Appendix F

Report of Geotechnical Investigation

REPORT OF GEOTECHNICAL INVESTIGATION

PROPOSED GYMNASIUM AND ANNEX BUILDING

VILLAGE CHRISTIAN SCHOOL

8930 VILLAGE AVENUE

SUN VALLEY, CALIFORNIA

FOR

VILLAGE CHRISTIAN SCHOOL

AUGUST 22, 2025

JOB NO. 2013-006-012

RTF&A

GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

RTF&A
GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

August 22, 2025

Village Christian School
8930 Village Avenue
Sun Valley, California 91352

Job No. 2013-006-012

Attn: Mr. Tom Konjoyan

Subject: Report of Geotechnical Investigation
Proposed Gymnasium and Annex Building
Village Christian School
8930 Village Avenue
Sun Valley, California

Ladies/Gentlemen:

Submitted herewith is our Report of Geotechnical Investigation for a proposed gymnasium and annex building to be constructed within the Village Christian School at the subject site. The report was performed in general accordance with the scope of services outlined in our "Proposal – Report of Geotechnical Investigation" dated June 23, 2025 (P031-2025-012). This report summarizes the results of our geotechnical investigation and includes geotechnical recommendations for the grading and construction phases of the subject development. The report has been distributed as indicated below; we have not submitted copies of this report for regulatory review.

Although the scope of work defined in our proposal (June 23, 2025) indicated that the geotechnical investigation would include the Administration/Chapel/Library building and Building No. 10, in addition to the subject Gymnasium and Annex Building, this report only summarizes the results of our geotechnical investigation performed for the Gymnasium and Annex Building as coordinated with the client prior to the commencement of field work.

Test borings were drilled to investigate the site and laboratory tests were performed on selected samples obtained from the test borings. The results of our investigation indicate that both the proposed Gymnasium and Annex Building areas are underlain by naturally deposited soils. The upper portion of those naturally deposited soils were found to be relatively dry and slightly disturbed. Groundwater was not encountered in any of the test borings that were drilled for the

subject investigation. Those test borings extended to depths of up to 31 feet below the present grade.

Since the upper portion of the naturally deposited soils were found to be relatively dry and slightly disturbed, it is recommended that grading be performed to remove and recompact the upper portion of those existing soils in areas where it is proposed to construct improvements as discussed in the following "Recommendations" section of this report. Once the recommended removal and recompaction of the upper naturally deposited soils has been completed and the final grades have been established, the proposed buildings and related improvements may be supported by naturally deposited soils and/or compacted fill soils as discussed in the "Foundations" section of this report. As further discussed in the "Foundations" section of this report, conventional spread foundations may be used to provide support for the proposed buildings and related improvements.

If you should have questions regarding this report, please do not hesitate to contact our firm.

Yours very truly,

R. T. FRANKIAN & ASSOCIATES

by: Brian Kenji Pitcher
Senior Project Engineer

and: Alan W. Rasplicka
Principal Geotechnical Engineer

BKP/AWR/jh

PDF Distribution via Email:

Village Christian School, Attn: Mr. Tom Konjoyan
Franco & Associates, Attn: Ms. Michele Stanghetti-DiScenza

RTF&A
GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

TABLE OF CONTENTS

SCOPE 1
SITE CONDITIONS 2
PROPOSED CONSTRUCTION 2
FIELD EXPLORATIONS 3
SUBSURFACE CONDITIONS 4
LABORATORY TESTS 4
SEISMIC DESIGN PARAMETERS 5
LIQUEFACTION 5
DISCUSSION 6
RECOMMENDATIONS 6
GENERAL 6
GRADING 6
GENERAL GRADING REQUIREMENTS 9
TEMPORARY EXCAVATIONS 10
CORROSION TESTS 11
FOUNDATIONS 11
LATERAL DESIGN 13
SETTLEMENT 13
FLOOR SLABS 14
RETAINING/FREE-STANDING WALLS 17
PAVEMENT DESIGN 20
UTILITY TRENCH BACKFILL 22
OBSERVATION/TESTING SERVICES 22

REFERENCES

PLOT PLAN, FIGURES 1.1 AND 1.2
APPENDIX A - EXPLORATIONS
APPENDIX B - LABORATORY TESTS

RTF&A
GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

REPORT OF GEOTECHNICAL INVESTIGATION

PROPOSED GYMNASIUM AND ANNEX BUILDING

VILLAGE CHRISTIAN SCHOOL

8930 VILLAGE AVENUE

SUN VALLEY, CALIFORNIA

FOR

VILLAGE CHRISTIAN SCHOOL

AUGUST 22, 2025

JOB NO. 2013-006-012

SCOPE

This report presents the results of a geotechnical investigation performed for the proposed Gymnasium and Annex Building at the subject site. The purpose of the study was to determine the general engineering characteristics of the soils underlying the areas of proposed construction and to provide specific recommendations for grading and the design of foundations and related improvements.

The Plot Plan, Figures 1.1 and 1.2 included with this report indicates the location of the subject site, the proposed development, and the locations of the seven (7) test borings that were

drilled under the observation of a representative from our firm to explore the site as part of the geotechnical investigation.

The boring logs for the 7 hollow-stem borings excavated under the observation of R. T. Frankian & Associates (RTF&A) are presented in Appendix A of this report and provide a detailed description of the soils encountered. The results of laboratory tests performed on soil samples obtained from the test borings, and a description of the methods of performing the tests, are presented in Appendix B of this report.

SITE CONDITIONS

The proposed Gymnasium and Annex Building are located within the campus of the Village Christian School at the subject site. For the purposes of description, it will be assumed that nearby Penrose Street is oriented in an east-west direction and that Village Avenue is oriented in a north-south direction.

The proposed Gymnasium and Annex Building will be constructed in the southern portion of the campus, to the southeast of the existing Football Practice Field and to the southwest of the existing Weight Facility building. The proposed structures will be constructed in what is presently a women's softball field.

The existing softball field consists of a relatively level playing field that has a dirt infield and grass outfields. There is an existing descending slope, approximately 10 feet in height, located immediately adjacent to the northwest side of the proposed Annex Building.

PROPOSED CONSTRUCTION

We have been provided with a "Proposed Master Site Plan," Sheet A0.1, with an issue date of May 27, 2025, prepared by Franco & Associates, Inc. That plan indicates the locations of the proposed Gymnasium and Annex Building. The "Proposed Master Site Plan" has been used as the base map for the attached Plot Plan, Figures 1.1 and 1.2.

The proposed Gymnasium is the larger of the two proposed structures and will be somewhat rectangular in shape, located southeast of the proposed Annex Building. The proposed Annex Building will also be rectangular in shape and located at the crest of a slope that descends towards the existing Football Practice Field. It appears that there will be access roads to the west, south, and east of the proposed Gymnasium and Annex Building, including isolated parking stalls.

We have not been provided with structural details nor load data regarding the proposed buildings and improvements. However, we understand that the proposed gymnasium building will be a single-story structure with a mezzanine, and that the annex building will be a single-story structure. For the purposes of preparing this proposal, it will be assumed that the proposed buildings will generate typical column or point-loads, and typical continuous foundation loads, for the type of construction being planned and that each building will tolerate typical settlement amounts that would be expected for the planned type of construction. We further understand that all of the buildings will be at-grade structures that will not include subterranean construction.

The project described above was the basis for the preparation of the recommendations presented in this report. We should be notified if the description of the project is inaccurate or if significant changes to the development are proposed.

FIELD EXPLORATIONS

A total of seven (7) exploratory test borings were drilled under the observation of RTF&A to determine the subsurface conditions below the site to prepare the subject Report of Geotechnical Investigation. A truck-mounted, hollow-stem auger drill rig was used to excavate all 7 of the test borings. The attached Plot Plan, Figures 1.1 and 1.2 indicates the locations of the 7 test borings (HS-1 through HS-7) that were drilled as part of the subject investigation.

Relatively undisturbed “ring” samples, and bulk samples obtained from the drill cuttings, were obtained during the drilling of the test borings and transported to our laboratory for testing. The boring logs are presented in Appendix A of this report and the results of the laboratory testing are presented in Appendix B.

SUBSURFACE CONDITIONS

The test borings drilled under the observation of RTF&A for the subject investigation indicate that the site is underlain by naturally deposited soils. Those naturally deposited soils primarily consist of silty and clean sands, with occasional lenses of clayey sand, and sandy silts.

The soils observed in the upper two feet of the site were primarily observed to consist of dry to damp soil. The soils exposed near the present grade were observed to be somewhat disturbed in some areas.

The soils encountered below depths of two feet were generally observed to be damp to moist with occasional lenses of very moist soil. The soils below depths of two feet were also observed to be dense to very dense with some lenses of medium dense soils. Weathered bedrock was encountered in hollow-stem borings (HS-5 through HS-7) as indicated in Appendix A.

The hollow-stem borings that were drilled for the subject geotechnical investigation (HS-1 through HS-7) ranged from 16 to 31 feet in depth. Groundwater was not observed within any of the test borings drilled for the subject geotechnical investigation. Variations of the materials encountered are indicated in the attached boring logs presented in Appendix A of this report.

LABORATORY TESTS

Laboratory tests were performed on selected samples, obtained from the test borings, to aid in the classification of the soils and to determine the pertinent engineering properties of the soils. The following tests were performed:

- moisture content and dry density determinations,
- direct shear tests,
- consolidation tests,
- expansion index tests, and
- maximum dry density tests.

The results of the moisture and density tests are indicated on the boring logs and the remaining test results are presented in Appendix B of this report.

SEISMIC DESIGN PARAMETERS

As with virtually all property in southern California, the site may be subjected to strong ground shaking during earthquakes on nearby or distant faults. The subject improvements should be designed to resist such shaking in accordance with current codes.

The following coefficients and factors apply to seismic force design of the proposed structures at the site. The parameters were determined using the Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps website. The parameters below are based on the Design Code Reference Document (DCRD) ASCE 7-16 and a Risk Category of II. We defer to the project Structural Engineer to determine the appropriate DCRD to be used for the subject development; we can provide additional parameters, based on an alternate DCRD or Risk Category, upon request and authorization.

Latitude	34.22930308
Longitude	-118.35526793
Site Class	C
S_S	2.077
S_1	0.756
S_{MS}	2.493
S_{M1}	1.058
S_{DS}	1.662
S_{D1}	0.706
PGA_M	1.045

LIQUEFACTION

As discussed in our "Proposal – Report of Geotechnical Investigation" dated June 23, 2025 (P031-2025-012), the scope of this geotechnical investigation does not include a liquefaction analysis for the site. It should be noted that the site is not located in a special "Liquefaction Zone" as determined by the State of California, Department of Conservation, Sunland Quadrangle map.

DISCUSSION

The results of our geotechnical investigation indicate that the subject Gymnasium and Annex Building project may be constructed as planned, from a geotechnical perspective. Our geotechnical investigation and laboratory testing indicates that the upper naturally deposited soils below the site are somewhat dry and slightly disturbed, and therefore unsuitable to provide support for the proposed improvements in their present state. Accordingly, removal and recompaction of the upper portion of the naturally deposited soils, as discussed below, will be required below areas where it is proposed to construct improvements. Once the recommended earthwork has been completed, the proposed buildings may be supported by conventional spread foundations seated in the recompacted fill soils and/or suitable naturally deposited soils as discussed in the following "Foundations" section of this report. The areas where removal and recompaction of soil will be required, as well as the recommended removal depths, are discussed in the following "Grading" section of this report.

RECOMMENDATIONS

GENERAL

The recommendations presented in this report are applicable to the construction of the project described in the previous "Proposed Construction" section of this report. If our description of the proposed development is inaccurate due to plan revisions or other reasons, we should be informed so that we may review our recommendations and determine if they will remain applicable for the type of construction that is being planned.

GRADING

As discussed in the previous "Soil Conditions" section of this report, the site is primarily underlain by naturally deposited sands and silts. The upper naturally deposited soils are not suitable in their present state to provide support for the subject improvements. Removal and

recompaction of those upper naturally deposited soils, as discussed below, is recommended to provide support for the subject improvements.

We have not been provided with Civil Plans that indicate the existing and final grades for the project. It is anticipated that the proposed improvements will be constructed at or near the present grade and that relatively minor cuts and fills will be required to establish the final grades for the subject development. To provide reduced and uniform settlement, it is recommended that the upper soils at the site be removed and recompacted below areas where it is proposed to construct improvements.

To provide uniform and reduced settlement below the proposed Gymnasium building, it is recommended that the existing soils within the upper 5 feet of the present grade, or the existing soils within 3 feet of the bottoms of the proposed foundations, whichever is deeper, be removed and replaced as compacted fill. The lateral removal of soil should extend beyond the perimeter of the proposed Gymnasium a distance at least equal to the vertical depth of the removed soils, or 5 feet, whichever is greater. The intent of the recommended grading is to construct compacted fills where the foundations for the proposed Gymnasium building will be underlain by a minimum of 3 feet of compacted fill soil.

To remediate the dry and disturbed soils that are present below the proposed Annex Building, it is recommended that the existing soils within the upper 2 feet of the present grade be removed and replaced as compacted fill. The lateral removal of soil should extend beyond the perimeter of the proposed Annex Building, a distance of at least 5 feet. The intent of the recommended grading for the proposed Annex Building is to replace the existing, dry, disturbed soils with uniformly moist, compacted fill soil. Completion of the recommended grading will allow the foundations for the proposed Annex Building to be founded in compacted fill soil and/or naturally deposited soil. It should be noted that the recompaction of the removed soil along the northwest side of the proposed Annex Building, where adjacent to the existing slope, will involve the reconstruction of the top of the existing slope.

Although not specified on the project “Proposed Master Site Plan,” it is possible that free-standing and/or retaining walls will be constructed as part of the subject development. The

removal and recompaction of existing soil in areas where it is being proposed to construct free-standing walls, retaining walls, and/or related improvements, should extend at least 2 feet below the present grade, or at least 2 feet below the bottoms of the proposed foundations, whichever is deeper. The lateral removal of soil should extend at least 2 feet beyond the perimeter of foundations for walls and related improvements. Alternatively, and if reduced bearing values are acceptable (see "Foundations" and "Retaining Walls" sections of this report), removal and recompaction of existing soils could be waived and the bottoms of the foundation excavations for free-standing walls, retaining walls, and/or related improvements could be compacted in-place (using a mechanical compactor) under the observation of a field representative from our office. The soil exposed in the bottoms of foundation excavations that have been compacted in place will be considered acceptable where field density tests indicate that compaction of at least 90 percent of the maximum dry density of the soil has been attained.

Exploratory test borings were not drilled in the areas where it is proposed to construct the access roads indicated on the attached "Proposed Master Site Plan." However, it is anticipated that the removal and recompaction of existing soils in areas where it is proposed to construct pavement, hardscape, or related improvements should extend at least 2 feet below the final soil subgrade elevation. If it is required to place compacted fill to establish final grade, the upper 2 feet of the existing grade should be removed and recompacted prior to placing compacted fill to elevate the existing grade. Removal and recompaction of soil should extend at least 2 feet beyond the perimeters of the pavement, hardscape, or related improvement areas, where possible.

Existing fill soils were not encountered within the borings drilled for the subject investigation. However, if fill soils are encountered during the course of the grading operations, it will be required to remove the fill soils and replace those soils as compacted fill in areas where improvements are planned.

The bottoms of the areas to be filled should be processed prior to placement of compacted fill. Processing should consist of scarifying the upper six to 12 inches of the exposed soils, adjusting the moisture content of the scarified soil to approximately two percent above optimum moisture content, and compaction of the exposed soil to at least 90 percent of the maximum dry

density of the soil. The bottoms of areas to be filled should be proof-rolled with relatively heavy grading equipment and be observed and approved by a representative of the Geotechnical Engineer of Record prior to fill placement. It may also be required that a representative from the governing agency observe bottom areas prior to fill placement.

Fill should be placed in layers not exceeding 12 inches in loose thickness, adjusted to approximately optimum moisture content, and compacted to at least 90 percent of the maximum dry density of the soil as determined by the current ASTM Soil Compaction Method D 1557. Organic and decomposable material should be excluded from the fill, as should solid material exceeding 12 inches in maximum dimension. Fill soils should be placed and compacted under the observation and testing of a representative of the Geotechnical Engineer of Record.

If imported soil is to be used as compacted fill, the imported soil should be relatively non-expansive and similar to the on-site soil. A 40-pound sample of proposed import soil should be submitted to the Geotechnical Engineer of Record at least 48 hours prior to importing it to the job site to determine if the soil would be acceptable for use on the project.

GENERAL GRADING REQUIREMENTS

1. All fills, unless otherwise specifically designed, shall be compacted to at least 90 percent of the maximum dry unit weight as determined by ASTM D 1557 Method of Soil Compaction.

2. No fill shall be placed until the area to receive the fill has been adequately prepared and subsequently approved by the Geotechnical Engineer of Record or his representative.

3. Fill soils should be kept free of debris and organic material.

4. Rocks or hard fragments larger than 12 inches may not be placed in the fill without approval of the Geotechnical Engineer of Record or his representative, and in a manner specified for each occurrence.

5. The fill material shall be placed in layers which shall not exceed 12 inches per layer. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to ensure uniformity of material and moisture content.

6. When the moisture content of the fill material is too low to obtain adequate compaction, water shall be added and thoroughly dispersed until the soil is approximately two percent over optimum moisture content.

7. When the moisture content of the fill material is too high to obtain adequate compaction, the fill material shall be aerated until the soil is approximately two percent over optimum moisture content.

8. Fill and cut slopes should not be constructed at gradients steeper than 2:1 (horizontal: vertical).

TEMPORARY EXCAVATIONS

It will be required to make temporary excavations during the grading and construction phases of the subject development. Temporary excavations are anticipated to be required during the grading phase of the project when removal and recompaction of the upper soils is performed as previously recommended in the "Grading" section of this report. Temporary excavations to be made during the construction phase of the project will include those made during the construction of building foundations, utility line trenches, and related improvements. Temporary excavations are generally anticipated to be less than 8 feet in depth.

Vertical excavations in silty sand should not be permitted to exceed 4 feet in height. Excavations in silty sand that are greater than 4 feet in height, but no greater than 8 feet in height, may be sloped at a gradient of no steeper than ¾:1 (horizontal: vertical) provided that clean sands or materials having low cohesion are not exposed in the excavation. Vertical excavations should not be made in soil consisting of clean sand. Temporary excavations made in clean sand should be sloped at a gradient of 1:1, up to a height of 8 feet. Temporary excavations should be observed by the Geotechnical Engineer of Record and excavation recommendations may be amended as a result of field conditions. Temporary excavations are subject to approval by the Geotechnical Engineer of Record. All regulations of state or federal OSHA should be followed.

The tops of excavations should be barricaded to prevent vehicles and storage loads from being within seven feet of the top of an excavation. A greater setback may be necessary when considering heavy vehicles, such as concrete trucks and cranes. The Geotechnical Engineer of

Record should be advised of such heavy vehicle loadings so that specific setback requirements can be established.

A berm should be constructed along the top of an excavation, where necessary, to prevent run-off water from flowing over the excavation. This recommendation would be particularly important during the rainy season (normally from November through April), when run-off water can cause excavations to erode. Excavations should be observed by the Geotechnical Engineer of Record so that any necessary modifications, based on variations in the soil conditions encountered, can be made.

CORROSION TESTS

As discussed in our "Proposal – Report of Geotechnical Investigation" dated June 23, 2025 (P031-2025-012), the scope of this geotechnical investigation does not include testing to determine the corrosivity of the site soils. The grading recommended in the previous "Grading" section of this report will alter the current soil conditions. It is recommended that corrosion testing be performed on soil samples obtained following the recommended grading to determine if the site soils will be corrosive to concrete and/or utility lines that are in contact with the site soils.

FOUNDATIONS

Once the grading recommended in this report has been completed, the proposed Gymnasium, Annex Building, and related improvements may be supported by conventional spread foundations. The bearing material should consist of compacted fill soil, placed in accordance with the recommendations presented in this submittal, and/or naturally deposited soil as discussed below. Spread foundations should be designed by the Project Structural Engineer in accordance with the current version of the California Building Code (CBC).

Gymnasium: Assuming that the grading work recommended in the previous "Grading" section of this report has been performed, the foundations for the proposed Gymnasium will be underlain by at least 3 feet of compacted fill. Foundations for the proposed Gymnasium should be established at a depth of at least 24 inches below the lowest adjacent final grade and have a

minimum width of 18 inches. Isolated column pad foundations should have dimensions of at least 24 inches in each direction. Foundations meeting these minimum size dimensions may be designed using a bearing value of 2,500 pounds per square foot (psf).

Annex Building: The grading recommended in the previous "Grading" section of this report specifies that the soil within the upper two feet of the present grade should be removed and replaced as compacted fill. The bearing soil for the proposed Annex Building may consist of the replaced compacted fill soil and/or dense naturally deposited soil. The foundations for the proposed Annex Building should be established at a depth of at least 18 inches below the lowest adjacent final grade and have a minimum width of 12 inches. Foundations meeting these minimum size dimensions may be designed using a bearing value of 2,000 pounds per square foot (psf). As indicated below, it will be required to deepen the northwest perimeter wall foundation of the proposed Annex Building to comply with a H/3 slope setback requirement.

Free-Standing and/or Retaining Walls: As previously discussed in the "Grading" section of this report, it is possible that free-standing and/or retaining walls will be constructed as part of the subject development. If the recommended removal and recompaction of soil discussed in the "Grading" section of this report is performed in proposed wall areas, the wall foundations will be established in compacted fill soil and a bearing value of 2,000 psf may be used for the design of those foundations. If the recommended removal and recompaction of soil is not performed, the exposed soils in the bottoms of the wall foundation excavations should be compacted in place as discussed in the "Grading" section of this report and a bearing value of 1,000 psf should be used for the design of the wall foundations. Free-standing wall foundations should be a minimum of 12 inches in width and depth. Retaining wall foundations should be a minimum of 12 inches in width and 18 inches in depth.

The bearing values indicated above apply to both continuous and isolated footings and may be increased by one-third for the total of all loads, including those attributed to seismic and wind forces. The recommended bearing value is a net value, i.e., the mass of concrete in footings may be neglected when computing the footing dimensions. The excavations for spread foundations must be manually cleaned of loose soils and/or debris prior to casting concrete.

Foundations located at the top of a slope should be set back from the face of the slope a horizontal distance at least equal to 1/3 the height of the slope (H/3, where H is the height of the slope). The minimum required setback distance is 5 feet and the maximum required setback distance is 40 feet. Foundations located at the toe of a slope should be set back a horizontal distance from the toe of the slope a distance at least equal to ½ the height of the slope (H/2, where H is the height of the slope), with a minimum required setback distance of 3 feet and a maximum required setback distance of 15 feet.

Foundations should be deepened, where necessary, to prevent surcharge loads from being imposed upon adjacent foundations or utilities. Surcharge loads should be assumed to be distributed out from the bottom edge of foundations at 45-degree angles. Foundation excavations should be cleaned of all loose material and be observed and approved by a representative of the Geotechnical Engineer of Record prior to casting concrete.

The Foundation Plans for the subject improvements should be reviewed by the Geotechnical Engineer of Record. The Geotechnical Engineer of Record should sign and stamp the plans, provided the plans have been found to conform to the geotechnical recommendations presented in this report.

LATERAL DESIGN

Lateral resistance at the base of footings or slabs may be assumed to be the product of the dead load and a coefficient of friction of 0.40. Passive pressure on the face of footings and grade beams may also be used to resist lateral forces. A passive pressure of zero at the surface of finished grade, increasing at the rate of 250 psf per foot of depth to a maximum of 2,000 psf, may be used for this project. Passive pressure and friction may be combined without reduction when evaluating the lateral resistance.

SETTLEMENT

Assuming that the grading recommended in this report has been performed, and that the proposed buildings are constructed in accordance with the recommendations presented in this

report, we estimate that static settlement for each structure will be up to about 1.0 inches. Static differential settlement for the proposed buildings are expected to be about 0.75 inches within a horizontal distance of 30 feet.

FLOOR SLABS

General: We have not been provided with structural details indicating the type of floors that will be utilized for the proposed buildings. The recommendations in this section of the report are mainly applicable to concrete floor slabs that will be supported by the soil subgrade.

The floor slab recommendations presented in this section of the report are based on the soil subgrade in the proposed building areas consisting of compacted fill soil placed in accordance with the recommendations summarized in this report. Any near-surface soils that become dried or disturbed during the course of construction should be moisture-conditioned and compacted prior to casting slabs.

As discussed below, the floor slabs for the proposed buildings should consist of either conventional concrete floor slabs, or post-tension floor slabs. Formal structural plans that indicate the floor slabs for the for the project should be reviewed, signed, and stamped by our office prior to initiation of construction.

Conventional Floor Slabs: Concrete floor slabs should have a thickness of at least 5 inches and be reinforced with No. 4 reinforcing bars spaced 18 inches, on center, in orthogonal directions. It is recommended that the soil subgrade be thoroughly moistened prior to casting the concrete slabs. Thicker slabs and additional reinforcement may be required, depending on the floor loads and the structural requirements. The slab thicknesses and reinforcing may be increased or decreased at the direction of the Project Structural Engineer. Floor slabs should be designed in accordance with the current version of the California Building Code (CBC).

Post-Tensioned Floor Slabs: Post-tensioned floor slabs may also be utilized for the subject development. Post-tensioned floor slab design should be designed in accordance with the recommendations of the current CBC. Perimeter edge footings should have a minimum depth of 12 inches. Footing depths should be measured from the lowest adjacent grade or from the top of

the floor slab for interior footings.

Net Bearing Value: An allowable net bearing value of 2,000 psf for footings with a minimum width and depth of 12 inches below the top of slab or lowest adjacent grade may be used.

Coefficient of Friction: 0.75 for pre-stressing, 0.40 for slab friction

Passive Pressure: 250 pcf for level ground condition

Modulus of Subgrade Reaction (K): 150 pounds per cubic inch (pci) for a footing width of one foot. For larger footings or floor slabs, this value should be reduced using the following equation:

$$Kr = K\left[\frac{(B+1)}{2B}\right]^2$$

where:

Kr = Reduced Modulus Value
K = Modulus of Subgrade Reaction for a One-Foot-Wide Plate
B = Width of Large Footing or Slab

Modulus of Elasticity: 1,000 pounds per square inch (psi)

Edge Moisture Variation Distance

Me (Center Lift):	5.25 feet
Me (Edge Lift):	2.5 feet

Estimated Differential Movement	Very Low	Low
My (swelling):	0.2	0.4
My (shrink):	0.2	0.3

Expansive Soil Conditions: The soils present in the upper portion of the site primarily consist of silty sands and sandy silts. Expansion Index Tests performed on 2 separate samples obtained during the subject investigation indicated Expansion Indexes that were in the Very Low to Low range. It is expected that the soils encountered during the course of the recommended grading operations will have Expansion Indexes ranging from Very Low to Low. Expansion Index tests should be performed upon the completion of grading to classify the soils present at final grade in the proposed building areas.

Since the soils at final grade are expected to have a Very Low to Low expansion potential, no special treatment of the soil, relative to expansive soil conditions, is anticipated to be required. As mentioned above, Expansion Index tests should be performed at the completion of the recommended grading operations to determine the expansion potential of the soils exposed near final grade in the proposed building areas. In the event that expansive soils are present, recommendations for the construction of foundations and concrete slabs founded on expansive soils would be presented in a report of observation and testing that would be prepared upon completion of the grading operations at the site.

The soil subgrade should be thoroughly moistened prior to casting concrete slabs. As previously mentioned in the "Grading" section of this report, if import soils are required for use as compacted fill, the import soils should be relatively non-expansive and similar to the on-site soils.

Water Vapor: Water vapor transmitted through concrete slabs can cause moisture-related issues. We recommend that an impermeable membrane "vapor barrier" be installed to reduce excess vapor drive through all concrete slabs. The function of the impermeable membrane is to reduce the amount of water vapor transmitted through concrete slabs. Vapor-related impacts should be expected in areas where a vapor barrier is not installed.

The method of vapor barrier mitigation affects the floor slab section thickness which in turn affects the elevation of the rough and fine grade plans that can have a significant effect on earthwork balance issues. It is recommended that the client and design team make an early decision on the method of vapor barrier mitigation that will be used below floor slabs for all areas of the project as early as possible.

Slabs should be underlain by a vapor barrier surrounded by 2 inches of sand above and below the barrier. The vapor barrier should be at least 15 millimeters thick; care should be taken to preserve the continuity and integrity of the barrier beneath the slab. The sand should be sufficiently moist to remain in place and be stable during construction; however, if the sand above the barrier becomes saturated before placing concrete, the moisture in the sand can become a source of water vapor. It is recommended that the top of all utilities running parallel to the ground surface be kept at least 4 inches below the top of the soil subgrade.

Another factor affecting vapor transmission through slabs is a high water-to-cement ratio in the concrete used for the slab. A high water-to-cement ratio increases the porosity of the concrete, thereby facilitating the transmission of water and water vapor through the slab. The Project Structural Engineer or a concrete mix specialist should provide recommendations for the design of concrete for footings and slabs in accordance with the CBC, with consideration of the above comments.

Alternative methods of providing floor slab water vapor mitigation have also been successfully utilized. If requested, we would be pleased to provide geotechnical comments if it is desired to utilize alternative mitigation methods. The recommendations presented herewith may be superseded by the design team based on their experience with alternative mitigation methods. However, RTF&A assumes no responsibility related to adverse impacts associated with superseding the recommendations of this report.

RETAINING/FREE-STANDING WALLS

General: The plans with which we were provided do not indicate that retaining or free-standing walls will be constructed as part of the subject development. If retaining walls are constructed as part of the development, they should be designed in accordance with the recommendations presented in this section of the report. Our office should review and approve the project Retaining Wall Plans prior to the initiation of construction.

Bearing Value: A bearing value of 2,000 psf may be used for the design of retaining wall foundations, provided that removal and recompaction of soil is performed in accordance with the recommendations presented in the "Grading" section of this report and that the retaining wall foundations are underlain by a minimum of 2 feet of compacted fill soils. If the alternate method of waiving the removal and recompaction of soil, and the bottoms of the foundation excavations are compacted in place as discussed in the "Grading" section of this report, a bearing value of 1,500 psf should be used for retaining wall design. Retaining wall foundations should be a minimum of 12 inches in width and 18 inches in depth.

Lateral Earth Pressure: Retaining wall backfill should consist of materials with a very low to low potential for expansion. Soils with an expansion potential of medium or higher should not be used as retaining wall backfill. Cantilevered retaining walls, separate and independent of buildings and retaining up to 12 feet of level backfill, may be designed using a lateral pressure equal to that developed by a fluid with a density of 35 pounds per cubic foot, provided the backfill soils are drained and do not exceed a very low to low potential for expansion. Where the retained surface of the backfill is inclined at 2:1, it may be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 60 pcf. The pressures indicated assume that a lateral deflection of up to about one percent of the wall height is acceptable at the top of the wall. If it is desired to decrease the amount of potential wall deflection, a greater lateral pressure could be used in the wall design.

For the design of a braced rigid wall, where rotation and lateral movement are not acceptable (as in the case of building walls), it may be assumed that drained, relatively non-expansive soils will exert a rectangular lateral pressure with a maximum pressure equal to 24H psf, where "H" is the wall height in feet. The pressure value and distribution may vary significantly when considering wall rigidity and restraining conditions. The structural characteristics of the wall are referred to the Project Structural Engineer. If requested, we can provide additional geotechnical design parameters for specific restrained conditions.

When placing backfill, walls should be braced. Heavy compaction equipment should not be used any closer to the back of the wall than the height of the wall. Soils having an Expansion

Index of greater than 50 should not be utilized for backfill behind walls that are greater than 3 feet in height.

A drainage system should be provided to prevent the development of hydrostatic pressure behind walls. If a drainage system is not installed, the walls should be designed to resist an additional hydrostatic pressure equal to that developed by a fluid with a density of 55 pcf against the full height of the wall.

In addition to the recommended earth pressure and hydrostatic pressures, the walls should be designed to resist any applicable surcharges due to buildings, walls, storage, or traffic loads. The upper 10 feet of walls adjacent to vehicular traffic areas should be designed to resist a uniform lateral pressure of 100 psf, acting as a result of an assumed 300 psf surcharge behind the walls due to normal traffic. If the traffic is kept back at least 10 feet from the walls, the traffic surcharge may be neglected.

Seismic Lateral Earth Pressure: The preceding recommended values indicate earth pressures for conventional static loading conditions. Ground shaking associated with earthquakes may cause additional pressure on walls. In addition to the previously mentioned lateral earth pressures, it is recommended that all rigid (building) walls of any height and cantilevered retaining walls greater than 6 feet in height, be designed to support an additional seismic earth pressure equal to an inverted equivalent fluid pressure of 29 pcf.

Density of Backfill: When designing retaining walls to resist over-turning, it can be assumed that compacted on-site soils will have a density of 125 pcf.

Drainage: A drainage system should be provided behind retaining walls or the walls should be designed to resist hydrostatic pressures as discussed above. Retaining wall backfill may be drained utilizing a perforated pipe. The perforated pipe should be at least 4 inches in diameter and be placed at the base of the wall, with the perforations pointed down. The pipe should be sloped to provide positive drainage, but in no instance shall the pipe be elevated more than 2 feet above the bottom of the wall. The pipe should be surrounded by at least 6 inches of uniform-sized gravel and be permitted to outlet onto a surface that would not be subject to erosion. Alternatively, the drain could be connected to a suitable outlet device. The gravel

should be separated from the surrounding soils by a filter fabric, such as Mirafi 140N or equivalent, wrapped around the gravel ("burrito-wrapped"). Alternatively, the filter fabric and gravel may be omitted when using a continuous slotted pipe and a graded sand that conforms to LACDPW "Graybook," F-1 Designated Filter Material.

Drainage panels, such as Miradrain or equivalent, or a 6- to 12-inch-wide gravel chimney drain should be installed behind retaining walls that are greater than 3 feet in height. The top of the drainage panels or chimney drain should be capped with 18 to 24 inches of compacted on-site soil; the thickness of the cap should be increased to provide a minimum of 3 feet of compacted fill soils under any footing within the area of the backfill, where appropriate. The intent of installing the drainage panels or chimney drain would be to reduce the potential for build-up of water directly behind the walls. Excessive build-up of water could result in wall failure if the wall is not designed to resist hydrostatic forces.

Retaining walls could be constructed utilizing weepholes in lieu of a drainage system consisting of perforated pipe. Weepholes should be at least 4 inches in diameter and be spaced at 8-foot intervals. The bottom of each weephole should be installed approximately 6 inches above the adjacent grade. At least one cubic foot of filter material should be placed behind each weephole and some means to minimize the loss of the material through the weephole should be provided.

The installed drainage system should be observed by the Geotechnical Consultant prior to backfilling the system. Observation of the drainage system may also be required by the reviewing governmental agencies prior to backfilling. The backs of retaining walls should be waterproofed.

PAVEMENT DESIGN

It is assumed that the access roads and parking stalls indicated on the attached "Proposed Master Site Plan" will consist of asphalt or concrete pavement. Recommendations related to the over-excavation and recompaction of soil in the proposed pavement areas of the development were previously presented in the "Grading" section of this report.

Soil samples should be obtained from the access road areas following the completion of the

recommended grading operations. The soil samples should be submitted to a paving consultant for the purposes of performing R-value tests. The results of the R-value tests would be used to determine pavement section recommendations.

For preliminary purposes, it will be assumed that the site soils will have an R-value of 20. The following preliminary pavement section recommendations are based on an R-value of 20. The final pavement section recommendations should be based on the actual results of R-value tests and may be different than the preliminary pavement section recommendations presented below.

TRAFFIC INDEX	ASPHALT THICKNESS (INCHES)	BASE COURSE THICKNESS (INCHES)
4	4	4
6	4	9
8	5	14

Base course material should consist of either crushed aggregate base (CAB), as defined by Section 200-2.2 of the Standard Specifications for Public Works Construction ("Greenbook"), or Crushed Miscellaneous Base (CMB), as defined by Section 200-2.4 of the Greenbook. The base course material should be compacted to at least 95 percent of the maximum dry density of the material as determined by ASTM Test D1557.

Base course material should be purchased from a supplier who will certify that the base course will meet or exceed the specifications in the Greenbook as indicated. We would, upon request, perform sieve analysis and sand equivalency tests on material delivered to the site that appears suspect. Additional tests could also be performed, upon request, to determine if the material is in compliance with the remainder of the Greenbook specifications.

Final concrete pavement recommendations would be based on the results of R-value tests performed upon the completion of the grading operations. It is anticipated that concrete pavement should be at least 8 inches in thickness and be underlain by at least 4 inches of compacted base course material.

To potentially increase the life of the pavement, concrete curbs and gutters could be

deepened to extend 6 inches below the base course material and be seated in the soil subgrade. The intent of deepening the curbs and gutters is to form a “cut-off” wall to reduce the amount of water flow through the base course material from adjacent landscaped areas. Subgrade soils that become saturated as a result of water flowing through base course material can reduce the life of the pavement. The curb subgrade should be thoroughly moistened prior to casting concrete.

The preliminary pavement section recommendations presented above are based upon assumed Traffic Index values. R. T. Frankian & Associates does not take responsibility for the numerical determination of the Traffic Index values or the areas where they apply within the site. We would be pleased to provide pavement section recommendations for alternative Traffic Index values upon request.

UTILITY TRENCH BACKFILL

Backfill placed in trenches excavated for the installation of utility lines must be compacted to at least 90 percent of the maximum dry density of the soil, from the top of the pipe to finish grade. If requested, detailed recommendations for compaction of utility trenches can be provided.

OBSERVATION/TESTING SERVICES

This report has been prepared assuming that R. T. Frankian & Associates will perform all geotechnical field observations and testing. If the recommendations presented in this report are utilized and observation/testing of the geotechnical work is performed by others, the party performing the observations/testing must review this report and assume responsibility for the recommendations presented herein or provide an additional report. That party would then assume the title "Geotechnical Engineer of Record" for the project and respond to any design and construction-related issues that may arise.

A representative of the Geotechnical Engineer of Record should be present to observe grading and backfill operations as well as foundation excavations for the project. A report

presenting the results of these observations and related testing should be issued upon completion of the work.

-oOo-

The following are attached and complete this report:

- Plot Plan, Figures 1.1 and 1.2 (Proposed Master Site Plan)
- Appendix A – Explorations
  - Unified Soil Classification System, Figure A-1
  - Boring Logs HS-1 through HS-7 (RTF&A)
- Appendix B – Laboratory Tests
  - Maximum Dry Density Test Data (Appendix B Text)
  - Direct Shear Test Data (3 pages)
  - Consolidation Test Data (3 pages)
  - Expansion Index Tests (Appendix B Text)

Respectfully submitted,

R. T. FRANKIAN & ASSOCIATES

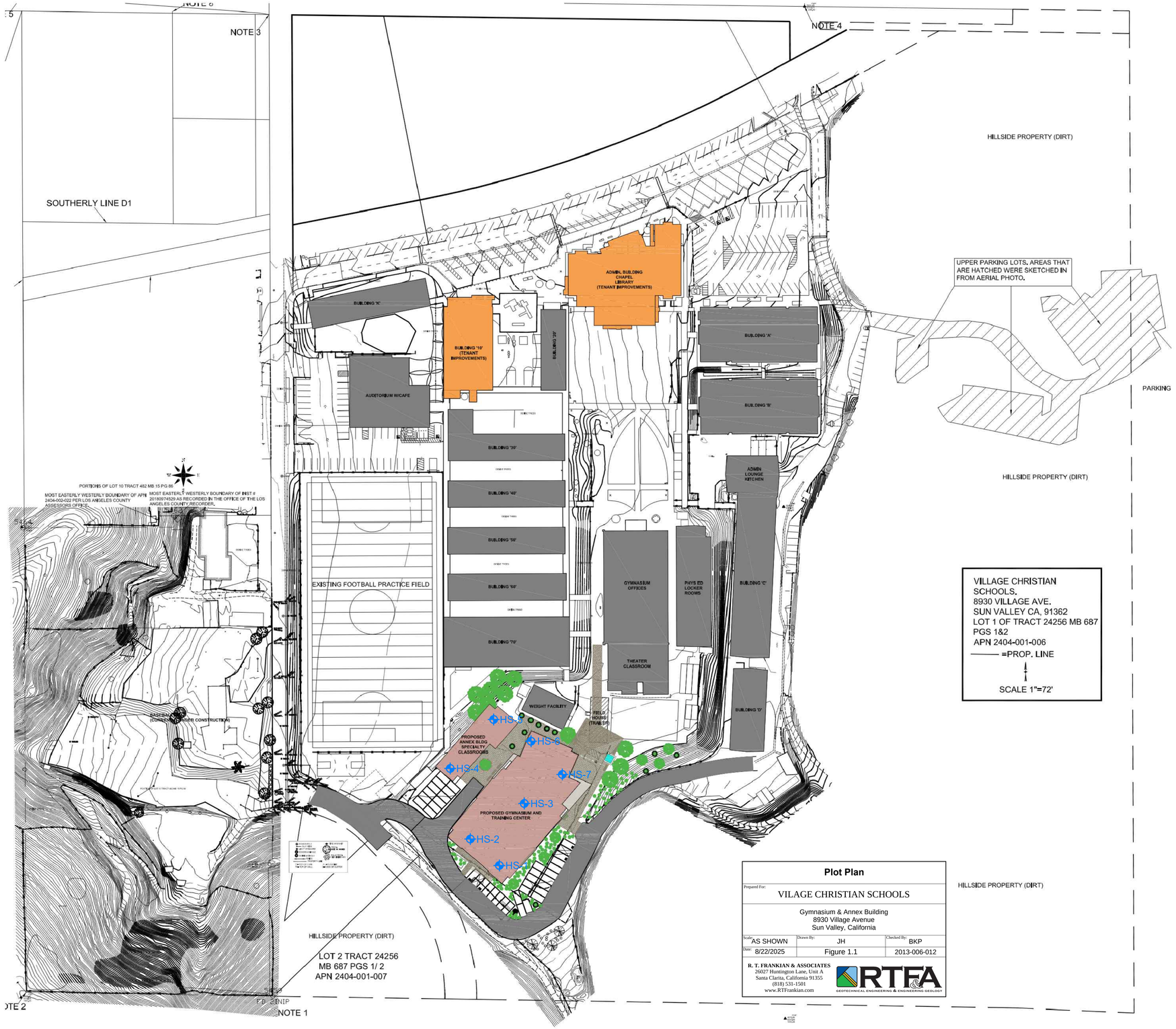
by: Brian Kenji Pitcher
Senior Project Engineer

REGISTERED PROFESSIONAL ENGINEER
ALAN W. RASPLICKA
No. GE 2558
GEOTECHNICAL
STATE OF CALIFORNIA

and: Alan W. Rasplicka
Principal Geotechnical Engineer

BKP/AWR/jh

RTF&A
GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY



VILLAGE CHRISTIAN SCHOOLS,
8930 VILLAGE AVE.
SUN VALLEY CA, 91362
LOT 1 OF TRACT 24256 MB 687 PGS 1&2
APN 2404-001-006
——— =PROP. LINE

SCALE 1"=72'

Plot Plan

Prepared For: VILAGE CHRISTIAN SCHOOLS

Gymnasium & Annex Building
8930 Village Avenue
Sun Valley, California

Scale: AS SHOWN	Drawn By: JH	Checked By: BKP
Date: 8/22/2025	Figure 1.1	2013-006-012

R. T. FRANKIAN & ASSOCIATES
26027 Huntington Lane, Unit A
Santa Clarita, California 91355
(818) 531-1501
www.RTFrankian.com

RTFA GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

1 PROPOSED MASTER SITE PLAN
SCALE: 1/64" = 1'-0"

0 10 40
5 20 37.5

PROPERTY INFORMATION

ADDRESS: 8930 VILLAGE AVENUE - SUN VALLEY, CA 91352
APN: 2404001006
LEGAL DESCRIPTION:
TRACT NO TR 24256 LOTS LT 1

ZONING: A2-1-K
SPECIFIC PLAN: SAN GABRIEL/VERDUGO MOUNTAINS SCENIC PRESERVATION

EXISTING BUILDING INFORMATION:
EXISTING BUILDING INFORMATION: REFER TO CHART BELOW
EXISTING OCCUPANCY TYPE: EDUCATION, PRIVATE SCHOOL GRADES K-12 PER CPC-8447-CU (1992), A MAXIMUM OF 1950 STUDENTS

BUILDING NAME	SQUARE FOOTAGE	STORIES	BLDG USE
BUILDING 'A'	7,904	1	EDUCATION
BUILDING 'B'	7,904	1	EDUCATION
BUILDING 'C'	13,940	1	EDUCATION
BUILDING 'D'	7,350	2	MAINTENANCE
BUILDING '10'	5,650	1	EDUCATION
BUILDING '20'	2,500	1	EDUCATION
BUILDING '30'	4,646	1	EDUCATION
BUILDING '40'	3,750	1	EDUCATION
BUILDING '50'	3,750	1	EDUCATION
BUILDING '60'	3,750	1	EDUCATION
BUILDING '70'	15,000	2	EDUCATION
BUILDING 'K'	3,991	1	EDUCATION
ADMIN BUILDING	8,600	1	ADMINISTRATION, RESOURCE, EDUCATION
PHYSICAL ED	3,746	1	EDUCATION
GYMNASIUM (700 SEATS)	12,750	2	ASSEMBLY
THEATRE BUILDING	4,662	1	ASSEMBLY AND EDUCATION
AUDITORIUM AND CAFE	7,000	1	ASSEMBLY AND SERVICE
FIELD HOUSE TRAILER	1,440	1	EDUCATION
WEIGHT FACILITY	2,160	1	EDUCATION
EXISTING TOTAL AREA	120493	-	
AREA SCOPE OF WORK			
BUILDING '10'	8,054	2	EDUCATION
ADMIN BUILDING	6,129	1	OFFICE, EDUCATION, ASSEMBLY
GYMNASIUM & TRAINING CENTER (700 SEATS)	18,347	1	PHYSICAL EDUCATION, ASSEMBLY
ANNEX BUILDING (SPECIALTY CLASSROOMS)	4,375	1	EDUCATION
PROPOSED TOTAL AREA	36905	-	
REVISED TOTAL BUILDING AREA	157398	-	

EXISTING PARKING REQUIREMENTS:
PER CPC-8447-CU (1992), INCREASED TO 330 PARKING STALLS REQUIRED. A TOTAL OF 359 PARKING STALLS HAVE BEEN PROVIDED WHICH ARE LOCATED ON THE NORTH AND NORTHEAST QUADRANT OF THE SITE.

SCOPE OF WORK:
1. TENANT IMPROVEMENT WITHIN THE OFFICE ADMIN/CHAPEL/LIBRARY BUILDING. PROVIDE ADDITIONAL OFFICES, CONFERENCE ROOMS AND SPECIALTY CLASSROOMS. ADDITIONAL SF OBTAINED BY EXPANDING THE EXISTING 1ST FLOOR NORTH AND SOUTH..
2. TENANT IMPROVEMENT WITHIN BUILDING '10'. PROVIDE ADDITIONAL CLASSROOMS AND SPECIALTY ROOM BY WAY OF ADDING A 2ND FLOOR ONTO THE EXISTING 1-STORY BUILDING.
3. CONSTRUCT A NEW GYMNASIUM WITH ATTACHED SPORTS TRAINING CENTER. SPORTS TRAINING CENTER TO HOUSE OFFICES AND EQUIPMENT RELOCATED FROM THE 'FIELD HOUSE TRAILER.
4. CONSTRUCT A NEW 1-STORY ANNEX BUILDING FOR SPECIALTY CLASSROOMS.
5. REMOVE THE FIELD HOUSE TRAILER.
6. EXTEND VILLAGE AVE FOR FIRE DEPARTMENT ACCESS TO NEW GYMNASIUM.
7. VACATE "FUTURE" STREET EXTENSION.

SITE PLAN LEGEND

- EXISTING BUILDING STRUCTURE TO REMAIN. N.I.C.
- TENANT IMPROVEMENT TO EXISTING BUILDING STRUCTURE
- NEW BUILDING STRUCTURE
- EXISTING BUILDING STRUCTURE TO BE REMOVED

Franco & Associates Inc.
Architecture
12345 Ventura Blvd. H
Studio City, CA 91604
Tel 818 754-2030
Fax 818 754-2032

VILLAGE CHRISTIAN SCHOOL
NEW SCOPE AND TENANT IMPROVEMENTS
8930 VILLAGE AVEUE
SUN VALLEY, CA 91352

REV	DESCRIPTION	DATE
	SCHEMATIC PLAN ISSUE	10/25/24
	SCHEMATIC PLAN ISSUE #2	11/11/24
	CASE MANAGEMENT APP. ISSUE	4/23/25
	SCHEMATIC PLAN T.I. ISSUE	4/29/25
	SCHEMATIC PLAN T.I. ISSUE #2	5/16/25
	CASE MANAGEMENT MEETING	5/27/25

PROJECT
VILLAGE CHRISTIAN SCHOOL
NEW SCOPE AND TENANT IMPROVEMENTS

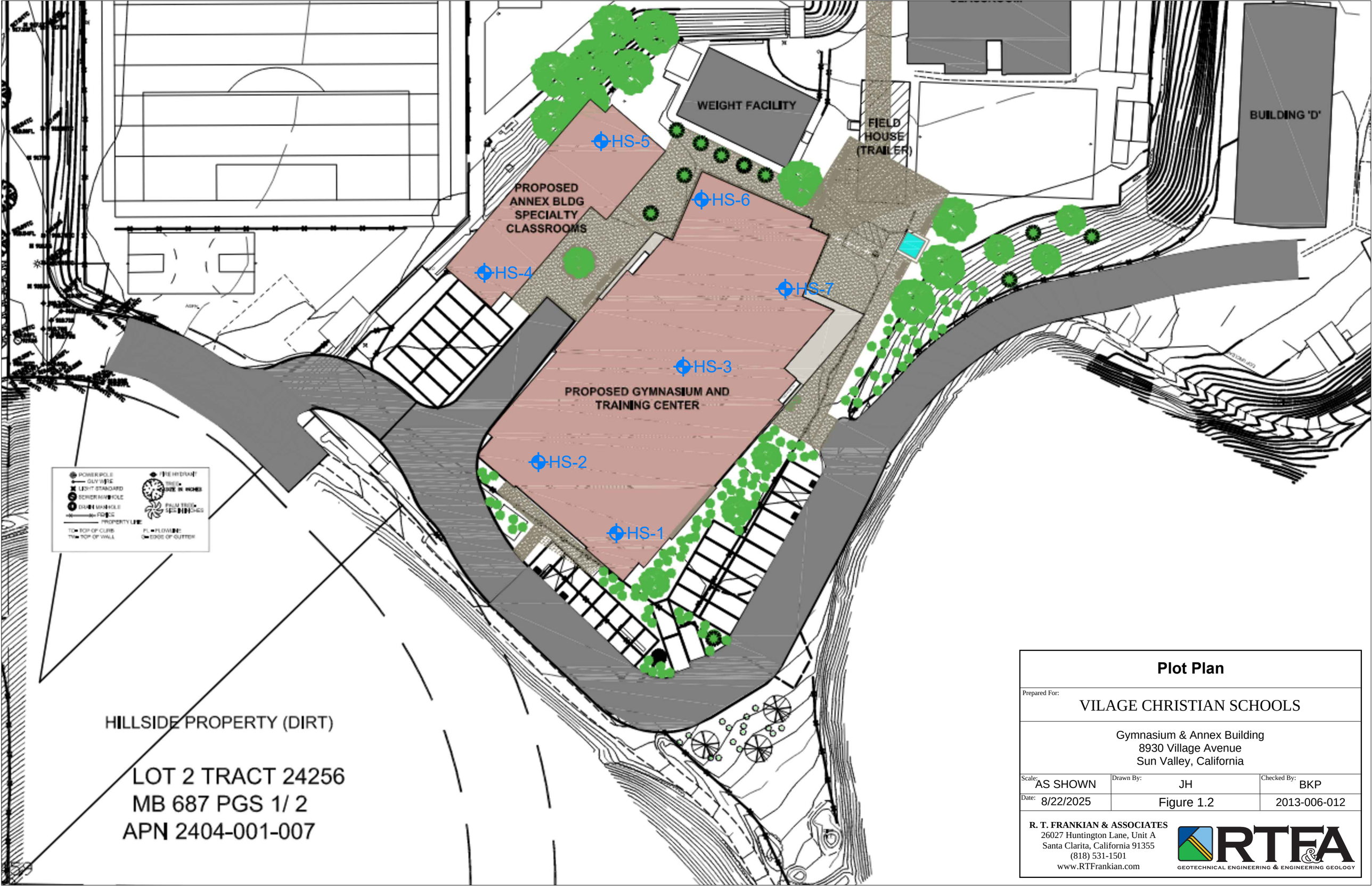
PROJECT ADDRESS
8930 VILLAGE AVENUE
SUN VALLEY
CALIFORNIA 91352

DRAWING TITLE
ENLARGED SITE PLAN
UPPER PARKING PLAN
(REFERENCE ONLY)

DRAWN BY	ISSUE DATE
	5/27/25
JOB NUMBER	DRAWING SCALE
	AS NOTED

APPROVED BY:

DRAWING NUMBER
A0.1



Plot Plan

Prepared For:
VILAGE CHRISTIAN SCHOOLS

Gymnasium & Annex Building
8930 Village Avenue
Sun Valley, California

Scale:	Drawn By:	Checked By:
AS SHOWN	JH	BKP
Date: 8/22/2025	Figure 1.2	2013-006-012

R. T. FRANKIAN & ASSOCIATES
26027 Huntington Lane, Unit A
Santa Clarita, California 91355
(818) 531-1501
www.RTFrankian.com

RTF&A
GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

Village Christian School
August __, 2025
2013-006-012

APPENDIX A

EXPLORATIONS

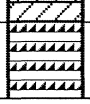
RTF&A
GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

APPENDIX A

EXPLORATIONS

The soil conditions in the area of the proposed subject improvements were explored by drilling 7, 8-inch-diameter, hollow-stem auger borings. The soils encountered were logged by our field engineer; undisturbed and bulk soil samples were obtained for laboratory inspection and testing. The results of our observations during the excavation of the borings are presented in this Appendix. Details of the explorations are summarized in the Field Explorations Section of the report and the approximate locations of the borings are shown on the Plot Plan, Figures 1.1 and 1.2. The soils encountered were classified in accordance with the United Soil Classification System.

Undisturbed samples were obtained from the borings using a heavy-duty sampler with an external diameter of 3.50 inches. The sample sleeves within the sampler are 8 inches in length and have an internal diameter of 2.625 inches. The barrel sampler was driven by successive blows from a drop hammer weighing 140 pounds and dropped from a height of 30 inches. The number of blows required to drive the sampler 12 inches was recorded as an indication of the density, or consistency, of the earth materials. The depths at which undisturbed samples were obtained and the number of blows required to drive the sampler are indicated on the boring logs.

MAJOR DIVISION			GROUP SYMBOLS		TYPICAL NAMES
COARSE GRAINED SOILS More than 50% retained on No. 200 (75 μm) sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 (4.75mm) sieve	CLEAN GRAVELS (Little or no fines)		GW	Well graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES (Appreciable amount of fines)		GM	Silty gravel, gravel-sand-silt mixture
				GC	Clayey gravels, gravel-sand-clay mixture
	SANDS More than 50% of coarse fraction passes No. 4 (4.75 mm) sieve	CLEAN SANDS (Little or no fines)		SW	Well graded sands, gravelly-sands, little or no fines
				SP	Poorly graded sands, gravelly-sands, little or no fines
		SANDS WITH FINES (Appreciable amount of fines)		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes No. 200 (75 μm) sieve	SILTS AND CLAYS (Liquid limit LESS than 50)			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS (Liquid limit GREATER than 50)			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils

*Based on the material passing the 3-inch (76 mm) sieve.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by a combination of group symbols.

PARTICLE SIZE LIMITS

SILT OR CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Coarse		
	No. 200	No. 40	No. 10	No. 4	3/4 in.	3 in.	12 in.

REFERENCE: ASTM D-2487

UNIFIED SOIL CLASSIFICATION SYSTEM

SAMPLE KEY:

- FRANKIAN LINED-BARREL SAMPLER (3.50" O.D., 2.625" I.D., 8.0" LONG SAMPLE TUBE)
- STANDARD PENETRATION TEST (ASTM D-1586)
- CALIFORNIA SAMPLER
- NO RECOVERY / DISTURBED SAMPLE
- BULK SAMPLE

BORING HS-1

JOB NUMBER: 2013-006
DATE DRILLED: 7/17/25
EQUIPMENT USED: 8" Diameter Hollow-Stem Auger with Heavy Duty Sampler
DRILLING CO.: Choice
LOGGED BY: MM
DEPTH: 0-31'

BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (LBS. PER CU. FT.)	N-VALUE	DEPTH (FEET)	SOIL TYPE	
					ML	SANDY SILT: damp, light brown
31	3	123	-		SM	SILTY SAND: fine to coarse grained, occasional fine gravel, dense, damp, tan
29	7.7	128	-	5		some fine gravel, moist, brown
11	6.1	117	-			less dense
8	5.5	113	-	10		
6	6.8	113	-			
8	5.4	118	-	15		
10	7.4	113	-	20		
10	6.8	117	-	25		reddish brown
10	9.1	114	-	30		
				35		Bottom of Boring at 31 feet. No water.
				40		

Note: The log of subsurface conditions shown hereon is approximate and applies only at the specific location and date indicated. It is not warranted to be representative of subsurface conditions at other locations or times.

BOREHOLE LOG 2013-006.GPJ FRANKIAN.GDT 8/8/25

LOG OF BORING

R.T. FRANKIAN & ASSOCIATES

BORING HS-2

JOB NUMBER: 2013-006
DATE DRILLED: 7/17/25
EQUIPMENT USED: 8" Diameter Hollow-Stem Auger with Heavy Duty Sampler
DRILLING CO.: Choice
LOGGED BY: MM
DEPTH: 0-26'

BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (LBS. PER CU. FT.)	N-VALUE	DEPTH (FEET)	SOIL TYPE	
					SM	SILTY SAND: slightly silty, damp, tan
20	6.9	120	-			fine to coarse grained, trace fine gravel, dense, moist, brown
23	6.4	135	-	5		occasional fine gravel, trace coarse gravel, light brown
34	8.8	128	-			trace fine gravel, no coarse gravel
16	5.5	123	-	10		no fine gravel
12	6	117	-			
14	5	117	-	15		
18	5.2	117	-	20		
	3.7	114		25		reddish brown
						Bottom of Boring at 26 feet. No water.
				30		
				35		
				40		

Note: The log of subsurface conditions shown hereon is approximate and applies only at the specific location and date indicated. It is not warranted to be representative of subsurface conditions at other locations or times.

BOREHOLE LOG 2013-006.GPJ FRANKIAN.GDT 8/8/25

LOG OF BORING

R.T. FRANKIAN & ASSOCIATES

BORING HS-3

JOB NUMBER: 2013-006
DATE DRILLED: 7/17/25
EQUIPMENT USED: 8" Diameter Hollow-Stem Auger with Heavy Duty Sampler
DRILLING CO.: Choice
LOGGED BY: MM
DEPTH: 0-26'

BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (LBS. PER CU. FT.)	N-VALUE	SOIL TYPE	
				ML	SANDY SILT: fine to medium grained, occasional coarse grained, damp, light brown
21	5.3	129	-	SW	SAND: fine to coarse grained, some fine to coarse gravel, dense, moist, light brown
16	12.5	121	-	SC	CLAYEY SAND: fine to coarse grained, medium dense, moist, brown
16	9.8	123	-	SM	SILTY SAND: fine to coarse grained, trace fine gravel, dense, moist, reddish brown
7	6.8	114	-		medium dense, brown
7	8.2	116	-		some fine gravel
17	8.5	128	-		dense
					light brown
22	13.7	118	-		some fine to coarse gravel, very moist
30	9.2	120	-		no gravel, very dense, moist, brown
					Bottom of Boring at 26 feet. No water.

DEPTH (FEET): 5, 10, 15, 20, 25, 30, 35, 40

SAMPLE LOCATION / GRAPHIC LOG

Note: The log of subsurface conditions shown hereon is approximate and applies only at the specific location and date indicated. It is not warranted to be representative of subsurface conditions at other locations or times.

BOREHOLE LOG 2013-006.GPJ FRANKIAN.GDT 8/8/25

LOG OF BORING

R.T. FRANKIAN & ASSOCIATES

BORING HS-4

JOB NUMBER: 2013-006
DATE DRILLED: 7/17/25
EQUIPMENT USED: 8" Diameter Hollow-Stem Auger with Heavy Duty Sampler
DRILLING CO.: Choice
LOGGED BY: MM
DEPTH: 0-31'

BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (LBS. PER CU. FT.)	N-VALUE	DEPTH (FEET)	SOIL TYPE	
					SM	SILTY SAND: dry, tan
54	2.1	136	-		SW	SAND: fine to coarse grained, trace fine gravel, very dense, damp, light brown
17	9.5	121	-	5	SC	CLAYEY SAND: fine to coarse grained, dense, damp, light brown
12	3.6	112	-		SW	SAND: fine to coarse grained, some fine gravel, loose to moderately dense, damp, tan
18	12	121	-	10	SC	CLAYEY SAND: fine to coarse grained, trace fine gravel, dense, moist, brown
7	5.3	112	-		SW	SAND: fine to coarse grained, loose to moderately dense, moist, tan
28	5.7	117	-	15	SM	SILTY SAND: fine to coarse grained, very dense, moist, brown
11	4.9	113	-	20		
16	5	119	-	25		trace fine gravel
59	9.7	128	-	30		no gravel
						Bottom of Boring at 31 feet. No water.
				35		
				40		

Note: The log of subsurface conditions shown hereon is approximate and applies only at the specific location and date indicated. It is not warranted to be representative of subsurface conditions at other locations or times.

BOREHOLE LOG 2013-006.GPJ FRANKIAN.GDT 8/8/25

LOG OF BORING

R.T. FRANKIAN & ASSOCIATES

BORING HS-5

JOB NUMBER: 2013-006
DATE DRILLED: 7/17/25
EQUIPMENT USED: 8" Diameter Hollow-Stem Auger with Heavy Duty Sampler
DRILLING CO.: Choice
LOGGED BY: MM
DEPTH: 0-26'

BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (LBS. PER CU. FT.)	N-VALUE	DEPTH (FEET)	SOIL TYPE	
				0	SM	SILTY SAND: fine to medium grained, moist, brown
24	3.7	130	-			fine to coarse grained, dense
23	4.3	130	-	5		trace coarse gravel
28	10.5	123	-			no gravel, very moist
24	10.4	122	-	10	SW	SAND: fine to coarse grained, dense, very moist, tan
34	8.6	118	-			**BEDROCK**
						SILTY SANDSTONE: fine to coarse grained, weathered, dense, moist, brown
30	8.9	118	-	15		
18	5.5	127	-	20		
28	6.8	105	-	25		
						Bottom of Boring at 26 feet. No water.
				30		
				35		
				40		

Note: The log of subsurface conditions shown hereon is approximate and applies only at the specific location and date indicated. It is not warranted to be representative of subsurface conditions at other locations or times.

BOREHOLE LOG 2013-006.GPJ FRANKIAN.GDT 8/23/25

LOG OF BORING

R.T. FRANKIAN & ASSOCIATES

BORING HS-6

JOB NUMBER: 2013-006
DATE DRILLED: 7/17/25
EQUIPMENT USED: 8" Diameter Hollow-Stem Auger with Heavy Duty Sampler
DRILLING CO.: Choice
LOGGED BY: MM
DEPTH: 0-26'

BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (LBS. PER CU. FT.)	N-VALUE	DEPTH (FEET)	SOIL TYPE	
				0	SM	SILTY SAND: fine to coarse grained, dense, moist, brown
19	9.3	124	-			
26	9.7	119	-	5		gravel
28	6	119	-			no cobble, damp, light brown
30	7.7	116	-	10		**BEDROCK**
						SANDSTONE: fine to coarse grained, occasional fine gravel, weathered, very dense, moist, light brown
20	11.5	123	-			CLAYEY SANDSTONE: fine to coarse, weathered, dense, moist, brown
30	7.1	122	-	15		SILTY SANDSTONE: fine to coarse grained, very dense, moist, brown
88	11.7	122	-	20		gravel/cobble
50/6"	7.3	115	-	25		fine to medium grained, (stoppage may be due to large rock)
						Bottom of Boring at 26 feet. No water.
				30		
				35		
				40		

Note: The log of subsurface conditions shown hereon is approximate and applies only at the specific location and date indicated. It is not warranted to be representative of subsurface conditions at other locations or times.

BOREHOLE LOG 2013-006.GPJ FRANKIAN.GDT 8/23/25

LOG OF BORING

R.T. FRANKIAN & ASSOCIATES

BORING HS-7

JOB NUMBER: 2013-006
DATE DRILLED: 7/17/25
EQUIPMENT USED: 8" Diameter Hollow-Stem Auger with Heavy Duty Sampler
DRILLING CO.: Choice
LOGGED BY: MM
DEPTH: 0-16'

BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (LBS. PER CU. FT.)	N-VALUE	DEPTH (FEET)	SOIL TYPE	
					ML	SANDY SILT: damp, light brown
60	2.4	134	-		SW	SAND: fine to coarse grained, very dense, damp, tan
60	2.3	121	-	5		trace fine gravel, rock
35	8.8	123	-			**BEDROCK**
80	3.3	122	-	10		CLAYEY SANDSTONE: fine to coarse grained, trace fine gravel, weathered, very dense, damp, tan
100/6"	2.5	123	-			gravel/cobble
80	3.2	121	-	15		SANDSTONE: fine to coarse grained, occasional fine to coarse gravel, very dense, dry to damp
						Bottom of Boring at 16 feet. No water.
				20		
				25		
				30		
				35		
				40		

Note: The log of subsurface conditions shown hereon is approximate and applies only at the specific location and date indicated. It is not warranted to be representative of subsurface conditions at other locations or times.

BOREHOLE LOG 2013-006.GPJ FRANKIAN.GDT 8/23/25

LOG OF BORING

R.T. FRANKIAN & ASSOCIATES

Village Christian School
August 22, 2025
2013-006-012

APPENDIX B

LABORATORY TESTS

RTF&A
GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

APPENDIX B

LABORATORY TESTS

Laboratory tests were performed on selected samples obtained from the borings to aid in the classification of the soils and to determine their engineering properties.

Moisture and Density Tests: Moisture content and unit dry density tests were performed on samples of undisturbed soil obtained in the test borings. Dry density and field moisture information is useful in correlating field and laboratory data and in providing an indication of the variations of soil characteristics. The results of these tests are shown on the Log of Borings in Appendix A.

Direct Shear Tests: Direct shear tests were performed on remolded bulk samples to determine the strength of the soils. The tests were performed after soaking the samples to near-saturated moisture content and at various surcharge pressures. The results of the direct shear tests are indicated on the attached summary of "Direct Shear Tests."

Consolidation Tests: Confined consolidation tests were performed on selected undisturbed samples at and below the proposed foundation level. Tests were performed on samples at or near the field moisture state. Samples of bearing soils that may become inundated were also tested in an artificially saturated state. For purposes of presentation, the results of the pertinent consolidation tests performed are shown on the attached summary of "Consolidation Tests."

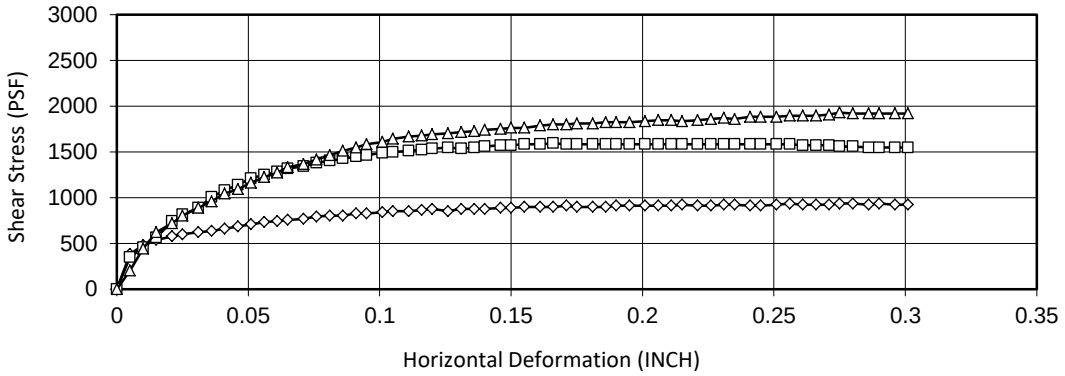
Maximum Density Tests: The maximum dry densities and optimum moisture contents of bulk soil samples obtained from the test borings were determined in our laboratory in accordance with the current ASTM Soil Compaction Method D 1557. The maximum dry density of each soil sample was determined from that portion of the sample that passed through the No. 4 sieve. The results of the maximum dry density tests are as follows:

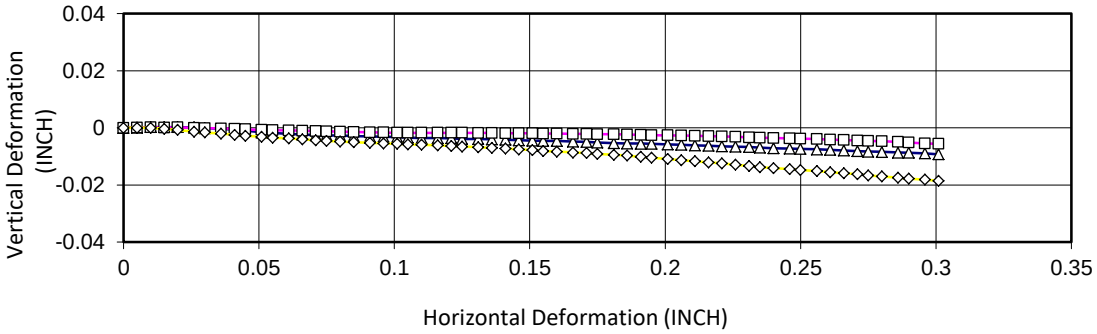
Soil Description and Classification	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
(HS-1 @ 1'-5') Medium brown, silty, very fine to fine with occasional medium sand (SM)	129.5	9.5
(HS-5 @ 1'-5') Medium brown, silty, very fine to fine with occasional clay size (SM)	136.5	6.5

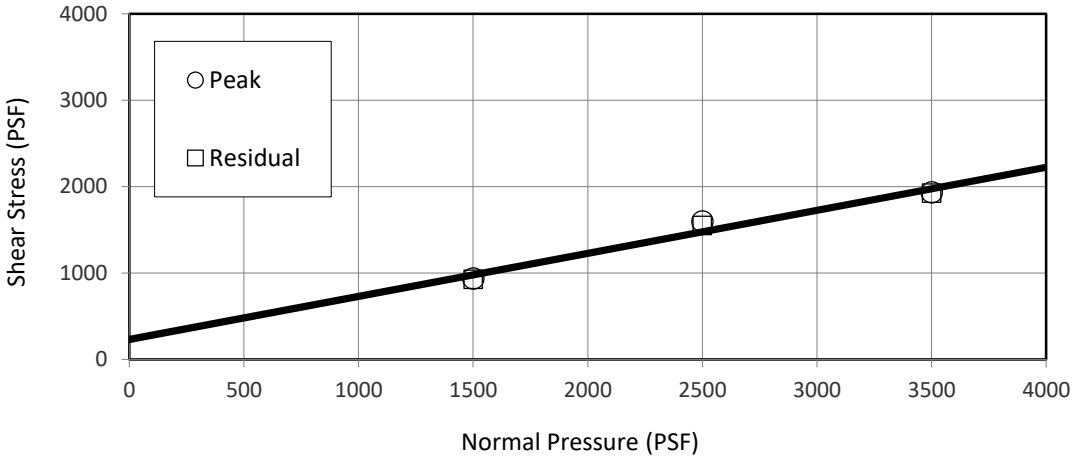
The optimum moisture contents are in percent of dry weight and the maximum dry densities are in pounds per cubic foot (pcf). The double-letter soil classification that follows each soil description is in accordance with the Uniform Soil Classification System (ASTM D 2487-00).

Expansion Index Tests: Expansion Index tests provide an index to the expansion potential of soils when inundated with water. This test method controls variables that influence the expansive characteristics of soils. Bulk soil samples were obtained from the test borings drilled for the subject investigation and Expansion Index tests were performed on the samples in accordance with ASTM Standard D4829. The results of the tests are presented below:

Sample No.	Expansion Index	Expansion Category
HS-1 @ 1'-5'	15	Very Low
HS-5 @ 1'-5'	42	Low







Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
HS-1	S-10	1.0-5.0	Ring	SC	○	243	26
					□	219	26

Note: Sample was remolded to **126.5 pcf** dry density and 8**.5%** moisture
Shear rate: **0.01 in/min**

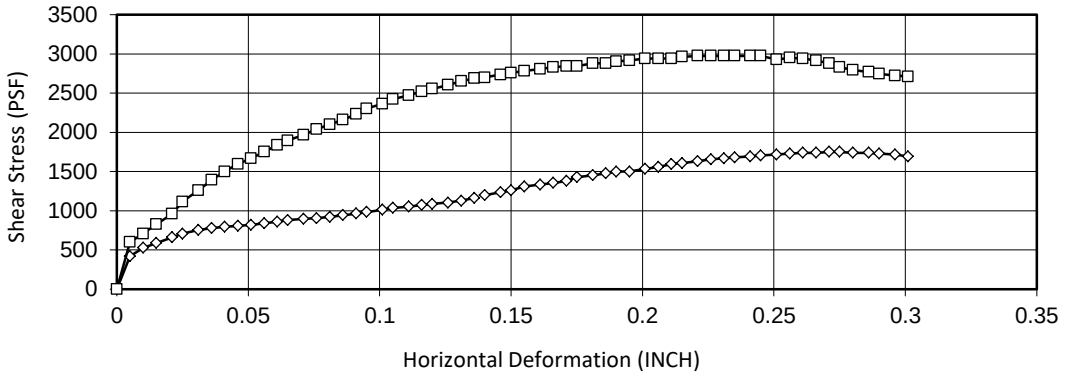
Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
1500	8.5	16.8
2500	8.5	15.8
3500	8.5	15.4

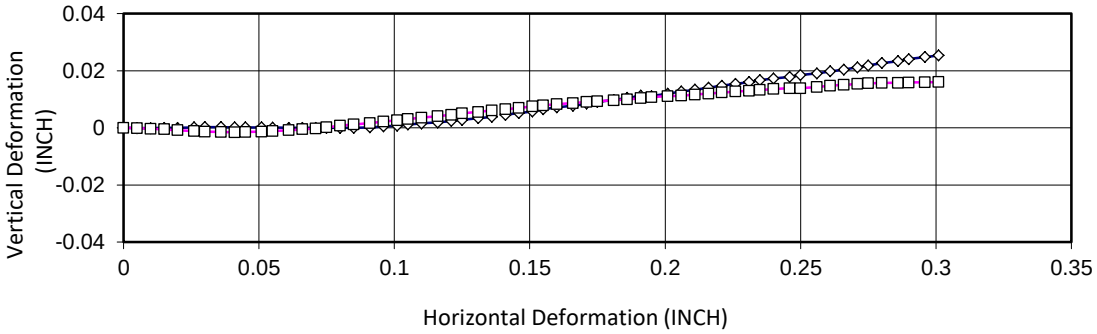
EGLAB, INC.

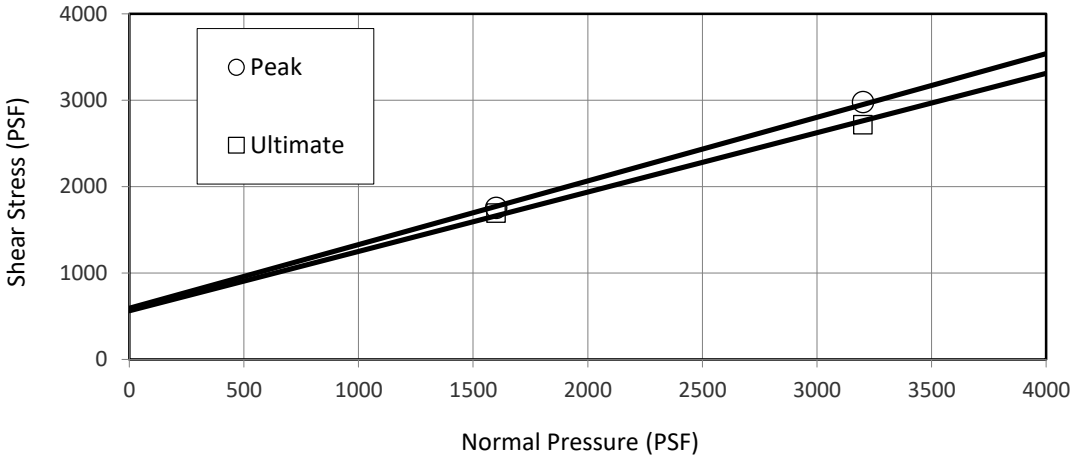
Project Name:
Village Christian Schools Project
Client: R.T. Frankian & Associates
Project No.: 2013-006-012
EGLAB Project No.: 25-013-004

DIRECT SHEAR

08/25 (ASTM D3080) Figure







Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
HS-3	S-2	5.0	Ring	SC	○	591	36
					□	563	34

Note: Shear rate: **0.01 in/min**

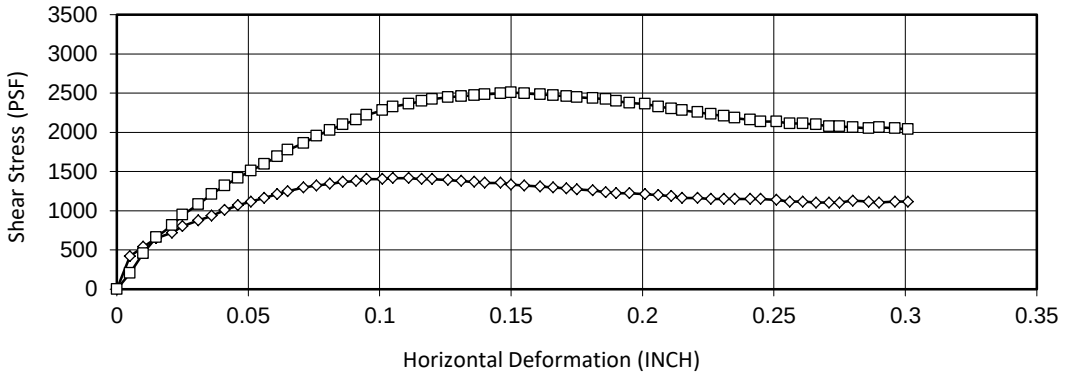
Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
1600	13.4	14.0	125.6	100
3200	13.4	14.7	128.1	100

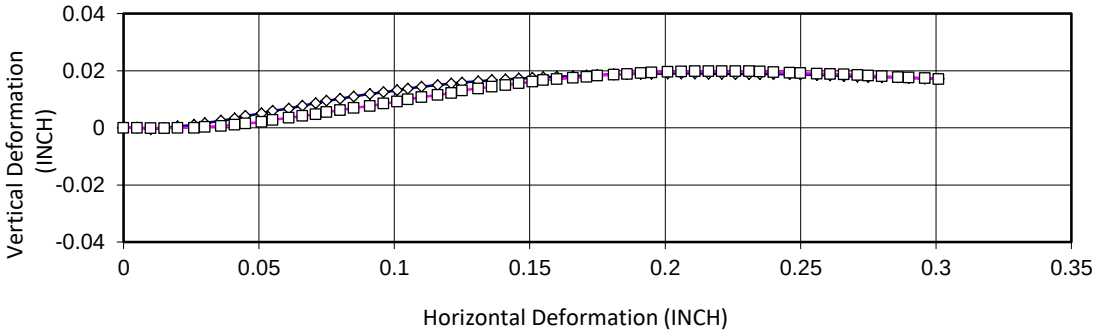
EGLAB, INC.

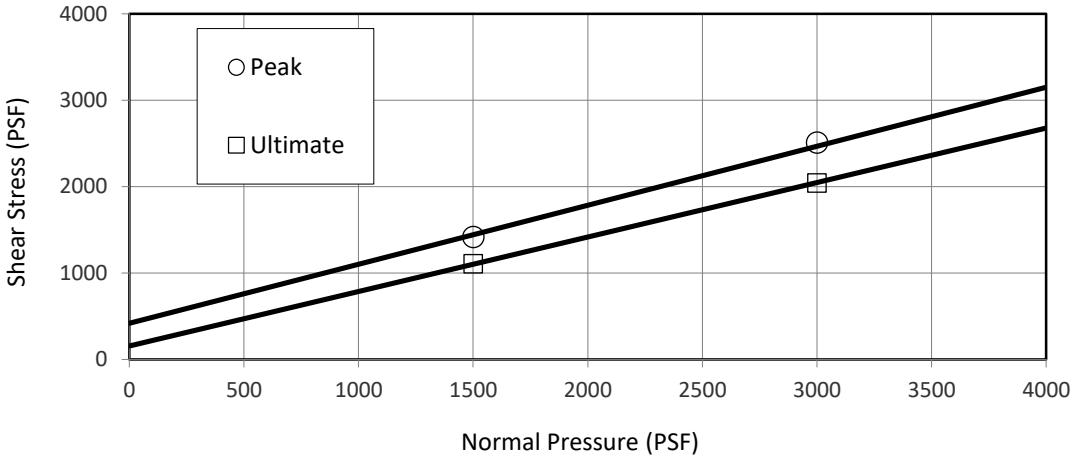
Project Name:
Village Christian Schools Project
Client: R.T. Frankian & Associates
Project No.: 2013-006-012
EGLAB Project No.: 25-013-004

DIRECT SHEAR

08/25 (ASTM D3080) Figure







Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
HS-4	S-2	5.0	Ring	SC	○	420	34
					□	154	32

Note: Shear rate: **0.01 in/min**

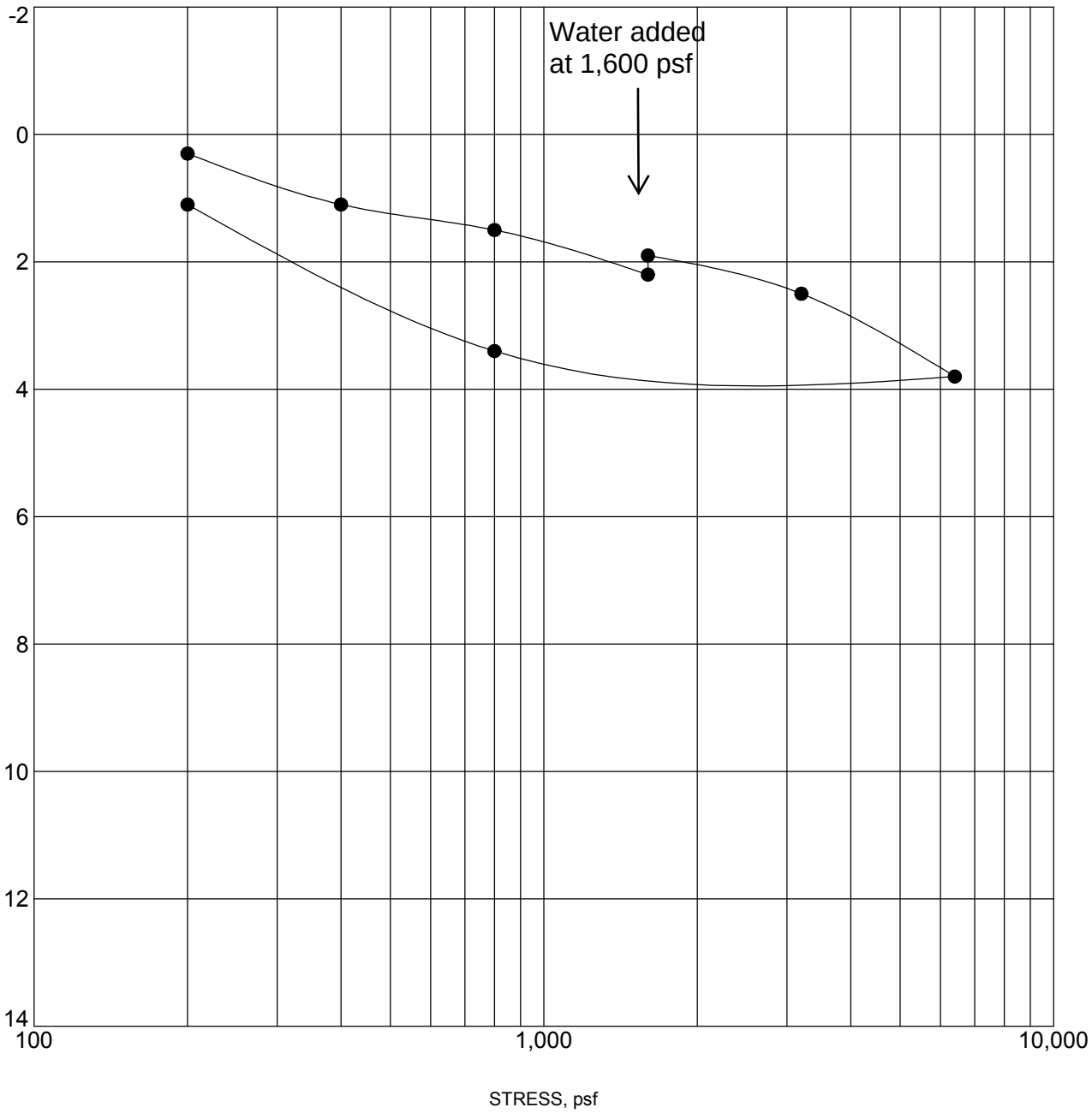
Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
1500	11.6	13.9	125.7	100
3000	11.6	14.0	127.6	100

EGLAB, INC.

Project Name:
Village Christian Schools Project
Client: R.T. Frankian & Associates
Project No.: 2013-006-012
EGLAB Project No.: 25-013-004

DIRECT SHEAR

08/25 (ASTM D3080) Figure



Water added at 1600 psf

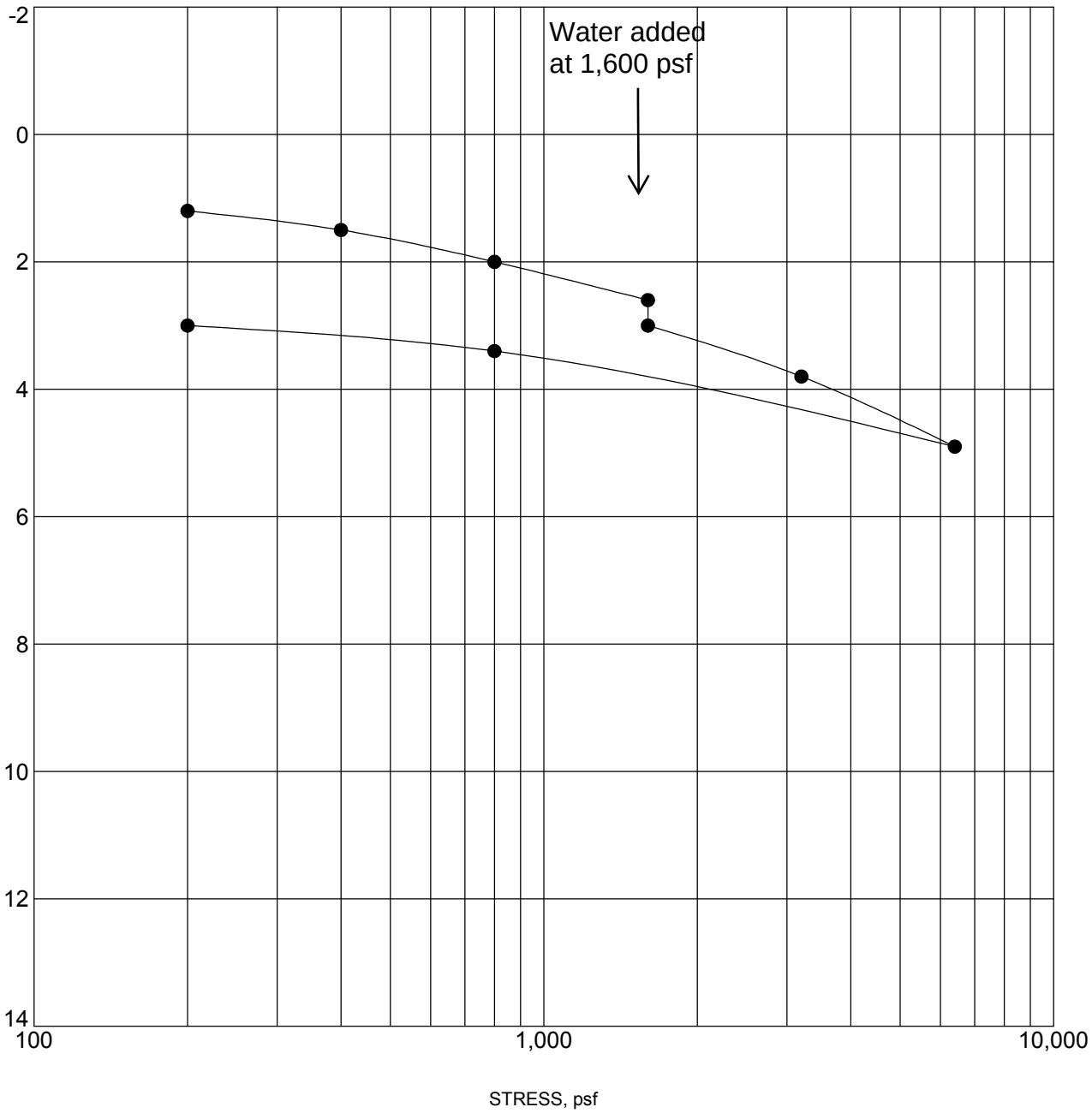
Specimen Identification		Classification
●	**HS-5 1-5'**	Remolded to dry density of
⊠		130.5 pcf at 9.3% moisture
▲		
★		
⊙		
✿		

R. T. Frankian & Associates
26027 Huntington Lane, Suite A
Santa Clarita CA 91355
Telephone: 818 531 1501
Fax: 818 531 1510

CONSOLIDATION TEST

JOB NUMBER: 2013-006

REPORT DATED:



Water added at 1600 psf

Specimen Identification		Classification		
●	**HS-5 5.0'**			
⊠				
▲				
★				
⊙				
✪				

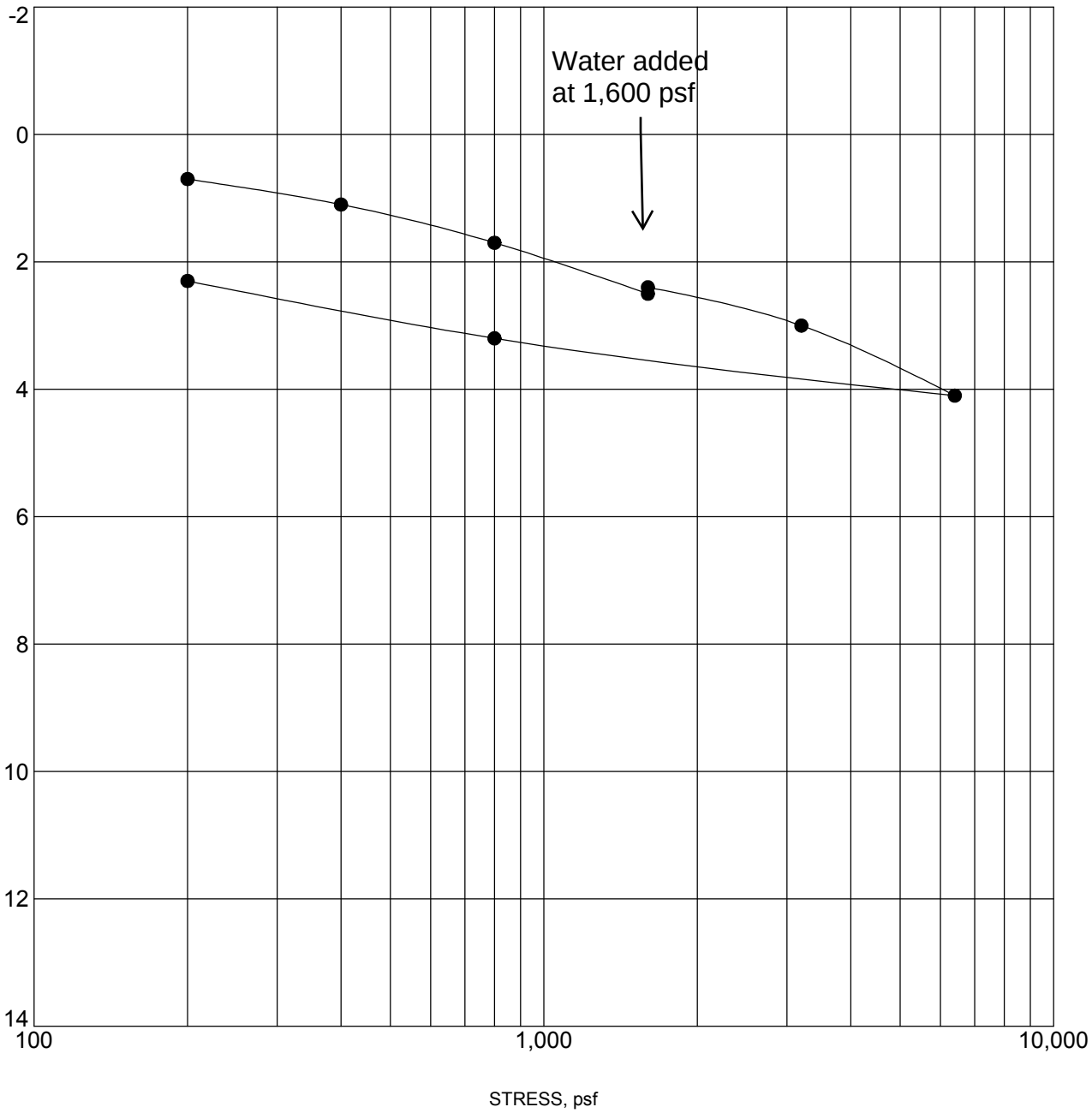
R. T. Frankian & Associates
26027 Huntington Lane, Suite A
Santa Clarita CA 91355
Telephone: 818 531 1501
Fax: 818 531 1510

CONSOLIDATION TEST

JOB NUMBER: 2013-006

REPORT DATED:

US CONSOL STRAIN 2013-006.GPJ FRANKIAN.GDT 8/22/25



Water added at 1600 psf

Specimen Identification		Classification		
●	**HS-7 8.0'**			
⊠				
▲				
★				
⊙				
✪				

R. T. Frankian & Associates
26027 Huntington Lane, Suite A
Santa Clarita CA 91355
Telephone: 818 531 1501
Fax: 818 531 1510

CONSOLIDATION TEST

JOB NUMBER: 2013-006

REPORT DATED: