well beyond design.

STUDIO W ARCHITECTS

October 10, 2025 **ADDENDUM 1**

RE: **Colusa Unified School District**
Burchfield ES – TK / K and Standard Classroom Modulars
Studio W Project Number 25033

From: **Studio W Architects**
1930 H Street, Sacramento, CA 95811

To: **Prospective Bidders**

This Addendum forms a part of the Contract Documents and modifies the original modular documents dated October 03, 2025 as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

The following changes or clarifications shall be made part of the Bid Documents and shall be taken into consideration when submitting bids.

CHANGES TO BIDDING REQUIREMENTS:

ADDITIONAL INFORMATION:

1. Draft Geologic Hazards & Geotechnical Report is provided, see attached. Thie Geologic Hazards & Geotechnical Report is still to be submitted to CGS.
2. Basis of Design Document is provided and supplemental information already issued, see attached.

CONTRACTOR PRE-BID QUESTIONS:

1. Will there be a job site walk? If so, when?
    a. Tuesday, October 14th at 11:30 AM at Burchfield site. Meet in front of Administration Building.
2. Can a construction schedule be provided?
    a. See attached schedule
3. In reviewing the documents, the bid bond form and the subcontractor list form are missing. Can you please provide these?
    a. There are three options shown on page 3 of the bid form for the 10% amount. Bid bond may be provided on surety company form. If manufacturer utilizes subcontractors please disclose. Otherwise, no subcontractor list is required.

Attachments: Draft Geologic Hazards & Geotechnical Report dated 10/3/2025
Basis of Design dated 10/9/2025
Construction Schedule dated 10/8/2025

END OF ADDENDUM 1

Distribution: CUSD
Studio W Project File 25033

Note: It is incumbent upon the Prime Bidder to notify his subcontractor and/or materials supplier of the above changes in the Contract Documents.

For: 400 Fremont Street, Colusa, CA 95932

Studio W Architects
1930 H Street, Sacramento, CA 95811
(916) 254-5600

Brian P. Whitmore, AIA
C30345

LICENSED ARCHITECT
BRIAN P WHITMORE
No. C 30345
Ren. 9/30/27
STATE OF CALIFORNIA

STATE OF CALIFORNIA – DIVISION OF THE STATE ARCHITECT

GEOLOGIC HAZARDS AND GEOTECHNICAL ENGINEERING REPORT
BURCHFIELD PRIMARY ELEMENTARY SCHOOL MODERNIZATION
400 FREMONT STREET
COLUSA, CALIFORNIA

OCTOBER 3, 2025

Prepared For:

COLUSA UNIFIED SCHOOL DISTRICT
745 10th Street
Colusa, California 95932

Mr. Scott Lantsberger, Chief Business Official

NV5

48 Bellarmine Court
Suite 40
Chico, CA 95928

2560125-0071554.00.001

October 3, 2025
Project No. 71554.00.001

Mr. Scott Lantsberger, Chief Business Official
Colusa Unified School District
745 10th Street
Colusa, California 95932

Via PDF: slantsberger@colusa.k12.ca.us

Reference: **Geologic Hazards and Geotechnical Engineering Report**
Burchfield Primary Elementary School Modernization
400 Fremont Street
Colusa, Colusa County, California

Dear Mr. Lantsberger,

NV5 conducted a geologic hazards evaluation and performed a geotechnical engineering investigation for the proposed modernization to the existing Burchfield Primary Elementary School campus located at 400 Fremont Street in Colusa, California. NV5's geologic hazards evaluation and geotechnical engineering investigation of the site were performed consistent with the scope of services presented in the July 25, 2025 proposal (PC25.155).

The findings, conclusions and recommendations presented in this report are based on the following relevant information collected and evaluated by NV5: literature review, surface observations, subsurface exploration, laboratory test results, and experience with similar projects, sites and conditions in the area. The proposed structural improvements include construction of two new modular classroom wings utilizing conventional design and construction practices. There were no geologic, seismic or geotechnical engineering hazards identified at the site that would require mitigation during construction. It is NV5's opinion that the site is suitable for the proposed construction provided the geotechnical engineering recommendations presented in this report are incorporated into the earthwork and structural improvements. This report should not be relied upon without review by NV5 if a period of 24 months elapses between the issuance report date shown above and the date when construction commences.

NV5 appreciates the opportunity to provide geologic and geotechnical engineering services for this important project. If you have questions or need additional information, please do not hesitate to contact the undersigned at 530-894-2487.

Sincerely,
NV5

Shane D. Cummings, CEG 2492
Principal Engineering Geologist

Chuck R. Kull, GE 2359
Principal Engineer

48 BELLARMINE COURT, SUITE 40 | CHICO, CA 95928 | WWW.NV5.COM | OFFICE 530.894.2487

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ACRONYMS

AB	aggregate base
AC	asphalt concrete
ACI	American Concrete Institute
ASCE	American Society of Civil Engineers
ASTM	ASTM International
bgs	below ground surface
BPES	Burchfield Primary Elementary School
CalEPA	California Environmental Protection Agency
CAT	Caterpillar
CBC	California Building Code
CDPH	California Department of Public Health
CGS	California Geological Survey
CQA	Construction Quality Assurance
CLSM	Controlled Low Strength Material
EFP	equivalent fluid pressure
FEMA	Federal Emergency Management Agency
FS	factor of safety
ft/s	feet per second
km	kilometer
M_L	local magnitude
MCE	maximum considered earthquake
mg/kg	milligrams per kilograms
msl	mean sea level
mybp	million years before present
NEIC	National Earthquake Information Center
NOA	naturally occurring asbestos
OSHA	Occupational Safety and Hazards Administration
oz/yd	ounce per square yard
P-waves	seismic compression waves
PCA	Portland Cement Association
pCi/L	picoCuries per liter
pcf	pounds per cubic foot
PGA_M	peak ground acceleration
PI	plasticity index
psf	pounds per square foot
psi	pounds per square inch
PVC	polyvinylchloride
S-wave	shear-wave
SEAOC	Structural Engineers Association of California
SFHA	Special Flood Hazard Area
SPT	standard penetration test
SRMS	Seismic Refraction Microtremor Survey
SSD	saturated surface dry
USCS	Unified Soils Classification System
USGS	United States Geological Survey
V_s Model	velocity profile

1.0 INTRODUCTION

NV5 conducted a geologic hazards evaluation, performed a geotechnical engineering investigation, and prepared this Geologic Hazards and Geotechnical Engineering Report for the proposed modernization of the existing Burchfield Primary Elementary School (BPES) campus located at 400 Fremont Street in Colusa, California, consistent with the scope of services presented in NV5's *Proposal for Geologic and Geotechnical Engineering Services* (PC25.155), dated July 25, 2025. The scope of services was based on the 2022 California Building Code (2022 CBC) and current *Checklist for Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings* (Note 48) available at the time the proposal was prepared. NV5's findings, conclusions and recommendations are presented herein.

1.1 SCOPE-OF-SERVICES

NV5 performed a specific scope-of-services to evaluate potential geologic hazards located within the site and its immediate vicinity and to develop geotechnical engineering design recommendations for earthwork and structural improvements. Brief descriptions of each work scope task are presented below. A detailed description of each work scope task is presented in Section 2 (Site Investigation) of this report.

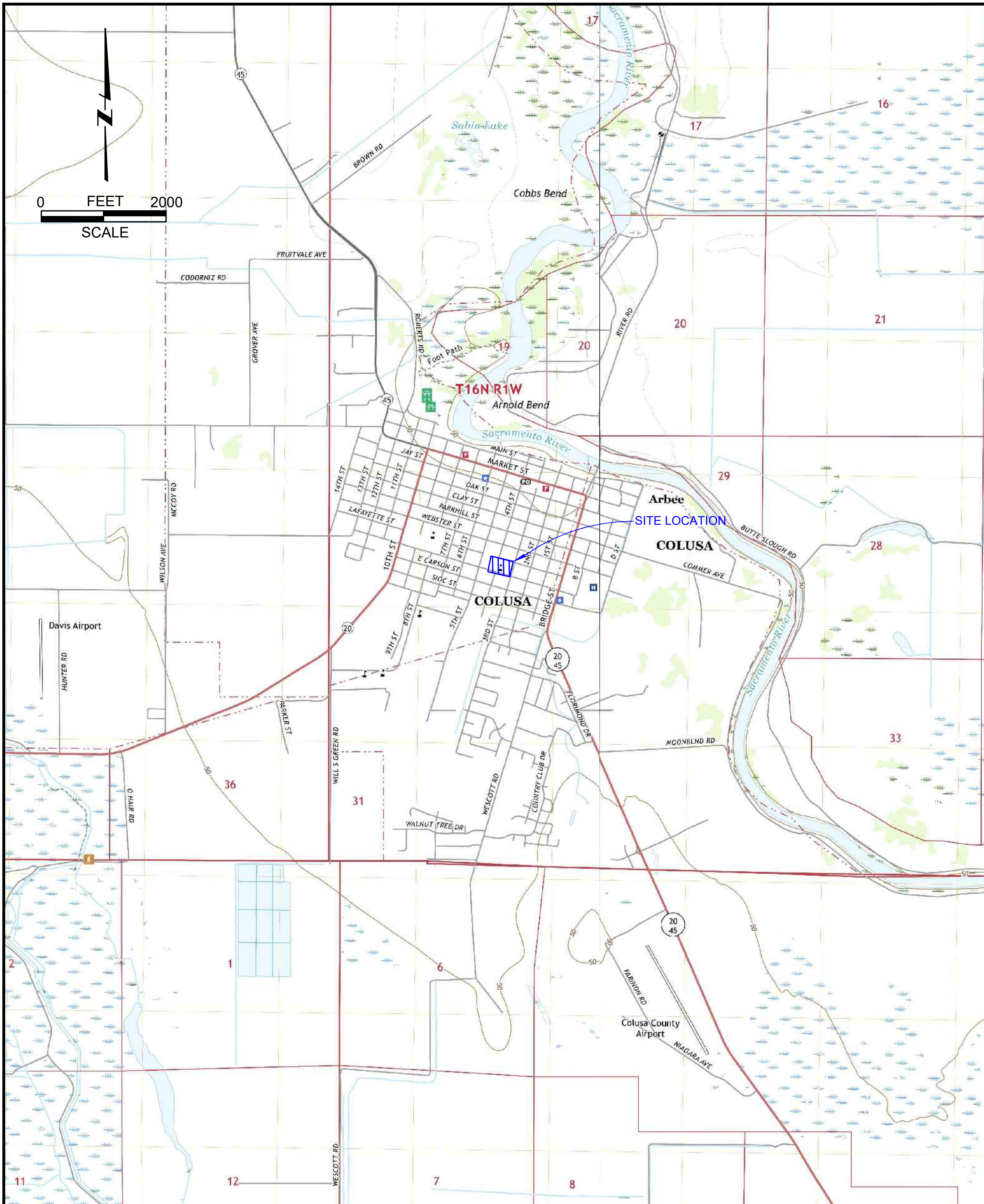
- **Task 1 Site Investigation:** NV5 performed a site investigation to characterize the existing surface and subsurface soil, rock and groundwater conditions encountered to the maximum depth excavated. NV5's field engineer/geologist made observations, collected representative soil samples, and performed field tests at a limited number of subsurface exploratory locations. NV5 performed laboratory tests on selected soil samples to evaluate their engineering material properties.
- **Task 2 Data Analysis and Engineering Design:** NV5 evaluated the field and laboratory site data and the proposed site improvements and used this information to evaluate potential geologic hazards that may negatively impact the proposed site improvements and to develop geotechnical engineering design recommendations for earthwork and structural improvements. NV5 used engineering judgment to extrapolate NV5's observations and conclusions regarding the field and laboratory data to other onsite areas located between and beyond the locations of NV5's subsurface exploratory excavations. NV5 reviewed geologic and seismic literature, maps, aerial photos, and on-line sources for information about site soil and rock conditions, and potential geologic and seismic hazards.
- **Task 3 Report Preparation:** NV5 prepared this report to present the findings, conclusions and recommendations for this geologic hazards evaluation and geotechnical engineering investigation. The report followed the guidelines presented in California Geological Survey (CGS) Note 48, *Checklist for Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings,* dated November 2022, and the 2022 CBC.

1.2 SITE LOCATION AND DESCRIPTION

The BPES modernization structural improvements are proposed in the northwestern and southeastern portions of the existing BPES campus located at 400 Fremont Street in Colusa, California. The BPES campus is centered at about latitude 39.2080 north and longitude -122.0089 west on the United States Geological Survey's (USGS), 7.5 minute *Colusa Quadrangle* topographic map. The property elevation is approximately 55 feet above mean sea level (msl), based on review of the USGS 7.5-minute *Colusa Quadrangle* topographic map. Figure 1 shows the site location and vicinity.

At the time the site investigation was performed on August 6, 2025, the following conditions were observed and are shown in the inset image above:

- The area of the proposed modular classroom wing in the northwestern portion of the BPES campus currently supports existing modular classrooms and asphalt concrete paved hardcourts. Underground utility boxes indicate several underground utilities are also located in the area.
- The area of the TK-K Classroom wing proposed in the southeastern portion of the BPES campus currently supports an irrigated grass play field and an existing playground.



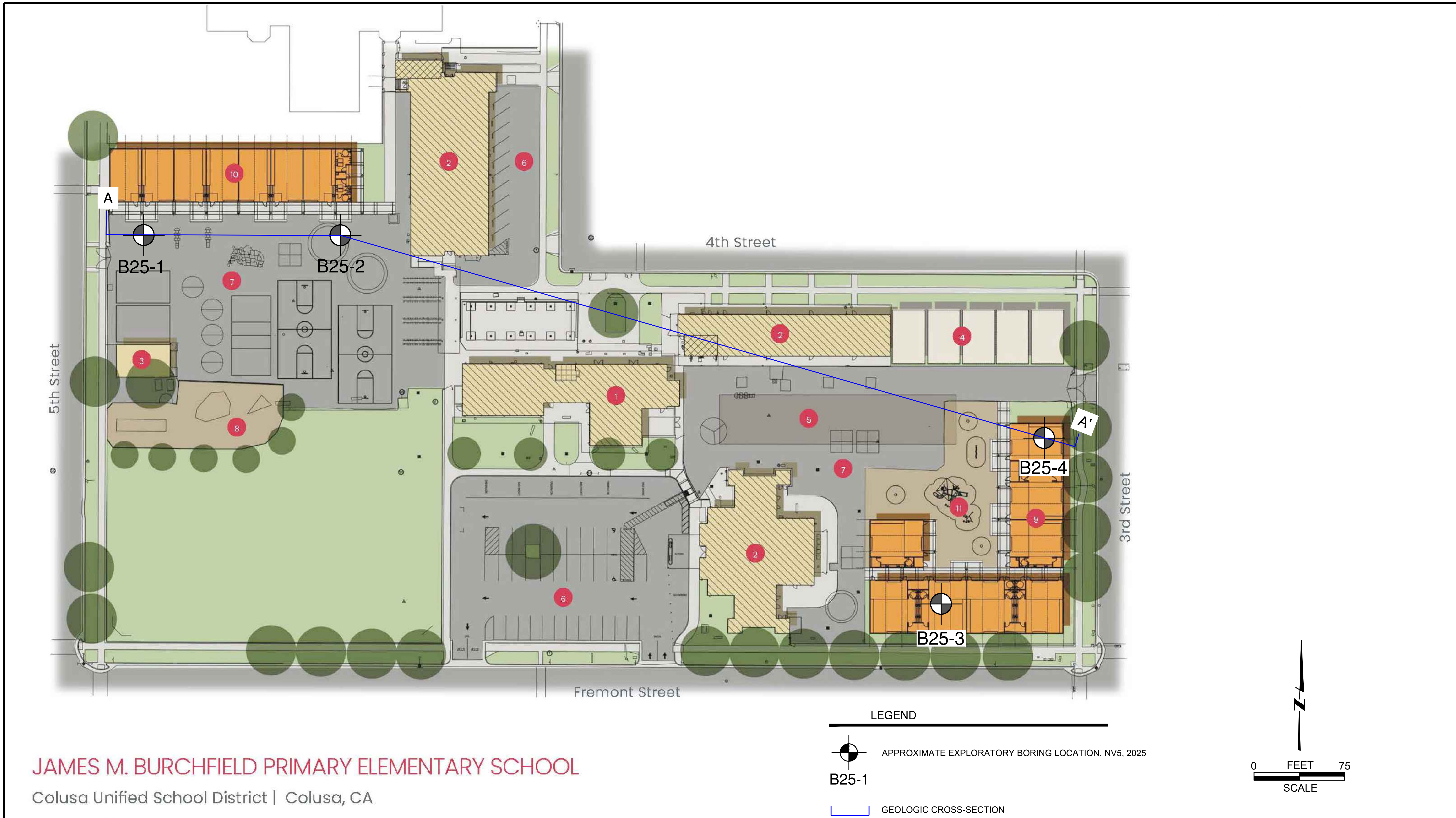
NV5	SITE LOCATION MAP BURCHFIELD PRIMARY ELEMENTARY SCHOOL COLUSA, COLUSA COUUNTY, CALIFORNIA	DRAWN BY: DJP CHECKED BY: SDC PROJECT: 71554.00.001 DATE: SEPTEMBER 2025	FIGURE 1

1.3 PROPOSED IMPROVEMENTS

Based on the project information provided by representatives of Studio W Architects and NV5's review of the *Proposed Site Plan*, dated August 8, 2025, prepared by Studio W Architects, NV5 understands the proposed structural improvements are indicated to include construction of one new TK/K Modular Classroom Wing, approximately 10,000 square feet (sf) in size, in the southeastern portion of the BPES campus and one new modular classroom wing, approximately 7,200 sf in size in the northwestern portion of the BPES campus. NV5 anticipates the new buildings will consist of single-story pre-engineered, pre-manufactured structures constructed using light gauge metal or wood framing supported on shallow perimeter and isolated spread foundations. Associated improvements may include construction of a new playground, underground utilities, concrete slab-on-grade sidewalks, and landscape improvements. Earthwork grading is anticipated to involve minor cuts and fills to meet the proposed building grades. Figure 2 presents the proposed structural improvements and the approximate exploratory boring locations.

1.4 INVESTIGATION PURPOSE

The purpose of the geologic hazard evaluation and geotechnical engineering investigation was to obtain sufficient on-site information about the soil, rock, and groundwater conditions to facilitate the updated evaluation of potential geologic hazards described in the subsequent sections of this report and provide geotechnical engineering recommendations for the proposed earthwork and structural improvements. As part of this contract, NV5 did not evaluate the site for the presence of hazardous waste, mold, asbestos, and radon gas. Therefore, the presence and removal of these materials are not discussed in this report.



Note: Adapted from the August 8, 2025, James M. Burchfield Primary Elementary School, Proposed Site Plan, prepared by Studio W Architects.

NV5

SITE PLAN AND EXPLORATORY BORING LOCATION MAP

BURCHFIELD PRIMARY ELEMENTARY SCHOOL

COLUSA, CALIFORNIA

DRAWN BY:	DJP
CHECKED BY:	SDC
PROJECT:	71554.00.001
DATE:	SEPTEMBER 2025

FIGURE 2

2.0 SITE INVESTIGATION

NV5 performed a site investigation to characterize the existing surface and subsurface conditions beneath the proposed BPES structural improvements. The site investigation included a literature review of published and unpublished geologic documents and maps, a surface reconnaissance investigation, and a subsurface exploratory investigation using a truck-mounted drill rig to excavate exploratory borings. Each component of the site investigation is presented below.

2.1 LITERATURE REVIEW

NV5 performed a limited review of available literature that was pertinent to the project site. The following summarizes NV5's findings:

2.1.1 Site Improvement Plans

Improvement plans were not available for review at the time this report was prepared.

2.1.2 Previous Site Investigation Reports

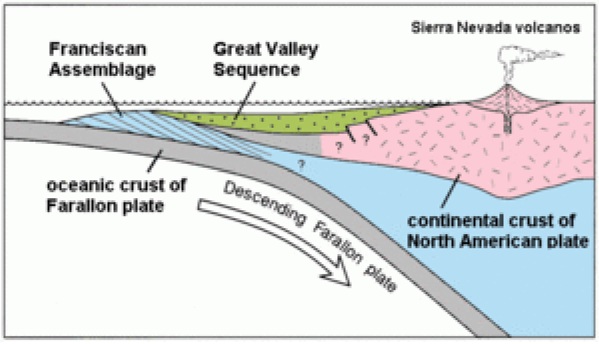
NV5 was not provided with previous geotechnical reports for review that may be associated with the existing site.

2.2 REGIONAL GEOLOGY

The BPES campus is situated in the Sacramento Valley within the Great Valley geologic province west of the boundary with the Cascade geologic province. The Great Valley province is generally bordered on the north by the Klamath Mountains and Cascade Range, to the east by the Sierra Nevada Mountain Range, and to the west by the Coast Ranges geomorphic provinces. The Great Valley or central valley of California is a large, relatively flat lying northwest to southeast trending area that is approximately 40 to 60 miles (60 to 100 kilometers [km]) wide (east-west) and approximately 450 miles (720 km) long (north-south). The northern one-third of the valley is drained to the south by the Sacramento River and the southern two-thirds of the valley are drained to the north by the San Joaquin River, thus the portions of the great valley drained by these rivers are called the Sacramento Valley and San Joaquin River, respectively. These rivers join to form a large delta on the eastern edge of the San Francisco Bay and eventually flow westward into the Pacific Ocean.

The Great Valley is thought to have originated during the late Jurassic Period (164 to 145 million years before present [mybp]) through Cretaceous Period (145 to 66 mybp) below sea level as a depressed offshore area caused by subduction of the Farallon Oceanic Plate consisting predominantly of heavier mafic rocks beneath the North American Continental Plate consisting predominantly of lighter salic rocks as shown in the inset figure. The theory of plate tectonics refers to this geologic environment as either a forearc basin, arc-trench gap, outer arc trough or island arc phenomenon because a chain of volcanoes defined the east boundary, and an ancient subduction zone associated with a deep-sea oceanic trench defined the west boundary.

The resulting depression was subsequently filled with approximately 40,000 feet (12 kilometers) of sediments referred to as the Great Valley Sequence derived from the ancient Sierra Nevadan volcanoes, followed by sediments eroded from the rapidly rising Sierra Nevada mountain range. The deeper sediments deposited during the late Jurassic and Cretaceous Periods generally consist of inter-layered coarse- and fine-grained marine sediments associated with mountain-building events. The shallower sediments deposited during the Pleistocene Epoch (2.6 to 0.01 mybp) and Holocene Epoch (0.01 mpyb to present) generally consist of marginal-marine to non-marine, predominantly coarser-grained sediments that represent the final stage of infilling of the basin.

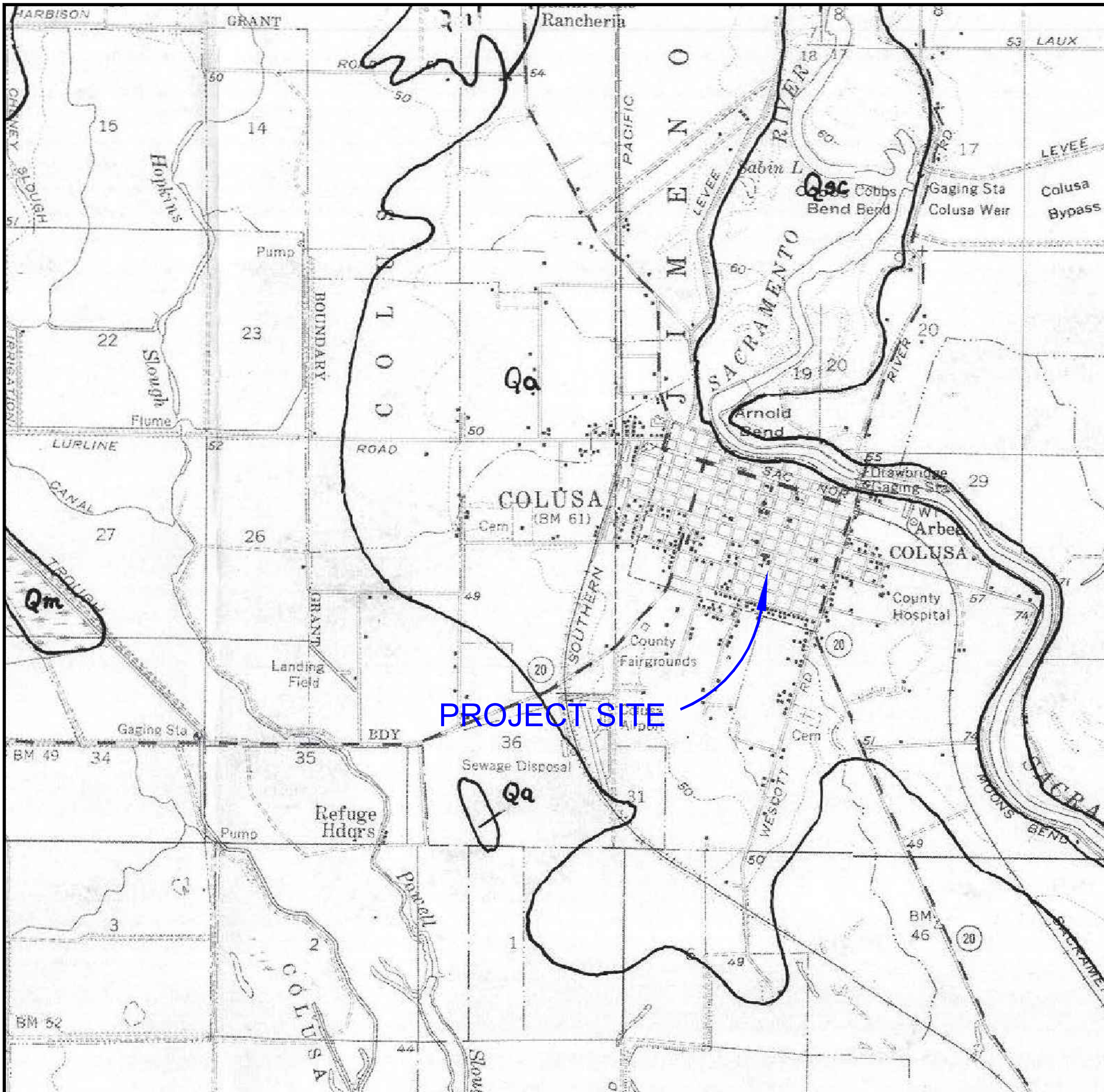


2.3 SITE GEOLOGY

Based on review of the *Geologic Map of Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California*, published by the USGS, the geology immediately underlying the subject site is comprised of Holocene alluvial deposits (Q_a). The alluvial deposits are generally comprised of unweathered gravel, sand, silt, and clay that are deposited by present-day stream and river systems that drain the Coast Ranges, Klamath Mountains, and Sierra Nevada (Helley, J., Harwood, D., 1985). A geologic map of the site area provided from the *Geologic Map of Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California* is provided as Figure 3.

2.4 REGIONAL FAULTING AND SEISMIC SOURCES

Regional faulting is associated with the Resort fault zone, the Barlett Springs Fault, the Little Indian Valley Fault, and the Hunting Creek fault zone to the west of the site. A group of unnamed faults within in the southern portion of the Sutter Buttes are located east of the site.



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SCALE

DESCRIPTION OF MAP UNITS

Qsc: Holocene-aged Stream Deposits

Qm: Modesto Formation

Qa: Alluvium

REFERENCE: GEOLOGIC MAP OF THE LATE CENOZOIC DEPOSITS OF THE SACRAMENTO VALLEY AND NORTHERN SIERRAN FOOTHILLS, CALIFORNIA; MF-1790

NV5	REGIONAL GEOLOGIC MAP BURCHFIELD PRIMARY ELEMENTARY SCHOOL COLUSA, CALIFORNIA	DRAWN BY: DJP CHECKED BY: SDC PROJECT: 71554.00.001 DATE: SEPTEMBER 2025	FIGURE 3

NV5 reviewed the California Geological Survey (CGS) California Earthquake Hazard Zone Application (EQ Zapp) on the internet at (https://maps.conservation.ca.gov/cgs/EQZApp/app/). These maps are updates to Special Publication 42, Interim Revision 2007 edition *Fault Rupture Hazard Zones in California*, which describes active faults and fault zones (activity within 11,000 years), as part of the Alquist-Priolo Earthquake Fault Zoning Act. Review of the available maps referenced in EQ Zapp (updated April 4, 2019) indicates that the site is not located within an Alquist-Priolo active fault zone. There are currently no proposed earthquake fault zone maps in the immediate area of Colusa, California.

According to the *Fault Activity Map of California and Adjacent Areas* (Jennings, 1994), the closest known active fault which has surface displacement within Holocene time (about the last 11,000 years) is the Cleveland Hills Fault. The 2010 Fault Activity Map of California by the California Geological Survey, (*http:// https://maps.conservation.ca.gov/cgs/fam/*), Geologic Data Map No. 6 shows the nearest known active fault with surface displacement within Holocene time to be the Cleveland Hill Fault. The mapped fault zone is located approximately 34 miles northeast of the subject site and is associated with ground rupture during the Oroville earthquakes of 1975. The approximate location of the BPES identified on the *Fault Activity Map of California and Adjacent Areas* is presented as Figure 4.

Based on no known faults being mapped crossing through the site and the closest mapped fault zone with surface displacement greater than 30 miles away, active fault deformation is not considered a hazard at this site.

2.5 FIELD INVESTIGATION

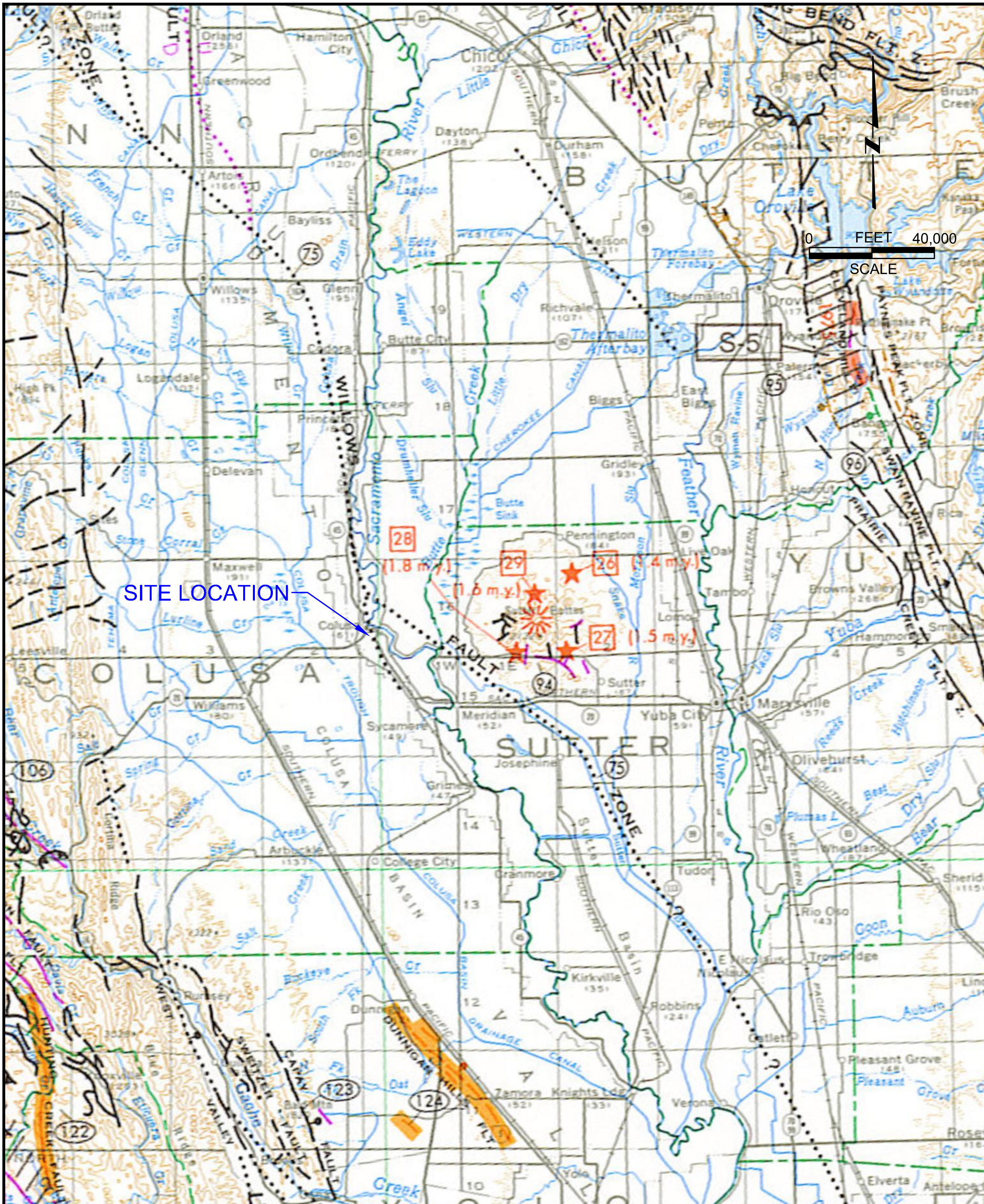
NV5 performed a field investigation of the site on August 6, 2025. NV5's field engineer/geologist described the surface and subsurface soil, rock and groundwater conditions observed at the site using the procedures cited in the ASTM International (ASTM), Volume 04.08, *Soil and Rock (I)* as general guidelines. The field engineer/geologist described the soil color using the general guideline procedures presented in the Munsell® Soil-Color Chart. Engineering judgment was used to extrapolate the observed surface and subsurface soil, rock and groundwater conditions to areas located between and beyond the subsurface exploratory locations. The surface, subsurface and groundwater conditions observed during the field investigation are summarized below.

2.5.1 Surface Conditions

NV5 observed the following surface conditions during the field investigation of the property. Figure 2 shows the proposed structural improvements and approximate exploratory boring locations.

The area of the proposed modular classroom wing in the northwestern portion of the BPES campus currently supports existing modular classrooms and asphalt concrete paved hardcourts. Underground utility boxes indicate several underground utilities are also located in the area.

The area of the TK-K Classroom wing proposed in the southeastern portion of the BPES campus currently supports an irrigated grass play field and an existing playground.



N|V|5

FAULT ACTIVITY MAP

BURCHFIELD PRIMARY ELEMENTARY SCHOOL

COLUSA, CALIFORNIA

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CHECKED BY:	SDC
PROJECT:	71554.00.001
DATE:	SEPTEMBER 2025

FIGURE

4

2.5.2 Subsurface Conditions

The subsurface soil and groundwater conditions were investigated by advancing exploratory borings in accessible areas in the vicinity of the proposed structures across the site. The subsurface information obtained from this investigation method is described in the following subsections.

2.5.2.1 Exploratory Boring Information

NV5 provided engineering oversight during the advancement of a total of 4 exploratory soil borings at the project site. The borings were advanced with a CME-75 truck-mounted drill rig equipped with 8-inch diameter hollow stem augers. Figure 2 shows the approximate locations of the subsurface exploratory excavations. The borings were advanced to maximum depths of 16.5 to 51.5 feet below ground surface (bgs). Engineering judgment was used to extrapolate the observed soil, rock and groundwater conditions to areas located between and beyond the subsurface exploratory excavations. NV5's field engineer/ geologist logged each exploratory boring using the ASTM D2487 Unified Soils Classification System (USCS) as guidelines for soil descriptions and the American Geophysical Union guidelines for rock descriptions.

NV5's field engineer/geologist logged each exploratory boring using the ASTM D2487 USCS as guidelines for soil descriptions and the American Geophysical Union guidelines for rock descriptions. Relatively undisturbed soil samples were collected with an unlined standard penetration test (SPT) split-spoon sampler and 2.5-inch-inside-diameter, split-spoon sampler equipped with stainless steel liner sampler tubes. The samplers were driven into the soil using an automatic-trip hammer weighing 140 pounds with a 30-inch free-fall. The stainless-steel liner samples were sealed with labeled plastic caps. The samples collected with the SPT sampler were sealed in labeled plastic bags. Representative bulk samples of the near-surface soil materials generated from drilling the exploratory borings also were collected and placed in labeled sample bags. The soil samples collected in the exploratory borings were transported to NV5's Chico soil laboratory facility.

Detailed descriptions of the soil, rock and groundwater conditions that were encountered in each subsurface exploratory location are presented on the exploratory boring logs included in Appendix B. The soil and rock descriptions include visual field estimates of the particle size percentages (by dry weight), color, relative density or consistency, moisture content and cementation that comprise each soil material encountered.

A generalized profile of the soil, rock and groundwater conditions encountered to the maximum depth explored (51.5 feet) below the proposed building area is presented below. The soil and/or rock units encountered in the subsurface exploratory excavations were generally stratigraphically continuous across the site with some variations in gradations and thicknesses. The units encountered in general stratigraphic sequence during the subsurface investigation of the site are described below.

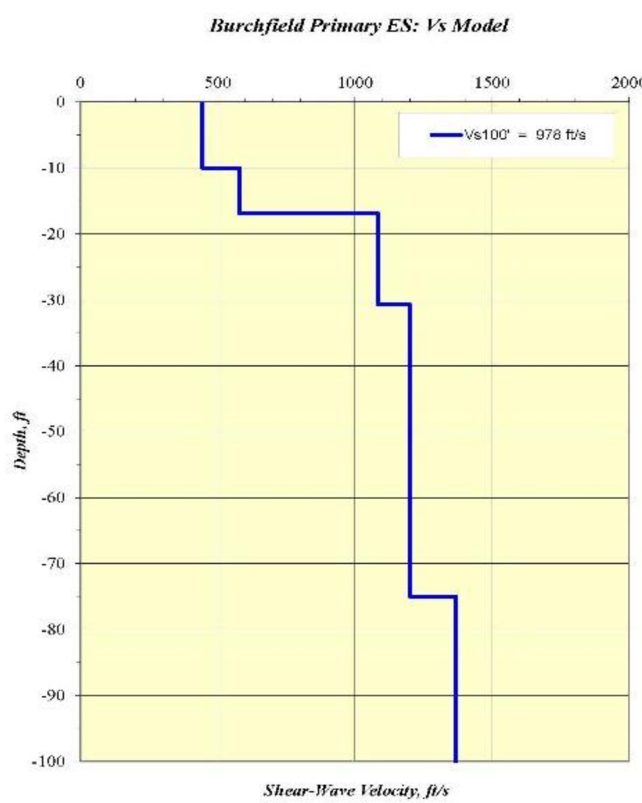
- **ML, Low Plasticity Silt Soil:** This soil is considered to be a native soil consisting of the following field estimated particle size percentages: 70 percent low plasticity silt and clay fines and 30 percent fine sand. This soil is predominantly dark grayish brown with a Munsell® Soil-Color Chart designation of (10YR, 4/2). This soil was stiff and moist at the time of the subsurface investigation.

- **SM, Silty Sand Soil:** This soil is considered to be a native soil consisting of the following field estimated particle size percentages: 65 percent fine sand and 35 percent low plasticity silt and clay fines. This soil is predominantly dark grayish brown with a Munsell® Soil-Color Chart designation of (10YR, 4/2). This soil was loose to medium dense and moist at the time of the subsurface investigation.
- **CL, Low Plasticity Clay Soil:** This soil is considered to be a native soil consisting of the following field estimated particle size percentages: 70 percent low plasticity silt and clay fines and 30 percent fine sand. This soil is predominantly brown with a Munsell® Soil-Color Chart designation of (10YR, 4/3). This soil was stiff to very stiff and moist to wet at the time of the subsurface investigation.

NV5 prepared a geologic cross section using the geologic boring logs from exploratory borings B25-1, B25-2 and B25-4 performed for this investigation. The alignment of the geologic cross section is presented in Figure 2. The geologic cross section is presented in Figure 5.

2.5.2.2 Seismic Refraction Microtremor Survey

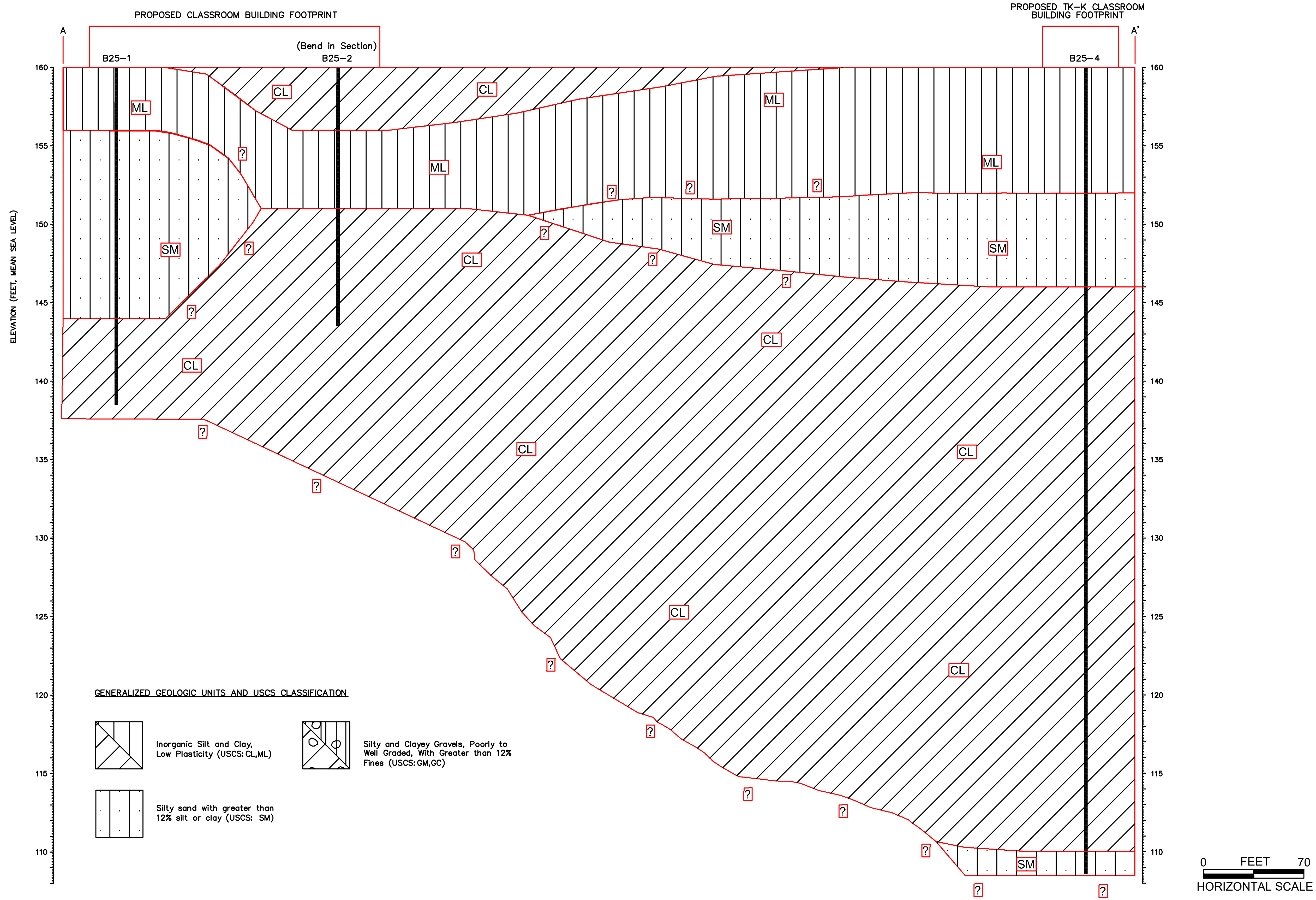
A Seismic Refraction Microtremor Survey (SRMS) was performed for the BPES campus using the SeisOpt® ReMi™ Vs30 method to determine the in-situ shear-wave (S-wave) velocity profile (Vs Model) of the uppermost 100 feet (30 meters) of soil beneath the site. The measured S-wave profile is used to determine the CBC Site Class in accordance with Chapter 16, Section 1613.3.2 and Chapter 20 of ASCE 7-16.



The SRMS method is performed at the surface using a conventional seismograph equipped with geophones that record both seismic compression waves (P-waves) and S-waves. The P-wave and S-wave sources consist of ambient seismic microtremors which are constantly being generated by cultural activities and natural noise in the area.

The data was collected in a series of twenty-one, 30-second-long, continuous recording periods. The inset image shows the Vs Model subsurface shear-wave velocity profile for the site that was developed from the SeisOpt® ReMi™ data.

The Vs Model developed for the site indicates that the harmonic mean seismic shear wave velocity for the upper 100 feet of the subsurface is approximately 978 feet per second (ft/s). This weighted shear wave velocity corresponds to the higher range of Site Class D (Stiff Soil Profile), as described in Chapter 20, Table 20.3-1 Site Classification of ASCE 7-16.



GEOLOGIC CROSS SECTION A-A'

BURCHFIELD PRIMARY ELEMENTARY SCHOOL

COLUSA, CALIFORNIA

DRAWN BY:	DJP
CHECKED BY:	SDC
PROJECT:	71554.00.001
DATE:	SEPTEMBER 2025

FIGURE 5

2.5.2.3 Groundwater Conditions

Groundwater was encountered in exploratory borings B25-1 and B25-4 performed on August 6, 2025, at a depth of approximately 13.0 feet bgs. The moisture content of each soil unit described on the exploratory boring logs is considered the natural moisture within the vadose soil zone (soil situated above the groundwater table). However, fluctuations in soil moisture content and groundwater levels should be anticipated depending on precipitation, irrigation, runoff conditions and other factors. Based on our experience in the project area, seasonal saturation of near-surface soil should be anticipated, especially during and immediately after seasonal prolonged rainstorms.

NV5 used the State Water Resources Control Board's database (http://geotracker.waterboards.ca.gov) to review historical groundwater elevation data in the immediate area. Based on review of groundwater elevation data generated from monitoring wells within the near vicinity of the site, NV5 estimates that historically high groundwater may be encountered at depths of 10 to 20 feet bgs in the late winter or spring during period of above average and prolonged rainfall.

3.0 LABORATORY TESTING

NV5 performed laboratory tests on selected soil samples taken from the subsurface exploratory excavations to determine their geotechnical engineering material properties. These engineering material properties were used to develop geotechnical engineering design recommendations for earthwork and structural improvements. The following laboratory tests were performed using the cited ASTM guideline procedures:

- ASTM G57 Resistivity (100% saturation)
- ASTM D422 Particle Size Gradation (Sieve Only)
- ASTM D2216 Soil Moisture Content
- ASTM D2487 Soil Classification by the USCS
- ASTM D2850 Unconsolidated-Undrained Triaxial Compressive Strength
- ASTM D2937 In Place Density of Soil
- ASTM D4318 Atterberg Limits (Dry Method)
- ASTM D4327 Chloride and Sulfate
- ASTM D4829 Expansion Index of Soils
- ASTM D4972 pH

Table 3.0-1 presents a summary of the geotechnical engineering laboratory test results. Section 6.2 Soil Corrosion Potential presents the results of the pH, Chloride and Sulfate, Redox, and Resistivity testing. Appendix C presents the laboratory test result data sheets.

Table 3.0-1, Laboratory Test Results

Boring	Sample		ASTM Test Results[1]								
No.	No.	Depth	D2487 D2488	D2216	D2937	D422		D4318		D4829	D2850
		(ft)	USCS (sym)	Moisture Content (%)	Dry Density (pcf)	Passing No. 4 Mesh Sieve (%)	Passing No. 200 Mesh Sieve (%)	Plasticity Index (%)	Liquid Limit (%)	Expansion Index (%)	UU Compressive Strength[2] (psf)
B25-1	L1-1-2	2.0	ML	21.0	104.6	-	-	-	-	-	3,007
B25-1	BLK-1	2-4	ML	-	-	95.4	65.6	NP	NP	-	-
B25-2	BLK-2	2-5	CL	-	-	94.4	60.3	11	30	-	-
B25-3	L3-1-2	10.0	SM	-	-	100.0	15.2	-	-	-	-
B25-4	BLK-3	2-5	ML	-	-	99.9	82.8	4	26	-	-
B25-4	L2-1-2	5.0	ML	10.7	89.7	-	-	-	-	-	2,093
B25-4	B1-1-1	30.0	CL	-	-	-	-	7	29	-	-

Notes:

(1)	Laboratory test forms are presented in Appendix C
(2)	UU Shear Strength equals ½ UU compressive strength.
%	percent
ASTM	ASTM International
ft	feet
No.	number
NP	Non-Plastic
sym	symbol
pcf	pounds per cubic foot
psf	pounds per square foot
USCS	Unified Soils Classification System
UU	Unconsolidated Undrained

4.0 SEISMICITY

4.1 HISTORICAL SEISMICITY

The regional geology and faulting are discussed in Section 2 of this report. NV5 used the USGS National Earthquake Information Center (NEIC) Earthquake Search Results online database (http://earthquake.usgs.gov/earthquakes/search/) to identify historical seismic activity within a 100-kilometer (km) (62 miles) radial distance of the subject site. The database includes several moderate size earthquakes (greater than magnitude 5.4 local magnitude [M_L]) that occurred in the Sacramento Valley and Cascade Range transition areas since 1836. These earthquakes include the following events:

- The August 1, 1975, 5.5 M_L Oroville Earthquake main shock occurred on the Cleveland Hill Fault located approximately 7 miles (11 km) south of Lake Oroville near the town of Bangor, California, which is approximately 25 miles (40 km) southeast of the subject site. This earthquake was accompanied by surface faulting which extended for several kilometers (Akers and McQuilkin, 1975). The earthquake sequence consisted of five foreshocks (M_L 3 or greater), the main shock, and numerous aftershocks (Toppozada and Cramer, 1984).
- April 21, 1892, 6.4 M_L Winters earthquake occurred approximately 4.2 miles (6.8 km) southeast of the town of Winters in Solano County, which is approximately 49 miles (79 km) southwest of the subject site. Moderate damage occurred to homes in the immediate area of Vacaville, Winters and Allendale. The initial shock was felt as far north as Redding and as far south as Salinas and Fresno; however, no documented damage was reported in the Colusa area.
- April 19, 1892, 6.6 M_L Vacaville earthquake occurred approximately 3 miles (4.8 km) north-northwest of the town of Vacaville in Solano County, which is approximately 55 miles (96 km) southwest of the subject site. The main shock was followed by two days later by the 6.4 M_L Winters earthquake. Moderate damage occurred to homes in the immediate area of Vacaville, Winters and Allendale. The initial shock was felt as far north as Redding and as far south as Salinas and Fresno; however, no documented damage was reported in the Colusa area.

No structural damage was recorded or documented to have occurred to structures in the area of Colusa during these events.

4.2 SEISMIC DESIGN PARAMETERS

NV5 developed the code-based seismic design parameters in accordance with Section 1613*A* of the 2022 CBC and the Structural Engineers Association of California (SEAOC), *Seismic Design Maps* web application. The internet-based application (www.seismicmaps.org) is used for determining seismic design values from the 2016 ASCE 7-16 Standard. The spectral acceleration, site class, site coefficients and adjusted maximum considered earthquake spectral response acceleration, and design spectral acceleration parameters are presented in Table 4.2-1. The Seismic Design Parameter detailed report from the SEAOC analysis is provided in Appendix D.

4.2.1.1 Long-Period Seismic Site Coefficient (F_V)

Using Table 1613*A*.2.3(2) of the 2022 CBC, NV5 calculated the long-period site coefficient (F_v) using S_1=0.313 and linear interpolation of the values presented in the table. Linear interpolating the values resulted in the following equations for calculating F_v:

- $F_v = (-2 \times S_1)+2.6$ (S_1 is less than 0.3)
- $F_v = (-1 \times S_1)+2.3$ (S_1 is greater than 0.3)

$$F_v = (-1 \times S_1) + 2.3 = (-1 \times 0.313) + 2.3 = 1.987$$

4.2.1.2 Seismic Design Category

Based on the short period response acceleration ground motion parameters (S_{DS} = 0.594), the 1-S period response acceleration ground motion parameters (S_{D1} = 0.415), and the Risk Category of I through III, the Seismic Design Category is D.

4.2.1.3 Geometric Mean Peak Ground Acceleration

NV5 used the SEAOC *Seismic Design Maps* web application to determine the seismic design parameters for the site, including the geometric mean peak ground acceleration (PGA_M). The PGA_M is calculated by using the Site Coefficient (F_{PGA}) multiplied by the PGA mapped values found on Figure 22-9 from ASCE 7-16. The PGA_M was calculated using the following equation:

$$PGA_M = F_{PGA} \times PGA = 1.283 \times 0.317 = 0.407 \text{ g}$$

The Seismic Design Maps report from the SEAOC analysis is provided in Appendix D

4.2.1.4 Site-Specific Ground Motion Hazard Analysis

Based on the preliminary information provided to NV5 on the proposed building sizes and types, NV5 anticipates a ground motion hazard analysis is not required for the site provided the Long (1.0 sec) Maximum Considered Earthquake (MCE) Spectral Response, S_{M1} parameter as determined by ASCE 7-16 Equation 11.4-2 is increased by 50% for all applications of S_{M1} in accordance with Exception 2 found in Section 11.4.8 of ASCE 7-16, Supplement 3. The resulting value of the Long (1.0 sec) Design Spectral Response, S_{D1} parameter determined by ASCE 7-16, Equation 11.4-4 (using the increased value of S_{M1}) should be used for all applications of S_{D1}.

- S_{M1} increased by 50%: $(1.5 \times S_{M1}) = (1.5 \times 0.622) = 0.933$
- Resulting S_{D1}: $(^2/_3 \times S_{M1}) = (^2/_3 \times 0.933) = 0.622$

Table 4.2-1, 2022 CBC Seismic Design Parameters

Description	Value	Reference
Latitude North (degree)	39.2080	Google Earth
Longitude West (degree)	-122.0089	Google Earth
Site Coefficient, F_A	1.211	*2022 CBC, Table 1613A.2.3(1), SEAOC Seismic Design Maps*
Site Coefficient, F_V	1.987	*2022 CBC, Table 1613A.2.3(2), SEAOC Seismic Design Maps*
Site Class	D = Stiff Soil	*ASCE 7-16, Chapter 20, Table 20.3-1*
Short (0.2 sec) Spectral Response, S_S (g)	0.736	*ASCE 7-16, Section 11.4.2, SEAOC Seismic Design Maps*
Long (1.0 sec) Spectral Response, S_1 *(g)*	0.313	*ASCE 7-16, Section 11.4.2, SEAOC Seismic Design Maps*
Short (0.2 sec) MCE Spectral Response, S_{MS} *(g)*	0.892	*ASCE 7-16, Section 11.4.4, SEAOC Seismic Design Maps*
Long (1.0 sec) MCE Spectral Response, S_{M1} *(g)*	0.622	*ASCE 7-16, Section 11.4.4, SEAOC Seismic Design Maps*
Short (0.2 sec) Design Spectral Response, S_{DS} *(g)*	0.594	*ASCE 7-16, Section 11.4.5, SEAOC Seismic Design Maps*
Long (1.0 sec) Design Spectral Response, S_{D1} *(g)*	0.415	*ASCE 7-16, Section 11.4.5, SEAOC Seismic Design Maps*
Seismic Design Category (Risk Category I, II or II)	D	*ASCE 7-16, Section 11.6, SEAOC Seismic Design Maps*
Geometric Mean Peak Ground Acceleration (PGA_M) (g)	0.407	*ASCE 7-16, Section 11.8.3, SEAOC Seismic Design Maps*

CBC = California Building Code
MCE = Maximum Considered Earthquake
g = gravitational acceleration (9.81 meters per second^2 = 32.2 feet per second^2)
sec = second

5.0 LIQUEFACTION AND SEISMIC SETTLEMENT

NV5 evaluated the potential for liquefaction occurring at this site based on the geologic units encountered in exploratory borings, blow count data, probabilistic expected seismic ground acceleration analysis, and literature review.

5.1 LIQUEFACTION

Soil liquefaction results when the shear strength of a saturated soil decreases to zero during cyclic loading that is generally caused by machine vibrations or earthquake shaking. Generally, saturated, clean, loose, uniformly graded sand and loose, silty sand soils of Holocene age are the most prone to undergo liquefaction. However, saturated, gravelly soil and some silt and clay-rich soil may be prone to liquefaction under certain conditions. The on-site soil and mapped geology underlying the subject site is comprised predominantly of Holocene-aged alluvial deposits (Q_a). The alluvial deposits are generally comprised of unweathered gravel, sand, silt, and clay that are deposited by present-day stream and river systems that drain the Coast Ranges, Klamath Mountains, and Sierra Nevada.

Groundwater was encountered in exploratory borings B25-1 and B25-4 performed on August 6, 2025, at a depth of approximately 13.0 feet bgs. Recent groundwater data collected from nearby groundwater monitoring wells within the past 10 to 20 years indicate the historical high groundwater table in the area may be encountered as shallow as approximately 10 to 20 feet bgs. NV5 considers 10 feet bgs to be the historical high groundwater elevation and used this data in the liquefaction analysis.

NV5 evaluated the liquefaction potential of the site using the procedures presented in the 2008 Earthquake Engineering Research Institute (EERI) Monograph publication *Soil Liquefaction During Earthquakes* by I. M. Idriss and R. W. Boulanger (Idriss, I. M. & Boulanger, R. W., 2008). It should be noted that NV5 used the maximum considered earthquake (MCE) modal magnitude $9M_w$ from a Cascadian subduction zone event. The shear stress reduction coefficient currently established does not use historical data from model magnitude $9M_w$, however current evaluations using recent magnitude 9M events are being evaluated. The determination of a shear stress reduction coefficient for a $9M_w$ earthquake exceeds the current model computations, therefore, NV5 conservatively assumed no stress reductions which is represented by an r_d value of 1 for all depths. This is a very conservative approach for liquefaction analyses.

The California Geological Society (CGS) Special Publication 117A suggests a minimum factor of safety (FS) of 1.3 for liquefaction analyses when using their ground motion maps. NV5 used a computed FS of less than 1.3 to indicate the occurrence of liquefaction at the site. The computed liquefaction FS for the project site soils was greater than 2.0 for the soil layer intervals evaluated. The calculation spreadsheet of this analysis is included in Appendix E. Table 5.1-1 summarizes the findings of the B25-4 borehole analyses using a depth to groundwater of 10 ft bgs.

Table 5.1.1-1, Liquefaction Potential Assuming High Groundwater Level of 30 ft bgs

Assumed Groundwater Level (ft bgs)	Earthquake Magnitude (Mm)	Deterministic PGA (g)	Boring ID (No.)	Liquefaction Interval FS<1.3 (ft bgs)	Seismically Induced Settlement (inches)	Expected Manifestation (Yes/No)
10.0	9.0	0.407	B25-4	N/A	0.0	No

Notes
bgs = below ground surface
ft = feet
g = gravitational acceleration
Mm = Moment Magnitude
N/A = Not Applicable
No. = Number

The liquefaction evaluation is a simplified procedure that has a number of limitations that cause it to produce conservative results. These limitations include the lack of a stress reduction coefficient (r_d) value for earthquake magnitudes over 8M, as well as the assumption that penetration resistance is a good indicator for liquefaction; however, other factors such as over consolidation and age of the deposit can influence the liquefaction potential. The procedure used does not take into account the age and over consolidation of the units.

Based on the subsurface exploratory boring 2.5-inch diameter California Modified split spoon sampler and SPT blow counts, field data, the mapped geology underlying the site, expected seismic peak ground acceleration and literature review, the site soil conditions make the probability of liquefaction occurring during ground shaking caused by a maximum considered earthquake to be low at the site.

5.2 SEISMIC SETTLEMENT AND LATERAL SPREADING

Based on the relatively flat topography in the area of the proposed building, the age of the mapped geology and the relatively low potential of a significant seismic event occurring at the site, NV5 considers there to be a low probability for the occurrence of post-liquefaction settlement and lateral spreading that would be detrimental to the proposed site improvements

6.0 OTHER GEOLOGIC HAZARDS

NV5 is providing a complete evaluation for the potential geologic hazards that could be applicable to the BPES campus area to compile a thorough report for the site that is up to date with the current guidelines and code standards. The evaluation of geologic hazards for the site was based on NV5's review of geologic maps and literature, regional aerial photographs, a site reconnaissance, and analysis of the soil and rock conditions encountered during the August 6, 2025, site investigation. This section provides additional information to meet the 2022 CBC and CGS Note 48 (November 2022). The BPES campus is not located within special geologic hazard zones designated by CGS or local building departments for liquefaction and landslides. The following presents NV5's evaluation of pertinent geologic hazards and their potential to negatively impact the site.

6.1 EXPANSIVE SOIL

The site soil conditions observed during the surface reconnaissance and the subsurface geotechnical investigation are characterized as fine grain (silt and clay) size soils. Atterberg Limits (ASTM D4318) testing was performed on representative near-surface soil samples collected during the subsurface investigation. The Atterberg Limits test results indicate the fine grain soil material encountered in exploratory borings B25-1 and B25-3 to be non-plastic silt (ML) soils. Based on review of the 2022 CBC, the results of the Atterberg Limits testing and our experience with similar soils in the area, the potential for expansive soil hazards to affect the proposed buildings is considered low if these soils are left in place beneath the proposed buildings.

6.2 SOIL CORROSION POTENTIAL

NV5 performed minimal testing to evaluate the corrosion potential of the onsite near-surface soils located at the BPES site that are anticipated to be in contact with concrete foundations and underground pipes associated with the proposed structural improvements. The soil samples tested were collected at a depth of approximately 2.0 to 4.0 feet bgs. The test results are summarized in Table 6.2-1 below.

Table 6.2-1. Summary of Corrosion Potential Lab Test Data

Sample No.	Sample Depth (feet)	Test No.	Description	Test Results
B25-4 BLK-3	2 – 5	ASTM D4327	Chloride	33.4 ppm
		ASTM D4327	Sulfate	16.7 ppm
		ASTM D4972	pH	7.20
		ASTM G57	Resistivity	1,850 ohms-cm

ASTM = ASTM International
ppm = parts per million (mg/kg = milligram per kilogram)
ohms-cm = ohms-centimeters
N.D. = None Detected

6.2.1 Caltrans Criteria

The California Department of Transportation (Caltrans) Corrosion Guidelines (Version 3.2, dated March 2021) considers a site to be corrosive to structural elements "if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: Chloride concentration is 500 ppm or greater, sulfate concentration of 1,500 ppm or greater, or the pH of 5.5 or less".

Based on the results of the corrosion test results, the near-surface soils are not considered to be corrosive to structural elements according to these Caltrans Corrosion Guidelines. Based on the local soil type, NV5 recommends that all concrete mixes use Type II/V Portland cement.

6.2.2 ACI Criteria

Based on a review of the American Concrete Institute (ACI) 318, Section 19.3, the following is noted:

- Per Table 19.3.1.1 and Table 19.3.2.1 – Sulfate Content Test Results
  - The tested site soils in a "Class S0" Exposure Category would require a minimum concrete compressive strength of 2,500 psi with no specific requirement for water cement ratio.
- Per Table 19.3.2.1 – Per Chloride Content Test Results
  - The tested site soils are in a "Class C1" Exposure Category (assuming some moisture exposure is likely). A minimum concrete compressive strength of 2,500 psi would be required with no specific requirement for water cement ratio. The maximum water-soluble ion content in non-prestressed concrete is 0.30 percent by weight of cement.

Based on these limited tests (i.e., pH, resistivity, chloride and sulfate) the soil is considered mildly corrosive to buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron. All buried metallic piping should be protected against corrosion in accordance with the pipe manufacturer's recommendations. The laboratory report with a brief summary of results is included in Appendix C.

6.3 VOLCANIC HAZARDS

According to the USGS Map of Potential Areas of Volcanic Hazards (Miller, 1989), the property is not situated within a recognized active volcanic area. The nearest known volcanic zone is the Mt. Konocti area, approximately 44 miles southwest of the site. However, the nearest known active volcanic zone is the Mt. Lassen area, located approximately 90 miles to the northeast of the site. The most recent volcanic eruptions occurring at Mt. Lassen were from 1914 to 1917. In summary, NV5's opinion is that there is low potential for encountering a volcanic hazard within the project site.

6.4 FLOODING

The BPES site is not located within the 100-year flood zone, a Special Flood Hazard Area (SFHA) as designated by the Federal Emergency Management Agency (FEMA). FEMA is required by federal law to compile Flood Insurance Rate Maps identifying areas of potential flooding. Property located within a SFHA is subject to a one percent (1%) or greater chance of complete or partial flooding in any given year. FEMA defines this type of flood as the "base flood" which is more commonly known as a "100-year-flood". A 100-year-flood has a 26 percent chance of occurring during any 30-year period. Based on review of the City of Chico FEMA Flood Insurance Rate Map (FIRM) 06011C0535G, dated March 27, 2024, the site is located within Zone X, defined as areas outside the 0.2 percent annual chance floodplain.

NV5's review of the DWR Division of Safety of Dams *California Dam Breach Indundation Maps* (fmds.water.ca.gov/damim) and other available dam inundation maps indicates the existing BPES school campus is located inside of the dam inundation area of Lake Oroville and Shasta Lake. However, it is NV5's opinion that the potential for stream induced-flooding and earthquake-induced flooding hazards that would negatively impact the proposed building footprint areas are low.

6.5 LANDSLIDES

The existing topography at the site and near vicinity consists of flat lying terrain. The site is not located in an area of known historical landslides and there is no indication of historic landslides, including rock falls, debris flows or deep and shallow failure. Therefore, the potential for the occurrence of a landslide hazard at the proposed building footprint area is considered remote.

6.6 TSUNAMIS AND SEICHES

There are no bodies of water with the potential for tsunamis and or seiches located near the subject property. In summary, we believe that the potential for encountering tsunami and/or seiches hazards within the proposed building footprint area is not probable.

6.7 SLUMPS AND LAND SUBSIDENCE

NV5 did not observe slumps or hummocky surface feature depressions that indicate the occurrence of land subsidence. NV5's opinion is that the potential for slumping and land subsidence hazards to occur within the proposed building areas to be low.

6.8 MINING RELICS

NV5 did not observe any evidence of past mining activities during our site reconnaissance. Our review of available geologic maps and mine-related literature did not show any past mining activities at the site or immediately surrounding area. If any evidence of mining activity is encountered during grading, then additional geotechnical engineering or environmental assessment may be warranted. In summary, we believe that the potential for encountering past mining-related hazards within the proposed building footprint areas to be low.

6.9 RADON-222 GAS

Colusa County and the subject site are not in an area identified as having an increased chance of elevated radon content in soil gas. Radon gas concentrations are considered to be elevated at 4 picoCuries per liter (pCi/L). However, each of the radon gas literature sources reviewed indicated that elevated radon gas in buildings may still exist in areas that are predicted to not have elevated radon gas.

The United States Environmental Protection Agency *Map of Radon Zones* (www.epa.gov/radon/epa-map-radon-zones) indicates that Colusa County is located in Radon Zone 3. This zone consists of counties with a predicted average indoor radon screening level less than 2 pCi/L.

NV5's review of the *Geologic Controls on the Distribution of Radon in California* prepared by the California Geological Survey, dated January 25, 1991, indicates that Colusa County is not underlain by geologic deposits that increase the chance of elevated radon gas.

California Department of Public Health (CDPH) published the *California Indoor Radon Levels Sorted by Zip Code* (Last updated Feb. 2016). This database summary indicates no recorded radon test results within 95932 Zip Code for Colusa County (Colusa).

6.10 NATURALLY OCCURING ASBESTOS

NV5 reviewed geologic literature regarding the distribution and occurrence of naturally occurring asbestos (NOA) in California. The site is not in an area mapped as likely to contain NOA and NV5's field engineer/geologist did not observe the presence of ultramafic rock outcrops (typically associated with the occurrence of NOA) at the site.

Based on review of the California Department of Conservation, Division of Mines and Geology, 2000. *A General Location Guide for Ultramafic Rocks in California - Areas Likely to Contain Naturally Occurring Asbestos*, August, Map scale 1:1,100,000, Open-File Report 2000-19 ultramafic rock is mapped approximately 25 miles west of the site.

The *Geologic Map Of The Wilbur Springs Quadrangle, Colusa and Lake Counties, California* (United States Geological Survey, Map I-538, E. I. Rich, 1971) shows a ultramafic metamorphic serpentinite rock unit mapped approximately 25 miles west of the site in the foothills of the Coast mountain range. The Mill Creek drainage area is located adjacent to the east of the mapped ultramafic rock rock unit. The subject site is located approximately 24 miles east of the existing Mill Creek drainage and outside of the drainage area of the Mill Creek, thus the potential to encounter NOA at the site is considered to be extremely low.

7.0 CONCLUSIONS

The conclusions presented in this section are based on information developed from the field and laboratory investigations.

1. It is NV5's opinion that the site is suitable for the proposed improvements provided that the geotechnical engineering design recommendations presented in this report are incorporated into the earthwork and structural improvement project plans. Prior to construction, NV5 should be allowed to review the proposed final earthwork grading plan and structural improvement plans to determine if the geotechnical engineering recommendations were properly incorporated, are still applicable or need modifications.
2. The site is not located within a geologic hazard zone or special studies zone mapped by the CGS, or Colusa County. The subject property does not contain geologic hazards that require mitigation for the proposed improvements to proceed. Based on the site geology, the observations within the exploratory borings, and the results of the nearby seismic survey, the site soil profile can be modeled, according to the 2022 CBC, Chapter 16*A*, and ASCE 7-16, Chapter 20, as a Site Class D (Stiff Soil Profile) designation for the purposes of establishing seismic design loads for the proposed improvements.
3. Based on the site geology, subsurface exploratory boring blow counts collected from the borings performed at the site, other field data, and literature review, NV5 believes that the site soil, rock and groundwater conditions make the probability of liquefaction occurring during a nearby earthquake to be low.
4. At the time of the NV5 site investigation, the area of the proposed modular classroom wing in the northwestern portion of the BPES campus currently supports existing modular classrooms and asphalt concrete paved hardcourts. Underground utility boxes indicate several underground utilities are also located in the area. The area of the TK-K Classroom wing proposed in the southeastern portion of the BPES campus currently supports an irrigated grass play field and an existing playground
5. The soil conditions observed to a maximum depth of 51.5 feet below the existing ground surface in our subsurface exploratory excavations (described relative to the existing ground surface) generally consisted of dark grayish brown, stiff, silt (ML) and sandy lean clay (CL) underlain by alternating layers of dark grayish brown, loose to medium dense, silty sand (SM) and brown, stiff to very stiff, sandy lean clay (CL).
6. NV5's field and laboratory test data indicate that the native silt (ML), silty sand (SM), and sandy lean clay (CL) encountered beneath the site have the following general geotechnical engineering properties: firm/loose to medium dense/stiff, non-plastic to low plasticity, and a low to moderate bearing capacity that is suitable for supporting shallow foundations.
7. The groundwater table was encountered within exploratory borings B25-1 and B25-4 on August 6, 2025, at a depth of approximately 13.0 feet bgs. Based on the subsurface geologic conditions and review of monitoring well data near the site, NV5 assumes that for design and evaluation purposes, the historically high groundwater table will probably be located at a depth of approximately 10 to 20 feet bgs.

8.0 RECOMMENDATIONS

NV5 developed geotechnical engineering design recommendations for earthwork and structural improvements from the field investigation and laboratory data. Subsequent to earthwork and site preparation, it is anticipated that the proposed structures may be supported on conventional continuous and/or spread footings founded in firm, non-expansive native soil or properly compacted fill. NV5's recommendations are presented below.

8.1 EARTHWORK GRADING

NV5's earthwork grading recommendations include demolition and abandonment of existing site improvements, import fill soil, temporary excavations, stripping and grubbing, native soil preparation for engineered fill placement, engineered fill construction with testable earth materials, cut and fill slope grading, erosion controls, underground utility trenches, construction dewatering, soil corrosion potential, subsurface groundwater drainage, surface water drainage, grading plan review and construction monitoring.

8.1.1 Demolition and Abandonment of Existing Site Improvements

NV5 anticipates that the existing site improvements within the proposed building areas will need to be demolished and removed from the site as described below.

1. All existing structures, concrete flatwork, asphalt concrete and aggregate base (AB) rock pavement materials within the proposed building areas should be excavated and disposed of offsite. However, it may be possible to use some of this demolition material to construct engineered fills provided they meet the gradation requirements specified for "testable fill" materials presented in this report. The project geotechnical engineer should approve the use of both asphalt concrete (AC) and AB rock demolition materials for use in constructing engineered fills.
2. All remaining foundations, underground utilities and other existing site improvements that are encountered during construction within the proposed building areas should be demolished and removed from the site. These demolition materials should be disposed off-site in compliance with applicable regulatory requirements.
3. Abandonment of any underground utilities within the construction area that will not interfere with the proposed site improvements should be plugged with cement grout to reduce migration of soil and/or water.

8.1.2 Import Fill Soil

Import fill soil should meet the geotechnical engineering material properties described in Section 8.1.6-1 (Engineered Fill Construction with Non-Expansive Soil) of this report. Prior to importation to the site, the source generator should document that the import fill meets the guidelines set forth by the California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control (DTSC) in their 2001 "Information Advisory, Clean Imported Fill Material." This advisory represents the best practice for characterization of soil prior to import for use as engineered fill. The project geotechnical engineer should approve all proposed import fill soil for use in constructing engineered fills at the site.

8.1.3 Temporary Excavations

All temporary excavations must comply with applicable local, state and federal safety regulations, including the current Occupational Safety and Hazards Administration (OSHA) excavation and trench safety standards. Construction site safety is the responsibility of the contractor, who is solely responsible for the means, methods and sequencing of construction operations. Under no circumstances should the findings, conclusions and recommendations presented herein be inferred to mean that NV5 is assuming any responsibility for temporary excavations, or for the design, installation, maintenance and performance of any temporary shoring, bracing, underpinning or other similar systems. NV5 could provide temporary cut slope gradients, if required.

8.1.4 Stripping and Grubbing

The site should be stripped and grubbed of vegetation and other deleterious materials, as described below.

1. Strip and remove the top 4 to 6 inches of organic-laden topsoil and other deleterious materials from the building area. Deeper stripping operations may be required to adequately remove organic-laden soils and deleterious materials. These soils should not be used for constructing compacted engineered fills. Grub the underlying 6 to 8 inches of soil to remove any large vegetation roots or other deleterious material while leaving the soil in place. The project engineer or their representative should approve the use of any soil materials generated from the clearing and grubbing activities.
2. Remove all large shrub, tree roots, tree stumps, debris, wood, and trash, Excavate the remaining cavities or holes to a sufficient width so that an approved backfill soil can be placed and compacted in the cavities or holes. Sufficient backfill soil should be placed and compacted in order to match the surrounding elevations and grades. The NV5 project engineer or their representative should observe and approve the preparation of the cavities and holes prior to placing and compacting engineered fill soil in the cavities and holes.
3. Excessively large amounts of vegetation and other deleterious materials should be removed from the site.

8.1.5 Native Soil Preparation for Engineered Fill Placement

After completing site stripping and grubbing activities, the exposed native soil should be prepared for placement and compaction of engineered fills, as described below.

1. Preparation of native soil for engineered fill placement within building pads should extend horizontally a minimum of 5 feet beyond the structural limits (perimeter foundations, isolated column foundations, etc.) of the structure.
2. The exposed native soil should be scarified to a minimum depth of 12 inches below the existing land surface, or stripped and grubbed surface, and then uniformly moisture conditioned. If the soil is classified as a coarse-grained soil by the USCS (i.e., GP, GW, GC, GM, SP, SW, SC or SM) then it should be moisture conditioned to within ± 2 percentage points of the ASTM D1557 optimum moisture content. If the soil is classified as a low plasticity fine-grained soil by the USCS (i.e., CL, ML), then it should be moisture conditioned to between 2 and 4 percentage points greater than the ASTM D1557 optimum moisture content. If soil is classified as a high plasticity

fine-grained soil by the USCS (i.e., CH, MH), the soil should be removed from the building pad area or contact NV5 for further recommendations.

3. The native soil should then be compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry unit weight (density). The moisture content, density and relative percent compaction should be tested by the project geotechnical engineer, or their field representative, to evaluate whether the compacted soil meets or exceeds the minimum percent compaction and moisture content requirements. The earthwork contractor shall assist the project geotechnical engineer or their field representative by excavating test pads with the on-site earth moving equipment. Native soil preparation beneath concrete slab-on-grade structures (i.e., floors, sidewalks, patios, etc.) and AC pavement should be prepared as specified in Section 8.2 (Structural Improvements).
4. The prepared native soil surface should be proof rolled with a fully loaded 4,000-gallon-capacity water truck with the rear of the truck supported on a double-axle, tandem-wheel undercarriage or approved equivalent. The proof rolled surface should be visually observed by the project geotechnical engineer, or their field representative, to be firm, competent and relatively unyielding. The project geotechnical engineer or their field representative may also evaluate the surface material by hand probing with a ¼-inch-diameter steel probe, however, this evaluation method should not be performed in place of proof rolling as described above.
5. Construction Quality Assurance (CQA) tests should be performed using the minimum testing frequencies presented in Table 8.1.5-1 or as modified by the project geotechnical engineer to better suit the site conditions.
6. The native soil surface should be graded to minimize ponding of water and to drain surface water away from the building foundations and associated structures. Where possible, surface water should be collected, conveyed and discharged into natural drainage courses, storm sewer inlet structures, permanent engineered storm water runoff percolation/evaporation basins or engineered infiltration subdrain systems.

Table 8.1.5-1, Minimum Testing Frequencies

ASTM No.	Test Description	Minimum Test Frequency(1)
D1557	Modified Proctor Compaction Curve	1 per 1,500 CY or Material Change (2)
D6938	Nuclear Density and Moisture Content	1 per 250 CY

Notes:
(1) These are minimum testing frequencies that may be increased or decreased at the project geotechnical engineer's discretion based on the site conditions encountered during grading.
(2) Whichever criteria provide the greatest number of tests.

ASTM = ASTM International
CY = cubic yards
No. = number

8.1.6 Engineered Fill Construction with Testable Earth Materials

Engineered fills are constructed to support structural improvements. Engineered fills should be constructed using non-expansive soil as described in Section 8.1.6-1. If possible, the use of expansive soil for constructing engineered fills should be avoided. If the use of expansive soil cannot be avoided, then engineered fills should be constructed as described in Section 8.1.6.2 or as modified by the project geotechnical engineer. If soil is to be imported to the site for constructing engineered fills, then NV5 should be allowed to evaluate the suitability of the borrowed soil source by taking representative soil samples for laboratory testing. Testable earth materials are generally considered soils with gravel and larger particle sizes retained on the No. 4 mesh sieve that make up less than 30 percent by dry weight of the total mass. The relative percent compaction of testable earth materials can readily be determined by the following ASTM test procedures: laboratory compaction curve (D1557), field moisture and density (D6938). Construction of engineered fills with non-expansive and expansive testable earth materials is described below.

8.1.6.1 Engineered Fill Construction with Non-Expansive Soil

Construction of engineered fills with non-expansive soil should be performed as described below.

1. Non-expansive soil used to construct engineered fills should consist predominantly of materials less than ½-inch in greatest dimension and should not contain rocks greater than 3 inches in greatest dimension (oversized material). Non-expansive soil should have a plasticity index (PI) of less than or equal to 15, as determined by ASTM D4318 Atterberg Indices testing. Oversized materials should be spread apart to prevent clustering so that void spaces are not created. The project geotechnical engineer or their field representative should approve the use of oversized materials for constructing engineered fills.
2. Non-expansive soil used to construct engineered fills should be uniformly moisture conditioned. If the soil is classified by the USCS as coarse grained (i.e., GP, GW, GC, GM, SP, SW, SC or SM), then it should be moisture conditioned to within ± 2 percentage points of the ASTM D1557 optimum moisture content. If the soil is classified by the USCS as fine grained (i.e., CL, ML), then it should be moisture conditioned to between 2 and 4 percentage points greater than the ASTM D1557 optimum moisture content.
3. Engineered fills should be constructed by placing uniformly moisture conditioned soil in maximum 8-inch-thick loose lifts (layers) prior to compacting.
4. The soil should then be compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density.
5. The earthwork contractor should compact each loose soil lift with a tamping foot compactor such as a Caterpillar (CAT) 815 Compactor or equivalent as approved by the project geotechnical engineer or their field representative. A smooth, steel drum roller compactor should not be used to compact loose soil lifts for construction of engineered fills.
6. The field and laboratory CQA tests should be performed consistent with the testing frequencies presented in Table 8.1.6.1-1 or as modified by the project geotechnical engineer to better suit the site conditions.

Table 8.1.6.1-1, Minimum Testing Frequencies for Non-Expansive Soil

ASTM No.	Test Description	Minimum Test Frequency(1)
D1557	Modified Proctor Compaction Curve	1 per 1,500 CY or Material Change (2)
D6983	Nuclear Density and Moisture Content	1 per 250 CY

Notes:
(1) These are minimum testing frequencies that may be increased or decreased at the project geotechnical engineer's discretion based on the site conditions encountered during grading.
(2) Whichever criteria provide the greatest number of tests.

ASTM = ASTM International
CY = cubic yards
No. = number

7. The moisture content, density and relative percent compaction of all engineered fills should be tested by the project geotechnical engineer's field representative during construction to evaluate whether the compacted soil meets or exceeds the minimum compaction and moisture content requirements. The earthwork contractor shall assist the project geotechnical engineer's field representative by excavating test pads with the on-site earth-moving equipment.
8. The prepared finished grade or finished subgrade soil surface should be proof rolled, as mentioned above in Section 8.1.5, Paragraph 3.

8.1.6.2 Engineered Fill Construction with Expansive Soil

NV5 did not encounter highly expansive soil within the shallow soil or zone that would be influenced by the foundation loads at the site during the subsurface investigation. If expansive soils are encountered during grading of the site, and if the property owner desires to use expansive soil to construct engineered fills, then NV5 should be notified to prepare recommendation options for constructing fills with potentially expansive soil.

8.1.7 Cut and Fill Slope Grading

NV5 does not anticipate that grading of cut and fill slopes will have vertical heights greater than 3 feet at the site. In general, both cut and fill slopes should be graded at a maximum slope gradient of 2H:1V (horizontal to vertical slope ratio). Surface water should not be allowed to flow over the cut and fill slopes graded at the site. If steeper cut and/or fill slopes are designed, then NV5 should be allowed to review the proposed cuts and provide additional recommendations as appropriate.

8.1.8 Erosion Controls

Erosion controls should be installed as described below.

1. Erosion controls should be installed on all cut and fill slopes to minimize erosion caused by surface water runoff.
2. Install on all slopes either an appropriate hydroseed mixture compatible with the soil and climate conditions of the site, as determined by the local United States Soil Conservation District, or apply an appropriate manufactured erosion control mat.

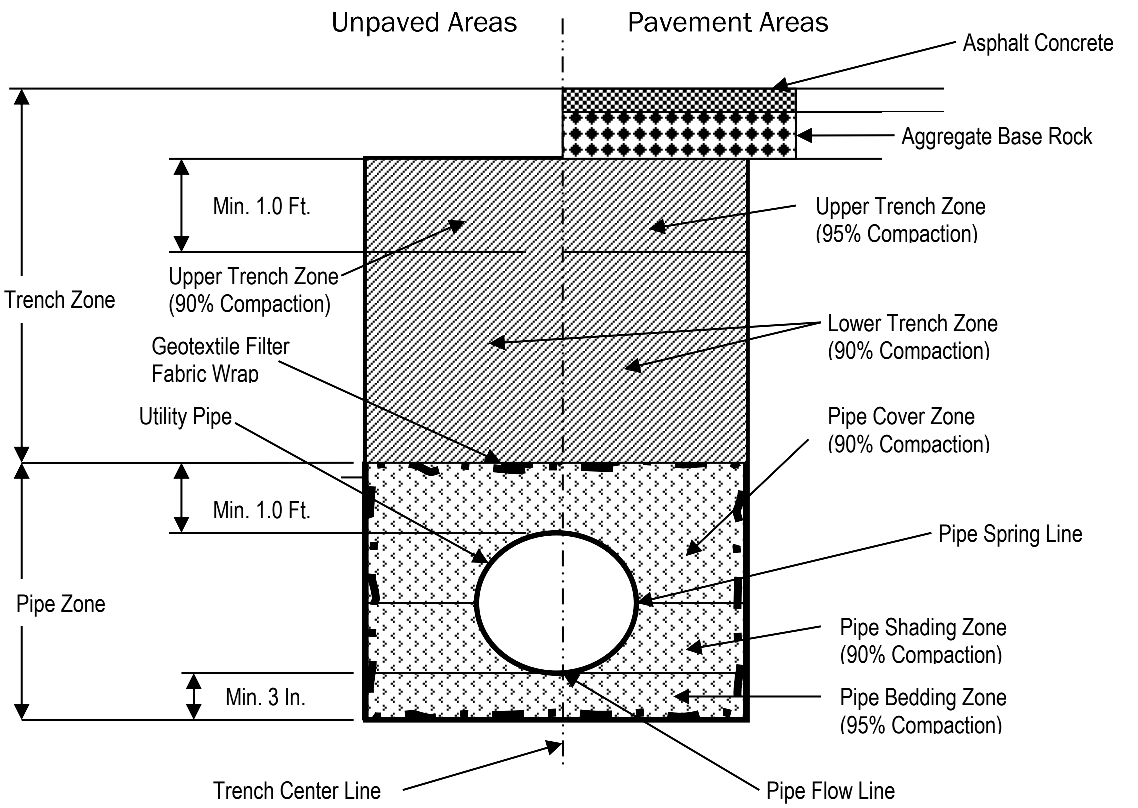
3. Install surface water drainage ditches at the top of cut and fill slopes (as necessary) to collect and convey both sheet flow and concentrated flow away from the slope face.
4. The intercepted surface water should be discharged into a natural drainage course or into other collection and disposal structures.

8.1.9 Underground Utility Trenches

Underground utility trenches should be excavated and backfilled as described below for each trench zone shown in the figure below.

1. **Trench Excavation Equipment:** NV5 anticipates that the contractor will be able to excavate all underground utility trenches with a Case 580 Backhoe or equivalent.
2. **Trench Shoring:** All utility trenches that are excavated deeper than 5 feet bgs are required by California OSHA to be shored with bracing equipment or sloped back to an appropriate slope gradient prior to being entered by any individuals.
3. **Trench Dewatering:** NV5 does not anticipate that the proposed underground utility trenches will encounter shallow groundwater. However, if the utility trenches are excavated during the winter rainy season, then shallow or perched groundwater may be encountered. The earthwork contractor may need to employ dewatering methods as discussed in Section 8.1.10 in order to excavate, place and compact the trench backfill materials.
4. **Pipe Zone Backfill Type and Compaction Requirements:** The backfill material type and compaction requirements for the pipe zone, which includes the bedding zone, the shading zone and the cover zone, are described in Detail 8.1.9-1 below.

Detail 8.1.9-1 TYPICAL TRENCH BACKFILL ZONES



Not to Scale

- **Pipe Zone Backfill Material Type:** Trench backfill used within the pipe zone, which includes the bedding zone, the shading zone and the cover zone, should consist of imported sand, Class 2 AB or ¾-inch-minus, washed, crushed rock. The crushed rock particle size gradation should meet the following requirements (percentages are expressed as dry weights using ASTM D422 test method): 100 percent passing the ¾-inch sieve, 80 to 100 percent passing the ½-inch sieve, 60 to 100 percent passing the 3/8-inch sieve, 0 to 30 percent passing the No. 4 sieve, 0 to 10 percent passing the No. 8 sieve, and 0 to 3 percent passing the No. 200 sieve. If groundwater is encountered within the trench during construction, or if groundwater is expected to rise during the rainy season to an elevation that will infiltrate the pipe zone within the trench, then the pipe zone material should be wrapped with a minimum 6 ounce per square yard, non-woven geotextile filter fabric such as TenCate® Mirafi N140 or an approved equivalent. The geotextile seam should be located along the trench centerline and have a minimum 1-foot overlap. If the utility pipes are coated with a corrosion protection material, then the pipes should be wrapped with a minimum 6 ounce per square yard, non-woven, geotextile cushion fabric such as TenCate® Mirafi N140 or an approved equivalent. The geotextile cushion fabric should have a minimum 6-inch seam overlap. The geotextile cushion fabric will protect the pipe from being scratched by the crushed rock backfill material.

- **Pipe Bedding Zone Compaction:** Trench backfill soil placed in the pipe bedding zone (beneath the utilities) should be a minimum of 3 inches thick, moisture conditioned to within ± 3 percentage points of the ASTM D1557 optimum moisture content and compacted to achieve a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry density. Crushed rock, if used, should be mechanically consolidated under the observation of NV5.
- **Pipe Shading Zone Compaction:** Trench backfill soil placed within the pipe shading zone (above the bedding zone and to a height of one pipe radius above the pipe spring line) should be moisture conditioned to within ± 3 percentage points of the ASTM D1557 optimum moisture content and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density. Crushed rock, is used, should be mechanically consolidated under the observation of NV5. The pipe shading zone backfill material should be shovel-sliced to remove voids and to promote compaction.
- **Pipe Cover Zone Compaction:** Trench backfill soil placed within the pipe cover zone (above the pipe shading zone to 1 foot over the pipe top surface) should be moisture conditioned to within ± 3 percentage points of the ASTM D1557 optimum moisture content and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density. Crushed rock, if used, should be mechanically consolidated under the observation of NV5.

5. **Trench Zone Backfill and Compaction Requirements:** The trench zone backfill materials consist of both lower and upper zones, as discussed below.
    - **Trench Zone Backfill Material Type:** Soil used as trench backfill within the lower and upper intermediate zones, as shown on the preceding figure, should consist of non-expansive soil with a PI of less than or equal to 15 (based on ASTM D4318) and should not contain rocks greater than 3 inches in greatest dimension.
    - **Lower Trench Zone Compaction:** Soil used to construct the lower trench zone backfills should be uniformly moisture conditioned to within 0 and 4 percentage points of the ASTM D1557 optimum moisture content, placed in maximum 12-inch-thick loose lifts prior to compacting and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density.
    - **Upper Trench Zone Compaction (Road and Parking Lot Areas):** Soil used to construct the upper trench zone backfills should be uniformly moisture conditioned to within 0 and 4 percentage points greater than the ASTM D1557 optimum moisture content, placed in maximum 8-inch-thick loose lifts (layers) prior to compacting and compacted to achieve a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry density.
    - **Upper Trench Zone Compaction (Non-Road and Non-Parking Lot Areas):** Soil used to construct the upper trench zone backfills should be uniformly moisture conditioned to within 0 and 2 percentage points greater than the ASTM D1557 optimum moisture content, placed in maximum 6-inch-thick loose lifts (layers) prior to compacting and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density.
6. **CQA Testing and Observation Engineering Services:** The moisture content, dry density and relative percent compaction of all engineered utility trench backfills should be tested by the project geotechnical engineer's field representative during construction to evaluate whether the compacted trench backfill materials meet or exceed the minimum compaction and moisture

content requirements presented in this report. The earthwork contractor shall assist the project geotechnical engineer's field representative by excavating test pads with the on-site earth moving equipment.

- **Compaction Testing Frequencies:** The field and laboratory CQA tests should be performed consistent with the testing frequencies presented in Table 8.1.9-1 or as modified by the project geotechnical engineer to better suit the site conditions.

Table 8.1.9-1, Minimum Testing Frequencies for Utility Trench Backfill

ASTM No.	Test Description	Minimum Test Frequency(1)
D1557	Modified Proctor Compaction Curve	1 per 500 CY (2) Or Material Change
D6983	Nuclear Density and Moisture Content	1 per 100 LF per 24-Inch-Thick Compacted Backfill Layer (2) The maximum loose lift thickness shall not exceed 12-inches prior to compacting.

Notes:
(1) These are minimum testing frequencies that may be increased or decreased at the project geotechnical engineer's discretion based on the site conditions encountered during grading.
(2) Whichever criteria provide the greatest number of tests.

ASTM = ASTM International
CY = cubic yards
No. = number

- **Final Proof Rolling:** The prepared finished grade AB rock surface and/or finished subgrade soil surface of utility trench backfills should be proof rolled, as mentioned above in Section 8.1.5, Paragraph 3.

8.1.9.1 Controlled Low Strength Material (CLSM) Trench Backfill

Control Low Strength Material (CLSM), also known as sand-cement slurry, generally consisting of a cementitious material composed of cement, fine aggregate and water, may also be used to backfill utility trenches, Underground utility trenches extending below structural foundations or located within the zone of influence of building foundations, should be backfilled with CLSM. CLSM. Underground utility trenches containing high-voltage or other critical infrastructure utilizes may also require CLSM backfill to provide additional protection from damage by excavation.

1. Prior to placing CLSM as trench backfill, the trench should be cleared of all debris and loose, disturbed soils.
2. CLSM may be placed within utility trenches over undisturbed, native soils or compacted engineered fill, and fully encasing conduits, where appropriate.
3. **Mix Design**: Contractor shall submit a mix design, prepared and tested under a professional engineer, that includes the relative proportions by weight of cementitious material, aggregates, water, any admixtures, and historical testing data.
4. **CLSM Compressive Strength:** A minimum compressive strength of 100 psi is recommended for CLSM trench backfill placed adjacent to, or below, structural foundations. A minimum compressive strength of 50 psi and up to a maximum of 150 psi should be placed in trenches where future access, tie-in, or repairs to underground utilities may be needed.

Testing of CLSM is at the discretion of the Geotechnical Engineer, depending on the mix design, history of use, and specific application of the CLSM on the project site. Field samples of the CLSM shall be taken for compressive strength testing for every 150 yards, or fraction thereof, when placed under foundations. CLSM shall be sampled in accordance with ASTM D5971. Compressive strength testing should be performed in accordance with ASTM D4832.

8.1.10 Construction Dewatering

NV5 does not anticipate the need to design or perform dewatering of the site during earthwork grading, however, the earthwork contractor should be prepared to dewater the utility trench excavations and any other excavations if perched water or the groundwater table is encountered during winter or spring grading. The following recommendations are preliminary and are not based on performing a groundwater flow analysis. A detailed dewatering analysis was not a part of the proposed work scope. It should be understood that it is the earthwork contractor's sole responsibility to select and employ a satisfactory dewatering method for each excavation.

1. NV5 anticipates that dewatering of utility trenches can be performed by constructing sumps to depths below the trench bottom and removing the water with sump pumps.
2. Additional sump excavations and pumps should be added as necessary to keep the excavation bottom free of standing water and relatively dry when placing and compacting the trench backfill materials.
3. If groundwater enters the trench faster than it can be removed by the dewatering system, thereby allowing the underlying compacted soil to become unstable while compacting successive soil lifts, then it may be necessary to remove the unstable soil and replace it with free-draining, granular drain rock. Native backfill soil can again be used after placing the granular rock to an elevation that is higher than the groundwater table.
4. If granular rock is used, it should be wrapped in a non-woven geotextile fabric, such as TenCate® Mirafi® N140 or an approved equivalent. The geotextile filter fabric should have minimum 1-foot overlapped seams. The granular rock should meet or exceed the following gradation specifications (all percentages are expressed as dry weights using ASTM D422 test method): 100 percent passing the 3/4-inch sieve, 80 to 100 percent passing the 1/2-inch sieve, 60 to 100 percent passing the 3/8-inch sieve, 0 to 30 percent passing the No. 4 sieve, 0 to 10 percent passing the No. 8 sieve, and 0 to 3 percent passing the No. 200 sieve.
5. NV5 recommends that the utility trench excavations be performed as late in the summer months as possible to allow the groundwater table to reach its lowest seasonal elevation.

8.1.11 Subsurface Groundwater Drainage

NV5 does anticipate encountering perched groundwater or a shallow local groundwater table during the wet weather construction season. If groundwater is encountered during grading, then NV5 should be allowed to observe the conditions and provide site-specific dewatering recommendations.

8.1.12 Surface Water Drainage

NV5 recommends the following surface water drainage mitigation measures:

1. Grade all slopes to drain away from building areas with a minimum 4 percent slope for a distance of not less than 10 feet from the building foundations.
2. Grade all landscape areas near and adjacent to buildings to prevent ponding of water.
3. Direct all building downspouts to solid pipe collectors, which discharge to natural drainage courses, storm sewers, catchment basins, infiltration subdrains or other drainage facilities.

8.1.13 Grading Plan Review and Construction Monitoring

CQA includes review of plans and specifications and performing construction monitoring, as described below.

1. NV5 should be allowed to review the final earthwork grading improvement plans prior to commencement of construction to determine whether the recommendations have been implemented and, if necessary, to provide additional and/or modified recommendations.
2. NV5 should be allowed to perform CQA monitoring of all earthwork grading performed by the contractor to determine whether the recommendations have been implemented and, if necessary, to provide additional and/or modified recommendations.
3. NV5's experience, and that of the engineering profession, clearly indicates that during the construction phase of a project the risks of costly design, construction and maintenance problems can be significantly reduced by retaining a design geotechnical engineering firm to review the project plans and specifications and to provide geotechnical engineering observation and CQA testing services. Upon your request, we will prepare a CQA geotechnical engineering services proposal that will present a work scope, a tentative schedule and a fee estimate for your consideration and authorization. If NV5 is not retained to provide geotechnical engineering CQA services during the construction phase of the project, then NV5 will not be responsible for geotechnical engineering CQA services provided by others nor any aspect of the project that fails to meet your or a third party's expectations in the future.

8.2 STRUCTURAL IMPROVEMENTS

NV5's structural improvement design criteria recommendations include: shallow foundations, cast-in-drilled-hole pier foundations, retaining walls entirely above the groundwater table, retaining wall backfill, and concrete slab-on-grade interior, sidewalk and patio construction. These recommendations are presented hereafter.

8.2.1 Shallow Foundations

Shallow continuous and isolated spread foundations that will support load bearing walls and interior columns shall be designed as follows:

1. The base of all shallow foundations should bear on firm, competent non-expansive native soil, or non-expansive engineered fill compacted consistent with the earthwork recommendations of

Section 8.1. Shallow foundations can also bear on CLSM, where it is used to cover underground utilities, used as backfill below foundations in over-excavation conditions, or for winterization of foundation excavations provided the minimum strength of the CLSM is 100 psi at 28 days.

2. Continuous strip foundations should be constructed with the following dimensions:

   a. Minimum Width = 12 Inches

   b. Minimum Embedment Depth below the lowest adjacent exterior surface grade as shown in Table 8.2.1-1.

3. The bearing capacities to be used for structural design of shallow foundations embedded in either non-expansive native soil or non-expansive engineered fill are presented in Table 8.2.1-1.

   - The calculated factor of safety (FS) for allowable bearing pressures including live plus dead loads is 3.0 for all foundation embedment depths.
   - The allowable bearing pressure capacities were increased by a factor of 1.33 to include wind or seismic short-term loads.
   - The project structural engineer of record should review the factor of safety and confirm that it is not less than the over-strength factor for this structure.

Table 8.2.1-1, Foundation Bearing Pressures for Shallow Foundations

Minimum Foundation Embedment Depth (in.)	Maximum Ultimate Bearing Pressures For Live + Dead Loads (psf)	Maximum Allowable Bearing Pressures For Live + Dead Loads (psf)	Maximum Allowable Bearing Pressures For Live + Dead + Wind or Seismic Loads (psf)	Allowable Safety Factor (Ultimate/Total) (dim.)
12	6,000	2,000	2,660	3.0
18	7,500	2,500	3,330	3.0
24	9,000	3,000	3,990	3.0

psf = pounds per square foot
in. = inches
dim. = dimensionless

4. Foundation lateral resistance may be computed from passive pressure along the side of the foundation and sliding friction/cohesion resistance along the foundation base, however, the larger of the two resistance forces should be reduced by 50 percent when combining these two forces. The passive pressure can be assumed to be equal to an equivalent fluid pressure (EFP) per foot of depth. The passive pressure force and sliding friction coefficient for computing lateral resistance are as follows:

   a. Passive pressure = 300 (H), pounds per square foot (psf), where H = foundation embedment depth (feet) below lowest adjacent soil surface.

   b. Foundation bottom sliding friction coefficient = 0.35 (dimensionless).

5. The bearing capacities and friction coefficient provided above remain applicable for portions of foundations bearing on CLSM with a minimum compressive strength of 100 psi, when tested in accordance with ASTM D4832.

6. Minimum steel reinforcement for continuous strip foundations should consist of two No. 4 bars with one bar placed near the top and one bar placed near the bottom of each foundation or as designated by a California licensed structural engineer.
7. The concrete should have a minimum 3,000 pounds per square inch (psi) compressive break strength after 28 days of curing, have a water-to-cement ratio from 0.40 to 0.50, and should be placed with minimum and maximum slumps of 4 and 6 inches, respectively. Since water is often added to uncured concrete to increase workability, it is important that strict quality control measures be employed during placement of the foundation concrete to ensure that the water-to-cement ratio is not altered prior to or during placement.
8. Concrete coverage over steel reinforcements should be a minimum of 3 inches as recommended by the American Concrete Institute (ACI).
9. Prior to placing concrete in any foundation excavations, the contractor shall remove all loose soil, rock, wood debris or other deleterious materials from the foundation excavations.
10. Foundation excavations should be saturated prior to placing concrete to aid the concrete curing process; however, concrete should not be placed in standing water.
11. Total settlement of individual foundations will vary depending on the plan dimensions of the foundation and actual structural loading. Based on the anticipated foundation dimensions and loads, we estimate that the total post-construction settlement of foundations designed and constructed in accordance with the recommendations will be on the order of 1/2 inch. Differential settlement between similarly loaded, adjacent foundations is expected to be about 1/4 inch, provided the foundations are founded into similar materials (e.g., all on competent and firm engineered fill, native soil or rock).
12. Prior to placing concrete in any foundation excavation, the project geotechnical engineer or their field representative should observe the excavations to document that the following requirements are achieved: minimum foundation dimensions, minimum reinforcement steel placement and dimensions, removal of all loose soil, rock, wood debris or other deleterious materials, and that firm and competent native or engineered fill soil is exposed along the entire foundation excavation bottom. Strict adherence to these requirements is paramount to the satisfactory behavior of a building foundation. Minor deviations from these requirements can cause the foundations to undergo minor to severe amounts of settlement, which can result in cracks developing in the foundation and adjacent structural members, such as concrete slab-on-grade floors.

8.2.2 Cast-In-Drilled-Hole Pier Foundations

NV5 evaluated the site conditions and prepared foundation design options to be used by the structural engineer to design steel-reinforced, cast-in-drilled-hole (CIDH) pier foundations. The shallow subsurface soil conditions encountered may require deep foundations to support heavy loads that are mostly dependent on lateral and uplift resistance support. The geotechnical engineering foundation design parameters are presented below. If the designer desires to use a different foundation other than the options presented below, or suggests modifications to the parameters used in these designs, then NV5 can prepare alternative recommendations to meet the specific design needs.

The CIDH pile foundation recommendations were developed assuming axial bearing (compressive) and pullout (tensile) capacities with full embedment into a cohesive soil using representative soil properties. The steel reinforcements, connections and lateral load capacities for CIDH pile foundations shall be designed by the structural engineer of record for this project. The CIDH pile foundations should be designed using the following geotechnical engineering design recommendations:

1. For the purposes of CIDH pier design, NV5 recommends that the soil conditions onsite be modeled as consisting of an approximately 15-foot thick layer of firm clay possessing an in-place total density of 110 pounds per cubic foot, an internal friction angle of 23 degrees, and a cohesion of 600 psf. At the option of the designer, the cohesion of the soil profile may be considered when resisting short duration, transient loads such as wind and seismic.
2. NV5 recommends that the upper 1 foot of soil be ignored for design of both axial bearing and uplift CIDH pier capacities and for design of lateral resistance capacities of the CIDH piers. However, the weight of the upper 1 foot of soil can be considered when calculating the friction and lateral resistance of the soil below depths of 5 feet.
3. NV5 recommends, for CIDH pier design methods, employing lateral bearing approaches, such as the traditional CBC approach for constrained or non-constrained foundations, that an allowable lateral bearing (passive) pressure of 150 pounds per square foot, per foot of depth (psf/ft) below the ground surface, be used for long-duration loads up to a maximum allowable lateral bearing pressure of 300 psf/ft. This value may act over two pier diameters. For short term, dynamic loading such as would result from wind or seismic events, an allowable lateral bearing (active) pressure of 200 psf/ft may be used for short duration loads up to a maximum allowable lateral bearing pressure of 400 psf. The use of this relatively high value assumes that the structures would not be adversely impacted by an approximate ½-inch displacement at the ground surface due to short term lateral loads. This would mostly be related to elastic movement and should be considered to rebound. If this magnitude of displacement is considered excessive for the proposed installation, then the recommended values above should be reduced by 50 percent or a more detailed foundation analysis including evaluation of lateral deflection should be performed.
4. At depths below 5 feet, an allowable skin friction/adhesion value of 300 psf may be used for long duration loading. This value can be increased to 450 psf for short duration loading such as uplift resulting from wind or seismic. These allowable values assume that the soil is modeled as cohesive and that pier embedment will be 10 feet or less below the ground surface.
5. NV5's experience has revealed that the CBC constrained and non-constrained equations are often conservative for CIDH piers and drilled shafts, and do not provide an estimate of pier deflection under lateral loading. NV5 can provide a more detailed review of pier performance under lateral loading, including an estimate of deflection, if requested, once pier reactions and design are established. In addition, we can provide soil values for input into L-Pile, if requested by the structural engineer.
6. For depths greater than 5 feet below the ground surface, we recommend that an allowable end bearing capacity of 4,000 psf be used for CIDH pier design. This value may be increased by a factor of 1.33 for transient or dynamic loads such as wind or seismic loads. In order to utilize end bearing values for CIDH pier design, the excavations must be cleaned thoroughly with a spin bucket capable of removing loose material from the bottom of the shaft. If end bearing is used for the design, skin friction should be considered as an additional factor of safety.

7. ACI 318-19, Chapter 19, presents four types of exposure categories and their exposure class to determine if the concrete pier foundations possess sufficient durability and resistance to aggressive elements that may arise during its life span. Based on the review of the site soil conditions and proposed foundations, NV5 considers the foundations to be designated as exposure classes F0, S0, C1, and W1. For durability requirements, the concrete should be designed with the appropriate water-cement ratio and specified concrete strength.

8.2.2.1 Pier Construction Recommendations

1. A representative of NV5 must observe drilled pier construction.
2. The shafts should be drilled within a vertical tolerance of 1.5% of the length.
3. Recently drilled holes should be covered with plywood or steel plates until cages are hung.
4. The drilling locations and dimensions should be determined by the structural engineer in the field or based on the locations shown on the project plans.
5. The rebar cage should be hung from the top of the drilled shaft and centered with concrete dobies to prevent contact with the sides of the excavation. If possible, steel reinforcement and pier concrete should be placed on the same day the shaft is drilled to reduce the likelihood of sidewall caving or sloughing. The contractor should anticipate the possibility of caving and be prepared to provide temporary casing, if necessary.
6. In order to develop end bearing, the pier excavations must be cleaned with a spin bucket capable of removing loose material from the bottom of the shaft.
7. Depending on when the drilling is performed, NV5 anticipates that seepage may accumulate in the drilled shafts. The contractor should be prepared to tremie the concrete if more than approximately 3 inches of standing water is present in the excavations.
8. Free fall concrete may be used if there is less than 3 inches of water in the drilled shaft, provided it is directed through a hopper, or equivalent. Free fall concrete should be poured vertically down the shaft without hitting the sidewalls or steel reinforcement. If this cannot be accomplished, pumping hose and tremie pipe.
9. The upper 5 feet of concrete should be vibrated after placement.

8.2.3 Retaining Walls Entirely Above the Groundwater Table

A California licensed civil engineer should design all retaining walls situated above the groundwater table with drained backfill using the following geotechnical engineering design criteria:

1. The retaining wall recommendations for static loading conditions are based on Rankine earth pressure theory published by W.J.M. Rankine (1857). The retaining wall recommendations for seismic loading conditions are based on the published work by Geraili and Sitar, *Seismic Earth Pressures on Retaining Structures in Cohesionless Soils*, (2013).

2. Retaining walls should be founded on firm competent bedrock or engineered fill consistent with the requirements of Section 8.1.

3. The retaining wall should be designed using the geotechnical engineering design parameters presented in Table 8.2.3-1.

4. The retaining wall backfill soil should be free draining material that meets or exceeds the material requirements of and is placed and compacted consistent with the requirements of Section 8.2.4.

5. The static lateral earth pressures exerted on the retaining walls may be assumed to be equal to an equivalent fluid pressure per foot of depth below the top of the wall. The lateral pressures presented in the table below are ultimate values and, therefore, do not include a safety factor, and assumes a free draining backfill (no hydrostatic forces acting on the wall) and no surcharge loads applied within a distance of 0.50H, where H equals the total vertical wall height.

6. The retaining wall backfill slope shall have a horizontal slope gradient for a minimum horizontal distance of 0.50H, where H equals the total vertical wall height. If a steeper backfill slope ratio is desired, then NV5 should be notified and contracted to perform additional retaining wall designs.

7. The retaining wall foundation excavations should be saturated prior to placing concrete to aid the concrete curing process. However, concrete should not be placed in standing water.

Table 8.2.3-1, Design Parameters for Retaining Walls

Design Parameters for Retaining Walls		
Loading Conditions	Static Loads On Retaining Wall With Horizontal Backfill Slope	Seismic Load On Retaining Wall With Horizontal Backfill Slope
Wall Active Condition Pressures (psf)/ft (1)	40 (H) (5)	-
Wall Passive Condition Pressures (psf)/ft (2)	300 (H)	-
Wall At-Rest Condition Pressures (psf)/ft (3)	60 (H)	-
Wall Seismic Load (Active Condition) (plf) (1)	-	7 (H^2)
Wall Seismic Load (Passive Condition) (plf) (2)	-	7 (H^2)
Wall Seismic Load (At-Rest Condition) (plf) (3)	-	15 (H^2)
P_{active} Force Located Above Foundation Base	0.33 (H)	-
$P_{passive}$ Force Located Above Foundation Base	0.33 (H)	-
$P_{at-rest}$ Force Located Above Foundation Base	0.33 (H)	-
$P_{earthquake}$ Force Located Above Foundation Base	-	0.33(H)
Maximum Allowable Foundation Bearing Capacity (psf), (Live + Dead Loads)	2,500	2,500
Maximum Allowable Foundation Bearing Capacity (psf) (Live + Dead + Wind or Seismic Loads)	3,330	3,330
Minimum Foundation Embedment Depth (in)	18	18
Foundation Bottom Friction Coefficient (dim.) (4)	0.35	0.35

Notes:

(1) The active pressure condition applies to a retaining wall with an unrestrained top (deflection allowed).

(2) The passive pressure condition applies to a retaining wall with soil resistance at the base. If passive pressures are used, then NV5 recommends that the top 1.0 feet of soil weight be ignored.

(3) The At-Rest pressure condition applies to a retaining wall with the top restrained (no deflection allowed).

(4) If the design horizontal resistance force acting on the wall foundation is computed by combining both the sliding friction force and passive soil pressure force, then the larger of the two forces should be reduced by 50 percent.

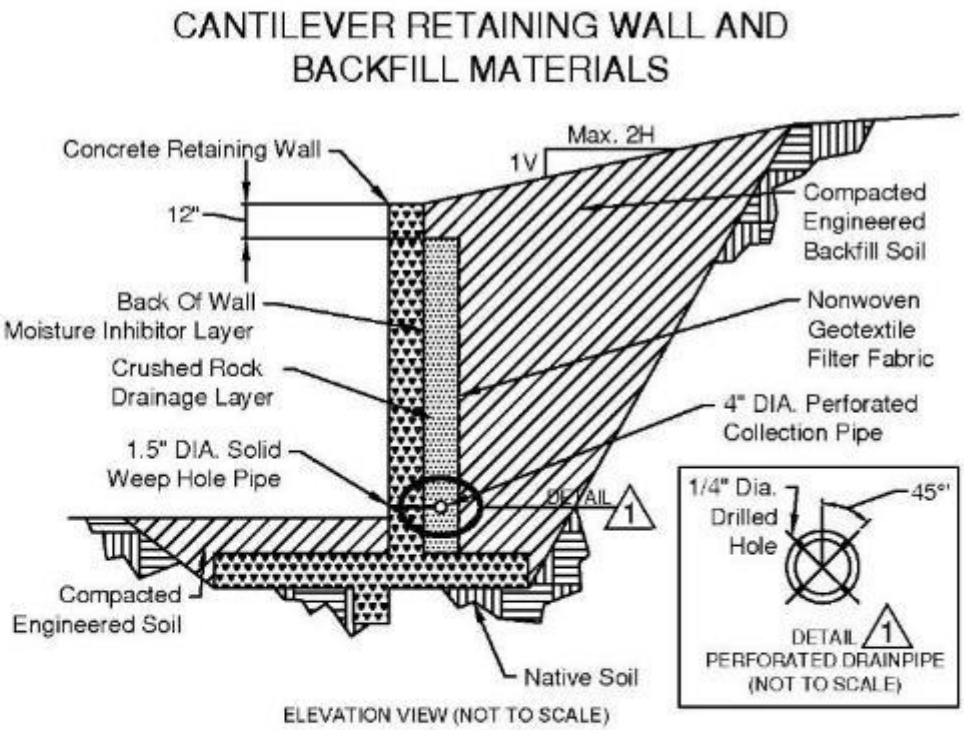
(5) H = The distance to a point in the backfill soil where the pressure is desired. The H distance is measured from the top of the wall for active and at-rest conditions and from one foot below the soil height at the toe of the wall for the passive condition (See Note 2 for passive condition).

psf = pounds per square foot

plf = pounds per lineal foot

8.2.4 Retaining Wall Backfill

Place and compact all retaining wall backfill and drainage layer materials as described below. NV5 did not review the final improvement plans for the site. If sub-structure retaining walls for below grade rooms, basements, garages, etc., are designed for this project, then these structures should also incorporate a water proofing sealant as described below. The water proofing sealant products should be installed by a qualified waterproofing contractor according to the manufacturer's directions. A typical retaining wall and backfill material zones figure is shown below.



1. **Waterproofing:** Waterproofing materials should be installed behind retaining walls prior to backfilling if retaining walls will be constructed for below grade rooms, basements, garages, elevator shafts, etc. The waterproofing materials should be installed by a qualified waterproofing contractor according to the manufacturer's directions.

2. **Drainage Layer:** A drainage layer should be placed between the wall and backfill material to prevent buildup of hydrostatic pressures behind the wall. Additionally, care should be taken during placement of the drainage layer materials so as not to crush, tear, or damage the waterproofing materials. The drainage layer can be constructed from drain rock, geosynthetic drain nets or a combination of both as described below.

    a. **Caltrans Class II Permeable Material Method:** Place a minimum 12-inch thick layer of Caltrans Class II Permeable Material directly against the wall or waterproofing system (as described below) without a geotextile wrapping to separate the backfill soil from the wall. The drainage material should extend from the wall bottom to within 12 inches of the wall top.

    b. **Geotextile Wrapped Drain Rock Method:** Place a minimum 12-inch-thick layer of ¾-inch-minus, washed crushed rock wrapped in a geotextile filter fabric directly against the wall or waterproofing system (as described below) to separate the backfill soil from the wall. The crushed rock particle size gradation should meet the following requirements (percentages are expressed as dry weights using ASTM D422 test method): 100 percent passing the ¾-inch sieve, 80 to 100 percent passing the ½-inch sieve, 60 to 100 percent passing the 3/8-inch sieve, 0 to 30 percent passing the No. 4 sieve, 0 to 10 percent passing the No. 8 sieve, and 0 to 3 percent passing the No. 200 sieve. The drain rock should extend from the wall bottom to within 12 inches of the wall top. A minimum 6-ounce per square yard (oz/sy) non-woven geotextile fabric, such as TenCate® Mirafi N140 manufactured by TenCate Geosynthetics or equivalent should be used.

c. **Geosynthetic Composite Drainnet (Geonet) Method:** Place a geosynthetic composite drain-net (geonet) directly against the wall or waterproofing system (as described below) to separate the backfill soil from the wall. The composite geonet should extend from the wall bottom to within 12 inches of the wall top. A geosynthetic composite drainnet such as Hydroduct 200 or Hydroduct 220 distributed by Grace Construction Products or equivalent should be used.

3. **Drainage Layer Collection and Discharge Pipes:** A minimum 4-inch diameter schedule 40, polyvinylchloride (PVC) perforated drainpipe should be placed at the wall base inside the geotextile wrapped drain rock or wrapped by the composite geonet. ¼–inch diameter perforations should be drilled into the pipe. The perforations should be oriented in cross section view at 90 degrees to one another and along the pipe length on 6-inch centers. The pipe should be placed such that the perforations are oriented 45 degrees from the vertical. A minimum of 3 inches of drain rock should be placed below the perforated PVC pipe. The pipe should direct water away from the wall by gravity with a minimum 1 percent slope. The pipe should collect groundwater collected by the drainage layer discharged to the surface at the end of the wall or through weep-hole penetrations through the wall.

4. **Backfill Placement and Compaction Equipment:** Heavy conventional motorized compaction equipment should not be used directly adjacent to a retaining wall unless the wall is designed with sufficient steel reinforcements and/or bracing to resist the additional lateral pressures. Compaction of backfill materials within 5 feet of the retaining wall should be accomplished by lightweight, hand-operated, walk-behind, vibratory equipment. Additionally, care should be taken during placement of the general backfill materials so as not to crush, tear or damage the waterproofing and/or drainage layer materials.

5. **Backfill Materials and Compaction:** The backfill material should be free draining and classified by the USCS as a coarse-grained material (i.e., GP, GW, GC, GM, SP, SW, SC, and SM). Materials classified by the USCS as a fine-grained material (i.e., CL, CH, ML, or MH) should not be used as retaining wall backfill. The retaining wall backfill material placed between the drainage layer and temporary cut-slope should be moisture conditioned to between ± 3 percentage points of the ASTM D1557 optimum moisture content and then compacted to a minimum of 90 percent and a maximum of 95 percent of the ASTM D1557 maximum dry density.

8.2.5 Concrete Slab-On-Grade Interior, Sidewalk and Patio Construction

In general, NV5 recommends that subgrade elevations on which the concrete slab-on-grade floors are constructed be a minimum of 6 inches above the elevation of the surrounding parking lots, driveways and landscaped areas. Elevating the building will reduce the potential for subsurface water to enter beneath the concrete slab-on-grade floors and exterior surfaces and underground utility trenches.

The concrete slab-on-grade building floors, sidewalks and patios areas should be evaluated by a California-licensed professional engineer for expected live and dead loads to determine if the minimum slab thickness and steel reinforcement recommendations presented in this report should be increased or redesigned.

NV5 recommends using the guideline procedures, methods and material properties that are presented in the following ASTM and ACI documents for construction of concrete slab-on-grade floors:

- ACI 302.1R-15, Guide for Concrete Floor and Slab Construction, reported by ACI Committee 302.
- ASTM E1643-18a, Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- ASTM E1745-17, Standard Specifications for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- ASTM F710-22, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

The interior building concrete slab-on-grade floor and exterior sidewalk and patio concrete slab-on-grade floor components are described below from top to bottom. If static or intermittent live floor loads greater than 250 psf are anticipated, then a California-licensed professional engineer should design the necessary concrete slab-on-grade floor thickness and steel reinforcements.

8.2.5.1 Interior Floor Slabs

1. Minimum 4-Inch-Thick Concrete Slab: The concrete slab should be installed with a minimum 3,000 psi compressive strength after 28 days of curing. NV5 recommends that the concrete design use a water-to-cement ratio between 0.40 and 0.45 and should be placed with minimum and maximum slumps of 3 and 5 inches, respectively. The concrete mix design is the responsibility of the concrete supplier.

2. Steel Reinforcement: Reinforcement should be used to improve the load-carrying capacity, to reduce cracking caused by shrinkage during curing and from both differential and repeated loadings. It should be understood that it is nearly impossible to prevent all cracks from development in concrete slabs; in other words, it should be expected that some cracking will occur in all concrete slabs no matter how well they are reinforced. Concrete slabs that will be subjected to heavy loads should be designed with steel reinforcements by a California-licensed professional engineer.

   Rebar: As a minimum, use No. 4 rebar (ASTM A615/A 615M-22 Grade 60), tied and placed with 18-inch centers in both directions (perpendicular) and supported on concrete "dobies" to position the rebar in the center of the slab during concrete pouring. NV5 does not recommend that the steel reinforcements of the concrete slab-on-grade floor be tied into the perimeter or interior continuous strip foundations or interior isolated column foundations. In other words, we recommend that the concrete slab-on-grade floors be constructed as independent structural members so that they can move (float) independently from the building foundations.

3. Underslab Vapor-Moisture Retarder Membrane: The underslab retarder membrane should be placed in areas with moisture sensitive floor coverings as a floor component that will minimize transmission of both liquid water and water vapor transmission through the concrete

slab-on-grade floor. NV5 recommends using at a minimum a Class A (ASTM E1745-17), minimum 10-mil-thick, plastic, vapor-moisture, retarder membrane material such as Stego Wrap® underslab vapor retarder membranes or equivalents. Additionally, the following materials are recommended: Stego® Tape and Stego® Mastic or equivalents to seal membrane joints and any utility penetrations.

Regardless of the type of moisture-vapor retarder membrane used, moisture can wick up through a concrete slab-on-grade floor. Excessive moisture transmission through a concrete slab floor can cause adhesion loss, warping and peeling of resilient floor coverings, deterioration of adhesive, seam separation, formation of air pockets, mineral deposition beneath flooring, odor and both fungi and mold growth. Slabs can be tested for water transmissivity in areas that are moisture sensitive. Commercial sealants, polymer additives to the concrete at the batch plant, entrained air, flyash, and a reduced water-to-content ratio can be incorporated into the concrete slab-on-grade floor mix design to reduce its permeability and water-vapor transmissivity properties. A waterproofing consultant should be contacted to provide detailed recommendations if moisture sensitive flooring materials will be installed on the concrete slab-on-grade floors.

4. <u>Minimum 4-Inch-Thick Crushed Rock or Class II Aggregate Base Rock Layer</u>: Interior floors should be underlain by clean crushed rock. Crushed rock should be mechanically consolidated under the observation of NV5. The crushed rock should be washed to produce a particle size distribution of 100 percent (by dry weight) passing the ¾ inch sieve and 5 percent passing the No. 4 sieve and 0 to 3 percent passing the No. 200 sieve. An alternative rock material for slab-on-grade concrete surfaces would include AB rock meeting the specification of Caltrans Class II AB. AB rock layers should be placed and compacted to a minimum of 95 percent of the ASTM D1557 dry density with a moisture content of ± 3 percentage points of the ASTM D1557 optimum moisture content. Just prior to pouring the concrete slab, the rock layer should be moistened to a saturated surface dry (SSD) condition. This measure will reduce the potential for water to be withdrawn from the bottom of the concrete slab while it is curing and will help minimize the development of shrinkage cracks.

   If the current property owner elects to eliminate the crushed rock or AB rock layer beneath the interior concrete slabs-on-grade for economic reasons, then there will be an inherent greater risk assumed by the developer for the development of both shrinkage and bearing-related cracks in the associated slabs.

5. <u>Subgrade Soil Preparation:</u> All concrete slab-on-grade subgrade soil should be prepared and compacted consistent with the recommendations of Section 8.1. The top 12 inches of the non-expansive soil should be compacted to a minimum of 90 percent of the ASTM D1557 dry density with a moisture content within ± 3 percentage points of the ASTM D1557 optimum moisture content.

6. <u>Crack Control:</u> Crack control grooves should be installed during placement or saw cuts should be made in accordance with the ACI and Portland Cement Association (PCA) specifications. Generally, NV5 recommends that expansion joints be provided between the slab and perimeter footings, and that crack control grooves or saw cuts are installed on 10-foot-centers in both directions (perpendicular).

7. <u>Field Observations;</u> All concrete slab-on-grade surfaces and installed steel reinforcements should be observed and inspected by an NV5 construction monitor prior to pouring concrete.

8. <u>Field Curing of Concrete:</u> Prior to applying construction loads, all exposed concrete slab-on-grade

floors should be moisture cured for a minimum of 7 days following placement of the concrete. If concrete is placed during the hot summer months when the ambient air temperatures may be as low as 50 to 60 degrees Fahrenheit (°F) in the early morning and in excess of 90°F in the afternoon, then the contractor may need to implement special curing measures to reduce the development of shrinkage cracks. The concrete contractor is responsible for determining the appropriate curing process to be applied to the slab-on-grade floor.

8.2.5.2 Exterior Sidewalks and Patios

1. Minimum 4-Inch-Thick Concrete Slab: should be installed with a minimum 2,500 psi compressive strength after 28 days of curing. NV5 recommends that the concrete design uses a water to cement ratio between 0.40 and 0.50 and should be placed with minimum and maximum slumps of 4 and 6 inches, respectively. The concrete mix design is the responsibility of the concrete supplier.
2. Concrete Slabs In Contact With Isolated Concrete Foundations: NV5 does not recommend that concrete slab-on-grade floors be placed in direct contact with the top surface of isolated column concrete foundations. Our experience is that during curing period of the concrete slab-on-grade floor a significant thermal gradient may develop between the portions of the slab placed directly on the typically more massive, isolated column concrete foundations and the portions of the slab placed over a vapor-moisture retarder membrane and crushed rock layers. The development of adverse thermal gradients may cause the development of significant orthogonal and/or circular shrinkage cracks around the isolated column foundations.
3. Steel Reinforcement: should be used to improve the load carrying capacity and to reduce cracking caused by shrinkage during curing and from both differential and repeated loadings. It should be understood that it is nearly impossible to prevent all cracks from development in concrete slabs; in other words, it should be expected that some cracking will occur in all concrete slabs no matter how well they are reinforced or cured. Concrete slabs that will be subjected to heavy loads should be designed with steel reinforcements by a California licensed professional engineer.

   Rebar: As a minimum, use No. 3 rebar (ASTM A615/A 615M-22 Grade 60), tied and placed with 18-inch centers in both directions (perpendicular) and supported on concrete "dobies" to position the rebar in the center of the slab during concrete pouring. NV5 does not recommend that the steel reinforcements of the concrete slab-on-grade floor be tied into the perimeter foundations or isolated column foundations. In other words, we recommend that the exterior concrete slab-on-grade be constructed as independent structural members so that they can move (float) independently from the building foundations.

   If the current property owner (developer) elects to eliminate the steel reinforcements from the exterior concrete slabs-on-grade for economic reasons, then there will be an inherent greater risk assumed by the developer for the development of both shrinkage and bearing related cracks in the associated slabs.
4. Minimum 4-Inch-Thick Crushed Rock Layer: Exterior concrete slabs-on-grade should be underlain by clean crushed rock. Crushed rock should be mechanically consolidated under the observation of NV5. The crushed rock should be washed to produce a particle size distribution of 100 percent (by dry weight) passing the ¾ inch sieve and 5 percent passing the No. 4 sieve and 0 to 3 percent passing the No. 200 sieve. An alternative rock material for slab-on-grade concrete surfaces would include AB rock meeting the specification of Caltrans Class II AB. AB rock layers

should be placed and compacted to a minimum of 95 percent of the ASTM D1557 dry density with a moisture content of ± 3 percentage points of the ASTM D1557 optimum moisture content. Just prior to pouring the concrete slab, the rock layer should be moistened to a SSD condition. This measure will reduce the potential for water to be withdrawn from the bottom of the concrete slab while it is curing and will help minimize the development of shrinkage cracks.

If the current property owner elects to eliminate the crushed rock or AB rock layer beneath the interior concrete slabs-on-grade for economic reasons, then there will be an inherent greater risk assumed by the developer for the development of both shrinkage and bearing-related cracks in the associated slabs.

5. Subgrade Soil Preparation: All concrete slab-on-grade subgrade soil should be prepared and compacted consistent with the recommendations of Section 8.1. The top 12 inches of the non-expansive soil should be compacted to a minimum of 90 percent of the ASTM D1557 dry density with a moisture content within ± 3 percentage points of the ASTM D1557 optimum moisture content.
6. Crack Control: Crack control grooves should be installed during placement or saw cuts should be made in accordance with the ACI and PCA specifications. Generally, NV5 recommends that expansion joints be provided between the slab and perimeter footings, and that crack control grooves or saw cuts are installed on 10-foot-centers in both directions (perpendicular).
7. Field Observations; All concrete slab-on-grade surfaces and installed steel reinforcements should be observed and inspected by an NV5 construction monitor prior to pouring concrete.

9.0 REFERENCES

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10.0 LIMITATIONS

The following limitations apply to the findings, conclusions and recommendations presented in this report:

1. This report should not be relied upon without review by NV5 if a period of 24 months elapses between the issuance report date shown above and the date when construction commences.
2. NV5's professional services were performed consistent with the generally accepted geotechnical engineering principles and practices employed in Northern California. No warranties are either expressed or implied.
3. NV5 provided engineering services for the site project consistent with the work scope and contract agreement presented in the proposal and agreed to by the client. The findings, conclusions and recommendations presented in this report apply to the conditions existing when NV5 performed the services and are intended only for the client, purposes, locations, timeframes and project parameters described herein. NV5 is not responsible for the impacts of any changes in environmental standards, practices or regulations subsequent to completing the services. NV5 does not warrant the accuracy of information supplied by others, or the use of segregated portions of this report. This report is solely for the use of the client unless noted otherwise. Any reliance on this report by a third party is at the party's sole risk.
4. If changes are made to the nature or design of the project as described in this report, then the conclusions and recommendations presented in this report should be considered invalid by all parties. The validity of the conclusions and recommendations presented in this report can only be made by NV5; therefore, NV5 should be allowed to review all project changes and prepare written responses with regards to their impacts on the conclusions and recommendations. Additional fieldwork and laboratory testing may be required for NV5 to develop any modifications to the recommendations. The cost to review project changes and perform additional fieldwork and laboratory testing necessary to modify the recommendations is beyond the scope-of-services presented in this report. Any additional work will be performed only after receipt of an approved scope-of-work, budget and written authorization to proceed.
5. The analyses, conclusions and recommendations presented in this report are based on the site conditions as they existed at the time NV5 performed the surface and subsurface field investigations. NV5 assumed that the subsurface soil and groundwater conditions encountered at the location of the exploratory borings were generally representative of the subsurface conditions throughout the entire project site; however, if the actual subsurface conditions encountered during construction are different than those described in this report, then NV5 should be notified immediately so that we can review these differences and, if necessary, modify the recommendations.
6. The elevation or depth to the groundwater table underlying the project site may differ with time and location; therefore, the depth to the groundwater table encountered in the exploratory borings is only representative of the specific time and location where it was observed.
7. The project site map shows approximate exploratory excavation locations as determined by pacing distances from identifiable site features; therefore, their locations should not be relied upon as being exact nor located with the accuracy of a California-licensed land surveyor.
8. NV5's geotechnical investigation scope-of-services did not include an evaluation of the project site for the presence of hazardous materials. Although NV5 did not observe the presence of

hazardous materials at the time of the field investigation, all project personnel should be careful and take the necessary precautions in the event hazardous materials are encountered during construction.

9. NV5's geotechnical investigation scope-of-services did not include an evaluation of the project site for the presence of mold nor for the future potential development of mold at the project site. If an evaluation of the presence of mold and/or for the future potential development of mold at the site is desired, then the property owner should contact a consulting firm specializing in these types of investigations. NV5 does not perform mold evaluation investigations.

10. NV5's experience and that of the civil engineering profession clearly indicates that during the construction phase of a project the risks of costly design, construction and maintenance problems can be significantly reduced by retaining a design geotechnical engineering firm to review the project plans and specifications and to provide geotechnical engineering CQA observation and testing services. Upon your request NV5 will prepare a CQA geotechnical engineering services proposal that will present a work scope, a tentative schedule and fee estimate for your consideration and authorization. If NV5 is not retained to provide geotechnical engineering CQA services during the construction phase of the project, then NV5 will not be responsible for geotechnical engineering CQA services provided by others nor any aspect of the project that fails to meet your or a third party's expectations in the future.

APPENDIX A:

Site Data Report

STUDIO W
ARCHITECTS

Site Data Report – California Geological Survey
Burchfield Elementary School

Colusa Unified School District
745 Tenth Street
Colusa, CA 95932

1. **Type of service** – K-12 School.

2. **Construction materials used for the project** - Concrete foundations for prefabricated modular classroom buildings.

3. **Type of construction** – Type V-B construction: (8) New TK/K Classrooms, (7) New Elementary Buildings and (1) playground

4. **Seismic force resisting system used for each structure in the project** –
   a) New Buildings – bearing walls / light frame (wood) walls sheathed with wood structural panels.

5. **Foundation system that will be used for each structure in the project** -
   a) New Buildings – concrete slab on grade.

6. **Analysis procedure used and basis of design** –
   a) New Buildings – analysis procedure is ASCE 7-16 equivalent lateral force procedure and the 2022 CBC code.

7. **Building characteristics such as number of stories above and below grade, foot print area at grade, grade slope on site**, etc.
   a) New Buildings – TK/K Modular Buildings: Single Story; 11,520 SF; Elementary Modular Buildings: Single Story; 7,200 SF.
   b) Site is fairly flat and has no prominent site features or grade slopes.

8. **Special features such as requirement for shoring, underpinning, retaining walls, etc.** – There are no special features for shoring, underpinning, retaining walls, etc.

Sincerely,
Studio W Architects

LICENSED ARCHITECT
BRIAN P WHITMORE
No. C 30345
Ren. 9/30/27
STATE OF CALIFORNIA

Brian P. Whitmore, AIA, LEED
President & CEO

well beyond design.

APPENDIX B:

Exploratory Boring Logs

EXPLORATORY BORING LOG

48 BELLARMINE COURT, SUITE 40, CHICO, CA., 95928
PHONE: 530-894-2487, www.NV5.com

Boring No. **B25-1** — **Sheet:** 1 **Of** 1

Project Name: Burchfield Primary School - TK-K	**Project No.:** 71554.00.001	**Task:** 001	**Start Date:** 8/6/25
Location: 400 Fremont Street, Colusa, California	**Estimated Ground Surface Elevation (Ft. AMSL):**		**Finish Date:** 8/6/25
Logged By: DJP	**Drilling Cmpny:** V&W Drilling		**Drill Rig Type:** CME-75
Driller: Anthony	**Drilling Method:** Hollow Stem Augers (HSA)		**Hammer Type:** 140-lb. automatic trip
Boring Dia. (In.): 8.00	**Total Depth (Ft.):** 21.5	**Backfill or Well Design:** Neat Cement	

Ground Water Information

Date	8/6/25			
Time (24 Hour)	12:40			
Depth (Ft.)	13.0			

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Soil And/Or Rock Material Descriptions
			HSA			0	3.5" AC / 4" AB
						1	(ML) SILT WITH SAND, FLD. EST: 70% Low Plastic Silt and Clay Fines and 30% Fine Sand; Dark Grayish Brown; (10YR 4/2); Stiff; Moist.
		2	2.5SS			2	
		3			L1-2-2		
	1.25	5		1.5/1.5	L1-1-2	3	
			HSA			4	
						4.5	(SM) SILTY SAND, Fld. Est.: 65% Fine Sand and 35% Low Plastic Silt and Clay Fines; Dark Grayish Brown (10YR, 4/2); Loose; Moist.
		4	2.5SS			5	
		5			L2-2-2		
		6		1.1/1.5	L2-1-2	6	
			HSA			7	
						8	
						9	
		2	2.5SS			10	
		2			L3-2-2		
		3		1.3/1.5	L3-1-2	11	
			HSA			12	
						13	(groundwater)
						14	
		10	2.5SS			15	
		13			L4-2-2		
		17		1.5/1.5	L4-1-2	16	(CL) SANDY LEAN CLAY, FLD. EST: 70% Low Plastic Silt and Clay Fines and 30% Fine Sand; Dark Grayish Brown (10YR 4/2); Stiff; Moist.
			HSA			17	
						18	
						19	
		7	2.5SS			20	
		9			L5-2-2		
		9		1.5/1.5	L5-1-2	21	

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

NOTES: HSA - Hollow Stem Augers
2.5SS - 2.5" Split Spoon Sampler
SPT - Standard Penetration Test

EXPLORATORY BORING LOG

48 BELLARMINE COURT, SUITE 40, CHICO, CA., 95928
PHONE: 530-894-2487, www.NV5.com

Boring No. **B25-2**

Project Name: Burchfield Primary School - TK-K	**Project No.:** 71554.00.001	**Task:** 001	**Start Date:** 8/6/25	
Location: 400 Fremont Street, Colusa, California	**Estimated Ground Surface Elevation (Ft. AMSL):**		**Finish Date:** 8/6/25	**Sheet:** 1 **Of** 1
Logged By: DJP	**Drilling Cmpny:** V&W Drilling		**Drill Rig Type:** CME-75	
Driller: Anthony	**Drilling Method:** Hollow Stem Augers (HSA)		**Hammer Type:** 140-lb. automatic trip	
Boring Dia. (In.): 8.00	**Total Depth (Ft.):** 16.5	**Backfill or Well Design:** Neat Cement		

Ground Water Information

Date	8/6/25			
Time (24 Hour)				
Depth (Ft.)				

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Soil And/Or Rock Material Descriptions
			HSA			0	3.5" AC / 4" AB
						0.75	(CL) SANDY LEAN CLAY, FLD. EST: 60% Low Plastic Silt and Clay Fines and 40% Fine Sand; Dark Grayish Brown (10YR 4/2); Stiff; Moist.
		4	2.5SS			2	
		4			L1-2-2		
	2.5	7		1.0/1.5	L1-1-2		
			HSA			3.5	
						4.5	(ML) SANDY SILT, FLD. EST: 60% Low Plastic Silt and Clay Fines, 40% Fine Sand; Dark Grayish Brown; (10YR 4/2); Firm; Moist.
		2	2.5SS			5	
		3			L2-2-2		
	1.0	4		0.9/1.5	L2-1-2		
			HSA			6.5	
						9	(CL) SANDY LEAN CLAY, FLD. EST: 70% Low Plastic Silt and Clay Fines and 30% Fine Sand; Dark Grayish Brown (10YR 4/2); Stiff; Moist.
		4	2.5SS			10	
		7		1.2/1.5	L3-2-2		
		9			L3-1-2		
			HSA			11.5	
		7	2.5SS			15	
		12			L4-2-2		
		17		1.3/1.5	L4-1-2	16.5	

NOTES: HSA - Hollow Stem Augers
2.5SS - 2.5" Split Spoon Sampler

EXPLORATORY BORING LOG

48 BELLARMINE COURT, SUITE 40, CHICO, CA., 95928
PHONE: 530-894-2487, www.NV5.com

Boring No. B25-3
Sheet: 1 **Of** 1

Project Name: Burchfield Primary School - TK-K	**Project No.:** 71554.00.001	**Task:** 001	**Start Date:** 8/7/25
Location: 400 Fremont Street, Colusa, California	**Estimated Ground Surface Elevation (Ft. AMSL):**		**Finish Date:** 8/7/25
Logged By: DJP	**Drilling Cmpny:** V&W Drilling		**Drill Rig Type:** CME-75
Driller: Anthony	**Drilling Method:** Hollow Stem Augers (HSA)		**Hammer Type:** 140-lb. automatic trip
Boring Dia. (In.): 8.00	**Total Depth (Ft.):** 16.5	**Backfill or Well Design:** Neat Cement	

Ground Water Information

Date	8/7/25			
Time (24 Hour)				
Depth (Ft.)				

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.
			HSA		
		7	2.5SS		
		7			L1-2-2
	1.5	8		1.3/1.5	L1-1-2
			HSA		
		4	2.5SS		
		4			L2-2-2
		5		1.3/1.5	L2-1-2
			HSA		
		4	2.5SS		
		5			L3-2-2
		9		1.4/1.5	L3-1-2
			HSA		
		4	2.5SS		
		9			L4-2-2
	2.0	15		1.5/1.5	L4-1-2

Depth B.G.S. (Ft.): 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

(ML) SANDY SILT, FLD. EST: 60% Low Plastic Silt and Clay Fines, 40% Fine Sand; Light Olive Brown; (2.5Y 5/3); Stiff; Moist.

(SM) SILTY SAND, Fld. Est.: 85% Fine Sand and 15% Low Plastic Silt and Clay Fines; Light Olive Brown (2.5Y, 5/3); Medium Dense; Moist.

(CL) LEAN CLAY with SAND, FLD. EST: 80% Low Plastic Silt and Clay Fines and 20% Fine Sand; Brown (10YR 4/3); Stiff; Moist.

NOTES: HSA - Hollow Stem Augers
2.5SS - 2.5" Split Spoon Sampler

EXPLORATORY BORING LOG

48 BELLARMINE COURT, SUITE 40, CHICO, CA., 95928
PHONE: 530-894-2487, www.NV5.com

Boring No. B25-4

Sheet: 1 **Of** 3

Project Name: Burchfield Primary School - TK-K	**Project No.:** 71554.00.001	**Task:** 001	**Start Date:** 8/7/25
Location: 400 Fremont Street, Colusa, California	**Estimated Ground Surface Elevation (Ft. AMSL):**		**Finish Date:** 8/7/25
Logged By: DJP	**Drilling Cmpny:** V&W Drilling		**Drill Rig Type:** CME-75
Driller: Anthony	**Drilling Method:** Hollow Stem Augers (HSA)		**Hammer Type:** 140-lb. automatic trip
Boring Dia. (In.): 8.00	**Total Depth (Ft.):** 51.5	**Backfill or Well Design:** Neat Cement	

Ground Water Information

Date	8/7/25			
Time (24 Hour)	11:00			
Depth (Ft.)	13.0			

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)
			HSA			0
		2	2.5SS			2
		2			L1-2-2	
	1.5	3		0.9/1.5	L1-1-2	3
			HSA			
		3	2.5SS			5
		3			L2-2-2	
		5		1.3/1.5	L2-1-2	6
			HSA			
		3	2.5SS			10
		5			L3-2-2	
		6		1.4/1.5	L3-1-2	11
			HSA			
		3	2.5SS			15
		8			L4-2-2	
	2.5	14		1.5/1.5	L4-1-2	16
			HSA			20

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

0 ft: (ML) SILT, FLD. EST: 80% Low Plastic Silt and Clay Fines, 20% Fine Sand; Dark Brown; (10YR 3/3); Stiff; Moist.

8 ft: (SM) SILTY SAND, Fld. Est.: 55% Fine Sand and 45% Low Plastic Silt and Clay Fines; Olive Brown (2.5YR, 4/4); Stiff; Moist.

14 ft: (CL) LEAN CLAY with SAND, FLD. EST: 75% Low Plastic Silt and Clay Fines and 25% Fine Sand; Brown (10YR 4/3); Very Stiff; Moist.

NOTES: HSA - Hollow Stem Augers
2.5SS - 2.5" Split Spoon Sampler
SPT - Standard Penetration Test

EXPLORATORY BORING LOG

48 BELLARMINE COURT, SUITE 40, CHICO, CA., 95928
PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. B25-4

Sheet: 2 **Of** 3

Project Name: Burchfield Primary School - TK-K	**Project No.:** 71554.00.001	**Task:** 001	**Start Date:** 8/7/25
Location: 400 Fremont Street, Colusa, California	**Estimated Ground Surface Elevation (Ft. AMSL):**		**Finish Date:** 8/7/25
Logged By: DJP	**Drilling Company:** V&W Drilling	**Drill Rig Type:** CME-75	
Driller: Anthony	**Drilling Method:** Hollow Stem Augers (HSA)	**Hammer Type:** 140-lb. automatic trip	
Boring Dia. (In.): 8.00	**Total Depth (Ft.):** 51.5	**Backfill or Well Design:** Neat Cement	

Ground Water Information

Date	8/7/25			
Time (24 Hour)	11:00			
Depth (Ft.)	13.0			

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Material Description
		3	2.5 SS			20	(CL) LEAN CLAY with SAND, FLD. EST: 85% Low Plastic Silt and Clay Fines and 15% Fine Sand; Brown (10YR 4/3); Very Stiff; Wet.
		7			L5-2-2		
	3.5	14		1.5/1.5	L5-1-2	21	
			HSA				
						22	
						23	
						24	
		10	2.5 SS			25	
		19			L6-2-2		
		27		1.5/1.5	L6-1-2	26	
			HSA				
						27	
						28	
						29	
		6	SPT			30	
		9					
		15		1.4/1.5	B1-1-1	31	
			HSA				
						32	
						33	
						34	
		5	SPT			35	
		9					
		11		1.5/1.5	B2-1-1	36	
			HSA				
						37	
						38	
						39	
						40	

NOTES:
2.5 SS - 2.5" Split Spoon Sampler
HSA - Hollow Stem Augers
SPT - Standard Penetration Test

EXPLORATORY BORING LOG

N|V|5

48 BELLARMINE COURT, SUITE 40, CHICO, CA., 95928
PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. **B25-4** **Sheet:** 3 **Of** 3

Project Name: Burchfield Primary School - TK-K | **Project No.:** 71554.00.001 | **Task:** 001 | **Start Date:** 8/7/25

Location: 400 Fremont Street, Colusa, California | **Estimated Ground Surface Elevation (Ft. AMSL):** | **Finish Date:** 8/7/25

Logged By: DJP | **Drilling Company:** V&W Drilling | **Drill Rig Type:** CME-75

Driller: Anthony | **Drilling Method:** Hollow Stem Augers (HSA) | **Hammer Type:** 140-lb. automatic trip

Boring Dia. (In.): 8.00 | **Total Depth (Ft.):** 51.5 | **Backfill or Well Design:** Neat Cement

Ground Water Information

Date	8/7/25			
Time (24 Hour)	11:00			
Depth (Ft.)	13.0			

Soil And/Or Rock Material Descriptions
SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Soil And/Or Rock Material Descriptions
		6	SPT			40	(CL) LEAN CLAY with SAND, FLD. EST: 80% Low Plastic Silt and Clay Fines and 20% Fine Sand; Brown (10YR 4/3); Very Stiff; Wet.
		8					
		11		1.5/1.5	B3-1-1	41	
			HSA			42	
						43	
						44	
		5	SPT			45	
		8					
		10		1.5/1.5	B4-1-1	46	
			HSA			47	
						48	
						49	
		6	SPT			50	(SM) SILTY SAND, Fld. Est.: 75% Fine Sand and 25% Low Plastic Silt and Clay Fines; Greenish Black (GLEY 1 2.5/1); Stiff; Moist.
		11					
		14		1.5/1.5	B5-1-1	51	
						52	
						53	
						54	
						55	
						56	
						57	
						58	
						59	
						60	

NOTES:
2.5 SS - 2.5" Split Spoon Sampler
HSA - Hollow Stem Augers
SPT - Standard Penetration Test

APPENDIX C:

Soil Laboratory Test Results

ATTERBERG INDICES

ASTM D4318

DSA LEA No. 284

DSA File No. ____________

DSA App No.

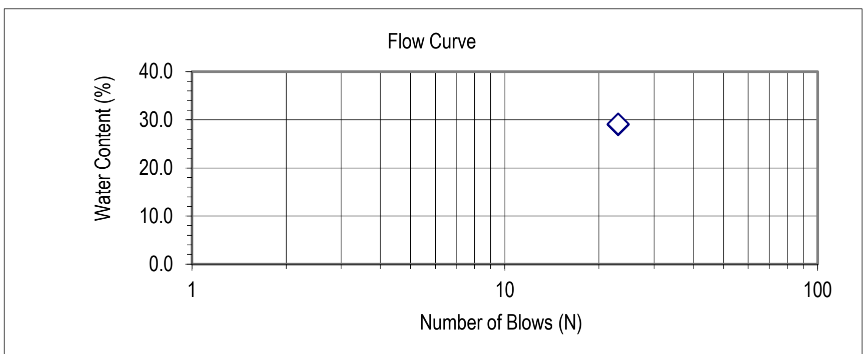
Project No.	71554.00.001	Project Name	PW Burchfield Primary ES - TK-K Modulars	Date:	08/08/25
Sample No.	B1-1-1	Boring/Trench	B25-4 Depth, (ft.): 30'	Tested By:	DOC/KJC
Description:	(CL) Lean Clay with Sand, Brown (10YR 4/3)			Checked By:	DJP
Sample Location:				Lab. No.	C25-171

Estimated % of Sample Retained on No. 40 Sieve: 　　 Sample Air Dried: yes

Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	X	Y				A	B	
Wt. Pan (gr)	38.22	37.12				18.44	18.39	
Wt. Wet Soil + Pan	49.48	48.33				24.27	24.37	
Wt. Dry Soil + Pan (	46.95	45.80				23.23	23.30	
Wt. Water (gr)	2.53	2.53				1.04	1.07	
Wt. Dry Soil (gr)	8.73	8.68				4.79	4.91	
Water Content (%)	29.0	29.1				21.7	21.8	
Number of Blows, N	23	23						

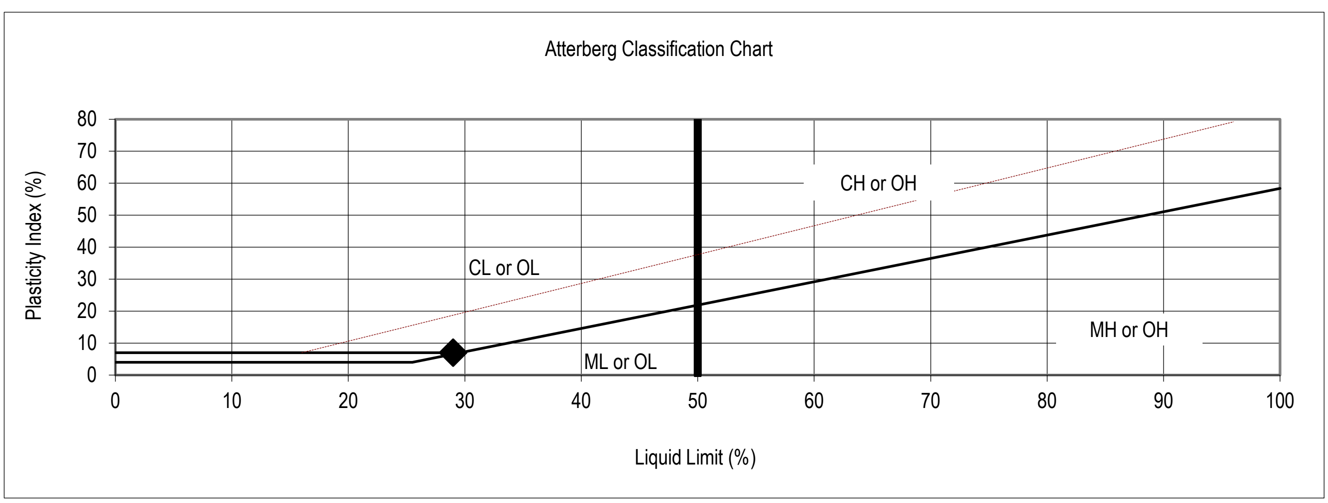
LIQUID LIMIT = 29 　　 PLASTIC LIMIT = 22



Plasticity Index = 7

Non-Plastic ☐

Group Symbol = CL



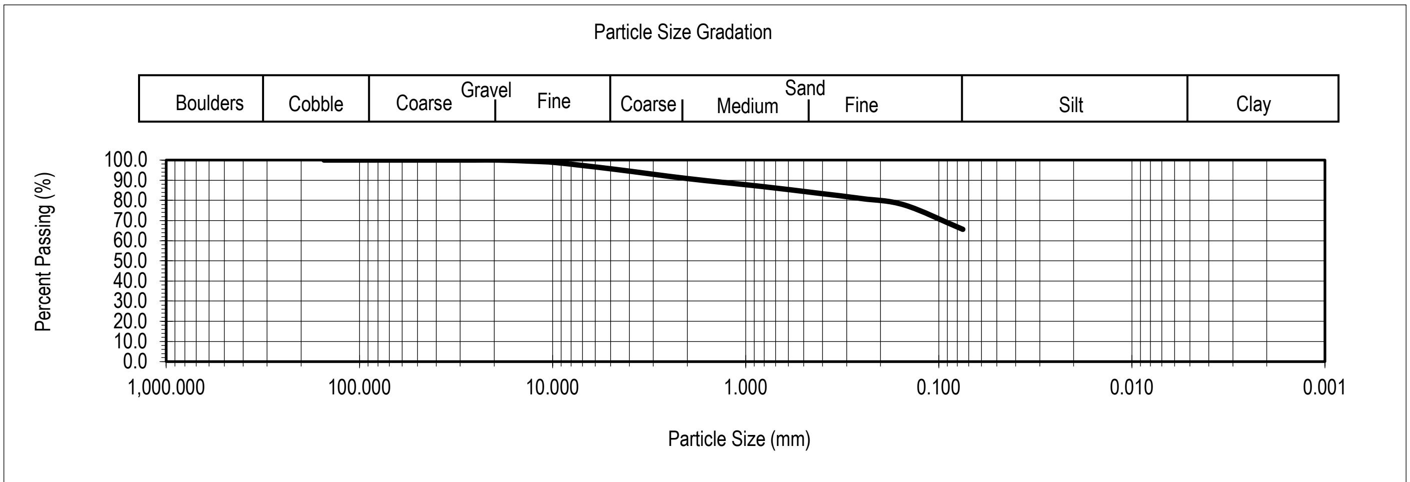
PARTICLE SIZE DISTRIBUTION

ASTM D422, C136

DSA LEA No.: 284

Project No.	**71554.00.001**	Project Name:	**PW Burchfield Primary ES - TK-K Modulars**	Date:	**8/8/2025**
Sample No.	**BLK-1**	Boring/Trench:	**B25-1** Depth, (ft.): **2-4'**	Tested By:	**DOIC**
Description:	**(ML) Silt with Sand, Dark Grayish Brown (!0YR, 4/2)**			Checked By:	**DJP**
Sample Location:				Lab. No.	**C25-171**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4	0.00	0.0	5,161.5	**100.0**
3 Inch	3.0000	76.2	0.00	0.0	5,161.5	**100.0**
2 Inch	2.0000	50.8	0.00	0.0	5,161.5	**100.0**
1.5 Inch	1.5000	38.1	0.00	0.0	5,161.5	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	5,161.5	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	5,161.5	**100.0**
1/2 Inch	0.5000	12.7	30.40	30.4	5,131.1	**99.4**
3/8 Inch	0.3750	9.5	35.30	65.7	5,095.8	**98.7**
#4	0.1870	4.7500	170.90	236.6	4,924.9	**95.4**
#10	0.0787	2.0000	237.23	473.8	4,687.7	**90.8**
#20	0.0335	0.8500	194.53	668.4	4,493.1	**87.1**
#40	0.0167	0.4250	177.13	845.5	4,316.0	**83.6**
#60	0.0098	0.2500	140.76	986.2	4,175.3	**80.9**
#100	0.0059	0.1500	166.06	1,152.3	4,009.2	**77.7**
#200	0.0030	0.0750	621.54	1,773.9	3,387.6	**65.6**
Hydrometer						



ATTERBERG INDICES

ASTM D4318

DSA LEA No. 284

DSA File No. ____________

DSA App No.

Project No.	71554.00.001	Project Name	PW Burchfield Primary ES - TK-K Modulars			Date:	08/08/25
Sample No.	BLK-1	Boring/Trench	B25-1	Depth, (ft.):	2-4'	Tested By:	DOIC
Description:	(ML) Silt with Sand, Dark Grayish Brown (!0YR, 4/2)					Checked By:	DJP
Sample Location:						Lab. No.	C25-171

Estimated % of Sample Retained on No. 40 Sieve:

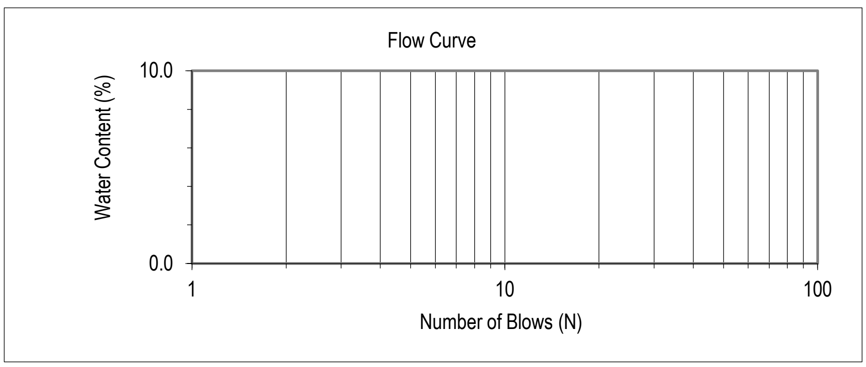
Sample Air Dried: yes

Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:								
Wt. Pan (gr)								
Wt. Wet Soil + Pan (gr)								
Wt. Dry Soil + Pan (gr)								
Wt. Water (gr)								
Wt. Dry Soil (gr)								
Water Content (%)								
Number of Blows, N								

LIQUID LIMIT =

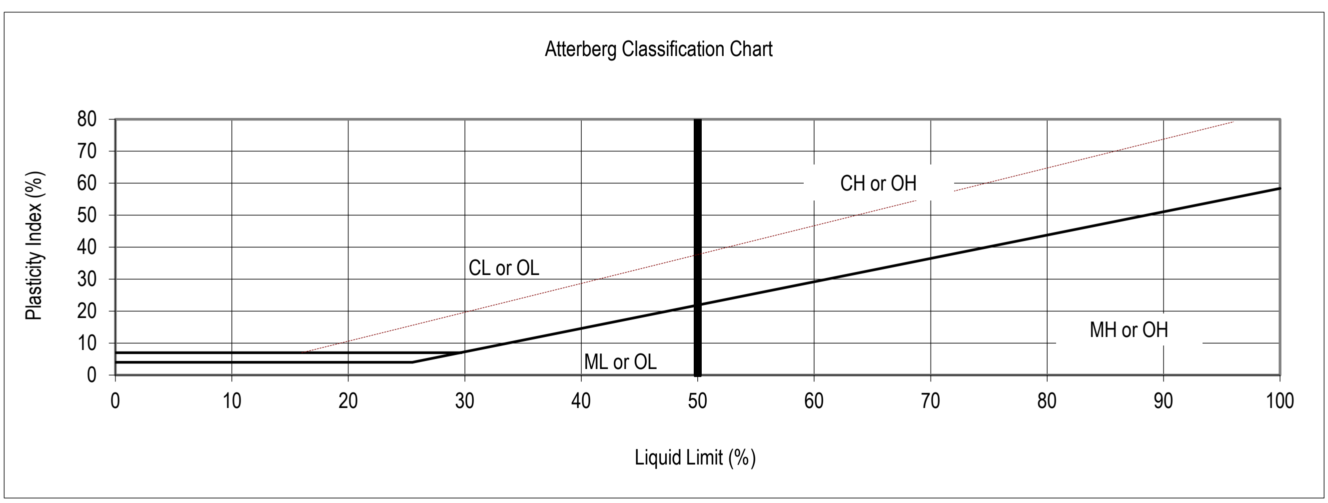
PLASTIC LIMIT =



Plasticity Index = ____________

Non-Plastic ☑

Group Symbol =



DSA LEA No.: 284

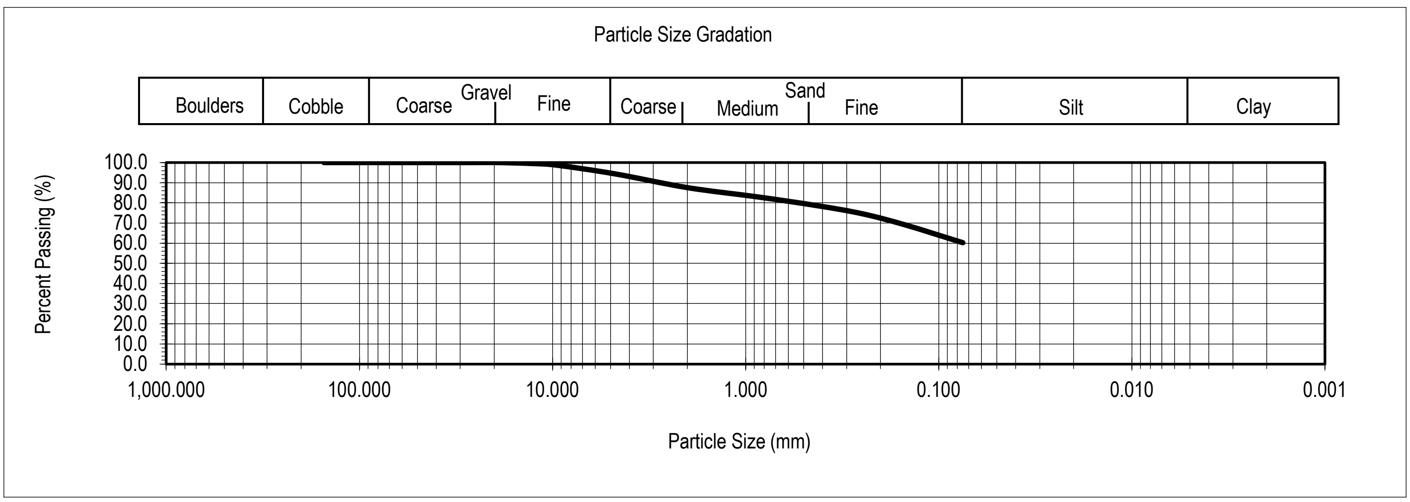
PARTICLE SIZE DISTRIBUTION

ASTM D422, C136

Project No.	**71554.00.001**	Project Name:	**PW Burchfield Primary ES - TK-K Modulars**	Date:	**8/8/2025**
Sample No.	**BLK-2**	Boring/Trench:	**B25-2** Depth, (ft.): **2-5'**	Tested By:	**DOC**
Description:	**(CL) Sandy Lean Clay, Dark Grayish Brown (10YR, 4/2)**			Checked By:	**DJP**
Sample Location:				Lab. No.	**C25-171**

Sieve Size (U.S. Standard)	Particle Diameter Inches (in.)	Particle Diameter Millimeter (mm)	Dry Weight on Sieve Retained On Sieve (gm)	Dry Weight on Sieve Accumulated On Sieve (gm)	Dry Weight on Sieve Passing Sieve (gm)	Percent Passing (%)
6 Inch	6.0000	152.4	0.00	0.0	9,158.0	**100.0**
3 Inch	3.0000	76.2	0.00	0.0	9,158.0	**100.0**
2 Inch	2.0000	50.8	0.00	0.0	9,158.0	**100.0**
1.5 Inch	1.5000	38.1	0.00	0.0	9,158.0	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	9,158.0	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	9,158.0	**100.0**
1/2 Inch	0.5000	12.7	43.20	43.2	9,114.8	**99.5**
3/8 Inch	0.3750	9.5	73.70	116.9	9,041.1	**98.7**
#4	0.1870	4.7500	396.00	512.9	8,645.1	**94.4**
#10	0.0787	2.0000	626.05	1,139.0	8,019.0	**87.6**
#20	0.0335	0.8500	431.28	1,570.2	7,587.8	**82.9**
#40	0.0167	0.4250	389.54	1,959.8	7,198.2	**78.6**
#60	0.0098	0.2500	361.72	2,321.5	6,836.5	**74.7**
#100	0.0059	0.1500	503.63	2,825.1	6,332.9	**69.2**
#200	0.0030	0.0750	815.26	3,640.4	5,517.6	**60.2**

Hydrometer



ATTERBERG INDICES

ASTM D4318

DSA LEA No. 284

DSA File No. ____________

DSA App No. ____________

Project No.	71554.00.001	Project Name	PW Burchfield Primary ES - TK-K Modulars	Date:	08/08/25
Sample No.	BLK-2	Boring/Trencl	B25-2 Depth, (ft.): 2-5'	Tested By:	DOC
Description:	(CL) Sandy Lean Clay, Dark Grayish Brown (10YR, 4/2)			Checked By:	DJP
Sample Location:				Lab. No.	C25-171

Estimated % of Sample Retained on No. 40 Sieve:

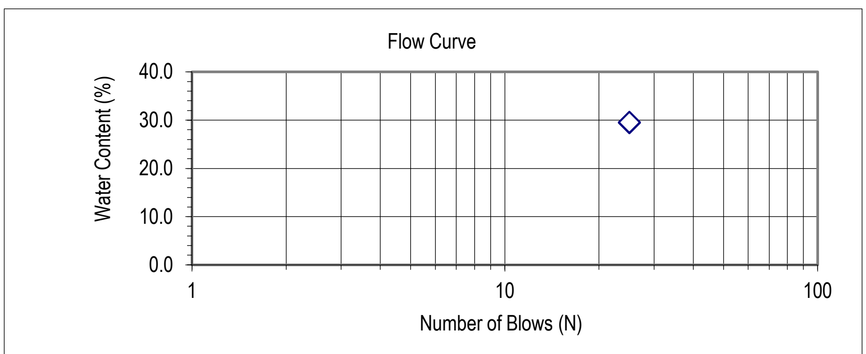
Sample Air Dried: yes

Test Method A or B: B

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	A	B				1	2	3
Wt. Pan (gr)	38.46	38.98				18.39	18.49	18.41
Wt. Wet Soil + Pan	54.14	56.08				25.10	25.16	25.07
Wt. Dry Soil + Pan (	50.57	52.18				24.01	24.07	23.99
Wt. Water (gr)	3.57	3.90				1.09	1.09	1.08
Wt. Dry Soil (gr)	12.11	13.20				5.62	5.58	5.58
Water Content (%)	29.5	29.5				19.4	19.5	19.4
Number of Blows, N	25	25						

LIQUID LIMIT = 30

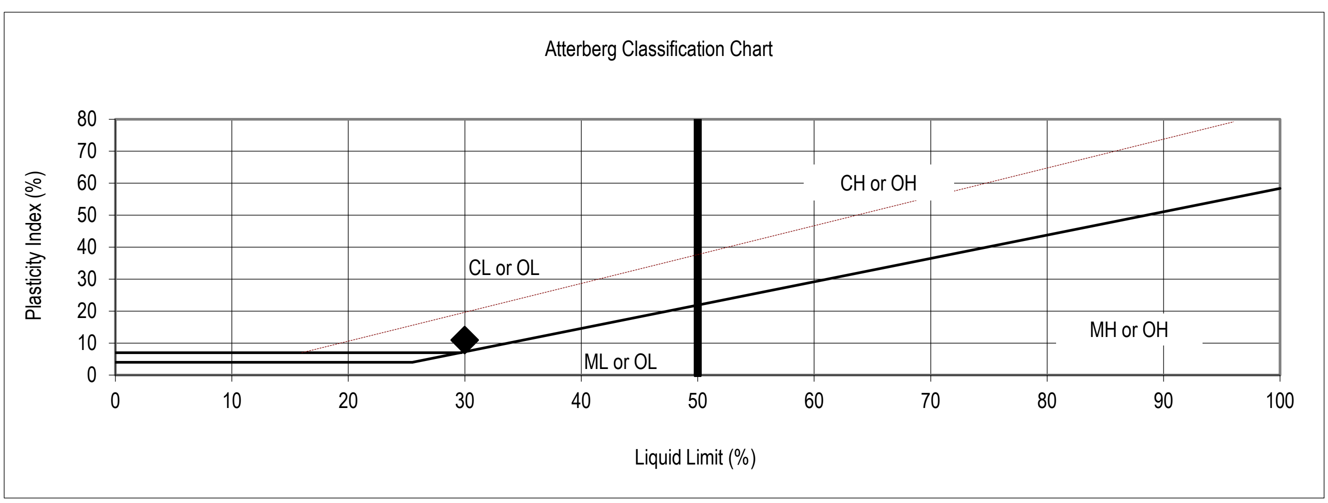
PLASTIC LIMIT = 19



Plasticity Index = 11

Non-Plastic ☐

Group Symbol = CL



DSA LEA No.: 284

PARTICLE SIZE DISTRIBUTION

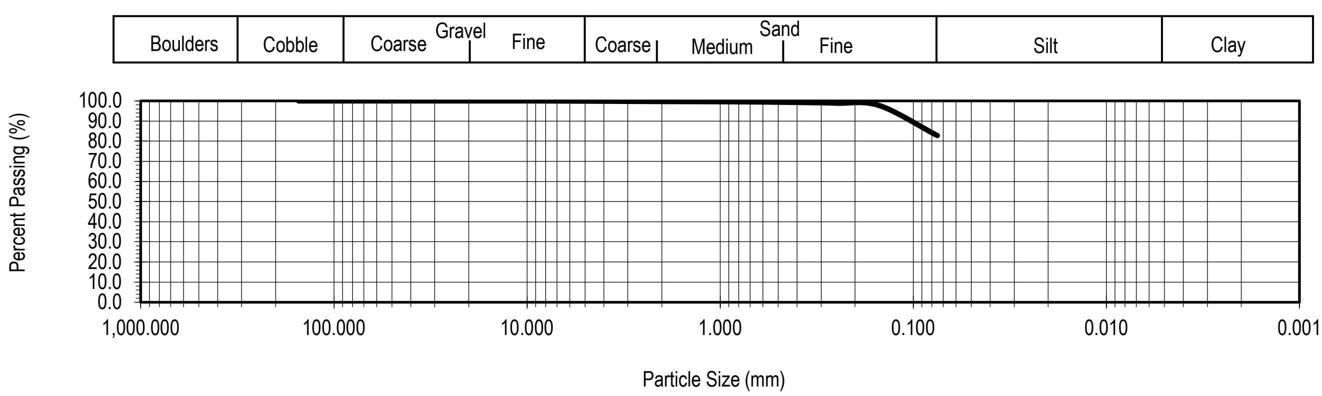
ASTM D422, C136

Project No.	**71554.00.001**	Project Name:	**PW Burchfield Primary ES - TK-K Modulars**	Date:	**8/8/2025**
Sample No.	**BLK-3**	Boring/Trench:	**B25-4** Depth, (ft.): **2-5'**	Tested By:	**DOC**
Description:	**(ML) Silt, Dark Brown (10YR, 3/3)**			Checked By:	**DJP**
Sample Location:				Lab. No.	**C25-171**

Sieve Size (U.S. Standard)	Particle Diameter Inches (in.)	Particle Diameter Millimeter (mm)	Dry Weight on Sieve Retained On Sieve (gm)	Accumulated On Sieve (gm)	Passing Sieve (gm)	Percent Passing (%)
6 Inch	6.0000	152.4	0.00	0.0	5,507.3	**100.0**
3 Inch	3.0000	76.2	0.00	0.0	5,507.3	**100.0**
2 Inch	2.0000	50.8	0.00	0.0	5,507.3	**100.0**
1.5 Inch	1.5000	38.1	0.00	0.0	5,507.3	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	5,507.3	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	5,507.3	**100.0**
1/2 Inch	0.5000	12.7	0.00	0.0	5,507.3	**100.0**
3/8 Inch	0.3750	9.5	0.00	0.0	5,507.3	**100.0**
#4	0.1870	4.7500	6.30	6.3	5,501.0	**99.9**
#10	0.0787	2.0000	10.11	16.4	5,490.9	**99.7**
#20	0.0335	0.8500	6.74	23.1	5,484.2	**99.6**
#40	0.0167	0.4250	16.84	40.0	5,467.3	**99.3**
#60	0.0098	0.2500	21.90	61.9	5,445.4	**98.9**
#100	0.0059	0.1500	64.00	125.9	5,381.4	**97.7**
#200	0.0030	0.0750	821.95	947.8	4,559.5	**82.8**

Hydrometer

Particle Size Gradation



ATTERBERG INDICES

ASTM D4318

DSA LEA No. 284

DSA File No. ____________

DSA App No.

Project No.	71554.00.001	Project Name	PW Burchfield Primary ES - TK-K Modulars			Date:	08/08/25
Sample No.	BLK-3	Boring/Trench	B25-4	Depth, (ft.):	2-5'	Tested By:	DOC
Description:	(ML) Silt, Dark Brown (10YR, 3/3)					Checked By:	DJP
Sample Location:						Lab. No.	C25-171

Estimated % of Sample Retained on No. 40 Sieve:

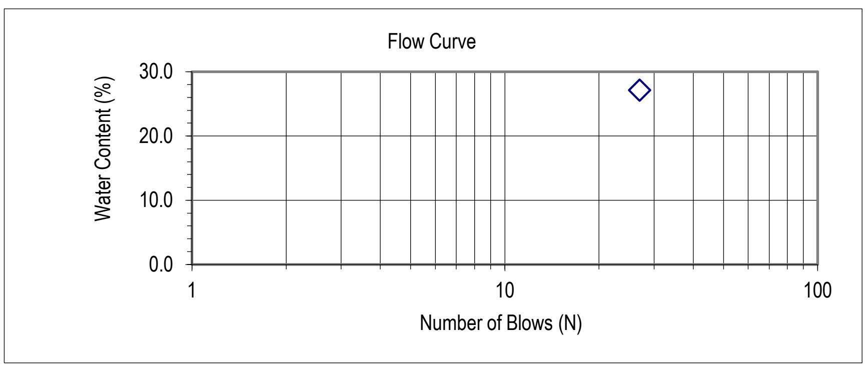
Sample Air Dried: yes

Test Method A or B: B

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	X	Y				A	B	C
Wt. Pan (gr)	38.22	37.12				18.44	18.39	18.53
Wt. Wet Soil + Pan	53.36	51.51				25.14	25.25	24.89
Wt. Dry Soil + Pan (	50.13	48.44				23.91	24.00	23.76
Wt. Water (gr)	3.23	3.07				1.23	1.25	1.13
Wt. Dry Soil (gr)	11.91	11.32				5.47	5.61	5.23
Water Content (%)	27.1	27.1				22.5	22.3	21.6
Number of Blows, N	27	27						

LIQUID LIMIT = 26

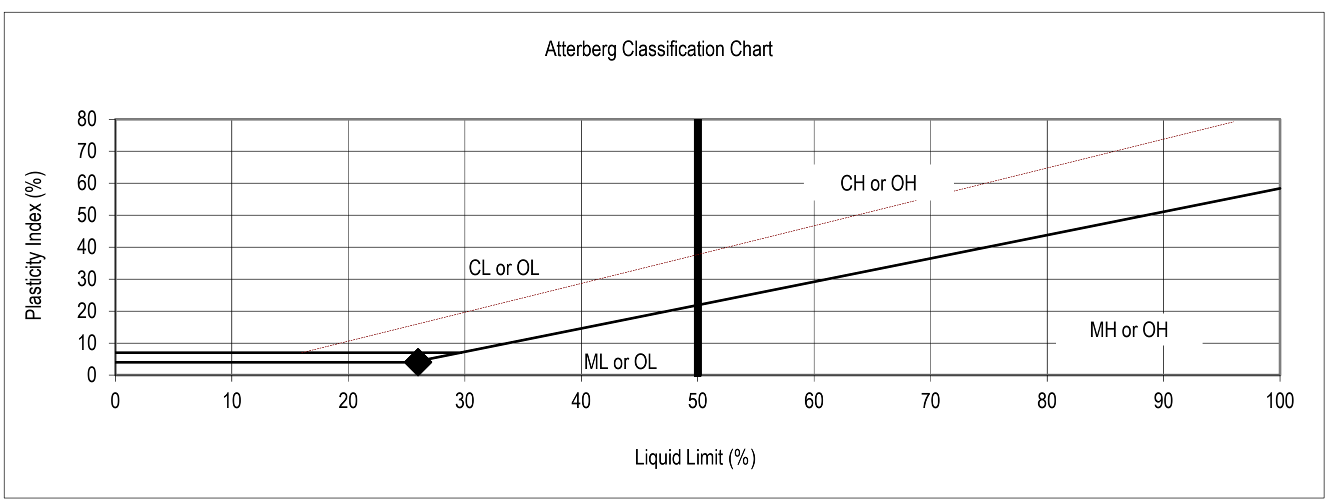
PLASTIC LIMIT = 22



Plasticity Index = 4

Non-Plastic ☐

Group Symbol = ML



NV5
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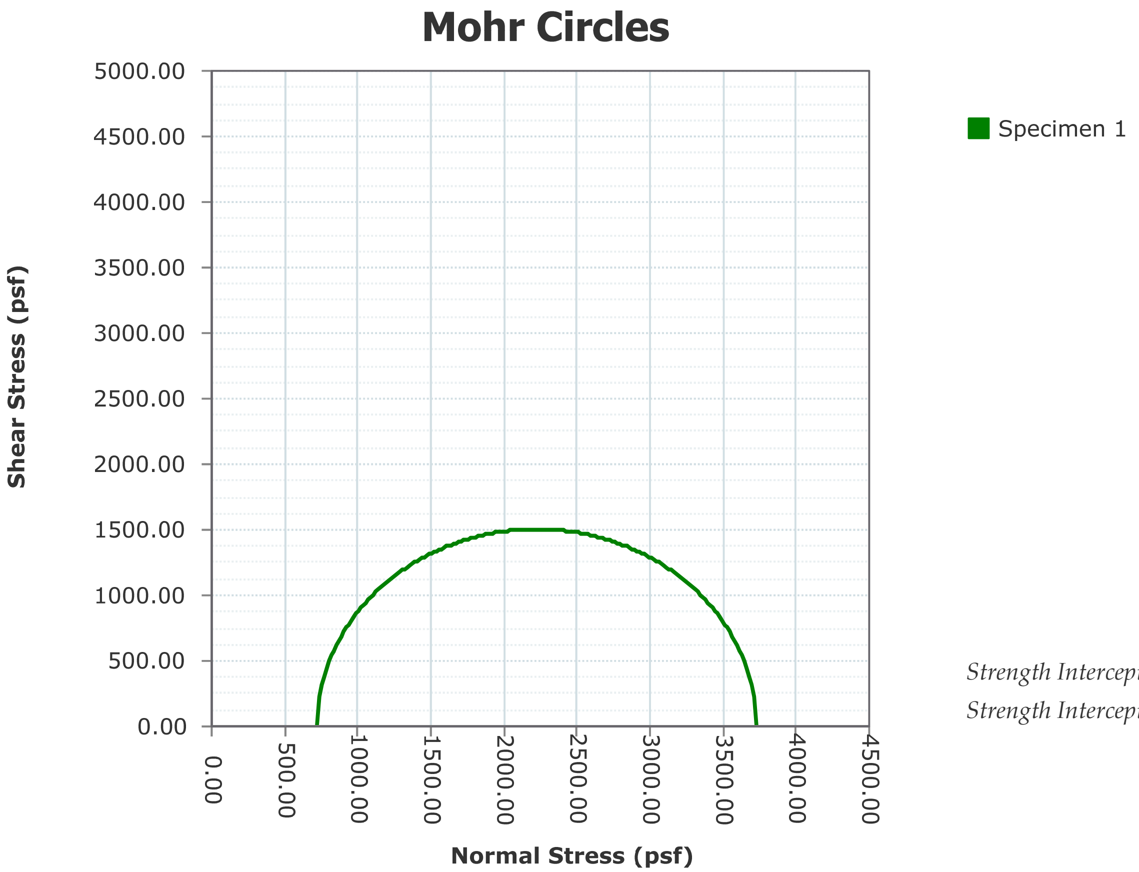
Unconsolidated Undrained Test

ASTM D2850



Strength Intercept = NA

Strength Intercept = NA

Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	9/26/2025
Sample Number:	L1-1-2
Sample Depth:	2.0 ft
Location:	B25-1
Client Name:	Colusa Unified School District
Project Remarks:	

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Unconsolidated Undrained Test

ASTM D2850

Before Test	Specimen Number 1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.001							
Initial Cell Pressure (psi)	5.0							
Height (in)	5.750							
Diameter (in)	2.380							
Water Content (%)	21.0							
Wet Density (pcf)	126.6							
Dry Density (pcf)	104.6							
Degree of Saturation (%)	91.8							
Void Ratio	0.623							
Height To Diameter Ratio	2.416							
Test Data	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Comp. Strength at Failure (psf)	3007.29							
σ1 at Failure (psf)	3727.29							
σ3 at Failure (psf)	720.00							
Rate of Strain (in/min)	0.057500							
Axial Strain at Failure (%)	10.92							
After Test	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Final Water Content (%)	22.9							

Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	9/26/2025
Sample Number:	L1-1-2
Sample Depth:	2.0 ft
Location:	B25-1
Boring Number:	B25-1
Client Name:	Colusa Unified School District
Project Remarks:	

Specimen 1 Failure Sketch	Specimen 2 Failure Sketch	Specimen 3 Failure Sketch	Specimen 4 Failure Sketch	Specimen 5 Failure Sketch	Specimen 6 Failure Sketch	Specimen 7 Failure Sketch	Specimen 8 Failure Sketch
							

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Unconsolidated Undrained Test

ASTM D2850

Specimen 1			
Test Description:	D2850		
Other Associated Tests:			
Device Details:			
Test Specification:			
Test Date:	9/26/2025		
Technician:		Sampling Method:	Undisturbed
Specimen Code:		Specimen Lab #:	
Specimen Description:			
Specific Gravity:	2.720		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.750	Diameter (in):	2.380
Area (in^2):	4.449	Volume (in^3):	25.58
Large Particle:			
Moisture Material:	Specimen		
Moist Weight (g):	850.4		
Test Remarks:			

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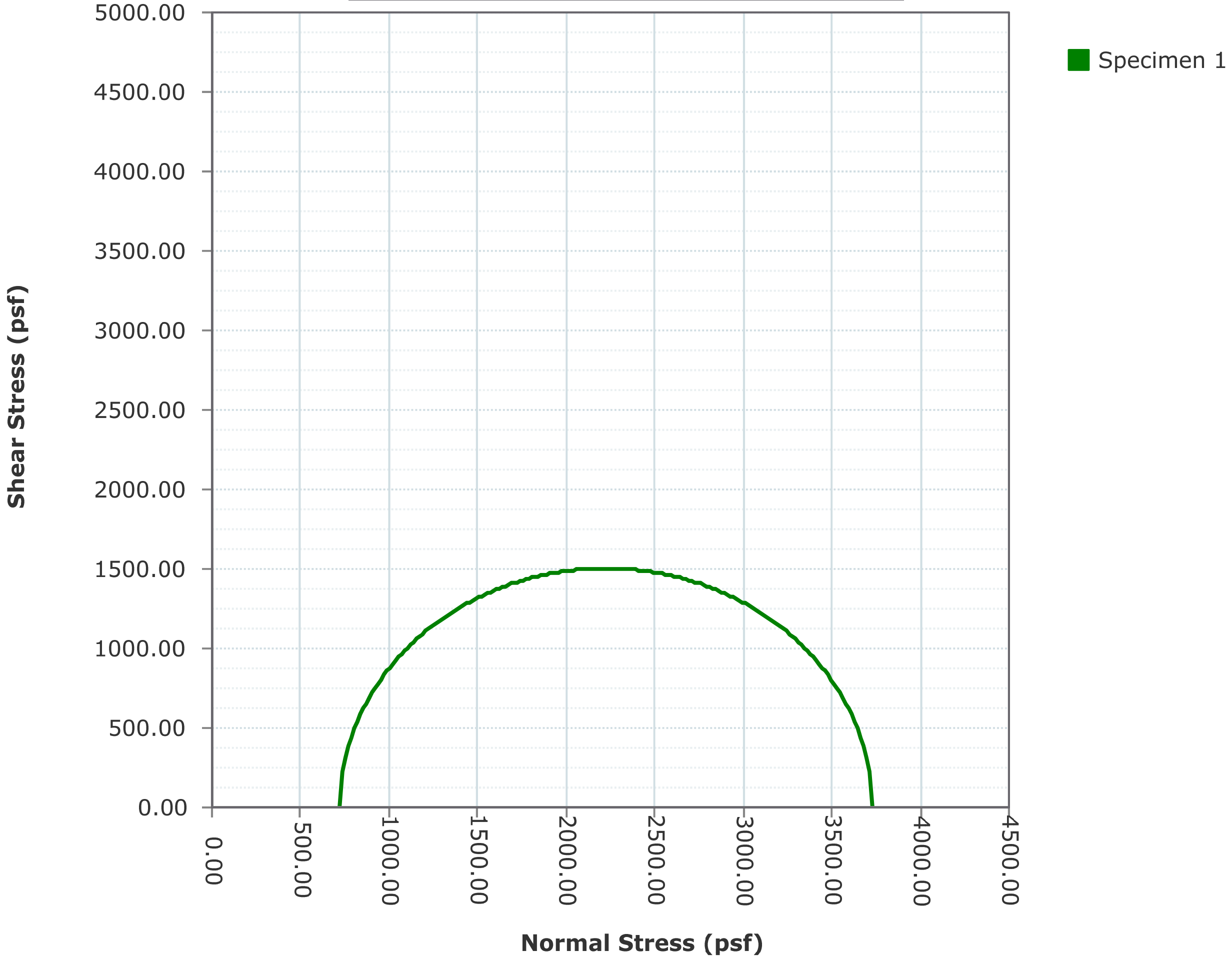
Mohr Circles (Total Stress) Graph

ASTM D2850

Strength Intercept (psi)	NA
Friction Angle (°)	NA



Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	9/26/2025
Sample Number:	L1-1-2
Sample Depth:	2.0 ft
Location:	B25-1
Client Name:	Colusa Unified School District
Project Remarks:	

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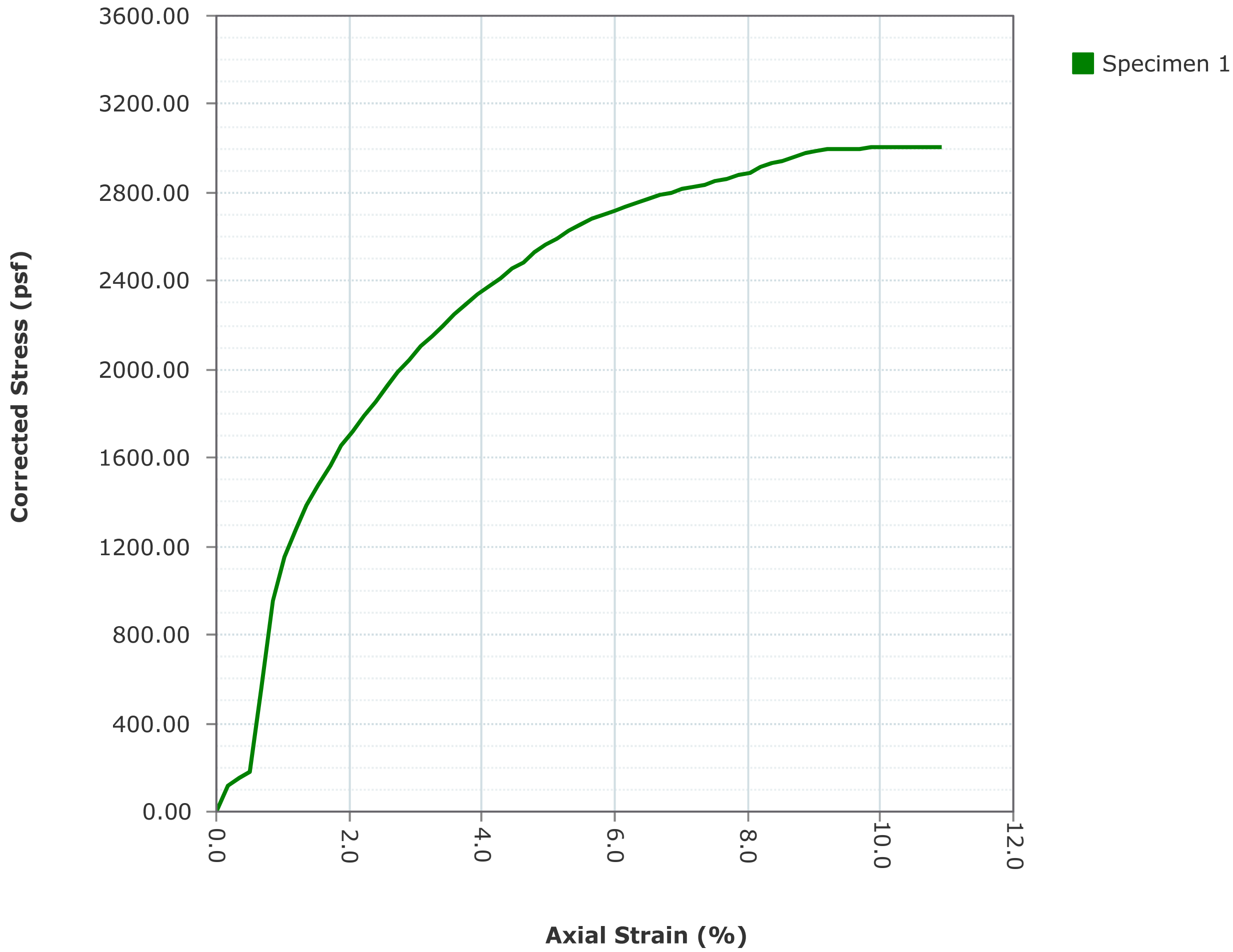
Stress-Strain Graph

ASTM D2850



Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	9/26/2025
Sample Number:	L1-1-2
Sample Depth:	2.0 ft
Location:	B25-1
Client Name:	Colusa Unified School District
Project Remarks:	

Unconsolidated Undrained Test - Tabulated Data - Specimen 1

ASTM D2850

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Disp. (in)	Corrected Load (Lbf)	Corrected Disp. (in)	Corrected Area (in²)	Axial Strain (%)	Stress (psf)	Corrected Compressive Stress (psf)	σ1 (psf)	σ3 (psf)	σ1 — σ3	p (psf)	q (psf)
0	00:00:00	0.0	0.0000	0.0	0.000	4.449	0.0	0.00	0.00	720.00	720.00	1.000	720.00	0.00
1	00:00:10	3.7	0.0100	3.7	0.010	4.457	0.2	119.76	119.47	839.47	720.00	1.166	779.74	59.73
2	00:00:20	4.7	0.0200	4.7	0.020	4.464	0.3	152.13	151.43	871.43	720.00	1.210	795.72	75.72
3	00:00:30	5.6	0.0290	5.6	0.029	4.471	0.5	181.26	180.10	900.10	720.00	1.250	810.05	90.05
4	00:00:40	17.4	0.0390	17.4	0.039	4.479	0.7	563.21	559.06	1,279.06	720.00	1.776	999.53	279.53
5	00:00:50	29.8	0.0490	29.8	0.049	4.487	0.9	964.57	956.35	1,676.35	720.00	2.328	1,198.18	478.18
6	00:01:00	35.9	0.0590	35.9	0.059	4.495	1.0	1,162.02	1,150.10	1,870.10	720.00	2.597	1,295.05	575.05
7	00:01:10	39.9	0.0690	39.9	0.069	4.503	1.2	1,291.49	1,275.99	1,995.99	720.00	2.772	1,358.00	638.00
8	00:01:20	43.4	0.0780	43.4	0.078	4.510	1.4	1,404.78	1,385.72	2,105.72	720.00	2.925	1,412.86	692.86
9	00:01:30	46.3	0.0880	46.3	0.088	4.518	1.5	1,498.65	1,475.71	2,195.71	720.00	3.050	1,457.86	737.86
10	00:01:40	49.3	0.0990	49.3	0.099	4.527	1.7	1,595.75	1,568.28	2,288.28	720.00	3.178	1,504.14	784.14
11	00:01:50	52.0	0.1080	52.0	0.108	4.534	1.9	1,683.15	1,651.53	2,371.53	720.00	3.294	1,545.77	825.77
12	00:02:00	54.3	0.1180	54.3	0.118	4.542	2.1	1,757.59	1,721.53	2,441.53	720.00	3.391	1,580.76	860.76
13	00:02:10	56.6	0.1280	56.6	0.128	4.550	2.2	1,832.04	1,791.26	2,511.26	720.00	3.488	1,615.63	895.63
14	00:02:20	58.7	0.1380	58.7	0.138	4.558	2.4	1,900.01	1,854.41	2,574.41	720.00	3.576	1,647.21	927.21
15	00:02:30	61.0	0.1480	61.0	0.148	4.566	2.6	1,974.46	1,923.64	2,643.64	720.00	3.672	1,681.82	961.82
16	00:02:40	63.1	0.1570	63.1	0.157	4.574	2.7	2,042.43	1,986.67	2,706.67	720.00	3.759	1,713.33	993.33
17	00:02:50	65.1	0.1670	65.1	0.167	4.582	2.9	2,107.17	2,045.97	2,765.97	720.00	3.842	1,742.99	1,022.99
18	00:03:00	67.0	0.1770	67.0	0.177	4.590	3.1	2,168.67	2,101.91	2,821.91	720.00	3.919	1,770.96	1,050.96
19	00:03:10	68.6	0.1870	68.6	0.187	4.598	3.3	2,220.46	2,148.25	2,868.25	720.00	3.984	1,794.12	1,074.12
20	00:03:20	70.3	0.1960	70.3	0.196	4.606	3.4	2,275.49	2,197.92	2,917.92	720.00	4.053	1,818.96	1,098.96
21	00:03:30	72.1	0.2060	72.1	0.206	4.614	3.6	2,333.75	2,250.14	2,970.14	720.00	4.125	1,845.07	1,125.07
22	00:03:40	73.7	0.2160	73.7	0.216	4.622	3.8	2,385.54	2,295.92	3,015.92	720.00	4.189	1,867.96	1,147.96

Unconsolidated Undrained Test - Tabulated Data - Specimen 1

ASTM D2850

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Disp. (in)	Corrected Load (Lbf)	Corrected Disp. (in)	Corrected Area (in²)	Axial Strain (%)	Stress (psf)	Corrected Compressive Stress (psf)	σ1 (psf)	σ3 (psf)	σ1 — σ3	p (psf)	q (psf)
23	00:03:50	75.2	0.2260	75.2	0.226	4.631	3.9	2,434.09	2,338.42	3,058.42	720.00	4.248	1,889.21	1,169.21
24	00:04:00	76.5	0.2360	76.5	0.236	4.639	4.1	2,476.17	2,374.54	3,094.54	720.00	4.298	1,907.27	1,187.27
25	00:04:10	77.9	0.2460	77.9	0.246	4.648	4.3	2,521.48	2,413.61	3,133.61	720.00	4.352	1,926.80	1,206.80
26	00:04:20	79.3	0.2560	79.3	0.256	4.656	4.5	2,566.80	2,452.52	3,172.52	720.00	4.406	1,946.26	1,226.26
27	00:04:30	80.6	0.2660	80.6	0.266	4.665	4.6	2,608.88	2,488.19	3,208.19	720.00	4.456	1,964.09	1,244.09
28	00:04:40	82.0	0.2750	82.0	0.275	4.672	4.8	2,654.19	2,527.25	3,247.25	720.00	4.510	1,983.63	1,263.63
29	00:04:50	83.3	0.2850	83.3	0.285	4.681	5.0	2,696.27	2,562.63	3,282.63	720.00	4.559	2,001.32	1,281.32
30	00:05:00	84.4	0.2950	84.4	0.295	4.689	5.1	2,731.88	2,591.72	3,311.72	720.00	4.600	2,015.86	1,295.86
31	00:05:10	85.8	0.3050	85.8	0.305	4.698	5.3	2,777.19	2,629.88	3,349.88	720.00	4.653	2,034.94	1,314.94
32	00:05:20	86.7	0.3150	86.7	0.315	4.707	5.5	2,806.32	2,652.59	3,372.59	720.00	4.684	2,046.29	1,326.29
33	00:05:30	87.8	0.3250	87.8	0.325	4.715	5.7	2,841.93	2,681.30	3,401.30	720.00	4.724	2,060.65	1,340.65
34	00:05:40	88.6	0.3350	88.6	0.335	4.724	5.8	2,867.82	2,700.74	3,420.74	720.00	4.751	2,070.37	1,350.37
35	00:05:50	89.3	0.3450	89.3	0.345	4.733	6.0	2,890.48	2,717.05	3,437.05	720.00	4.774	2,078.53	1,358.53
36	00:06:00	90.2	0.3540	90.2	0.354	4.741	6.2	2,919.61	2,739.87	3,459.87	720.00	4.805	2,089.93	1,369.93
37	00:06:10	90.9	0.3640	90.9	0.364	4.749	6.3	2,942.27	2,756.01	3,476.01	720.00	4.828	2,098.01	1,378.01
38	00:06:20	91.7	0.3740	91.7	0.374	4.758	6.5	2,968.17	2,775.10	3,495.10	720.00	4.854	2,107.55	1,387.55
39	00:06:30	92.3	0.3840	92.3	0.384	4.767	6.7	2,987.59	2,788.07	3,508.07	720.00	4.872	2,114.03	1,394.03
40	00:06:40	92.9	0.3940	92.9	0.394	4.776	6.9	3,007.01	2,800.96	3,520.96	720.00	4.890	2,120.48	1,400.48
41	00:06:50	93.5	0.4030	93.5	0.403	4.784	7.0	3,026.43	2,814.31	3,534.31	720.00	4.909	2,127.16	1,407.16
42	00:07:00	94.0	0.4130	94.0	0.413	4.793	7.2	3,042.61	2,824.07	3,544.07	720.00	4.922	2,132.04	1,412.04
43	00:07:10	94.6	0.4230	94.6	0.423	4.802	7.4	3,062.03	2,836.77	3,556.77	720.00	4.940	2,138.39	1,418.39
44	00:07:20	95.2	0.4320	95.2	0.432	4.810	7.5	3,081.45	2,849.94	3,569.94	720.00	4.958	2,144.97	1,424.97
45	00:07:30	95.8	0.4420	95.8	0.442	4.819	7.7	3,100.87	2,862.51	3,582.51	720.00	4.976	2,151.26	1,431.26

Unconsolidated Undrained Test - Tabulated Data - Specimen 1

ASTM D2850

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Disp. (in)	Corrected Load (Lbf)	Corrected Disp. (in)	Corrected Area (in²)	Axial Strain (%)	Stress (psf)	Corrected Compressive Stress (psf)	σ1 (psf)	σ3 (psf)	σ1 — σ3	p (psf)	q (psf)
46	00:07:40	96.5	0.4520	96.5	0.452	4.828	7.9	3,123.53	2,878.00	3,598.00	720.00	4.997	2,159.00	1,439.00
47	00:07:50	97.2	0.4620	97.2	0.462	4.837	8.0	3,146.19	2,893.40	3,613.40	720.00	5.019	2,166.70	1,446.70
48	00:08:00	98.0	0.4710	98.0	0.471	4.846	8.2	3,172.08	2,912.25	3,632.25	720.00	5.045	2,176.13	1,456.13
49	00:08:10	98.8	0.4810	98.8	0.481	4.855	8.4	3,197.98	2,930.46	3,650.46	720.00	5.070	2,185.23	1,465.23
50	00:08:20	99.5	0.4900	99.5	0.490	4.863	8.5	3,220.64	2,946.18	3,666.18	720.00	5.092	2,193.09	1,473.09
51	00:08:30	100.2	0.5000	100.2	0.500	4.873	8.7	3,243.29	2,961.27	3,681.27	720.00	5.113	2,200.63	1,480.63
52	00:08:40	101.0	0.5100	101.0	0.510	4.882	8.9	3,269.19	2,979.23	3,699.23	720.00	5.138	2,209.61	1,489.61
53	00:08:50	101.5	0.5190	101.5	0.519	4.890	9.0	3,285.37	2,988.83	3,708.83	720.00	5.151	2,214.42	1,494.42
54	00:09:00	101.9	0.5290	101.9	0.529	4.900	9.2	3,298.32	2,994.88	3,714.88	720.00	5.160	2,217.44	1,497.44
55	00:09:10	102.3	0.5380	102.3	0.538	4.908	9.4	3,311.27	3,001.45	3,721.45	720.00	5.169	2,220.72	1,500.72
56	00:09:20	102.4	0.5480	102.4	0.548	4.917	9.5	3,314.50	2,998.62	3,718.62	720.00	5.165	2,219.31	1,499.31
57	00:09:30	102.6	0.5570	102.6	0.557	4.926	9.7	3,320.98	2,999.28	3,719.28	720.00	5.166	2,219.64	1,499.64
58	00:09:40	103.0	0.5670	103.0	0.567	4.935	9.9	3,333.93	3,005.17	3,725.17	720.00	5.174	2,222.59	1,502.59
59	00:09:50	103.3	0.5770	103.3	0.577	4.945	10.0	3,343.64	3,008.11	3,728.11	720.00	5.178	2,224.06	1,504.06
60	00:10:00	103.5	0.5860	103.5	0.586	4.954	10.2	3,350.11	3,008.69	3,728.69	720.00	5.179	2,224.35	1,504.35
61	00:10:10	103.6	0.5960	103.6	0.596	4.963	10.4	3,353.35	3,005.77	3,725.77	720.00	5.175	2,222.88	1,502.88
62	00:10:20	103.8	0.6060	103.8	0.606	4.973	10.5	3,359.82	3,005.72	3,725.72	720.00	5.175	2,222.86	1,502.86
63	00:10:30	104.1	0.6150	104.1	0.615	4.982	10.7	3,369.53	3,009.14	3,729.14	720.00	5.179	2,224.57	1,504.57
64	00:10:40	104.3	0.6250	104.3	0.625	4.991	10.9	3,376.00	3,009.05	3,729.05	720.00	5.179	2,224.52	1,504.52
65	00:10:42	104.3	0.6280	104.3	0.628	4.994	10.9	3,376.00	3,007.29	3,727.29	720.00	5.177	2,223.64	1,503.64

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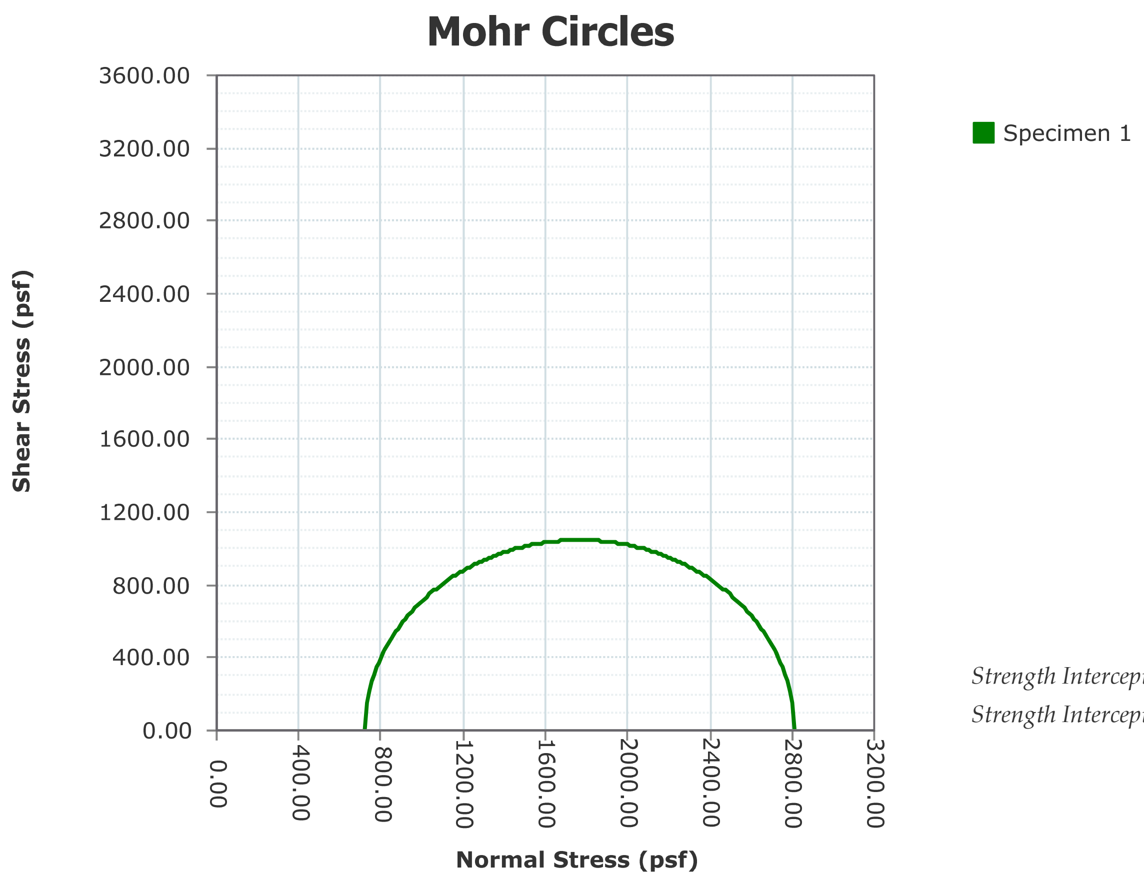
Unconsolidated Undrained Test

ASTM D2850



Strength Intercept = NA

Strength Intercept = NA

Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	8/6/2025
Sample Number:	L2-1-2
Sample Depth:	5.0 ft
Location:	B25-4
Client Name:	Colusa Unified School District
Project Remarks:	

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530-894-2487

Unconsolidated Undrained Test

ASTM D2850

Before Test	Specimen Number 1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.001							
Initial Cell Pressure (psi)	5.0							
Height (in)	5.310							
Diameter (in)	2.360							
Water Content (%)	10.7							
Wet Density (pcf)	99.3							
Dry Density (pcf)	89.7							
Degree of Saturation (%)	32.6							
Void Ratio	0.894							
Height To Diameter Ratio	2.250							
Test Data	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Comp. Strength at Failure (psf)	2092.95							
σ1 at Failure (psf)	2812.95							
σ3 at Failure (psf)	720.00							
Rate of Strain (in/min)	0.057500							
Axial Strain at Failure (%)	12.18							
After Test	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Final Water Content (%)	31.2							

Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	8/6/2025
Sample Number:	L2-1-2
Sample Depth:	5.0 ft
Location:	B25-4
Boring Number:	B25-4
Client Name:	Colusa Unified School District
Project Remarks:	

Specimen 1 Failure Sketch	Specimen 2 Failure Sketch	Specimen 3 Failure Sketch	Specimen 4 Failure Sketch	Specimen 5 Failure Sketch	Specimen 6 Failure Sketch	Specimen 7 Failure Sketch	Specimen 8 Failure Sketch
							

NV5
48 Bellarmine Court, Suite 40
Chico, CA 95928
530-894-2487

Unconsolidated Undrained Test

ASTM D2850

Specimen 1

Test Description:	D2850		
Other Associated Tests:			
Device Details:			
Test Specification:			
Test Date:	9/26/2025		
Technician:		Sampling Method:	Undisturbed
Specimen Code:		Specimen Lab #:	
Specimen Description:			
Specific Gravity:	2.720		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.310	Diameter (in):	2.360
Area (in^2):	4.374	Volume (in^3):	23.23
Large Particle:	None		
Moisture Material:	Specimen		
Moist Weight (g):	605.2		
Test Remarks:			

NV5
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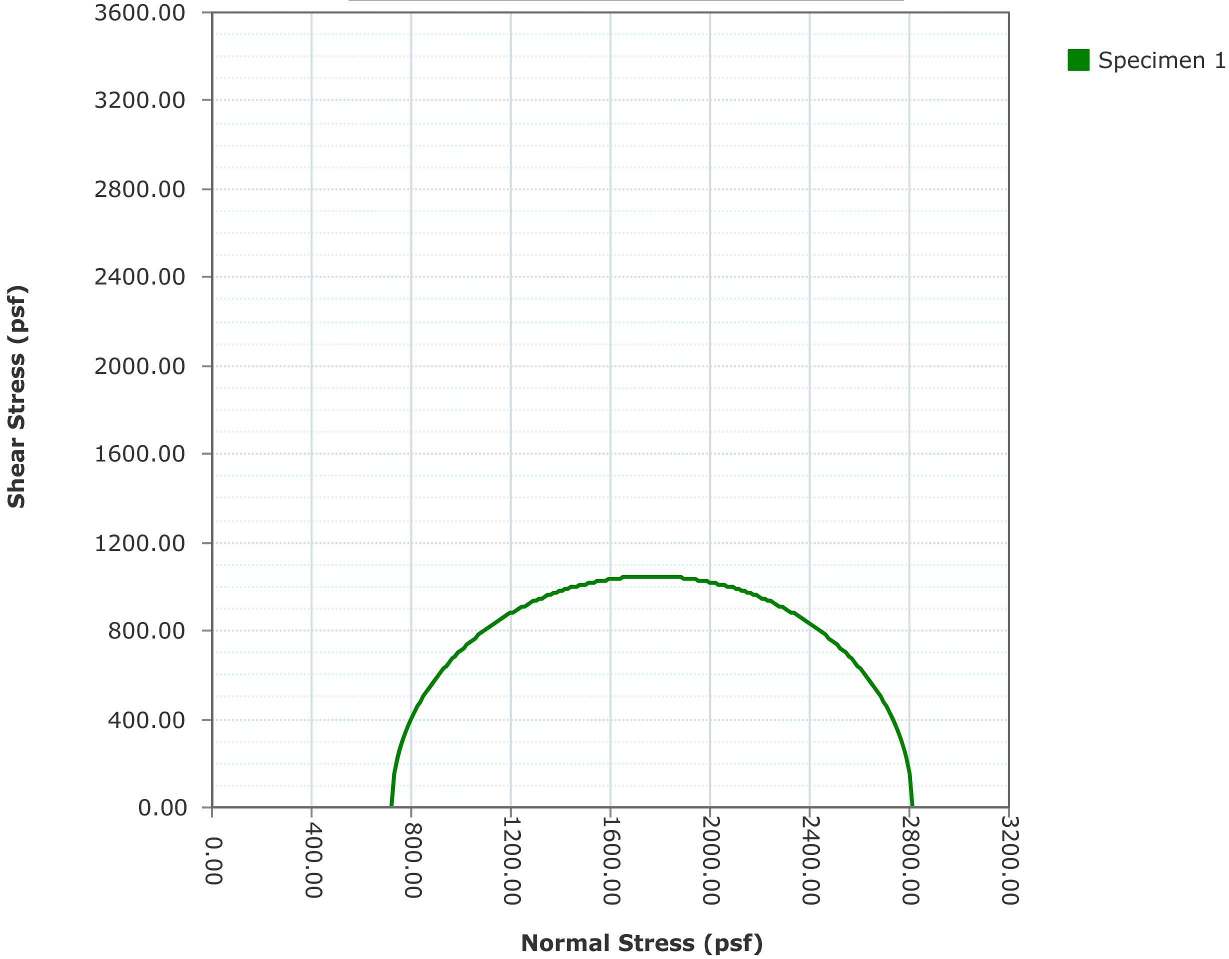
Chico, CA 95928
530-894-2487

Mohr Circles (Total Stress) Graph

ASTM D2850

Strength Intercept (psi)	NA
Friction Angle (°)	NA

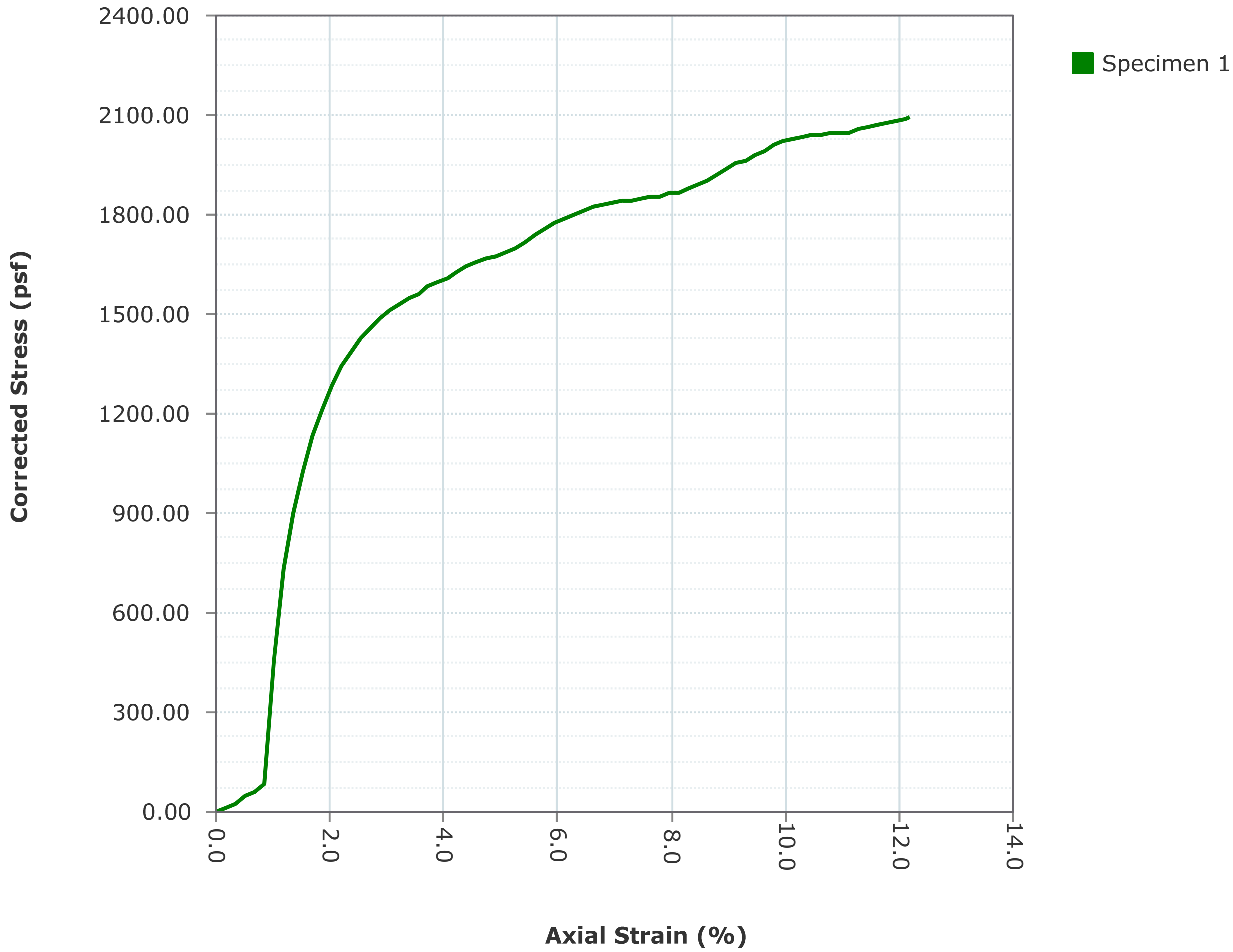


Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	8/6/2025
Sample Number:	L2-1-2
Sample Depth:	5.0 ft
Location:	B25-4
Client Name:	Colusa Unified School District
Project Remarks:	

NV5
48 Bellarmine Court, Suite 40
Chico, CA 95928
530-894-2487

Stress-Strain Graph

ASTM D2850



Project:	Burchfield Primary ES
Project Number:	71554.00.001
Sampling Date:	8/6/2025
Sample Number:	L2-1-2
Sample Depth:	5.0 ft
Location:	B25-4
Client Name:	Colusa Unified School District
Project Remarks:	

Unconsolidated Undrained Test - Tabulated Data - Specimen 1

ASTM D2850

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Disp. (in)	Corrected Load (Lbf)	Corrected Disp. (in)	Corrected Area (in²)	Axial Strain (%)	Stress (psf)	Corrected Compressive Stress (psf)	σ1 (psf)	σ3 (psf)	σ1 — σ3	p (psf)	q (psf)
0	00:00:00	0.0	0.0000	0.0	0.000	4.374	0.0	0.00	0.00	720.00	720.00	1.000	720.00	0.00
1	00:00:10	0.3	0.0090	0.3	0.009	4.382	0.2	9.88	9.78	729.78	720.00	1.014	724.89	4.89
2	00:00:20	0.7	0.0180	0.7	0.018	4.389	0.3	23.04	22.80	742.80	720.00	1.032	731.40	11.40
3	00:00:30	1.4	0.0270	1.4	0.027	4.397	0.5	46.09	45.60	765.60	720.00	1.063	742.80	22.80
4	00:00:40	1.8	0.0360	1.8	0.036	4.404	0.7	59.25	58.52	778.52	720.00	1.081	749.26	29.26
5	00:00:50	2.5	0.0450	2.5	0.045	4.412	0.8	82.30	81.19	801.19	720.00	1.113	760.59	40.59
6	00:01:00	14.0	0.0540	14.0	0.054	4.419	1.0	460.87	455.69	1,175.69	720.00	1.633	947.84	227.84
7	00:01:10	22.5	0.0630	22.5	0.063	4.427	1.2	740.68	731.32	1,451.32	720.00	2.016	1,085.66	365.66
8	00:01:20	27.7	0.0720	27.7	0.072	4.434	1.4	911.86	898.84	1,618.84	720.00	2.248	1,169.42	449.42
9	00:01:30	31.7	0.0810	31.7	0.081	4.442	1.5	1,043.54	1,027.62	1,747.62	720.00	2.427	1,233.81	513.81
10	00:01:40	35.0	0.0900	35.0	0.090	4.450	1.7	1,152.17	1,132.64	1,852.64	720.00	2.573	1,286.32	566.32
11	00:01:50	37.6	0.0990	37.6	0.099	4.457	1.9	1,237.76	1,214.68	1,934.68	720.00	2.687	1,327.34	607.34
12	00:02:00	39.8	0.1080	39.8	0.108	4.465	2.0	1,310.18	1,283.53	2,003.53	720.00	2.783	1,361.77	641.77
13	00:02:10	41.8	0.1170	41.8	0.117	4.473	2.2	1,376.02	1,345.70	2,065.70	720.00	2.869	1,392.85	672.85
14	00:02:20	43.2	0.1260	43.2	0.126	4.481	2.4	1,422.11	1,388.36	2,108.36	720.00	2.928	1,414.18	694.18
15	00:02:30	44.5	0.1350	44.5	0.135	4.488	2.5	1,464.90	1,427.66	2,147.66	720.00	2.983	1,433.83	713.83
16	00:02:40	45.6	0.1440	45.6	0.144	4.496	2.7	1,501.11	1,460.41	2,180.41	720.00	3.028	1,450.20	730.20
17	00:02:50	46.5	0.1530	46.5	0.153	4.504	2.9	1,530.74	1,486.63	2,206.63	720.00	3.065	1,463.32	743.32
18	00:03:00	47.3	0.1620	47.3	0.162	4.512	3.1	1,557.08	1,509.57	2,229.57	720.00	3.097	1,474.79	754.79
19	00:03:10	48.0	0.1710	48.0	0.171	4.520	3.2	1,580.12	1,529.23	2,249.23	720.00	3.124	1,484.62	764.62
20	00:03:20	48.6	0.1800	48.6	0.180	4.528	3.4	1,599.87	1,545.64	2,265.64	720.00	3.147	1,492.82	772.82
21	00:03:30	49.2	0.1890	49.2	0.189	4.536	3.6	1,619.62	1,561.98	2,281.98	720.00	3.169	1,500.99	780.99
22	00:03:40	49.9	0.1970	49.9	0.197	4.543	3.7	1,642.67	1,581.72	2,301.72	720.00	3.197	1,510.86	790.86

Unconsolidated Undrained Test - Tabulated Data - Specimen 1

ASTM D2850

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Disp. (in)	Corrected Load (Lbf)	Corrected Disp. (in)	Corrected Area (in²)	Axial Strain (%)	Stress (psf)	Corrected Compressive Stress (psf)	σ1 (psf)	σ3 (psf)	σ1 — σ3	p (psf)	q (psf)
23	00:03:50	50.4	0.2060	50.4	0.206	4.551	3.9	1,659.13	1,594.76	2,314.76	720.00	3.215	1,517.38	797.38
24	00:04:00	51.0	0.2160	51.0	0.216	4.560	4.1	1,678.88	1,610.58	2,330.58	720.00	3.237	1,525.29	805.29
25	00:04:10	51.6	0.2240	51.6	0.224	4.567	4.2	1,698.63	1,626.97	2,346.97	720.00	3.260	1,533.49	813.49
26	00:04:20	52.2	0.2330	52.2	0.233	4.575	4.4	1,718.38	1,642.98	2,362.98	720.00	3.282	1,541.49	821.49
27	00:04:30	52.7	0.2420	52.7	0.242	4.583	4.6	1,734.84	1,655.78	2,375.78	720.00	3.300	1,547.89	827.89
28	00:04:40	53.1	0.2520	53.1	0.252	4.592	4.7	1,748.01	1,665.05	2,385.05	720.00	3.313	1,552.53	832.53
29	00:04:50	53.5	0.2610	53.5	0.261	4.600	4.9	1,761.18	1,674.61	2,394.61	720.00	3.326	1,557.30	837.30
30	00:05:00	53.9	0.2700	53.9	0.270	4.609	5.1	1,774.34	1,684.12	2,404.12	720.00	3.339	1,562.06	842.06
31	00:05:10	54.5	0.2790	54.5	0.279	4.617	5.3	1,794.09	1,699.83	2,419.83	720.00	3.361	1,569.91	849.91
32	00:05:20	55.2	0.2880	55.2	0.288	4.625	5.4	1,817.14	1,718.58	2,438.58	720.00	3.387	1,579.29	859.29
33	00:05:30	56.0	0.2980	56.0	0.298	4.634	5.6	1,843.47	1,740.02	2,460.02	720.00	3.417	1,590.01	870.01
34	00:05:40	56.7	0.3070	56.7	0.307	4.643	5.8	1,866.52	1,758.60	2,478.60	720.00	3.443	1,599.30	879.30
35	00:05:50	57.3	0.3160	57.3	0.316	4.651	6.0	1,886.27	1,774.02	2,494.02	720.00	3.464	1,607.01	887.01
36	00:06:00	57.9	0.3250	57.9	0.325	4.660	6.1	1,906.02	1,789.36	2,509.36	720.00	3.485	1,614.68	894.68
37	00:06:10	58.4	0.3340	58.4	0.334	4.668	6.3	1,922.48	1,801.55	2,521.55	720.00	3.502	1,620.78	900.78
38	00:06:20	58.8	0.3430	58.8	0.343	4.676	6.5	1,935.65	1,810.61	2,530.61	720.00	3.515	1,625.31	905.31
39	00:06:30	59.3	0.3520	59.3	0.352	4.685	6.6	1,952.11	1,822.70	2,542.70	720.00	3.532	1,631.35	911.35
40	00:06:40	59.6	0.3610	59.6	0.361	4.693	6.8	1,961.98	1,828.60	2,548.60	720.00	3.540	1,634.30	914.30
41	00:06:50	59.9	0.3700	59.9	0.370	4.702	7.0	1,971.86	1,834.46	2,554.46	720.00	3.548	1,637.23	917.23
42	00:07:00	60.3	0.3790	60.3	0.379	4.711	7.1	1,985.03	1,843.34	2,563.34	720.00	3.560	1,641.67	921.67
43	00:07:10	60.4	0.3880	60.4	0.388	4.719	7.3	1,988.32	1,843.03	2,563.03	720.00	3.560	1,641.52	921.52
44	00:07:20	60.6	0.3960	60.6	0.396	4.727	7.5	1,994.90	1,846.13	2,566.13	720.00	3.564	1,643.06	923.06
45	00:07:30	60.9	0.4050	60.9	0.405	4.736	7.6	2,004.78	1,851.87	2,571.87	720.00	3.572	1,645.94	925.93

Unconsolidated Undrained Test - Tabulated Data - Specimen 1

ASTM D2850

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Disp. (in)	Corrected Load (Lbf)	Corrected Disp. (in)	Corrected Area (in²)	Axial Strain (%)	Stress (psf)	Corrected Compressive Stress (psf)	σ1 (psf)	σ3 (psf)	σ1 — σ3	p (psf)	q (psf)
46	00:07:40	61.1	0.4140	61.1	0.414	4.744	7.8	2,011.36	1,854.54	2,574.54	720.00	3.576	1,647.27	927.27
47	00:07:50	61.6	0.4230	61.6	0.423	4.753	8.0	2,027.82	1,866.28	2,586.28	720.00	3.592	1,653.14	933.14
48	00:08:00	61.8	0.4320	61.8	0.432	4.762	8.1	2,034.40	1,868.89	2,588.89	720.00	3.596	1,654.45	934.45
49	00:08:10	62.3	0.4400	62.3	0.440	4.770	8.3	2,050.86	1,880.92	2,600.92	720.00	3.612	1,660.46	940.46
50	00:08:20	62.8	0.4490	62.8	0.449	4.778	8.5	2,067.32	1,892.52	2,612.52	720.00	3.628	1,666.26	946.26
51	00:08:30	63.3	0.4580	63.3	0.458	4.787	8.6	2,083.78	1,904.05	2,624.05	720.00	3.645	1,672.03	952.03
52	00:08:40	64.0	0.4670	64.0	0.467	4.796	8.8	2,106.83	1,921.54	2,641.54	720.00	3.669	1,680.77	960.77
53	00:08:50	64.7	0.4760	64.7	0.476	4.805	9.0	2,129.87	1,938.94	2,658.94	720.00	3.693	1,689.47	969.47
54	00:09:00	65.4	0.4850	65.4	0.485	4.814	9.1	2,152.91	1,956.27	2,676.27	720.00	3.717	1,698.14	978.14
55	00:09:10	65.8	0.4940	65.8	0.494	4.823	9.3	2,166.08	1,964.57	2,684.57	720.00	3.729	1,702.28	982.28
56	00:09:20	66.4	0.5030	66.4	0.503	4.832	9.5	2,185.83	1,978.77	2,698.77	720.00	3.748	1,709.39	989.39
57	00:09:30	67.0	0.5120	67.0	0.512	4.841	9.6	2,205.58	1,992.92	2,712.92	720.00	3.768	1,716.46	996.46
58	00:09:40	67.6	0.5200	67.6	0.520	4.849	9.8	2,225.33	2,007.41	2,727.41	720.00	3.788	1,723.71	1,003.71
59	00:09:50	68.2	0.5290	68.2	0.529	4.858	10.0	2,245.09	2,021.42	2,741.42	720.00	3.808	1,730.71	1,010.71
60	00:10:00	68.6	0.5380	68.6	0.538	4.868	10.1	2,258.25	2,029.45	2,749.45	720.00	3.819	1,734.73	1,014.73
61	00:10:10	68.8	0.5470	68.8	0.547	4.877	10.3	2,264.84	2,031.53	2,751.53	720.00	3.822	1,735.77	1,015.77
62	00:10:20	69.2	0.5550	69.2	0.555	4.885	10.5	2,278.01	2,039.91	2,759.91	720.00	3.833	1,739.95	1,019.95
63	00:10:30	69.4	0.5640	69.4	0.564	4.894	10.6	2,284.59	2,041.93	2,761.93	720.00	3.836	1,740.97	1,020.97
64	00:10:40	69.6	0.5730	69.6	0.573	4.903	10.8	2,291.17	2,043.93	2,763.93	720.00	3.839	1,741.97	1,021.97
65	00:10:50	69.8	0.5810	69.8	0.581	4.912	10.9	2,297.76	2,046.35	2,766.35	720.00	3.842	1,743.17	1,023.17
66	00:11:00	70.0	0.5900	70.0	0.590	4.921	11.1	2,304.34	2,048.30	2,768.30	720.00	3.845	1,744.15	1,024.15
67	00:11:10	70.5	0.5990	70.5	0.599	4.931	11.3	2,320.80	2,059.00	2,779.00	720.00	3.860	1,749.50	1,029.50
68	00:11:20	70.9	0.6080	70.9	0.608	4.940	11.5	2,333.97	2,066.73	2,786.73	720.00	3.870	1,753.36	1,033.36

Unconsolidated Undrained Test - Tabulated Data - Specimen 1

ASTM D2850

Index	Elapsed Time (hh:mm:ss)	Load (Lbf)	Disp. (in)	Corrected Load (Lbf)	Corrected Disp. (in)	Corrected Area (in²)	Axial Strain (%)	Stress (psf)	Corrected Compressive Stress (psf)	σ1 (psf)	σ3 (psf)	σ1 — σ3	p (psf)	q (psf)
69	00:11:30	71.1	0.6160	71.1	0.616	4.948	11.6	2,340.55	2,069.03	2,789.03	720.00	3.874	1,754.52	1,034.52
70	00:11:40	71.5	0.6250	71.5	0.625	4.958	11.8	2,353.72	2,076.68	2,796.68	720.00	3.884	1,758.34	1,038.34
71	00:11:50	71.8	0.6340	71.8	0.634	4.967	11.9	2,363.60	2,081.39	2,801.39	720.00	3.891	1,760.69	1,040.69
72	00:12:00	72.1	0.6430	72.1	0.643	4.977	12.1	2,373.47	2,086.06	2,806.06	720.00	3.897	1,763.03	1,043.03
73	00:12:04	72.4	0.6470	72.4	0.647	4.981	12.2	2,383.35	2,092.95	2,812.95	720.00	3.907	1,766.47	1,046.47

DSA LEA No.: 284

PARTICLE SIZE DISTRIBUTION

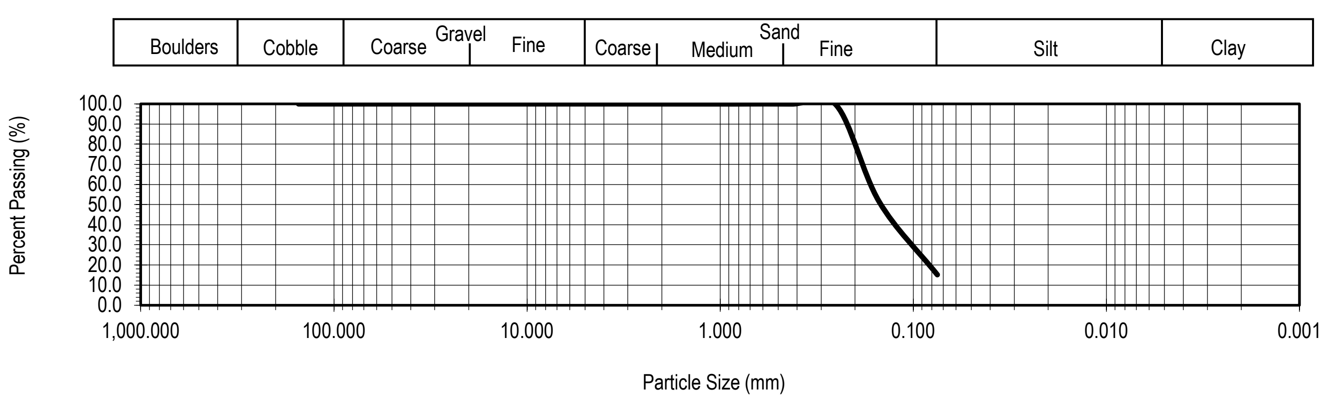
ASTM D422, C136

Project No.	**71554.00.001**	Project Name:	**PW Burchfield Primary ES - TK-K Modulars**	Date:	**8/8/2025**
Sample No.	**L3-1-2**	Boring/Trench:	**B25-3** Depth, (ft.): **10'**	Tested By:	**DOC**
Description:	**(SM) Silty Sand, Light Olive Brown (2.5Y, 5/3)**			Checked By:	**DJP**
Sample Location:				Lab. No.	**C25-171**

Sieve Size (U.S. Standard)	Particle Diameter Inches (in.)	Particle Diameter Millimeter (mm)	Dry Weight on Sieve Retained On Sieve (gm)	Dry Weight on Sieve Accumulated On Sieve (gm)	Dry Weight on Sieve Passing Sieve (gm)	Percent Passing (%)
6 Inch	6.0000	152.4	0.00	0.0	615.5	**100.0**
3 Inch	3.0000	76.2	0.00	0.0	615.5	**100.0**
2 Inch	2.0000	50.8	0.00	0.0	615.5	**100.0**
1.5 Inch	1.5000	38.1	0.00	0.0	615.5	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	615.5	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	615.5	**100.0**
1/2 Inch	0.5000	12.7	0.00	0.0	615.5	**100.0**
3/8 Inch	0.3750	9.5	0.00	0.0	615.5	**100.0**
#4	0.1870	4.7500	0.00	0.0	615.5	**100.0**
#10	0.0787	2.0000	0.08	0.1	615.4	**100.0**
#20	0.0335	0.8500	0.08	0.2	615.3	**100.0**
#40	0.0167	0.4250	0.08	0.2	615.3	**100.0**
#60	0.0098	0.2500	3.81	4.0	611.5	**99.3**
#100	0.0059	0.1500	295.03	299.1	316.4	**51.4**
#200	0.0030	0.0750	223.13	522.2	93.3	**15.2**

Hydrometer

Particle Size Gradation



Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 08/15/2025
Date Submitted 08/12/2025

To: Dominic Potestio
NV5-Chico
48 Bellarmine Ct.
Chico, CA 95928

From: Gene Oliphant, Ph.D. \ Ty Bui
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 71554.00.001BURCHFIE Site ID : B25-4 BLK-3(2-5.
Thank you for your business.

* For future reference to this analysis please use SUN # 95307-197052.

EVALUATION FOR SOIL CORROSION

Soil pH	7.20		
Minimum Resistivity	1.85	ohm-cm (x1000)	
Chloride	33.4 ppm	00.00334	%
Sulfate	16.7 ppm	00.00167	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m

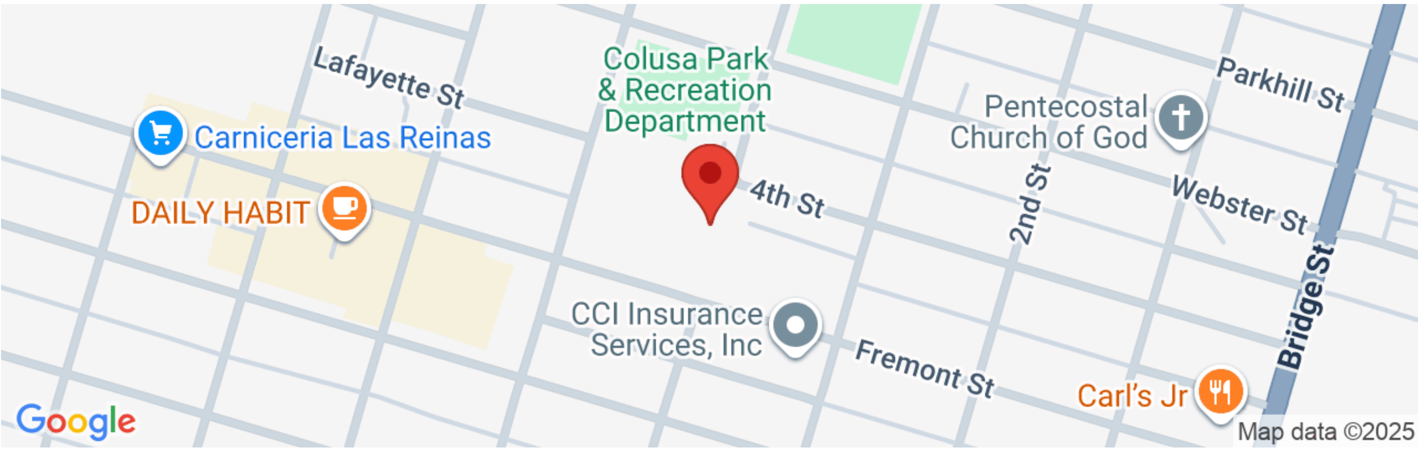
APPENDIX D:

Seismic Design Parameters

OSHPD

Burchfield Primary ES

Latitude, Longitude: 39.2080, -122.0089



Date	9/17/2025, 11:28:22 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D

Type	**Value**	**Description**
S_S	0.736	MCE_R ground motion. (for 0.2 second period)
S_1	0.313	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.892	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	0.594	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	**Value**	**Description**
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.211	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.317	MCE_G peak ground acceleration
F_{PGA}	1.283	Site amplification factor at PGA
PGA_M	0.407	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	0.736	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.8	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.313	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.342	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.317	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.92	Mapped value of the risk coefficient at short periods
C_{R1}	0.917	Mapped value of the risk coefficient at a period of 1 s
C_V	1.168	Vertical coefficient

APPENDIX E:

Liquefaction Analysis

Appendix C: SPT-Based Liquefaction Triggering Analysis for a Single Boring

Project Name: Burchfield Primary Elementary School
Project No.: 71554.00.001
Boring No.: B25-4

Input parameters:

Peak ground accel (g) = 0.407 PGA_M
Earthquake magnitude, M = 9
Water table depth (m) = 3.048
Average ϒ above water table (kN/m³) = 18.1 *multiply unit weight in pcf by 0.15709 to obtain metric units
Average ϒ below water table (kN/m³) = 18.1
Borehole Diameter (mm) = 203.2
Requires correction for sampler liners (YES/NO) Yes
Rod lengths assumed equal to the depth plus 1.5m (for the above ground extension).

Liquefaction Potential and Triggering

SPT Sample Number	Depth	Measured N	Soil Type	Flag "Clay" "Unsaturated" "Unreliable"	Fines Content	Energy Ratio, ER	C_E	C_B	C_R	C_S	N_{60}	α_{vc}	α_{vc}'	C_N	$(N_1)_{60}$	Δn for fines content	$(N_1)_{60-cs}$	Stress Reduct. Coefficient r_d	CSR	MSF for sand	K_σ for sand	crr FOR m=7.5 & α_{vc} '=1atm	CRR	Factor of Safety
	(m)		(USCS)		(%)	(%)						(kPa)	(kPa)											
1	1.524	6	ML	Unsaturated	80	75	1.25	1.15	0.80	1.13	7.8	28	28	1.70	13.3	5.5	18.83	1.00	0.266	0.67	1.10	0.192	n.a.	n.a.
2	3.048	8	ML	Unsaturated	80	75	1.25	1.15	0.85	1.15	11.2	55	55	1.31	14.6	5.5	20.17	1.00	0.266	0.67	1.08	0.208	n.a.	n.a.
3	4.572	15	SM		40	75	1.25	1.15	0.95	1.30	26.6	83	68	1.14	30.3	5.6	35.90	1.01	0.325	0.67	1.10	1.346	0.991	2.00
4	6.096	15	CL	Clay	75	75	1.25	1.15	0.95	1.30	26.6	110	80	1.06	n.a.	n.a.	n.a.	1.01	0.365	0.67	1.07	n.a.	n.a.	n.a.
5	7.620	32	CL	Clay	80	75	1.25	1.15	0.95	1.30	56.8	138	93	1.02	n.a.	n.a.	n.a.	1.01	0.395	0.67	1.02	n.a.	n.a.	n.a.
6	9.144	24	CL	Clay	80	75	1.25	1.15	1.00	1.30	44.9	165	105	0.99	n.a.	n.a.	n.a.	1.01	0.417	0.67	0.99	n.a.	n.a.	n.a.
7	10.668	20	CL	Clay	80	75	1.25	1.15	1.00	1.30	37.4	193	118	0.96	n.a.	n.a.	n.a.	1.00	0.434	0.67	0.95	n.a.	n.a.	n.a.
8	12.192	19	CL	Clay	80	75	1.25	1.15	1.00	1.30	35.5	220	131	0.93	n.a.	n.a.	n.a.	1.00	0.447	0.67	0.92	n.a.	n.a.	n.a.
9	13.716	18	CL	Clay	80	75	1.25	1.15	1.00	1.30	33.6	248	143	0.91	n.a.	n.a.	n.a.	1.00	0.458	0.67	0.90	n.a.	n.a.	n.a.
10	15.240	25	SM		25	75	1.25	1.15	1.00	1.30	46.7	275	156	0.89	41.7	5.1	46.76	1.00	0.466	0.67	0.87	2.000	1.168	2.00

Seismically Induced Settlement

SPT Sample Number	Depth	Measured N	Soil Type	Limiting shear strain Υ_{lim}	Para-meter Fα	Maximum shear strain Υ_{max}	Δh_i	ΔLDI_i	Vertical reconsol. Strain ε_v	ΔS_i	ΔS_i
	(m)		(USCS)				(m)	(m)		(m)	(in)
1	1.524	6	ML	0.181	0.578	0.000	1.524	0.000	0.000	0.000	0.000
2	3.048	8	ML	0.156	0.509	0.000	1.524	0.000	0.000	0.000	0.000
3	4.572	15	SM	0.019	-0.501	0.000	1.524	0.000	0.000	0.000	0.000
4	6.096	15	CL	0.000	0.000	0.000	1.524	0.000	0.000	0.000	0.000
5	7.620	32	CL	0.000	0.000	0.000	1.524	0.000	0.000	0.000	0.000
6	9.144	24	CL	0.000	0.000	0.000	1.524	0.000	0.000	0.000	0.000
7	10.668	20	CL	0.000	0.000	0.000	1.524	0.000	0.000	0.000	0.000
8	12.192	19	CL	0.000	0.000	0.000	1.524	0.000	0.000	0.000	0.000
9	13.716	18	CL	0.000	0.000	0.000	1.524	0.000	0.000	0.000	0.000
10	15.240	25	SM	0.001	-1.329	0.000	1.524	0.000	0.000	0.000	0.000
							LDI=	0.000	Total S=	0.000	0.000

Field Data for Conversion

Sample Number	*Sample Depth*	*Strata Δh*	*Depth to GW*	*Historic High Depth to GW*	*Ave. Unit Wt Above GW*	*Ave. Unit Wt Below GW*	*Borehole Dia.*
	(ft)		*(ft)*	*(ft)*	*(pcf)*	*(pcf)*	*(in)*
1	*5*	1.524	*13*	*10*	*115*	*115*	*8*
2	*10*	1.524					
3	*15*	1.524					
4	*20*	1.524					
5	*25*	1.524					
6	*30*	1.524					
7	*35*	1.524					
8	*40*	1.524					
9	*45*	1.524					
10	*50*	1.524					

Colusa Unified School District

BASIS OF DESIGN

for

MODULAR DESIGN AND CONSTRUCTION SERVICES FOR THE

Burchfield Elementary School Project

10/09/2025

TABLE OF CONTENTS

Re: Burchfield Primary Elementary School Basis of Design

Site Grading

Site grading will be limited to the areas surrounding the proposed buildings, located on the north and east sections of the site. This includes connections to the existing asphalt concrete courtyard, the new poured-in-place playground, and any required sidewalk improvements to establish accessible paths of travel between the new buildings, parking lot, and the administration building. Five existing portables will also be removed, requiring grading and earthwork of the soil underneath the buildings. The ground underneath the portables will also need to be reseeded. Minimal modifications are anticipated to the existing asphalt concrete courtyards adjacent to the proposed buildings and playground. The site will primarily consist of two types of flatwork, non-traffic-rated concrete and asphalt concrete.

Underground Utilities

NorthStar reviewed the as-builts provided by the district and has located existing utilities based on that information and above ground utilities discovered in the survey. The discussion below assumes that each utility has sufficient capacity in their current lines to serve the proposed development. Below is a brief description of the individual utilities and most likely service points.

Storm Drainage

Infiltration trenches will be used to treat storm water runoff generated by the new classroom buildings and associated hardscape located on the north and east sides of the site. The system will be decided to accommodate runoff from a 10-year storm event. Runoff exceeding the design capacity will overflow into the city's existing storm drain system.

Sanitary Sewer

The intent for the proposed east buildings will connect to onsite existing sanitary sewer. The northern classroom building will connect into the city sewer main on 5th Street.

Domestic & Fire Water

Domestic water service for the proposed site will be supplied with a new backflow which will be installed after the existing water meter located along 3rd Street. Fire water service will be provided by connecting to the existing water line along 3rd Street. The new fire water connection will include a new backflow preventer and a fire department connection.

Existing fire hydrants are located on public streets surrounding the school.

Civil will coordinate with the Landscape Architect on the final location of the landscape backflow.

Gas & Electric

The gas and electric lines for the east classroom buildings will be routed north in the direction of the 5 existing portables that are being removed. They will connect back to existing gas and electrical lines on the school property. The proposed buildings on the north side of the site will utilize existing electric and gas connections in the area.

Offsite Improvements

Minor offsite work will be required, including trenching for new fire water, sewer, and storm drain connections.

Questions or comments please contact me at (530) 893-1600.

Sincerely,

NorthStar
Camille Semons

BASIS OF DESIGN – LANDSCAPE:

1.1 PROJECT OVERVIEW

A. Description:

1. This Basis of Design (BOD) outlines the landscape design intent and criteria for the redevelopment of Burchfield Elementary School.
2. The work includes a new playground area, planting design, and a complete irrigation system to support the building redevelopment and outdoor usability.

B. Scope of Work:

1. Installation of new playground equipment and safety surfacing.
2. Installation of new trees, shrubs, and groundcover plantings.
3. Installation of new automated irrigation system.
4. Modification of existing irrigation that will remain.
5. Grading and soil preparation for landscaped areas.
6. Coordination with architectural, civil, and electrical disciplines.

C. Design Objectives:

1. Provide a safe, engaging, and ADA-accessible outdoor environment.
2. Utilize drought-tolerant, low-maintenance, and regionally appropriate plant materials.
3. Integrate efficient water use and sustainable practices.
4. Enhance the visual and functional relationship between landscape and building.

1.2 DESIGN CRITERIA – SITE AND LAYOUT

A. Site Planning:

1. Playground to be centrally located within the limits of work for accessibility and visibility.
2. Maintain clear pedestrian routes connecting building entries and open spaces.
3. Ensure positive drainage away from play areas and buildings.
4. Maintain required safety and maintenance clearances.

B. Accessibility:

1. All circulation routes, play areas, and site amenities shall meet ADA and ASTM standards.
2. Provide accessible paths of travel to playground areas.

1.3 PLAYGROUND DESIGN

A. Equipment:

1. Commercial-grade modular system for age-appropriate groups (2–5 years).
2. Constructed of powder-coated steel and UV-stabilized components.
3. Minimum 10-year structural warranty.

B. Safety Surfacing:

1. Poured-in-place rubber or engineered wood fiber system meeting ASTM F1292.
2. Thickness as required for certified fall height protection.

C. Furnishings:

1. Provide benches, trash receptacles, and shade structures (as applicable).
2. Materials to be durable, low-maintenance, and consistent with site aesthetics.

SECTION 2.0 – PLANTING DESIGN

2.1 GENERAL REQUIREMENTS

A. Plant Selection:

1. Use drought-tolerant and regionally adapted species.
2. Group plants by water-use (hydrozones) and exposure.

B. Trees:

1. Provide shade for playgrounds, paths, and seating areas per DSA requirements.
2. Space trees to avoid conflicts with lighting, utilities, and structures.

C. Shrubs and Groundcovers:

1. Select species for low maintenance and visual continuity.
2. Use dense plantings for erosion control and weed suppression (as applicable).

D. Soil Preparation:

1. Perform soil testing prior to installation.
2. Amend soil as needed to improve structure and fertility.
3. Apply organic mulch (3-inch depth) in all non-turf planting areas.

SECTION 3.0 – IRRIGATION DESIGN

3.1 SYSTEM DESCRIPTION

A. System Type:

1. Fully automated system with weather-based controller and rain/freeze sensor.
2. Zoning based on hydrozones and solar exposure.

B. Water Source:

1. Connect to on-site existing domestic system as available.
2. Install new irrigation backflow to service new irrigation system.

C. Distribution Methods:

1. Drip irrigation for shrub and groundcover areas.
2. Rotary or spray heads for turf areas (if applicable).

3.2 EQUIPMENT AND MATERIALS

A. Controller:

1. Smart weather-based irrigation controller with flow monitoring (e.g., Hunter or Rain Bird control).

B. Valves:

1. Electric remote control valves with pressure regulation.
2. Inline filters and pressure regulation for drip zones.

C. Piping:

1. Schedule 40 or class 315 PVC for pressure mainlines.
2. Class 200 for non-pressure lateral lines.
3. Polyethylene tubing for drip laterals.

D. Backflow Prevention:

1. Reduced Pressure Principle Assembly (RPPA) per local jurisdiction.

SECTION 4.0 – CODES AND STANDARDS

A. Accessibility: ADA Standards for Accessible Design (2010).
B. Playground Safety: ASTM F1487, ASTM F1292, and CPSC Playground Safety Handbook.
C. Irrigation: Local Water Efficiency Landscape Ordinance (WELO).
D. Planting: ANSI A300 – Planting and Transplanting.
E. Local MWELO: For irrigation design and installation.
F. DSA: Requirements for Landscape Development.

CUSD – Burchfield Elementary School

BASIS OF DESIGN - MECHANICAL

1.1 General:

A. The purpose of this narrative is to provide basis requirements for the mechanical design solutions for this facility to be incorporated by the modular building manufacturer.

B. Quality Assurance

1. General Requirements. Installation of all items shall be performed in strict accordance with all codes and regulations set forth by the State, Local, DSA and Federal authorities.
2. Requirements of Regulatory Agencies:
   a. Codes and Ordinances.
      (1) All Work shall meet the requirements of local codes, ordinances, and utility companies except adhere to the Contract Documents when more strict requirements are specified.
      (2) Codes which govern the work in this project are as follows:
         (a) California Administrative Code Part 1, 2022 Edition
         (b) California Building Code Part 2, 2022 Edition
         (c) California Electric Code Part 3, 2022 Edition
         (d) California Mechanical Code Part 4, 2022 Edition
         (e) California Plumbing Code Part 5, 2022 Edition
         (f) California Energy Code Part 6, 2022 Edition
         (g) California Green Building Standard Code Part 11, 2022 Edition
         (h) California Health & Safety Section 116875
         (i) California Fire Code Part 9, 2022 Edition
         (j) DSA Regulations

1.2 Outdoor Design Criteria:

A. Load Calculations:

1. Project Location: Colusa, California
2. CEC Title-24 Climate Zone: 11
3. Summer Outdoor Design Conditions (CEC Title-24 – 0.5%): 100°F DB / 71°F WB.
4. Winter Outdoor Design Conditions (CEC Title-24 – 0.2%): 29°F DB.

1.3 Equipment Sizing:

A. Air Cooled Systems: Summer 105°F DB.

1.4 Interior Design Conditions:

A. Indoor Temperatures:

Occupied Facilities	Summer (°F)	Winter (°F)	RH %	Humidity Control
Classrooms	74 +/- 2	70 +/- 2	50	No
Unoccupied Support Areas	85 (Ventilation only)	55 (Ventilation only)	NA	No
IDF/MDF/Server	72 +/- 2	None	50	No
Mechanical/Electrical	100 (Ventilation Only)	55 (Ventilation Only)	NA	No

B. Non-conditioned rooms: Janitor Closets, Storage Rooms less than 100 square feet, Mechanical Rooms, Electrical Rooms, Single Occupancy Restrooms, Janitor Closets.

1.5 Internal Loads:

A. Equipment/Process: Actual electrical equipment and process loads shall be used where provided and per District Standard specification sheets. Computer loads shall be per actual computer counts. Where data is not available standard CEC Title-24 and/or ASHRAE data shall be included.

B. Lighting: Lighting densities and controls shall be per CEC Title-24 allowed values. Actual lighting densities and controls shall be used where available, per coordination with Electrical Engineer.

C. People: People densities shall be per CEC Title-24 and/or ASHRAE Standard 62.1, as required to account for occupant cooling loads ventilation loads. For areas with fixed seating as defined by CEC Title-24 actual people counts shall be used. People sensible and latent loads shall be as defined by CEC Title-24 and/or ASHRAE.

1.6 Ventilation:

A. Occupied Areas: Per CEC Title-24 and/or ASHRAE 55 and 62.1. Most stringent shall be used.

B. Restrooms: 10 ACH

C. Janitor Closets: 12 ACH

D. Electrical/Mechanical Rooms: Per cooling load calculations.

1.7 Methodology:

A. Load and compliance calculations shall be completed using industry standard software using practices approved by CEC Title-24. Final calculations shall also incorporate requirements defined by ASHRAE where required.

1.8 Equipment Sizing:

A. Safety factors shall be only incorporated as allowed by CEC Title-24 and as required to size airside equipment at local ambient conditions.

B. Single zone equipment shall be sized at peak loads. Airside system airflow capacity shall account for 5 percent duct leakage as required for equipment sizing only.

1.09 Equipment & Device Selection:

A. Ductwork: Low pressure ducts will be sized based on .08" pressure drop per 100 foot linear distance or 1800 fpm (most stringent shall apply), with maximum duct aspect ratio of 4 to 1.

B. Exhaust air velocity and volume shall be sufficient to prevent condensation of liquid and/or condensate solids on the walls of the duct. Velocities per referenced standards and per 2016 California Mechanical Code shall be maintained.

1.10 Noise Criteria (per ASHRAE standards):

A. General Criteria:

Room:	NC
Classrooms	25-30

1.11 Temperature control and Zoning:

A. Temperature control shall be maximized by providing dedicated thermostats at all classrooms.

B. Areas with 24/7 cooling loads shall include dedicated systems with dedicated thermostats.

1.12 Test and Balance Criteria:

A. Prior to occupancy, the entire H.V.A.C. systems shall be balanced in accordance with (AABC) Associated Air Balance Council Standards by an independent air balance contractor. Certified certification shall be provided by the contractor for air and hydronic as applicable. Systems shall be balanced as indicated on plans including fresh air ventilation.

1.13 Air Distribution Device Criteria:

A. Air Distribution (i.e. grilles, registers, etc.) shall be by an approved manufacturer (Krueger, Titus, and Price). All air distribution will have a white baked enamel finish unless other specified by the Architect. T-bar and hard ceiling diffusers and grilles designed/optimized for variable air volume operation will be used. Face velocity shall not exceed 500 fpm.

1.14 Mechanical Insulation:

A. Provide complete systems of insulation for all piping, ducts, and equipment. Insulation, jackets, facings, adhesives, coating, and accessories fire hazard rated in accordance with the requirements of UL 723, ASTM E-84, ASTM E-136, and NFPA 255, water vapor sorption in accordance with ASTM C 1104, corrosion limits in accordance with ASTM C 665, and Microbial Growth in accordance with ASTM C 1338. Most stringent requirements shall apply. Installation shall comply with all C.E.C. Title-24 standard requirements.

b. All exterior piping insulation shall be provided with aluminum jacketing.

1.15 Mechanical Identification:

A. Provide marking and identification required on mechanical piping systems, ducts, controls, valves, apparatus, etc., as specified in the provided specifications or any related sections. Piping and duct systems, controls, valves, apparatus, etc., except those that are installed in inaccessible locations in partitions, walls, and floors, and those buried underground, alarm generating devices, shall be permanently identified. Assign unit identification numbers to all operating units of equipment during the design phase. Numbers shall be sequential and shall include building identification, system type, and match any District standards. All numbers shall be unique to the specific piece of equipment. Identify all hazardous systems per ANSI A13.1, ANSI Z53.1, and ANSI Z535.1. Meet latest ANSI/ASME A13.1 requirements. Most stringent requirements shall apply.

1.16 Filtration Criteria:

A. Air Conditioning equipment serving occupied areas shall include minimum MERV-13 per current Mechanical Code Standards. Dedicated exhaust and filtration shall be provided where required per code and per equipment manufacture guidelines.

2.1 Heating, Ventilation, and Air Conditioning Systems

A. Option 1: Packaged Rooftop Gas-Fired A/C Units

1. All spaces shall be provided with gas-fired packaged rooftop a/c units with integral MERV 13 filters, power exhaust economizers, and demand control ventilation. Units shall be mounted on fixed roof curbs a minimum of 10’ from the roof edge. Permanent roof access shall be provided.

2. Supply and return air ducts located above ceiling and air distribution provided via supply air diffuser and return air grilles.

3. Thermostats complete with CO2 sensors shall be provided on an interior wall (where possible) and near to the return registers.

4. Shared work rooms shall be conditioning by the adjacent interior classroom a/c unit.

B. Option 2: Ducted Gas Furnaces with Split DX Cooling Coils

1. All spaces shall be provided with ducted condensing gas furnaces with split DX cooling coils located above the ceiling with integral MERV 13 filters, economizer mixing boxes, and Demand Control Ventilation. Concentric vents shall be provided up through the roof.

2. Barometric relief shall be provided to each classroom through a ceiling register to roof cap w/curb and include a vertical gravity relief damper.

3. Outdoor condensing units located on the roof shall be provided new roof platforms and be located a minimum of 10’ from the roof edge. Permanent roof access shall be provided.

4. Outdoor condensing units located on grade shall be provided concrete equipment pads and lockable protective cages.

5. Shared work rooms shall be conditioning by the adjacent interior classroom a/c system.

C. Self-Contained Wall Mounted A/C units.

1. Self-contained wall mounted a/c units are not an acceptable option for air conditioning for this project.

D. Split Systems: MDF/IDF

1. Split wall mounted fan coil unit and outdoor Heat Pump shall be provided for Data room.

E. Restroom Exhaust Systems

1. All new gang restrooms shall be provided with new roof mounted centrifugal exhaust fans with ductwork to new ceiling registers.

2. Single occupancy restroom shall be provided with a new ceiling exhaust fan interlocked with the light switch.

F. New DDC Controls

1. Facility will be provided with a fully electronic Direct Digital Control (DDC) energy management and control system (EMCS) designed to provide designated remote building HVAC system control and monitoring functions together with the necessary local building system control, including required temperature control. The EMCS will be designed and specified to be compatible with the existing District EMCS system that is installed on the site (Pelican Wireless).

BASIS OF DESIGN – PLUMBING:

1.1 General:

A. The purpose of this narrative is to provide basis requirements for the plumbing design solutions for this facility to be incorporated by the modular building manufacturer.

B. Quality Assurance:

1. General Requirements. Installation of all items shall be performed in strict accordance with all codes and regulations set forth by the State, Local, DSA and Federal authorities.

2. Requirements of Regulatory Agencies:

a. Codes and Ordinances.

(1) All Work shall meet the requirements of local codes, ordinances, and utility companies except adhere to the Contract Documents when more strict requirements are specified.

(2) Codes which govern the work in this project are as follows:

(a) California Administrative Code Part 1, 2022 Edition.

(b) California Building Code Part 2, 2022 Edition.

(c) California Electric Code Part 3, 2022 Edition.

(d) California Plumbing Code Part 4, 2022 Edition.

(e) California Plumbing Code Part 5, 2022 Edition.

(f) California Energy Code Part 6, 2022 Edition.

(g) California Green Building Standard Code Part 11, 2022 Edition.

(h) California Health & Safety Section 116875.

(i) California Fire Code Part 9, 2022 Edition.

(j) DSA Regulations.

1.2 Work Included:

A. Aboveground and underground sanitary waste and vent system.

B. Potable domestic cold water (CW) system.

C. Potable domestic hot water (HW) system.

D. Condensate drain and water piping system for mechanical equipment.

E. Plumbing Fixtures.

1.3 Calculations/Design Criteria:

A. The following are the calculations to be used in designing the plumbing system.

1. Potable water sizing calculations.

2. Sanitary drainage calculations.

3. Natural gas sizing calculations.

B. Design Criteria:

1. Plumbing:

a. Sewer, water and vent plumbing system shall comply with the requirements of the California Plumbing Code and local jurisdiction.

b. Sewer piping shall be sloped at ¼ inch per foot unless noted otherwise.

c. Domestic shall be sized with a maximum pressure drop of 3 PSI per 100 feet and a maximum velocity of 8 feet per second for cold water and 5 feet per second for hot water.

2. Natural Gas:

a. Natural gas piping system shall be sized per Chapter 12 of California Plumbing Code.

2.1 Plumbing Fixtures:

A. Water Closets:

1. Water closets shall be floor mounted, low-flow 1.28 gallons per flush, elongated bowl, vitreous china fixture. Water closets located in standard classroom areas shall be 15” high to top of seat for standard height and 17”-19” high to top of seat for accessible fixtures. Water closets located in the TK/Kindergarten areas shall be 10” high.

2. Flush valves for water closets shall be 1.28 gallons per flush, with manual flush valves.

3. Heavy-duty commercial grade toilet seat, less cover

B. Urinals:

1. Urinals shall be wall-mounted, vitreous china fixture. Urinals shall have a flow of 1/8 gallons per flush.

2. Flush valves for urinals shall be 1/8 gallons per flush, with manual flush valves.

C. Lavatories:

1. Student Restrooms

a. Lavatories shall be an enameled cast iron with glossy porcelain finish.

b. Faucets shall be a metered-type faucet with cold water supply only, with a flow of 0.5 gallons per minute.

2. Staff Restrooms

a. Lavatories shall be an enameled cast iron with glossy porcelain finish.

b. Faucets shall be a metered type faucet with tempered hot water supplies and a flow of 0.5 gallons per minute.

D. Hose Bibb:

1. Each gang restrooms shall be provided with one wall-mounted, loose-key hose bibb with integral vacuum breaker.

2. Roofs shall be provided shall be provided with free standing, loose-key hose bibb with integral vacuum breaker at all locations where mechanical units are located.

3. Recessed hose bibb shall be provided along the perimeter of the exterior walls every 100’-0” or as required. Complete with recessed stainless steel box, locking door and integral vacuum breaker.

E. Floor Drains:

1. Gang restrooms and single restrooms shall be provided with a floor drain. Complete with a trap primer with shut-off valve and access panel.

F. Service Sink

1. Custodial rooms shall be provided with a corner floor mounted, enameled cast-iron service sink. Complete with a wall mounted faucet with integral vacuum breaker, male hose thread outlet, wall brace and pail hook.

G. Drinking Fountains

1. Wall-mounted dual height stainless steel drinking fountains complete with bottle fillers shall be provided as required.

2.2 Sanitary Sewer and Vent System:

A. All waste and vent shall be no-hub cast iron service weight pipe and fittings and shall comply with C.I.S.P.I. Standard 301.

B. Stainless steel four-band couplings shall be used for sewer piping and vent piping below grade.

C. Standard couplings should be used for vent piping above grade.

2.3 Domestic Water Piping:

A. All water piping shall be Type K copper pipe below grade and Type L copper above grade.

B. All hot water and hot water return piping shall be insulated.

2.4 Natural Gas System

B. Concealed gas piping within the building shall be Schedule 40 black steel pipe.

C. Exposed gas piping outside the building shall be Schedule 40 galvanized steel pipe.

D. Underground gas piping shall be Schedule 40 SDR-11 polyethylene PE2406 (yellow).

E. Fittings shall be socket fusion weld polyethylene.

F. Gas pressure regulator shall be provided as required, to be located on the roof.

G. New gas piping serving the modular building shall extend and connect at existing gas meter. Contractor shall coordinate with utility to upsize the existing gas meter as required.

2.5 Condensate Drain Piping:

A. All piping shall be Type M copper.

B. All condensate drain piping above the ceiling shall be insulated.

C. Condensate piping from air conditioning equipment shall terminate at a service sink with fixed air gap or to a sink tailpiece.

2.6 Fire Riser Hub Drain:

A. Fire riser main drain shall be provided a hub drain complete with connection to sanitary sewer, vent, and electronic trap primer.

2.7 Domestic Hot Water Heaters:

A. Janitor service sink shall be provided electric, tank type 20-gallon water heater mounted on a platform above the service sink.

B. Lavatories in stall restrooms shall be provided electric instantaneous water heater complete with integral mixing valve in recessed panel below lavatory. (1) water heater may serve up to (2) lavatories.

BASIS OF DESIGN – FIRE SPRINKLER

A. General:

1. The purpose of this narrative is to provide basis requirements for the fire sprinkler design solutions for this facility to be incorporated by the modular building manufacturer.

B. Quality Assurance:

1. General Requirements. Installation of all items shall be performed in strict accordance with all codes and regulations set forth by the State and Local authorities.
2. Requirements of Regulatory Agencies:
    a. Codes and Ordinances:
        (1) All Work shall meet the requirements of local codes, ordinances, and utility companies except adhere to the Contract Documents when more stringent requirements are specified.
        (2) Codes and Standards which govern the work in this project are as follows:
            (a) California Administrative Code Part 1, 2022 Edition.
            (b) California Building Code Part 2, 2022 Edition.
            (c) California Fire Code Part 9, 2022 Edition.
            (d) National Fire Protection Association (NFPA-13, 14 & 20 – Latest Edition).
            (e) DSA Regulations.

C. Work Included:

1. Installation of a new automatic fire sprinkler system for the building to provide protection in accordance with the requirements of the California Building Code, Chapter 9 and NFPA 13. This specification is intended to establish the required performance and quality of the work necessary to provide for a complete automatic fire sprinkler system above and below ceiling to serve the buildings.

D. Calculations/Design Criteria:

1. The following are the calculations to be used in designing the automatic sprinkler system:
    a. Hydraulic calculations for automatic fire sprinkler system.
2. Design Criteria Guideline Requirements for automatic fire sprinkler system:
    a. Automatic fire sprinkler system:
        (1) Provide complete automatic fire sprinkler system to serve the building area and extending service main to a point five (5) feet beyond the building line for a point of connection into the underground service main. Coordinate with civil drawings for exact point of connection. The automatic fire sprinkler system(s) shall be located as shown on the drawings.

(2) The main drain valve for the fire sprinkler riser shall discharge to sewer and into a hub drain, provide by plumbing.

E. Automatic Sprinkler Pipe and Fittings:

1. Black steel Schedule 40, ASTM A 135 or ASTM A 795 for all piping with threaded joints and fittings. U.L./F.M. approved threadable schedule 10 lightwall pipe, such as Allied "XL" or equivalent, will be accepted for piping 4” diameter and larger.

F. Sprinkler Heads:

1. Interior Finished Ceilings and Exterior Soffits:
   a. Heads shall be Reliable Model F4FR quick response, concealed, flush-to-ceiling automatic sprinklers. Equivalent products of Viking or Tyco are acceptable.
   b. Corrosion-resistant finish shall be installed at exterior areas; finish shall be polyester or Teflon coating with matching escutcheon. Cover plate finish shall be per Architect’s specifications. Color shall be factory finish in custom color as selected by the Architect.
   c. All areas without Suspended Ceilings, Concealed Areas, Unfinished Ceilings and Storage Areas: Heads shall be Reliable, model F1FR quick response sprinkler upright/pendent with rough brass finish. Equivalent products of Viking or Tyco are acceptable. Where required, escutcheons shall be Sweet and Donaldson #401 with chrome finish at storage, mechanical, and electrical room ceilings.
   d. Concealed Areas: Heads shall be Reliable, model F1FR quick response sprinkler upright/pendent with rough brass finish. Equivalent products of Viking or Tyco are acceptable. Where required, escutcheons shall be Sweet and Donaldson #401 with chrome finish at storage, mechanical, and electrical room ceilings.
   e. Sidewall Sprinklers: Sidewall sprinklers Reliable Model F1FR quick response sprinkler, and may be installed for interior and exterior applications, subject to prior approval by Architect. Heads shall be Reliable Model F1FR quick response sprinkler horizontal, with bright chrome finish. Equivalent products of Viking or Tyco are acceptable.
   f. Temperature Ratings: Heads below finished ceilings, and in all other occupied areas shall have a temperature rating of Ordinary (155-165 degrees). Heads in unventilated, concealed and void spaces shall have a temperature rating of Intermediate (200-212 degrees), unless otherwise required by code.
   g. Provide metal cabinet for a reserve supply of sprinkler heads, as required by N.F.P.A. 13. Include suitable head wrenches for each type of sprinkler installed. Stock shall include all types and temperature ratings installed. Locate as directed by Architect.

G. Sprinkler System Supervision Alarms:

1. All valves controlling the water supply for automatic sprinkler systems and water flow switches on all sprinkler systems shall be electrically supervised in accordance with Section 903.4 of the 2022 California Building Code.
2. All required alarm devices including flow switches and tamper switches shall be provided and installed by the automatic fire sprinkler contractor. All associated conduit, wiring and electrical connections between such devices and the fire alarm system shall be the responsibility of the fire alarm contractor. It shall be the automatic fire sprinkler contractor's responsibility to coordinate with the fire alarm contractor regarding the points of connection for electrical services.

Basis of Design – Electrical and Low Voltage Systems

ELECTRICAL SYSTEMS DESIGN CRITERIA

Codes, Guidelines and Standards

The equipment, design, materials and installation shall meet or exceed the requirements as set forth in the following codes, guidelines and standards. Do not construe anything in this BOD to permit work that does not conform to code. Consider interpretations and rulings of the enforcing agencies as part of the design criteria. All State, Local, County or City Ordinances shall also apply.

ADA	American with Disabilities Act, Accessibility Guidelines for Buildings and Facilities
ANSI	American National Standards Institute, Inc.
CAL/OSHA	California Occupational Safety & Health Administration
CBC	California Building Code
CEC	California Electric Code
CFC	California Fire Code
IEEE	Institute of Electrical and Electronic Engineers
IESNA	Illuminating Engineering Society of North America
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturer's Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
SMF	California State and Local Fire Marshal
UL	Underwriters' Laboratories

POWER DISTRIBUTION SYSTEM

1. Power distribution system shall consist of a 120/208-volt, single phase panel located in each classroom building.
2. All required working clearance and space around electrical equipment shall be maintained per the California Electrical Code.
3. Panels shall have copper bussing.
4. Panels shall be sized to accommodate 15% spare load capacity and 20% spare breaker capacity.
5. The site engineer is to determine if the school's existing electrical service has capacity to serve the new buildings. As soon as possible after award of contract, the building manufacturer shall provide electrical load information to the site engineer so that determination can be made in a timely matter.

LIGHTING SYSTEM

1. Lighting system shall consist of dimmable LED fixtures with occupancy sensors, dimmers and, standalone lighting control panels.
2. Automatic control of exterior lights shall be controlled by an astronomical clock and have photocell override.
3. Battery packs for egress interior and exterior lighting shall be provided as required by Code. The battery packs shall be sized to provide back-up power for a minimum of 90-minutes for a short utility outage duration.
4. Layout lighting to meet the requirements of the architectural ceiling plan and light levels of the space as indicated below.
5. Lighting switching to meeting the mandatory measures of Title 24.
6. Exit signs will be coordinated with architectural egress plan. Signs are to be located in all paths of egress.
7. Lamps shall be LED, 3500 degrees Kelvin color temperature with a color rendering index of 80 or better.
8. LED drivers shall be electronic type with less than 10% harmonic distortion. Drivers are to be 0-10V diming.
9. Lighting control shall consist of occupancy sensors for automatic shut-off with wall mounted switches for override in enclosed spaces. Also all lighting shall be able to be automatically be shut off during hours of non-operation and shall comply with Title 24 mandatory measures.

Room Name	**Minimum Foot Candle Level**
Workroom	50
Classrooms	40
Toilet Room	20
Storage	30
IDF Room	30
Fire Riser Room	30

BRANCH CIRCUIT LOADS

1. For new branch circuits, connect no more than five general purpose receptacles to a 20A/1P circuit.
2. Provide dedicated circuit for AV equipment.
3. Design branch circuits to carry less than 65% of breaker ampacity.
4. Do not combine power and lighting on same circuits.
5. Receptacles shall be tamper resistant.

5. The grounding terminals of all receptacles and all non-current-carrying conductive surfaces of fixed electrical equipment shall be connected to an insulated copper equipment grounding conductor.
6. All wiring shall be copper, #12 AWG minimum and installed in metal raceway or as a part of listed cables having a metallic armor with the branch circuit conductors supplying these receptacles or fixed equipment.

7. Unless otherwise indicated, all 120V, 20-amp branch circuits shall have dedicated neutrals. Do not share neutrals.
8. Provide all disconnect switches and combination disconnect motor starter for equipment provided by mechanical and plumbing contractors. Coordinate disconnect and motor starter requirements with the mechanical and plumbing contactors.
9. Conduits shall be sized to accommodate 15% spare.

FIRE ALARM SYSTEM
The fire alarm system shall consist of junction boxes with conduit stubs for wall mounted devices and devices located at hard ceilings (devices in t-bar ceilings to be installed by the site contractor).

DATA COMMUNICATIONS SYSTEM
The data communications system shall consist of junction boxes with conduit stubs for wall mounted devices and devices located at hard ceilings (devices in t-bar ceilings to be installed by the site contractor).

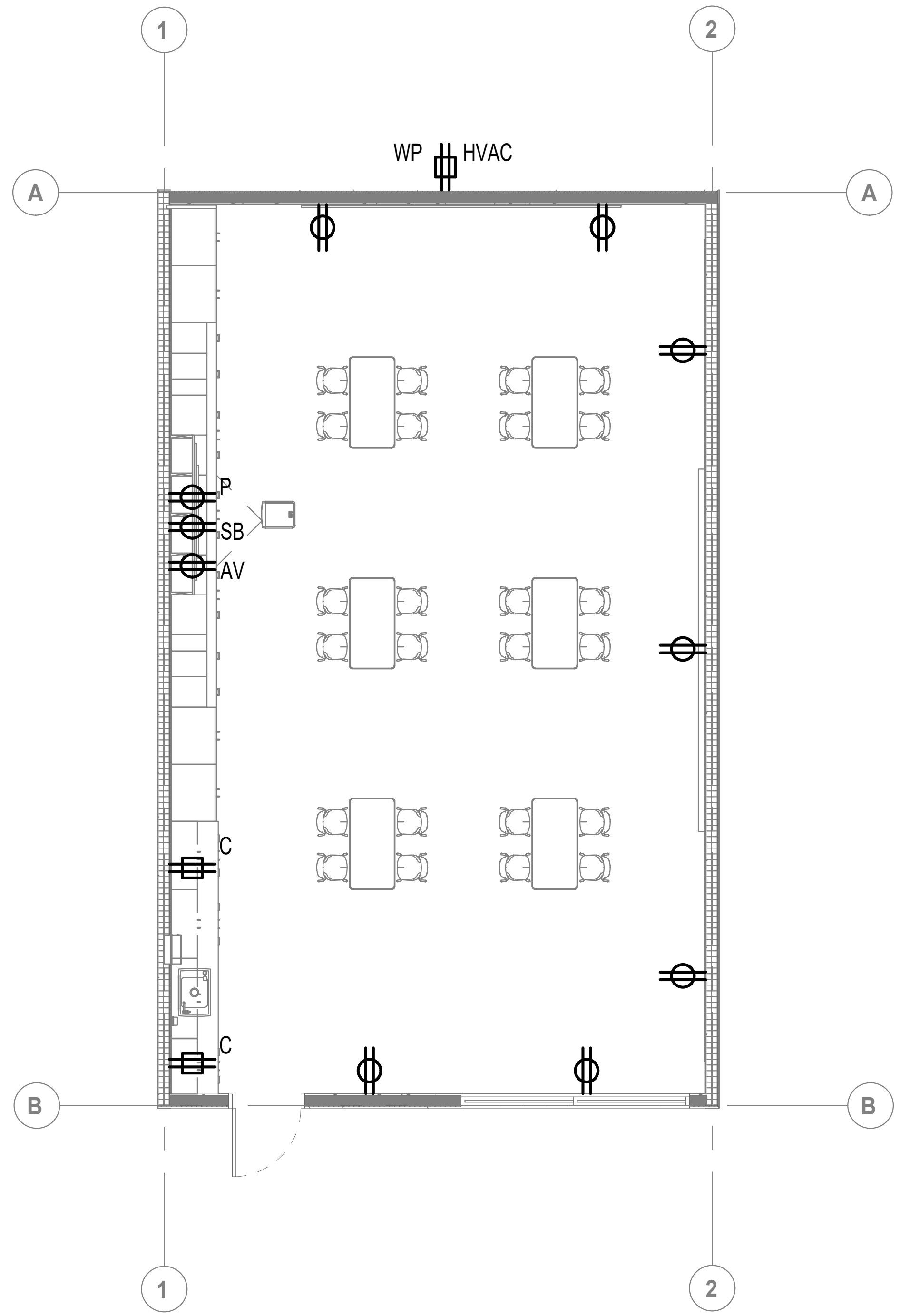
SUBSCRIPTS

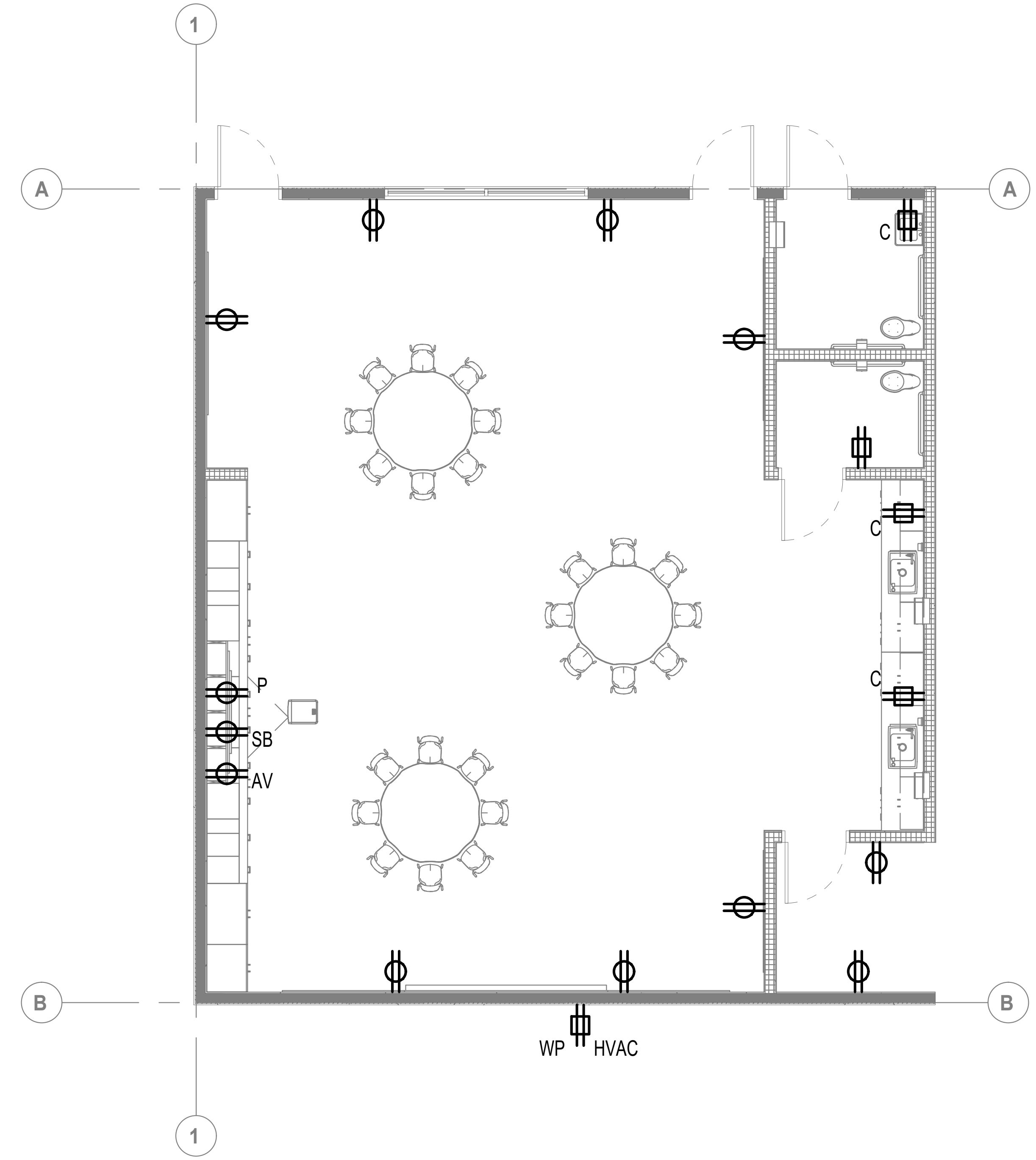
SUBSCRIPTS:	DEVICE SUBSCRIPTS DESIGNATE THE FOLLOWING:
AV	= LOCATE FOR AV EQUIPMENT.
C	= ABOVE COUNTER MOUNTED.
HVAC	= LOCATE FOR HVAC UNIT.
P	= LOCATE FOR PROJECTOR.
SB	= LOCATE FOR SMARTBOARD.
WP	= WEATHERPROOF

STANDARD ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	20 AMP 125V 3W DUPLEX CONVENIENCE RECEPTACLE.
	20 AMP 125V 3W DUPLEX CONVENIENCE RECEPTACLE W/ GROUND FAULT INTERRUPTER.
	JUNCTION BOX FOR FUTURE DATA OUTLET. PROVIDE 1" CONDUIT STUBBED ABOVE T-BAR CEILING.
	JUNCTION BOX FOR FUTURE FIRE ALARM SMOKE DETECTOR. PROVIDE 0.75" CONDUIT STUBBED ABOVE T-BAR CEILING.
	JUNCTION BOX FOR FUTURE FIRE ALARM SPEAKER, WALL MOUNTED. PROVIDE 0.75" CONDUIT STUBBED ABOVE T-BAR CEILING.
	JUNCTION BOX FOR FUTURE FIRE ALARM SPEAKER / STROBE COMBINATION, WALL MOUNTED. PROVIDE 0.75" CONDUIT STUBBED ABOVE T-BAR CEILING.
	JUNCTION BOX FOR FUTURE AV OUTLET. PROVIDE (2) 1" CONDUITS STUBBED ABOVE T-BAR CEILING.

STUDIO W
ARCHITECTS



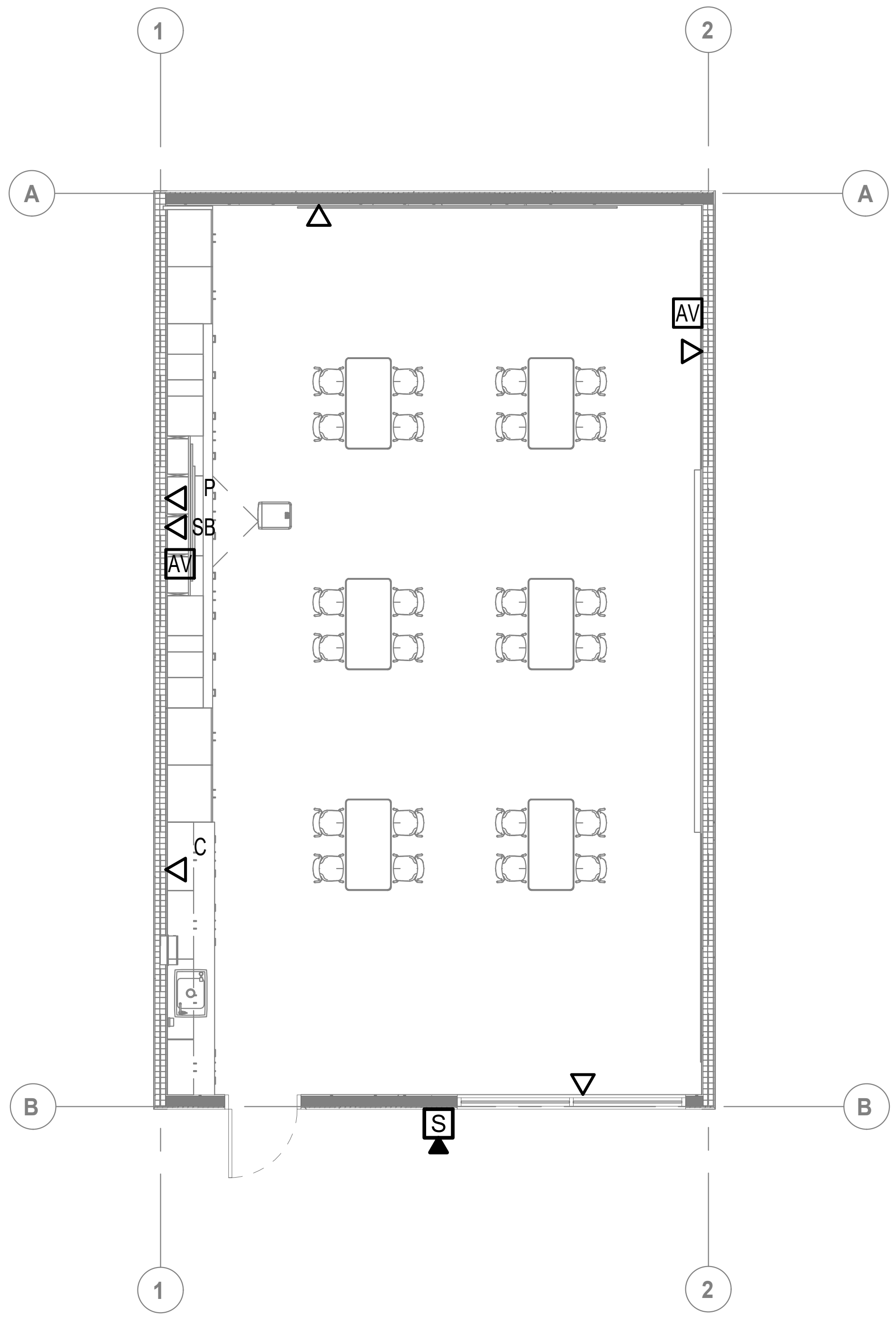


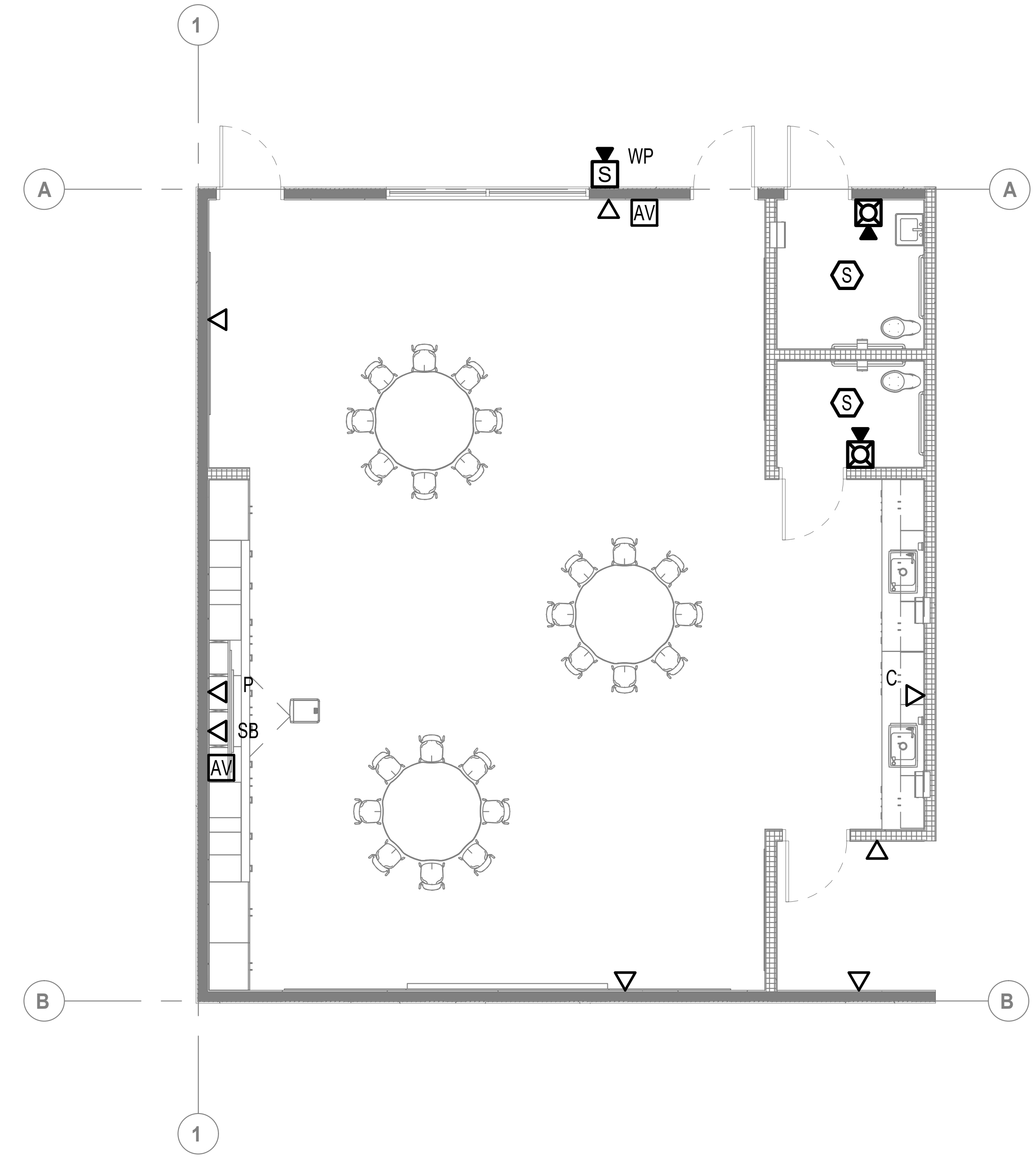
COLUSA USD BURCHFIELD

COLUSA UNIFIED SCHOOL DISTRICT | 400 FREMONT STREET
COLUSA, CA 95932

ELECTRICAL FLOOR PLAN

STUDIO W ARCHITECTS





COLUSA USD BURCHFIELD

COLUSA UNIFIED SCHOOL DISTRICT | 400 FREMONT STREET
COLUSA, CA 95932

ELECTRICAL DATA FLOOR PLAN

STUDIO W
ARCHITECTS

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**25033 - Colusa USD - Burchfield Primary ES TK/K**	**494 days**	**Tue 5/13/25**	**Fri 4/2/27**	
2		**General Requirements**	**84 days**	**Tue 5/13/25**	**Fri 9/5/25**	
11		**Pre-Design / Start-Up Services / Schematic Design**	**74 days**	**Mon 6/23/25**	**Thu 10/2/25**	
28		**Modular RFP**	**24 days**	**Fri 10/3/25**	**Wed 11/5/25**	
29		Proposal Advertisement	6 days	Fri 10/3/25	Fri 10/10/25	27
30		Proposal Period for Modular Manufacturer	4 wks	Fri 10/3/25	Thu 10/30/25	27
31		Proposal Day	1 day	Fri 10/31/25	Fri 10/31/25	30
32		Modular RFP Due Diligence	2 days	Mon 11/3/25	Tue 11/4/25	31
33		Board of Trustees Meeting (Special Meeting if possible)	1 day	Wed 11/5/25	Wed 11/5/25	32
34		**Design Development**	**21 days**	**Tue 11/4/25**	**Tue 12/2/25**	
35		Design Development Documents	2 wks	Wed 11/5/25	Tue 11/18/25	33FS-1 day
36		Design Development Meeting #1	1 day	Wed 11/5/25	Wed 11/5/25	33FS-1 day
37		Color and Material Board	1 wk	Mon 11/10/25	Fri 11/14/25	36FS+2 days
38		Submit DSA 1 / 1-REG	1 day	Tue 11/4/25	Tue 11/4/25	61FS-7 wks
39		Design Development Documents Due from Consultants	1 day	Tue 11/18/25	Tue 11/18/25	35FS-1 day
40		Design Development Meeting #2	1 day	Wed 11/19/25	Wed 11/19/25	36FS+9 days
41		SWA Review Design Development Drawings	1 day	Wed 11/19/25	Wed 11/19/25	39
42		District Review Design Development Documents	3 days	Wed 11/19/25	Fri 11/21/25	39
43		Design Development Cost Estimate	2 wks	Wed 11/19/25	Tue 12/2/25	39
44		District Approval to move forward	1 day	Fri 11/21/25	Fri 11/21/25	42FS-1 day
45		**Construction Documents**	**25 days**	**Mon 11/24/25**	**Fri 12/26/25**	
46		50% Construction Document Drawings	2 wks	Mon 11/24/25	Fri 12/5/25	44
47		50% Construction Document Specifications	2 wks	Mon 11/24/25	Fri 12/5/25	44

Project: 25033 Colusa USD Burc
Date: Wed 10/8/25

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
48		Construction Document Meeting #1	1 day	Wed 11/26/25	Wed 11/26/25	46FS-8 days
49		50% Construction Documents Due from Consultants	1 day	Fri 12/5/25	Fri 12/5/25	46FS-1 day
50		Fire Marshal Review of Site Plan	1 day	Mon 12/8/25	Mon 12/8/25	49
51		District Review 50% Construction Documents	1 wk	Mon 12/8/25	Fri 12/12/25	49
52		95% Construction Document Drawings	1 wk	Mon 12/8/25	Fri 12/12/25	49
53		95% Construction Document Specifications	1 wk	Mon 12/8/25	Fri 12/12/25	49
54		Construction Document Meeting #2	1 day	Wed 12/10/25	Wed 12/10/25	48FS+9 days
55		95% Construction Documents Due from Consultants	1 day	Fri 12/12/25	Fri 12/12/25	52FS-1 day
56		SWA Review 95% Construction Document Drawings	1 wk	Mon 12/15/25	Fri 12/19/25	52
57		District Review 95% Construction Document Drawings	1 wk	Mon 12/15/25	Fri 12/19/25	52
58		95% Construction Document Cost Estimate	2 wks	Mon 12/15/25	Fri 12/26/25	52
59		District Approval to move forward	1 day	Fri 12/26/25	Fri 12/26/25	58FS-1 day
60		**Agency Approvals**	**70 days**	**Mon 12/22/25**	**Fri 3/27/26**	
61		DSA Submittal	1 day	Mon 12/22/25	Mon 12/22/25	57
62		DSA Review Time	6 wks	Mon 12/22/25	Fri 1/30/26	61FS-1 day
63		Respond to DSA Comments	2 wks	Mon 2/2/26	Fri 2/13/26	62
64		DSA Back Check Phase 1 Submittal	2 wks	Mon 2/16/26	Fri 2/27/26	63
65		Respond to DSA Back Check Phase 1 Comments	1 wk	Mon 3/2/26	Fri 3/6/26	64
66		DSA Back Check Phase 2	1 wk	Mon 3/9/26	Fri 3/13/26	65
67		Respond to DSA Back Check Phase 2 Comments	1 wk	Mon 3/16/26	Fri 3/20/26	66
68		DSA Approval	1 wk	Mon 3/23/26	Fri 3/27/26	67
69		**Bidding Support**	**73 days**	**Thu 12/18/25**	**Mon 3/30/26**	
70		Construction Bid	3 wks	Tue 12/23/25	Mon 1/12/26	61

Project: 25033 Colusa USD Burc
Date: Wed 10/8/25

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
71		Pre-Bid Meeting	1 day	Thu 12/18/25	Thu 12/18/25	70FS-18 days
72		Construction Bid Day	1 day	Wed 1/14/26	Wed 1/14/26	70FS+1 day
73		Board Approval (Special Meeting - if possible)	1 day	Mon 3/30/26	Mon 3/30/26	68
74		**Construction Administration**	**250 days**	**Mon 3/30/26**	**Fri 3/12/27**	
75		Construction Administration Phase 1 - Estimated	4.5 mons	Mon 3/30/26	Fri 7/31/26	73FS-1 day
76		Punch List Walk	1 day	Mon 7/20/26	Mon 7/20/26	75FS-2 wks
77		Construction Administration Phase 2/3- Estimated (Could start in June if TK completed)	8 mons	Mon 8/3/26	Fri 3/12/27	75
78		Punch List Walk	1 day	Mon 3/1/27	Mon 3/1/27	77FS-2 wks
79		**Close Out**	**25 days**	**Mon 3/1/27**	**Fri 4/2/27**	
80		Punch List Modifications by Contractor	2 wks	Mon 3/1/27	Fri 3/12/27	78FS-1 day
81		Punch List Verification	1 day	Wed 3/17/27	Wed 3/17/27	80FS+2 days
82		Review As-Builts, O&Ms and Warranties	2 wks	Mon 3/22/27	Fri 4/2/27	80FS+1 wk

Project: 25033 Colusa USD Burc
Date: Wed 10/8/25

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	