lines. Therefore, operations would need to meet a worst-case nighttime standard of 52.5 dBA Leq (arithmetic mean between 45 dBA for residential and 60 dBA for commercial).

**Table 2-1: Sound Level Limits in Decibels (dBA)**

| Land Use | Time of Day | One-Hour Average Sound Level (decibels) |
|---|---|---|
| 1. Single Family Residential | 7 a.m. to 7 p.m.<br>7 p.m. to 10 p.m.<br>10 p.m. to 7 a.m. | 50<br>45<br>40 |
| 2. Multi-Family Residential (Up to a maximum density of 1/2000) | 7 a.m. to 7 p.m.<br>7 p.m. to 10 p.m.<br>10 p.m. to 7 a.m. | 55<br>50<br>45 |
| 3. All other Residential | 7 a.m. to 7 p.m.<br>7 p.m. to 10 p.m.<br>10 p.m. to 7 a.m. | 60<br>55<br>50 |
| 4. Commercial | 7 a.m. to 7 p.m.<br>7 p.m. to 10 p.m.<br>10 p.m. to 7 a.m. | 65<br>60<br>60 |
| 5. Industrial or Agricultural | any time | 75 |

Source: City of San Diego Noise Ordinance Section 59.5.0401

## 2.3 Vibration

The City of San Diego has not yet adopted vibration criteria. The United States Department of Transportation Federal Transit Administration (FTA) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration. For purposes of identifying potential project-related vibration impacts, the FTA criteria will be used. The human reaction to various levels of vibration is highly subjective. The upper end of the range shown for the threshold of perception, or roughly 65 VdB, may be considered annoying by some people. Vibration below 65 VdB may also cause secondary audible effects, such as a slight rattling of doors, suspended ceilings/fixtures, windows, and dishes, any of which may result in additional annoyance. Table 2-2 shows the FTA groundborne vibration and noise impact criteria for human annoyance.

**Table 2-2: Groundborne Vibration and Noise Impact Criteria (Human Annoyance)**

| | Groundborne Vibration Impact Levels (VdB re 1 microinch/second) | | | Groundborne Noise Impact Levels (dB re 20 micropascals) | | |
|---|---|---|---|---|---|---|
| | Frequent Events[1] | Occasional Events[2] | Infrequent Events[3] | Frequent Events[1] | Occasional Events[2] | Infrequent Events[3] |
| **Category 1**: Buildings where low ambient vibration is essential for interior operations. | 65 VdB[4] | 65 VdB[4] | 65 VdB[4] | N/A[4] | N/A[4] | N/A[4] |
| **Category 2**: Residences and buildings where people normally sleep. | 72 VdB | 75 VdB | 80 VdB | 35 dBA | 38 dBA | 43 dBA |
| **Category 3**: Institutional land uses with primarily daytime use. | 75 VdB | 78 VdB | 83 VdB | 40 dBA | 43 dBA | 48 dBA |

Source: US Department of Transportation Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* June 2006.

[1] "Frequent Events" are defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day. Most commuter truck lines have this many operations.

[3] "Infrequent Events" are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines

[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

[5] Vibration-sensitive equipment is not sensitive to groundborne noise.

In addition to the vibration annoyance standards presented above, the FTA also applies the following standards for construction vibration damage. As shown in Table 2-3, structural damage is possible for typical residential construction when the peak particle velocity (PPV) exceeds 0.2 inch per second (in/sec). This criterion is the threshold at which there is a risk of damage to normal dwellings. In the context of this analysis, the noise and vibration impacts associated with the construction operations and blasting operations will be conditioned to comply with the thresholds stated above. The potential noise and vibration impacts are analyzed separately below.

**Table 2-3: Groundborne Vibration Impact Criteria (Structural Damage)**

| Building Category | PPV (in/sec) | VdB |
|---|---|---|
| I. Reinforced-concrete, steel, or timber (no plaster) | 0.5 | 102 |
| II. Engineered concrete and masonry (no plaster) | 0.3 | 98 |
| III. Non-engineered timber and masonry buildings | 0.2 | 94 |
| IV. Buildings extremely susceptible to vibration damage | 0.12 | 90 |

Source: US Department of Transportation Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* June 2006.
Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

## 3.0 APPLICABLE STANDARDS

### 3.1 Onsite Transportation Noise (Land Use Compatibility)

The City uses the Land Use - Noise Compatibility Guidelines as shown on Table NE-3 in the Noise Element of the General Plan (provided as Table 3-1 below) for evaluating land use noise compatibility when reviewing proposed land use development projects. A "compatible" land use indicates that standard construction methods will attenuate exterior noise to an acceptable indoor noise level and people can carry out outdoor activities with minimal noise interference. Evaluation of land use that falls into the "conditionally compatible" noise environment should have an acoustical study prepared. The acoustical study should include, with consideration of the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with speech, sleep, or other activities characteristic of the land use. For land uses indicated as "conditionally compatible", structures must be capable of attenuating exterior noise to the indoor noise level as shown in Table 3-1. For land uses indicated as "incompatible", new construction should generally not be undertaken.

### 3.2 Offsite Transportation Noise

In accordance with CEQA, a project should not have a noticeable adverse impact on the surrounding environment. Noise level changes greater than 3 dBA, or a doubling of the acoustic energy, are often identified as audible and considered potentially significant, while changes less than 1 dBA are not discernible. For the purposes for this analysis, a direct and cumulative roadway noise impact would be considered significant if the project increases noise levels at a noise sensitive land use 3 dBA CNEL and if the noise level increases above an unacceptable noise level per the City's General Plan.

## Table 3-1: Land Use - Noise Compatibility Guidelines

| Land Use Category | Exterior Noise Exposure (dBA CNEL) | | | | |
|---|---|---|---|---|---|
| | 60 | 65 | 70 | 75 | |
| *Parks and Recreational* | | | | | |
| Parks, Active and Passive Recreation | | | | | |
| Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities | | | | | |
| *Agricultural* | | | | | |
| Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables | | | | | |
| *Residential* | | | | | |
| Single Dwelling Units; Mobile Homes | | 45 | | | |
| Multiple Dwelling Units; **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3. For uses affected by motor vehicle traffic noise, refer to Policy NE-B.10.* | | 45 | 45* | | |
| *Institutional* | | | | | |
| Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Child Care Facilities | | 45 | | | |
| Professional Educational Facilities including Vocational/Trade Schools and Colleges and Universities | | 45 | 45 | | |
| Cemeteries | | | | | |
| *Retail Sales* | | | | | |
| Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories | | | 50 | 50 | |
| *Commercial Services* | | | | | |
| Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support | | | 50 | 50 | |
| Visitor Accommodations | | 45 | 45 | 45 | |
| *Offices* | | | | | |
| Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters | | | 50 | 50 | |
| *Vehicle and Vehicular Equipment Sales and Services Use* | | | | | |
| Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking | | | | | 50 |
| *Wholesale, Distribution, Storage Use Category* | | | | | |
| Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution | | | | | 50 |
| *Industrial* | | | | | |
| Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries | | | | | 50 |
| Research & Development | | | | 50 | 50 |

| | | | |
|---|---|---|---|
| | Compatible | Indoor Uses | Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I. |
| | | Outdoor Uses | Activities associated with the land use may be carried out. |
| 45,50 | Conditionally Compatible | Indoor Uses | Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas , including residential habitable areas, commercial work/shopping areas, and office areas associated with industrial uses.. Refer to Section I. |
| | | Outdoor Uses | Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. Refer to Section I. |
| | Incompatible | Indoor Uses | New construction should not be undertaken. |
| | | Outdoor Uses | Severe noise interference makes outdoor activities unacceptable. |

Source: City of San Diego Noise Element (2024)

## 4.0 FUNDAMENTALS

### 4.1 Acoustical Fundamentals

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs, and when the noise occurs.

Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as Leq represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

The Community Noise Equivalent Level (CNEL) is the 24-hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder.

A vehicle's noise level is a combination of the noise produced by a vehicle's engine, exhaust, and tires. The cumulative traffic noise levels along a roadway segment are based on three primary factors: the amount of traffic, the travel speed of the traffic, and the vehicle mix ratio or number of medium and heavy trucks. The intensity of traffic noise is increased by higher traffic volumes, greater speeds, and increased number of trucks.

Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore, the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiate in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. Hard site conditions consist of concrete, asphalt, and hard pack dirt while soft site conditions exist in areas having slight grade changes, landscaped areas, and vegetation. Alternately, fixed/point sources radiate outward uniformly as it travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of

distance.

The most effective noise reduction methods consist of controlling the noise at the source and blocking the noise transmission with barriers. Any or all of these methods may be required to reduce noise levels to an acceptable level. To be effective, a noise barrier must have enough mass to prevent significant noise transmission through it and high enough and long enough to shield the receiver from the noise source. A safe minimum surface weight for a noise barrier is 3.5 pounds/square foot (equivalent to 3/4-inch plywood), and the barrier must be carefully constructed so that there are no cracks or openings.

Barriers constructed of wood or as a wooden fence must have minimum design considerations as follows: the boards must be ¾ inch thick and free of any gaps or knot holes. The design must also incorporate either overlapping the boards at least 1 inch or utilizing a tongue-and-grove design for this to be achieved.

## 4.2 Vibration Fundamentals

Vibration is a trembling or oscillating motion of the ground. Like noise, vibration is transmitted in waves, but in this case through the ground or solid objects. Unlike noise, vibration is typically felt rather than heard. Vibration can be either natural as in the form of earthquakes, volcanic eruptions; or manmade as from explosions, heavy machinery, or trains. Both natural and manmade vibration may be continuous, such as from operating machinery; or infrequent, as from an explosion.

As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized in three ways: displacement, velocity, and acceleration. Particle displacement is a measure of the distance that a vibrated particle travels from its original position and for the purposes of soil displacement is typically measured in inches or millimeters. Particle velocity is the rate of speed at which soil particles move in inches per second or millimeters per second. Particle acceleration is the rate of change in velocity with respect to time and is measured in inches per second or millimeters per second. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration. Table 4-1 shows the human reaction to various levels of peak particle velocity.

Vibrations also vary in frequency and this affects perception. Typical construction vibrations fall in the 10 to 30 Hz range and usually occurring around 15 Hz. Traffic vibrations exhibit a similar range of frequencies; however, due to their suspension systems, it is less common, to measure traffic frequencies above 30 Hz.

Propagation of ground-borne vibrations is complicated and difficult to predict because of the endless variations in the soil through which the waves travel. There are three main types of

vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by dropping an object into water. P-waves, or compression waves, are waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and special voids. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

**Table 4-1: Human Reaction to Typical Vibration Levels**

| Vibration Level Peak Particle Velocity (in/sec) | Human Reaction | Effect on Buildings |
|---|---|---|
| 0.006–0.019 | Threshold of perception, possibility of intrusion | Vibrations unlikely to cause damage of any type |
| 0.08 | Vibrations readily perceptible | Recommended upper level of vibration to which ruins and ancient monuments should be subjected |
| 0.10 | Level at which continuous vibration begins to annoy people | Virtually no risk of "architectural" (i.e., not structural) damage to normal buildings |
| 0.20 | Vibrations annoying to people in buildings | Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings |
| 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: Caltrans, Division of Environmental Analysis, *Transportation Related Earthborne Vibration, Caltrans Experiences*, Technical Advisory, Vibration, TAV-02-01-R9601, 2002. | | |

## 5.0 EXISTING NOISE ENVIRONMENT

### 5.1 Existing Noise Environment Onsite

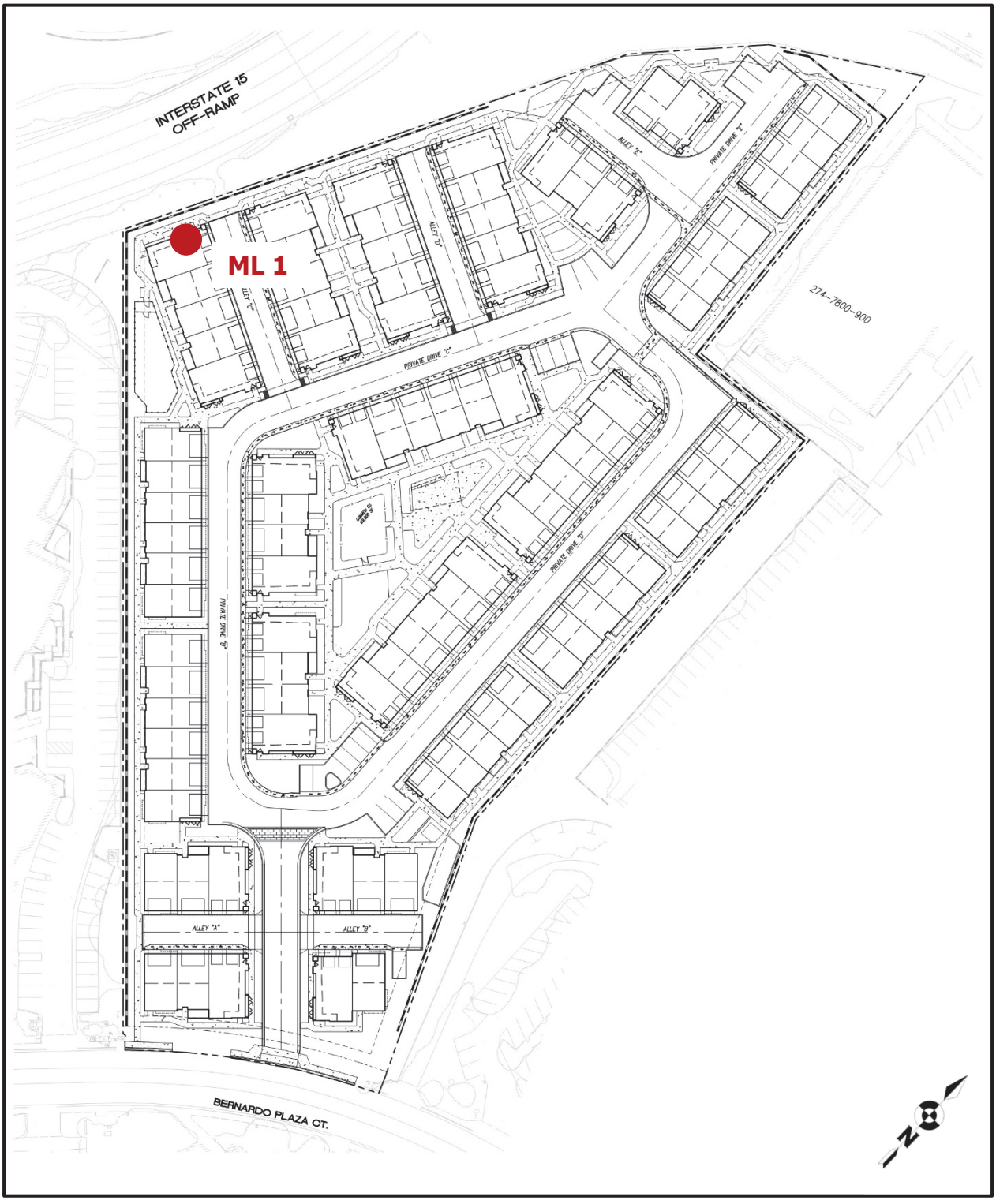
Noise measurements were taken March 7, 2024, in the mid-day hours using a Larson-Davis Model LxT Type 1 precision sound level meter, programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meter and microphone were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

Monitoring location 1 (M1) was located at the western property line to determine the worst-case noise level from Interstate 15. The noise monitoring location is provided graphically in Figure 5-1 on the following page. The results of the noise level measurement are presented in Table 5-1. The noise measurement was monitored for a time period of 10 minutes during typical traffic conditions. The existing noise levels in the project area consisted primarily of traffic Interstate 15. The ambient Leq noise level measured in the area of the project during the mid-day hours was found to be 67.6 dBA Leq based on the separation from Interstate 15. The statistical indicators Lmax, Lmin, L10, L50 and L90, are given for the monitoring location. As can be seen from the L90 data, 90% of the time the noise level is approximately 65.1 dBA from adjacent Interstate 15.

**Table 5-1: Measured Ambient Noise Levels**

| Measurement Identification | Description | Time | Noise Levels (dBA) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Leq | Lmax | Lmin | L10 | L50 | L90 |
| M1 | Western Property Line | 12:50-1:00 p.m. | 67.6 | 74.5 | 61.6 | 69.6 | 67.2 | 65.1 |
| Source: Ldn Consulting, Inc. March 7, 2024 | | | | | | | | |

## Figure 5-1: Ambient Noise Monitoring Locations



## 6.0 POTENTIAL IMPACTS

### 6.1 Construction Noise Levels

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders, and scrapers and demolition which can reach relatively high levels. Grading activities typically represent one of the highest potential sources for noise impacts. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours. Division 4 of Article 9.5 of the City of San Diego Municipal Code addresses the limits of disturbing or offensive construction noise. The Municipal Code states that with the exception of an emergency, it should be unlawful to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12–hour period from 7:00 a.m. to 7:00 p.m.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment can range from 60 dBA to in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 75 dBA measured at 50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor and reduced to 63 dBA at 200 feet from the source.

Using a point-source noise prediction model, calculations of the expected construction noise levels were completed. The essential model input data for these performance equations include the source levels of the equipment, source to receiver horizontal and vertical separations, the amount of time the equipment is operating in a given day (also referred to as the duty-cycle), and any transmission loss from topography or barriers.

#### 6.1.1 Potential Noise Impact Identification

The proposed CPA Buildout and Project would demolish all existing structures and then grade the site. Not all the equipment will operate continuously, the equipment will be utilized on an as-needed basis depending on the demolition activities are required. As an example: a saw will be used to weaken some of the structural components of the structure and then the excavator would be utilized to demo that section of the structure. The excavator or a loader will then be used to place the debris into the haul trucks. Noise levels from the demolition activities can reach short-term peak noise levels in excess of 90 dBA but will decay rapidly. This is due to the fact that once the equipment knocks down a portion of the building the debris needs to be removed, sorted and

inspected. Based on empirical data gathered during the monitoring of a similar project, the worst-case hourly noise level was found to be up to 81 dBA Leq at an average distance of 25 feet for demolition activities (Source: Aztec Court Noise Monitoring – San Diego, Ldn Consulting, 2012). At an average distance of 50 feet, the noise level from the demolition activities would be roughly 75 dBA. Given this, the noise levels will comply with the average 75 dBA threshold at the property lines. Therefore, demolition noise will be less than significant.

Community Plan Amendment

Based on the EPA noise emissions, empirical data and the amount of equipment needed, worst-case noise levels from the construction equipment operations would occur during the base operations (grading phase). The anticipated grading of the Community Plan Amendment Project will occur in a single phase, with the entire site prepared for building construction. Construction must meet the City's Noise Ordinance (City of San Diego Municipal Code 59.5.0404). Therefore, construction noise will be less than significant.

Proposed Project

The noise levels utilized in this analysis for the grading are shown in Table 6-1. The construction equipment would be moving near the property lines to distances as far as 300-feet away or more. Therefore, the average distance during construction would be 100-feet. As can be seen in Table 6-1, with the equipment working closely together the cumulative noise levels would be 72.0 dBA at the nearest property line located 100 feet from the construction activities over a 12-hour period. Therefore, the construction activities would be expected to comply with the City's 75 dBA Leq 12-hour standard at the property lines and no impacts are anticipated.

**Table 6-1: Grading and Site Preparation Noise Levels**

| Construction Equipment | Quantity | Source Level @ 50-Feet (dBA)* | Duty Cycle (Hours/Day) | 12 Hour Noise Level @ Property Line (dBA) |
|---|---|---|---|---|
| Grader | 1 | 73 | 6 | 71.8 |
| Backhoe | 1 | 72 | 6 | 70.8 |
| Roller Compactor | 1 | 74 | 4 | 71.0 |
| Water Truck | 1 | 70 | 4 | 67.0 |
| | | | Cumulative Levels @ 50 Feet (dBA) | 76.5 |
| | | | Average Distance To Property Line | 100 |
| | | | Noise Reduction Due To Distance | -6.0 |
| | | | **NEAREST PROPERTY LINE NOISE LEVEL** | **70.5** |
| *Source: U.S. Environmental Protection Agency (U.S. EPA) and Empirical Data | | | | |

### 6.1.2 Construction Noise Conclusions

Construction of the CPA Buildout must meet the City's Noise Ordinance (City of San Diego Municipal Code 59.5.0404). Therefore, construction noise will be less than significant.

During the site preparation and grading the equipment will be spread out over the project site from distances near the occupied property to distances of more than 100-feet. Based upon the calculations of the noise levels when construction equipment is located near the property line the average noise levels are anticipated not to exceed the 75 dBA 12-hour standard and no impacts will occur and no mitigation measures are required.

## 6.2 Transportation Noise Levels

### 6.2.1 Onsite Transportation Related Noise Levels

Community Plan Amendment

CEQA does not require any analysis for the environment onto the project site. The CPA Buildout will be designed to conform to the City's Noise Element requiring noise levels to be below the City's 65 dBA CNEL Noise compatibility threshold at a minimum of 75% of the private use areas per the RM-2-5 zoning. Therefore, noise will be less than significant.

Proposed Project

To determine the future noise environment and impact potentials the Caltrans Sound32 noise model was utilized. The critical model input parameters, to determine the projected traffic noise levels, include vehicle travel speeds, the percentages of automobiles, medium trucks and heavy trucks in the roadway volume, the site conditions (hard or soft) and the peak hour traffic volume.

Table 6-2 presents the roadway parameters used in the analysis including the average daily traffic volumes, vehicle speeds and the hourly traffic flow distribution (vehicle mix) for the future Buildout 2035 conditions provided by SANDAG Traffic Prediction Model. The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks and heavy trucks for input into the Sound32 Model. The traffic noise model utilizes a traffic mix per Caltrans 2021 Annual Average Daily Truck Traffic for Interstate 15. The modeled observer locations of the outdoor usable areas and building facades of the proposed project are presented in Figure 6-1 on the following page.

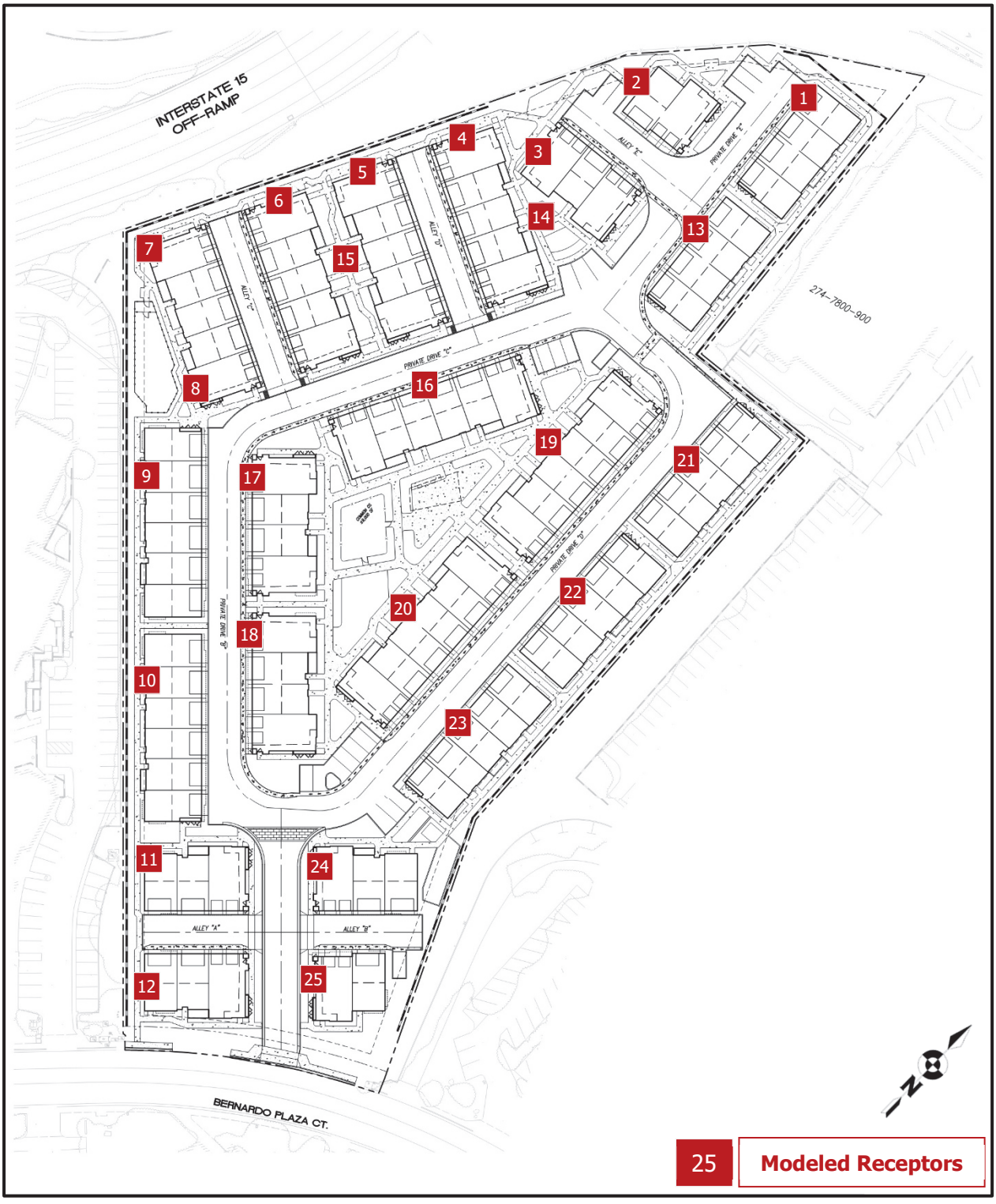
**Table 6-2: Traffic Parameters**

| Source | Average Daily Traffic (ADT)[1] | Peak Hour Volume [2] | Vehicle Speeds (MPH) | Vehicle Mix % | | |
|---|---|---|---|---|---|---|
| | | | | Auto | Medium Trucks | Heavy Trucks |
| I-15 Northbound | 103,000 | 10,300 | 65 | 92.90[3] | 3.46 | 3.64 |
| I-15 Southbound | 116,600 | 11,660 | 65 | 92.90[3] | 3.46 | 3.64 |
| I-15 Northbound HOV | 21,200 | 2,120 | 65 | 100 | 0 | 0 |
| I-15 Southbound HOV | 16,000 | 1,600 | 65 | 100 | 0 | 0 |
| Off-Ramp | 8,900 | 890 | 30 | 95[4] | 3 | 2 |
| Rancho Bernardo Road | 35,600 | 3,560 | 40 | 95[4] | 3 | 2 |

[1] Source: SANDAG Series ABM2+/2021 RP, Forecast Year 2035
[2] 10% of the ADT
[3] Source: Caltrans 2021 Annual Average Daily Truck Traffic
[4] Source: Typical mix found on City roadways

The required coordinate information necessary for the traffic noise prediction model input was taken from the preliminary site plans provided by Latitude 33, 2025. To predict the future noise levels, the preliminary site plans were used to identify the pad elevations, the roadway elevations, and the relationship between the noise source(s) and the receptor areas. The traffic was broken into lane segments for the main lanes and HOV lanes based on the ultimate Buildout configuration and the roadway segments were extended beyond the observer locations.

## Figure 6-1: Modeled Receptor Locations



The Buildout analysis was modeled utilizing the roadway parameters described above and shown in Table 6-1 for the future conditions. Sensitive outdoor observers were located in the ground floor private patios, the second-floor balconies, and upper floor building facades. The modeling results are quantitatively shown in Table 6-3 below. Additionally, the Proposed Project is proposing a 6-foot noise barrier facing Interstate 15 as a project design feature. The modeling results include noise levels with and without shielding.

Based upon the findings, the outdoor use areas were determined to be below the City's 65 dBA CNEL Noise compatibility threshold at a minimum of 75% of the private use areas without attenuation measures. The units above the City's noise thresholds are shown in Figure 6-2 and represent less than 15% of the 122 total units. The modeling is provided in ***Attachment A***.

**Table 6-3: Future Residential Exterior Noise Levels**

| Receptor Number | Unshielded Ground Floor Patio Noise Levels (dBA CNEL) | Shielded Ground Floor Patio Noise Levels (dBA CNEL) | Second Level Building Facade Noise Levels (dBA CNEL) | Third Level Building Facade Noise Levels (dBA CNEL) |
|---|---|---|---|---|
| 1 | 68 | 68 | 71 | 71 |
| 2 | 68 | 68 | 70 | 70 |
| 3 | 67 | 67 | 70 | 70 |
| 4 | 68 | 65 | 71 | 71 |
| 5 | 67 | 63 | 70 | 71 |
| 6 | 68 | 61 | 71 | 72 |
| 7 | 63 | 61 | 70 | 72 |
| 8 | 66 | 65 | 69 | 69 |
| 9 | 62 | 61 | 69 | 70 |
| 10 | 64 | 64 | 66 | 69 |
| 11 | 65 | 65 | 67 | 68 |
| 12 | 65 | 65 | 68 | 68 |
| 13 | 56 | 56 | 59 | 60 |
| 14 | 62 | 62 | 64 | 64 |
| 15 | 63 | 63 | 65 | 66 |
| 16 | 56 | 56 | 59 | 60 |
| 17 | 57 | 57 | 57 | 60 |
| 18 | 56 | 56 | 58 | 59 |
| 19 | 55 | 55 | 58 | 59 |
| 20 | 55 | 55 | 58 | 59 |
| 21 | 55 | 55 | 58 | 58 |
| 22 | 55 | 55 | 58 | 58 |
| 23 | 55 | 55 | 58 | 58 |
| 24 | 55 | 55 | 58 | 58 |
| 25 | 54 | 54 | 57 | 57 |
| Interior Noise Study required if noise level is above 60 dBA CNEL per City Guidelines. | | | | |

## Figure 6-2: Units Above City Noise Threshold

The City of San Diego as part of its noise guidelines also states, consistent with Title 24 of the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. The City of San Diego's Noise Compatibility Guidelines require interior noise levels in residential structures to be reduced to 45 dBA CNEL as shown above in Table 3-1.

Standard building construction will provide a noise reduction of approximately 10-15 dBA with a windows open condition (Source: Federal Highway Administration Highway Traffic Noise Analysis and Abatement Policy and Guidance). An interior noise level reduction of 21-27 dBA CNEL is needed for the proposed residential units located along the western and northern property lines and a noise level reduction of 19-22 dBA CNEL is needed for the residential units set further back. Based on the preliminary architectural plans, to meet the 45 dBA CNEL interior noise standard, a minimum STC 33-35 rated dual pane windows and mechanical ventilation would be needed to achieve the necessary interior noise reductions to meet the City's standard for the residential units along the western and northern property line. A minimum STC 30-33 rated assemblies and mechanical ventilation would be needed to achieve the interior noise reductions for the second row of residential units set further back. The remainder units would require a minimum STC 28. Once the final architectural plans are prepared, the Proposed Project site will require an interior noise study be prepared prior to the issuance of building permits to determine the detailed components to reduce interior noise to 45 dBA CNEL.

### 6.2.2 Offsite Project Related Transportation Noise Levels

To determine if direct or cumulative off-site noise level increases associated with the development of the proposed project would create noise impacts, the traffic volumes for the existing conditions were compared with the traffic volume increase of existing plus project.

Community Plan Amendment

The CPA Buildout would include up to 160 multi-family residential units for a total of 960 daily trip ends (ADTs) and AM peak hour volume of 77 trips and PM peak hour volume of 86 trips (*Linscott, Law, and Greenspan, 2025*). The existing average daily traffic (ADT) volumes on the area roadways are more than several thousand ADT. Typically, it requires a project to double (or add 100%) the traffic volumes to have a direct impact of 3 dBA CNEL or be a major contributor to the cumulative traffic volumes. Therefore, off-site traffic noise will be less than significant.

Proposed Project

The Proposed Project is estimated to only generate 732 daily trips with AM peak hour volume of 59 trips and 66 PM peak hour volume trips (*LLG, 2025*). Therefore, no direct or cumulative impacts are anticipated.

### 6.2.3 Transportation Noise Conclusions

Community Plan Amendment

CEQA does not require any analysis for the environment onto the project site. The CPA Buildout will be designed to conform to the City's Noise Element requiring noise levels to be below the City's 65 dBA CNEL Noise compatibility threshold at a minimum of 75% of the private use areas without attenuation measures. Therefore, noise will be less than significant.

The project will not create a direct impact of more than 3 dBA CNEL on any roadway segment and no cumulative noise increase of 3 dBA CNEL or more were found. Therefore, off-site traffic noise will be less than significant.

Proposed Project

The results of this analysis indicate that future vehicle noise from Interstate 15 and Rancho Bernardo Road is the principal source of community noise that could impact the site. The Proposed Project is proposing ground floor patios and upper floor balconies to provide the private use area. Based upon the findings, the outdoor use areas were determined to be below the City's 65 dBA CNEL Noise compatibility threshold at a minimum of 75% of the private use areas without attenuation measures.

The City of San Diego as part of its noise guidelines also states, consistent with Title 24 of the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. The City of San Diego's Noise Compatibility Guidelines require interior noise levels in residential structures to be reduced to 45 dBA CNEL.

Standard building construction will provide a noise reduction of approximately 10-15 dBA with a windows open condition (Source: Federal Highway Administration Highway Traffic Noise Analysis and Abatement Policy and Guidance). An interior noise level reduction of 21-26 dBA CNEL is needed for the proposed residential units located along the western and northern property lines and a noise level reduction of 19-22 dBA CNEL is needed for the residential units set further back.

Based on the preliminary architectural plans, to meet the 45 dBA CNEL interior noise standard, a minimum STC 33-35 rated dual pane windows and mechanical ventilation would be needed to achieve the necessary interior noise reductions to meet the City's standard for the residential units along the western and northern property line. A minimum STC 30-33 rated assemblies and mechanical ventilation would be needed to achieve the interior noise reductions for the second row of residential units set further back. The remainder units would require a minimum STC 28. Once the final architectural plans are prepared, the Proposed Project site will require an interior noise study be prepared prior to the issuance of building permits to determine the detailed components to reduce interior noise to 45 dBA CNEL.

The Proposed Project will not create a direct impact of more than 3 dBA CNEL on any roadway segment and no cumulative noise increase of 3 dBA CNEL or more were found. Therefore, the Proposed Project's direct and cumulative contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

## 6.3 Vibration

The nearest vibration-sensitive uses are the existing commercial uses located 100 feet or more from the nearest proposed construction. Table 6-4 lists the average vibration levels that would be experienced at the nearest vibration sensitive land uses from the temporary construction activities.

**Table 6-4: Vibration Levels from Construction Activities**

| Equipment | Approximate Velocity Level at 25 Feet (VdB) | Approximate RMS Velocity at 25 Feet (in/sec) | Approximate Velocity Level at 100 Feet (VdB) | Approximate RMS Velocity at 100 Feet (in/sec) |
|---|---|---|---|---|
| Small bulldozer | 58 | 0.003 | 39.9 | 0.0111 |
| Jackhammer | 79 | 0.035 | 60.9 | 0.0044 |
| Loaded trucks | 86 | 0.076 | 67.9 | 0.0095 |
| Large bulldozer | 87 | 0.089 | 68.9 | 0.0004 |
| | | FTA Criteria | 83 | 0.2 |
| | | **Significant Impact?** | **No** | **No** |

[1] PPV at Distance D = PPVref x $(25/D)^{1.5}$

The FTA has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for vibration induced structural damage is 0.20 in/sec for the peak particle velocity (PPV). Proposed Project

construction activities would result in PPV levels below the FTA's criteria for vibration induced structural damage. Therefore, Proposed Project construction activities would not result in vibration induced structural damage to commercial buildings near the demolition and construction areas. The FTA criterion for infrequent vibration induced annoyance is 83 Vibration Velocity (VdB) for commercial uses. Construction activities would generate levels of vibration that would not exceed the FTA criteria for nuisance for nearby residential uses. Therefore, vibration impacts would be less than significant for both the CPA and proposed Project.

## 6.4 Operational Noise

Community Plan Amendment Project

A review of the CPA Buildout indicates that noise sources such as the pad mounted mechanical ventilation systems (HVAC) are the primary source of stationary noise. Noise levels generated by the operations of the CPA Buildout must meet the City's noise level thresholds at the nearest property lines (City of San Diego Municipal Code 59.5.0404). Therefore, operational noise will be less than significant.

Proposed Project

This section examines the potential operational noise source levels associated with the development and operation of the Proposed Project. Noise from a fixed or point source drops off at a rate of 6 dBA for each doubling of distance. Which means a noise level of 70 dBA at 5 feet would be 64 dBA at 10 feet and 58 dBA at 20 feet. A review of the Proposed Project indicates that noise sources such as the pad mounted mechanical ventilation systems (HVAC) are the primary source of stationary noise. The project anticipates installing Carrier CA15NA (Series, 24-A) or equivalent HVAC units with a reference noise level of 71 dBA at 3-feet (Source: Carrier).

The Proposed Project is adjacent to existing retail and commercial uses, therefore, would be required to meet the 52.5 dBA threshold during the nighttime hours from 10:00 p.m. to 7:00 a.m. (arithmetic mean between 45 dBA for residential and 60 dBA for commercial). The HVAC units are located a minimum of 20 feet from the property lines and will be shielded by proposed retaining walls that will break the line of sight to the HVAC units. To determine the noise level reductions from the retaining walls, the Fresnel Barrier Reduction Calculations based on distance, source height, receiver elevation and the top of barrier were modeled. The adjacent receptor was located 5 feet behind the retaining wall. It was determined from the Fresnel Barrier Reduction Calculations that the retaining wall would provide a minimum 13.1 dBA reduction.

The typical locations of the proposed HVAC units are shown in Figure 6-3. Up to four HVAC units may be clustered together with the proposed buildings separating them and would create the worst-case cumulative noise level. The remainder of the units are separated by at least 60 feet. This separation of 60 feet would result in a 20 dBA difference between two separate HVAC clusters and would not cumulatively increase the noise levels. Therefore, the worst-case combined noise from the HVAC would occur from four units.

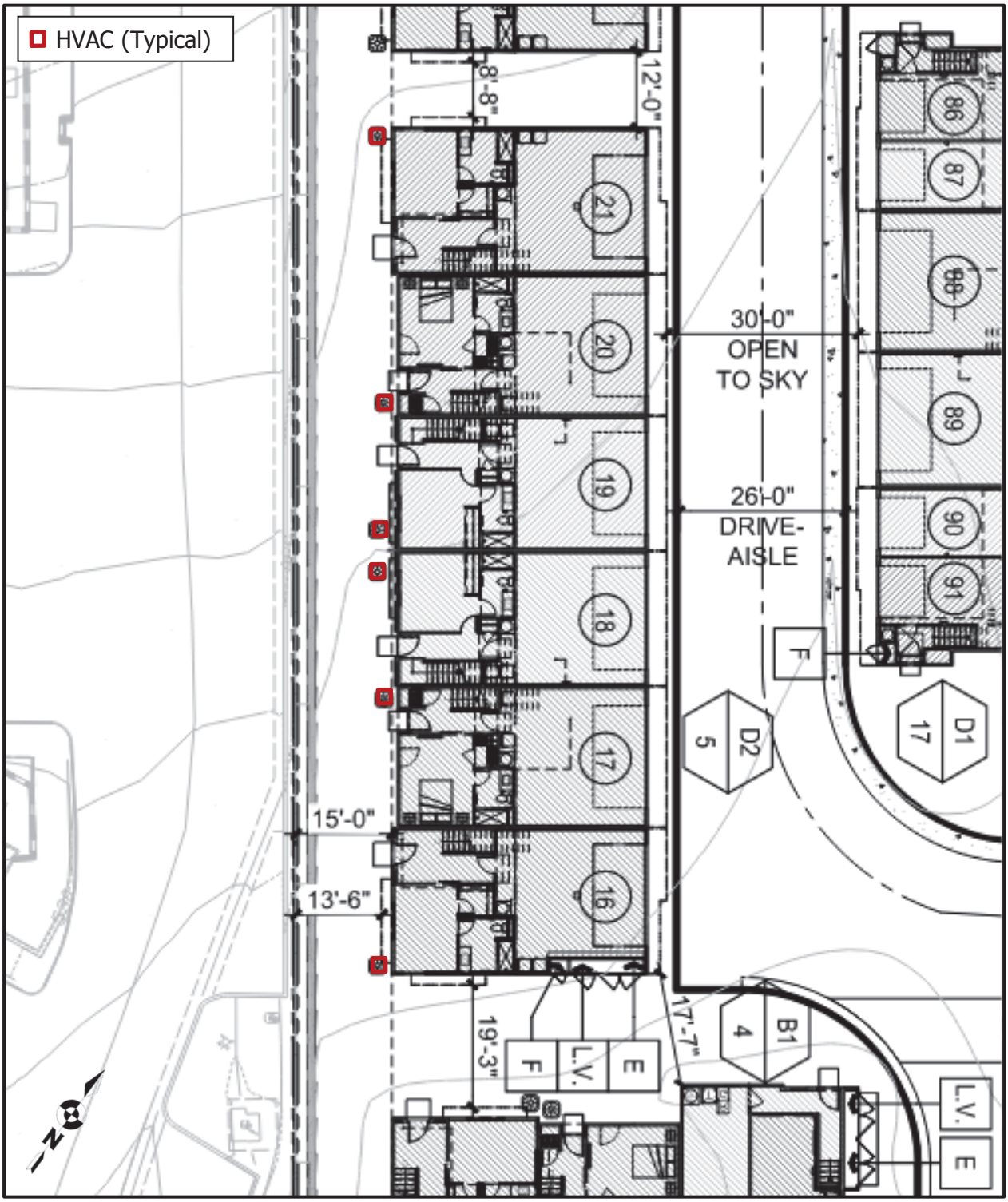
Utilizing a 6 dBA decrease per doubling of distance, noise levels at the nearest property line as described above were calculated for the HVAC. The noise levels associated with the HVAC will be limited by the buildings that will shield them both visually and acoustically. The HVAC units are located a minimum of 20 feet from the nearest property lines. The noise level reductions due to distance and the building for the nearest property line is provided in Table 6-5 below.

**Table 6-5: Proposed Project HVAC Noise Levels (Nearest Property Line)**

| Hourly Reference Noise Level (dBA) | Noise Source Reference Distance (Feet) | Noise Reduction Due to Distance (dBA) | Noise Reduction Due to Barriers (dBA) | Noise Level at Property Line (dBA) | Quantity | Property Line Cumulative Noise Level (dBA)* |
|---|---|---|---|---|---|---|
| 71.0 | 3.0 | -16.5 | -13.1 | 41.4 | 4 | **47.4** |
| *Complies with the nighttime Noise Standard of 52.5 dBA. | | | | | | |

Based upon the property line noise levels determined above none of the proposed noise sources directly or cumulatively exceeds the most restrictive nighttime property line standards at the shared property lines. Therefore, the proposed developments related operational noise levels comply with the noise standards at the property lines. All other property lines are located further from the proposed HVAC units and the resulting noise levels would also be below the property line thresholds. No Impacts are anticipated and no mitigation is required.

**Figure 6-3: Locations of Proposed HVAC Units**



# **ATTACHMENT A**

FUTURE NOISE MODEL INPUT AND
OUTPUT FILES

City View Ground Level Unshielded
T-PEAK HOUR TRAFFIC CONDITIONS, 1
9569 , 65 , 356 , 65 , 375 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 2
10832 , 65 , 403 , 65 , 424 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 3
2120 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 4
1600 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 5
846 , 40 , 27 , 40 , 18 , 40
T-PEAK HOUR TRAFFIC CONDITIONS, 6
3382 , 40 , 107 , 40 , 71 , 40
L-I-15 North Main, 1
N,304,155,582,
N,336,482,580,
N,377,877,576,
N,394,1079,574,
N,413,1455,570,
N,414,1636,568,
N,418,2098,566,
L-I-15 South Main, 2
N,111,173,582,
N,143,502,580,
N,184,895,576,
N,200,1092,574,
N,219,1461,570,
N,220,1637,568,
N,224,2099,566,
L-I-15 North HOV, 3
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N,267,489,580,
N,307,883,576,
N,324,1084,574,
N,343,1457,570,
N,344,1636,568,
N,348,2098,566,
L-I-15 South HOV, 4
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N,217,494,580,
N,257,888,576,
N,274,1087,574,
N,293,1459,570,
N,294,1637,568,
N,298,2098,566,
L-Off-Ramp, 5
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N,488,906,560,
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N,658,1142,544,
N,774,1288,532,
N,838,1410,525,
N,870,1527,520,
N,890,1637,516,
L-Rancho Bernardo, 6
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696,1111,545,545,
968,1438,520,520,
1087,1527,517,517,
1153,1549,505,505,
1226,1568,500,500,
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1007,760,525,525,
759,1180,539.2,539.2,
808,1236,534,534,
900,1345,526,526,
936,1388,523.2,523.2,
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R, 2 , 65 ,10
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991,1406,519,R3
R, 4 , 65 ,10
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R, 10 , 65 ,10
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1105,1370,518,R13
R, 14 , 65 ,10
1003,1345,519,R14
R, 15 , 65 ,10
898,1248,528,R15
R, 16 , 65 ,10
997,1193,526,R16
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1135,997,525,R23

R, 24 , 65 ,10
1092,875,522,R24
R, 25 , 65 ,10
1131,808,519,R25
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K,-9.9
6 ,8,9,10,11,12
K,-5
ALL,14,15
K,-9.9
ALL,13,16,17,18,19,20,21,22,23,24,25
C,C

SOUND32 - RELEASE 07/30/91

TITLE:
City View Ground Level Unshielded

| REC | REC ID | DNL | PEOPLE | LEQ(CAL) |
|---|---|---|---|---|
| 1 | R1 | 65. | 10. | 67.8 |
| 2 | R2 | 65. | 10. | 67.5 |
| 3 | R3 | 65. | 10. | 67.4 |
| 4 | R4 | 65. | 10. | 68.0 |
| 5 | R5 | 65. | 10. | 66.6 |
| 6 | R6 | 65. | 10. | 67.7 |
| 7 | R7 | 65. | 10. | 62.8 |
| 8 | R8 | 65. | 10. | 65.6 |
| 9 | R9 | 65. | 10. | 62.1 |
| 10 | R10 | 65. | 10. | 63.8 |
| 11 | R11 | 65. | 10. | 65.0 |
| 12 | R12 | 65. | 10. | 64.7 |
| 13 | R13 | 65. | 10. | 56.0 |
| 14 | R14 | 65. | 10. | 62.0 |
| 15 | R15 | 65. | 10. | 63.0 |
| 16 | R16 | 65. | 10. | 56.3 |
| 17 | R17 | 65. | 10. | 57.2 |
| 18 | R18 | 65. | 10. | 55.8 |
| 19 | R19 | 65. | 10. | 55.4 |
| 20 | R20 | 65. | 10. | 55.3 |
| 21 | R21 | 65. | 10. | 55.3 |
| 22 | R22 | 65. | 10. | 55.4 |
| 23 | R23 | 65. | 10. | 55.4 |
| 24 | R24 | 65. | 10. | 54.7 |
| 25 | R25 | 65. | 10. | 54.2 |

City View Ground Level Shielded
T-PEAK HOUR TRAFFIC CONDITIONS, 1
 9569 , 65 , 356 , 65 , 375 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 2
 10832 , 65 , 403 , 65 , 424 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 3
 2120 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 4
 1600 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 5
 846 , 40 , 27 , 40 , 18 , 40
T-PEAK HOUR TRAFFIC CONDITIONS, 6
 3382 , 40 , 107 , 40 , 71 , 40
L-I-15 North Main, 1
N,304,155,582,
N,336,482,580,
N,377,877,576,
N,394,1079,574,
N,413,1455,570,
N,414,1636,568,
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L-I-15 South Main, 2
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N,870,1527,520,
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L-Rancho Bernardo, 6
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N,890,1637,520,
N,1168,1637,500,
N,1469,1635,482,
N,1648,1635,474,
N,1788,1635,470,
N,2101,1636,470,
B-I-15 EOP East, 1 , 2 , 0 ,0
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409,874,576,576,
426,1077,574,574,
445,1454,570,570,
446,1635,568,568,
450,2097,566,566,

B-HOV K-Rail, 2 , 2 , 0 ,0
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296,486,580,583,
337,880,576,579,
354,1082,574,577,
373,1456,570,573,
374,1636,568,571,
378,2098,566,569,
B-Off-Ramp EOP, 3 , 2 , 0 ,0
418,530,572,572,
461,748,566,566,
532,893,562,562,
625,1034,554,554,
696,1111,545,545,
968,1438,520,520,
1087,1527,517,517,
1153,1549,505,505,
1226,1568,500,500,
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B-PL Wall, 4 , 2 , 0 ,0
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1007,760,525,525,
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759,1180,539.2,545.2,
808,1236,534,540,
900,1345,526,532,
936,1388,523.2,529.2,
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1124,1511,518,R1
R, 2 , 65 ,10
1024,1452,519,R2
R, 3 , 65 ,10
991,1406,519,R3
R, 4 , 65 ,10
931,1362,524,R4
R, 5 , 65 ,10
881,1303,524,R5
R, 6 , 65 ,10
838,1251,528,R6
R, 7 , 65 ,10
791,1197,528,R7
R, 8 , 65 ,10
847,1119,525,R8
R, 9 , 65 ,10
840,1068,525,R9
R, 10 , 65 ,10
949,886,523,R10
R, 11 , 65 ,10
992,811,524,R11
R, 12 , 65 ,10
1027,752,524,R12
R, 13 , 65 ,10
1105,1370,518,R13
R, 14 , 65 ,10
1003,1345,519,R14
R, 15 , 65 ,10
898,1248,528,R15
R, 16 , 65 ,10
997,1193,526,R16
R, 17 , 65 ,10
916,1091,525,R17
R, 18 , 65 ,10
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R, 20 , 65 ,10
1069,1053,524,R20
R, 21 , 65 ,10
1183,1251,518,R21
R, 22 , 65 ,10
1159,1124,522,R22
R, 23 , 65 ,10

1135,997,525,R23
R, 24 , 65 ,10
1092,875,522,R24
R, 25 , 65 ,10
1131,808,519,R25
D, 4.5
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5 ,8,9,10,11,12
K,-9.9
6 ,8,9,10,11,12
K,-5
ALL,14,15
K,-9.9
ALL,13,16,17,18,19,20,21,22,23,24,25
C,C

SOUND32 - RELEASE 07/30/91

TITLE:
City View Ground Level Shielded

| REC | REC ID | DNL | PEOPLE | LEQ(CAL) |
|---|---|---|---|---|
| 1 | R1 | 65. | 10. | 68.8 |
| 2 | R2 | 65. | 10. | 67.5 |
| 3 | R3 | 65. | 10. | 67.3 |
| 4 | R4 | 65. | 10. | 65.1 |
| 5 | R5 | 65. | 10. | 62.8 |
| 6 | R6 | 65. | 10. | 63.4 |
| 7 | R7 | 65. | 10. | 60.8 |
| 8 | R8 | 65. | 10. | 64.7 |
| 9 | R9 | 65. | 10. | 61.3 |
| 10 | R10 | 65. | 10. | 63.8 |
| 11 | R11 | 65. | 10. | 65.0 |
| 12 | R12 | 65. | 10. | 64.7 |
| 13 | R13 | 65. | 10. | 56.0 |
| 14 | R14 | 65. | 10. | 61.9 |
| 15 | R15 | 65. | 10. | 62.5 |
| 16 | R16 | 65. | 10. | 56.2 |
| 17 | R17 | 65. | 10. | 57.1 |
| 18 | R18 | 65. | 10. | 55.7 |
| 19 | R19 | 65. | 10. | 55.3 |
| 20 | R20 | 65. | 10. | 55.3 |
| 21 | R21 | 65. | 10. | 55.3 |
| 22 | R22 | 65. | 10. | 55.3 |
| 23 | R23 | 65. | 10. | 55.3 |
| 24 | R24 | 65. | 10. | 54.7 |
| 25 | R25 | 65. | 10. | 54.1 |

City View Second Level Facade
T-PEAK HOUR TRAFFIC CONDITIONS, 1
9569 , 65 , 356 , 65 , 375 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 2
10832 , 65 , 403 , 65 , 424 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 3
2120 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 4
1600 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 5
846 , 40 , 27 , 40 , 18 , 40
T-PEAK HOUR TRAFFIC CONDITIONS, 6
3382 , 40 , 107 , 40 , 71 , 40
L-I-15 North Main, 1
N,304,155,582,
N,336,482,580,
N,377,877,576,
N,394,1079,574,
N,413,1455,570,
N,414,1636,568,
N,418,2098,566,
L-I-15 South Main, 2
N,111,173,582,
N,143,502,580,
N,184,895,576,
N,200,1092,574,
N,219,1461,570,
N,220,1637,568,
N,224,2099,566,
L-I-15 North HOV, 3
N,235,161,582,
N,267,489,580,
N,307,883,576,
N,324,1084,574,
N,343,1457,570,
N,344,1636,568,
N,348,2098,566,
L-I-15 South HOV, 4
N,185,166,582,
N,217,494,580,
N,257,888,576,
N,274,1087,574,
N,293,1459,570,
N,294,1637,568,
N,298,2098,566,
L-Off-Ramp, 5
N,395,530,572,
N,445,783,566,
N,488,906,560,
N,555,1026,554,
N,658,1142,544,
N,774,1288,532,
N,838,1410,525,
N,870,1527,520,
N,890,1637,516,
L-Rancho Bernardo, 6
N,480,1693,538,
N,663,1656,530,
N,890,1637,520,
N,1168,1637,500,
N,1469,1635,482,
N,1648,1635,474,
N,1788,1635,470,
N,2101,1636,470,
B-I-15 EOP East, 1 , 2 , 0 ,0
336,152,582,582,
368,479,580,580,
409,874,576,576,
426,1077,574,574,
445,1454,570,570,
446,1635,568,568,
450,2097,566,566,

B-HOV K-Rail, 2 , 2 , 0 ,0
264,158,582,585,
296,486,580,583,
337,880,576,579,
354,1082,574,577,
373,1456,570,573,
374,1636,568,571,
378,2098,566,569,
B-Off-Ramp EOP, 3 , 2 , 0 ,0
418,530,572,572,
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532,893,562,562,
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696,1111,545,545,
968,1438,520,520,
1087,1527,517,517,
1153,1549,505,505,
1226,1568,500,500,
1694,1591,480,480,
B-PL Wall, 4 , 2 , 0 ,0
1024,730,524,524,
1007,760,525,525,
759,1180,539.2,539.2,
808,1236,534,534,
900,1345,526,526,
936,1388,523.2,523.2,
R, 1 , 65 ,10
1124,1511,528.,R1
R, 2 , 65 ,10
1024,1452,529.,R2
R, 3 , 65 ,10
991,1406,529.,R3
R, 4 , 65 ,10
931,1362,534.,R4
R, 5 , 65 ,10
881,1303,534.,R5
R, 6 , 65 ,10
838,1251,538.,R6
R, 7 , 65 ,10
791,1197,538.,R7
R, 8 , 65 ,10
847,1119,535.,R8
R, 9 , 65 ,10
840,1068,535.,R9
R, 10 , 65 ,10
949,886,533.,R10
R, 11 , 65 ,10
992,811,534.,R11
R, 12 , 65 ,10
1027,752,534.,R12
R, 13 , 65 ,10
1105,1370,528.,R13
R, 14 , 65 ,10
1003,1345,529.,R14
R, 15 , 65 ,10
898,1248,538.,R15
R, 16 , 65 ,10
997,1193,536.,R16
R, 17 , 65 ,10
916,1091,535.,R17
R, 18 , 65 ,10
972,996,534.,R18
R, 19 , 65 ,10
1097,1204,529.,R19
R, 20 , 65 ,10
1069,1053,534.,R20
R, 21 , 65 ,10
1183,1251,528.,R21
R, 22 , 65 ,10
1159,1124,532.,R22
R, 23 , 65 ,10
1135,997,535.,R23

R, 24 , 65 ,10
1092,875,532.,R24
R, 25 , 65 ,10
1131,808,529.,R25
K,-3
5 ,8,9,10,11,12
K,-9.9
6 ,8,9,10,11,12
K,-5
ALL,14,15
K,-9.9
ALL,13,16,17,18,19,20,21,22,23,24,25
C,C

SOUND32 - RELEASE 07/30/91

TITLE:
City View Second Level Facade

| REC | REC ID | DNL | PEOPLE | LEQ(CAL) |
|---|---|---|---|---|
| 1 | R1 | 65. | 10. | 70.7 |
| 2 | R2 | 65. | 10. | 70.3 |
| 3 | R3 | 65. | 10. | 70.0 |
| 4 | R4 | 65. | 10. | 70.5 |
| 5 | R5 | 65. | 10. | 70.4 |
| 6 | R6 | 65. | 10. | 71.0 |
| 7 | R7 | 65. | 10. | 70.2 |
| 8 | R8 | 65. | 10. | 68.7 |
| 9 | R9 | 65. | 10. | 68.9 |
| 10 | R10 | 65. | 10. | 66.1 |
| 11 | R11 | 65. | 10. | 67.4 |
| 12 | R12 | 65. | 10. | 67.5 |
| 13 | R13 | 65. | 10. | 59.3 |
| 14 | R14 | 65. | 10. | 64.2 |
| 15 | R15 | 65. | 10. | 64.7 |
| 16 | R16 | 65. | 10. | 59.3 |
| 17 | R17 | 65. | 10. | 57.4 |
| 18 | R18 | 65. | 10. | 57.8 |
| 19 | R19 | 65. | 10. | 58.3 |
| 20 | R20 | 65. | 10. | 58.2 |
| 21 | R21 | 65. | 10. | 57.9 |
| 22 | R22 | 65. | 10. | 57.8 |
| 23 | R23 | 65. | 10. | 57.7 |
| 24 | R24 | 65. | 10. | 57.6 |
| 25 | R25 | 65. | 10. | 57.1 |

City View Third Level Facade
T-PEAK HOUR TRAFFIC CONDITIONS, 1
 9569 , 65 , 356 , 65 , 375 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 2
 10832 , 65 , 403 , 65 , 424 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 3
 2120 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 4
 1600 , 65 , 0 , 0 , 0 , 0
T-PEAK HOUR TRAFFIC CONDITIONS, 5
 846 , 40 , 27 , 40 , 18 , 40
T-PEAK HOUR TRAFFIC CONDITIONS, 6
 3382 , 40 , 107 , 40 , 71 , 40
L-I-15 North Main, 1
N,304,155,582,
N,336,482,580,
N,377,877,576,
N,394,1079,574,
N,413,1455,570,
N,414,1636,568,
N,418,2098,566,
L-I-15 South Main, 2
N,111,173,582,
N,143,502,580,
N,184,895,576,
N,200,1092,574,
N,219,1461,570,
N,220,1637,568,
N,224,2099,566,
L-I-15 North HOV, 3
N,235,161,582,
N,267,489,580,
N,307,883,576,
N,324,1084,574,
N,343,1457,570,
N,344,1636,568,
N,348,2098,566,
L-I-15 South HOV, 4
N,185,166,582,
N,217,494,580,
N,257,888,576,
N,274,1087,574,
N,293,1459,570,
N,294,1637,568,
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L-Off-Ramp, 5
N,395,530,572,
N,445,783,566,
N,488,906,560,
N,555,1026,554,
N,658,1142,544,
N,774,1288,532,
N,838,1410,525,
N,870,1527,520,
N,890,1637,516,
L-Rancho Bernardo, 6
N,480,1693,538,
N,663,1656,530,
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N,1168,1637,500,
N,1469,1635,482,
N,1648,1635,474,
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N,2101,1636,470,
B-I-15 EOP East, 1 , 2 , 0 ,0
336,152,582,582,
368,479,580,580,
409,874,576,576,
426,1077,574,574,
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B-HOV K-Rail, 2 , 2 , 0 ,0
264,158,582,585,
296,486,580,583,
337,880,576,579,
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B-Off-Ramp EOP, 3 , 2 , 0 ,0
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R, 2 , 65 ,10
1024,1452,539.,R2
R, 3 , 65 ,10
991,1406,539.,R3
R, 4 , 65 ,10
931,1362,544.,R4
R, 5 , 65 ,10
881,1303,544.,R5
R, 6 , 65 ,10
838,1251,548.,R6
R, 7 , 65 ,10
791,1197,548.,R7
R, 8 , 65 ,10
847,1119,545.,R8
R, 9 , 65 ,10
840,1068,545.,R9
R, 10 , 65 ,10
949,886,543.,R10
R, 11 , 65 ,10
992,811,544.,R11
R, 12 , 65 ,10
1027,752,544.,R12
R, 13 , 65 ,10
1105,1370,538.,R13
R, 14 , 65 ,10
1003,1345,539.,R14
R, 15 , 65 ,10
898,1248,548.,R15
R, 16 , 65 ,10
997,1193,546.,R16
R, 17 , 65 ,10
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972,996,544.,R18
R, 19 , 65 ,10
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R, 20 , 65 ,10
1069,1053,544.,R20
R, 21 , 65 ,10
1183,1251,538.,R21
R, 22 , 65 ,10
1159,1124,542.,R22
R, 23 , 65 ,10
1135,997,545.,R23

R, 24 , 65 ,10
1092,875,542.,R24
R, 25 , 65 ,10
1131,808,539.,R25
K,-3
5 ,8,9,10,11,12
K,-9.9
6 ,8,9,10,11,12
K,-5
ALL,14,15
K,-9.9
ALL,13,16,17,18,19,20,21,22,23,24,25
C,C

SOUND32 - RELEASE 07/30/91

TITLE:
City View Third Level Facade

| REC | REC ID | DNL | PEOPLE | LEQ(CAL) |
|---|---|---|---|---|
| 1 | R1 | 65. | 10. | 70.8 |
| 2 | R2 | 65. | 10. | 70.2 |
| 3 | R3 | 65. | 10. | 69.7 |
| 4 | R4 | 65. | 10. | 71.3 |
| 5 | R5 | 65. | 10. | 71.1 |
| 6 | R6 | 65. | 10. | 71.5 |
| 7 | R7 | 65. | 10. | 71.8 |
| 8 | R8 | 65. | 10. | 69.3 |
| 9 | R9 | 65. | 10. | 70.1 |
| 10 | R10 | 65. | 10. | 68.8 |
| 11 | R11 | 65. | 10. | 68.3 |
| 12 | R12 | 65. | 10. | 67.9 |
| 13 | R13 | 65. | 10. | 59.8 |
| 14 | R14 | 65. | 10. | 64.0 |
| 15 | R15 | 65. | 10. | 66.1 |
| 16 | R16 | 65. | 10. | 59.8 |
| 17 | R17 | 65. | 10. | 60.1 |
| 18 | R18 | 65. | 10. | 59.3 |
| 19 | R19 | 65. | 10. | 58.8 |
| 20 | R20 | 65. | 10. | 58.7 |
| 21 | R21 | 65. | 10. | 58.4 |
| 22 | R22 | 65. | 10. | 58.2 |
| 23 | R23 | 65. | 10. | 58.1 |
| 24 | R24 | 65. | 10. | 58.0 |
| 25 | R25 | 65. | 10. | 57.4 |

**Reference 2 (SA Geotechnical, 2024)**

SA GEOTECHNICAL
OPTIMIZED SOIL ENGINEERING

February 21, 2024

Project No. 24009-01

To: KB Home
9915 Mira Mesa Boulevard, Suite 100
San Diego, California 92131

Attention: Mr. Jesse Kleist

Subject: Geotechnical Exploration, Due Diligence Study and Preliminary Design Recommendations, Proposed Rancho Bernardo Townhomes, Bernardo Plaza Court, Assessor Parcel Number 274-781-14-00, City of San Diego, California

At your request, SA Geotechnical, Inc. (SA GEO) has conducted geotechnical subsurface exploration and due diligence study for the subject proposed residential development at Bernardo Plaza Court in the City of San Diego, California (Figure 1). The purpose of this study was to evaluate the geotechnical site conditions in light of the proposed grading and improvements in order to provide a geotechnical summary and preliminary geotechnical recommendations for project design, grading and construction. Our evaluation included review of background geologic and geotechnical engineering maps and reports for the subject site; subsurface exploration; geotechnical analysis; and preparation of this report.

Based on our review, the primary geotechnical constraints include the presence of shallow crystalline (tonalite) bedrock, undocumented artificial fills which will need to be removed/replaced with compacted fill, and the potential for seismic shaking during a strong seismic event. The site is generally underlain by tonalite bedrock that is variably weathered/decomposed and anticipated to be rippable with heavy-duty grading equipment (i.e., Caterpillar D9 Bulldozer). Groundwater was not encountered in any onsite boring. Stormwater infiltration is not considered feasible as the site is underlain by crystalline bedrock with sloping terrain and perimeter slopes along the eastern property line.

This report presents our findings, conclusions, and preliminary design recommendations for the proposed subject development. Based on our review, the proposed grading and development is considered geotechnically feasible provided the recommendations in this report are implemented during design, grading, and construction. Additional geotechnical evaluation and analysis will need to be performed once the project plans for grading, utility improvements and foundations are developed.

References pertinent to the site are included in Appendix A. Boring logs are included in Appendix B. Laboratory test data is included in Appendix C. The geophysics (rippability) report is included in Appendix D. Seismic design parameters are presented in Appendix E. General Earthwork and grading specifications are presented in Appendix F.

If you have any questions regarding this report, please contact our office. We appreciate the opportunity to provide our services.

Respectfully submitted,

SA GEOTECHNICAL, INC.

Anthony Zepeda, CEG 2681
Project Geologist

Reza Saberi, GE 3071
Principal Engineer


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# EXECUTIVE SUMMARY

The subject site is underlain by tonalite bedrock generally described as yellowish brown, reddish brown, and olive grey fine to coarse-grained, massive, and variably weathered. The uppermost portion is weathered (decomposed) and excavates as damp to moist silty sand and sand. Hard rock was encountered at variable depths across the site and resulted in refusal in three borings (H-1, H-4, and H-5). Bedrock will be encountered during grading/remedial grading and excavations for utility lines throughout the site.

The primary geotechnical constraints for the proposed site redevelopment include the following:

- Presence of shallow tonalite bedrock that is generally hard to excavate throughout the site;
- Presence of undocumented artificial fills (up to 7.5 feet thick); and,
- Potential for strong seismic shaking during an earthquake event.

Remedial grading for the site should consist of the removal and recompaction of undocumented fill materials and highly weathered or disturbed bedrock. In general, remedial removals are anticipated to be 3 feet below existing grades (and locally deeper to remove any undocumented fill). Overexcavation (within cut areas) is recommended to be to a minimum depth of 3 feet below design grades. Within streets or utility corridors, overexcavation/removal should be extended a minimum of 1 foot below the deepest utility line to facilitate utility pipeline construction. Wells, septic tanks and/or seepage pits may be encountered during demolition and grading and, if encountered, need to be properly removed and/or abandoned in accordance with County of San Diego Department of Environmental Health requirements (or other governing agency) and the environmental consultant's recommendations.

Per the results of the geophysics/rippability study, weathered tonalite bedrock was encountered (with p-wave velocities less than 5,500 feet/second) to the maximum investigation depth of 30 feet. We anticipate that the tonalite bedrock will be rippable for the design/remedial grading with heavy duty earthmoving equipment (i.e., Caterpillar D-9 bulldozer). However, trenching for utility construction may be very difficult (especially in the presence of boulders); thus, we recommend that streets and utility corridors be overexcavated to 1 foot below the deepest utility line during rough grading. Grading and rippability should be reviewed once grading and utility plans have been prepared. Locally, less weathered zones within the bedrock and slow/difficult excavation should be anticipated. Oversize rocks will be generated during grading. Blasting is not anticipated to be required to complete the design excavations or for remedial grading.

Groundwater seepage was not encountered during our exploration to a maximum depth of 20 feet below ground surface. In general, groundwater is anticipated to remain more than 10 feet below design grades upon the completion of grading. However, seepage/groundwater may be present at shallow depth locally and fluctuates on an annual and seasonal basis.

Building foundations and slabs should be designed to tolerate a total settlement of 1-inch and differential settlement of ½-inch over a span of 40 feet. The site is categorized as Site Class "C" for seismic design. Onsite soils are anticipated to have "Very Low" expansion potential at the completion of grading. Onsite soils are not anticipated to be corrosive to concrete but are anticipated to be moderately corrosive to metals.

Based on our findings, we conclude that the proposed residential development is feasible from a geotechnical viewpoint, provided it is designed and constructed in accordance with the recommendations presented in this report and any future design/plan review reports. The site is not considered suitable for infiltration of stormwater.

# 1.0 INTRODUCTION

## 1.1 Introduction and Scope of Services

At your request, SA Geotechnical, Inc. (SA GEO) has conducted geotechnical exploration and due diligence study for the subject proposed residential development at Bernardo Plaza Court in the city of San Diego, California (Figure 1). The purpose of our review was to assess the onsite geologic and geotechnical conditions and provide preliminary recommendations for design, grading, and construction of the proposed improvements. We have reviewed the Conceptual Density Study prepared by KTGY Architecture & Planning, dated December 8, 2023. The conceptual site plan was used as the base for our Geotechnical Map (Plate 1).

Our scope of services for this study included the following tasks:

- Review of available geologic and geotechnical maps, reports, and data for the subject site and surrounding area. A list of references is included in Appendix A.
- Review of available historic aerial photographs dating back to 1947.
- Subsurface exploration consisting of five hollow-stem auger borings (H-1 through H-5) to depths ranging from 3.5 to 20 feet below ground surface (bgs).
- A geophysical refraction survey, which included two survey lines (SL-1 and SL-2), to evaluate hardness and rippability of the tonalite bedrock.
- Laboratory testing of selected samples to determine engineering properties of onsite soils, including in-situ moisture and density, grain size distribution, Atterberg limits, shear strength, maximum density and optimum moisture content, R-value, expansion potential, and soluble sulfate content.
- Geotechnical evaluation and analysis of the compiled data regarding the proposed grading and development.
- Evaluation of faulting, seismicity, and seismic and static settlement in accordance with the 2022 California Building Code (CBC).
- Preparation of this report including our findings, conclusions, preliminary recommendations, and accompanying illustrations.
- Consultations with the project team.

SA GEO's expertise and scope of services do not include assessment of potential subsurface environmental contaminants or environmental health hazards.

## 1.2 Site Condition and History

The approximately 5.6-acre, irregularly shaped site is located north of Bernardo Plaza Court, situated between I-15 and Bernardo Center Drive in the Rancho Bernardo neighborhood of San Diego, California (Figure 1). The site is bound to the east and west by commercial businesses, to the north by an off-ramp from I-15 Northbound, and to the south by Bernardo Plaza Court. Overall site topography slopes gently to the northeast, with elevations ranging from approximately 504 to 545 feet above mean sea level. Descending slopes are present along portions of the easterly and northerly property lines, approximately 8 to 14 feet in height. The slopes were generally 2H:1V

(horizontal:vertical) or flatter; however, along the property line to the northeast (adjacent to the AT&T building) the existing cut slope is oversteepened to nearly 1:1. Bedrock outcrops (tonalite) were observed during our site reconnaissance along these slopes.

The subject site is developed with five buildings occupied by existing businesses and associated parking lots and drive aisles. The commercial/office campus includes interior slopes and some small retaining walls to accommodate grade changes across the site. An approximately 6-to-8-foot-high retaining wall is present along a portion of the eastern property line (adjacent to the USPS building) at the toe of an existing slope. Onsite slopes and landscaping are variably vegetated with large, mature trees throughout the site.

Based on our review of available historic aerial photographs dating back to 1947, the following summarizes our understanding of the site history:

- **1947-1953:** The site was undeveloped natural scrubland and appeared to have been used for ranching. Man-made water features/ponds were present to the east/southeast. The nearest modified land use was for agriculture, with a farm approximately 1.5 miles to the east.
- **1964-1966:** Portions of the subject site and surrounding area were mass graded. The grading appears to have been performed as part of I-15 construction, the associated off/on ramps, Rancho Bernardo Road, and other related infrastructure. The north and east-facing bedrock slopes (discussed above) appear to have been cut during this time.
- **1967-1978:** The site remained undeveloped. Bernardo Plaza Court (road) was partially constructed during this time. By 1978, the adjacent properties to the east (AT&T and USPS buildings) were constructed.
- **1980:** The site was actively being graded for commercial development. The eastern portion of the site appears to have been raised with fill material. Bernardo Plaza Court (road) was completed by 1980. The existing retaining wall (offsite) adjacent to the easterly property line was constructed.
- **1981:** Four of the five existing onsite commercial/office buildings were constructed, with associated hardscape and landscape improvements.
- **1982:** The fifth building, 11858 Bernardo Plaza Court, was constructed.
- **1984 - Present:** The adjacent commercial property to the west was under construction, completed by 1985. Between 2002 and 2003 Caltrans performed off-ramp widening adjacent to the northern portion of the site. The subject site appears to have remained largely unchanged.

## 1.3 Proposed Grading and Improvements

Prior to site grading and redevelopment, the existing structures, pavements, and utilities to be abandoned will be demolished. Based on our review of the conceptual site plan, the site is proposed to be redeveloped for residential use. The Conceptual Density Study shows 20 multifamily residential buildings with approximately 110 total units proposed. The project will also include stormwater quality/filtration devices, drive aisles and parking, and utility infrastructure improvements to support the development. We understand that the proposed attached units will be three stories and consist of wood-framed construction.

The planned earthwork/grading is currently unknown; however, considering the topographic relief across the site, we anticipate design cuts and fills generally on the order of 2 to 8 feet will be required to create a relatively level site and building pads. We also anticipate that some retaining walls or slopes will be needed to accommodate grade changes across the site or near property lines.

## 1.4 Subsurface Exploration

Our field exploration was performed on January 27, 2024, and included excavation of five hollow stem auger borings (H-1 through H-5) to depths ranging from 3.5 to 20 feet bgs. Borings H-1, H-4, and H-5 encountered refusal on hard rock prior to reaching target depths. A geophysical refraction survey was performed on January 31, 2024, and included two survey lines (SL-1 and SL-2).

The borings were geologically logged, and samples were obtained at selected intervals. After completion of drilling, the excavations were backfilled with soil cuttings and tamped. Pavement at the boring locations was repaired with cold patch asphalt. The approximate boring locations are shown on Plate 1 (Geotechnical Map). Boring logs are included in Appendix B.

Soil sampling was performed using a Modified California ring sampler. Relatively undisturbed ring samples were obtained from the borings at various depths with a 2.5-inch inside-diameter, split-barrel sampler. The sampler was driven with a 140-pound, automatic trip hammer, free falling 30 inches. The sampling was used to assess the soil beneath the site as well as to obtain a measure of resistance of the soil to penetration (recorded as blows-per-foot on the geotechnical boring logs). Representative bulk samples of onsite soils were also collected from soil cuttings and used for additional soil identification purposes and laboratory testing.

A geophysical refraction survey included two survey lines (SL-1 and SL-2) within the eastern and southern portions of the site, where we encountered shallow refusal during drilling. The approximate geophysical survey line locations are shown on the Geotechnical Map (Plate 1). The refraction survey measured compressional (P) wave velocities of the tonalite bedrock for rippability assessment. The geophysical study report is attached in Appendix D.

## 1.5 Laboratory Testing

Representative samples of onsite soils collected during our field exploration were tested to characterize the engineering properties. Laboratory tests performed on selected relatively undisturbed and bulk soil samples included:

- Moisture content and dry density;
- Sieve analysis;
- Atterberg limits;
- Direct shear;
- Maximum density and optimum moisture content;
- R-value;
- Expansion potential; and
- Soluble sulfate.

Laboratory tests were conducted in general conformance with applicable ASTM International standards. The laboratory test results are provided in Appendix C.

# 2.0 GEOTECHNICAL FINDINGS

## 2.1 Geologic Setting and Earth Units

The subject site is located southeast of Lake Hodges and the San Dieguito River, northeast of Black Mountain, within the Peninsular Ranges geomorphic province of Southern California. The site is mapped by the California Geologic Survey (2008) as underlain by Cretaceous-age crystalline bedrock (tonalite) of the Peninsular Ranges batholith.

The **tonalite bedrock (Kt)** is generally described as yellowish brown, reddish brown, grey, and olive grey fine to coarse-grained, massive, and weathered near surface. The uppermost portion has been completely weathered and decomposed into silty sand and sand that was excavatable with a hollow-stem drill rig to variable depth. Borings H-1, H-4, and H-5 encountered difficulty drilling and were terminated due to hard rock conditions ("refusal") anywhere from 3.5 to 15.5 feet bgs. We also performed a site-specific geophysical refraction survey to better evaluate rock hardness and rippability. A detailed discussion regarding the rock hardness and rippability is included in Section 2.7.

Within the eastern portion of the site (Boring H-2), the bedrock is overlain by **Undocumented Artificial Fill (Afu)** likely associated with prior site grading and development. The undocumented artificial fill encountered was up to 7.5 feet thick and generally consisted of yellowish brown silty fine sand that was damp and medium dense to very dense. The limits of undocumented artificial fill are approximated on the Geotechnical Map (Plate 1).

## 2.2 Geotechnical Conditions

Based on our geotechnical exploration and laboratory testing data (Appendix C), the geotechnical conditions are generally as follows:

**Soil Moisture Content and Dry Density**: The collected samples show that dry densities of the weathered tonalite bedrock generally vary from 110.1 to 127.9 pcf with moisture contents in the range of 0.4 to 7.2 percent. Blow counts in the tonalite bedrock were generally 50+ blows per foot.

**Soil Properties:** A grain-size distribution test was conducted on one sample, representative of the near-surface weathered tonalite bedrock. The sample had a fines content (passing Sieve No. 200) of 36 percent. The sample was classified as silty sand (SM) per the Unified Soil Classification System (USCS). Soil plasticity testing was performed on the fines portion of the sample and indicated the sample was non-plastic.

Maximum density testing of the near-surface onsite soils (uppermost 5 feet) indicates a maximum dry density of 140.0 pcf at an optimum moisture content of 6.5 percent, respectively.

**Shear Strength:** Direct shear testing was conducted on one remolded sample to represent the future fill materials. The remolded sample (remolded to 90% relative compaction) had an ultimate internal friction angle of 31 degrees with a cohesion of 100 psf. The peak values of internal friction angle and cohesion were 34 degrees and 300 psf, respectively.

**Expansion Potential:** One sample was tested to determine the expansion potential of the near-surface weathered tonalite. The sample had an Expansion Index of 0, indicating "Very Low" expansion potential.

**Chemical Properties:** Soluble sulfate content of the soil was measured in one sample representative of the near-surface weathered tonalite. Soluble sulfate content testing indicates the soil may be classified as "S0" per Table 19.3.1.1 of ACI-318-14. We anticipate onsite soils are moderately corrosive to metals.

**R-Value:** One sample from Boring H-2, collected in the upper 5 feet, had an R-value of 40.

## 2.3 Groundwater and Surface Water

Groundwater was not encountered in any of our onsite borings to a maximum depth of 20 feet bgs. Historic high groundwater mapping by the State has not yet been performed for this region. We have reviewed groundwater data available through the GeoTracker database for sites near the subject site. Depth to groundwater in the vicinity of the subject site has been documented between 4 and 83 feet bgs. It should be noted that the sites with very shallow groundwater are located topographically lower and/or situated within a different geologic setting/earth unit than the subject site. Based on our review, we anticipate that the groundwater is more than 20 feet deep at the site.

Groundwater levels may fluctuate on an annual and seasonal basis based on rainfall and variations in future residential irrigation and/or adjacent land use. The presence of locally saturated soils and/or perched water at the soil/bedrock contact and/or within weathered tonalite, cannot be ruled out and may be encountered during grading and construction of utility lines.

## 2.4 Regional Faulting and Seismicity

**Regional Faults:** The site is not located within a fault-rupture hazard zone as defined by the Alquist-Priolo Special Studies Zones Act (CGS, 2018). Also, based on mapping by the State (Jennings and Bryant, 2010) and County/City of San Diego, there are no active faults mapped at the site. Regional faults are presented on Figure 3.

**Seismicity:** Properties in southern California are subject to seismic hazards of varying degrees depending upon the proximity, degree of activity, and capability of nearby faults. These hazards can be primary (i.e., directly related to the energy release of an earthquake) or secondary (i.e., related to the effect of earthquake energy on the physical world). Since there are no active faults at the site, the potential for primary ground rupture is considered very low. The primary seismic hazard for this site is ground shaking during a future earthquake. The maximum moment magnitude for the controlling fault is 7.2 Mw, which would be generated from the Rose Canyon Fault. Using the site coordinates of 33.02138 degrees latitude and -117.07632 degrees longitude, the Rose Canyon Fault is the closest fault to the site, at a distance of 13.8 miles to the west.

The site is not located within a mapped potential liquefaction hazard zone per the County of San Diego (2023)/City of San Diego (2008). The attached Site Location and Seismic Hazards Map (Figure 1) depicts the site relative to County mapped potential liquefaction hazard zones. Other

secondary seismic hazards, such as tsunami and seiche are considered nil due to site elevation and distance from the ocean or other confined bodies of water (CGS, 2022).

## 2.5 Settlement

In general, the anticipated settlements depend upon the building loads, type of foundations, and the geotechnical properties of the supporting subgrade. Shallow bedrock is present throughout the site. Considering the subsurface soil conditions, laboratory test data, and anticipated lightly loaded residential structures, we estimate total settlement (combined static and seismic) to be on the order of less than 1-inch with differential settlement of less than ½-inch over a 40-foot span. The settlement estimate assumes remedial grading measures recommended in Section 3.2 of this report are implemented during grading.

## 2.6 Shrinkage and Bulking

The shrinkage and bulking (reduction or increase in volume of excavated materials upon recompaction and replacement as fill) varies by soil type, earth unit, and location. Volume changes depend primarily on in-situ density and the maximum dry density of the soil type. We anticipate the weathered tonalite bedrock will bulk slightly (less than 5 percent) and shrinkage of the near surface soils including the undocumented fill materials will be negligible. Ground subsidence at the site is estimated to be on the order of 0.1 foot.

## 2.7 Rippability and Generation of Oversize Material

The rippability characteristics of bedrock depend on many factors including rock type, hardness, the depth and degree of weathering and fracturing, rock structure, equipment size/type used for excavation, and operator experience and skill level. Based on our boring data, the underlying tonalite is weathered/decomposed to variable depths. The borings drilled onsite were met with refusal on hard rock at depths ranging from 3.5 to 15 feet bgs. Two borings were successfully drilled to the target depth (20 feet).

A geophysical refraction survey was performed as part of our study and included two survey lines (SL-1 and SL-2) within the southern and eastern portions of the subject site, where we encountered shallow refusal during drilling (see Plate 1). The refraction survey was used to measure compressional (P) wave velocities of the tonalite bedrock to assist in rippability assessment. The survey lines were approximately 100 to 125 feet in length to provide a minimum investigation depth of 25 feet bgs. The published Caterpillar Tractor Company bulldozer ripper performance charts and the local experience of the geophysical subcontractor indicate that granitic-type rocks with velocities below approximately 5,500 feet/second are "rippable" with difficulty using a D9R (single shank) bulldozer. For trenching operations, the rippability values should be scaled downward, especially if the presence of boulders is anticipated.

SL-1 and SL-2 encountered weathered rock (p-wave velocity less than 5,500 feet/second) to the maximum investigation depth (30 feet). It should be noted that lateral velocity variations are evident within the model and may indicate the presence of less weathered rock at shallow depth (SL-2), which may be difficult to excavate for trenching operations. Oversize rocks (defined as rock exceeding 12 inches in the maximum diameter) are anticipated to be generated during

grading, especially in deeper excavations. The seismic line velocity profile and accompanying geophysical report are included in Appendix D.

## 2.8 Existing Pavement Section and Utilities

The existing asphalt concrete pavement sections, as measured during our exploration, are shown on the boring logs (Appendix B). The asphalt thickness ranged from 3 to 3.5 inches. No aggregate base was encountered below the asphalt pavement in any of our borings.

Several utility service lines are present, servicing the existing onsite structures, including sewer, gas, and water. Overhead electrical utilities were also observed onsite.

# 3.0 CONCLUSION AND PRELIMINARY RECOMMENDATIONS

## 3.1 General Conclusion and Recommendation

Construction of the proposed residential development, as described herein, is considered geotechnically feasible provided the preliminary recommendations in this report are implemented during design, grading, and construction. Additional geotechnical exploration is not considered necessary provided there are no significant plan changes. Grading, foundation, utility/street improvements, structural and wall plans for the project should be reviewed by the geotechnical consultant during the design phase. Updated recommendations may be provided once the project plans are finalized and as needed.

The recommendations in this report should be considered minimum and may be superseded by more restrictive requirements of others. In addition to the following recommendations, General Earthwork and Grading Specifications are provided in Appendix F.

## 3.2 Site Preparation and Earthwork

Site preparation and grading should be performed in accordance with the recommendations herein and the requirements of the City of San Diego.

### 3.2.1 Site Demolition and Clearing

Prior to remedial grading, the existing structures, foundations, hardscape/landscape, and utilities to be abandoned should be demolished. Deleterious materials and debris should be cleared and disposed of offsite. Concrete material may be mixed with onsite soils and placed as compacted fill provided that it is broken into pieces that are smaller than 6 inches in the largest diameter and placed in accordance with Section 3.2.5. Asphalt concrete may also be used in compacted fill materials; however, it should not be placed under the residential pads. Placement of concrete and asphalt as compacted fill should also be approved by the project environmental consultant. Excavations for the removal of existing foundations, utilities and vegetation, including any onsite trees, should be observed by the geotechnical consultant. Large roots, highly organic soils, and utility/pipeline debris should be removed and should not be incorporated into new fills.

Soil that is disturbed as part of excavations or during removal of trees or underground utilities should be evaluated by the geotechnical consultant. Excavations that require backfill should be properly documented and compacted under the observation and testing of the geotechnical consultant in accordance with the recommendations provided in Section 3.2.6.

Wells, cesspools, and/or septic tanks may be encountered at the site. If encountered, these features should be removed and/or properly abandoned in accordance with County of San Diego Department of Environmental Health or other governing agency requirements, and the project environmental consultant's recommendations. Any voids created during demolition and removal should be backfilled with suitable onsite or import materials and compacted in accordance with the recommendations provided in Section 3.2.6.

### 3.2.2 Protection of Existing Improvements and Utilities

Existing buildings, improvements, and utilities adjacent to the site that are to be protected in place should be located and visually marked prior to grading operations. Excavations adjacent to improvements to be protected in-place or any utility easement should be performed with care, so as not to undermine existing foundations or destabilize the adjacent ground.

Stockpiling of soils more than 5 feet in height at or near existing structures and over utility lines should not be allowed. If deep excavation/removals are required, shoring or other special measures (i.e., setback or laybacks) to provide safety and mitigate the potential for lateral/vertical movements may be required.

### 3.2.3 Remedial Grading Measures

Remedial grading at the site should consist of removal of highly weathered/disturbed bedrock and all undocumented fill materials. In general, we recommend that remedial removals within design fill areas consist of removal and recompaction of soils in the upper 3 feet. Locally, deeper unsuitable material (undocumented artificial fill encountered up to 7.5 feet thick) is anticipated and the removals should be extended to competent bedrock. The remedial removals should also extend a minimum of 1 foot below the deepest utility lines in order to facilitate future excavations by the utility contractor(s). The geotechnical consultant should review and approve the removal bottoms prior to fill placement and should provide specific recommendations based on actual conditions, as necessary.

Excavations deeper than 4 feet will need to be laid back a minimum inclination of 1H:1V (horizontal to vertical) or provided with shoring. Shallow, unconfined excavations (4 feet or less) may consist of near-vertical excavation. Excavations should be performed in accordance with Cal/OSHA requirements for Soil Type "B". Locally, Type "C" soils (unstable fractured rock) may be encountered, and the excavations should be performed accordingly. The contractor's qualified person should verify compliance with Cal/OSHA requirements. Excavations near existing structures (within a 1:1 projection) should be provided with shoring that is designed to support the surcharge load of the existing structure. Otherwise, excavations may be performed in sections (A/B/C slot cuts). The conditions should be reviewed in the field by the project geotechnical consultant. Additional recommendations will be provided based on the actual conditions encountered during excavation and grading, as needed.

### 3.2.4 Lot Capping/Overexcavation

The proposed grading is anticipated to expose cut and fill transitions at finish grade within some lots. The cut portions of lots should be overexcavated to a minimum depth of 3 feet and replaced with compacted fill to provide a uniform fill cap over each lot. The lot overexcavations should be graded such that the overexcavation bottom is sloped a minimum 1 percent toward the nearest adjacent street or deeper fill areas, to limit ponding of nuisance water along the fill/bedrock contact. Overexcavation within streets or proposed utility alignments is recommended to 1 foot below the deepest utility, to facilitate future utility construction.

Additional lot overexcavation may be recommended during grading in areas where earth materials are highly variable within an individual lot. The conditions should be evaluated by the geotechnical consultant in the field during grading. The overexcavation bottoms should be mapped and approved by the geotechnical consultant.

### 3.2.5 Rippability and Placement of Oversize Material

Granitic-type (Tonalite) bedrock with p-wave velocities greater than 5,500 feet/second are generally regarded as very difficult to rip, marginally rippable, and/or non-rippable (greater than 7,000 feet/second). These velocity thresholds for rippability should be scaled downward for trenching operations, especially if the presence of boulders is anticipated. Velocities below 5,500 feet/second are anticipated to be rippable with some difficulty; however, it should be noted that rock characteristics, fracture spacing and orientation, and skill and experience level of operators play a significant role in determining rippability. Additionally, localized hard zones and/or contact irregularities within the weathered rock zone cannot be ruled out, and if encountered, will require additional excavation and processing effort.

Seismic Lines 1 and 2 (SL-1 and SL-2) encountered weathered rock (p-wave velocity less than 5,500 feet/second) to the maximum investigation depth of 30 feet. We anticipate that the tonalite bedrock will be rippable for the anticipated design/remedial grading excavation with heavy duty earthmoving equipment (i.e., Caterpillar D-9 bulldozer); however, this will need to be reviewed by the geotechnical consultant once grading and utility plans are available. Blasting is not anticipated to be required to complete the design excavations or for remedial grading.

Trenching operations below 7 to 10 feet bgs may be very difficult even with large excavators (i.e. Caterpillar 330); thus, we recommend that streets and utility corridors be overexcavated to 1 foot below the deepest utility during rough grading (see Section 3.2.4).

Grading cuts are anticipated to produce oversize rock (greater than 12 inches in size). If grading equipment cannot break down the material into smaller pieces, oversize rock will need to be disposed of in deeper fill areas. Oversize rocks may be placed in fills deeper than 10 feet below design grades. The grading contractor should consider performing deeper remedial removals within design fill areas to facilitate placement of oversize rocks. Rocks larger than 6 inches and smaller than 12 inches in the largest dimension may be placed at depth between 4 and 10 feet below design finish grades or 1 foot below the deepest utility line, whichever is deeper. Rocks greater than 3 inches in dimension are typically not suitable for backfill of utility trench excavations (unless accepted by the agency/utility owner). Thus, we recommend that the grading contractor consider placement of rocks larger than 3 inches in dimension outside of proposed utility alignments.

The Grading and Earthwork Specifications in Appendix F include details for placement of oversize rock.

### 3.2.6 Fill Placement

Upon the completion of remedial grading measures, the approved removal/overexcavation bottoms should be scarified a minimum of 6 inches. The removal bottoms and fill materials

should be compacted to at least 90 percent of maximum dry density, as determined by ASTM Test Method D1557. Fill materials should be placed in loose lifts no thicker than 8 inches.

Fill materials should be relatively free of deleterious material. The weathered bedrock materials are considered suitable for re-use as compacted fill provided any deleterious material is removed and the recommendations provided in the prior section are followed. Concrete material may be mixed with onsite soils and placed as compacted fill provided it is broken into pieces that are smaller than 6 inches in the largest diameter and in accordance with Section 3.2.5. Asphalt concrete may also be used in compacted fill materials; however, it should not be placed under the residential pads. Placement of concrete and asphalt as compacted fill should be approved by the project environmental consultant.

We recommend that the moisture content of new compacted fill soils be above the optimum moisture content but should be within the compactable moisture range. Appropriate equipment should be used and other measures (e.g., mixing, stockpiling, drying) may be needed to achieve the uniform and correct moisture content for fill placement. If the soils become extremely wet, special measures for mixing and drying may be required that will need to be determined based on the actual field conditions.

### 3.2.7 Import

The geotechnical consultant should evaluate and accept any import soils prior to transportation to the subject site. We recommend that import soils have similar engineering properties as onsite soils. At minimum, the import materials should have Expansion Index of less than 50, Plasticity Index of less than 15, fines content (passing Sieve 200) of less than 50 percent, and negligible soluble sulfate content.

## 3.3 Settlement Potential

The amount of settlement will depend upon the type of foundation(s) selected and future loading by additional fill and structures. Based on the subsurface exploration and laboratory data, our review and analysis, considering the remedial grading recommendations provided in this report are implemented during grading, and the anticipated structural loads typically associated with the proposed structures, we estimate that total and differential settlement (combined static and seismic) will be less than 1-inch and ½-inch over a span of 40 feet, respectively.

SA GEO should be provided with the foundation plans and structural loads, once available, to further evaluate the potential for post-construction settlement of the proposed buildings and associated improvements. The parameters provided herein will then be confirmed/updated based on the planned foundation layout and loads and any additional testing/analysis.

## 3.4 Foundation Design

The slab and foundations should be designed by the project structural engineer based on the proposed structure type and the anticipated loading conditions. Onsite soils are anticipated to have "Very Low" expansion potential at the completion of grading. The following foundation recommendations are provided with the assumption that the recommendations included in Section 3.2 of this report are implemented during grading.

The recommended net allowable bearing capacity for continuous and isolated footings may be calculated based on the following equation:

$q_{all} = 800\ D + 300\ B + 700$ (but not to exceed 4,500 psf)

where:
D = embedment depth of footing, in feet
B = width of footing, in feet

Also, the following parameters may be used for design of foundation and slabs:

- Soil unit weight = 120 pcf
- Soil internal friction angle = 30 degrees
- Coefficient of Friction = 0.38
- Subgrade modulus (k) of 150 pci (corrected for large slabs)
- Soil elastic modulus (Es) of 2,000 psi

The dead load of concrete below adjacent grades (buried concrete foundations) may be neglected. The allowable bearing pressure and friction coefficient may be increased by one-third for wind and seismic loading.

We recommend that strip and isolated footings for the buildings have a minimum embedment depth of 12 inches below the lowest adjacent grade. Continuous footings should be at least 12 inches wide and isolated column footings should be at least 24 inches wide. The footings of freestanding and isolated structures, such as walls and pilasters, should have a minimum embedment depth of 18 inches into approved soils.

The following table provides our general guidelines and preliminary recommendations for design of post-tensioned foundations and slabs on expansive soil in accordance with the 2022 CBC and Post-Tension Institute (PTI) DC 10.5 Edition provisions.

**GEOTECHNICAL GUIDELINES**
**FOR DESIGN OF POST-TENSIONED SLABS***

| *Parameter* | *Recommendation* |
|---|---|
| **Center Lift** | |
| * Edge Moisture Variation Distance, $e_m$ | 9.00 feet |
| * Center Lift, $y_m$ | 0.35 inches |
| **Edge Lift** | |
| * Edge Moisture Variation Distance, $e_m$ | 5.0 feet |
| * Edge Lift, $y_m$ | 0.50 inch |
| Presaturation, as needed, to obtain the minimum moisture down to the minimum depth | 1.1 x optimum down to 6 inches |
| ****Based on method in CBC 2022*** | |

For post-tensioned slabs, we recommend that the slabs have a thickened edge such that the slab is embedded a minimum of 12 inches below the lowest adjacent grade. The thickened edge should be tapered and have a minimum width of 12 inches.

In addition, as indicated in the DC 10.5 Edition of PTI, shape factor calculations should be performed by the project structural engineer in order to determine if strengthening/modification of foundations are necessary. Per PTI guidelines, the modifications to the foundations design should be considered if the shape factor (ratio of square of foundation perimeter over foundation area) exceeds 24.

If non-post-tensioned slabs-on-grade and foundations are considered at the site in accordance with Wire Reinforcement Institute (WRI) method (per the 2022 CBC), an effective Plasticity Index of 15 or less is considered appropriate for the upper 15 feet of soil materials. For non-post-tensioned slabs, we recommend a minimum embedment of 12 inches below the lowest adjacent grade for the perimeter footings. Also, the upper 6 inches of subgrade soil should be moisture conditioned to 110 percent of optimum moisture content prior to placement of moisture barrier and concrete.

The foundations and slabs should be designed to tolerate the total and differential settlements discussed in Section 3.3 of these recommendations.

For the design of pole-type foundations (i.e., light poles, shade structures, etc.), an allowable soil-bearing pressure ($s_1$) of 360 psf/ft may be used for Equation 18-1 (the "pole" equation) of the 2022 CBC Section 1807.3.2.1 to determine the depth of embedment for the footings, considering level ground conditions. The equation is applicable for designed embedment depths of less than 12 feet for the purpose of computing lateral pressure. Also, for vertical loads on pole-type foundations, an allowable skin friction of 300 pounds per square foot may be used. For cast-in-place pole-type foundations, the vertical end bearing pressure should be neglected.

## 3.5 Retaining Wall Design and Lateral Earth Pressures

Recommendations for lateral earth pressures for permanent retaining walls and structures with approved onsite drained soils and above groundwater table (drained condition) are as follows:

| *Conditions* | *Level (pcf)* | *2:1 Sloping* |
|---|---|---|
| Active | 40 | 65 |
| At-Rest | 60 | 85 |
| Passive | 360 | 180 (sloping down) |

parameters provided above are based on a soil internal friction angle of 30 degrees and soil unit weight of 120 pcf.

To design an unrestrained retaining wall, such as a cantilever wall, the active earth pressure may be used. For a restrained retaining wall, the at-rest pressure should be used. Passive pressure is used to compute lateral soils resistance developed against lateral structural movement. The passive pressures provided above may be increased by one-third for wind and seismic loads. The passive resistance is taken into account only if it is ensured that the soil against embedded structure will remain intact with time. Future landscaping/planting and improvements adjacent to the retaining walls should also be taken into account in the design of the retaining walls. Excessive soil disturbance, trenches (excavation and backfill), future landscaping adjacent to footings and over-saturation can adversely impact retaining structures and result in reduced lateral resistance.

For sliding resistance, the friction coefficient of 0.38 may be used at the concrete and soil interface. The coefficient of friction may be increased by one-third for wind and seismic loading. The retaining walls may also need to be designed for additional lateral loads if other structures or walls are planned within a 1H:1V projection.

The seismic lateral earth pressure for walls retaining more than 6 feet of soil may be estimated to be an additional 11 pcf for active and at-rest conditions. The earthquake soil pressure has a triangular distribution and is added to the static pressures. For the active and at-rest conditions, the additional earthquake loading is zero at the top and maximum at the base. The seismic lateral earth pressure does not apply to walls retaining less than, or equal to, 6 feet of soil (2022 CBC Section 1803.5.12).

Drainage behind retaining walls (retaining more than 30 inches of soil) should also be provided in accordance with the attached Figure 4. Specific drainage connections, outlets and avoiding open joints should be considered for the retaining wall design.

## 3.6 Seismic Design Parameters

The following table summarizes the seismic design criteria for the subject site. The seismic design parameters are developed in accordance with ASCE 7-16 and 2022 CBC. Please note that, considering the proposed structures and anticipated structural periods, site-specific ground-motion hazard analysis was not performed for the site. The seismic response coefficient, Cs, should be determined per the parameters provided below and using equation 12.8-2 of ASCE 7-16.

| ***Selected Seismic Design Parameters from 2022 CBC/ASCE 7-16*** | ***Seismic Design Values*** | ***Reference*** |
|---|---|---|
| Latitude | 33.02138 North | |
| Longitude | -117.07632 West | |
| Controlling Seismic Source | Rose Canyon | USGS, 2024 |
| Site Class per Table 20.3-1 of ASCE 7-16 | C | |
| Spectral Acceleration for Short Periods (Ss) | 0.829 g | SEA/OSHPD, 2024 |
| Spectral Accelerations for 1-Second Periods ($S_1$) | 0.306 g | SEA/OSHPD, 2024 |
| Site Coefficient $F_a$, Table 11.4-1 of ASCE 7-16 | 1.2 | SEA/OSHPD, 2024 |
| Site Coefficient $F_v$, Table 11.4-2 of ASCE 7-16 | 1.5 | SEA/OSHPD, 2024 |
| Design Spectral Response Acceleration at Short Periods ($S_{DS}$) from Equation 11.4-4 of ASCE 7-16 | 0.663 g | SEA/OSHPD, 2024 |
| Design Spectral Response Acceleration at 1-Second Period ($S_{D1}$) from Equation 11.4-4 of ASCE 7-16 | 0.306 g | SEA/OSHPD, 2024 |
| $T_S$, $S_{D1}$ /$S_{DS}$ 11.4.6 of ASCE 7-16 | 0.462 sec | |
| $T_L$, Long-Period Transition Period | 8 sec | SEA/OSHPD, 2024 |
| Peak Ground Acceleration Corrected for Site Class Effects ($PGA_M$) from Equation 11.8-1 of ASCE 7-16 | 0.427 g | SEA/OSHPD, 2024 |
| Seismic Design Category Section 11.6 of ASCE 7-16 | D | SEA/OSHPD, 2024 |

## 3.7 Slope Setback

Footings for structures located above descending slopes should be set back from the slope face in accordance with the minimum requirements of the City of San Diego and section 1808.7.1 of the 2022 CBC, whichever is greater. The setback distance is measured from the outside edge of the footing bottom along a horizontal line to the face of the slope.

The tables below summarize the minimum setback criteria for structures above descending slopes:

**Case A – Building and Retaining Wall Footings Above Descending Slopes**

| *Slope Height [H] (feet)* | *Minimum Setback from Slope face (feet)* |
|---|---|
| Less than 10 | 5 |
| 10 to 20 | ½ * H |
| 20 to 30 | 10 |
| Greater than 30 | ⅓ * H (maximum of 40') |

**Case B – Freestanding Wall Footings Above Descending Slopes**

| *Slope Height [H] (feet)* | *Minimum Setback from Slope face (feet)* |
|---|---|
| Less than 10 | 5 |
| 10 to 20 | ½ * H |
| Greater than 20 | Maximum of 10 |

For freestanding walls and other structures that are sensitive to lateral movement (e.g., smooth stucco finish, glass screens, etc.), SA GEO recommends that the structural setback requirements in accordance with Case A above be followed or that additional design measures be used to help control the potential for cracking and displacements. Otherwise, typical freestanding walls may have a setback in accordance with Case B.

## 3.8 Corrosivity

Based on laboratory testing, soluble sulfate exposure in the onsite soils may be classified as "S0" per Table 19.3.1.1 of ACI-318-14. Structural concrete elements in contact with soil include footings and building slabs-on-grade. The flatwork and sidewalk concrete are typically not considered structural elements. Concrete mix for structural elements should be based on the "S0" soluble sulfate exposure class of Table 19.3.2.1 in ACI-318-14. Other ACI guidelines for structural concrete are recommended. Also, onsite soils are anticipated to be moderately corrosive to metals.

## 3.9 Expansion Potential

At the completion of grading, we anticipate that onsite soils will have "Very Low" expansion potential. The geotechnical recommendations provided in this report including the design parameters for foundations, slab-on-grade and flatwork improvement should be implemented

during design and construction. Updated recommendations will be provided upon additional testing at the completion of grading at the site and as needed.

## 3.10 Interior Slab Moisture Mitigation

In addition to geotechnical and structural considerations, the project owner should also consider interior moisture mitigation when designing and constructing slabs-on-grade.

The intended use of the interior space, type of flooring, and type of goods in contact with the floor may dictate the need for, and design of, measures to mitigate potential effects of moisture emission from and/or moisture vapor transmission through the slab. Typically, for human occupied structures, a vapor retarder or barrier is recommended under the slab to help mitigate moisture transmission through slabs. The most recent guidelines by the American Concrete Institute (ACI 302.1R-04) suggest that the vapor retarder be placed directly under the slab (no sand layer). However, the location of the vapor retarder may also be subject to the builder's past successful practice. Placement of 1 or 2 inches of sand over the moisture retardant has been common practice by builders in southern California. Specifying the strength of the retarder to resist puncture and its permeance rating is important. These qualities are not necessarily a function of the retarder thickness. A minimum of 10-mil is typical but some materials, such as 10-mil polyethylene ("Visqueen"), may not meet the desired standards for toughness and permeance.

Vapor retarders, when used, should be installed in accordance with standards such as ASTM E 1643 and/or those specified by the manufacturer.

Concrete mix design and curing are also significant factors in mitigating slab moisture problems. Concrete with lower water/cement ratios results in denser, less permeable slabs that also "dry" faster with regard to when flooring can be installed (reduced moisture emissions quantities and rates). Rewetting of the slab following curing should be avoided since it can result in additional drying time required prior to flooring installation. Proper concrete slab testing prior to flooring installation is also important.

Concrete mix design, the type and location of the vapor retarder should be determined in coordination with all parties involved in the finished product, including the project owner, architect, structural engineer, geotechnical consultant, concrete subcontractors, and flooring subcontractors.

## 3.11 Exterior Concrete

The driveway, patio slabs and other flatwork elements should be at least 4 inches thick. Considering that the onsite soils have "Very Low" expansion potential, reinforcement of concrete is not necessary from a geotechnical standpoint; however, reinforcement will reduce the potential for concrete cracking as a result of shrinkage. If reinforcement is used, we recommend that No. 3 bars be placed at 24 inches on center both ways. Equivalent wire mesh reinforcement may also be used. Concrete slabs should be provided with construction or weakened plane control joints at a maximum spacing of 10 feet. The control joints should have a thickness that is ¼ of the total concrete thickness.

For exterior slabs, the use of a granular sublayer is primarily intended to facilitate presaturation and subsequent construction by providing a better working surface over the saturated soil. It also helps retain the added moisture in the native soil in the event that the slab is not placed immediately. Where these factors are not significant, the layer may be omitted. If used, we recommend placement of 2 to 4 inches of granular material over subgrade soils.

Exterior concrete elements such as curb and gutter, driveways, sidewalks and patios are susceptible to lifting and cracking when constructed over expansive soils. With expansive soils, the impacts to flatwork/hardscape can be significant, generally requiring removal and replacement of the affected improvements. Please also note that reducing concrete problems is often a function of proper slab design, concrete mix design, placement, and curing/finishing practices. Adherence to guidelines of the American Concrete Institute (ACI) is recommended. Also, the amount of post-construction watering, or lack thereof, can have a very significant impact on the adjacent concrete flatwork.

On projects with expansive soils, additional measures such as thickened concrete edges/footings, subdrains and/or moisture barriers should be considered where planter or natural areas with irrigation are located adjacent to the concrete improvements. Design and maintenance of proper surface drainage is also very important. If the concrete will be subject to heavy loading from cars/trucks or other heavy objects, thicker pavement section will be required the design of which should be performed by the geotechnical consultant, as needed.

## 3.12 Preliminary Asphalt Concrete Pavement Design

Final structural pavement sections should be based on R-value testing after the completion of grading and in accordance with City of San Diego requirements. Based on an R-value of 30 and estimated traffic indices (TIs), we recommend the following preliminary pavement sections:

| ***Street Location*** | ***Estimated TIs*** | ***Pavement Section*** |
|---|---|---|
| Parking Stalls | TI – 4.0 | 0.25' AC / 0.50' AB |
| General Drives | TI – 5.5 | 0.35' AC / 0.50' AB |
| Driveways with Heavy Truck Traffic | TI – 7.0 | 0.35' AC / 0.80' AB or<br>0.45' AC / 0.55' or<br>0.50' AC / 0.50' AB |
| *AC = Asphalt Concrete, AB = Aggregate Base* | | |

Please note that for two-stage paving operations, we recommend that the final AC cap be a minimum of 0.10 foot thick and the base AC course have a minimum thickness of 0.25 foot.

Asphalt concrete pavement should be placed in accordance with the requirements of Sections 301 and 302 of the Standard Specifications of Public Works Construction (the Greenbook). Prior to construction of pavement sections, the subgrade soils should be scarified to a minimum depth of 6 inches, moisture-conditioned as needed, and recompacted in-place to a minimum of 90 percent relative compaction (per ASTM D1557). Subgrade should be firm prior to AB placement.

AB materials can be crushed aggregate base or crushed miscellaneous base in accordance with the Greenbook (Section 200-2). The materials should be free of any deleterious materials. Aggregate base materials should be placed in 6- to 8-inch-thick loose lifts, moisture-conditioned as necessary, and compacted to a minimum of 95 percent relative compaction (per ASTM D1557). Asphalt concrete should also be compacted to a minimum relative compaction of 95 percent.

Unpaved median and parkway areas should be provided with vertical moisture barriers.

## 3.13 Trench Excavation and Backfill

Excavations should be performed in accordance with the requirements set forth by Cal/OSHA Excavation Safety Regulations (Construction Safety Orders, Section 1504, 1539 through 1547, Title 8, California Code of Regulations). In general, onsite soils may be classified as Type "B" soils for excavations into compacted fill and bedrock, and Type "C" soils for any excavations with unstable/fractured rock. Cal/OSHA regulations indicate that, for workmen in confined conditions, the steepest allowable slopes in Type "B" and Type "C" soils are 1:1 and 1.5:1 (horizontal to vertical), respectively, for excavations less than 20 feet deep. Where there is no room for these layback slopes, we anticipate that shoring will be necessary. Adequate shoring/shield should be provided, as deemed necessary. Excavations should be reviewed periodically by the contractor's qualified person to confirm compliance with Cal/OSHA requirements.

Utility trench backfill should be in accordance with City of San Diego and/or the governing jurisdiction's specifications. Please note that some agencies require select material for backfilling of trenches and therefore import soils may be required (typical in San Diego area). Native soils should be suitable for use as trench backfill from a geotechnical viewpoint provided that they are approved by the governing agency. Native backfill materials should be compacted to a minimum of 90 percent relative compaction (per ASTM D1557). Rocks greater than 3 inches in largest diameter should generally not be used as trench backfill unless approved by the agency and geotechnical consultant of record. Excavation and backfilling of HDPE pipes (if any) should be in accordance with the manufacturer’s requirement and the Greenbook. Select granular backfill (i.e., clean sand with SE 30 or better) may be used in lieu of native soils but should also be compacted or densified with water jetting and flooding.

Trenches excavated next to structures and foundations should also be properly backfilled and compacted to provide full lateral support and reduce settlement potential.

## 3.14 Groundwater

In general, groundwater is anticipated to remain more than 10 feet below design grades upon the completion of grading. However, shallow, perched groundwater/seepage may occur on an annual and seasonal basis as a result of rainfall, irrigation and/or seepage from adjacent properties and along the bedrock contact.

## 3.15 Stormwater Infiltration Feasibility

Considering that the site is underlain by very dense bedrock, the sloping topography across the site, and perimeter slopes along portions of the northerly and easterly boundaries, infiltration of stormwater is not feasible at the site from a geotechnical viewpoint. Other methods of stormwater treatment, such as detention and biofiltration basins, should be evaluated by the project civil engineer.

## 3.16 Surface Drainage and Irrigation

Maintaining adequate surface drainage, proper disposal of run-off water, and control of irrigation will help reduce the potential for future moisture-related problems and differential movements from soil heave/settlement.

Surface drainage should be carefully taken into consideration during grading, landscaping, and building construction. Positive surface drainage should be provided to direct surface water away from structures and slopes and toward the street or suitable drainage devices. Ponding of water adjacent to the structures should not be allowed. Buildings should have roof gutter systems and the run-off should be directed to parking lot/street gutters by area drainpipes or by sheet flow over paved areas. Paved areas should be provided with adequate drainage devices, gradients, and curbing to prevent run-off flowing from paved areas onto adjacent unpaved areas.

Considering the climatic conditions in southern California and provided that the recommendations included in this report are implemented during grading and construction, a minimum two-percent slope away from structures is considered acceptable and in substantial compliance with the 2022 CBC. Also, swales with one-percent slopes are acceptable from a geotechnical standpoint and are common practice in this locale.

Construction of planter areas immediately adjacent to structures should be avoided if possible. If planter boxes are constructed adjacent to or near buildings, the planters should be provided with controls to prevent excessive penetration of the irrigation water into the foundation and flatwork subgrades. Provisions should be made to drain excess irrigation water from the planters without saturating the subgrade below or adjacent to the planters. Raised planter boxes may be drained with weepholes. Deep planters (such as palm tree planters) should be drained with below-ground, water-tight drainage lines connected to a suitable outlet. Moisture barriers should also be considered.

It is also important to maintain a consistent level of soil moisture, not allowing the subgrade soils to become overly dry or overly wet. Properly designed landscaping and irrigation systems can help in that regard.

## 3.17 Maintenance of Graded Slopes

To reduce the erosion and slumping potential of graded slopes, all permanent manufactured slopes should be protected from erosion by planting with appropriate vegetation, or suitable erosion protection should be applied as soon as is practical. Proper drainage should be designed and maintained to collect surface waters and direct them away from slopes. A rodent-control program should also be established and maintained to reduce the potential for damage related to burrowing.

In addition, the design and construction of improvements and landscaping should also provide appropriate drainage measures.

## 3.18 Additional Subsurface Exploration and Laboratory Testing

Additional subsurface exploration during the design phase of the project is not anticipated provided no significant plan changes occur. Additional laboratory testing should be performed during and upon completion of the grading to confirm/update the design parameters provided herein.

## 3.19 Review of Future Plans

The project grading, foundation, street improvement, wall, and landscape plans should be reviewed and accepted by the geotechnical consultant prior to grading and construction. Additional recommendations should be provided upon the review of the project plans and as needed.

## 3.20 Observation and Testing during Grading and Construction

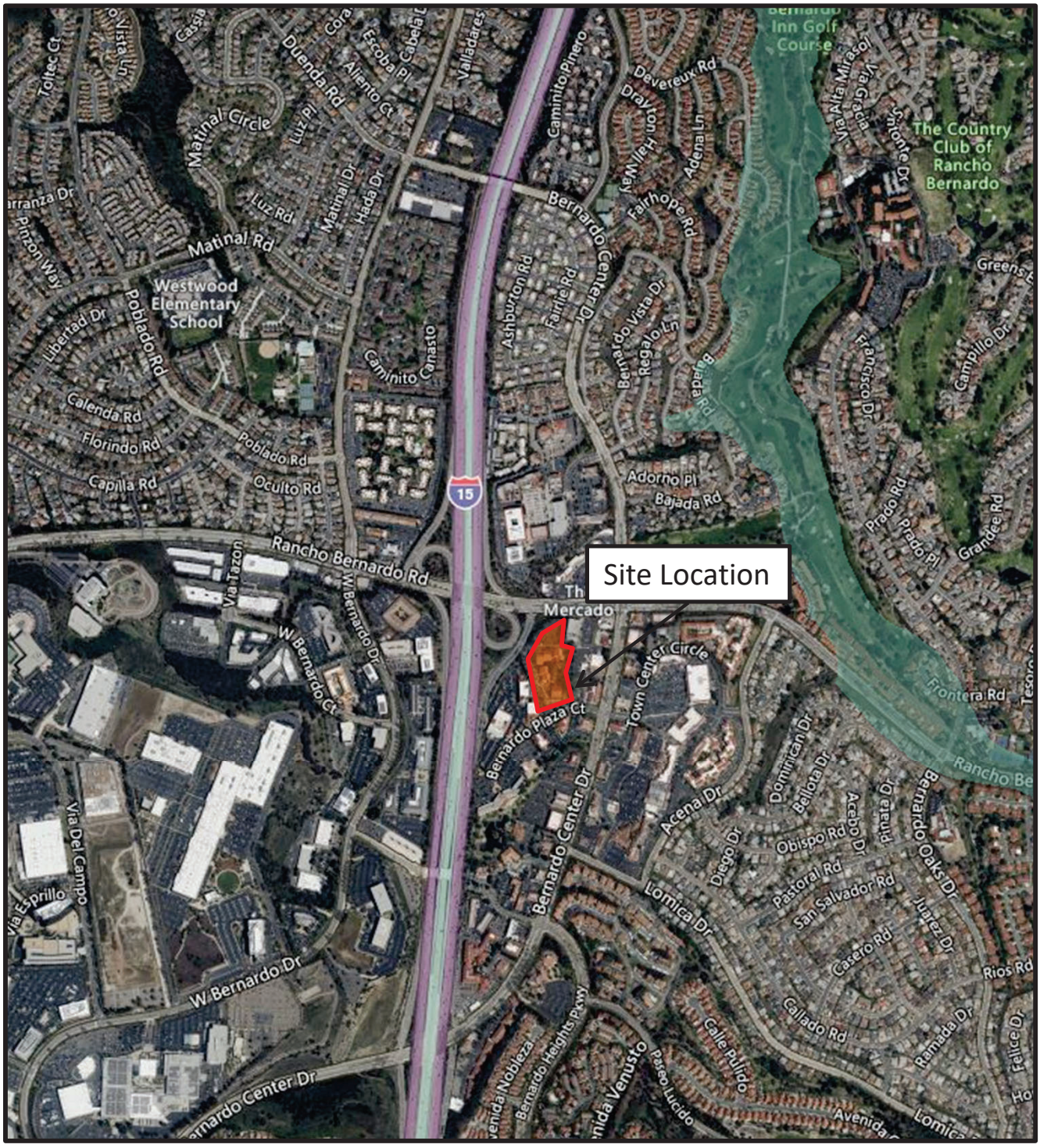
Geotechnical observation and testing should be performed by SA GEO during the following phases of grading and construction:

- During site demolition, preparation and clearing;
- During excavations performed for remedial grading and to relocate or remove existing underground improvements and structures;
- During earthwork, including observation and acceptance of remedial removal/overexcavation bottoms and fill placement, including import material (if any);
- Following the completion of grading, in order to verify soil properties for foundations, slab-on-grade and pavement areas;
- Upon completion of any foundation or structural excavation, prior to pouring concrete;
- During slab and flatwork subgrade preparation including pre-saturation, prior to pouring of concrete;
- During placement of backfill for utility trenches;
- During construction of the stormwater filtration devices/basins;
- During placement of backfill for retaining structures;
- During installation and backfill of subdrainage systems; and
- When any unusual soil conditions are encountered.

# 4.0 LIMITATIONS

This report has been prepared for the exclusive use of our client, KB Home, within the scope of services requested for the subject property described herein. This report or its contents should not be used or relied upon for other projects or purposes, or by other parties without the acknowledgement of SA GEO and the consultation of a geotechnical professional. The means and methods used by SA GEO for this study are based on local geotechnical standards of practice, care, and requirements of governing agencies. No warranty or guarantee, expressed or implied, is given.

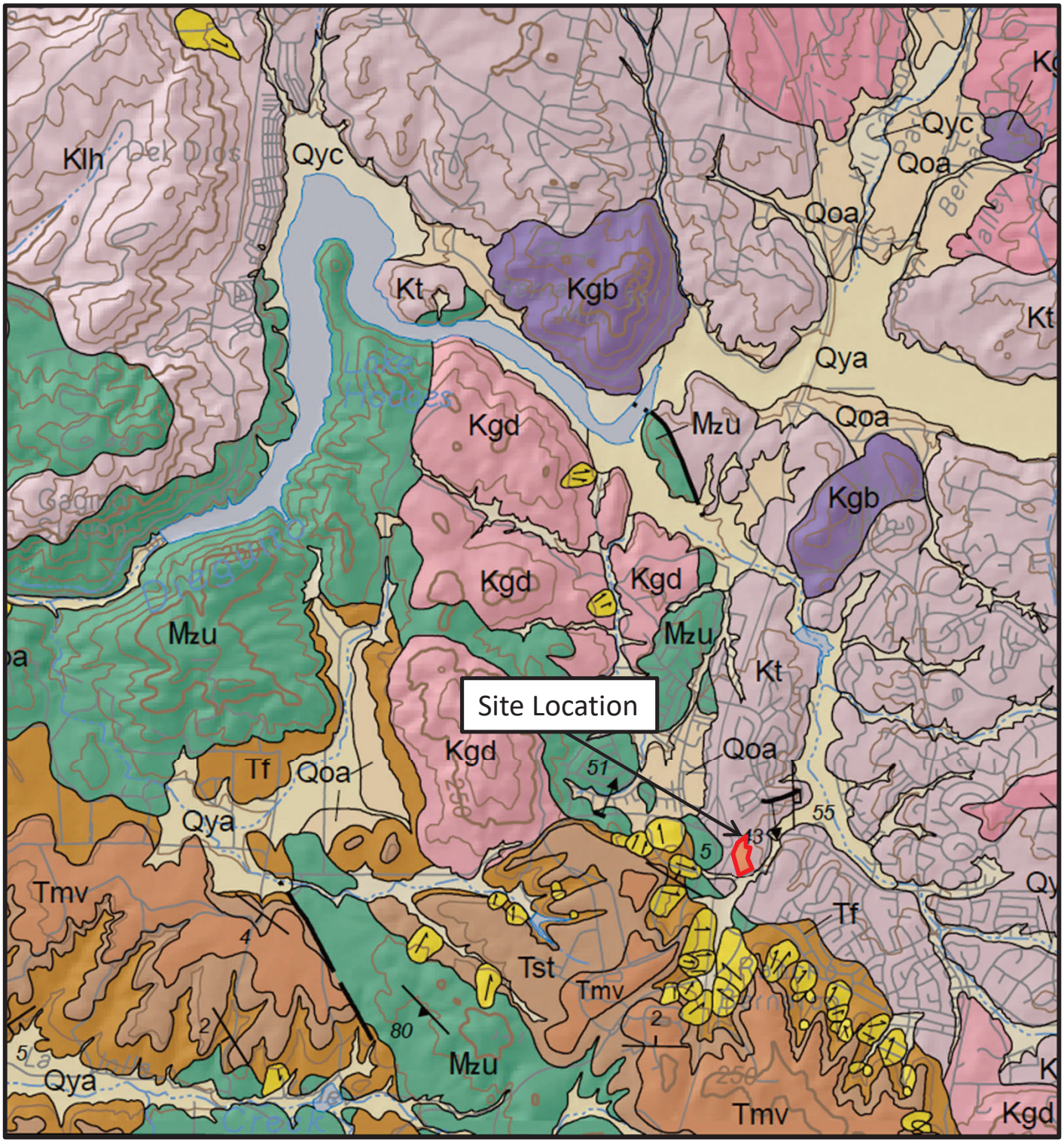
Our findings, conclusions, and recommendations are professional opinions based on interpretations and inferences made from geologic and engineering data from specific locations and depths, observed or collected at a given time. By nature, geologic conditions can vary from point to point, can be very different in-between exploration points, and can also change over time. Our conclusions and recommendations are, by nature, preliminary and subject to verification and/or modification during grading and construction when more subsurface data is exposed.




Source: ESRI, County of San Diego (2023)

Potential Liquefaction Hazard Zone

| Site Location and Seismic Hazard Map | | |
|---|---|---|
| Proposed Rancho Bernardo Townhomes<br>Bernardo Plaza Court<br>Accessors Parcel No. 274-781-14<br>San Diego, California | Project Number: 24009-01<br>Date: February 21, 2024<br>Figure 1 | S A |




Source: Geologic Map of the Oceanside 30'x60' Quadrangle, (CGS, 2007)

| Regional Geologic Map | |
|---|---|
| Proposed Rancho Bernardo Townhomes<br>Bernardo Plaza Court<br>Accessors Parcel No. 274-781-14<br>San Diego, California | Project Number: 24009-01<br>Date: February 21, 2024<br>Figure 2 |


Source: Fault Activity Map of California (Jennings and Bryant, 2010)

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

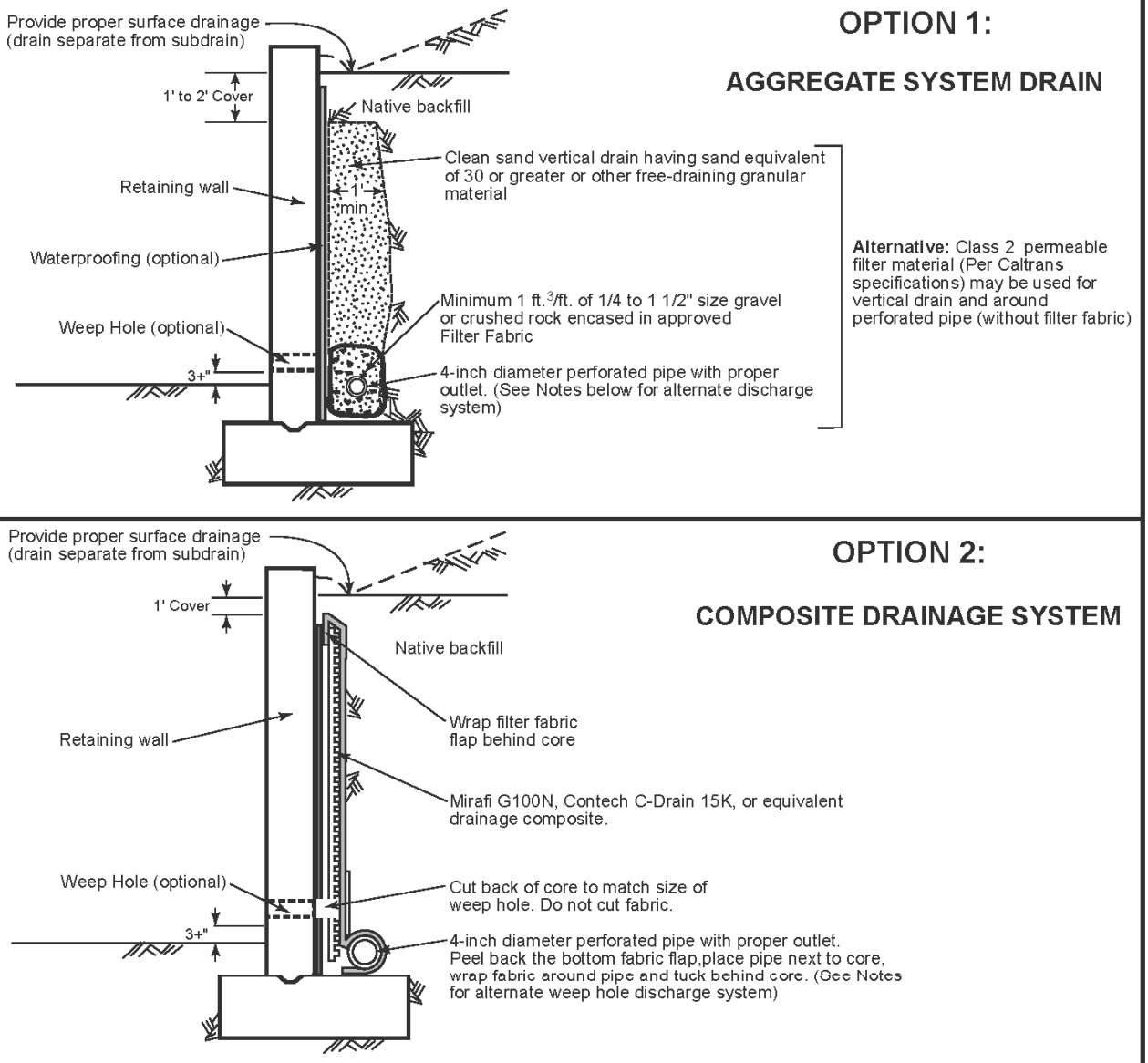
Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

## Regional Fault Map

Proposed Rancho Bernardo Townhomes
Bernardo Plaza Court
Accessors Parcel No. 274-781-14
San Diego, California

Project Number: 24009-01
Date: February 21, 2024
Figure 3




**NOTES:**

1. PIPE TYPE SHOULD BE PVC OR ABS, SCHEDULE 40 OR SDR35 SATISFYING THE REQUIREMENTS OF ASTM TEST STANDARD D1527, D1785, D2751 , OR D3034.
2. FILTER FABRIC SHALL BE APPROVED PERMEABLE NON-WOVEN POLYESTER, NYLON, OR POLYPROPYLENE MATERIAL.
3. DRAIN PIPE SHOULD HAVE A GRADIENT OF 1 PERCENT MINIMUM.
4. WATERPROOFING MEMBRANE MAY BE REQUIRED FOR A SPECIFIC RETAINING WALL (SUCH AS A STUCCO OR BASEMENT WALL).
5. WEEP HOLES MAY BE PROVIDED FOR LOW RETAINING WALLS (LESS THAN 3 FEET IN HEIGHT) IN LIEU OF A VERTICAL DRAIN AND PIPE AND WHERE POTENTIAL WATER FROM BEHIND THE RETAINING WALL WILL NOT CREATE A NUISANCE WATER CONDITION. IF EXPOSURE IS NOT PERMITTED, A PROPER SUBDRAIN OUTLET SYSTEM SHOULD BE PROVIDED.
6. IF EXPOSURE IS PERMITTED, WEEP HOLES SHOULD BE 2-INCH MINIMUM DIAMETER AND PROVIDED AT 25-FOOT MAXIMUM SPACING ALONG WALL. WEEP HOLES SHOULD BE LOCATED 3+ INCHES ABOVE FINISHED GRADE.
7. SCREENING SUCH AS WITH A FILTER FABRIC SHOULD BE PROVIDED FOR WEEP HOLES/OPEN JOINTS TO PREVENT EARTH MATERIALS FROM ENTERING THE HOLES/JOINTS.
8. OPEN VERTICAL MASONRY JOINTS (I.E., OMIT MORTAR FROM JOINTS OF FIRST COURSE ABOVE FINISHED GRADE) AT 32-INCH MAXIMUM INTERVALS MAY BE SUBSTITUTED FOR WEEP HOLES.
9. THE GEOTECHNICAL CONSULTANT MAY PROVIDE ADDITIONAL RECOMMENDATIONS FOR RETAINING WALLS DESIGNED FOR SELECT SAND BACKFILL.

# Retaining Wall Drainage Detail

Figure 4

# Appendix A

# APPENDIX A

# REFERENCES

Atlas Technical Consultants, 2024, Geophysical Evaluation, 11848 Bernardo Plaza Court, San Diego, California, Atlas No. 11945, Dated February 19, 2024.

California Geological Survey (CGS), 2007, Geologic Map of the Oceanside 30' x 60' Quadrangle, California, 1:100,000.

California Geological Survey (CGS), 2008, Guidelines for Evaluation and Mitigating Seismic Hazards in California, Special Publication 117A.

California Geological Survey (CGS), 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42, Revised 2018.

California Geological Survey (CGS), 2022, Tsunami Hazard Area Map, County of San Diego, Dated October 7, 2022.

City of San Diego, 2008, City of San Diego Development Services Department, Seismic Safety Study, Geologic Hazards and Faults, Grid Tile: 47.

County of San Diego, 2023, Multi-Jurisdictional Hazard Mitigation Plan, San Diego County, California, Adopted February 2023.

Jennings, Charles W. and Bryant W.A., 2010, Fault Activity Map of California, Department of Conservation, California Geological Survey, Geologic Data Map No. 6.

Nationwide Environmental Title Research, LLC (NETR), 2024, Historic Aerials by NETR Online, Date Accessed: February 6, 2024; website address: http://historicaerials.com

State of California Water Resources Control Board, 2024, GeoTracker Website, http://geotracker.waterboards.ca.gov/

Structural Engineers Association/Office of Statewide Health Planning and Development (SEA/OSHPD), 2024, U.S. Seismic Design Maps, web site address: https://seismicmaps.org/; Date Accessed: January 25, 2024.

U.S. Geological Survey, 2024, Unified Hazard Tool, NSHM 2014 Dynamic Deaggregation Program; web site address: https://earthquake.usgs.gov/hazards/interactive/; Date Accessed: January 25, 2024.

# Appendix B

# SOIL CLASSIFICATION CHART

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

NOTE: Dual symbols are used to indicate gravels or sand with 5-12% fines and soils with fines classifying as CL-ML. Symbols separated by a slash indicate borderline soil classifications.

**Sampler and Symbol Descriptions**

- Modified California sample (D-#)
- Standard Penetration Test (S-#)
- Shelby tube sample (T-#)
- Large bulk sample (B-#)
- Small bulk sample (SB-#)
- Approximate depth of groundwater during drilling
- Approximate depth of static groundwater

Note: Number of blows required to advance driven sample 12 inches (or length noted).

**Laboratory and Field Test Abbreviations**

| | |
|---|---|
| **AL** | Atterberg limits (plasticity) |
| **CC** | Chemical Testing incl. Soluble Sulfate |
| **CN** | Consolidation |
| **DS** | Direct Shear |
| **EI** | Expansion Index |
| **GS** | Grain Size Analysis (Sieve, Hydro. and/or -No. 200) |
| **MD** | Maximum Density and Optimum Moisture |
| **RV** | Resistance Value (R-Value) |
| **SE** | Sand Equivalent |
| **UU** | Unconsolidated Undrained Shear Strength |

**Notes:**

1. Soil classifications are based on the Unified Soil Classification System and include color, moisture, and relative density or consistency. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate. Bedrock descriptions are based on visual classification and include rock type, moisture, color, grain size, strength, and weathering.
2. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were drilled. They are not warranted to be representative of subsurface conditions at other locations or times.

S/A

## KEY TO LOG OF BORING

| | | |
|---|---|---|
| **Date(s) Drilled:** 1-27-2024 | **Logged By:** AZ | **H-1** |
| **Drilling Method:** Hollow Stem | **Drill Bit Size/Type:** 10" | |
| **Drill Rig Type:** CME 75 | **Hammer Type:** Auto (140lbs @ 30") | Page 1 of 1 |
| **Sampling Method(s):** Modified California, Bulk | | **Total Depth Drilled (ft)** 7 |
| **Approximate Groundwater Depth:** Groundwater Not Encountered | | **Approximate Ground Surface Elevation (ft)** |
| **Comments:** | | |

| Depth (ft) | SAMPLES Type Number | SAMPLES Blows Per Foot | USCS | MATERIAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | REMARKS |
|---|---|---|---|---|---|---|---|
| 0 | | | | Surface: 3" AC, No AB. | | | |
| | B-1 | | SM | **Tonalite (Kt)**<br>@ 0-2' (Hand Auger): Yellowish brown to grey silty fine- to coarse-grained SAND, damp, weathered/decomposed. | | | B-1 @ 0-5' |
| | D-1 | 50/ 1" | SP-SM | @ 2.5': Olive grey fine- to coarse-grained SAND with silt, dry to damp, very dense, micaceous, weathered/decomposed. – No Ring Sample Recovery - | 0.4 | | Hard Drilling @3.5' |
| 5 | D-2 | 50/ 1" | SP-SM | @ 5': Olive grey fine- to coarse-grained SAND with silt, damp, very dense, micaceous, weathered/decomposed. Coarse gravel/rock in sampler tip. - No Ring Sample Recovery - | | | |
| 10 | | | | Notes:<br>Total Depth: 7 Feet. (Refusal)<br>No Groundwater Encountered.<br>Backfilled with Cuttings and Tamped.<br>AC Patched with Cold Patch AC. | | | |
| 15 | | | | | | | |
| 20 | | | | | | | |
| 25 | | | | | | | |
| 30 | | | | | | | |

## Log Of Boring

KB Home
Proposed Residential Development
Bernardo Plaza Court
Rancho Bernardo, San Diego, California

Project Number: 24009-01

Appendix B

| | | |
|---|---|---|
| **Date(s) Drilled:** 1-27-2024 | **Logged By:** AZ | **H-2** |
| **Drilling Method:** Hollow Stem | **Drill Bit Size/Type:** 10" | |
| **Drill Rig Type:** CME 75 | **Hammer Type:** Auto (140lbs @ 30") | Page 1 of 1 |
| **Sampling Method(s):** Modified California, Bulk | | **Total Depth Drilled (ft)** 20 |
| **Approximate Groundwater Depth:** Groundwater Not Encountered | | **Approximate Ground Surface Elevation (ft)** |
| **Comments:** | | |

| Depth (ft) | SAMPLES Type Number | SAMPLES Blows Per Foot | USCS | MATERIAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | Surface: 3" AC, No AB. | | | |
| 0 | B-1 | | SM | **Undocumented Artificial Fill (Afu)**<br>@ 0-2' (Hand Auger): Yellowish brown silty fine- to coarse-grained SAND, damp, fine to coarse gravel. | | | B-1 @ 0-5' GS, AL, DS, MD, EI, RV, CC |
| | D-1 | 82/ 11.5" | SM | @ 2.5': Yellowish brown silty fine- to coarse-grained SAND, damp, very dense, micaceous. | 2.3 | 127.5 | |
| 5 | D-2 | 39 | SM | @ 5': Yellowish brown to reddish brown silty fine- to coarse-grained SAND, damp, medium dense, micaceous. | 2.4 | 120.2 | |
| | D-3 | 50/ 1" | | **Tonalite (Kt)**<br>@ 7.5': - No Sample Recovery - | | | |
| 10 | D-4 | 50/ 1" | SP-SM | @ 10': Olive grey to yellowish brown fine- to coarse-grained SAND with silt, damp, very dense, micaceous, weathered/decomposed. - No Ring Sample Recovery - | | | |
| 15 | D-5 | 50/ 1" | SP-SM | @ 15': Olive grey to yellowish brown fine- to coarse-grained SAND with silt, damp, very dense, micaceous, weathered/decomposed. - No Ring Sample Recovery - | | | |
| 20 | D-6 | 50/ 1" | SP-SM | @ 20': Olive grey to yellowish brown fine- to coarse-grained SAND with silt, damp, very dense, micaceous, weathered/ decomposed. - No Ring Sample Recovery - | | | |
| 25 | | | | Notes:<br>Total Depth: 20 Feet.<br>No Groundwater Encountered.<br>Backfilled with Cuttings and Tamped.<br>AC Patched with Cold Patch AC. | | | |
| 30 | | | | | | | |

## Log Of Boring

KB Home
Proposed Residential Development
Bernardo Plaza Court
Rancho Bernardo, San Diego, California

Project Number: 24009-01

Appendix B

| | | |
|---|---|---|
| **Date(s) Drilled:** 1-27-2024 | **Logged By:** AZ | **H-3** |
| **Drilling Method:** Hollow Stem | **Drill Bit Size/Type:** 10" | |
| **Drill Rig Type:** CME 75 | **Hammer Type:** Auto (140lbs @ 30") | Page 1 of 1 |
| **Sampling Method(s):** Modified California, Bulk | | **Total Depth Drilled (ft)** 20 |
| **Approximate Groundwater Depth:** Groundwater Not Encountered | | **Approximate Ground Surface Elevation (ft)** |
| **Comments:** | | |

| Depth (ft) | SAMPLES Type Number | SAMPLES Blows Per Foot | USCS | MATERIAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | Surface: 3" AC, No AB. | | | |
| 0 | B-1 | | SM | **Tonalite (Kt)**<br>@ 0-2' (Hand Auger): Yellowish brown silty fine- to coarse-grained SAND, damp to moist, weathered/decomposed. | | | B-1 @ 0-5' |
| | D-1 | 50/ 4" | SP-SM | @ 2.5': Olive brown to pale yellow fine- to coarse-grained SAND with silt, damp, very dense, weathered/decomposed, rock in sampler tip. | 2.2 | 127.9 | |
| 5 | D-2 | 50/ 1" | SP-SM | @ 5': Olive brown fine- to coarse-grained SAND with silt, damp, very dense, weathered/decomposed. - No Ring Sample Recovery - | | | |
| | D-3 | 50/ 1" | | @ 7.5': - No Sample Recovery - | | | |
| 10 | D-4 | 50/ 3" | SP-SM | @ 10': Mottled olive brown and reddish brown fine- to coarse-grained SAND with silt, damp, very dense, micaceous, weathered/decomposed. | 2.2 | 110.1 | |
| 15 | D-5 | 50/ 1" | SP-SM | @ 15': Mottled olive brown and reddish brown fine- to coarse-grained SAND with silt, damp, very dense, micaceous, weathered/ decomposed. - No Ring Sample Recovery - | | | |
| 20 | D-6 | 50/ 1" | SP-SM | @ 20': Greyish brown to bluish grey fine- to coarse-grained SAND, damp, very dense, micaceous, weathered/ decomposed. - No Ring Sample Recovery - | | | |
| 25 | | | | Notes:<br>Total Depth: 20 Feet.<br>No Groundwater Encountered.<br>Backfilled with Cuttings and Tamped.<br>AC Patched with Cold Patch AC. | | | |
| 30 | | | | | | | |

## Log Of Boring

KB Home
Proposed Residential Development
Bernardo Plaza Court
Rancho Bernardo, San Diego, California

Project Number: 24009-01

Appendix B

| | | |
|---|---|---|
| **Date(s) Drilled:** 1-27-2024 | **Logged By:** AZ | **H-4** |
| **Drilling Method:** Hollow Stem | **Drill Bit Size/Type:** 10” | |
| **Drill Rig Type:** CME 75 | **Hammer Type:** Auto (140lbs @ 30”) | Page 1 of 1 |
| **Sampling Method(s):** | | **Total Depth Drilled (ft)** 3.5 |
| **Approximate Groundwater Depth:** Groundwater Not Encountered | | **Approximate Ground Surface Elevation (ft)** |
| **Comments:** | | |

| Depth (ft) | SAMPLES Type Number | SAMPLES Blows Per Foot | USCS | MATERIAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | Surface: 3" AC, No AB. | | | |
| 0 | | | SM | **Tonalite (Kt)**<br>@ 0-2’ (Hand Auger): Olive brown silty fine- to coarse-grained SAND, very moist. | | | |
| | | | SM | @ 2-3.5’: Olive brown to yellowish brown silty fine- to coarse-grained SAND, damp, abundant coarse gravel, mildly weathered, hard drilling. | | | |
| 5 | | | | Notes:<br>Total Depth: 3.5 Feet. (Refusal)<br>No Groundwater Encountered.<br>Backfilled with Cuttings and Tamped.<br>AC Patched with Cold Patch AC. | | | |
| 10 | | | | | | | |
| 15 | | | | | | | |
| 20 | | | | | | | |
| 25 | | | | | | | |
| 30 | | | | | | | |

## Log Of Boring

KB Home
Proposed Residential Development
Bernardo Plaza Court
Rancho Bernardo, San Diego, California

Project Number: 24009-01

Appendix B

| | | |
|---|---|---|
| **Date(s) Drilled:** 1-27-2024 | **Logged By:** AZ | **H-5** |
| **Drilling Method:** Hollow Stem | **Drill Bit Size/Type:** 10" | |
| **Drill Rig Type:** CME 75 | **Hammer Type:** Auto (140lbs @ 30") | Page 1 of 1 |
| **Sampling Method(s):** Modified California, Bulk | | **Total Depth Drilled (ft)** 15 |
| **Approximate Groundwater Depth:** Groundwater Not Encountered | | **Approximate Ground Surface Elevation (ft)** |
| **Comments:** | | |

| Depth (ft) | SAMPLES Type Number | SAMPLES Blows Per Foot | USCS | MATERIAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | Surface: 3.5" AC, No AB. | | | |
| 0 | B-1 | | SM | **Tonalite (Kt)**<br>@ 0-3.5' (Hand Auger): Yellowish brown silty fine- to coarse-grained SAND, damp to moist, weathered/decomposed. | | | B-1 @ 0-5' |
| | D-1 | 50/ 5" | SM | @ 3.5': Pale olive brown to yellowish brown silty fine- to coarse-grained SAND, moist, very dense, weathered. | 7.2 | 115.1 | |
| 5 | D-2 | 50/ 2" | SP-SM | @ 5': Olive brown fine- to coarse-grained SAND with silt, damp, very dense, weathered/decomposed. - No Ring Sample Recovery - | | | |
| | D-3 | 50/ 6" | SP | @ 7.5': Pale olive brown to pale yellow fine- to coarse-grained SAND, damp to moist, very dense, trace coarse gravel, weathered/decomposed. | 3.7 | 119.3 | |
| 10 | D-4 | 50/ 3" | | @ 10': - No Sample Recovery - | | | |
| 15 | D-5 | 50/ 1" | SP | @ 15': Pale olive brown to pale yellow fine- to coarse-grained SAND, damp to moist, very dense, trace coarse gravel, weathered/decomposed. - No Ring Sample Recovery - | | | @ 14' Hard Drilling, Rig Chatter |
| 20 | | | | Notes:<br>Total Depth: 15 Feet. (Refusal)<br>No Groundwater Encountered.<br>Backfilled with Cuttings and Tamped.<br>AC Patched with Cold Patch AC. | | | |
| 25 | | | | | | | |
| 30 | | | | | | | |

## Log Of Boring

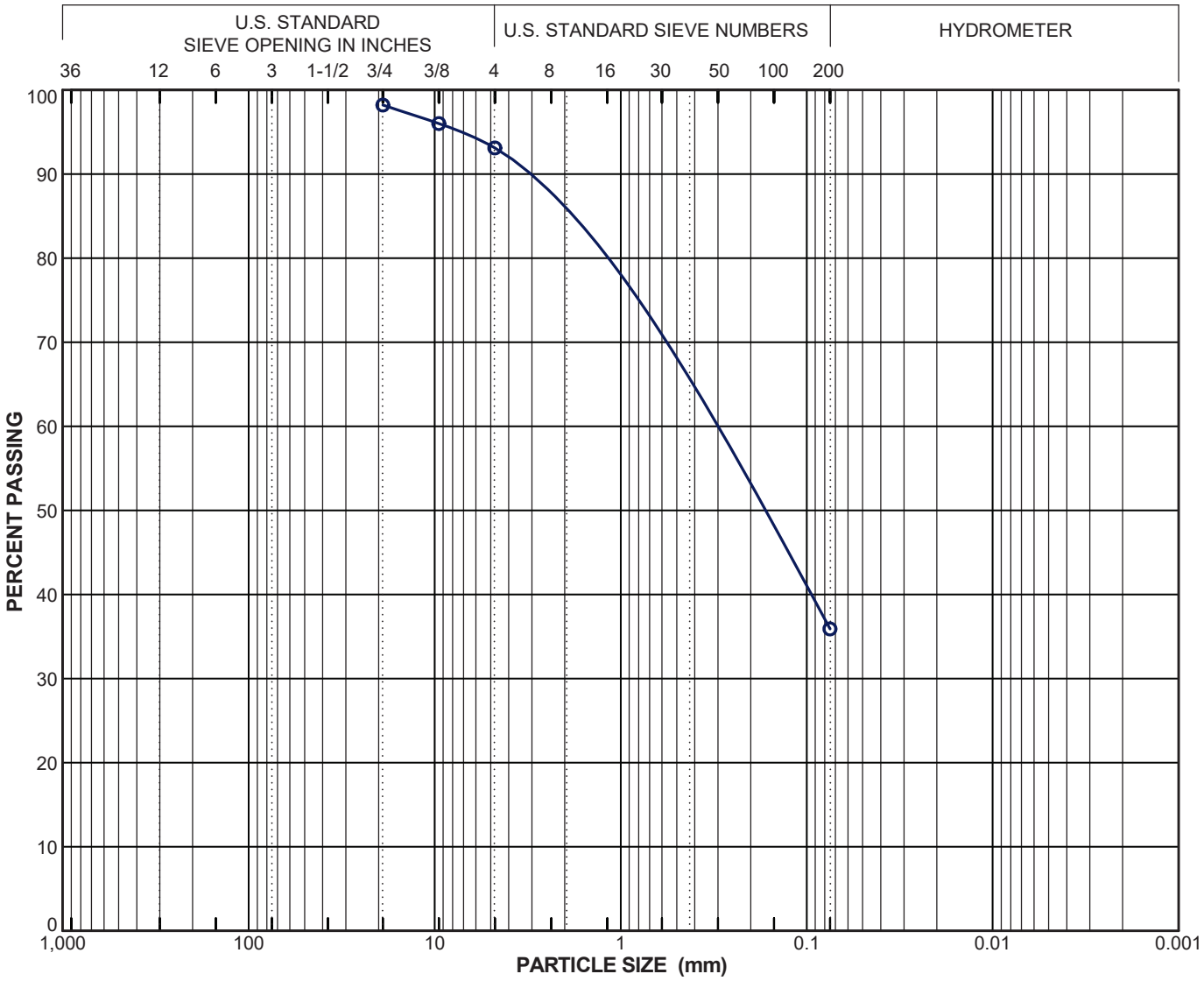
KB Home
Proposed Residential Development
Bernardo Plaza Court
Rancho Bernardo, San Diego, California

Project Number: 24009-01

Appendix B

# Appendix C

| BOULDERS | COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|---|
| | | coarse | fine | coarse | medium | fine | |

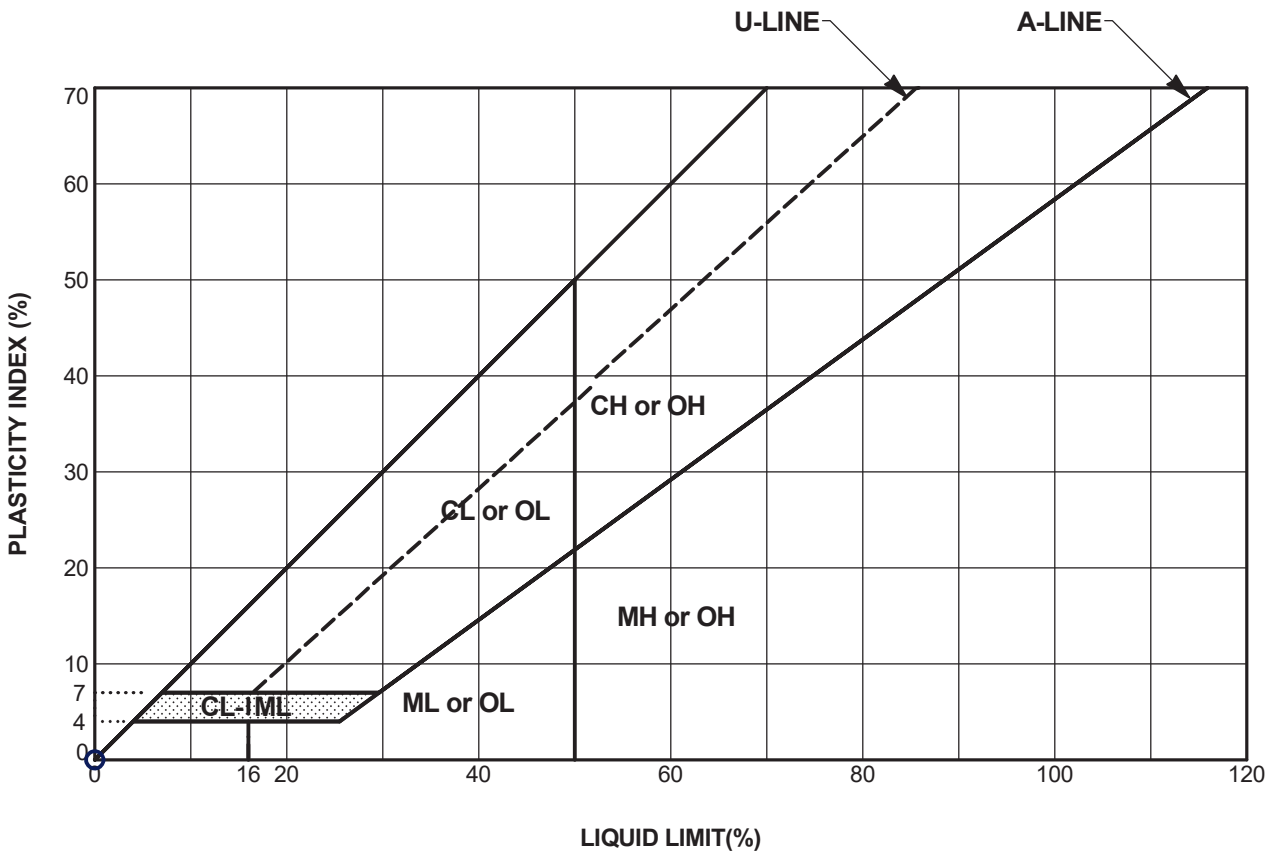



| Symbol | Boring Number | Sample Number | Depth (feet) | Field Moisture (%) | LL | PI | Activity PI/-2μ | $C_u$ | $C_c$ | Passing No. 200 Sieve (%) | Passing 2μ (%) | USCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| O | H-2 | B-1 | 0.0 - 5.0 | | NP | NP | | | | 36 | | SM |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## PARTICLE SIZE DISTRIBUTION

**SA Geo/ Bernardo Plaza Court (24009-01)**
**California**
**PROJECT NO. 22026-92**

NMG Geotechnical, Inc.




| Symbol | Boring Number | Sample Number | Depth (feet) | Passing No. 200 Sieve (%) | LL | PI | USCS | Description |
|---|---|---|---|---|---|---|---|---|
| O | H-2 | B-1 | 0.0 - 5.0 | 36 | NP | NP | SM | (Afu) Brown silty SAND |
| | | | | | | | | |
| | | | | | | | | |
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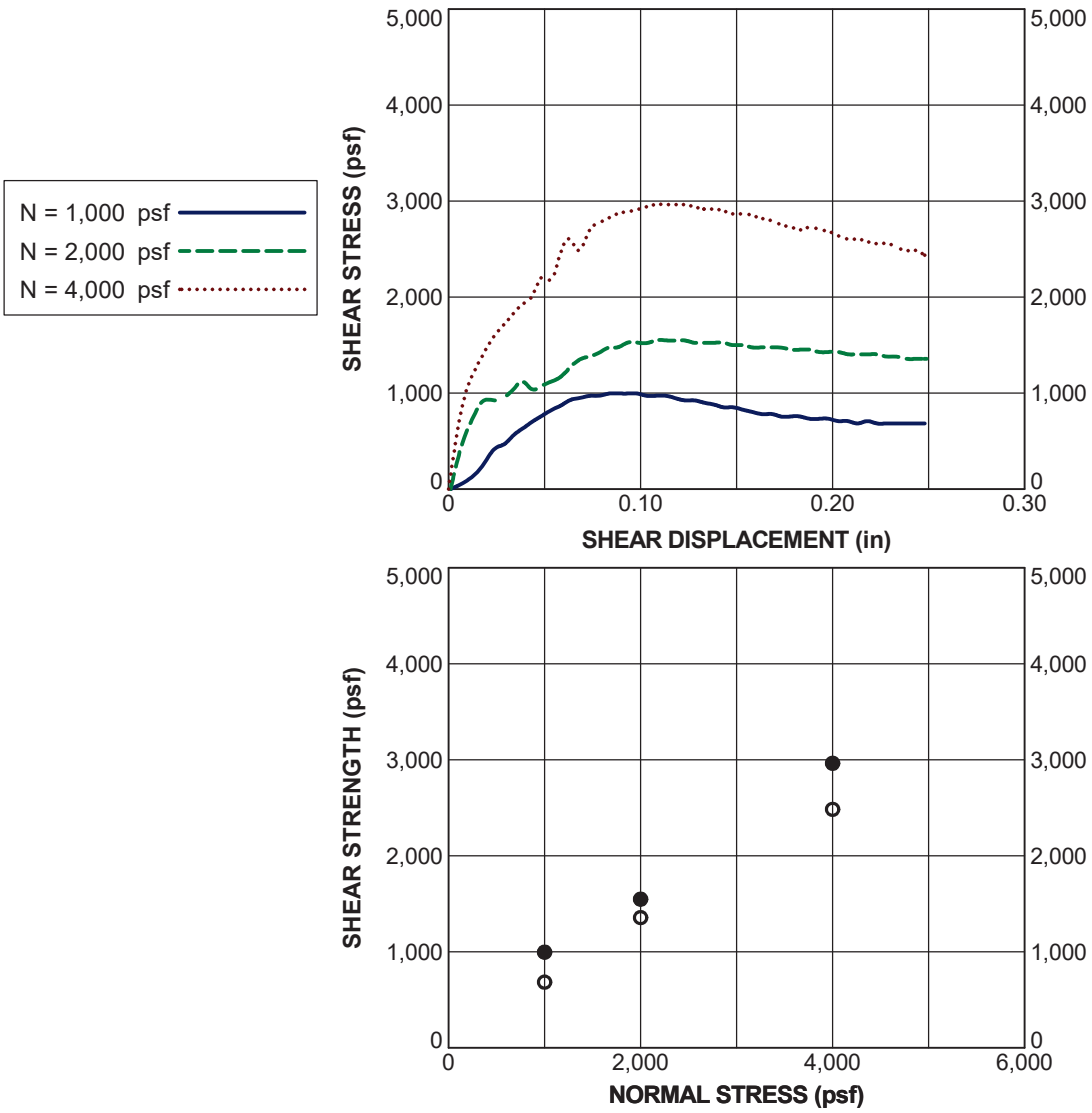
## PLASTICITY CHART

**SA Geo/ Bernardo Plaza Court (24009-01)**
**California**
**PROJECT NO. 22026-92**

NMG Geotechnical, Inc.



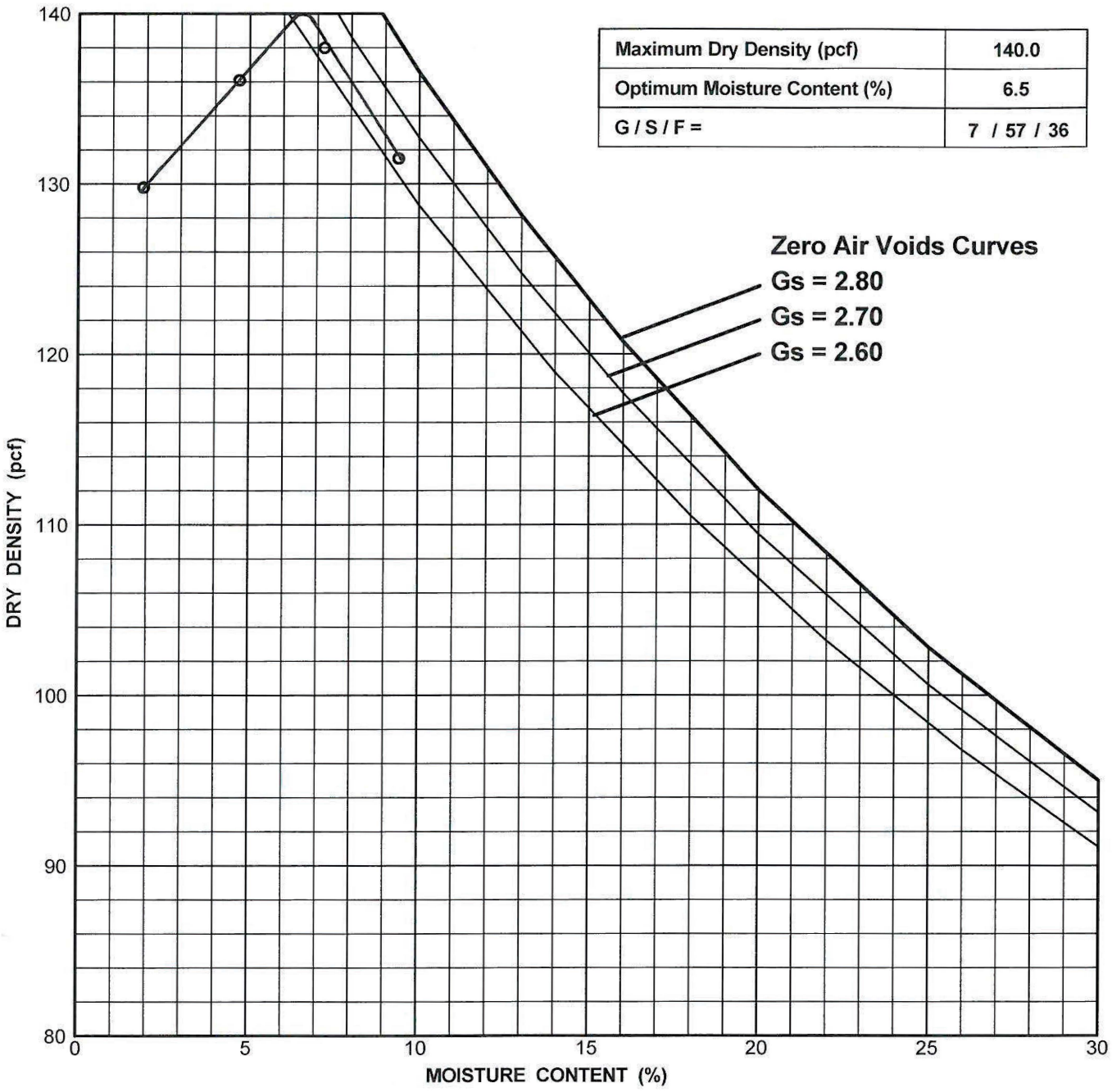

| | | | | | |
|---|---|---|---|---|---|
| **Boring No. H-2** | | **Sample No. B-1** | | **Depth: 0.0 - 5.0 ft** | |
| **Sample Description:** (Afu) Brown silty SAND | | | | **USCS:** SM | |
| **Liquid Limit:** | NP | **Plasticity Index:** | NP | **Percent Passing No. 200 Sieve:** | 36 |
| **Final Moisture Content (%):** | 13.4 | **Final Dry Density (pcf):** | 126.0 | **Degree of Saturation (%):** | 99 |
| **Sample Type:** | Remolded to 90% RC | **Rate of Shear (in./min.):** | 0.05 | | |

| SHEAR STRENGTH PARAMETERS | | |
|---|---|---|
| **Parameter** | **Peak ●** | **Ultimate ○** |
| **Cohesion (psf)** | 300 | 100 |
| **Friction Angle (degrees)** | 34 | 31 |

## DIRECT SHEAR TEST RESULTS

**SA Geo/ Bernardo Plaza Court (24009-01)**
**California**
**PROJECT NO. 22026-92**

NMG Geotechnical, Inc.




| | |
|---|---|
| Maximum Dry Density (pcf) | 140.0 |
| Optimum Moisture Content (%) | 6.5 |
| G / S / F = | 7 / 57 / 36 |

| | | | | | |
|---|---|---|---|---|---|
| **Boring No. H-2** | | **Sample No. B-1** | | **Depth: 0.0 - 5.0 ft** | |
| **Sample Description:** (Afu) Brown silty SAND | | | | **USCS:** SM | |
| **Liquid Limit:** NP | | **Plasticity Index:** NP | | **Percent Passing No. 200 Sieve:** | 36 |
| **Comments:** 1557C | | | | | |

## COMPACTION TEST RESULTS

**SA Geo/ Bernardo Plaza Court (24009-01)**
**California**
**PROJECT NO. 22026-92**

NMG Geotechnical, Inc.

# R-VALUE TEST DATA CTM 301 / ASTM D2844

| | | |
|---|---|---|
| Project: SA Geo/Bernardo Plaza Court | Project No: 22026-92 | Date: 2/7/2024 |
| Boring Trench No: H-2 | Sample No: B-1 | Sample Depth: 0-5' |
| Field Description: SM | | |
| Lab Description: Brown silty SAND | | |

| Specimen Number | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Mold Number | 1 | 2 | 3 | |
| Water Adjustment (g) | +85 | +97 | +105 | |
| Compactor Pressure (psi) | 350 | 350 | 350 | |
| Exudation Pressure (psi) | 725 | 362 | 233 | |
| Gross Weight (g) | 3236.2 | 3302.1 | 3291.2 | |
| Mold Tare (g) | 2094.9 | 2114.1 | 2098.8 | |
| Wet Weight (g) | 1141.3 | 1188.0 | 1192.4 | |
| Sample Height (in) | 2.36 | 2.49 | 2.49 | |
| Initial Dial Reading | 0.0512 | 0.0411 | 0.0609 | |
| Final Dial Reading | 0.0527 | 0.0419 | 0.0616 | |
| Expansion (in $x10^{-4}$) | 15 | 8 | 7 | |
| Stability(psi) at 2,000 lbs (160 psi) | 32 58 | 40 74 | 60 100 | |
| Turns Displacement | 2.48 | 3.10 | 3.33 | |
| R-Value Uncorrected | 64 | 48 | 31 | |
| R-Value Corrected | 62 | 48 | 31 | |
| Moisture Content (%) | 6.7 | 7.5 | 8.5 | |
| Dry Density (pcf) | 137.4 | 134.4 | 133.8 | |
| Assumed Traffic Index | 4.0 | 4.0 | 4.0 | |
| G.E. by Stability | 0.39 | 0.53 | 0.71 | |
| G.E. by Expansion | 0.50 | 0.27 | 0.23 | |
| Gf | 1.25 | | | |

| Moisture Content | | | | |
|---|---|---|---|---|
| Dish No. | V | X | ZZ | |
| Weight of Moist Soil and Dish (g) | 370.5 | 337.6 | 334.2 | |
| Weight of Dry Soil and Dish (g) | 350.5 | 317.4 | 312.0 | |
| Water Loss (g) | 20.0 | 20.2 | 22.2 | |
| Weight of Dish (g) | 50.1 | 49.5 | 50.3 | |
| Dry Soil (g) | 300.4 | 267.9 | 261.7 | |
| Moisture Content (%) | 6.7 | 7.5 | 8.5 | |

R-Value by Exudation = 40

R-Value by Expansion = 69

R-Value at Equilibrium = 40 by Exudation

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301 and/or ASTM Standard D2844

Remarks: A traffic index of 4.0 was used for calculation purposes.

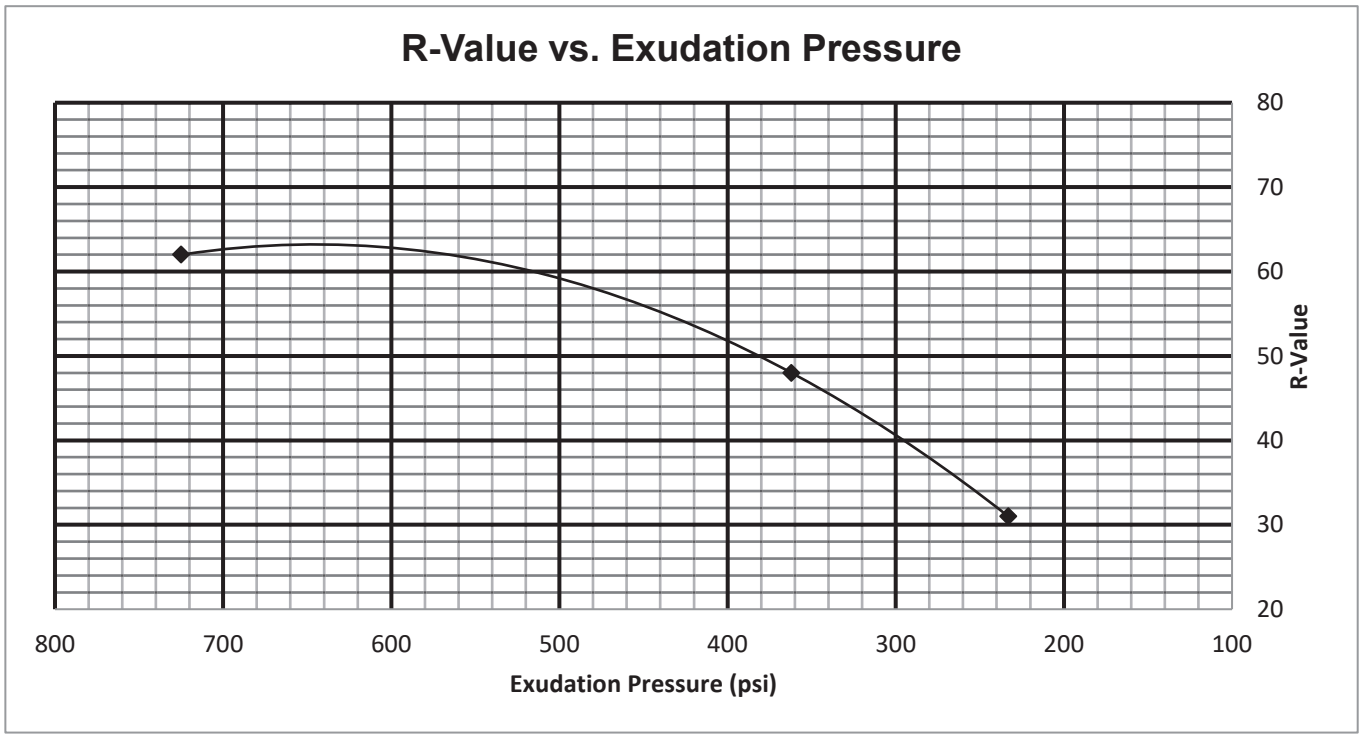
Set up by: BMP Run by: BAJ TG

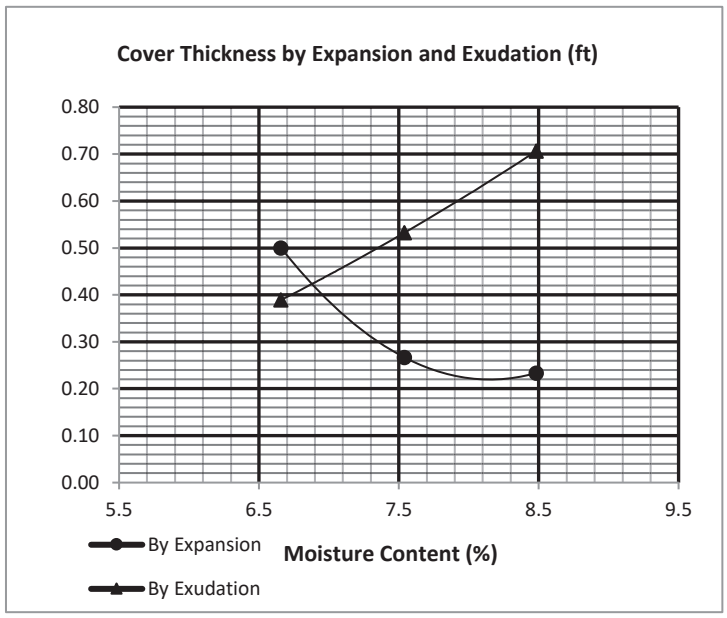
Calculated by: BAJ Checked by: BAJ Date Completed: 2/8/2024

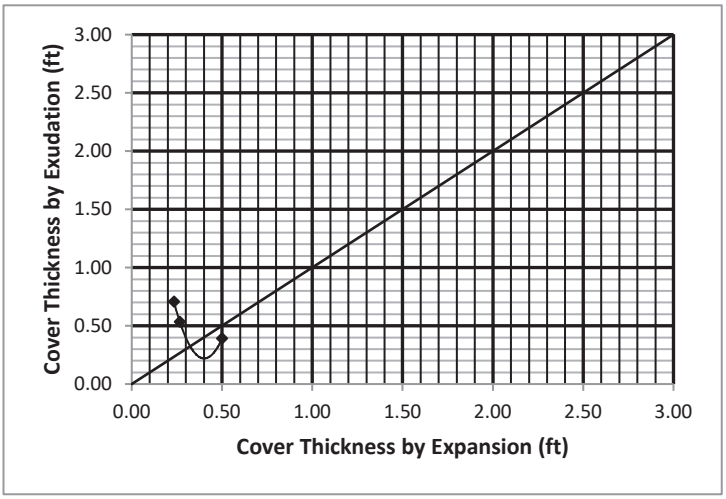
NMG Geotechnical, Inc.

# R-VALUE GRAPHICAL PRESENTATION

| | | |
|---|---|---|
| Project: SA Geo/Bernardo Plaza Court | Project No: 22026-92 | Date: 2/7/2024 |
| Boring Trench No: H-2 | Sample No: B-1 | Sample Depth: 0-5' |
| Field Description: SM | | |
| Lab Description: Brown silty SAND | | |




Cover Thickness (ft) = 0.32

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301 and/or ASTM Standard D2844

| | | | | | |
|---|---|---|---|---|---|
| Remarks: | A traffic index of 4.0 was used for calculation purposes. | | | | |
| Set up by: | BMP | Run by: | BAJ TG | | |
| Calculated by: | BAJ | Checked by: | BAJ | Date Completed: | 2/8/2024 |

NMG Geotechnical, Inc.

| Sample | *Compacted Moisture (%)* | *Compacted Dry Density (pcf)* | *Final Moisture (%)* | *Volumetric Swell (%)* | *Expansion Index[1] Value/Method* | | *Expansive Classification[2]* | *Soluble Sulfate (%)* | *Sulfate Exposure[3]* |
|---|---|---|---|---|---|---|---|---|---|
| H-2<br>B-1<br>0-5' | 7.0 | 122.5 | 12.0 | -0.08 | 0 | A | Very Low | 0.06 | S0 |
| | | | | | | | | | |
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*Test Method:*
ASTM D4829

HACH SF-1 (Turbidimetric)

*Notes:*
1. Expansion Index (EI) method of determination*:*
   **[A]** E.I. determined by adjusting water content to achieve a 50 ±2% degree of saturation
   **[B]** E.I. calculated based on measured saturation within the range of 40% and 60%
2. ASTM D4829 *(Classification of Expansive Soil)*
3. ACI-318-14 Table 19.3.1.1 *(Requirement for Concrete Exposed to Sulfate-Containing Solutions)*

# Expansion Index and Soluble Sulfate Test Results

(FRM001 Rev.5)

Project No. 22026-92

Project Name: SA Geo/Bernardo Plaza Court (24009-01)

NMG

# Appendix D

# GEOPHYSICAL EVALUATION

## 11848 BERNARDO PLAZA COURT

San Diego, California

**PREPARED FOR:**

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**PREPARED BY:**

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February 19, 2024

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February 19, 2024

Atlas No. 11945

MR. ANTHONY ZEPEDA, P.G., C.E.G.
**SA GEOTECHNICAL, INC.**
2280 MARKET STREET, SUITE 300
RIVERSIDE, CA 92501

**Subject:** **Geophysical Services**
**11848 Bernardo Plaza Court**
**San Diego, California**

Dear Mr. Zepeda:

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to the subject project located at 11848 Bernardo Plaza Court in San Diego, California. The purpose of our evaluation was to develop P-wave velocity profiles through the collection of P-wave refraction data for design and construction purposes at the subject site. Our services were conducted on January 31, 2024. This data report presents our methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions, please contact the undersigned at your convenience.

Respectfully submitted,
**Atlas Technical Consultants LLC**

REGISTERED PROFESSIONAL GEOPHYSICIST
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KJA:PFL:ds

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Table 1: Rippability Classification


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Figure 2 Line Location Map
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Figure 4a P-Wave Profile, SL-1
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## 1. INTRODUCTION

In accordance with your authorization, Atlas has performed a geophysical evaluation pertaining to the subject project located at 11848 Bernardo Plaza Court in San Diego, California (Figure 1). The purpose of our evaluation was to develop P-wave velocity profiles through the collection of P-wave refraction data for design and construction purposes at the subject site. Our services were conducted on January 31, 2024. This data report presents our methodology, equipment used, analysis, and results.

## 2. SCOPE OF SERVICES

Our scope of services included:

- Performance of two P-wave refraction traverses (SL-1 and SL-2) at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results and conclusions.

## 3. SITE AND PROJECT DESCRIPTION

The project site was located at 11848 Bernardo Plaza Court in San Diego, California (Figure 1). Specifically, SL-1 was located in a landscaped grass area along Bernardo Plaza Court and SL-2 was located in landscaping adjacent to businesses to the north (Figure 2). The site conditions consisted of relatively flat topography and landscaped vegetation (Figure 3). The general line locations and spread lengths were selected by your office. Where surface limitations existed, the lines were adjusted as needed to accommodate the site conditions.

## 4. STUDY METHODOLOGY

The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component 14-Hz geophones and recorded with a 24-channel Geometrics Geode seismograph.

SL-1 and SL-2 were composed of 24 geophones placed at regularly spaced intervals of 4 feet and 5 feet, respectively. Total line lengths of 100 feet and 125 feet, including the innermost off end shots, were acquired for SL-1 and SL-2. The general locations and lengths of the lines were determined by depth of investigation and site conditions. Shot points (signal-generation locations) were conducted along the lines at the ends, midpoint, and intermediate points between the ends and the midpoint.

The seismic refraction theory requires that subsurface velocities increase with depth (generalized reciprocal method (GRM) and time-intercept modeling). In classical analysis methods, a layer

having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, interaction with the water table (groundwater potentiometric surface)/saturated materials, lateral variations in velocity such as those caused by core stones, intrusions, boulders, lithology changes, fill materials, fractures, faults, and anisotropic materials can also result in the misinterpretation of the subsurface conditions. The application of seismic tomography methods, as was performed for this project by Atlas, produces velocity models which, in general, may not be subject to this limitation. However, even the application of seismic tomography analysis does have certain limitations regarding vertical and horizontal resolution. When a velocity anomaly target is of similar scale length to the seismic wavelet (or smaller), then diffraction behavior dominates because scattering is governing the loci of the wavefronts. For travel time analysis, a target feature must be at a scale versus its depth that is detectable relative to the scale length of the seismic wavelet we produce and receive. There is therefore a general limit to what scale of feature seismic tomography methods can detect regarding relatively small velocity anomaly features, related to both source and to medium velocities, and travel time uncertainties. In effect, some relatively smaller scale features including "thin" velocity inversion layers or voids, and some types of lateral and vertical velocity variations caused by core stones and intrusions might not be detected in our results. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth of the length of the spread.

Generally, the seismic P-wave velocity of a material can be correlated to rippability (see Table 1 below), or to some degree "hardness." Table 1 is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2018), as well as our experience with similar materials, and assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristic, such as fracture spacing and orientation, play a significant role in determining rock quality or rippability. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

For trenching operations, the rippability values should be scaled downward. For example, P-wave velocities as low as 3,500 feet/second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in narrow trenching operations, should be anticipated.

**Table 1: Rippability Classification**

| Seismic P-wave Velocity | Rippability |
|---|---|
| 0 to 2,000 feet/second | Easy |
| 2,000 to 4,000 feet/second | Moderate |
| 4,000 to 5,500 feet/second | Difficult, Possible Blasting |
| 5,500 to 7,000 feet/second | Very Difficult, Probable Blasting |
| Greater than 7,000 feet/second | Blasting Generally Required |

It should be noted that the rippability cutoffs presented in Table 1 are slightly more conservative than those published in the Caterpillar Performance Handbook. Accordingly, the above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

## 5. DATA ANALYSIS

The collected refraction data were processed and analyzed using Rayfract® Version 4.03 (Intelligent Resources Inc., 2022) which employs wave path analysis. Rayfract first provides forward modeling of refraction, transmission, and diffraction and then back-projects travel-time residuals along wave paths also known as Fresnel volumes instead of conventional analysis by rays. This increases the numerical robustness of the inversion. A smooth minimum-structure one dimensional starting velocity-depth profile model is determined automatically directly from the seismic travel-time data first arrival picks and elevation data to produce subsurface velocities by horizontally averaging via the Delta t-V method. The Delta t-V method is based on common mid-point sorted travel times and assumes multiple horizontal layers with constant interior velocity gradients (Rohdewald 2007; Gebrande 1985). Modeled seismic rays follow circular arcs inside each modeled layer. The Delta t-V starting model is then refined with 2-D Wavepath Eikonal Traveltime (WET) inversion method (Schuster, 1993). The resulting 2-D WET velocity model provides a 2-D tomographic image of the P-wave velocities which can be used to estimate subsurface geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are generally revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

## 6. RESULTS AND CONCLUSIONS

Figures 4a and 4b present the P-wave profiles generated from our evaluation. Specifically, Figure 4a presents the SL-1 model and Figure 4b presents the SL-2 model. Based on the results, it appears that the project site is generally underlain by low-velocity materials in the near-surface and higher velocity materials at depth. Distinct vertical and lateral velocity variations are evident in the models.

As previously indicated, for trenching operations, the rippability values should be scaled downward. For example, P-wave velocities as low as 3,500 feet/second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in narrow trenching operations, should be anticipated.

Based on the refraction results, variability in the excavatability (including depth of rippability) of the subsurface materials may be expected across the project area. In addition, oversized materials should be expected. A contractor with excavation experience in similarly difficult conditions should be consulted for expert advice on excavation methodology, equipment, and production rate.

## 7. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

## 8. SELECTED REFERENCES


Caterpillar, Inc., 2018, Caterpillar Performance Handbook, Edition 48, Caterpillar, Inc., Peoria, Illinois.

Gebrande H. and Miller H., 1985, Refraktionsseismik (in German). In: F. Bender (Editor), Angewandte Geowissenschaften II. Ferdinand Enke, Stuttgart; pp. 226-260. ISBN 3-432-91021-5.

Golden Software, Inc., 2022, Surfer, Surface Mapping System: Version 24.2.204.

Intelligent Resources Inc., 2022, Seismic Refraction Interpretation and Modeling Program (Rayfract), V-4.03.

Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Rohdewald S., 2007, XTV Inversion. See http://rayfract.com/xtv_inversion.pdf

Schuster, G.T. and Quintus-Bosz, A., 1993, Wavepath eikonal traveltime inversion: Theory. Geophysics, 58(9), 1314-1323.

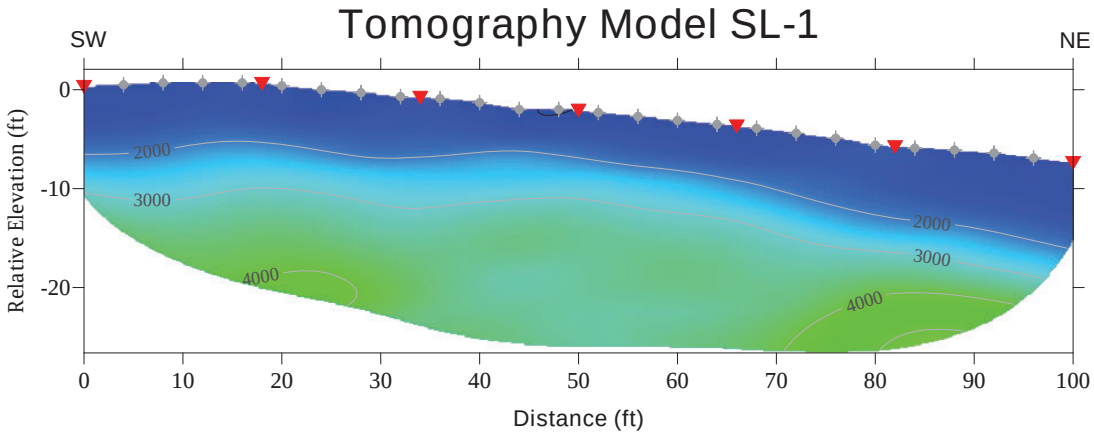
Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Pres.


| | | | | |
|---|---|---|---|---|
| ATLAS | 11848 Bernardo Plaza Court<br>San Diego, California | Project No.: 11945<br>Date: 02/24 | Figure 1 | SITE LOCATION MAP |


| | | | | |
|---|---|---|---|---|
| ATLAS | 11848 Bernardo Plaza Court<br>San Diego, California | Project No.: 11945<br>Date: 02/24 | Figure 2 | LINE LOCATION MAP |



| | | | | |
|---|---|---|---|---|
| ATLAS | 11848 Bernardo Plaza Court<br>San Diego, California | Project No.: 11945<br>Date: 02/24 | Figure<br>3 | SITE PHOTOGRAPHS |




LEGEND

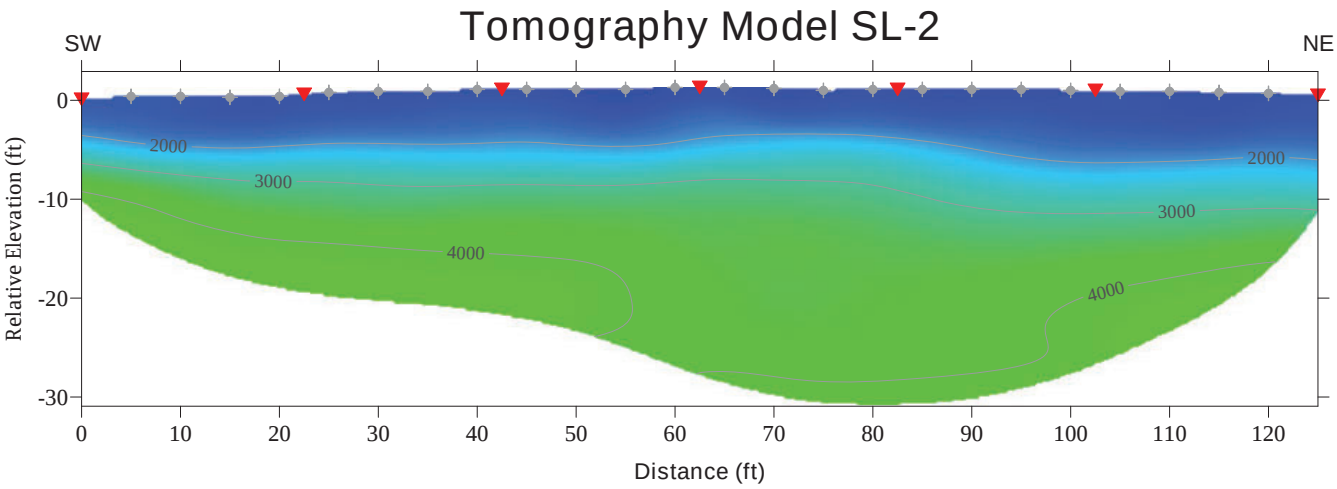
Geophone

Shot point

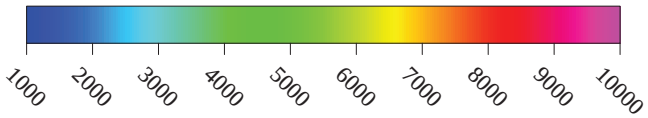
P-Wave Velocity (ft/s)
CI = 1000

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

| | | | | |
|---|---|---|---|---|
| ATLAS | 11848 Bernardo Plaza Court<br>San Diego, California | Project No.: 11945<br>Date: 02/24 | Figure 4a | P-WAVE PROFILE<br>SL-1 |




P-Wave Velocity (ft/s)
CI = 1000




| | | | | |
|---|---|---|---|---|
| ATLAS | 11848 Bernardo Plaza Court<br>San Diego, California | Project No.: 11945<br>Date: 02/24 | Figure 4b | P-WAVE PROFILE<br>SL-2 |

# Appendix E

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

## Latitude, Longitude: 33.02138, -117.07632


| | |
|---|---|
| **Date** | 1/25/2024, 11:24:04 AM |
| **Design Code Reference Document** | ASCE7-16 |
| **Risk Category** | II |
| **Site Class** | C - Very Dense Soil and Soft Rock |

| Type | Value | Description |
|---|---|---|
| $S_S$ | 0.829 | $MCE_R$ ground motion. (for 0.2 second period) |
| $S_1$ | 0.306 | $MCE_R$ ground motion. (for 1.0s period) |
| $S_{MS}$ | 0.995 | Site-modified spectral acceleration value |
| $S_{M1}$ | 0.458 | Site-modified spectral acceleration value |
| $S_{DS}$ | 0.663 | Numeric seismic design value at 0.2 second SA |
| $S_{D1}$ | 0.306 | Numeric seismic design value at 1.0 second SA |

| Type | Value | Description |
|---|---|---|
| SDC | D | Seismic design category |
| $F_a$ | 1.2 | Site amplification factor at 0.2 second |
| $F_v$ | 1.5 | Site amplification factor at 1.0 second |
| PGA | 0.356 | $MCE_G$ peak ground acceleration |
| $F_{PGA}$ | 1.2 | Site amplification factor at PGA |
| $PGA_M$ | 0.427 | Site modified peak ground acceleration |
| $T_L$ | 8 | Long-period transition period in seconds |
| SsRT | 0.829 | Probabilistic risk-targeted ground motion. (0.2 second) |
| SsUH | 0.895 | Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration |
| SsD | 1.5 | Factored deterministic acceleration value. (0.2 second) |
| S1RT | 0.306 | Probabilistic risk-targeted ground motion. (1.0 second) |
| S1UH | 0.33 | Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration. |
| S1D | 0.6 | Factored deterministic acceleration value. (1.0 second) |
| PGAd | 0.5 | Factored deterministic acceleration value. (Peak Ground Acceleration) |
| $PGA_{UH}$ | 0.356 | Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration |
| $C_{RS}$ | 0.927 | Mapped value of the risk coefficient at short periods |
| $C_{R1}$ | 0.927 | Mapped value of the risk coefficient at a period of 1 s |
| $C_V$ | 1.057 | Vertical coefficient |

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U.S. Geological Survey - Earthquake Hazards Program

# Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Please also see the new USGS Earthquake Hazard Toolbox for access to the most recent NSHMs for the conterminous U.S. and Hawaii.

## Input

Edition

Dynamic: Conterminous U.S. 2014 (updat…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

33.02138

Time Horizon

Return period in years

2475

Longitude

Decimal degrees, negative values for western longitudes

-117.07632

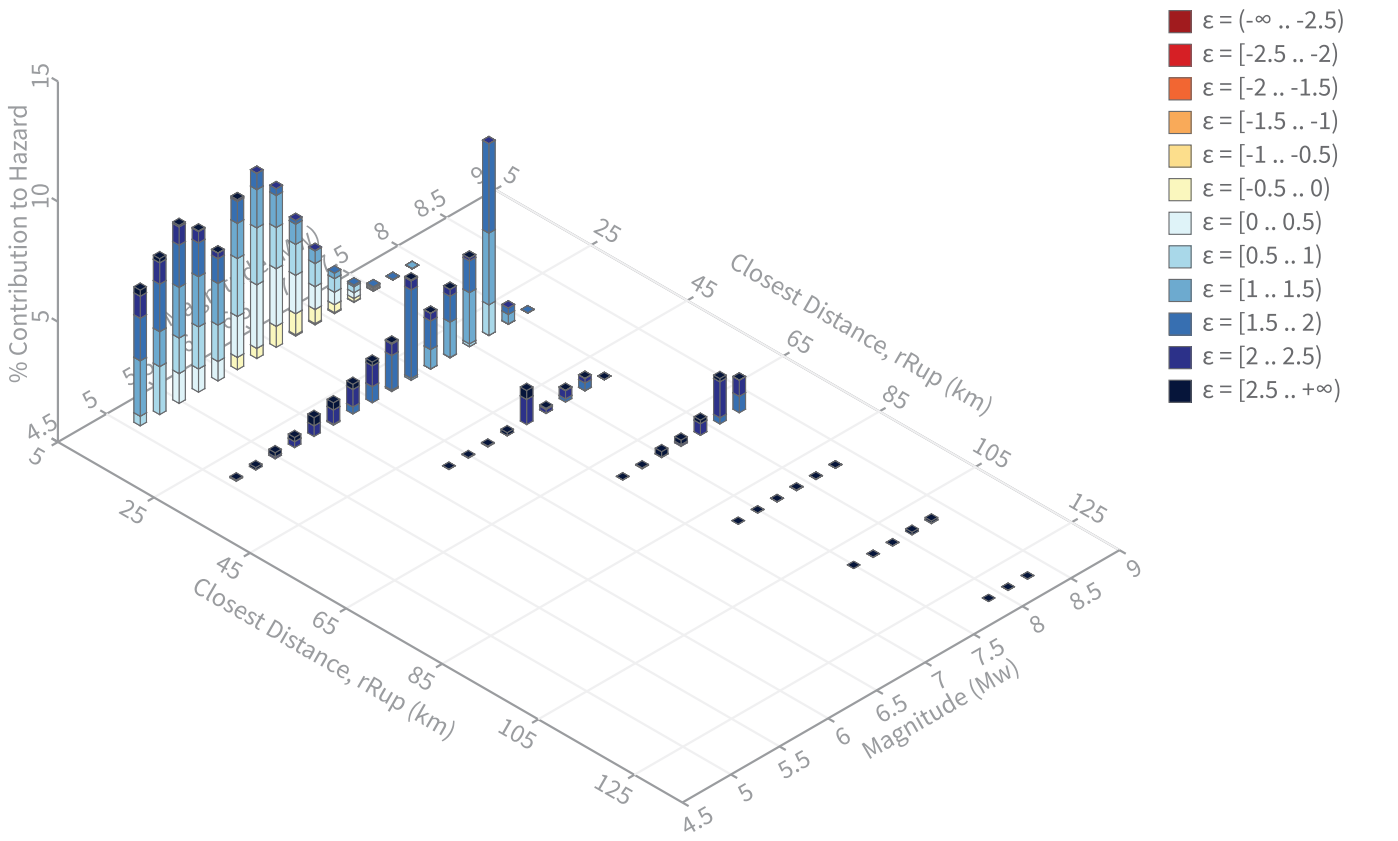
Site Class

537 m/s (Site class C)

## Deaggregation

Component

Total



# Summary statistics for, Deaggregation: Total

## Deaggregation targets

**Return period:** 2475 yrs
**Exceedance rate:** 0.0004040404 $yr^{-1}$
**PGA ground motion:** 0.41727348 g

## Recovered targets

**Return period:** 2796.517 yrs
**Exceedance rate:** 0.00035758767 $yr^{-1}$

## Totals

**Binned:** 100 %
**Residual:** 0 %
**Trace:** 0.1 %

## Mean (over all sources)

**m:** 6.46
**r:** 18.82 km
**$\varepsilon_0$:** 1.27 σ

## Mode (largest m-r bin)

**m:** 7.7
**r:** 31.86 km
**$\varepsilon_0$:** 1.4 σ
**Contribution:** 7.97 %

## Mode (largest m-r-$\varepsilon_0$ bin)

**m:** 7.71
**r:** 35.71 km
**$\varepsilon_0$:** 1.66 σ
**Contribution:** 3.72 %

## Discretization

**r:** min = 0.0, max = 1000.0, Δ = 20.0 km
**m:** min = 4.4, max = 9.4, Δ = 0.2
**ε:** min = -3.0, max = 3.0, Δ = 0.5 σ

## Epsilon keys

**ε0:** [-∞ .. -2.5)
**ε1:** [-2.5 .. -2.0)
**ε2:** [-2.0 .. -1.5)
**ε3:** [-1.5 .. -1.0)
**ε4:** [-1.0 .. -0.5)
**ε5:** [-0.5 .. 0.0)
**ε6:** [0.0 .. 0.5)
**ε7:** [0.5 .. 1.0)
**ε8:** [1.0 .. 1.5)
**ε9:** [1.5 .. 2.0)
**ε10:** [2.0 .. 2.5)
**ε11:** [2.5 .. +∞]

## Deaggregation Contributors

| Source Set ↳ Source | Type | r | m | $\varepsilon_0$ | lon | lat | az | % |
|---|---|---|---|---|---|---|---|---|
| UC33brAvg_FM31 (opt) | Grid | | | | | | | 34.18 |
| PointSourceFinite: -117.076, 33.053 | | 6.05 | 5.75 | 0.56 | 117.076°W | 33.053°N | 0.00 | 4.55 |
| PointSourceFinite: -117.076, 33.053 | | 6.05 | 5.75 | 0.56 | 117.076°W | 33.053°N | 0.00 | 4.54 |
| PointSourceFinite: -117.076, 33.089 | | 8.35 | 5.90 | 0.86 | 117.076°W | 33.089°N | 0.00 | 2.79 |
| PointSourceFinite: -117.076, 33.089 | | 8.35 | 5.90 | 0.86 | 117.076°W | 33.089°N | 0.00 | 2.78 |
| PointSourceFinite: -117.076, 33.125 | | 11.08 | 6.01 | 1.17 | 117.076°W | 33.125°N | 0.00 | 2.29 |
| PointSourceFinite: -117.076, 33.125 | | 11.08 | 6.01 | 1.18 | 117.076°W | 33.125°N | 0.00 | 2.29 |
| PointSourceFinite: -117.076, 33.107 | | 9.60 | 5.98 | 0.99 | 117.076°W | 33.107°N | 0.00 | 2.08 |
| PointSourceFinite: -117.076, 33.107 | | 9.60 | 5.98 | 0.99 | 117.076°W | 33.107°N | 0.00 | 2.08 |
| UC33brAvg_FM32 (opt) | Grid | | | | | | | 34.09 |
| PointSourceFinite: -117.076, 33.053 | | 6.05 | 5.75 | 0.56 | 117.076°W | 33.053°N | 0.00 | 4.55 |
| PointSourceFinite: -117.076, 33.053 | | 6.05 | 5.75 | 0.56 | 117.076°W | 33.053°N | 0.00 | 4.54 |
| PointSourceFinite: -117.076, 33.089 | | 8.35 | 5.90 | 0.86 | 117.076°W | 33.089°N | 0.00 | 2.79 |
| PointSourceFinite: -117.076, 33.089 | | 8.35 | 5.90 | 0.86 | 117.076°W | 33.089°N | 0.00 | 2.78 |
| PointSourceFinite: -117.076, 33.125 | | 11.07 | 6.01 | 1.17 | 117.076°W | 33.125°N | 0.00 | 2.28 |
| PointSourceFinite: -117.076, 33.125 | | 11.07 | 6.01 | 1.17 | 117.076°W | 33.125°N | 0.00 | 2.28 |
| PointSourceFinite: -117.076, 33.107 | | 9.60 | 5.98 | 0.99 | 117.076°W | 33.107°N | 0.00 | 2.08 |
| PointSourceFinite: -117.076, 33.107 | | 9.60 | 5.98 | 0.99 | 117.076°W | 33.107°N | 0.00 | 2.07 |
| UC33brAvg_FM31 | System | | | | | | | 15.97 |
| Rose Canyon [13] | | 22.24 | 7.16 | 1.46 | 117.305°W | 32.965°N | 253.59 | 5.78 |
| Elsinore (Julian) [6] | | 35.90 | 7.67 | 1.64 | 116.877°W | 33.297°N | 31.03 | 3.09 |
| San Jacinto (Coyote Creek) [0] | | 70.25 | 8.09 | 2.17 | 116.543°W | 33.469°N | 44.77 | 1.33 |
| UC33brAvg_FM32 | System | | | | | | | 15.76 |
| Rose Canyon [13] | | 22.24 | 7.13 | 1.49 | 117.305°W | 32.965°N | 253.59 | 5.54 |
| Elsinore (Julian) [6] | | 35.90 | 7.68 | 1.63 | 116.877°W | 33.297°N | 31.03 | 3.36 |
| San Jacinto (Coyote Creek) [0] | | 70.25 | 8.08 | 2.18 | 116.543°W | 33.469°N | 44.77 | 1.31 |

# Appendix F

# APPENDIX F

# GENERAL EARTHWORK AND GRADING SPECIFICATIONS

## 1.0 GENERAL

**1.1** **Intent:** These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these general Specifications. Observations of the earthwork by the project Geotechnical Consultant during grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

**1.2** **Geotechnical Consultant:** Prior to commencement of work, the project owner shall employ a geotechnical consultant. The geotechnical consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground after it has been cleared for receiving fill but before fill is placed, bottoms of all "remedial removal" areas, all keyway bottoms, and benches made on sloping ground to receive fill.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of subgrade and fill materials and perform adequate relative compaction testing of fill to determine the attained level of compaction and assess if, in their opinion, if the work was performed in substantial compliance

with the geotechnical report(s) and these specifications. The Geotechnical Consultant shall provide test results to the owner on a routine and frequent basis.

**1.3 The Earthwork Contractor:** The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with applicable grading codes, the project plans, and these specifications.

The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of work and the estimated quantities of daily earthwork planned for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are corrected.

## 2.0 PREPARATION OF FILL AREAS

**2.1 Clearing and Grubbing:** Areas to be excavated and filled shall be cleared and grubbed. Vegetation, such as brush, grass, roots, and other deleterious material, man-made structures, and similar debris shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant. Borrow areas shall be cleared and grubbed to the extent necessary to provide a suitable fill material.

Concrete fragments that are free of reinforcing street may be placed in fills, provided they are placed in accordance with Section 3 and 4. Earth fill material

shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 5 percent organic matter. Nesting of organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area. As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, etc.) have chemical constituents that are considered hazardous waste. As such, the indiscriminate dumping or spillage of such fluids may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

The Geotechnical Consultant shall not be responsible for the identification or analysis of potentially hazardous materials; however, if observations, odors, or soil discoloration are suspect, the Geotechnical Consultant may request from the owner the termination of grading operations until such materials are deemed not hazardous as defined by applicable laws and regulations.

**2.2** **Evaluation/Acceptance of Fill Areas:** All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

**2.3** **Processing:** Ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Ground that is not satisfactory shall be removed/overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction. After scarification, the surface should be moisture conditioned, as necessary, to achieve the proper moisture content and compacted in accordance with Section 4 of these specifications.

**2.4** **Overexcavation:** In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured, or otherwise unsuitable ground shall be overexcavated to competent ground as recommended by the Geotechnical Consultant during grading.

**2.5** **Benching:** Fills to be placed on ground sloping steeper than 5H:1V (horizontal to vertical units) shall be stepped or benched. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for fill placement.

## 3.0 FILL MATERIAL

**3.1** **General:** Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

**3.2** **Oversize:** Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 12 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or other underground construction.

**3.3** **Import:** If importing of fill material is required for grading, proposed import material shall meet the requirements of Section 3.1 and/or requirements defined in the project geotechnical report(s). The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before import begins so that suitability can be determined, and appropriate laboratory tests performed.

## 4.0 FILL PLACEMENT AND COMPACTION

**4.1** **Fill Layers:** Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

**4.2** **Fill Moisture Conditioning:** Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with ASTM International (ASTM Test Method D1557).

**4.3** **Compaction of Fill:** After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction and uniformity.

**Compaction of Fill Slopes:** In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557.

**4.4** **Compaction Testing:** Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

**4.5** **Frequency of Compaction Testing:** Tests shall be taken at intervals required by the governing agency and as deemed necessary by the Geotechnical Consultant in order to adequately qualify the fill material. In general, it should be anticipated that tests will be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill, unless recommended otherwise by the Geotechnical Consultant. In addition, test(s) shall be taken on slope faces and/or each 10 feet of vertical height of slope as deemed necessary by the Geotechnical Consultant. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

**4.6** **Compaction Test Locations:** The Geotechnical Consultant shall document the approximate elevation and location of each compaction test. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided. Alternatively, GPS units may be used to determine the approximate location/coordinates of the field density tests.

## 5.0 SUBDRAIN INSTALLATION

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and standard details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys. The Contractor should consider videoing the subdrains shortly after burial to check proper installation and functionality. The Contractor is responsible for the performance of subdrains.

## 6.0 EXCAVATION

Excavations, including over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical report(s) and plans are estimates. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

## 7.0 TRENCH BACKFILLS

**7.1** Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

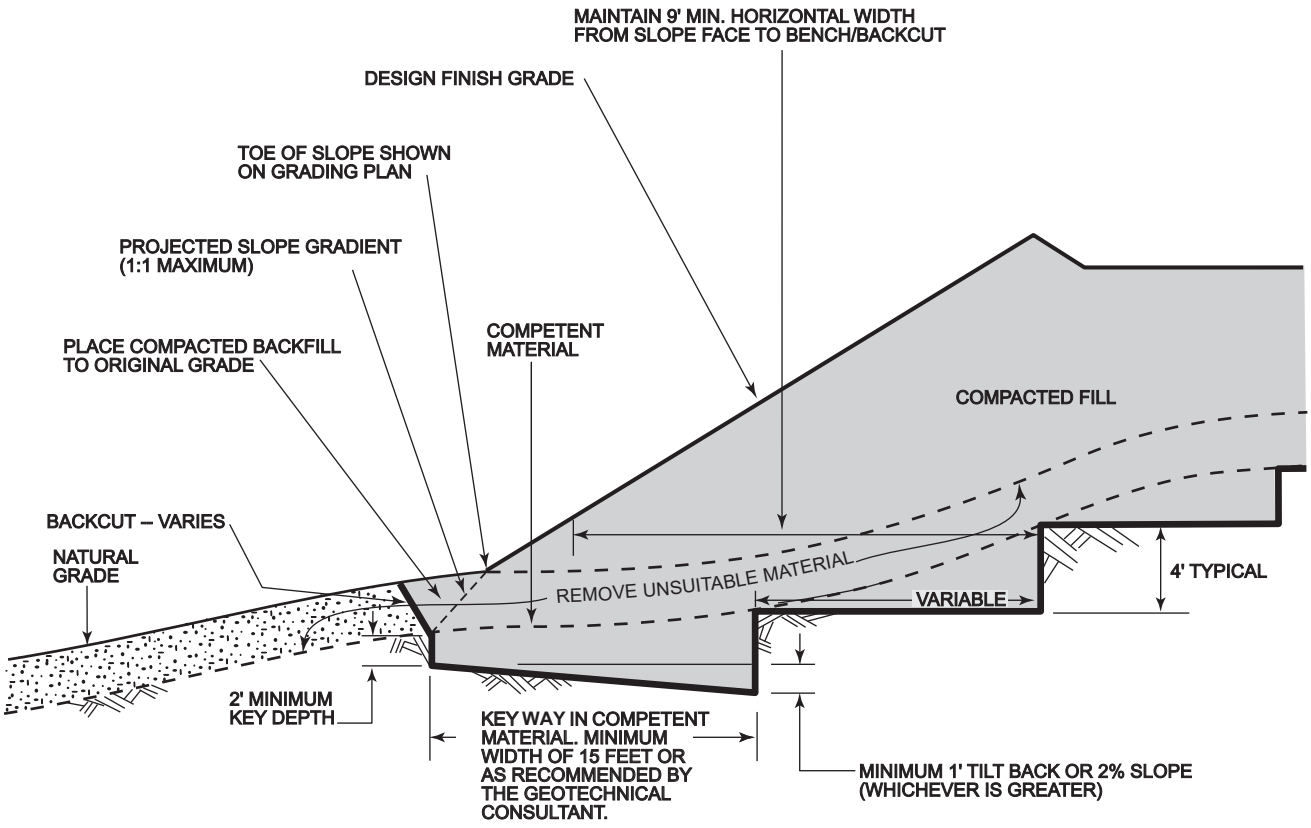
**7.2** Bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum 90 percent of maximum from 1 foot above the top of the conduit to the surface, except in traveled ways (see Section 7.6 below).

**7.3** Jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

**7.4** Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill, unless required differently by the governing agency or the Geotechnical Consultant.

**7.5** Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

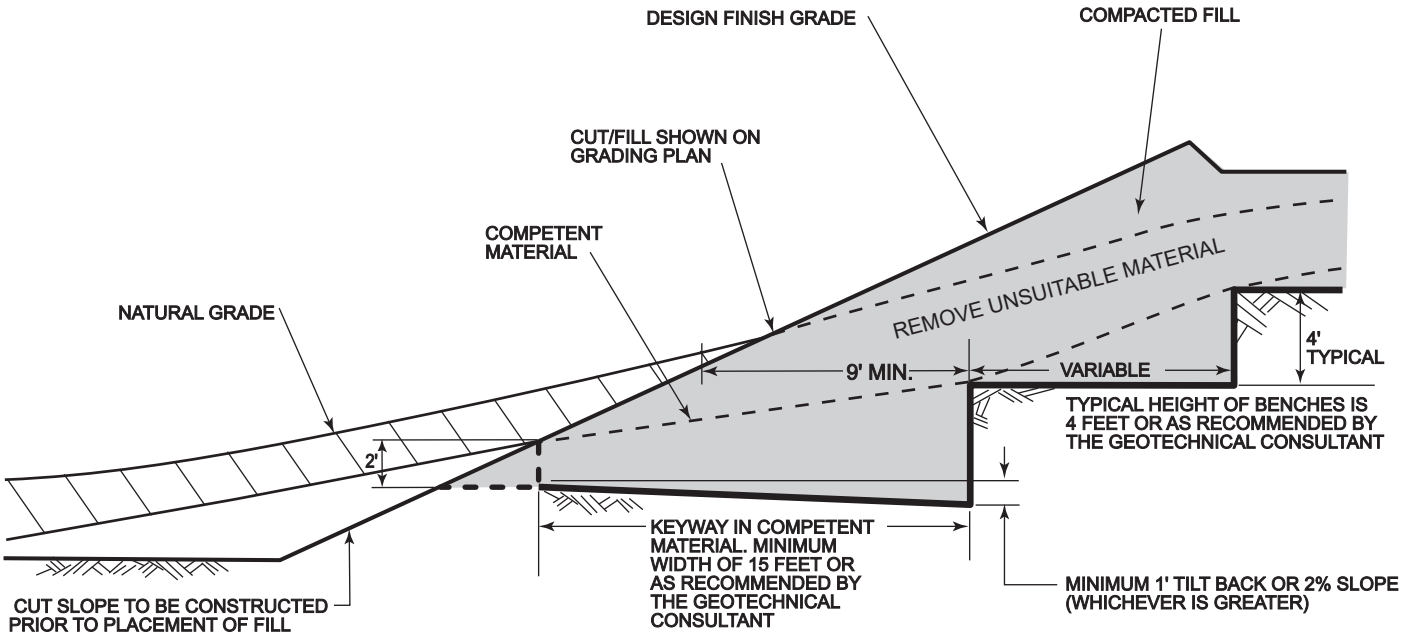
**7.6** Trench backfill in the upper foot measured from finish grade within existing or future traveled way, shoulder, and other paved areas (or areas to receive pavement) should be placed to a minimum 95 percent relative compaction.




NOTE: BENCHING SHALL BE REQUIRED WHEN SLOPES ARE EQUAL TO OR STEEPER THAN 5H:1V OR WHEN RECOMMENDED BY THE GEOTECHNICAL CONSULTANT. WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIFIC RECOMMENDATIONS SHOULD BE PROVIDED BY THE GEOTECHNICAL CONSULTANT.

FIGURE 1

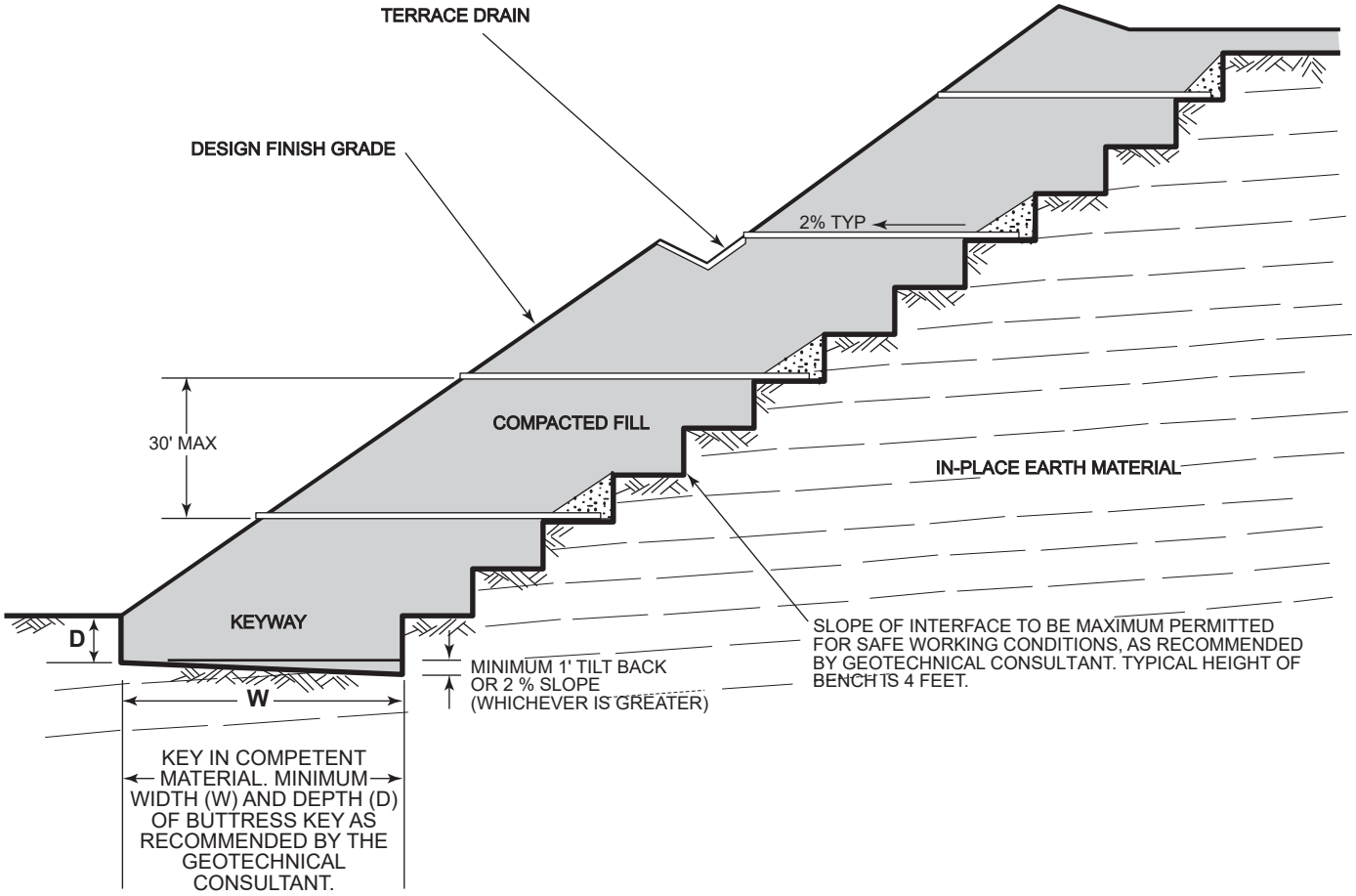
# TYPICAL FILL KEY ABOVE NATURAL SLOPE MINIMUM STANDARD GRADING DETAIL




NOTE: BENCHING SHALL BE REQUIRED WHEN SLOPES ARE EQUAL TO OR STEEPER THAN 5H:1V OR WHEN RECOMMENDED BY THE GEOTECHNICAL CONSULTANT. WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIFIC RECOMMENDATIONS SHOULD BE PROVIDED BY THE GEOTECHNICAL CONSULTANT.

FIGURE 2

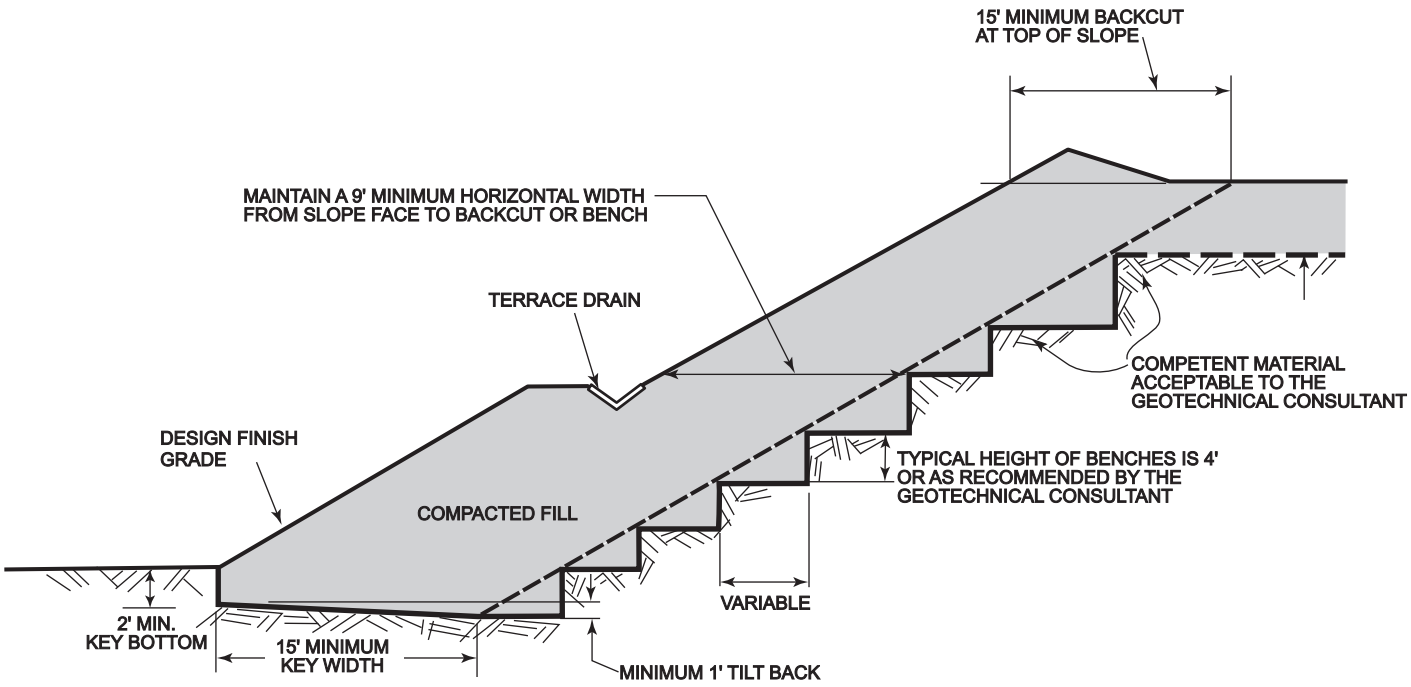
# TYPICAL FILL ABOVE CUT SLOPE MINIMUM STANDARD GRADING DETAIL




NOTE: FOR SUBDRAIN DETAILS, SEE FIGURE 5.

FIGURE 3

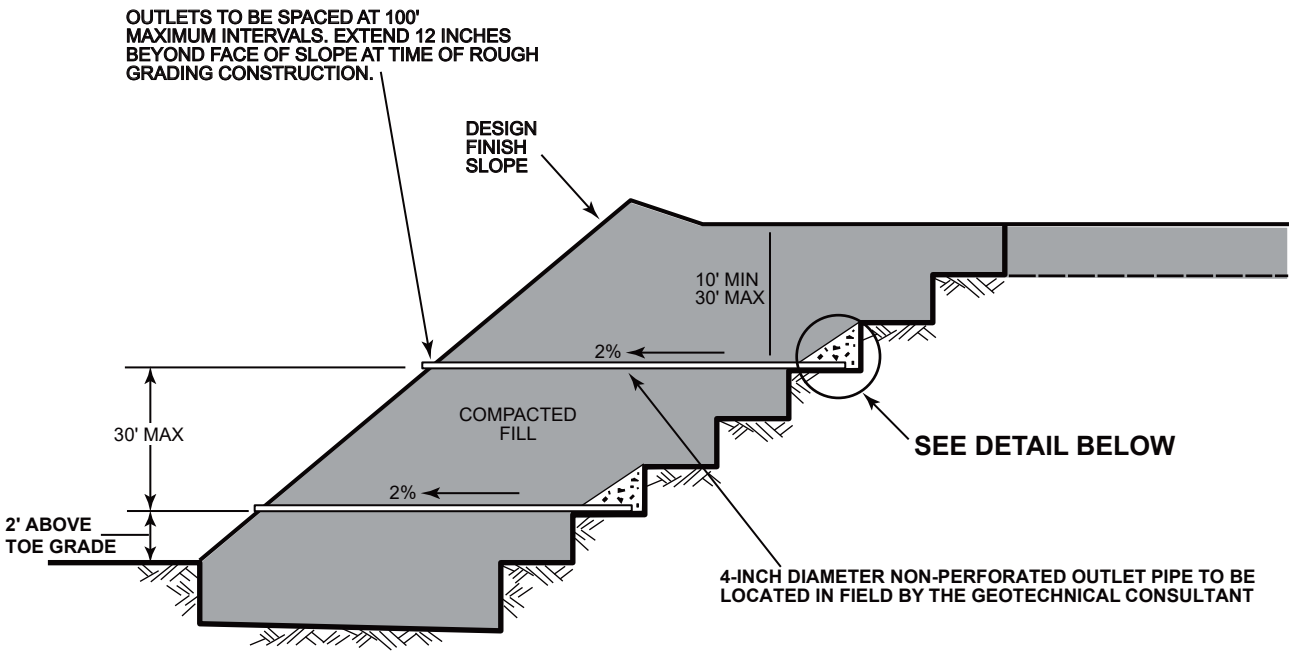
# TYPICAL BUTTRESS FILL
# MINIMUM STANDARD GRADING DETAIL




NOTE: FOR SUBDRAIN DETAILS, SEE FIGURE 5.

FIGURE 4

# TYPICAL STABILIZATION FILL
# MINIMUM STANDARD GRADING DETAIL



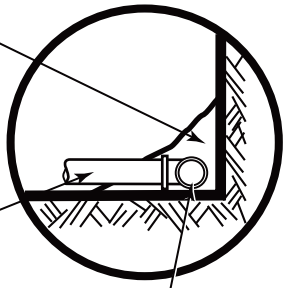

FILTER MATERIAL - MINIMUM OF THREE CUBIC FEET PER FOOT OF PIPE. SEE FILTER MATERIAL SPECIFICATION.

ALTERNATE: IN LIEU OF FILTER MATERIAL, THREE CUBIC FEET OF GRAVEL PER FOOT OF SUBDRAIN (WITHOUT PIPE) MAY BE ENCASED IN FILTER FABRIC.

GRAVEL TO CONSIST OF 1/2" TO 1" CRUSHED ROCK PER STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. FIGURE 6 FOR FILTER FABRIC SPECIFICATION

FILTER FABRIC SHALL BE LAPPED A MINIMUM OF 12 INCHES ON ALL JOINTS. SEE FIGURE 6 FOR FILTER FABRIC SPECIFICATION

**DETAIL**



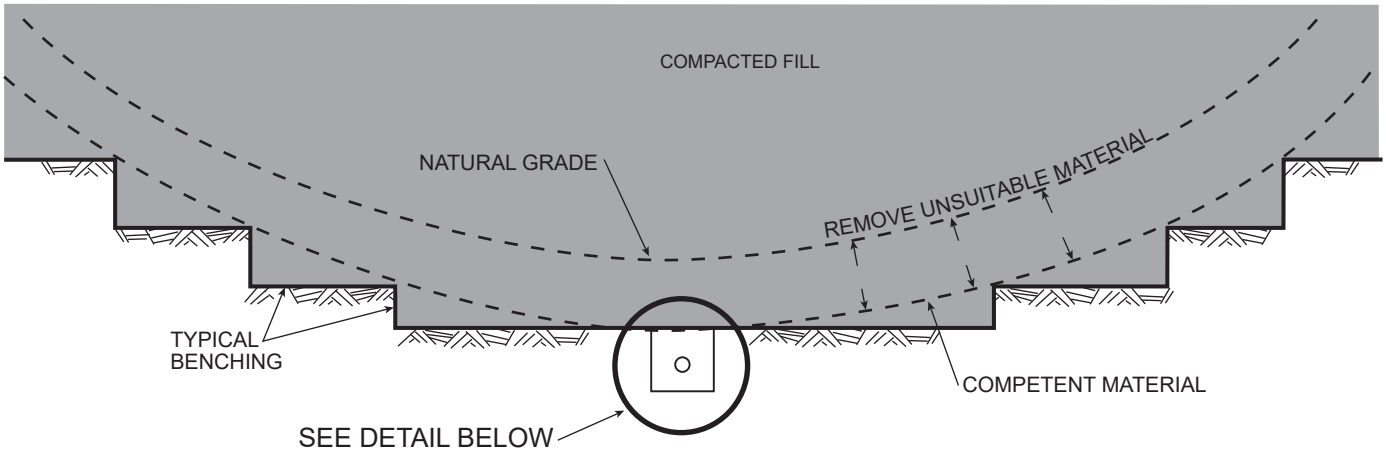
OUTLET PIPE TO BE CONNECTED TO SUBDRAIN PIPE WITH TEE OR ELBOW

MINIMUM 4-INCH DIAMETER SCHEDULE 40 ASTM D1527 OR D1785 OR SDR 35 ASTM D2751 OR D 3034. FOR FILL DEPTH OF 60 FEET OR GREATER, USE ONLY SCHEDULE 40 OR EQUIVALENT. THERE SHALL BE A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE. PROVIDE CAP AT UPSTREAM END OF PIPE. SLOPE A MINIMUM OF 2 PERCENT TO OUTLET PIPE.

| "FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT. | |
|---|---|
| SIEVE SIZE | PERCENTAGE PASSING |
| 1" | 100 |
| 3/4" | 90-100 |
| 3/8" | 40-100 |
| NO. 4 | 25-40 |
| NO. 8 | 18-33 |
| NO. 30 | 5-15 |
| NO. 50 | 0-7 |
| NO. 200 | 0-3 |

FIGURE 5

# TYPICAL STABILIZATION AND BUTTRESS FILL SUBDRAINS MINIMUM STANDARD GRADING DETAIL



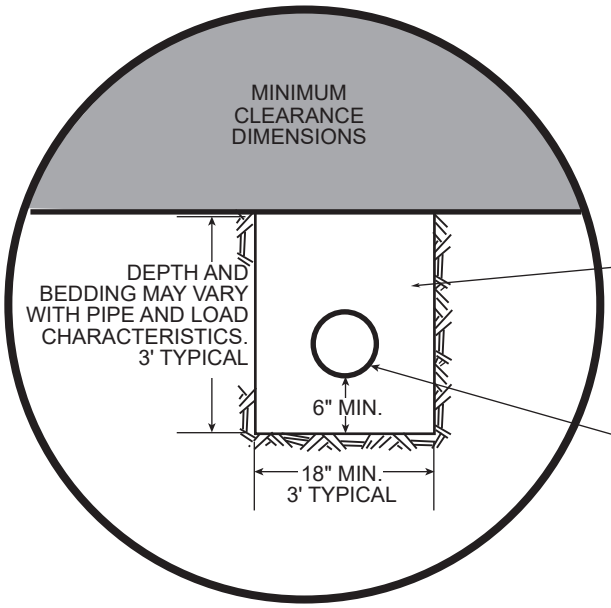

FILTER FABRICS SHALL BE PERMEABLE NON-WOVEN POLYESTER, NYLON, OR POLYPROPYLENE MATERIAL CONFORMING TO THE FOLLOWING:

1) GRAB TENSILE STRENGTH. POUNDS, MIN. ASTM D 4632.....90
2) ELONGATION, AT PEAK LOAD, PERCENT, MIN. ASTM D 4632.....50
3) PUNCTURE STRENGTH, LBS., MIN. ASTM D 3787.....45
4) COEFFICIENT OF WATER PERMITTIVITY, 1/SEC. ASTM D 4491.....>0.7
5) BURST STRENGTH, P.S.I., MIN. ASTM D 3786.....180

NOTES: DOWNSTREAM 20' OF PIPE AT OUTLET SHALL BE NON-PERFORATED AND BACKFILLED WITH FINE-GRAINED MATERIAL

PIPE SHALL BE A MINIMUM OF 4-INCH DIAMETER. FOR RUNS OF 500 FEET OR MORE, USE 6-INCH DIAMETER PIPE, OR AS RECOMMENDED BY THE GEOTECHNICAL CONSULTANT

## DETAIL




FILTER MATERIAL - MINIMUM OF NINE CUBIC FEET PER FOOT OF PIPE. SEE FIGURE 5 FOR FILTER MATERIAL SPECIFICATIONS.

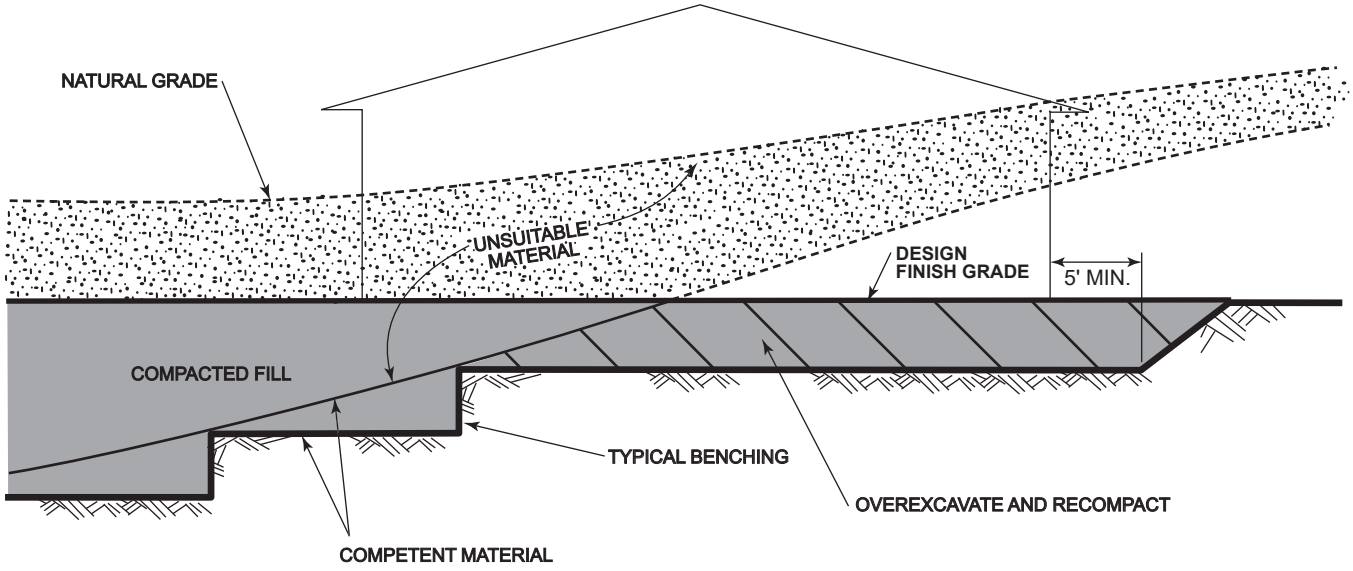
ALTERNATE: IN LIEU OF FILTER MATERIAL, NINE CUBIC FEET OF GRAVEL PER FOOT OF SUBDRAIN (WITHOUT PIPE) MAY BE ENCASED IN FILTER FABRIC. SEE FIGURE 5 TO GRAVEL SPECIFICATION. SEE ABOVE FOR FILTER FABRIC SPECIFICATION. FILTER FABRIC SHALL BE LAPPED MINIMUM OF 12 INCHES ON ALL JOINTS.

MINIMUM 4 INCH DIAMETER SCHEDULE 40 ASTM D 1527, OR D 1785, OR SDR 35 ASTM 2751 OR D 3034. FOR FILL DEPTH OF 60 FEET OR GREATER, USE ONLY SCHEDULE 40 OR APPROVED EQUIVALENT. THERE SHALL BE A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE.

FIGURE 6

# TYPICAL CANYON SUBDRAIN MINIMUM STANDARD GRADING DETAIL

## CUT LOT




## CUT/FILL LOT TRANSITION LOT

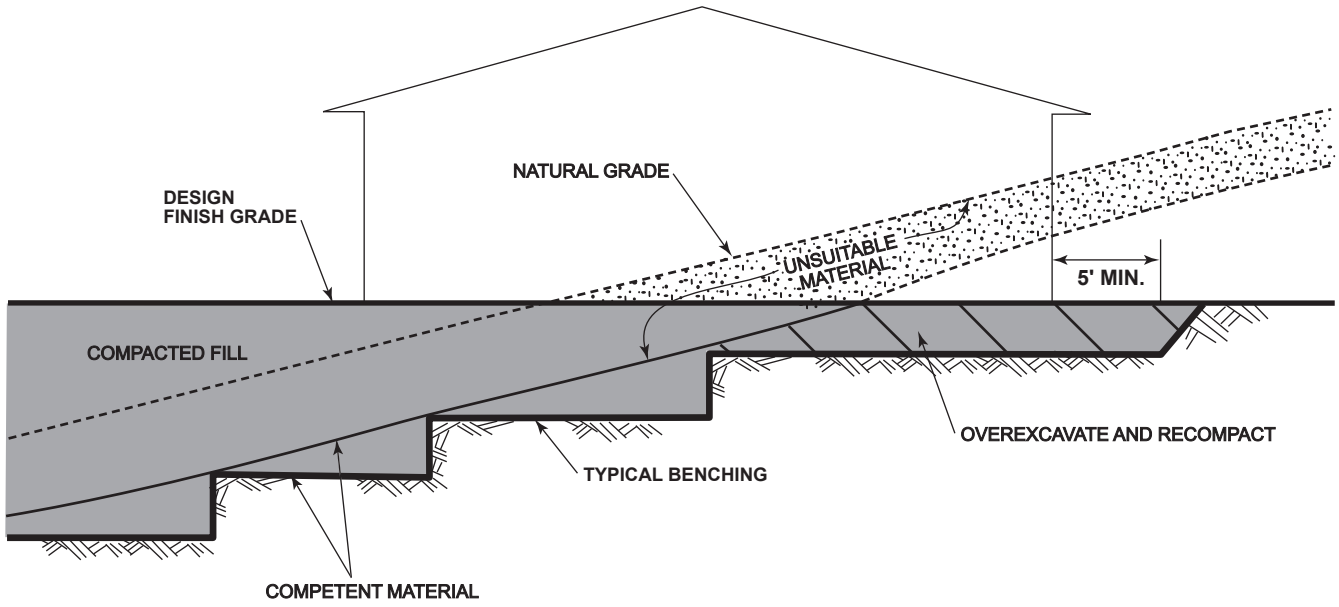
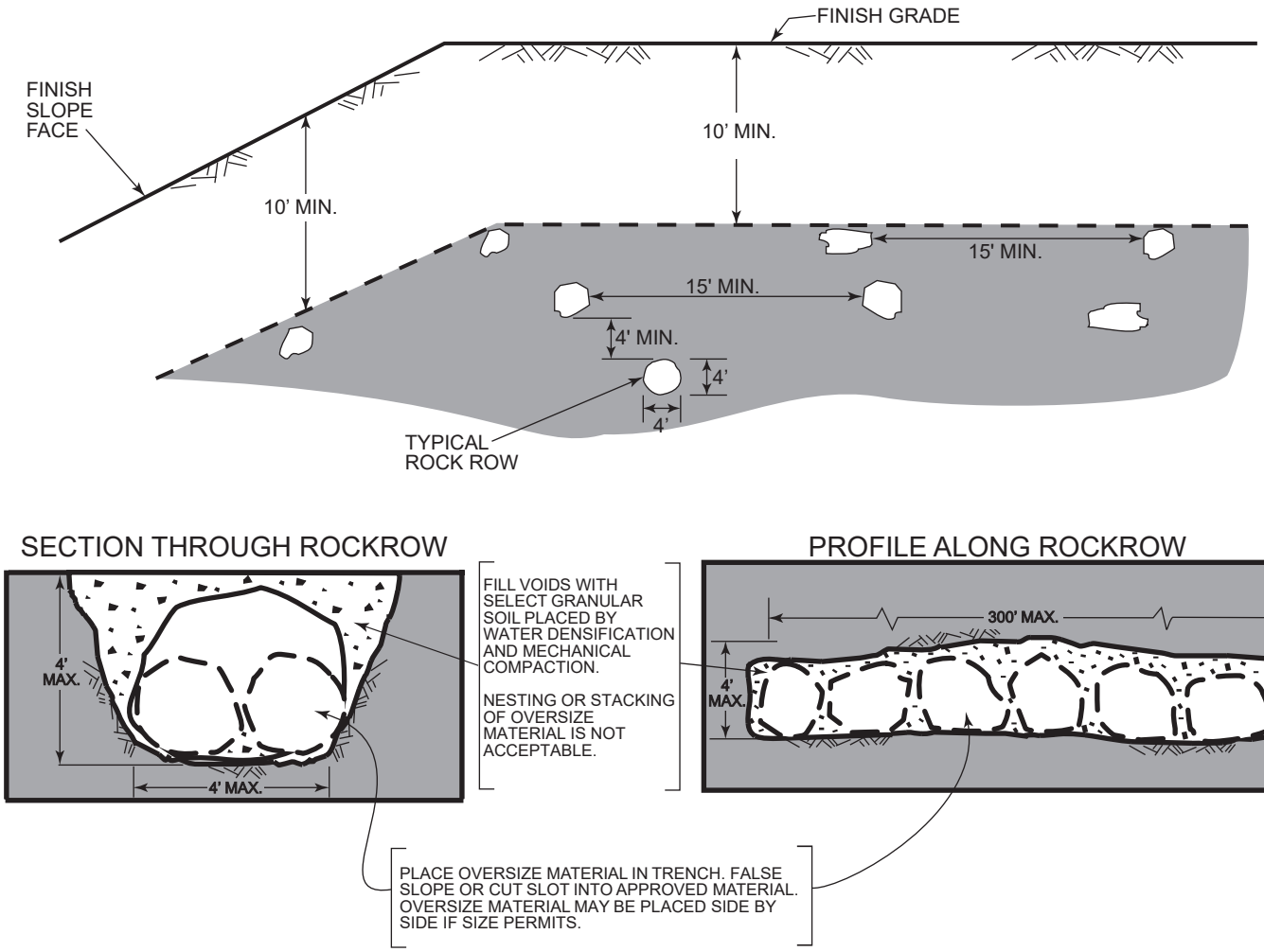



FIGURE 7

# TYPICAL OVEREXCAVATION OF DAYLIGHT LINE MINIMUM STANDARD GRADING DETAIL




NOTES:

**A)** OVERSIZED ROCK IS DEFINED AS LARGER THAN 12" IN SIZE IN GREATEST DIMENSION.

**B)** SPACE BETWEEN ROCKROWS SHOULD BE ONE EQUIPMENT WIDTH OR A MINIMUM OF 15 FEET.

**C)** THE WIDTH AND HEIGHT OF THE ROCKROW SHALL BE LIMITED TO FOUR FEET AND THE LENGTH LIMITED TO 300 FEET UNLESS APPROVED OTHERWISE BY THE GEOTECHNICAL CONSULTANT. OVERSIZE SHOULD BE PLACED WITH FLATEST SIDE ON THE BOTTOM.

**D)** OVERSIZE MATERIAL EXCEEDING FOUR FEET MAY BE PLACED ON AN INDIVIDUAL BASIS IF APPROVED BY THE GEOTECHNICAL CONSULTANT.

**E)** FILLING OF VOIDS WILL REQUIRE SELECT GRANULAR SOIL (SE > 20, OR LESS THAN 20 PERCENT FINES) AS APPROVED BY THE GEOTECHNICAL CONSULTANT. VOIDS IN THE ROCKROW TO BE FILLED BY WATER DENSIFYING GRANULAR SOIL INTO PLACE ALONG WITH MECHANICAL COMPACTION EFFORT.

**F)** IF APPROVED BY THE GEOTECHNICAL CONSULTANT, ROCKROWS MAY BE PLACED DIRECTLY ON COMPETENT MATERIALS OR BEDROCK, PROVIDED ADEQUATE SPACE IS AVAILABLE FOR COMPACTION.

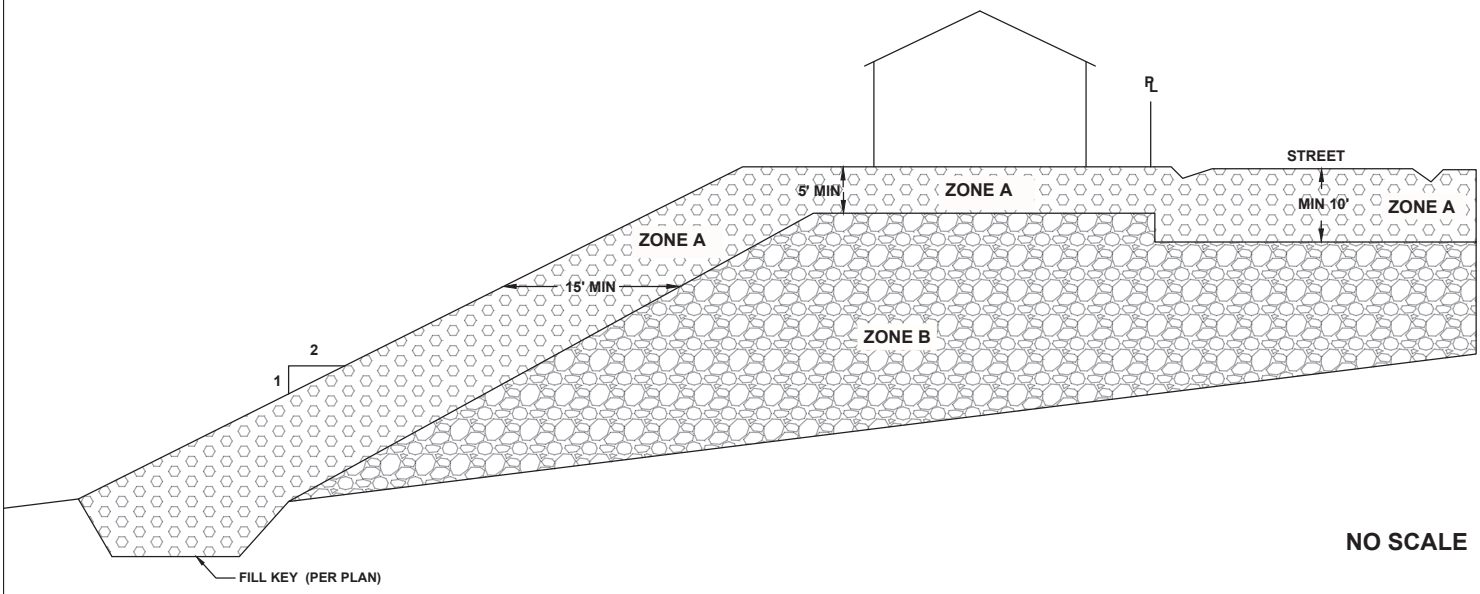
**G)** THE FIRST LIFT OF MATERIAL ABOVE THE ROCKROW SHALL CONSIST OF GRANULAR MATERIAL AND SHALL BE PROOF-ROLLED WITH A D-8 OR LARGER DOZER OR EQUIVALENT.

**H)** ROCKROWS NEAR SLOPES SHOULD BE ORIENTED PARALLEL TO SLOPE FACE.

**I)** NESTING OR STACKING OF ROCKS IS NOT ACCEPTABLE.

FIGURE 8

# TYPICAL OVERSIZE ROCK PLACEMENT METHOD MINIMUM STANDARD GRADING DETAIL




NO SCALE

**LEGEND**

**ZONE A:**

- **THE UPPER 5 FEET OF FILL UNDER PADS SHOULD NOT HAVE ROCKS GREATER THAN 12 INCHES IN THE LARGEST DIMENSION (12-INCH MINUS).**
- **FILLS IN PUBLIC STREETS, RIGHT OF WAYS AND EASEMENTS SHOULD CONTAIN ONLY 12-INCH MINUS MATERIALS TO A DEPTH OF 10 FEET BELOW FINISH GRADE OR 2 FEET BELOW THE DEEPEST UTILITY, WHICHEVER IS DEEPER.**
- **FILLS IN SLOPE AREAS MAY HAVE OVERSIZE ROCK PLACED PER ROCK BLANKET DETAIL TO WITHIN 15 FEET OF SLOPE FACE. FILL WITHIN 15 FEET OF SLOPE FACE SHOULD ONLY CONSIST OF 12-INCH MINUS MATERIAL.**

**ZONE B:**

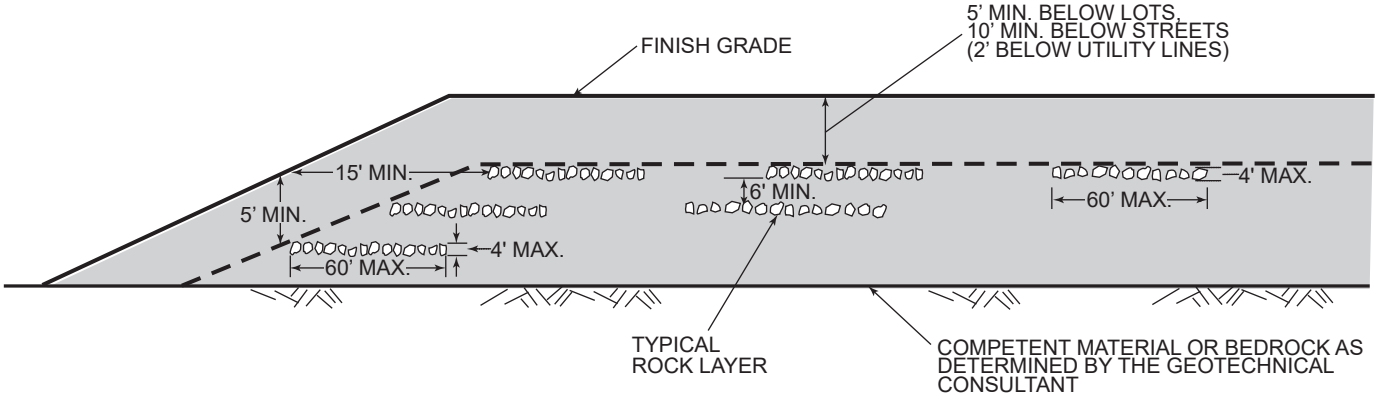
- **ROCKS UP TO 2 FEET IN HEIGHT (LYING FLAT) WITH OCCASIONAL INDIVIDUAL FRAGMENTS UP TO 4 FEET MAXIMUM DIMENSION MAY BE PLACED WITHIN ZONE B AREA.**
- **ROCKS EXCEEDING 2 FEET IN THE SMALLEST DIMENSION MAY BE PLACED IN ROWS WITH THE FLATTEST SIDE DOWN (SEE NEXT PAGE). THE WIDTH OF THE ROWS MAY EXCEED 4 FEET PROVIDED THE FILL OPERATION CAN ACCOMMODATE A MINIMUM OF 15 FEET BETWEEN ROWS, AND PROVIDED THAT THERE IS SUFFICIENT EQUIPMENT TO PLACE FILL AGAINST AND OVER THE ROWS.**
- **FILL SOILS PLACED AGAINST OR OVER ROCK ROWS SHOULD BE FREE OF ROCKS THAT MAY CAUSE NESTING/VOIDS WITHIN THE ROCK ROWS AND ROCK FILL. THIS CONDITION SHOULD BE CAREFULLY REVIEWED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT TO VERIFY SATISFACTORY OPERATIONS.**
- **ROCKS UP TO 10 FEET IN THE LEAST DIMENSION MAY BE PLACED AS INDIVIDUAL ROCKS WITHIN THE COMPACTED FILL. THE FILL SOILS NEAR AND AGAINST THESE ROCKS SHOULD BE FREE OF ROCKS THAT MAY CAUSE NESTING/VOIDS WITH THE LARGER ROCKS. THIS CONDITION SHOULD BE CAREFULLY REVIEWED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT TO VERIFY SATISFACTORY OPERATIONS.**
- **ROCKS, LARGER THAN 10 FEET IN THE SMALLEST DIMENSION, SHOULD BE REDUCED IN SIZE TO MEET THE SPECIFIED DIMENSIONS FOR INDIVIDUAL ROCK PLACEMENT AND/OR FOR PLACEMENT IN ROCK ROWS.**

**NOTES:** **CONTINUOUS OBSERVATION IS REQUIRED BY GEOTECHNICAL CONSULTANT DURING ROCK PLACEMENT.**

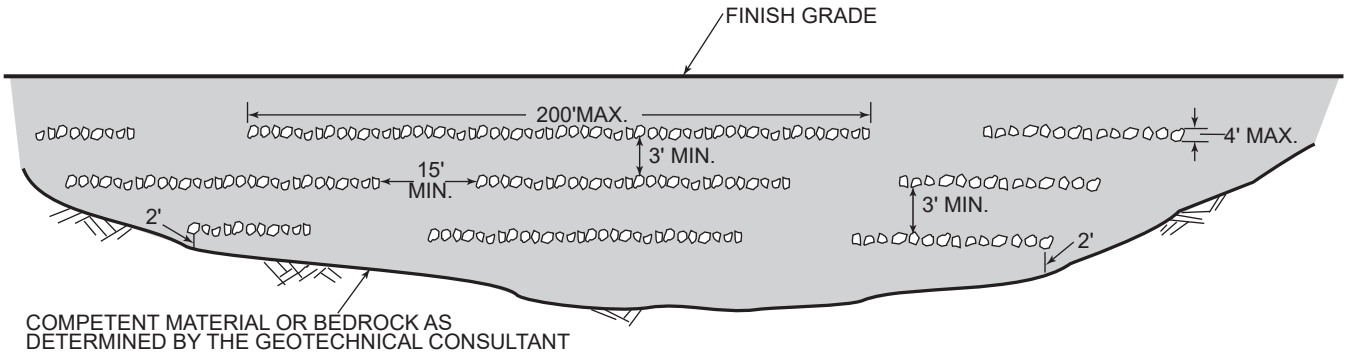
**FIGURE 9**

# STRUCTURAL ROCK FILL PLACEMENT DETAIL

## VIEW NORMAL TO SLOPE FACE




## VIEW PARALLEL TO SLOPE FACE




**NOTES:**

**1) ORIENTATION AND STAGGERING MAY VARY, BUT SHALL BE AS RECOMMENDED BY THE GEOTECHNICAL CONSULTANT.**

**2) ROCK LAYERS SHALL NOT BE MORE THAN 4 FEET IN HEIGHT. ROCK SHALL NOT BE STACKED OR NESTED.**

**3) EACH ROCK CELL MUST BE COVERED WITH A GRANULAR SOIL WITH A MINIMUM SAND EQUIVALENT (SE) OF 20 OR WITH LESS THAN 10% PASSING THE NO. 200 SIEVE AS DETERMINED BY THE GEOTECHNICAL CONSULTANT. THE GRANULAR SOIL IS TO BE FLUSHED, FLOODED, AND JETTED IN THE ROCK LAYER IN ORDER TO FILL THE VOIDS. ADDITIONAL LIFTS OF GRANULAR SOIL SHALL BE PLACED AS NECESSARY TO ALLOW FOR THE FILLING OF VOIDS BY FLOODING, AND JETTING. THE ROCK LAYER SHALL THEN BE ADEQUATELY COMPACTED WITH HEAVY EARTH MOVING EQUIPMENT.**

**4) ADEQUACY OF ABOVE PROCEDURE SHALL BE VERIFIED BY THE GEOTECHNICAL CONSULTANT.**

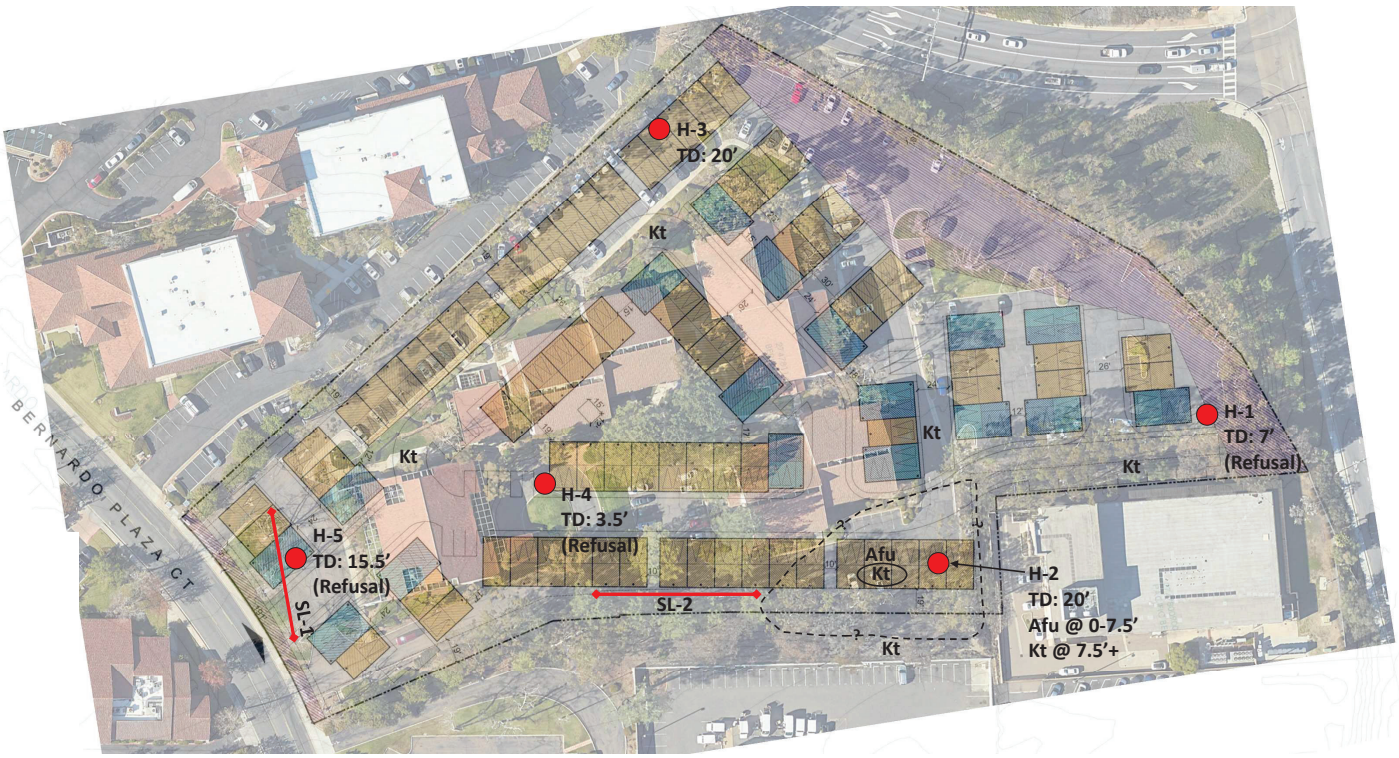
**5) ROCKS EXCEEDING 2 FEET IN THE SMALLEST DIMENSION MAY BE PLACED IN ROWS AS SHOWN IN THE FIGURE WITH THE FLATTEST SIDE DOWN. THE WIDTH OF THE ROWS MAY EXCEED 4 FEET PROVIDED THE FILL OPERATION CAN ACCOMMODATE A MINIMUM OF 15 FEET BETWEEN ROWS, AND PROVIDED THAT THERE IS SUFFICIENT EQUIPMENT TO PLACE FILL AGAINST AND OVER THE ROWS. THE FILL SOILS SHOULD BE FREE OF ROCKS THAT MAY CAUSE NESTING/VOIDS WITHIN THE ROCK ROWS. THIS CONDITION SHOULD BE CAREFULLY REVIEWED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT TO VERIFY SATISFACTORY OPERATIONS.**

**6) ROCKS UP TO 10 FEET IN THE LEAST DIMENSION MAY BE PLACED AS INDIVIDUAL ROCKS WITHIN THE COMPACTED FILL. THE FILL SOILS NEAR AND AGAINST THESE ROCKS SHOULD BE FREE OF ROCKS THAT MAY CAUSE NESTING/VOIDS WITH THE LARGER ROCKS. THIS CONDITION SHOULD BE CAREFULLY REVIEWED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT TO VERIFY SATISFACTORY OPERATIONS.**

**7) ROCKS, LARGER THAN 10 FEET IN THE SMALLEST DIMENSION, SHOULD BE REDUCED IN SIZE TO MEET THE SPECIFIED DIMENSIONS FOR INDIVIDUAL ROCK PLACEMENT AND/OR FOR PLACEMENT IN ROCK ROWS.**

FIGURE 10

# OVERSIZE ROCK ROW PLACEMENT FOR ZONE B STRUCTURAL ROCK FILL




North
Scale: 1" = 75'

**Legend**

| | |
|---|---|
| H-5 TD: 15.5' (Refusal) | Approximate Hollow Stem Auger Boring, Showing Total Depth and Depth to Earth Units in Feet |
| SL-2 | Seismic Refraction Line |

Earth Units
Circled Where Buried

| | |
|---|---|
| Afu | Undocumented Artificial Fill |
| Kt | Tonalite Bedrock |
| | Geologic Contact |

**Geotechnical Map**

Proposed Rancho Bernardo Townhomes
Bernardo Plaza Court
Accessors Parcel No. 274-781-14
San Diego, California

Project Number: 24009-01
Date: February 21, 2024
Plate 1

S/A

**Reference 3 (T&B Planning, 2025)**

# PRELIMINARY
# WASTE MANAGEMENT PLAN
# FOR THE

# CITY VIEW PROJECT

**Lead Agency**
550 West C St.
12th Floor
San Diego, CA 92101

**Prepared By:**
T&B Planning, Inc.
8690 Aero Drive, Suite 115 PBM 383
San Diego, CA 92123

July 29, 2025

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# 1.0 INTRODUCTION

The purpose of this Waste Management Plan (WMP) for the City View Project (Project) in the City of San Diego (City) is to identify potential impacts of the Project on solid waste services and if necessary, identify mitigation measures to reduce these impacts to less-than-significant levels. This Project shall strive for a goal of 75 percent of waste reduction for construction and demolition debris, consistent with the requirements of Chapter 6, Article 6, Division 6 of the Municipal Code and City policies regarding waste reduction and recycling. The Project shall also divert waste generated during occupancy in accordance with City policies regarding waste reduction and recycling.

This WMP addresses site demolition, building construction, and occupancy of the Project. This WMP addresses the projected amount of waste that could be generated by the Project based on current City generation rates and estimates; waste reduction goals; and recommended techniques to achieve the waste reduction goals, such as recycling.

The City has established thresholds of significance for cumulative and direct impacts related to solid waste generation. Projects that include the construction, demolition and/or renovation of 40,000 square feet or more of building space may generate sufficient waste (approximately 60 tons) to have a potentially cumulatively significant impact on solid waste facilities. Additionally, projects that include the construction, demolition, or renovation of 1,000,000 square feet or more of building space may generate 1,500 tons of waste or more and are considered to have direct impacts on solid waste facilities. The Project as proposed exceeds the cumulatively significant impact threshold.

Because the City View Project exceeds the thresholds for solid waste generation, this WMP has been prepared to mitigate the cumulative impacts of this Project by addressing the following elements for the demolition, construction, and occupancy phases of the Project as applicable:

- Tons of waste anticipated to be generated;
- Material type of waste to be generated;
- Source separation techniques for waste generated;
- How materials will be reused on-site;
- Name and location of recycling, reuse, and landfill facilities where recyclables and waste will be taken if not reused on-site;
- A “buy recycled” program;
- How the Project will aim to reduce the generation of construction/demolition debris;
- A plan of how waste reduction and recycling goals will be communicated to subcontractors; and
- A timeline for each of the three main phases of the Project (demolition, construction, and occupancy).

# 2.0 PROJECT DESCRIPTION

The 5.5-acre Project site is located at 11818 Bernardo Plaza Court, west of Bernardo Center Drive and east of Interstate 15 within the Rancho Bernardo Community Plan area of the City of San Diego and is shown on Figure 1, *Aerial Photograph*. The Project proposes the development of 122 multi-family residential units and would include the demolition of 75,000 square feet of commercial office space currently developed on the Project site. The Project includes a Community Plan Amendment and Rezone to change the land use designation from Special Commercial to Medium Density Residential. Additionally, the Project proposes a Planned Development Permit and Vesting Tentative Map, which would be processed prior to construction. The Project would include 13,834 cubic yards (cy) of cut, 14,291 cy of fill and would require 457 cy of import for grading activities on site.

This WMP evaluates all components of the Project, including waste that would be generated by demolition of existing structures throughout the Project site, and waste that would be generated with construction and occupancy of the proposed uses on-site.


*Source(s): ESRI, NearMap Imagery (May 2025)*

Figure 1

0 62.5 125 250 Feet

## Aerial Photograph

# 3.0 APPLICABLE REGULATORY REQUIREMENTS

The following is a brief description of the state and local environmental laws and related regulations related to solid waste.

## 3.1 State Regulations

### 3.1.1 California Solid Waste Integrated Waste Management Act (AB 939, 1989)

The California Integrated Waste Management Act was enacted by the California Legislature in 1989 with the goal of reducing dependence on landfills for the disposal of solid waste and to ensure an effective and coordinated system for the safe management of all solid waste generated within the state. Assembly Bill (AB) 939 mandated a reduction in the amount of solid waste disposed of by jurisdictions and required diversion goals of 25% by 1995 and 50% by the year 2000. The Integrated Waste Management Act established a hierarchy of preferred waste management practices, which include (1) source reduction, (2) recycling and composting, and (3) environmentally safe disposal by transformation or landfilling. It addresses all aspects related to solid waste regulation, including the details regarding the lead enforcement agency's requirements and responsibilities; the permit process, including inspections and denials of permits; enforcement; and site clean-up and maintenance. It requires that each county prepare a countywide integrated waste management plan that is reviewed at least once every 5 years to assure that waste management practices remain consistent with the practices defined in the California Public Resources Code. In 2013, AB 341 increased the waste diversion target to 75% by 2020.

### 3.1.2 Waste Management (AB 1594)

"Alternative daily cover" (ADC) is cover material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging. CalRecycle has approved 11 ADC material types that can currently be reported as diversion: ash and cement kiln dust, treated auto shredder waste, construction and demolition waste, compost, green material, contaminated sediment, sludge, and shredded tires. Generally, these materials must be processed so that they do not allow gaps in the exposed landfill face (CalRecycle 2015a).

Pursuant to California Public Resources Code Section 41781.3 and AB 1594, beginning January 1, 2020, the use of green material as ADC will not constitute diversion through recycling and will be considered disposal. "Green material" is defined as any plant material that is either separated at the point of generation, or separated at a centralized facility that employs methods to minimize contamination. Green material includes, but is not limited to, yard trimmings, untreated wood wastes, paper products, and natural fiber products. Green material does not include treated wood waste, mixed demolition or mixed construction debris, or manure and plant waste from the food processing industry, alone or blended with soil. As of August 1, 2018, local jurisdictions are required to include information in an annual report on how the local jurisdiction intends to address the diversion requirements and divert green material that is being used as ADC. A jurisdiction that does not meet certain diversion requirements as a result of not being able to claim diversion for the use of green material as ADC

would be required to identify and address, in an annual report, barriers to recycling green material and, if sufficient capacity at facilities that recycle green material is not expected to be operational before a certain date, to include a plan to address those barriers.

### 3.1.3 Waste Reuse and Recycling Act (AB 1327)

The Waste Reuse and Recycling Act (WRRA) required the CIWMB to approve a model ordinance for adoption by any local government for the transfer, receipt, storage, and loading of recyclable materials in development projects by March 1, 1993. The WRRA also required local agencies to adopt a local ordinance by September 1, 1993 or allow the model ordinance to take effect. The WRRA requires all development projects that are commercial, industrial, institutional, or marina in nature and where solid waste is collected and loaded, to provide an adequate area for collecting and loading recyclable materials over the lifetime of the project. The area is required to be provided before building permits are issued. (CalRecycle, 2018b)

### 3.1.4 2019 California Green Building Standards Code

California Code of Regulations, Title 24, Part 11 is referred to as the California Green Building Standards Code (CALGreen Code). CALGreen went into effect in January 2011. The most recently approved update to Cal Green became effective January 1, 2020, and is applicable to the planning, design, operation, construction, use, and occupancy of newly constructed buildings and structures throughout the State of California. The purpose of the CALGreen 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 positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality." The CALGreen Code is not intended to substitute or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission (CBSC). Section 5.408.1 of the CALGreen Code requires that 65 percent of construction and demolition waste be diverted from landfills and that 100 percent of trees, stumps, rocks, and associated vegetation and soils resulting from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on-site until the storage site is developed. Unless otherwise noted in the regulation, all newly constructed buildings in California are subject of the requirements of the CALGreen Code.

### 3.1.5 Short-Lived Climate Pollutants (SLCP): Organic Waste Methane Emissions Reductions (SB 1383)

In September 2016, Governor Brown signed into law SB 1383 (Lara, Chapter 395, Statutes of 2016), establishing methane emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants (SLCP) in various sectors of California's economy. The new law codifies the California Air Resources Board's Short-Lived Climate Pollutant Reduction Strategy PDF download, established pursuant to SB 605 (Lara, Chapter 523, Statutes of 2014), to achieve reductions in the statewide emissions of short-lived climate pollutants. Actions to reduce short-lived climate pollutants are essential to address the many impacts of climate change on human health, especially in California's most at-risk communities, and on the environment.

As it pertains to CalRecycle, SB 1383 establishes targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. The law grants CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets and establishes an additional target that not less than 20 percent of currently disposed edible food is recovered for human consumption by 2025. The provisions of SB 1383 will go into effect on January 1, 2022.

## 3.2 Local Regulations

### 3.2.1 City of San Diego Zero Waste Plan: Road to Zero Waste, Next Stop 75%

State of California regulations for solid waste (California Public Resources Code, Section 41700 et seq.) require that each region have a plan with adequate capacity to manage or dispose of solid waste for at least 15 years into the future. The City of San Diego's Zero Waste Plan (City of San Diego 2015b) establishes goals to target 75% diversion by 2020, 90% diversion by 2035, and "zero" by 2040 and outlines potential diversion strategies to help the City achieve these goals.

### 3.2.2 The Whitebook: Standard Specifications for Public Works Construction

The City created the Whitebook (City of San Diego 2015c), a supplement which takes precedence over the specification language contained in the "Greenbook." Standard Specifications for Public Works Construction (Public Works Standards 2015), and addresses the unique conditions in the City that are not addressed in the Greenbook. Specifically, Part 1 - General Provisions (A), Section 7-21 addresses construction and demolition waste management.

### 3.2.3 City of San Diego Ordinance No. O-19420 & O-19694 (Municipal Code Chapter 6, Article 6, Division 6)

Starting on July 1, 2008, all new construction projects are required to pay a refundable solid waste deposit on construction waste. This ordinance requires the applicant to do the following:

- All applicants for a Building Permit or a Demolition/Removal Permit shall submit a properly completed Waste Management Form Part I with the Building Permit or Demolition/Removal Permit application, in accordance with the requirements set forth in the Land Development Manual.
- All applicants shall pay a refundable deposit at the time the Building Permit or Demolition/Removal Permit is issued.
- No Building Permit or Demolition/Removal Permit shall be issued unless the applicant has submitted a properly completed Waste Management Form Part I and paid the required deposit.

### 3.2.4 Municipal Code Chapter 14, Article 2, Division 8

Municipal Code Chapter 14 Article 2 Division 8 sets forth the general regulations for refuse and recyclable materials storage for residential and commercial development. These sections include guidelines for the size of material storage areas based on the number of residential dwelling units and non-residential commercial square footage; location of material storages areas; and screening of material storage areas. (City of San Diego, 2009)

# 4.0 DEMOLITION WASTE

As previously discussed, all existing structures on-site would be demolished to accommodate the Project. Although specific statistical information is not currently available regarding the generation of waste associated with the demolition of 75,000 square feet of commercial office space and associated landscaping and parking, based on the City's construction and Demolition Debris Conversion Rate Table, approximately 10,705 cubic yards (cy) of waste would be generated during the demolition phase. The actual tonnage of materials to be removed would be determined by the contractor at the time of removal.

The summary of the waste types and volumes of demolition anticipated to be generated by the Project are shown in Table 1, *Existing Use Demolition Waste Content*. Table 2, *Estimated Demolition Waste – Quantities and Percent Diverted*, shows the estimated demolition waste separated by material, and the percentage of each material that would be diverted from the landfill through salvage or recycling. The assumptions for Table 1 and Table 2 are based on the City's Construction & Demolition Debris Conversion Rate Table, which assumes that approximately 10,705 cy of waste (approximately 4,267.26 tons) would be generated during the demolition phase.

## 4.1 Salvage

In order to provide a conservative analysis, this WMP assumes that no salvage of materials in the existing buildings is proposed.

## 4.2 Recycling

The Project site currently includes commercial office space totally 75,000 square feet, as well as associated parking and landscaping. All of the green waste materials would be sent to San Pasqual Valley Soils, located at 16111 Old Milky Way, Escondido, CA 92027, for 100% diversion.

**Table 1 Existing Use Demolition Waste Content**

| Material | Percentage Waste by Material (%)[1] | Volume Waste by Material (cy) | Tons/Unit Conversion Factor[1] | Volume Waste by Material (Tons) |
|---|---|---|---|---|
| Asphalt and Concrete | 21 | 2207 | 0.95 | 1,867.4 |
| Building Materials (doors, windows, cabinets, etc.) | 10 | 1120 | 0.15 | 168 |
| Carpet | 4 | 480 | 0.30 | 144 |
| Drywall | 28 | 3000 | 0.25 | 750 |
| Landscape Debris | 27 | 2900 | 0.15 | 435 |
| Mixed Debris | 7 | 710 | 0.51 | 844.9 |
| Roofing Material (shingles) | 2 | 168 | 0.22 | 36.96 |
| Garbage/Trash | 1 | 120 | 0.18 | 21 |
| **TOTAL:** | **--** | **10,705** | **--** | **4,267.26** |

cy = cubic yard

1. Percentages and totals are the result of rounding. Tons/Unit Conversion Factor per the City of San Diego Construction & Demolition (C&D) Debris Conversion Rate Table. (City of San Diego, 2016b)

**Table 2 Estimated Demolition Waste – Quantities and Percent Diverted**

| Material | Estimated Waste Quantity (tons) | Handling[1] | Diversion Rate (%) | Estimated Diversion (tons) | Estimated Disposal (tons) |
|---|---|---|---|---|---|
| Asphalt, Concrete, Stone, and Masonry | 1,867.4 | Escondido Resource Recovery | 100 | 1,867.4 | 0 |
| Building Materials | 168 | JEB Sand & Gravel | 50 | 84 | 84 |
| Carpet | 144 | EDCO CDI Recycling & Buy Back Center | 100 | 144 | 0 |
| Drywall | 750 | Escondido Resource Recovery | 100 | 750 | 0 |
| Landscape Debris | 435 | San Pasqual Valley Soils | 100 | 435 | 0 |
| Mixed Debris | 844.9 | Escondido Resource Recovery | 65 | 549.19 | 295.71 |
| Roofing Material | 36.96 | Escondido Resource Recovery | 100 | 36.96 | 0 |
| Garbage/Trash | 21 | EDCO CDI Recycling & Buy Back Center | 0 | 0 | 21 |
| **TOTAL:** | **4,267.26** | **--** | **76.9%** | **3,866.55** | **400.71** |

1. Percentages and totals are the result of rounding. Handling Facilities were selected from the City of San Diego "*2025 Certified Construction and Demolition (C&D) Recycling Facility Directory*" (City of San Diego, 2025)

The following materials would be segregated from the mixed debris for recycling at a recycling facility achieving 100% diversion:

- Asphalt, Concrete, Stone, and Masonry
- Carpet
- Drywall
- Landscape Debris
- Roofing Material

It is anticipated that 76.9% of the waste materials generated during the demolition phase of the Project would be diverted by source separating the materials as described in Table 2 above. Therefore, the Project would exceed the 75% waste reduction requirement for construction and demolition debris as required by the City's Municipal Code. Tonnage for each material is subject to change based on actual data and would ultimately be documented by the contractor in a Construction Report. The Construction Report is required to be completed prior to issuance of any building permit for the Project. This

requirement applies to the Project as Mitigation Measure 3, discussed below under Section 8.0 of this WMP. Additionally, the recycling facilities identified above in Table 2 are subject to change based on their availability at the time demolition operations commence. Each year, the City of San Diego updates and maintains a directory of approved demolition recycling facilities, which should be consulted by the contractor prior to the start of demolition (City of San Diego, 2025). The contractor may elect to utilize one of the equally appropriate facilities listed in this directory. Furthermore, as required by Municipal Code Chapter 6, Article 6, Division 6, the Project would be required to submit a properly completed Waste Management Form Part I and pay a refundable solid waste deposit on demolition waste.

# 5.0 CONSTRUCTION WASTE

During construction of the Project, solid waste requiring landfill disposal would be required. The solid waste generated would primarily consist of discarded materials and packaging generated by the construction process. Construction debris would be separated on-site into material-specific containers to facilitate reuse and recycling and to increase the efficiency of waste reclamation and/or would be collected by a contracted waste hauler and separated at an off-site waste collection facility. Separation of materials at the construction site is necessary in order to ensure appropriate waste diversion rate, minimize costs associated with transportation and disposal, and facilitate compliance with the C&D ordinance. The types of construction waste anticipated to be generated include:

- Asphalt and concrete
- Brick/Masonry/Tile
- Cabinets/Doors/Fixtures
- Cardboard
- Carpet, padding/foam
- Ceiling Tile
- Drywall
- Landscape debris
- Mixed C&D material
- Roofing Materials
- Scrap metal
- Stucco
- Unpainted wood and pallets
- Garbage/Trash

Materials to be recycled would be redirected to appropriate recipients selected from the City of San Diego Environmental Services Department's (ESD) directory of facilities that recycle construction materials, scrap metal, and yard waste.

## 5.1 On-Site Grading

The Project anticipates 13,834 cy of cut and 14,291 cy of fill would be required on site. Thus, 457 cy of soil import would be required on site. Therefore, the grading phase of the Project would generate a

negligible amount of waste generated by contractors working on-site, and no soil would be exported from the Project site.

Existing vegetation would also be removed as part of the grading process (clearing and tree removal) and would be processed and recycled 100% at a suitable green waste recycling facility. No vegetation would be sent to the landfill.

## 5.2 Building Construction

Construction of the Project would occur in one phase. The City of San Diego ESD requires projects to estimate tonnage of expected construction waste. The City's *Guidelines for a Waste Management Plan* estimates a solid waste generation rate of three pounds per sf during the construction phase of project (City of San Diego, 2013, p. 10). The Project proposes 281,605 sf of building area. As shown below, the construction of 281,605 sf of building area would result in the generation of approximately 422.41 tons of building construction waste.

*Construction Waste Calculation:*

$$281{,}605\ sf \times \frac{3\ lbs}{sf} \times \frac{.0005\ tons}{lb} = 422.41 \text{ tons of Building Construction Waste}$$

Approximately 422.41 tons of construction waste is the initial estimate used for purposes of preparing this WMP until construction documents have been prepared and a contractor has been hired who can more accurately compute the expected waste in total quantity and by type. For planning purposes, the contractors shall source separate the waste materials generated according to what is shown in Table 3, *Project Waste Generation – Construction*, below.

Based on the information shown in Table 3, the Project would divert approximately 83.1% of construction-related waste from the landfill, which exceeds the 75% waste reduction requirement for construction and demolition debris as required by the City's Municipal Code. Additionally, as required by Municipal Code Chapter 6, Article 6, Division 6, the Project would be required to submit a properly completed Waste Management Form Part I and pay a refundable solid waste deposit on construction waste.

**Table 3 Project Waste Generation – Construction**

| Material Type | Estimated Waste Quantity (tons) | Handling[1] | Diversion Rate (%) | Estimated Diversion (tons) | Estimated Disposal (tons) |
|---|---|---|---|---|---|
| Clean Wood (forming and framing lumber) | 10.56 | Escondido Resource Recovery | 100 | 10.56 | 0 |
| Metals (pipes, rebar, finishing, steel, aluminum, copper, brass, stainless steel) | 105.61 | Escondido Resource Recovery | 100 | 105.61 | 0 |
| Blocks, Bricks | 67.58 | Escondido Resource Recovery | 100 | 67.58 | 0 |
| Asphalt, Concrete | 126.72 | Escondido Resource Recovery | 100 | 126.72 | 0 |
| Trash (treated wood) | 10.56 | EDCO CDI Recycling & Buy Back Center | 0 | 0 | 10.56 |
| Mixed Debris (insulation, vinyl, doors, floor tile, plastic pipes, film, broken glass, drywall) | 84.48 | Escondido Resource Recovery | 65 | 54.91 | 29.57 |
| Cardboard | 8.45 | Escondido Resource Recovery | 100 | 8.45 | 0 |
| Carpet/Carpet Padding | 8.45 | EDCO CDI Recycling & Buy Back Center | 100 | 8.45 | 0 |
| **TOTAL** | **422.41** | | **83.1%** | **382.28** | **40.13** |

1. Percentages and totals are the result of rounding. Handling Facilities were selected from the City of San Diego "*2025 Certified Construction and Demolition (C&D) Recycling Facility Directory*" (City of San Diego, 2025)

# 6.0 OPERATIONAL WASTE

Demolition of existing structures and construction of new structures occurs as a one-time waste generation event. Resident occupancy requires an on-going plan to manage waste disposal to meet the waste reduction goals established by the City and State. It should be noted that the Project proposes development of 122 dwelling units totaling 281,605 of building square footage.

## 6.1 Operational Solid Waste

The Project would include the construction and operation of 122 multi-family residential units. The analysis below utilizes a generation rate of 3.6 pounds/unit/day for multi-family residential uses, based on CalRecycle solid waste generation rates. (CalRecycle, n.d.) Approximately 80.18 tons of waste would be generated per year by the Project's residential uses, as calculated below.

*Residential Waste Calculation:*

$$122\ units \times \frac{3.6\ lbs/unit}{Day} \times \frac{365\ days}{year} \times \frac{.0005\ tons}{lb} = 80.15 \text{ tons per year}$$

Each dwelling unit proposed as part of the Project would be provided with a waste bin, organics bin, and a recycling bin, which would be stored in the garage of each unit, and would be serviced by waste and recycling collection service, as stated in the City of San Diego Recycling Ordinance.

## 6.2 Change in Waste Generation Compared to Existing Conditions

Under existing conditions, the Project site consists of commercial office uses and generates approximately 8.2 tons of waste per year, based on CalRecycle solid waste generation rates. The Project would result in a net increase in 71.95 tons of waste per year compared to existing conditions. In accordance with AB 939 and City Municipal Code Chapter 6, Article 6, Division 7, the Project would be required to divert approximately 50% of operation-related waste from the landfill. Thus, approximately 40.07 tons of waste would be disposed in the landfill and approximately 40.07 tons of waste would be diverted from the landfill.

## 6.3 Waste Reduction, Recycling, and Diversion Measures

On-site recycling services shall be provided to the Project. Residents of the Project that receive solid waste collection service shall participate in a recycling program by separating recyclable materials from other solid waste and depositing the recyclable materials in the recycling container provided for each resident. Recycling services are required by Chapter 6, Article 6, Division 7 of the City of San Diego Municipal Code.
Based on current requirements, these services shall include the following:

- Collection of plastic bottles and jars, paper, newspaper, metal containers, cardboard, and glass containers;
- Collection of other recyclable materials for which markets exist, such as scrap metal, wood pallets;
- Collection of food waste for recycling by composting, where available (prior to issuance of building and occupancy permits, the Project proponent will meet with representatives from ESD to ensure that their educational materials and haulers can comply with the requirements for this service);
- Use of recycling receptacles or containers that comply with the standards in the Container and Signage Guidelines established by ESD;
- Designated recycling collection and storage areas;
- Signage on all recycling receptacles, containers, chutes, and/or enclosures in compliance with the standards described in the Container and Signage Guidelines established by ESD.

As required by Sections 66.0706 and 66.0707 of the City's Municipal Code, the Homeowner's Association or other designated personnel shall ensure that occupants are educated about the recycling services as follows:

- Information, including the types of recyclable materials accepted, the location of recycling containers, and the occupants' responsibility to recycle shall be distributed to all occupants annually;
- All residents shall be given information and instructions upon occupancy; and
- All residents shall be given information and instructions upon any change in recycling service to the Project area.

### 6.4 Landscaping, Green Waste, and Organics Recycling

Plant material selection shall be guided by the Project's Landscape Plan, submitted for City review and approval. Landscape maintenance shall include the collection of green waste and disposal of green waste at recycling centers that accept green waste. This will help further reduce the waste generated by the Project during the occupancy phase.

The Project is subject to comply with SB 1383 and the City of San Diego's Organic Waste Recycling Program. Residences will be required to collect food scraps, food-soiled paper, and yard trimmings in compliance with the City's Recycling Ordinance.

## 7.0 CONCLUSION

The City of San Diego Development Services Department is requiring that this preliminary WMP be prepared and submitted to the City of San Diego's ESD because the Project exceeds the significance thresholds for solid waste disposal. Because the Project is in the Site Plan phase, this is only a preliminary plan, which specifies the intent to meet the requirements and goals of the Public Resources Code and City plans and ordinances.

To ensure impacts are mitigated to below a level of significance, the Project Applicant has prepared this WMP which explains and provides directions as to how to appropriately implement salvage and recycling activities for the Project. This WMP shall be implemented to the fullest degree of accuracy and efficiency. Additionally, the Project would be required to adhere to the CALGreen Code and City ordinances, including the Construction and Demolition Debris Diversion Deposit Program, the City's Recycling Ordinance, and the Refuse and Recyclable Materials Storages Regulations. The WMP for the Project is designed to implement and adhere to all City ordinances and regulations with regard to waste management.

# 8.0 WASTE REDUCTION, RECYCLING, AND DIVERSION MEASURES

The following measures are proposed to mitigate the Project's cumulative solid waste impacts to below a level of significance.

1. Prior to initiation of any grading or construction activities, the Applicant shall designate one person or agency connected with the Project to act as Solid Waste Management Coordinator. The Solid Waste Management Coordinator's responsibility is to work with all contractors and subcontractors to ensure material separation and coordination proper disposal and diversion of waste generated. The Solid Waste Management Coordinator will help ensure all diversion practices outlined in this WMP are upheld and communicate goals to all contractors involved efficiently. The responsibilities of the Solid Waste Management Coordinator, include, but are not limited to, the following:

    - Review the Solid Waste Management Plan;
    - Coordinate and oversee salvage operations;
    - Review and update procedures as needed for material separation and verify availability of containers and bins needed to avoid delays;
    - Review and update procedures for periodic solid waste collection and transportation to recycling and disposing facilities; and
    - The authority to stop work orders if proper procedures aren't being followed.

2. Prior to initiation of any grading or construction activities, the Solid Waste Coordinator shall conduct a Contractor Education Program presentation to ensure all Project personnel are trained regarding content and requirements of this WMP. The Solid Waste Coordinator shall ensure the following waste management procedures are implemented:

    - Solid Waste Management Coordinator shall be responsible for educating contractors and subcontractors regarding waste management plan requirements and ensuring that contractors and subcontractors carry out the measures described in the WMP.
    - Solid Waste Management Coordinator shall ensure ESD attendance at a pre-construction meeting and ensure compliance with segregation requirements, and verification of recycled content in base materials.
    - Recycling areas shall be clearly identified with large signs, approved by ESD, and sufficient amounts of material-specific bins shall be provided for necessary segregation.
    - Recycling bins shall be placed in areas that are readily accessible to contractors/subcontractors and in areas that will minimize misuse or contamination by employees and the public.

- Solid Waste Management Coordinator shall be responsible for ensuring that contamination rates in bins remain below 5 percent by weight of the bin.

3. The Project contractors shall perform daily inspections of the construction site to ensure compliance with the requirements of the WMP and all other applicable laws and ordinances. Daily inspections shall include verifying the availability and number of dumpsters based on the amount of debris being generated, correct labeling of dumpsters, proper sorting and segregation materials, and salvaging of excess materials. The Project contractors shall report the results of the daily site inspections to the Solid Waste Management Coordinator

4. Prior to the issuance of any construction permits, the Solid Waste Coordinator shall ensure ESD's attendance at a pre-construction meeting. The Solid Waste Coordinator shall ensure that (1) the proposed approach to contractor education is approved, (2) the written specifications for base materials, concrete pavers, decomposed granite, and mulch are approved, (3) the C&D Ordinance deposit has been paid, (4) an appropriate diversion rate (from the Waste Management Plan) has been included on all construction permits and documents, including the C&D deposit form, and (5) that the ESD inspector approves the separate waste containers, signage, and hauling contract(s) for the following materials:

    - Concrete
    - Polystyrene
    - Roofing and exterior scrap metals
    - Cardboard
    - Trash

    The Project will achieve the 75 percent goal of construction waste to be diverted and/or recycled. The Project shall implement environmentally sound waste management by salvaging material such as steep, copper, other metals, and equipment; and reusing material such as concrete, steel, and asphalt. The Project shall recycle, salvage, and reuse materials and then divert materials to a landfill. These bins shall be clearly labeled, located in areas to avoid contamination, and regularly inspected by the Solid Waste Management Coordinator to remove contaminates. These materials will be either reused in the building construction process, or taken to designated recycling facilities which have been certified by the City of San Diego and have a diversion rate of 100%.

5. Prior to the issuance of any building permit, the Mitigation Monitoring Coordinator (MMC) shall verify that all of the requirements of the Refuse and Recyclable Materials Storage Regulations and all of the requirements of the Waste Management Plan are shown and noted on the appropriate construction documents. All requirements, notes, and graphics shall be in substantial conformance with the conditions and exhibits of the associated discretionary approval.

    - The construction documents shall include a Waste Management Plan. Notification shall be sent to the following:

MMC Environmental Review Specialist Development Services Department
9601 Ridgehaven Court
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6. Prior to the issuance of building permits, the Project Applicant shall be required to submit written evidence to the MMC that the final Construction Report has been approved by the MMC and the (ESD). The Construction Report will be required to include the following information:

    - The actual construction waste generated and diverted from the Project;
    - The construction waste reduction percentage achieved; and
    - How the construction waste reduction percentage goal was achieved.

7. Prior to the issuance of building permits, the Project Applicant shall provide evidence to a representative of the City's ESD that the following measures as described in this report have been successfully implemented:

    - Adequate storage area has been provided as consistent with the City's Storage Ordinance, as modified with the Project's requested incentive,
    - Hauler(s) has been retained to provide recyclable materials collection, and
    - Education materials for building residents/owners have been prepared as required per the City's Recycling Ordinance.

With implementation of the above-listed mitigation measures, impacts are mitigated to a level considered less that significant. The following Table 4, *Calculated Diversion Rate*, summarizes the waste impacts and the waste reduction goals for each project phase.

**Table 4 Calculated Diversion Rate**

| Phase/Type | Estimated Tons Generated | Handling | Diversion Rate | Estimated Tons Diverted | Estimated Tons Disposed |
|---|---|---|---|---|---|
| **Demolition:** | | | | | |
| Mixed Demolition Waste Per Table 2 | 4,267.26 | Facilities Identified Per Material in Table 2 | 76.9% | 3,866.55 | 400.71 |
| **Construction:** | | | | | |
| New Construction Per Table 3 | 422.41 | Source Separation/Recycling as Identified per Material in Table 3 | 83.1% | 382.28 | 40.13 |
| | | | | | |
| **Occupancy:** | | | | | |
| Net Solid Waste Generation | 80.15 | Compliance with Recycling Ordinance | 50% | 40.07 | 40.07 |
| **Total for Occupancy Phase:** | 80.15 | | **50%** | 40.07 | 40.07 |

# 9.0 REFERENCES


| ***Cited As:*** | ***Citation:*** |
|---|---|
| (CalRecycle, 2018a) | CalRecycle, 2018. *History of California Solid Waste Law, 1985-1989* (website). July 27, 2018. Accessed December 1, 2020. Available online: http://www.calrecycle.ca.gov/laws/legislation/calhist/1985to1989.htm. |
| (CalRecycle, 2018b) | CalRecycle, 2018. *History of California Solid Waste Law, 1990-1994* (website). July 27, 2018. Accessed December 1, 2020. Available online: http://www.calrecycle.ca.gov/Laws/Legislation/calhist/1990to1994.htm. |
| (CalRecycle, n.d.) | CalRecycle, n.d. *Estimated Solid Waste Generation Rates* (website). Accessed July 23, 2025. Available online. https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates |
| (City of San Diego, 2009) | City of San Diego. 2009. *Article 2: General Development Regulations, Division 8: Refuse and Recyclable Materials Storage Regulations*. December 2009. December 1, 2020. Available online: https://docs.sandiego.gov/municode/MuniCodeChapter14/Ch14Art02Division08.pdf. |
| (City of San Diego, 2013) | City of San Diego. 2013. *California Environmental Quality Act Guidelines for a Waste Management Plan*. June 2013. August 12, 2021. Available online: https://www.sandiego.gov/sites/default/files/legacy/environmental-services/pdf/recycling/wmpguidelines.pdf |
| (City of San Diego, 2016a) | City of San Diego. 2016. *Article 6: Collection, Transportation and Disposal of Refuse and Solid Waste, Division 6: Construction and Demolition Debris Diversion Deposit Program*. September 2016. Accessed: December 1, 2020. Available online: https://docs.sandiego.gov/municode/MuniCodeChapter06/Ch06Art06Division06.pdf. |
| (City of San Diego, 2016b) | City of San Diego. 2016. *City of San Diego Construction & Demolition (C&D) Debris Conversion Rate Table.* June 6, 2016. Available online: |

https://www.sandiego.gov/sites/default/files/material_conversion_table_6.8.16_0.xls.

(City of San Diego, 2018) City of San Diego. 2018. *Article 6: Collection, Transportation and Disposal of Refuse and Solid Waste, Division 7: Recycling Ordinance*. March 2018. Accessed: December 1, 2020. Available online: https://docs.sandiego.gov/municode/MuniCodeChapter06/Ch06Art06Division07.pdf.

(City of San Diego, 2025) City of San Diego, 2025. *2025 Certified Construction & Demolition (C&D) Recycling Facility Directory*. July 2025. Accessed: July 24, 2025. Available online: https://www.sandiego.gov/sites/default/files/certified-cd-recycling-facility-directory.pdf.