REPORT OF GEOTECHNICAL INVESTIGATION

SEDONA LOFTS
10 NAVAJO DRIVE
SEDONA, ARIZONA 86336
ACS PROJECT NO. 2001877

PREPARED FOR:

Mr. Keith Holben, Manager
KMJ LIV, LLC
15010 N. 78th Way, Suite 109
Scottsdale, AZ 85260

PREPARED BY:

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January 12, 2021

ACS

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ACS SERVICES LLC

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DBE - SBE - WBE

January 12, 2021 Project 2001877

Mr. Keith Holben, Manager
KMJ LIV, LLC
15010 N. 78th Way, Suite 109
Scottsdale, AZ 85260

RE: GEOTECHNICAL INVESTIGATION REPORT
SEDONA LOFTS
10 NAVAJO DRIVE
SEDONA, ARIZONA 86336

Dear Keith:

Transmitted herewith is a copy of the final report of the subsurface soil and foundation investigation on the above-mentioned project. The services performed provide an evaluation at selected locations of the subsurface soil conditions throughout the zone of significant foundation influence. As an additional service, this firm may review the project plans and structural notes for conformance to the intent of this report.

This firm possesses the capability to provide testing and inspection services during the course of construction. Such quality control/assurance activities may include, but are not limited to, compaction testing as related to fill control, foundation inspection, and concrete sampling. Please notify this firm if a proposal for such services is desired.

Should any questions arise concerning the content of this report, please feel free to contact this office at your earliest convenience.

Respectfully submitted,

ACS SERVICES LLC

H. Eugene Hansen, P.E.
Geotechnical and Materials Testing Engineer

cc: (1) Addressee via email (pdf copy)

SCOPE

This report is submitted following a geotechnical investigation conducted by this firm for the proposed **SEDONA LOFTS**, located at 10 Navajo Drive, in Sedona, Arizona 86336. The objectives of the investigation were to determine the physical characteristics of the soil underlying the site and to provide final recommendations for safe and economical foundation design and slab support. For purposes of foundation design, the maximum column and wall loads have been assumed to be as summarized below.

	Maximum Column Load (KIPS)	Maximum Wall Load (KLF)
Shallow Spread Foundations	74	4.5

Anticipated structural loads in excess of those stated above will need to be addressed in an addendum, i.e. they are not covered under the scope of work involved with this effort. The recommendations for site grading contained in this report do not address the presence or removal of contaminants from the site soils.

FIELD INVESTIGATION

On December 15 and 16, 2020, this firm advanced fifteen (15) exploratory test borings (6.625-inch hollow stem auger) for examination of the subsurface soil profile to depths ranging from 2.0 to 15.5 feet below the existing site grade. Borings 3, 6, 9, 10, 11, 13, 14, and 15 were terminated at depths ranging from 2.0 to 12.0 feet due auger refusal on hard mudstone bedrock (Supai Formation). The soils and rock encountered were examined, visually classified and wherever applicable, sampled. Refer to the Boring Logs in Appendix B for a detailed description of the subsurface soil and rock conditions at the boring locations. Refer to Figure 2 in Appendix A for the approximate locations of the borings.

On December 15, 2020, one (1) standard percolation test was conducted at the location of a proposed retention basin in the southwest corner of the site (See Figure 2 in Appendix A). The percolation test was initiated through the advancement of a 14-inch boring to a depth of approximately 3 feet below the existing site grade. A PVC sleeve or lining with a diameter of 12.0 inches was placed within the borehole and soil was backfilled around it. The test hole was presoaked for approximately one hour, and then refilled to a water depth of approximately 12 inches. The rate of water level decline was recorded at approximately 10 minute time intervals until a stabilized rate had been achieved. The results of the percolation test are presented in Appendix C. The measured stabilized infiltration rate was 8.577 minutes per inch (0.5833 ft^3/hr per ft^2 of drainage area) for Percolation Test P-1**. This percolation rate has not be de-rated, which may be required for retention basin design.**

Boring B-1 was drilled next to the percolation test to a depth of 14.0 feet below the existing ground surface. The native soils below 3.0 feet are generally stiff to very stiff sandy silt soils. Refer to the boring log for Boring B-1 in Appendix B for a detailed description of the subsurface soil conditions below the location of the standard percolation test.

LABORATORY TESTING

Representative samples obtained during the field investigation were subjected to the following laboratory analyses:

Test	Sample(s)	Purpose
Consolidation	Undisturbed native soils (9)	Allowable soil bearing capacity and settlement analysis
Sieve Analysis and Atterberg Limits	Native subgrade soils (13)	Soil classification
Proctor	Native subgrade soils (2)	Moisture-Density Relationship

Refer to Appendix D of this report for the results of the laboratory testing.

SITE CONDITIONS

General Notes:

(1) Topographic relief — The surface of the site slopes gently downward to the south-southwest.

(2) Fill — No apparent fill was encountered at the locations of the borings.

(3) Evidence of surface disturbance — The surface of the site has not been significantly disturbed.

(4) Site use — The site is currently vacant native high desert land. The site is moderately vegetated with some trees and bushes, weeds and wild grass, and a few yucca cacti. Refer to Figure 2 in Appendix A for an aerial view of the current site conditions.

GEOLOGIC HAZARDS

The following list represents a general summary of the on-site soil characteristics relative to engineering applications:

Depth to groundwater - None encountered
Potential for soil expansion - Low based on the plasticity index test data for the upper native site soils
Potential for soil collapse - Moderate based on the laboratory consolidation test data and field penetration blow counts for the native soils below foundation level
Existence of loose soil at foundation bearing elevation - Possible
Potential for excessive differential soil movement - Moderate based soil collapse potential

Potential for earth subsidence fissures	- Not applicable
Frost depth	- 1.0 feet, Sedona
Presence of caliche, bedrock or other hard stratum	- Hard sandy clay or silt soils or very dense silty gravelly sand soils (highly weathered mudstone bedrock) were encountered below depths ranging from 1.5 to 9.0 feet at the locations of the borings. Auger refusal on hard mudstone bedrock (Supai Formation) was encountered at depths ranging from 2.0 to 12.0 feet at the locations of the Borings 3, 6, 9, 10, 11, 13, 14, and 15.
2006/2018 IBC Site Class	- C, very dense soil or soft rock

RECOMMENDATIONS

The recommendations contained herein are based upon the properties of the surface and subsurface soils as described by the field and laboratory testing, the results of which are presented and discussed in this report. Alternate recommendations may be possible and will be considered upon request.

Conventional Spread Foundations

It is recommended that all perimeter foundations and isolated exterior foundations be embedded a minimum of 1.5 feet below the lowest adjacent finish pad grade within 5.0 feet of proposed exterior walls. Interior footings should be founded a minimum of 1.5 feet below finish floor level.

For all construction, 2.0 feet and 1.33 feet are recommended as the minimum width of spread and continuous footings, respectively.

The following tabulation may be used in the design of spread (column) and continuous (wall) foundations for the proposed structures. The column labeled Bearing stratum refers to the soil layer that the footing pad rests on, and does not imply that the foundation be fully embedded into that particular stratum.

Conventional Surface Level Foundations Bearing on Controlled Compacted Fill:

			Allowable Load	
Foundation Depth (ft)	**Bearing Stratum**	**Allowable Soil Bearing Pressure**	**Wall (KLF)**	**Column (KIP)**
1.5	1.0 feet of controlled compacted fill	1500 PSF	4.5	74

***** It is necessary that a minimum of 1.0 feet of controlled compacted fill lie beneath all foundations for the structure. The over-excavation to a depth of 2.5 feet below finished pad

grade to achieve 1.0 feet of controlled compacted fill beneath foundations shall extend across the entire building pad and to a minimum lateral distance of five feet beyond exterior foundation edges. **The over-excavation for placement of controlled compacted fill below foundations may be terminated upon contact with hard sandy silt to clay soils or very dense silty gravelly sand soils (highly weathered mudstone bedrock - Supai Formation), which were encountered below depths ranging from 1.5 to 9.0 feet at the locations of the borings.**

Alternatively, foundations may bear directly on native undisturbed soil as follows:

Surface Level Foundations Bearing on Native Undisturbed Soil

			Allowable Load	
Foundation Depth (ft)	**Bearing Stratum**	**Allowable Soil Bearing Capacity**	**Wall (KLF)**	**Column (KIP)**
2.5	Native undisturbed soil	1500 PSF	4.5	74

A mixture of 2-sack ABC/cement slurry may be utilized in the lower portions of the foundation excavations for footings bearing on native undisturbed soil. If 2-sack ABC/cement slurry is used, a minimum of 1.0 feet of the mixture should underlie a conventional foundation depth of 1.5 feet (for an allowable soil bearing capacity of 1500 PSF). The width of the mixture of 2-sack ABC/cement slurry shall equal the width of the footing. **Foundation excavations for foundations bearing on native undisturbed soils may be terminated at a depth of less than 2.5 feet upon contact with hard sandy silt to clay soils or very dense silty gravelly sand soils (highly weathered mudstone bedrock - Supai Formation), which were encountered below depths ranging from 1.5 to 9.0 feet at the locations of the borings. However all foundations must have a minimum foundation embedment depth of 1.5 feet.**

Explanations

Foundation Embedment Depth - i.e.,

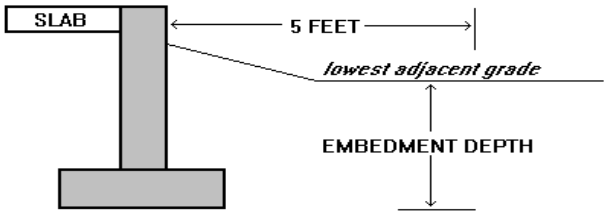
A) The depth below the lowest adjacent exterior pad grade within 5.0 feet of proposed exterior walls;

B) The depth below finish compacted pad grade provided that a sufficient pad blow-up (the lateral extent to which the building pad is constructed beyond the limits of the exterior walls or other structural elements, inclusive of exterior column foundations) has been incorporated into the grading and drainage design (5.0 feet or greater);

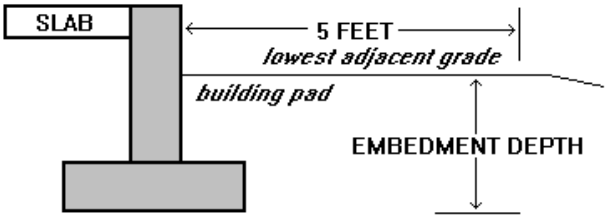
C) The depth below finish floor level for interior foundations.

FOUNDATION EMBEDMENT

Condition A



Condition B



The previously tabulated bearing values and the allowable wall and column loads associated with each are based on a total settlement of 1/2 inch. **It is anticipated that the magnitude of differential settlement will be roughly 1/4 inch** if construction is performed in accordance with locally accepted standards and the recommendations contained herein.

The allowable loads are based on maximum footing sizes of 3.0 and 7.0 feet for continuous and spread footings, respectively. Greater loads and larger footings may be accommodated by the listed bearing values, if there is toleration for increased settlements. This office should be contacted if this situation should arise.

The weight of the foundation below grade may be neglected in dead load computations.

The previously tabulated bearing capacities should be considered allowable maximums for dead plus design live loads and may be increased by one-third when considering total loads, including wind or seismic forces or other transient loading conditions.

Retaining wall or building foundations to be constructed in close proximity to retention basins (within 5.0 feet) should be embedded 1.0 feet deeper than the stated depths in the preceding bearing capacity tables.

Shallow foundations that are adjacent to lower foundation areas must be stepped down so that their base is below the lower backfill materials, and below a line projected upward from the nearest lower foundation edge at a 45 degree angle. In no case should ancillary structures be designed or constructed, whose foundations will bear into deeper, non-verified backfills.

This firm recommends that continuous footings and stem walls be reinforced, and bearing walls be constructed with frequent joints to better distribute stresses in the event of localized foundation movements. Similarly, all masonry walls should be constructed with both vertical and horizontal reinforcement.

It is strongly recommended that all foundation excavations be inspected (prior to the placement of reinforcing steel) by a representative of the project geotechnical engineer, **ACS Services LLC**, to ensure that they are free of loose soil which may have blown or sloughed into the excavations, the embedment depth is adequate, and the dimensions are in accordance with the project requirements. It will also be necessary for the project geotechnical engineer, **ACS Services LLC**, to verify that the footings will bear upon a minimum of 1.0 feet of controlled compacted fill as described above with a minimum foundation embedment of 1.5 feet. Alternatively, footings may bear on native undisturbed soil as described above with a minimum foundation embedment depth of 2.5 feet.

A minimum of MAG A (3000 PSI), or equivalent, concrete with Type II cement should be used for footings, stem walls and floor slabs.

Lateral Stability Analyses

The following tabulation presents recommendations for lateral stability analyses for native undisturbed soil, controlled compacted fill, and highly weathered mudstone bedrock:

[a]Foundation Toe Pressures .....1.33 x max. allowable

	Native Undisturbed Soil	Controlled Compacted Fill	Highly Weathered Mudstone Bedrock
[b]Lateral Backfill Pressures:			
Unrestrained walls	38 psf/ft.	34 psf/ft.	30 psf/ft.
Restrained walls[c]	56 psf/ft.	52 psf/ft.	46 psf/ft.
Lateral Passive Pressures For Surficial Soils:			
Continuous walls/footings	195 psf/ft.	240 psf/ft.	249 psf/ft.
Spread columns/footings	291 psf/ft.	358 psf/ft.	371 psf/ft.
Coefficient of Base Friction For Surficial Soils:			
Independent of passive resistance	0.53	0.62	0.67
In conjunction with passive resistance	0.36	0.42	0.45

Superscript Explanations

[a]Increase in allowable foundation bearing pressure (previously stated) for foundation toe pressures due to eccentric or lateral loading.

[b]Equivalent fluid pressures for vertical walls and horizontal backfill surfaces (maximum 12.0 feet in height). Pressures do not include temporary forces during compaction of the backfill, expansion pressures developed by overcompacted clayey backfill, hydrostatic

pressures from inundation of backfill, or surcharge loads. Walls should be suitably braced during backfilling to prevent damage and excessive deflection.

[C]The backfill pressure can be reduced to the unrestrained value if the backfill zone between the wall and cut slope is a narrow wedge (width less than one-half height).

Drainage

In unpaved areas, it is suggested that finished slopes extend a minimum of 5.0 feet horizontally from building walls and have a minimum vertical fall of 3.0 inches. Minimum grades of 2 percent should be maintained where the horizontal slope distance exceeds 5.0 feet. **In no case should long-term ponding be allowed near structures.** Backfill against footings, exterior walls, retaining walls, and in utility trenches should be well compacted to minimize the possibility of moisture infiltration through loose soil.

Conventional Slab Support

Site grading within the building areas should be accomplished as recommended herein. Aggregate base course (ABC) floor fill should immediately underlie interior grade floor slabs with a typical thickness of 4.0 inches. The aggregate base material should conform to the requirements of Section 702 under Sub-section 702.2 "Crushed Aggregate" of the "Uniform Standard Specifications for Public Works Construction" sponsored by the Maricopa Association of Governments and all supplements which require a particle size grading as follows:

Sieve Size	Percent Passing
1-1/4”	100
#4	38-65
#8	25-60
#30	10-40
#200	3-12

Maximum Plasticity Index – 5

Building pads for conventional systems should be constructed with sufficient lateral pad “blow-up” to accommodate the entire perimeter slab width.

To further reduce the potential for slab related damage in conjunction with conventional systems, we recommend the following:

1. Placement of effective control joints on relatively close centers.
2. Proper moisture and density control during placement of subgrade fills.
3. Provision for adequate drainage in areas adjoining the slabs.
4. Use of designs which allow for the differential vertical movement described herein between the slabs and adjoining structural elements, i.e. ½ inch.

The use of vapor retarders may be considered for any slab-on-grade where the floor will be covered by products using water based adhesives, wood, vinyl backed carpet, vinyl tile, impermeable floor coatings (urethane, epoxy, or acrylic terrazzo),and moisture-sensitive rock tile products. When used, the design and installation should be in accordance with the recommendations given in ACI 302.1R-04, Section 3.2.3 Moisture protection.

Fill Slope Stability

The maximum fill slopes may conform to a 3:1 (horizontal:vertical) ratio if fill is placed in accordance with the recommendations contained herein.

Pavement Design

Site grading within pavement areas should provide requisite subgrade support for flexible pavements. A compacted subgrade of on-site soils or soils with comparable properties is assumed. The stability of compacted pavement subgrade soils is reduced under conditions of increased soil moisture. Therefore, base course or pavement materials should not be placed when the surface is in a wet condition. Adequate surface drainage should be provided away from the edge of paved areas to minimize lateral moisture transmission into the subgrade.

The following presents the recommended pavement sections for on-site pavements:

Light Vehicles or Low Volume Traffic Areas (Parking Areas)

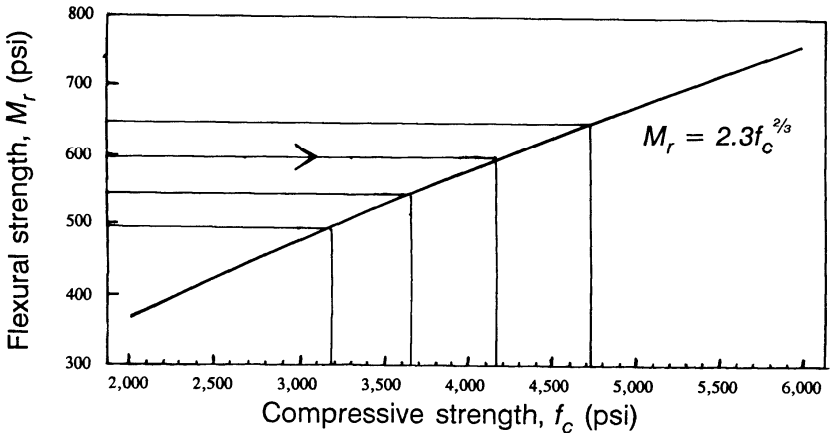
Alternate	Prepared Subgrade (Inches)	ABC (Inches)	Asphaltic Concrete (Inches)	Concrete Pavement (Inches)
A[a]	8	6	2	
B[a]	8		4	
C[b]	8			5.5*

Heavy Vehicle Areas (Drive Areas or Path of Garbage Trucks)

Alternate	Prepared Subgrade (Inches)	ABC (Inches)	Asphaltic Concrete (Inches)	Concrete Pavement (Inches)
A[a]	8	6	3	
B[a]	8		5	
C[b]	8			6.5*

[a] – 10 to 15 year design life, with typical maintenance
[b] – 20 year design life, with typical maintenance

***The above thicknesses for Portland Cement concrete pavement are based on a modulus of rupture of 600 PSI. The recommended concrete thicknesses should be increased in increments of 0.5 inch for every 50 PSI decrease in the modulus of rupture. The following chart relates rupture modulus to compressive strength.**



All 8.0 inches of the prepared subgrade may be comprised of the native site soils.

Specifications for ABC should be as previously stated under "Slab Support". Compaction of subbase fill and base course materials should be accomplished to the density criteria listed under "Compaction and Moisture Content Recommendations".

Compaction of asphalt should be accomplished to the following density criteria:

Material	Percent Compaction 75-blow method
Asphaltic Concrete	95 minimum

The asphaltic concrete material shall conform to all requirements as established in MAG Section 710 for Asphaltic Concrete Mix Designation 1/2" Marshall mix.

EARTHWORK

The following final earthwork recommendations are presented as a guide in the compilation of construction specifications. The final recommendations are not comprehensive contract documents and should not be utilized as such.

Site Preparation

It is recommended that all trees or bushes (inclusive of significant root systems), weeds, wild grass, yucca, and any other deleterious material be removed from proposed structure and pavement areas at the commencement of site grading activities.

Following the removal of the above-listed items, the uppermost 8.0 inches of the native soils should be scarified, moisture processed and properly compacted in accordance with the section on compaction and moisture content recommendations in all areas (i.e. slab support areas and proposed pavement areas), prior to the placement of structural fill or resultant in a cut situation.

Scarification and compaction may be waived if highly weathered mudstone bedrock is exposed after completion of the removals.

Special note for all structures for conventional foundations on controlled compacted fill: To accommodate a minimum of 1.0 feet of controlled compacted fill below foundations to achieve an allowable bearing pressure of 1500 PSF, over-excavation and re-compaction of soils to a minimum depth of 2.5 feet below finish pad grade shall be required. **The over-excavation for placement of controlled compacted fill below foundations may be terminated upon contact with hard sandy silt to clay soils or very dense silty sandy gravel soils (highly weathered mudstone bedrock - Supai Formation), which were encountered below depths ranging from 1.5 to 9.0 feet at the locations of the borings.** Over-excavation and re-compaction shall extend across the entire area of the building pad and to a minimum lateral distance of five feet beyond foundation edges. **The proper depth of over-excavation must be verified by the project geotechnical engineer, ACS Services LLC, prior to placement of controlled compacted fill for the building pads.** The base of the zone of sub-excavation will not require scarification and compaction prior to placement of controlled compacted fill for the building pad.

Complete removal and cleaning of any undesirable materials and proper backfilling of removal excavations will be necessary to develop support for the proposed facilities. Widen all removal over-excavations or depressions as necessary to accommodate compaction equipment and provide a level base for placing any fill. All fill shall be properly moistened and compacted as specified in the section on compaction and moisture content recommendations.

All removed native soils are considered by this firm to be suitable for use as engineered fill, provided that they are free of vegetation, debris, and oversized particles (greater than 3.0 inches).

All subbase fill required to bring the structure areas up to subgrade elevation should be placed in horizontal lifts not exceeding 6.0 inches compacted thickness or in horizontal lifts with thicknesses compatible with the compaction equipment utilized.

It is very important that a sufficient pad blow-up (the lateral extent to which each building pad is constructed beyond the limits of the exterior walls or other structural elements, inclusive of exterior column foundations) be incorporated into the site grading (5.0 feet or greater).

It is the understanding of this firm that various utility trenches may traverse the completed pads. The backfill of all utility trenches, if not in conformance with this report, may adversely impact the integrity of the completed pads. This firm recommends that all utility trench backfill crossing the pads be inspected and tested to ensure full conformance with this report. Untested utility trench backfill will nullify any as-built grading report regarding the existence of controlled compacted fill beneath the proposed building foundations and place the owner at greater risk in terms of potential unwanted foundation and floor slab movement.

Compaction and Moisture Content Recommendations

Compaction of backfill, subgrade soil, subbase fill, and base course materials used as subbase fill or backfill for structural or pavement support should be accomplished to the following density criteria:

Material	Percent Compaction (ASTM D698)
On-site native soils:	
Building areas below foundation level	95 min.
Building areas above foundation level	95 min.
Below asphalt pavements	95 min.
Imported fill material:	
Building areas below foundation level	95 min.
Building areas above foundation level	95 min.
Below asphalt pavements	95 min.
Base course:	
Below asphalt pavements	100 min.
Below interior concrete slabs	95 min.

Increase the required degree of compaction to a minimum of 98 percent for fill materials greater than 5.0 feet below final grade.

During construction and prior to concrete placement, moisture contents should be controlled as follows:

Material	Compaction Moisture Content Range
On-site native soils:	
Building areas below foundation level	optimum -2 to optimum +2%
Building areas above foundation level	optimum -2 to optimum +2%
Below asphalt pavements	optimum -2 to optimum +2%
Imported fill material:	
Building areas below foundation level	optimum -2 to optimum +2%
Building areas above foundation level	optimum -2 to optimum +2%
Below asphalt pavements	optimum -2 to optimum +2%

Note: The recommendations previously tabulated under the heading entitled "Above Foundation Level" also apply to the subgrade in exterior slab, sidewalk, curb, and gutter areas except as otherwise noted.

Any soil disturbed during construction shall be compacted to the applicable percent compaction as specified herein.

Natural undisturbed soils or compacted soils subsequently disturbed or removed by construction operations should be replaced with materials compacted as specified above.

All imported fill material to be used as structural-supporting fill, should be free of vegetation, debris, and other deleterious material and meet the following requirements:

Maximum Particle Size	3 inches
Maximum Plasticity Index	14
Maximum Passing #200 Sieve	60 percent
Maximum Expansion	1.5 %*

* - Performed on a sample remolded to 95 percent of the maximum ASTM D698 density at roughly 2.0 percent below the optimum moisture content, under a 100 psf surcharge.

Water settling and/or slurry shall not be used, in any case, to compact or settle surface soils, fill material, or trench backfill within 10.0 feet of any proposed structure.

Shrinkage

Assuming the average degree of compaction will approximate 95 percent of the standard maximum density, the approximate shrinkage of the reworked upper site soils should be 20 to 25 percent based on the laboratory test data. This may result in a vertical elevation change of approximately 0.20 to 0.25 feet following the pre-compaction effort.

Excavating Conditions

Excavations into the site subsurface soils, extending to depths ranging from 1.5 to 9.0 feet, should be possible with conventional excavating equipment. Heavier excavating equipment may be required below depths ranging from 1.5 to 9.0 feet due to the presence of hard sandy silt to clay soils or very dense silty sandy gravel soils (highly weathered mudstone bedrock – Supai Formation). Auger refusal on hard mudstone bedrock was encountered at depths ranging from 2.0 to 12.0 feet at the locations of Borings 3, 6, 9, 10, 11, 13, 14, and 15.

Excavations greater than 4.0 feet should be sloped or braced as required to provide personnel safety and satisfy local safety code regulations.

CONSTRUCTION OBSERVATION

ACS Services LLC should be retained to provide documentation that the recommendations set forth are met. These include but are not limited to documentation of site clearing activities, verification of fill suitability and compaction, and inspection of footing excavations. Relative to field density testing, a minimum of 1 field density test should be taken for every 2500 square feet of building area, per 6.0-inch layer of compacted fill.

Prior to construction, we recommend the following:

1. Consultation with the design team in all areas that concern soils and rocks to ensure a clear understanding of all key elements contained within this report.
2. Review of the General Structural Notes to confirm compliance to this report and determination of which allowable soil bearing capacity has been selected by the

project structural engineer (this directly affects the extent of earthwork and foundation preparation at the site).
3. This firm be notified of all specific areas to be treated as special inspection items (designated by the architect, structural engineer or governmental agency).

Relative to this firm's involvement with the project during the course of construction, we offer the following recommendations:

1. The site or development owner should be directly responsible for the selection of the geotechnical consultant to provide testing and observation services during the course of construction.
2. This firm should be contracted by the owner to provide the course of construction testing and observation services for this project, as we are most familiar with the interpretation of the methodology followed herein.
3. All parties concerned should understand that there exists a priority surrounding the testing and observation services completed at the site. From a geotechnical perspective, it is imperative to understand the following priority list, presented in order of decreasing priority.

    A. Fill control for building pads (verification of overexcavation depths and lateral extents, compaction testing, and the general monitoring of fill placement).
    B. Foundation observations (compliance with the General Structural Notes, depths, bearing strata, etc.).
    C. Basement, structural or retaining wall backfill testing.
    D. Utility trench backfill
    E. Special inspections as dictated by the local municipality.
    F. Concrete sampling and testing for footings, stem walls and floor slabs.
    G. Subgrade testing for proposed pavement areas.
    H. ABC testing for proposed pavement areas.
    I. Asphaltic concrete testing for proposed pavement areas.
    J. Subgrade preparation for on-site sidewalk areas
    K. Grout sampling and testing, where applicable.
    L. Mortar sampling and testing, where applicable.
    M. Off-site subgrade, ABC, asphalt, curb, gutter and sidewalk testing.

Please understand that Item A above is the only area where this firm has control on-site (once it has started) to verify or deny compliance with applicable standards, without the need for any entity to schedule testing activities with this office. Other than Item A, it shall be another entity's responsibility to schedule all testing and observation services, to coincide with the progress of construction. Since this firm is not a contributor to the construction schedule, we do not possess an inherent knowledge as to when our services shall be needed or required.

LIMITATIONS

Since our investigation is based upon review of background data, the site materials observed, selected laboratory testing and engineering analysis, the conclusions and recommendations are professional opinions. Our professional services have been performed using that degree and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities. These opinions have been derived in accordance with current standards of practice and no other warranty, express or implied, is made.

This report is not intended as a bidding document, and any contractor reviewing this report must draw his own conclusions regarding specific construction techniques to be used on this project.

The scope of services carried out by **ACS Services LLC** does not include an evaluation pertaining to environmental issues. If these services are required by the lender, we would be most pleased to discuss the varying degrees of environmental site assessments.

The materials encountered on the subject site and utilized in our laboratory analysis are believed to be representative of the total area; however, soil and rock materials do vary in character between points of investigation. The recommendations contained in this report are based on the assumption that the soil conditions do not deviate appreciably from those disclosed by the investigation. Should unusual material or conditions be encountered during construction, the soil engineer must be notified so that he may make supplemental recommendations if they should be required.

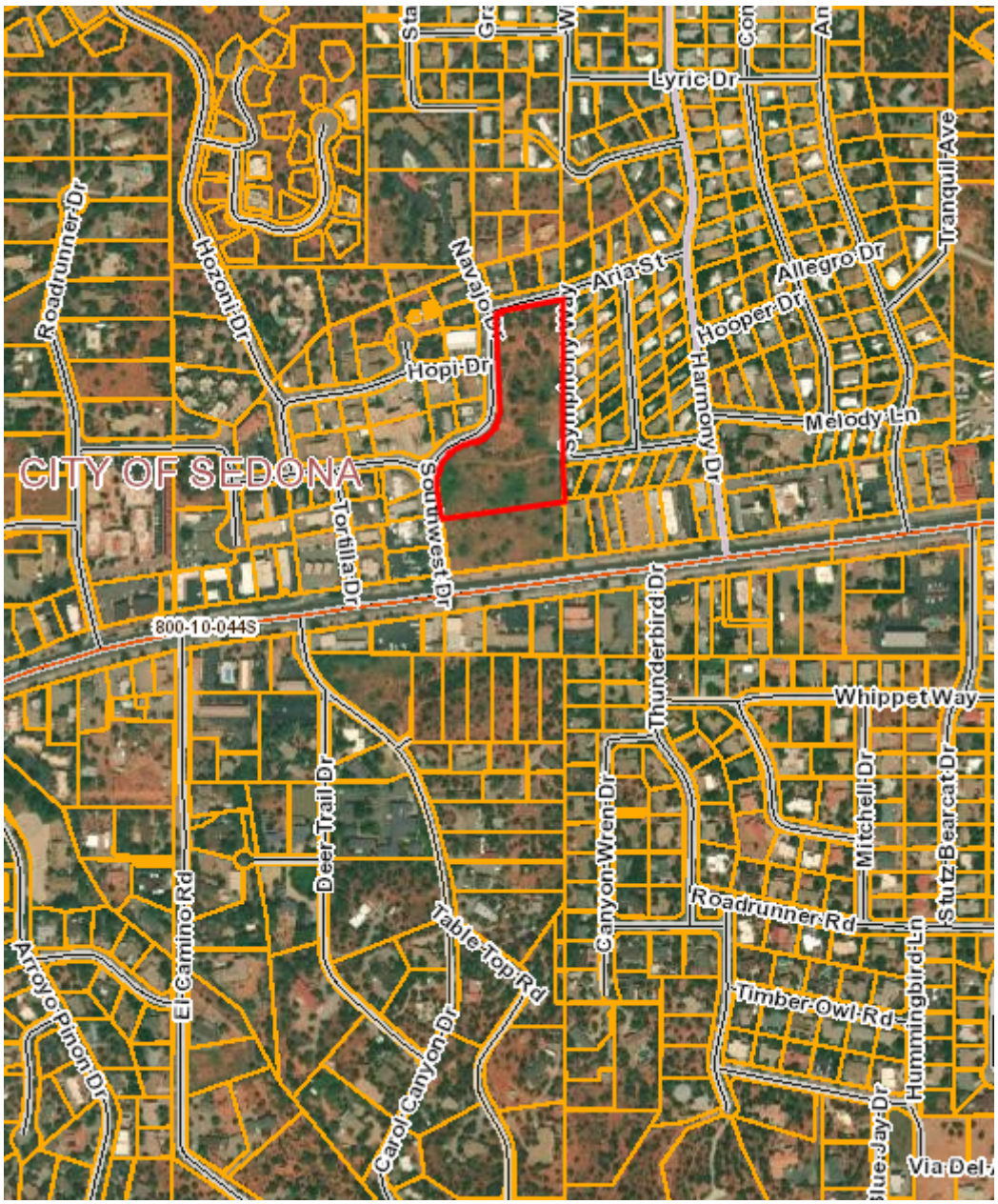
This report is issued with the understanding that it is the responsibility of the owner to see that its provisions are carried out or brought to the attention of those concerned. In the event that any changes of the proposed project are planned, the conclusions and recommendations contained in this report shall be reviewed and the report shall be modified or supplemented as necessary.

January 12, 2021
Project 2001877 – Sedona Lofts
10 Navajo Drive
Sedona, Arizona 86336

DEFINITION OF TERMINOLOGY

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Aggregate Base Course (ABC)	A sand and gravel mixture of specified gradation, used for slab and pavement support.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson	A concrete foundation element cased in a circular excavation, which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
Concrete Slabs-on-Grade	A concrete surface layer cast directly upon a base, subbase, or subgrade.
Controlled Compacted Fill	Engineered Fill. Specific material placed and compacted to specified density and/or moisture conditions under observation of a representative of a soil engineer.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Existing Fill	Materials deposited through the action of man prior to exploration of the site.
Expansive Potential	The potential of a soil to increase in volume due to the absorption of moisture.
Fill	Materials deposited by the action of man.
Finish Grade	The final grade created as a part of the project.
Heave	Upward movement due to expansion or frost action.
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Overexcavate	Lateral extent of subexcavation.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting, or other methods of extraordinary force for excavation.
Scarify	To mechanically loosen soil or break down the existing soil structure.
Settlement	Downward movement of the soil mass and structure due to vertical loading.
Soil	Any unconsolidated material composed of disintegrated vegetable or mineral matter, which can be separated by gentle mechanical means, such as agitation in water.
Strip	To remove from present location.
Subbase	A layer of specified material between the subgrade and base course.
Subexcavate	Vertical zone of soil removal and recompaction required for adequate foundation or slab support
Subgrade	Prepared native soil surface.

APPENDIX A



NORTH
N.T.S.

PROJECT NUMBER: 2001877

FIGURE 1

ACS SERVICES LLC
2235 W BROADWAY RD
MESA, ARIZONA 85202
(480) 968-0190
(480) 968-0156 FAX
WWW.ACSSERVICESLLC.COM

VICINITY MAP

Sedona Lofts
10 Navajo Drive
Sedona, AZ. 86336

NORTH
N.T.S.

PROJECT NUMBER: 2001877

FIGURE 2

ACS SERVICES LLC

2235 W BROADWAY RD
MESA, ARIZONA 85202
(480) 968-0190
(480) 968-0156 FAX
WWW.ACSSERVICESLLC.COM

SITE PLAN & APPROXIMATE BORING LOCATIONS

Sedona Lofts
10 Navajo Drive
Sedona, AZ. 86336

APPENDIX B

ACS Services LLC

BORING B-1

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/15/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Description of Subsurface Conditions
1				ML	Red sandy SILT, stiff, slightly damp, low to NP
2					
3					
4					
5				ML	Red sandy SILT, stiff to very stiff, slightly damp, low to NP
6					
7					
8					
9					
10				ML	Red sandy SILT, stiff to very stiff, slightly damp, low to NP
11					
12					
13					
14					
15					Terminated boring at a depth of 14.0 feet
16					
17					

ACS Services LLC

BORING B-2

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/15/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Bulk sample obtained from 0.0 to 4.0 feet Description of Subsurface Conditions
1		4.8		CL	Red sandy CLAY, stiff, slightly damp, PI of 8
2					
3					
4					
5					Terminated boring at a depth of 4.0 feet
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-3

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/15/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Bulk sample obtained from 0.0 to 2.0 feet Description of Subsurface Conditions
1		3.0		ML	Red sandy SILT, very stiff to hard, slightly damp, PI of 3
2					
3					Terminated drilling at a depth of 2.0 feet due to auger refusal on possible mudstone bedrock (Supai Formation)
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-4

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/15/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Bulk sample obtained from 0.0 to 4.0 feet Description of Subsurface Conditions
1		1.9		SM	Red silty gravelly SAND, medium dense to dense, dry, NP
2					
3					
4					
5					Terminated drilling at a depth of 4.0 feet
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-5

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/15/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Bulk sample obtained from 0.0 to 4.0 feet Description of Subsurface Conditions
1		4.9		CL-ML	Red sandy CLAY to SILT, stiff, slightly damp, PI of 7
2					
3					
4					
5					Terminated drilling at a depth of 4.0 feet
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-6

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Ring sample obtained from 1.5 to 2.5 feet Description of Subsurface Conditions
1	4 6	1.7		ML	Red sandy SILT, stiff, dry, NP
2	8 10			ML	Red sandy SILT, very stiff, dry, low to NP
3	14 18	2.6	94.0		
4	21 24				
5	20 29	4.9		CL	Red sand CLAY, hard, slightly damp, PI of 8
6	37				
7					
8					
9					
10	50/4"				Red silty sandy GRAVEL, very dense, dry, low PI (probable highly weathered mudstone bedrock - Supai Formation)
11					
12					Terminated boring at a depth of 11.0 feet due to auger refusal on hard mudstone bedrock (Supai Formation)
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-7

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Remarks: Ring sample obtained from 1.5 to 2.5 feet

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Description of Subsurface Conditions
	6			ML	Red sandy SILT, stiff, dry, low PI
1	6				
	10				
2	12	4.6		CL	Red CLAY with sand, very stiff, slightly damp, PI of 8
	15	5.4	95.4		
3	20				
	32				
4	28				
	15				
5	22	4.9		CL	Red CLAY sandy CLAY, hard, slightly damp, PI of 8
	36				
6					
7					
8					
9					
	50/5"			CL-ML	Red sandy CLAY to SILT, trace of gravel, very hard, dry, low PI
10					(highly weathered mudstone bedrock (Supai Formations)
11					
12					
13					
14					
	50/2"			GM	Tan silty sandy GRAVEL, very dense, dry, NP (mudstone bedrock)
15					Terminated boring at a depth of 14.2 feet
16					
17					

ACS Services LLC

BORING B-8

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Remarks: Ring sample obtained from 1.5 to 2.5 feet

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Description of Subsurface Conditions
1	14 21	4.1		CL	Red sandy CLAY, very stiff, slightly damp, PI of 10
2	17 18			CL	Red CLAY sandy CLAY, hard, slightly damp, PI of 8
3	22 25	5.8	97.8		
4	28 32				
5	14 50/6"	4.9		CL	Red sandy CLAY, hard, slightly damp, PI of 8 (highly weathered mudstone bedrock - Supai Formation)
6					
7					
8					
9					
10	36 50/3"			SC	Red clayey SAND, very dense, slightly damp, low PI (highly weathered mudstone bedrock (Supai Formations)
11					
12					
13					
14					
15	50/6"			SC	Red clayey SAND, very dense, slightly damp, low PI
16					Terminated boring at a depth of 14.5 feet
17					

ACS Services LLC

BORING B-9

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Ring sample obtained from 1.5 to 2.3 feet Description of Subsurface Conditions
1	9 13 15			ML	Red sandy SILT, very stiff, dry, low PI
2	32			ML	Red sandy SILT, very hard, slightly damp, low PI
3	50/4"	4.8	111.4		(highly weathered mudstone bedrock - Supai Formation)
4					
5	50/6"	2.8		SC-SM	Red very clayey silty SAND, very dense, slightly damp, PI of 4
6					(highly weathered mudstone bedrock - Supai Formation)
7					
8					Terminated boring at a depth of 7.0 feet due to auger refusal on hard mudstone bedrock (Supai Formation)
9					
10					
11					
12					
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-10

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Ring sample obtained from 1.5 to 1.8 feet - no recovery Description of Subsurface Conditions
1	6 14 26			GM	Red silty sandy GRAVEL, medium dense, dry, low PI
2	50/3'			GM	Red silty sandy GRAVEL, very dense, dry, low PI (highly weathered mudstone bedrock - Supai Formation)
3					
4					
5	50/6"	2.8		SC-SM	Red very clayey silty SAND, very dense, slightly damp, PI of 4 (highly weathered mudstone bedrock - Supai Formation)
6					
7					
8					Terminated boring at a depth of 7.0 feet due to auger refusal on hard mudstone bedrock (Supai Formation)
9					
10					
11					
12					
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-11

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Ring sample obtained from 1.5 to 2.5 feet Description of Subsurface Conditions
1	20 34			ML	Red sandy SILT, very stiff, slightly damp, low PI
2	30 6	3.5		ML	Red sandy SILT, very stiff, slightly damp, PI of 3
3	13	3.8	88.2		
4	25 23 22				
5	9	2.8		SC-SM	Red very clayey silty SAND, medium dense, slightly damp, PI of 4
6	14 18				
7					
8					
9					
10	50/5"			SM	Red silty SAND, very dense, slightly damp, low PI (highly weathered mudstone bedrock - Supai Formation)
11					
12					
13					Terminated boring at a depth of 12.0 feet due to auger refusal on hard mudstone bedrock (Supai Formation)
14					
15					
16					
17					

ACS Services LLC

BORING B-12

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive, Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Remarks: Ring sample obtained from 1.5 to 2.5 feet

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Description of Subsurface Conditions
1	5 7			ML	Red sandy SILT, stiff, slightly damp, low PI
2	8 3	3.5		ML	Red sandy SILT, firm, slightly damp, PI of 3
3	4 4	1.8	94.1		
4	6 6				
5	4 7	3.2		ML	Red sandy SILT, stiff to very stiff, slightly damp, NP
6	12				
7					
8					
9					
10	11 18			CL-ML	Red sandy CLAY to SILT, hard, slightly damp, low PI
11	21				
12					
13					
14					
15	13 20			CL	Red sandy CLAY, very stiff to hard, slightly damp, low PI
16	50/3"				(possible mudstoned bedrock below 15.0 feet - Supai Formation)
17					Terminated boring at a depth of 15.3 feet

ACS Services LLC

BORING B-13

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Remarks: Ring sample obtained from 1.5 to 2.5 feet Description of Subsurface Conditions
1	23 25	2.3		SM	Red silty gravelly SAND, dense, dry, NP
2	18 17			SM	Red silty gravelly SAND, dense, dry, low PI
3	16 15	1.6	106.0		
4	17 18				
5	12 14	3.2		ML	Red sandy SILT, very stiff, dry, no PI
6	15				
7					
8					
9					
10	15 30			SM	Red silty gravelly SAND, very dense, dry, low PI (very highly weathered mudstone bedrock - Supai Formation)
11	38				
12					Terminated boring at a depth og 11.0 feet due to auger refusal on hard mudstone bedrock (Supai Formation)
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-14

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew, EIT
Location: See Site Plan

Remarks: Ring sample obtained from 1.5 to 2.5 feet

Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Description of Subsurface Conditions
1	9 16			ML	Red sandy SILT, very stiff, dry, low PI
2	13 8	4.1		CL-ML	Red sandy CLAY to SILT, stiff, slightly damp, PI of 7
3	7 12	4.9	90.9		
4	12 13				
5	11 17	3.2		ML	Red sandy SILT, hard, dry, NP
6	31				
7					
8					
9				GM	Red silty sand GRAVEL, very dense, dry, low PI (mudstone bedrock)
10					Terminated boring at a depth of 9.0 feet due to auger refusal on hard mudstone bedrock (Supai Formation)
11					
12					
13					
14					
15					
16					
17					

ACS Services LLC

BORING B-15

For: KMJ LIV, LLC
Project: Sedona Lofts
Location: 10 Navajo Drive
Sedona, AZ

Date: 12/16/2020 **Project No.** 2001877
Type of Boring: 6.625-inch HS Auger
Field Engineer: Geoffrey Matthew
Location: See Site Plan

Remarks: Ring sample obtained from 1.5 to 2.5 feet

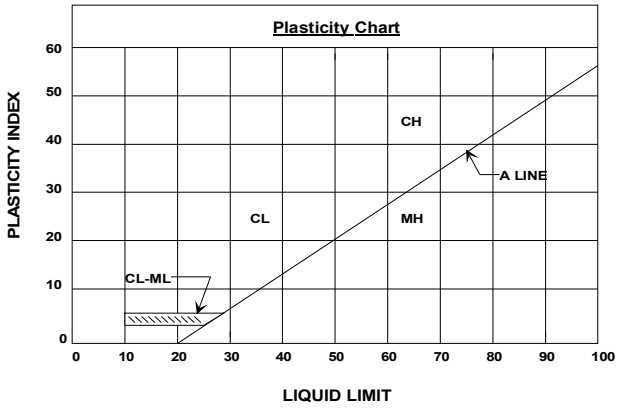
Depth (Feet)	Blows per 6"	Moisture %	Dry Density (PCF)	USCS Soil Class	Description of Subsurface Conditions
1	11 22			SM	Red silty gravelly SAND, medium dense, dry, low PI
2	16 10			ML	Red sandy SILT, very stiff, to hard, dry, low pl
3	30 21	2.7	94.6		
4	31 45				
5	50/5"			SM	Red silty SAND, very dense, dry, low PI (highly weathered mudstone bedrock - Supai Formation)
6					
7					
8					
9					
10	50/4"			SM	Red silty SAND, very dense, dry, low PI (highly weathered mudstone bedrock - Supai Formation)
11					
12					
13					Terminated boring at a depth of 12.0 feet due to auger refusal on hard mudstone bedrock (Supai Formation)
14					
15					
16					
17					

January 12, 2021
Project 2001877 – Sedona Lofts
10 Navajo Drive
Sedona, Arizona 86336

LEGEND

Major Divisions				Group Symbol	Typical Names
Coarse-Grained Soils (Less than 50% passes No. 200 sieve)	Gravels (50% or less or coarse fraction passes No. 4 sieve)	Clean Gravels (Less than 5% passes No. 200 sieve)		GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
				GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		Gravels with Fines (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on Plasticity Chart.	GM	Silty gravels, gravel-sand-silt mixtures.
			Limits plots above "A" line & hatched zone on Plasticity Chart.	GC	Clayey gravels, gravel-sand-clay mixtures.
	Sands (More than 50% of coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% passes No. 200 sieve)		SW	Well graded sands, gravelly sands.
				SP	Poorly graded sands, gravelly sands.
		Sands with Fines (More than 12% passes No. 200 sieve)	Limits plots below "A" line & hatched zone on Plasticity Chart.	SM	Silty sands, sand-silt mixtures.
			Limits plots above "A" line & hatched zone on Plasticity Chart.	SC	Clayey sands, sand-clay mixtures.
Fine-Grained Soils (50% or more passes No. 200 sieve)	Silts-Plot below "A" line & hatched zone on Plasticity Chart	Silts of Low Plasticity (Liquid Limit Less Than 50)		ML	Inorganic silts, clayey silts with slight plasticity.
		Silts of High Plasticity (Liquid Limit More Than 50)		MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	Clays-Plot above "A" line & hatched zone on Plasticity Chart	Clays of Low Plasticity (Liquid Limit Less Than 50)		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		Clays of High Plasticity (Liquid Limit More Than 50)		CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

Note: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the Plasticity Chart to have double symbol.



DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to 3/4 in.
Fine gravel	3/4 in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

January 12, 2021
Project 2001877 – Sedona Lofts
10 Navajo Drive
Sedona, Arizona 86336

TEST DRILLING EQUIPMENT & PROCEDURES

Drilling Equipment

ACS SERVICES LLC uses a CME-45 drill-rig capable of auger drilling to depths of 50 feet in southwestern soils. The drill is truck-mounted for rapid, low cost mobilization to the jobsite and on the jobsite. Drilling through soil or softer rock is performed with 6.625 inch O.D. hollow-stem auger. Carbide insert teeth are normally used on the auger bits so they can often penetrate rock or very strongly cemented soils that require blasting or very heavy equipment for excavation. The operation of well-maintained equipment by an experienced crew allows **ACS SERVICES LLC** to complete drilling jobs to a depth of 50 feet with minimum downtime and maximum efficiency.

Sampling Procedures

Dynamically driven tube samples are usually obtained at selected intervals in the borings by the ASTM D1586 procedure. In many cases, 2 inch O.D., $1^{3}/_{8}$-inch I.D. samplers are used to obtain the standard penetration resistance. Undisturbed" samples of firmer soils are often obtained with 3 inch O.D. samplers lined with 2.42 inch I.D. brass rings. The driving energy is generally recorded as a number of blows of a 140-pound hammer, utilizing a 30-inch free fall drop, per six inches of penetration. However, in stratified soils, driving resistance is sometimes recorded in 2 or 3-inch increments so that soil changes and the presence of scattered gravel or cemented layers can be readily detected and the realistic penetration values obtained for consideration in design. These values are expressed in blows per six inches on the logs. Undisturbed sampling of softer soils is sometimes performed with thin-walled Shelby tubes (ASTM D1587). Tube samples are labeled and placed in watertight containers to maintain field moisture contents for testing from auger cuttings.

Continuous Penetration Tests

Continuous penetration tests are performed by driving a 2-inch O.D. bullnose penetrometer adjacent to or in the bottom of test borings. The penetrometer is attached to $1^{5}/_{8}$-inch O.D. drill rods to provide clearance and thus minimize side friction so that penetration values are as nearly as possible a measure of end resistance. Penetration values are recorded as the number of blows of a 140 pound hammer, utilizing a 30 inch drop required to advance the penetrometer in six-inch increments or less.

Boring Records

Drilling operations are directed by our field engineer or geologist who examines soil recovery and prepares boring logs. Soils are visually classified in accordance with the Unified Soil Classification System (ASTM D2487) with appropriate group symbols being shown on the logs.

APPENDIX C

ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* *PERCOLATION DATA*

ACS Project No.:	**2001877**		
Client:	KMJ LIV, LLC	Test Date:	12/15/2020
Project Name:	Sedona Lofts	Tested By:	Geoffrey Matthew, EIT
Project Address:	10 Navajo Drive	Test Type:	Preliminary Percolation Test
Project City:	Sedona, AZ	Location:	See Site Plan

Apparatus Data:

- ☐ Square _____ in
- ☑ Diameter 12 in
- ☐ Other _____

Site Data:

Test No.: P-1
Test Depth: 3.00 ft
Area: 0.785 sqft
Weather: Sunny

Presoak Information:

Start Time - 1:30 PM
End Time - 3:25 PM

Percolation Data:

Reading No.	Start (S) End (E)	Time	Change in Time (min)	Reading Level (in)	Drop (in)	Water Added (gal)	Perc. Rate (min/in)	Perc. Rate (cu.ft./hr/sf)
1	S	3:25 PM	10.00	23.6875	1.19		8.421	0.5938
	E	3:35 PM		24.875				
2	S	3:36 PM	10.00	24.125	1.13		8.889	0.5625
	E	3:46 AM		25.25				
3	S	3:47 PM	10.00	23.625	1.19		8.421	0.5938
	E	3:57 PM		24.8125				
4								
5			Average		1.17		8.577	0.5833
6								
7								
8								
9								
10								
11								
12								

Average	
Flow Rate (min./in.)	**Flow Rate (cu.ft./hr/sf)**
8.577	0.5833

APPENDIX D

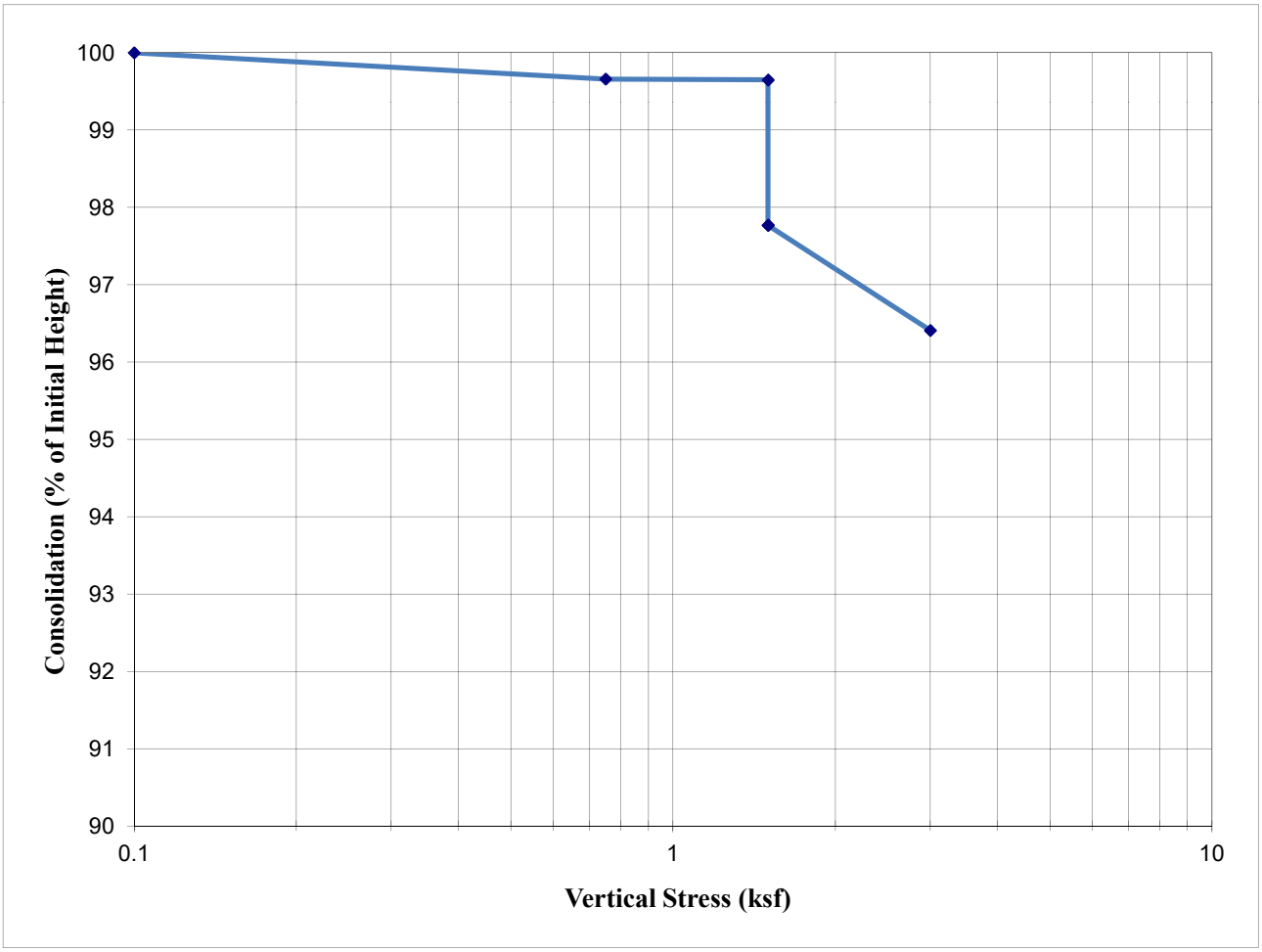
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-8	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/28/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B-6 @ 1.5'-2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.44
INITIAL MOISTURE CONTENT	2.6%	FINAL MOISTURE CONTENT	22.4%
INITIAL DRY DENSITY(pcf)	94.0	FINAL DRY DENSITY(pcf)	97.4
INITIAL DEGREE OF SATURATION	9%	FINAL DEGREE OF SATURATION	85%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



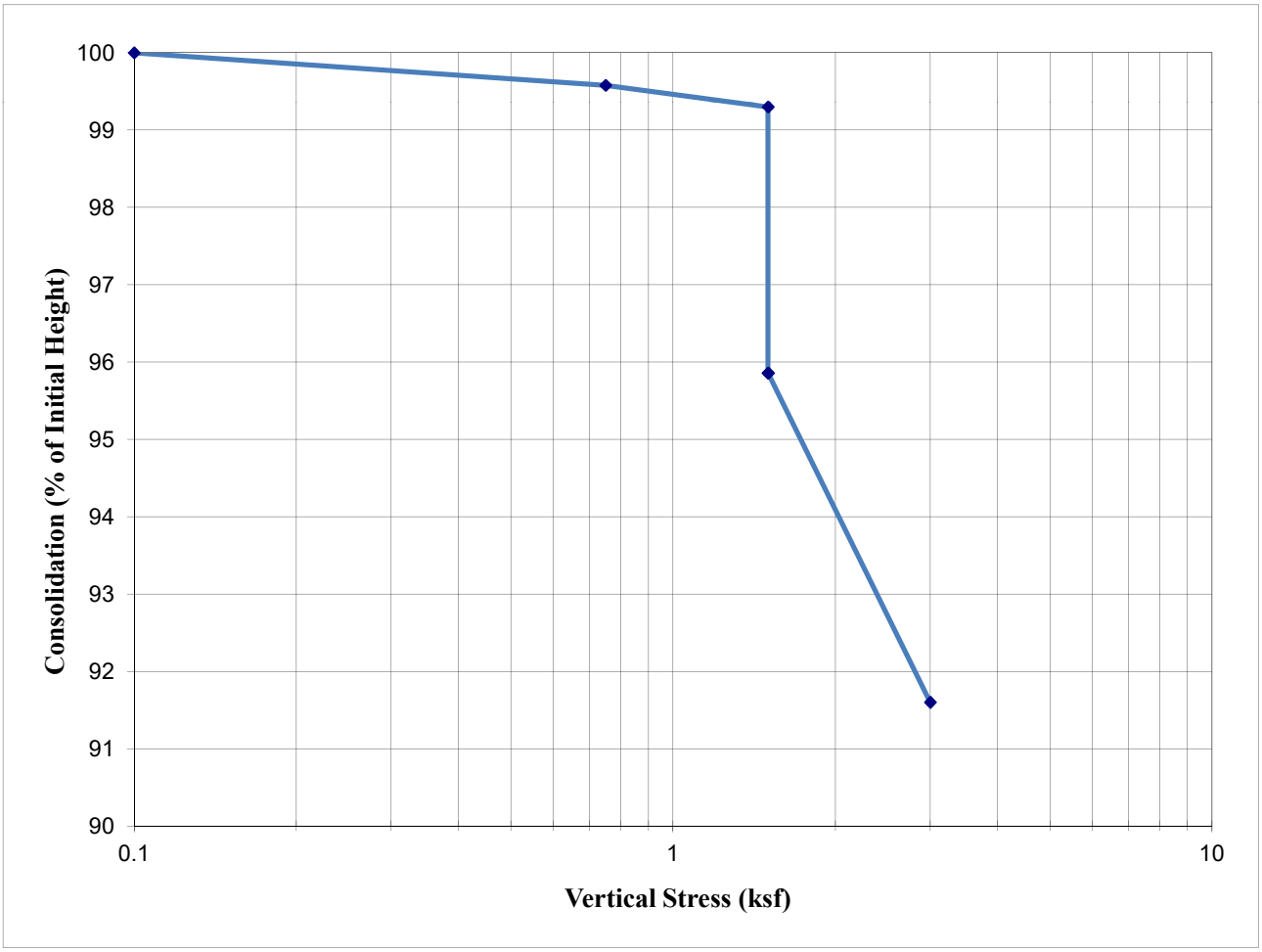
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-9	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/28/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 7 @ 1.5' - 2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.22
INITIAL MOISTURE CONTENT	5.4%	FINAL MOISTURE CONTENT	20.6%
INITIAL DRY DENSITY(pcf)	95.4	FINAL DRY DENSITY(pcf)	104.1
INITIAL DEGREE OF SATURATION	19%	FINAL DEGREE OF SATURATION	93%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



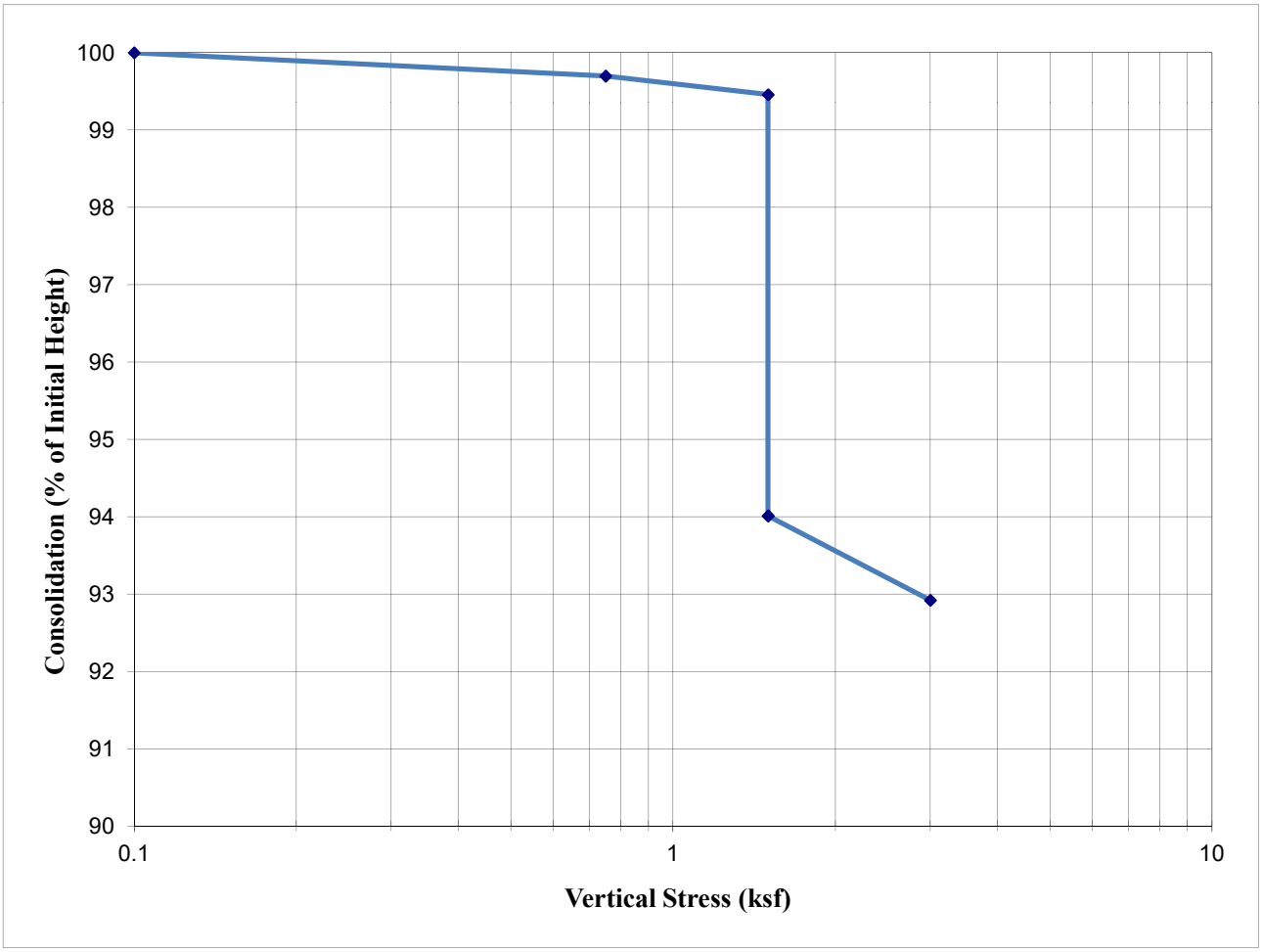
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-10	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/28/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 8 @ 1.5' - 2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.28
INITIAL MOISTURE CONTENT	5.8%	FINAL MOISTURE CONTENT	18.3%
INITIAL DRY DENSITY(pcf)	97.8	FINAL DRY DENSITY(pcf)	105.2
INITIAL DEGREE OF SATURATION	22%	FINAL DEGREE OF SATURATION	85%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



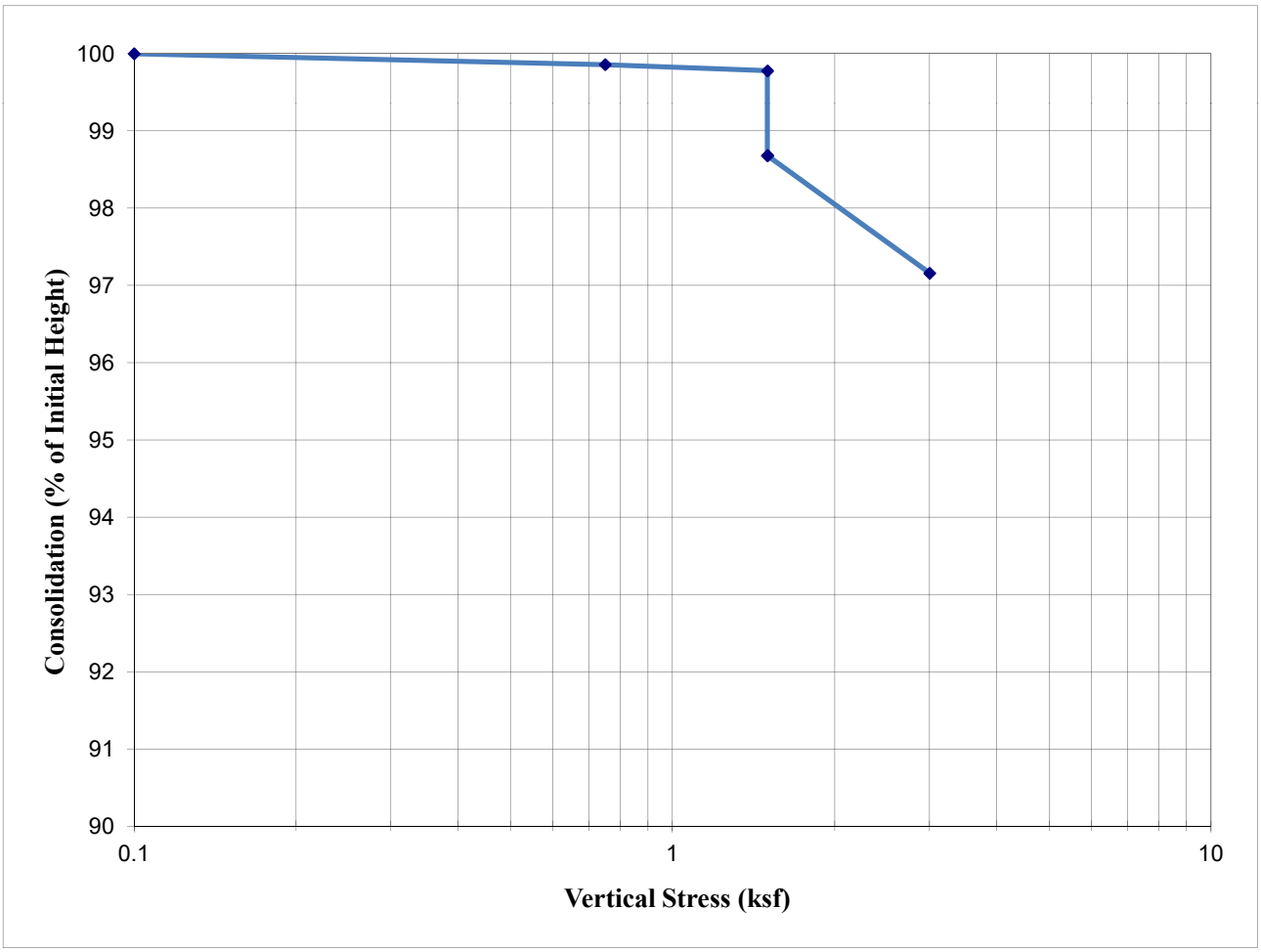
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-11	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/29/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 9 @ 1.5' - 2.3'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.47
INITIAL MOISTURE CONTENT	4.8%	FINAL MOISTURE CONTENT	13.9%
INITIAL DRY DENSITY(pcf)	111.4	FINAL DRY DENSITY(pcf)	114.7
INITIAL DEGREE OF SATURATION	26%	FINAL DEGREE OF SATURATION	83%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



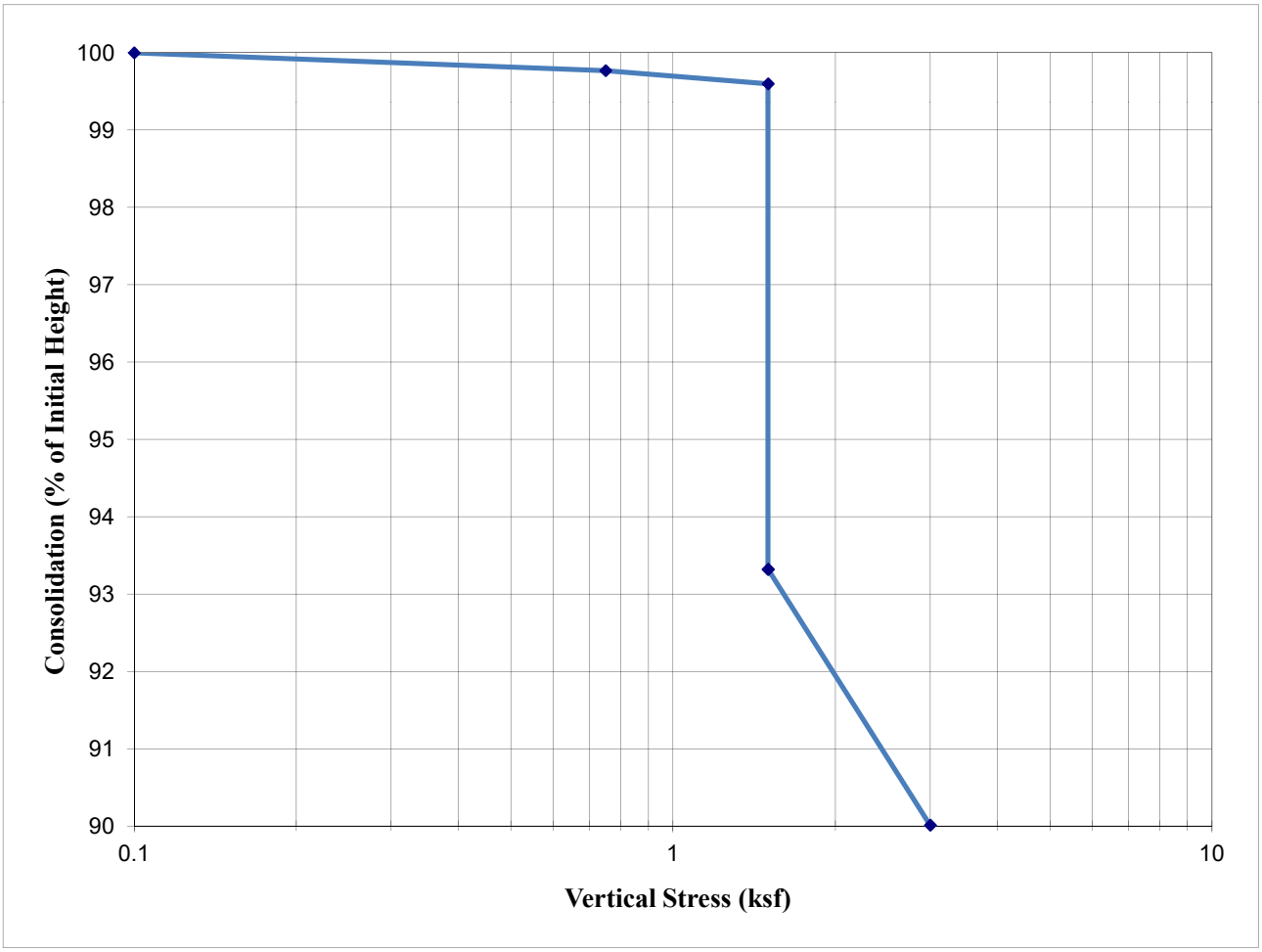
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-12	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/29/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 11 @ 1.5' - 2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.14
INITIAL MOISTURE CONTENT	3.8%	FINAL MOISTURE CONTENT	18.7%
INITIAL DRY DENSITY(pcf)	88.2	FINAL DRY DENSITY(pcf)	97.9
INITIAL DEGREE OF SATURATION	11%	FINAL DEGREE OF SATURATION	72%
INITIAL VOID RATIO	0.9	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



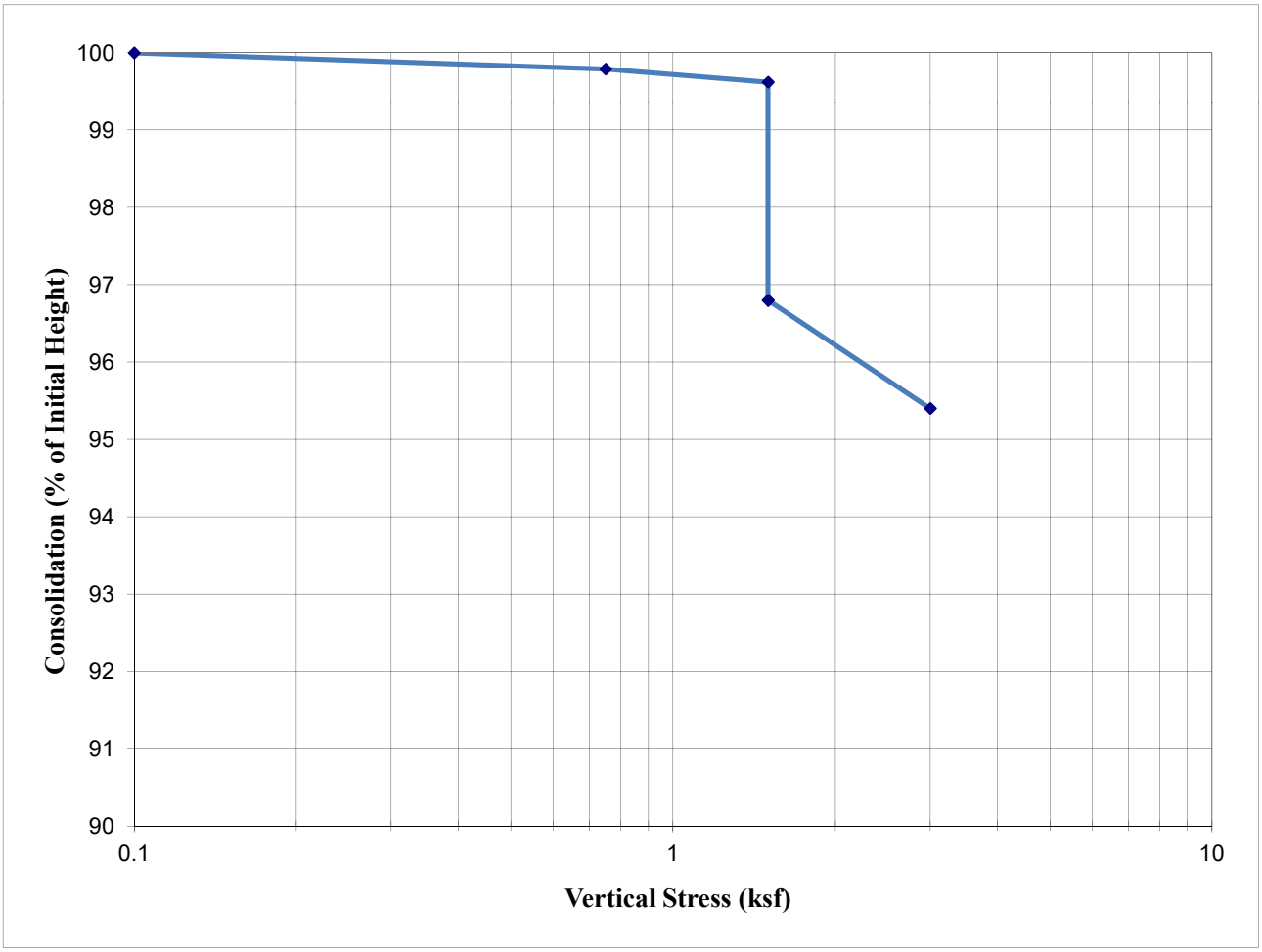
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-13	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/28/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 12 @ 1.5' - 2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.39
INITIAL MOISTURE CONTENT	1.8%	FINAL MOISTURE CONTENT	19.0%
INITIAL DRY DENSITY(pcf)	94.1	FINAL DRY DENSITY(pcf)	98.6
INITIAL DEGREE OF SATURATION	6%	FINAL DEGREE OF SATURATION	74%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



ACS Services LLC

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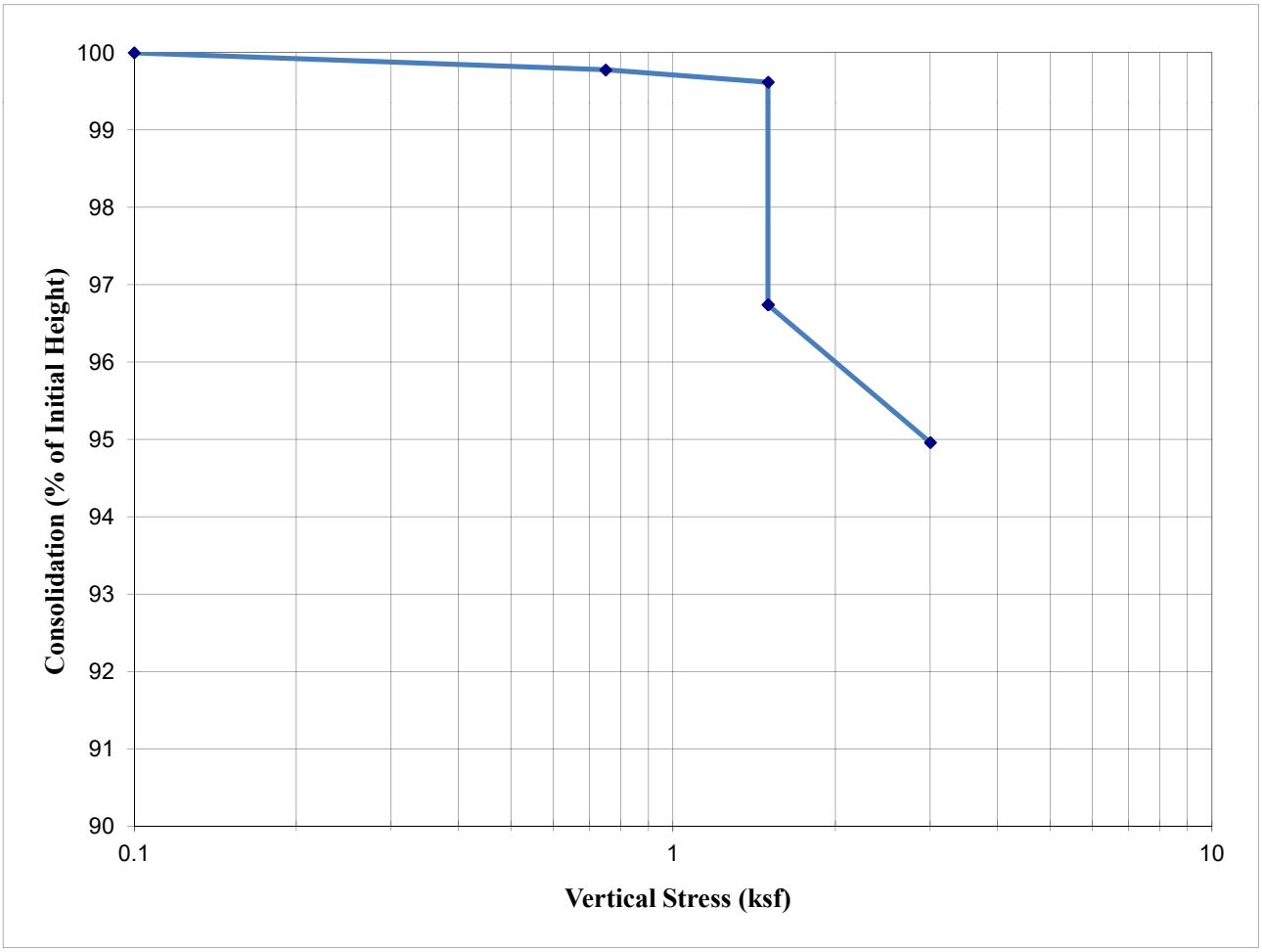
* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-14	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/23/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 13 @ 1.5' - 2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.37
INITIAL MOISTURE CONTENT	1.6%	FINAL MOISTURE CONTENT	13.9%
INITIAL DRY DENSITY(pcf)	106.0	FINAL DRY DENSITY(pcf)	111.6
INITIAL DEGREE OF SATURATION	7%	FINAL DEGREE OF SATURATION	76%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



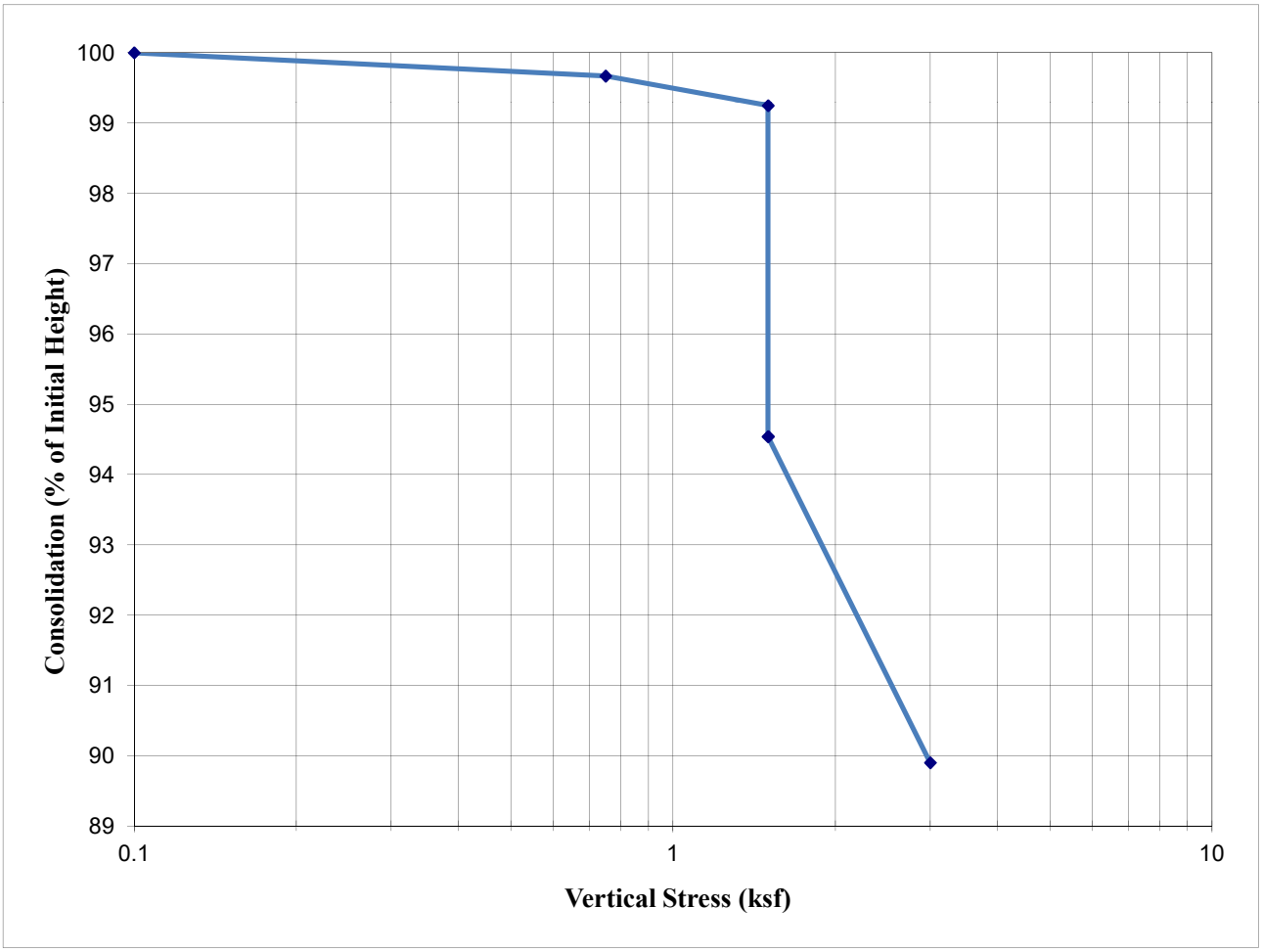
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-15	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/28/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 14 @ 1.5' - 2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.14
INITIAL MOISTURE CONTENT	4.9%	FINAL MOISTURE CONTENT	19.7%
INITIAL DRY DENSITY(pcf)	90.9	FINAL DRY DENSITY(pcf)	101.1
INITIAL DEGREE OF SATURATION	16%	FINAL DEGREE OF SATURATION	82%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



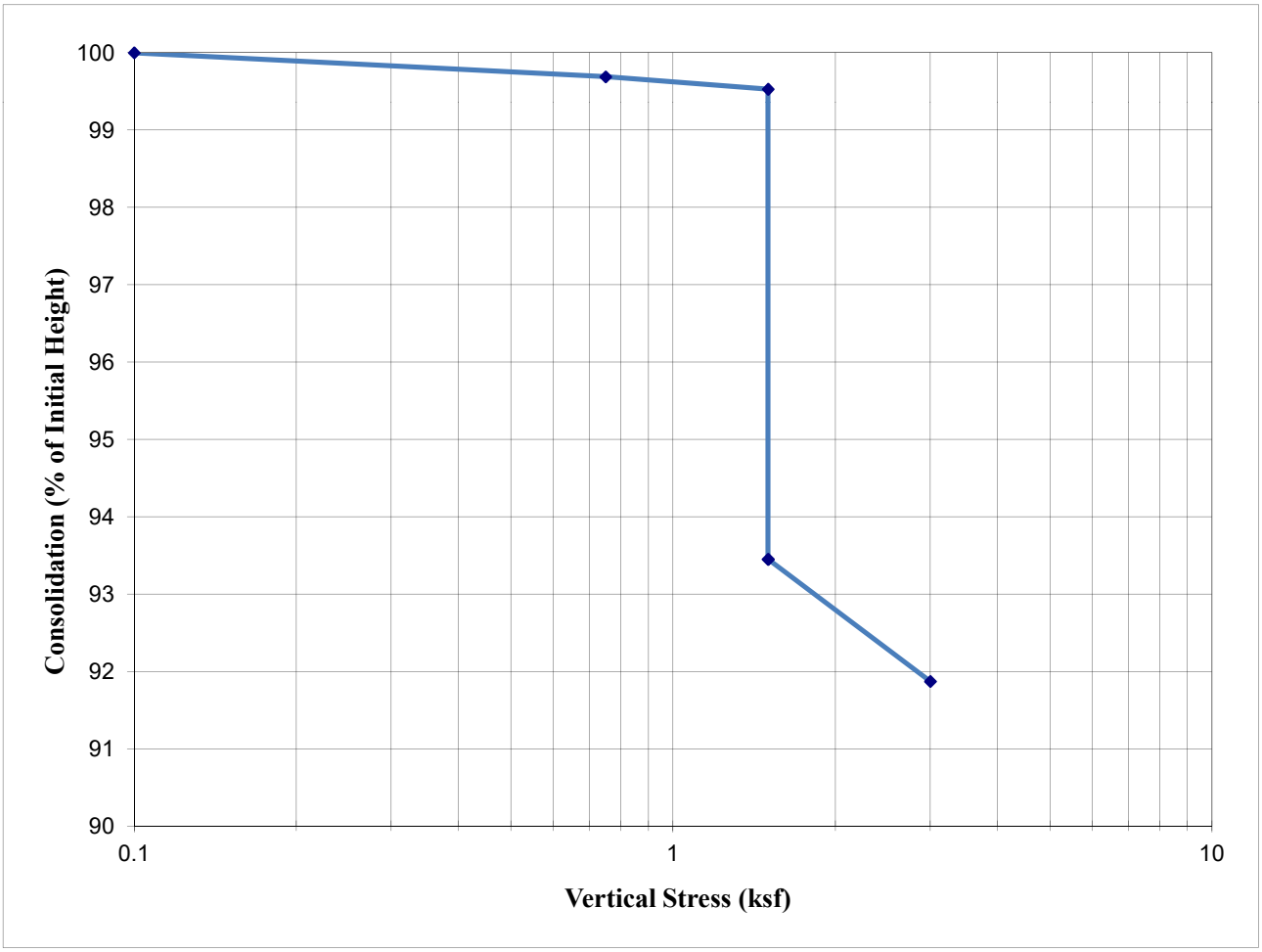
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2001877**		
Lab No.:	20-5939-16	Material Type:	Native
Client:	KMJ LIV, LLC	Date of Extraction:	12/16/2020
Project Name:	Sedona Lofts	Extracted By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date of Lab Test:	12/28/2020
Project City:	Sedona, AZ	Lab Tested By:	Trevor Burns
Sample Location:	B - 15 @ 1.5' - 2.5'	Reviewed By:	Gene Hansen

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.23
INITIAL MOISTURE CONTENT	2.7%	FINAL MOISTURE CONTENT	17.1%
INITIAL DRY DENSITY(pcf)	94.6	FINAL DRY DENSITY(pcf)	102.9
INITIAL DEGREE OF SATURATION	10%	FINAL DEGREE OF SATURATION	74%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1.5 ksf



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-1	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/15/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B - 2 @ 0.0'-4.0'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	1	98	
#4	1	98	
#8	2	95	
#10	1	95	
#16	1	93	
#30	2	91	
#40	1	90	
#50	2	88	
#100	6	82	
#200	16	66.2	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-255)	4.8
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-2	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/15/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/26/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-3 @ 0.0'-2.0'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	0	98	
#30	1	97	
#40	1	97	
#50	1	95	
#100	8	87	
#200	36	51.4	

Liquid Limit (AASHTO T-89)	20
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-255)	3.0
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	ML

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-3	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/15/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona Lofts	Tested By:	Trevor Burns
Sample Location:	B-4 @ 0.0'-4.0'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	7	89	
3/8"	5	85	
1/4"	7	78	
#4	5	73	
#8	10	63	
#10	2	61	
#16	4	57	
#30	4	53	
#40	1	52	
#50	2	50	
#100	6	44	
#200	13	31.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	1.9
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-4	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/15/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B - 5 @ 0.0'-4.0'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	99	
#8	0	99	
#10	0	99	
#16	0	99	
#30	1	98	
#40	1	97	
#50	1	96	
#100	4	92	
#200	12	79.9	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-255)	4.9
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL-ML

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-5	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-6 @ 0.0'-1.5'	Reviewed By:	0

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	99	
3/8"	0	99	
1/4"	1	98	
#4	1	97	
#8	4	93	
#10	1	92	
#16	3	89	
#30	3	86	
#40	1	85	
#50	2	83	
#100	6	77	
#200	22	54.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	1.7
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	ML

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-17	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-6, B-7, B-8 @ 4.0'-5.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	98	
#4	1	97	
#8	2	95	
#10	0	94	
#16	1	93	
#30	1	92	
#40	1	91	
#50	1	90	
#100	2	88	
#200	9	79.6	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-255)	4.9
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-9	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-7 @ 1.5'-2.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	0	98	
#30	1	97	
#40	0	97	
#50	0	96	
#100	1	95	
#200	9	85.6	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-255)	4.6
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-6	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-8 @ 0.0'-1.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	99	
#8	1	97	
#10	0	97	
#16	1	96	
#30	2	94	
#40	1	93	
#50	1	92	
#100	2	90	
#200	9	81.0	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-255)	4.1
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-18	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona , AZ	Tested By:	Trevor Burns
Sample Location:	B-9, B-10, B-11 @ 4.0'-5.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	99	
3/8"	1	98	
1/4"	2	96	
#4	2	94	
#8	9	85	
#10	2	83	
#16	5	78	
#30	5	73	
#40	2	71	
#50	2	69	
#100	6	63	
#200	17	45.9	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-255)	2.8
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC-SM

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-12	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-11 @ 1.5'-2.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	0	99	
#30	0	99	
#40	0	99	
#50	0	98	
#100	4	94	
#200	20	74.5	

Liquid Limit (AASHTO T-89)	20
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-255)	3.5
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	ML

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-19	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-12, B-13, B-14 @ 4.0'-5.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	1	97	
#30	1	97	
#40	0	96	
#50	1	96	
#100	5	91	
#200	25	66.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	3.2
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	ML

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-7	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-13 @ 0.0'-1.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	2	96	
1/2"	4	92	
3/8"	3	89	
1/4"	6	83	
#4	3	80	
#8	6	74	
#10	1	73	
#16	3	70	
#30	3	66	
#40	1	65	
#50	2	63	
#100	6	57	
#200	17	40.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	2.3
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2001877	Material Type:	Native
ACS Lab #	20-5939-15	Supplier:	
Client:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Test Date:	12/29/2020
Project City	Sedona, AZ	Tested By:	Trevor Burns
Sample Location:	B-14 @ 1.5'-2.5'	Reviewed By:	Gene Hansen

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	4	96	
#10	1	95	
#16	2	93	
#30	2	90	
#40	1	89	
#50	1	88	
#100	6	82	
#200	19	63.2	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-255)	4.1
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL-ML

Gene Hansen
Project Manager

Gene Hansen
Signature

ACS Services LLC

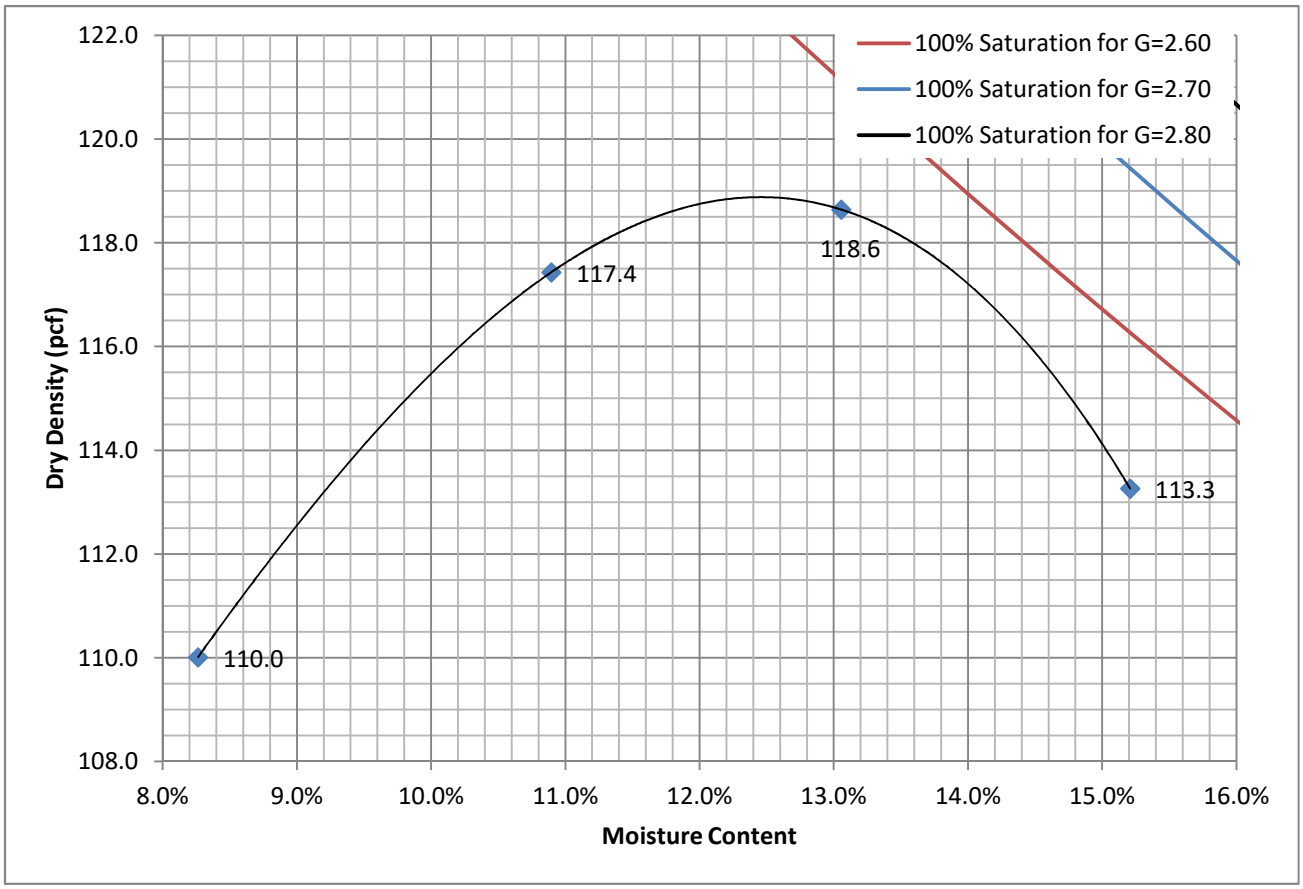
Maximum Dry Density & Optimum Moisture

☐ AASHTO T-99 | ☐ AASHTO T-180 | ☑ ASTM D-698 | ☐ ASTM D-1557

ACS Project #	2001877	Material Type:	Native
ACS Lab #	20-5939-6	Material Supplier:	-
Client Name:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date Tested:	12/28/2020
Project City:	Sedona, AZ	Tested By:	Brett Rotenberger
		Reviewed By:	Gene Hansen
Sample Location:	B8 @ 0.0'-1.5'	Method:	☑ A ☐ B ☐ C ☐ D

Dry Density	117.4	118.6	113.3	110.0
Moisture Content	10.9%	13.1%	15.2%	8.3%

Uncorrected Dry Density	118.9	Uncorrected Moisture Content	12.4
% Rock	1	% Passing	99
Rock Corrected Dry Density	**118.9**	Rock Corrected Moisture Content	**12.4**
Specific Gravity of Oversize Aggregate	**2.650**		



Gene Hansen

Project Manager

ACS Services LLC

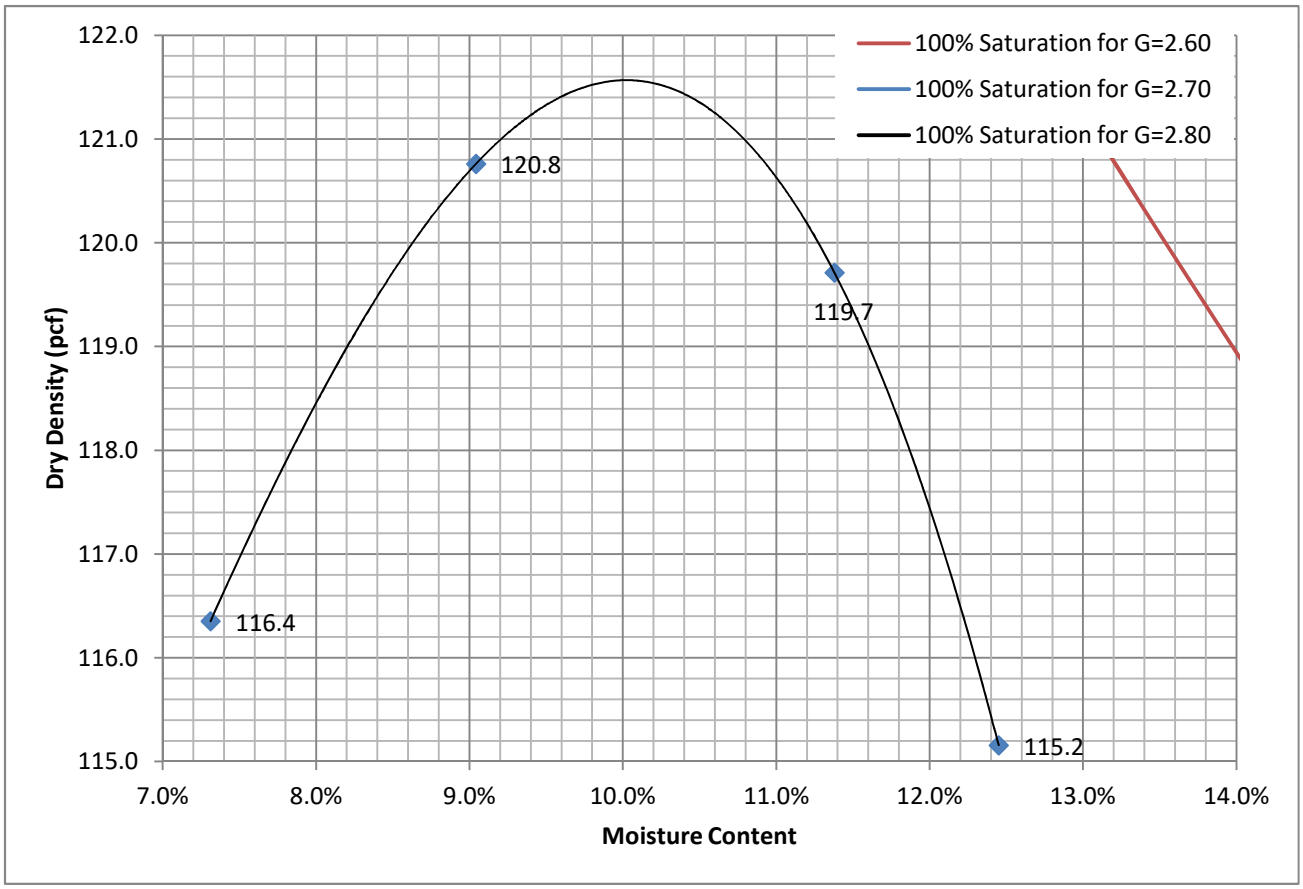
Maximum Dry Density & Optimum Moisture

☐ AASHTO T-99 | ☐ AASHTO T-180 | ☑ ASTM D-698 | ☐ ASTM D-1557

ACS Project #	2001877	Material Type:	Native
ACS Lab #	20-5939-7	Material Supplier:	-
Client Name:	KMJ LIV, LLC	Sample Date:	12/16/2020
Project Name:	Sedona Lofts	Sampled By:	Geoffrey Matthew
Project Address:	10 Navajo Drive	Date Tested:	12/28/2020
Project City:	Sedona, AZ	Tested By:	Brett Rottenberger
		Reviewed By:	Gene Hansen
Sample Location:	B13 @ 0.0'-1.5'	Method:	☑ A ☐ B ☐ C ☐ D

Dry Density	120.8	119.7	116.4	115.2
Moisture Content	9.0%	11.4%	7.3%	12.4%

Uncorrected Dry Density	121.6	Uncorrected Moisture Content	10.0
% Rock	20	% Passing	80
Rock Corrected Dry Density	**128.4**	Rock Corrected Moisture Content	**8.4**
Specific Gravity of Oversize Aggregate	**2.650**		



Gene Hansen

Project Manager