ADDENDUM NUMBER ONE

FOR THE

URBAN GREENING PATHWAYS PROJECT

City capital project # 1902

July 22, 2020

City of Arvin
200 Campus Drive
Arvin, CA 93203

ADDENDUM No. 1

The following additions, deletions, or modifications shall become part of the Contract Documents for this Project:

REVISIONS TO BID PACKAGE:

1. PRE-BID RFI DEADLINE: Please note that the deadline for all pre-bid RFIs shall be modified. Prospective bidders must provide requests for interpretations and information to the City Engineer no later than by the **5:00 p.m. on Monday, July 27th**. Any and all references in the bid documents showing a date and time other than this shall be understood to have been modified to be this new date and time.

2. BID SHEET: Please see the attached bid sheet pages for items 1-18. Items 3 and 15 have been updated to correct an issue with text that was cut off. Th bid items themselves have not changed. The bidders should replace the same pages in the bid package dated July 10, 2020 with these sheets which should be included in the bid.

REVISIONS TO SPECIFICATIONS:

No modifications to the specifications are a part of this addendum.

REVISIONS TO DRAWINGS:

No modifications to the construction drawings are a part of this addendum.

CONTRACTOR QUESTIONS:

The following questions (requests for interpretation) have been provided in writing by interested contractors. Such questions may have been edited for clarification purposes only. In some cases, multiple contractors may have asked the same question in which case the questions have been combined such that only one response is necessary. The response to these questions should not be construed as a formal modification to the plans or specifications (bid documents). They are intended to clarify information contained therein only to aide each contractor in developing their bid for the project.

Q1: Attached are a few pages from the bid package as provided by the City of Arvin, the 15-G is required at the time of bid with the bid documents however it is not in the bid package, general specifications, or technical specs. Please provide form as required.

A1: *Please refer to the Caltrans Local Assistance webpage for the necessary forms. As a practice, these forms are not included in the bid documents to assure that the most updated versions of said forms are being accessed by bidders:* https://dot.ca.gov/programs/local-assistance/forms/local-assistance-procedures-manual-forms

Q2: Please provide the AutoCAD surface file to aid in earthwork calculations.

A2: The CAD file will be emailed to the plan holders along with this addendum. Any plan holders added to the plan holder's list following the publication of this addendum should request the CAD file via email to the City Engineer.

Q3: Can you please also provide technical specs for the DG?

A3: The goal is to match the color of the DG that was placed at Garden in the Sun Park across the street. In that case, the DG installed was 3/8" "Leather Brown" from Southwest Boulder and Stone. The contractor shall either provide this product or a acceptable alternative that reasonably matches this color.

Q4: Please provide the plan holder's list.

A4: The current plan holder's list is attached to this addendum. Please note that it is subject to change in the event that new plan holders are added to the list. It shall be the responsibility of the bidders to request updates to the list up to the bid due date and time.

Q5: Please provide the dial in information for the pre-bid meeting and the remote bid opening.

A5: An email will be sent out to the contractors that are on the plan holder's list at the close of business (roughly 5:00 p.m.) on the day before each meeting. It shall be the responsibility of the bidders to make sure they receive the emails, and shall report any issues to the City Engineer as soon as possible on the day of each meeting.

Q6: Please clarify the minimum wage required for this project.

A6: As noted in the "GENERAL PROVISIONS", "SPECIAL PROVISIONS", and elsewhere in the bid package and bid documents, prevailing wages as determined by the California Department of Industrial Relations for Kern County. It shall be the bidder's responsibility to obtain the wage rate determination in effect at the time that a bid is due, and shall pay all applicable trades at least those amounts including fringe benefits. If a contractor is not familiar with prevailing wage rates and complying with DIR regulations, said contractor should strongly consider their ability to bid a prevailing wage project such as this. Please go to this website for more information and for current wage rate determinations:
https://www.dir.ca.gov/oprl/dprewagedetermination.htm

Additionally, please also note that the general contractor and any subcontractors must be registered with the Department of Industrial Relations to be eligible to participate in this project. Failure of any contractor or subcontractor to be registered at the time of the bid opening may cause the entire bid to be rejected.

Q7: Description of bid items no.3 and 15 on the bid sheet page no.19 and 20 are not completely worded. Please provide full description for the specified bid items.

A7: See "Revisions to Bid Package" item number 2 above for the response to this question.

Q8: Per special provision, Scope of work, paragraph "B", project description, installation of drinking fountains are specified. There is no drinking fountain shown on the plans and also there is no line items, please clarify.

A8: This is a reference to drinking fountains that were once a part of the project plan, but were removed. Please ignore this and any other referenced to drinking fountains you may see elsewhere in the bid documents.

Q9: Per special provision, Scope of work, paragraph "B", project description, installation of under ground utilities for water services is specified. This work is not shown on drawings and there is no line item for this scope, please clarify.

A9: This is similar to the above question and response. Certain utilities have been removed from the project plan. In general, the current project includes underground electrical and landscape irrigation lines only. Any reference to any other utility can be ignored.

Q10: Please clarify what line items will cover the cost of staking and grading, required for this project.

A10: Per specification section 01 57 50, the City Surveyor will provide two sets of stakes. One will be for limits of demolition limits, and the other will be for grade control stakes. This shall be at no cost to the contractor. Any additional survey requirements shall be the responsibility of the contractor who should coordinate with their own surveyor or whom may contact the City survey consultant, DeWalt Corporation. This shall be done at no additional cost to the city, and shall be considered to be a part of the line item price of whatever is being staked.

Q11: Please confirm if there is any stockpiled soil at the project location that can be used in case that fill materials required.

A11: The project site is an unimproved empty piece of land that is generally level with no notable ridges and valleys. There is no stockpile of material on this site or elsewhere nearby where the contractor may borrow from, if necessary. The contractor shall be responsible for determining the source of any necessary import materials, if necessary.

Q12: Per sheet C2, note no.26, engineer fill shall be placed in accordance with the requirements of the geotechnical report. No geotechnical report is provided, please advise.

A12: The geotechnical report for this project has been included as an attachment to this addendum.

Q13: Please confirm if the bid proposal for the subject project's bid can be mailed to the City of Arvin prior of the bid deadline. Regarding this matter please provide delivery details.

A13: As shown in the “NOTICE INVITING SEALED PROPOSALS (BIDS)”, bids may be mailed to the City Clerk at 200 Campus Drive, Arvin, CA 93203.

Also take note of item 11 in the “INSTRUCTIONS TO BIDDERS”. Due to Covid-19, all City offices are closed to the public at this time. This does not mean that bidders are not free to hand deliver their own bids. However, this should be scheduled directly with the City Engineer if any bidder elects to do so. Please contact him directly at aojeda@arvin.org or 661-606-6066 (office) 661-972-7755 (cell).

ADDENDUM No. 1

NOTE: As outlined in the bid documents, any bid must include the "ADDENDUM ACKNOWLEDGEMENT FORM" and must show that this addendum was received prior to submitting a bid. Failure to do so may result in a bid being determined to be non-responsive, and subject to disqualification.

Approved by: _____ 7/22/20

Adam Ojeda, P.E.
City Engineer

Date

PLAN HOLDERS LIST Page _____ of _____

PROJECT: URBAN GREENING PATHWAYS PROJECT 1902

LOCATION: ARVIN **Fee: No fee; digital plans and specs only**

BID DUE DATE: JULY 30 @ 2:00PM

Set #	Name (First, Last)	Job Title	Business Name	Address (include City, State, Zip)	Date Picked Up/Shipped
1	Niki Franklin	Contract Administrator	R.C. Becker & Son	28355 Kelly Johnson Pkwy Santa Clarita, CA 91355	DIGITAL ONLY
	Phone	**Fax**	**Email Address**	**Paid Cash ________**	**Shipping/Tracking #**
	661-259-4845	661-259-9869	nfranklin@rcbeckerandson.com	**Check# _______**	DIGITAL ONLY
Set #	**Name (First, Last)**	**Job Title**	**Business Name**	**Address (include City, State, Zip)**	**Date Picked Up/Shipped**
2	Joe Fuentes	N/A	Marina Co	3707 W. Garden Grove Blvd Orange, CA 92868	DIGITAL ONLY
	Phone	**Fax**	**Email Address**	**Paid Cash ________**	**Shipping/Tracking #**
	714-939-6600	N/A	joe@marinaco.com	**Check# _____**	DIGITAL ONLY
Set #	**Name (First, Last)**	**Job Title**	**Business Name**	**Address (include City, State, Zip)**	**Date Picked Up/Shipped**
3	Steve Blackwood	Project Manager	JTS Construction Inc	7001 McDivitt Drive Bakersfield, CA 93313	DIGITAL ONLY
	Phone	**Fax**	**Email Address**	**Paid Cash ________**	**Shipping/Tracking #**
	661-835-9270	N/A	steveb@jtsconstruction.com	**Check# _______**	DIGITAL ONLY
Set #	**Name (First, Last)**	**Job Title**	**Business Name**	**Address (include City, State, Zip)**	**Date Picked Up/Shipped**
4	Michele Marquez	Contract Administr	Griffith Company	1128 Carrier Parkway Ave Bakersfield, CA 93308	DIGITAL ONLY
	Phone	**Fax**	**Email Address**	**Paid Cash ________**	**Shipping/Tracking #**
	661-392-6640	N/A	mmarquez@griffithcompany.net	**Check# _______**	DIGITAL ONLY
Set #	**Name (First, Last)**	**Job Title**	**Business Name**	**Address (include City, State, Zip)**	**Date Picked Up/Shipped**
	Phone	**Fax**	**Email Address**	**Paid Cash ________**	**Shipping/Tracking #**
				Check# _______	
Set #	**Name (First, Last)**	**Job Title**	**Business Name**	**Address (include City, State, Zip)**	**Date Picked Up/Shipped**
	Phone	**Fax**	**Email Address**	**Paid Cash ________**	**Shipping/Tracking #**
				Check# _______	
Set #	**Name (First, Last)**	**Job Title**	**Business Name**	**Address (include City, State, Zip)**	**Date Picked Up/Shipped**
	Phone	**Fax**	**Email Address**	**Paid Cash ________**	**Shipping/Tracking #**
				Check# _______	
Set #	**Name (First, Last)**	**Job Title**	**Business Name**	**Address (include City, State, Zip)**	**Date Picked Up/Shipped**

BID SHEET

NAME OF COMPANY: _____

Bidder agrees to enter into a contract to furnish all labor, materials, equipment and supplies for the project identified as URBAN GREENING PATHWAYS PROJECT in accordance with the Contract Documents to the satisfaction of the City at the following prices:

BASE BID

Item No.	Quantity	Unit	Item description (Unit Cost in Words)	Unit Price (Figures)	Total Price
1	1	LS	Mobilization, bonds, insurance, permits, security, storm/dust control _____ _____ _____ Dollars per lump sum amount	_____	_____
2	1	LS	Traffic Control and Site Safety _____ _____ _____ Dollars per lump sum amount	_____	_____
3	1	LS	Clearing, grubbing, miscellaneous demolition, and construction water _____ _____ _____ Dollars per lump sum amount	_____	_____
4	1,065	SF	4" Concrete Sidewalk _____ _____ _____ Dollars per square foot	_____	_____
5	215	LF	6" Curb with 24" Gutter _____ _____ _____ Dollars per linear foot	_____	_____
6	1	EA	Curb Ramp _____ _____ _____ Dollars per each item	_____	_____
7	17,456	SF	Decomposed granite walking surface _____ _____ _____ Dollars per square foot	_____	_____

Item No.	Quantity	Unit	Item description (Unit Cost in Words)	Unit Price (Figures)	Total Price
8	2	EA	6' Bench Dollars per each item		
9	4	EA	4' Bench Dollars per each item		
10	6	EA	Trash Receptacles Dollars per each item		
11	5	EA	Road Signs Dollars per each item		
12	4	EA	Funding acknowledgement signs Dollars per each item		
13	1	LS	Landscape Planting Dollars per lump sum amount		
14	1	LS	Landscape Irrigation System Dollars per lump sum amount		
15	1	LS	On-site Electrical Conduit, Wiring, Pull Boxes Complete and in Place Dollars per lump sum amount		
16	12	EA	Pole mounted lights Dollars per each item		
17	20	EA	Bollard lights Dollars per each item		
18	17	EA	Pathway lights Dollars per each item		

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEEERIING
CONSTRUCTION TESTING & INSPECTION

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED ARVIN PATHWAYS PROJECT
WALNUT STREET AND 4TH STREET
ARVIN, CALIFORNIA

PROJECT NO. 022-19038
MAY 22, 2019

Prepared for:

MR. ADAM OJEDA
CITY OF ARVIN
141 PLUMTREE DRIVE
ARVIN, CALIFORNIA 93203

Prepared by:

KRAZAN & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERING DIVISION
2205 COY AVENUE
BAKERSFIELD, CALIFORNIA 93307
(661) 837-9200

Krazan & ASSOCIATES, INC.
SITE DEVELOPMENT ENGINEERS

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

May 22, 2019

Project No. 022-19038

Mr. Adam Ojeda
City of Arvin
141 Plumtree Drive
Arvin, California 93203

RE: Geotechnical Engineering Investigation
Proposed Arvin Pathways Project
Walnut Street and 4th Street
Arvin, California

Dear Mr. Ojeda:

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.

David R. Jarosz, II
Managing Engineer
RGE No. 2698/RCE No. 60185

DRJ:ht

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GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED ARVIN PATHWAYS PROJECT
WALNUT STREET AND 4TH STREET
ARVIN, CALIFORNIA

INTRODUCTION

This report presents the results of our Geotechnical Engineering Investigation for the proposed Arvin Pathways Project, to be located at Walnut Street and 4th Street in Arvin, 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, soil cement reactivity, and pavement design.

A site plan showing the approximate boring locations is 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 also 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 revised proposal dated April 2, 2019 (KA Proposal No. P434-18R2) 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 5 borings to depths ranging from approximately 10 to 30 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 structures are unavailable. On a preliminary basis, it is understood that the development will include the construction of a new city park. The park will include a walking/bike path covering approximately 2 acres. On-site restroom facilities, picnic shelters and a trash enclosure are also planned. Footing loads are anticipated to be light to moderate. On-site storm water retention, paved parking and landscaping are also planned for the development of the project.

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 irregular in shape and encompasses approximately 2 acres. The site is located approximately 200 feet north of Richard Street, just east of Walnut Street in Arvin, California. A community park is located west of the site. The remainder of the site is predominately surrounded by vacant land and commercial developments.

Presently, the site predominately consists of vacant land. The site is covered by a sparse to moderate weed growth and the surface soils have a loose consistency. Buried utility lines are located along the edges of the site associated with two oil wells and the surrounding developments. The site is relatively level with no major changes in grade.

GEOLOGIC SETTING

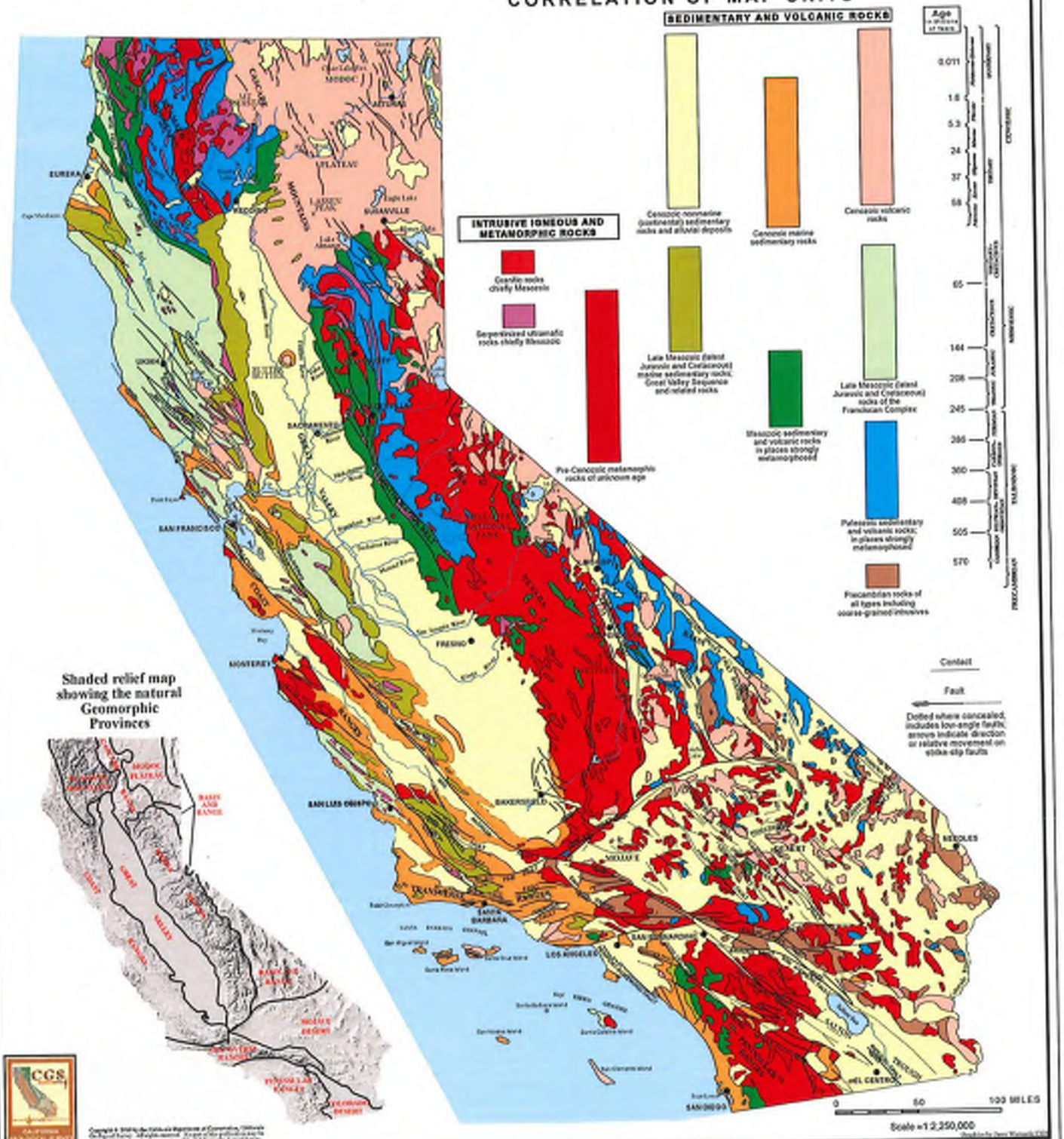
Geologically, the property is situated on the eastern flank, near the south end of the Great Valley Geomorphic Province. This province is a large northwesterly trending geosyncline or structural trough between the Coast Range Mountains and the Sierra Nevada Mountains. Erosion from both of these mountain 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.

SIMPLIFIED GEOLOGIC MAP OF CALIFORNIA

CORRELATION OF MAP UNITS



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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. Vertical displacements of as much as three 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 two 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 5 borings to depths ranging from approximately 10 to 30 feet below existing site grade, using a truck-mounted drill rig. In addition, 2 bulk subgrade samples were obtained from the site for laboratory R-value testing. Furthermore, 2 percolation tests were conducted on the site. The approximate boring, bulk sample and percolation test 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, 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 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 upper soils predominately consisted of approximately 6 to 12 inches of very loose silty sand. These soils are disturbed, have low strength characteristics, and are highly compressible when saturated.

Below the loose surface soils, approximately 2 to 3 feet of loose to medium dense silty sand was encountered. Field and laboratory tests indicate these soils have moderate strength characteristics and are slightly compressible. Penetration resistance ranged from 14 to 31 blows per foot. Dry densities ranged from 90 to 104 pcf. A representative soil sample consolidated approximately 2 percent under a 2 ksf load when saturated. A representative soil sample had an angle of internal friction of 34 degrees.

Below approximately 3 to 4 feet, layers of predominately medium dense to very dense silty sand, silty sand/sandy silt, sandy clayey silt or sand were encountered. Field and laboratory tests suggest that these soils are moderately strong and slightly compressible. Penetration resistance ranged from 15 blows per foot to greater than 50 blows per 6 inches. Dry densities ranged from 88 to 104 pcf. These soils have 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.

PERCOLATION TESTING

Two percolation tests were performed the project site. The percolation tests were performed at depths of 6 and 9 feet below the existing ground surface. The tests were conducted in accordance with the criteria set in the "Manual of Septic Tank Practice" published by the Department of Health, Education, and Welfare. Results of the tests are as follows:

Test No	Depth (feet)	Percolation Rate (min/in)	Soil Type
1	9	8	Sand (SP)
2	6	12	Silty Sand (SM)

The test results indicate that these soils are classified as Type III and Type IV soils based on the Uniform Plumbing Code. The percolation rates given are based on 1 inch of fall within a 6-inch diameter hole with a 6-inch head of water.

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, water level 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.

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 and previous 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.

Trees are located on the site. If not utilized for the proposed development, tree removal operations should include roots greater than 1 inch in diameter. The resulting excavations should be backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

The site may have been previously utilized as agricultural land. In addition, the site is surrounded by residential developments, commercial developments and several oil wells. Associated with these developments may be buried structures, such as utility lines and irrigation lines that may extend into the site. Demolition activities should include proper removal of any buried structures. Any buried structures or utilities encountered during construction should be properly removed and/or relocated. It is suspected that demolition activities of any existing structures encountered will disturb the upper soils. Following demolition activities, the exposed subgrade should be cleaned to firm native ground and backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

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.

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 2,000 psf for dead-plus-live loads. Footings should have a minimum embedment of 12 inches.

Alternatively, the proposed structures may be supported on drilled cast in place concrete piers/caissons. Recommendations regarding conventional foundations and drilled piers are provided in the Foundation section of this report.

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 vegetation; debris; existing utilities; 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 use as Engineered Fill. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas.

The site may have been previously utilized as agricultural land. Agricultural and residential developments presently surround the site. In addition, several oil wells are located within the project site vicinity. Associated with these developments are buried structures, such as utility lines and irrigation lines that may extend throughout the site. Demolition activities should include proper removal of any buried structures. Any buried structures or utilities encountered during construction should be properly removed and/or relocated. The resulting excavations should be cleaned to firm native ground and backfilled with Engineered Fill, compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Excavations, depressions, or soft and pliant areas extending below planned finish subgrade level 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. 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 backfilled with Engineered Fill.

Trees are located on the site. If not utilized for the proposed development, tree removal operations should include roots greater than 1 inch in diameter. The resulting excavations should be backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Following stripping and demolition activities, the exposed subgrade in building, exterior flatwork and pavement areas should be excavated/scarified to a depth of at least 12 inches, worked until uniform and free from large clods, moisture-conditioned as necessary, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Limits of recompaction should extend a

minimum of 5 feet beyond building areas and 2 feet beyond the edge of pavements or sidewalks. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation.

The upper soils, during wet winter months, become very moist due to the absorptive 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 upper on-site native soils predominately consist of silty sand, sandy silt and sand. Preliminary testing indicates these soils will be suitable for reuse as Engineered Fill provided they are cleansed of excessive organics and debris.

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 based on 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 2016 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 structures. 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.

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 reduced; 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 shortly 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's 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

After completion of the recommended site preparation, the site should be suitable for shallow footing support. The proposed structures may be supported on a shallow foundation system bearing on undisturbed native soils or Engineered Fill. Spread and continuous footings can be designed for the following maximum allowable soil bearing pressures:

Load	Allowable Loading
Dead Load Only	1,500 psf
Dead-Plus-Live Load	2,000 psf
Total Load, including wind or seismic loads	2,650 psf

The footings should have a minimum embedment depth of 12 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. Ultimate design of the foundation and reinforcement should be performed by the project structural engineer.

The total settlement is not expected to exceed 1 inch. Differential settlement should be less than ½ inch. Most of the movement 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 0.4 acting between the base of foundations and the supporting subgrade. Lateral resistance for footings can alternatively be developed using an equivalent fluid passive pressure of 350 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 above value may be used for short duration, wind, or seismic loads.

Foundations - Drilled Caissons

The proposed structures can be supported on drilled caissons using an allowable sidewall friction of 400 psf. This value is for dead-plus-live loads. This value may be increased by ⅓ for short duration loads, such as wind or seismic. The upper 12 inches should be neglected from friction calculations. Uplift loads can be resisted by caissons using an allowable sidewall friction of 225 psf of the surface area and the weight of the pier. Caissons should have a minimum embedment depth of 8 feet. The total settlement of the structure footing is not expected to exceed 1 inch. Differential settlement should be less than ½ inch. Most of the settlement is expected to occur during construction as the loads are applied.

Caissons may be designed using a lateral bearing capacity of 175 psf/ft using the applicable formula for nonconstrained or constrained conditions in Sections 1807.3.2.1 and 1807.3.2.2 of the 2016 California Building Code. This value can be doubled for allowable deflections of up to ½ inch. Nonconstrained or flexible cap conditions apply to isolated piers, and constrained or rigid cap (fixed against rotation) conditions apply to piers with a rigid connection to the structure.

Sandy soils were encountered at the site. These sandy soils may be subject to caving during drilling operations. Accordingly, cased caissons may be required.

Floor Slabs and Exterior Flatwork

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 aid 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 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 (i.e. ventilation fans) is recommended to reduce the accumulation of interior moisture.

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 35 pounds per square foot per foot of depth. Walls that are incapable of this deflection or walls that are fully constrained against deflection may be designed for an equivalent fluid at-rest pressure of 55 pounds per square foot per foot per 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. All of the above earth pressures are unfactored and are, therefore, not inclusive of factors of safety.

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

Two 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. Results of the tests are as follows:

Sample	Depth	Description	R-Value at Equilibrium
1	12-24"	Silty Sand (SM)	59
2	12-24"	Silty Sand (SM)	58

The test results are moderate and indicate good subgrade support characteristics under dynamic traffic loads. The following table shows the recommended pavement sections for various traffic indices.

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"	4.0"	12.0"
5.5	3.0"	4.0"	12.0"
6.0	3.0"	4.0"	12.0"
6.5	3.5"	4.0"	12.0"
7.0	4.0"	4.0"	12.0"
7.5	4.0"	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*

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 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"	--	12.0"

HEAVY DUTY

Traffic Index	Portland Cement Concrete***	Class II Aggregate Base*	Compacted Subgrade**
7.0	6.5"	--	12.0"

** 95% compaction based on ASTM Test Method D1557 or CAL 216*
*** 90% compaction based on ASTM Test Method D1557 or CAL 216*
****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 materials should be moisture-conditioned to above optimum moisture and compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Seismic Parameters – 2016 California Building Code

The Site Class per Section 1613 of the 2016 California Building Code (2016 CBC) and Table 20.3-1 of ASCE 7-10 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. For seismic design of the structures based on the seismic provisions of the 2016 CBC, we recommend the following parameters:

Seismic Item	Value	CBC Reference
Site Class	D	Section 1613.3.2
Site Coefficient F_a	1.000	Table 1613.3.3 (1)
S_s	1.531	Section 1613.3.1
S_{MS}	1.531	Section 1613.3.3
S_{DS}	1.021	Section 1613.3.4
Site Coefficient F_v	1.500	Table 1613.3.3 (2)
S_1	0.570	Section 1613.3.1
S_{M1}	0.855	Section 1613.3.3
S_{D1}	0.570	Section 1613.3.4

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 from these soil samples were less than 150 ppm and are below the maximum allowable values established by HUD/FHA and UBC. Therefore, no special design requirements are necessary 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.

Steve Nelson
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
DAVID R. JAROSZ II
NO. 2698
EXP. 6/30/2020
GEOTECHNICAL
STATE OF CALIFORNIA

David R. Jarosz, II
Managing Engineer
RGE No. 2698/RCE No. 60185

SN/DRJ:ht

SITE MAP	**Scale:** NTS	**Date:** May 2019
Arvin Pathways Project **Walnut Street and 4th Street** **Arvin, California**	**Drawn by:** HT	**Approved by:** DJ
	Project No. 022-19038	**Figure No.** 1

Krazan
GEOTECHNICAL ENGINEERING

Appendix A

Log of Borings & Laboratory Testing

APPENDIX A

FIELD AND LABORATORY INVESTIGATIONS

Field Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploratory program. Five 4½-inch exploratory borings were advanced. The boring locations are shown on the site plan.

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 core barrel. 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, and sieve analysis tests were completed for the undisturbed samples representative of the subsurface material. 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

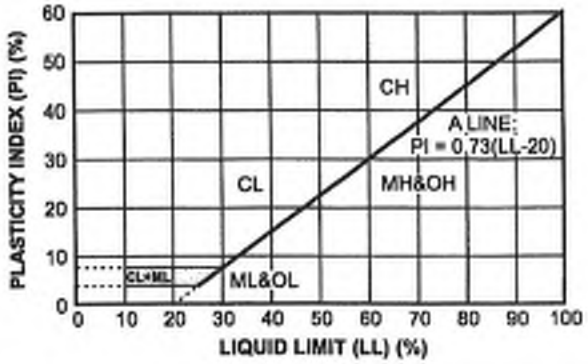
CONSISTENCY CLASSIFICATION

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	12 to 13 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 0.042
Fine-grained	No. 40 to No. 200	0.042 to 0.074
Silt and Clay	Below No. 200	Below 0.074

PLASTICITY CHART



Log of Boring B1

Project: Arvin Pathways Project

Project No: 022-19038

Client: City of Arvin

Figure No.: A-1

Location: Walnut Street and 4th Street, Arvin, California

Logged By: Wayne Andrade

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; light brown, damp, drills easily Loose below 12 inches Medium dense below 1½ feet				
2			89.7	4.7		31
4						
6			89.0	3.3		19
8						
10		***SAND (SP)*** Medium dense, fine- to medium-grained; light gray, damp, drills easily	112.6	1.1		16
12						
14						
16		***SANDY CLAYEY SILT (ML)*** Loose, fine-grained; dark brown, moist, drills easily	117.6	1.3		15
18						
20		***SILTY SAND/SANDY SILT (SM/ML)*** Medium dense, fine-grained; brown, moist, drills easily				

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight

Drill Rig: CME 45C-1

Driller: Chris Wyneken

Krazan and Associates

Drill Date: 4-12-19

Hole Size: 4½ Inches

Elevation: 30 Feet

Log of Boring B1

Project: Arvin Pathways Project

Project No: 022-19038

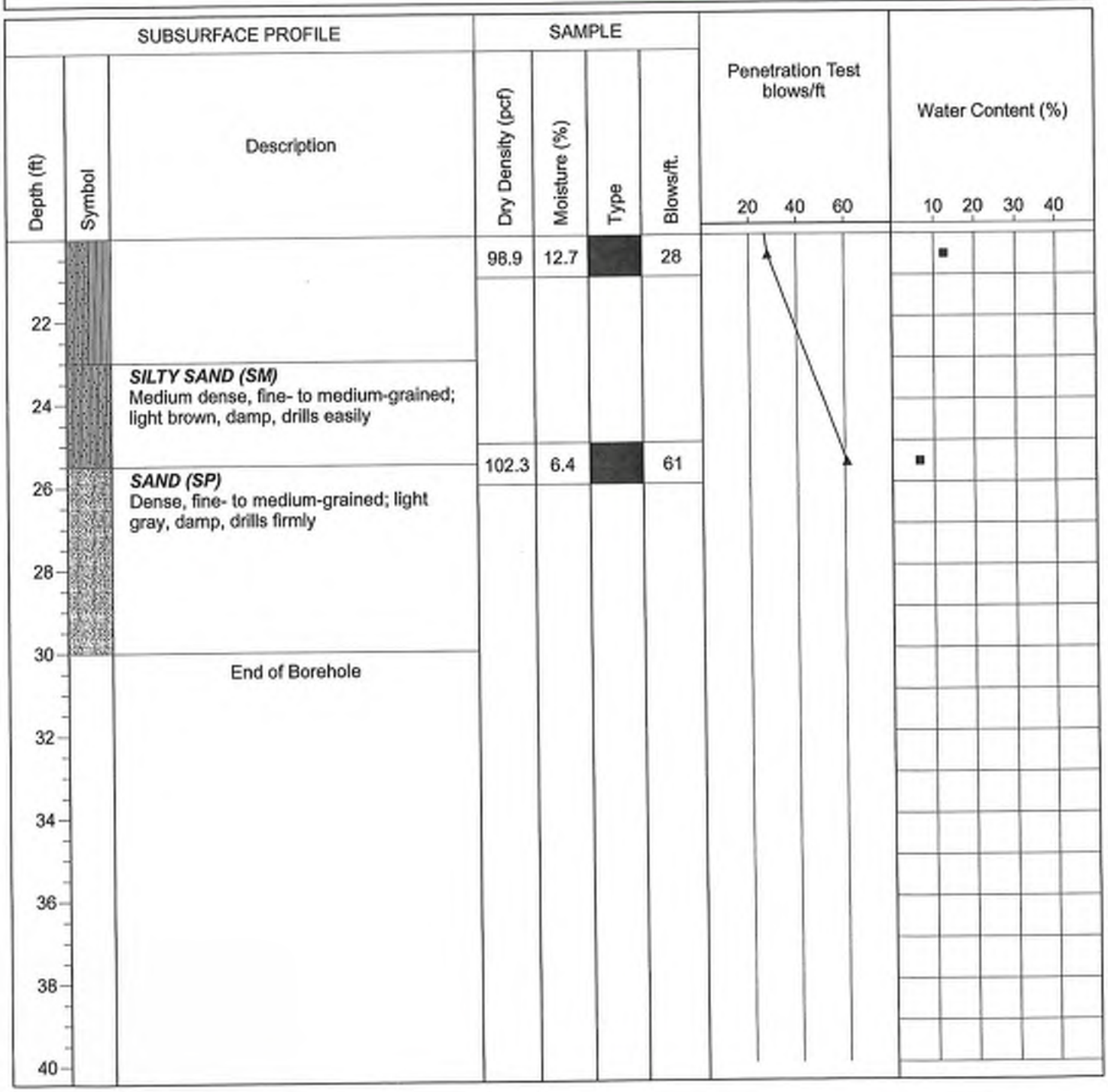
Client: City of Arvin

Figure No.: A-1

Location: Walnut Street and 4th Street, Arvin, California

Logged By: Wayne Andrade

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Solid Flight

Drill Rig: CME 45C-1

Driller: Chris Wyneken

Krazan and Associates

Drill Date: 4-12-19

Hole Size: 4½ Inches

Elevation: 30 Feet

Sheet: 2 of 2

Log of Boring B2

Project: Arvin Pathways Project

Project No: 022-19038

Client: City of Arvin

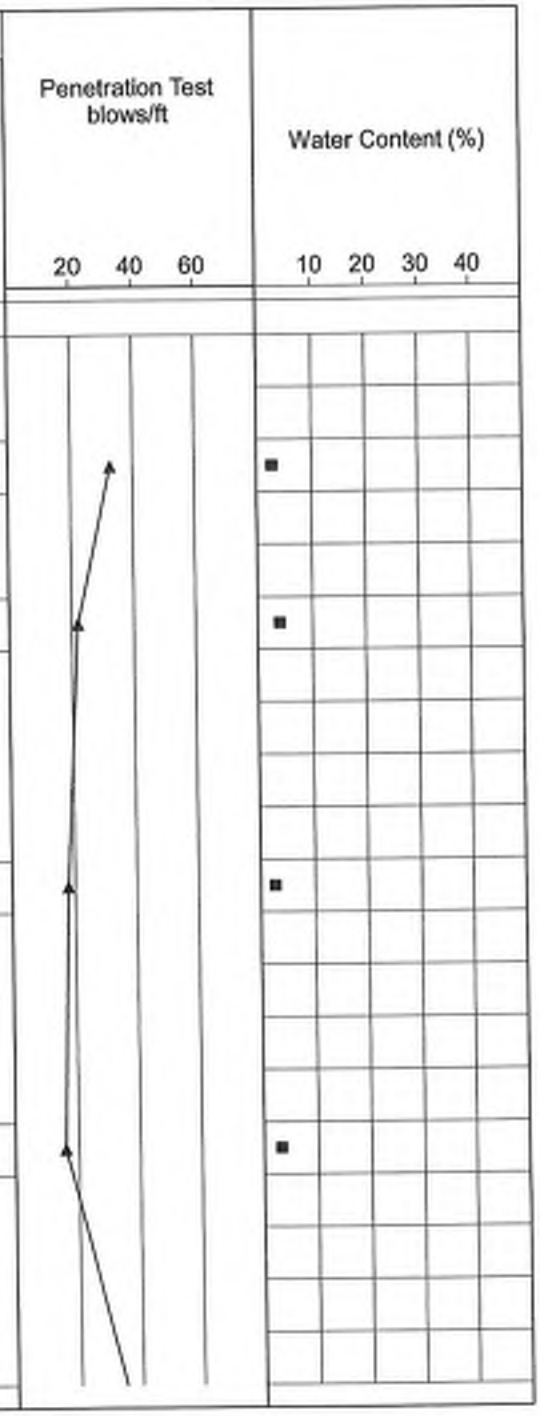
Figure No.: A-2

Location: Walnut Street and 4th Street, Arvin, California

Logged By: Wayne Andrade

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; light brown, damp, drills easily Medium dense below 12 inches				
2			92.1	2.8		33
4						
6			100.2	4.0		22
8		***SAND (SP)*** Medium dense, fine- to coarse-grained with trace fine GRAVEL; light gray, damp, drills easily				
10			93.8	2.7		18
12						
14						
16			105.4	3.3		16
18		***SILTY SAND/SANDY SILT (SM/ML)*** Medium dense, fine-grained; brown, damp, drills easily				
20						



Drill Method: Solid Flight

Drill Rig: CME 45C-1

Driller: Chris Wyneken

Krazan and Associates

Drill Date: 4-12-19

Hole Size: 4½ Inches

Elevation: 30 Feet

Log of Boring B2

Project: Arvin Pathways Project

Project No: 022-19038

Client: City of Arvin

Figure No.: A-2

Location: Walnut Street and 4th Street, Arvin, California

Logged By: Wayne Andrade

Depth to Water> **Initial:** None **At Completion:** None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
22			107.2	11.7		37
24		***SAND (SP)*** Very dense, fine- to medium-grained; light gray, damp, drills hard	107.5	5.7		50+
26						
28						
30		End of Borehole				
32						
34						
36						
38						
40						

Penetration Test blows/ft: 20, 40, 60

Water Content (%): 10, 20, 30, 40

Drill Method: Solid Flight

Drill Rig: CME 45C-1

Driller: Chris Wyneken

Krazan and Associates

Drill Date: 4-12-19

Hole Size: 4½ Inches

Elevation: 30 Feet

Log of Boring B3

Project: Arvin Pathways Project

Project No: 022-19038

Client: City of Arvin

Figure No.: A-3

Location: Walnut Street and 4th Street, Arvin, California

Logged By: Wayne Andrade

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 Loose below 12 inches				
2			101.0	4.8		14
4						
6		Medium dense below 5½ feet	107.1	4.6		19
8		***SAND (SP)*** Medium dense, fine- to medium-grained; light gray, damp, drills easily				
10		End of Borehole				
12						
14						
16						
18						
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight

Drill Rig: CME 45C-1

Driller: Chris Wyneken

Krazan and Associates

Drill Date: 4-12-19

Hole Size: 4½ Inches

Elevation: 10 Feet

Sheet: 1 of 1

Log of Boring B4

Project: Arvin Pathways Project

Project No: 022-19038

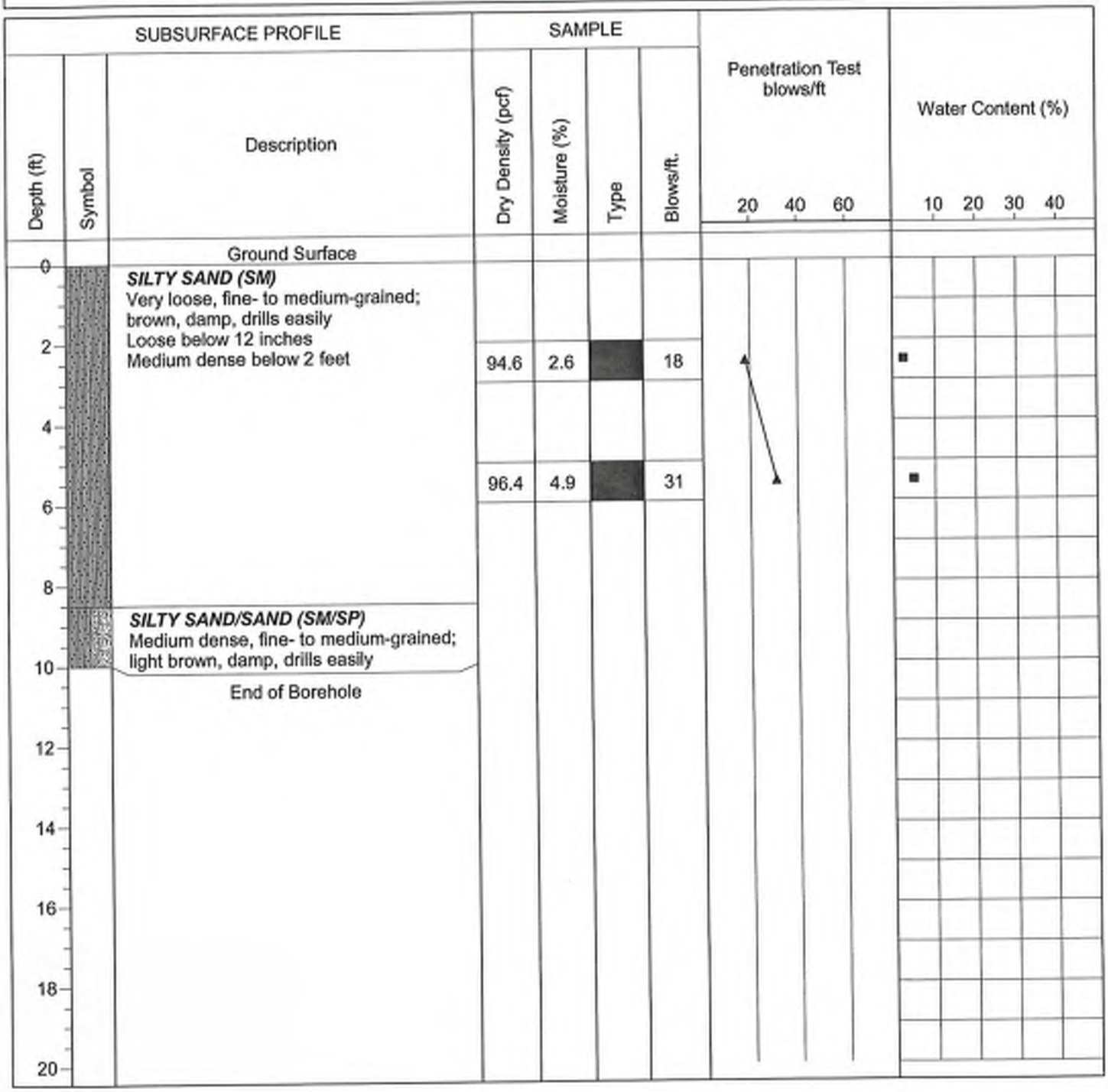
Client: City of Arvin

Figure No.: A-4

Location: Walnut Street and 4th Street, Arvin, California

Logged By: Wayne Andrade

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Solid Flight

Drill Rig: CME 45C-1

Driller: Chris Wyneken

Krazan and Associates

Drill Date: 4-12-19

Hole Size: 4½ Inches

Elevation: 10 Feet

Sheet: 1 of 1

Log of Boring B5

Project: Arvin Pathways Project

Project No: 022-19038

Client: City of Arvin

Figure No.: A-5

Location: Walnut Street and 4th Street, Arvin, California

Logged By: Wayne Andrade

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		Loose below 12 inches Medium dense below 2 feet	103.7	5.2		17
4		Loose below 4 feet				
6			86.1	7.5		13
8		With increased SAND below 7½ feet				
10		End of Borehole				
12						
14						
16						
18						
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight

Drill Rig: CME 45C-1

Driller: Chris Wyneken

Krazan and Associates

Drill Date: 4-12-19

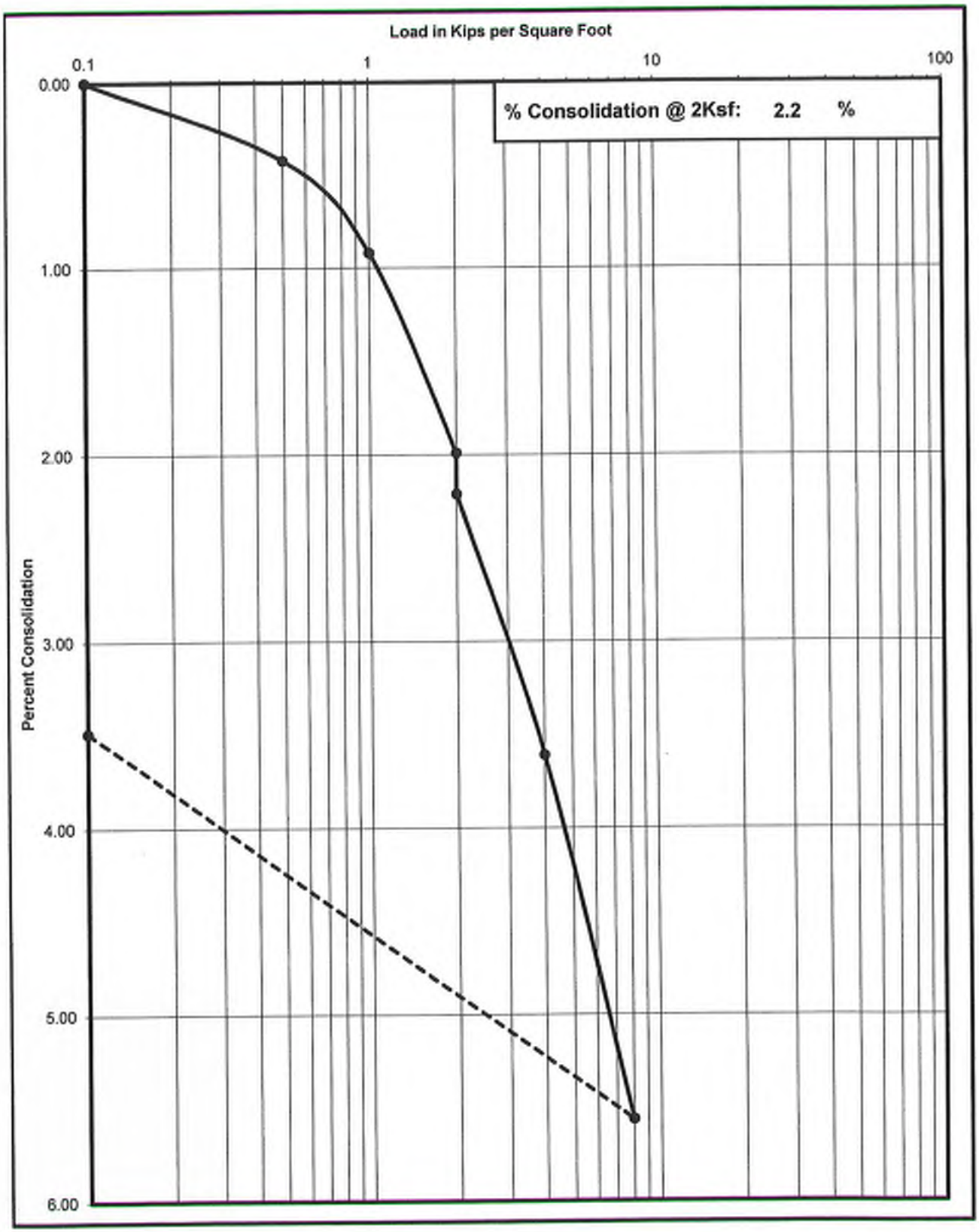
Hole Size: 4½ Inches

Elevation: 10 Feet

Sheet: 1 of 1

Consolidation Test

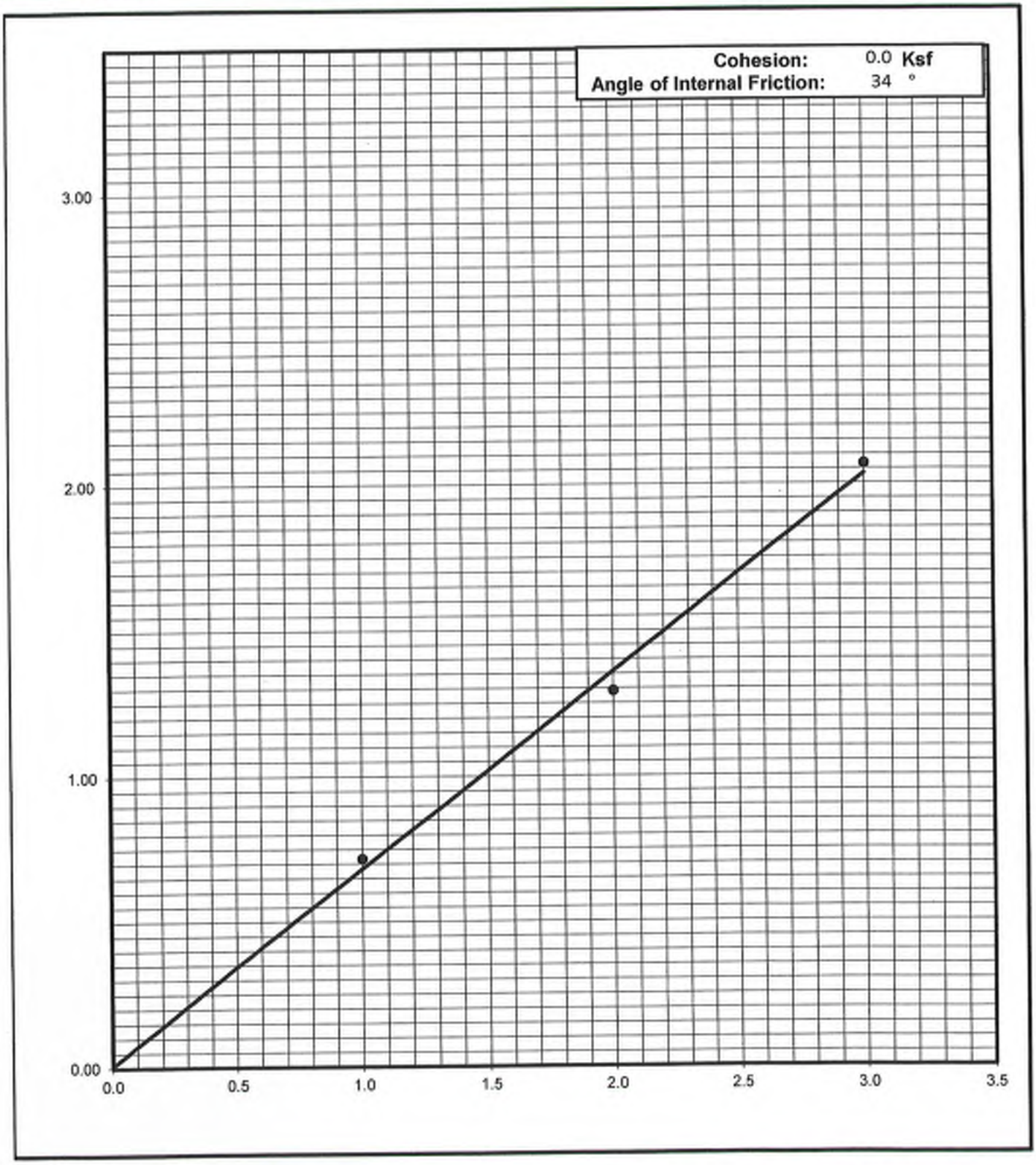
Project No	Boring No. & Depth	Date	Soil Classification
022-19038	B5 @ 2-3'	4/24/2019	SM



Krazan Testing Laboratory

Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
022-19038	B4 @ 2-3'	SM	4/24/2019



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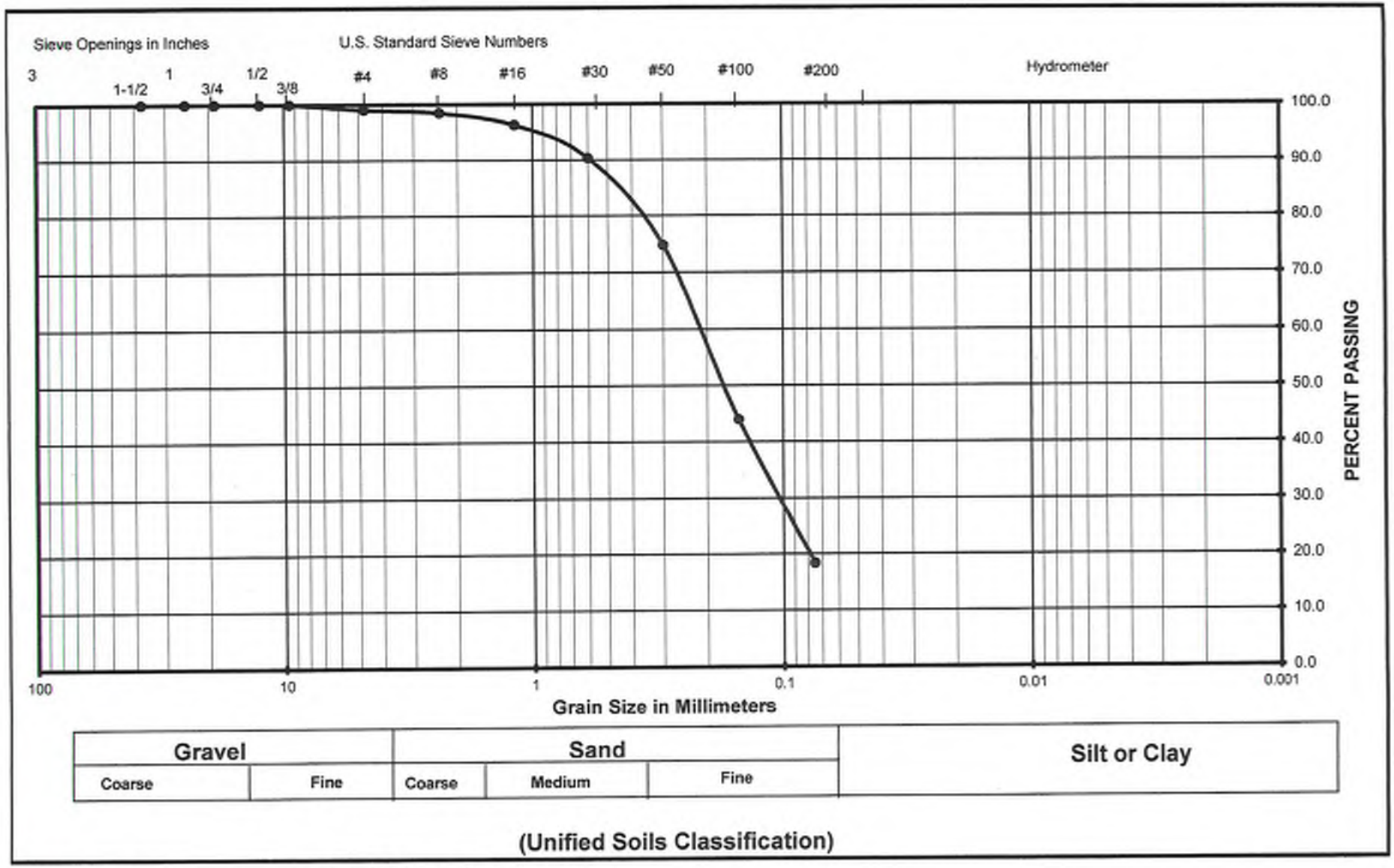
Grain Size Analysis



(Unified Soils Classification)

Project Name	Arvin Pathways Project
Project Number	022-19038
Soil Classification	SM
Sample Number	B5 @ 2-3'

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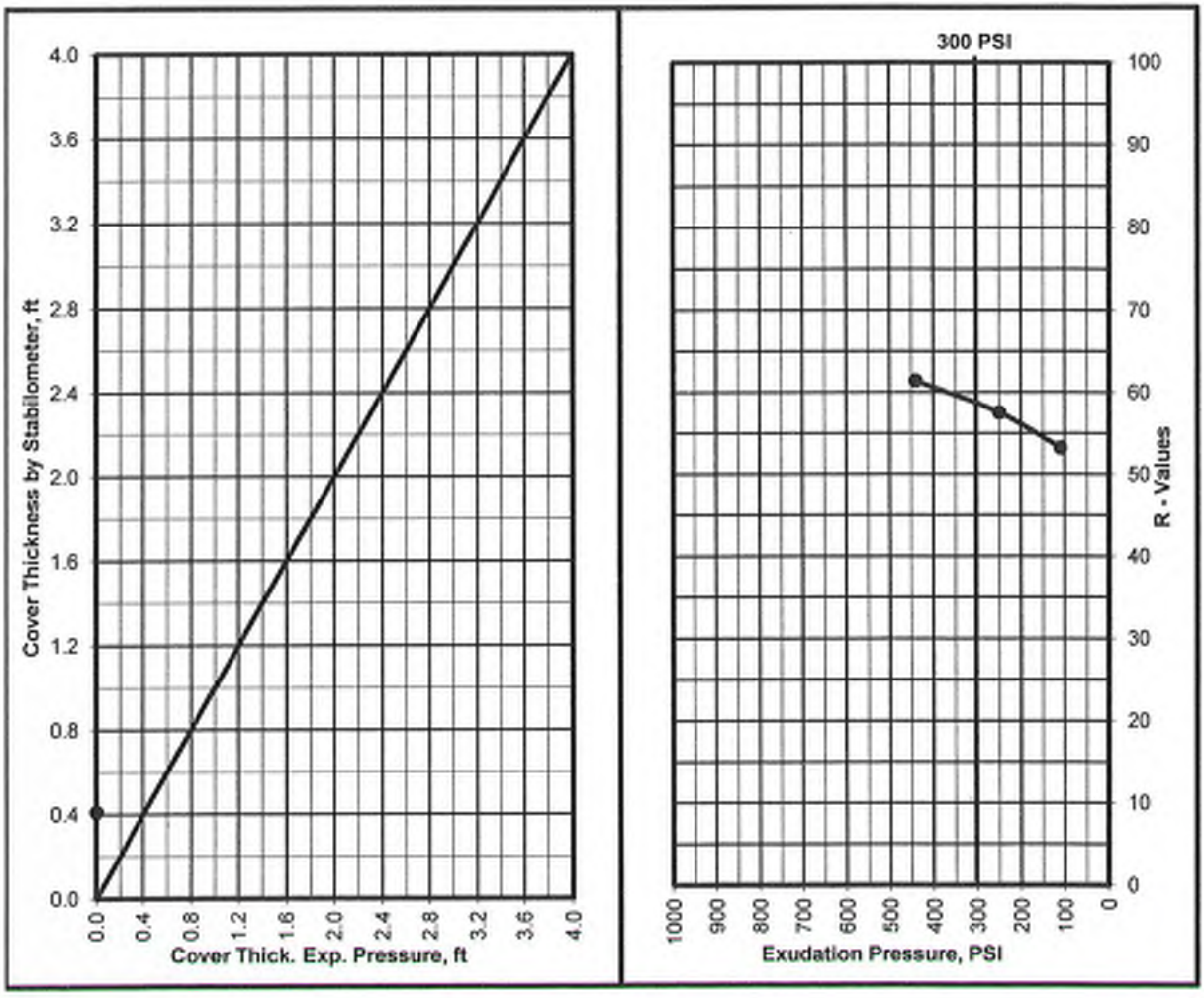
R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	022-19038
Project Name	:	Arvin Pathways Project
Date	:	4/16/2019
Sample Location/Curve Number	:	RV#1
Soil Classification	:	SM

TEST	A	B	C
Percent Moisture @ Compaction, %	11.8	12.8	6.0
Dry Density, lbm/cu.ft.	118.9	118.4	126.1
Exudation Pressure, psi	440	250	110
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	61	58	53

R Value at 300 PSI Exudation Pressure	**59**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



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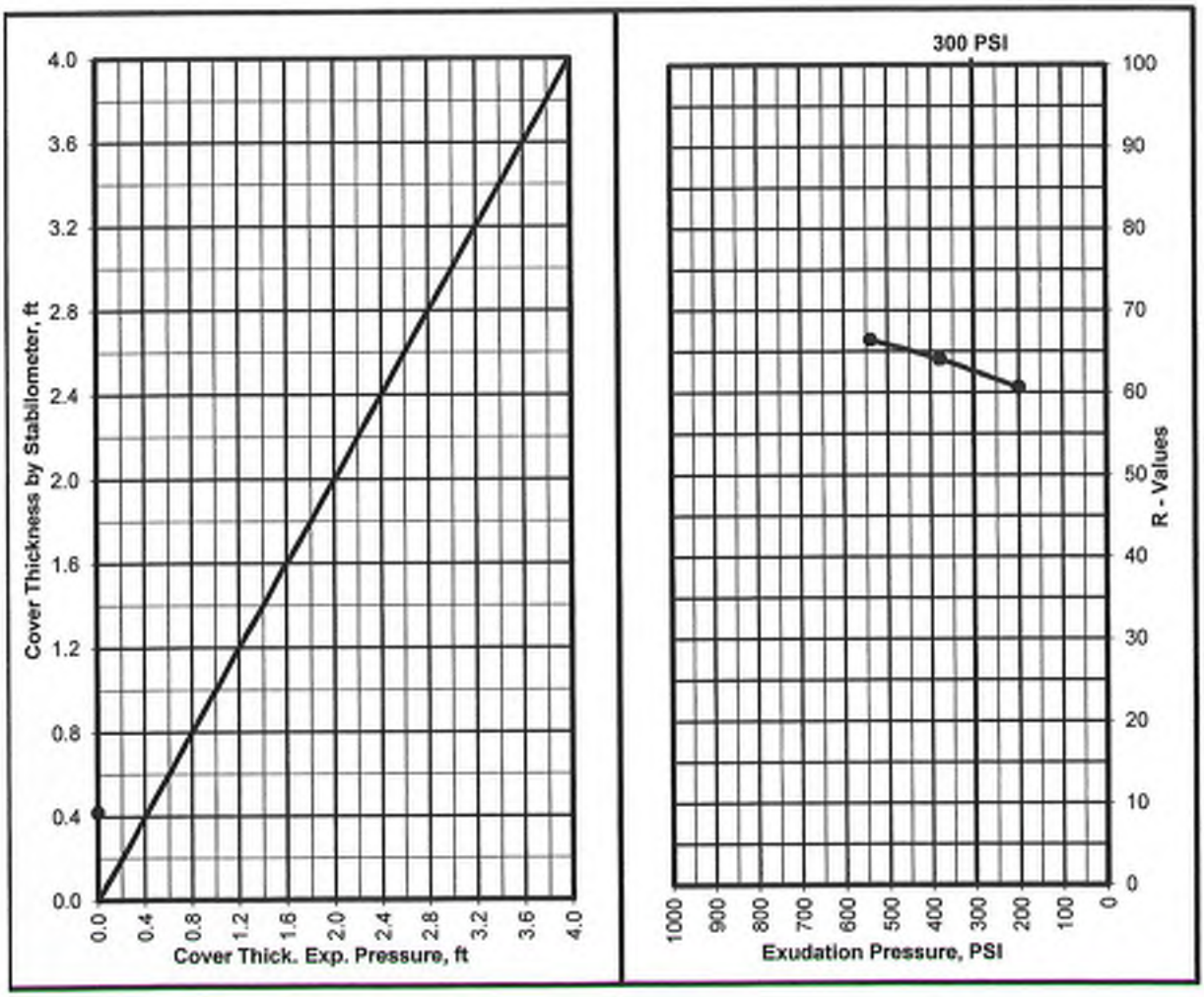
R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	022-19038
Project Name	:	Arvin Pathways Project
Date	:	4/16/2019
Sample Location/Curve Number	:	RV#2
Soil Classification	:	SM

TEST	A	B	C
Percent Moisture @ Compaction, %	11.5	10.6	10.1
Dry Density, lbm/cu.ft.	122.7	123.7	124.2
Exudation Pressure, psi	200	380	540
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	61	64	66

R Value at 300 PSI Exudation Pressure	**58**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



Krazan Testing Laboratory

Appendix B

General Earthwork Specifications

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.

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

General Paving Specifications

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.