Initial Study

7th Standard Marketplace Project

Prepared For

City of Bakersfield
1715 Chester Avenue
Bakersfield, CA 93301
661-326-3733

Prepared By

Kimley-Horn and Associates, Inc.
1100 W Town and Country Road, Suite 700
Orange, CA 92868
714-939-1030

August 2026

TABLE OF CONTENTS

INITIAL STUDY 2
ENVIRONMENTAL ANALYSIS 2
ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED 2
EVALUATION OF ENVIRONMENTAL IMPACTS: 3
ENVIRONMENTAL CHECKLIST AND ANALYSIS 5
I. AESTHETICS 5
II. AGRICULTURE AND FORESTRY RESOURCES 7
III. AIR QUALITY 9
IV. BIOLOGICAL RESOURCES 10
V. CULTURAL RESOURCES 12
VI. ENERGY 14
VII. GEOLOGY AND SOILS 15
VIII. GREENHOUSE GAS EMISSIONS 19
IX. HAZARDS AND HAZARDOUS MATERIALS 20
X. HYDROLOGY AND WATER QUALITY 23
XI. LAND USE AND PLANNING 26
XII. MINERAL RESOURCES 28
XIII. NOISE 29
XIV. POPULATION AND HOUSING 31
XV. PUBLIC SERVICES 32
XVI. RECREATION 34
XVII. TRANSPORTATION 35
XVIII. TRIBAL CULTURAL RESOURCES 37
XIX. UTILITIES AND SERVICE SYSTEMS 39
XX. WILDFIRE 41
XXI. MANDATORY FINDINGS OF SIGNIFICANCE 42
REFERENCES 44

INITIAL STUDY

ENVIRONMENTAL ANALYSIS

1.0 PROJECT TITLE:	7th Standard Marketplace Project Planned Development Review (PDR) No. 25-0022 Vesting Tentative Parcel Map (VTPM) No. 12633
2.0 LEAD AGENCY:	City of Bakersfield Development Services Department 1715 Chester Avenue Bakersfield, CA 93301
3.0 CONTACT PERSON:	Louis Ramirez Associate Planner 661-326-3023
4.0 PROJECT LOCATION:	Southwest corner of the 7th Standard Road and Calloway Drive intersection (APN: 492-060-12)
5.0 APPLICANT:	Halferty Development Company, LLC 199 South Los Robles Avenue #840, Pasadena, CA 91101
6.0 GENERAL PLAN DESIGNATION:	General Commercial (GC)
7.0 ZONING:	Regional Commercial/ Planned Commercial Development Combining (C-2/PCD)

8.0 DESCRIPTION OF PROJECT:

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

The 7th Standard Marketplace Project ("Project" or "Marketplace") proposes to construct and operate approximately 225,365 SF of commercial uses at a 0.15 floor area ratio (FAR), as depicted in **Figure 1: Preliminary Development Plan** and summarized in **Table 1: Marketplace Land Use Summary**. The Project site would be subdivided into 11 parcels and developed with commercial uses including one automated car wash, four restaurants with drive-throughs, one financial institution with a drive-through, retail and restaurant space, a major anchor store, a fuel facility, and a 2.39-acre drainage basin. Additionally, the Project proposes a surface parking lot with approximately 1,369 surface parking spaces, and hardscape and landscape improvements throughout the site.

Table 1: Marketplace Land Use Summary

Land Use	Parcel and Building Number[1,2]	Parcel Area (Gross Acre)[1]	Floor Area (Square Feet)[2]
Car Wash	1	1.20	4,874
Financial Institution, with Drive-Through	2	1.78	3,500
Retail	3	1.42	6,815
Restaurant, with Drive-Through	4	1.24	2,115
Restaurant, with Drive-Through	5	1.43	2,300
Restaurant, with Drive-Through	6	1.25	4,298
Retail	7	0.83	6,000
Restaurant	7	0.83	6,000
Restaurant, with Drive-Through	8	1.92	4,857
Major Anchor Store	9	20.83	184,478
Fuel Facility (Mechanical Kiosk)[3]	10	1.87	128
Drainage Basin	11 / NA	2.52	N/A
Total	**11**	**36.29**	**225,365**

Sources/Notes:

1. Landmark. (March 2026). *VTPM No. 12633.*
2. MMA Architecture. (March 2026). *7th Standard Marketplace Site Plan.*
3. Fuel facility canopy area is approximately 11,655 SF and is excluded from total floor area calculation as it is not an enclosed structure.

Figure 1: Preliminary Development Plan



Source: MMA, Site Plan, July 2026.

Figure 1: Preliminary Development Plan
7th Standard Marketplace Project

Not to scale.

Kimley»Horn

BUILDING DESIGN

The Marketplace's proposed overall architectural style, modern contemporary, incorporates design elements intended to meet the requirements of the Bakersfield Municipal Code (BMC) §§17.24.050 to 17.24.110, which establish the City's C-2 Zone development standards, and BMC §17.08.140, which establishes the City's design standards for retail commercial developments. It is anticipated that the Project will comply with all applicable design and development standards; however, the Project includes an application for approval of exceptions to certain standards to allow for variation within the parameters of BMC §17.54.060: Latitude of Regulations.

In accordance with BMC §17.08.140.D.3, each building in the Marketplace would include prominent modern contemporary architectural characteristics which would be shared by all buildings to form a cohesive sense of place. The Marketplace's color and materials palette would provide a contrast between the charcoal grey metal paneling and stucco finishes, as well as the fiber cement siding in various wood textures and tones. In accordance with BMC §17.08.140.D.7, Buildings 1 through 9 would not include finished exterior building materials such as smooth-faced concrete block or tilt-up concrete panels as major components (i.e., more than 50 percent) of each façade or exterior wall. Building 10 proposes a fuel canopy and kiosk comprised of only metal panels. All Buildings would incorporate prefabricated steel panels to reflect a contemporary look. Building 10 would also include rooftop solar panels.

SITE LAYOUT

In accordance with BMC §17.08.140.F.2, parking lots surrounding Buildings 1 through 8 have been divided into sections of 200 spaces or less by integrating internal pedestrian walkways, buildings, or landscaped areas. Additionally, the parking lots surrounding Buildings 9 generally conform with this requirement and provide access to internal pedestrian walkways and landscape for every 200 spaces throughout most of the parking lot. The parking area immediately north of the loading dock is used to accommodate the movement of large vehicles and would function primarily as employee parking. Employee parking does not include cart corrals or pedestrian enhancements because the frequency of use is much lower than the areas designated for members. Additionally, given this area is located furthest from Building 9's customer entrance and is the least desired on-site parking for members, Building 9's business management would direct employees to park in this area.

Areas for bicycle parking would be provided throughout the Marketplace and would not interfere with pedestrian walkways. Drive-through pads fronting 7th Standard Road and retail shops at the rear side of the Marketplace would be capped with raised corner elements finished with composite wood as well as a plaza area for community gatherings. These enhancements would accentuate the main entrance off 7th Standard Road, providing a welcoming environment.

Outdoor spaces are designed to respond to the unique placement and orientation of the buildings in the Marketplace. Trash enclosures and transformers are also designed and located to avoid creating distractions from the overall shopping center experience. Building 10 would include two enclosed trash compactors located along the southwest portion of the building. The enclosed trash compactors would be screened from public view and secured to prevent public access to materials or debris.

As discussed in the *Landscaping* section, landscaping and a 12-foot-high masonry wall are proposed along the Project site's southern and western site boundaries near the loading docks, compactors, and

transformer. Additionally, two 13.5-foot masonry screening walls would be located at the western edge of the northern and southern loading docks, and bay doors would be equipped with sealed gaskets. These features are intended to attenuate noise and provide visual screening of store operations from adjacent properties and public areas. Additionally, the approximately 2.4-acre drainage basin, which would include enhanced landscaping, would provide an approximately 150-foot setback from the residentially zoned property to the south. The basin, enhanced landscaping, setback, and proposed masonry wall would serve as a buffer zone between the residential uses to the south and the Marketplace operations to attenuate noise and provide visual screening, while improving aesthetics.

Landscaping and planting elements that are drought-tolerant would be provided to activate the premises around the building and provide users with direct physical connections to the building and street with corner monument signs, screen planting, and shade trees to enhance connectivity to pedestrian travel, see *Landscaping* section below. In accordance with BMC §17.08.140.G.2, the Marketplace includes continuous internal pedestrian walkways which connect public sidewalks from 7th Standard Road and Calloway Drive to the principal customer entrances of all buildings and link buildings in the Marketplace. The pedestrian walkways feature adjoining landscaped areas. Additionally, internal pedestrian crossings and walkways would be clearly distinguished from driving surfaces using scored concrete to enhance pedestrian safety and comfort, as well as the attractiveness of the walkways in accordance with BMC §17.08.140.G.4.

OPERATIONS

Building 1 would be an automated car wash that includes an approximately 750 square foot office area and associated outdoor vacuum facilities. Building 2 would consist of a financial institution with a drive-through window. Building 3 would accommodate a single-tenant retail use. Buildings 4, 5, 6, and 8 would be single-tenant restaurant uses with drive-through service, including a 24-hour drive-through window at Building 6. Building 7 would include a multi-tenant retail and restaurant building with an approximately 1,800 SF outdoor patio area. Transformers and trash enclosures would be located in proximity to each building.

Building 9, the major anchor store, would be a membership warehouse business (i.e., Costco Warehouse), which would include a variety of integrated elements, such as a general merchandise sales floor including appliances, grocery, meat department, bakery, liquor sales, optical and hearing centers, food court, pharmacy, tire center, and associated loading, storage, and delivery facilities. A tire center would be located along Building 9's eastern façade and the loading, storage, and delivery facilities would be located on the west side of the building. Building 9 delivery facilities would accommodate receiving, storage, and shipping of large items, such as furniture, appliances, patio furniture, televisions, fitness equipment, mattresses, and grills, purchased either in-store or online. Building 9 includes 16 loading docks located on the north and south sides of the building's western portion.

Building 10 would be a members-only fuel facility which would include an approximately 11,655-square-foot canopy, a mechanical kiosk, three 40,000-gallon underground gasoline storage tanks, one 30,000-gallon underground diesel storage tank, and one 3,500-gallon split-additive underground storage tank. Sixteen dispensers, each equipped with dual-sided hoses, would provide a total of 32 fueling positions. The facility will operate as a self-service station with a roaming attendant on site during all operating hours to oversee fueling operations, maintain equipment, and assist members. The fuel facility's canopy would

be equipped with flat-lens lighting fixtures designed to minimize glare and light spill onto adjacent properties and roadways. Vehicle circulation within the fuel facility would be oriented internally to shield headlights from spilling over onto Calloway Drive and nearby properties.

CIRCULATION AND PARKING

The Marketplace's onsite and offsite circulation improvements are summarized below.

Offsite Circulation

The Project site is fronted by 7th Standard Road along the north and Calloway Drive along the east. Along 7th Standard Road, access would be provided by three right-in/right-out driveways. Along Calloway Drive, access would be provided by two right-in/right-out driveways and a full-access signalized intersection. See also Offsite Improvements section below.

Onsite Circulation

Onsite ADA accessible paths would be provided throughout the Project site providing internal connections between buildings, between parking lots and buildings, and connecting the overall development to the public rights-of-way. As discussed above, pedestrian path of travel would flow throughout the Marketplace connecting the northern and southern portions of the Project site, supporting pedestrian connectivity.

Onsite vehicle access throughout the Project site would be provided via an internal network of drive aisles and parking aisles. Access to and from the northern portion of the Project site would be provided via three drive aisles from the three 7th Standard Road site driveways and two additional drive aisles. These five north/south drive aisles would provide localized access to the small parking lots of the retail pads in the site's northern portion and connect to an east/west drive aisle along the northern perimeter of the major anchor store with fuel facility parking field. The east/west drive aisle would span the full width of the site from a right-in/right-out driveway on Calloway Drive to the western north/south drive aisle, further providing access to multiple major anchor store parking aisles. Access from the Calloway Drive signalized site access would be provided internally via a channelized throat to an internal T-intersection so as not to direct traffic directly at the major anchor store's building entrance, which would experience substantial pedestrian activity, and to direct fuel facility traffic efficiently toward the facility. Onsite access to the fuel facility would be located away from the major anchor store's entrance to further separate heavy vehicular traffic from busy pedestrian areas.

Onsite truck access would be provided for the major anchor store via an east/west drive aisle along the southern perimeter of the major anchor store portion of the site. Fuel truck access to the fuel facility would be provided via that southern east/west drive aisle, the north/south drive aisle adjacent to the fuel facility, and the drive aisle to/from the Calloway Drive signalized access. Truck access to the northern retail pads would be provided via the three north/south drive aisles in that portion of the site connecting to the 7th Standard Road access; see **Figure 1**.

Parking

Table 2: Marketplace Parking identifies the off-street parking spaces required pursuant to BMC Chapter 17.58 standards. The Marketplace requires a minimum of 884 off-street parking spaces. In total, the Marketplace would provide 1,369 off-street parking spaces (including accessible spaces, electric vehicle

charging station (EVCS) spaces, and EV capable spaces), providing 485 more parking spaces than the minimum required pursuant to BMC standards. Additionally, shopping cart corrals would be installed and distributed in the parking area serving Building 9.

Table 2: Marketplace Parking

Project Land Use	Building Number1	Gross Floor Area (GFA)1	BMC Parking Standard	Parking Required (Spaces)
Carwash (Automated)	1	4,124	For uses not listed in the parking space requirements table (e.g., car wash), parking will be determined by the Planning Director based on the listed use(s) that most closely resembles the proposed use (BMC §17.58.110.D). The following is assumed: • BMC §17.58.110.E.41 (Automated Equipment Building): No parking required	3
Carwash (Automated)	1	750	BMC §17.58.110.E.5 (General Office) • 1 space per 250 SF of GFA	3
Financial Institution	2	3,500	BMC §17.58.110.E.15 (Bank): • 1 space per 300 SF of GFA; and • If use has 1 or more drive-up windows with drive-in lanes 24 feet in length, credit for 1 parking space per window	12 minus 2
Retail	3	6,815	BMC §17.58.110.E.12 (General Retail, Single Tenant): • 1 space per 300 SF of GFA	23
Retail	7	12,000	BMC §17.58.110.E.10 (Neighborhood and Regional Shopping Center): • 1 space per 200 SF of GFA up to and including 35,000 SF	60
Restaurants	4, 5, 6, 8	13,570	BMC §17.58.110.E.12 (Fast Food Restaurant): • 1 parking space per 75 SF of GFA (no additional parking is required for outdoor seating); and • If use has 1 or more drive-up windows with drive-in lanes 24 feet in length, credit for 1 parking space per window	182 minus 8
Major Anchor Store	9	184,478	BMC §17.58.110.E.12 (General Retail, Single Tenant): • 1 space per 300 SF of GFA	613
Fuel Facility (mechanical Kiosk)	10	128	BMC §17.58.110.E.5 (General Office): • 1 parking space per 250 SF of GFA	1
Total	--	**225,365**	--	**884**

Sources/Notes:
GFA = gross floor area; SF = square feet
1. MMA Architecture. (March 2026). 7th Standard Marketplace Preliminary Development Plan.
2. BMC §17.58.040, parking computations are based on the gross floor area of entire buildings and structures, unless otherwise stated.

SIGNAGE

One free-standing pylon sign and four monument signs would be located along the Project site's 7th Standard Road frontage. One additional freestanding pylon sign would be located along the Project site's Calloway Drive frontage. One monument sign would be located at the Project site's northeast corner. Additionally, each building would include wall-mounted signage.

LANDSCAPING

The Project includes landscaping pursuant to the requirements of BMC Chapter 17.61: Landscape Standards. The Marketplace's landscaping would include a variety of evergreen and deciduous trees, shrubs, and groundcover planting primarily including coral aloe, fortnight lily, atlas fescue, breeze mate rush, deer grass, canyon prince wild, and dwarf rosemary, totaling approximately 288,641 sf of total landscape area. Along 7th Standard Road, enhanced landscaping within the 15-foot landscaped setback would include perimeter evergreen and deciduous trees and groundcover. Along Calloway Drive, evergreen and deciduous perimeter trees, groundcover, and a meandering sidewalk would be provided. All driveways would be landscaped with enhanced entry groundcover planting.

In accordance with BMC §17.58.050.N, a minimum 7-foot landscape strip is proposed along the full extent of the site's southern and western boundaries. The approximately 2.4-acre drainage basin, which would include enhanced landscaping, would provide an approximately 150-foot setback from the residentially zoned property to the south to the nearest drive aisles. The basin, enhanced landscaping, and setback would serve as a buffer zone between the residential uses to the south and the Marketplace operations. Additionally, along the western boundary, a 12-foot high, 800 linear foot long (as measured from the southwest corner), solid masonry wall is proposed along the southern segment of the western boundary. The remainder of the western boundary would include enhanced landscaping to provide visual screening from adjacent properties and public areas. Along the southern boundary, a 12-foot high, 330 linear foot long (as measured from the southwest corner), solid masonry wall is proposed along the western segment of the southern boundary. Similar to the western boundary, the remainder of the southern boundary would include enhanced landscaping to provide visual screening from adjacent properties and public areas.

The Marketplace's parking/community space, located east of the central driveway, would include enhanced paving, landscaping, and pergolas. The stormwater basin would be landscaped with bioretention planting materials to maximize infiltration. Landscaping throughout the Marketplace parking areas would consist of evergreen trees, providing 40 percent shade coverage. Internal pedestrian paths would be landscaped with evergreen and deciduous trees. All irrigation would be automatic and installed to provide 100 percent coverage for all planting areas. Irrigation water supply would be provided via a potable water connection, and a dedicated irrigation meter would be provided. Marketplace landscaping would comply with the City's Water Efficient Landscape Ordinance.

LIGHTING

The parking lot surrounding Buildings 1 through 8 would be illuminated with high efficiency LED fixtures affixed to light poles ranging from 15 to 25 feet in height. Downward facing wall-mounted sconces and LED wall mounts placed around the building exteriors to provide safety and security are proposed as well. Parking lot lighting would remain on to provide security and emergency lighting only along the main driveways.

The parking lot surrounding Buildings 9 and 10 would be illuminated with high efficiency LED fixtures affixed to light poles 36.5 feet in height. The Marketplace south and west perimeters would be illuminated with high efficiency LED fixtures affixed to 15-feet light poles in accordance with BMC §17.58.060.B.2. The fuel facility would have 41 lighting fixtures which are flat lens, canopy ceiling mounted LED fixtures. The fuel facility and parking lot lights would have astronomical timer controls to limit lighting after the

warehouse has closed, and most employees are gone. Parking lot lighting would remain on to provide security and emergency lighting only along the main driveways. Fuel facility lighting would have motion sensors for safety and security. Warehouse lighting fixtures would be downward facing wall-mounted LED fixtures, located approximately every 40 feet around the building exteriors to provide safety and security. Parking and site lighting proposes to incorporate the use of cutoff lenses to keep light from overflowing beyond the site boundaries.

All lighting systems would be designed to comply with the 2025 California Energy Code standards and City requirements outlined in BMC Chapter 17.71: Outdoor Lighting requirements.

GRADING

Onsite grading would be designed to balance earthwork cut and fill to the extent practical. Project grading would require approximately 17,892 cubic yards of cut and 76,193 cubic yards of fill; therefore, approximately 58,302 cubic yards of imported fill would be required. Project grading would be designed to applicable development standards and the Project-specific Geotechnical Report recommendations. Site grading design would conform with local and federal ADA requirements and provide the required accessible routes.

UTILITY INFRASTRUCTURE

The Project proposes onsite wet and dry utility improvements to provide service to the Marketplace by connecting to existing available utilities and the Project's proposed offsite utility improvements located within the Project site vicinity.

Wet Utilities

Existing wet utilities include a California Water Service Company (CalWater)-serviced water line located along the Project's eastern boundary on Calloway Drive and a North of the River Sanitary District (NORSD)-serviced sewer line connection point located at the intersection with Etchart Road (located approximately 2,480 feet south of the Project site).

Along 7th Standard Road, the Project would extend the existing CalWater water line along 7th Standard Road to provide water service to Buildings 2, 4, 6, and 8. Along Calloway Drive, the Project proposes to connect to the existing CalWater water line at the southeast corner of the site.

Along Calloway Drive, the Project would extend the existing NORSD sewer line along Calloway Drive to provide sewer service to the Marketplace. The Project proposes to connect to the proposed sewer line at the Project's northern and central entrance on Calloway Drive.

Dry Utilities

Existing dry utilities include a Pacific Gas and Electric (PG&E) major power transmission line, which extends along 7th Standard Road, and two PG&E poles and guy wire, located along Calloway Drive. Additionally, there are six existing natural gas and hazardous waste pipelines within 7th Standard Road and Calloway Drive, three within 7th Standard Road and three within Calloway Drive.

The existing major transmission line along the south side of 7th Standard Road would remain in place. All dry utility connections to serve the Marketplace would be located in Calloway Drive. Along Calloway Drive, the Marketplace's electrical service would connect to the existing PG&E line at Calloway Drive at the southernmost driveway to provide separate services to the major anchor store and the fuel facility.

The existing natural gas and hazardous waste pipelines within 7th Standard Road and Calloway Drive would remain in place. Along Calloway Drive, the Project would connect to the existing SoCalGas natural gas line at the central driveway to provide service to the major anchor store.

Storm Drainage

No storm drainage infrastructure exists in the Project vicinity. The Project would construct onsite stormwater infrastructure pursuant to the City's Municipal Storm Drain System Design and Construction Standards, as detailed in the Subdivision & Engineering Design Manual. Catch basins would be constructed along 7th Standard Road and Calloway Drive to direct flows from the roadway to the Project site's internal storm drains. Multiple internal storm drain lines would be provided throughout the site to direct flows towards an approximately 2.39-acre basin with a 6.5-acre-foot capacity at the southern boundary. The basin would be sized to accommodate the developed onsite storm runoff and the adjacent 7th Standard and Calloway roadway runoff as described above. The basin would provide permanent storm water quality treatment and retention volumes according to City and Regional Water Board requirements.

OFFSITE IMPROVEMENTS

The Project also proposes various offsite improvements, including right-of-way frontage, roadway, utility, and traffic improvements, on 11.3-acres along 7th Standard Road and Calloway Drive. These offsite improvements consist of new curb, gutter, sidewalks, landscaping, ADA ramps, streetlights, and fire hydrants, along with roadway widening to add bike lanes and additional travel lanes. Utility work includes relocation of dry utilities (only along Calloway Drive, as well as installation and extension of storm drains, water, and sewer lines. Additional offsite traffic improvements include a relocated signal at 7th Standard Road/Calloway Drive, a new signal at the Project's central driveway along Calloway Drive, and updated striping, signage, and pedestrian crossing features along the Project frontage, as well as minor roadway modifications in the Project study area.

CONSTRUCTION SCHEDULE

Project construction is anticipated to occur over approximately 15 months beginning in the fourth quarter of 2027 and ending in the beginning of the fourth quarter of 2028.

9.0 ENVIRONMENTAL SETTING

(Briefly describe the existing onsite conditions and surrounding land uses.)

LOCATION AND SETTING

The approximately 36-acre Project site is one parcel (Accessors Parcel Number [APN] 492-060-12), located at the southwest corner of the intersection of 7th Standard Road and Calloway Drive in northwest Bakersfield, and borders the City of Shafter ("Shafter") to the north, as depicted on **Figure 2: Local Vicinity Map**. Bakersfield is located in central Kern County ("County"), California. Bakersfield is generally east of Interstate 5 and bisected by State Route 99, as depicted on **Figure 3: Regional Vicinity Map**. Regional access to the Project site would be provided via State Route 99 (SR-99), located approximately 0.9-mile to the northeast.

The proposed Project site is undeveloped property that has historically been used for agricultural purposes. A retention basin and irrigation wellhead are located in the site's northwest corner. Aboveground utilities are located along the site's frontage of 7th Standard Road and Calloway Drive,

including a PG&E major transmission line that extends along 7th Standard Road and two PG&E guy poles and wire along Calloway Drive. Although oil production has occurred in the area, only one abandoned/plugged dry gas well exists in the northeast corner of the Project site.

The approximately 11.3-acres offsite improvement area encompasses portions of 7th Standard Road, which currently exists along the Project site northerly frontage as a five-lane roadway with paved shoulders on the north side, the signalized intersection of 7th Standard Road and Calloway Drive, portions of Calloway Drive, which currently exists along the Project site easterly frontage as a two-lane roadway with unpaved shoulders on both sides, and the unsignalized intersection of Calloway Drive and Etchart Road. Various aboveground and subsurface utilities are located within 7th Standard Road and Calloway Drive.

Land uses surrounding the Project site include 7th Standard Road to the north with single-family residential uses in Shafter north of 7th Standard Road and single-family residential uses in the County northeast of 7th Standard Road; single-family residential uses to the south; Calloway Drive to the east with vacant land east of Calloway Drive and single-family residential uses in the County southeast of Calloway Drive; and vacant land to the west; see **Figure 2: Local Vicinity Map**.

GENERAL PLAN LAND USE

The 2002 Metropolitan Bakersfield General Plan (General Plan) serves as the City's adopted comprehensive framework for guiding future development. The General Plan outlines goals and policies that inform land use decisions and ensure consistency with the City's long-term vision. The existing General Plan land use designations on the Project site and surrounding properties, including properties in Shafter and the County, are depicted in **Figure 4: Existing General Plan Land Use Designations**. and summarized in **Table 3: Existing General Plan Land Use Designations, Zoning, and Land Uses.** The Project site's land use designation is General Commercial (GC), which is intended for "retail and service facilities providing a broad range of goods and services which serve the day-to-day needs of nearby residents" (**Figure 4** The GC designation allows a maximum floor area ratio (FAR) of 1.0 and a maximum height of four stories.

As depicted in **Figure 4** and identified in **Table 3**, the properties bordering the Project site are designated Gossamer Grove Specific Plan to the north (in Shafter), Suburban Residential to the northeast (in the County), Suburban Residential (SR) to the south and west, Low Density Residential (LR) to the east, and Estate Residential (in the County) to the southeast.

ZONING

The existing zoning on the Project site and surrounding properties is depicted in **Figure 5: Existing Zoning** and summarized in **Table 3**. As depicted in **Figure 5**, the Project site is zoned Regional Commercial and Planned Commercial Development (C-2/PCD), which is a combining zone. Requirements and development standards for these zones are addressed in BMC Chapters 17.24 and 17.54, respectively. The purpose of the PCD Zone is to allow for innovative design and diversification in the relationship of various uses, buildings, structures, lot sizes, and open spaces while ensuring compliance with the General Plan and BMC §17.54.010). The Project site's PCD zoning is used as a combining zone, where the C-2 zone is considered the base zone which defines allowable uses. The purpose of the C-2 zone is to permit the development of concentrated large-scale retail operations providing a broad range of goods and services, which serve the

metropolitan market area (BMC §17.24.010). The C-2 Zone development standards are provided in BMC §§17.24.050 to 17.24.110 and §17.08.140, and uses permitted are identified in BMC §17.24.020.

As depicted in **Figure 5** and summarized in **Table 3**, the properties bordering the site are zoned Gossamer Grove Specific Plan: Planning Area 2 (Estate Residential) to the north (in Shafter), Estate .5 Acres, Residential Suburban Combining to the northeast (in the County), Estate One Family Dwelling (E) to the south and west, Mixed Use Transit (MX-2) to the east, and Exclusive Agriculture (A) (in the County) to the southeast **Figure 5.**

Table 3: Existing General Plan Land Use Designations, Zoning, and Land Uses

Location	Jurisdiction	Land Use Designation	Zoning	Existing Land Use[1]
Project Site	Bakersfield[2]	General Commercial[2]	C-2/PCD (Regional Commercial/Planned Commercial Development)[3]	Agriculture
North	Shafter[4]	Gossamer Grove Specific Plan[4,5]	Gossamer Grove Specific Plan: Planning Area 2 (Estate Residential)[5]	Single-Family Residential
Northeast	Kern	Suburban Residential[6]	E(1/2) RS (Estate .5 Acres, Residential Suburban Combining) [6]	Single-Family Residential
South	Bakersfield[2]	Suburban Residential (≤ 4 DU/net acre)[2]	E (Estate One Family Dwelling)[3]	Single-Family Residential
Southeast	Kern[2,6]	Estate Residential [2, 6]	A (Exclusive Agriculture)[6]	Single-Family Residential
East	Bakersfield[2]	Low Density Residential (≤ 7.26 DU/net acre)[2]	MX-2 (Mixed Use Transit)[3]	Agriculture
West	Bakersfield[2]	Suburban Residential (≤ 4 DU/net acre)[2]	E (Estate One Family Dwelling)[3]	Agriculture

Sources and Notes:
DU = dwelling unit

1. NearMaps. (2025). *Aerial Imagery, Bakersfield, CA*. Retrieved from: https://apps.nearmap.com. Accessed August 2026.
2. City of Bakersfield. (May 2024). *Metropolitan Bakersfield General Plan City of Bakersfield and County of Kern General Plan Land Use Map*. Retrieved from: https://docs.bakersfieldcity.us/WebLink/DocView.aspx?id=1483728&dbid=0&repo=CITYRECORDS. Accessed August 2026.
3. City of Bakersfield. (March 2025). *Official Zoning Map of the City of Bakersfield*. Retrieved from: https://docs.bakersfieldcity.us/WebLink/DocView.aspx?id=1574130&dbid=0&repo=CITYRECORDS. Accessed August 2026.
4. City of Shafter. (February 2022). *Land Use - Zoning Map*. Retrieved from: https://gis.shafter.com/portal/apps/mapviewer/index.html?webmap=b77cf197556b400db0b2def14494f93b. Accessed August 2026.
5. City of Shafter. (2018). *Gossamer Grove Specific Plan, Figure 3-1: Land Use Plan.* Retrieved from: https://www.shafter.com/DocumentCenter/View/5750/Gossamer-Grove-Specific-Plan---Approved-062023. Accessed August 2026.
6. County of Kern. (2024). *Kern County Interactive GIS Mapping, Planning: County Zoning Layer*. Retrieved from: https://maps.kerncounty.com/H5/index.html?viewer=KCPublic. Accessed August 2026.

Figure 2: Local Vicinity Map



Figure 3: Regional Vicinity Map

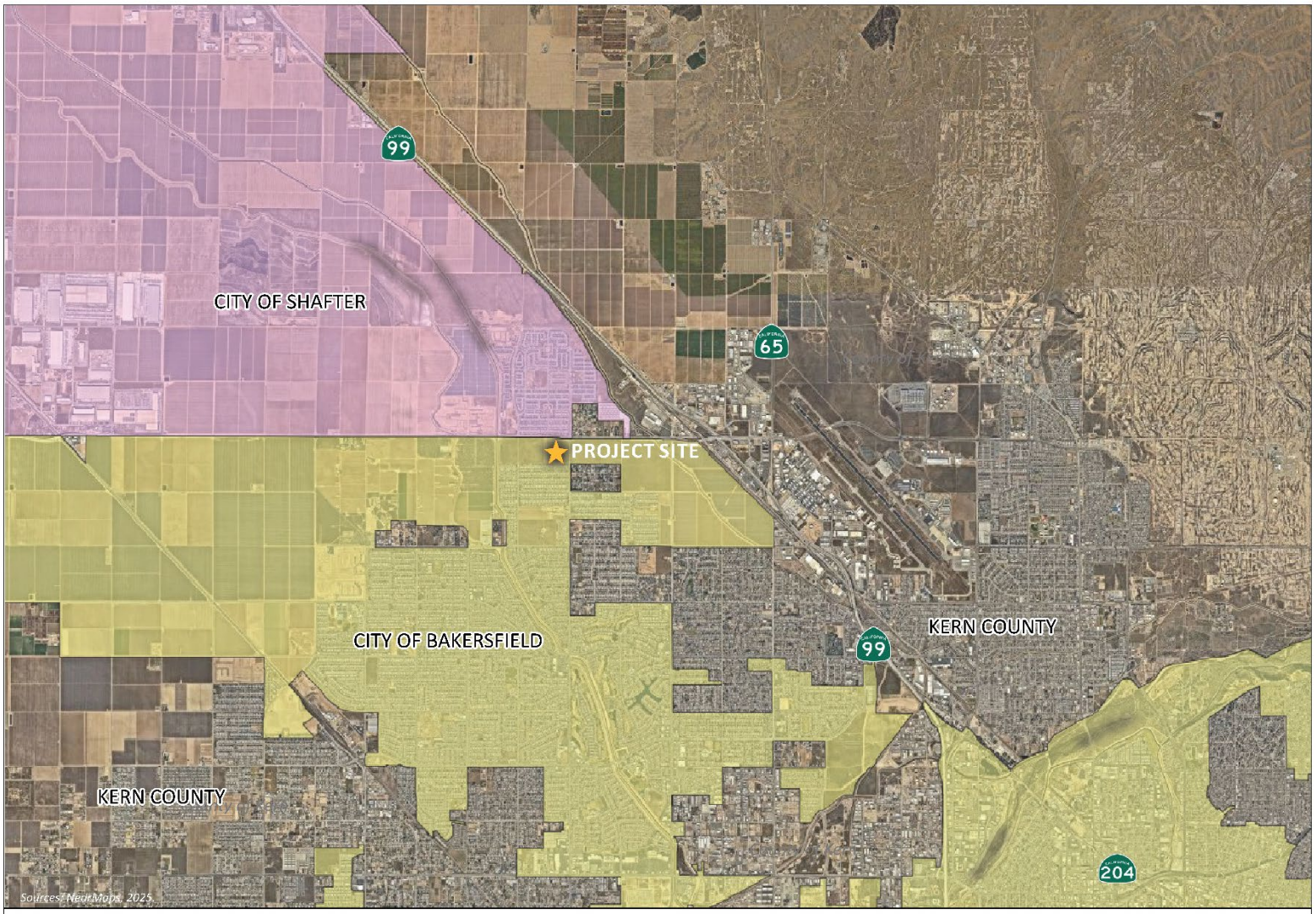


Figure 4: Existing General Plan Land Use Designations

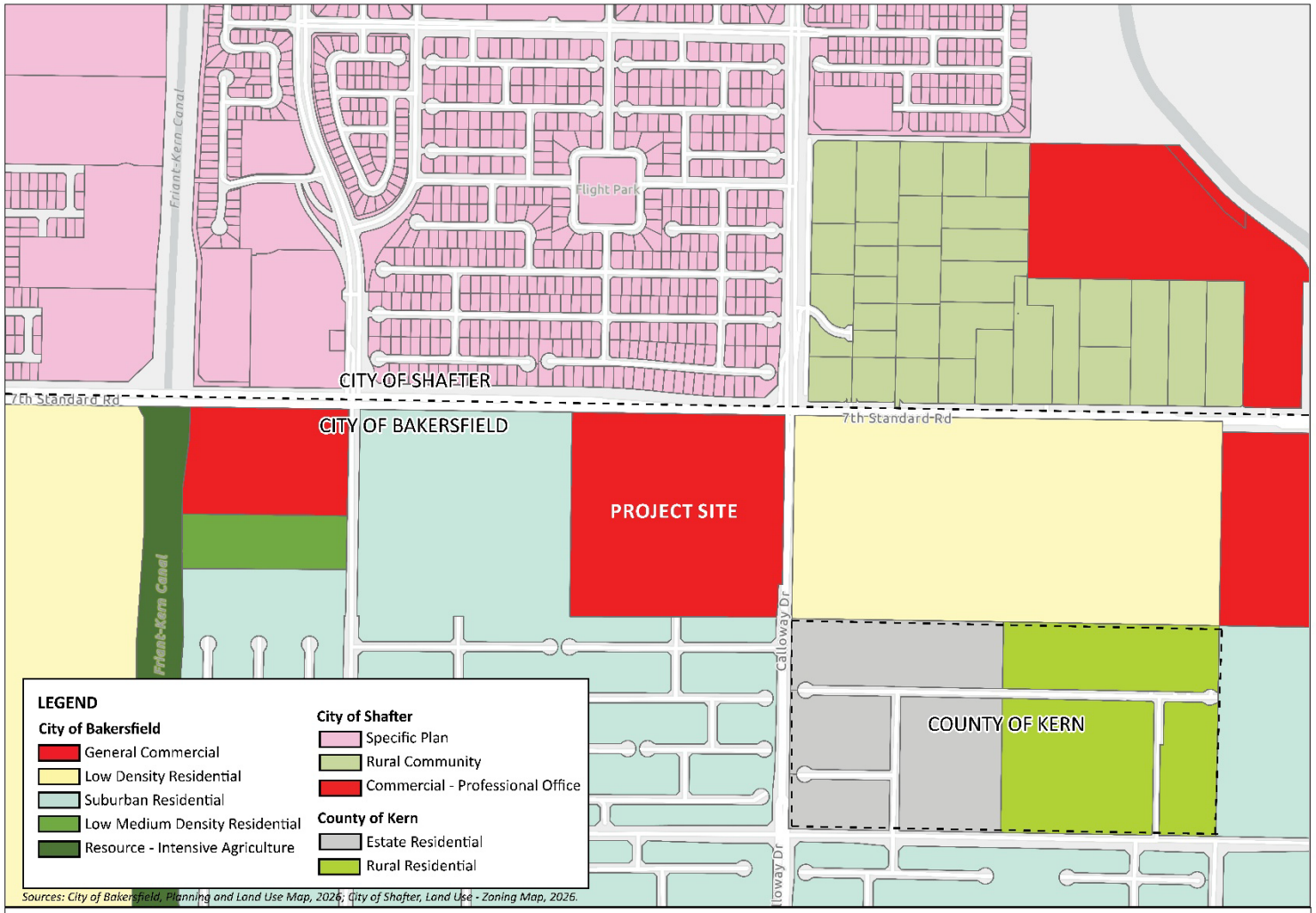


Figure 4: Existing General Plan Land Use Designations
7th Standard Marketplace Project

Not to scale.

Kimley»Horn

Figure 5: Existing Zoning

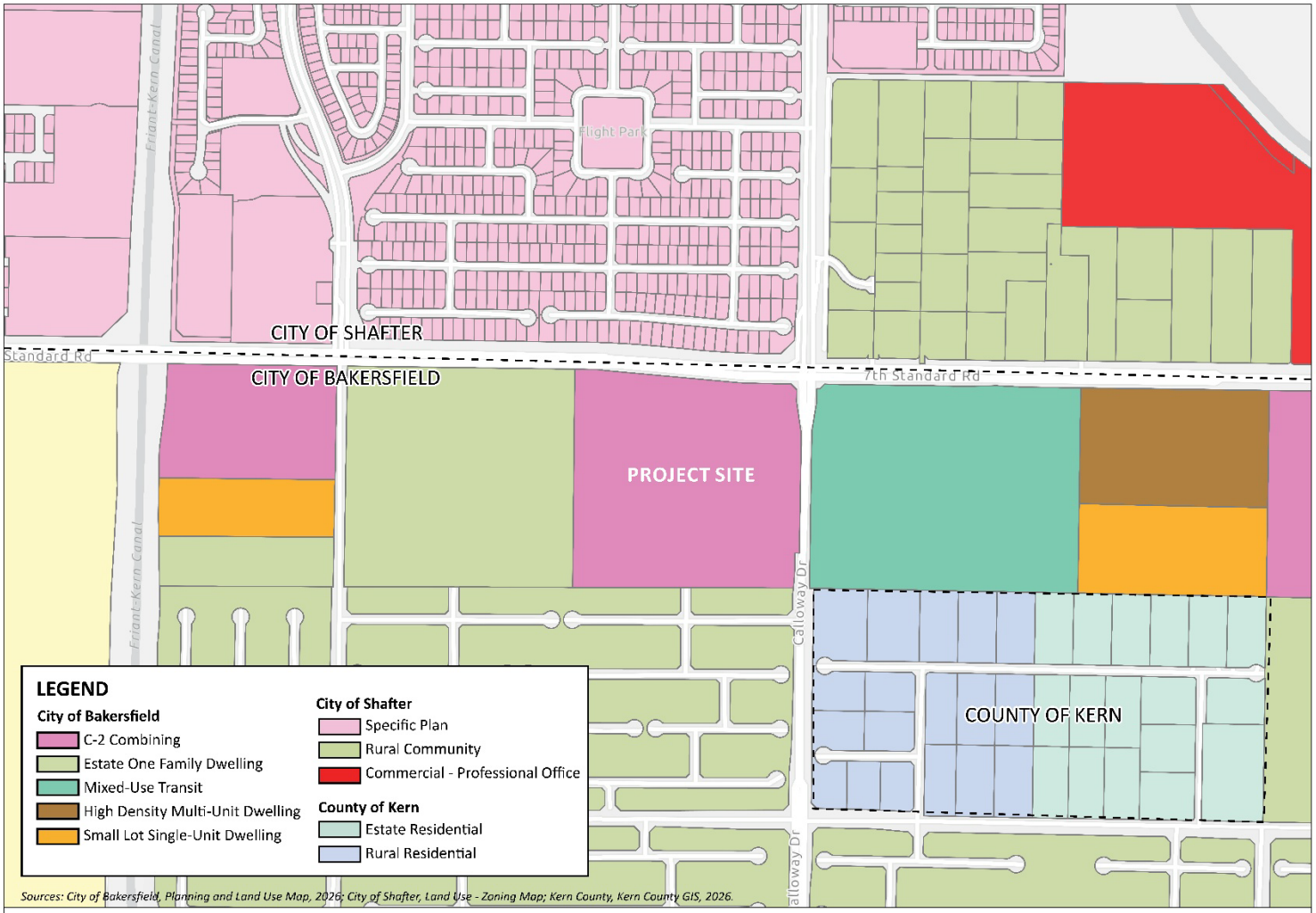


Figure 5: Existing Zoning
7th Standard Marketplace Project

Not to scale.

Kimley»Horn

10.0 ENTITLEMENTS REQUIRED

- Planned Development Review (PDR): The Project is subject to the PDR process and requires a Planning Commission approval to allow the proposed development pursuant to BMC §17.54.030.B.
- Vesting Tentative Parcel Map (VTPM) No. 12633: To subdivide the property into 11 parcels.

11.0 OTHER PUBLIC AGENCIES APPROVAL ANTICIPATED TO BE REQUIRED

- State Water Resources Control Board;
- Central Valley Regional Water Quality Control Board; and
- San Joaquin Valley Air Pollution Control District.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

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

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

DETERMINATION:

On the basis of this initial evaluation (check one):

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

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

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

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

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

CERTIFICATION:

Signature



Date

8/17/2026

EVALUATION OF ENVIRONMENTAL IMPACTS:

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

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

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

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

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

    A. Earlier Analysis Used. Identify and state where they are available for review.

    B. Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

    C. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

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

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

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

    A. The significance criteria or threshold, if any, used to evaluate each question; and

    B. The mitigation measure identified, if any, to reduce the impact to less than significant.

ENVIRONMENTAL CHECKLIST AND ANALYSIS

I. AESTHETICS

Would the project:

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

a) Have a substantial adverse effect on a scenic vista?

No Impact. Although the Project site is undeveloped, it is in the City's urban core (Figure 3) and has historically been used for agricultural purposes rather than open space. The General Plan does not define or map scenic vistas[1] and no recognized scenic vistas, open space resources, or visually prominent natural resources occur on or near the Project site. Given the Project site's urbanized setting and the absence of identified scenic resources, Project implementation would not adversely affect a scenic vista. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. No scenic resources occur on or adjacent to the Project site and no state scenic highway traverses or is near the Project site.[2] Therefore, the Project would not damage scenic resources within a state scenic highway. No impact would occur, and this issue will not be further analyzed in the EIR.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly

[1] City of Bakersfield General Plan. (2002). *City of Bakersfield General Plan*. Retrieved from: https://content.civicplus.com/api/assets/6c7a0380-7841-40d6-b3ef-23ceb4fa0fd7. Accessed May 2026.
[2] California Department of Transportation. (2026). *Statewide Scenic Highway Map*. Retrieved from: https://experience.arcgis.com/experience/47e2009986264718a5a13a2c81382774. Accessed April 2026.

accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Potentially Significant Impact. Pursuant to State CEQA Guidelines §15387, an urbanized area is a city or a group of contiguous cities with a population of 50,000 or more and a population density of at least 1,000 persons per square mile. The United States Census Bureau reports that the City of Bakersfield had a population of 403,455 in 2020 and a population density of approximately 2,694 persons per square mile.[3] Therefore, the Project site is located within an urbanized area, and the significance determination is based on whether the Project would conflict with applicable zoning or other regulations governing scenic quality.

The City of Bakersfield General Plan does not identify the Project site or the surrounding area as a scenic resource area, scenic corridor, or any other location subject to special scenic-quality protection requirements. The Project site is vacant, generally flat, and is surrounded by existing urban development, which includes residential uses to the north and south and undeveloped land designated for residential and mixed uses to the east and west, respectively. The Project would be required to comply with all applicable planning regulations stipulated for all proposed zoning districts regarding appropriate building heights, setbacks, landscaping, and screening, with minor exceptions. However, the EIR will analyze whether proposed development directly or indirectly would result in conflicts with zoning or other regulations governing scenic quality in the vicinity of the Project site.

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

Potentially Significant Impact. Although the undeveloped properties to the east and west do not contain lighting sources and thus do not contribute to ambient nighttime lighting conditions, the residential neighborhoods to the north and south, and nearby arterial roadways contain lighting sources, which contribute to ambient nighttime lighting conditions. The Project would introduce new sources of lighting and glare associated with commercial development, including building-mounted lighting, parking lot lighting, pedestrian lighting, fuel station canopy lighting, security lighting, illuminated signage, vehicle headlights, and windows. However, exterior lighting associated with the Project would be required to comply with applicable provisions of the BMC. Lighting fixtures would be designed and installed to minimize off-site light spill and glare by using shielded, downward-directed fixtures and other design measures that focus illumination onsite. In addition, modern building materials typically used in commercial development are not expected to create substantial glare conditions beyond those commonly associated with urban commercial environments. Although the Project site is located in an urbanized area, it is surrounded by existing residential uses to the north and south and undeveloped land designated for residential uses and mixed uses to the east and west, respectively. Therefore, the Project would increase lighting and introduce reflective surfaces compared to existing vacant conditions. Further analysis is needed to determine if the Project would create a substantial new source of light or glare that would adversely affect day or nighttime views in the area. A Photometric Plan will be prepared for the EIR. This issue will be further analyzed in the EIR.

[3] United States Census Bureau. (2026). *QuickFacts: Bakersfield City, California*. Retrieved from: https://www.census.gov/quickfacts/fact/table/bakersfieldcitycalifornia/PST045225. Accessed August 2026.

II. AGRICULTURE AND FORESTRY RESOURCES

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

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

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

No Impact. The California Department of Conservation designates the Project site as Grazing Land; not Farmland,[4] and the Project site is not currently used for agricultural purposes. Therefore, the Project

[4] California Department of Conservation. (2022). *California Important Farmland Finder*. Retrieved from: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed April 2026

would not convert Farmland to non-agricultural use. No impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. The Project site is zoned Planned Commercial Development (C-2/PCD).[5] BMC §17.24.020 does not identify agricultural uses as permitted uses in the C-2/PCD Zone.[6] The property (APN 492-060-12) is not under a Williamson Act contract or other agricultural land conservation agreement.[7] Therefore, the Project would not conflict with existing zoning for agricultural use or a Williamson Act contract. No impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. The Project site is zoned Planned Commercial Development (C-2/PCD) and not zoned forest land, timberland, or timberland production.[8] Therefore, the Project would not conflict with existing zoning for, or cause rezoning of, forest land. No impact would occur, and this issue will not be further analyzed in the EIR.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. The Project site is undeveloped land that has historically been used for agricultural purposes and is not forest land; see **Figure 3**. Therefore, the Project would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. The Project site was historically used for agricultural purposes; however, the General Plan designates the Project site and surrounding properties for non-agricultural uses. Adjacent properties to the north and south are developed with single-family residential uses, and adjacent properties to the east and west are planned for urban development consistent with General Plan designations. Therefore, the Project would not induce or facilitate the conversion of additional farmland to non-agricultural use, nor would it contribute to the conversion of forest land to non-forest use. The Project site and surrounding area have already been planned and largely converted to urban uses. No impact would occur, and this issue will not be further analyzed in the EIR.

[5] City of Bakersfield. (2025). *Planning & Land Use Map*. Retrieved from: https://cob.maps.arcgis.com/apps/webappviewer/index.html?id=9fbb25e825e3425a84e7dea631e42f7b. Accessed April 2026.
[6] BMC §17.24.020. Retrieved from: https://bakersfield.municipal.codes/Code. Accessed April 2026.
[7] California Department of Conservation. (2024). *Williamson Act Enrollment Finder*. Retrieved from: https://maps.conservation.ca.gov/dlrp/WilliamsonAct/. Accessed April 2026
[8] Ibid.

III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

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

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

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

c) Expose sensitive receptors to substantial pollutant concentrations?

d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?

Potentially Significant Impact. The Project site is located within the San Joaquin Valley Air Basin (SJVAB), which is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The Project involves construction and operational activities that would produce short-term and long-term pollutants and other emissions. Localized concentrations of emissions from construction and operational activities could potentially affect sensitive receptors. During construction, emissions from construction equipment, architectural coatings, and paving activities may generate odors. During operations, trucks and vehicles associated with the fuel facility and other commercial uses may emit odors. These odors could negatively affect people near the Project site. Further analysis is needed to determine if the Project would significantly impact air quality. An Air Quality Assessment and a Health Risk Assessment will be prepared as part of the EIR, and air quality modeling will be based on the latest available version of the California Emissions Estimator Model (CalEEMod). This issue will be further analyzed in the EIR.

IV. BIOLOGICAL RESOURCES

Would the project:

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

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

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological?

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

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

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Potentially Significant Impact. The Project site is currently undeveloped and consists of previously disturbed agricultural land that has been routinely disked, with sparse nonnative grasses and ruderal vegetation occurring throughout the site. Although the site has been previously disturbed by agricultural activities, it may provide habitat for special-status plant and wildlife species, as well as other biological resources. In addition, the Project site may contain sensitive natural communities, jurisdictional waters or wetlands, protected trees, or other biological resources protected by federal, State, or local regulations. Project construction would require vegetation removal, site clearing, grading, and construction activities that could directly or indirectly affect biological resources. Project construction and operation could also affect wildlife movement and other biological resource functions on or adjacent to the Project site. A Biological Resources Evaluation will be prepared to evaluate existing biological resources on and adjacent to the Project site, including special-status species, sensitive natural communities, jurisdictional resources, wildlife movement, and applicable local policies and regulations protecting biological resources. The EIR will evaluate potential impacts to biological resources and identify mitigation measures, as necessary. Therefore, these issues will be further analyzed in the EIR.

V. CULTURAL RESOURCES

Would the project:

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	Yes	-	-	-
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	Yes	-	-	-
c)	Disturb any human remains, including those interred outside of dedicated cemeteries?	-	-	Yes	-

a) Cause a substantial adverse change in the significance of a historical resource pursuant to in §15064.5?

Potentially Significant Impact. The Project site is currently undeveloped and consists of former agricultural land that has been routinely disked. Although the Project site does not contain any structures, Public Resources Code (PRC) §15064.5 states a historical resource includes "[a]ny object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California…Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources." As such, a Cultural Resources Study will be prepared to evaluate potentially significant historic resources at the Project site and as appropriate, identify mitigation measures to reduce impacts. Therefore, impacts related to archaeological resources will be further analyzed in the EIR.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Potentially Significant Impact. The Project site is currently undeveloped and consists of former agricultural land that has been routinely disked. Ground-disturbing activities associated with Project construction, including grading, excavation, utility installation, and other earthmoving activities, could encounter previously undiscovered archaeological resources. A Cultural Resources Study will be prepared to evaluate the potential presence of archaeological resources at the Project site and as appropriate, identify mitigation measures to reduce impacts. Therefore, impacts related to archaeological resources will be further analyzed in the EIR.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Less Than Significant Impact. No known cemeteries or other locations of human remains are present on or adjacent to the Project site. Although ground-disturbing activities associated with Project construction

could encounter previously undiscovered human remains, the Project would be subject to compliance with an established regulatory framework that would ensure impacts remain less than significant. The Project would be subject to compliance with State of California Health and Safety Code (HSC) §§7050.5-7055 and PRC §5097.98 and §5097.99. HSC §§7050.5-7055 describes the general provisions for treatment of human remains. Specifically, HSC §7050.5 prescribes the requirements for the treatment of any human remains that are accidentally discovered during excavation of a site. HSC §7050.5 also requires that all activities cease immediately, and a qualified archaeologist and Native American monitor be contacted immediately. As required by State law, the procedures set forth in PRC §5087.98 would be implemented, including evaluation by the County Coroner and notification of the NAHC. The NAHC would designate the "Most Likely Descendent" of the unearthed human remains. If human remains are found during excavation, excavation would be halted near the find and any area that is reasonably suspected to overlay adjacent remains shall remain undisturbed until the County Coroner has investigated, and appropriate recommendations have been made for treatment and disposition of the remains. Therefore, following compliance with these existing State requirements, the Project's potential impacts associated with the inadvertent discovery/disturbance of human remains would be less than significant. Therefore, this topic will not be further analyzed in the EIR.

VI. ENERGY

Would the project:

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Yes	-	-	-
b)	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Yes	-	-	-

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Potentially Significant Impact. Project construction would require energy to operate construction vehicles, equipment, and worker vehicles. Additionally, operation of the Marketplace would consume energy to power the proposed uses and to fuel workers' vehicles and delivery trucks. An Energy Analysis will be prepared to assess the Project's energy consumption and identify appropriate mitigation measures to reduce potential impacts. Therefore, this topic will be further analyzed in the EIR.

VII. GEOLOGY AND SOILS

Would the project:

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

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

No Impact. An Alquist-Priolo Earthquake Fault Zone does not traverse the Project site.[9] Additionally, the Project's Geotechnical Reports (see **Appendix A: Geotechnical Study – Proposed Anchor Commercial Use – and Fuel Facility** (Kleinfelder, 2025) and **Appendix B: Geotechnical** Engineering **Investigation – Proposed Retail Development** (Krazan & Associates, 2025)) concluded that potential for surface fault rupture at the Project site during the design life of onsite structures is considered low. Therefore, no impact would occur, and this issue will not be analyzed in the EIR.

ii) Strong seismic ground shaking?

Less Than Significant Impact. The City is located between several active fault systems including the White Wolf, Breckenridge, Kern Canyon, and Garlock faults, as well as the San Andreas Fault.[10] These fault systems are capable of generating significant seismic ground shaking that could affect the City. As identified in the Project's Geotechnical Reports, the zoned fault nearest the Project site is the Premier Fault, located approximately 3.3 miles northeast of the Project site. The faults identified above could cause moderate to intense ground shaking on the Project site during the Project's lifetime. Additionally, the Project site has experienced earthquake-induced ground shaking in the past and can be expected to experience further shaking in the future. Therefore, Project development could expose people and structures to potential adverse effects involving strong seismic ground shaking. The intensity of ground shaking on the Project site would depend upon the earthquake's magnitude, distance to the epicenter, and geology of the area between the Project site and epicenter. Regulatory controls to address potential seismic hazards would be imposed on the Project through the permitting process. Pursuant to BMC Chapter 15.05: California Building Code, the City has adopted the 2025 California Building Standards Code (CBSC). The Project would be subject to compliance with all applicable regulations in the most recently published CBSC, which specifies design requirements to mitigate the effects of potential earthquake hazards, including strong seismic ground shaking. Moreover, the Bakersfield Building Services Division would review construction plans to verify compliance with standard engineering practices, the BMC/CBSC, and the recommendations for Project design and construction, including seismic design parameters, in the Project's Geotechnical Reports. Following compliance with standard engineering practices, the established regulatory framework (i.e., BMC and CBSC), and the recommendations in the Project's Geotechnical Reports, the Project's potential impacts concerning exposure of people or structures to potential adverse effects involving strong seismic ground shaking would be less than significant. This issue will not be further analyzed in the EIR.

[9] California Department of Conservation. (2026). *Earthquake Zones of Required Investigation*. Retrieved from https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/. Accessed April 2026
[10] California Department of Conservation. (2015). *CGS Information Warehouse: Regulatory Maps*. Retrieved from http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. The Project's Geotechnical Reports determined the potential for seismic-related ground failure, including liquefaction to be low. Moreover, the Project would be subject to compliance with standard engineering practices, the established regulatory framework (i.e., BMC and CBSC), and the recommendations in the Project's Geotechnical Reports. Therefore, the Project's potential impacts concerning exposure of people or structures to potential adverse effects involving seismic-related ground failure, including liquefaction would be less than significant. This issue will not be further analyzed in the EIR.

iv) Landslides?

No Impact. The Project's Geotechnical Reports determined that the Project site and surrounding area are relatively flat. As a result, the potential for landslides is considered to be low. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. The Project's Geotechnical Reports determined that the Project site is not at risk of soil erosion or loss of topsoil. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

No Impact. The Project's Geotechnical Reports determined the potential for lateral spreading is considered to be low. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. The Project's Geotechnical Reports determined the expansion potential of the near surface soils on the Project site is considered low. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. There are no septic tanks or alternative waste water disposal systems associated with the Project. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Potentially Significant Impact. The Project site is currently undeveloped and has historically been used for agricultural purposes. Project construction would require ground-disturbing activities, including grading, excavation, trenching, utility installation, and foundation construction, which could encounter previously undiscovered paleontological resources. A Paleontological Resources Study will be prepared to

evaluate the potential presence of paleontological resources at the Project site and as appropriate, identify mitigation measures to reduce impacts. Therefore, impacts related to paleontological resources will be further analyzed in the EIR.

VIII. GREENHOUSE GAS EMISSIONS

Would the project:

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Yes	-	-	-
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Yes	-	-	-

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Potentially Significant Impact. Project construction and operations would generate greenhouse gas (GHG) emissions from sources including construction equipment, vehicle trips, energy consumption, fuel use, material transport, and other activities associated with the development and operation of the Project. As a result, the Project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. In addition, the Project must be evaluated for consistency with applicable plans, policies, and regulations adopted to reduce GHG emissions, including State climate goals and regulations. A GHG Emissions Analysis will be prepared to quantify Project-generated GHG emissions and evaluate consistency with applicable GHG reduction plans, policies, and regulations. Therefore, these issues will be further analyzed in the EIR.

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

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

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Potentially Significant Impact. Project construction activities would involve the temporary use, transport, and storage of hazardous materials, including fuels, lubricants, solvents, paints, and other construction-related materials. The Project's proposed commercial uses may involve the use, storage, transport, and disposal of hazardous materials commonly associated with retail, restaurant, maintenance, and commercial operations. Additionally, operation of the fuel facility would involve the routine transport,

storage, and use of petroleum products and other hazardous materials. Project development could expose the public or the environment to hazards associated with the routine use of hazardous materials or reasonably foreseeable upset and accident conditions involving the release of hazardous materials. Therefore, potentially significant impacts may occur, and these issues will be further analyzed in the EIR.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Potentially Significant Impact. Project construction activities would involve the temporary use, transport, and storage of hazardous materials, including fuels, lubricants, solvents, paints, and other construction-related materials. Furthermore, because the Project site was historically used for agricultural purposes, residual agricultural chemicals may be present in site soils. Project implementation could expose the public or the environment to hazards associated with the routine use of hazardous materials or reasonably foreseeable upset and accident conditions involving the release of hazardous materials. Therefore, potentially significant impacts may occur, and these issues will be further analyzed in the EIR.

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

No Impact. The Project site is not located within one-quarter mile of an existing or proposed school. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. The Project would not be on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5.[11] Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

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

No Impact. The Project site is located approximately 2.2 miles east of Meadow Fields Airport. The Kern County Airport Land Use Compatibility Plan[12, 13] indicates the Project site is located outside of the Meadow Field Airport Land Use Compatibility Plan area and 60 dBA CNEL contour. Therefore, the Project would not result in a safety hazard or excessive noise for people residing or working in the Project area. No impact would occur, and this issue will not be further analyzed in the EIR.

[11] Department of Toxic Substances Control. (2026). *Hazardous Waste and Substances Site List (Cortese).* Retrieved from: https://www.envirostor.dtsc.ca.gov/public/search?cmd=search&reporttype=CORTESE&site_type=CSITES,FUDS&status=ACT,BKLG,COM&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29. Accessed April 2026.
[12] County of Kern. (2011). *Airport Land Use Compatibility Plan*. Retrieved from: https://docs.bakersfieldcity.us/WebLink/DocView.aspx?dbid=0&id=932206&page=1. Accessed May 2026
[13] County of Kern. (2026). *Interactive County Map (GIS Tool).* Retrieved from: https://maps.kerncounty.com/H5/index.html?viewer=KCPublic. Accessed May 2026.

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

Less Than Significant Impact. The Project proposes development of a commercial center and various off-site improvements on 7th Standard Road and Calloway Drive. Construction activities would be temporary and would not require permanent closure of public roadways or emergency access routes. The Project would be required to maintain adequate emergency vehicle access and comply with applicable City of Bakersfield Fire Department requirements. The Project would include internal circulation improvements and multiple site access points designed to accommodate emergency access. Furthermore, the proposed offsite improvements along 7th Standard Road and Calloway Drive would not physically interfere with the Kern County Emergency Operations Plan. Development would also be subject to review by applicable emergency service providers and would be required to comply with adopted emergency access standards. The results of such analysis will determine whether the Project would physically interfere with an adopted emergency response or evacuation plans. As such, this topic will be further analyzed in the EIR.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No Impact. The Project site is in the City's northwestern portion and is not located within a State Responsibility Area, Very High Fire Hazard Severity Zone, or Local Responsibility Area Fire Hazard Severity Zone. The Project is not located in an area identified as a wildland-urban interface (WUI).[14] The Project is surrounded by existing residential uses to the north and south and undeveloped land designated for residential uses to the east and mixed uses to the west. Further, Project development would involve clearing and grubbing to construct the proposed commercial center which would remove potential fuel for fires. Therefore, the Project would not expose people or structures to a significant risk involving wildland fires. No impact would occur and this issue will not be further analyzed in the EIR.

[14] U.S. Forest Service. (2026). *Wildland Urban Interface: 2020 Map Service*. Retrieved from: https://data-usfs.hub.arcgis.com/documents/usfs::wildland-urban-interface-2020-map-service/explore?path=. Accessed August 2026.

X. HYDROLOGY AND WATER QUALITY

Would the project:

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

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Potentially Significant Impact. CalWater would provide water service to the Project site. The Project is within the San Joaquin Valley Groundwater Basin and Kern County subbasin. The Department of Water Resources has classified the Kern County subbasin as a basin in a critical condition of overdraft. The Project would generate an increase in water demand and further analysis is needed to determine if the Project would substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin. A Water Supply Assessment will be prepared for the EIR. This topic will be further analyzed in the EIR.

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i) Result in substantial erosion or siltation on- or off-site?

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

iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

iv) Impede or redirect flood flows?

Potentially Significant Impact. Project construction activities, including grading, excavation, utility installation, and paving, could temporarily affect surface water quality through erosion, sedimentation, and pollutant discharges. Project operations would introduce substantial impervious surfaces and associated stormwater runoff, which could affect drainage patterns, runoff characteristics, groundwater recharge, and water quality. In addition, the operation of the fuel facility, automated car wash, and other commercial development could result in the use, storage, and handling of materials that may affect stormwater quality if not properly managed.

The Project would be required to comply with applicable federal, State, and local stormwater, drainage, and water quality regulations, including NPDES requirements. However, further analysis is necessary to evaluate potential impacts related to surface water quality, groundwater resources, stormwater runoff, drainage patterns, flooding, groundwater recharge, compliance with applicable water quality control plans, and consistency with sustainable groundwater management requirements. Accordingly, these issues will be further analyzed in the EIR.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No Impact. According to the Federal Emergency Management Agency (FEMA) National Flood Hazard Layer, the Project site is located within Flood Zone X, an area of minimal flood hazard that is outside the 100-year floodplain.[15] Therefore, the Project site is not located within a Special Flood Hazard Area and is not subject to inundation from a 100-year flood event. According to California Geological Survey hazard mapping, the Project site is not located within a tsunami hazard area.[16] The Project site also is not subject to flooding hazards associated with a seiche because no enclosed bodies of surface water are found nearby the Project site. In addition, the Project site is located within the Central Valley and is not adjacent to a large lake, reservoir, or other standing body of water capable of generating a seiche. Further, as noted in the Lake Isabella Dam Failure Evacuation Plan prepared for the Kern County OA Office of Emergency Services, the site is mapped outside of the Lake Isabella inundation hazard area[17]. Therefore, because the Project site is not within a flood hazard, tsunami, or seiche zone, the Project would not risk release of pollutants due to Project inundation. No impact would occur, and this issue will not be evaluated further in the EIR.

[15] FEMA. (2026). *National Flood Hazard Layer.* Retrieved from: https://www.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd. Accessed August 2026.
[16] California Department of Conservation, California Geologic Survey. (2026). *Tsunami Hazard Area Map*. Retrieved from: https://maps.conservation.ca.gov/cgs/informationwarehouse/ts_evacuation/#data_s=id%3AdataSource_3-19194927b24-layer-13%3A15. Accessed August 2026.
[17] County of Kern. (2026). *Isabella Dam Main Dam Failure – Figure 27 – Peak Inundation Depth (Full Study View)*. Retrieved from: https://www.kernpublicworks.com/home/showpublisheddocument/10906/638315043327130000. Accessed August 2026.

XI. LAND USE AND PLANNING

Would the project:

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Physically divide an established community?	-	-	Yes	-
b)	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	Yes	-	-	-

a) Physically divide an established community?

Less Than Significant Impact. Physical division of an established community typically occurs when a project introduces a substantial physical barrier, such as a freeway, railroad, or other infrastructure that restricts access and circulation between portions of an existing neighborhood or community. There are established communities to the north and south of the Project site. Although the Project includes roadway improvements along 7th Standard Road and Calloway Drive, such improvements would occur within or adjacent to existing transportation corridors and would enhance connectivity and circulation within the area. Therefore, the Project would not construct a physical barrier that would restrict access and circulation between portions of an existing neighborhood or community. Impacts would be less than significant, and this issue will not be further analyzed in the EIR.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Potentially Significant Impact. The proposed Project includes development of a regional-serving commercial center consisting of an automated car wash, four restaurants with drive-throughs, one financial institution with a drive-through, retail and restaurant space, Costco Warehouse, a fuel facility, and associated offsite utility and roadway improvements. Additionally, the Project seeks approval of a Planned Commercial Development (PCD) Review, VTPM No. 12633, and Comprehensive Sign Plan. The Project site is designated General Commercial (GC) and zoned Regional Commercial and Planned Commercial Development (C-2/PCD), which is a combining zone, and is surrounded by existing urban development, which includes residential uses and undeveloped land designated for residential and mixed uses. The proposed Project includes development of a regional-serving commercial center consisting of an automated car wash, four restaurants with drive-throughs, one financial institution with a drive-through, retail and restaurant space, Costco Warehouse, a fuel facility, and associated offsite utility and roadway improvements. Additionally, the Project requires approval of a VTPM and Comprehensive Sign Plan. The Project site is designated General Commercial (GC) and zoned Regional Commercial and Planned Commercial Development (C-2/PCD), which is a combining zone, and is surrounded by existing urban development, which includes residential uses and undeveloped land designated for residential and mixed uses. The Project site's GC land use designation is intended for "retail and service facilities providing a

broad range of goods and services which serve the day-to-day needs of nearby residents." The GC land use designation allows a maximum floor area ratio (FAR) of 1.0 and a maximum height of four stories. The Project proposes approximately 225,365 SF of commercial uses at a 0.15 FAR within nine single-story buildings and one fuel facility, consistent with the GC land use designation.

Requirements and development standards for the site's C-2/PCD zone are addressed in BMC Chapters 17.08, 17.24, and 17.54, respectively. The purpose of the PCD Zone is to allow for innovative design and diversification in the relationship of various uses, buildings, structures, lot sizes, and open spaces while ensuring compliance with the General Plan and BMC § 17.54.010. The Project site's PCD zoning is used as a combining zone, where the C-2 zone is considered the base zone which defines allowable uses. The purpose of the C-2 zone is to permit the development of concentrated large-scale retail operations providing a broad range of goods and services, which serve the metropolitan market area (BMC § 17.24.010). The C-2 Zone development standards are provided in BMC §§17.24.050 to 17.24.110, and uses permitted are identified in BMC §17.24.020. Additionally, BMC §17.08.140 provides development standards for retail developments. The Project's proposed uses, including one automated car wash, four restaurants with drive-throughs, one financial institution with a drive-through, retail and restaurant space, a Major Anchor Store, and a fuel facility, are permitted uses within the C-2/PCD zone.

Additionally, the Project's proposed development would be consistent with the C-2/PCD and retail development standards provided in BMC §§17.24.050 to 17.24.110 and §17.08.140, respectively, with minor exceptions. In accordance with BMC § 17.54.060, the Project requests the City's approval for exceptions concerning the following BMC standards: BMC § 17.08.140.D.1 and BMC § 17.08.140.D.4 regarding exterior building elevations.; BMC § 17.08.140.F.2 regarding internal site pedestrian walkways; and BMC § 17.24.050.E. and § 17.58.050.N. regarding wall adjacent to residentially-zoned property.

Various federal, State, regional, and local plans, policies, and regulations have been adopted to avoid or mitigate environmental effects, including those related to land-use compatibility, transportation, air quality, biological resources, water resources, greenhouse gas emissions, public services, and other environmental topics. Because Project implementation could potentially conflict with one or more applicable plans, policies, or regulations adopted for environmental protection purposes, the significance of potential impacts requires further analysis. Therefore, potentially significant impacts may occur, and this issue will be further analyzed in the EIR.

XII. MINERAL RESOURCES

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	-	-	-	Yes
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	-	-	-	Yes

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The Project site is not located within a Mineral Resource Zone (MRZ) as identified by the California Geological Survey.[18] Therefore, the Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. No impact would occur, and this issue will not be further analyzed in the EIR.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. The General Plan EIR identifies that land designated as Mineral and Petroleum (R-MP) and areas located within the Fruitvale, Rosedale, Bellevue and Canfield Oil Fields contain petroleum, natural gas, sand, and/or gravel resources that would be of value to the Metropolitan Bakersfield area and California residents.[19] The Project site is designated Regional Commercial and CalGEM identifies the Project site is located outside any oil fields, including the Fruitvale and Rosedale Oil Fields.[20] Therefore, the Project would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impact would occur, and this issue will not be further analyzed in the EIR.

[18] California Department of Conservation. *Mineral Land Classification Map*. Retrieved from: https://maps.conservation.ca.gov/cgs/minerals/?page=Mineral-Land-Classification#data_s=id%3AdataSource_4-18a47b5b8e5-layer-10-192c08351d6-layer-28%3A36. Accessed April 2026.
[19] City of Bakersfield General Plan. (2002). *Metropolitan Bakersfield General Plan EIR, Chapter 4.14*. Retrieved from: https://psbweb.kerncounty.com/planning/pdfs/mbgp/MBGP_FPEIR.pdf. Accessed July 2026.
[20] CalGEM. (2026). *Well Finder*. Retrieved from: https://maps.conservation.ca.gov/calgem/findwells/. Accessed July 2026.

XIII. NOISE

Would the project result in:

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

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b) Generation of excessive groundborne vibration or groundborne noise levels?

Potentially Significant Impact. Project construction and operations would generate temporary and permanent noise. Construction activities, including site preparation, grading, utility installation, roadway improvements, building construction, paving, and landscaping, would generate noise and vibration from construction equipment, trucks, and other heavy machinery. Operational noise would be generated by customer vehicles, truck deliveries, fuel facility operations, parking lot activities, mechanical equipment, and other commercial activities associated with the Project. Because construction and operation of the Project would result in increases in ambient noise levels and the generation of groundborne vibration, further analysis is required to evaluate potential impacts relative to applicable City of Bakersfield noise standards and other applicable regulations. A Noise Analysis will be prepared to evaluate the impacts of construction noise, operational noise, and vibration. Therefore, these issues will be further analyzed in the EIR.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Project site is located approximately 2.2 miles east of Meadow Fields Airport. The Kern County Airport Land Use Compatibility Plan indicates the Project site is located outside of the Meadow Field Airport Land Use Compatibility Plan area and 60 dBA CNEL contour. Therefore, the Project would not expose people working in the Project area to excessive noise levels associated with Meadow Fields Airport. No impact would occur, and this issue will not be further analyzed in the EIR.

XIV. POPULATION AND HOUSING

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	-	-	Yes	-
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	-	-	-	Yes

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Less Than Significant Impact. The Project does not propose housing or extensions of roads or other unplanned infrastructure into undeveloped areas. Therefore, the Project would not induce population growth in the City through these means.

The Project would generate short-term jobs during construction and long-term jobs during operations. It is anticipated that most of these positions would be filled by persons who already reside within the broader Project area. Moreover, the General Plan designates the Project site as GC. As such, the Project's employment-related population growth, if any, would not be unplanned. Therefore, the Project would not induce substantial unplanned population growth indirectly through employment. No impact would occur, and this issue will not be further analyzed in the EIR.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. The Project would not remove any existing housing and would not displace any people or housing, as the Project site is currently undeveloped. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

XV. PUBLIC SERVICES

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	-	-	-	-
i) Fire protection?	Yes	-	-	-
ii) Police protection?	Yes	-	-	-
iii) Schools?	-	-	-	Yes
iv) Parks?	-	-	-	Yes
v) Other public facilities?	-	-	-	Yes

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i) Fire protection?

Potentially Significant Impact. The City and Kern County have a joint agreement that allows both agencies to effectively respond to emergencies. The closest fire station to the Project site is Kern County Fire Station 61, located at 6400 Fruitvale Avenue, approximately 2.5 miles southeast of the Project site. The next closest fire station is Kern County Fire Station 62, located at 1652 Sunnyside Court, approximately 3.1 miles southeast of the Project site.

The Project proposes development of a regional-serving commercial center, which would increase the number of structures, employees, and visitors within the Project area, incrementally increasing the demand for fire protection and emergency response services. Therefore, the Project could result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts. These issues will be further analyzed in the EIR.

ii) Police protection?

Potentially Significant Impact. The City and Kern County provide law enforcement protection services through a joint agreement that allows both agencies to effectively respond to emergencies. The nearest police station is the Kern County Sheriff Office located at 1350 Norris Road, approximately 3.7 miles southeast of the Project site. The Project proposes development of a regional-serving commercial center, which would increase the number of employees, customers, and visitors within the Project area, incrementally increasing the demand for police protection services. Therefore, the Project could result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities. These issues will be further analyzed in the EIR.

iii) Schools?

No Impact. As concluded in **Section XIV**, the Project would not induce substantial unplanned population growth indirectly through employment. As such, the Project would not increase the City's student population such that construction of new/physically altered school facilities that could cause significant environmental impacts would occur. The Project would also be subject to Senate Bill 50, which requires payment of mandatory impact fees to offset any impact to school services or facilities. The Project would pay developer fees in compliance with the established regulatory framework to support provision of adequate school services. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

iv) Parks?

No Impact. The Project does not propose any parks. Also, as concluded in **Section XIV**, the Project would not induce substantial unplanned population growth indirectly through employment. As such, the Project would not increase the City's population such that construction of new/physically altered parks that could cause significant environmental impacts would occur. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

v) Other public facilities?

No Impact. The Project does not propose any libraries or other public facilities. Also, as concluded in **Section XIV**, the Project would not induce substantial unplanned population growth indirectly through employment. As such, the Project would not increase the City's population such that construction of new/physically altered government facilities (e.g., libraries) that could cause significant environmental impacts would occur. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

XVI. RECREATION

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

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Impact. As concluded in **Section XIV**, the Project would not induce substantial unplanned population growth indirectly through employment. As such, the Project would not increase the use of existing neighborhood parks or regional parks in the City and surrounding area such that substantial deterioration of the facility would occur or be accelerated. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. The Project does not include recreational facilities. Also, as concluded in **Section XIV**, the Project would not induce substantial unplanned population growth indirectly through employment. As such, the Project would not require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

XVII. TRANSPORTATION

Would the project:

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

a) Conflict with an program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Potentially Significant Impact. The Project proposes development of a commercial center, which would generate vehicle, bicycle, pedestrian, and transit trips that could affect the operation of the surrounding transportation network. The Project may require roadway, intersection, bicycle, pedestrian, and transit-related improvements along 7th Standard Road, Calloway Drive, and other nearby transportation facilities**.** As a result, the Project must be analyzed for potential conflicts with applicable transportation plans, policies, and programs, including the City of Bakersfield Bicycle Master Plan, General Plan Circulation Element, and other applicable transportation planning documents. Therefore, this issue will be further analyzed in the EIR.

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

Potentially Significant Impact. The Project would generate vehicle trips associated with proposed commercial uses, employees, customers, deliveries, and other commercial activities. As of August 2026, the City of Bakersfield has not adopted any policies or thresholds for VMT analysis. Nonetheless, a VMT analysis would be conducted for the Project and would identify mitigation measures, if necessary. Therefore, potentially significant impacts may occur, and this issue will be further analyzed in the EIR.

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

Potentially Significant Impact. Project would include construction of new onsite driveways, internal roadways, and circulation improvements, as well as offsite transportation improvements, which could pose transportation safety hazards if not properly designed. Potential hazards include driveway spacing

and alignment, turning conflicts, sight distance limitations, truck access, pedestrian crossings, and vehicle queuing associated with the fuel facility and drive-throughs. Therefore, the Project's circulation design must be analyzed to determine whether it would substantially increase traffic hazards or result in incompatible land uses in the area. This issue will be further analyzed in the EIR.

d) Result in inadequate emergency access?

Less Than Significant Impact. The Project would be subject to the City's Planned Development Review process, including compliance with BMC §15.65.165, which requires construction projects to obtain approval from the Bakersfield Fire Department to ensure adequate access for firefighting. The California Fire Code sets minimum standards for road dimensions, designs, grades, and other fire safety features. Additionally, more stringent 2025 CBSC also apply regarding new construction and development of emergency access issues associated with earthquakes, flooding, and other natural hazards. The Project would be required to comply with applicable building and fire safety regulations required for the design of new commercial uses and emergency access; and would be required to adhere to applicable State and local requirements. Therefore, given compliance with the established regulatory framework, the Project would not result in inadequate emergency access. Impacts would be less than significant, and this issue will not be further analyzed in the EIR.

XVIII. TRIBAL CULTURAL RESOURCES

Would the project:

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

a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i) Listed or eligible for listing in the California:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code §5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code §5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Potentially Significant Impact. Project construction would involve grading, excavation, trenching, utility installation, and other ground-disturbing activities associated with the development of the Marketplace and associated utility and roadway improvements. Although no known tribal cultural resources have been

identified within the Project site to date, ground-disturbing activities associated with the Project may uncover previously unidentified tribal cultural resources. Potential tribal cultural resources may include archaeological deposits, cultural landscapes, sacred places, traditional cultural properties, traditional use areas, or other resources that the City, in consultation with California Native American tribes and supported by substantial evidence, determines to be significant pursuant to PRC §5024.1(c). The City will conduct tribal consultation in accordance with PRC §21080.3.1 et seq. (Assembly Bill 52), as applicable. Because Project implementation could disturb previously unidentified tribal cultural resources, potentially significant impacts may occur. Therefore, this issue will be further analyzed in the EIR.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:

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

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

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

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

Potentially Significant Impact. The Project proposes development of a regional-serving commercial center consisting of an automated car wash, four restaurants with drive-throughs, one financial institution with a drive-through, retail and restaurant space, Costco Warehouse, and a fuel facility on a currently undeveloped site. The Project would require connections to public water, wastewater, storm drainage,

electric power, natural gas, telecommunications, and other utility systems. Additionally, the Project may require construction of new on-site and off-site utility infrastructure improvements necessary to serve the maximum development program. Operation of development within the Project site would increase demand for potable water supplies, wastewater conveyance and treatment services, stormwater management facilities, electrical service, natural gas service, telecommunications infrastructure, and other utility services. Further analysis is required to evaluate the availability and capacity of existing and planned utility systems and service providers, including water supply facilities, wastewater conveyance and treatment facilities, stormwater drainage infrastructure, electrical service infrastructure, natural gas facilities, and telecommunications systems. The EIR will evaluate whether the Project would require new or expanded utility facilities and if adequate wastewater conveyance and treatment capacity exists to serve the projected demand associated with the Project. Additionally, a Water Supply Assessment will be prepared to determine whether sufficient water supplies are available during normal, dry, or multiple dry years. Therefore, these issues will be further analyzed in the EIR.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Potentially Significant Impact. Implementation of the proposed Project would generate solid waste during both Marketplace construction and operation. Construction activities would generate excavation materials, packaging materials, and construction debris, while the operation of the commercial uses would generate municipal solid waste, recyclable materials, and organic waste. Solid waste generated within the City is collected and managed in accordance with applicable provisions of the BMC and regional solid waste management programs. Sufficient transfer, disposal, recycling, and organic waste management capacity would be assessed in order to determine if the existing waste facilities could accommodate projected waste generation associated with the Project. Therefore, these issues will be further analyzed in the EIR.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Potentially Significant Impact. Implementation of the proposed Project would generate solid waste during both construction and operation. Construction activities would generate excavation, packaging, and building-material waste, while the operation of the commercial uses would generate routine municipal solid waste, recyclable materials, and organic waste. The Project would be required to comply with all applicable federal, State, and local solid waste regulations, which require the implementation of recycling, waste diversion, and organic waste collection programs, and would reduce the amount of waste requiring landfill disposal. The Project would be assessed to determine if it would comply with applicable solid waste management and waste reduction regulations or exceed the capacity of local solid waste facilities. Therefore, potentially significant impacts may occur, and these issues will be further analyzed in the EIR.

XX. WILDFIRE

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

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

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No Impact. The CalFire Fire Hazard Severity Zone Map for Kern County indicates the Project site is not located in or near a State Responsibility Area (SRA) or lands classified as a Very High Fire Hazard Severity Zone (VHFHSZ). [21] Instead, the Project site is located in a Local Responsibility Area in land classified as a Non-Very High Fire Hazard Severity Zone (Non-VHFHSZ). Therefore, no impact would occur, and this issue will not be further analyzed in the EIR.

[21] California Department of Forestry & Fire Protection. *Fire Hazard Severity Zone Viewer.* Retrieved from: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones. Accessed April 2026.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

Does the project:

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

a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

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

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

Potentially Significant Impact. The Project proposes development of a regional-serving commercial center consisting of an automated car wash, four restaurants with drive-throughs, one financial institution with a drive-through, retail and restaurant space, Costco Warehouse, and fuel facility, on a currently undeveloped site. The Project also includes offsite utility and roadway improvements along 7th Standard Road and Calloway Drive; such improvements would occur within or adjacent to existing transportation

corridors and would enhance connectivity and circulation within the area. As discussed throughout this Initial Study, the Project may result in potentially significant impacts related to aesthetics, biological resources, cultural resources, tribal cultural resources, hazards and hazardous materials, transportation, utilities and service systems, and other environmental issue areas. Because potentially significant impacts have been identified in one or more environmental resource categories, the Project could potentially degrade environmental quality, affect biological and cultural resources, contribute to cumulatively considerable impacts, and result in direct or indirect adverse effects on human beings. The extent and significance of these impacts cannot be fully determined based on the information currently available. Accordingly, potentially significant impacts may occur, and these issues will be further analyzed in the EIR.

REFERENCES

CalGEM. (2026). *Well Finder*. Retrieved from: https://maps.conservation.ca.gov/calgem/findwells/. Accessed July 2026.

California Department of Conservation. (2015). *CGS Information Warehouse: Regulatory Maps*. Retrieved from http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps. Accessed July 2026.

California Department of Conservation. (2022). *California Important Farmland Finder*. Retrieved from: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed April 2026

California Department of Conservation. (2024). *Williamson Act Enrollment Finder*. Retrieved from: https://maps.conservation.ca.gov/dlrp/WilliamsonAct/. Accessed April 2026

California Department of Conservation. (2026). *Earthquake Zones of Required Investigation*. Retrieved from https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/. Accessed April 2026

California Department of Conservation, California Geologic Survey. (2026). *Tsunami Hazard Area Map*. Retrieved from: https://maps.conservation.ca.gov/cgs/informationwarehouse/ts_evacuation/#data_s=id%3AdataSource_3-19194927b24-layer-13%3A15. Accessed August 2026.

California Department of Conservation, California Geologic Survey. (2026). *Mineral Land Classification Map*. Retrieved from: https://maps.conservation.ca.gov/cgs/minerals/?page=Mineral-Land-Classification#data_s=id%3AdataSource_4-18a47b5b8e5-layer-10-192c08351d6-layer-28%3A36. Accessed April 2026.

California Department of Forestry & Fire Protection. *Fire Hazard Severity Zone Viewer*. Retrieved from: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones. Accessed April 2026.

California Department of Transportation. (2026). *Statewide Scenic Highway Map*. Retrieved from: https://experience.arcgis.com/experience/47e2009986264718a5a13a2c81382774. Accessed April 2026.

City of Bakersfield. (2002). *City of Bakersfield General Plan*. Retrieved from: https://content.civicplus.com/api/assets/6c7a0380-7841-40d6-b3ef-23ceb4fa0fd7. Accessed May 2026.

City of Bakersfield General Plan. (2002). *Metropolitan Bakersfield General Plan EIR*. Retrieved from: https://psbweb.kerncounty.com/planning/pdfs/mbgp/MBGP_FPEIR.pdf. Accessed July 2026.

City of Bakersfield. (2025). *Planning & Land Use Map*. Retrieved from: https://cob.maps.arcgis.com/apps/webappviewer/index.html?id=9fbb25e825e3425a84e7dea631e42f7b. Accessed April 2026.

City of Bakersfield. (2026). *Municipal Code §17.24.020*. Retrieved from: https://bakersfield.municipal.codes/Code. Accessed April 2026.

County of Kern. (2011). *Airport Land Use Compatibility Plan*. Retrieved from: https://docs.bakersfieldcity.us/WebLink/DocView.aspx?dbid=0&id=932206&page=1. Accessed May 2026

County of Kern. (2026). *Interactive County Map (GIS Tool)*. Retrieved from: https://maps.kerncounty.com/H5/index.html?viewer=KCPublic. Accessed May 2026.

County of Kern. (2026). *Isabella Dam Main Dam Failure – Figure 27 – Peak Inundation Depth (Full Study View)*. Retrieved from: https://www.kernpublicworks.com/home/showpublisheddocument/10906/638315043327130000. Accessed August 2026.

Department of Toxic Substances Control. (2026). *Hazardous Waste and Substances Site List (Cortese)*. Retrieved from: https://www.envirostor.dtsc.ca.gov/public/search?cmd=search&reporttype=CORTESE&site_type=CSITES,FUDS&status=ACT,BKLG,COM&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29. Accessed April 2026.

FEMA. (2026). *National Flood Hazard Layer*. Retrieved from: https://www.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd. Accessed August 2026.

United States Census Bureau. (2026). *QuickFacts: Bakersfield City, California*. Retrieved from: https://www.census.gov/quickfacts/fact/table/bakersfieldcitycalifornia/PST045225. Accessed August 2026.

U.S. Forest Service. (2026). *Wildland Urban Interface: 2020 Map Service*. Retrieved from: https://data-usfs.hub.arcgis.com/documents/usfs::wildland-urban-interface-2020-map-service/explore?path=. Accessed August 2026.

Appendix A

Geotechnical Study – Proposed Anchor Commercial Use – and Fuel Facility

March 7, 2025
Kleinfelder Project No.: 25000882.001A

Costco Wholesale
730 Lake Drive
Issaquah, Washington 98027

Attention: Mr. Sean Anderson
Director, Real Estate Development

SUBJECT: Geotechnical Study
Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California 93314
CW# 23-0481

Dear Mr. Anderson:

Kleinfelder is pleased to present this report summarizing our geotechnical study for the proposed Costco Wholesale Warehouse located on the southwest corner of 7th Standard Road and Calloway Drive in Bakersfield, California. The conclusions and recommendations presented in this report are subject to the limitations presented in Section 7.

We appreciate the opportunity to provide geotechnical engineering services to you on this project. If you have any questions regarding this report or if we can be of further service, please do not hesitate to contact Brian Crystal 949.727.4466, or Andy Franks, Kleinfelder's Client Account Manager for Costco at 480.650.4905.

Sincerely,

KLEINFELDER

Hector Marquez, PE
Project Engineer

Brian E. Crystal, PE, GE
Senior Project Manager

Copyright 2025 Kleinfelder

24411 Ridge Route Dr. Suite 225, Laguna Hills 92653 p | 949.727.4466 f | 949.727.9242

GEOTECHNICAL STUDY
PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SWC OF 7TH STANDARD ROAD AND CALLOWAY DRIVE
BAKERSFIELD, CALIFORNIA 93314
CW# 23-0481
KLEINFELDER PROJECT NO. 25000882.001A

MARCH 7, 2025

Copyright 2025 Kleinfelder
All Rights Reserved

ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC PROJECT FOR WHICH THIS REPORT WAS PREPARED.

Copyright 2025 Kleinfelder

A Report Prepared for:

Costco Wholesale
730 Lake Drive
Issaquah, Washington 98027

Attention: Mr. Sean Anderson

GEOTECHNICAL STUDY
PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SWC OF 7TH STANDARD ROAD AND CALLOWAY DRIVE
BAKERSFIELD, CALIFORNIA 93314
CW# 23-0481



Hector Marquez, PE
Project Engineer



Brian E. Crystal, PE, GE
Senior Project Manager

KLEINFELDER
24411 Ridge Route Drive, Suite 225
Laguna Hills, California
Phone: 949.727.4466
Fax: 949.727.9242

March 7, 2025
Kleinfelder Project No. 25000882.001A

Copyright 2025 Kleinfelder

Geotechnical Investigation Summary Checklist for Costco Wholesale Projects

General Information

Costco Real Estate Main Contact: Sean Anderson
Geotechnical Main Contact: Brian Crystal (949.727.4466)
Geotechnical Engineer of Record: Kleinfelder
Project Location: Southwest of 7th Standard Road and Calloway Drive
CW#: 23-0481
Warehouse #: N/A
Report Date: March 7, 2025
Consultant Project/Document Number: 25000882.001A/LH24R171614
Addendums (List):

Report Purpose: ☐ Preliminary ☐ Draft ☒ Final ☐ Addendum/Revision

	Yes	No or NA	Describe/ Comments	Report Section
Pre-existing Conditions/Information				
Developer provided geotechnical report (describe):	☐	☒		
Pre-existing development (describe)	☒	☐	Agricultural Farming	2.1
Foundation type (describe):	☐	☒		
Performance Issues (describe):	☐	☒		
Environmental Issues (describe)	☐	☒		
Site Grading Records (stripping,compaction test results,field reports, etc.)	☐	☒		
Typical Building Structural Design Criteria				
Other (describe):	☒	☐	New Costco Warehouse	1.1
Building size (describe):	☒	☐	177,294-square-foot Costco Wholesale Warehouse and Fuel Facility	1.1
Typical wall loading				
3 kips / foot* (Metal Buildings)	☐	☒		
4.5 kips / foot* (CMU or pre-cast)	☒	☐	Both CMU and Metal	1.1
Typical column loading				
120 kips in non-snow regions	☒	☐		1.1
150 kips in snow regions	☐	☒		
Typical canopy loading: 50 kips	☒	☐		1.1
Typical floor slab loading				
500 pounds per square foot, (psf, total)	☒	☐		1.1
250 psf (dead) at rack areas	☒	☐		
150 psf (dead) at non-rack areas	☒	☐		
350 psf (live)	☒	☐		
Paving Design (20 year life)				
Heavy Duty paving shall accommodate 30 trucks per day (Traffic Index of 7.0)	☒	☐		4.8
Light Duty paving shall accommodate 6,600 cars per day (Traffic Index of 5.0)	☒	☐		4.8
Performance Grade (PG) binder oil identified for local climate conditions	☒	☐	PG 64-10	4.8.3

	Yes	No or NA	Describe/ Comments	Report Section
Site Grading Conditions/Assumptions				
Deviations to Typical Criteria (list/describe):	☐	☒		
Design Finished Floor Elevation (FFE) (describe):	☒	☐	Elevation 396.50 feet	1.1
Basis for FFE (assumed, per Civil) (describe):	☒	☐	Preliminary Grading Plan	1.1
Effects of change to assumed FFE (describe):	☐	☒		1.1
Maximum anticipated cuts (describe):	☒	☐	Approx. 10 feet in basin area	1.1
Maximum anticipated fills (describe):	☒	☐	Less than 5 feet	1.1
Cross sections prepared for sites that are not essentially flat	☒	☐		Figures 3-6
Amount of import/export anticipated (describe):	☐	☒		1.1
Frost Depth (describe):	☐	☒		
Retaining walls				
Number of walls (describe):	☒	☐	1 wall on the west boundary of the site	1.1
Height/Length of walls (describe):	☒	☐	6-foot-high	1.1
Wall construction/type (describe):	☐	☒		
Cut/fill transition in pad (describe):	☐	☒		
Offsite Improvements (describe)	☐	☒		
Fieldwork/Results				
Costco Due Diligence Design Criteria				
Version (describe):	☒	☐	Version 2022, dated Oct. 28, 2022	1.1
Followed Criteria?	☒	☐		
Deviations to standard investigation (describe):	☐	☒		
Groundwater				
Depth (describe):	☒	☐	Groundwater was not encountered during our investigation which was drilled to an approximate depth of 51½ feet bgs.	3.3
Perched	☒	☐	Perched groundwater should be expected during and following periods of rainfall	3.3
Expected seasonal fluctuation (describe):	☐	☒		
Piezometers installed?	☐	☒		
Unusual/Challenging Soils conditions encountered				
Moisture-sensitive soils	☐	☒		
Undocumented fill	☐	☒		
Unsuitable soils (require removal)	☒	☐	Overexcavation and recompaction of the surface soils is recommended to provide relatively uniform support for the proposed building and other improvements.	5.2.2
Wet soils	☐	☒		
Debris	☐	☒		
Bedrock/potential non-rippable conditions	☐	☒	Additional, thick or more resistant cemented deposits may be present in locations beyond those explored.	5.2.5
Refusal	☐	☒		
Collapsible soils	☐	☒		
Expansive soils	☐	☒		

	Yes	No or NA	Describe/ Comments	Report Section
Compressible soils	☐	☒		
Liquefaction	☐	☒		
Sinkholes	☐	☒		
Other (describe):	☐	☒		
Potential Contamination Identified				
Soil	☐	☒		
Groundwater	☐	☒		
Restoration of Disturbed Areas				
Backfilled with soil	☒	☐	Borings and test pits were backfilled with soil cuttings	1.2.2
Backfilled with grout	☐	☒		
Other (describe):	☐	☒		
Topsoil samples collected/analyzed	☒	☐		Appendix B
Corrosivity testing performed/addressed	☒	☐	Corrosive potential to ferrous metals	4.9
Culinary water quality testing performed	☐	☒		
Report				
Executive summary	☒	☐		ES-1
Wet weather construction recommendations	☒	☐		5.3
Pad winterization/pad recommendations	☐	☒		
Frost protection recommendations	☐	☒		
Design Parameters				
Fill material parameters provided				
Structural fill (below foundations, slabs)	☒	☐		5.2.2
Site grading fill (below pavements, flatwork)	☒	☐		5.2.2
Select backfill (behind truck dock walls, foundations, grade beams, etc.)	☒	☐		5.2.4
Trench backfill	☒	☐		5.2.8
Drainage fill	☐	☒		
Frost resistant fill	☐	☒		
Slab base aggregate	☒	☐	Aggregate Base Material	4.4
Limits of debris/unsuitable removal provided	☒	☐		5.2.2
Over-excavation/recompaction required	☒	☐		5.2.2
Depth (describe):	☒	☐	Soils within 10 feet of the warehouse pad should be overexcavated to a depth of at least 2 feet below existing grade or 2 feet below the bottom of the footings and floor slabs, whichever is deeper, and replaced as structural fill.	5.2.2
Extent (include cross-section diagram)	☐	☒		
Pad subgrade stabilization required (describe):	☐	☒	Recommendations provided	5.3
Surcharge	☐	☒		

	Yes	No or NA	Describe/ Comments	Report Section
Height (describe):	☐	☒		
Lateral extent (describe):	☐	☒		
Estimated duration (describe):	☐	☒		
Shallow Foundations	☒	☐		
psf allowable soil bearing pressure (describe):	☒	☐	3,000 psf	4.3.2
Deep Foundations	☒	☐	For light poles and/or Fuel Facility	4.3.3
Type (describe):	☒	☐	Drilled piles	
Options and Value Engineering Matrix provided	☐	☒		
Floor Slabs				
Unreinforced (>2500 psf)	☒	☐		4.4
Reinforced (describe why)	☐	☒		
Subgrade modulus (ksi/in) (describe):	☒	☐	150 pci	4.4
Base Material thickness (min 6") (describe):	☒	☐	6 inches of AB	4.4
Seismic Conditions				
Governing Building Code (IBC, UBC, other)	☒	☐	2022 CBC	4.2.1
Geologic Hazard Identified	☒	☐		3.4
Proximity to earthquake fault zone(s)	☒	☐		3.4.1
Proximity to seismic hazard zone(s)	☐	☒		
Potential for liquefaction	☐	☒		
Potential for lateral spreading	☐	☒		
Potential for seismic settlement	☐	☒		
Potential for slope stability/landslides	☐	☒		
Potential for groundshaking or geologic hazards	☐	☒		
Retaining Walls	☒	☐		4.7
Recommended Wall Types	☐	☒		
Recommend Kleinfelder Design	☐	☒		
Lateral earth pressure design values	☒	☐		4.7
Active:	☒	☐		4.7
At-rest:	☒	☐		4.7
Passive:	☒	☐		4.7
Seismic:	☒	☐		4.7
Backfill material, placement requirements	☒	☐		4.7
Drainage requirements and cross-section drawing	☐	☒		
Finger Drains	☐	☒		
Required for frost	☐	☒		
Recommended for long term maintenance and constructability	☐	☒		
Pavement				
Pavement subgrade stabilization required (describe):	☐	☒		5.2.2
Costco asphalt mix design specified	☒	☐		4.8.3
Heavy and light duty pavement sections specified	☒	☐		4.8.2
Alternative pavement sections identified	☒	☐	PCC pavement	4.8.4
Specification for offsite pavement sections included	☐	☒		
Data Gaps/Unknowns (describe):	☐	☒		

TABLE OF CONTENTS

Section **Page**

EXECUTIVE SUMMARY **ES-1**

1 INTRODUCTION **1**
1.1 PROJECT DESCRIPTION 1
1.2 SCOPE OF SERVICES 2
1.2.1 Task 1 – Background Data Review 2
1.2.2 Task 2 – Field Exploration 2
1.2.3 Task 3 – Laboratory Testing 3
1.2.4 Task 4 – Geotechnical Analyses 3
1.2.5 Task 5 – Report Preparation 4

2 SITE CONDITIONS **5**
2.1 SITE DESCRIPTION 5

3 GEOLOGY **6**
3.1 GEOLOGIC SETTING 6
3.1.1 Site Geology 6
3.2 SUBSURFACE CONDITIONS 6
3.3 GROUNDWATER 7
3.4 ASSESSMENT OF POTENTIAL GEOLOGIC HAZARDS 7
3.4.1 Localized Faulting 7
3.4.2 Land Subsidence 8
3.4.3 Landsliding 8
3.4.4 Liquefaction and Seismic Compression 9
3.4.5 Collapsible Soils 9
3.4.6 Expansive Soils 10
3.4.7 Flooding 10

4 GEOTECHNICAL DESIGN RECOMMENDATIONS **11**
4.1 GENERAL 11
4.2 SEISMIC DESIGN CONSIDERATIONS 13
4.2.1 2022 CBC Seismic Design Parameters 13
4.3 FOUNDATIONS 14
4.3.1 General 14
4.3.2 Shallow Foundations 14
4.3.3 Short Drilled Pile Foundations 15
4.4 BUILDING SLAB-ON-GRADE 16
4.5 EXTERIOR FLATWORK 17
4.6 SITE DRAINAGE 17
4.7 RETAINING STRUCTURES 18
4.8 PAVEMENT SECTIONS 20
4.8.1 Costco Pavement Design Parameters 20
4.8.2 Asphalt Concrete Pavement 20
4.8.3 Asphalt Performance Grade Binder 21
4.8.4 Portland Cement Concrete Pavement 21
4.8.5 Aggregate Base 22
4.8.6 Pavement Maintenance 22
4.9 SOIL CORROSIVITY 22
4.10 STORMWATER MANAGEMENT 23

Copyright 2025 Kleinfelder

Section **Page**

5 CONSTRUCTION RECOMMENDATIONS 24
5.1 GENERAL 24
5.2 EARTHWORK 24
5.2.1 General 24
5.2.2 Site Preparation 24
5.2.3 Foundation Excavations 25
5.2.4 Fill Material and Compaction Criteria 26
5.2.5 Excavation Characteristics 27
5.2.6 Temporary Excavations 28
5.2.7 Oversize Material 28
5.2.8 Trench Backfill 28
5.3 UNSTABLE SUBGRADE CONDITIONS 29
5.4 EXTERIOR FLATWORK 30
5.5 PAVEMENTS 30
5.5.1 HMA Design 30
5.5.2 Construction Considerations 30
6 ADDITIONAL SERVICES 32
6.1 PLANS AND SPECIFICATIONS REVIEW 32
6.2 CONSTRUCTION OBSERVATION AND TESTING 32
7 LIMITATIONS 33
8 REFERENCES 35

TABLES
1 Summary of Significant Holocene-Active Faults Near the Project Site
2 2022 CBC Seismic Design Parameters
3 Lateral Earth Pressures for Retaining Structures (On-Site Granular Backfill)
4 Recommended Minimum Asphalt Concrete Pavement Sections
5 Corrosion Test Results
6 Summary of Infiltration Test Results
7 Structural Fill Placement and Compaction Criteria

FIGURES
1 Site Vicinity Map
2 Exploration Location Map
3 – 6 Cross Section A-A', B-B', C-C', and D-D'

APPENDICES
A Field Explorations
B Laboratory Testing
C Infiltration Test Results

Copyright 2025 Kleinfelder

EXECUTIVE SUMMARY

This report presents the results of Kleinfelder's geotechnical study for the proposed Costco Wholesale Warehouse and Fuel Facility (CW# 23-0481) located at the southwest corner of 7th Standard Road and Calloway Drive in Bakersfield, California. The purpose of our geotechnical study was to evaluate soil and groundwater conditions at the site and provide geotechnical recommendations for project design and construction. We based our study on the Costco Wholesale Development Requirements (CWDRs), Version 2022, dated October 28, 2022.

Kleinfelder understands Costco plans to purchase an approximately 20.97-acre site to construct a new approximately 177,294-square-foot (sf) warehouse and fuel facility. Approximately 18,692 sf of the proposed warehouse will serve as a Merchandise Delivery Operation (MDO) facility. The warehouse building will be a single-story, steel-framed and concrete-masonry-unit structure (30 feet in height). The fuel facility will contain three 40,000-gallon underground storage tanks (USTs), a fuel additive UST, four fueling islands, and a pre-manufactured metal canopy. The building surroundings will consist mainly of surface parking with some landscape areas. A retention basin is proposed on the south portion of the site and a 6-foot-high retaining wall is proposed on the west boundary of the site. The site is part of a larger mixed-commercial development (not part of this project), which will be developed by others.

Surface elevations interpreted from preliminary grading plans prepared by Kimley Horn (the project civil engineer) indicates that the existing grades vary from a high of approximately 395 feet at the east end of the site to a low of approximately 391 feet on the west end of the site. Based on the preliminary grading plans, we understand that the finished floor elevation for the building slab will be established at approximately 396.50 feet. Fills less than about 5 feet from existing grade are anticipated to achieve the desired site grades, with exception to the retention basin that will require approximately 10 feet of cut.

The proposed Costco site is located southwest of 7th Standard Avenue and Calloway Drive, as shown on Figure 1. The site is currently bounded by Calloway Drive to the east, 7th Standard Road to the north, residential properties to the south, and vacant fields to the west. At the time of our field exploration, the site was undeveloped and exposed bare earth and dry grass. An irrigation ditch and berm border the perimeter of the north and east sides of the property. Based on a review of historical aerial photography, the site had been used for agricultural purposes.

Subsurface conditions at the site were explored by drilling 38 borings and excavating 9 test pits. In addition, 4 borehole infiltration tests were performed. A total of 21 borings and 6 test pits were

Copyright 2025 Kleinfelder

advanced in the building area; 13 borings and 3 test pits were advanced in the parking and drive areas; 4 borings were advanced in the proposed fuel facility location; and 4 infiltration tests were performed in the retention basins area. The borings were drilled using truck-mounted, hollow-stem-auger drilling equipment to depths between approximately 21½ and 51½ feet below the existing ground surface (bgs) in the warehouse building area, approximately 11½ feet bgs in the parking and drive areas; and between approximately 11½ and 26½ feet bgs in the fuel facility area. The borehole infiltration tests were drilled to depths of approximately 5 or 10 feet bgs. The test pits were excavated to depths approximately 10 feet bgs.

The soils encountered within our borings and test pits consist of alluvial deposits. The upper approximately 6 to 12 inches was disturbed and generally contained roots and other organic material. The organic content of the upper 6 to 12 inches ranged from approximately 0.40 to 1.23 percent. The alluvial soils generally consist of medium dense silty sands to stiff sandy silts with interbedded layers of poorly graded sands. Some near-surface soils were observed to be weakly to moderately cemented (hardpan).

Groundwater was not encountered in our borings to the maximum depth explored of approximately 51½ feet. Groundwater levels in the area have been measured at depths deeper than 195 feet below the existing ground surface (State Water Resources Control Board, Well No. MW-03).

Based on the results of our field exploration, and observations during this exploration, it is our professional opinion that the proposed project is geotechnically feasible, provided the recommendations presented in the geotechnical report are incorporated into the project design and construction. We identified the following key geotechnical considerations during our study.

- The proposed Costco warehouse and fuel facility may be supported on a conventional shallow foundation system. Overexcavation and recompaction of the surface soils is recommended to provide relatively uniform support for the proposed building and other improvements. Light poles and the fuel facility canopy (as an alternative) may be supported on drilled pile foundations.
- Soils within 10 feet of the warehouse pad (including the entrance canopy, building aprons, utility pads, stairs, ramps, stoops, and the loading dock) should be overexcavated to a depth of at least 4 feet below existing grade or 2 feet below the bottom of the footings and floor slabs, whichever is deeper, and replaced as structural fill. If fill soils are encountered at the base of the excavation, the overexcavation should continue until the fill is removed.

Copyright 2025 Kleinfelder

The overexcavated soils can be moisture conditioned and recompacted as structural fill once oversized material is removed, as described below.

- For pavement, sidewalk, and flatwork areas, soils should be overexcavated to a depth of at least 18 inches below existing grade or 12 inches below the finished subgrade elevation, whichever is deeper. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The overexcavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.
- For the retaining wall on the west boundary of the site, soils should be overexcavated to a depth of at least 2 feet below existing grade or 2 feet below the bottom of the footing, whichever is deeper. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The overexcavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.
- Following overexcavation and prior to replacing soils, the exposed subgrade should be proof rolled with at least a 10-ton roller, fully loaded tandem-axle dump truck or water truck. Areas identified as being soft or yielding may require additional compaction or overexcavation, as determined by Kleinfelder. Following proof rolling and any additional overexcavation, the exposed subgrade should be scarified, moisture conditioned, and recompacted.
- Organic matter in the topsoil is low based on laboratory testing and stripping will not be necessary. However, any roots and vegetative matter in excess of one inch should be removed by screening or raking prior to reuse as structural fill. After screening or raking, the surface soils can be moisture conditioned and used as structural fill.
- Should grading be performed during or following extended periods of rainfall, the moisture content of the near-surface soils will be significantly above the optimum moisture content. Site grading should be well maintained during development so that ponding water is avoided, particularly near the building pad and open excavations. Ponding water should be promptly pumped out and these areas should be allowed to dry prior to continued construction activities.
- We have assessed the potential for storm water infiltration into the subgrade soils at the subject project site. Four borehole infiltration tests were performed at depths of approximately 5 and 10 feet bgs. Based on the results of the infiltration testing, stormwater infiltration is feasible. We recommend a long-term design infiltration rate of 0.4 inches per hour for the soils in the upper 5 to 10 feet bgs.

Copyright 2025 Kleinfelder

- Pavement underdrains at drainage inlets and catch basins should be included as shown in Detail 16_16 of the CWDRs. Drains should be designed and constructed per Costco's standard details and laterals should extend at least 10 feet from the catch basins. Perimeter foundation drains are not necessary.
- Minimum resistivity values of the samples tested indicate that the soil may be highly corrosive to ferrous metals. The concentrations of soluble sulfates indicate that the subsurface soils represent a Class S0 Class S0 exposure to sulfate attack on concrete in contact with the soil based on ACI 318-14 Table 19.3.1.1. Therefore, in accordance with ACI Building Code 318-14, no special provisions for selection of cement type are required.

The findings, conclusions, and recommendations presented in this executive summary should not be relied upon without consulting our geotechnical report for more information. The conclusions and recommendations presented in this report are subject to the limitations presented in Section 7.

Copyright 2025 Kleinfelder

1 INTRODUCTION

This report presents the results of Kleinfelder's geotechnical study for the proposed Costco Wholesale Warehouse and Fuel Facility (CW# 23-0481) located at the southwest corner of 7th Standard Road and Calloway Drive in Bakersfield, California. The location of the project site is presented on Figure 1, Site Vicinity Map. The purpose of our geotechnical study was to evaluate soil and groundwater conditions at the site and provide geotechnical recommendations for project design and construction. The scope of our services was presented in our proposal titled, "Proposal for Geotechnical Study, Proposed Costco Wholesale Warehouse and Fuel Facility, SWC of 7th Standard Road and Calloway Drive, Bakersfield, California 93314, CW# 23-0481," dated May 24, 2024. We based our study on the Costco Wholesale Development Requirements (CWDRs), Version 2022, dated October 28, 2022.

This report presents a description of the services performed, a discussion of the geotechnical conditions observed at the site, and recommendations developed from our engineering analyses of field and laboratory data. Individuals using this report should read the limitations presented in Section 7.

1.1 PROJECT DESCRIPTION

Kleinfelder understands Costco plans to purchase an approximately 20.97-acre site to construct a new approximately 177,294-square-foot (sf) warehouse and fuel facility. Approximately 18,692 sf of the proposed warehouse will serve as a Merchandise Delivery Operation (MDO) facility. The warehouse building will be a single-story, steel-framed and concrete-masonry-unit structure (30 feet in height). The fuel facility will contain three 40,000-gallon underground storage tanks (USTs), a fuel additive UST, four fueling islands, and a pre-manufactured metal canopy. The building surroundings will consist mainly of surface parking with some landscape areas. A retention basin is proposed on the south portion of the site and a 6-foot-high retaining wall is proposed on the west boundary of the site. The site is part of a larger mixed-commercial development (not part of this project), which will be developed by others.

Based on the CWDRs, we understand maximum column loads will be on the order of 120 kips, typical wall loads will be approximately 4.5 kips per lineal foot, canopy column loads will be approximately 50 kips, and the total slab load (dead plus live loads) will be approximately 500 psf. The warehouse surroundings will consist mainly of parking with a loading dock and some landscaped areas. Parking and drive areas will be paved with either Portland cement concrete or asphalt concrete pavements.

Copyright 2025 Kleinfelder

Surface elevations interpreted from preliminary grading plans prepared by Kimley Horn (the project civil engineer) indicates that the existing grades vary from a high of approximately 395 feet at the east end of the site to a low of approximately 391 feet on the west end of the site. Based on the preliminary grading plans, we understand that the finished floor elevation for the building slab will be established at approximately 396.50 feet. Fills less than about 5 feet from existing grade are anticipated to achieve the desired site grades, with exception to the retention basin that will require approximately 10 feet of cut.

1.2 SCOPE OF SERVICES

The scope of our geotechnical study consisted of a literature review, subsurface explorations, geotechnical laboratory testing, engineering evaluation and analysis, and preparation of this report. Studies to assess environmental hazards that may affect the soil and groundwater at the site were beyond our geotechnical scope of services. The following paragraphs present a description of our services.

1.2.1 Task 1 – Background Data Review

We reviewed readily available published and unpublished geologic literature in our files and the files of public agencies, including selected publications prepared by the California Geological Survey and the U.S. Geological Survey. We also reviewed readily available seismic and faulting information, including data for designated earthquake fault zones and our in-house database of faulting in the general site vicinity.

1.2.2 Task 2 – Field Exploration

Subsurface conditions at the site were explored by drilling 38 borings and excavating 9 test pits. In addition, 4 borehole infiltration tests were performed. A total of 21 borings and 6 test pits were advanced in the building area; 13 borings and 3 test pits were advanced in the parking and drive areas; 4 borings were advanced in the proposed fuel facility location; and 4 infiltration tests were performed in the retention basins area. The borings were drilled using truck-mounted, hollow-stem-auger drilling equipment to depths between approximately 21½ and 51½ feet below the existing ground surface (bgs) in the warehouse building area, approximately 11½ feet bgs in the parking and drive areas; and between approximately 11½ and 26½ feet bgs in the fuel facility area. The borehole infiltration tests were drilled to depths of approximately 5 or 10 feet bgs. The test pits were excavated to depths approximately 10 feet bgs. The approximate locations of the borings, infiltration tests, and test pits are presented on Figure 2, Exploration Location Map.

Copyright 2025 Kleinfelder

Prior to commencement of the fieldwork, Underground Service Alert (USA) was notified and various geophysical techniques were used at the boring and test pit locations to identify potential conflicts with subsurface structures. A Kleinfelder staff professional supervised the field operations and logged the explorations. Selected bulk and drive samples were retrieved, placed in plastic bags, or sealed in sample tubes, and transported to our laboratory for further evaluation. The number of blows necessary to drive a Standard Penetration Test (SPT) sampler or California-type sampler was recorded. Soil descriptions used on the logs result from field observations and data, as well as from laboratory test data. Stratification lines on the logs represent the approximate boundary between soil types, and the actual transition may vary and can be gradual. Appendix A presents a description of the field exploration program, exploration logs, and a legend of terms and symbols used on the logs.

1.2.3 Task 3 – Laboratory Testing

Laboratory testing was performed on representative bulk and relatively undisturbed samples to assist in soil classification and development of engineering parameters for geotechnical design. Laboratory testing consisted of moisture content, dry unit weight, wash sieve (percent passing No. 200 sieve), sieve analysis, hydrometer, Atterberg limits, direct shear, collapse potential, Modified Proctor, R-value, and preliminary corrosion testing. Laboratory testing was performed by both Kleinfelder and AP Engineering and Testing, Inc. of Pomona, California. Appendix B presents the results of the laboratory testing performed for this study.

Analytical testing was performed on a composite topsoil sample for essential elements in accordance with CWDRs, and eighteen topsoil samples were tested for organic content. The topsoil analysis and organic content testing were performed by Waypoint Analytical to assess soil fertility, localized concentrations of various metals, and organic content. Appendix B also presents analytical test results.

1.2.4 Task 4 – Geotechnical Analyses

We analyzed field and laboratory data relative to the anticipated finished grades, warehouse layout, and structural loads to provide geotechnical recommendations for design and construction. We evaluated feasible foundation systems, concrete slab support, pavement design, and earthwork. Seismic design parameters in accordance with the 2022 California Building Code (CBC) are also presented.

Copyright 2025 Kleinfelder

1.2.5 Task 5 – Report Preparation

This report summarizes the services performed, data acquired, and our findings, conclusions, and geotechnical recommendations for the design and construction of the proposed improvements. Our report includes the following items:

- Vicinity map and field exploration location map showing the approximate boring, infiltration test, and test pit locations.
- Boring, infiltration test, and test pit logs (Appendix A).
- Results of laboratory testing (Appendix B).
- Results of infiltration tests (Appendix C).
- Discussion of general site conditions.
- Discussion of general subsurface conditions as encountered during our field exploration.
- Discussion of regional and local geology.
- Recommendations for seismic design parameters in accordance with the 2022 CBC.
- Recommendations for foundation design, allowable bearing pressures, embedment depths, and compatibility constraints under various loading conditions.
- Anticipated total and differential static settlements.
- Recommendations for site preparation, earthwork, temporary slope inclinations, fill placement, and compaction specifications, including the excavation characteristics of subsurface soil deposits and formational materials.
- Recommendations for support of floor slabs and slabs-on-grade.
- Recommendations for flexible and rigid pavement structural sections for light- and heavy-duty pavement based on Equivalent Single Axle loading presented in the CWDRs.
- Recommendations for design of retaining structures, including active and at-rest lateral earth pressures, passive and frictional resistance, and applicable surcharge loads.
- Preliminary evaluation of the corrosion potential of the on-site soils.
- Assessment of infiltration feasibility for stormwater management.

Copyright 2025 Kleinfelder

2 SITE CONDITIONS

2.1 SITE DESCRIPTION

The proposed Costco site is located southwest of 7th Standard Avenue and Calloway Drive, as shown on Figure 1. The site is currently bounded by Calloway Drive to the east, 7th Standard Road to the north, residential properties to the south, and vacant fields to the west. At the time of our field exploration, the site was undeveloped and exposed bare earth and dry grass. An irrigation ditch and berm border the perimeter of the north and east sides of the property. Based on a review of historical aerial photography, the site had been used for agricultural purposes.

Copyright 2025 Kleinfelder

3 GEOLOGY

3.1 GEOLOGIC SETTING

California is divided into eleven natural geomorphic provinces that are recognized based on geology, landscape or landform, topographic relief, and climate (CGS, 2002). The project site is located at the southern end of the Great Valley, between the Sierra Nevada and Coast Ranges geomorphic provinces to the east and west respectively. The Great Valley is a northwest-trending valley that has been infilled with sediments deposited from various streams and rivers that emanate from the mountains surrounding the valley. The Sierra Nevada is a northwest-trending mountain range that extends roughly 400 miles from the Mojave Desert geomorphic province in the south to the Cascade Range geomorphic province in the north. In general, the Sierra Nevada consists of igneous and metamorphic rocks that have been incised into by glacial activity (CGS, 2002).

The Coast Ranges is a northwest-trending geomorphic province that consists of a series of northwest-trending mountains and valleys that are parallel to the San Andreas Fault. This province extends over 600 miles from the Transverse Ranges in the south to the California-Oregon border in the north. Its western margin is bordered by the Pacific Ocean. The region consists primarily of sedimentary deposits underlain by a granitic core. In many places, these sedimentary deposits are capped by volcanics (CGS, 2002).

3.1.1 Site Geology

The project site is located at the southeastern end of the alluvial-filed San Joaquin Valley, which is immediately west of the Sierra Nevada Mountain range. This section of the San Joaquin Valley consists of alluvial fans that emanate from the mountains to the east. Fluvial terraces that have been incised into by modern stream activity are also present and underlie the site. These terrace deposits consist of sand, gravel, silt, and clay that have undergone pedogenisis. (Bartow, 1984). Descriptions of the soils encountered in Kleinfelder's subsurface exploration are presented in the following sections and on the test pit and boring logs presented in Appendix A. Generalized cross sections are presented on Figures 3 through 6.

3.2 SUBSURFACE CONDITIONS

The soils encountered within our borings and test pits consist of alluvial deposits. The upper approximately 6 to 12 inches was disturbed and generally contained roots and other organic material. The organic content of the upper 6 to 12 inches ranged from approximately 0.4 to

Copyright 2025 Kleinfelder

1.2 percent. The alluvial soils generally consist of medium dense silty sands to stiff sandy silts with interbedded layers of poorly graded sands. Some near-surface soils were observed to be weakly to moderately cemented (hard pan).

3.3 GROUNDWATER

Groundwater was not encountered in our borings to the maximum depth explored of approximately 51½ feet. Groundwater levels in the area have been measured at depths deeper than 195 feet below the existing ground surface (State Water Resources Control Board, Well No. MW-03).

Localized zones of perched water, increased soil moisture content and fluctuations of the groundwater level, should be anticipated during and following the rainy season. Irrigation of landscaped areas on or adjacent to the site can also cause a fluctuation of local groundwater levels.

3.4 ASSESSMENT OF POTENTIAL GEOLOGIC HAZARDS

3.4.1 Localized Faulting

We consider the most significant geologic hazard to the project to be the potential for moderate to strong seismic shaking that is likely to occur during the design life of the proposed project. The project site is located in the seismically active central California region containing abundant, active faults capable of producing intense ground shaking during seismic events. Based on the information provided in CGS Special Publication 42 (CGS, 2018), the site is not located within a State-designated Earthquake Fault Zone (also called AP Zones). The nearest mapped Earthquake Fault Zone, the Premier Fault, is located approximately 3.3 miles northeast of the site (CGS, 2024).

The CGS defines Holocene-active faults as those demonstrated to have displacement of the Holocene-age ground surface within the past 11,700 years (end of the Holocene geologic era) and are believed to pose the risk of ground rupture. Pre-Holocene faults that have been demonstrated to have no Holocene surface displacement are not regulated for fault hazards under the CGS Earthquake Zoning Act. Faults of undetermined age cannot be classified as Holocene-active or pre-Holocene active because there is insufficient data to demonstrate activity with respect to the Holocene time period. Active faults without surface expression (buried faults) and other potentially active seismic sources which may be capable of generating earthquakes are not currently zoned by the Act, but they are known to be present in the region (e.g., Poso Creek fault).

Copyright 2025 Kleinfelder

On-site ground shaking could be caused by an earthquake occurring along any of the region's Holocene-active faults. Some of the Holocene-active faults near the project site that are capable of causing significant shaking include the White Wolf fault, San Andreas fault and the Garlock fault. Table 1 below provides the nearest distance to each fault and a listing of some of the seismic parameters (i.e., fault type, slip rate and magnitude) associated with each of the faults.

Table 1
Summary of Significant Holocene-Active Faults Near the Project Site

Fault Name (segment name)	Approximate Fault Distance and Direction from Site (miles)	Fault Type	Slip Rate/Year (millimeters)	Maximum Magnitude (Mmax)
Premier	3.3, northeast	Normal	Unspecified	N/A
Kern Front	4.5, northeast	Normal	Unspecified	N/A
White Wolf	25.6, southeast	Reverse	1.0-5.0	N/A
San Andreas	37.1, southwest	Right lateral strike-slip	>5	N/A
Garlock	43.0, southeast	Left lateral strike-slip	>5	N/A

Sources:

U.S. Geologic Survey (USGS) and California Geological Survey (CGS), Quaternary fault and fold database for the United States, accessed 8/4/2024 at https://www.usgs.gov/programs/earthquake-hazards/faults
California Geological Survey (CGS), 2022, DOC Maps: Geologic Hazards, accessed 08/4/2024 at https://maps.conservation.ca.gov/geologichazards/

3.4.2 Land Subsidence

In general, land subsidence is the sinking or settlement of the ground surface due to the rearrangement of subsurface materials. Over 80 percent of the documented cases of land subsidence in the United States have been caused by groundwater extractions from the underlying aquifer-system (USGS, 2018).

Due to the underlying subsurface materials, and the deep groundwater at the site, the risk of land subsidence and earth fissures due to groundwater withdrawal at the site is considered low (USGS, 2024).

3.4.3 Landsliding

Landslides and other forms of mass wasting, including mud flows, debris flows, soil slips, and rock falls occur as soil or rock moves down slope under the influence of gravity. Landslides are frequently triggered by intense rainfall or seismic shaking.

Copyright 2025 Kleinfelder

The site and surrounding area are relatively flat; therefore, landslides or other forms of natural slope instability do not represent a hazard to the project.

3.4.4 Liquefaction and Seismic Compression

The term liquefaction describes a phenomenon in which saturated, cohesionless soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and/or undergo lateral spreading. The factors known to influence liquefaction potential include soil type, relative density, grain size, confining pressure, depth to groundwater, and the intensity and duration of the seismic ground shaking. Liquefaction is most prevalent in loose to medium dense, silty, sandy, and gravelly soils below the groundwater table.

Based on our review of available groundwater well data, it is our opinion that the regional groundwater is deep. Therefore, based on the results of the subsurface explorations and review data, the potential for liquefaction and its adverse effects (i.e., seismic settlement) is not considered a hazard at the site.

Seismic compression results from the accumulation of contractive volumetric strains in unsaturated soil during earthquake shaking. Loose to medium dense granular material with no fines or with low plasticity fines are most susceptible to seismic compression. Based on the density and soil composition of the underlying soils, the potential for seismic compression (dynamic dry settlement) is considered low.

3.4.5 Collapsible Soils

Collapsible soils are characterized by their ability to undergo significant shrinkage (collapse) during inundation. Inundation in soils can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade. Based on the results of laboratory testing, the collapse potential of the near-surface soils ranges from approximately ½ to 1 percent collapse under inundation. Collapse potential less than 2 percent is considered to be low and does not represent a hazard to the project.

Copyright 2025 Kleinfelder

3.4.6 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors, and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade. The surficial soils are generally silty sands to sandy silts. The expansion potential of the near surface soils is considered low.

3.4.7 Flooding

The Flood Insurance Rate Map prepared by the Federal Emergency Management Agency (FEMA) was reviewed to identify the potential flood hazard for the project. This map indicates the site is not within any zones of potential flooding. Therefore, there is little to no potential for the project site to be impacted by regional flooding. However, the accuracy of this information should be confirmed by a qualified civil engineer/hydrologist. The need and/or method for mitigation of potential flooding should also be addressed.

Copyright 2025 Kleinfelder

4 GEOTECHNICAL DESIGN RECOMMENDATIONS

4.1 GENERAL

Based on the results of our field exploration, laboratory testing, and engineering analyses conducted during this study, it is our professional opinion the proposed project is geotechnically feasible, provided the design and construction recommendations presented in this report are incorporated into the project. We identified the following key geotechnical considerations during our study.

- The proposed Costco warehouse and fuel facility may be supported on a conventional shallow foundation system. Overexcavation and recompaction of the surface soils is recommended to provide relatively uniform support for the proposed building and other improvements. Light poles and the fuel facility canopy (as an alternative) may be supported on drilled pile foundations.
- Soils within 10 feet of the warehouse pad (including the entrance canopy, building aprons, utility pads, stairs, ramps, stoops, and the loading dock) should be overexcavated to a depth of at least 4 feet below existing grade or 2 feet below the bottom of the footings and floor slabs, whichever is deeper, and replaced as structural fill. If fill soils are encountered at the base of the excavation, the overexcavation should continue until the fill is removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill once oversized material is removed, as described below.
- For pavement, sidewalk, and flatwork areas, soils should be overexcavated to a depth of at least 18 inches below existing grade or 12 inches below the finished subgrade elevation, whichever is deeper. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The overexcavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.
- For the retaining wall on the west boundary of the site, soils should be overexcavated to a depth of at least 2 feet below existing grade or 2 feet below the bottom of the footing, whichever is deeper. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The overexcavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.
- Following overexcavation and prior to replacing soils, the exposed subgrade should be proof rolled with at least a 10-ton roller, fully loaded tandem-axle dump truck or water truck. Areas identified as being soft or yielding may require additional compaction or

Copyright 2025 Kleinfelder

overexcavation, as determined by Kleinfelder. Following proof rolling and any additional overexcavation, the exposed subgrade should be scarified, moisture conditioned, and recompacted.

- Organic matter in the topsoil is low based on laboratory testing and stripping will not be necessary. However, any roots and vegetative matter in excess of one inch should be removed by screening or raking prior to reuse as structural fill. After screening or raking, the surface soils can be moisture conditioned and used as structural fill.
- Should grading be performed during or following extended periods of rainfall, the moisture content of the near-surface soils will be significantly above the optimum moisture content. Site grading should be well maintained during development so that ponding water is avoided, particularly near the building pad and open excavations. Ponding water should be promptly pumped out and these areas should be allowed to dry prior to continued construction activities.
- We have assessed the potential for storm water infiltration into the subgrade soils at the subject project site. Four borehole infiltration tests were performed at depths of approximately 5 and 10 feet bgs. Based on the results of the infiltration testing, stormwater infiltration is feasible. We recommend a long-term design infiltration rate of 0.4 inches per hour for the soils in the upper 5 to 10 feet bgs.
- Pavement underdrains at drainage inlets and catch basins should be included as shown in Detail 16_16 of the CWDRs. Drains should be designed and constructed per Costco's standard details and laterals should extend at least 10 feet from the catch basins. Perimeter foundation drains are not necessary.
- Minimum resistivity values of the samples tested indicate that the soil may be highly corrosive to ferrous metals. The concentrations of soluble sulfates indicate that the subsurface soils represent a Class S0 Class S0 exposure to sulfate attack on concrete in contact with the soil based on ACI 318-14 Table 19.3.1.1. Therefore, in accordance with ACI Building Code 318-14, no special provisions for selection of cement type are required.

The following opinions, conclusions, and recommendations are based on the properties of the materials encountered in the borings and test pits, the results of the laboratory-testing program, and our engineering analyses performed, and should be incorporated into project design and construction.

Copyright 2025 Kleinfelder

4.2 SEISMIC DESIGN CONSIDERATIONS

4.2.1 2022 CBC Seismic Design Parameters

According to the 2022 California Building Code, every structure, and portion thereof, including non-structural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE/SEI 7-16. The Seismic Design Category for a structure may be determined in accordance with Section 1613 of the 2019 CBC.

Based on information obtained from the investigation, published geologic literature and maps, and on our interpretation of the ASCE/SEI 7-16 criteria, it is our opinion that the project site may be classified as Site Class D, Stiff Soil. Approximate coordinates for the site are noted below.

- Latitude: 35.4390 °N
- Longitude: 119.1122 °W

The Risk-Targeted Maximum Considered Earthquake (MCER) mapped spectral accelerations for 0.2 seconds and 1 second periods (S_s and S_1) were estimated using Section 1613 of the 2022 CBC and the California Office of Statewide Planning and Development (OSHPD) seismic design maps web-based application (available at https://seismicmaps.org/). In accordance with Section 11.4.8 of ASCE 7-16, a site-specific ground motion hazard analysis is required for Site Class D sites with an S_1 greater than 0.2 g. However, a site-specific ground motion hazard analysis is not required if the exception in Section 11.4.8 of ASCE 7-16 are taken. In accordance with the 2022 CBC, which adopts Supplement 3 of ASCE 7-16, the exception requires the values of parameters S_{M1} and S_{D1} to be increased by 50 percent. The following table provides the 2022 CBC seismic design parameters for the project site assuming the exception will be taken.

Copyright 2025 Kleinfelder

Table 2
2022 CBC Seismic Design Parameters

DESIGN PARAMETER	RECOMMENDED VALUE
Site Class	D
S_s (g)	0.872
S_1 (g)	0.320
F_a	1.151
F_v	N/A*
S_{MS} (g)	1.004
S_{M1} (g)	N/A
S_{DS} (g)	0.669
S_{D1} (g)	N/A
PGA_M (g)	0.463

N/A* = Not Applicable; Section 11.4.8 of ASCE 7-16 requires a site-specific ground motion hazard analysis be performed for Site Class D sites with S_1 values greater than or equal to 0.2g unless exceptions are taken in which the values of S_{M1} and S_{D1} are increased by 50 percent. If exceptions are taken, then a Fv value of 1.98 may be used in accordance with Table 11.4-2 of ASCE 7-16, Supplement 3 (per the 2022 CBC).

4.3 FOUNDATIONS

4.3.1 General

Based on the results of our field exploration, laboratory testing, and geotechnical analyses, the proposed warehouse building may be supported on conventional shallow spread footing foundations founded on subgrade prepared in accordance with Section 5.2.2. Light poles and the fuel facility canopy (as an alternative) may be supported on drilled pile foundations. Recommendations for the design and construction of shallow foundations and short drilled pile foundations are presented below.

4.3.2 Shallow Foundations

Allowable Soil Bearing Pressure

Footings may be designed for a net allowable soil bearing pressure of 3,000 pounds per square foot (psf) for dead plus sustained live loads. Footings should be embedded at least 24 inches below the lowest adjacent exterior grade. The footing dimension and reinforcement should be

Copyright 2025 Kleinfelder

designed by the structural engineer; however, continuous and isolated spread footings should have minimum widths of 18 and 24 inches, respectively. A one-third increase in the above bearing pressure can be used for transient wind or seismic loads.

Estimated Settlements

We estimate total static settlement of foundations designed and constructed in accordance with the recommendations presented above to be less than 1 inch. Differential static settlement between similarly loaded footings is estimated to be less than ½ inch over 50 feet.

Lateral Resistance

Lateral load resistance may be derived from passive resistance along the vertical sides of the footings, friction acting at the base of the footing, or a combination of the two. An allowable passive resistance of 250 psf per foot of depth may be used for design. Allowable passive resistance values should not exceed 2,500 psf. An allowable coefficient of friction of 0.35 between the base of the footings and the engineered fill soils can be used for sliding resistance using the dead load normal stresses. Friction and passive resistance may be combined without reduction. We recommend that the first foot of soil cover be neglected in the passive resistance calculations if the ground surface is not protected from erosion or disturbance by a slab, pavement, or in a similar manner.

4.3.3 Short Drilled Pile Foundations

Axial Capacity

The compressive axial capacity of drilled piles may be estimated based on an allowable skin friction capacity of 175 pounds per square foot. The upper one foot of the skin friction capacity should be ignored. The uplift capacity may be estimated as 70 percent of the allowable compressive axial capacity. A one-third increase in the allowable capacities may be used for transient loading conditions such as wind or seismic loads.

Settlement

Settlement of the proposed canopy supported on drilled piles, as recommended, is estimated to be less than ½ inch. This value does not include elastic compression of the piers under design loads.

Copyright 2025 Kleinfelder

Lateral Resistance

The drilled pile foundations lateral resistance can be designed in general accordance with Section 1807.3 of the CBC. We recommend a lateral soil bearing pressure of 250 psf per foot of depth below grade. The lateral soil bearing pressure should not exceed 2,500 psf. Since drilled piles will act as isolated pole foundations, the allowable lateral soil bearing pressure may be increased by a factor of two for short-term lateral loads provided the structure will not be adversely affected by ½ inch of lateral movement at the ground surface.

4.4 BUILDING SLAB-ON-GRADE

Concrete slab-on-grade floors are appropriate for the proposed warehouse, provided subgrade is prepared in accordance with Section 5.2.2. In accordance with the CWDRs, we recommend the slab be a minimum nominal thickness of 6.0 inches and underlain by at least 6.0 inches of aggregate base material. Aggregate base materials should meet current Caltrans specifications for Class 2 aggregate base. Please note that Caltrans Class 2 aggregate base may utilize recycled materials. Costco typically does not allow the use of recycled materials within the building pad. Alternatively, the aggregate base course could meet the specifications for Crushed Aggregate Base (CAB) as defined in Section 200-2 of the current edition of the Standard Specifications for Public Works Construction (Greenbook).

A modulus of subgrade reaction of 150 pounds per cubic inch may be used for design of slabs underlain by 6.0 inches of aggregate base material. Pursuant to current Costco Wholesale standard construction design practices, we have evaluated whether steel reinforcement is needed in the floor slab. Based on the geotechnical characteristics of the site, the proposed warehouse can be built with a non-reinforced slab.

Floor slab control joints should be used to reduce damage due to shrinkage cracking. Control joint spacing is a function of slab thickness, aggregate size, slump and curing conditions. The requirements for concrete slab thickness, joint spacing, and reinforcement should be established by the designer, based on experience, recognized design guidelines and the intended slab use. Placement and curing conditions will have a strong impact on the final concrete slab integrity.

Kleinfelder typically recommends installation of a vapor barrier beneath the slab to mitigate potential moisture issues such as flooring performance and mold. However, we understand that Costco Wholesale has determined that moisture barriers are not to be used in construction of Costco Wholesale warehouses due to adverse effects on concrete curing and performance. Therefore, we have provided construction recommendations that do not include installation of a

Copyright 2025 Kleinfelder

moisture barrier, with the understanding that there will be an increased risk for adverse moisture issues.

4.5 EXTERIOR FLATWORK

Prior to casting exterior flatwork, the subgrade soils should be scarified, moisture conditioned, and recompacted or overexcavated, as recommended in Section 5.2.2. Exterior concrete slabs for pedestrian traffic or landscape outside of the building pad limits should be at least four inches thick. Weakened plane joints in sidewalks should be located at intervals of about 6 feet. Careful control of the water/cement ratio should be performed to avoid shrinkage cracking due to excess water or poor concrete finishing or curing. Unreinforced slabs should not be built in areas where further saturation may occur following construction.

4.6 SITE DRAINAGE

Foundation and slab performance depends greatly on proper irrigation and how well runoff water drains from the site. This drainage should be maintained both during construction and over the entire life of the project. The ground surface around structures should be graded such that water drains away from structures without ponding. The surface gradient needed to do this depends on the landscaping type. Surface gradients should conform to current Costco Wholesale standards and the CBC.

Pavement underdrains at drainage inlets and catch basins should be included as shown in Detail 16_16 of the CWDRs. Drains should be designed and constructed per Costco's standard details and laterals should extend at least 10 feet from the catch basins. Perimeter foundation drains are not necessary.

Where slabs or pavement areas abut landscaped areas, the aggregate base and subgrade soil should be protected against saturation. Vertical cut off structures are recommended to reduce lateral seepage under slabs from adjacent landscaped areas. Vertical cut-off structures may consist of deepened concrete perimeters, or equivalent, extending at least three inches below the base/subgrade interface. Vertical cut-off structures should be poured neat against undisturbed native soil or compacted fill. The cut-off structures should be continuous.

Operations personnel should be instructed to limit irrigation to the minimum level necessary to properly sustain landscaping plants. Should excessive irrigation, waterline breaks or unusually high rainfall occur, saturated zones and "perched" groundwater may develop, which could soften subgrade and reduce pavement life, and could also create potholes. We also recommend that

Copyright 2025 Kleinfelder

the downspouts from roof drains be connected to a designed subsurface drainage system such as a storm sewer, etc. to avoid discharging water onto pavement areas and backfill zones around the warehouse.

Potential sources of water such as water pipes, drains, and the like should be frequently examined for signs of leakage or damage. Any such leakage or damage should be promptly repaired. Sewer lines beneath the warehouse should have a sufficient slope (at least 1 percent). Plumbing and utility lines should be provided with flexible joints or oversized sleeves where they penetrate floor slabs to prevent breakage caused by differential slab movement.

4.7 RETAINING STRUCTURES

Design earth pressures for retaining structures depend primarily on the allowable wall movement, wall inclination, type of backfill materials, backfill slopes, surcharges, and drainage. The earth pressures provided assume that on-site granular (sandy) soils will used as backfill. Determination of whether the active or at-rest condition is appropriate for design will depend on the flexibility of the walls. Walls that are free to rotate at least 0.002 radians (deflection at the top of the wall of at least 0.002 x H, where H is the unbalanced wall height) may be designed for the active condition. Walls that are not capable of this movement should be assumed rigid and designed for the at-rest condition. The recommended active and at-rest earth pressures and passive resistance values are provided in Table 3.

Table 3
Lateral Earth Pressures for Retaining Structures
(On-site Granular Backfill)

Wall Movement	Backfill Condition	Equivalent Fluid Pressure (pcf)	Seismic Increment (pcf)
Free to Deflect (active condition)	Level	40	12*
Restrained (at-rest condition)		60	N/A**

*Note: * Walls supporting more than 6 feet of backfill should be designed to support an incremental seismic lateral pressure, which is applied as a triangular pressure distribution with a maximum pressure at the bottom of the wall, applied similar to the active lateral earth pressure.*

*** for restrained walls, use the static active earth pressure plus the seismic increment to check the seismic condition; use at-rest earth pressure only to check the static condition; the larger loading of both cases should be used for the design of restrained wall.*

The above lateral earth pressures do not include the effects of surcharges (e.g., traffic, footings), compaction, or truck-induced wall pressures. Any surcharge (live, including traffic, or dead load) located within a 1:1 (horizontal to vertical) plane drawn upward from the base of the excavation should be added to the lateral earth pressures. The lateral contribution of a uniform surcharge

Copyright 2025 Kleinfelder

load located immediately behind walls may be calculated by multiplying the surcharge by 0.33 for cantilevered walls under active conditions and 0.50 for restrained walls under at-rest conditions. Walls adjacent to areas subject to vehicular traffic should be designed for a 2-foot equivalent soil surcharge (250 psf). Lateral load contributions from other surcharges located behind walls may be provided once the load configurations and layouts are known.

Walls should be properly drained or designed to resist hydrostatic pressures. Adequate drainage is essential to provide a free-drained backfill condition so that there is no hydrostatic buildup behind the wall. Walls should also be appropriately waterproofed to reduce the potential for staining. Drainage behind loading dock walls can consist of weep holes placed along the base of the wall. Weep holes should be spaced 10 to 15 feet apart and connected with a gravel drain consisting of approximately 2 cubic feet of clean gravel per foot of wall length wrapped with filter fabric. Drains should be provided within the loading dock areas to collect both surface water and any seepage from the weep holes. Other types of retaining walls should have a continuous back drain as described below.

For backfill of walls with a continuous back drain, except for the upper 2 feet, the backfill immediately behind retaining walls (minimum horizontal distance of 2 feet measured perpendicular to the wall) should consist of free-draining ¾-inch crushed rock wrapped with filter fabric. The upper 2 feet of cover backfill should consist of relatively impervious material. A 4-inch-diameter perforated PVC pipe, placed perforations down at the bottom of the rock layer leading to a suitable gravity outlet, should be installed at the base of the walls.

As an alternative to the gravel drain noted above, a manufactured drain panel may be utilized behind retaining walls in addition to normal waterproofing. This system generally consists of a prefabricated drain panel lined with filter fabric. At the wall base, we recommend that a gravel drain be installed to collect and discharge drainage to a suitable outlet. The drain should consist of a 4-inch-diameter perforated PVC pipe, placed perforations down at the bottom of approximately 2 cubic feet of clean gravel per foot of wall length. The gravel drain should be wrapped in filter fabric (Mirafi 140N or equivalent). The pipe should be sloped to drain to a suitable outlet and cleanouts should be provided at appropriate intervals.

If drainage behind the wall is omitted, the wall should be designed for full hydrostatic pressure. The design of any drain system should be submitted to Kleinfelder for review to check that our recommendations have been properly incorporated into the design. Installation of the drainage system should be reviewed and documented by a Kleinfelder representative.

Copyright 2025 Kleinfelder

4.8 PAVEMENT SECTIONS

The required pavement structural sections will depend on the expected wheel loads, volume of traffic, and subgrade soils. We have provided asphalt concrete pavement sections for traffic indices provided in the CWDRs (Costco, 2022). Positive drainage of the paved areas should be provided since moisture infiltration into the subgrade may decrease the life of pavements. Curbing located adjacent to paved areas should be founded in the subgrade, not the aggregate base, in order to provide a cutoff, which reduces water infiltration into the base course.

The following pavement sections provided above are based on the soil conditions encountered during our field exploration, our assumptions regarding final site grades, and limited laboratory testing.

4.8.1 Costco Pavement Design Parameters

We developed pavement design recommendations using traffic loading parameters provided in the Costco Wholesale Development Requirements and the following test data:

- A 20-year pavement design life.
- Light-duty pavements subject to 6,600 passenger vehicle trips per day (Traffic Index of 5.0).
- Heavy-duty pavements subject to 30 tractor-trailer truck tips per day (Traffic Index of 7.0).
- For asphalt concrete pavements, a design R-value of 20 based on laboratory testing and engineering judgement.
- For Portland cement concrete (PCC) Pavements, a 28-day flexural strength (modulus of rupture determined by the third-point method) of at least 550 pounds per square inch (psi) (approximate compressive strength of 4,000 psi); a modulus of subgrade reaction (k value) of 150 pounds per cubic inch (pci) for native subgrade; and interlock at the control joints.

4.8.2 Asphalt Concrete Pavement

We designed asphalt concrete pavement, also referred to as Hot Mix Asphalt (HMA), in general accordance with the Caltrans Highway Design Manual (2022), which is the current design practice in California. Table 4 presents the asphalt concrete pavement sections for the noted traffic indices. The designer should select the appropriate pavement sections based on projects requirements.

Copyright 2025 Kleinfelder

Prior to placement of aggregate base, pavement subgrade should be prepared in accordance with Section 5.2.2.

Table 4
Recommended Minimum Asphalt Concrete Pavement Sections

Traffic Use	Traffic Index, TI	Design Method	Asphalt Concrete* (inches)	Aggregate Base* (inches)
Light-Duty Pavement	5.0	Caltrans	3.5	6.0
Heavy-Duty Pavement	7.0	Caltrans	5.0	10.0

* Rounded to the closest ½ inch.

4.8.3 Asphalt Performance Grade Binder

An asphalt performance grade (PG) binder of 64-10 should be used for the project and is locally available. This recommendation was developed in accordance with Costco Wholesale Asphalt Paving Specification Section 321216. Air temperature data nearest the project site was used with the MERRA Climate Data option and the PG binder was selected using the FHWA program LTTPBind Online web-based tool based on the AASHTO M323-13 standard. The high-end and low-end temperature rating was selected to provide a reliability of at least 98 and 90 percent, respectively.

4.8.4 Portland Cement Concrete Pavement

We designed PCC pavement in accordance with the Portland Cement Association (PCA) Thickness Design for Concrete Pavements (PCA, 1984) using the design parameters stated above. For heavy-duty pavements, we recommend that PCC pavement section should be comprised of 7.0 inches of PCC with 6.0 inches of aggregate base. We understand that Costco is considering paving the American Disability Act (ADA) access area in front of the main entry with PCC pavement. For ADA access area, we recommend that PCC pavement section should be comprised of 6.0 inches of PCC with 6.0 inches of aggregate base to match the building pad flatwork. Prior to placement of aggregate base, pavement subgrade should be prepared in accordance with Section 5.2.2.

Longitudinal and transverse joint spacing should not exceed 12 feet and 15 feet, respectively. Joint details should conform to PCA guidelines. Expansion joints in concrete slabs should be sealed with petroleum resistant sealant to prevent minor releases from impacting subsurface soil.

Copyright 2025 Kleinfelder

4.8.5 Aggregate Base

Aggregate base materials should meet current Caltrans specifications for Class 2 aggregate base.

4.8.6 Pavement Maintenance

Pavements may undergo movement due to changes in subgrade moisture content. This movement tends to accelerate pavement deterioration. A crack sealing program should be performed annually to slow pavement deterioration. Any areas where surface water stands on the surface should be remediated. Over time, as cracking becomes more pronounced, a slurry seal coat should be applied.

4.9 SOIL CORROSIVITY

We performed laboratory testing for parameters commonly used to evaluate corrosivity of soils, including pH, minimum resistivity, chloride and soluble sulfate content. Table 5 presents the results.

Table 5
Corrosion Test Results

Location	Depth (ft)	Minimum Resistivity (ohm-cm)	pH	Soluble Sulfate Content (ppm)	Soluble Chloride Content (ppm)
TP-2	1-5	3,130	8.7	26	20
TP-5	1-5	4,617	9.0	24	19
TP-7	1-5	3,686	8.7	22	21
TP-9	1-5	2,715	8.6	27	20

These tests are a generalized indicator of soil corrosivity for the samples tested. Other soils on site may be more, less, or similarly corrosive in nature. Imported fill materials should be tested to confirm that their corrosion potential is not more severe than those noted.

Although Kleinfelder does not practice corrosion engineering, resistivity values between 1,000 and 3,000 ohm-cm are normally considered highly corrosive to buried ferrous metals (Roberge, 2006). The concentrations of soluble sulfates indicate that the subsurface soils represent a Class S0 Class S0 exposure to sulfate attack on concrete in contact with the soil based on ACI 318-19 Table 19.3.1.1. Therefore, in accordance with ACI Building Code 318-19, no special provisions for selection of cement type are required.

Copyright 2025 Kleinfelder

4.10 STORMWATER MANAGEMENT

We understand that as part of the storm water management for the project, Infiltration Best Management Practices (BMPs), are being considered. We performed four (4) borehole percolation tests. We also performed sieve analysis and hydrometer testing to assess the grain-size characteristics of the onsite soils. The results of the laboratory testing and infiltration testing results are attached in Appendix B and C, respectively.

Based on visual soil classification and laboratory testing of the soil samples collected during our field exploration, the near-surface soils consist of silty sands to sandy silts. The fines content of the samples tested during our field exploration ranged from approximately 34 to 58 percent based on laboratory testing of the near surface soils. Table 6 summarizes the tested (in-situ) infiltration rates and the long-term design infiltration rates for each test location.

Table 6
Summary of Infiltration Test Results

Test Location	Approximate Test Depth (feet bgs)	Tested Infiltration Rate (inches per hour)	Design Infiltration Rate (inches per hour)[1]
INF-1	3 – 5	2.4	0.5
INF-2	5 – 10	2.3	0.5
INF-3	3 – 5	1.8	0.4
INF-4	5 – 10	1.9	0.4

Notes: [1]Design Infiltration Rate determined using a factor of safety of 4.0.

Based on the results of our infiltration testing, laboratory testing, and analysis, it is our opinion that the site is suitable for stormwater infiltration. For design purposes, we recommend a long-term design infiltration rate of 0.4 inches per hour be used for BMPs in the upper 5 to 10 feet of soil.

If infiltration BMP systems are employed, we recommend that the BMPs be built such that water exiting from them will not seep into the foundation areas or beneath slabs and pavement. If planters are located within 10 feet of structures or foundations, or adjacent to slabs and pavements, then some means of diverting water away from the structures, foundation soils, or soils that support slabs and pavements would be required, such as lining the planters.

Copyright 2025 Kleinfelder

5 CONSTRUCTION RECOMMENDATIONS

5.1 GENERAL

The following recommendations should be used by the contractor for construction of the project.

5.2 EARTHWORK

5.2.1 General

Site preparation and earthwork operations should be performed in accordance with applicable codes, safety regulations and other local, state or federal specifications, and the recommendations included in this report. References to maximum dry unit weights are established in accordance with the latest version of ASTM Test Method D1557 (modified Proctor). The earthwork operations should be observed and tested by a representative of Kleinfelder.

5.2.2 Site Preparation

Abandoned utilities and other existing features within the proposed development areas (if any are encountered) should be removed and the excavation(s) backfilled with engineered fill. Debris produced by demolition operations, including wood, steel, piping, plastics, etc., should be separated and disposed of off-site. Existing utility pipelines or conduits that extend beyond the limits of the proposed construction and are to be abandoned in place, should be plugged with non-shrink cement grout to prevent migration of soil and/or water. Demolition, disposal, and grading operations should be observed and tested by a representative of Kleinfelder.

Prior to grading and subgrade preparation, all vegetation should be cut and removed from the site. Roots and vegetative matter in excess of one inch should be removed by screening or raking. Other than plant roots, organic matter in the topsoil is low based on our laboratory testing (less than 1.5 percent). Based on the organic content tests, stripping and stockpiling of topsoil is not necessary. After grubbing, the surface soils can be moisture conditioned and recompacted as structural fill.

Overexcavation and recompaction of the surface soils is recommended to provide relatively uniform support for the proposed building and other improvements. Soils within 10 feet of the warehouse pad (including the entrance canopy, building aprons, utility pads, stairs, ramps, stoops, and the loading dock) should be overexcavated to a depth of at least 4 feet below existing grade or 2 feet below the bottom of the footings and floor slabs, whichever is deeper, and replaced as structural fill. If fill soils are encountered at the base of the excavation, the overexcavation

Copyright 2025 Kleinfelder

should continue until the fill is removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill.

Soils in pavement, sidewalk, and other flatwork areas should be overexcavated to a depth of at least 18 inches below existing grade or 12 inches below the finished subgrade elevation, whichever is deeper. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The overexcavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.

For the retaining wall on the west boundary of the site, soils should be overexcavated to a depth of at least 2 feet below existing grade or 2 feet below the bottom of the footing, whichever is deeper. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The overexcavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.

Following overexcavation and prior to replacing soils, the exposed subgrade should be proof rolled with at least a 10-ton roller, fully loaded tandem-axle dump truck or water truck. Areas identified as being soft or yielding may require additional compaction or overexcavation as determined by Kleinfelder. Following proof rolling and any additional overexcavation, the exposed subgrade should be scarified, moisture conditioned, and recompacted.

5.2.3 Foundation Excavations

Shallow Foundations

Following excavation to the foundation subgrade elevations, the exposed subgrade should be observed by a representative of the geotechnical engineer to evaluate the presence of satisfactory materials at design elevations. If unsatisfactory material, such as soft or disturbed soil, debris or otherwise unsuitable soil is present at the base of footing excavations, it should be overexcavated and replaced with structural concrete, 2-sack sand-cement slurry, or structural fill to the depth determined by the geotechnical engineer.

Drilled Pile Foundations

The performance and capacities of piles can be influenced significantly by the selected construction methods and procedures used. Construction methods that create large zones of disturbance around the drilled shafts can lead to lower than expected skin friction due to excessive

Copyright 2025 Kleinfelder

stress relief around the shaft length. Drilling of the pile shafts should be accomplished using conventional heavy-duty excavation equipment maintained in good condition.

Caving of the pile shafts should be anticipated and will need to be prevented. Temporary steel casing may be required to stabilize the sides of the pile shaft. Concrete should be placed immediately after drilling of the hole is complete. The concrete should be pumped to the bottom of the drilled shaft using a down-hole tremie. If the tremie method is used to place concrete below the water level, we recommend it have a slump of at least 8 inches. If steel casing is used, the casing should be removed as the concrete is placed but the bottom of the casing should be kept at least 5 feet below the top of the concrete.

5.2.4 Fill Material and Compaction Criteria

The on-site soils, minus debris, organic matter, or other deleterious materials may be used as structural fill. Rock or other soil fragments greater than 3 inches in size should not be used in the fills. Based on the organic content tests, stripping of topsoil is not necessary and the overexcavated soils can be moisture conditioned and recompacted as structural fill.

Import soils, if needed, should have no particles greater than 3 inches in maximum dimension, no less than 70 percent of the particles passing the No. 4 sieve, no more than 30 percent of particles passing the No. 200 sieve, and a Plasticity Index (PI) less than 5. The contractor should provide documentation that all imported soil is free of hazardous materials, including petroleum or petroleum byproducts, chemicals and harmful minerals. Test results with the geotechnical and analytical properties of the proposed import material should be provided to Costco for approval prior to transportation and use on site.

Soils should be compacted to at least 95 percent of the maximum dry unit weight (ASTM D1557) in accordance with the Costco Wholesale Development Requirements (CWDRs). Fill should be placed in loose horizontal lifts not more than 8 inches thick (loose measurement). The moisture content of the fill should be maintained within 2 percent of optimum during compaction.

Processing may require ripping the material, disking to break up clumps, and blending to attain uniform moisture contents necessary for compaction. Utility trench backfill should be mechanically compacted. Flooding should not be permitted. Table 7 presents structural fill placement and compaction criteria.

Copyright 2025 Kleinfelder

Table 7
Structural Fill Placement and Compaction Criteria

Fill Location/Use	Material Type	Relative Compaction[1] (ASTM D1557)	Moisture Content Range	Minimum Compaction Testing Frequency Per Lift
Aggregate Base Course for Pavements and Concrete Slabs	Aggregate Base	At least 95 percent	-2 to +2% of optimum	10,000 Square Feet
Structural Areas (Warehouse Building Pad)	On-site Soils or Imported Material	At least 95 percent	-2 to +2% of optimum	10,000 Square Feet
Subgrade for Pavements, Sidewalks and Other Flatwork Areas	On-site Soils or Imported Material	At least 95 percent	-2 to +2% of optimum	15,000 Square Feet
Retaining Wall Backfill	On-site Soils or Imported Material	At least 92 percent	-2 to +2% of optimum	1,000 Square Feet
Utility Trenches Backfill	On-site Soils or Imported Material	At least 95 percent	-2 to +2% of optimum	150 Linear Feet
Lawns or Unimproved Areas	On-site Soils or Imported Material	At least 90 percent	At least optimum	20,000 Square Feet

Note: [1] Where two or more compaction specifications coincide, the more stringent specification should be utilized.

5.2.5 Excavation Characteristics

Borings drilled and test pits excavated as part of our field exploration were advanced using hollow-stem-auger drilling equipment and standard backhoe equipment, respectively, without refusal. Some near-surface soils were observed to be weakly to moderately cemented. Layers of caliche were observed in the upper 5 to 10 feet bgs. Excavation effort was easy to moderate within the alluvial soils. It is anticipated that conventional heavy-duty earthmoving equipment maintained in good condition should be capable of excavating the soil. However, additional, thick or more resistant cemented deposits may be present in locations beyond those explored. Contractors should be made aware of the potential to encounter these cemented deposits during construction.

During seasonal rains, handling of saturated soils may pose problems with equipment access and cleanup, and we suggest the materials be allowed to dry out prior to excavation.

Copyright 2025 Kleinfelder

5.2.6 Temporary Excavations

All excavations must comply with applicable local, state, and federal safety regulations, including OSHA requirements. The responsibility for excavation safety and stability of temporary construction slopes lies solely with the contractor. We are providing this information below solely as a service to our client. Under no circumstances should this information provided be interpreted to mean that Kleinfelder is assuming responsibility for final engineering of excavations or shoring, construction site safety, or the contractors' activities; such responsibility is not being implied and should not be inferred.

Minor sloughing and/or raveling of slopes should be anticipated as they dry out. Where space for sloped embankments is not available, shoring will be necessary. In addition, excavations within a 1:1 plane extending downward from a horizontal distance of 2 feet beyond the bottom outer edge of existing improvements should not be attempted without bracing and/or underpinning the footings, as discussed above. The geotechnical engineer or their field representative should observe the excavations so that modifications can be made to the excavations, as necessary, based on variations in the encountered soil conditions. All applicable excavation safety requirements and regulations, including OSHA requirements, should be met.

Vertical or steeply sided trench excavations should not be attempted without proper shoring or bracing. All trench excavations should be braced and shored in accordance with good construction practice and all applicable safety ordinances and codes. Stockpiled (excavated) materials should be placed no closer to the edge of an excavation than a distance equal to the depth of the excavation, but no closer than 4 feet.

5.2.7 Oversize Material

Oversized material (e.g. material greater than 3 inches in diameter) is not anticipated to be encountered. However, if encountered, material larger than 3 inches in diameter should be removed and disposed of off-site.

5.2.8 Trench Backfill

Pipe zone backfill (i.e. material beneath and in the immediate vicinity of the pipe) should consist of imported soil less than ¾-inch in maximum dimension. Trench zone backfill (i.e., material placed between the pipe zone backfill and finished subgrade) may consist of onsite soil or imported fill that meets the requirements for engineered fill provided above.

Copyright 2025 Kleinfelder

If imported material is used for trench zone backfill, we recommend it consist of silty sand. In general, gravel should not be used for trench zone backfill due to the potential for soil migration into the relatively large void spaces present in this type of material and for water seepage along trenches backfilled with coarse-grained sand and/or gravel.

Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local building requirements and/or bedding requirements for specific types of pipes. We recommend the project civil engineer develop these material specifications based on planned pipe types, bedding conditions, and other factors beyond the scope of this study.

Trench backfill should be placed and compacted in accordance with recommendations provided for engineered fill in Section 5.2.4. Mechanical compaction is recommended; ponding or jetting should be avoided, especially in areas supporting structural loads or beneath concrete slabs supported on grade, pavements, or other improvements.

5.3 UNSTABLE SUBGRADE CONDITIONS

Should grading be performed during or following extended periods of rainfall, the moisture content of the near-surface soils may be significantly above the optimum moisture content. These conditions could seriously impede grading by causing an unstable subgrade condition. Typical remedial measures for the site conditions include the following.

- Drying: Drying unstable subgrade involves disking or ripping wet subgrade to a depth of approximately 18 to 24 inches and allowing the exposed soil to dry. Multiple passes of the equipment (likely on a daily basis) will be needed because as the surface of the soil dries, a crust forms that reduces further evaporation. Frequent disking will help prevent the formation of a crust and will promote drying. This process could take several days to several weeks depending on the material, the depth of ripping, the number of passes, and the weather.
- Removal and Replacement with Crushed Rock and Geotextile Fabric: Unstable subgrade could be overexcavated 12 to 24 inches below existing grade and replaced with ¾- or 1-inch crushed rock underlain by geotextile fabric. The geotextile fabric should consist of a woven geotextile, such as Mirafi HP series or equivalent. The final depth of removal will depend upon the conditions observed in the field once overexcavation begins. The geotextile fabric should be placed in accordance with the manufacturer's recommendations.

Copyright 2025 Kleinfelder

- Cement Treatment: Unstable subgrade could be stabilized by mixing the upper 12 to 18 inches of the subgrade with Portland cement. For estimating purposes, an application rate 4 to 5 percent Portland cement may be used. Final application rates should be determined in the field at the time of construction in consultation with the geotechnical engineer. Cement treatment should be performed by a specialty contractor experienced in this work. Since soil treatment uses the on-site soil, the expense of importing material can be avoided.

5.4 EXTERIOR FLATWORK

Prior to casting exterior flatwork, the existing soils should be overexcavated and subgrade soils should be scarified, moisture conditioned, and recompacted as recommended in Section 5.2.2. The moisture content of the finished subgrade soils should be maintained around optimum prior to the placement of any flatwork or structural fill. Careful control of the water/cement ratio should be performed to avoid shrinkage cracking due to excess water or poor concrete finishing or curing.

5.5 PAVEMENTS

5.5.1 HMA Design

Hot Mix Asphalt (HMA) should conform to requirements of the Costco Wholesale Specification Section 321216, Asphalt Paving. Section 1.3.C of the HMA specification requires that the HMA section be placed in at least two lifts. The HMA specification allows the use of ½- or ¾-inch Nominal Maximum Aggregate Size (NMAS) mixes for the base course and ⅜- or ½-inch NMAS mixes for surface course. Maximum and minimum HMA compacted lift thicknesses are provided in Table 3.1 in Section 3.3.B of the HMA specification.

5.5.2 Construction Considerations

The pavement sections provided above are contingent on the following recommendations being implemented during construction.

- Pavement subgrade should be prepared as recommended in Section 5.2.2.
- Subgrade soils should be in a stable, non-pumping condition at the time the aggregate base materials are placed and compacted.
- Aggregate base materials should be compacted to at least 95 percent relative compaction (ASTM D1557).

Copyright 2025 Kleinfelder

- Asphalt paving materials and placement methods should meet current Costco Wholesale Specifications Section 321216.
- Adequate drainage (both surface and subsurface) should be provided such that the subgrade soils and aggregate base materials are not allowed to become wet.

Note that pavement materials and construction must be completed in strict accordance with the Costco's specifications that contain very specific pavement material (asphalt, aggregate and concrete) criteria and construction practices to be used (compaction and material sampling). The general contractor and pavement construction subcontractor should be aware that asphalt and concrete mix designs must be submitted to the design architect and Kleinfelder at least 45 days prior to the scheduled production and laydown for review and approval.

Copyright 2025 Kleinfelder

6 ADDITIONAL SERVICES

6.1 PLANS AND SPECIFICATIONS REVIEW

We recommend Kleinfelder perform a review of geotechnical-related portions of the project plans and specifications before they are finalized to see that geotechnical recommendations have been properly interpreted and implemented during design. If we are not accorded the privilege of performing this review, we can assume no responsibility for misinterpretation of our recommendations.

6.2 CONSTRUCTION OBSERVATION AND TESTING

The construction process is an integral design component with respect to the geotechnical aspects of a project. Because geotechnical engineering is an inexact science due to the variability of natural processes, and because we sample only a limited portion of the soils affecting the performance of the proposed structure, unanticipated or changed conditions can be encountered during grading. Proper geotechnical observation and testing during construction are imperative to allow the geotechnical engineer the opportunity to verify assumptions made during the design process. Therefore, we recommend that Kleinfelder be retained during the construction of the proposed improvements to observe compliance with the design concepts and geotechnical recommendations, and to allow design changes in the event that subsurface conditions or methods of construction differ from those assumed while completing this study.

Our services are typically needed at the following stages of grading:

- After demolition and grubbing;
- During grading;
- During the installation of temporary construction shoring;
- After the overexcavation, but prior to subgrade preparation;
- During utility trench backfill;
- During fill placement of wall backfill;
- During base placement and site paving; and
- After excavation for foundations.

Copyright 2025 Kleinfelder

7 LIMITATIONS

This geotechnical study has been prepared for the exclusive use of Costco Wholesale and their agents for specific application to the proposed Costco Wholesale Warehouse and Fuel Facility (CW# 23-0481) located southwest corner of 7th Standard Road and Calloway Drive in Bakersfield, California. The findings, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No other warranty, express or implied, is made.

The scope of services was limited to a background data review and the field exploration described in Section 1.2. It should be recognized that definition and evaluation of subsurface conditions are difficult. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. The conclusions of this assessment are based on our field exploration and laboratory testing programs, and engineering analyses.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service, which provide information for their purposes at acceptable levels of risk. The client and key members of the design team should discuss the issues covered in this report with Kleinfelder, so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk and expectations for future performance and maintenance.

Recommendations contained in this report are based on our field observations and subsurface explorations, limited laboratory tests, and our present knowledge of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Kleinfelder is notified immediately so that we may reevaluate the recommendations of this report. If the scope of the proposed construction, including the estimated Traffic Index or locations of the improvements, changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed, and the conclusions of this report are modified or approved in writing, by Kleinfelder.

Copyright 2025 Kleinfelder

The scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

Kleinfelder cannot be responsible for interpretation by others of this report or the conditions encountered in the field. Kleinfelder must be retained so that all geotechnical aspects of construction will be monitored on a full-time basis by a representative from Kleinfelder, including site preparation, preparation of foundations, and placement of engineered fill and trench backfill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, Kleinfelder must also be retained to perform a supplemental evaluation and to issue a revision to our original report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinion, recommendations, or conclusions contained in the report. Because of the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder's geotechnical engineer can be contacted to confirm those conditions. We recommend the contractor describe the nature and extent of the differing conditions in writing and that the construction contract include provisions for dealing with differing conditions. Contingency funds should be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land use, site conditions (both on site and off site) or other factors may change over time, and additional work may be required with the passage of time. Any party, other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of this report and the nature of the new project, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and the client agrees to defend, indemnify, and hold harmless Kleinfelder from any claims or liability associated with such unauthorized use or non-compliance.

Copyright 2025 Kleinfelder

8 REFERENCES

American Concrete Institute (ACI), 2019. Building Code Requirements for Structural Concrete (ACI 318-19) and Commentary (ACI318-19R).

American Society of Civil Engineers (ASCE), 2016, Minimum Design Load for Buildings and Other Structures (ASCE/SEI 7-16) with Supplements 1, 2 and 3.

Bartow, A.J., 1984, Geologic Map and Cross Sections of the Southeastern Margin of the San Joaquin Valley, California. 1:125,000.

California Geologic Survey (CGS), 2002, California Geomorphic Provinces, Note 36, California Dept. of Conservation, Sacramento, California.

California Geologic 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), 2024, DOC Maps: Geologic Hazards, accessed 08/04/2024 at https://maps.conservation.ca.gov/geologichazards/

Costco, 2022. Costco Wholesale Development Requirements, Version 2022, dated October 28, 2022.

Federal Emergency Management Agency. FEMA Flood Map Service Center, accessed 8/2/2024 at https://msc.fema.gov/portal/home

International Code Council, Inc., 2022 California Building Code.

Kimley-Horn and Associates, Inc., 2025, Preliminary Overall Grading & Drainage Plan, Costco Bakersfield, 26 Sheets, dated January 31, 2025.

MG2, 2024, Preliminary Site Plan, Sheet P11-23, dated April 29, 2024.

Portland Cement Association (PCA), 1984, Thickness Design for Concrete Highway and Street Pavements, Skokie, Illinois: Portland Cement Association.

Portland Cement Association, 1988. Design and Control of Concrete Mixtures, Portland Cement Association, Skokie, Illinois.

Copyright 2025 Kleinfelder

Roberge, P., 2006, Corrosion Basics, 2nd ed.

State Water Resources Control Board, Geotracker, accessed 8/1/2024 at https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL205064267.

U.S. Geologic Survey (USGS) and California Geological Survey (CGS), Quaternary fault and fold database for the United States, accessed 8/4/2024 at https://www.usgs.gov/programs/earthquake-hazards/faults

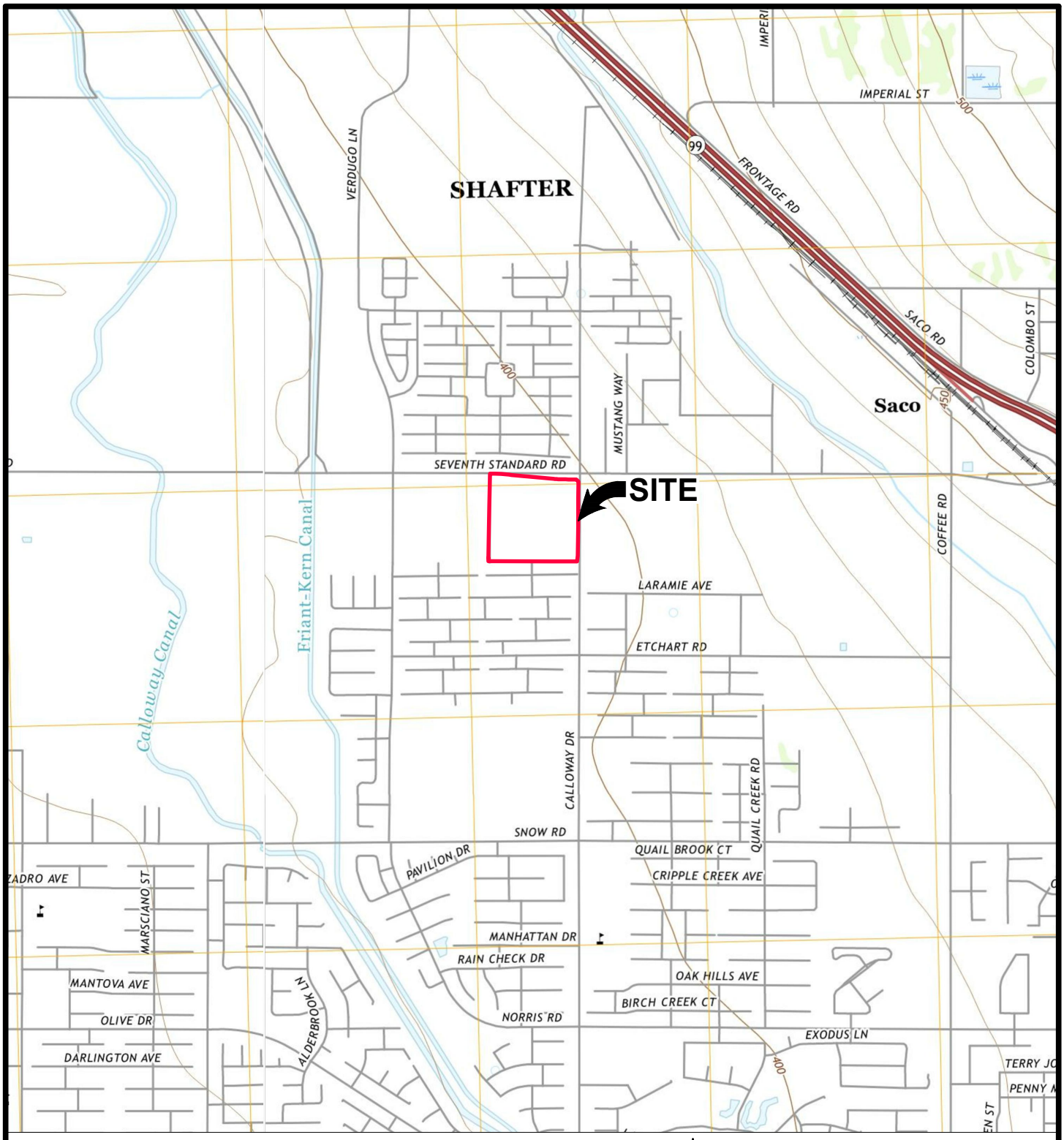
U.S. Geologic Survey (USGS), Areas of Land Subsidence in California, accessed 8/4/2024 at https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html

U.S. Geologic Survey (USGS), 2018, Land Subsidence, Water Science School, accessed 8/12/2024 at https://www.usgs.gov/special-topics/water-science-school/science/land-subsidence

Copyright 2025 Kleinfelder

FIGURES

Copyright 2025 Kleinfelder



SOURCE: U.S.G.S. 7.5' topographic series, Oildale and Rosedale, California quadrangles, dated 2021.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

N

2,000 1,000 0 2,000

APPROXIMATE SCALE (feet)

KLEINFELDER
Bright People. Right Solutions.

PROJECT:	25000882
DRAWN BY:	DMF
CHECKED BY:	HM
DATE:	08/2024
REVISED:	-

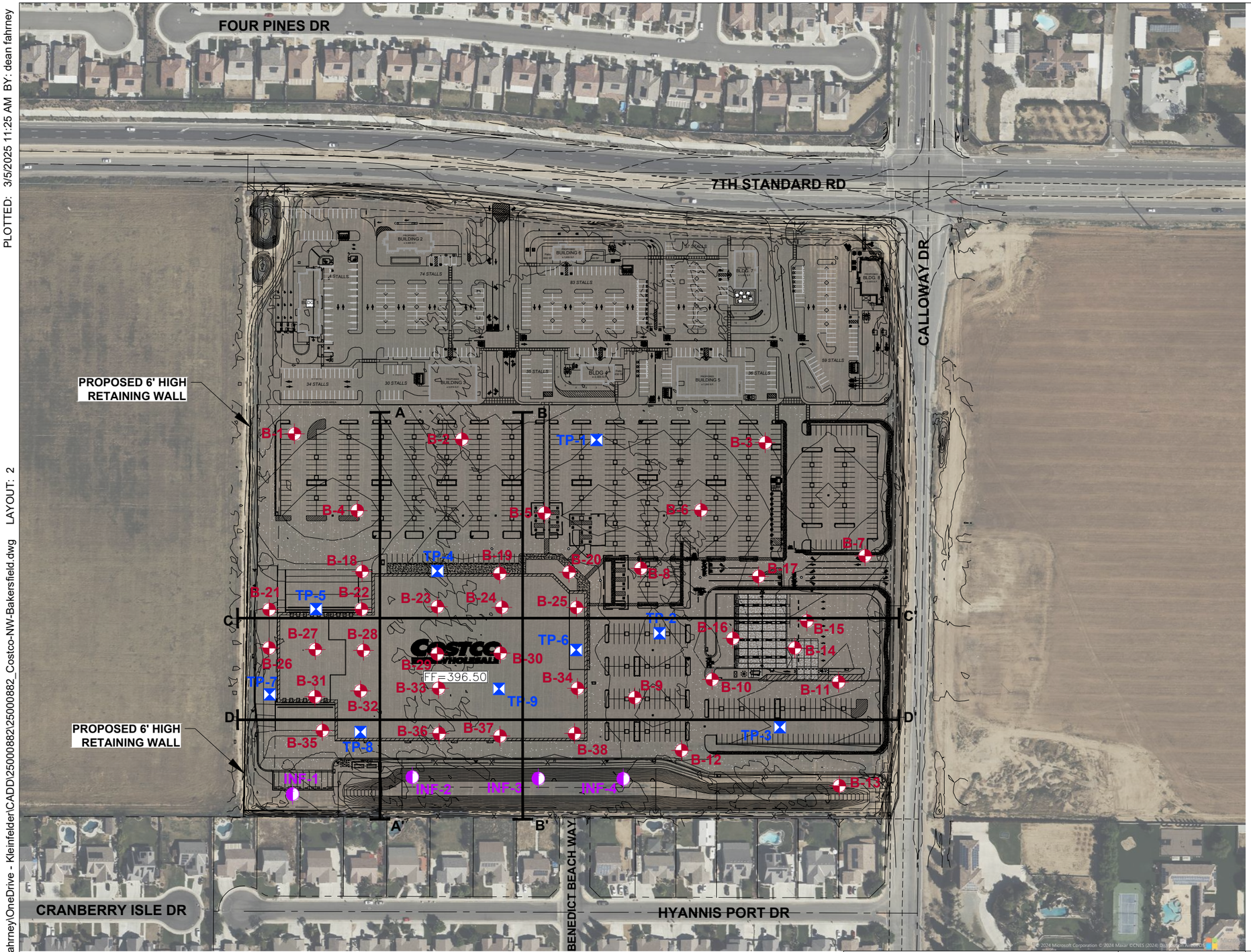
SITE VICINITY MAP

PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SWC 7TH STANDARD RD AND CALLOWAY DR
BAKERSFIELD, CALIFORNIA

FIGURE

1

PLOTTED: 8/9/2024 10:16 PM BY: dean fahrney
CAD FILE: C:\Users\DFahrney\Downloads\25000882\25000882_Costco-NW-Bakersfield.dwg



200 100 0 200

APPROXIMATE SCALE (feet)

EXPLANATION

- B-38 — APPROXIMATE BORING LOCATION
- INF-4 — APPROXIMATE INFILTRATION TEST LOCATION
- TP-9 — APPROXIMATE TEST PIT LOCATION
- D — D' — CROSS-SECTION LOCATION

REFERENCE: GRADING AND DRAINAGE PLAN PROVIDED BY KIMLEY-HORN, DATED 01/31/2025

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.

PROJECT:	25000882
DRAWN BY	DMF
CHECKED BY	HM
DATE:	08/2024
REVISED:	03/2025

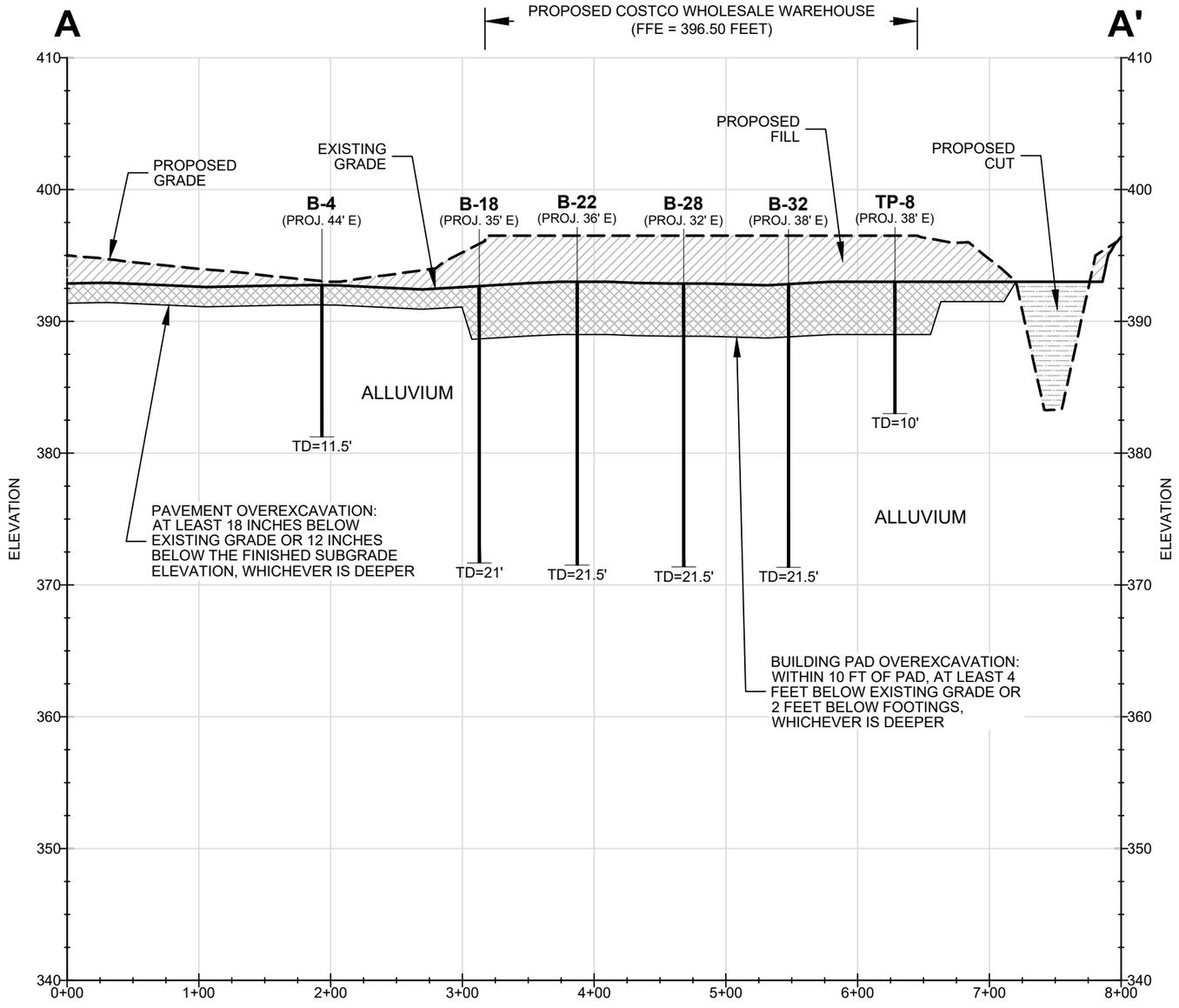
EXPLORATION LOCATION MAP

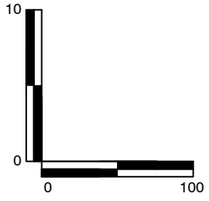
PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SWC 7TH STANDARD RD AND CALLOWAY DR
BAKERSFIELD, CALIFORNIA

FIGURE 2

PLOTTED: 3/5/2025 11:25 AM BY: dean fahrney
LAYOUT: 2
CAD FILE: C:\Users\DFahrney\OneDrive - Kleinfelder\CADD\25000882\25000882_Costco-NW-Bakersfield.dwg

PLOTTED: 3/5/2025 11:36 AM BY: dean fahrney
CAD FILE: C:\Users\DFahrney\OneDrive - Kleinfelder\CADD\25000882\25000882_Costco-NW-Bakersfield.dwg LAYOUT: 3





VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 100'

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

EXPLANATION

B-36 (PROJ.15' N)	APPROXIMATE BORING ELEVATION PROJECTION OF BORING IN FEET
TD=11.5'	APPROXIMATE TEST DEPTH AND LENGTH OF BORING
ALLUVIUM	SILTY SANDS TO SANDY SILTS WITH INTERBEDDED LAYERS OF POORLY GRADED SANDS

NOTE: REFER TO APPENDIX A FOR DETAILED LOGS

KLEINFELDER
Bright People. Right Solutions.

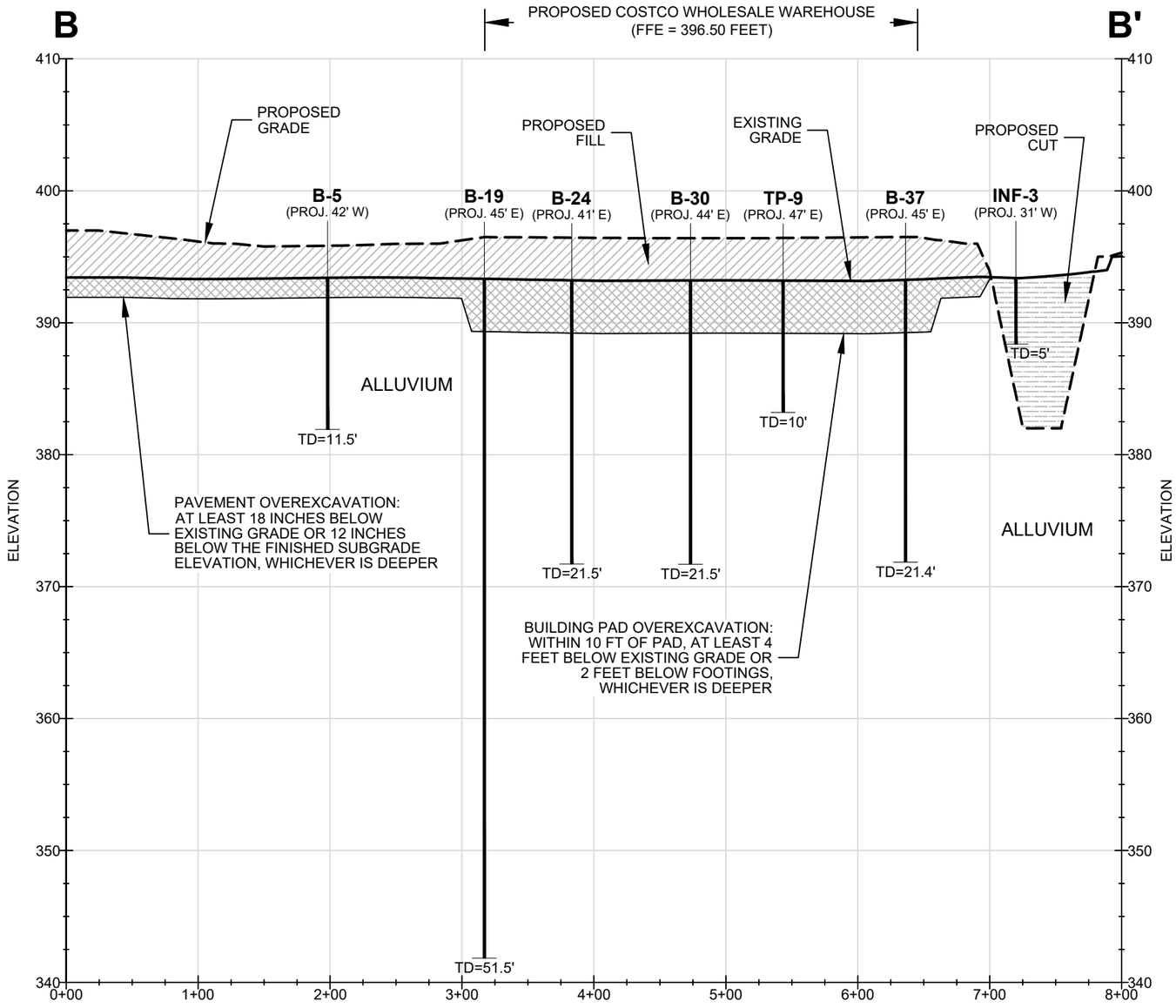
PROJECT:	25000882
DRAWN BY	DMF
CHECKED BY	HM
DATE:	03/2025
REVISED:	-

CROSS-SECTION A-A'

PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SWC 7TH STANDARD RD AND CALLOWAY DR
BAKERSFIELD, CALIFORNIA

FIGURE
3

PLOTTED: 3/5/2025 11:36 AM BY: dean fahrney
CAD FILE: C:\Users\DFahrney\OneDrive - Kleinfelder\CADD\25000882\25000882_Costco-NW-Bakersfield.dwg LAYOUT: 4



10
0
0 100

VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 100'

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

EXPLANATION

B-36 (PROJ.15' N)	APPROXIMATE BORING ELEVATION PROJECTION OF BORING IN FEET
TD=11.5'	APPROXIMATE TEST DEPTH AND LENGTH OF BORING
ALLUVIUM	SILTY SANDS TO SANDY SILTS WITH INTERBEDDED LAYERS OF POORLY GRADED SANDS

NOTE: REFER TO APPENDIX A FOR DETAILED LOGS

KLEINFELDER
Bright People. Right Solutions.

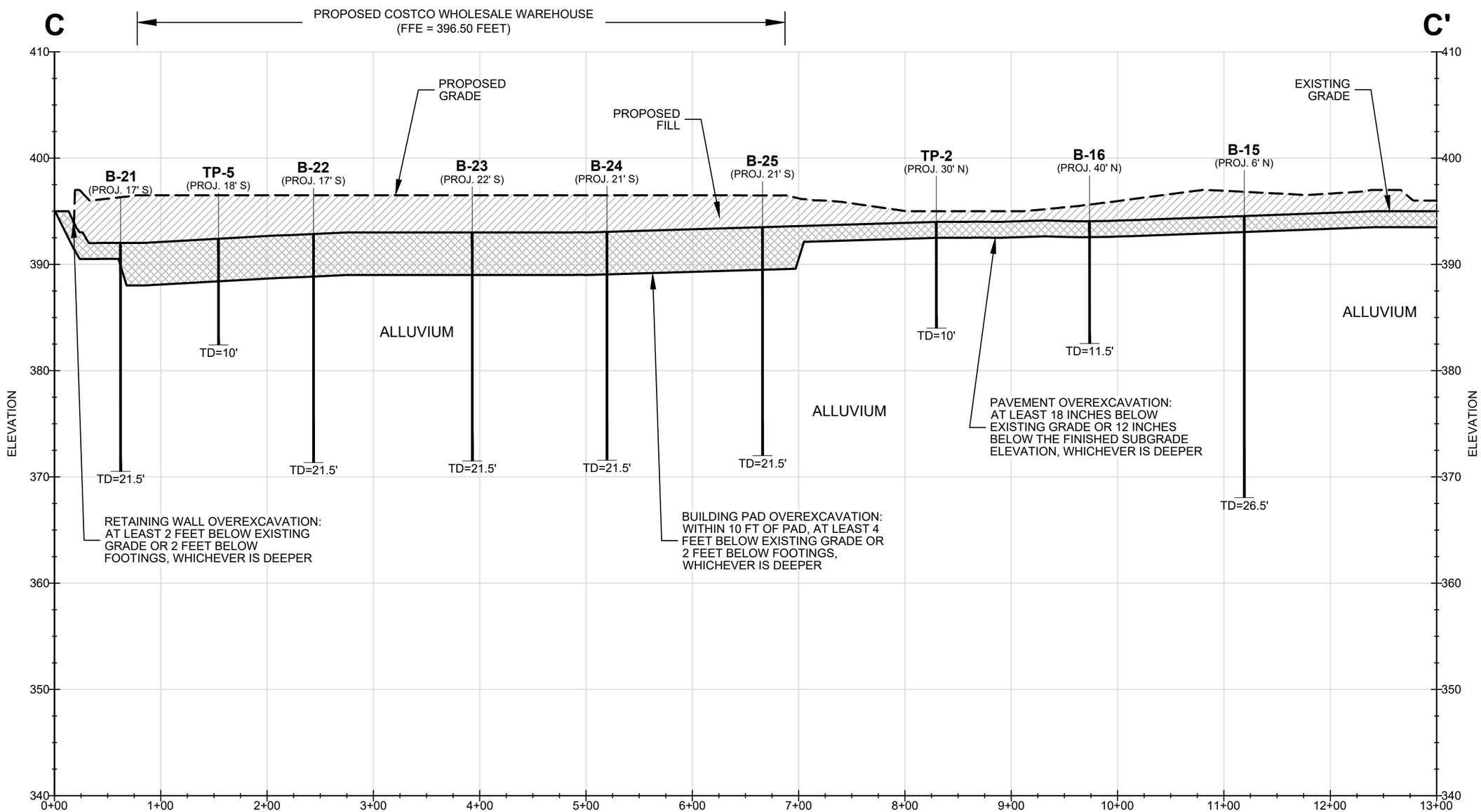
PROJECT:	25000882
DRAWN BY	DMF
CHECKED BY	HM
DATE:	03/2025
REVISED:	-

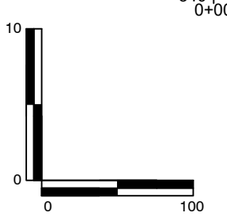
CROSS-SECTION B-B'

PROPOSED COSTCO WHOLESALE WAREHOUSE
AND FUEL FACILITY
SWC 7TH STANDARD RD AND CALLOWAY DR
BAKERSFIELD, CALIFORNIA

FIGURE
4

PLOTTED: 3/5/2025 12:08 PM BY: dean fahrney
CAD FILE: C:\Users\DFahrney\OneDrive - Kleinfelder\CADD\25000882\25000882_Costco-NW-Bakersfield.dwg LAYOUT: 5





VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 100'

EXPLANATION

B-36 (PROJ.15' N)	APPROXIMATE BORING ELEVATION PROJECTION OF BORING IN FEET
TD=11.5'	APPROXIMATE TEST DEPTH AND LENGTH OF BORING
ALLUVIUM	SILTY SANDS TO SANDY SILTS WITH INTERBEDDED LAYERS OF POORLY GRADED SANDS

NOTE: REFER TO APPENDIX A FOR DETAILED LOGS

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.

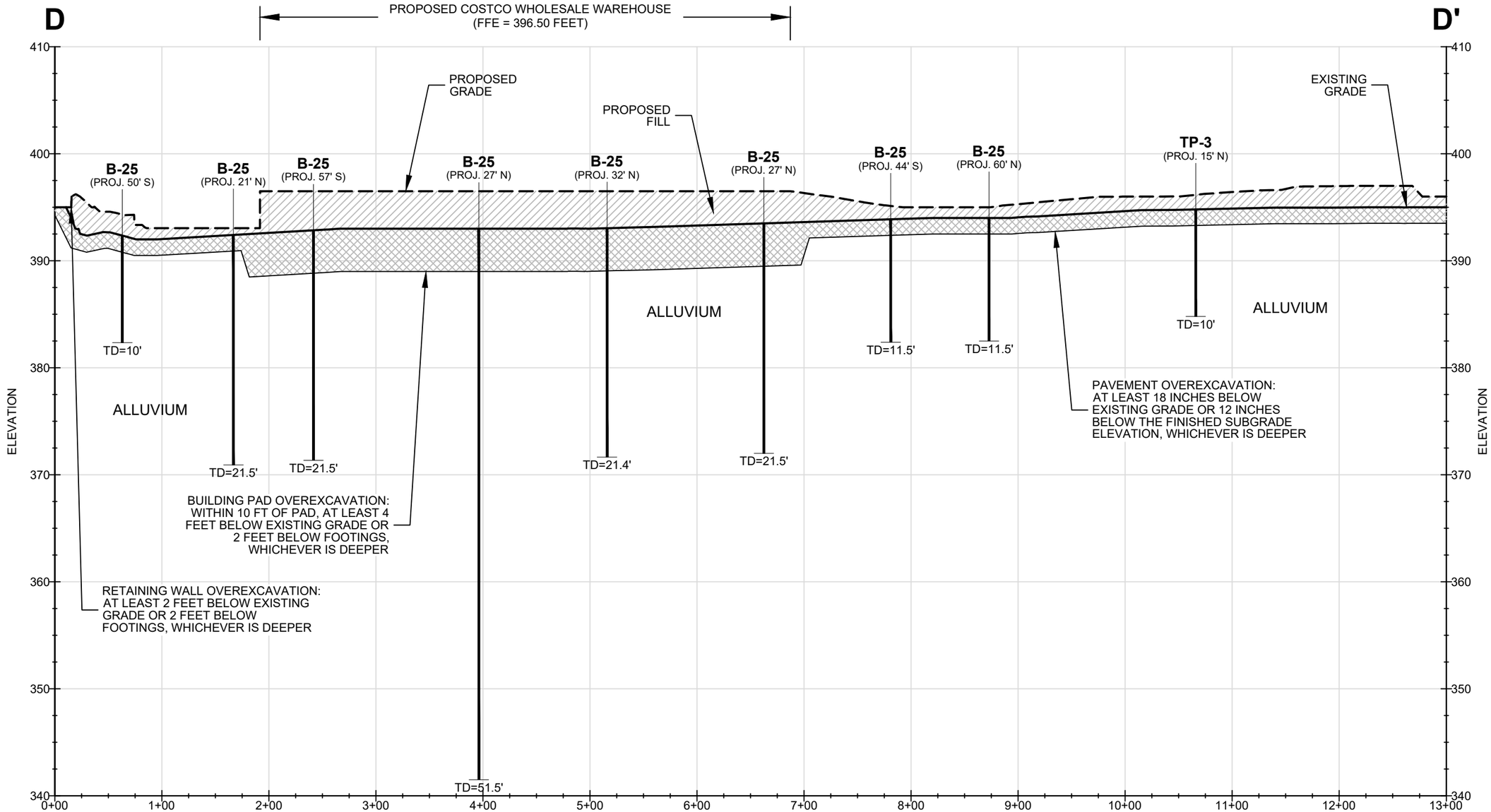
PROJECT:	25000882
DRAWN BY	DMF
CHECKED BY	HM
DATE:	03/2025
REVISED:	-

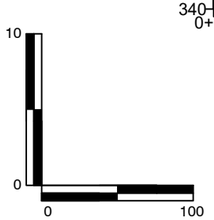
CROSS-SECTION C-C'

PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SWC 7TH STANDARD RD AND CALLOWAY DR
BAKERSFIELD, CALIFORNIA

FIGURE
5

PLOTTED: 3/5/2025 12:09 PM BY: dean fahrney
CAD FILE: C:\Users\DFahrney\OneDrive - Kleinfelder\CADD\25000882\25000882_Costco-NW-Bakersfield.dwg LAYOUT: 6





VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 100'

EXPLANATION

B-36 (PROJ.15' N) / TD=11.5'	APPROXIMATE BORING ELEVATION PROJECTION OF BORING IN FEET APPROXIMATE TEST DEPTH AND LENGTH OF BORING
ALLUVIUM	SILTY SANDS TO SANDY SILTS WITH INTERBEDDED LAYERS OF POORLY GRADED SANDS

NOTE: REFER TO APPENDIX A FOR DETAILED LOGS

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.

PROJECT:	25000882
DRAWN BY	DMF
CHECKED BY	HM
DATE:	03/2025
REVISED:	-

CROSS-SECTION D-D'

PROPOSED COSTCO WHOLESALE WAREHOUSE
AND FUEL FACILITY
SWC 7TH STANDARD RD AND CALLOWAY DR
BAKERSFIELD, CALIFORNIA

FIGURE
6

APPENDIX A
FIELD EXPLORATIONS

Copyright 2025 Kleinfelder

APPENDIX A
FIELD EXPLORATIONS

GENERAL

Subsurface conditions at the site were explored by drilling 38 borings and excavating 9 test pits. In addition, 4 borehole infiltration tests were performed. The borings and infiltration tests were drilled by 2R Drilling, Inc. using truck-mounted, hollow-stem-auger drilling equipment to depths of between approximately 11½ and 51½ feet below the existing ground surface (bgs) in the warehouse building, fuel facility, parking and drive areas. The test pits were excavated by Staib Backhoe and Excavation to a depth of approximately 10 feet bgs. The approximate locations of the borings, infiltration tests, and test pits are presented on Figure 2.

Prior to commencement of the fieldwork, Underground Service Alert (USA) was notified and various geophysical techniques were used at the exploration locations to identify potential conflicts with subsurface structures.

The boring, infiltration test, and test pit logs are presented as Figures A-3 through A-55. An explanation to the logs is presented as Figures A-1 and A-2. The exploration logs describe the earth materials encountered, samples obtained and show field and laboratory tests performed. The logs also shows the location, boring/test pit number, drilling/excavation date and the name of the drilling/excavation subcontractor. The borings and test pits were logged by a Kleinfelder engineer or geologist using the Unified Soil Classification System. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Bulk and drive samples of selected earth materials were obtained from the borings and test pits.

A modified-California sampler was used to obtain drive samples of the soil encountered. This sampler consists of a 3-inch O.D., 2.4-inch I.D. split barrel shaft that is pushed or driven a total of 18-inches into the soil at the bottom of the boring. The soil was retained in six 1-inch brass rings for laboratory testing. An additional 2 inches of soil from each drive remained in the cutting shoe and was usually discarded after visually classifying the soil. The sampler was driven using a 140-pound hammer falling 30 inches. The total number of blows required to drive the sampler the final 12 inches is termed blow count and is recorded on the Log of Boring.

Samples were also obtained using a Standard Penetration Sampler (SPT). This sampler consists of a 2-inch O.D., 1-inch I.D. split barrel shaft that is advanced into the soils at the bottom of the drill hole a total of 18 inches. The sampler was driven using a 140-pound hammer falling

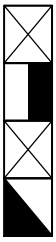
Copyright 2025 Kleinfelder

30 inches. The total number of hammer blows required to drive the sampler the final 12 inches is termed the blow count (N) and is recorded on the Log of Boring. The procedures we employed in the field are generally consistent with those described in ASTM Standard Test Method D1586.

Bulk and grab samples of the near-surface soils were directly retrieved from the auger cuttings from the borings and the excavated material in the test pits.

Copyright 2025 Kleinfelder

DRILLING METHOD/SAMPLER TYPE GRAPHICS



BULK SAMPLE

CALIFORNIA SAMPLER
(3 in. (76.2 mm.) outer diameter)

GRAB SAMPLE

STANDARD PENETRATION SPLIT SPOON SAMPLER
(2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)

GROUND WATER GRAPHICS

- WATER LEVEL (level where first observed)
- WATER LEVEL (level after stabilizing period)
- WATER LEVEL (additional levels after exploration)
- OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Solid lines separating strata on the logs represent approximate boundaries only, dashed lines are inferred or extrapolated boundaries. Actual transitions may be gradual or differ from those represented.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System (ASTM D2488/D2487) designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., CL-ML, GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS

C_u - Coefficients of Uniformity
C_c - Coefficients of Curvature
WOH - Weight of Hammer
WOR - Weight of Rod

REFERENCES

1. American Society for Materials and Testing (ASTM), 2011, ASTM D2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System).

UNIFIED SOIL CLASSIFICATION SYSTEM[1]

COARSE GRAINED SOILS (More than 50% retained on No. 200 Sieve)	**GRAVELS** (More than 50% of coarse fraction retained on No. 4 Sieve)	CLEAN GRAVEL WITH <5% FINES		**GW**	WELL-GRADED GRAVEL, WELL-GRADED GRAVEL WITH SAND
				GP	POORLY GRADED GRAVEL, POORLY GRADED GRAVEL WITH SAND
		GRAVELS WITH 5% TO 12% FINES		**GW-GM**	WELL-GRADED GRAVEL WITH SILT, WELL-GRADED GRAVEL WITH SILT AND SAND
				GW-GC	WELL-GRADED GRAVEL WITH CLAY (OR SILTY CLAY), WELL-GRADED GRAVEL WITH CLAY AND SAND (OR SILT CLAY AND SAND)
				GP-GM	POORLY GRADED GRAVEL WITH SILT, POORLY GRADED GRAVEL WITH SILT AND SAND
				GP-GC	POORLY GRADED GRAVEL WITH CLAY (OR SILTY CLAY), POORLY GRADED GRAVEL WITH CLAY AND (OR SILTY CLAY AND SAND)
		GRAVELS WITH > 12% FINES		**GM**	SILTY GRAVEL, SILTY GRAVEL WITH SAND
				GC	CLAYEY GRAVEL, CLAYEY GRAVEL WITH SAND
				GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL WITH SAND
	SANDS (50% or more of coarse fraction passes the No. 4 Sieve)	CLEAN SANDS WITH <5% FINES		**SW**	WELL-GRADED SAND, WELL-GRADED SAND WITH GRAVEL
				SP	POORLY GRADED SAND, POORLY GRADED SAND WITH GRAVEL
		SANDS WITH 5% TO 12% FINES		**SW-SM**	WELL-GRADED SAND WITH SILT, WELL-GRADED SAND WITH SILT AND GRAVEL
				SW-SC	WELL-GRADED SAND WITH CLAY (OR SILTY CLAY), WELL-GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
				SP-SM	POORLY GRADED SAND WITH SILT, POORLY GRADED SAND WITH SILT AND GRAVEL
				SP-SC	POORLY GRADED SAND WITH CLAY, POORLY GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
		SANDS WITH > 12% FINES		**SM**	SILTY SAND, SILTY SAND WITH GRAVEL
				SC	CLAYEY SAND, CLAYEY SAND WITH GRAVEL
				SC-SM	SILTY, CLAYEY SAND, SILTY, CLAYEY SAND WITH GRAVEL
FINE GRAINED SOILS (50% or more passes the No. #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)			**ML**	SILT, SILT WITH SAND, SILT WITH GRAVEL
				CL	LEAN CLAY, LEAN CLAY WITH SAND, LEAN CLAY WITH GRAVEL
				CL-ML	SILTY CLAY, SILTY CLAY WITH SAND, SILTY CLAY WITH GRAVEL
				OL	ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL
	SILTS AND CLAYS (Liquid Limit 50 or greater)			**MH**	ELASTIC SILT. ELASTIC SILT WITH SAND, ELASTIC SILT WITH GRAVEL
				CH	FAT CLAY, FAT CLAY WITH SAND, FAT CLAY WITH GRAVEL
				OH	ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL

NOTE: USE MATERIAL DESCRIPTION ON THE LOG TO DEFINE A GRAPHIC THAT MAY NOT BE PROVIDED ON THIS LEGEND.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

GRAPHICS KEY

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_GEO_LEG1_GRAPHICS_KEY_W_USCS]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS
PLOTTED: 08/22/2024 02:43 PM BY: ACorob

GRAIN SIZE[1]

DESCRIPTION		SIEVE SIZE	GRAIN SIZE
Boulders		>12 in.	>12 in. (304.8 mm.)
Cobbles		3 - 12 in.	3 - 12 in. (76.2 - 304.8 mm.)
Gravel	coarse	3/4 -3 in.	3/4 -3 in. (19 - 76.2 mm.)
	fine	#4 - 3/4 in.	0.19 - 0.75 in. (4.8 - 19 mm.)
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)
Fines		Passing #200	<0.0029 in. (<0.07 mm.)

SECONDARY CONSTITUENT[1]

Term of Use	AMOUNT	
	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

PLASTICITY[1]

DESCRIPTION	CRITERIA
Non-Plastic	A 1/8 in. (3 mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

MOISTURE CONTENT[1]

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

CONSISTENCY - FINE-GRAINED SOIL[2, 3]

CONSISTENCY	SPT - N (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Easily penetrated several inches by fist
Soft	2 - 4	0.25 ≤ PP <0.5	500 - 1,000	Easily penetrated several inches by thumb
Medium Stiff	4 - 8	0.5 ≤ PP <1	1,000 - 2,000	Can be penetrated several inches by thumb with moderate effort
Stiff	8 - 15	1 ≤ PP <2	2,000 - 4,000	Readily indented by thumb but penetrated only with great effort
Very Stiff	15 - 30	2 ≤ PP <4	4,000 - 8,000	Readily indented by thumbnail
Hard	>30	4 ≤ PP	>8,000	Indented by thumbnail with difficulty

APPARENT DENSITY - COARSE-GRAINED SOIL[2]

APPARENT DENSITY	SPT-N (# blows / ft)
Very Loose	<4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

STRUCTURE[1]

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. (6mm) thick, note thickness.
Laminated	Alternating layers of varying material or color with the layers less than 1/4-in. (6 mm) thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.
Homogeneous	Same color and appearance throughout

ANGULARITY[1]

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

REACTION WITH HYDROCHLORIC ACID[1]

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

CEMENTATION[1]

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or little finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

REFERENCES

1. American Society for Materials and Testing (ASTM), 2017, ASTM D2488: Standard Practice for Description and Identification of Soils (Visual Manual Procedures).
2. Terzaghi, K and Peck, R., 1948, Soil Mechanics in Engineering Practice, John Wiley & Sons, New York.
3. United States Department of the Interior Bureau of Reclamation (USBR), 1998, Earth Manual, Part I.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

SOIL DESCRIPTION KEY
(For additional tables, see ASTM D2488)

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-2

PLOTTED: 08/22/2024 02:48 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [KLF_GEO_LEG2_SOIL_DESC_KEY]

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-1**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION: Latitude: 35.44002° N, Longitude: -119.11408° E, Approximate Ground Surface Elevation (ft.): 395, Surface Condition: Bare Earth Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium **Sandy SILT (ML)**: fine sand, non-plastic, light brown, dry to moist					3.6						Hand auger to 5 ft bgs
390	5		**Silty SAND (SM)**: fine sand, light brown, dry to moist, medium dense		BC=7 12 15	18"		4.1			42			
			fine to medium sand, brown, dense		BC=9 20 32	18"		10.3	20.1					
385	10		medium dense, weakly to moderately cemented		BC=12 10 11	18"								
380	15													
375	20													
370	25													
365	30													

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A	BORING LOG B-1	FIGURE
DRAWN BY: AC	Proposed Costco Wholesale Warehouse and Fuel Facility SWC of 7th Standard Road and Calloway Drive Bakersfield, California	A-3
CHECKED BY: HM		
DATE:		PAGE: 1 of 1

PLOTTED: 08/22/2024 03:49 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

PLOTTED: 08/22/2024 03:49 PM BY: ACorob

BORING LOG B-2

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.44000° N
Longitude: -119.11298° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Sandy SILT (ML)**: non-plastic, light brown, dry to moist, fine sand					3.8						Hand auger to 5 ft bgs
	5		stiff		BC=6 7 7	18"		5.0						
390			**Silty SAND (SM)**: fine to medium sand, reddish brown, moist, medium dense		BC=7 15 19	18"		14.0	117.2					
	10				BC=5 5 11	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-2

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-4

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 03:49 PM BY: ACorob

BORING LOG B-3

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.44000° N
Longitude: -119.11098° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					6.3						Hand auger to 5 ft bgs
	5		light yellowish brown, medium dense		BC=5 7 6	18"		6.2			49			
390			dense		BC=11 20 33	18"		10.2	121.8					
	10		**Clayey SAND (SC)**: fine to medium sand, brown, dry to moist, dense		BC=10 14 20	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-3

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-5

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-4**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43961° N
Longitude: -119.11366° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Sandy SILT (ML)**: non-plastic, light brown, dry to moist, fine sand					5.0						Hand auger to 5 ft bgs
	5		very stiff		BC=12 11 18	18"		5.0	120.9					
390			**Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, medium dense		BC=5 8 11	18"								
	10		reddish brown, iron oxide staining		BC=11 28 32	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-4

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-6

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:49 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

PLOTTED: 08/22/2024 03:49 PM BY: ACorob

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-5**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43961° N
Longitude: -119.11243° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Sandy SILT (ML)**: non-plastic, light brown, dry to moist, fine sand					4.1						Hand auger to 5 ft bgs
	5		**Silty SAND (SM)**: fine sand, light brown, dry to moist, medium dense		BC=9 13 14	18"		4.6	113.3	100	40			
390			reddish brown		BC=7 11 11	12"								
	10				BC=7 14 20	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-5

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-7

PLOTTED: 08/22/2024 03:49 PM BY: ACorob

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-6**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43963° N
Longitude: -119.11139° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Sandy SILT (ML)**: non-plastic, light brown, dry to moist, fine sand					3.6						Hand auger to 5 ft bgs
	5		**Silty SAND (SM)**: fine sand, light reddish brown, dry to moist, medium dense		BC=10 15 18	18"		4.2	116.5					
390			light brown		BC=10 12 10	18"								
	10		fine to medium sand, reddish brown		BC=14 21 28	18"								
385	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-6

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-8

PLOTTED: 08/22/2024 03:49 PM BY: ACorob

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-7**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43940° N
Longitude: -119.11031° E
Approximate Ground Surface Elevation (ft.): 398
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine sand, reddish brown, dry to moist					5.0						Hand auger to 5 ft bgs
	5		**Poorly Graded SAND (SP)**: fine to coarse sand, light gray, dry, medium dense		BC=7 10 11	18"		0.6	101.9					
390					BC=6 7 11	18"								
	10		dense		BC=6 19 20	18"								
			Silty SAND (SM): fine sand, brown, dry to moist, dense											
385	15													
380	20													
375	25													
370	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

LABORATORY RESULTS

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-7

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-9

PLOTTED: 08/22/2024 03:49 PM BY: ACorob

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-8**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43932° N
Longitude: -119.11179° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					4.7						Hand auger to 5 ft bgs
	5		loose to medium dense		BC=5 5 5	18"		7.8						
390			**Sandy SILT (ML)**: non-plastic, light brown, moist, very stiff, fine sand		BC=4 9 22	18"		21.5	106.5					
	10		**Silty SAND (SM)**: fine sand, reddish brown, dry to moist, medium dense fine to medium sand		BC=6 7 5	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-8

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-10

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 03:49 PM BY: ACorob

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-9**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43862° N
Longitude: -119.11182° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly cemented					5.6						Hand auger to 5 ft bgs
	5		loose		BC=3 4 4	18"		4.7						
390			fine to coarse sand, medium dense, not visibly cemented, iron oxide staining		BC=10 6 11	18"		9.6	109.4					
	10		fine to medium sand, weakly cemented		BC=5 5 6	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-9

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-11

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-10**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43872° N
Longitude: -119.11131° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist											Hand auger to 5 ft bgs
								5.0						
	5		medium dense		BC=5 9 13	18"		3.9	87.1	100	39			
390			fine to medium sand		BC=5 9 13	18"								
	10		reddish brown		BC=8 8 8	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 19, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-10

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-12

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:49 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

PLOTTED: 08/22/2024 03:50 PM BY: ACorob

BORING LOG B-11

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43871° N
Longitude: -119.11047° E
Approximate Ground Surface Elevation (ft.): 398
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					5.2						Hand auger to 5 ft bgs
	5		light yellowish brown, medium dense		BC=9 11 14	18"		12.2	99.4					
			Poorly Graded SAND (SP): fine to medium sand, browish gray, dry to moist, medium dense											
390			**Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist, medium dense		BC=6 10 11	18"								
	10				BC=6 8 8	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 19, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-11

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-13

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-12**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43833° N
Longitude: -119.11150° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist					4.0						Hand auger to 5 ft bgs
	5		light yellowish brown, dense, weakly cemented, caliche		BC=10 16 18	18"		4.9	114.6					
390			medium dense		BC=4 5 11	18"								
	10		light reddish brown, dense, no cementation, no caliche		BC=12 26 21	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-12

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-14

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:50 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 03:50 PM BY: ACorob

BORING LOG B-13

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43814° N
Longitude: -119.11045° E
Approximate Ground Surface Elevation (ft.): 398
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium **Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist											Hand auger to 5 ft bgs
395					BC=5 8 9	12"		4.8						
	5		light yellowish brown, very dense, weakly cemented, caliche		BC=26 34 40	18"		5.1	126.8					Collapse Test
390			loose		BC=2 3 2	18"								
	10		medium dense, not visibly cemented, no caliche		BC=6 8 10	18"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-13

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-15

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-14**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43889° N
Longitude: -119.11076° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					4.1						Hand auger to 5 ft bgs
	5		fine to medium sand, dense		BC=16 18 24	18"		4.4	108.6					
390			medium dense		BC=6 8 12	18"								
	10		dense		BC=10 17 22	18"		6.1	116.0					
385			**Poorly Graded SAND (SP)**: fine to medium sand, light brown, dry to moist, dense fine to coarse sand, light gray, medium dense		BC=7 10 10	18"								
	15		light brown		BC=7 13 17	18"		2.0	103.0					
380			**Sandy SILT (ML)**: non-plastic, brown, dry to moist, very stiff, fine sand		BC=7 11 12	18"								
	20		**Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist, medium dense		BC=7 12 22	18"								
375														
	25		brown, loose		BC=3 3 5	18"								
370														
	30													
365														

The boring was terminated at approximately 26.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-14

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-16

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:50 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-15**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43904° N
Longitude: -119.11069° E
Approximate Ground Surface Elevation (ft.): 398
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium											Hand auger to 5 ft bgs
395			**Sandy SILT (ML)**: non-plastic, light brown, dry to moist, fine sand	⊠				4.7						
	5		stiff		BC=5 6 7	18"		5.2	123.0					
390			medium stiff		BC=4 9 17	18"		11.8	112.1					
	10		**Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist, medium dense iron oxide staining		BC=5 5 8	18"								
385					BC=6 11 23	18"		5.2	123.0					Direct Shear Test
	15		very dense, no staining		BC=11 23 35	18"								
380			**Sandy SILT (ML)**: non-plastic, yellowish brown, dry to moist, very stiff, fine sand		BC=7 22 26	18"		12.5	117.1					
	20		hard		BC=8 15 18	18"								
375			**Silty SAND (SM)**: fine sand, light grayish brown, dry to moist, dense											
	25				BC=11 21 32	18"								
370			The boring was terminated at approximately 26.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.											
	30													
365														

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-15

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-17

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:50 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT FILE: Klf_gint_master_2025 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 03:50 PM BY: ACorob

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-16**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43894° N
Longitude: -119.11117° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, reddish brown, dry					4.2						Hand auger to 5 ft bgs
	5		light brown, medium dense		BC=7 7 9	10"		4.1			48			
390			iron oxide staining, black mottling		BC=4 9 9	18"		13.4						
	10		fine to medium sand, brown, no black mottling		BC=7 8 10	12"								
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 19, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-16

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-18

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-17**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43928° N
Longitude: -119.11101° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Sandy SILT (ML)**: non-plastic, light brown, dry, fine sand					4.5						Hand auger to 5 ft bgs
	5		**Silty SAND (SM)**: fine sand, yellowish brown, dry, medium dense		BC=6 9 10	18"		4.8	108.2					
390			reddish brown		BC=6 12 11	12"		10.3						
	10		fine to medium sand		BC=7 7 7	12"								
385	15													
380														
	20													
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 19, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-17

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-19

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:50 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

PLOTTED: 08/22/2024 03:50 PM BY: ACorob

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-18**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43928° N
Longitude: -119.11363° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					3.4						Hand auger to 5 ft bgs
	5		fine to medium sand, light grayish brown, dry to moist, dense		BC=10 25 27	18"		6.8	121.5					
390			**Sandy SILT (ML)**: non-plastic, light grayish brown, dry to moist, stiff, fine sand		BC=3 4 10	18"								
	10		**Silty SAND (SM)**: fine to medium sand, light grayish brown, dry to moist, dense, iron oxide staining, black mottling		BC=10 18 19	18"		4.6	125.5					
385														
	15		fine sand, reddish brown, very dense, no staining, no mottling		BC=15 30 36	18"								
380			**Poorly Graded SAND (SP)**: fine to medium sand, light grayish brown, dry to moist, very dense											
	20				BC=30 50/6"	12"								
375			**Sandy SILT (ML)**: fine sand, non-plastic, light brownish gray, dry to moist, hard, fine sand											
	25													
370														
	30													
365														

The boring was terminated at approximately 21 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-18

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-20

Date Begin - End: 7/18/2024 **Drilling Company:** 2R Drilling **BORING LOG B-19**

Logged By: A. Corob **Drill Crew:** Cody, Justin

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-75 (truck-mounted) **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Hollow Stem Auger

Weather: Sunny, 90s **Exploration Diameter:** 8 in. O.D.

FIELD EXPLORATION | LABORATORY RESULTS

Latitude: 35.43928° N
Longitude: -119.11271° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist											Hand auger to 5 ft bgs
								3.7						
	5		fine to medium sand, loose, trace caliche		BC=3 4 4	18"		5.5			40			
390			light to reddish brown, medium dense, weakly cemented, no caliche		BC=7 13 21	18"		8.3	120.5					
	10		black mottling		BC=5 7 7	18"		7.5						
385			**Sandy SILT (ML)**: non-plastic, light brown, dry to moist, hard, moderately cemented, iron oxide staining, fine sand, caliche											
	15				BC=18 30 50/3"	13"								
380														
	20		reddish brown		BC=7 12 17	18"								
375			**Poorly Graded SAND (SP)**: fine to coarse sand, light gray, dry to moist, medium dense, trace fine gravel											
	25				BC=7 10 13	18"								
370														
	30		dense		BC=13 19 25	18"								
365			**Silty SAND (SM)**: fine to medium sand, light brownish gray, dry to moist, dense, weakly cemented											

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-19

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-21

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS
PLOTTED: 08/22/2024 03:50 PM BY: ACorob

BORING LOG B-19

Date Begin - End:	7/18/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43928° N
Longitude: -119.11271° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)
360			**Silty SAND (SM)**: fine to medium sand, light brownish gray, dry to moist, dense, weakly cemented		BC=6 13 27	18"
			Sandy SILT (ML): non-plastic, light grayish brown, dry to moist, hard, iron oxide staining, fine sand, caliche			
	40				BC=8 14 17	18"
355						
	45				BC=12 17 20	18"
350						
			Silty SAND (SM): fine to medium sand, reddish black, slightly moist, medium dense			
	50				BC=8 13 17	18"
345						
	55					
340						
	60					
335						
	65					
330						

LABORATORY RESULTS

USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks

The boring was terminated at approximately 51.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 18, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-19

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-22

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS
PLOTTED: 08/22/2024 03:50 PM BY: ACorob

PLOTTED: 08/22/2024 03:50 PM BY: ACorob

BORING LOG B-20

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43929° N
Longitude: -119.11226° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Sandy SILT (ML)**: non-plastic, light brown, dry to moist, fine sand					5.1						Hand auger to 5 ft bgs
	5		**Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist, medium dense		BC=7 6 6	18"		3.0						
390			**Sandy SILT (ML)**: non-plastic, grayish brown, moist, very stiff, fine sand		BC=7 7 18	18"		21.4	108.6					
	10		**Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist, loose		BC=4 4 5	18"		6.1						
385														
	15		very dense		BC=22 50/6"	12"								
380														
	20		dense, caliche and black mottling		BC=12 17 28	18"								
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT FILE: Klf_gint_master_2025 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-20

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-23

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-21**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43907° N
Longitude: -119.11423° E
Approximate Ground Surface Elevation (ft.): 395
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium **Silty SAND (SM)**: fine sand, light brown, dry to moist											Hand auger to 5 ft bgs
				☒				3.0						
390	5		fine to medium sand, grayish brown, medium dense, weakly cemented		BC=8 14 16	18"		5.7	118.7					
			fine sand, brown, not visibly cemented		BC=3 5 5	18"								
385	10		fine to medium sand, weakly to moderately cemented, iron oxide staining		BC=5 8 17	18"		6.8	118.6					
380	15		light gray, not visibly cemented, iron oxide staining		BC=4 5 8	18"								
			Poorly Graded SAND with Gravel (SP): fine to coarse sand, light gray, dry to moist, medium dense, fine gravel											
375	20				BC=10 12 13	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A	BORING LOG B-21	FIGURE	
DRAWN BY: AC	Proposed Costco Wholesale Warehouse and Fuel Facility SWC of 7th Standard Road and Calloway Drive Bakersfield, California	A-24	
CHECKED BY: HM			
DATE:		PAGE: 1 of 1	

PLOTTED: 08/22/2024 03:50 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-22**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43908° N
Longitude: -119.11363° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					3.0						Hand auger to 5 ft bgs
390	5		fine to medium sand, medium dense		BC=5 6 8	18"		7.0						
			light gray		BC=7 8 14	18"		10.7	102.3					
385	10		iron oxide staining		BC=8 10 10	18"		6.2						
			Sandy SILT (ML): non-plastic, light gray, dry to moist, hard, iron oxide staining, fine sand											
380	15				BC=15 50/6"	12"								
			Silty SAND (SM): fine to medium sand, light brownish gray, dry to moist, dense											
375	20				BC=9 15 30	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A	BORING LOG B-22	FIGURE	
DRAWN BY: AC	Proposed Costco Wholesale Warehouse and Fuel Facility SWC of 7th Standard Road and Calloway Drive Bakersfield, California	A-25	
CHECKED BY: HM			
DATE:		PAGE: 1 of 1	

PLOTTED: 08/22/2024 03:50 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-23**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43910° N
Longitude: -119.11313° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					5.3						Hand auger to 5 ft bgs
	5		brown, medium dense		BC=4 5 8	18"		5.8	100.0					
390			fine sand, light brown, loose		BC=3 3 6	18"								
	10		medium dense, weakly cemented, iron oxide staining		BC=7 24 23	18"		7.7	122.0					
385														
	15		reddish brown, dense, weakly to moderately cemented, no staining, trace caliche		BC=14 23 26	18"								
380														
	20		grayish brown to reddish brown, very dense, not visibly cemented, no caliche		BC=23 28 40	18"								
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-23

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-26

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-24**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43910° N
Longitude: -119.11270° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, brown, dry to moist					3.2						Hand auger to 5 ft bgs
	5		light brown, loose		BC=3 4 5	18"		3.7						
390			**SILT with Sand (ML)**: non-plastic, light brown, dry to moist, hard, fine sand		BC=6 15 24	18"		15.4	112.0			37	NP	
	10		**Silty SAND (SM)**: fine sand, reddish brown, dry to moist, medium dense		BC=6 7 6	18"		6.8						
385														
	15		brown, very dense, caliche		BC=16 40 50/5"	17"								
380														
	20		dense		BC=9 15 24	18"								
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A	BORING LOG B-24	FIGURE
DRAWN BY: AC	Proposed Costco Wholesale Warehouse and Fuel Facility SWC of 7th Standard Road and Calloway Drive Bakersfield, California	A-27
CHECKED BY: HM		
DATE:		PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-25**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43910° N
Longitude: -119.11221° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					3.3						Hand auger to 5 ft bgs
	5		medium dense		BC=9 13 16	18"		2.8	110.4					
390			iron oxide staining, trace black mottling		BC=5 7 9	18"								
	10		reddish brown, no staining, no black mottling		BC=7 14 17	18"		7.7	121.4					
385			**Sandy SILT (ML)**: low plasticity, dark reddish brown, dry to moist, hard, weakly to moderately cemented, iron oxide staining, black mottling											
	15				BC=11 15 30	18"								
380														
	20		reddish brown, dry to moist, white caliche streaks		BC=17 26 14	18"								
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-25

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-28

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

BORING LOG B-26

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43886° N
Longitude: -119.11423° E
Approximate Ground Surface Elevation (ft.): 395
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					5.1						Hand auger to 5 ft bgs
390	5		medium dense, weakly cemented		BC=6 5 6	18"		5.4		100	41			
			fine sand, iron oxide staining		BC=5 5 12	18"		18.5	105.0					
385	10		fine to medium sand, not visibly cemented, no staining		BC=6 6 7	18"		5.7						
380	15		fine to medium sand, gray		BC=14 50/6"	12"								
			Poorly Graded SAND with Gravel (SP): fine to coarse sand, gray, dry to moist, dense, fine gravel											
375	20				BC=12 15 28	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-26

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-29

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 03:51 PM BY: ACorob

BORING LOG B-27

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43886° N
Longitude: -119.11393° E
Approximate Ground Surface Elevation (ft.): 395
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					3.7						Hand auger to 5 ft bgs
390	5		gray, medium dense		BC=4 6 6	18"		3.4						
			fine sand, light grayish brown, iron oxide staining		BC=6 10 15	18"		7.9	109.2					
385	10		fine to medium sand, weakly cemented, no staining		BC=6 9 8	18"		6.1						
			Sandy SILT (ML): non-plastic, gray and mottled brown, dry to moist, hard, fine sand											
380	15				BC=10 50/6"	12"								
			Poorly Graded SAND with Gravel (SP): fine to coarse sand, gray, medium dense, fine gravel											
375	20				BC=7 9 8	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-27

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-30

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-28**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43886° N
Longitude: -119.11361° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					2.6						Hand auger to 5 ft bgs
	5		fine sand, light brownish gray, dry to moist, medium dense, weakly cemented		BC=10 10 11	18"		5.1	100.2					
390			loose		BC=3 3 3	18"								
	10		fine to medium sand, dense, moderately cemented, iron oxide staining		BC=15 28 24	18"		5.3	126.2					
385														
	15		fine sand, not visibly cemented, no staining		BC=8 19 24	18"								
380														
			Poorly Graded SAND (SP): fine to coarse sand, gray, dry to moist, very dense											
	20				BC=18 27 40	18"								
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-28

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-31

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-29**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION | LABORATORY RESULTS

Latitude: 35.43884° N
Longitude: -119.11312° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					4.2						Hand auger to 5 ft bgs
	5		fine to medium sand, medium dense, weakly cemented		BC=5 6 8	18"		4.7						
390														
	10		dense, weakly to moderately cemented, iron oxide staining		BC=28 23 30	18"		5.4	128.9					
385			**Poorly Graded SAND (SP)**: fine to coarse sand, light gray, dry to moist, medium dense											
	15				BC=7 12 17	18"								
380														
	20		**Silty SAND (SM)**: fine sand, light brownish gray, dry to moist, dense, weakly to moderately cemented		BC=12 17 38	18"								
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-29

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-32

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 03:51 PM BY: ACorob

BORING LOG B-30

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43885° N
Longitude: -119.11271° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist											Hand auger to 5 ft bgs
								4.3						
390	5		fine to medium sand, medium dense, trace caliche		BC=7 8 9	18"		5.7	102.0					Collapse Test
			fine sand, no caliche		BC=3 4 8	18"								
385	10		iron oxide staining		BC=10 17 18	18"		5.6	124.1					
380	15		fine to medium sand, reddish brown, dry to moist, very dense, caliche		BC=12 24 27	18"								
375	20		moderately cemented, black nodules		BC=12 37 50	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-30

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-33

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-31**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43860° N
Longitude: -119.11393° E
Approximate Ground Surface Elevation (ft.): 395
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium **Silty SAND (SM)**: fine sand, light grayish brown, dry to moist					3.3						Hand auger to 5 ft bgs
390	5		dense, weakly to moderately cemented, caliche		BC=17 26 26	18"		3.4	112.5					
			loose, weakly cemented, no caliche		BC=3 4 4	18"								
385	10		dense, weakly to moderately cemented		BC=10 11 34	18"		6.6	120.0					
380	15				BC=17 20 20	18"								
			Poorly Graded SAND (SP): fine to coarse sand, gray, dry to moist, dense											
375	20				BC=12 24 23	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-31

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-34

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-32**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43864° N
Longitude: -119.11363° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					3.6						Hand auger to 5 ft bgs
	5		light gray, dense, weakly to moderately cemented		BC=14 22 28	18"		3.4	116.7					
390			**Poorly Graded SAND with Silt (SP-SM)**: fine to coarse sand, gray, dry to moist, medium dense		BC=4 5 5	18"				100	6.9			
	10				BC=9 10 19	18"		3.8	112.5					
385			**Silty SAND (SM)**: fine to medium sand, light brownish gray, dry to moist, dense, weakly cemented, iron oxide staining											
	15				BC=9 15 16	18"								
380														
	20		light grayish brown, not visibly cemented, no staining		BC=9 15 22	18"								
375														
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-32

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-35

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 03:51 PM BY: ACorob

BORING LOG B-33

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43866° N
Longitude: -119.11311° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					4.7						Hand auger to 5 ft bgs
	5		medium dense, weakly cemented		BC=5 6 7	18"		4.4						
390			fine sand, light brownish gray, not visibly cemented, iron oxide staining		BC=9 11 20	18"		16.3	112.0					
	10				BC=6 8 8	18"		5.1						
385														
	15		fine to medium sand, reddish brown, dry to moist, very dense		BC=20 34 50/5"	17"								
380														
	20		light grayish brown, dry to moist, dense, no staining		BC=12 19 30	18"								
375														
	25													
370														
	30													
365														

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-33

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-36

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-34**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43866° N
Longitude: -119.11219° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist					3.9						Hand auger to 5 ft bgs
390	5		fine to medium sand, light grayish brown, medium dense		BC=9 11 12	18"		4.6	113.6					
			weakly cemented		BC=4 8 10	18"								
385	10		reddish brown, not visibly cemented		BC=10 17 14	18"		7.7	117.0					
380	15		fine sand, light grayish brown, dense, weakly to moderately cemented		BC=10 12 26	18"								
375	20		fine to coarse sand, reddish brown, moist, very dense, moderately cemented		BC=26 40 50	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-34

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-37

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:51 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT FILE: Klf_gint_master_2025 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 03:52 PM BY: ACorob

BORING LOG B-35

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43842° N
Longitude: -119.11388° E
Approximate Ground Surface Elevation (ft.): 395
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium **Sandy SILT (ML)**: non-plastic, light brown, dry, fine to medium sand					3.0						Hand auger to 5 ft bgs
390	5		light brownish gray, very stiff, weakly cemented, trace caliche		BC=6 7 11	18"		4.7		100	54			
			Silty SAND (SM): fine sand, light brownish gray, moist, medium dense, not visibly cemented, no caliche		BC=12 14 19	18"		18.3	102.2					
385	10		fine to medium sand, iron oxide staining		BC=8 10 10	18"		5.7						
380	15		fine sand, brown, very dense, moderately cemented, no staining		BC=9 24 37	18"								
			Poorly Graded SAND with Silt (SP-SM): fine to coarse sand, gray, dry, medium dense											
375	20				BC=9 10 14	8"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-35

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-38

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End: 7/17/2024 **Drilling Company:** 2R Drilling **BORING LOG B-36**

Logged By: A. Corob **Drill Crew:** Cody, Justin

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-75 (truck-mounted) **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Hollow Stem Auger

Weather: Sunny, 90s **Exploration Diameter:** 8 in. O.D.

FIELD EXPLORATION

Latitude: 35.43841° N
Longitude: -119.11310° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist, weakly cemented					4.0						Hand auger to 5 ft bgs
390	5		fine to medium sand, medium dense, not visibly cemented		BC=4 5 8	18"		5.3						
			light brownish gray, dense		BC=10 17 26	18"		5.3	117.9					
385	10		weakly cemented, caliche		BC=9 15 14	18"		7.4						
380	15		light gray, very dense, moderately cemented, no caliche		BC=15 50/6"	12"								
			Poorly Graded SAND (SP): fine to medium sand, light brown, dry to moist, very dense											
375	20		**Silty SAND (SM)**: fine sand, light grayish brown, dry to moist, very dense, iron oxide staining, caliche		BC=7 25 38	18"								
370	25		reddish brown, moderately cemented, no caliche		BC=37 50/4"	10"								
365	30		fine to medium sand, dry to moist, medium dense, weakly to moderately cemented, caliche		BC=6 7 9	18"								

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG B-36

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-39

PLOTTED: 08/22/2024 03:52 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

PLOTTED: 08/22/2024 03:52 PM BY: ACorob

BORING LOG B-36

Date Begin - End:	7/17/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43841° N
Longitude: -119.11310° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
360			**Silty SAND (SM)**: fine to medium sand, reddish brown, dry to moist, dense, not visibly cemented, no caliche		BC=11 17 21	18"								Hard drilling
	40		black nodules		BC=10 12 20	18"								
355			**Lean CLAY with Sand (CL)**: low to medium plasticity, light yellowish brown, dry to moist, hard, fine sand											
	45				BC=5 12 19	18"								
350			**Silty SAND (SM)**: fine sand, reddish brown, dry to moist, dense, weakly cemented, iron oxide staining											
	50		fine to coarse sand, brown, moist, not visibly cemented, trace clay		BC=8 13 26	18"								
345														
	55													
340														
	60													
335														
	65													
330														

The boring was terminated at approximately 51.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 17, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-36

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-40

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End: 7/16/2024 **Drilling Company:** 2R Drilling

Logged By: A. Corob **Drill Crew:** Cody, Justin

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-75 (truck-mounted) **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Hollow Stem Auger

Weather: Sunny, 90s **Exploration Diameter:** 8 in. O.D.

BORING LOG B-37

FIELD EXPLORATION

Latitude: 35.43840° N
Longitude: -119.11270° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light reddish brown, dry to moist					5.8						Hand auger to 5 ft bgs
390	5		light grayish brown, medium dense, weakly cemented		BC=6 9 11	18"		4.5	116.2					Collapse Test
			light yellowish brown, not visibly cemented		BC=3 5 8	18"								
385	10		fine to coarse sand, light brown, dense, iron oxide staining		BC=8 16 25	18"		8.5	120.1					
380	15		fine to medium sand, light brownish gray, no staining		BC=9 16 26	18"								
375	20		**Poorly Graded SAND (SP)**: fine to coarse sand, gray, dry to moist, very dense		BC=12 22 50/5"	17"								
			Silty SAND (SM): fine to medium sand, brown, dry to moist, very dense, moderately cemented, caliche											
370	25		The boring was terminated at approximately 21.4 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.											
365	30													

LABORATORY RESULTS

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A

DRAWN BY: AC

CHECKED BY: HM

DATE:

BORING LOG B-37

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE

A-41

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:52 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

Date Begin - End:	7/16/2024	**Drilling Company:**	2R Drilling	**BORING LOG B-38**	
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Latitude: 35.43842° N
Longitude: -119.11221° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist					3.6						Hand auger to 5 ft bgs
390	5		loose		BC=4 4 5	18"		5.5						
			medium dense		BC=5 6 9	18"		4.7	102.2					
385	10		weakly cemented, iron oxide staining		BC=8 9 10	18"		7.3						
380	15		very dense, not visibly cemented, no staining, caliche		BC=15 27 39	18"								
375	20		reddish brown, dense, weakly to moderately cemented, no caliche		BC=13 15 19	18"								
370	25													
365	30													

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with auger cuttings on July 16, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG B-38

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-42

PAGE: 1 of 1

PLOTTED: 08/22/2024 03:52 PM BY: ACorob
OFFICE FILTER: LAGUNA HILLS
PROJECT NUMBER: 25000882.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 03:52 PM BY: ACorob

BORING LOG INF-1

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION: Latitude: 35.43810° N, Longitude: -119.11406° E, Approximate Ground Surface Elevation (ft.): 395, Surface Condition: Bare Earth / Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
390	5		**Alluvium** **Sandy SILT (ML)**: non-plastic, yellowish brown, dry, fine sand							100	58			Hand auger to 5 ft bgs
385	10													
380	15													
375	20													
370	25													
365	30													

The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with auger cuttings on July 22, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG INF-1

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-43

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 03:52 PM BY: ACorob

BORING LOG INF-2

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43818° N
Longitude: -119.11328° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist											Hand auger to 5 ft bgs
390	5		fine to medium sand, yellowish brown, medium dense		BC=4 6 13	18"				100	48			
385	10													
380	15													
375	20													
370	25													
365	30													

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with auger cuttings on July 22, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG INF-2

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-44

PLOTTED: 08/22/2024 03:52 PM BY: ACorob

BORING LOG INF-3

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43818° N
Longitude: -119.11245° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395			**Alluvium** **Silty SAND (SM)**: fine sand, light brown, dry to moist											Hand auger to 5 ft bgs
	5									100	34			
390			The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with auger cuttings on July 22, 2024.											
	10													
385														
	15													
380														
	20													
375														
	25													
370														
	30													
365														

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A
DRAWN BY: AC
CHECKED BY: HM
DATE:

BORING LOG INF-3

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-45

PLOTTED: 08/22/2024 03:52 PM BY: ACorob

BORING LOG INF-4

Date Begin - End:	7/19/2024	**Drilling Company:**	2R Drilling		
Logged By:	A. Corob	**Drill Crew:**	Cody, Justin		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-75 (truck-mounted)	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Sunny, 90s	**Exploration Diameter:**	8 in. O.D.		

FIELD EXPLORATION

Latitude: 35.43818° N
Longitude: -119.11189° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Sandy SILT (ML)**: non-plastic, brownish gray, dry, iron oxide staining, fine to medium sand											Hand auger to 5 ft bgs
390	5		very stiff		BC=4 8 11	18"				100	52			
385	10		The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with auger cuttings on July 22, 2024.											
380	15													
375	20													
370	25													
365	30													

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

BORING LOG INF-4

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-46

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End: 7/15/2024 **Excavation Company:** Staib

Logged By: A. Corob **Excavation Crew:** Daniel

Hor.-Vert. Datum: Not Available **Excavation Equip.:** JCB 3CX Excavator

Plunge: N/A degrees **Excav. Dimensions:** 8 x 10 ft

Weather: Sunny, 90s

TEST PIT LOG TP-1

FIELD EXPLORATION

Latitude: 35.44001° N
Longitude: -119.11209° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, brown, dry to moist, weakly to moderately cemented									R-Value
			light brown									
390	5		**Poorly Graded SAND with Silt (SP-SM)**: fine to coarse sand, light grayish brown, dry to moist									
385	10		**Clayey SAND (SC)**: fine to medium sand, dark brown, moist									

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000882.001A

DRAWN BY: AC

CHECKED BY: HM

DATE:

TEST PIT LOG TP-1

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE

A-47

PAGE: 1 of 1

PLOTTED: 08/22/2024 02:39 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf_gint_master_2025

PLOTTED: 08/22/2024 02:39 PM BY: ACorob

TEST PIT LOG TP-2

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib
Logged By:	A. Corob	**Excavation Crew:**	Daniel
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft
Weather:	Sunny, 90s		

FIELD EXPLORATION

Latitude: 35.43897° N
Longitude: -119.11166° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly cemented, organics in upper 1'									Corrosion
390	5		reddish yellow									
385	10											
380	15											
375	20											
370	25											
365	30											

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

TEST PIT LOG TP-2

Proposed Costco Wholesale Warehouse
and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE

A-48

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 02:39 PM BY: ACorob

TEST PIT LOG TP-3

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib
Logged By:	A. Corob	**Excavation Crew:**	Daniel
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft
Weather:	Sunny, 90s		

Latitude: 35.43847° N
Longitude: -119.11086° E
Approximate Ground Surface Elevation (ft.): 397
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly cemented, organics in upper 1'									R-Value
	5		reddish yellow									
390												
	10											
385												
	15											
380												
	20											
375												
	25											
370												
	30											
365												

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

TEST PIT LOG TP-3

Proposed Costco Wholesale Warehouse
and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE

A-49

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 02:39 PM BY: ACorob

TEST PIT LOG TP-4

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib
Logged By:	A. Corob	**Excavation Crew:**	Daniel
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft
Weather:	Sunny, 90s		

FIELD EXPLORATION

Latitude: 35.43929° N
Longitude: -119.11313° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly to moderately cemented caliche 1.5'-2' fine sand									Modified Proctor
	5		light grayish brown									
390												
	10		medium brown									
385												
	15											
380												
	20											
375												
	25											
370												
	30											
365												

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

TEST PIT LOG TP-4

Proposed Costco Wholesale Warehouse
and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE

A-50

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 02:39 PM BY: ACorob

TEST PIT LOG TP-5

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib
Logged By:	A. Corob	**Excavation Crew:**	Daniel
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft
Weather:	Sunny, 90s		

FIELD EXPLORATION

Latitude: 35.43908° N
Longitude: -119.11393° E
Approximate Ground Surface Elevation (ft.): 395
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly to moderately cemented									Corrosion
			fine to coarse sand, caliche 2'-2.5'									
390	5		fine sand, light brownish gray									
			medium brown, moist									
385	10											
380	15											
375	20											
370	25											
365	30											

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

TEST PIT LOG TP-5

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-51

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib	**TEST PIT LOG TP-6**
Logged By:	A. Corob	**Excavation Crew:**	Daniel	
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator	
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft	
Weather:	Sunny, 90s			

FIELD EXPLORATION

Latitude: 35.43887° N
Longitude: -119.11221° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly to moderately cemented, organics upper 1' caliche 2.5'-3'									
390	5											
385	10											
380	15											
375	20											
370	25											
365	30											

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

TEST PIT LOG TP-6

Proposed Costco Wholesale Warehouse
and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-52

PAGE: 1 of 1

PLOTTED: 08/22/2024 02:39 PM BY: ACorob
PROJECT NUMBER: 25000882.001A OFFICE FILTER: LAGUNA HILLS
gINT FILE: Klf_gint_master_2025 gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 08/22/2024 02:39 PM BY: ACorob

TEST PIT LOG TP-7

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib
Logged By:	A. Corob	**Excavation Crew:**	Daniel
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft
Weather:	Sunny, 90s		

FIELD EXPLORATION

Latitude: 35.43861° N
Longitude: -119.11423° E
Approximate Ground Surface Elevation (ft.): 395
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Alluvium									
			Silty SAND (SM): fine to medium sand, light brown, dry to moist, weakly to moderately cemented, organics in upper 1'									Corrosion
390	5		fine sand, light grayish brown, weakly cemented									
385	10		fine to medium sand, medium brown, moist, not visibly cemented									

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 25000882.001A	TEST PIT LOG TP-7	FIGURE A-53
	DRAWN BY: AC CHECKED BY: HM DATE:	Proposed Costco Wholesale Warehouse and Fuel Facility SWC of 7th Standard Road and Calloway Drive Bakersfield, California	PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 02:39 PM BY: ACorob

TEST PIT LOG TP-8

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib
Logged By:	A. Corob	**Excavation Crew:**	Daniel
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft
Weather:	Sunny, 90s		

FIELD EXPLORATION

Latitude: 35.43841° N
Longitude: -119.11362° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly to moderately cemented									Modified Proctor
			fine sand, light brownish gray, not visibly cemented									
390	5		brown, moist									
	10											
385												
	15											
380												
	20											
375												
	25											
370												
	30											
365												

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

TEST PIT LOG TP-8

Proposed Costco Wholesale Warehouse
and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE

A-54

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

PLOTTED: 08/22/2024 02:39 PM BY: ACorob

TEST PIT LOG TP-9

Date Begin - End:	7/15/2024	**Excavation Company:**	Staib
Logged By:	A. Corob	**Excavation Crew:**	Daniel
Hor.-Vert. Datum:	Not Available	**Excavation Equip.:**	JCB 3CX Excavator
Plunge:	N/A degrees	**Excav. Dimensions:**	8 x 10 ft
Weather:	Sunny, 90s		

FIELD EXPLORATION

Latitude: 35.43866° N
Longitude: -119.11271° E
Approximate Ground Surface Elevation (ft.): 396
Surface Condition: Bare Earth

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
395	0		**Alluvium** **Silty SAND (SM)**: fine to medium sand, light brown, dry to moist, weakly to moderately cemented									Corrosion
			reddish yellow, not visibly cemented, trace caliche 3.5'-4'									
390	5		light brown									
385	10											
380	15											
375	20											
370	25											
365	30											

The test pit was terminated at approximately 10 ft. below ground surface.
The test pit was backfilled with excavated material on July 15, 2024.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Google Earth.



KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
DRAWN BY:	AC
CHECKED BY:	HM
DATE:	

TEST PIT LOG TP-9

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE
A-55

PAGE: 1 of 1

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000882.001A
OFFICE FILTER: LAGUNA HILLS

APPENDIX B
LABORATORY TESTING

Copyright 2025 Kleinfelder

APPENDIX B
LABORATORY TESTING

GENERAL

Laboratory tests were performed on selected samples as an aid in classifying the soils and to evaluate physical properties of the soils that may affect foundation design and construction procedures. Laboratory testing was performed by both Kleinfelder and AP Engineering and Testing, Inc. of Pomona, California. The tests were performed in general conformance with the current ASTM or Caltrans standards. A description of the laboratory-testing program is presented below.

MOISTURE AND UNIT WEIGHT

Moisture content and dry unit weight testing was performed on a selected sample recovered from our borings. Moisture contents were determined in general accordance with ASTM Test Method D2216; dry unit weight was calculated using the entire weight of the samples collected in general accordance with ASTM Test Method D7263. Results of these tests are presented on the boring logs in Appendix A.

WASH SIEVE

Selected soil samples were tested for the percent passing the No. 200 sieve, which was performed by wash sieving in accordance with ASTM Standard Test Method D1140. Results of these tests are presented on the boring logs in Appendix A.

SIEVE AND HYDROMETER ANALYSIS

Sieve and hydrometer analysis of selected samples was performed to evaluate the grain size distribution of the onsite soils and to aid in classification of the soils. Sieve analysis and hydrometer analysis was performed in accordance with ASTM Standard Test Method D6913. The results of the tests are presented as an attachment in this appendix.

ATTERBERG LIMITS

Atterberg limits testing was performed on selected soil samples to assist in classification. Testing was performed in general accordance with ASTM Standard Test Method D4318. Results of these tests are presented on the boring logs and attached to this appendix.

Copyright 2025 Kleinfelder

DIRECT SHEAR TESTS

Select samples were subject to direct shear testing in order to evaluate the shear strength of the in-situ soils in accordance with ASTM Standard Test Method D3080. The tests were performed by AP Engineering and Testing, Inc. The results are attached to this appendix.

ONE-DIMENSIONAL SWELL/COLLAPSE TEST

Laboratory testing was performed on selected soil samples to study the collapse potential of the subgrade soils. During this test, the soil sample is inundated with water at a specific surcharge loading and the percent swell or collapse is measured. These tests were performed in accordance with ASTM Standard Test Method D4546. The tests were performed by AP Engineering and Testing, Inc. The results are attached to this appendix.

MODIFIED PROCTOR

Modified Proctor (maximum dry density and optimum moisture content) testing was performed on two select bulk samples of the near surface soils to evaluate the compaction characteristics of the onsite soils. The testing was performed in general accordance with ASTM Standard Test Method D1557. The test results are attached to this appendix.

R-VALUE

Resistance value (R-value) tests were performed on two select bulk soil samples to evaluate pavement support characteristics of the near-surface onsite soils. R-value tests were performed in accordance with ASTM Standard Test Method D2844. The test results are attached to this appendix.

SOIL CORROSIVITY TESTS

A series of chemical tests were performed on selected samples of the near-surface soils to estimate pH, resistivity and sulfate and chloride contents. The samples were tested for pH and minimum resistivity, soluble chlorides, and soluble sulfates, respectively. The tests were performed by AP Engineering and Testing, Inc. Test results may be used by a qualified corrosion engineer to evaluate the general corrosion potential with respect to construction materials. The results of the tests are presented in the body of the report and are attached to this appendix.

Copyright 2025 Kleinfelder

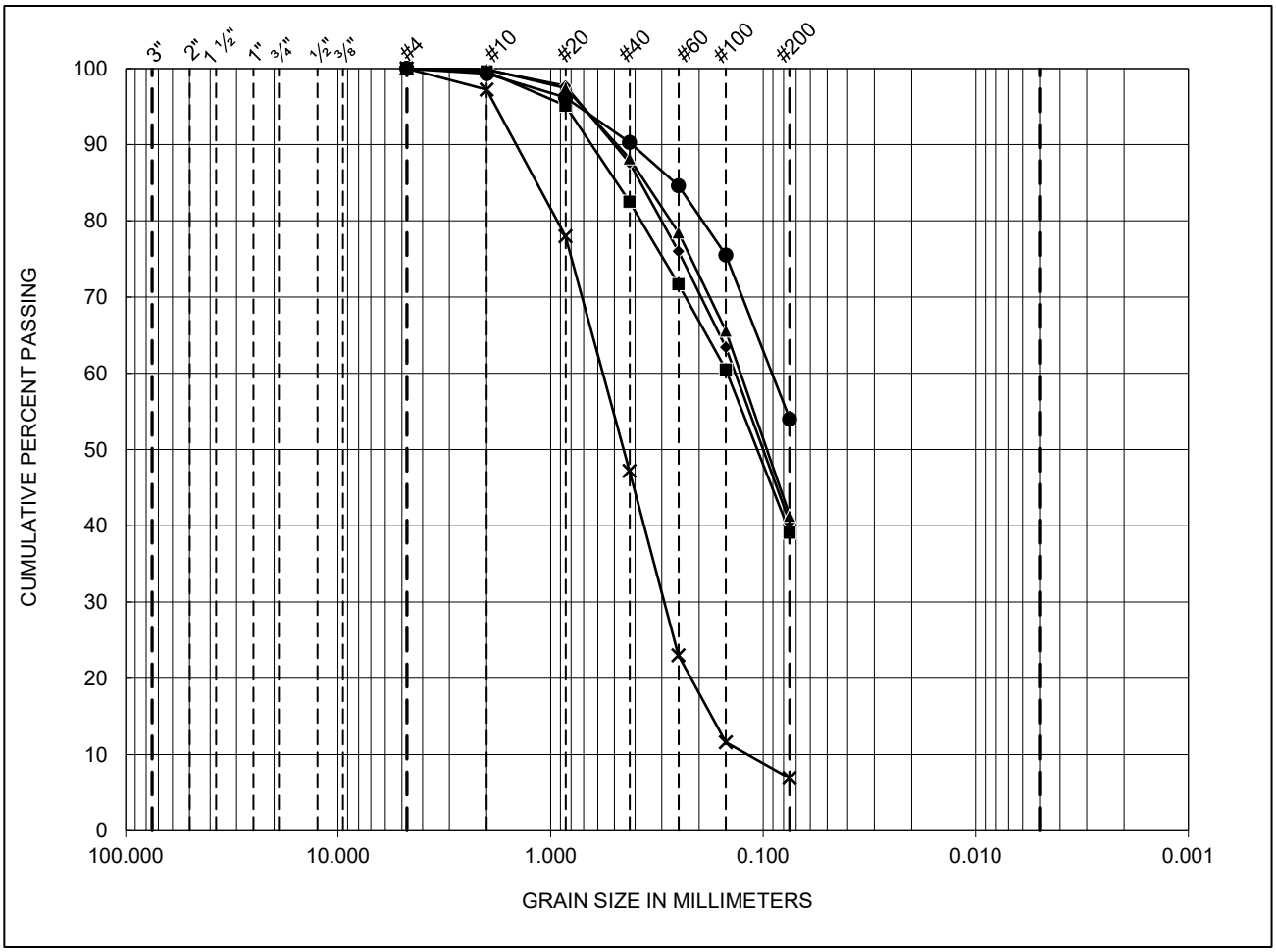
TOPSOIL ANALYTICAL TESTS

Topsoil analytical testing was performed on one composite sample of the near-surface soils by Waypoint Analytical of Anaheim, California. The composite topsoil sample was tested for percentages of organic matter, percentages of deleterious material, pH, mineral content, micro and macro nutrient content, and herbicide presence in the soil. Results of the testing are attached to this appendix.

ORGANIC CONTENT

Organic content testing was performed on the near surface topsoil samples to estimate the quantity of organics within the soil. Organic testing was performed by Waypoint Analytical of Anaheim, California. Results of the testing are attached to this appendix.

Copyright 2025 Kleinfelder



COBBLE	GRAVEL	SAND	SILT	CLAY

SYMBOL	SAMPLE IDENTIFICATION			PERCENTAGES			ATTERBERG LIMITS			SOIL CLASSIFICATION
	BORING NO.	SAMPLE NO.	DEPTH (ft.)	GRAVEL	SAND	FINES	LL	PL	PI	
◆	B-5	2	5	0.0	59.6	40.4	NM	NM	NM	Silty Sand (SM)
■	B-10	2	5	0.0	60.9	39.1	NM	NM	NM	Silty Sand (SM)
▲	B-26	2	5	0.0	58.7	41.3	NM	NM	NM	Silty Sand (SM)
×	B-32	3	7.5	0.0	93.1	6.9	NM	NM	NM	Poorly Graded Sand with Silt (SP-SM)
●	B-35	2	5	0.0	46.0	54.0	NM	NM	NM	Sandy Silt (ML)

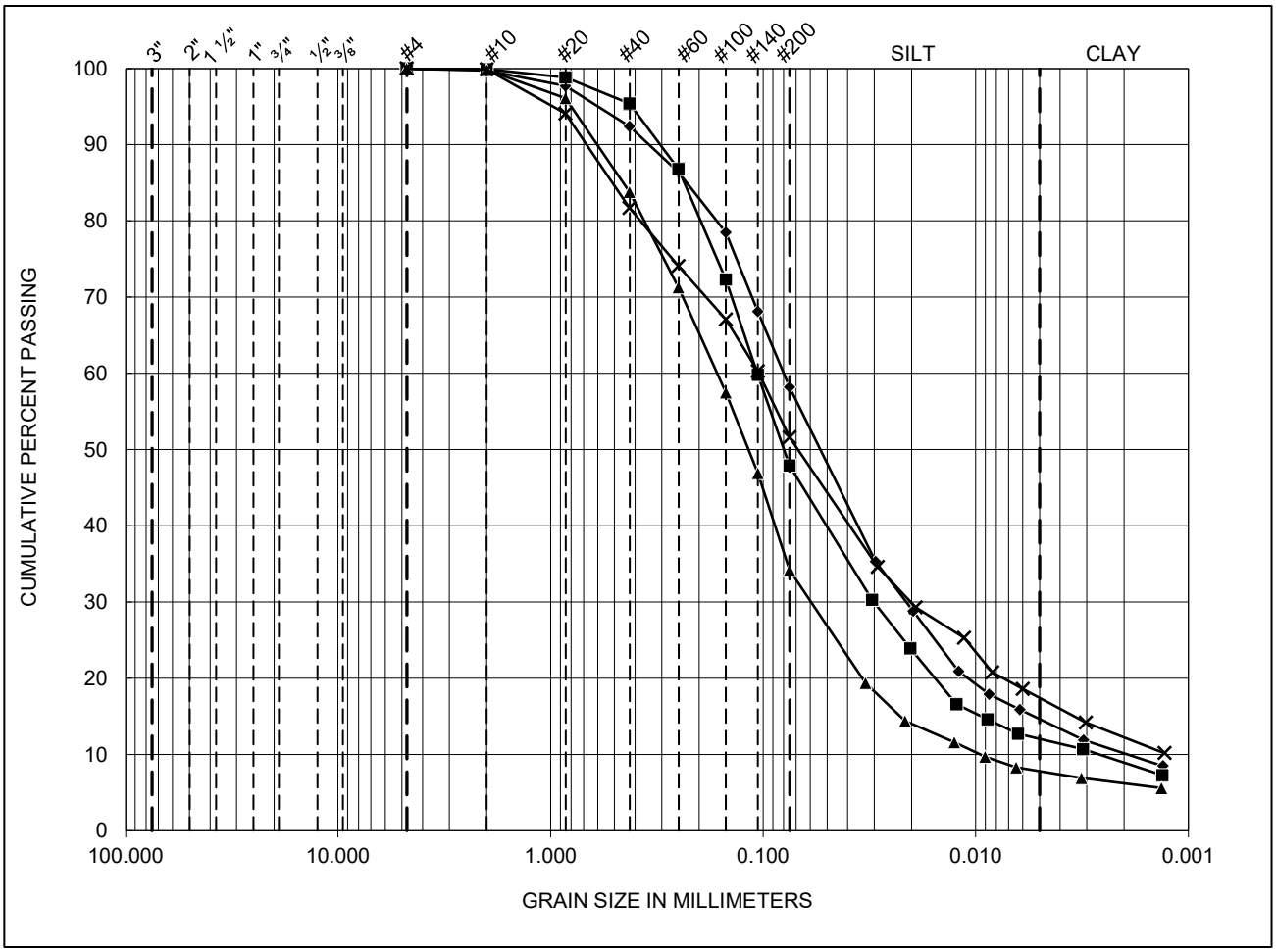
KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
TESTED BY:	M.Magaña
DATE:	8/15/2024
CHECKED BY:	M.Magaña
DATE:	8/16/2024

GRAIN SIZE DISTRIBUTION

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE



COBBLE	GRAVEL	SAND	SILT	CLAY

SYMBOL	SAMPLE IDENTIFICATION			PERCENTAGES			ATTERBERG LIMITS			SOIL CLASSIFICATION
	BORING NO.	SAMPLE NO.	DEPTH (ft.)	GRAVEL	SAND	FINES	LL	PL	PI	
◆	INF-1	1	4.5-5	0.0	41.8	58.2	NM	NM	NM	Sandy Silt (ML)
■	INF-2	1	8.5	0.0	52.1	47.9	NM	NM	NM	Silty Sand (SM)
▲	INF-3	1	4.5-5	0.0	65.8	34.2	NM	NM	NM	Silty Sand (SM)
×	INF-4	1	8.5	0.0	48.4	51.6	NM	NM	NM	Sandy Silt (ML)

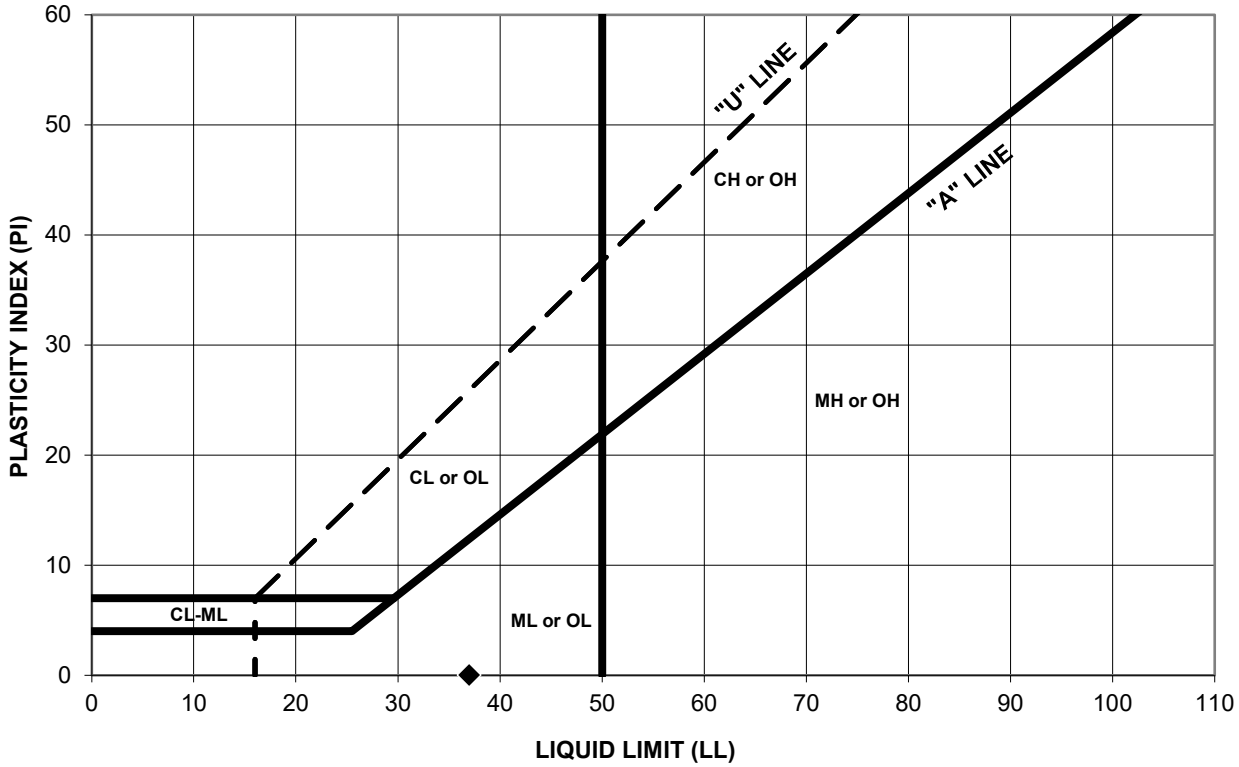
KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
TESTED BY:	M.Magaña
DATE:	8/15/2024
CHECKED BY:	M.Magaña
DATE:	8/16/2024

GRAIN SIZE DISTRIBUTION

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE



SYMBOL	SAMPLE IDENTIFICATION			ATTERBERG LIMITS			SOIL CLASSIFICATION
	BORING NO.	SAMPLE NO.	DEPTH (ft)	LL	PL	PI	
◆	B-24	3	7.5	37	37	NP	Silt with Sand (ML)

Testing performed in general accordance with ASTM D4318

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
TESTED BY:	N.Brown
DATE:	8/15/2024
CHECKED BY:	M.Magaña
DATE:	8/16/2024

PLASTICITY TESTING

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

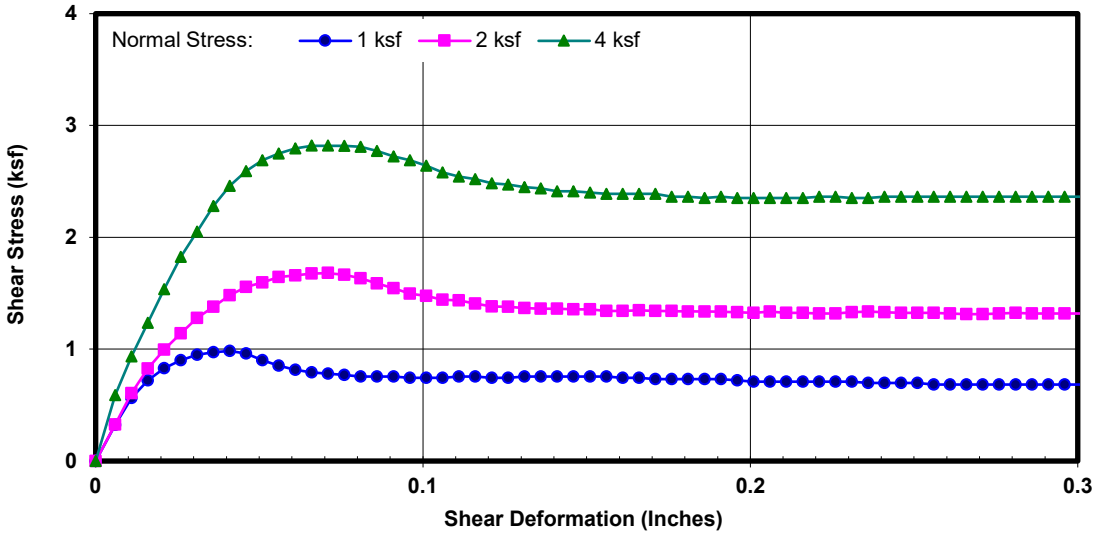
FIGURE

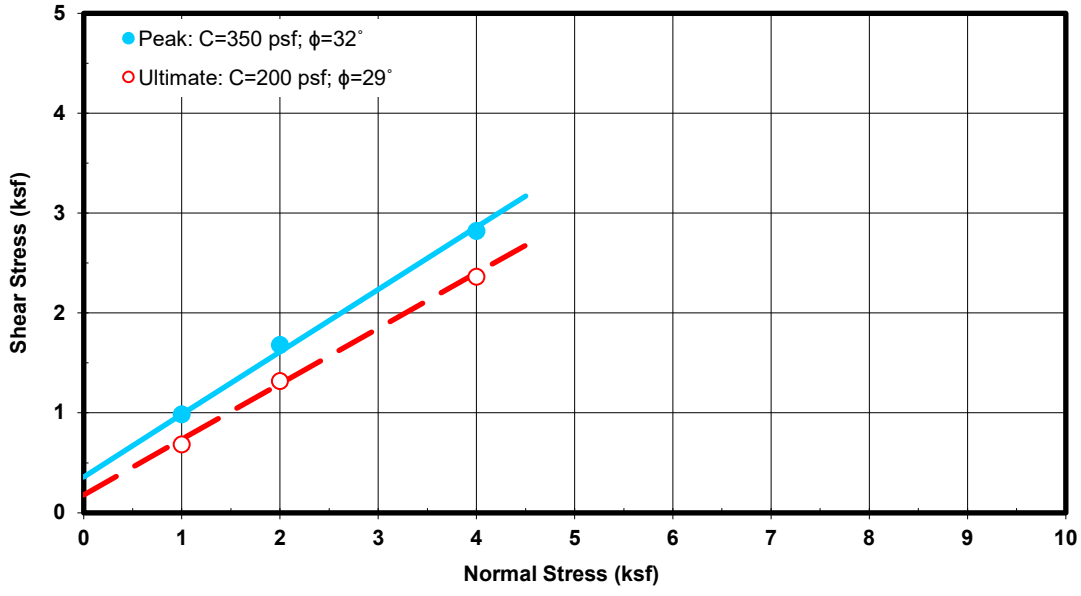
AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com

DIRECT SHEAR TEST RESULTS
ASTM D 3080

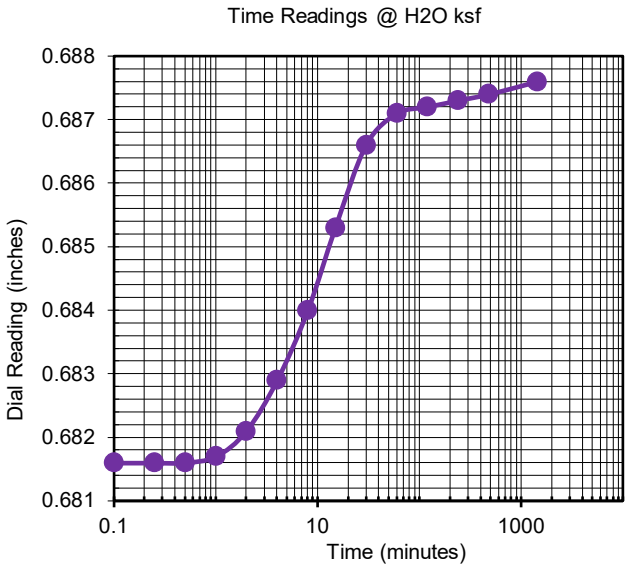
Project Name:	Costco NW Bakersfield, CA GEO		**Tested By:**	AP	**Date:** 08/20/24
Project No.:	25000882.001A		**Computed By:**	JP	**Date:** 08/21/24
Boring No.:	B-15		**Checked by:**	AP	**Date:** 08/21/24
Sample No.:	5	**Depth (ft):** 12.5			
Sample Type:	Mod. Cal.				
Soil Description:	Sandy Clay				
Test Condition:	Inundated	**Shear Type:** Regular			

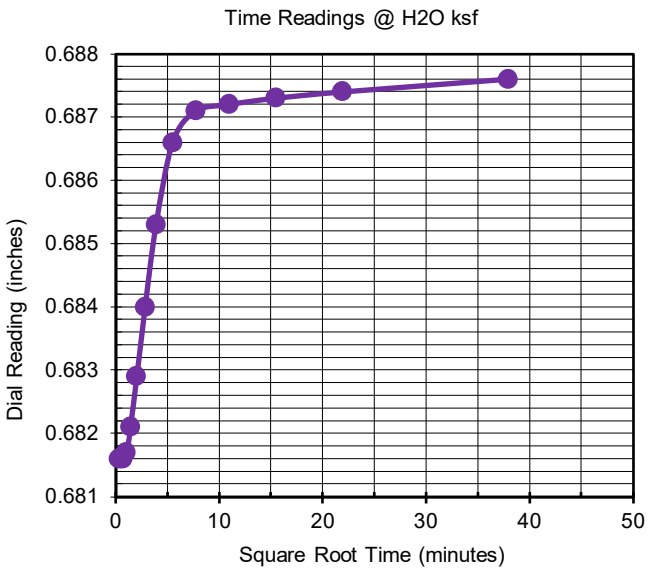
Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
129.4	123.0	5.2	13.8	38	100	1	0.984	0.684
						2	1.681	1.319
						4	2.820	2.364

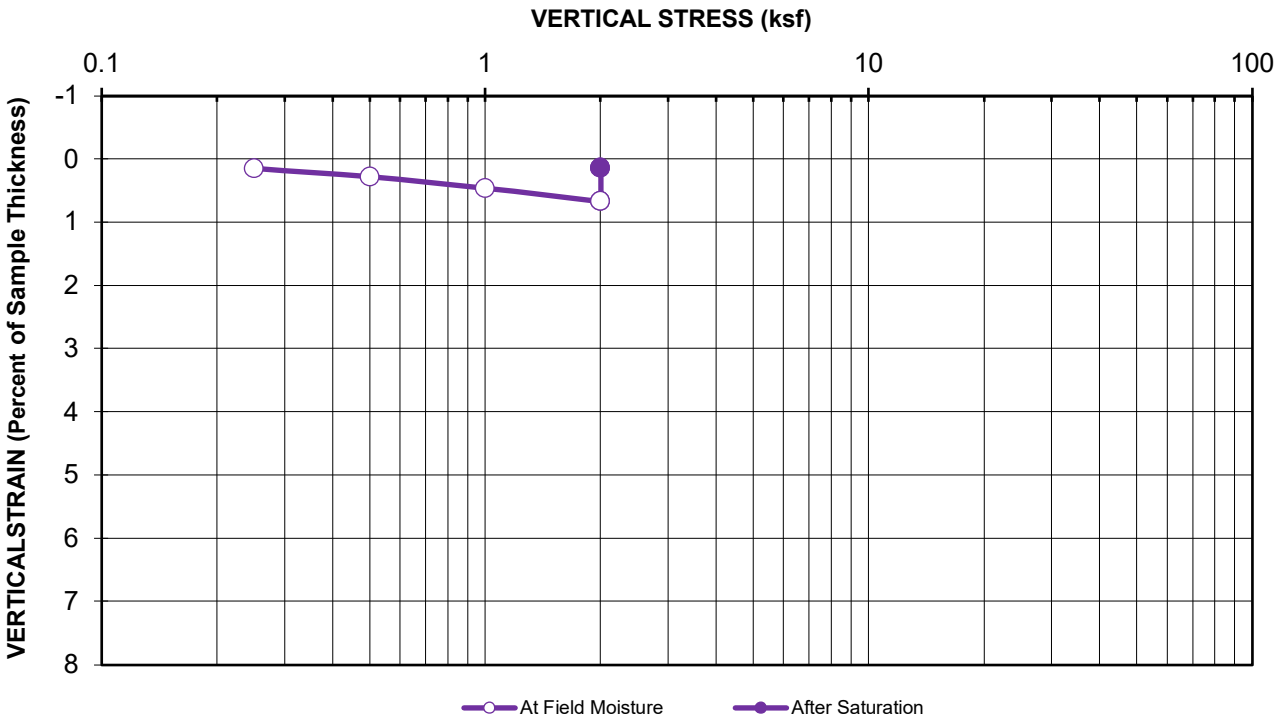




AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com





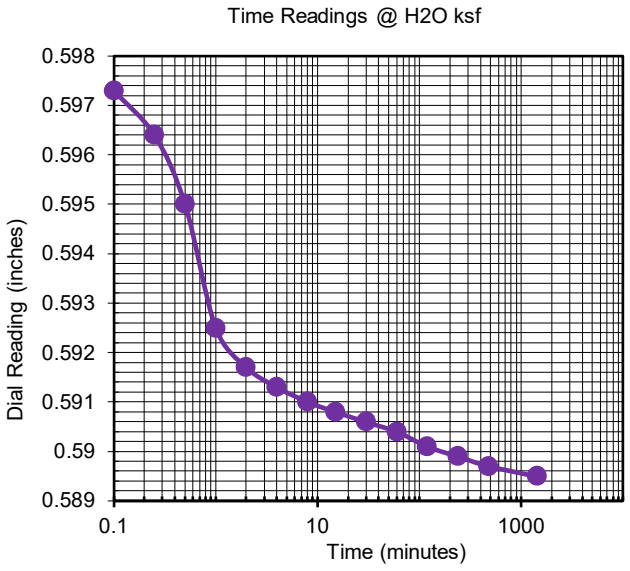


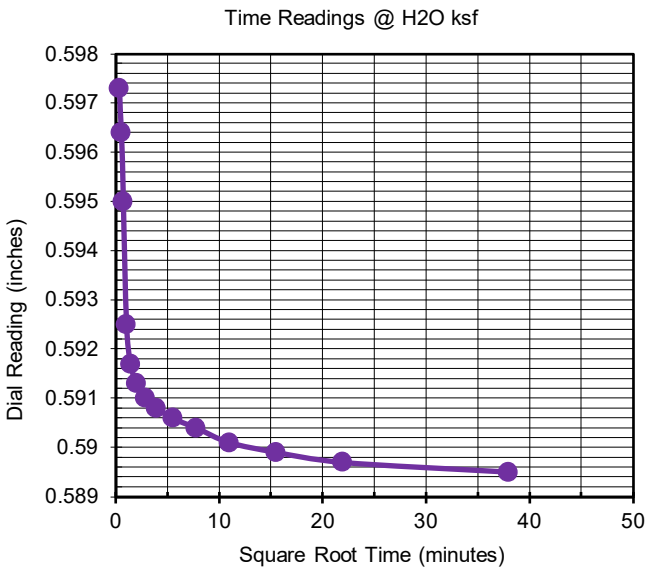
Boring No. :	B-13	Initial Dry Unit Weight (pcf):	126.8
Sample No.:	2	Initial Moisture Content (%):	5.1
Depth (feet):	5	Final Moisture Content (%):	14.4
Sample Type:	Mod Cal	Initial Void Ratio:	0.33
Soil Description:	Clayey Sand		
Remarks:	Swell = 0.53% upon inundation		

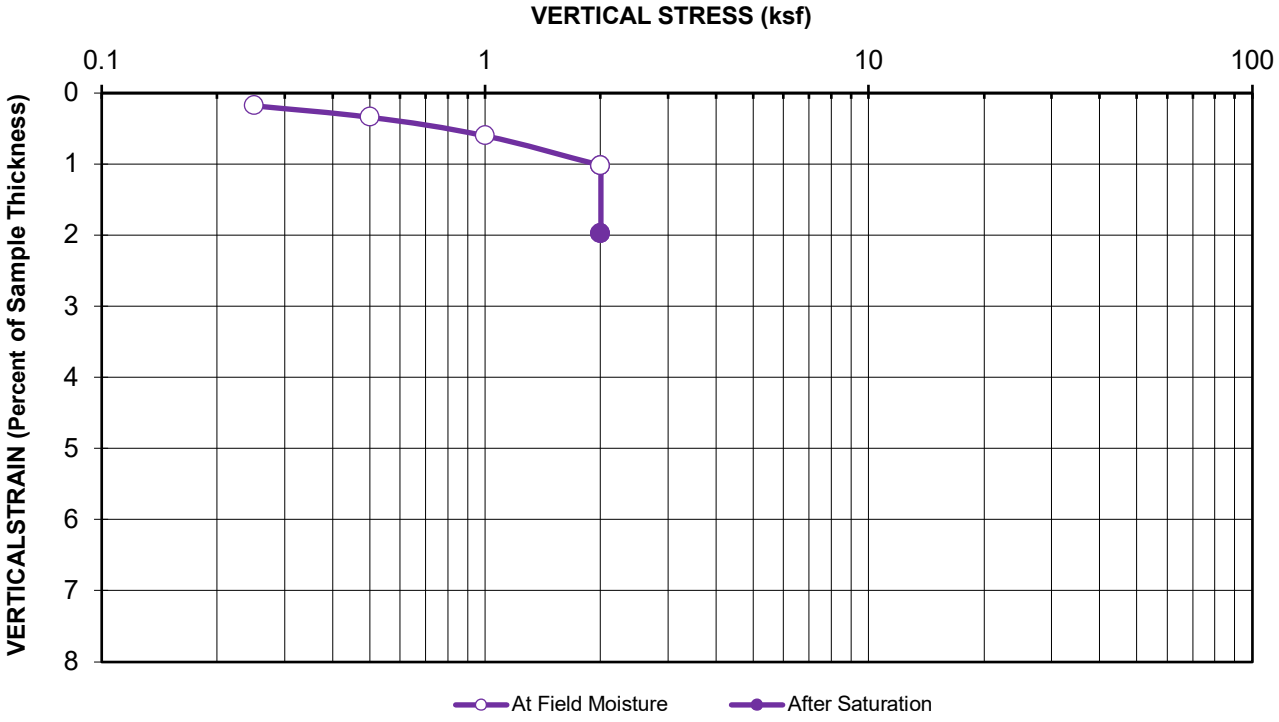
1-D SWELL/COLLAPSE
ASTM D 4546-14, Method B

Project Name:	Costco NW Bakersfield, CA GEO
Project No.:	25000882.001A
Date:	8/19/24
AP No:	24-0836

AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com





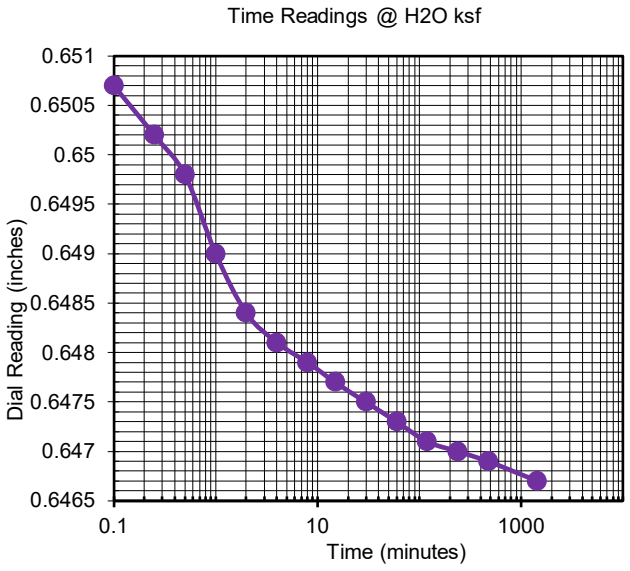


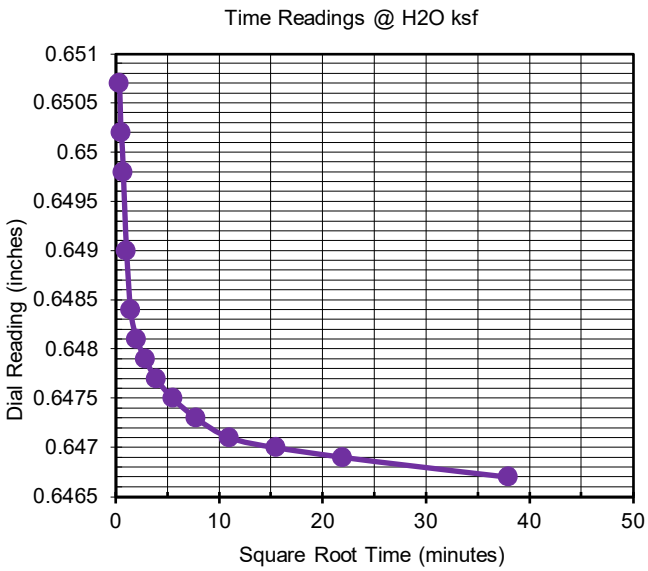
Boring No. :	B-30	Initial Dry Unit Weight (pcf):	102.0
Sample No.:	2	Initial Moisture Content (%):	5.7
Depth (feet):	5	Final Moisture Content (%):	22.4
Sample Type:	Mod Cal	Initial Void Ratio:	0.65
Soil Description:	Silty Sand		
Remarks:	Collapse = 0.96% upon inundation		

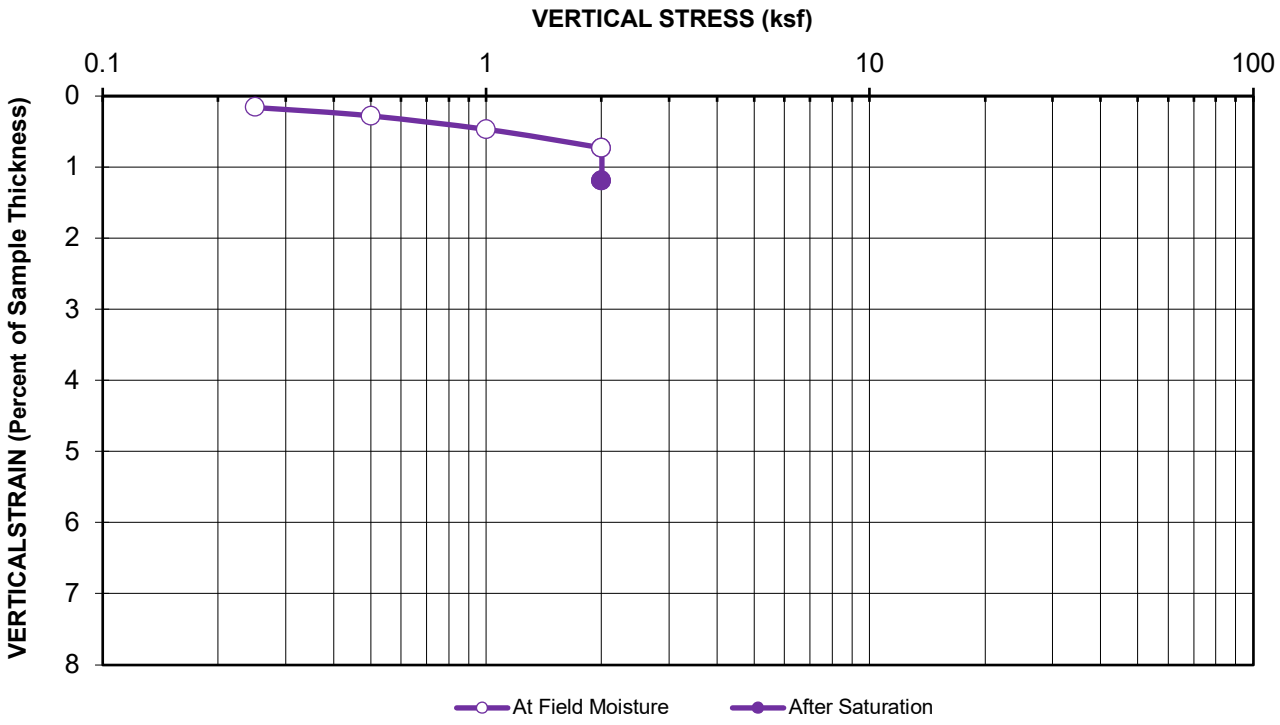
1-D SWELL/COLLAPSE
ASTM D 4546-14, Method B

Project Name:	Costco NW Bakersfield, CA GEO
Project No.:	25000882.001A
Date:	8/19/24
AP No:	24-0836

AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com



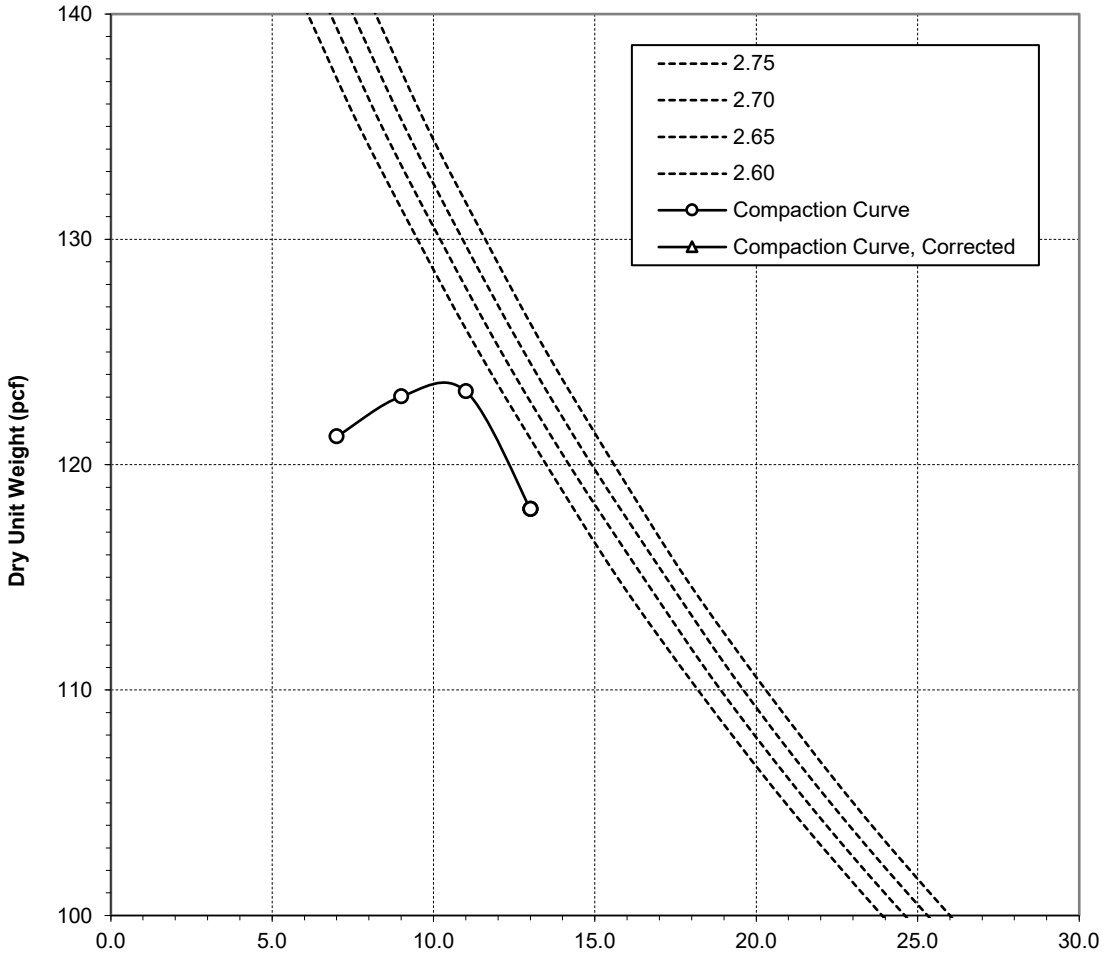




Boring No. :	B-37	Initial Dry Unit Weight (pcf):	116.2
Sample No.:	2	Initial Moisture Content (%):	4.5
Depth (feet):	5	Final Moisture Content (%):	19.8
Sample Type:	Mod Cal	Initial Void Ratio:	0.45
Soil Description:	Silty Sand		
Remarks:	Collapse = 0.46% upon inundation		

1-D SWELL/COLLAPSE
ASTM D 4546-14, Method B

Project Name:	Costco NW Bakersfield, CA GEO
Project No.:	25000882.001A
Date:	8/19/24
AP No:	24-0836



Boring No.: TP-4

Sample No.: 3

Depth: 1-5

Material Description: Silty Sand (SM)

	Uncorrected	Corrected
Maximum Dry Unit Weight (pcf)	**123.5**	**na**
Optimum Water Content (%)	**10.3**	**na**
Oversize Fraction, retained on 3/8 (%)		**<5**
Bulk Specific Gravity of Oversize Fraction		**na**

na = not applicable

Tested in accordance with: ASTM D1557, Method B

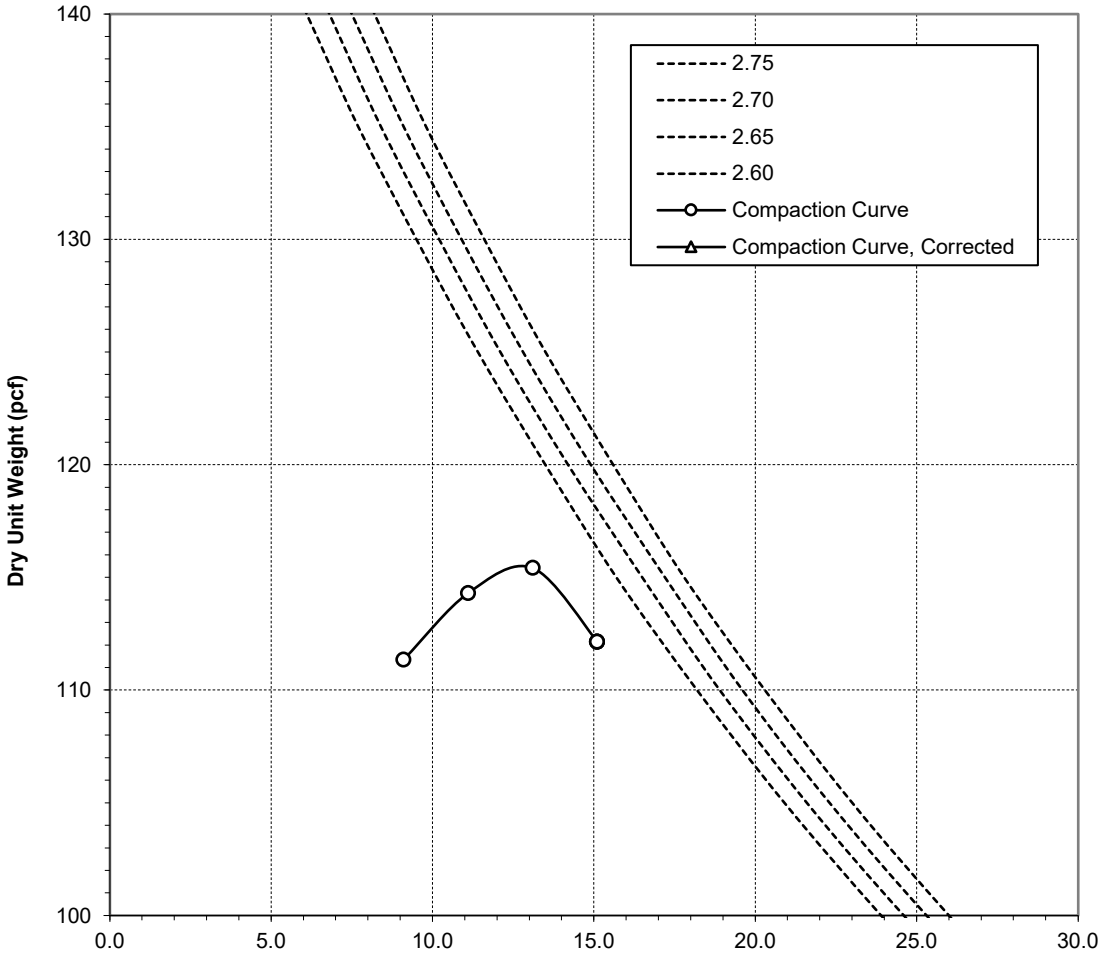
KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
TESTED BY:	M.Magaña
DATE:	7/26/2024
CHECKED BY:	M.Magaña
DATE:	8/13/2024

Compaction Curve

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE



Boring No.: TP-8

Sample No.: 3

Depth: 1-5

Material Description: Silty Sand (SM)

	Uncorrected	Corrected
Maximum Dry Unit Weight (pcf)	**115.5**	**na**
Optimum Water Content (%)	**12.7**	**na**
Oversize Fraction, retained on 3/8 (%)		**<5**
Bulk Specific Gravity of Oversize Fraction		**na**

na = not applicable

Tested in accordance with: ASTM D1557, Method B

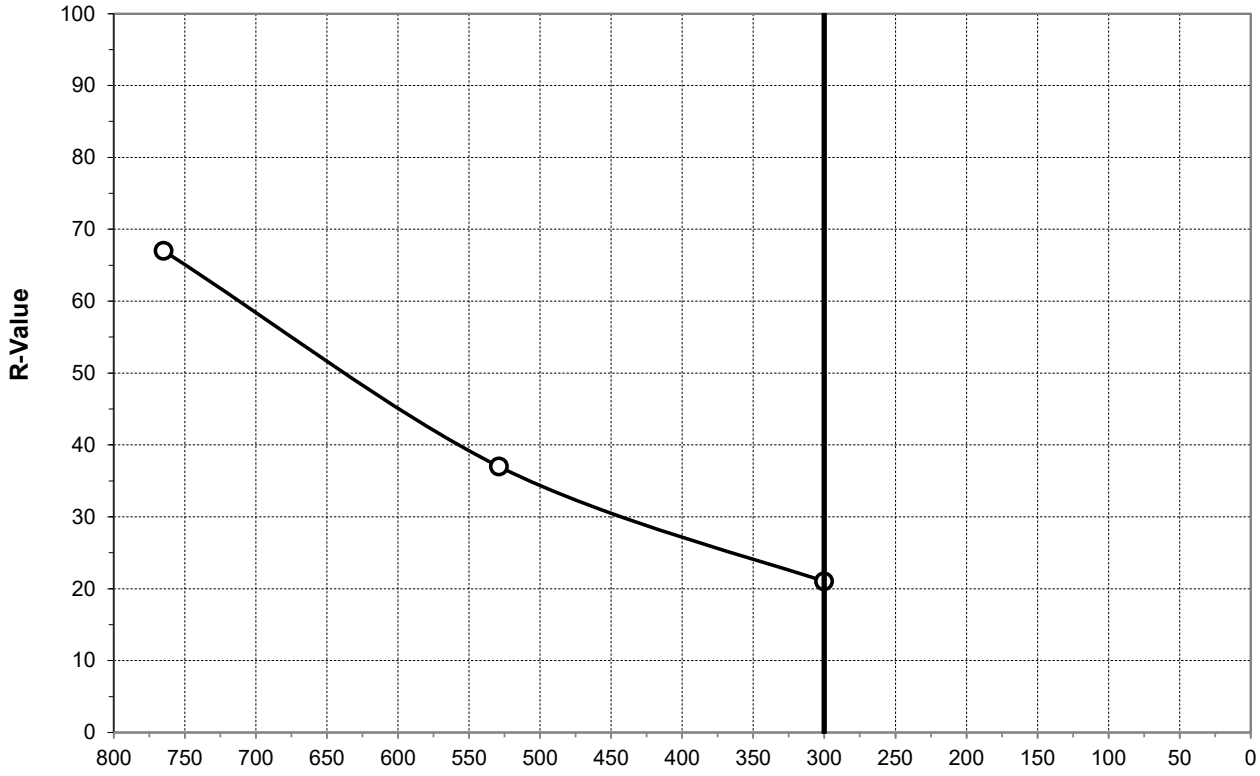
KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	25000882.001A
TESTED BY:	M.Magaña
DATE:	7/26/2024
CHECKED BY:	M.Magaña
DATE:	8/13/2024

Compaction Curve

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE



Boring No.: TP-1
Sample No.: 3
Depth: 1-5
Material Description: Silty Sand (SM)

Specimen No.	A	B	C
Moisture at Test (%)	11.6	12.9	14.2
Dry Unit Weight at Test (pcf)	121.7	119.1	116.6
Expansion Pressure (psf)	346.4	82.3	17.3
Exudation Pressure (psi)	764.8	528.8	300.0
Resistance Value	67	37	21
R - VALUE AT 300 PSI EXUDATION PRESSURE			**21**

Test Procedure: ASTM D2844

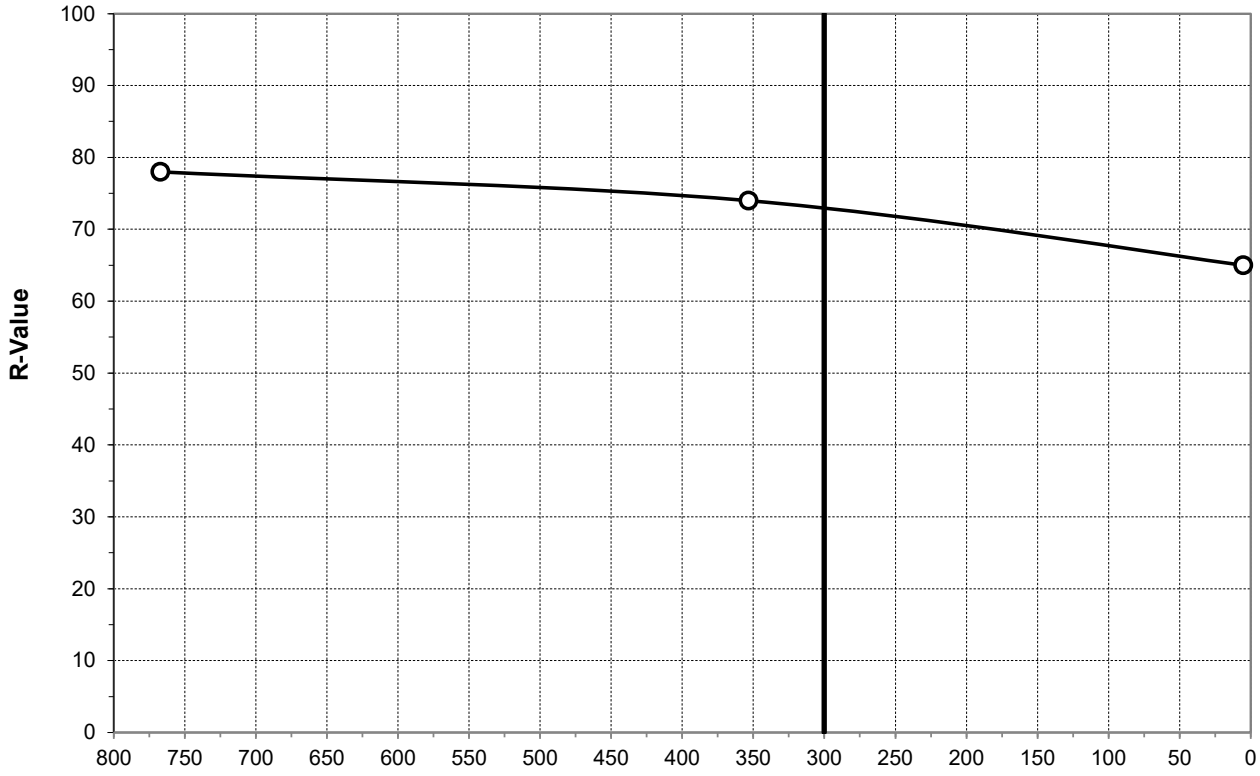
KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000822.001A
TESTED BY: M.Magaña
DATE: 8/9/2024
CHECKED BY: M.Magaña
DATE: 8/13/2024

R-VALUE

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE



Boring No.: TP-3
Sample No.: 3
Depth: 1-5
Material Description: Silty Sand (SM)

Specimen No.	A	B	C
Moisture at Test (%)	8.6	9.5	10.3
Dry Unit Weight at Test (pcf)	123.7	123.3	121.9
Expansion Pressure (psf)	134.2	65.0	47.6
Exudation Pressure (psi)	767.2	353.2	5.2
Resistance Value	78	74	65
R - VALUE AT 300 PSI EXUDATION PRESSURE			**73**

Test Procedure: ASTM D2844

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 25000822.001A
TESTED BY: M.Magaña
DATE: 8/9/2024
CHECKED BY: M.Magaña
DATE: 8/13/2024

R-VALUE

Proposed Costco Wholesale Warehouse and Fuel Facility
SWC of 7th Standard Road and Calloway Drive
Bakersfield, California

FIGURE

AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com

CORROSION TEST RESULTS

Client Name: Kleinfelder
Project Name: Costco NW Bakersfield, CA GEO
Project No.: 25000882.001A

AP Job No.: 24-0836
Date: 08/20/24

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
TP-2	3	1-5	Silty Sand w/ trace clay	3,130	8.7	26	20
TP-5	3	1-5	Silty Sand	4,617	9.0	24	19
TP-7	3	1-5	Silty Sand	3,686	8.7	22	21
TP-9	3	1-5	Silty Sand	2,715	8.6	27	20

NOTES: Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Sample Summary Table

Report Number: **24-225-0005**

Client Project Description: **Costco - NW Bakersfield, CA**
Job #: 25000882.001A

Lab No	Client Sample ID	Matrix	Date Collected	Date Received	Method	Lab ID
69516	Composite	Solids	08/12/2024 10:54	08/12/2024	SW-7471A	
69516	Composite	Solids	08/12/2024 10:54	08/12/2024	SW-DRYWT	
69516	Composite	Solids	08/12/2024 10:54	08/12/2024	6010D	

: A&L Analytical Laboratories, Inc., Memphis, TN

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

04219
Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225

Laguna Hills , CA 92653

Project Information : Costco - NW Bakersfield, CA
Job #: 25000882.001A

Report Number : **24-225-0005**

REPORT OF ANALYSIS

Report Date : 08/16/2024
Received : 08/12/2024

Lab No : **69516**
Sample ID : **Composite**

Matrix: **Solids**
Sampled: **8/12/2024 10:54**

Analytical Method: 6010D
Prep Method: 3050B

Prep Batch(es): **L767045** 08/14/24 07:55

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Batch
Total Beryllium	**0.632**	mg/Kg - dry	0.0511	1	08/15/24 01:55	BKN	L767359
Total Antimony	<0.511	mg/Kg - dry	0.511	1	08/15/24 01:55	BKN	L767359
Total Thallium	<1.02	mg/Kg - dry	1.02	1	08/15/24 01:55	BKN	L767359
Total Vanadium	**35.1**	mg/Kg - dry	0.511	1	08/15/24 01:55	BKN	L767359
Total Barium	**117**	mg/Kg - dry	0.511	1	08/15/24 01:55	BKN	L767359
Total Copper	**15.6**	mg/Kg - dry	0.512	1	08/15/24 01:55	BKN	L767359
Total Arsenic	**6.18**	mg/Kg - dry	0.511	1	08/15/24 01:55	BKN	L767359
Total Silver	<0.256	mg/Kg - dry	0.256	1	08/15/24 01:55	BKN	L767359
Total Chromium	**18.2**	mg/Kg - dry	0.255	1	08/15/24 01:55	BKN	L767359
Total Cadmium	**0.528**	mg/Kg - dry	0.102	1	08/15/24 01:55	BKN	L767359
Total Cobalt	**6.60**	mg/Kg - dry	0.511	1	08/15/24 01:55	BKN	L767359
Total Molybdenum	**0.413**	mg/Kg - dry	0.255	1	08/15/24 01:55	BKN	L767359
Total Nickel	**15.9**	mg/Kg - dry	0.255	1	08/15/24 01:55	BKN	L767359
Total Lead	**5.62**	mg/Kg - dry	0.306	1	08/15/24 01:55	BKN	L767359
Total Selenium	<0.511	mg/Kg - dry	0.511	1	08/15/24 01:55	BKN	L767359
Total Zinc	**50.1**	mg/Kg - dry	1.28	1	08/15/24 01:55	BKN	L767359

Qualifiers/ Definitions DF Dilution Factor MQL Method Quantitation Limit

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

04219
Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225

Laguna Hills , CA 92653

Project Information : Costco - NW Bakersfield, CA
Job #: 25000882.001A

Report Number : **24-225-0005**

REPORT OF ANALYSIS

Report Date : 08/16/2024
Received : 08/12/2024

Lab No : **69516**
Sample ID : **Composite**

Matrix: **Solids**
Sampled: **8/12/2024 10:54**

Analytical Method: SW-7471A **Prep Batch(es):** **L767016** 08/14/24 09:40
Prep Method: SW-7471A (PREP)

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Batch
Mercury (Total)	<0.16574	mg/Kg - dry	0.16574	1	08/14/24 11:51	FDS	L767264

Analytical Method: SW-DRYWT

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Batch
% Moisture	**2.26**	%	0.050	1	08/14/24 07:56	CAH	L767098

Qualifiers/ Definitions DF Dilution Factor MQL Method Quantitation Limit

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09692
Sample ID: TP-1 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.91		WALK-BLACK	08/14/2024 10:32	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09693
Sample ID: TP-1 0.5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.90		WALK-BLACK	08/14/2024 10:32	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09694
Sample ID: TP-2 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	1.11		WALK-BLACK	08/14/2024 10:32	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09695
Sample ID: TP-2 0.5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.51		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09696
Sample ID: TP-3 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.49		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09697
Sample ID: TP-3 0.5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.58		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09698
Sample ID: TP-4 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.85		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09699
Sample ID: TP-4 0.5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.46		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09700
Sample ID: TP-5 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	1.23		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09701
Sample ID: TP-5 0-5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	1.02		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09702
Sample ID: TP-6 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	1.14		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09703
Sample ID: TP-6 0-5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.84		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09704
Sample ID: TP-7 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.96		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09705
Sample ID: TP-7 0.5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	1.03		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09706
Sample ID: TP-8 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	1.09		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09707
Sample ID: TP-8 0.5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.40		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09708
Sample ID: TP-9 0-0.5'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	0.92		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Report Number
24-225-0006

Account Number
04219

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Send To: Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225
Laguna Hills, CA 92653

Purchase Order: 25000882.001A
Report Date: 08/16/2024
Date Received: 08/12/2024

Project: Costco - NW Bakersfield, CA
Job #: 25000882.001A

REPORT OF ANALYSIS

Date Sampled:

Lab Number: 09709
Sample ID: TP-9 0-5-1'

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Organic Matter (Titration) , %	1.02		WALK-BLACK	08/14/2024 10:35	AAB

Method Reference:
Methods of Soil Analysis, Part 3 - Chemical Methods, 2nd Ed. Rev. Soil Science Society of America, Black, C.A et al. 1982, pages 995-996.

Comments:

Kleinfelder West, Inc.
24411 Ridge Route Dr, Suite 225

Laguna Hills CA 92653

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

Project : Costco - NW Bakersfield, CA
Job #: 25000882.001A

COMPREHENSIVE SOIL ANALYSIS

Report No : **24-225-0006**
Purchase Order : 25000882.001A
Date Recd : 08/12/2024
Date Printed : 08/16/2024

Sample Description - Sample ID	Half Sat %	pH	ECe dS/m	NO_3-N ppm	NH_4-N ppm	PO_4-P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
	TEC	Qual Lime		Sufficiency Factors											
Composite	19	7.3	0.40	5	1	24	56	1310	108	0.7	0.7	8	11	0.69	09710
	74	High		0.2		1.1	0.5	1.1	0.6	0.7	0.2	1.0	0.3		

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO_4 meq/L		Coarse 5 - 12	Fine 2 - 5	Sand: Very Coarse 1 - 2	Sand: Coarse 0.5 - 1	Sand: Med. to Very Fine 0.05 - 0.5	Silt .002-.05	Clay 0-.002		
2.9	0.88	0.95	0.07	0.22	1.1	0.7	0.5	1.0	1.4	6.8	35.5	32.4	23.7	Loam	09710

09710 Chloride (Cl) = 0.940 meq/L
09710 Aluminum = 1.23 ppm

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m),Boron (B), Sulfate(SO_4), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

* LOW , SUFFICIENT , HIGH

APPENDIX C
INFILTRATION TEST RESULTS

Copyright 2025 Kleinfelder

Infiltration Test Reults

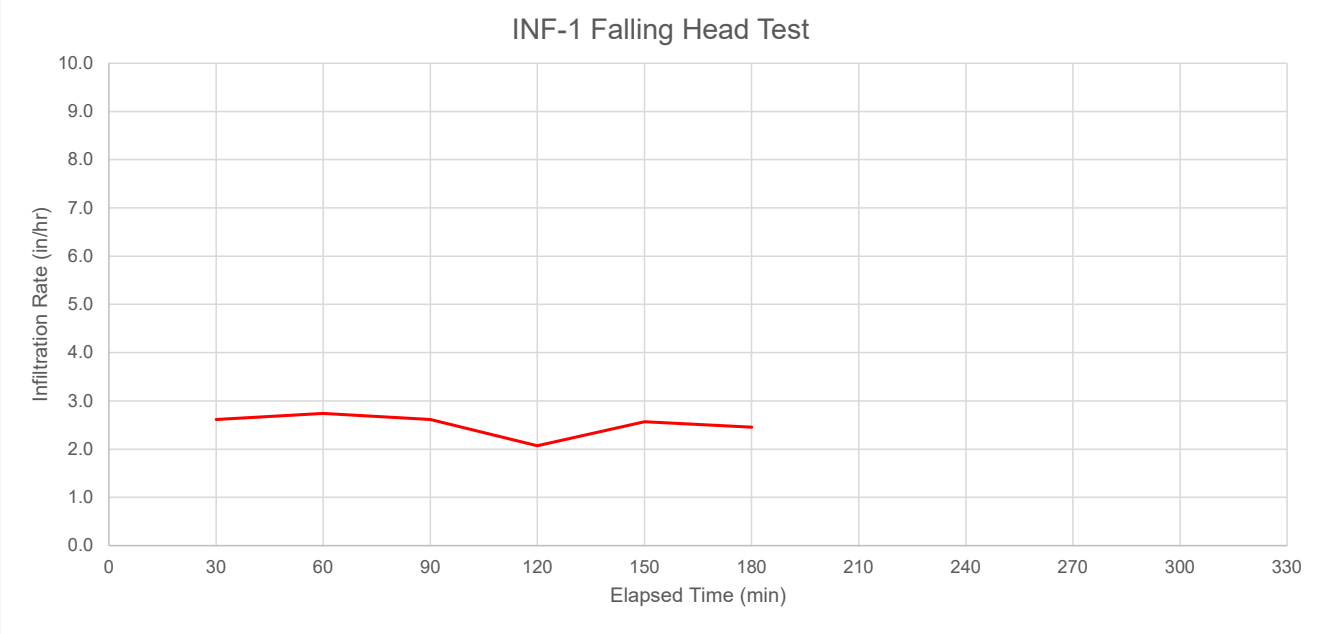
Project No.: 25000882.001A
Project Name: Costco NW Bakersfield, CA GEO

Date: 7/22/2024
Tested by: AC

Boring/Test Number:	INF-1	Measurement Method:	Sounder
Boring Diameter:	8 in	Liquid Description:	Water
Total Depth:	5 ft bgs	Water Depth (d1):	± 3 ft bgs
Earth Description:	Sandy Silt (ML)	Presoak:	7/19/2024
Duration:	3 hrs	Test Interval:	30 min

Start Time (hh:mm)	Flow Rate (gpm)	Δ Time (min)	Initial Depth (ft bgs)	Final Depth (ft bgs)	Water Drop (ft)	Inf. Rate in/hr	Notes:
07:36	0.134	30	2.81	4.35	1.54	2.6	Start of falling head test
07:36	0.145	30	2.73	4.40	1.67	2.7	
08:06	0.178	30	2.03	4.08	2.05	2.6	
08:36	0.106	30	2.81	4.03	1.22	2.1	
09:06	0.115	30	3.11	4.43	1.32	2.6	
09:36	0.113	30	3.05	4.35	1.30	2.5	End of falling head test

Average measured infiltration rate = 2.4 in/hr
Design infiltration rate = 0.5 in/hr



Infiltration Test Reults

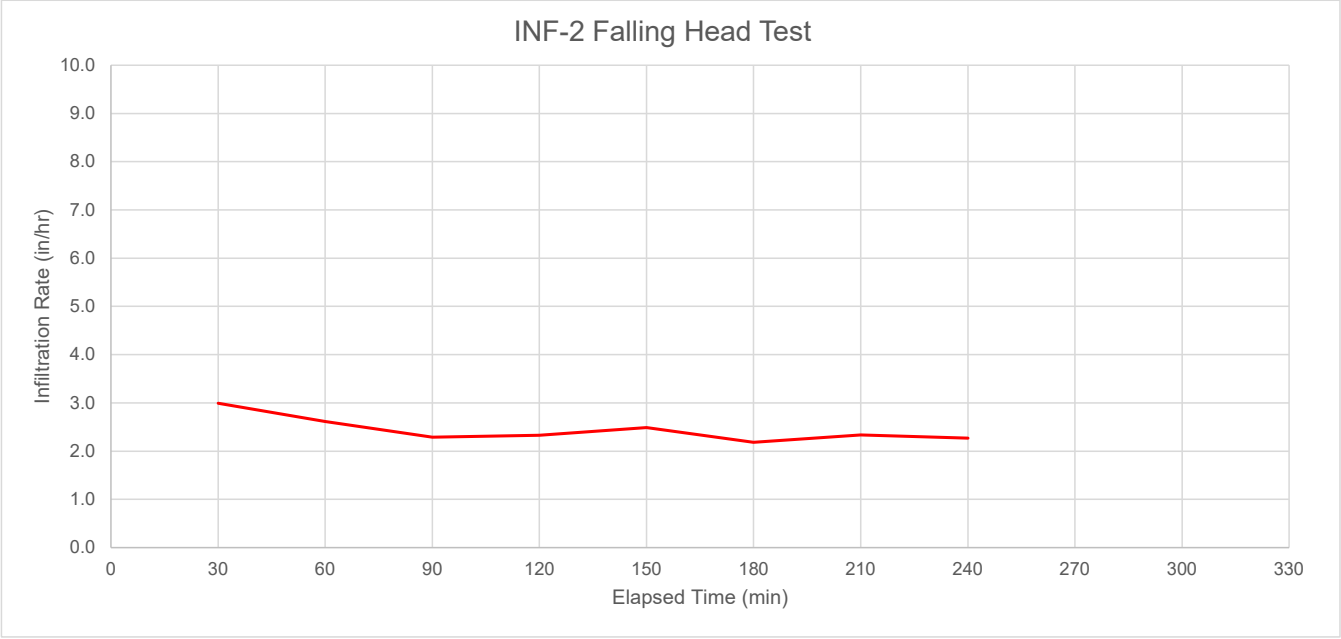
Project No.: 25000882.001A
Project Name: Costco NW Bakersfield, CA GEO

Date: 7/22/2024
Tested by: AC

Boring/Test Number:	INF-2	Measurement Method:	Sounder
Boring Diameter:	8 in	Liquid Description:	Water
Total Depth:	10 ft bgs	Water Depth (d1):	± 5 ft bgs
Earth Description:	Silty Sand (SM)	Presoak:	7/19/2024
Duration:	4 hrs	Test Interval:	30 min

Start Time (hh:mm)	Flow Rate (gpm)	Δ Time (min)	Initial Depth (ft bgs)	Final Depth (ft bgs)	Water Drop (ft)	Inf. Rate in/hr	Notes:
07:03	0.349	30	4.81	8.82	4.01	3.0	Start of falling head test
07:33	0.297	30	4.95	8.36	3.41	2.6	
08:03	0.270	30	4.75	7.85	3.10	2.3	
08:33	0.263	30	4.98	8.00	3.02	2.3	
09:03	0.288	30	4.85	8.16	3.31	2.5	
09:33	0.238	30	5.15	7.89	2.74	2.2	
10:03	0.254	30	5.17	8.09	2.92	2.3	
10:33	0.260	30	4.89	7.88	2.99	2.3	End of falling head test

Average measured infiltration rate = 2.3 in/hr
Design infiltration rate = 0.5 in/hr



Infiltration Test Reults

Project No.: 25000882.001A

Project Name: Costco NW Bakersfield, CA GEO

Date: 7/22/2024

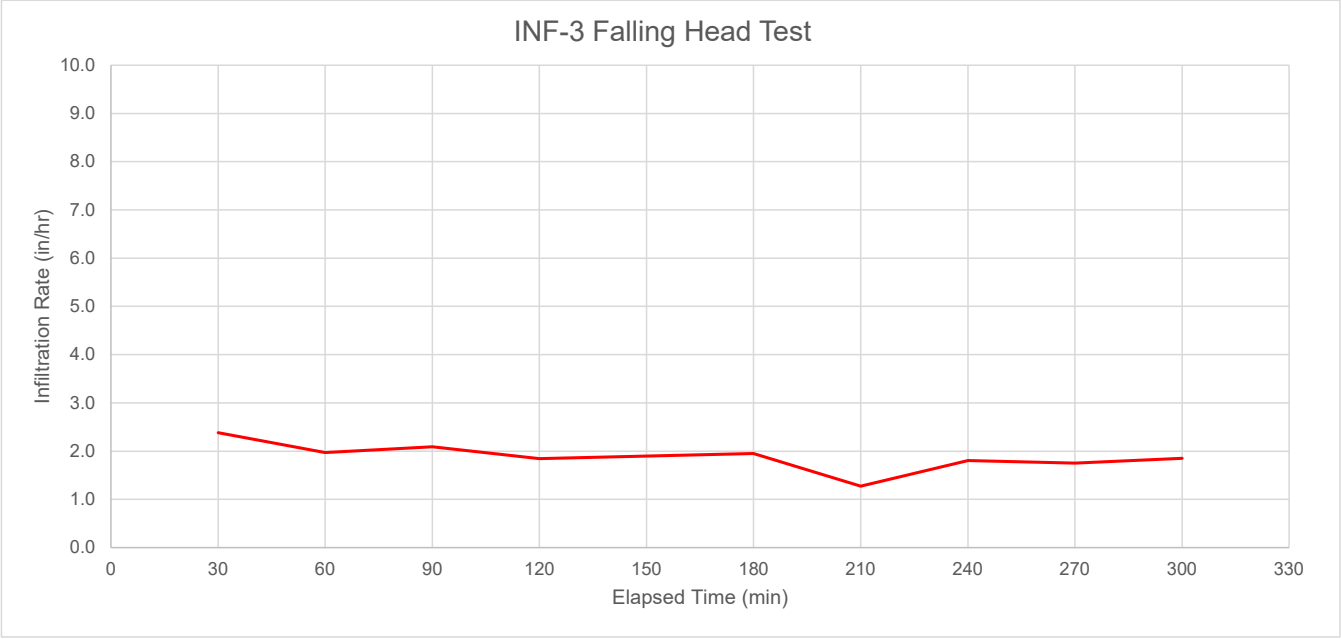
Tested by: AC

Boring/Test Number:	INF-3	Measurement Method:	Sounder
Boring Diameter:	8 in	Liquid Description:	Water
Total Depth:	5 ft bgs	Water Depth (d1):	± 3 ft bgs
Earth Description:	Silty Sand (SM)	Presoak:	7/19/2024
Duration:	5 hrs	Test Interval:	30 min

Start Time (hh:mm)	Flow Rate (gpm)	Δ Time (min)	Initial Depth (ft bgs)	Final Depth (ft bgs)	Water Drop (ft)	Inf. Rate in/hr	Notes:
06:59	0.117	30	2.90	4.25	1.35	2.4	Start of falling head test
07:29	0.111	30	2.57	3.85	1.28	2.0	
07:59	0.139	30	2.10	3.70	1.60	2.1	
08:29	0.093	30	2.85	3.92	1.07	1.8	
08:59	0.096	30	2.85	3.95	1.10	1.9	
09:29	0.113	30	2.50	3.80	1.30	2.0	
09:59	0.062	30	2.94	3.65	0.71	1.3	
10:29	0.087	30	2.95	3.95	1.00	1.8	
10:59	0.092	30	2.75	3.81	1.06	1.8	
11:29	0.085	30	3.05	4.03	0.98	1.9	End of falling head test

Average measured infiltration rate = 1.8 in/hr

Design infiltration rate = 0.4 in/hr



Infiltration Test Reults

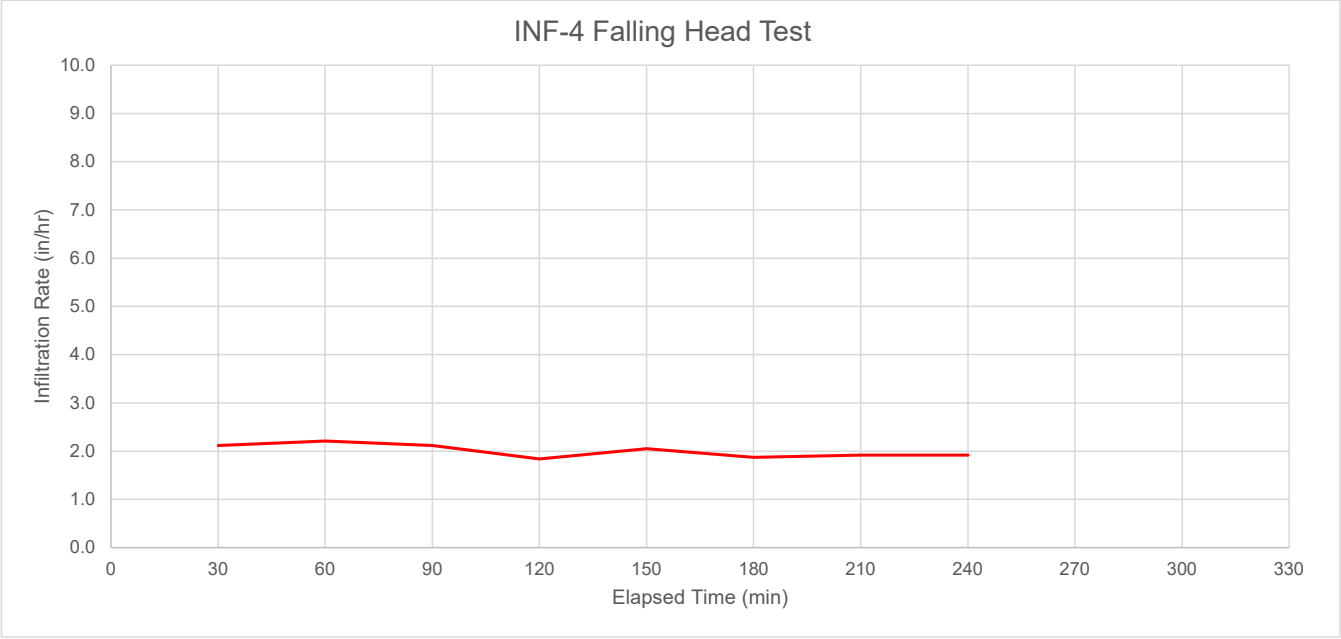
Project No.: 25000882.001A
Project Name: Costco NW Bakersfield, CA GEO

Date: 7/22/2024
Tested by: AC

Boring/Test Number:	INF-4	Measurement Method:	Sounder
Boring Diameter:	8 in	Liquid Description:	Water
Total Depth:	10 ft bgs	Water Depth (d1):	± 5 ft bgs
Earth Description:	Sandy Silt (ML)	Presoak:	7/19/2024
Duration:	4 hrs	Test Interval:	30 min

Start Time (hh:mm)	Flow Rate (gpm)	Δ Time (min)	Initial Depth (ft bgs)	Final Depth (ft bgs)	Water Drop (ft)	Inf. Rate in/hr	Notes:
06:53	0.258	30	4.56	7.53	2.97	2.1	Start of falling head test
07:23	0.248	30	5.00	7.85	2.85	2.2	
07:53	0.240	30	4.95	7.71	2.76	2.1	
08:23	0.205	30	5.05	7.40	2.35	1.8	
08:53	0.245	30	4.69	7.50	2.81	2.1	
09:23	0.205	30	5.15	7.50	2.35	1.9	
09:53	0.213	30	5.05	7.50	2.45	1.9	
10:23	0.222	30	4.85	7.40	2.55	1.9	End of falling head test

Average measured infiltration rate = 1.9 in/hr
Design infiltration rate = 0.4 in/hr



Appendix B

Geotechnical Engineering Investigation – Proposed Retail Development

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RETAIL DEVELOPMENT
SWC 7TH STANDARD ROAD AND CALLOWAY DRIVE
BAKERSFIELD, CALIFORNIA

PROJECT NO. 022-25058
JULY 30, 2025

Prepared for:

MR. MICHAEL DAUSTER
LANDMARK SURVEYING & ENGINEERING
8302 ESPRESSO DRIVE, SUITE 130
BAKERSFIELD, CALIFORNIA 93312

Prepared by:

KRAZAN & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERING DIVISION
2205 COY AVENUE
BAKERSFIELD, CALIFORNIA 93307
(661) 837-9200

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

July 30, 2025

KA Project. No. 022-25058

Mr. Michael Dauster
Landmark Surveying & Engineering
8302 Espresso Drive, Suite 130
Bakersfield, California 93312

RE: Geotechnical Engineering Investigation
Proposed Retail Development
SWC 7th Standard Road and Calloway Drive
Bakersfield, California

Dear Mr. Dauster:

In accordance with your request, we have completed a Geotechnical Engineering Investigation for the above-referenced site. The results of our investigation are presented in the attached report.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (661) 837-9200.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

Ryan K. Privett, PE
Project Engineer
RCE No. 59372



RKP:ht

TABLE OF CONTENTS

INTRODUCTION 1

PURPOSE AND SCOPE 1

PROPOSED CONSTRUCTION 2

SITE LOCATION AND SITE DESCRIPTION 2

GEOLOGIC SETTING 2

FIELD AND LABORATORY INVESTIGATIONS 3

SOIL PROFILE AND SUBSURFACE CONDITIONS 3

GROUNDWATER 4

GEOLOGIC AND SEISMIC HAZARDS 4

CONCLUSIONS AND RECOMMENDATIONS 5

Administrative Summary 5
Groundwater Influence on Structures/Construction 7
Site Preparation 7
Engineered Fill 10
Drainage and Landscaping 10
Utility Trench Backfill 11
Foundations 11
Floor Slabs and Exterior Flatwork 12
Excavation Stability 13
Lateral Earth Pressures and Retaining Walls 14
R-Value Test Results and Pavement Design 15
Seismic Parameters – 2022 CBC 17
Soil Cement Reactivity 18
Compacted Material Acceptance 18
Testing and Inspection 18

LIMITATIONS 18

SITE PLAN 21

LOGS OF BORINGS (1 TO 26) ..... **Appendix A**

GENERAL EARTHWORK SPECIFICATIONS ..... **Appendix B**

GENERAL PAVEMENT SPECIFICATIONS ..... **Appendix C**

July 30, 2025 KA Project No. 022-25058

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RETAIL DEVELOPMENT
SWC 7TH STANDARD ROAD AND CALLOWAY DRIVE
BAKERSFIELD, CALIFORNIA

INTRODUCTION

This report presents the results of our Geotechnical Engineering Investigation for the proposed retail development to be located at the southwest corner of 7th Standard Road and Calloway Drive in Bakersfield, California. Discussions regarding site conditions are presented herein, together with conclusions and recommendations pertaining to site preparation, Engineered Fill, utility trench backfill, drainage and landscaping, foundations, concrete floor slabs and exterior flatwork, retaining walls, pavement design, and soil cement reactivity.

The site plan showing the approximate boring locations are presented following the text of this report. A description of the field investigation, boring logs, and the boring log legend are presented in Appendix A. Appendix A contains a description of the laboratory testing phase of this study; along with the laboratory test results. Appendices B and C contain guides to earthwork and pavement specifications. When conflicts in the text of the report occur with the general specifications in the appendices, the recommendations in the text of the report have precedence.

PURPOSE AND SCOPE

This investigation was conducted to evaluate the soil and groundwater conditions at the site, to make geotechnical engineering recommendations for use in design of specific construction elements, and to provide criteria for site preparation and Engineered Fill construction.

Our scope of services was outlined in our proposal dated January 10, 2025 (KA Proposal No. P017-23R) and included the following:

- A site reconnaissance by a member of our engineering staff to evaluate the surface conditions at the project site.
- A field investigation consisting of drilling 26 borings to depths ranging from approximately 15 to 50 feet for evaluation of the subsurface conditions at the project site.
- Performing laboratory tests on representative soil samples obtained from the borings to evaluate the physical and index properties of the subsurface soils.

- Evaluation of the data obtained from the investigation and an engineering analysis to provide recommendations for use in the project design and preparation of construction specifications.

- Preparation of this report summarizing the results, conclusions, recommendations, and findings of our investigation.

PROPOSED CONSTRUCTION

We understand that design of the proposed development is currently underway; structural load information and other final details pertaining to the structure are unavailable. On a preliminary basis, it is understood that the proposed development will include nine (9) retail and restaurant buildings. The buildings will range in size from approximately 1,800 to 150,000 square feet. It is anticipated the buildings will be single- or two-story structures. The buildings are anticipated to be pre-engineered metal-framed, wood-framed, or concrete masonry unit (CMU) block structures utilizing conventional concrete foundations and slab-on-grade. On-site and off-site paved areas, on-site storm water detention, and landscaping are also associated with the development.

In the event these structural or grading details are inconsistent with the final design criteria, the Soils Engineer should be notified so that we may update this writing as applicable.

SITE LOCATION AND SITE DESCRIPTION

The site is roughly rectangular in shape and encompasses approximately 34.88 acres. The site is located at the southwest corner of 7th Standard Road and Calloway Drive in Bakersfield, California, and is identified as Assessor's Parcel Number 492-060-12. The site is predominately surrounded by vacant land to the east; agricultural land to the west; and by residential developments to the north and south. The site was previously utilized for agricultural row crop production.

Presently, the site is predominately vacant. An existing agricultural basin is located at the northwest corner of the site. Underground and overhead utilities are located along the edges of the site and may extend into the site. The site was recently disced, is covered by a scattered short weed growth, and the surface soils have a loose consistency. The site is relatively level with major changes in grade.

GEOLOGIC SETTING

Geologically, the property is situated on the eastern flank, near the south end of the Great Valley Geomorphic Province. This province is a large northwesterly trending geosyncline or structural trough between the Coast Ranges and the Sierra Nevada Mountains. Erosion from both of these mountain systems has resulted in the deposition of immense thickness of sediments in the Valley floor. Heavily-laden streams from the Sierra Nevada have built very prominent alluvial fans along the margins of the San Joaquin Valley. This has resulted in a rather flat topography in the vicinity of the project site. The site is composed of alluvial deposits which are mostly cohesionless sands and silts.

The south end of the San Joaquin Valley is surrounded on all sides, excluding the north, by active fault systems (San Andreas, White Wolf-Breckenridge-Kern Canyon, and Garlock Faults). Numerous smaller faults exist within the valley floor.

There is on-going seismic activity in the Kern County area, with the most noticeable earthquake being the July 21, 1952 Kern County Earthquake. The initial shock was 7.7 magnitude shake with the epicenter near Wheeler Ridge, about 45 miles from Bakersfield. Vertical displacements of as much as 3 feet occurred at the fault line. Estimated average value of the maximum bedrock accelerations from the 1952 event are about 0.25 gravity at the project site.

The closest known faults to the property are subsurface faults located at the Fruitvale Oil Field. These faults cut the older sediments and, although numerous, are not thought to be active in the last 2 million years.

No evidence was observed that indicated surface faulting has occurred across the property during the Holocene time. Faults not yet identified, however, may exist. The site is not within an Earthquake Fault Zone (Special Studies Zone).

FIELD AND LABORATORY INVESTIGATIONS

Subsurface soil conditions were explored by drilling 26 borings to depths ranging from approximately 15 to 50 feet below existing site grade, using a truck-mounted drill rig. In addition, 13 bulk subgrade samples were obtained from the site and from proposed off-site roadway widening areas for laboratory R-value testing. The approximate boring and bulk sample locations are shown on the site plan. During drilling operations, penetration tests were performed at regular intervals to evaluate the soil consistency and to obtain information regarding the engineering properties of the subsoils. Soil samples were retained for laboratory testing. The soils encountered were continuously examined and visually classified in accordance with the Unified Soil Classification System. A more detailed description of the field investigation is presented in Appendix A.

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory testing program was formulated with emphasis on the evaluation of natural moisture, density, gradation, shear strength, consolidation potential, expansion potential, permeability, R-value and moisture-density relationships of the materials encountered. In addition, chemical tests were performed to evaluate the soil-cement reactivity. Details of the laboratory test program and the results of the laboratory tests are summarized in Appendix A. This information, along with the field observations, was used to prepare the final boring logs in Appendix A.

SOIL PROFILE AND SUBSURFACE CONDITIONS

Based on our findings, the subsurface conditions encountered appear typical of those found in the geologic region of the site. In general, the surface soils consisted of approximately 6 to 12 inches of very loose silty sand, clayey silty sand, sandy silt, or silty sand/sandy silt. These soils contained varying amounts of clay. These soils are disturbed, have low strength characteristics and are highly compressible when saturated.

Below the loose surface soils, approximately 3 to 4½ feet of medium dense to dense silty sand, clayey silty sand, sandy silt, or silty sand/sandy silt were encountered. These soils included varying amounts of clay. Field and laboratory tests suggest that these soils are moderately strong, slightly to moderately compressible, and have a low expansion potential. Penetration resistance ranged from 16 to 53 blows per foot. Dry densities ranged from 88 to 118 pcf. Representative soil samples consolidated approximately 3½ to 6 percent under a 2 ksf load when saturated. Representative soil samples had angles of internal friction of 32 and 36 degrees. Six bulk samples obtained from the upper 3 feet had expansion indices of 2 to 28.

Below 4 to 5 feet, predominately loose to very dense silty sand, clayey silty sand, sand, sandy silt, silty sand/sandy silt, clayey sand, silty sand/sand, medium dense/very stiff clayey sand/sandy clay, and very stiff to hard sandy clay were encountered. These soils contained varying amounts of clay. These soils have moderate strength characteristics and are slightly to highly compressible. Penetration resistance ranged from 11 blows per foot to greater than 50 blows per 6 inches. Dry densities ranged from 90 to 124 pcf. Representative soil samples consolidated approximately 2½ to 11½ percent under a 2 ksf load when saturated. A representative soil sample had an angle of internal friction of 37 degrees. These soils had similar strength characteristics as the upper soils and extended to the termination depth of our borings.

For additional information about the soils encountered, please refer to the logs of borings in Appendix A.

GROUNDWATER

Test boring locations were checked for the presence of groundwater during and immediately following the drilling operations. Free groundwater was not encountered.

It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, and climatic conditions, as well as other factors. Therefore, waterlevel observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

GEOLOGIC AND SEISMIC HAZARDS

Soil liquefaction, a primary geologic/seismic hazard, is a state of soil particle suspension, caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs in soils, such as sands, in which the strength is purely frictional. However, liquefaction has occurred in soils other than clean sands. Liquefaction usually occurs under vibratory conditions, such as those induced by seismic events.

To evaluate the liquefaction potential of the site, the following items were evaluated:

1) Soil type

2) Groundwater depth

3) Relative density

4) Initial confining pressure

5) Intensity and duration of groundshaking

The predominant soils within the project site consist of layers of silty sand, clayey silty sand, clayey sand, sandy silt, silty sand/sand, sand, sandy clay or clayey sand/sandy clay. Groundwater was not encountered within the depths explored. In addition, groundwater has been historically encountered at depths greater than 50 feet below site grade within the project site and vicinity since 1969. Therefore, the potential for liquefaction and related settlement is low at this site and no liquefaction mitigation procedures are necessary for this project.

Secondary hazards from earthquakes include rupture, seiche, slope instability, landslides, lateral spreading, and subsidence. Since there are no known faults within the immediate area, ground rupture from surface faulting should not be a potential problem. Seiche, lateral spreading, slope instability, and landslides are not hazards in the area either. In addition, there are no known occurrences of structural or architectural damage due to deep subsidence in the Bakersfield area. The total and differential seismic-induced settlements should be less than 1-inch.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of our field and laboratory investigations, along with previous geotechnical experience in the project area, the following is a summary of our evaluations, conclusions, and recommendations.

Administrative Summary

In brief, the subject site and soil conditions, with the exception of the loose surface soils, highly compressible upper native soils, expansive nature of the clayey soils, and surrounding development, appear to be conducive to the development of the project. The surface soils have a loose consistency. These soils are disturbed, have low strength characteristics, and are highly compressible when saturated. Accordingly, it is recommended that the surface soils be recompacted. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation.

Fill material was not encountered in our borings. However, fill may be present between and beyond our boring locations. The extent of fill material was determined based on limited test borings and visual observation. Verification of the extent of fill should be determined during site grading. It is recommended that fill soils which have not been properly compacted and certified be excavated and stockpiled so that the native soils can be prepared properly. It is anticipated the fill material will be suitable for reuse as general Engineered Fill, provided it is cleansed of excessive organics and debris. However, supplemental testing would be required to verify its suitability for re-use as non-expansive Engineered Fill.

An agricultural basin is located at the northwest corner of the site. All deleterious materials and loose soils should be removed from the basin and the resulting excavations should be cleaned to firm native soil, and backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

The upper soils are highly compressible under saturated conditions and subject to excessive total and differential settlement. In order to reduce the amount of total and differential settlement and to provide uniform foundation support, it is recommended that following stripping operations and demolition activities, the exposed subgrade in building pad areas should be excavated to a minimum depth of 6 feet, worked until uniform and free from large clods, moisture-conditioned to a minimum of 2 percent above optimum moisture content and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. In addition, it is recommended that the proposed foundations be supported by a minimum of 24 inches of Engineered Fill. Over-excavation should extend to a minimum of 5 feet beyond structural elements. The on-site native soils will be suitable for reuse as general Engineered Fill, provided they are cleansed of excessive organics, debris, and fragments greater than 4 inches in maximum dimension. Prior to backfilling, the bottom of the excavation should be proof-rolled and observed by Krazan & Associates, Inc. to verify stability. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation. Soft or pliant areas encountered should be excavated to firm native ground. Fill material should be compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

The upper soils within the site are predominately silty sand, clayey silty sand, sandy silt, silty sand/sand, or clayey sand/sandy clay. These soils contain varying amounts of clay. The clayey soils have a low swell potential. The estimated swell pressures of the clayey soils may cause movement affecting slabs and possible stucco or similar brittle exterior finishes. To reduce potential soil movement, it is recommended the upper 12 inches of soil within slab-on-grade and exterior flatwork areas consist of non-expansive Engineered Fill. The on-site soils that have an expansion index of 20 or less will be suitable for reuse as non-expansive Engineered Fill, provided they are cleansed of excessive organics, debris, and fragments larger than 4 inches in maximum dimension. During construction, it is recommended that additional tests should be performed on the on-site soils to verify their physical and index properties.

Existing structures are located within the project site vicinity. Associated with these developments are buried structures, such as utility lines that may extend into the project site. Any buried structures, including loosely backfilled excavations, encountered during construction should be properly removed and the resulting excavations backfilled with Engineered Fill. After demolition activities, it is recommended that the disturbed soils be removed and/or recompacted. This compaction effort should stabilize the upper soils and locate any unsuitable or pliant areas not found during our field investigation.

Relatively clean sands were encountered at various locations throughout the site. The possibility exists that site grading operations could expose these soils in areas of proposed buildings, pavements, and/or retaining walls. The Contractor should note that these soils lack the cohesion necessary to stand vertically, even in shallow excavations such as footing trenches. If these conditions are encountered, it will be necessary to over-excavate the affected area(s) to a minimum of 12 inches below the proposed

bearing surface. These areas may be backfilled using a mix of the silty sand and sand soils that contains at least 20 percent fines and meeting the requirements for Engineered Fill. This material may be obtained from elsewhere at the site, imported to the site from an approved off-site source, or manufactured through blending of the excavated clean sand with other suitable material containing a higher percentage of fines to result in material meeting the requirements for Engineered Fill.

Sandy and gravelly soil conditions were encountered at the site. These cohesionless soils have a tendency to cave in trench wall excavations. Shoring or sloping back trench sidewalls may be required within these sandy and gravelly soils.

After completion of the recommended site preparation, the site should be suitable for shallow footing support. The proposed structure footings may be designed utilizing an allowable bearing pressure of 2,500 psf for dead-plus-live loads. Footings should have a minimum embedment of 18 inches.

Groundwater Influence on Structures/Construction

Based on our findings and historical records, it is not anticipated that groundwater will rise within the zone of structural influence or affect the construction of foundations and pavements for the project. However, if earthwork is performed during or soon after periods of precipitation, the subgrade soils may become saturated, "pump," or not respond to densification techniques. Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material; or mixing the soil with an approved lime or cement product. Our firm should be consulted prior to implementing remedial measures to observe the unstable subgrade conditions and provide appropriate recommendations.

Site Preparation

General site clearing should include removal of concrete; vegetation and existing utilities; and structures; including foundations; basement walls and floors; existing stockpiled soil; trees and associated root systems; rubble; rubbish; and any loose and/or saturated materials. Site stripping should extend to a minimum depth of 2 to 4 inches, or until all organics in excess of 3 percent by volume are removed. Deeper stripping may be required in localized areas. These materials will not be suitable for reuse as Engineered Fill. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas.

Fill material was not encountered in our borings. However, fill may be present between and beyond our boring locations. The extent of fill material was determined based on limited test borings and visual observation. Verification of the extent of fill should be determined during site grading. It is recommended that fill soils which have not been properly compacted and certified be excavated and stockpiled so that the native soils can be prepared properly. It is anticipated the fill material will be suitable for reuse as general Engineered Fill, provided it is cleansed of excessive organics and debris. However, supplemental testing would be required to verify its suitability for re-use as non-expansive Engineered Fill.

Existing structures are located within the project site vicinity. Associated with these developments are buried structures, such as utility lines, septic systems, water wells, and irrigation lines that may extend into the project site. Demolition activities should include proper removal of any buried structures. Any buried structures, including utilities or loosely backfilled excavations, encountered during construction should be properly removed and the resulting excavations backfilled. Disturbed areas caused by demolition activities should be removed and/or recompacted. Excavations, depressions, or soft and pliant areas extending below planned finished subgrade levels should be cleaned to firm, undisturbed soil and backfilled with Engineered Fill. In general, any septic tanks, debris pits, cesspools, or similar structures should be entirely removed. Water wells should be abandoned in accordance with county standards. Oil wells should be abandoned according to state and federal guidelines. Existing concrete footings should be removed to an equivalent depth of at least 3 feet below proposed footing elevations or as recommended by the Soils Engineer. Any other buried structures should be removed in accordance with the recommendations of the Soils Engineer. The resulting excavations should be cleaned to firm native ground and backfilled with Engineered Fill.

An agricultural basin is located at the northwest corner of the site. All deleterious materials and loose soils should be removed from the basin and the resulting excavations should be cleaned to firm native soil, and backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

In order to provide uniform foundation support, it is recommended that following stripping operations and demolition activities, the upper 6 feet of native soils within the proposed building areas be excavated, worked until uniform and free from large clods, moisture-conditioned to a minimum of 2 percent above optimum moisture content, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. In addition, it is recommended that the proposed foundations be supported by a minimum of 24 inches of Engineered Fill. Over-excavation should extend to a minimum of 5 feet beyond structural elements. During construction, it is recommended that additional tests be performed on the on-site soils to verify their physical and index properties. Prior to backfilling, the bottom of the excavation should be proof-rolled and observed by Krazan & Associates, Inc. to verify stability. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation. Soft or pliant areas should be excavated to firm native ground. Fill material should be compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Following stripping operations and demolition activities, the exposed subgrade in exterior flatwork and pavement areas should be excavated to a depth of at least 12 inches, worked until uniform and free from large clods, moisture-conditioned to a minimum of 2 percent above optimum moisture content, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Limits of recompaction should extend 2 feet beyond flatwork and pavements. Prior to backfilling, the bottom of the excavation should be proofrolled and observed by Krazan & Associates, Inc. to verify stability. Soft or pliant areas should be excavated to firm native ground. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation.

It is recommended that the upper 12 inches of soil within proposed slab-on-grade and exterior flatwork areas consist of non-expansive Engineered Fill. The intent is to support slab-on-grade and exterior flatwork areas with 12 inches of non-expansive fill. The fill placement serves two functions: 1) it provides a uniform amount of soil, which will more evenly distribute the soil pressures and 2) it reduces moisture content fluctuation in the clayey material beneath the building area. The non-expansive fill material should be a well-graded silty sand or sandy silt soil. A clean sand or very sandy soil is not acceptable for this purpose. A sandy soil will allow the surface water to drain into the expansive clayey soil below, which may result in soil swelling. Imported Fill should be approved by the Soils Engineer prior to placement. The fill should be placed as specified as Engineered Fill.

It is recommended that any uncertified fill material encountered within pavement areas be removed and/or recompacted. The fill material should be moisture-conditioned to a minimum of 2 percent above optimum moisture content and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. As an alternative, the Owner may elect not to recompact the existing fill within paved areas. However, the Owner should be aware that the paved areas may settle, which may require annual maintenance. At a minimum, it is recommended that the upper 12 inches of subgrade soil be moisture-conditioned as necessary and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Relatively clean sands were encountered at various locations throughout the site. The possibility exists that site grading operations could expose these soils in areas of proposed buildings, pavements, and/or retaining walls. The Contractor should note that these soils lack the cohesion necessary to stand vertically, even in shallow excavations such as footing trenches. If these conditions are encountered, it will be necessary to over-excavate the affected area(s) to a minimum of 12 inches below the proposed bearing surface. These areas may be backfilled using a mix of the silty sand and sand soils that contains at least 20 percent fines and meeting the requirements for Engineered Fill. This material may be obtained from elsewhere at the site, imported to the site from an approved off-site source, or manufactured through blending of the excavated clean sand with other suitable material containing a higher percentage of fines to result in material meeting the requirements for Engineered Fill.

The upper soils, during wet winter months, becomes very moist due to the absorption characteristics of the soil. Earthwork operations performed during winter months may encounter very moist unstable soils which may require removal to grade a stable building foundation. Project site winterization consisting of placement of aggregate base and protecting exposed soils during the construction phase should be performed.

A representative of our firm should be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Soils Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section and the Engineered Fill section.

Engineered Fill

The organic-free, on-site, upper soils are predominately silty sand, clayey silty sand, sandy silt, or silty sand/sandy silt. These soils contain varying amounts of clay. Preliminary testing indicates the soils that do not contain clay will be suitable for reuse as non-expansive Engineered Fill, provided they are cleansed of excessive organics, debris, and fragments larger than 4 inches in maximum dimension. Clayey soils with an expansion index greater than 20 will not be suitable for reuse as non-expansive Engineered Fill. Clayey soils with an expansion index greater than 20 will be suitable for reuse as General Engineered Fill, within pavement areas and below 12 inches from finished pad grade in slab-on-grade areas, provided they are cleansed of excessive organics, debris and are moisture-conditioned to at least 2 percent above optimum moisture.

Relatively clean sands were encountered at various locations throughout the site. The possibility exists that site grading operations could expose these soils in areas of proposed buildings, pavements, and/or retaining walls. The Contractor should note that these soils lack the cohesion necessary to stand vertically, even in shallow excavations such as footing trenches. If these conditions are encountered, it will be necessary to over-excavate the affected area(s) to a minimum of 12 inches below the proposed bearing surface. These areas may be backfilled using a mix of the silty sand and sand soils that contains at least 20 percent fines and meeting the requirements for Engineered Fill. This material may be obtained from elsewhere at the site, imported to the site from an approved off-site source, or manufactured through blending of the excavated clean sand with other suitable material containing a higher percentage of fines to result in material meeting the requirements for Engineered Fill.

The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the contractor since he has complete control of the project site at that time.

Imported Fill material should be predominately non-expansive granular material with a plasticity index less than 10 and a UBC Expansion Index less than 15. Imported Fill should be free from rocks and clods greater than 4 inches in diameter. All Imported Fill material should be submitted to the Soils Engineer for approval at least 48 hours prior to delivery at the site.

Fill soils should be placed in lifts approximately 6 inches thick, moisture-conditioned to a minimum of 2 percent above optimum moisture content, and compacted to achieve at least 90 percent maximum density as determined by ASTM Test Method D1557. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

Drainage and Landscaping

The ground surface should slope away from building pad and pavement areas toward appropriate drop inlets or other surface drainage devices. In accordance with Section 1804 of the 2022 California Building Code, it is recommended that the ground surface adjacent to foundations be sloped a minimum of 5 percent for a minimum distance of 10 feet away from structures, or to an approved alternative means of drainage conveyance. Swales used for conveyance of drainage and located within 10 feet of

foundations should be sloped a minimum of 2 percent. Impervious surfaces, such as pavement and exterior concrete flatwork, within 10 feet of building foundations should be sloped a minimum of 1 percent away from the structure. Drainage gradients should be maintained to carry all surface water to collection facilities and off-site. These grades should be maintained for the life of the project.

Slots or weep holes should be placed in drop inlets or other surface drainage devices in pavement areas to allow free drainage of adjoining base course materials. Cutoff walls should be installed at pavement edges adjacent to vehicular traffic areas; these walls should extend to a minimum depth of 12 inches below pavement subgrades to limit the amount of seepage water that can infiltrate the pavements. Where cutoff walls are undesirable, subgrade drains can be constructed to transport excess water away from planters to drainage interceptors. If cutoff walls can be successfully used at the site, construction of subgrade drains is considered unnecessary.

Utility Trench Backfill

Utility trenches should be excavated according to accepted engineering practices following OSHA (Occupational Safety and Health Administration) standards by a contractor experienced in such work. The responsibility for the safety of open trenches should be borne by the contractor. Traffic and vibration adjacent to trench walls should be minimized; cyclic wetting and drying of excavation side slopes should be avoided. Depending upon the location and depth of some utility trenches, groundwater flow into open excavations could be experienced; especially during or following periods of precipitation.

Sandy soil conditions were encountered at the site. These cohesionless soils have a tendency to cave in trench wall excavations. Shoring or sloping back trench sidewalls may be required within these sandy soils.

Utility trench backfill placed in or adjacent to buildings and exterior slabs should be compacted to at least 90 percent of maximum density based on ASTM Test Method D1557. The utility trench backfill placed in pavement areas should be compacted to at least 90 percent of maximum density based on ASTM Test Method D1557. Pipe bedding should be in accordance with pipe manufacturer recommendations.

The Contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The Contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

Foundations

The proposed structures may be supported on a shallow foundation system bearing on a minimum of 24 inches of Engineered Fill. Spread and continuous footings can be designed for the following maximum allowable soil bearing pressures:

Load	Allowable Loading
Dead Load Only	1,875 psf
Dead-Plus-Live Load	2,500 psf
Total Load, Including Wind or Seismic Loads	3,325 psf

The footings should have a minimum depth of 18 inches below pad subgrade (soil grade) or adjacent exterior grade, whichever is lower. Footings should have a minimum width of 12 inches, regardless of load.

The footing excavations should not be allowed to dry out any time prior to pouring concrete. It is recommended that footings be reinforced by at least one No. 4 reinforcing bar in both top and bottom.

The total movement is not expected to exceed 1 inch. Differential movement should be less than ½ inch. Most of the settlement is expected to occur during construction as the loads are applied. However, additional post-construction movement may occur if the foundation soils are flooded or saturated.

Resistance to lateral footing displacement can be computed using an allowable friction factor of 0.35 acting between the base of foundations and the supporting subgrade. Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 325 pounds per cubic foot acting against the appropriate vertical footing faces. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance. A ⅓ increase in the value above may be used for short duration, wind, or seismic loads.

Floor Slabs and Exterior Flatwork

In areas that will utilize moisture-sensitive floor coverings, concrete slab-on-grade floors should be underlain by a water vapor retarder. The water vapor retarder should be installed in accordance with accepted engineering practice. The water vapor retarder should consist of a vapor retarder sheeting underlain by a minimum of 3 inches of compacted, clean, gravel of ¾-inch maximum size. To aide in concrete curing an optional 2 to 4 inches of granular fill may be placed on top of the vapor retarder. The granular fill should consist of damp clean sand with at least 10 to 30 percent of the sand passing the 100 sieve. The sand should be free of clay, silt, or organic material. Rock dust which is manufactured sand from rock crushing operations is typically suitable for the granular fill. This granular fill material should be compacted.

The floor slab should be reinforced at a minimum with #3 reinforcement bars at 18 inches on-center each way within the middle one-third. Thicker floor slabs with increased concrete strength and reinforcement should be designed wherever heavy concentrated loads, heavy equipment, or machinery is anticipated.

The exterior floors should be poured separately in order to act independently of the walls and foundation system. All fills required to bring the building pads to grade should be Engineered Fills.

Moisture within the structure may be derived from water vapors, which were transformed from the moisture within the soils. This moisture vapor can travel through the vapor membrane and penetrate the slab-on-grade. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To reduce moisture vapor intrusion, it is recommended that a vapor retarder be installed. It is recommended that the utility trenches within the structure be compacted, as specified in our report, to reduce the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the building is recommended. Positive drainage should be established away from the structure and should be maintained throughout the life of the structure. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed. In addition, ventilation of the structure is recommended to reduce the accumulation of interior moisture.

Excavation Stability

Temporary excavations planned for the construction of the building and other associated structures may be excavated, according to the accepted engineering practices following Occupational Safety and Health Administration (OSHA) standards by a Contractor experienced in such work. Open, unbraced excavations in undisturbed soils should be made according to the table below.

Recommended Excavation Slopes	
Depth of Excavation (ft)	**Slope (Horizontal:Vertical)**
	Temporary
0-5	1½:1
5-10	1½:1
10-15	1¾:1
15+	2:1

If, due to space limitation, excavation near existing structures or roads is performed in a vertical position, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavation and installation. A specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction. The lateral pressures provided below may be used in the design of a braced-type shoring system.

Recommended Lateral Earth Pressure for Braced Shoring	
Depth of Excavation Below Ground Surface (feet)	**Lateral Soil Pressure (psf)**
0	40 H
0.25 H	40 H
H	40 H
Where H is the total depth of the excavation in feet.	

The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given above.

Since the Contractor has the ultimate responsibility for excavation stability, he may design a different shoring system for the excavation.

The excavation/shoring recommendations provided herein are based on soil characteristics derived from limited test borings within the site. Variations in soil conditions will likely be encountered during the excavations. Krazan & Associates, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation.

Lateral Earth Pressures and Retaining Walls

Walls retaining horizontal backfill and capable of deflecting a minimum of 0.1 percent of its height at the top may be designed using an equivalent fluid active pressure of 40 pounds per square foot per foot of depth. Walls that are incapable of this deflection or walls that are fully constrained walls against deflection, may be designed for an equivalent fluid at-rest pressure of 60 pounds per square foot per foot of depth. Expansive soils should not be used for backfill against walls. The wedge of non-expansive backfill material should extend from the bottom of each retaining wall outward and upward at a slope of 2:1 (horizontal to vertical) or flatter. The stated lateral earth pressures do not include the effects of hydrostatic water pressures generated by infiltrating surface water that may accumulate behind the retaining walls; or loads imposed by construction equipment, foundations, or roadways.

The 2022 CBC requires determination of dynamic seismic lateral earth pressures on foundation walls and retaining walls supporting more than 6 feet of backfill height due to design earthquake ground motions. The Site Modified Peak Ground Acceleration (PGA_M), based on ASCE7-16 and information from the SEAOC and OSHPD Seismic Design Maps website (https://seismicmaps.org), is 0.463. We recommend an incremental seismic lateral pressure of 21 pcf be included in the stability analyses for retaining walls supporting more than 6 feet of backfill height. The incremental seismic lateral pressure should be applied in a reverse triangular distribution at the back side of the wall.

Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic concrete, or other suitable backfill to reduce surface drainage into the wall drain system. The aggregate should conform to Class 2 permeable materials graded in accordance with CalTrans Standard Specifications (2024). Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel, provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.

Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements. The pipes should be placed no higher than 6 inches above the heel of the wall, in the center line of the drainage blanket and should have a minimum diameter of four inches. Collector pipes may be either slotted or perforated. Slots should be no wider than ⅛ inch, while perforations should be no more than ¼ inch in diameter. If retaining walls are less than 6 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 4-inch diameter holes (concrete walls) or unmortared head joints (masonry walls) and not be higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to CalTrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.

During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall, or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

R-Value Test Results and Pavement Design

Thirteen subgrade soil samples were obtained from the project site for R-value testing at the locations shown on the attached site plan. The samples were tested in accordance with the State of California Materials Manual Test Designation 301. The results of the tests are as follows:

Sample	Depth	Description	R-Value at Equilibrium
1	12-24"	Silty Sand (SM)	48
2	12-24"	Silty Sand (SM)	53
3	12-24"	Silty Sand (SM)	55
4	12-24"	Silty Sand (SM)	54
5	12-24"	Silty Sand (SM)	52
6	12-24"	Silty Sand (SM)	57
7	12-24"	Silty Sand (SM)	51
8	12-24"	Silty Sand (SM)	45
9	12-24"	Silty Sand (SM)	59
10	12-24"	Silty Sand (SM)	54
11	12-24"	Silty Sand (SM)	44
12	12-24"	Silty Sand (SM)	42
13	12-24"	Silty Sand (SM)	53

The test results are moderate and indicate good subgrade support characteristics under dynamic traffic loads. The following table shows the recommended on-site pavement sections for various traffic indices based on a design R-Value of 42.

Traffic Index	Asphaltic Concrete	Class II Aggregate Base*	Compacted Subgrade**
4.0	2.0"	4.0"	12.0"
4.5	2.5"	4.0"	12.0"
5.0	2.5"	4.5"	12.0"
5.5	3.0"	4.5"	12.0"
6.0	3.0"	6.0"	12.0"
6.5	3.5"	6.0"	12.0"
7.0	4.0"	6.5"	12.0"
7.5	4.0"	7.5"	12.0"

** 95% compaction based on ASTM Test Method D1557 or CAL 216*
*** 90% compaction based on ASTM Test Method D1557 or CAL 216*

If traffic indices are not available, an estimated (typical value) index of 4.5 may be used for light automobile traffic, and an index of 7.0 may be used for light truck traffic.

The following table shows the recommended off-site pavement sections for various traffic indices based on a design R-Value of 45.

Traffic Index	Asphaltic Concrete	Class II Aggregate Base*	Compacted Subgrade**
6.0	3.0"	5.0"	12.0"
7.0	4.0"	5.5"	12.0"
8.0	4.5"	7.0"	12.0"
9.0	5.0"	8.5"	12.0"
10.0	6.0"	9.5"	12.0"
11.0	7.0"	10.0"	12.0"
12.0	7.5"	12.0"	12.0"

** 95% compaction based on ASTM Test Method D1557 or CAL 216*
*** 90% compaction based on ASTM Test Method D1557 or CAL 216*

The following table shows the recommended off-site pavement sections for various traffic indices based on a design R-Value of 51.

Traffic Index	Asphaltic Concrete	Class II Aggregate Base*	Compacted Subgrade**
6.0	3.0"	4.0"	12.0"
7.0	4.0"	4.0"	12.0"
8.0	4.5"	5.5"	12.0"
9.0	5.0"	7.0"	12.0"
10.0	6.0"	7.5"	12.0"
11.0	7.0"	8.0"	12.0"
12.0	7.5"	9.5"	12.0"

** 95% compaction based on ASTM Test Method D1557 or CAL 216*
*** 90% compaction based on ASTM Test Method D1557 or CAL 216*

The following recommendations are for light-duty and heavy-duty Portland Cement Concrete Pavement Sections based on the design procedures developed by the Portland Cement Association.

PORTLAND CEMENT PAVEMENT
LIGHT DUTY

Traffic Index	Portland Cement Concrete***	Class II Aggregate Base*	Compacted Subgrade**
4.5	5.0"	4.0"	12.0"

HEAVY DUTY

Traffic Index	Portland Cement Concrete***	Class II Aggregate Base*	Compacted Subgrade**
7.0	6.5"	4.0"	12.0"

** 95% compaction based on ASTM Test Method D1557 or CAL 216*
*** 90% compaction based on ASTM Test Method D1557 or CAL 216*
****Minimum compressive strength of 3000 psi*

It is recommended that any uncertified fill material encountered within pavement areas be removed and/or recompacted. The fill material should be moisture-conditioned to a minimum of 2 percent above optimum moisture and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. As an alternative, the Owner may elect not to recompact the existing fill within paved areas. However, the Owner should be aware that the paved areas may settle which may require annual maintenance. At a minimum, it is recommended that the upper 12 inches of subgrade soil be moisture-conditioned as necessary and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Seismic Parameters – 2022 California Building Code

The Site Class per Section 1613 of the 2022 California Building Code (2022 CBC) and ASCE 7-16, Chapter 20 is based upon the site soil conditions. It is our opinion that a Site Class D is most consistent with the subject site soil conditions. A site modified peak ground acceleration (PGA_M) of 0.463 may be used for seismic analysis. If the project is being designed based on the 2022 CBC and the exception to Item 1 from Section 11.4.8 given in Supplement 3 of ASCE 7-16 is utilized, the value of S_{M1} (and the resulting values of S_{D1} and T_S) should be increased by 50 percent.

Seismic Item	Value	CBC Reference
Site Class	D	Section 1613.2.2
Site Coefficient F_a	1.151	Table 1613.2.3 (1)
S_s	0.872	Section 1613.2.1
S_{MS}	1.004	Section 1613.2.3
S_{DS}	0.669	Section 1613.2.4
Site Coefficient F_v	1.980	Table 1613.2.3 (2)
S_1	0.320	Section 1613.2.1

S_{M1}	0.634	Section 1613.2.3
S_{D1}	0.422	Section 1613.2.4
T_S	0.631	Section 1613.2

* Based on Equivalent Lateral Force (ELF) Design Procedure being used.

Soil Cement Reactivity

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete (or stucco) and the soil. HUD/FHA and UBC have developed criteria for evaluation of sulfate levels and how they relate to cement reactivity with soil and/or water.

Soil samples were obtained from the site and tested in accordance with State of California Materials Manual Test Designation 417. The sulfate concentrations detected in these soil samples were less than 150 ppm (27.4 ppm) and are below the maximum allowable values established by HUD/FHA and UBC. However, it is recommended Type II cement be utilized to compensate for sulfate reactivity with the cement.

Compacted Material Acceptance

Compaction specifications are not the only criteria for acceptance of the site grading or other such activities. However, the compaction test is the most universally recognized test method for assessing the performance of the Grading Contractor. The numerical test results from the compaction test cannot be used to predict the engineering performance of the compacted material. Therefore, the acceptance of compacted materials will also be dependent on the stability of that material. The Soils Engineer has the option of rejecting any compacted material regardless of the degree of compaction if that material is considered to be unstable or if future instability is suspected. A specific example of rejection of fill material passing the required percent compaction is a fill which has been compacted with an in-situ moisture content significantly less than optimum moisture. This type of dry fill (brittle fill) is susceptible to future settlement if it becomes saturated or flooded.

Testing and Inspection

A representative of Krazan & Associates, Inc. should be present at the site during the earthwork activities to confirm that actual subsurface conditions are consistent with the exploratory fieldwork. This activity is an integral part of our service, as acceptance of earthwork construction is dependent upon compaction testing and stability of the material. This representative can also verify that the intent of these recommendations is incorporated into the project design and construction. Krazan & Associates, Inc. will not be responsible for grades or staking, since this is the responsibility of the Prime Contractor.

LIMITATIONS

Soils Engineering is one of the newest divisions of Civil Engineering. This branch of Civil Engineering is constantly improving as new technologies and understanding of earth sciences advance. Although your site was analyzed using the most appropriate and most current techniques and methods,

undoubtedly there will be substantial future improvements in this branch of engineering. In addition to advancements in the field of Soils Engineering, physical changes in the site, either due to excavation or fill placement, new agency regulations, or possible changes in the proposed structure after the soils report is completed may require the soils report to be professionally reviewed. In light of this, the Owner should be aware that there is a practical limit to the usefulness of this report without critical review. Although the time limit for this review is strictly arbitrary, it is suggested that 2 years be considered a reasonable time for the usefulness of this report.

Foundation and earthwork construction is characterized by the presence of a calculated risk that soil and groundwater conditions have been fully revealed by the original foundation investigation. This risk is derived from the practical necessity of basing interpretations and design conclusions on limited sampling of the earth. The recommendations made in this report are based on the assumption that soil conditions do not vary significantly from those disclosed during our field investigation. If any variations or undesirable conditions are encountered during construction, the Soils Engineer should be notified so that supplemental recommendations may be made.

The conclusions of this report are based on the information provided regarding the proposed construction. If the proposed construction is relocated or redesigned, the conclusions in this report may not be valid. The Soils Engineer should be notified of any changes so the recommendations may be reviewed and re-evaluated.

This report is a Geotechnical Engineering Investigation with the purpose of evaluating the soil conditions in terms of foundation design. The scope of our services did not include any Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring log regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices and a degree of conservatism deemed proper for this project. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

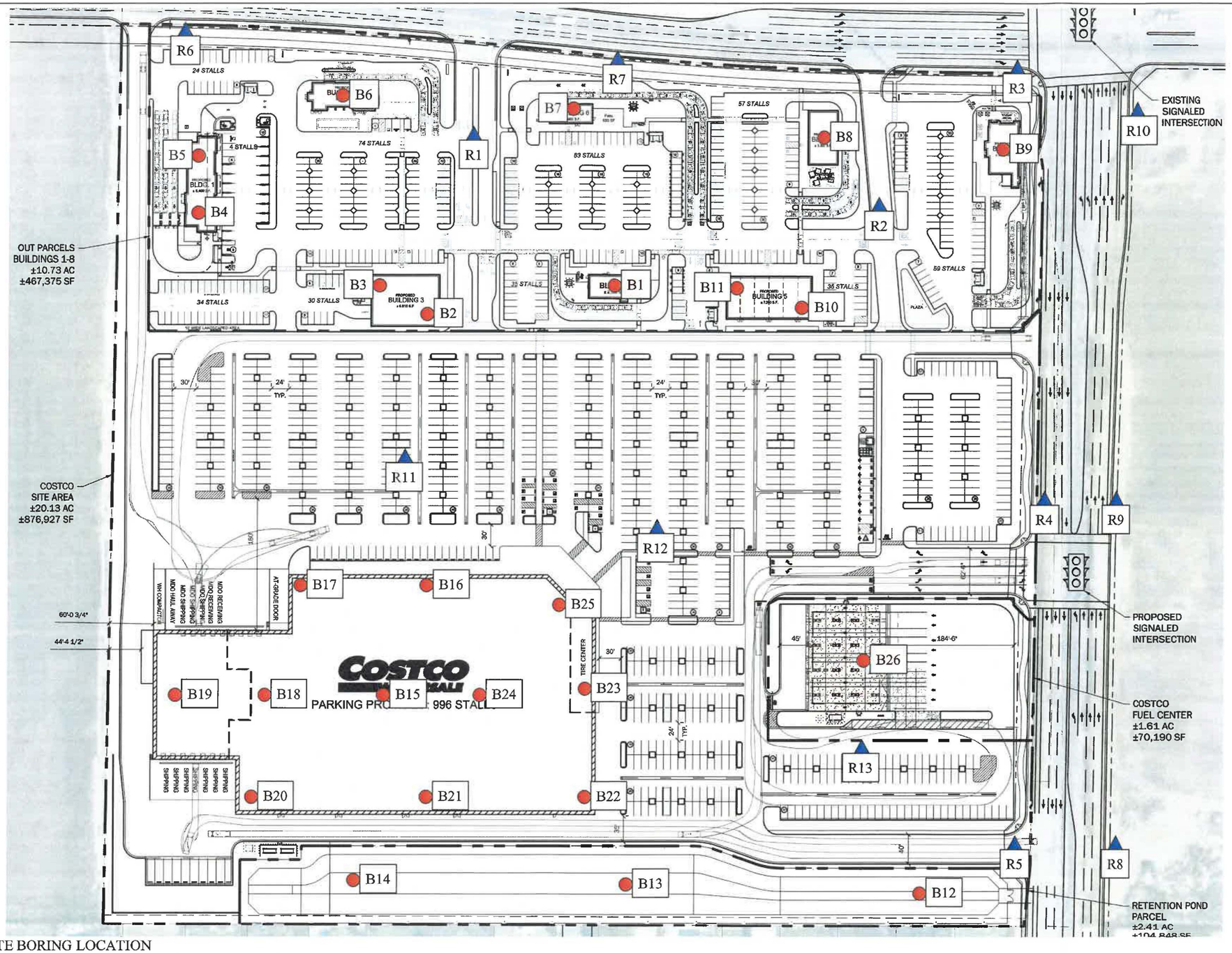
If you have any questions or if we may be of further assistance, please do not hesitate to contact our office at (661) 837-9200.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

Ryan K. Privett, PE
Project Engineer
RCE No. 59372

David R. Jarosz, II
Managing Engineer
RGE No. 2698/RCE No. 60185

RKP/DRJ:ht



APPROXIMATE BORING LOCATION

APPROXIMATE R-VALUE LOCATION

SITE MAP	**Scale:** NTS	**Date:** July 2025
Retail Development **SWC 7th Standard Road and Calloway Drive** **Bakersfield, California**	**Drawn by:** HT	**Approved by:** DJ
	Project No. 022-25058	**Figure No.** 1

Krazan
GEOTECHNICAL ENGINEERING

APPENDIX A

FIELD AND LABORATORY INVESTIGATIONS

Field Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploratory program. Twenty-six 4½-inch to 6½-inch exploratory borings were advanced. The boring locations are shown on the site plans.

The soils encountered were logged in the field during the exploration, and with supplementary laboratory test data are described in accordance with the Unified Soil Classification System.

Modified standard penetration tests were performed at selected depths. This test represents the resistance to driving a 2½-inch diameter split barrel sampler. The driving energy was provided by a hammer weighing 140 pounds, falling 30 inches. Relatively undisturbed soil samples were obtained while performing this test. Bag samples of the disturbed soil were obtained from the auger cuttings. All samples were returned to our Clovis laboratory for evaluation.

Laboratory Investigation

The laboratory investigation was programmed to determine the physical and mechanical properties of the foundation soil underlying the site. Test results were used as criteria for determining the engineering suitability of the surface and subsurface materials encountered.

In-situ moisture content, dry density, consolidation, direct shear, permeability and sieve analysis tests were determined for the undisturbed samples representative of the subsurface material. Expansion index and R-value tests were completed for select bag samples obtained from the auger cuttings. These tests, supplemented by visual observation, comprised the basis for our evaluation of the site material.

The logs of the exploratory borings and laboratory determinations are presented in this Appendix.

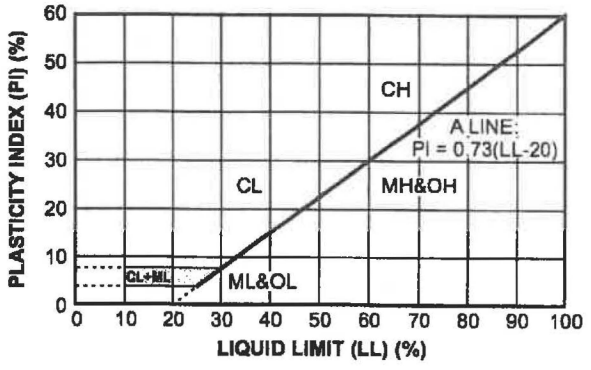
UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART			
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% 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 (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more 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 of 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 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

CONSISTENCY CLASSIFICATION	
Description	**Blows per Foot**
Granular Soils	
Very Loose	< 5
Loose	5 – 15
Medium Dense	16 – 40
Dense	41 – 65
Very Dense	> 65
Cohesive Soils	
Very Soft	< 3
Soft	3 – 5
Firm	6 – 10
Stiff	11 – 20
Very Stiff	21 – 40
Hard	> 40

GRAIN SIZE CLASSIFICATION		
Grain Type	*Standard Sieve Size*	*Grain Size in Millimeters*
Boulders	Above 12 inches	Above 305
Cobbles	3 to 12 inches	305 to 76.2
Gravel	3 inches to No. 4	76.2 to 4.76
Coarse-grained	3 to ¾ inches	76.2 to 19.1
Fine-grained	¾ inches to No. 4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
Coarse-grained	No. 4 to No. 10	4.76 to 2.00
Medium-grained	No. 10 to No. 40	2.00 to 0.42
Fine-grained	No. 40 to No. 200	0.42 to 0.074
Silt and Clay	Below No. 200	Below 0.074

PLASTICITY CHART



Log of Boring B1

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-1

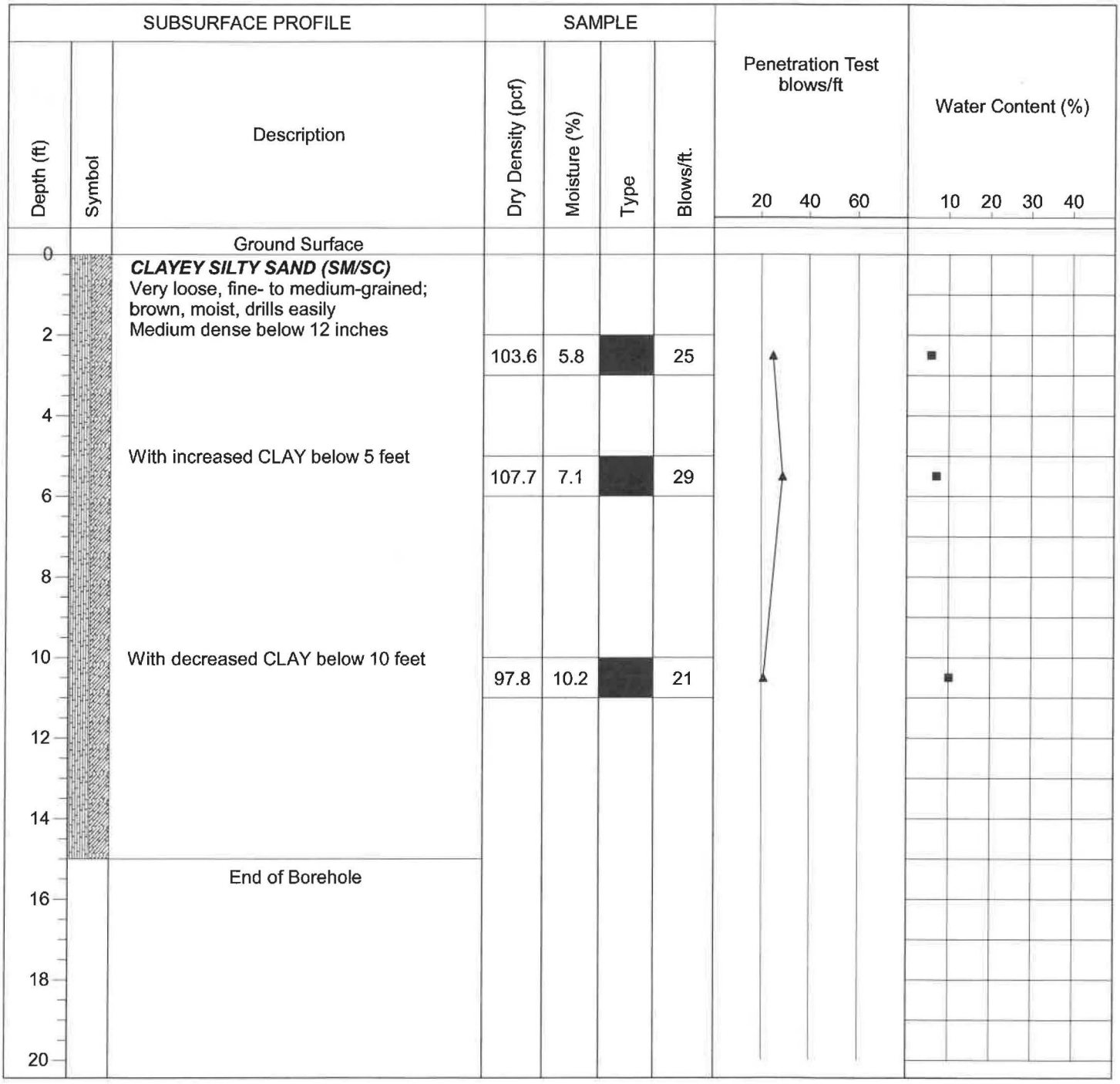
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water>

Initial: None

At Completion: None



Drill Method: Solid Flight

Drill Date: 5/1/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B2

Project: Retail Development

Project No: 022-25058

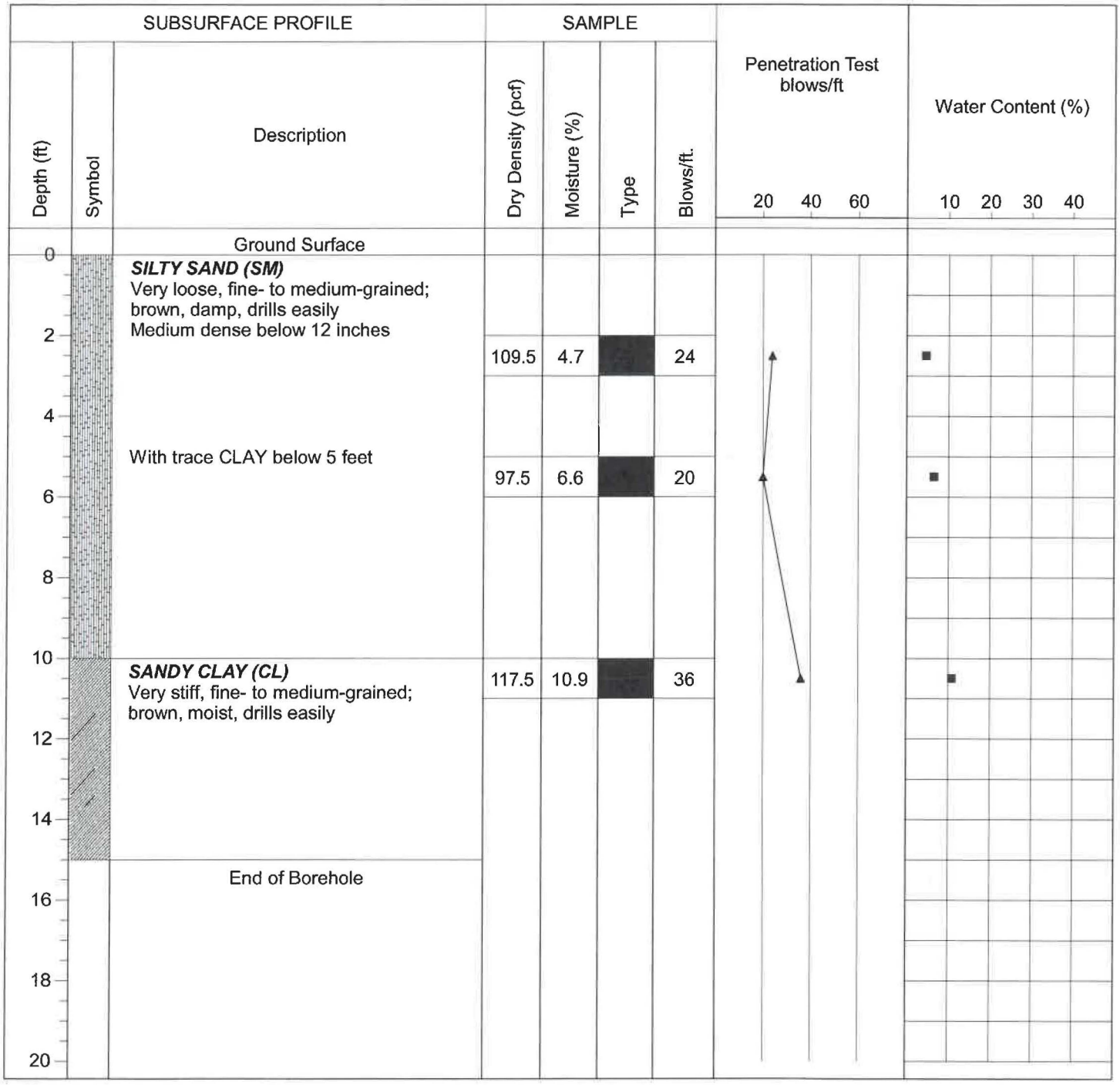
Client: Landmark Surveying & Engineering

Figure No.: A-2

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Solid Flight

Drill Date: 5/1/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 15 Feet

Sheet: 1 of 1

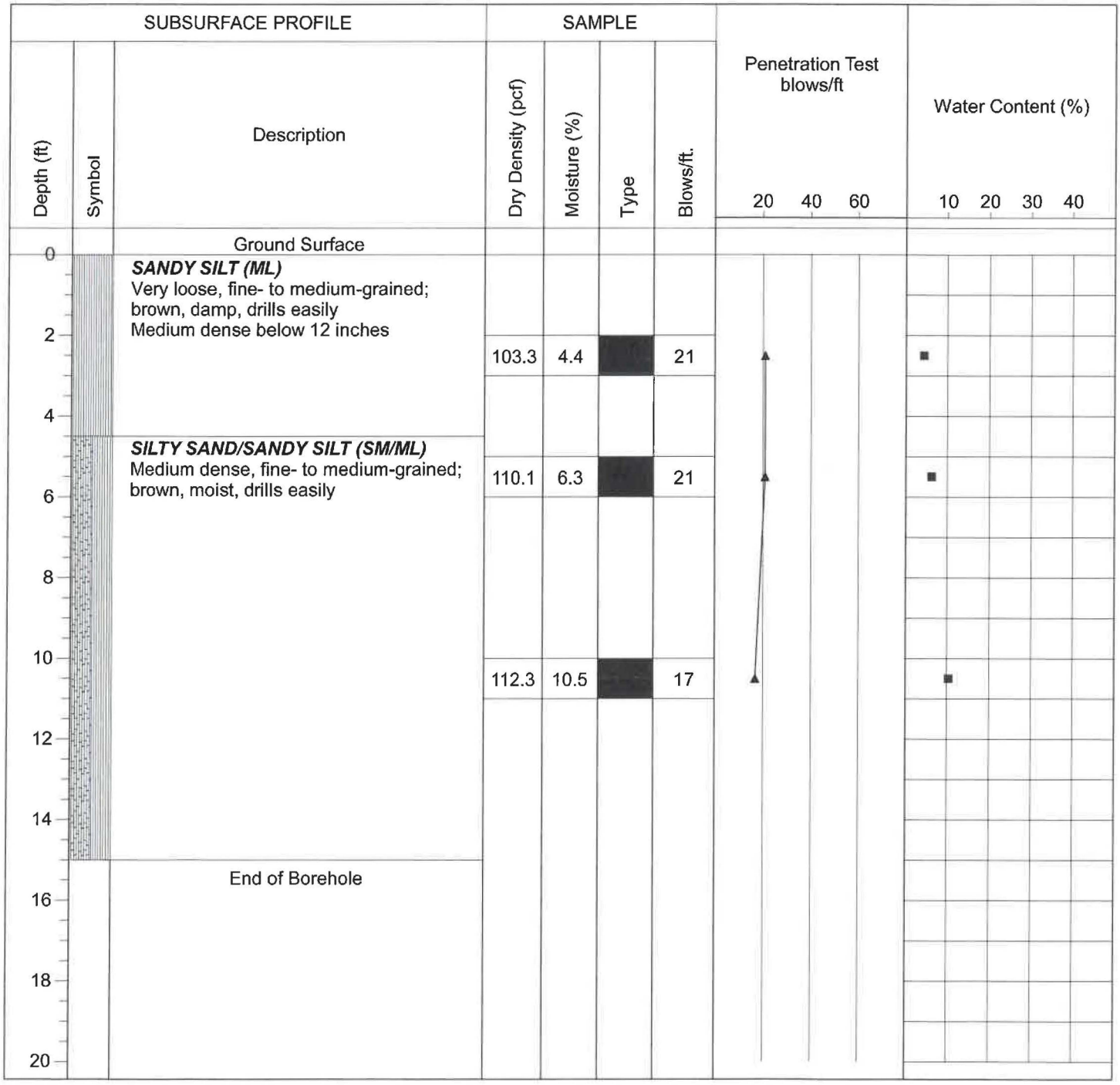
Log of Boring B3

Project: Retail Development | **Project No:** 022-25058

Client: Landmark Surveying & Engineering | **Figure No.:** A-3

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA | **Logged By:** Sarah Redondo

Depth to Water> | **Initial:** None | **At Completion:** None



Drill Method: Solid Flight | **Drill Date:** 5/1/25

Drill Rig: CME 45C-6 | **Hole Size:** 4½ Inches

Driller: Jim Watts | **Elevation:** 15 Feet

Krazan and Associates

Sheet: 1 of 1

Log of Boring B4

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-4

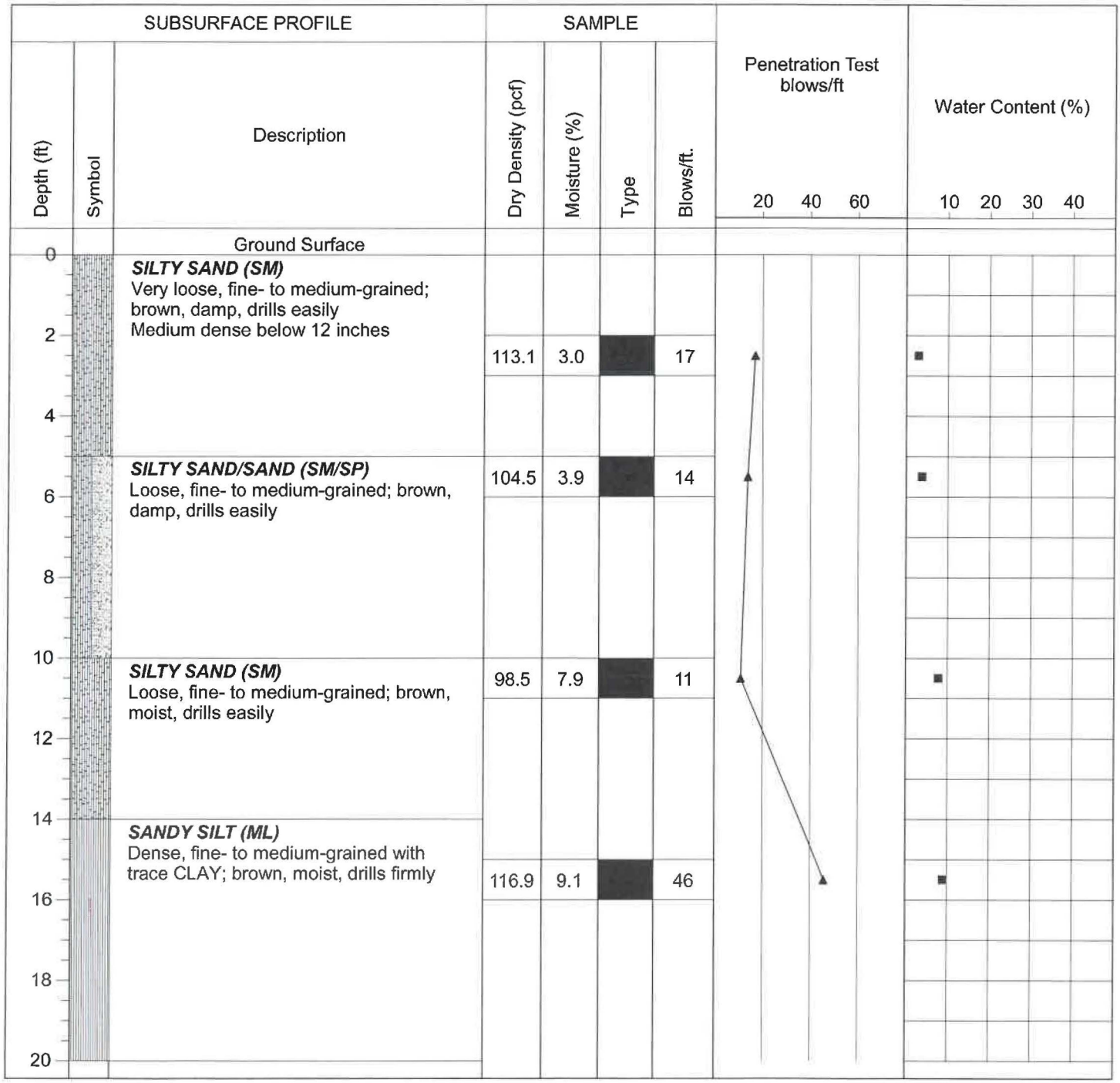
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water>

Initial: None

At Completion: None



Drill Method: Solid Flight

Drill Date: 5/1/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B5

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-5

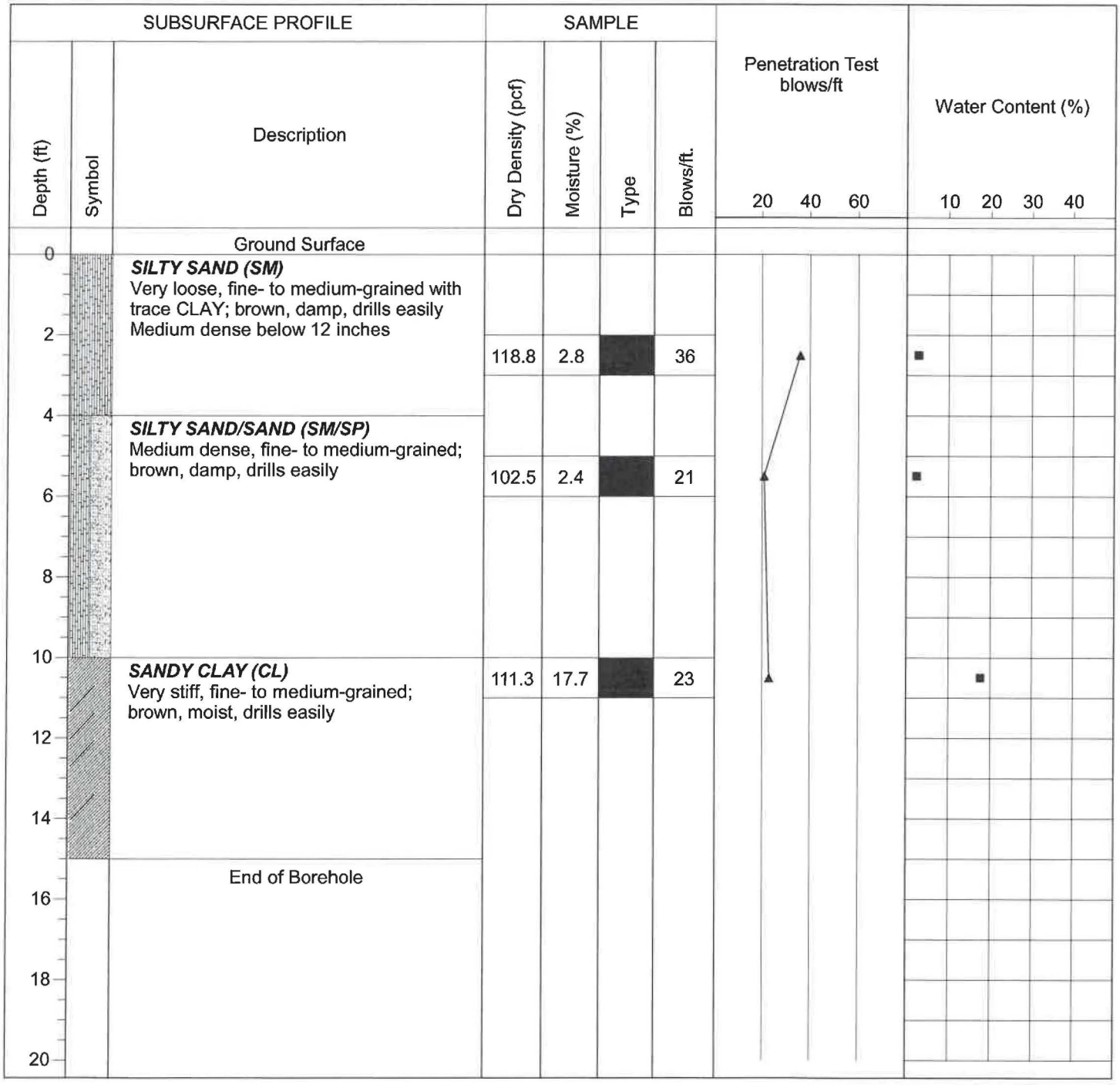
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water>

Initial: None

At Completion: None



Drill Method: Solid Flight

Drill Date: 5/1/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B6

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-6

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

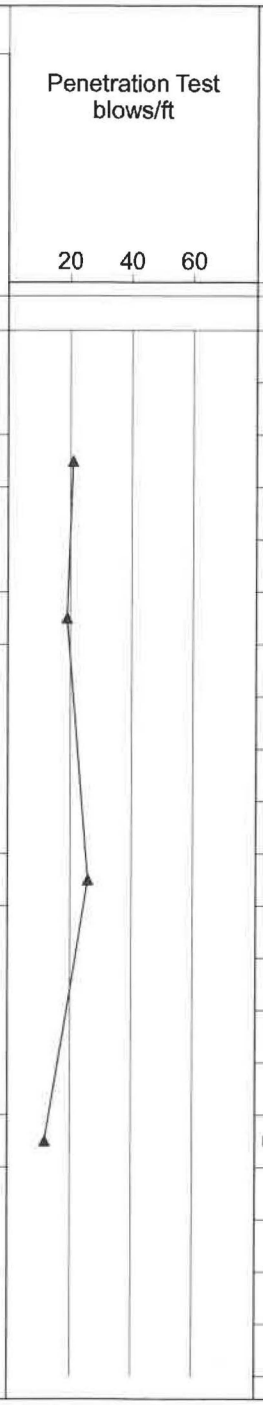
Logged By: Sarah Redondo

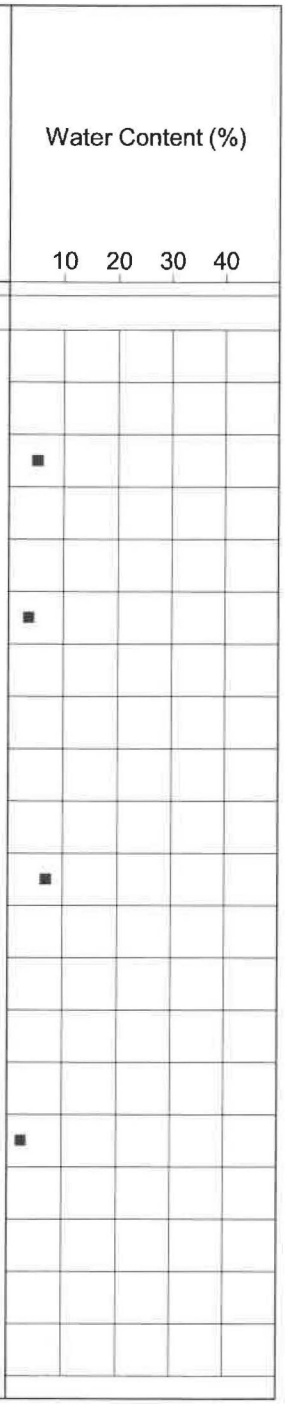
Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
0		***SILTY SAND/SANDY SILT (SM/ML)*** Very loose, fine- to medium-grained; brown, moist, drills easily Medium dense below 12 inches				
2			104.4	5.3		21
4		Damp below 5 feet				
6			110.6	3.8		19
8						
10		***CLAYEY SILTY SAND (SM/SC)*** Medium dense, fine- to medium-grained; brown, moist, drills easily	115.3	7.0		26
12						
14		***SILTY SAND/SAND (SM/SP)*** Loose, fine- to medium-grained; brown, damp, drills easily		2.6		12
16						
18						
20						





Drill Method: Solid Flight

Drill Rig: CME 45C-6

Driller: Jim Watts

Krazan and Associates

Drill Date: 5/1/25

Hole Size: 4½ Inches

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B7

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-7

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

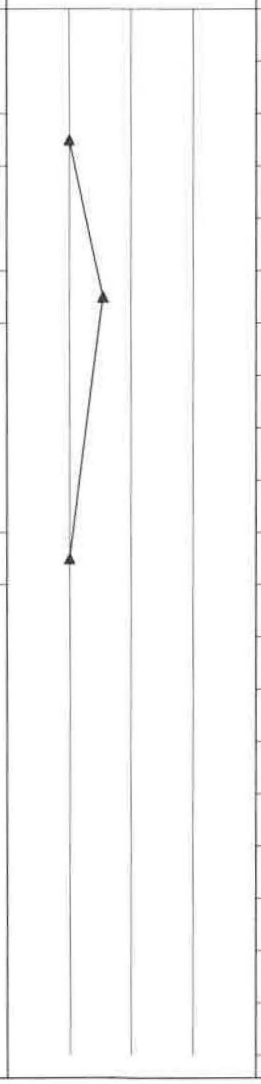
Logged By: Sarah Redondo

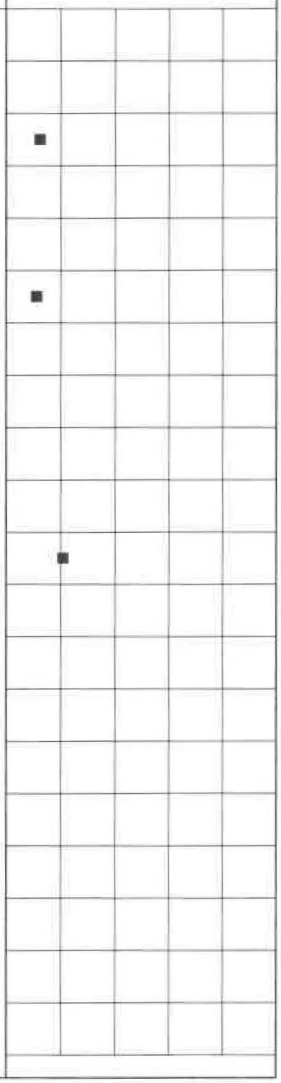
Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
		Ground Surface				
0		***SILTY SAND/SANDY SILT (SM/ML)*** Very loose, fine- to medium-grained; brown, moist, drills easily Medium dense below 12 inches				
2			101.1	6.3		20
4						
6		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained; brown, moist, drills easily	118.0	5.7		31
8						
10		***SANDY SILT (ML)*** Medium dense, fine- to medium-grained with CLAY; brown, moist, drills easily	112.4	10.5		20
12						
14						
16		End of Borehole				
18						
20						





Drill Method: Solid Flight

Drill Date: 5/1/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B8

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-8

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water> **Initial:** None **At Completion:** None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
0		***SILTY SAND/SANDY SILT (SM/ML)*** Very loose, fine- to medium-grained; brown, moist, drills easily Medium dense below 12 inches				
2			107.8	7.6		18
4						
6			119.3	4.9		17
8						
10		***SILTY SAND (SM)*** Loose, fine- to medium-grained with CLAY; brown, moist, drills easily	103.5	7.9		15
12						
14						
16		End of Borehole				
18						
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight

Drill Date: 5/1/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B9

Project: Retail Development

Project No: 022-25058

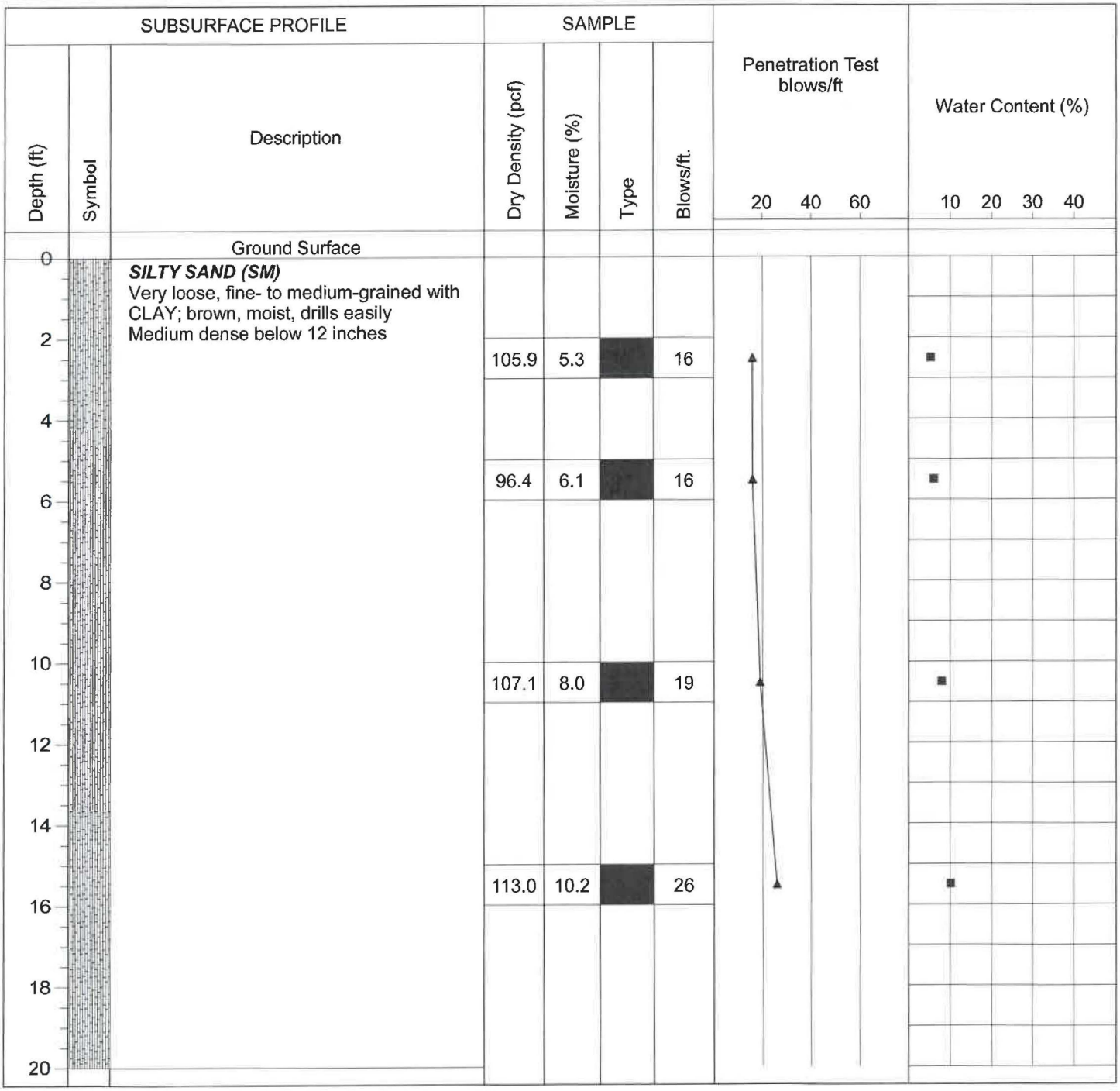
Client: Landmark Surveying & Engineering

Figure No.: A-9

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Solid Flight

Drill Date: 5/2/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B10

Project: Retail Development | **Project No:** 022-25058

Client: Landmark Surveying & Engineering | **Figure No.:** A-10

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA | **Logged By:** Sarah Redondo

Depth to Water> | **Initial:** None | **At Completion:** None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
0		***SANDY SILT (ML)*** Very loose, fine- to medium-grained; brown, moist, drills easily Medium dense below 12 inches				
2			92.9	6.8		21
4						
6		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained with CLAY; brown, moist, drills easily	105.0	7.0		16
8						
10		Loose below 10 feet	101.9	6.7		14
12						
14						
16		End of Borehole				
18						
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight | **Drill Date:** 5/2/25

Drill Rig: CME 45C-6 | **Hole Size:** 4½ Inches

Driller: Jim Watts | **Elevation:** 15 Feet

Krazan and Associates

Sheet: 1 of 1

Log of Boring B11

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-11

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
		Ground Surface				
0		***SANDY SILT (ML)*** Very loose, fine- to medium-grained; brown, moist, drills easily Medium dense below 12 inches				
2			100.0	5.9		32
4						
6		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained; brown, damp, drills easily	102.1	3.9		39
8						
10		Loose and moist below 10 feet	106.6	6.7		14
12						
14						
16		End of Borehole				
18						
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight

Drill Date: 5/2/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 4½ Inches

Driller: Jim Watts

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B12

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-12

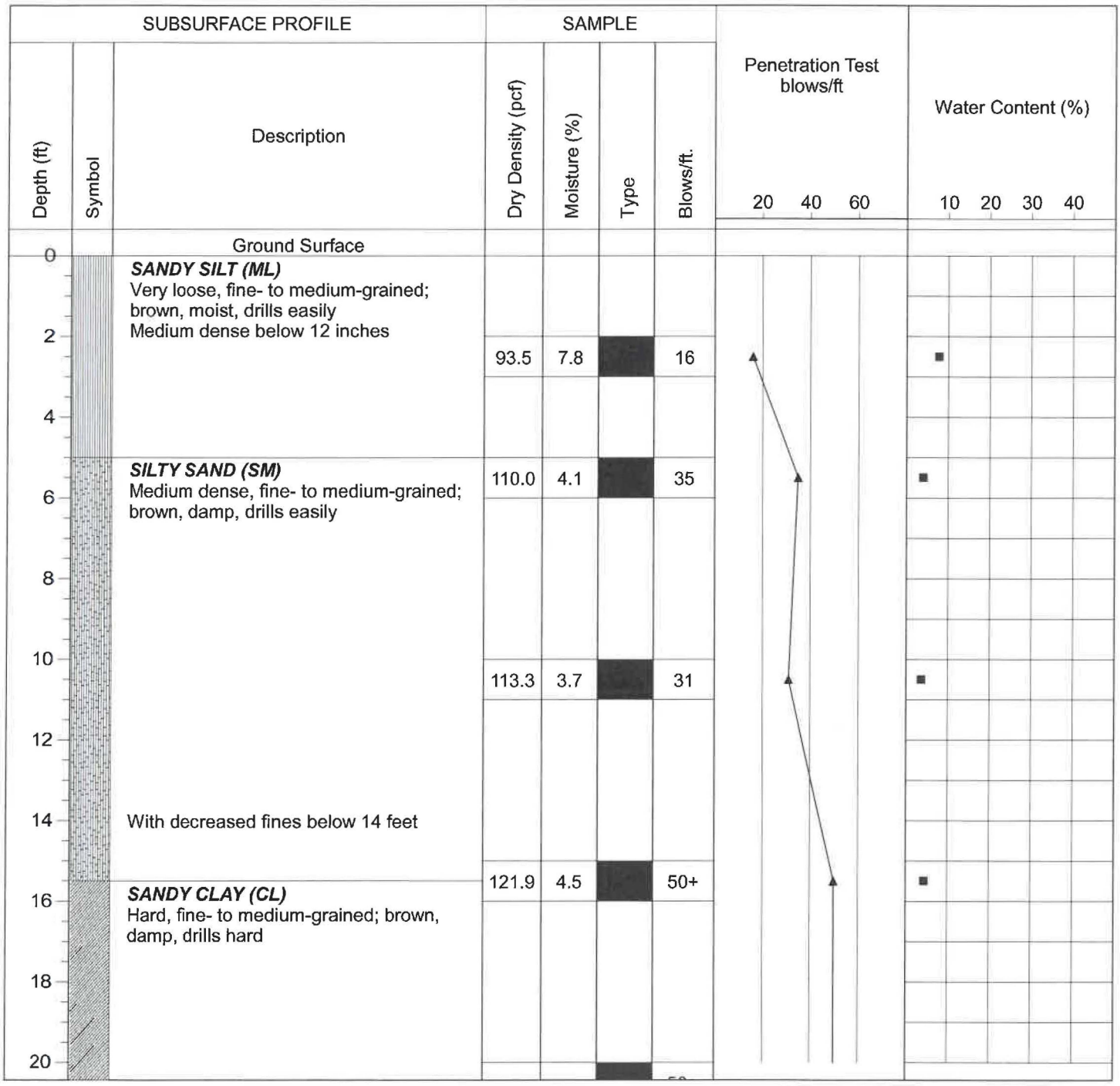
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/2/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 6½ Inches

Driller: Jim Watts

Elevation: 51 Feet

Log of Boring B12

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-12

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

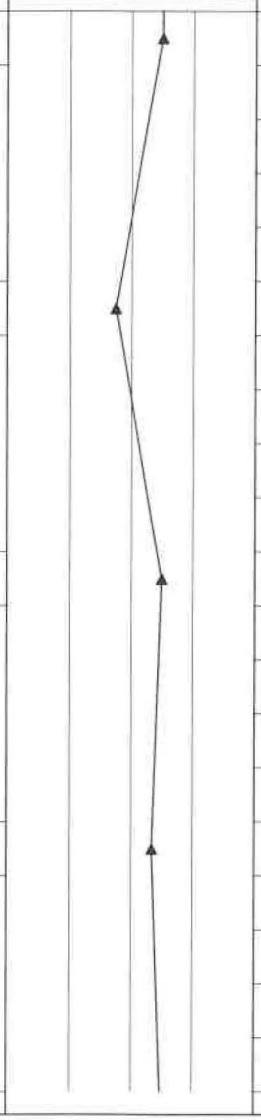
Logged By: Sarah Redondo

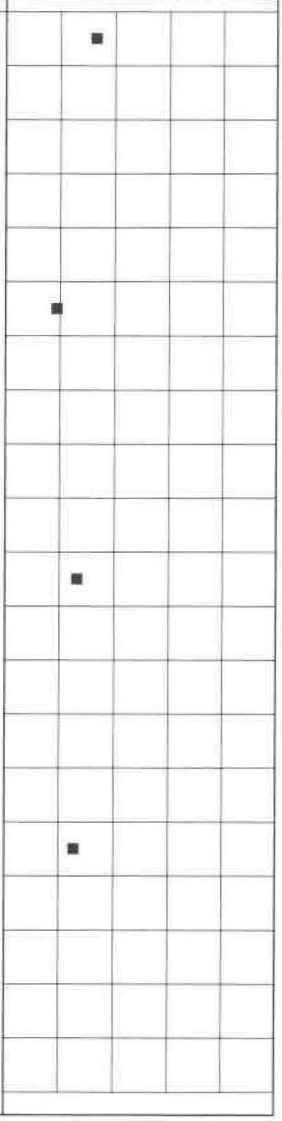
Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
			107.9	16.5		50+
22						
24						
26		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained with trace CLAY; brown, moist, drills hard	106.6	9.5		35
28						
30		***SANDY SILT (ML)*** Very dense, fine- to medium-grained, weakly cemented; brown, moist, drills hard	104.8	13.3		50+
32						
34						
36		***CLAYEY SAND (SC)*** Dense, fine- to medium-grained; brown, moist, drills firmly	118.4	12.8		47
38						
40						





Drill Method: Hollow Stem

Drill Rig: CME 45C-6

Driller: Jim Watts

Krazan and Associates

Drill Date: 5/2/25

Hole Size: 6½ Inches

Elevation: 51 Feet

Log of Boring B12

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-12

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Sarah Redondo

Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
42		***SAND (SP)*** Very dense, fine- to medium-grained; brown, damp, drills hard	111.4	3.6		50+
44		***SILTY SAND (SM)*** Very dense, fine- to medium-grained; brown, moist, drills hard				
46			119.8	14.0		50+
48						
50		Dense below 50 feet	106.6	11.0		48
52		End of Borehole				
54						
56						
58						
60						

Penetration Test blows/ft: 20, 40, 60

Water Content (%): 10, 20, 30, 40

Drill Method: Hollow Stem

Drill Date: 5/2/25

Drill Rig: CME 45C-6

Krazan and Associates

Hole Size: 6½ Inches

Driller: Jim Watts

Elevation: 51 Feet

Log of Boring B13

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-13

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

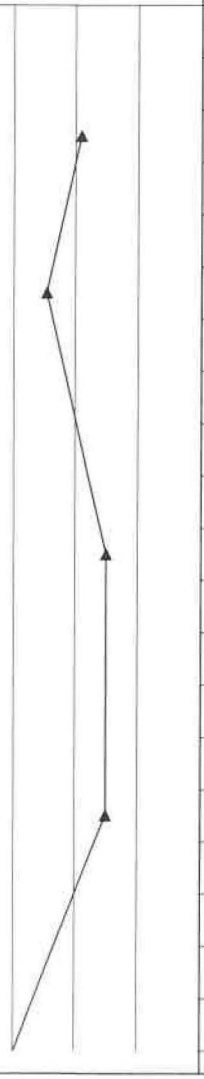
Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
0		Ground Surface						
0		***SILTY SAND (SM)*** Very loose, fine- to medium-grained; brown, moist, drills easily						
2		Loose below 12 inches Dense, with CLAY below 18 inches	106.9	6.3		42		
4		Medium dense below 5 feet						
6			105.2	5.8		31		
8		***SANDY CLAY (CL)*** Very stiff, fine- to medium-grained; brown, moist, drills easily						
10		Hard below 10 feet	116.0	13.3		50+		
12								
14								
16		***SANDY SILT (ML)*** Very dense, fine- to medium-grained with CLAY; brown, moist, drills firmly	115.9	13.3		50+		
18								
20		Medium dense below 20 feet						



Drill Method: Hollow Stem

Drill Date: 5/13/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 50 Feet

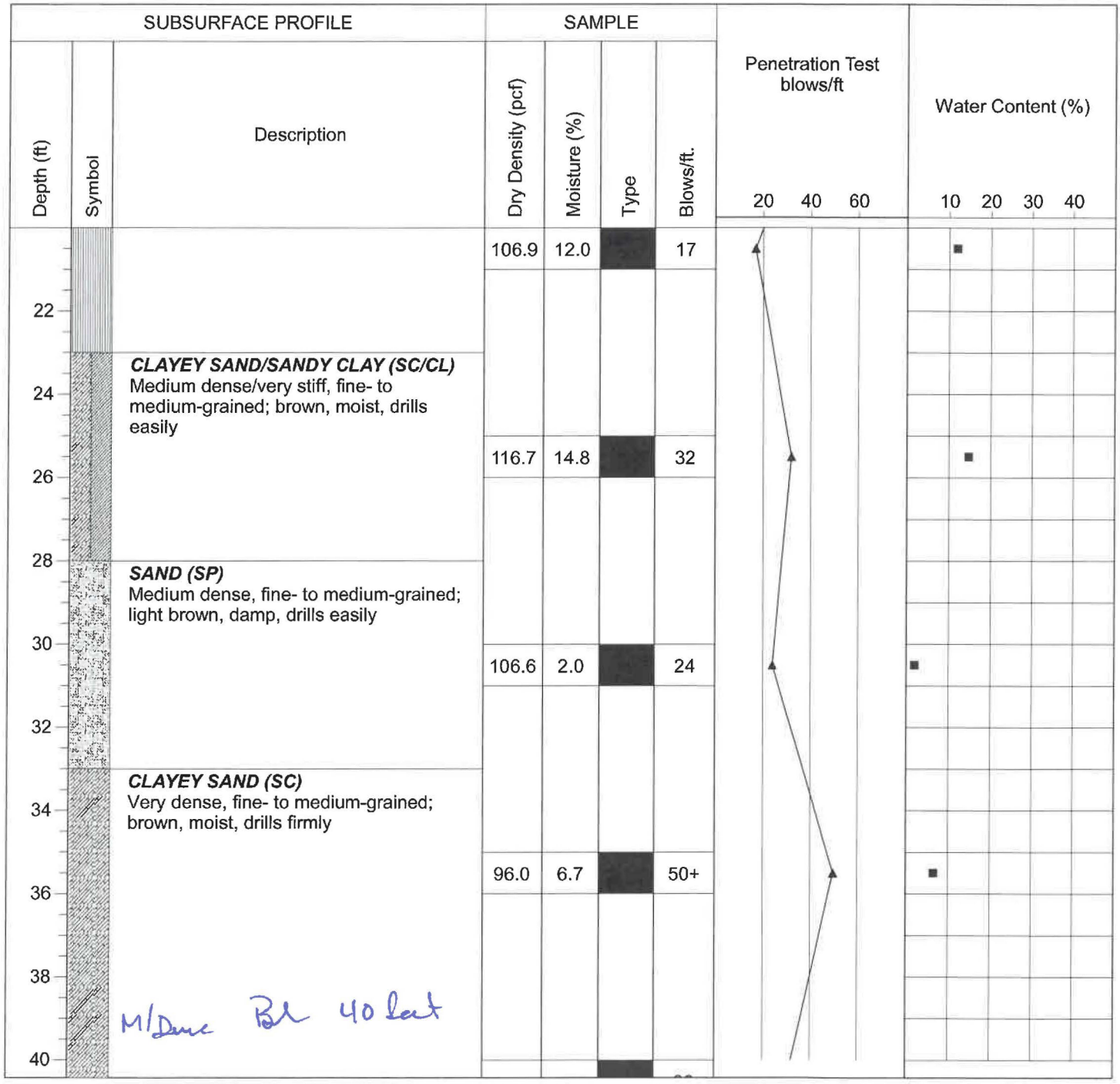
Log of Boring B13

Project: Retail Development | **Project No:** 022-25058

Client: Landmark Surveying & Engineering | **Figure No.:** A-13

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA | **Logged By:** Dave Adams

Depth to Water> | **Initial:** None | **At Completion:** None



Drill Method: Hollow Stem | **Drill Date:** 5/13/25

Drill Rig: Mobile B-80 | **Krazan and Associates** | **Hole Size:** 6 Inches

Driller: David Lopez | **Elevation:** 50 Feet

Log of Boring B13

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-13

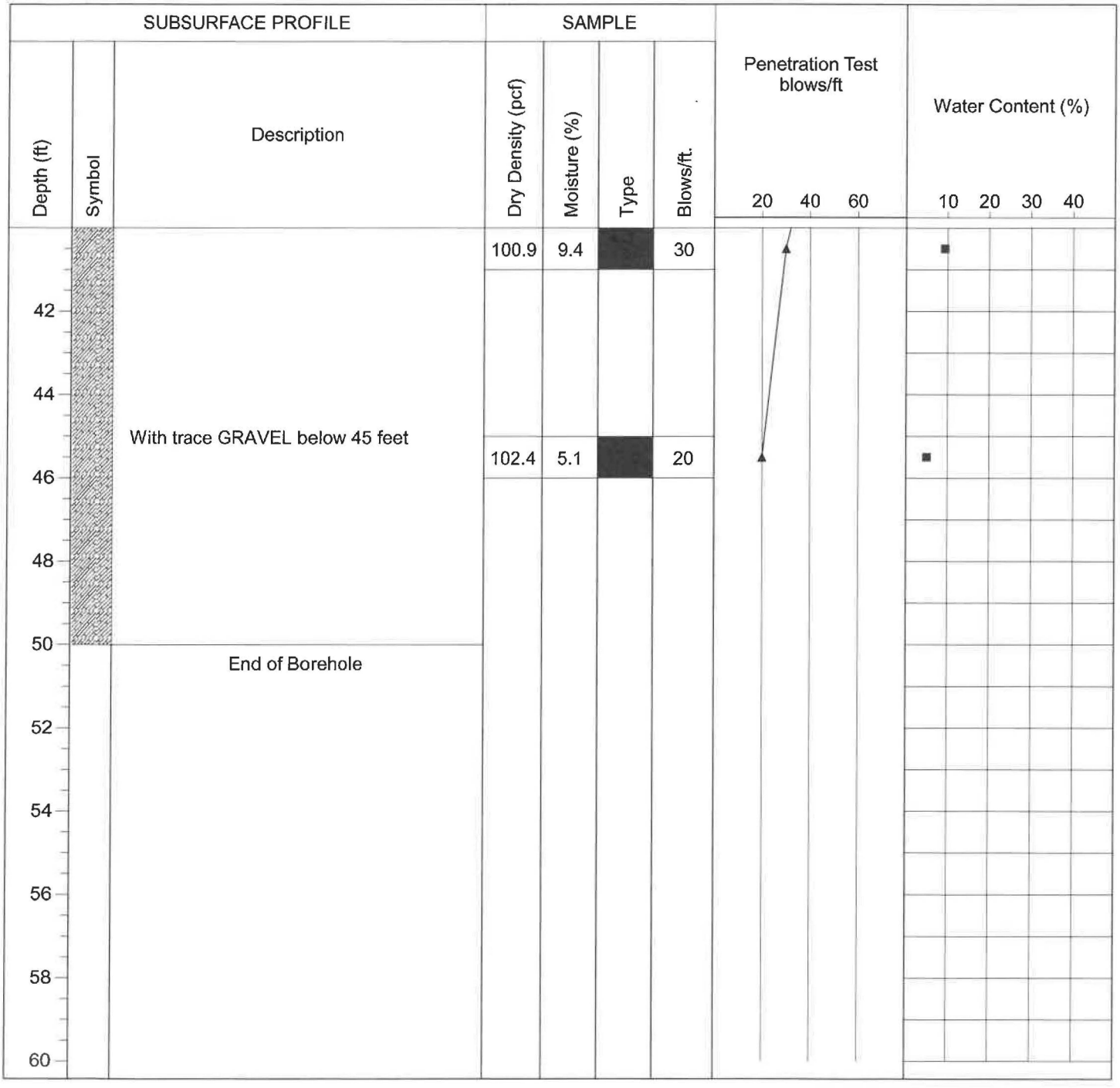
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/13/25

Hole Size: 6 Inches

Elevation: 50 Feet

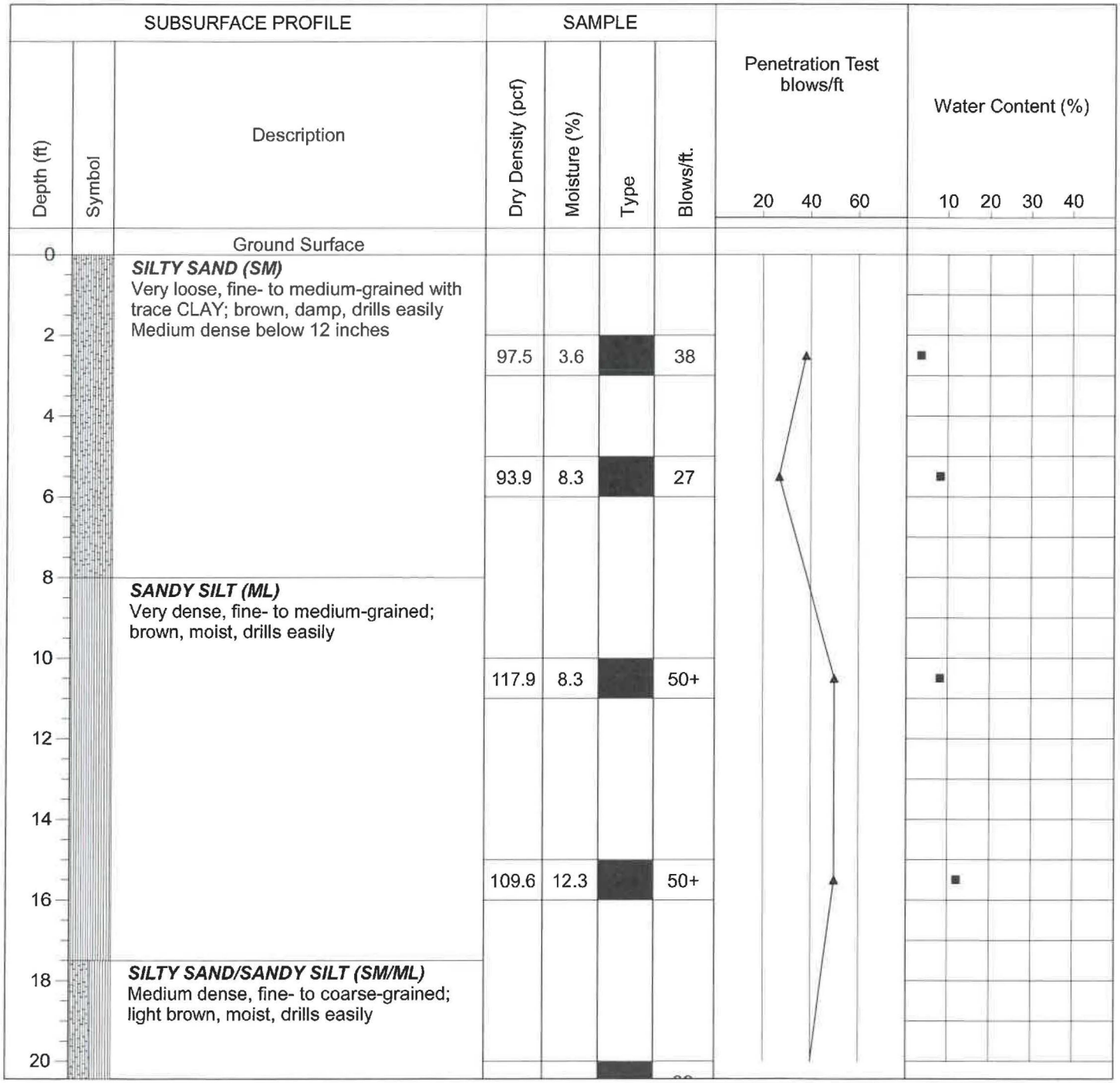
Log of Boring B14

Project: Retail Development | **Project No:** 022-25058

Client: Landmark Surveying & Engineering | **Figure No.:** A-14

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA | **Logged By:** Dave Adams

Depth to Water> | **Initial:** None | **At Completion:** None



Drill Method: Hollow Stem | **Drill Date:** 5/13/25

Drill Rig: Mobile B-80 | **Krazan and Associates** | **Hole Size:** 6 Inches

Driller: David Lopez | **Elevation:** 50 Feet

Log of Boring B14

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-14

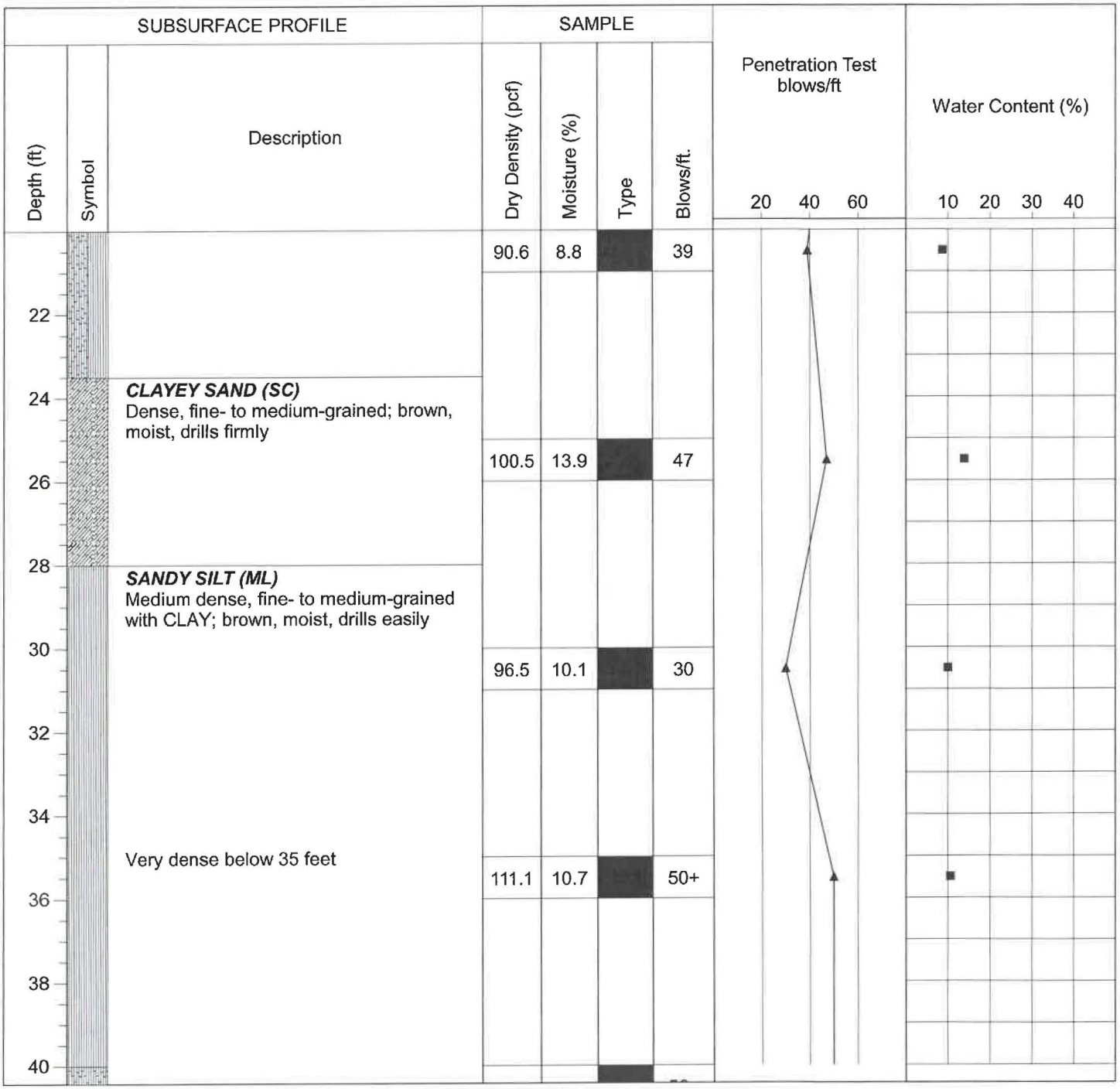
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/13/25

Hole Size: 6 Inches

Elevation: 50 Feet

Log of Boring B14

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-14

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water> **Initial:** None **At Completion:** None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	Penetration Test blows/ft (20 40 60)	Water Content (%) (10 20 30 40)
42		***SILTY SAND (SM)*** Very dense, fine- to medium-grained; brown, moist, drills firmly	117.5	10.2		50+		
44		***SAND (SP)*** Very dense, fine- to course- grained; light brown, damp, drills firmly						
46			112.6	2.2		50+		
48								
50		End of Borehole						
52								
54								
56								
58								
60								

Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/13/25

Hole Size: 6 Inches

Elevation: 50 Feet

Sheet: 3 of 3

Log of Boring B15

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-15

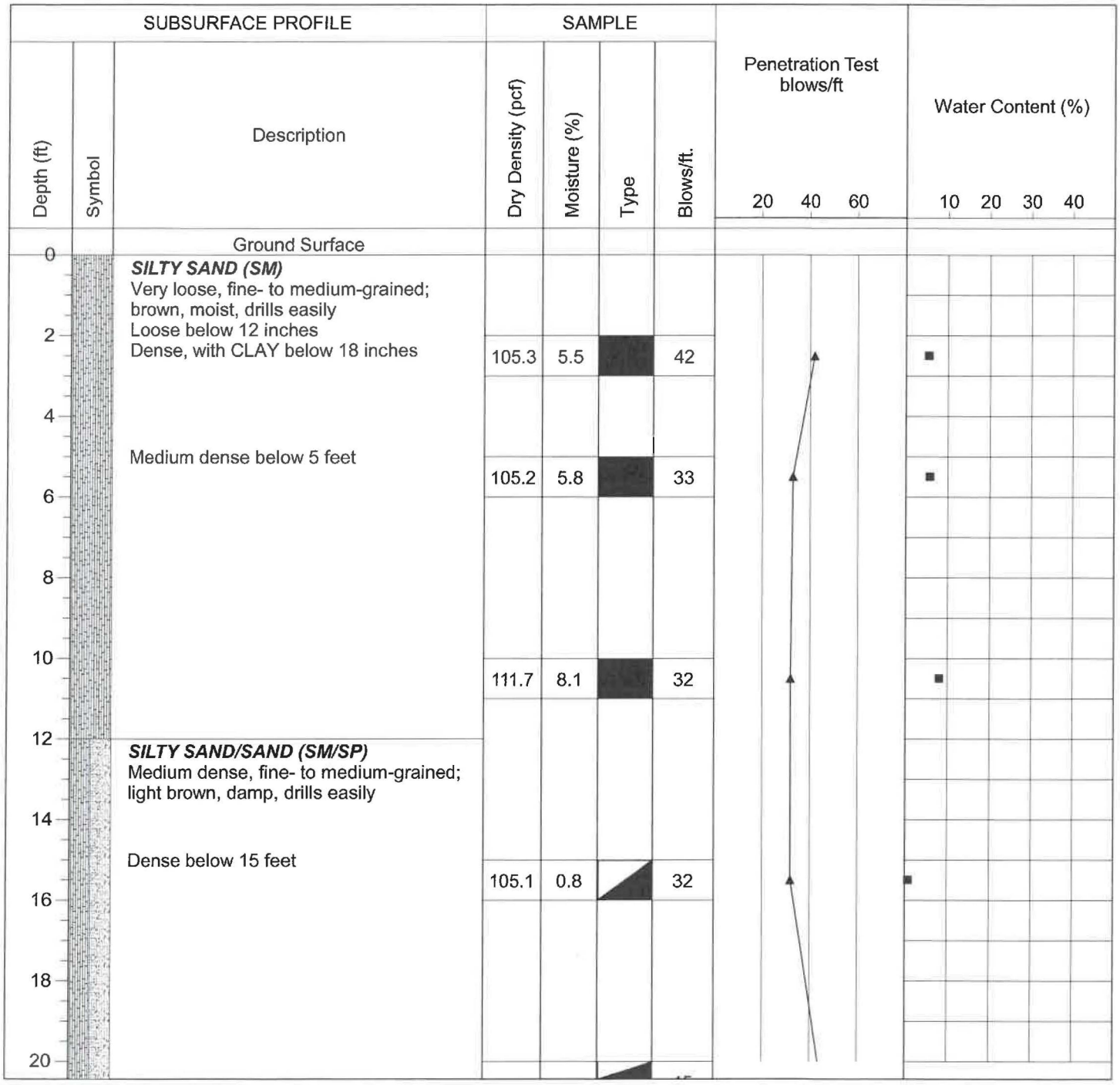
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/14/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 50 Feet

Log of Boring B15

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-15

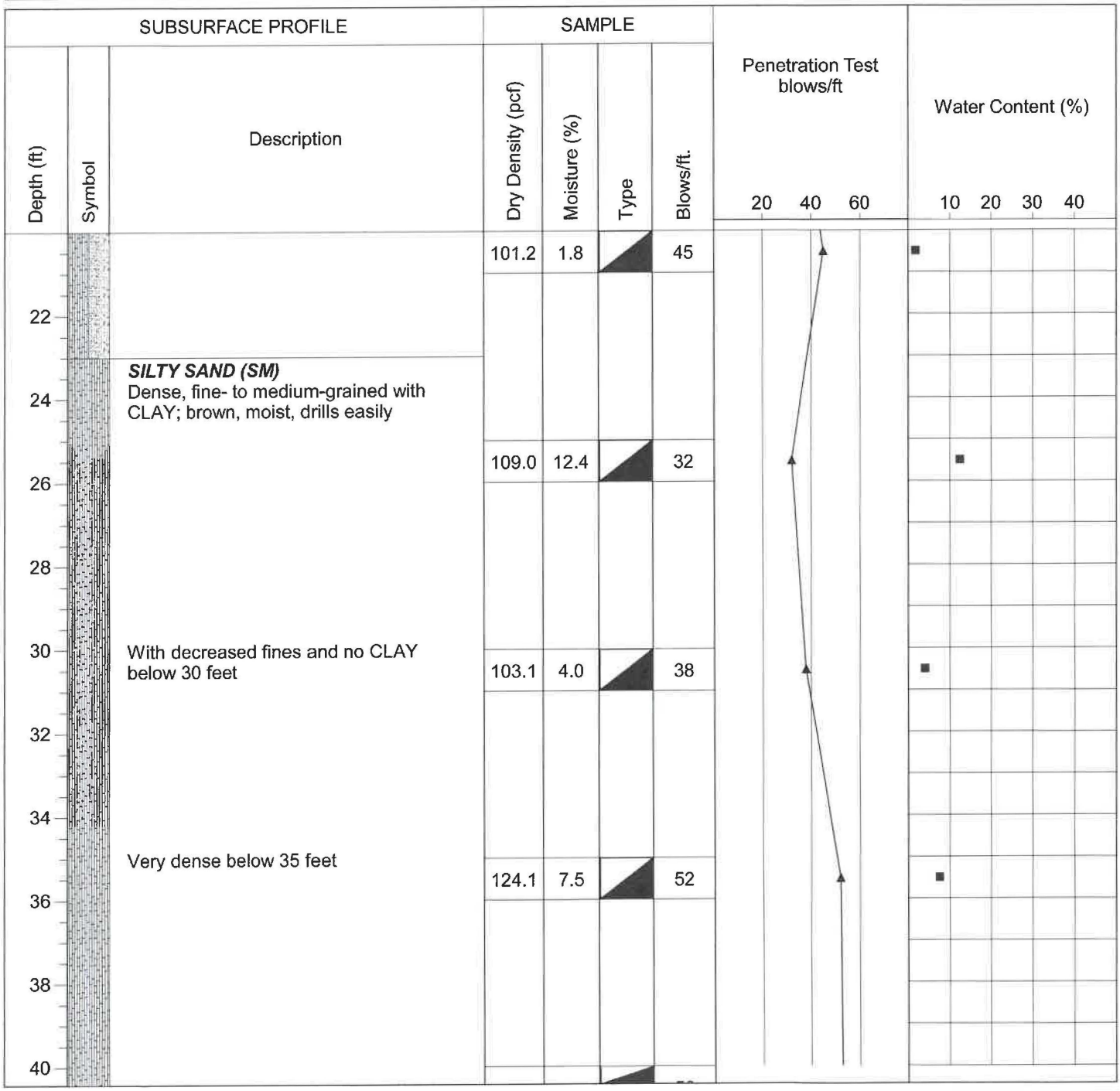
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/14/25

Hole Size: 6 Inches

Elevation: 50 Feet

Log of Boring B15

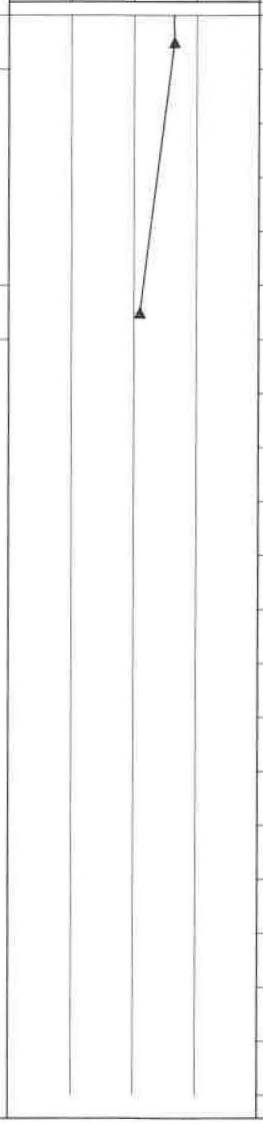
Project: Retail Development | **Project No:** 022-25058

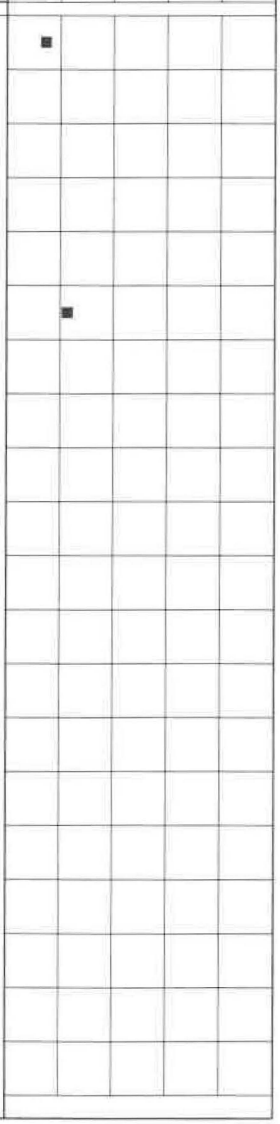
Client: Landmark Surveying & Engineering | **Figure No.:** A-15

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA | **Logged By:** Dave Adams

Depth to Water> | **Initial:** None | **At Completion:** None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
42			106.7	7.3		53
44		***SILTY SAND/SANDY SILT (SM/ML)*** Dense, fine- to medium-grained with CLAY; brown, moist, drills easily				
46			110.2	11.4		42
48						
50		End of Borehole				
52						
54						
56						
58						
60						





Drill Method: Hollow Stem | **Drill Date:** 5/14/25

Drill Rig: Mobile B-80 | **Hole Size:** 6 Inches

Driller: David Lopez | **Elevation:** 50 Feet

Krazan and Associates

Log of Boring B16

Project: Retail Development

Project No: 022-25058

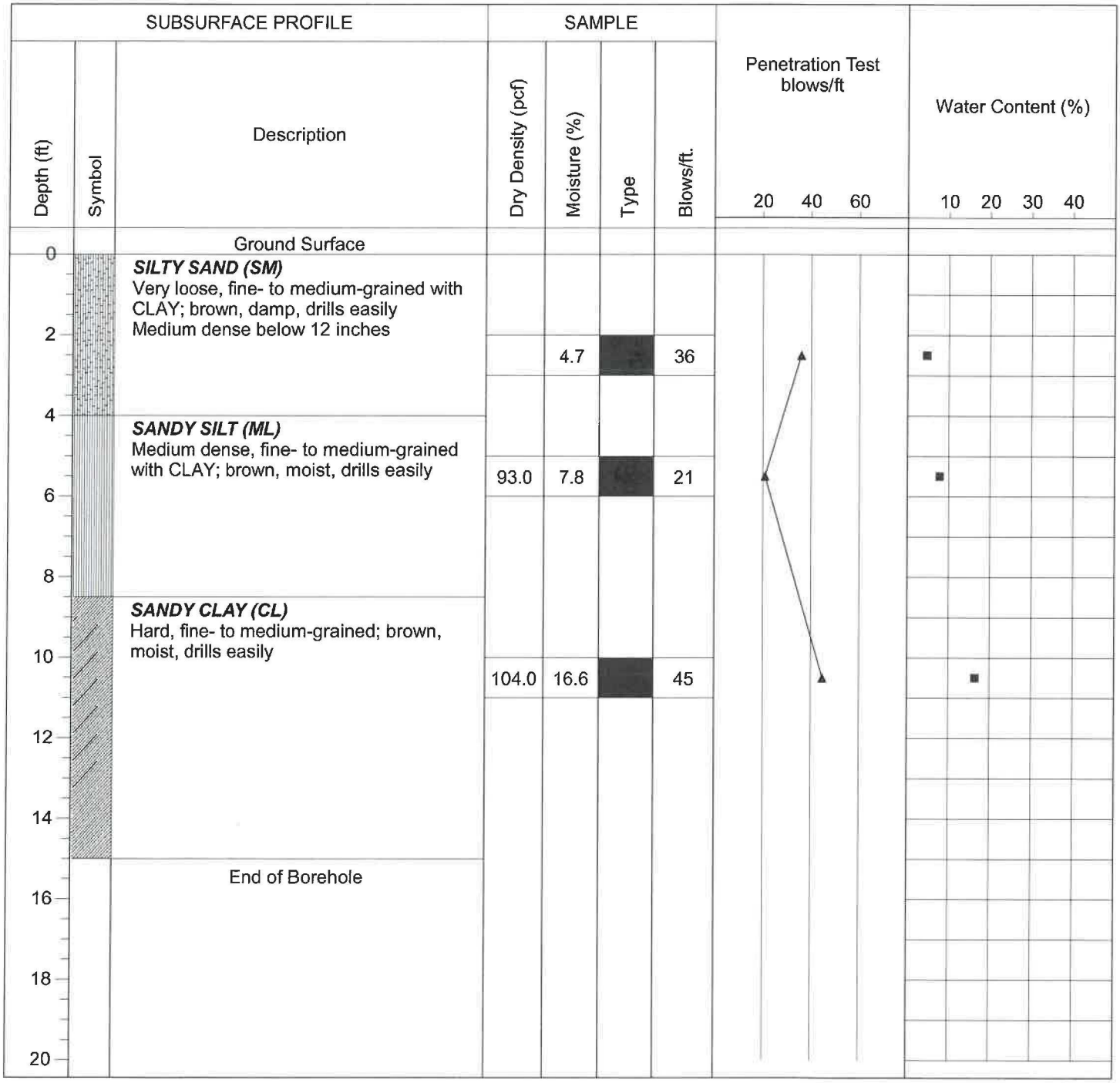
Client: Landmark Surveying & Engineering

Figure No.: A-16

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/14/25

Hole Size: 6 Inches

Elevation: 15 Feet

Log of Boring B17

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-17

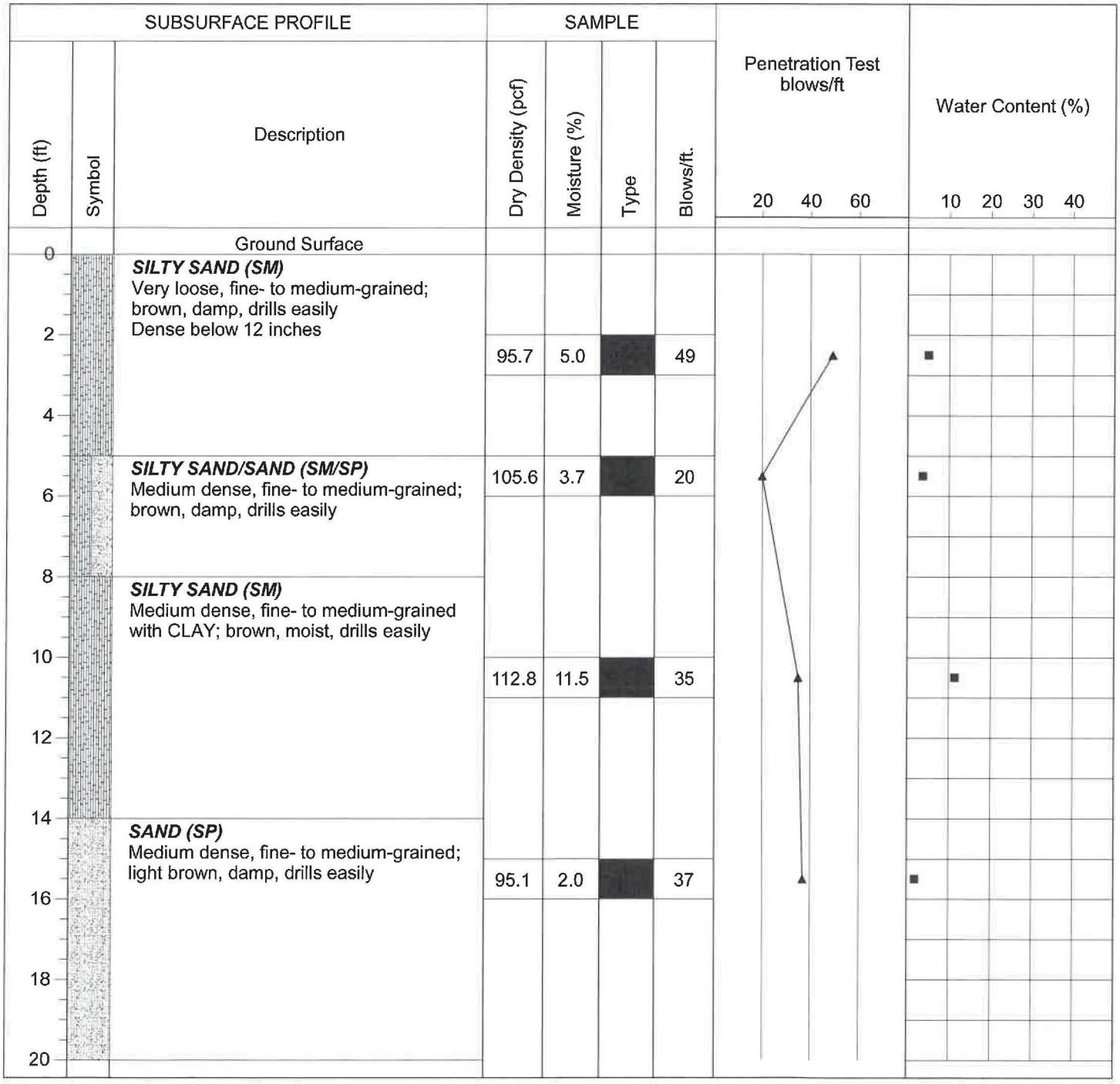
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/14/25

Hole Size: 6 Inches

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B18

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-18

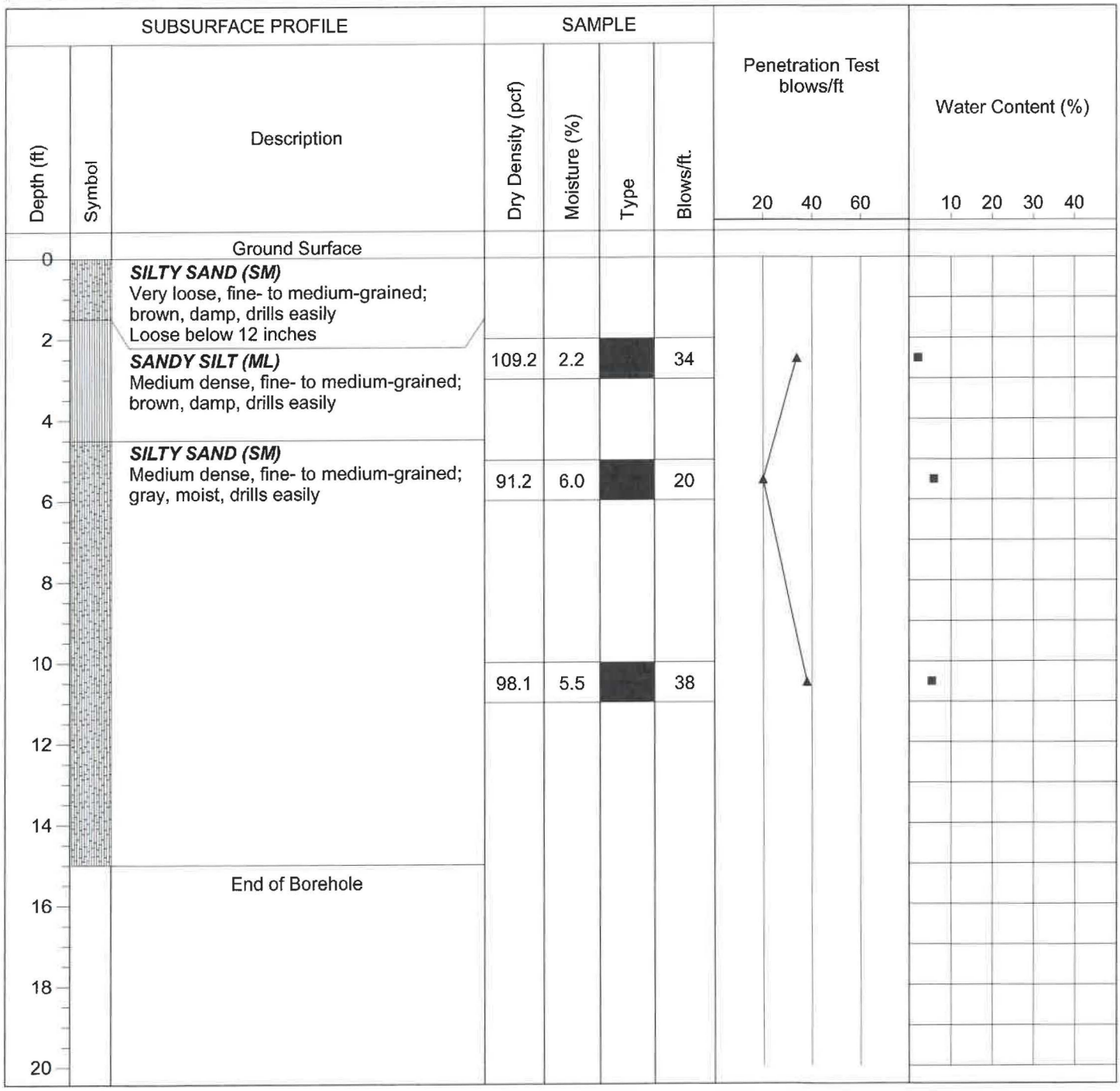
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/14/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B19

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-19

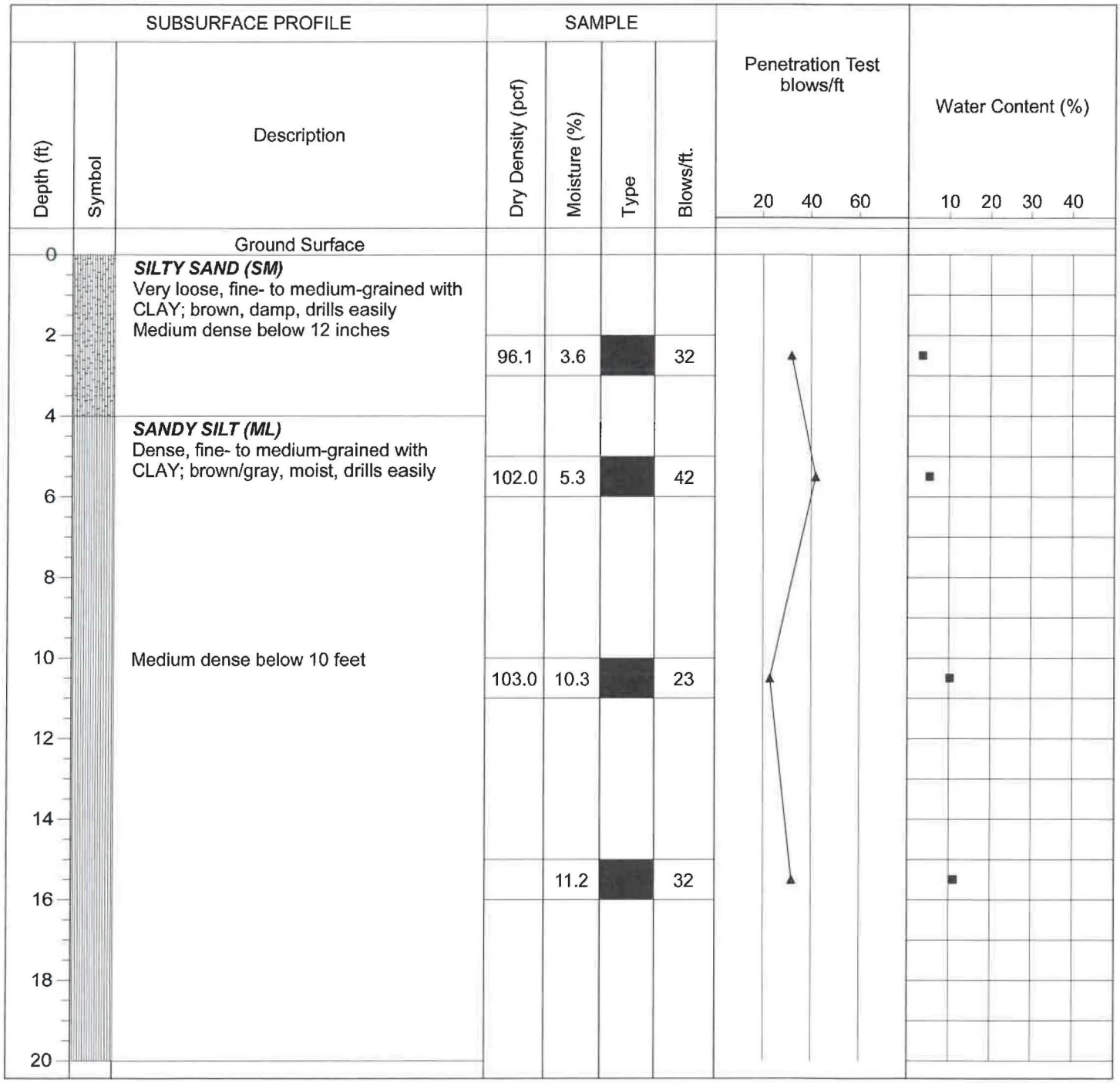
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/14/25

Hole Size: 6 Inches

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B20

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-20

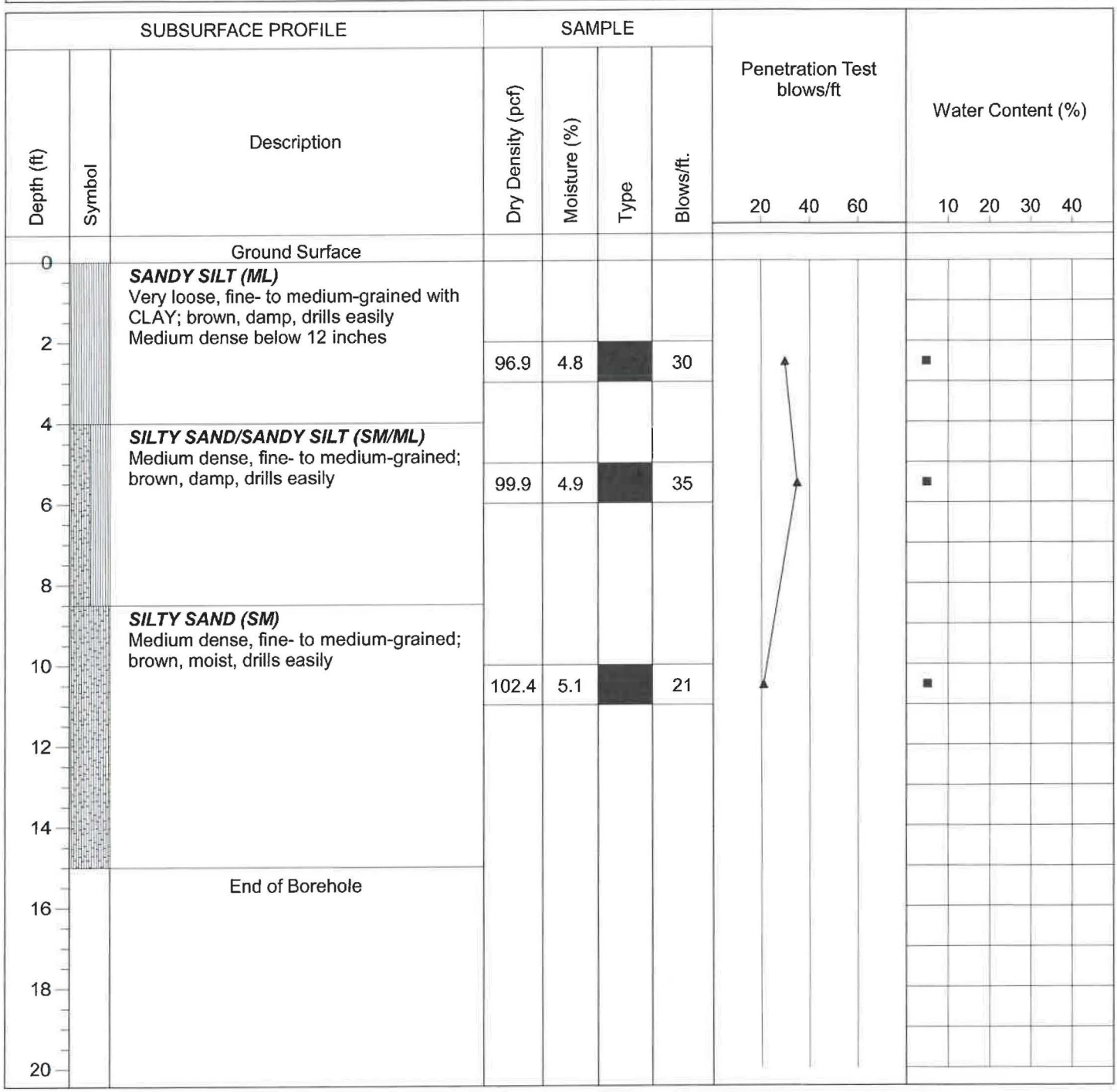
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/14/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B21

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-21

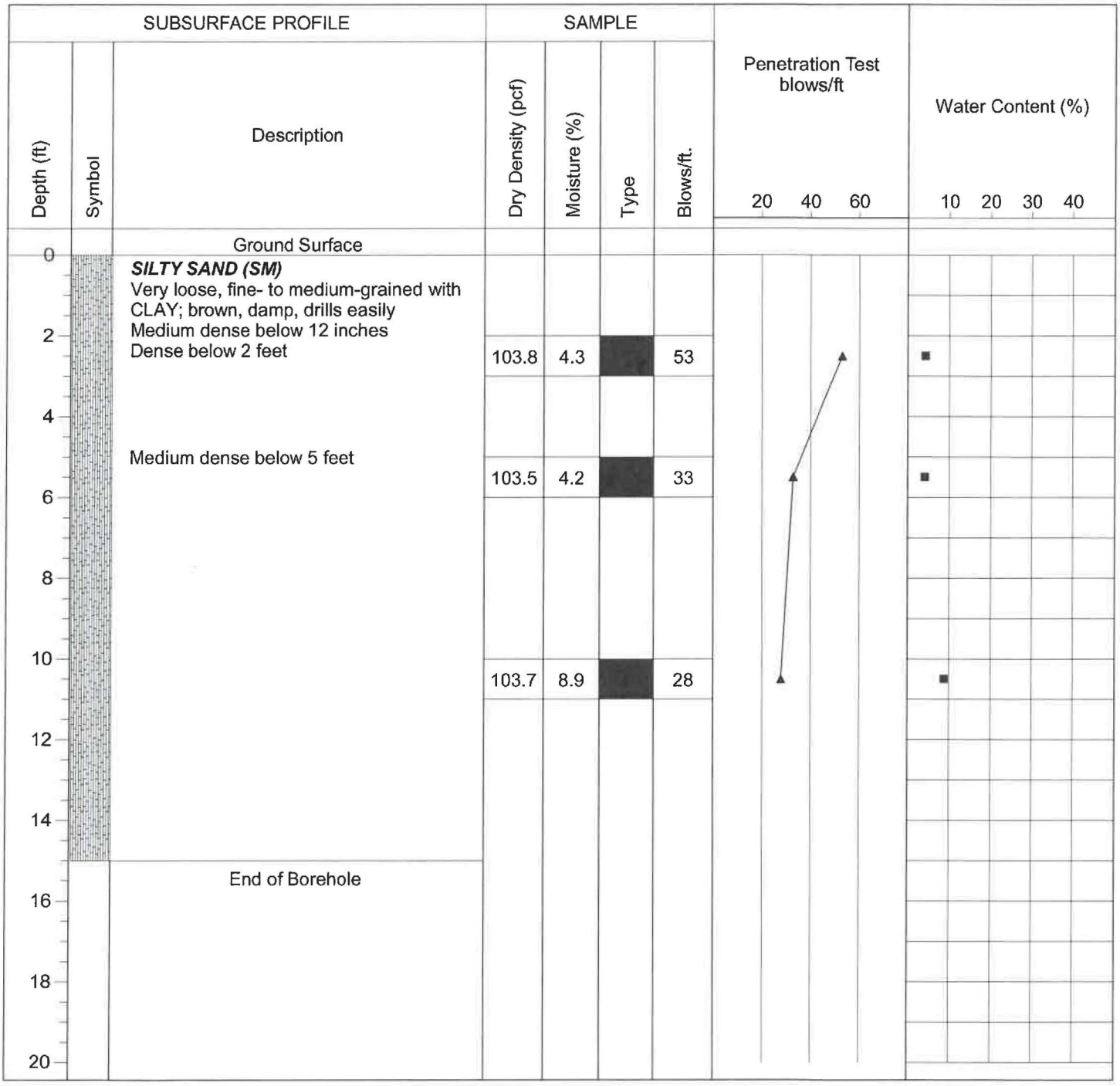
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/14/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B22

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-22

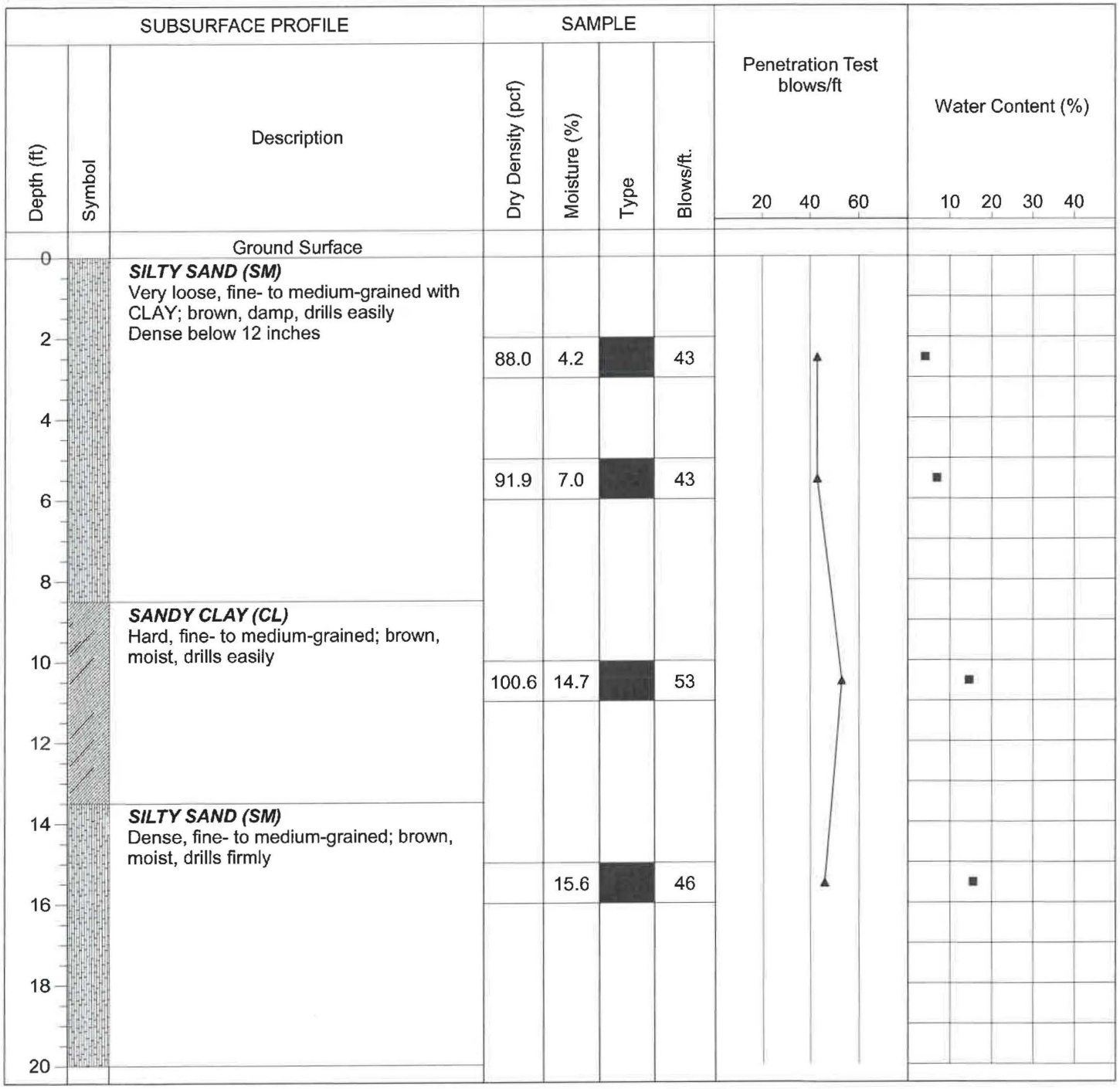
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/14/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B23

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-23

Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
0		***SILTY SAND (SM)*** Very loose, fine- to medium-grained; brown, damp, drills easily				
2		Medium dense below 12 inches	96.2	3.0		44
2		Dense below 2 feet				
6			97.6	5.2		46
10		With CLAY below 10 feet	103.3	10.4		58
16		End of Borehole				

Penetration Test blows/ft: 20, 40, 60

Water Content (%): 10, 20, 30, 40

Drill Method: Hollow Stem

Drill Date: 5/14/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B24

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-24

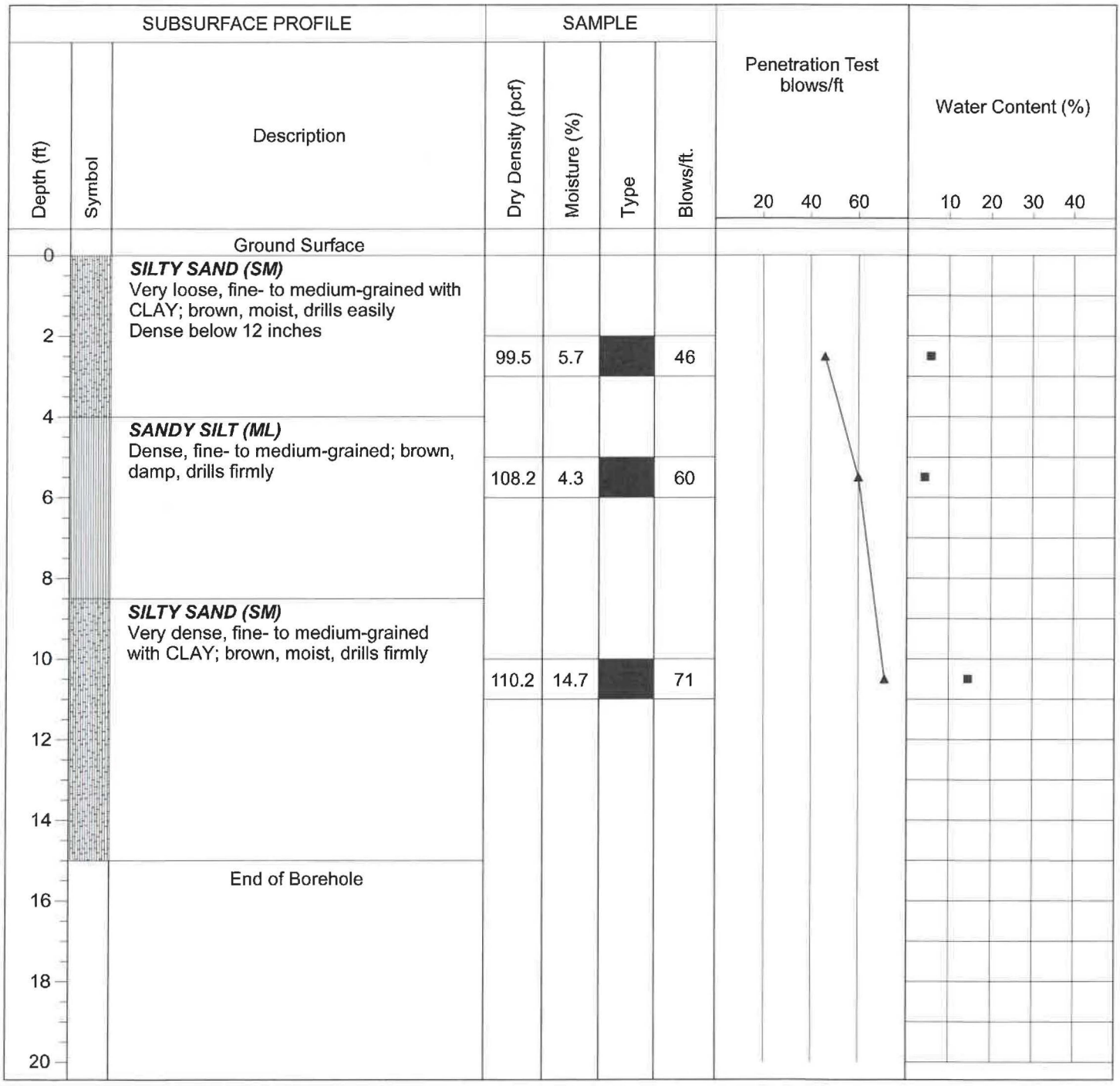
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/15/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B25

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-25

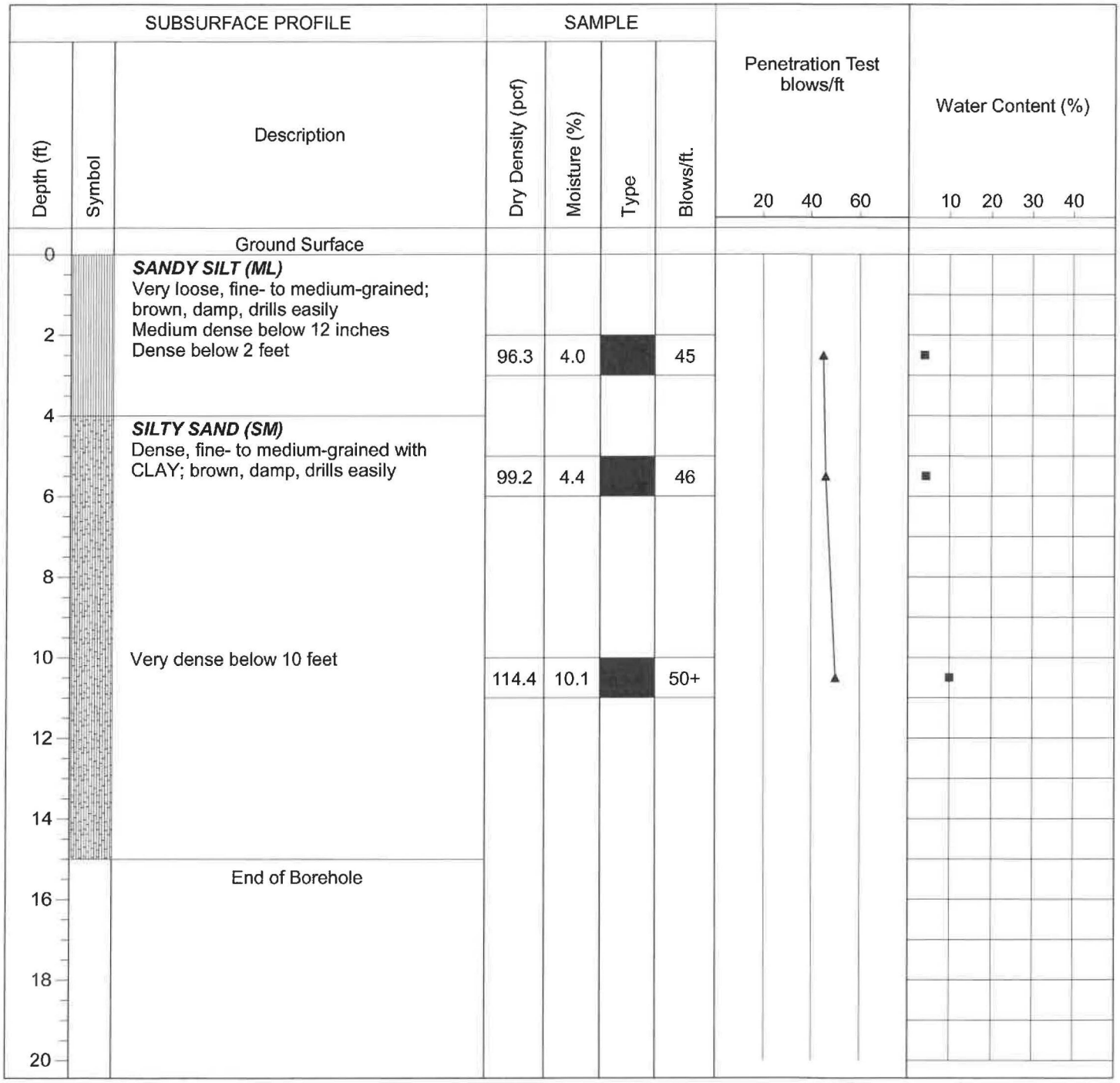
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 5/14/25

Drill Rig: Mobile B-80

Krazan and Associates

Hole Size: 6 Inches

Driller: David Lopez

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B26

Project: Retail Development

Project No: 022-25058

Client: Landmark Surveying & Engineering

Figure No.: A-26

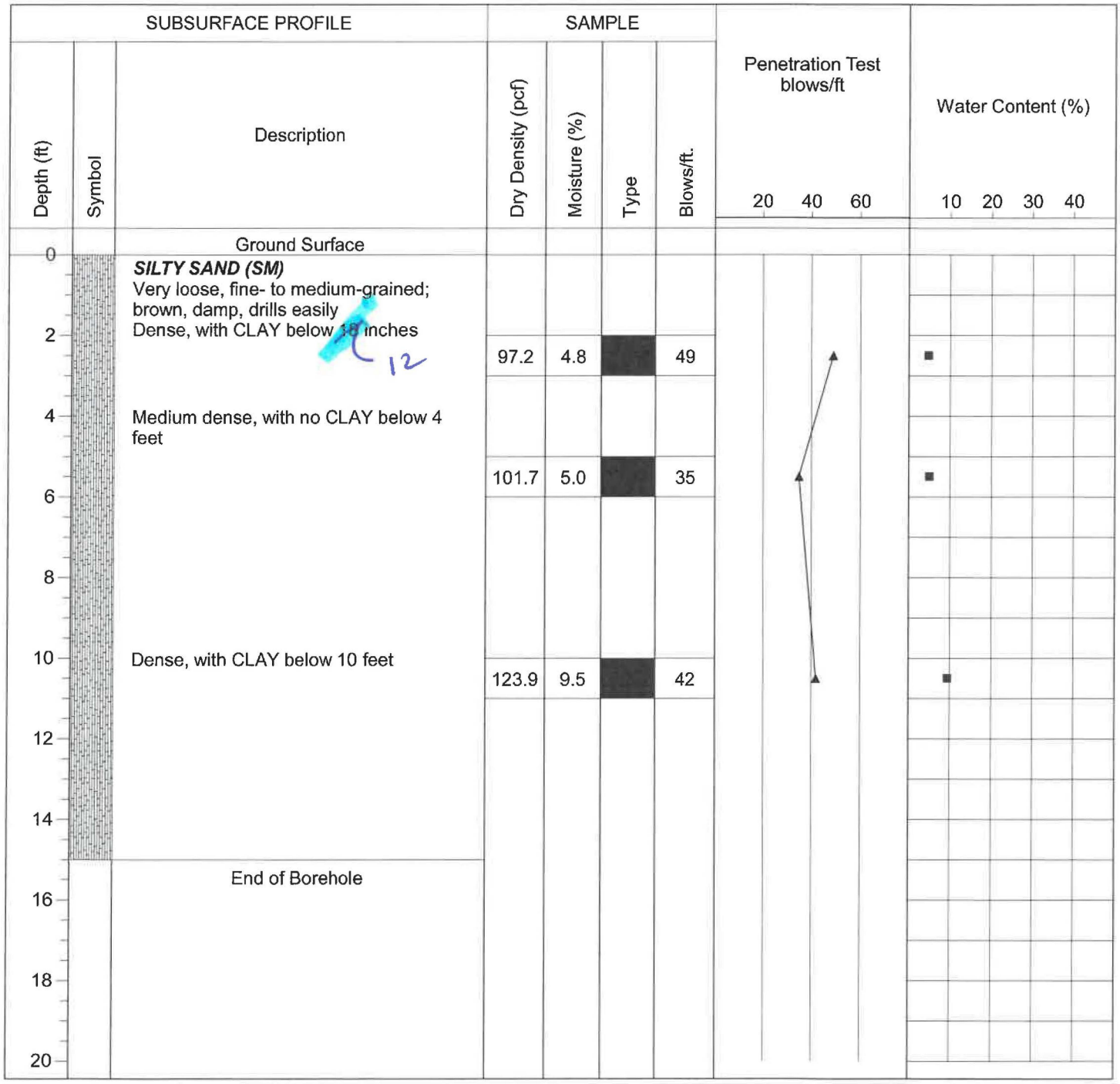
Location: SWC of 7th Standard Road and Calloway Drive, Bakersfield, CA

Logged By: Dave Adams

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Rig: Mobile B-80

Driller: David Lopez

Krazan and Associates

Drill Date: 5/24/25

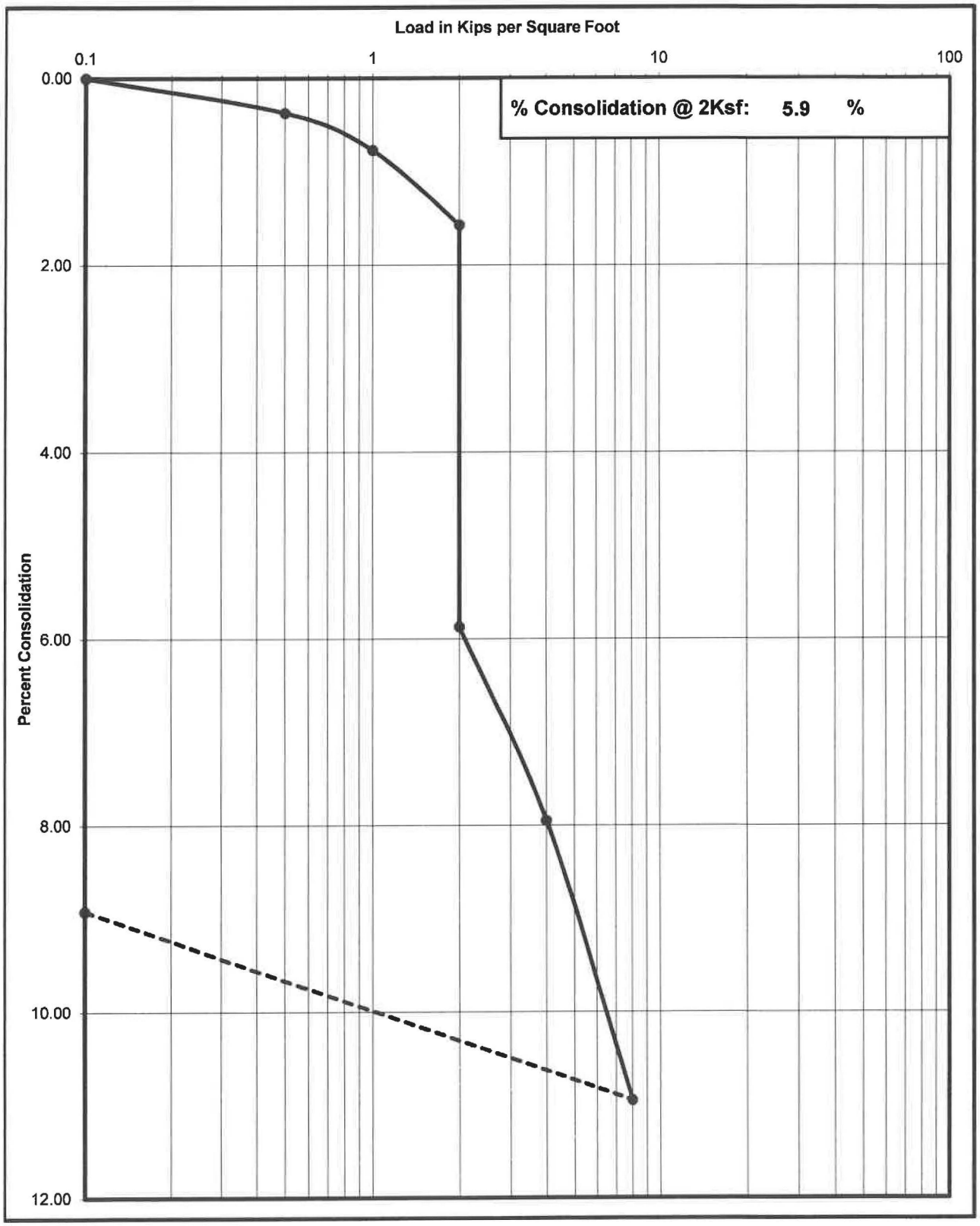
Hole Size: 6 Inches

Elevation: 15 Feet

Sheet: 1 of 1

Consolidation Test

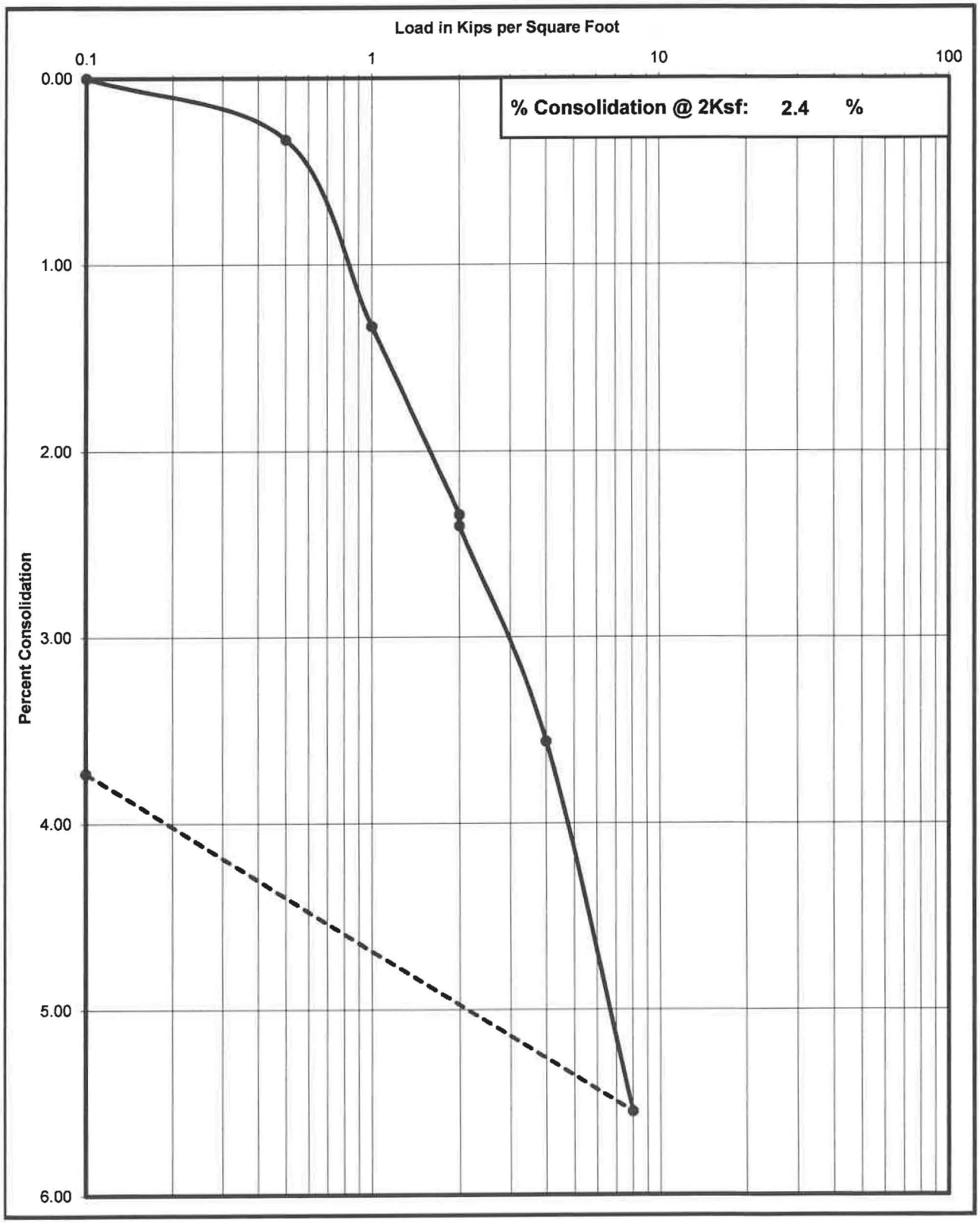
Project No	Boring No. & Depth	Date	Soil Classification
022-25058	B3 @ 2-3'	5/15/2025	ML



Krazan Testing Laboratory

Consolidation Test

Project No	Boring No. & Depth	Date	Soil Classification
022-25058	B3 @ 5-6'	5/15/2025	SM/ML



Krazan Testing Laboratory

Consolidation Test

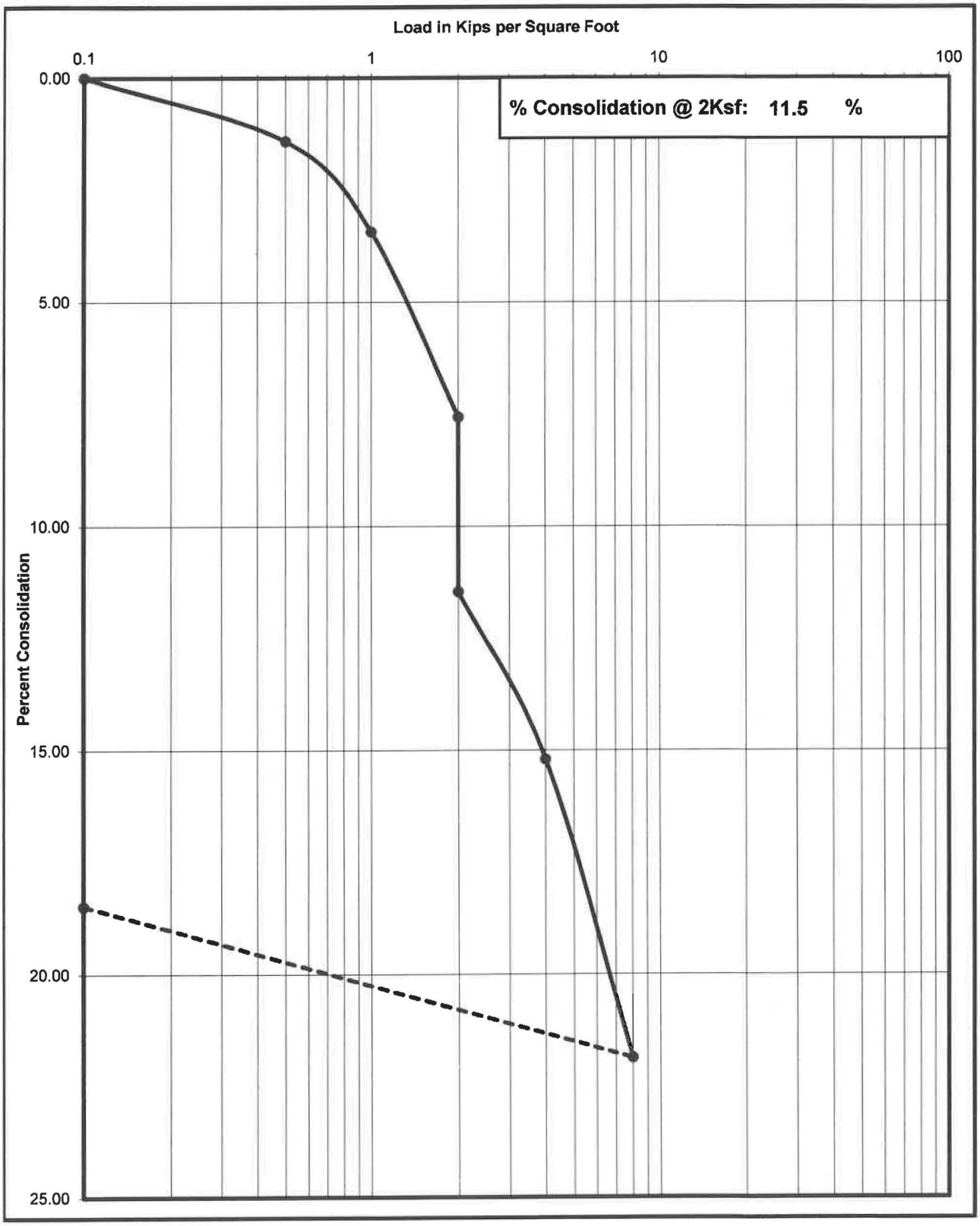
Project No	Boring No. & Depth	Date	Soil Classification
022-25058	B8 @ 2-3'	5/15/2025	SM/ML



Krazan Testing Laboratory

Consolidation Test

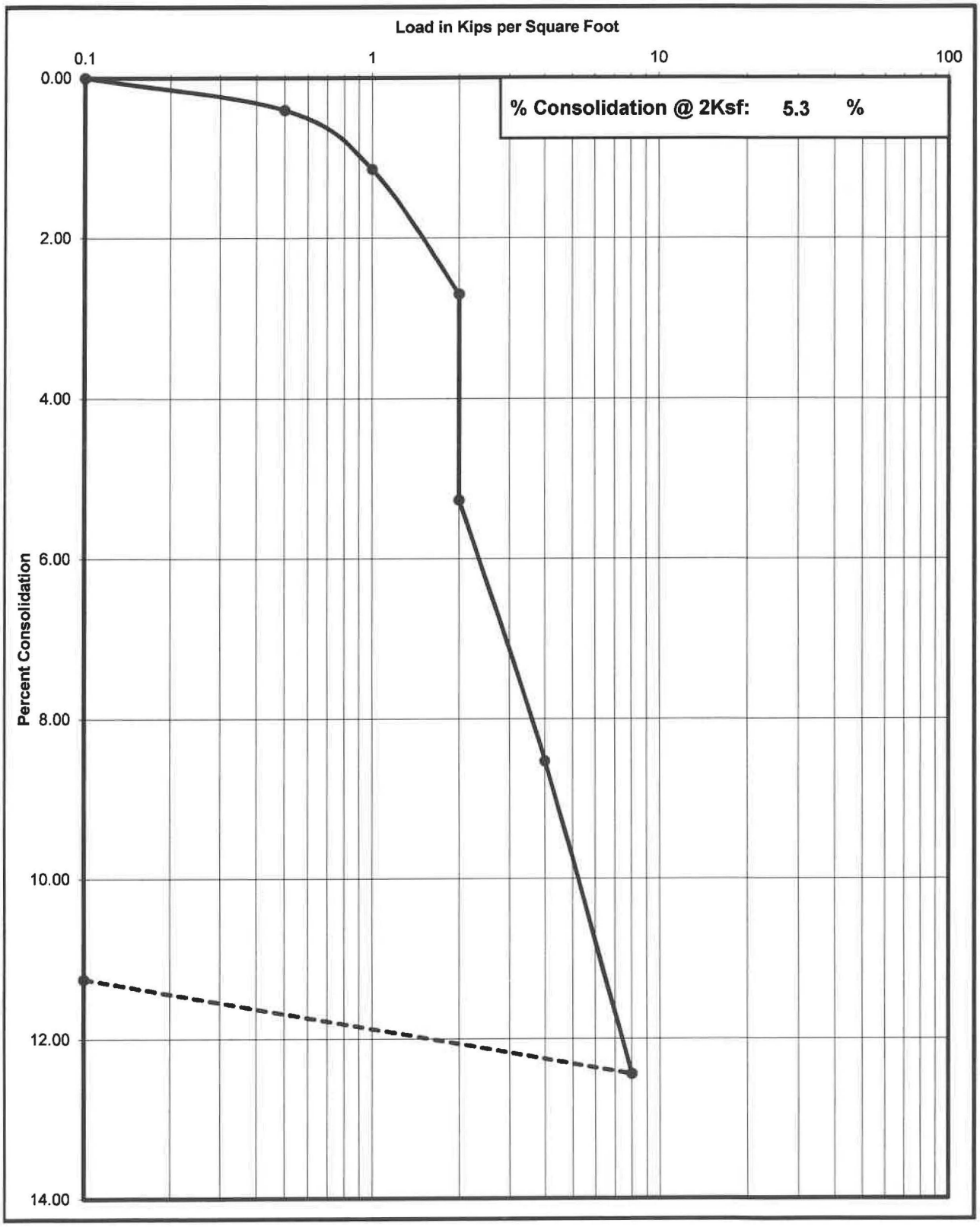
Project No	Boring No. & Depth	Date	Soil Classification
022-25058	B8 @ 5-6'	5/15/2025	SM/ML



Krazan Testing Laboratory

Consolidation Test

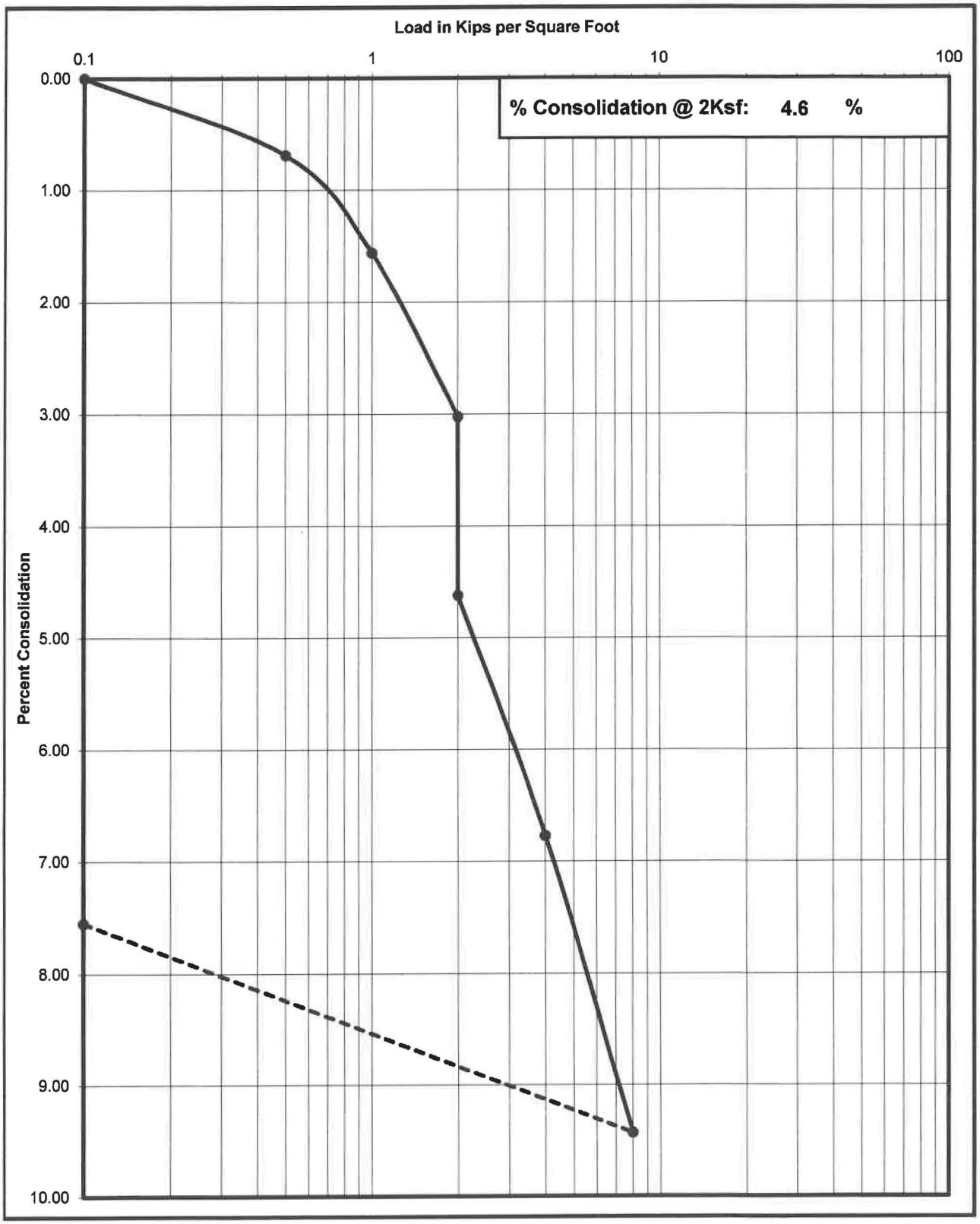
Project No	Boring No. & Depth	Date	Soil Classification
022-25058	B20 @ 2-3'	5/23/2025	ML w/ clay



Krazan Testing Laboratory

Consolidation Test

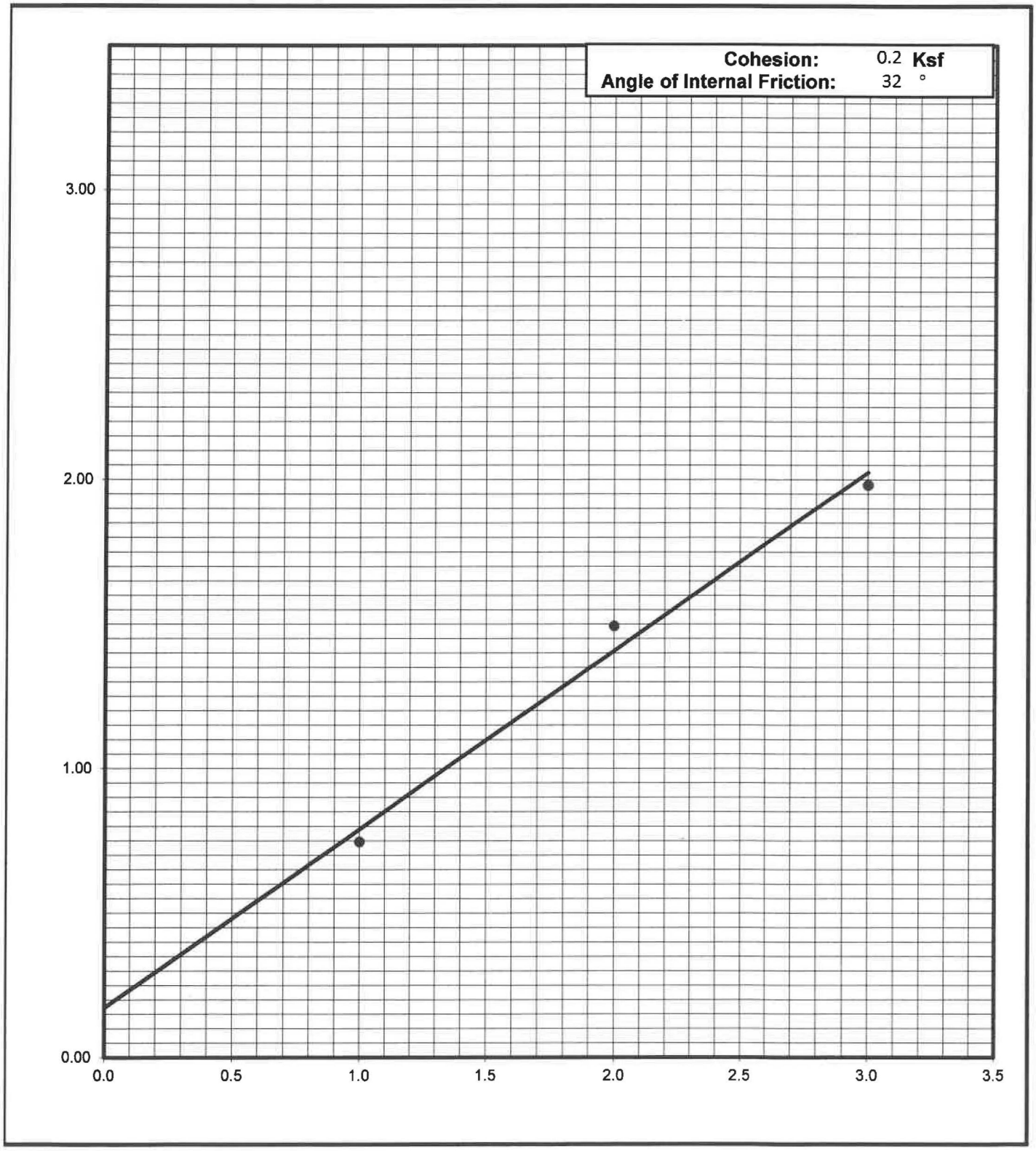
Project No	Boring No. & Depth	Date	Soil Classification
022-25058	B20 @ 5-6'	5/23/2025	SM/ML



Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

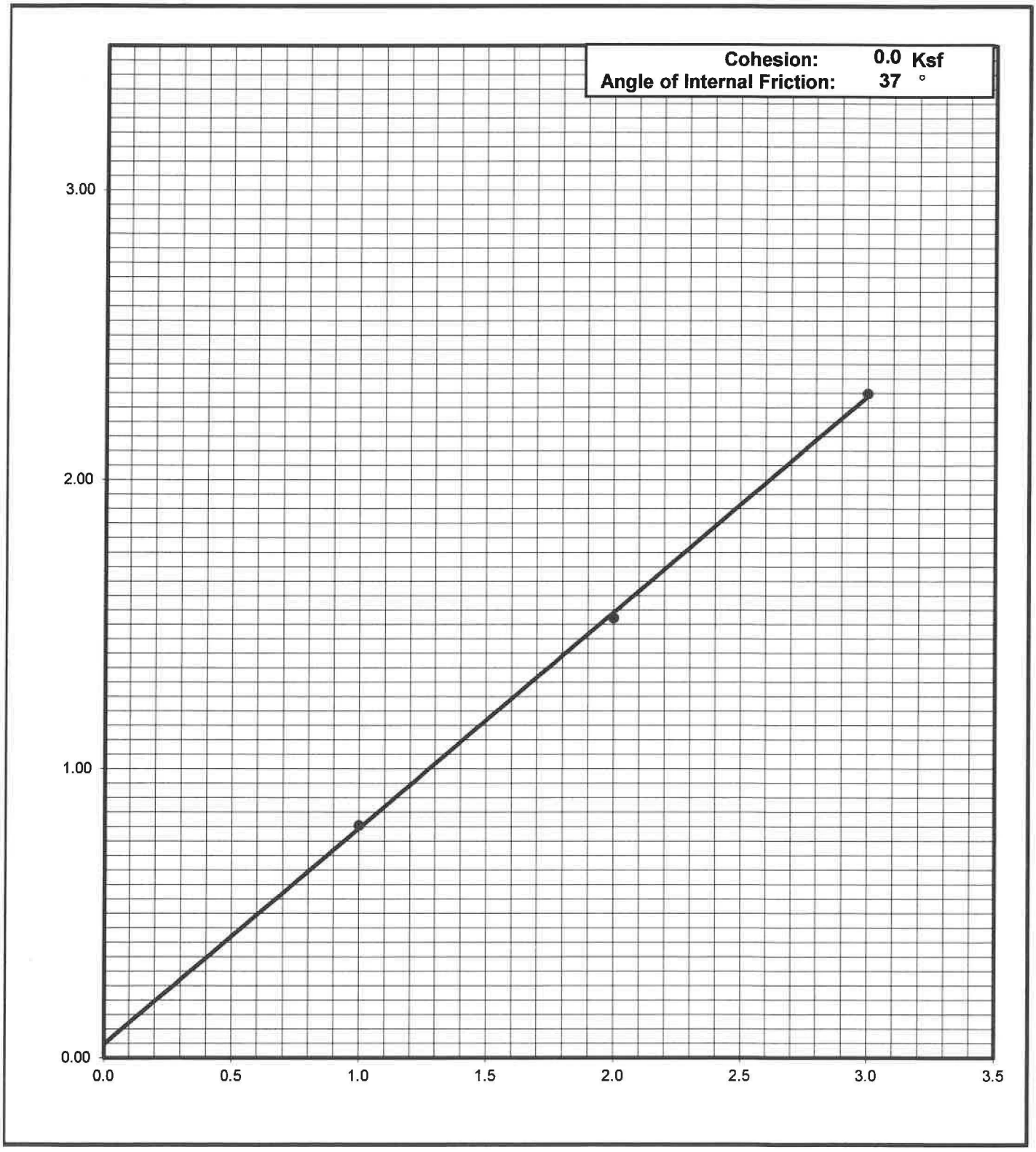
Project Number	Boring No. & Depth	Soil Type	Date
022-25058	B1 @ 2-3'	SM/SC	5/15/2025



Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

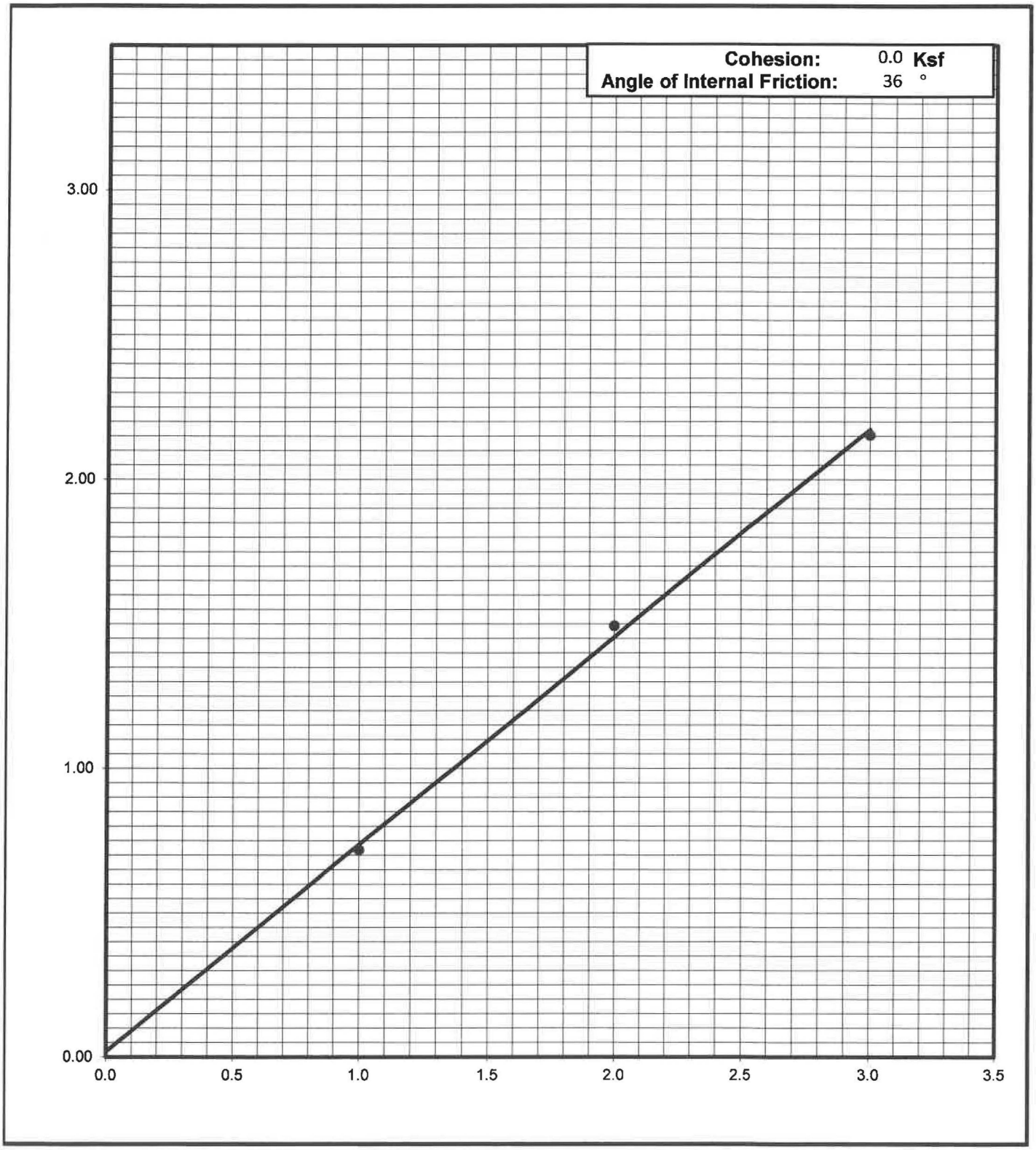
Project Number	Boring No. & Depth	Soil Type	Date
022-25058	B13 @ 5-6'	SM w/ clay	5/23/2025



Krazan Testing Laboratory

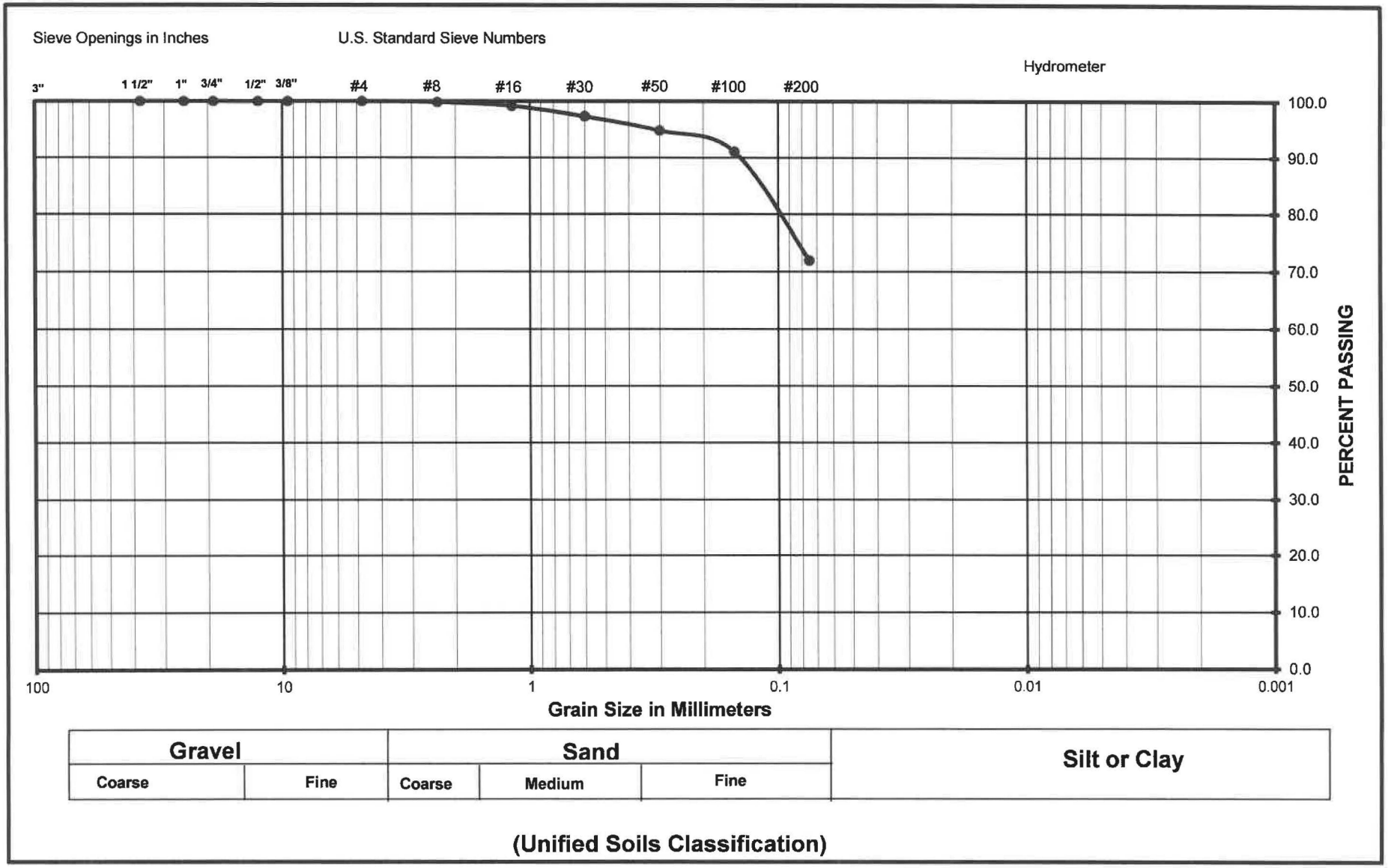
Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
022-25058	B22 @ 2-3'	SM w/ clay	5/23/2025



Krazan Testing Laboratory

Grain Size Analysis

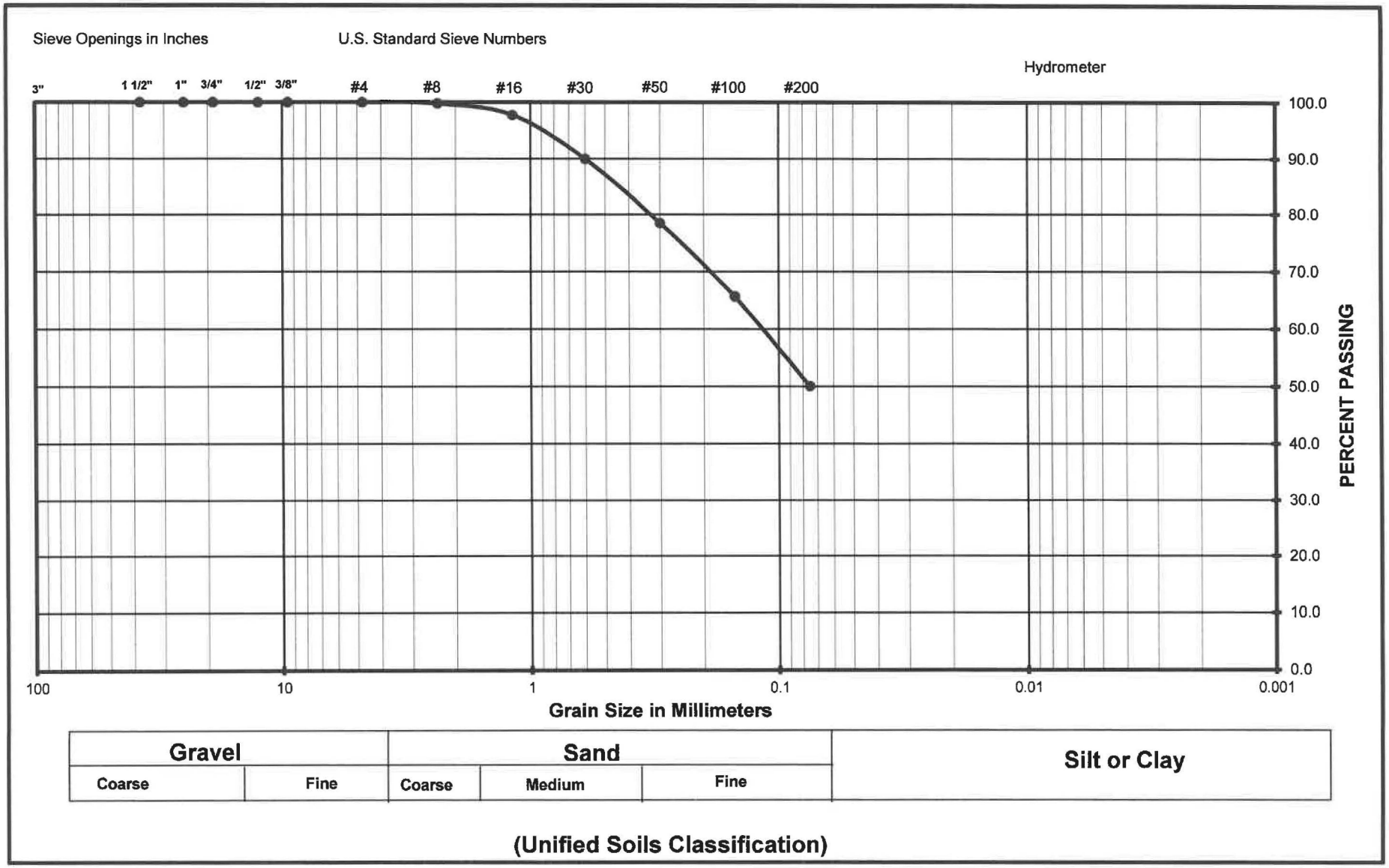


(Unified Soils Classification)

Project Name	Retail Development
Project Number	022-25058
Soil Classification	ML
Sample Number	B3 @ 2-3'

Krazan Testing Laboratory

Grain Size Analysis



(Unified Soils Classification)

Project Name	Retail Development
Project Number	022-25058
Soil Classification	SM/ML
Sample Number	B8 @ 2-3'

Krazan Testing Laboratory

Grain Size Analysis



(Unified Soils Classification)

Project Name	Retail Development
Project Number	022-25058
Soil Classification	ML w/ clay
Sample Number	B20 @ 2-3'

Krazan Testing Laboratory

Expansion Index Test

ASTM D - 4829

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 7/11/2025
Sample location/ Depth	: #1 @ 1-2'
Sample Number	: 223726-1
Soil Classification	: SM/SC

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	781.9		
Weight of Mold, gms	367.3		
Weight of Soil, gms	414.6		
Wet Density, Lbs/cu.ft.	125.0		
Weight of Moisture Sample (Wet), gms	200.0		
Weight of Moisture Sample (Dry), gms	184.5		
Moisture Content, %	8.4		
Dry Density, Lbs/cu.ft.	115.3		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	49.2		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	0	--	--	--	--	0.0284

Expansion Index $_{measured}$ = 28.4

Expansion Index = **28**

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Krazan Testing Laboratory

Expansion Index Test

ASTM D - 4829

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 7/11/2025
Sample location/ Depth	: #2 @ 1-2'
Sample Number	: 223726-2
Soil Classification	: SM

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	795.0		
Weight of Mold, gms	366.1		
Weight of Soil, gms	428.9		
Wet Density, Lbs/cu.ft.	129.4		
Weight of Moisture Sample (Wet), gms	200.0		
Weight of Moisture Sample (Dry), gms	186.2		
Moisture Content, %	7.4		
Dry Density, Lbs/cu.ft.	120.4		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	50.1		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	0	--	--	--	--	0.0023

Expansion Index $_{measured}$ = 2.3

Expansion Index = **2**

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Krazan Testing Laboratory

Expansion Index Test

ASTM D - 4829

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 7/10/2025
Sample location/ Depth	: #3 @ 1-2'
Sample Number	: 223726-3
Soil Classification	: SC/SM

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	786.2		
Weight of Mold, gms	367.4		
Weight of Soil, gms	418.8		
Wet Density, Lbs/cu.ft.	126.3		
Weight of Moisture Sample (Wet), gms	200.0		
Weight of Moisture Sample (Dry), gms	185.2		
Moisture Content, %	8.0		
Dry Density, Lbs/cu.ft.	117.0		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	49.0		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	0	--	--	--	--	0.0246

Expansion Index $_{measured}$ = 24.6

Expansion Index = 25

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Krazan Testing Laboratory

Expansion Index Test

ASTM D - 4829

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 7/11/2025
Sample location/ Depth	: #4 @ 1-2'
Sample Number	: 223726-4
Soil Classification	: SM/SC

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	776.9		
Weight of Mold, gms	366.5		
Weight of Soil, gms	410.4		
Wet Density, Lbs/cu.ft.	123.8		
Weight of Moisture Sample (Wet), gms	200.0		
Weight of Moisture Sample (Dry), gms	183.6		
Moisture Content, %	8.9		
Dry Density, Lbs/cu.ft.	113.6		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	50.0		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	0	--	--	--	--	0.0258

Expansion Index $_{measured}$ = 25.8

Expansion Index = **26**

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Krazan Testing Laboratory

Expansion Index Test

ASTM D - 4829

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 7/11/2025
Sample location/ Depth	: #5 @ 1-2'
Sample Number	: 223726-5
Soil Classification	: SM

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	788.3		
Weight of Mold, gms	367.1		
Weight of Soil, gms	421.2		
Wet Density, Lbs/cu.ft.	127.0		
Weight of Moisture Sample (Wet), gms	200.0		
Weight of Moisture Sample (Dry), gms	185.1		
Moisture Content, %	8.0		
Dry Density, Lbs/cu.ft.	117.6		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	50.2		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	0	--	--	--	--	0.0097

Expansion Index $_{measured}$ = 9.7

Expansion Index = **10**

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Krazan Testing Laboratory

Expansion Index Test

ASTM D - 4829

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 7/11/2025
Sample location/ Depth	: #6 @ 1-2'
Sample Number	: 223726-6
Soil Classification	: SM

Trial #	**1**	**2**	**3**
Weight of Soil & Mold, gms	788.3		
Weight of Mold, gms	366.2		
Weight of Soil, gms	422.1		
Wet Density, Lbs/cu.ft.	127.3		
Weight of Moisture Sample (Wet), gms	200.0		
Weight of Moisture Sample (Dry), gms	185.6		
Moisture Content, %	7.8		
Dry Density, Lbs/cu.ft.	118.1		
Specific Gravity of Soil	2.7		
Degree of Saturation, %	49.2		

Time	Inital	30 min	1 hr	6hrs	12 hrs	24 hrs
Dial Reading	0	--	--	--	--	0.0071

Expansion Index $_{measured}$ = 7.1

Expansion Index = **7**

Expansion Potential Table	
Exp. Index	Potential Exp.
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Krazan Testing Laboratory

Soil Permeability

Constant Head

ASTM D-2434 / Cal 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/15/2025
Sample Number	: -
Sample Location	: B12 @ 15-16'
Soil Classification	: SM

Max Dry Density	--	lb/cu.ft	Relative Density	--	Max. Particle Size	--
Optimum Moisture	--	%	%Over Optimum	--	% Passing 3/8"	--
Sample Dry Density	121.9	lb/cu.ft	Sample Diameter	7.6	% Passing # 10	--
Sample Moisture	4.5	%	Sample Length,cm	7.5	% Passing # 200	13.4
Sample Compaction	--	%	Sample Area sq.cm	45.4	Temperature	20.0
Comp. Procedure	Remolded to approximate In-Situ density				Type of Permeant	Tap Water

Test	Time sec	H1 cm	H2 cm	Flow Q
1	120	68	7.0	36.0
2	150	65	6.0	43.0
3	180	64	5.0	52.0
4				
5				
6				

Test	Time sec	Head Const.	Flow Q	K cm/sec	k20 cm/sec
1	120	61.0	36.0	8.12E-04	8.125E-04
2	150	59.0	43.0	8.03E-04	8.027E-04
3	180	59.0	52.0	8.09E-04	8.089E-04
4					
5					
6					

Permeability
8.1E-04 cm/sec
2.28232 ft/day
833.05 ft/year

Krazan Testing Laboratory

Soil Permeability

Flexible Wall, Falling Head (Rising Tail)

ASTM D - 5084 / CAL 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/14/2025
Sample Number	: -
Sample Location	: B12 @ 20-21'
Soil Classification	: CL

Max Dry Density, lbs/cu.ft	--	Degree of Sat. %		Max. Particle Size	0.0
Optimum Moisture, %	--	%Over Optimum		% Passing 3/8"	--
Initial Dry Density, lbs/cu.ft	107.9	Initial Diameter, cm	3.56	% Passing # 10	--
Initial Moisture, %	16.5	Initial Length,cm	7.11	% Passing # 200	60.2
Sample Compaction, %	--	Initial Area sq.cm	9.95	Temperature	20.0
Final Dry Density, lbs/cu.ft	--	Final Diameter, cm	3.56	Type of Permeant	Tap Water
Final Moisture, %	--	Final Length, cm	7.11	$\Delta\mu$ (Pore Pressure)	5.0
Specific Gravity (Assumed)	2.7	Final Area, sq.cm	9.95	$\Delta\sigma$ (Cell Pressure)	5.0
Comp. Procedure	Undisturbed			$\Delta\mu/\Delta\sigma$ (**B** Value)	1.00

Test	Start Time	Finish Time	H in Start	H in Final	H out Start	H out Final	Back Press	Tail Press.	Cell Press
1	6:05	6:46	0.18	0.52	9.54	9.20	30.5	27.2	31.5
2	6:46	7:40	0.52	0.96	9.20	8.76	30.5	27.2	31.5
3									
4									
5									
6									

Test	Time sec	h1/h2	K cm/sec	k20 cm/sec
1	2460	0.98275	6.6E-07	6.647E-07
2	3240	0.97728	6.7E-07	6.664E-07
3				
4				
5				
6				

Permeability
6.66E-07 cm/sec
6.66E-09 m/sec

Krazan Testing Laboratory

Soil Permeability

Flexible Wall, Falling Head (Rising Tail)

ASTM D - 5084 / CAL 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/13/2025
Sample Number	: -
Sample Location	: B12 @ 50-51'
Soil Classification	: SM

Max Dry Density, lbs/cu.ft	--	Degree of Sat. %		Max. Particle Size	0.0
Optimum Moisture, %	--	%Over Optimum		% Passing 3/8"	--
Initial Dry Density, lbs/cu.ft	106.6	Initial Diameter, cm	3.56	% Passing # 10	--
Initial Moisture, %	11.0	Initial Length,cm	7.11	% Passing # 200	31.2
Sample Compaction, %	--	Initial Area sq.cm	9.95	Temperature	20.0
Final Dry Density, lbs/cu.ft	--	Final Diameter, cm	3.56	Type of Permeant	Tap Water
Final Moisture, %	--	Final Length, cm	7.11	Δμ (Pore Pressure)	5.0
Specific Gravity (Assumed)	2.7	Final Area, sq.cm	9.95	Δσ (Cell Pressure)	5.0
Comp. Procedure	Undisturbed			Δμ/Δσ (**B** Value)	1.00

Test	Start Time	Finish Time	H in Start	H in Final	H out Start	H out Final	Back Press	Tail Press.	Cell Press
1	5:44	6:05	0.38	6.12	9.74	4.00	19.5	18.0	20.5
2	6:08	6:34	0.44	6.88	9.70	3.26	19.5	18.0	20.5
3	6:38	7:09	0.40	7.42	9.64	2.62	19.5	18.0	20.5
4									
5									
6									

Test	Time sec	h1/h2	K cm/sec	k20 cm/sec
1	1260	0.42555	6.4E-05	6.372E-05
2	1560	0.35263	6.3E-05	6.278E-05
3	1860	0.29154	6.2E-05	6.227E-05
4				
5				
6				

Permeability
6.29E-05 cm/sec
6.29E-07 m/sec

Krazan Testing Laboratory

Soil Permeability

Flexible Wall, Falling Head (Rising Tail)

ASTM D - 5084 / CAL 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/23/2025
Sample Number	: -
Sample Location	: B13 @ 15-16'
Soil Classification	: ML w/ clay

Max Dry Density, lbs/cu.ft	--	Degree of Sat. %		Max. Particle Size	0.0
Optimum Moisture, %	--	%Over Optimum		% Passing 3/8"	--
Initial Dry Density, lbs/cu.ft	115.9	Initial Diameter, cm	3.56	% Passing # 10	--
Initial Moisture, %	13.3	Initial Length,cm	7.11	% Passing # 200	67.3
Sample Compaction, %	--	Initial Area sq.cm	9.95	Temperature	20.0
Final Dry Density, lbs/cu.ft	--	Final Diameter, cm	3.56	Type of Permeant	Tap Water
Final Moisture, %	--	Final Length, cm	7.11	$\Delta\mu$ (Pore Pressure)	5.0
Specific Gravity (Assumed)	2.7	Final Area, sq.cm	9.95	$\Delta\sigma$ (Cell Pressure)	5.0
Comp. Procedure	Undisturbed			$\Delta\mu/\Delta\sigma$ (**B** Value)	1.00

Test	Start Time	Finish Time	H in Start	H in Final	H out Start	H out Final	Back Press	Tail Press.	Cell Press
1	5:15	5:42	0.30	0.56	9.22	8.96	35.0	31.8	36.0
2	5:42	6:27	0.56	0.98	8.96	8.54	35.0	31.8	36.0
3									
4									
5									
6									

Test	Time sec	h1/h2	K cm/sec	k20 cm/sec
1	1620	0.98623	8.0E-07	8.041E-07
2	2700	0.97745	7.9E-07	7.938E-07
3				
4				
5				
6				

Permeability
7.99E-07 cm/sec
7.99E-09 m/sec

Krazan Testing Laboratory

Soil Permeability

Flexible Wall, Falling Head (Rising Tail)

ASTM D - 5084 / CAL 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/22/2025
Sample Number	: -
Sample Location	: B13 @ 25-26'
Soil Classification	: SC/CL

Max Dry Density, lbs/cu.ft	--	Degree of Sat. %		Max. Particle Size	0.0
Optimum Moisture, %	--	%Over Optimum		% Passing 3/8"	--
Initial Dry Density, lbs/cu.ft	116.7	Initial Diameter, cm	3.56	% Passing # 10	--
Initial Moisture, %	14.8	Initial Length,cm	7.11	% Passing # 200	--
Sample Compaction, %	--	Initial Area sq.cm	9.95	Temperature	20.0
Final Dry Density, lbs/cu.ft	--	Final Diameter, cm	3.56	Type of Permeant	Tap Water
Final Moisture, %	--	Final Length, cm	7.11	$\Delta\mu$ (Pore Pressure)	5.0
Specific Gravity (Assumed)	2.7	Final Area, sq.cm	9.95	$\Delta\sigma$ (Cell Pressure)	5.0
Comp. Procedure	Undisturbed			$\Delta\mu/\Delta\sigma$ (**B** Value)	1.00

Test	Start Time	Finish Time	H in Start	H in Final	H out Start	H out Final	Back Press	Tail Press.	Cell Press
1	4:30	5:15	0.22	0.86	9.84	9.20	30.2	27.6	31.2
2	5:15	5:58	0.86	1.44	9.20	8.62	30.2	27.6	31.2
3									
4									
5									
6									

Test	Time sec	h1/h2	K cm/sec	k20 cm/sec
1	2700	0.96028	1.4E-06	1.41E-06
2	2580	0.96252	1.4E-06	1.391E-06
3				
4				
5				
6				

Permeability
1.40E-06 cm/sec
1.4E-08 m/sec

Krazan Testing Laboratory

Soil Permeability

Constant Head

ASTM D-2434 / Cal 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/23/2025
Sample Number	: -
Sample Location	: B13 @ 30-31'
Soil Classification	: SP

Max Dry Density	--	lb/cu.ft	Relative Density	--	Max. Particle Size	--
Optimum Moisture	--	%	%Over Optimum	--	% Passing 3/8"	--
Sample Dry Density	106.6	lb/cu.ft	Sample Diameter	7.6	% Passing # 10	--
Sample Moisture	2.0	%	Sample Length,cm	7.5	% Passing # 200	4.7
Sample Compaction	--	%	Sample Area sq.cm	45.4	Temperature	20.0
Comp. Procedure	Remolded to approximate In-Situ density				Type of Permeant	Tap Water

Test	Time sec	H1 cm	H2 cm	Flow Q
1	30	64	44.0	224.0
2	35	62	41.0	266.0
3	35	61	40.0	271.0
4				
5				
6				

Test	Time sec	Head Const.	Flow Q	K cm/sec	k20 cm/sec
1	30	20.0	224.0	6.17E-02	6.167E-02
2	35	21.0	266.0	5.98E-02	5.979E-02
3	35	21.0	271.0	6.09E-02	6.091E-02
4					
5					
6					

Permeability
6.1E-02 cm/sec
171.7114 ft/day
62674.65 ft/year

Krazan Testing Laboratory

Soil Permeability

Flexible Wall, Falling Head (Rising Tail)

ASTM D - 5084 / CAL 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/21/2025
Sample Number	: -
Sample Location	: B14 @ 20-21'
Soil Classification	: SM/ML

Max Dry Density, lbs/cu.ft	--	Degree of Sat. %		Max. Particle Size	0.0
Optimum Moisture, %	--	%Over Optimum		% Passing 3/8"	--
Initial Dry Density, lbs/cu.ft	90.6	Initial Diameter, cm	3.56	% Passing # 10	--
Initial Moisture, %	8.8	Initial Length,cm	7.11	% Passing # 200	46.4
Sample Compaction, %	--	Initial Area sq.cm	9.95	Temperature	20.0
Final Dry Density, lbs/cu.ft	--	Final Diameter, cm	3.56	Type of Permeant	Tap Water
Final Moisture, %	--	Final Length, cm	7.11	$\Delta\mu$ (Pore Pressure)	5.0
Specific Gravity (Assumed)	2.7	Final Area, sq.cm	9.95	$\Delta\sigma$ (Cell Pressure)	5.0
Comp. Procedure	Undisturbed			$\Delta\mu/\Delta\sigma$ (**B** Value)	1.00

Test	Start Time	Finish Time	H in Start	H in Final	H out Start	H out Final	Back Press	Tail Press.	Cell Press
1	4:55	5:30	0.46	1.02	9.70	9.14	22.5	20.8	23.5
2	5:30	6:30	1.02	1.94	9.14	8.22	22.5	20.8	23.5
3	6:30	7:27	1.94	2.72	8.22	7.44	22.5	20.8	23.5
4									
5									
6									

Test	Time sec	h1/h2	K cm/sec	k20 cm/sec
1	2100	0.94926	2.3E-06	2.33E-06
2	3600	0.91218	2.4E-06	2.399E-06
3	3420	0.91838	2.3E-06	2.339E-06
4				
5				
6				

Permeability
2.36E-06 cm/sec
2.36E-08 m/sec

Krazan Testing Laboratory

Soil Permeability

Flexible Wall, Falling Head (Rising Tail)

ASTM D - 5084 / CAL 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/20/2025
Sample Number	: -
Sample Location	: B14 @ 25-26'
Soil Classification	: SC

Max Dry Density, lbs/cu.ft	--	Degree of Sat. %		Max. Particle Size	0.0
Optimum Moisture, %	--	%Over Optimum		% Passing 3/8"	--
Initial Dry Density, lbs/cu.ft	100.5	Initial Diameter, cm	3.56	% Passing # 10	--
Initial Moisture, %	13.9	Initial Length,cm	7.11	% Passing # 200	34.2
Sample Compaction, %	--	Initial Area sq.cm	9.95	Temperature	20.0
Final Dry Density, lbs/cu.ft	--	Final Diameter, cm	3.56	Type of Permeant	Tap Water
Final Moisture, %	--	Final Length, cm	7.11	$\Delta\mu$ (Pore Pressure)	5.0
Specific Gravity (Assumed)	2.7	Final Area, sq.cm	9.95	$\Delta\sigma$ (Cell Pressure)	5.0
Comp. Procedure	Undisturbed			$\Delta\mu/\Delta\sigma$ (**B** Value)	1.00

Test	Start Time	Finish Time	H in Start	H in Final	H out Start	H out Final	Back Press	Tail Press.	Cell Press
1	5:15	6:30	0.96	1.66	9.18	8.48	25.5	23.5	26.5
2	6:30	7:11	1.66	2.02	8.48	8.12	25.5	23.5	26.5
3									
4									
5									
6									

Test	Time sec	h1/h2	K cm/sec	k20 cm/sec
1	4500	0.94243	1.2E-06	1.238E-06
2	2460	0.96859	1.2E-06	1.219E-06
3				
4				
5				
6				

Permeability
1.23E-06 cm/sec
1.23E-08 m/sec

Krazan Testing Laboratory

Soil Permeability

Flexible Wall, Falling Head (Rising Tail)

ASTM D - 5084 / CAL 220

Project Number	: 022-25058
Project Name	: Retail Development
Date	: 5/22/2025
Sample Number	: -
Sample Location	: B14 @ 30-31'
Soil Classification	: ML w/ clay

Max Dry Density, lbs/cu.ft	--	Degree of Sat. %		Max. Particle Size	0.0
Optimum Moisture, %	--	%Over Optimum		% Passing 3/8"	--
Initial Dry Density, lbs/cu.ft	96.5	Initial Diameter, cm	3.56	% Passing # 10	--
Initial Moisture, %	10.1	Initial Length,cm	7.11	% Passing # 200	61.5
Sample Compaction, %	--	Initial Area sq.cm	9.95	Temperature	20.0
Final Dry Density, lbs/cu.ft	--	Final Diameter, cm	3.56	Type of Permeant	Tap Water
Final Moisture, %	--	Final Length, cm	7.11	$\Delta\mu$ (Pore Pressure)	5.0
Specific Gravity (Assumed)	2.7	Final Area, sq.cm	9.95	$\Delta\sigma$ (Cell Pressure)	5.0
Comp. Procedure	Undisturbed			$\Delta\mu/\Delta\sigma$ (**B** Value)	1.00

Test	Start Time	Finish Time	H in Start	H in Final	H out Start	H out Final	Back Press	Tail Press.	Cell Press
1	6:10	6:55	0.46	0.92	8.98	8.52	33.7	30.4	34.7
2	6:55	7:49	0.92	1.46	8.52	7.98	33.7	30.4	34.7
3									
4									
5									
6									

Test	Time sec	h1/h2	K cm/sec	k20 cm/sec
1	2700	0.97605	8.4E-07	8.436E-07
2	3240	0.97120	8.5E-07	8.476E-07
3				
4				
5				
6				

Permeability
8.46E-07 cm/sec
8.46E-09 m/sec

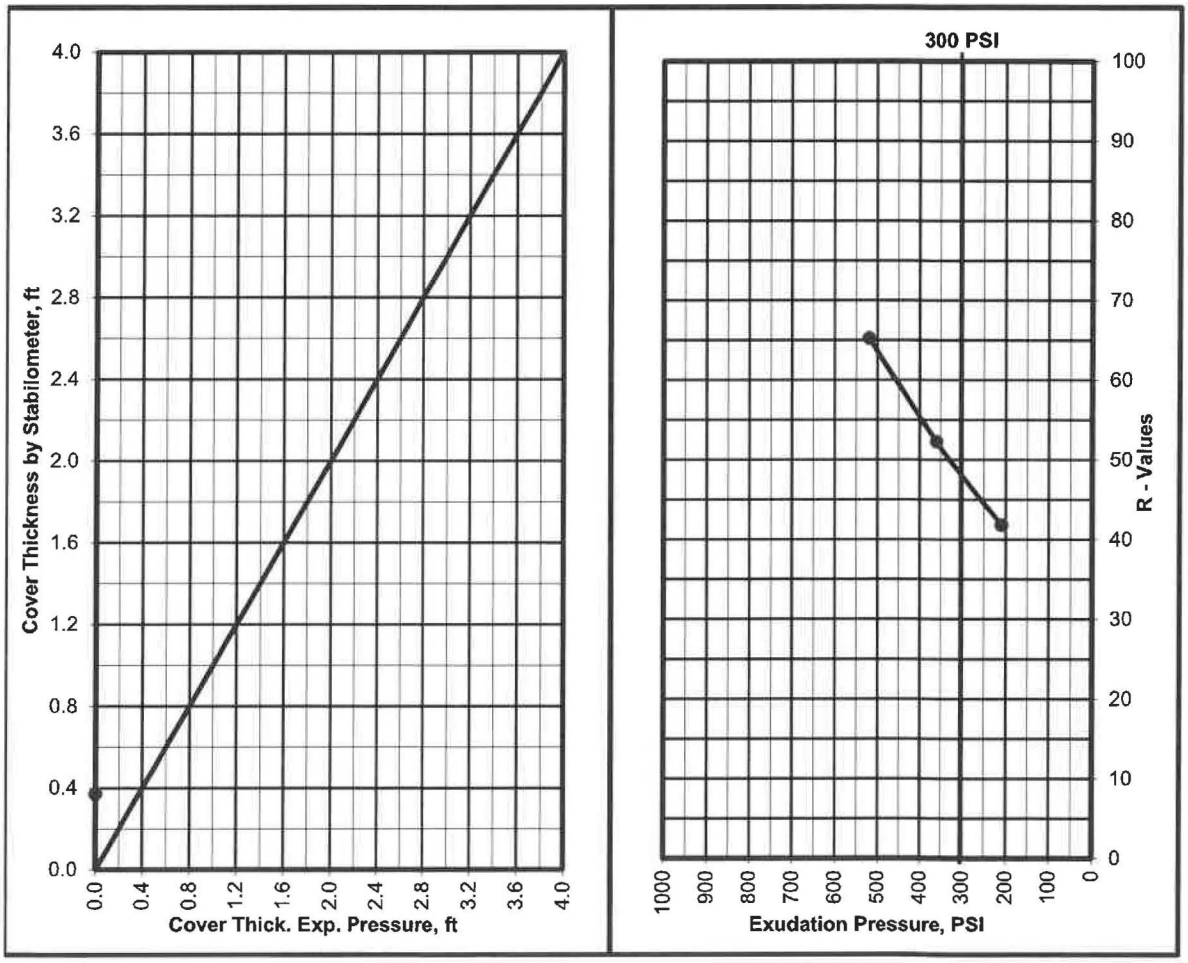
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/13/2025
Sample Location/Curve Number	:	R1 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	10.2	11.2	12.2
Dry Density, lbm/cu.ft.	125.1	124.5	124.4
Exudation Pressure, psi	520	360	210
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	65	52	42

R Value at 300 PSI Exudation Pressure	**48**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



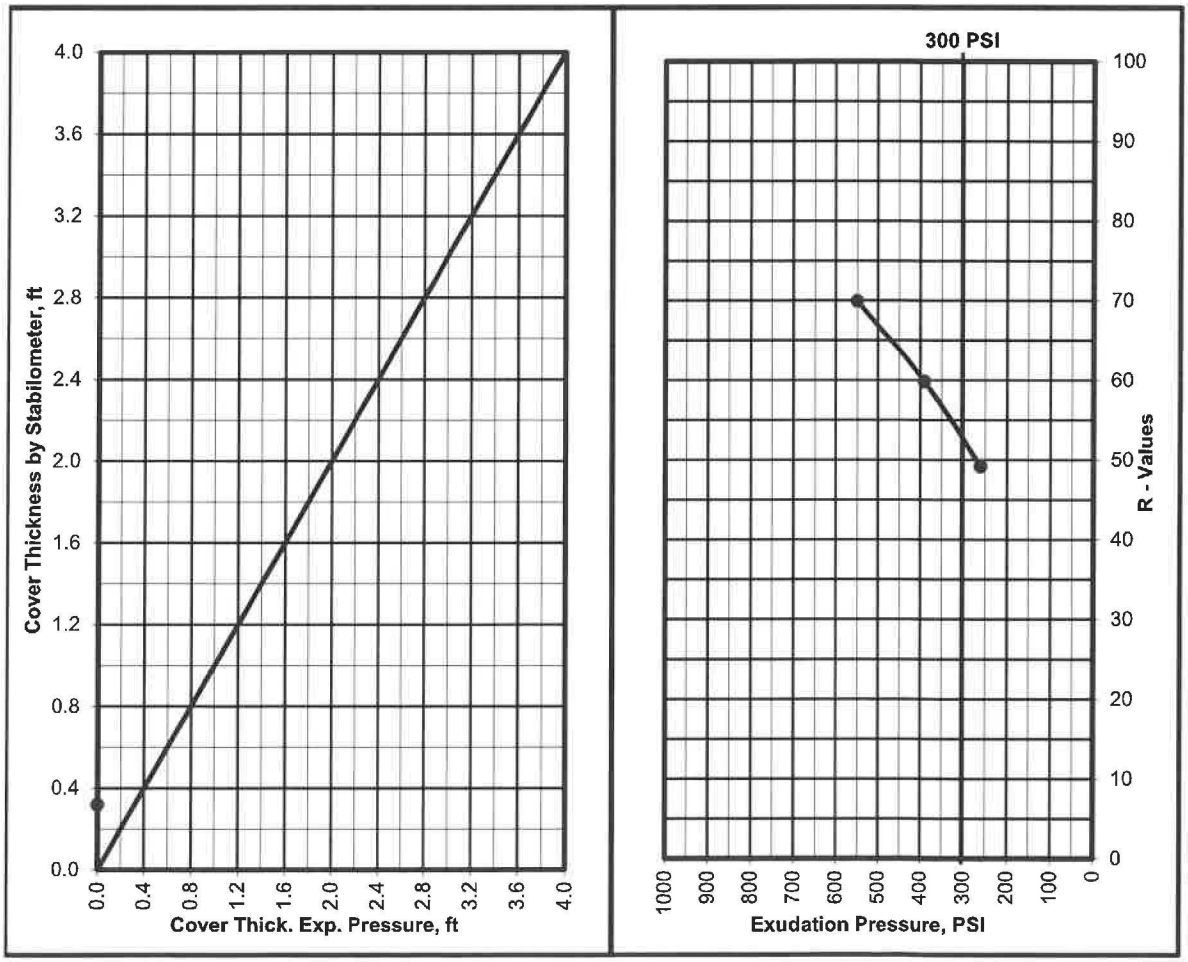
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/13/2025
Sample Location/Curve Number	:	R2 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	10.8	11.7	12.7
Dry Density, lbm/cu.ft.	125.5	125.6	125.1
Exudation Pressure, psi	550	390	260
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	70	60	49

R Value at 300 PSI Exudation Pressure	**53**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



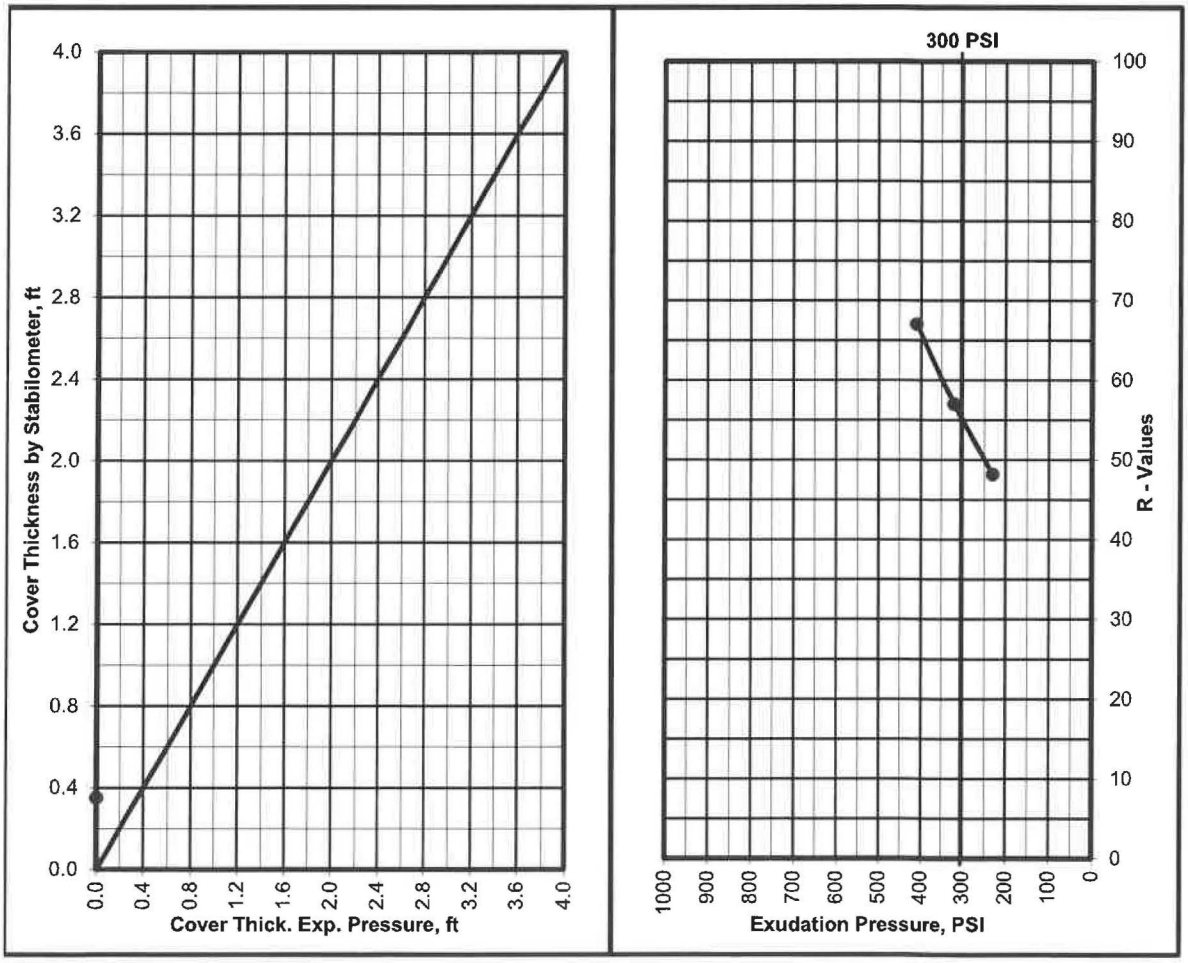
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/13/2025
Sample Location/Curve Number	:	R3 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	11.7	12.2	12.7
Dry Density, lbm/cu.ft.	124.0	123.8	122.9
Exudation Pressure, psi	410	320	230
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	67	57	48

R Value at 300 PSI Exudation Pressure	**55**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



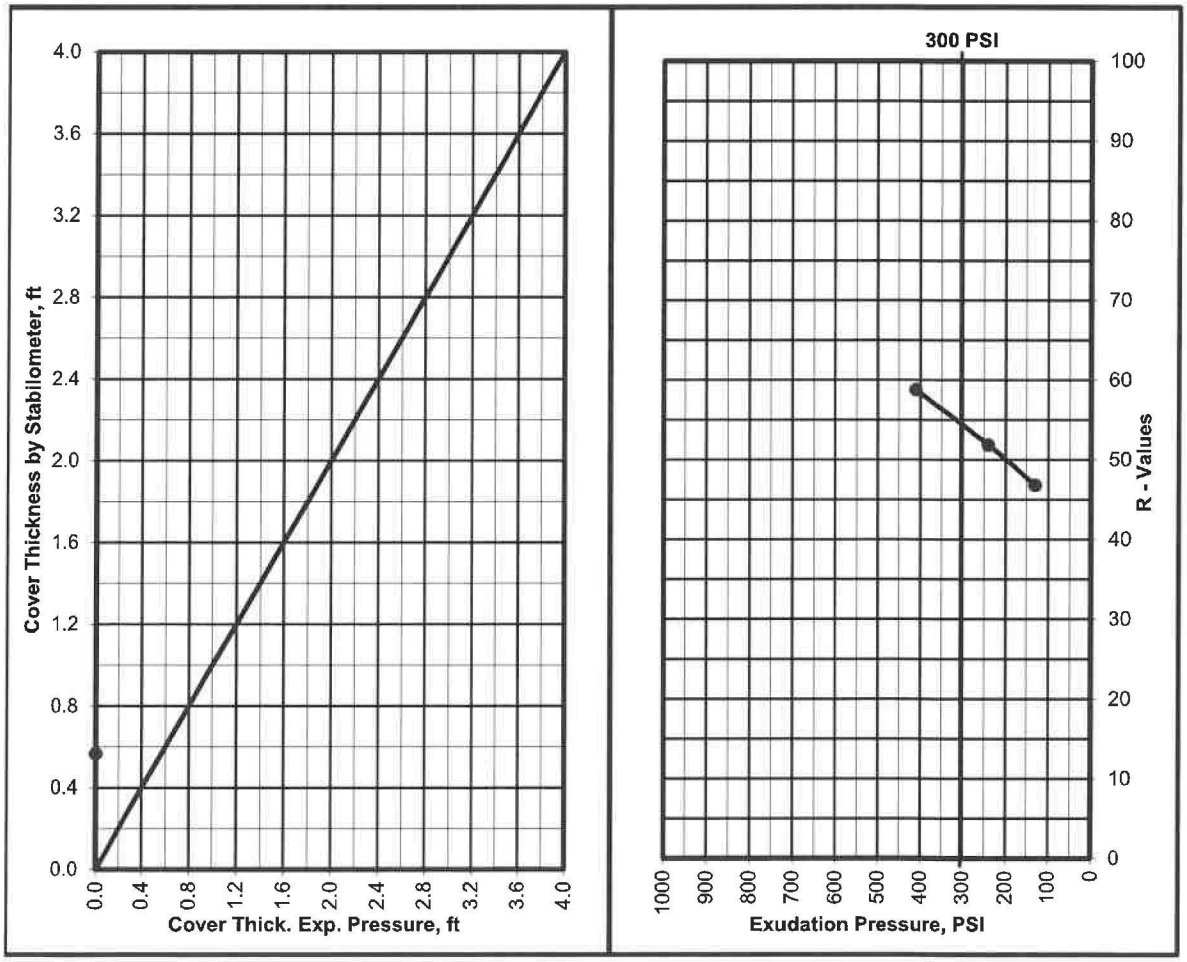
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/13/2025
Sample Location/Curve Number	:	R4 (1-3')
Soil Classification	:	SM Brown F-M Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	10.8	9.9	8.9
Dry Density, lbm/cu.ft.	124.1	124.0	124.1
Exudation Pressure, psi	130	240	410
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	47	52	59

R Value at 300 PSI Exudation Pressure	**54**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



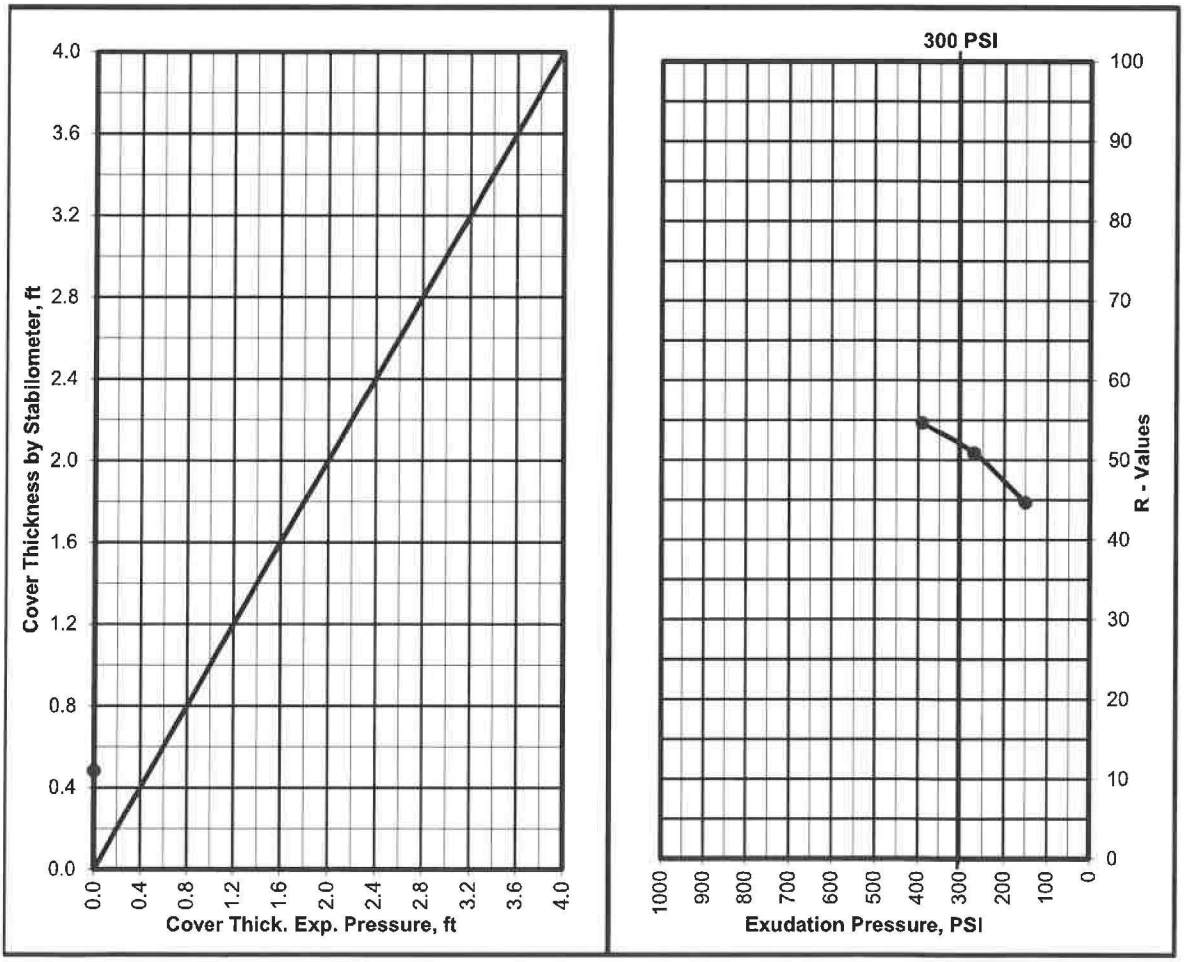
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/13/2025
Sample Location/Curve Number	:	R5 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	12.3	12.8	13.2
Dry Density, lbm/cu.ft.	124.5	124.3	123.7
Exudation Pressure, psi	390	270	150
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	55	51	45

R Value at 300 PSI Exudation Pressure	**52**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



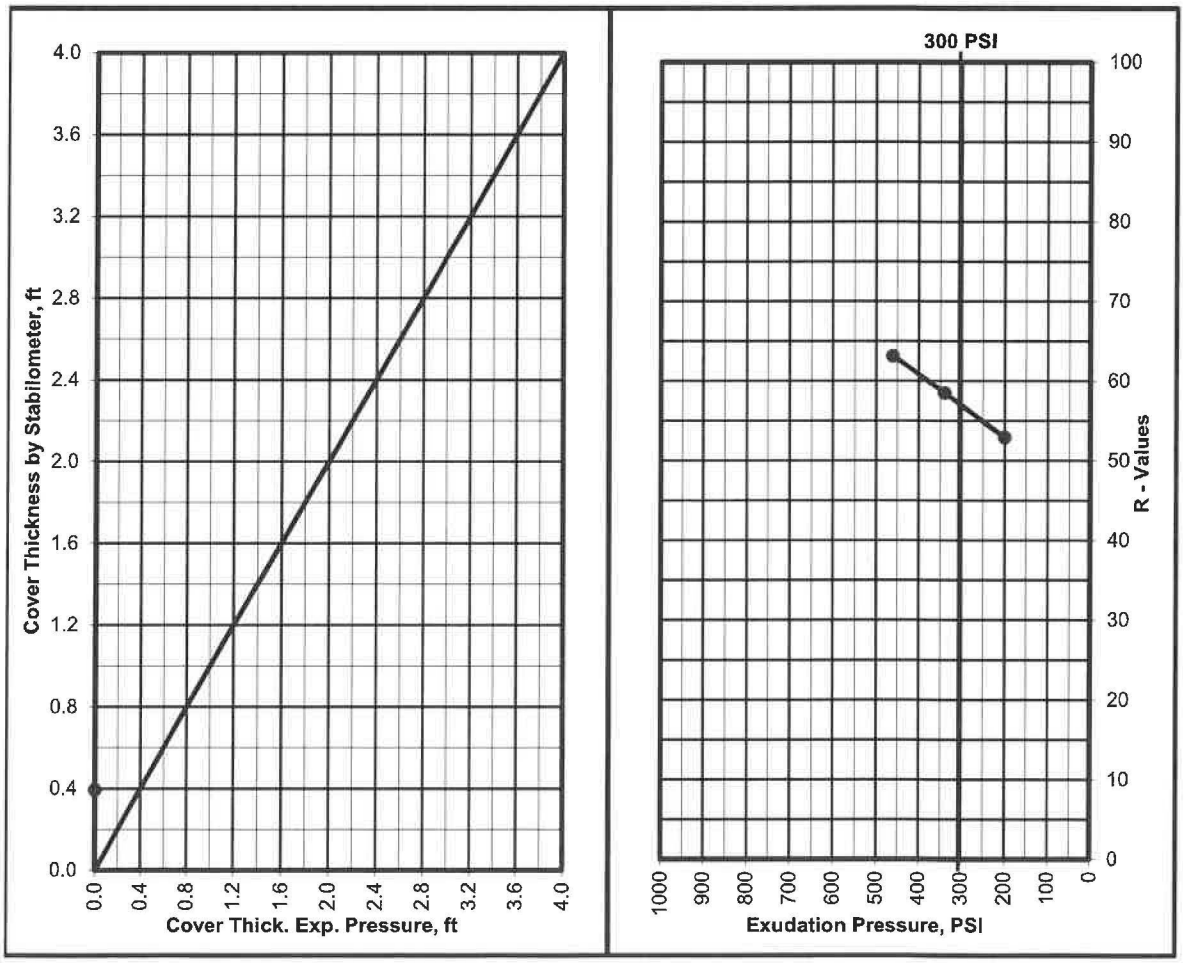
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/14/2025
Sample Location/Curve Number	:	R6 (1-3')
Soil Classification	:	SM Brown F-M Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	10.8	11.3	11.8
Dry Density, lbm/cu.ft.	123.1	123.5	122.8
Exudation Pressure, psi	460	340	200
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	63	59	53

R Value at 300 PSI Exudation Pressure	**57**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



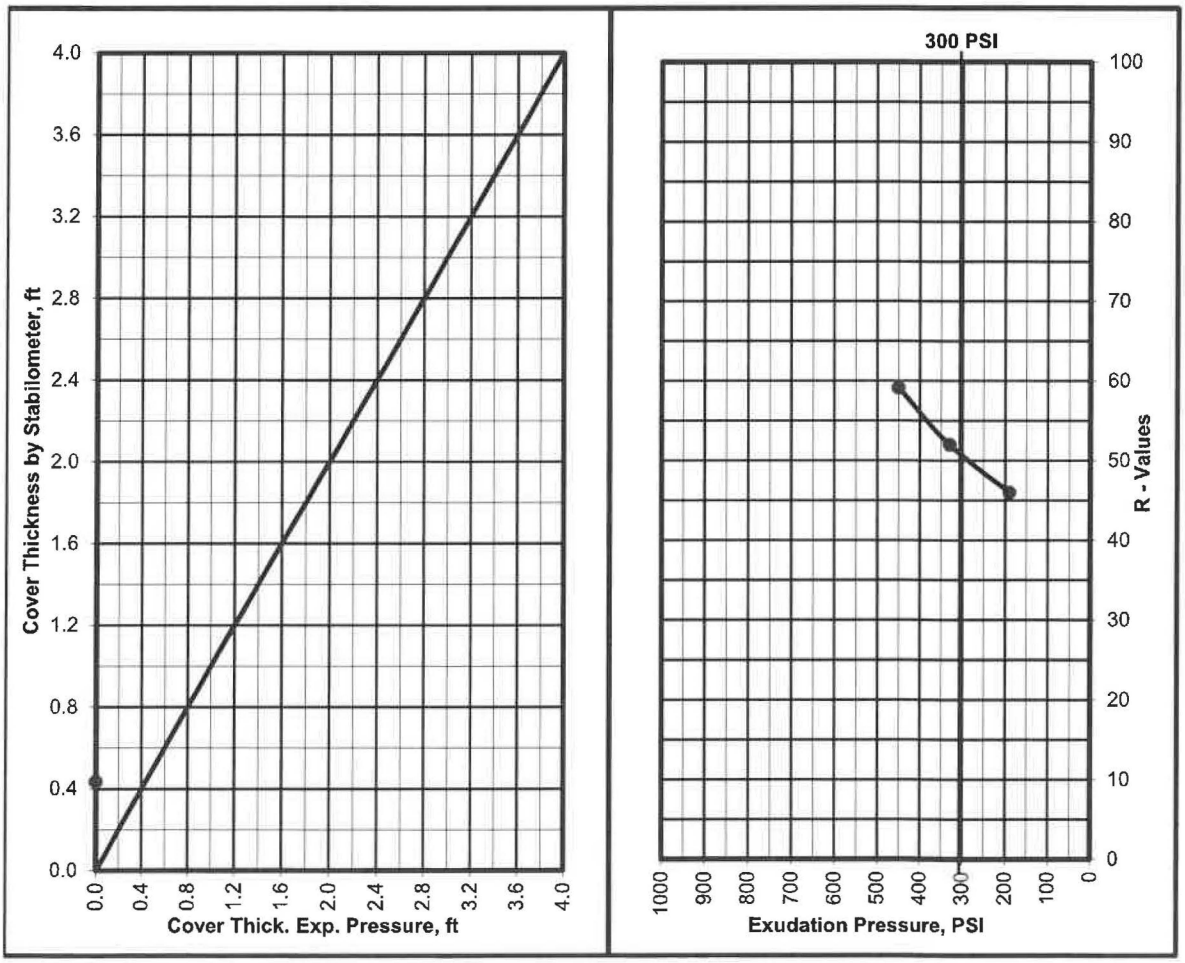
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/14/2025
Sample Location/Curve Number	:	R7 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	11.8	12.3	12.8
Dry Density, lbm/cu.ft.	124.1	123.7	123.7
Exudation Pressure, psi	450	330	190
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	59	52	46

R Value at 300 PSI Exudation Pressure	**51**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



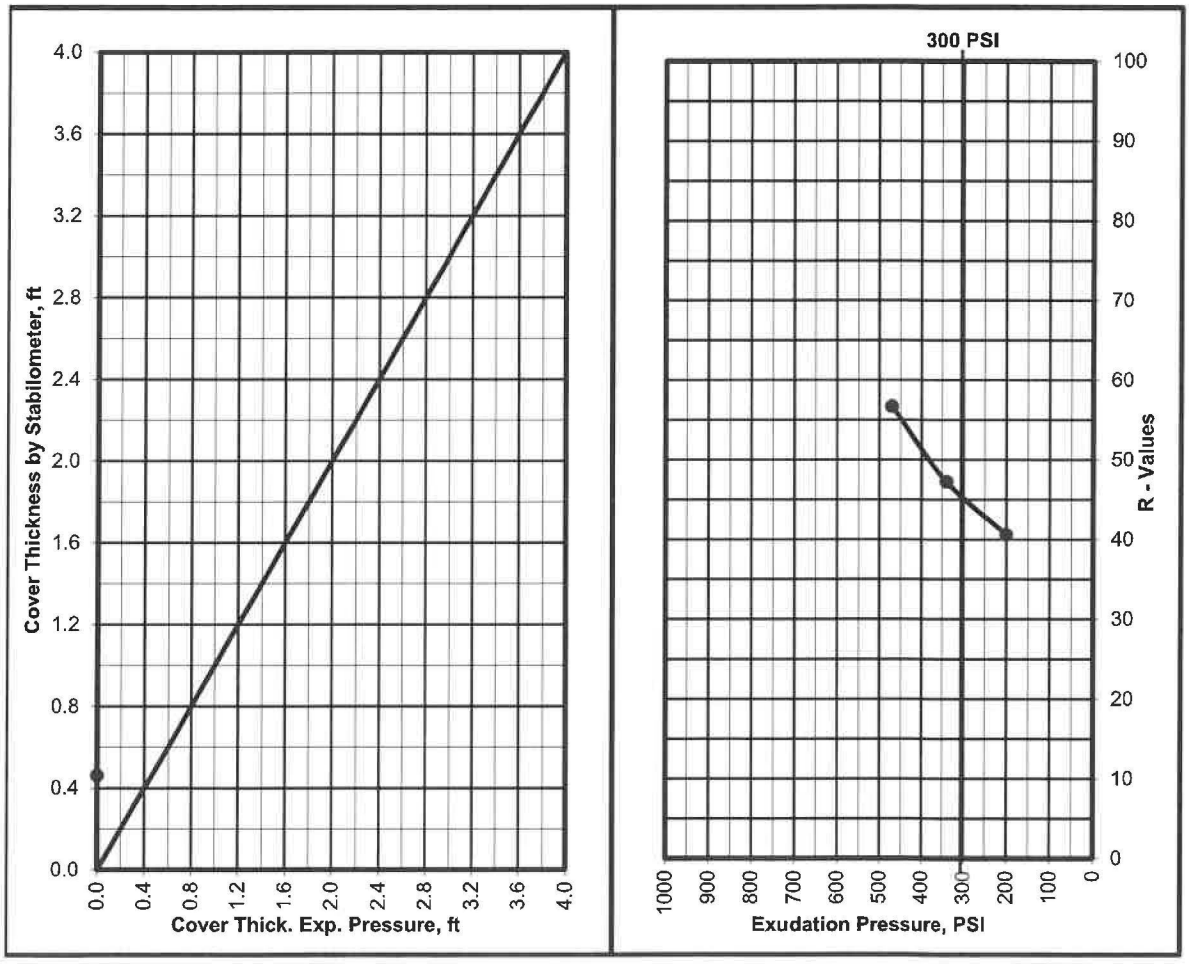
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/15/2025
Sample Location/Curve Number	:	R8 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	10.7	11.7	12.7
Dry Density, lbm/cu.ft.	123.9	123.8	123.1
Exudation Pressure, psi	470	340	200
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	57	47	41

R Value at 300 PSI Exudation Pressure	**45**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



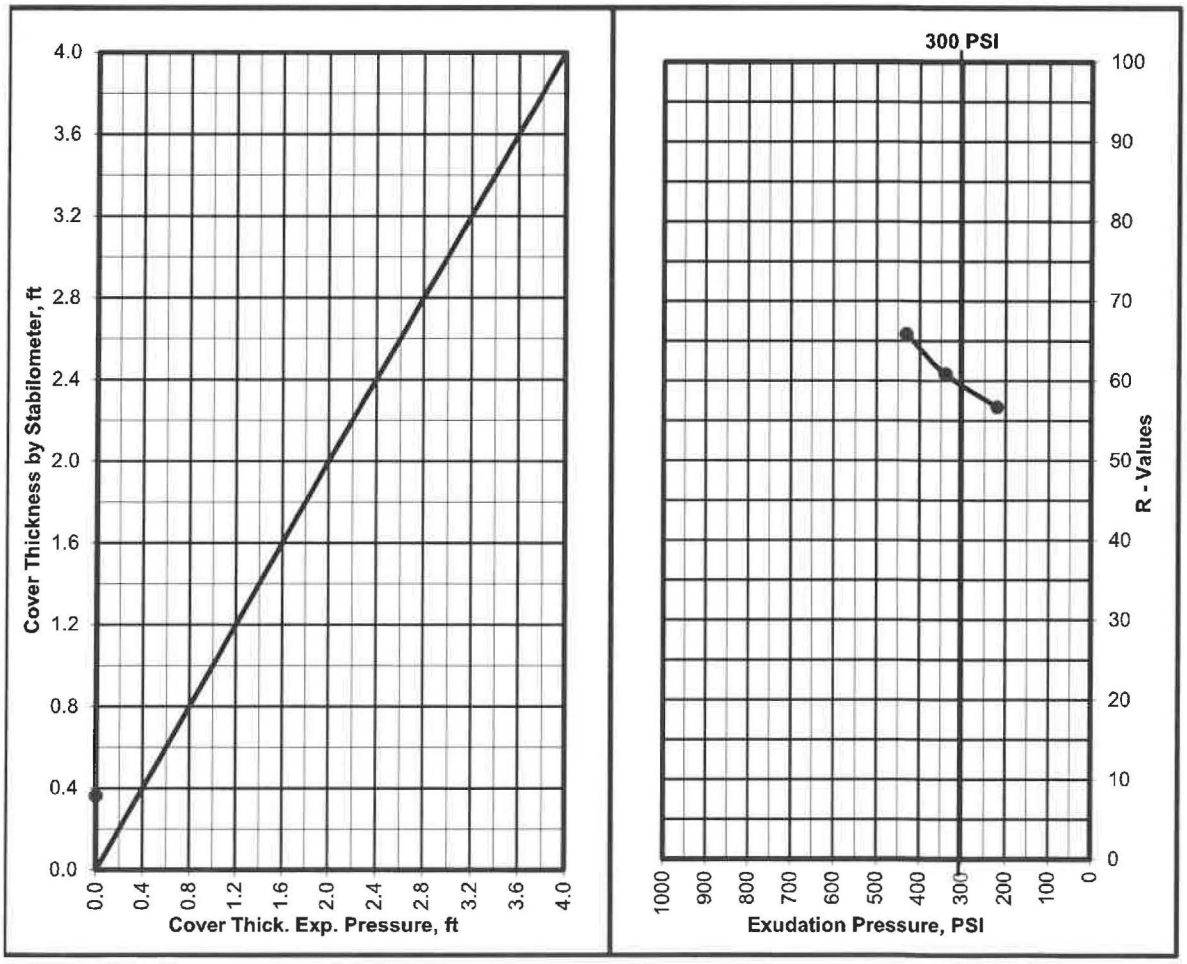
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/15/2025
Sample Location/Curve Number	:	R9 (1-3')
Soil Classification	:	SM Brown F-M Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	12.4	12.9	13.4
Dry Density, lbm/cu.ft.	124.7	124.5	123.6
Exudation Pressure, psi	430	340	220
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	66	61	57

R Value at 300 PSI Exudation Pressure	**59**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



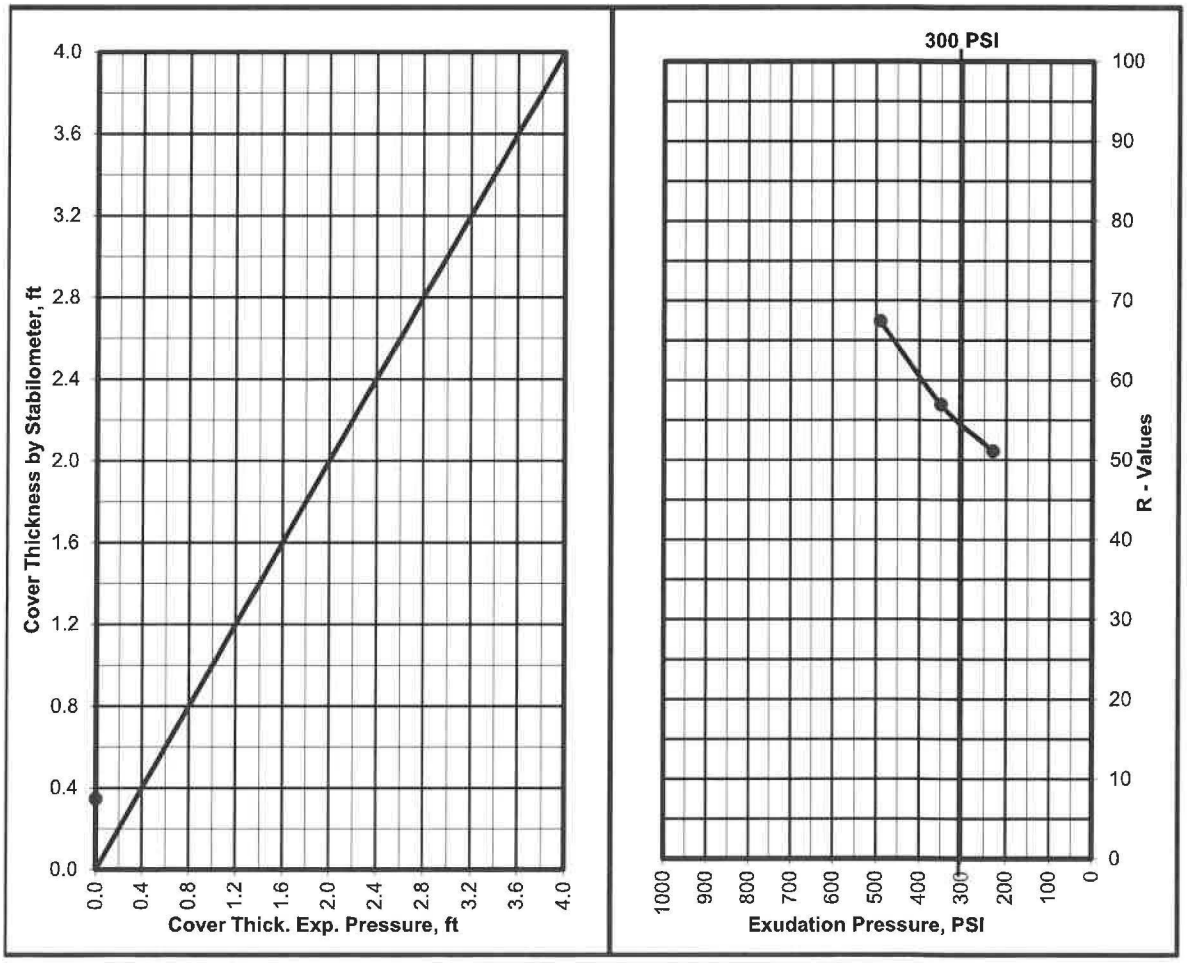
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/15/2025
Sample Location/Curve Number	:	R10 (1-3')
Soil Classification	:	SM Brown F-M Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	12.7	13.2	13.6
Dry Density, lbm/cu.ft.	124.9	125.6	124.5
Exudation Pressure, psi	490	350	230
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	67	57	51

R Value at 300 PSI Exudation Pressure	**54**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



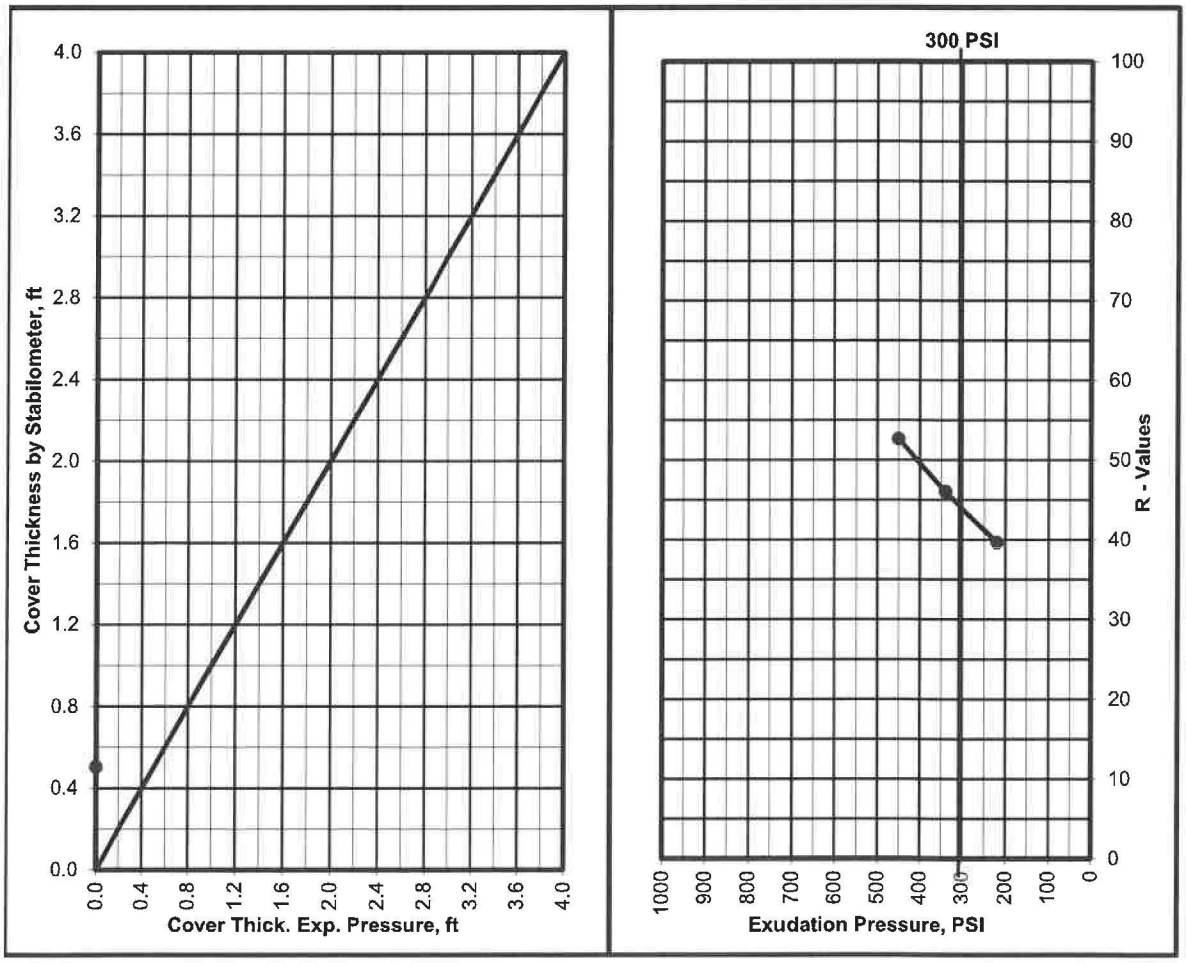
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/15/2025
Sample Location/Curve Number	:	R11 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	11.4	11.8	12.3
Dry Density, lbm/cu.ft.	124.6	124.3	124.0
Exudation Pressure, psi	450	340	220
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	53	46	40

R Value at 300 PSI Exudation Pressure	**44**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



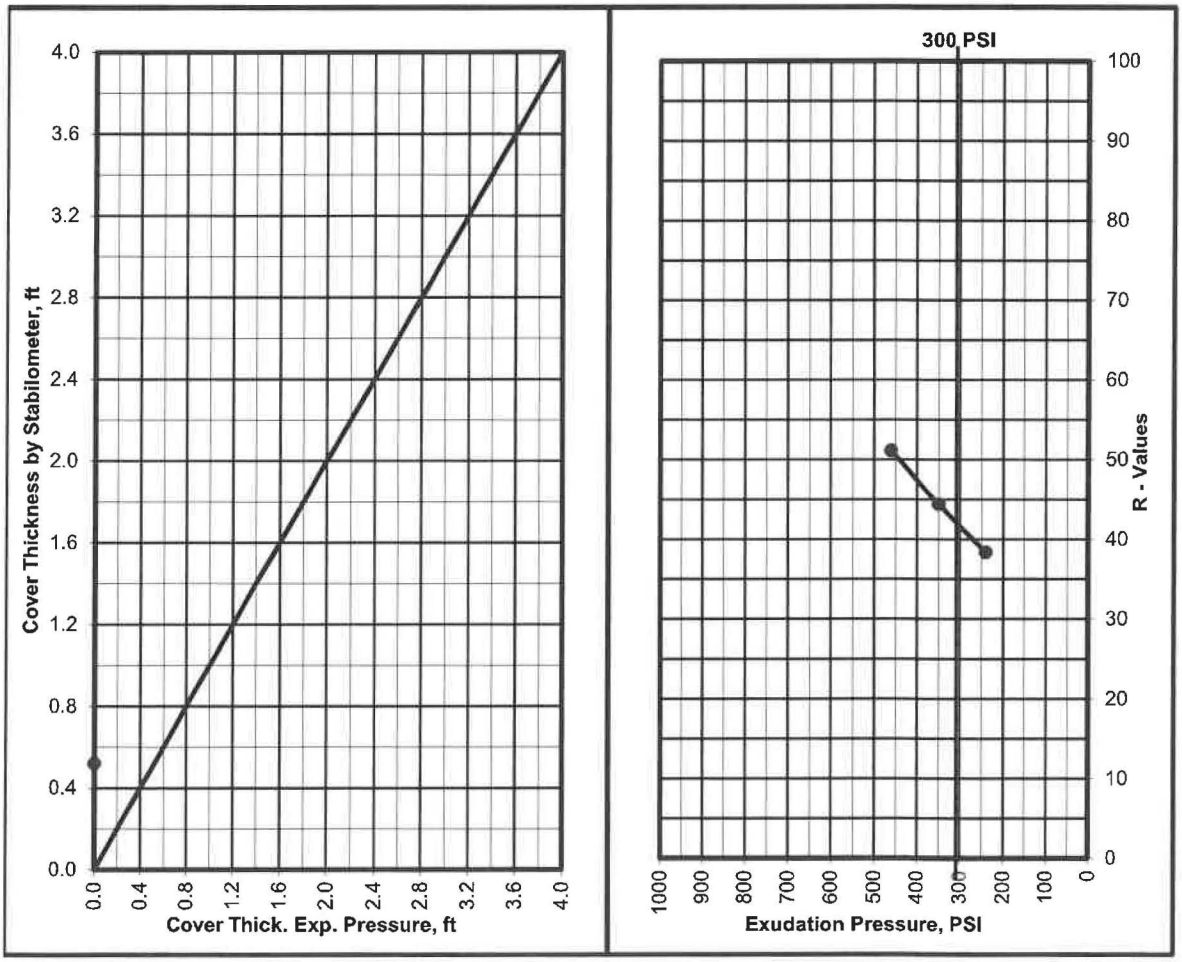
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/15/2025
Sample Location/Curve Number	:	R12 (1-3')
Soil Classification	:	SM Brown F Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	10.9	11.4	11.8
Dry Density, lbm/cu.ft.	125.5	125.9	125.8
Exudation Pressure, psi	460	350	240
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	51	44	38

R Value at 300 PSI Exudation Pressure	**42**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



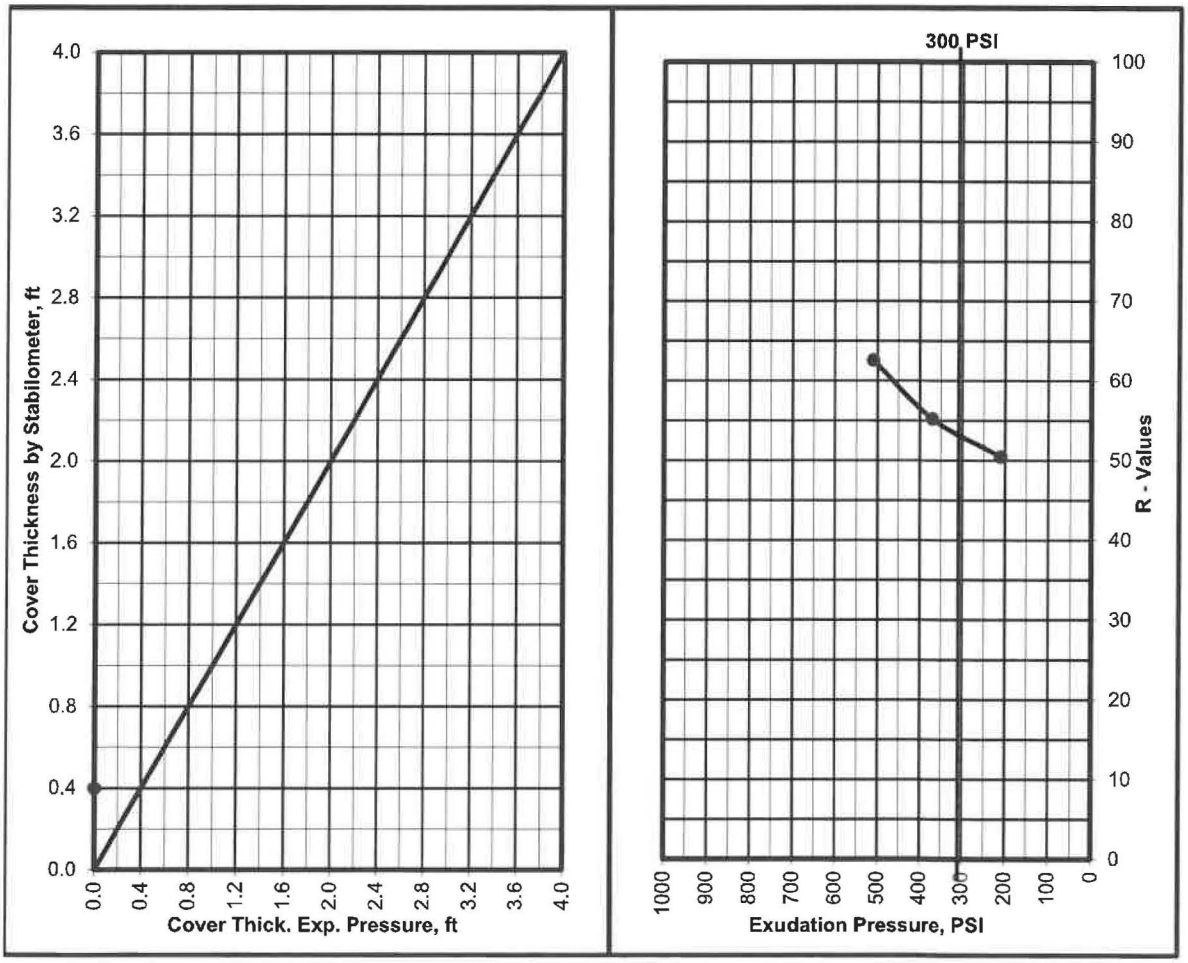
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	2225058
Project Name	:	Retail Development
Date	:	5/15/2025
Sample Location/Curve Number	:	R13 (1-3')
Soil Classification	:	SM Brown F-M Silty Sand

TEST	A	B	C
Percent Moisture @ Compaction, %	10.8	11.3	11.8
Dry Density, lbm/cu.ft.	124.4	124.5	124.4
Exudation Pressure, psi	510	370	210
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	63	55	50

R Value at 300 PSI Exudation Pressure	**53**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



Krazan Testing Laboratory

APPENDIX B

EARTHWORK SPECIFICATIONS

GENERAL

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including but not limited to the furnishing of all labor, tools, and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans, and disposal of excess materials.

PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of Krazan and Associates, Inc., hereinafter known as the Soils Engineer and/or Testing Agency. Attainment of design grades when achieved shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

TECHNICAL REQUIREMENTS: All compacted materials shall be densified to a density not less than 90 percent relative compaction based on ASTM Test Method D1557 or CAL-216, as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be as determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the soil report.

The Contractor shall make his own interpretation of the data contained in said report, and the Contractor shall not be relieved of liability under the Contract documents for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or windblown materials attributable to his work.

SITE PREPARATION

Site preparation shall consist of site clearing and grubbing and the preparations of foundation materials for receiving fill.

CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter, and all other matter determined by the Soils Engineer to be deleterious or otherwise unsuitable. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed building areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots larger than 1 inch. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations should not be permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

SUBGRADE PREPARATION: Surfaces to receive Engineered Fill, building or slab loads shall be prepared as outlined above, excavated/scarified to a depth of 12 inches, moisture-conditioned as necessary, and compacted to 90 percent relative compaction.

Loose soil areas, areas of uncertified fill, and/or areas of disturbed soils shall be moisture-conditioned as necessary and recompacted to 90 percent relative compaction. All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any of the fill material.

EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. However, compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer.

Both cut and fill areas shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill are as specified.

APPENDIX C

PAVEMENT SPECIFICATIONS

1. DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term "Standard Specifications": hereinafter referred to is the 2018 Standard Specifications of the State of California, Department of Transportation, and the "Materials Manual" is the Materials Manual of Testing and Control Procedures, State of California, Department of Public Works, Division of Highways. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as defined in the applicable tests outlined in the Materials Manual.

2. SCOPE OF WORK - This portion of the work shall include all labor, materials, tools, and equipment necessary for, and reasonably incidental to the completion of the pavement shown on the plans and as herein specified, except work specifically noted as "Work Not Included."

3. PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 90 percent. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

4. UNTREATED AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class 2 material, 1½ inches maximum size. The aggregate base material shall be spread and compacted in accordance with Section 26 of the Standard Specifications. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent.

5. AGGREGATE SUBBASE - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class 2 material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent, and it shall be spread and compacted in accordance with Section 25 of the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

6. ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10. The mineral aggregate shall be Type B, ½ inch maximum size, medium grading and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning and mixing of the materials shall conform to Section 39.

The prime coat, spreading and compacting equipment and spreading and compacting mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50° F. The surfacing shall be rolled with a combination of steel wheel and pneumatic rollers, as described in Section 39-6. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

7. FOG SEAL COAT - The fog seal (mixing type asphaltic emulsion) shall conform to and be applied in accordance with the requirements of Section 37.