



**February 28, 2022**  
**SS-434-S**

Keeley Mircetic  
keeley.mircetic.61@my.csun.edu

**Subject: SOILS ENGINEERING REPORT**  
Proposed Single-Family Residence, 11820 Topa Vista Road, Upper Ojai, Ventura County, California

**Reference:** On-Site Wastewater Treatment System Design Report, Existing Studio, 11820 Topa Vista Road, Upper Ojai, Ventura County, California, by *Solid Soils & Geologic*, dated November 29, 2021

Dear Keeley:

**Introduction**

The following report summarizes the findings of our Soils Engineering Report with percolation testing for septic system design performed on the subject property. Our purpose was to evaluate the distribution and engineering characteristics of the earth materials present on the site so that we might assess their impact upon the proposed single-family residence.

It is the intent of this report to aid in the design and completion of the proposed work and to reduce certain risks associated with construction projects. This report is prepared for the use of the client and authorized agents and should not be considered transferable. Prior to use by others, the site and this report should be reviewed by *Solid Soils & Geologic Consultants*. Following review, additional work may be required to update this report.

The scope of work for this project included: 1) a reconnaissance of the site and its immediate vicinity, 2) logging and sampling of 7 test pits excavated with a backhoe and hand auger, 3) percolation testing in 4 of the 7 test pit excavations, 4) select laboratory testing of the retrieved samples, 5) soils engineering analysis of the assembled data, and 6) preparation of this report. Field data and the approximate locations of the exploratory excavations are shown on the enclosed Plot Plan. Descriptions of the materials encountered in the exploratory excavations are provided on the enclosed logs (Plates TP-1 through TP-7). Pertinent laboratory test results are provided in this report.

<p>County of Ventura Planning Commission Hearing Case No. PL23-0009 Exhibit 1.7 - Geotechnical Report</p>
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### **Site Location & Description**

The subject property is located at 11820 Topa Vista Road in Upper Ojai, Ventura County, California. The approximate site location is shown on the enclosed Vicinity Maps. The subject property currently consists of relatively level to moderately sloping property with an existing studio. The recent *Thomas Fire* destroyed the previous residence on the property. The site is not located within an active fault zone, as issued by the State of California nor is the site located within a Seismic Hazard Zone for potential earthquake induced liquefaction or landsliding.

### **Proposed Development**

Based on the information provided by you, it is planned to construct a new single-family residence in the same general area as the previous residence. A new septic system will be required for the proposed residence. Appropriate recommendations are provided later in this report. Grading will be limited to site preparation. This information was the basis for the field exploration. It is expected that the proposed residence will be constructed using conventional wood and/or steel frames and will not have any unusual features such as a basement or extremely high foundation loads.

### **Exploration Observations**

The scope of our exploration was based on our understanding of the project, as described above. The site was explored on July 15, 2021 with the aid of a rubber-tired backhoe, hand labor, and field geologic mapping. A total of 7 backhoe test pits were excavated to depths of between 4½ and 9½ feet below existing grade. The excavations were backfilled and tamped, but may not be compacted.

The earth materials encountered included artificial fill, older alluvium, and bedrock. A summary of the earth materials is provided in the enclosures. The excavations are logged on Plates TP-1 through TP-7 and their locations are plotted on the enclosed Plot Plan.

Groundwater was not encountered in our subsurface excavations. Fluctuations in the level of groundwater may occur due to variations in rainfall, irrigation, temperature, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site.

### **Seismicity**

The subject site has no known active or potentially active faults crossing the property. An "active fault" is one that has had movement in the last 11,000 years. The site is not within an Alquist-Priolo Earthquake Fault Zone. An Alquist-Priolo Earthquake Fault Zone is the area designated by the State of California as being the zone where primary ground rupture is considered most likely to occur during a seismic event on the fault.

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Earthquake epicenters may happen anywhere in Southern California along thrust faults or buried faults, as has been evidenced by several recent historic earthquakes including the Whittier Narrows Earthquake and the Northridge Earthquake. The proximity of a site to the surface trace of a fault may have little relationship to the potential of being near an earthquake epicenter.

The property is situated within the seismically active Southern California region and therefore will be subjected to moderate to strong ground shaking should one of the many active Southern California faults produce an earthquake. It is likely that at least one significant seismic event will affect the site during the lifetime of the structure. Secondary effects, such as earthquake-induced landsliding or ground rupture are not considered likely to occur. However, severe ground shaking may cause some consolidation and settlement of the underlying soils. Soil parameters for current seismic design are provided in the enclosures.

#### **Laboratory Testing**

Bulk and relatively undisturbed samples of earth materials encountered at the site were collected during the course of our fieldwork. Select samples were transported to the laboratory for further testing and analysis. Laboratory tests completed on the retrieved samples are described below.

#### **Expansion Tests**

An expansion index test was performed in accordance with the UBC Standard 29-2 or equivalent. The results of the test are included in Table I.

#### **Shear Tests**

Shear tests were performed in a Direct Shear Machine of the strain control type. The rate of deformation was approximately 0.05 inches per minute. Shearing occurred under a variety of confining loads in order to determine the Coulomb shear strength parameters. The tests were performed on relatively undisturbed and remolded (at 90% relative compaction) samples in an artificially flooded condition. The test results are presented graphically on Plates S-1 and S-2.

#### **Consolidation Tests**

Predictions of the soils settlement characteristics under load were made on the basis of consolidation tests. A one-inch high sample was loaded in a geometric progression of increasing normal loads and the resulting deformation recorded at selected time intervals. Porous stones were placed in contact with the sample (top and bottom) to permit addition and release of pore fluid. The sample was flooded with clean water at a selected load during the progression. Results are plotted on the enclosed Consolidation-Pressure Curve, Plate C-1.

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**TABLE I**  
Summary of  
Laboratory Test Data

Sample	Depth (ft)	Field Dry Density (PCF)	Field Moisture Content (%)	Expansion Index
Composite.....	0-5 .....			35
TP-1 .....	4½ .....	112.4 .....	11.8	
TP-3.....	5 .....	108.1 .....	15.1	

#### **Discussion & Recommendations**

The following discussion and recommendations are based on the data presented in this report and our understanding of the project. Recommendations, derived from the data available at this time, are presented for your consideration.

Based upon the exploration performed for this investigation, it is our finding that construction of the single-family residence and septic system, as described, is feasible from a soils engineering standpoint, provided our advice and recommendations are made a part of the plans and are implemented during construction.

The surficial soils on the site are relatively soft and may be subject to consolidation and settlement upon loading. Therefore, it is recommended that the surficial soils in the area of the proposed residence be removed and compacted to a minimum depth of 3 feet below the bottom of the proposed foundations (and to dense natural material) and 5 feet beyond the perimeter. The fill should be compacted to a minimum of 90% of the laboratory maximum dry density. If compacted fill cannot extend 5 feet beyond the perimeter of the proposed footings, due to existing foundations, etc. then the fill should be compacted to a minimum of 95% of the laboratory maximum dry density for a horizontal distance of at least 5 feet. This will provide a dense, uniform bearing material and will distribute the loads more evenly upon the natural soils. Following proper removal and compaction of the soils, conventional continuous foundations may be used to support the proposed residence. Details are provided below for grading of compacted fills, foundation design, and other criteria, as considered warranted.

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**Grading - Compacted Fills**

The following recommendations are for the preparation and placement of compacted fills. The contractor should be aware that if grading is done during or following periods of rain, or if the ground moisture is over optimum from any source of water, such as excessive irrigation watering, etc., then a considerable amount of time and/or effort may be needed to achieve proper moisture for compaction purposes.

1. Any imported materials that are to be used as fill should be approved by this office prior to placement.
2. All vegetation, trash, debris or other deleterious materials should be removed from the area to be graded and exported from the site. Rocks larger than 8 inches should not be included in the fill.
3. All existing fill and incompetent surface soils within the area to be filled should be removed to dense natural material and replaced as properly compacted fill.
4. The foundation for the proposed residence should be provided with at least 3 feet of compacted fill beneath the base of proposed foundation. Final foundation plans should be given to the grader prior to starting work in order to determine the minimum depth of the excavation. The difference in the depth of the fill beneath the proposed structure should not exceed 5 feet. The fill should extend at least 5 feet beyond the edge of the footings or for a distance equal to the depth of the fill below the footings, whichever is deeper. If compacted fill cannot extend 5 feet beyond the perimeter of the proposed footings, due to existing foundations, etc. then the fill should be compacted to a minimum of 95% of the laboratory maximum dry density for a horizontal distance of at least 5 feet. The required vertical and lateral extent of the fill with respect to the location of the proposed structure should be verified by a licensed surveyor.
5. The excavated fill bottom should expose dense natural material, per our recommendations. All bottom excavations should be observed by a representative of our office prior to placement of fill. The bottom excavation should be scarified, watered or dried to near optimum moisture content, and compacted to 90% using the most recent version of ASTM D 1557 as the standard.
6. Fill should be placed in thin lifts, watered to near optimum moisture content, and compacted to at least 90% (or 95%, see above) of the material's maximum dry density, using the latest version of ASTM D 1557 as the standard, prior to placement of the next lift. All fill should be placed under the observation and testing of *Solid Soils & Geologic Consultants* to assist the contractor in achieving proper compaction.

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7. Approved fill material that is expansive should be placed slightly above optimum moisture. This will help reduce the detrimental affects of expansion and swelling.
8. Areas that are to receive paving should be processed to at least 24 inches below the existing grade or the finished subgrade, whichever is deeper.
9. All grading should comply with the grading specifications and the requirements of the County of Ventura.
10. It is anticipated that some shrinkage of the material will occur from the compaction process.

### **Spread Footings**

Continuous spread footings may be used to support the proposed residence provided that they are founded entirely in future compacted fill. Footings may not be supported by two dissimilar materials such as fill and natural material. Continuous footings should be a minimum of 12 inches in width. Preliminary foundation design parameters are outlined on the following chart. Final foundation design parameters will be provided at the completion of grading based on the expansiveness of the surficial material. The engineer will ultimately decide the total depths and widths of the proposed footings based on loads, etc. The footing depths and widths provided herein are the minimums.

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Bearing Material	Minimum Depth into Bearing Material (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Future Compacted Fill .....	*18 .....	1,500 .....	0.30 .....	200 .....	1,500

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\*The structural engineer will ultimately decide the total depths and widths of the footings based on loads, etc. The footing depths and widths provided herein are the minimums.

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The allowable soil strength parameters indicated above are for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one third. For the purpose of bearing calculations, the weight of the concrete in the footing may be neglected.

All continuous footings should be reinforced with a minimum of four #4 steel bars, two placed near the top and two placed near the bottom of the footings. Footing excavations should be cleaned of all debris, loose soil, moistened, and free of shrinkage cracks prior to placing concrete. Observation of the footing excavations should be performed by *Solid Soils & Geologic Consultants* prior to placing forms, steel or concrete to verify the proper depths. All work and materials should comply with the specifications of the building official.

#### **Floor Slabs**

The recommended material to support the proposed floor slabs is future compacted fill. Following proper removal and compaction (as described above) slabs may be supported on the compacted fill. All footing excavation spoils and debris should be removed from the area. Floor slabs should be a minimum of 4 inches thick and should be cast over a clean, firm subgrade and reinforced with a minimum of #4 steel bars spaced 16 inches on center, both ways. The rebar should be bent in an "L" fashion and extend a minimum of 12 inches into the adjacent foundations. Care should be taken to cast the reinforcement near the center of the slab. Slabs should be provided with a bed of 4 inches of clean dry granular material beneath the concrete.

All slabs should be protected with a vapor retarder at least 10 mil thick, beneath them. The vapor retarder should conform to ASTM E1745 and have a permeance of less than 0.3 US perms (0.2 metric perms). The vapor retarder should be uncertain by a 2-inch thick layer of clean dry granular material. Installation of the vapor retarder should conform to the recommendations of ACI 302.2R.

The slab-on-grade area should be pre-saturated to 120% of optimum moisture to a depth of 21 inches, in accordance with the specifications of the County of Ventura Building Code prior to placing concrete. This office should verify all pre-saturations 24 hours prior to concrete placement, and the pre-saturation should be started at least 72 hours prior to concrete placement. It should be noted that pre-saturation would be difficult and cause muddy working conditions.

#### **Foundation Settlement**

Settlement of the foundation system is expected to occur on initial application of loading. Anticipated differential settlement for properly supported foundations should be on the order of ½ to 1 inch over the length of 40 feet. Total settlement is not expected to exceed approximately 1 inch.

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### **Temporary Excavations**

A vertical cut of up to 5 feet may be made in the on-site material. Excavations greater than 5 feet should be trimmed back to 1½:1 (horizontal to vertical). Our office should observe all initial excavations and may need to provide alternative recommendations to those provided herein, such as shoring or slot cutting, if considerable caving is observed.

A representative of *Solid Soils & Geologic Consultants* should be present during grading to observe the performance of temporary slopes and excavations. All excavations should be properly fenced off (or other appropriate method) for safety and should be stabilized within 30 days of the initial excavation. Water should not be allowed to pond near the top of the excavations nor flow towards them. No vehicles should be allowed within 7 feet of a cut.

### **Sewage Disposal**

Public sewers are not presently available for the subject property. An On-Site Wastewater Treatment System (OWTS) will be required for the proposed residence. Based on the information presented in this report, the use of a leach line type septic system is feasible from a geologic standpoint. The system should consist of a septic tank and leach lines. Based on the information presented in this report, such a system will not have an adverse geological effect on the property or adjacent properties. The accepted percolation strata is the older alluvium at a depth of approximately 4½ feet below existing grade.

The proposed residence will have 3 bedroom equivalents (per the County of Ventura Environmental Health) and will have less than 25 Fixture Units. Based on the County of Ventura Environmental Health Department Septic Tank Sizing Criteria (copy enclosed), the required septic tank size is 1,000 gallons for the proposed residence.

Four excavations were tested for percolation rates on the subject property. One deep and 3 shallow percolation tests were performed in order to verify the percolation rates in the area of proposed OWTS. The percolation tests were performed north of the proposed residence, as shown on the enclosed Plot Plan.

The information presented below and in the enclosures indicates that the slowest percolation rate in the area of the proposed leach lines was 60.0 minutes per inch. Based on a plot of UPC Table I-6 (see copy enclosed), the required absorption area per bedroom is 330 square feet, which is 990 square feet for the proposed 3 bedroom equivalent residence. A leach line trench 3 feet wide with 3 feet of gravel under the perforated pipe (see Typical Leach Line Detail, enclosed) will provide 6 square feet of absorption surface per linear foot. Two leach lines with total lengths of 83 feet each will supply the required area. The effluent should be equally distributed to each leach line by proper installation of a distribution box. Space must be provided for the 100% expansion leach lines as shown on the enclosed Plot Plan.

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Percolation testing in the area of the proposed leach lines consisted of a total of 4 excavations. One deep excavation was dug with a backhoe in the area of the proposed leach lines to a depth of 9½ feet below existing grade in order to determine if historic groundwater was present within 5 vertical feet of the bottom of the proposed trenches. Groundwater or indications of past groundwater levels were not observed in the deep excavation. The historically high groundwater level beneath the site is greater than 40 feet below existing grade. The historically high groundwater level beneath the site was obtained from the "Seismic Hazard Zone Report for the Ojai 7.5-Minute Quadrangle, Ventura County, California", dated 2002.

In order to perform percolation testing to current Ventura County standards, the deep excavation was tested for percolation rates at a depth of 9½ feet below existing grade. Next, a series of 3 shallow excavations were dug with the backhoe in the locations to be tested, to the anticipated depth of the proposed leach line bottoms (4½ feet below existing grade). The backhoe dug approximate 3-foot square excavations with access ramps. The test holes were spaced to provide representative percolation rates for the area of the anticipated leach lines and 100% expansion area. In the cleaned bottom of the backhoe excavations, percolation tests were run in 12-inch diameter by 12-inch deep hand dug holes. The percolation testing was setup and run in accordance with the requirements of the Ventura County Environmental Health Division's Onsite Wastewater Treatment Systems Technical Manual. The percolation results are provided in the enclosures.

A schematic design of the OWTS is provided in the enclosures. A Plot Plan, showing the locations of the proposed residence, septic tank, leach lines, distribution box, and the 100% expansion leach lines, as well as other information required by the County of Ventura are included in the enclosures. The locations of the proposed septic tank, leach line, and the 100% expansion leach line for the existing studio are also shown on the enclosed Plot Plan. The design was performed as a part of our report referenced above.

In the event of any changes in the design or location of the OWTS or any structure, as outlined in this report, the conclusions and recommendations contained herein may not be considered valid. Any changes should be reviewed by *Solid Soils & Geologic Consultants*, and our conclusions and recommendations modified or reaffirmed after such a review.

### **Drainage**

Positive control of surface water should be established. Irrigation water should not enter the development area. Roof gutters and downspouts should be provided to collect **all** roof water. Downspouts should deposit the water into a buried drain or paved swale. Downspouts should not direct water onto the soil next to the foundations. Pad and roof drainage should be collected and transferred to the street or approved drainage system in non-erosive drainage devices. Water should be directed away from foundations. Drainage should not be allowed to pond on the pad, under the building, against any foundations, or behind walls. A minimum of 2% (2 vertical per 100

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horizontal) drainage should be provided in all areas. A 5% slope should be considered for non-paved areas in the vicinity of the structures. The 5% zone should be at least seven feet wide, where possible. Fine-grade fills placed to create pad drainage should be compacted in order to retard infiltration of surface water.

Crawl spaces for raised floors, which are below the adjacent grade, should be graded for drainage per the above recommendations. All water should be collected by an area drain or other appropriate device, and transported to the drain system in a solid pipe. This should be shown on the appropriate plans.

Preserving proper surface drainage is also important. Planters, decorative walls, plants, trees or accumulations of organic matter should not be allowed to retard surface drainage or clog drains. Area drains and roof gutters should be kept free of obstructions. Roof gutters and condensation lines from air conditioners should outlet to area drains or paved areas which conduct the water to the street. Positive drainage along the backs of walls should be maintained. Any other measures that will facilitate positive surface drainage should be employed. Long-term saturation of the soils or subsurface may adversely affect structure foundations, slabs, patios, sidewalks and other rigid surfaces. The property owner and gardener should be reminded of the need to preserve proper drainage.

#### **Vegetation and Irrigation**

The landscaping process should aid in abating erosion. Care should be taken not to over-irrigate the property. Watering patterns should be modified to reflect rainy periods. The irrigation system should be checked on a regular basis for leakage. All leaks should be repaired immediately. Irrigation water should be applied only to the minimum extent needed to support plant life. A good source of information is your local city or county agency, the "Sunset New Western Garden" book, or similar publications.

Planter boxes adjacent to building foundations should either be avoided or appropriately sealed so that the irrigation water does not impact the foundations. Sealing may be accomplished by constructing the planters with a solid base and sidewall weep holes (exiting on side away from the building), or by providing a cutoff wall adjacent to the foundations. Cutoff walls should be at least 6 inches thick and extend at least 30 inches below the grade.

Control of irrigation water is a necessary part of site maintenance. Soggy ground, perched water, seeps and/or water damage may result if irrigation water is excessively or improperly applied. All irrigation systems should be adjusted to provide the minimum water needed to sustain landscaping. Adjustments should be made for changes of the seasons. Irrigation should stop when sufficient water is provided by precipitation. Broken, leaking, or plugged sprinklers or irrigation lines should be repaired immediately. Frequent inspections of the irrigation systems should be performed. The

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property owner and gardener should be reminded of the need to properly irrigate the property and the potential damage that may occur from irresponsible watering.

#### **Utility Trench Backfill**

Backfill for utility trench excavations should be compacted to at least 90% relative compaction. The designer and contractor should be aware of the potential of backfill sand in utility trenches to act as a subdrain. Water can be collected in the utility trenches and transported considerable distances, often across property lines. Flooding of junction boxes or service laterals may result. Flooding of service laterals may cause water damage to the addition and detached garage, including the interior of the structure. Appropriate measures should be taken in the design and construction phase to prevent such flooding.

#### **Plan Review**

Finalized plans should be submitted to *Solid Soils & Geologic Consultants* for comment and review. Additional recommendations may be provided at that time, if such are considered warranted. **A minimum of 48 hours should be allowed for the review of the plans.**

#### **Construction Monitoring**

A pre-construction meeting should be held at the site between the owner, contractor, grader, and *Solid Soils & Geologic Consultants*. The meeting should be held at least two days prior to starting any fieldwork. Compliance with *Solid Soils & Geologic Consultants* design concepts, specifications and recommendations during construction requires our review during the course of construction.

All temporary excavations should be observed by a representative of *Solid Soils & Geologic Consultants* to verify that the anticipated conditions are present and that our recommendations have been implemented at the construction site.

All fill bottom excavations should be observed prior to placement of fill. A representative of this office should monitor placement of all fill. Supplemental recommendations may prove warranted based upon the materials exposed in the actual excavations.

Foundation excavations should be observed by a representative of *Solid Soils & Geologic Consultants* to determine if the recommended depth into the proper bearing material has been achieved and that the site conditions are the same as those anticipated. Such observations should be made prior to placing concrete, steel or forms. Please notify our office at least 24 hours prior to a site visit. The approved plans and permits should be on the job site and available for our review.

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**General Conditions**

In the event of any changes in the design or location of any structure, as outlined in this report, the conclusions and recommendations contained herein may not be considered valid. Any changes should be reviewed by *Solid Soils & Geologic Consultants* and our conclusions and recommendations modified or reaffirmed after such a review.

The subsurface conditions described herein have been projected from excavations on the site. They should in no way be construed to reflect any variations which may occur between these excavations or which may result from changes in subsurface conditions. If conditions encountered during construction appear to differ from those disclosed herein, notify *Solid Soils & Geologic Consultants* immediately so we may consider the need for modifications.

Exploration was performed on only a portion of the site. The findings for the study area cannot be considered as indicative of areas not explored.

This report is made and issued for the sole use and benefit of the client and is not transferable. This report states conditions as of the date of the exploration. Any liability in connection herewith shall not exceed our fee for the exploration. No warranty, expressed or implied, is made or intended in connection with the exploration, by the furnishing of this report, or by any other oral or written statement.

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Thank you for this opportunity to be of service. If you have any questions regarding this report, please feel free to contact the undersigned at (805) 202-6533.

Respectfully submitted,  
*SOLID SOILS & GEOLOGIC CONSULTANTS*



Jeff Sivas  
C.E.G. 2565 expires 2/23

Shaun Simon  
R.C.E. 82610 expires 10/22



Enclosures:

Vicinity Maps	
Plot Plan	
Test Pit Logs .....	Plates TP-1 through TP-7
Shear Test Results .....	Plates S-1 and S-2
Consolidation Test Results .....	Plate C-1
Seismic Information	
Percolation Test Data & Information	

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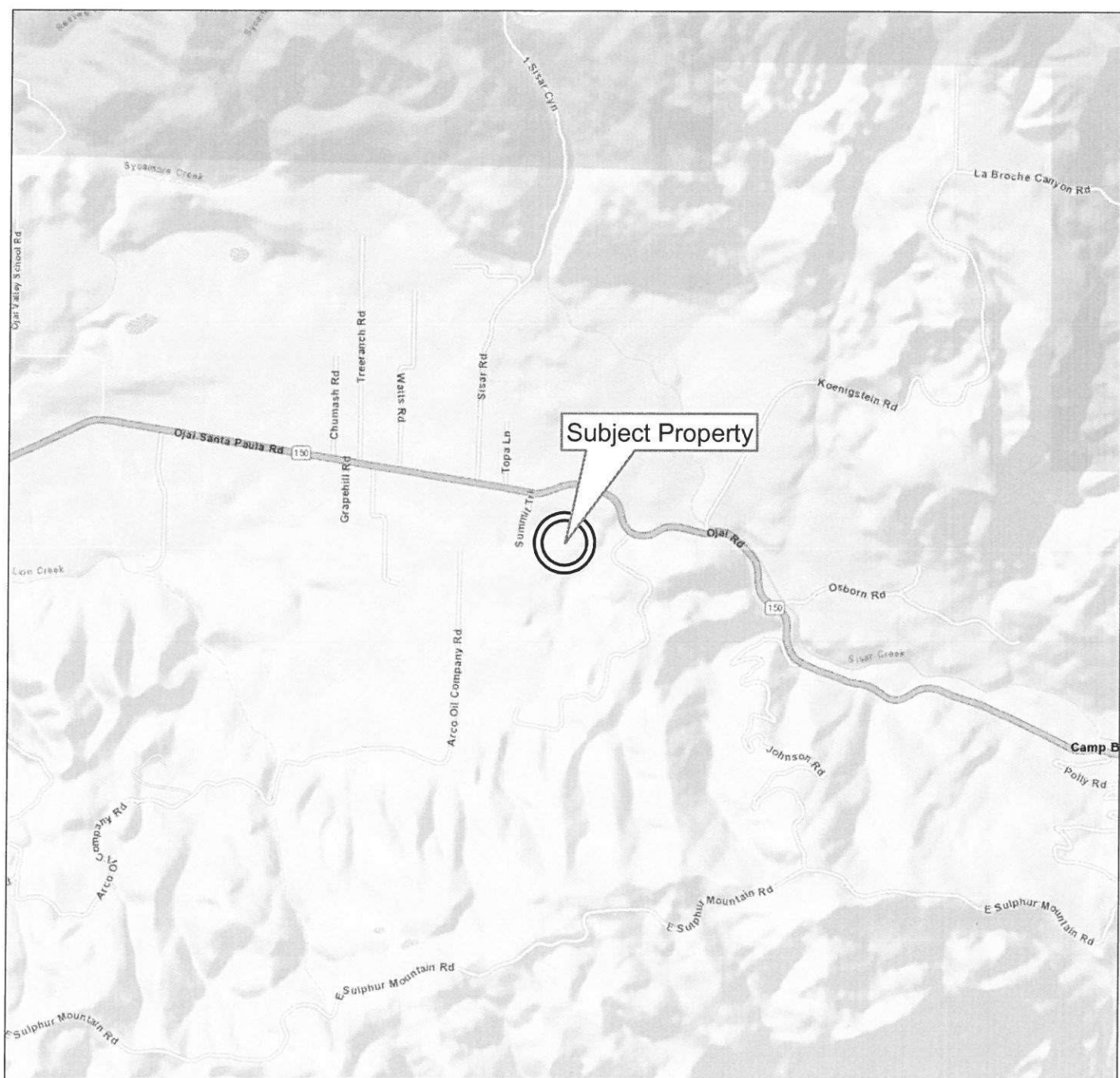


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Subject: Vicinity Map  
Reference: ESRI World Street Map  
Scale: 1" = 2000'

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022



0 1,000 2,000 4,000  
Feet

## Vicinity Map

1 Inch = 2,000 Feet

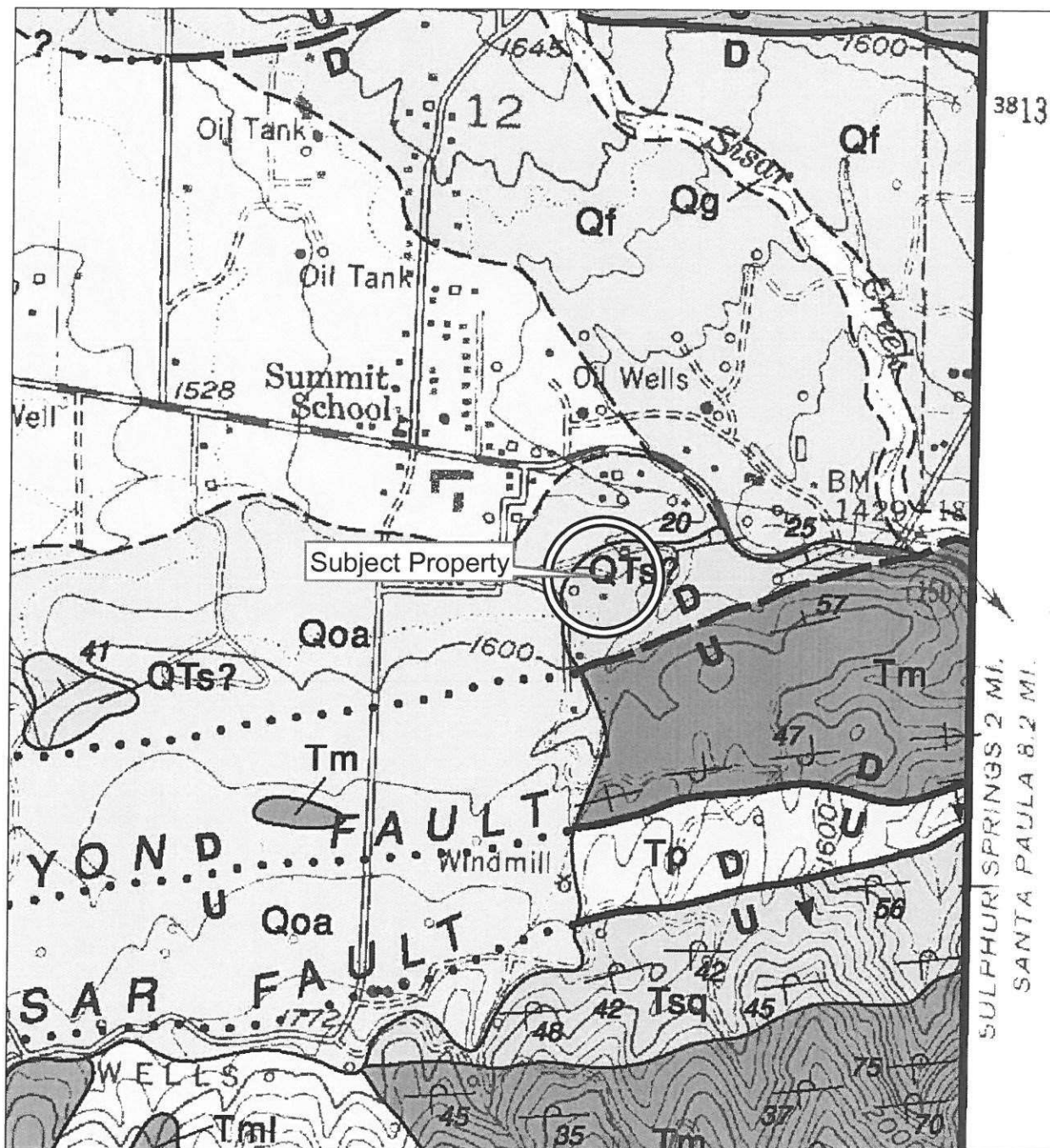


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Subject: Vicinity Geologic Map 1  
Reference: Dibblee, Ojai Quad  
Scale: 1" = 1000'

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022



0 500 1,000 2,000  
Feet

## Vicinity Geologic Map 1

1 Inch = 1,000 Feet





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Subject: Vicinity Geologic Map 2  
Reference: USGS Ojai Quad  
Scale: 1" = 1000'

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022



0 500 1,000 2,000  
Feet

## Vicinity Geologic Map 2

1 Inch = 1,000 Feet



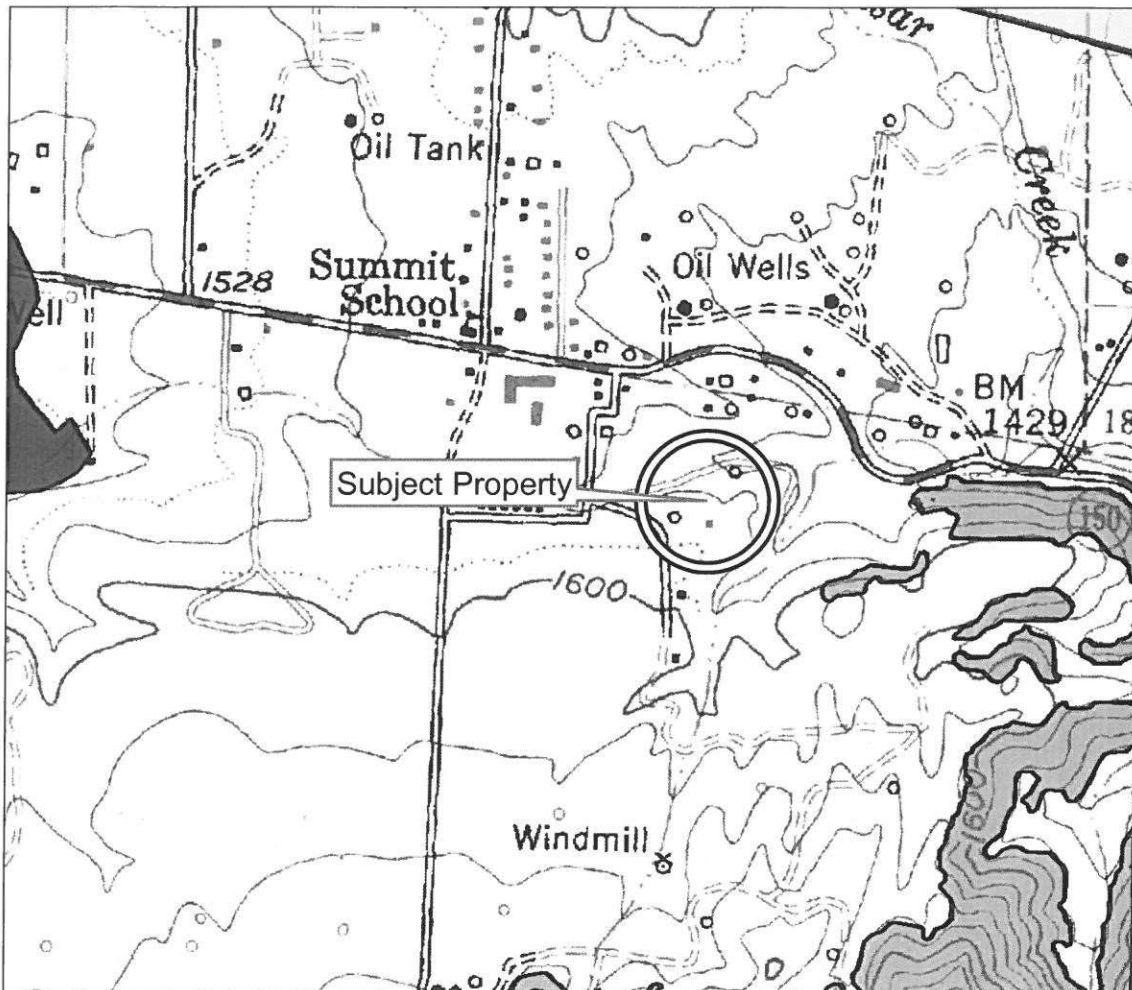


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Subject: Seismic Hazard Zones Map  
Reference: California Geological Survey  
Scale: 1" = 1000'

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022



#### EARTHQUAKE FAULT ZONES

##### Earthquake Fault Zones

Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

##### Active Fault Traces

Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

#### SEISMIC HAZARD ZONES

##### Liquefaction Zones

Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

##### Earthquake-Induced Landslide Zones

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.



0 500 1,000 2,000  
Feet

## Seismic Hazard Zones Map

1 Inch = 1,000 Feet



**SOLID***Soils & Geologic Consultants*  
solidsolls.com; (805) 202-6533**TEST PIT LOG**

Job #: SS-434-S

Client: Mircetic

Address: 11820 Topa Vista Rd.

Test Pit #: TP-1

Date Excavated: 07/15/2021

Logged By: JN

**DEPTH (ft)****DESCRIPTION**

0 - 2

ARTIFICIAL FILL (af):

Silty SAND with Clay; very fine grained, dark brown, moist, medium dense to dense, trace amounts of gravel up to 1".

2 - 8

BEDROCK: MONTEREY FORMATION (Tm):

Clayey, Silty SANDSTONE; very fine to fine grained with some medium grains and trace coarse grains, medium orangish, tannish, and greyish brown, moist to very moist, moderately weathered, dense to very dense at 4.5', some siliceous clasts up to approximately 6" across.

APPROX. BEDDING at 4': N60°E/ 9° N

Total Depth: 8'. No Water. No Caving. Fill to 2'.

PLATE TP-1

**SOLID***Soils & Geologic Consultants*  
solidsolls.com; (805) 202-6533**TEST PIT LOG**

Job # : SS-434-S

Client: Mircetic

Address: 11820 Topa Vista Rd.

Test Pit # : TP-2

Date Excavated: 07/15/2021

Logged By: JN

**DEPTH (ft)****DESCRIPTION**

0 - 2

ARTIFICIAL FILL (af):

Silty SAND with Clay and Gravel; very fine to coarse grained, medium brown, slight moist to moist at approx. 1', gravel up to 3" across, dense to very dense.

2 - 5

BEDROCK; MONTEREY FORMATION (Tm):

Clayey, Silty SANDSTONE; very fine to fine grained with some medium grains and trace coarse grains, medium orangish, tannish, and greyish brown, moist, moderately weathered, dense to very dense at approx. 3.5', some siliceous clasts up to approximately 6" across.

Total Depth: 5'. No Water. No Caving. Fill to 2'.

PLATE TP-2





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## TEST PIT LOG

Job # : SS-434-S

Client: Mircetic

Address: 11820 Topa Vista Rd.

Test Pit # : TP-3

Date Excavated: 07/15/2021

Logged By: JN

### DEPTH (ft)

### DESCRIPTION

0 - 1

ARTIFICIAL FILL (af):

Silty SAND with Clay and Gravel; very fine to coarse grained, medium brown, slight moist to moist at approx. 1', gravel up to 3" across, dense to very dense, 3" layer of asphalt at 0.75'.

1 - 5

BEDROCK; MONTEREY FORMATION (Tm):

Clayey, Silty SANDSTONE; very fine to fine grained with some medium grains and trace coarse grains, medium orangish, tannish, and greyish brown, moist, moderately weathered, dense to very dense at approx. 3', some siliceous clasts up to approximately 6" across.

Total Depth: 5'. No Water. No Caving. Fill to 1'.

**SOLID***Soils & Geologic Consultants*  
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Job # : SS-434-S

Client: Mircetic

Address: 11820 Topa Vista Rd.

Test Pit # : TP-4

Date Excavated: 07/15/2021

Logged By: JN

**DEPTH (ft)****DESCRIPTION**

0 - 1.0

ARTIFICIAL FILL (af):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, loose, slightly moist to dry, abundant roots and pinhole voids.

1.0 - 4.5

OLDER ALLUVIUM (Qoal):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, slightly moist, medium dense to dense at approx. 2.5', cobbles up to 6" across.

Total Depth: 4.5'. No Water. No Caving. Fill to 1'.

PLATE TP-4

**SOLID***Soils & Geologic Consultants*  
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Job # : SS-434-S

Client: Mircetic

Address: 11820 Topa Vista Rd.

Test Pit # : TP-5

Date Excavated: 07/15/2021

Logged By: JN

**DEPTH (ft)****DESCRIPTION**

0 - 1.0

ARTIFICIAL FILL (af):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, loose, slightly moist to dry, abundant roots and pinhole voids.

1.0 - 4.5

OLDER ALLUVIUM (Qoal):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, slightly moist, medium dense to dense at approx. 2.5', cobbles up to 4" across.

Total Depth: 4.5'. No Water. No Caving. Fill to 1'.

PLATE TP-5

**SOLID***Soils & Geologic Consultants*  
solidsolls.com; (805) 202-6533**TEST PIT LOG**

Job # : SS-434-S

Client: Mircetic

Address: 11820 Topa Vsita Rd.

Test Pit # : TP-6

Date Excavated: 07/15/2021

Logged By: JN

**DEPTH (ft)****DESCRIPTION**

0 - 1.0

ARTIFICIAL FILL (af):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, loose, slightly moist to dry, abundant roots and pinhole voids.

1.0 - 9.5

OLDER ALLUVIUM (Qoal):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, slightly moist, medium dense to very dense at approx. 3.0', cobbles up to 6" across.

Total Depth: 9.5'. No Water. No Caving. Fill to 1'.

PLATE TP-6





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## TEST PIT LOG

Job # : SS-434-S

Client: Mircetic

Address: 11820 Topa Vista Rd.

Test Pit # : TP-7

Date Excavated: 07/15/2021

Logged By: JN

### DEPTH (ft)

### DESCRIPTION

0 - 1.0

ARTIFICIAL FILL (af):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, loose, slightly moist to dry, abundant roots and pinhole voids.

1.0 - 4.5

OLDER ALLUVIUM (Qoal):

Silty, Gravelly SAND with Clay; very fine to coarse grained, medium brown, slightly moist, medium dense to dense at approx. 2.5', boulders up to 1.5' across.

Total Depth: 4.5'. No Water. No Caving. Fill to 1'.



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Job Number: SS-434-S

Client: Mircetic

Sample Location: TP-3 @ 5'

Earth Material: Clayey Silty Sand

Cohesion: 797.0 (psf)

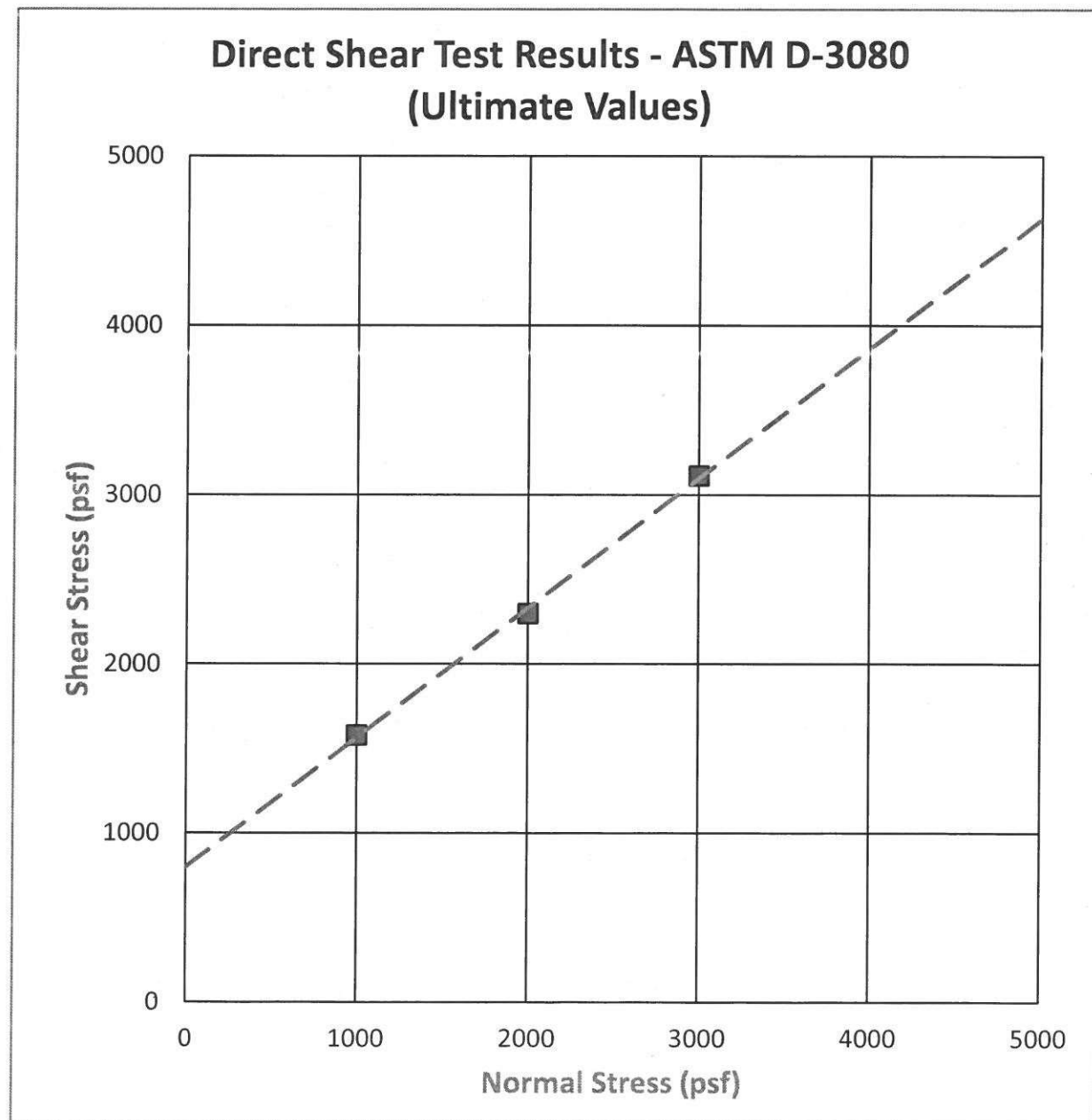
Phi Angle: 37.5°

Shear Rate: 0.05 in/min

Initial Moisture Content: 15.1 %

Dry Density: 107.9 (pcf)

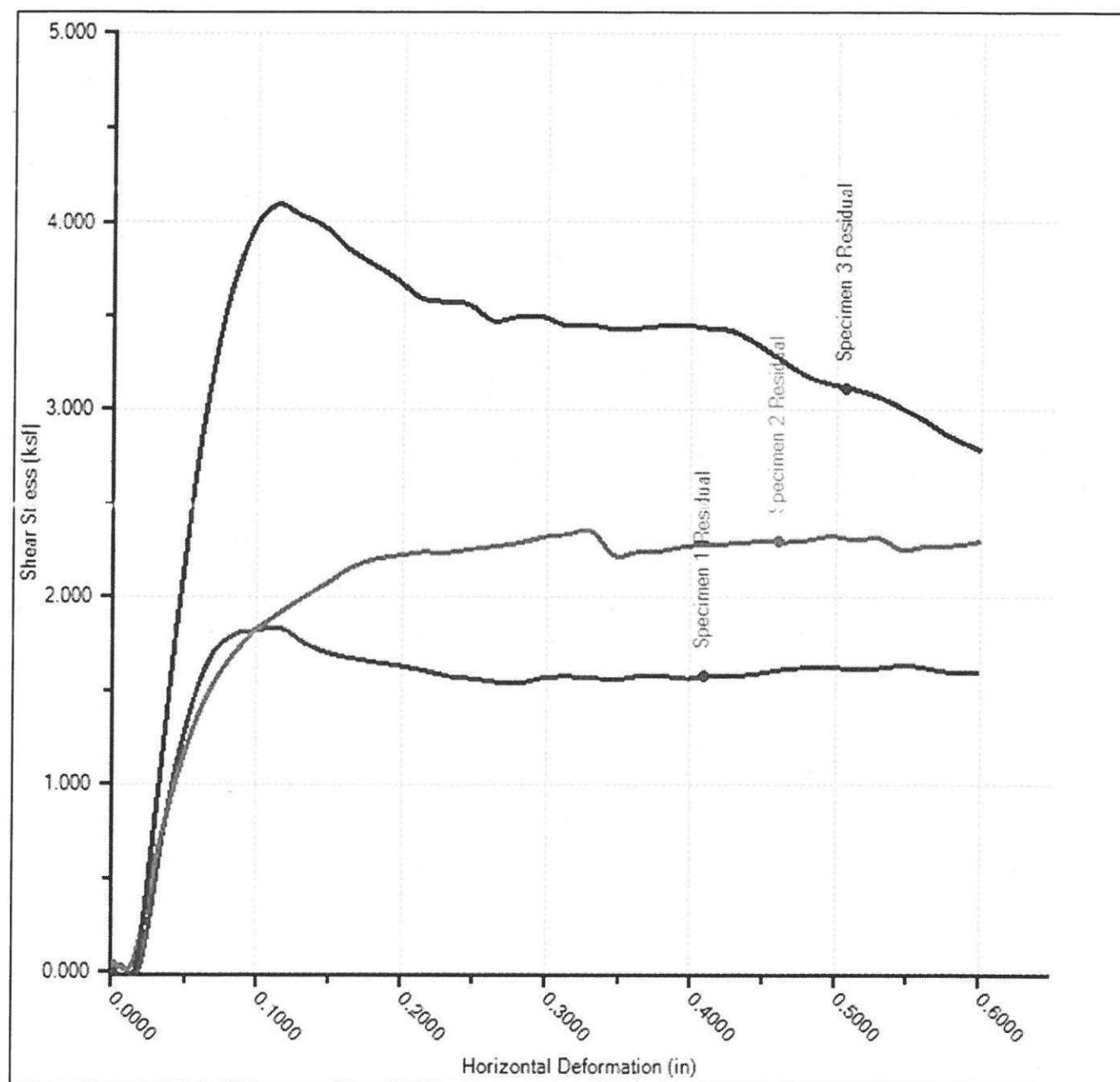
Degree of Saturation: 98.3 %



**SHEAR DIAGRAM S-1**



# SS-434-S Mircetic TP-3 @ 5'.HSDN - DS Test





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Job Number: SS-434-S

Client: Mircetic

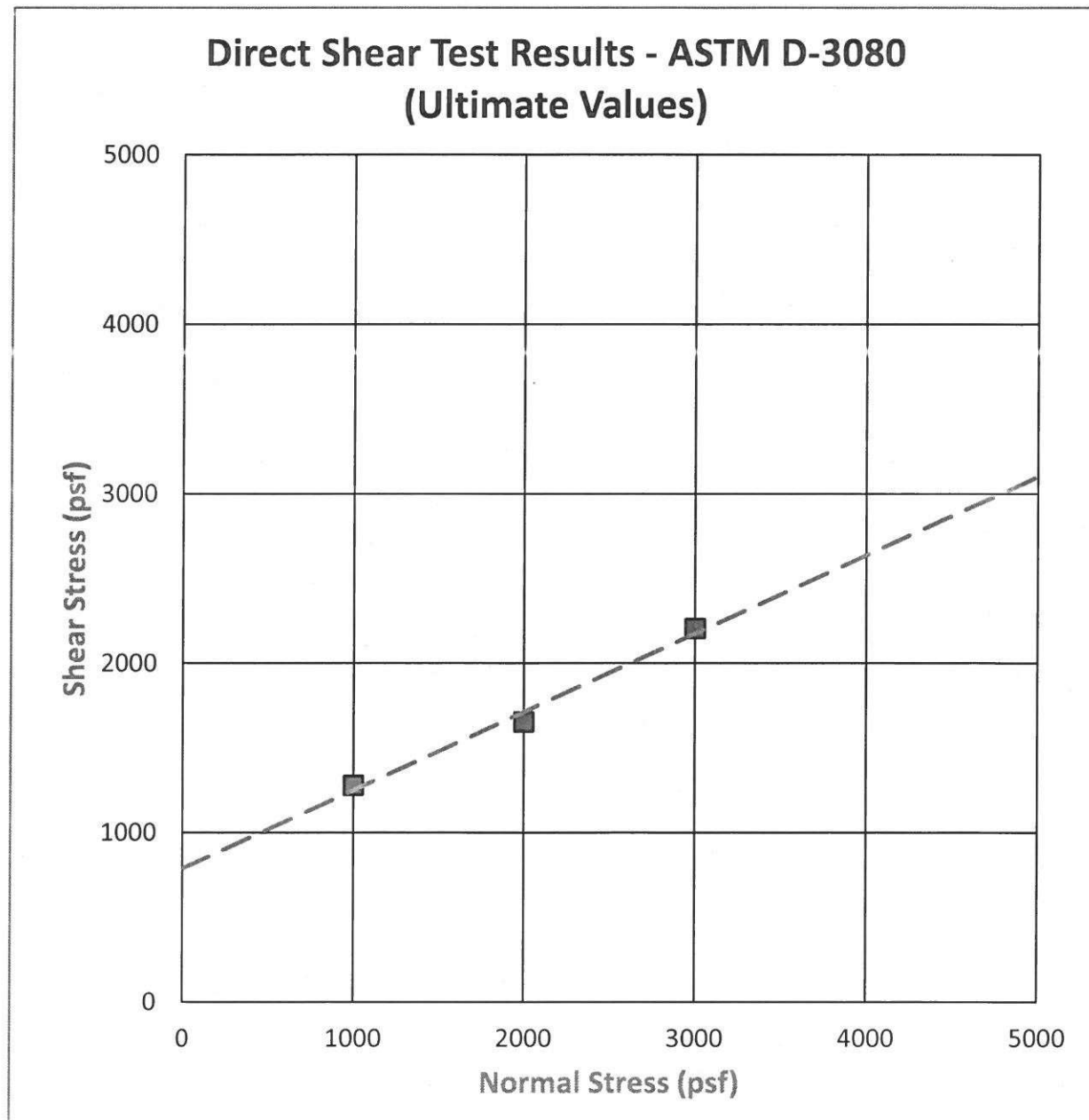
Sample Location: TP-1-2 @ 0-5'

Earth Material: Clayey Silty Sand

Cohesion: 787.33 (psf)

Phi Angle: 24.8°

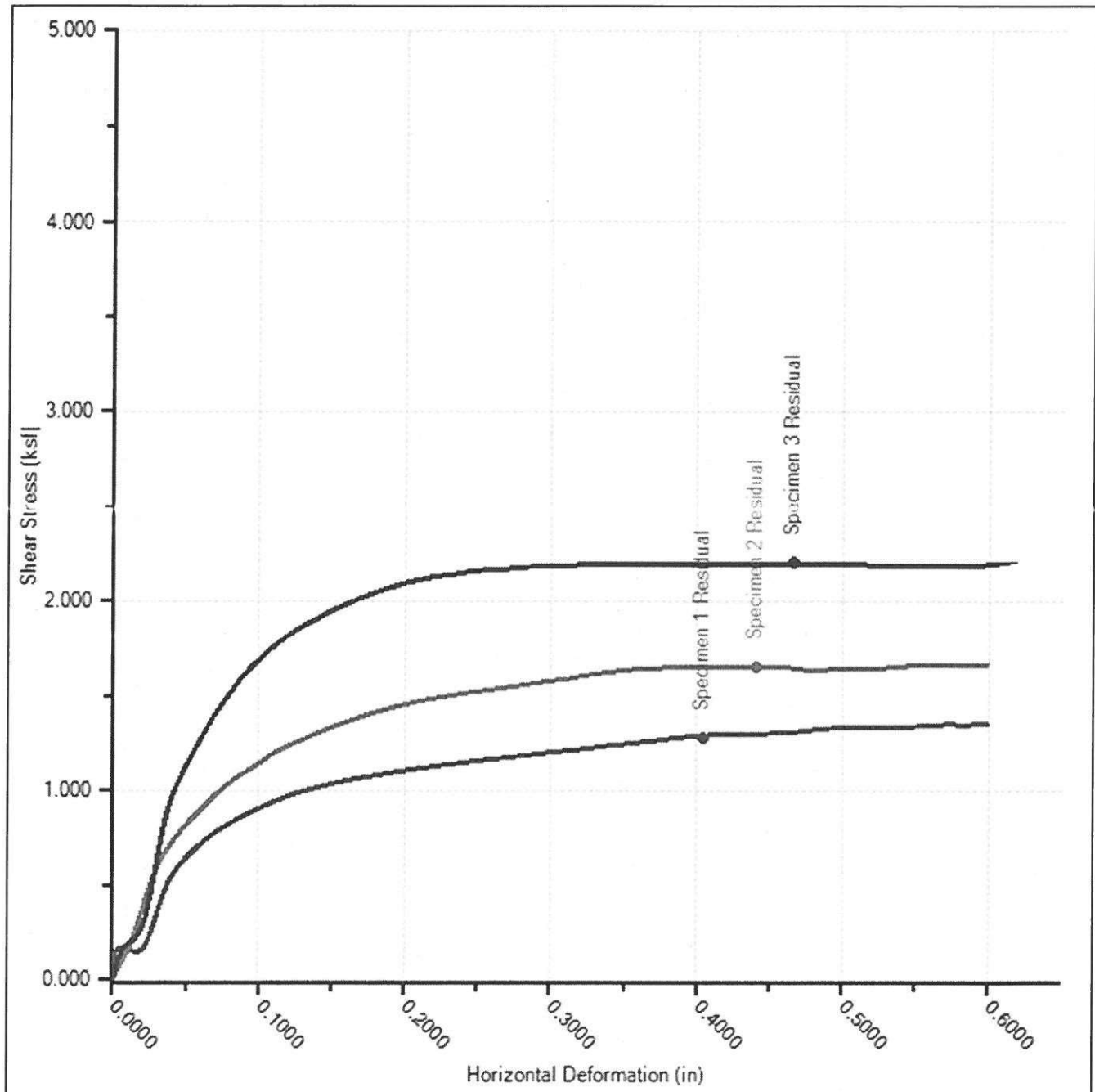
Shear Rate: 0.05 in/min



**SHEAR DIAGRAM S-2**



DS SS-434-S Mercetic Composite @ 0-5'.HSDN - DS Test

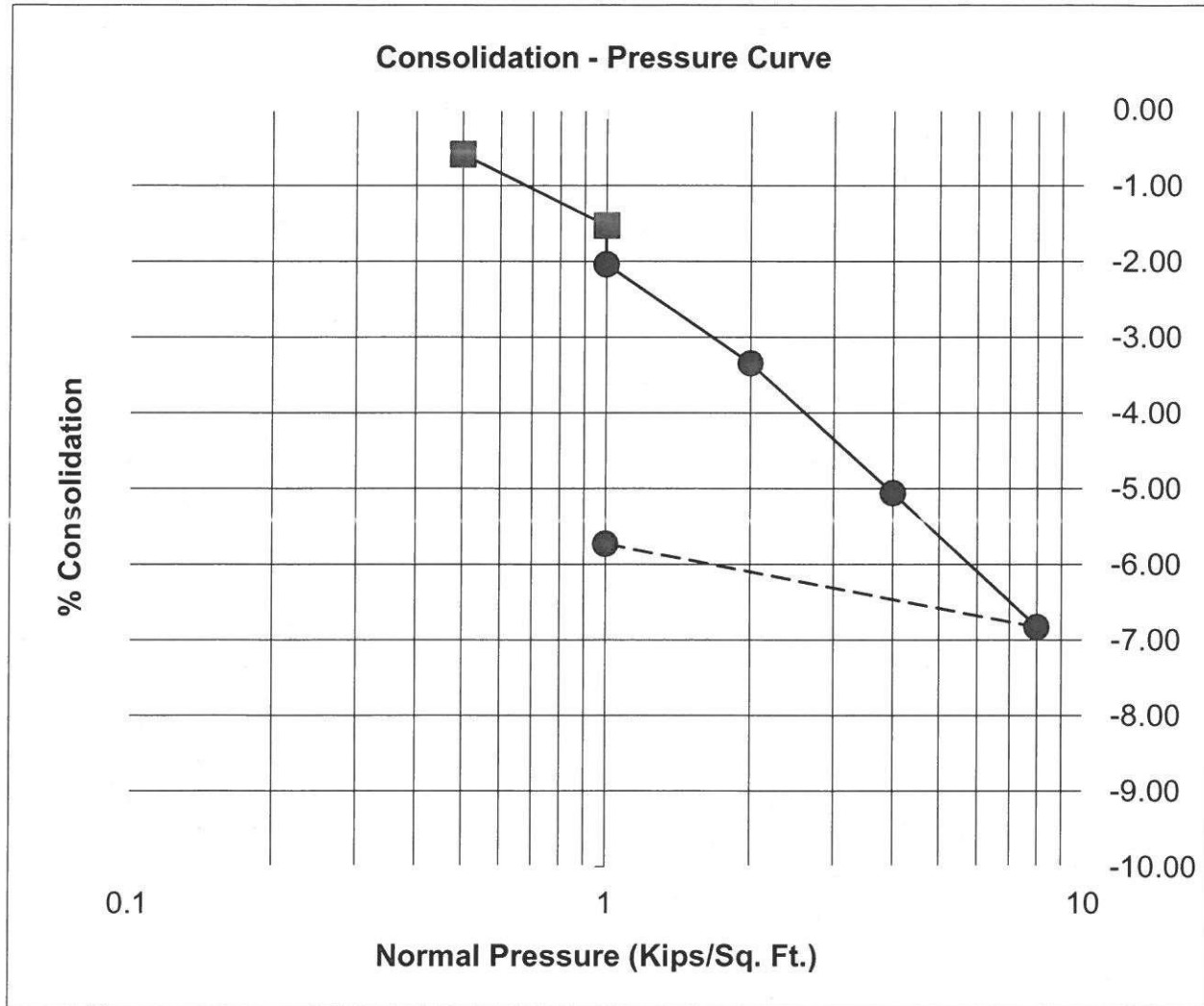


# Consolidation Test Results

Job: SS-434-S  
Test by: LE  
Test Pit or Boring: TP-1

Client: Mircetic  
Checked by: JS  
Depth: 4.5"

Date: 7/26/21  
Subject: Consolidation Diagram  
Material: Clayey Silty Sand



■ = Field Moisture

● = Sample Flooded

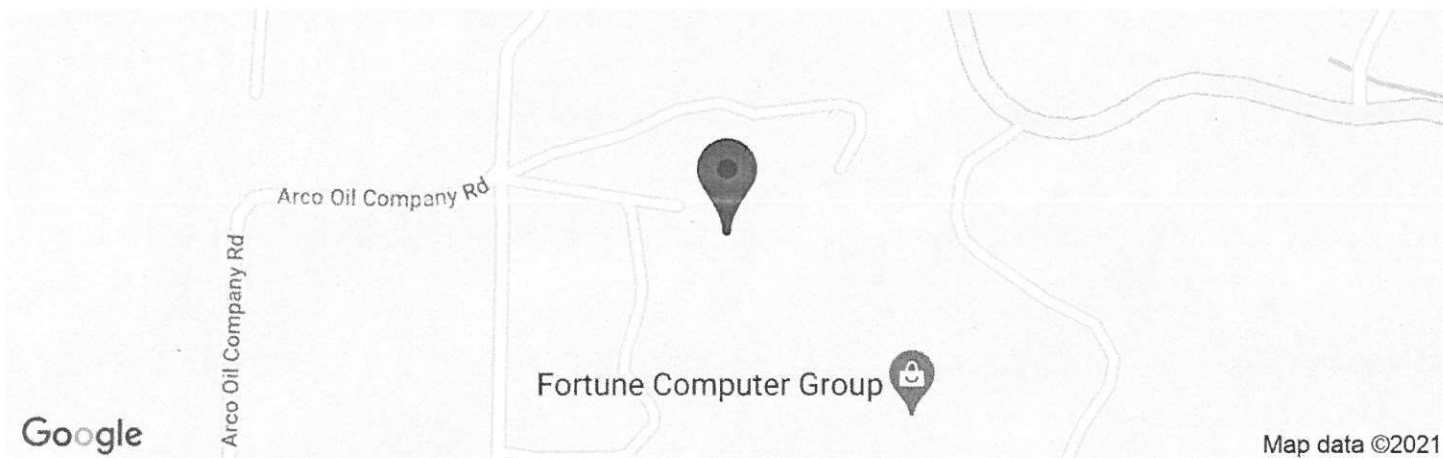
Plate: C-1



# MIRCETIC

11820 Topa Vista Rd, Santa Paula, CA 93060, USA

Latitude, Longitude: 34.4336708, -119.1332982



Date	7/26/2021, 1:13:13 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
$S_S$	1.899	$MCE_R$ ground motion. (for 0.2 second period)
$S_1$	0.727	$MCE_R$ ground motion. (for 1.0s period)
$S_{MS}$	2.279	Site-modified spectral acceleration value
$S_{M1}$	null -See Section 11.4.8	Site-modified spectral acceleration value
$S_{DS}$	1.519	Numeric seismic design value at 0.2 second SA
$S_{D1}$	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
$F_a$	1.2	Site amplification factor at 0.2 second
$F_v$	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.833	$MCE_G$ peak ground acceleration
$F_{PGA}$	1.2	Site amplification factor at PGA
$PGA_M$	0.999	Site modified peak ground acceleration
$T_L$	8	Long-period transition period in seconds
$S_{sRT}$	1.899	Probabilistic risk-targeted ground motion. (0.2 second)
$S_{sUH}$	2.128	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
$S_{sD}$	2.148	Factored deterministic acceleration value. (0.2 second)
$S_{1RT}$	0.727	Probabilistic risk-targeted ground motion. (1.0 second)
$S_{1UH}$	0.815	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S_{1D}$	0.77	Factored deterministic acceleration value. (1.0 second)
$PGA_d$	0.885	Factored deterministic acceleration value. (Peak Ground Acceleration)
$C_{RS}$	0.893	Mapped value of the risk coefficient at short periods
$C_{R1}$	0.891	Mapped value of the risk coefficient at a period of 1 s

# PERCOLATION TEST DATA

JOB ADDRESS: 11820 Topa Vista Rd

NEAREST CROSS STREET: Ojai-Santa Paula Rd.

OWNER: Mircetic

DATE OF PRESOAKING: 07/15/2021

DATE OF TESTING: 07/16/2021

TEST PERFORMED BY: JS/JN

WEATHER: Clear

TEMP: 90° F

**TEST HOLE NUMBER: TP-4**

DEPTH TO BOTTOM: 54.0"

DEPTH TO REFERENCE POINT: 42.0"

REFERENCE POINT TO BOTTOM: 12.0"

SLOWEST RATE (MIN/INCH): 18.5

TIME	TIME INTERVAL (MIN)	DEPTH TO WATER (IN)	CHANGE IN H2O LEVEL (IN)	PERC. RATE MIN/INCH
12:37		6.00		
13:07	30	7.75	1.75	17.1
13:08		6.00		
13:38	30	7.75	1.75	17.1
13:39		6.00		
14:09	30	7.63	1.63	18.5
14:10		6.00		
14:40	30	7.75	1.75	17.1
14:41		6.00		
15:11	30	7.88	1.88	16.0
15:12		6.00		
15:42	30	7.75	1.75	17.1
15:43		6.00		
16:16	33	7.88	1.88	17.6

**SOLID SOILS GEOLOGIC CONSULTANTS, INC.**

2064 Eastman Avenue, Suite 111, Ventura, CA 93003

solidsoils.com, (805) 202-6533



# PERCOLATION TEST DATA

JOB ADDRESS: 11870 Topa Vista Rd

NEAREST CROSS STREET: Ojai-Santa Paula Rd.

OWNER: Mircetic

DATE OF PRESOAKING: 07/15/2021

DATE OF TESTING: 07/17/2021

TEST PERFORMED BY: JS/JN

WEATHER: Clear

TEMP: 90° F

**TEST HOLE NUMBER: TP-5**

DEPTH TO BOTTOM: 54.0"

DEPTH TO REFERENCE POINT: 42.0"

REFERENCE POINT TO BOTTOM: 12.0"

SLOWEST RATE (MIN/INCH): 51.2

TIME	TIME INTERVAL (MIN)	DEPTH TO WATER (IN)	CHANGE IN H2O LEVEL (IN)	PERC. RATE MIN/INCH
12:38		5.75		
13:09	31	6.88	1.13	27.6
13:10		6.00		
13:40	30	6.75	0.75	40.0
13:41		6.00		
14:11	30	6.63	0.63	48.0
14:12		6.00		
14:42	30	6.63	0.63	48.0
14:43		6.00		
15:14	31	6.64	0.64	48.8
15:15		6.00		
15:47	32	6.63	0.63	51.2
15:48		6.00		
16:20	32	6.63	0.63	51.2

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# PERCOLATION TEST DATA

JOB ADDRESS: 11820 Topa Vista Rd

NEAREST CROSS STREET: Ojai-Santa Paula Rd.

OWNER: Mircetic

DATE OF PRESOAKING: 07/15/2021

DATE OF TESTING: 07/16/2021

TEST PERFORMED BY: JS/JN

WEATHER: Clear

TEMP: 90° F

**TEST HOLE NUMBER: TP-6**

DEPTH TO BOTTOM: 114.0"

DEPTH TO REFERENCE POINT: 102.0"

REFERENCE POINT TO BOTTOM: 12.0"

SLOWEST RATE (MIN/INCH): 60.0

TIME	TIME INTERVAL (MIN)	DEPTH TO WATER (IN)	CHANGE IN H2O LEVEL (IN)	PERC. RATE MIN/INCH
12:38		6.00		
13:08	30	6.75	0.75	40.0
13:09		6.00		
13:39	30	6.70	0.70	42.9
13:40		6.00		
14:10	30	6.65	0.65	46.2
14:11		6.00		
14:41	30	6.55	0.55	54.5
14:42		6.00		
15:12	30	6.51	0.51	58.8
15:13		6.00		
15:43	30	6.50	0.50	60.0
15:44		6.00		
16:14	30	6.50	0.50	60.0

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# PERCOLATION TEST DATA

JOB ADDRESS: 11820 Topa Vista Rd

NEAREST CROSS STREET: Ojai-Santa Paula Rd.

OWNER: Mircetic

DATE OF PRESOAKING: 07/15/2021

DATE OF TESTING: 07/16/2021

TEST PERFORMED BY: JS/JN

WEATHER: Clear

TEMP: 90° F

**TEST HOLE NUMBER: TP-7**

DEPTH TO BOTTOM: 54.0"

DEPTH TO REFERENCE POINT: 42.0"

REFERENCE POINT TO BOTTOM: 12.0"

SLOWEST RATE (MIN/INCH): 60.0

TIME	TIME INTERVAL (MIN)	DEPTH TO WATER (IN)	CHANGE IN H2O LEVEL (IN)	PERC. RATE MIN/INCH
12:40		6.00		
13:11	31	6.80	0.80	38.8
13:12		6.00		
13:42	30	6.75	0.75	40.0
13:43		6.00		
14:13	30	6.70	0.70	42.9
14:14		6.00		
14:45	31	6.65	0.65	47.7
14:46		6.00		
15:16	30	6.55	0.55	54.5
15:17		6.00		
15:47	30	6.55	0.55	54.5
15:48		6.00		
16:18	30	6.50	0.50	60.0

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2064 Eastman Avenue, Suite 111, Ventura, CA 93003

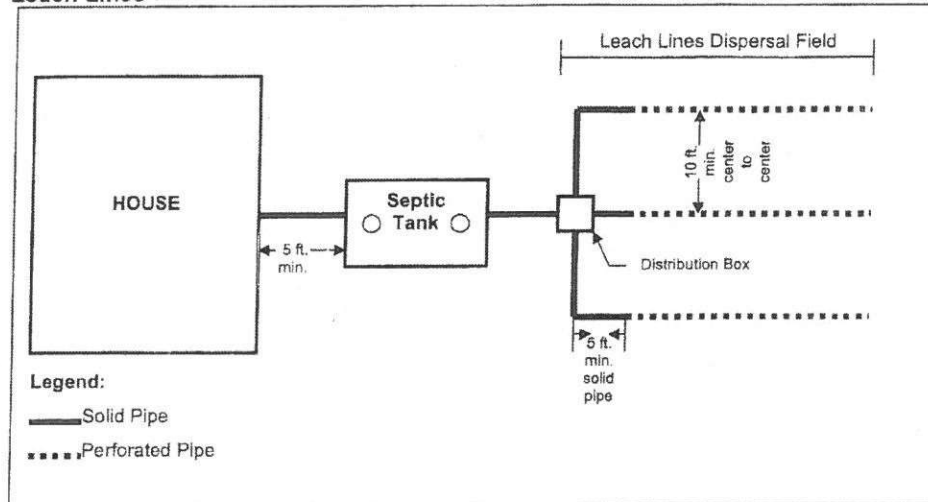
solidsoils.com, (805) 202-6533

Subject: Septic Detail  
Reference: Ventura County Environmental Health  
Scale: --

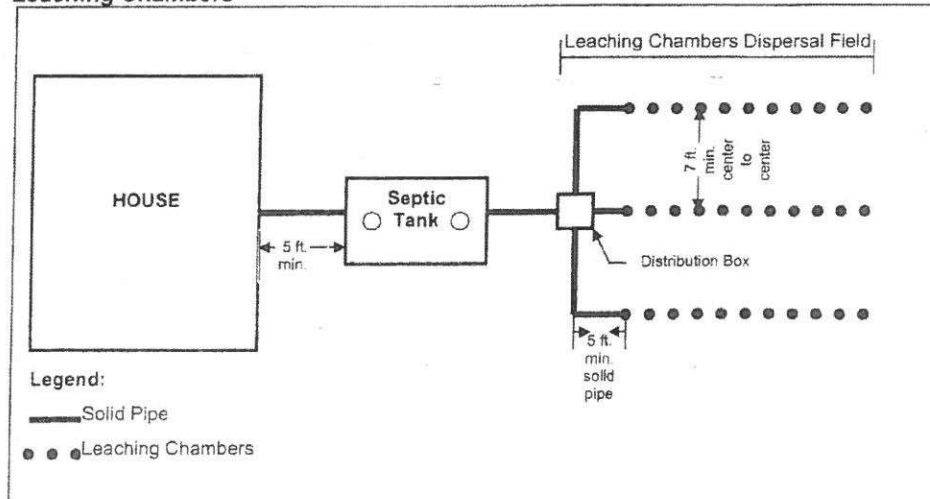
Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022

### Typical Septic Tank System with Conventional Dispersal Field

#### Leach Lines



#### Leaching Chambers



# Typical Septic Tank System with Conventional Dispersal Field





**SOLID**  
Soils & Geologic Consultants  
solidsoils.com: (805) 202-6533

Subject: Absorption Area Requirements  
Reference: Ventura County Environmental Health  
Scale: --

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022

### Absorption Area Requirements

Percolation Rate (Time in minutes required for water to fall one inch)	Required Absorption Area (Sq. ft. per bedroom using standard leach lines. See notes (a) through (e) below.
1 or less	75
2	85
3	100
4	115
5	125
10	165
15	190
30	250
45	300
60	330
over 60 (e)	---

- (a) Sufficient usable land area must be available to provide 100% expansion of required absorption area when/if necessary. See Sec. UPC APPENDIX K-1(d) in this Code.
- (b) Absorption area should be sufficient to accommodate increased future use stemming from the addition of bedrooms or conversion of unfinished spaces to bedroom use, whenever such changes can be reasonably be anticipated.
- (c) The absorption area for leach lines and leaching beds is calculated as trench bottom area only except as provide in Sec. UPC APPENDIX K-3 in this ordinance. Minimum required area for leaching trenches is 150 sq. ft.
- (d) The above table allows for the connection of domestic food waste units and automatic clothes washing machines without further increase in absorption area.
- (e) Soil having a percolation rate over 60 min/inch is unsuitable for installation of an absorption system.

# Absorption Area Requirements

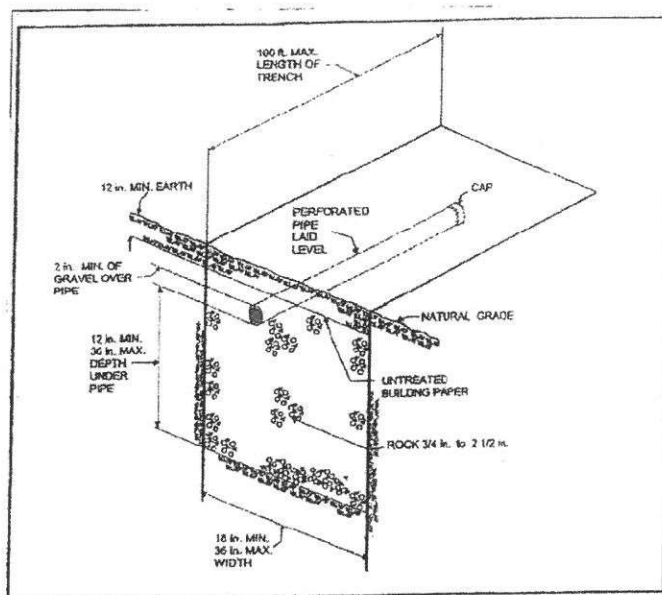


**SOLID**  
Soils & Geologic Consultants  
solidsoils.com:(805) 202-6533

Subject: Typical Leach Lines  
Reference: Ventura County Environmental Health  
Scale: --

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022

### Typical Leach Lines



### Square Feet Per Lineal Foot Trench Widths and Depths

		Width of Trench Bottom			
		18 inches	24 inches	30 inches	36 inches
Depth of Gravel Below Pipe	12 inches	1 ½ Feet <sup>2</sup>	2 Feet <sup>2</sup>	2 ½ Feet <sup>2</sup>	3 Feet <sup>2</sup>
	18 inches	2 ½ Feet <sup>2</sup>	3 Feet <sup>2</sup>	3 ½ Feet <sup>2</sup>	4 Feet <sup>2</sup>
	24 inches	3 Feet <sup>2</sup>	4 Feet <sup>2</sup>	4 ½ Feet <sup>2</sup>	5 Feet <sup>2</sup>
	30 inches	3 Feet <sup>2</sup>	4 Feet <sup>2</sup>	5 Feet <sup>2</sup>	6 Feet <sup>2</sup>
	36 inches	3 Feet <sup>2</sup>	4 Feet <sup>2</sup>	5 Feet <sup>2</sup>	6 Feet <sup>2</sup>

1. No system may be installed with less than 150 square feet of trench bottom.
2. In large specially designed systems 50% of the required square footage of leaching area must be obtained from trench bottom, and no more than 50% from side walls.
3. Additional footage may be obtained from side walls measured between 12 inches and 36 inches below the pipe.

# Typical Leach Lines



**SOLID**  
Soils & Geologic Consultants  
solidsoils.com:(805) 202-6533

Subject: ISDS Setbacks  
Reference: Ventura County Environmental Health  
Scale: --

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022



Ventura County Environmental Health Division - 800 S. Victoria Ave., Ventura CA 93009-1730  
805/654-5008, 654-2802, or 654-2859  
Internet Web Site Address: [www.ventura.org/rma/envhealth](http://www.ventura.org/rma/envhealth)

### INDIVIDUAL SEWAGE DISPOSAL SYSTEM SETBACK REQUIREMENTS

Minimum Horizontal Distance in Feet from:	Building Sewer	Septic Tank	Disposal Field	Seepage Pit	Subsurface Sand Filtration System	Mound System
Buildings or Structures <sup>1</sup>	2	5	8	8	8	20 <sup>2</sup>
Property line adjoining private property	Clear <sup>3</sup>	5	5	8	8	10
Water supply well on suction line	50 <sup>4</sup>	50	100	150	100 <sup>5</sup>	100
Streams, lakes, tidal waters, or ocean waters	50	50	100	150	100	100
Large Trees	--	10	--	10	10	--
Seepage pits or cesspools	--	5	5	12	--	--
Disposal Field	--	5	4 <sup>6</sup>	5	--	--
Onsite domestic water service line	1 <sup>7</sup>	5	5	5	5	5
Distribution Box	--	--	5	5	--	--
Pressure public water main	10 <sup>8</sup>	10	10	10	10	10

NOTE: When disposal fields and/or seepage pits are installed in sloping ground, the minimum horizontal distance between any part of the leaching system and ground surface shall be fifteen (15) feet.

When facilities are located near tidal or ocean waters, the horizontal distance shall be measured from the historically most landward location of the beach at the mean high tide elevation. Structures or facilities shall be constructed in accordance with Federal, State, and local laws to prevent erosion of the beaches and movement of the mean high tide closer than the horizontal distances specified above.

- 1 Including porches and steps, whether covered or uncovered; breezeways; roofed port-cocheres; roofed patios; carports; covered walks; covered driveways; and similar appurtenances.
- 2 This distance shall be increased to 30 feet when the system is located upslope of the structure.
- 3 See UPC, Section 315(c)
- 4 The distance may be reduced to not less than twenty-five (25) feet when approved metallic piping is installed. Where special hazards are involved, the distance required shall be increased, as may be directed by the County Health Officer or the Administrative Authority.
- 5 This distance shall be increased to 150 feet when seepage pits are used as a component of the system.
- 6 Plus two (2) feet for each additional foot of depth in excess of one (1) foot below the bottom of the drain line (See UPC, Section 1-6(f)).
- 7 See UPC, Section 1108
- 8 For parallel construction. For crossings, approval by the Administrative Authority is required.

## Individual Sewage Disposal System Setback Requirements



**SOLID**  
Soils & Geologic Consultants  
solidsoils.com:(805) 202-6533

Subject: Septic Tank Criteria  
Reference: Ventura County Environmental Health  
Scale: --

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022

### Septic Tank Criteria

#### SINGLE FAMILY DWELLINGS

Calculate septic tank capacity by both number of bedrooms and by number of plumbing fixture units. Use the capacity based on plumbing fixture units if greater than capacity based on number of bedrooms.

Number of Bedrooms	Septic Tank Capacity (gallons)	Number of Plumbing Fixture Units	Septic Tank Capacity (gallons)
3 or less	1,000	25 or less	1,000
4	1,200	26-33	1,200
5-6	1,500	34-45	1,500
Additional Bedrooms	Add 150 gallons capacity per bedroom in excess of 6	46-55	2,000
		56-60	2,250
		61-70	2,500
		71-80	2,750
		81-90	3,000
		91-100	3,250
		Over 100	Add 25 gallons capacity per fixture unit in excess of 100

#### NON-RESIDENTIAL STRUCTURES

Calculate septic tank capacity based solely on number of plumbing fixture units.

Number of Plumbing Fixture Units	Septic Tank Capacity (gallons)
20 or less	1,000
21-25	1,200
26-33	1,500
34-45	2,000
46-55	2,250
56-60	2,500
61-70	2,750
71-80	3,000
81-90	3,250
91-100	3,500
Over 100	Add 25 gallons capacity per plumbing fixture unit in excess of 100.

NOTE: Where tank size is not commercially available for calculated capacity, round up to the next available size.

# Septic Tank Criteria



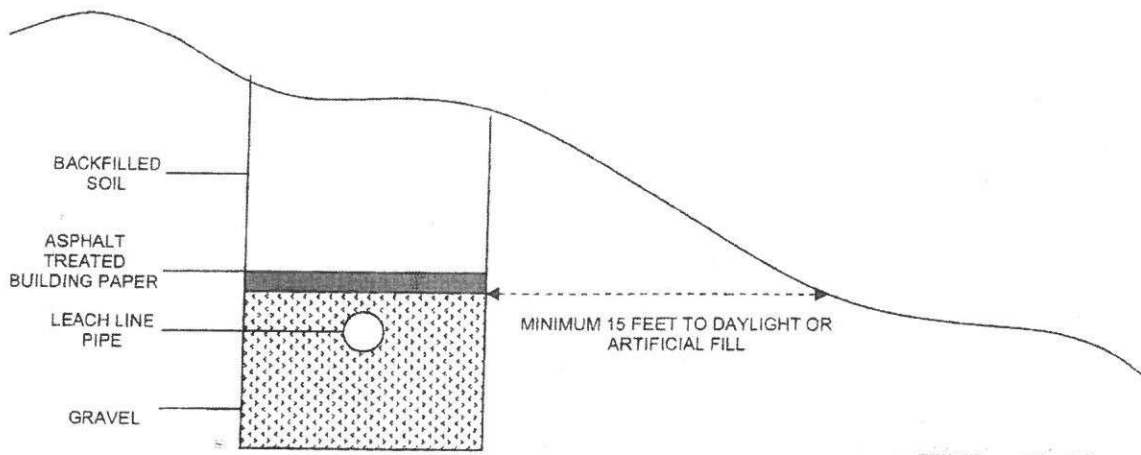
**SOLID**

*Soils & Geologic Consultants*  
solidsoils.com:(805) 202-6533

Subject: Leach Line Horizontal Setback from Daylight  
Reference: Ventura County Environmental Health  
Scale: --

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022

### Leach Line Horizontal Setback from Daylight



Leach Line Horizontal  
Setback from Daylight



# SOLID

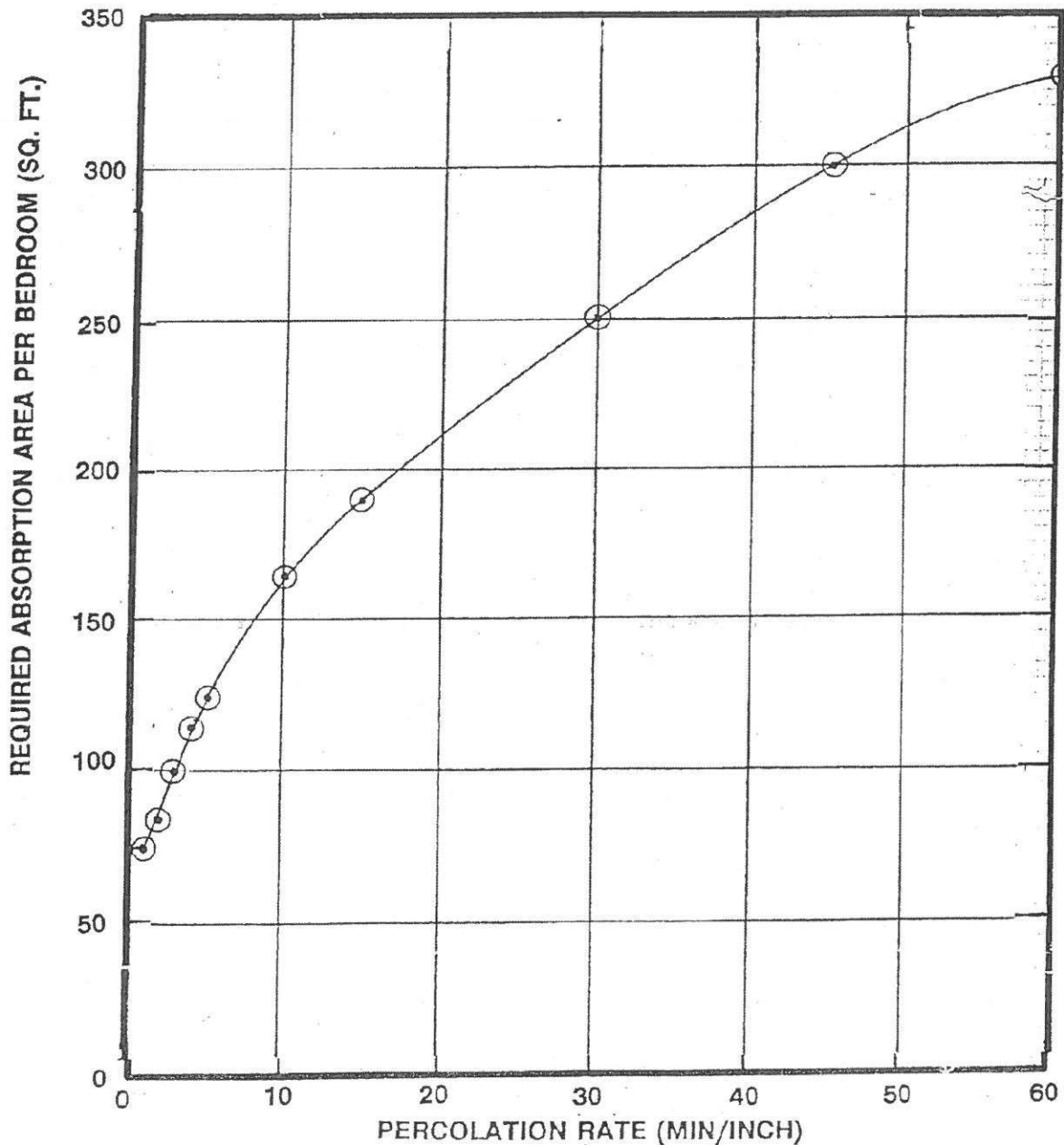
Soils & Geologic Consultants

solidsoils.com: (805) 202-6533

Subject: Plot of UPC Table I-6  
Reference: Ventura County Environmental Health  
Scale: --

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022

## PLOT OF UPC TABLE I-6



REFERENCE: UPC Table I-6, as modified by the County of Ventura Environmental Health, 8/23/90

## Plot of UPC Table I-6



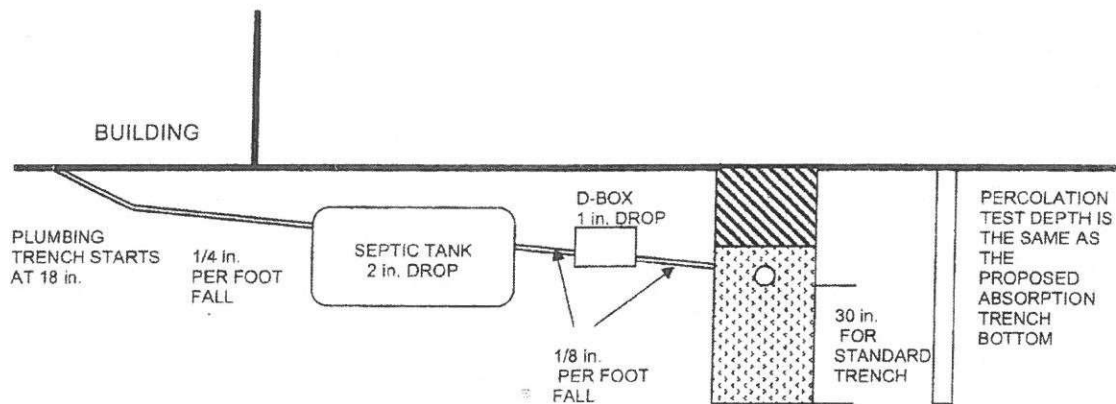


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Soils & Geologic Consultants  
solidsoils.com:(805) 202-6533

Subject: Cross Section of a Septic System with Rock Filled Leach Line  
Reference: Ventura County Environmental Health  
Scale: --

Client: Mircetic  
Job #: SS-434-S  
Date: 2/2022

### Cross Section of a Septic System with Rock Filled Leach Line



## Cross Section of a Septic with Rock Filled Leach Line