Appendix E-2

A Report Prepared for:

Monahan Pacific
1101 5th Ave. Suite 150
San Rafael, CA 94901

Attention: Mr. Victor Gonzalez

GEOTECHNICAL INVESTIGATION REPORT
SOUTH SONOMA BUSINESS PARK
COTATI, CALIFORNIA

Kleinfelder Job No.: 41-4584-01

by

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GEOTECHNICAL INVESTIGATION REPORT
SOUTH SONOMA BUSINESS PARK
COTATI, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of Kleinfelder's geotechnical investigation for the proposed South Sonoma Business Park project in Cotati, California. The general project location is illustrated on the Site Plan, Plate 1. The objective of this report is to provide the owner with findings, conclusions and recommendations regarding earthwork and foundation design relative to the site conditions and proposed construction. Our investigation has been coordinated through Mr. Victor Gonzalez of Monahan Pacific. Kleinfelder previously performed a geotechnical study on this site in February, 1988 (reference Kleinfelder file number 41-126201). The data collected from our previous study is used to supplement this investigation.

1.1 Project Description

The planned project is located on the northwest corner of Redwood Drive and Gravenstein Highway in Cotati, California. The project site is bordered by Helman Lane on the north and Alder Avenue on the west. The proposed development is to consist of constructing approximately one million square feet of commercial office space on approximately fifty acres. The development is to contain eleven three-story structures of concrete tilt-up construction. We anticipate maximum wall loads to be on the order of 5 to 7 kips per lineal foot and expected isolated column loads to be on the order of 200 to 300 kips.

Site development will also include asphalt paved driveways and parking lots. We anticipate the site grading to consist of cuts and fills on the order of 3 feet in maximum vertical height as measured from existing grades to establish site drainage and level building pads. The proposed layout for the development is presented on Plate 1, Site Plan.

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1.2 Purpose and Scope of Services

The purpose of our geotechnical investigation was to explore and evaluate the surface and subsurface soils at the site and provide recommendations for foundation design, earthwork and asphalt pavement design. The results of our previous investigation were presented in a report titled "Geotechnical Investigation Report, Factory Stores Outlet, Cotati, California" dated February 22, 1988. We have utilized the information and boring log data from the previous study, where applicable, as a supplement to our investigation. The scope of our investigation was outlined in our March 27, 2000 proposal and consists of a supplemental field exploration, laboratory testing, engineering analysis and preparation of this report.

1.3 Authorization

This investigation was authorized by Kleinfelder's standard Engineering Services Agreement, dated March 27, 2000, executed by Gale Paddock of Kleinfelder, Inc. and Mr. Victor Gonzalez of Monahan Pacific.

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2.0 SOIL INVESTIGATION

2.1 Site Description

The 50-acre, irregularly-shaped site is relatively level with the primary topographic feature being the shallow depressions within the eastern portion of the site that retain surface runoff waters. The site is currently vacant but contains several buildings along the northern portions of the site. Vegetation consists of a sparse growth of trees and an annual high growth off grass and weeds. The site layout is presented on Plate 1, Site Plan.

2.2 Field Exploration

Our field exploration was performed on March 26 and May 2, 2000. Six (6) borings were drilled at the approximate locations shown on the Site Plan, Plate 1. Our borings were used to evaluate and supplement the existing borings at the site. The locations of the borings were estimated by our field engineer based on rough measurements from the existing landmarks at the site. As such, the location of the borings presented herein should be considered approximate.

The borings were drilled and sampled using a CME 750, all-terrain drill rig equipped with 8-inch-diameter hollow stem augers. The borings extended to depths from 26-½ to 41-½ feet below the existing ground surface. Our field engineer specified the boring locations, boring depths and sampling intervals, and observed the drilling operations. Our field engineer logged the borings on a full-time basis. The borings were backfilled with cement immediately after drilling in accordance with County of Sonoma regulations.

Relatively undisturbed samples were recovered from the test borings using a Modified California (MC) sampler containing relatively thin, 6-inch long, 2.5-inch (outside diameter) tubes. The MC

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sampler was driven 18 inches using a 140-pound hammer falling 30 inches, with blow counts recorded for successive 6-inch penetration intervals. After the sampler was withdrawn from the test borings, the samples were removed, sealed to minimize moisture loss, and returned to our Santa Rosa laboratory for testing.

Soil classifications made in the field from auger cuttings and sample observation were checked in the laboratory after further examination and testing. Sample descriptions, converted blow counts (equivalent Standard Penetration N-values, blows per foot), and other pertinent field and laboratory data are presented on the Log of Exploration Borings K-1 through K-6, Plates 2 through 7. The soils were classified in accordance with the Unified Soil Classification System presented on the Boring Log Legend, Plate 8. Logs of the previous borings performed on the site by Kleinfelder are presented in the Appendix.

2.3 Laboratory Testing

Selected samples were tested in our laboratory to evaluate some of the engineering properties of the soils encountered. The laboratory testing program evaluated the natural moisture content, density, plasticity, consolidation, undrained shear strength and resistance value of the soils encountered. Classifications made in the field were modified, as appropriate, based on the laboratory test results; classifications presented on the boring logs reflect modifications made as a result of laboratory tests. The results of unconfined compression, triaxial shear, consolidation, and Atterberg Limits are presented graphically on Plates 9 through 13. Test results are also reported adjacent to the samples tested as shown on the boring logs.

2.4 Subsurface Conditions

The soils encountered in our borings indicate the site is underlain by a surficial layer of silty clay with varying amounts of sand and localized concentrations of gravel. The clays range from soft near the surface to very stiff, at depths generally greater than seven feet. Silty sand fill was encountered along the southern central portion of the site in boring B-1 from our previous study.

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The fill extended to an approximate depth of 3 feet. The Atterberg Limits tests performed on the native soil indicates the near surface silty clay soils to be of moderate to high plasticity.

Groundwater was encountered in all 6 borings drilled for this study. Groundwater depths at the time of drilling were measured at between 10 and 20 feet below existing grades During our previous study, groundwater was generally recorded at depths ranging from 8.5 to 9.5 below existing grades. However, two of the previous borings encountered a perched water table at depths of 1 and 2.5 feet below grade.

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3.0 CONCLUSIONS

Based upon data collected during this investigation, it is our opinion that the site is suitable for the proposed development. Once reconditioned, the near-surface soils at the site are suitable for support of the anticipated building loads. The primary geotechnical concerns for this project are site drainage, expansive near surface soils, settlement, proper site grading and subgrade preparation.

The moderate to high expansion potential of the surface clay will require special consideration in designing and constructing foundations, slabs-on-grade and pavements in order to decrease the potential for damage due to heave (swelling).

The site is underlain by semi-consolidated alluvial deposits and residual soil. The near surface clay soils are soft and will need to be over-excavated and recompacted as engineered fill. The clays, placed wet of optimum moisture content can be used to support foundations, concrete slabs and asphalt pavements if they are kept wet of optimum moisture until they are covered with permanent construction. However, slabs and pavements may experience differential heave and/or cracking near the edges adjacent to landscaping where the subgrade soils are exposed to seasonal variations in moisture content.

The site contains low-lying areas that pond surface water. Standing water and soft sediments will need to be removed from the site prior to finish grading. As previously presented, groundwater was encountered in our borings at depths ranging from 8.5 to 20 feet below existing grades at the time of our field investigation. The local groundwater levels are anticipated to fluctuate depending on factors such as seasonal rainfall, groundwater withdrawal and construction activities on this or adjacent properties. The influence of these time dependant factors could not be determined at the time of our investigation.

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Geologic and Seismic Conditions

No active faults are known to extend through the site. Since surface fault rupture generally follows the trace of pre-existing active faults, the risk of future surface rupture at this site is considered to be low to non-existent. The intensity of ground shaking from future earthquakes will depend on several factors including the distance from the site to the earthquake focus, the magnitude and duration of the earthquake, and the response of the underlying soil or bedrock. The nearest known active fault is the Healdsburg-Rodgers Creek fault located approximately 5 miles northeast of the site. Additionally, the San Andreas fault is located approximately 15 miles southwest of this site. Past seismic history suggests that strong shaking up to level IX on the Modified Mercalli Scale, is possible from earthquakes on active faults in the region.

During severe vibration from earthquakes, liquefaction can occur in saturated, loose, cohesionless sands. The clayey soils encountered in our borings are not considered to be liquefiable during strong ground shaking at the site.

The site is essentially level, and landslide hazards to the planned commercial structures is considered non-existent. Our evaluation found no identifiable geologic hazards that would preclude use of the site for the proposed development. The only potential geologic hazard identified at the site is from future strong earthquake ground shaking.

Additional details and recommendations for foundations, site preparation and grading, concrete slab support, and asphalt concrete pavement thicknesses are presented in Section 4.0 of this report.

Field and laboratory test data indicate that the site approximates and can be assigned a soil profile type S_D based on average soil properties in the top 100 feet (30,480 millimeters) and according to Table 16-J of the 1997 Uniform Building Code (UBC). S_D is defined as a profile consisting of a stiff soil with a shear wave velocity between 180 and 360 meters per second (m/s), a Standard Penetration Test, N (blows/foot), between 15 and 50, and an undrained shear strength between 50 to 100 kilopascals (kPa). According to Figure 16-2 of the UBC, the site is within Seismic Zone 4;

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therefore, a Seismic Zone Factor, Z, of 0.40 should be used. According to Sheet D-15 of the Maps of Known Active Fault Near-Source Zones in California, the site is located approximately 7.5 kilometers (km) from the Healdsburg/Rodgers Creek fault which is classified as a Seismic Source Type A. Using the above information, the near-source factors N_a and N_v are 1.1 and 1.4, respectively, based on interpolation between the values presented in Tables 16-S and 16-T of the UBC. The UBC seismic coefficients C_a and C_v are both used to determine the total design lateral force or shear at the base of a building or structure. The seismic coefficients C_a and C_v can be obtained from Tables 16-Q and 16-R of the UBC, respectively, based on the soil profile type, Seismic Zone Factor and near-source factors presented herein. For this site, the following relationships apply: $C_a=0.44N_a$ and $C_v=0.64N_v$.

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4.0 RECOMMENDATIONS

4.1 Site Preparation

Construction areas should be stripped of vegetation and organic debris before general site grading commences. Depending on the amount of vegetation that is allowed to grow at the site prior of the start of construction, we anticipate that this may require the removal of 2 to 4 inches of topsoil in most areas. Deeper stripping may be required in the low lying areas to remove soft organic rich sediments. The stripped, organic-rich material (greater than 3% organics by volume) may be stockpiled and used for landscaping purposes; this material should not be incorporated into any engineered fill.

Surface and near-surface debris including rubbish and rubble, any existing structural foundations, buried pipes and utilities should be removed from the construction area. Any undocumented fill located within the limits of construction should be removed and the resulting void filled with approved compacted fill. The abandoned septic tanks, cesspools or wells that may exist on the site should be completely excavated and removed from the construction site. Any existing wells should be plugged and abandoned according to the regulations set forth by the Sonoma County Health Department. Excavations for the removal of the above mentioned items should be cleaned of all loose materials, dish-shaped, and widened, as necessary to permit access for compaction equipment. The resulting excavations should be backfilled with properly compacted engineered fill as specified in the following section of this report.

The upper surface soils beneath building pads should be overexcavated a minimum of two feet below existing grades and replaced as engineered fill. Beneath exterior slabs-on-grade and asphalt pavements the depth of overexcavation can be reduced to 18 inches. The lateral limits of overexcavation should extend at least 5 feet from the building footprint and 3 feet beyond the

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outer edge of exterior slabs and pavement areas. The bottom of areas to receive fill should be scarified a minimum of 8 inches, moisture conditioned to at least 4 percent wet of optimum and recompacted to at least 90 percent of the maximum dry density as determined by ASTM test Method D-1557 (known as "relative compaction"). Shrinkage cracks should be closed for their full depth, thus, if the grading for this project is performed when large shrinkage cracks are present, deeper moisture conditioning or presoaking of the surface soils may be necessary.

4.2 Temporary Excavation and Backfill

Shallow excavations for footings and utility trenches can be made with either a backhoe or trencher; larger earth moving equipment should be used for deeper excavations. We expect the walls of trenches less than five feet deep to remain in a near vertical configuration during construction provided no equipment or excavated spoil surcharges are located near the top of the excavation. Where trenches are extended deeper than five feet, the excavation may become unstable. All trenches, regardless of depth, should be evaluated to monitor stability prior to personnel entering the trenches. Shoring or sloping of any deep trench wall may be necessary to protect personnel and to provide stability. All trenches should conform to the current CAL-OSHA requirements for work safety.

We recommend a minimum compaction of native trench backfill of 90 percent relative compaction. The moisture content of the backfill soils should be 4 percent over the optimum moisture.

Special care should be taken in the control of utility trench backfilling in the pavement areas. Poor compaction may cause excessive settlements resulting in damage to the pavement structural section. In pavement areas, the top 12 inches of trench backfill should be compacted to at least 95 percent relative compaction.

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4.3 Drainage Control

To minimize the potential detrimental affects of ponded water during wet weather construction, the construction areas should be graded to provide slopes that facilitate positive surface drainage. We recommend a minimum two percent gradient be provided sloping away from foundations within a minimum 4-foot-wide perimeter zone outside of the foundation footprint. Positive drainage should also be provided away from exterior pavements and concrete flatwork. Drainage gradients should connect to swales that are properly sloped to outlet collected surface water into an approved storm drain system. Beneath building areas, where possible surface water inundation and the effects of rainfall conditions are to be reduced, the ground should be sloped a minimum of two percent toward an area having positive drainage into the site storm drain system.

4.4 Fill Material

Native soil used for engineered fill should be moisture conditioned to, and maintained at, at least 4 percent above optimum moisture content and compacted as recommended below.

If select import fill is required, it should be a material having a low expansion potential and conforming to the following criteria:

Plasticity Index	Less than 15
Liquid Limit	Less than 40
Percent Passing the #200 Sieve	between 20% and 60%
Maximum Particle size	3 inches

4.5 Fill Compaction

We recommend the moderately-expansive native surficial soils be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM test Method D-1557 at a water

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content at least 4 percent wet of optimum. Imported and non-expansive native fill (from southern portion of the site) should be compacted to a minimum of 90 percent relative compaction. The moisture content of non-expansive fill soils should be slightly above the optimum. A Kleinfelder representative should be on-site during the site preparation and grading process to observe the exposed soil conditions, fill suitability and compaction operations, as well as to perform compaction testing.

4.6 Foundations

In our opinion, the foundation loads can be supported on shallow spread footings bearing on engineered fill or firm native soils.

As presented in Section 4.1, the upper 24 inches of soft near-surface soils within building areas, should be overexcavated and recompacted as engineered fill. The recommended soil bearing pressures, depth of embedment and width of footings are presented in Table No. 1. The bearing values provided have been calculated assuming that all footings uniformly bear on engineered fill or firm native soils.

TABLE NO. 1
FOUNDATION RECOMMENDATIONS

Footing Type	Allowable Bearing Pressures*	Minimum Embedment** (in)	Width (in)
Continuous Wall	3800	18	18
Isolate Column	4200	24	24

* Dead plus live load

** Below lowest adjacent grade

The allowable soil bearing pressures are net values. The weight of the foundation and backfill over the foundation may be neglected when computing dead loads. Allowable soil bearing pressures may be increased by one-third for transient applications such as wind and seismic loads.

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Resistance to lateral forces may be computed using friction or passive pressure. A friction factor of 0.35 is considered appropriate between the undersurface of concrete structures and the subgrade soils. A passive pressure equivalent to that exerted by a fluid weighing 350 pounds per cubic foot (pcf) is recommended. In computations, if friction and passive pressures are combined, the larger value should be reduced by 50 percent.

Footing concrete should be placed neat against undisturbed soil. Footing excavations should not be allowed to dry before placing concrete. If shrinkage cracks appear in the footing excavations, the soil should be thoroughly moistened to close all cracks prior to concrete placement.

Total settlement of individual foundations will vary depending on the width of the foundation and the actual load supported. Foundation settlements have been estimated based on anticipated loading conditions. Maximum settlements of the shallow foundations designed and constructed in accordance with the preceding recommendations are estimated to be less than one inch. Differential settlements between similarly loaded, adjacent footings are expected to be less than one-half this amount. The majority of the settlement is expected to occur during construction and the placement of dead loads.

4.7 Concrete Slabs-on-Grade

We understand that concrete slabs-on-grade for this project are expected to consist of interior floors and exterior flatwork. The surface clay layer will provide sufficient support for the slabs-on-grade where prepared as previously recommended in this report. However, to minimize seasonal fluctuations in moisture content and, thus, reduce the potential for swelling, the slabs should be underlain by a 12-inch-layer of non-expansive granular material such as the soil meeting the specifications for import material presented in Section 4.3 or Caltrans Class 2 Aggregate Base. Exterior flatwork may also experience minor differential movement (heave) with respect to buildings. However, if similar site preparation and granular base material is provided for the supporting subgrade, differential heave within exterior flatwork should be reduced.

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Alternatively, if some risk of heave (say on the order of one-inch) is acceptable, landscape irrigation around the flatwork perimeter along with a 6-inch layer of non-expansive fill can be somewhat effective in reducing some shrink-swell movement. In such a case, the irrigation should be maintained in such a way that the adjacent soil is not allowed to dry out. This preparation relies on year-round maintenance of soil moisture adjacent to flatwork and needs to be carefully managed by the property owner. As such, this preparation inherently has a higher risk for detrimental and differential movement of flatwork that should be taken into account by the owner as their responsibility to maintain.

Concrete slabs-on-grade should be supported on at least four inches of under-slab rock to provide a capillary moisture break; this rock should be graded so that 100 percent passes the one-inch sieve and no more than 5 percent passes the No. 4 sieve. If the subgrade materials dry out prior to slab-on-grade construction, the subgrade should be re-moisture conditioned to wet of optimum before concrete is placed.

We recommend that slabs-on-grade be a minimum of four inches thick and be reinforced according to the recommendations set forth by the structural designer. During construction, care should be taken to check that reinforcement is placed at the slab mid-height, particularly when using welded-wire fabric. The slabs-on-grade should be separated from footings or other fixed structural supports by low-friction felt or mastic materials to allow for some differential movement at this interface.

4.8 Retaining Structures

Buried (retaining) walls (if needed) should be designed for lateral earth pressures. Walls that are unrestrained and free to deflect at the top may be designed for "active" soil pressures. In the case of foundations or walls that are restrained from movement at the top, soil pressures will approach "at-rest" pressures. At the corners of the building the walls should be designed for "at-rest" pressures for a distance equal to the wall height away from the corner.

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To design for lateral loads, pressures resulting from the following equivalent fluid weights are recommended according to the type of restraint at the top of the wall and the slope of the final backfill behind the wall. Table No. 2 lists equivalent fluid densities which should be used for the design of permanent below ground structures. **Values are provided for non-expansive backfill and do not include surcharge loads or hydrostatic pressures that might be caused by ground water or trapped water behind the structure.** Retaining walls should be drained to minimize hydrostatic pressures. A typical drainage system consists of a one to two foot wide zone of Caltrans Class 2 permeable material placed immediately adjacent to the structure with a perforated pipe at the base of the structure discharging into a storm drain or other discharge facility.

Backfill against structures should be compacted to between 90 and 95 percent relative compaction at or within 2 percent of the optimum moisture content. Over-compaction should be avoided because increased compactive effort can result in lateral pressures higher than those recommended above.

TABLE NO. 2
LATERAL EARTH PRESSURES

	Equivalent Fluid Weight for Select Fill Backfill (pcf)	
Load Condition	**Level Backfill (<6:1)**	**2:1 (H:V) Backfill**
Restrained (at-rest)	55	70
Unrestrained (active)	35	50

The allowable equivalent fluid pressure for passive resistance previously presented may be used for design of subsurface walls.

4.9 Asphalt Pavement Design

Pavement for this project is expected to consist primarily of asphalt concrete paved automobile parking areas and driveways. Our pavement thickness recommendations are based on the assumption that the pavement subgrade soils will be the moderately plastic clay soils typically

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encountered in the near surface soils across the project area. Based on a Resistance (R-) Value of 20 (taken from our previous investigation), Traffic Indices (T.I.) of 4.5 and 5.5 for parking and driveways, respectively, and the Caltrans Flexible Pavement Design Method, the recommended pavement sections are presented below:

ASPHALT CONCRETE PAVEMENT DESIGN R-VALUE = 20		
Assumed	Pavement Section (inches)*	
T.I.	AC	AB
4.5 (parking)	2.5	7.0
5.5 (driveways)	3.0	9.0
* AC = Type B Asphalt Concrete AB = Class 2 Aggregate Base (Minimum R-Value = 78)		

The above thicknesses for the AC and AB should be checked by the project Civil Engineer. The upper 18 inches of subgrade soil beneath the pavement sections are to be firm native soils or engineered fill as recommended in Section 4.1 of this report. The top 8 inches of subgrade should be scarified and recompacted to at least 92 percent relative compaction at 4 percent over the optimum moisture content. Aggregate baserock should be compacted to at least 95 percent relative compaction at or near optimum moisture. The subgrade soils should be maintained in a moist condition and free of shrinkage cracks until covered with the complete pavement section. The aggregate base and asphalt concrete materials should conform to the quality requirements of Caltrans Standard Specifications, latest edition.

If desired, a lean (2-sack cement) concrete cut-off wall (approximately 36 inches deep, with a minimum thickness of 4 inches) could be used at pavement edges to reduce the effects of detrimental expansive soil movement, due to moisture variations, which could cause cracking along the pavement edges.

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5.0 ADDITIONAL SERVICES AND LIMITATIONS

5.1 Additional Services

The conclusions and recommendations contained in this report are based on 6 borings drilled for this investigation and 7 previous borings by Kleinfelder. Additional information on subsurface conditions at the site will become available during the course of construction. As such, the review of project plans and specifications along with field observation and testing during building construction by Kleinfelder are an integral part of the conclusions and recommendations made in this report. If Kleinfelder is not retained for these services, then the Client will be assuming Kleinfelder's responsibility for any potential claims that may arise during or after construction. The recommended tests, observations, and consultation by Kleinfelder prior to and during construction include, but are not limited to:

- Review of plans and specifications.
- Observation of foundation excavations.
- Observation and testing of engineered fill, finished subgrade and aggregate base.

We have provided Monahan Pacific (Client) with (6) bound original copies of this report. If additional copies are required, we can provide them at an additional fee (in accordance with our current fee schedule) after receipt of a written request from our Client. **Under no circumstances will we provide a copy of the report to other design consultants or contractors without written permission from our Client.**

The above additional services are not included as part of our agreement for this investigation but can be provided by our firm on a time-and-expense basis, when requested.

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5.2 Limitations

The recommendations contained in this report are subject to the limitations presented herein. In addition, a brochure prepared by ASFE (Association of Firms Practicing in the Geosciences) has been included in this report. We recommend that all individuals reading this report also read this attached brochure.

Recommendations contained in this report are based on our field observations, data from our exploratory borings (plus the review of previously drilled borings at the site), laboratory tests, and our present knowledge of the proposed construction. It is possible that subsurface conditions could vary between or beyond the points explored. If soil and groundwater conditions are encountered during construction which differ from those described herein, our firm should be notified immediately in order that a review may be made and supplemental recommendations provided, if warranted. If the scope of the proposed construction, including the type of structures and planned grading, changes from that described in this report, our recommendations should also be reviewed and modified, where necessary.

Our firm has prepared this report for the exclusive use of our client and their design team on this project in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our investigation. No warranty is expressed or implied. The recommendations provided in this report are based on the assumption that our firm will conduct an adequate program of testing and observation during subsequent building construction phases in order to evaluate compliance with our recommendations. If we are not retained for these services, our Client must assume Kleinfelder's responsibility for any potential claims that may arise during or after construction.

This report is issued with the understanding that our Client has assumed the risk they wish to bear by the design approach, construction expenditures and scheduling that are chosen. It is our Client's responsibility to see that all parties to the project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety including the Additional Services and Limitations sections.

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LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample				
						1			**CLAY WITH SAND** - gray, moist, stiff
						2			
						3			
				13		4			
						5			same, very stiff
110	17.2	2.4	UC, see Plate 9	20		6			
						7			
						8			
						9			
						10			gray-brown, stiff to very stiff
102	20.8			13		11			
						12			
						13			
						14			
						15			same, stiff
101	23.5			13		16		CL	
						17			
						18			
						19			
						20			▽ **SILTY CLAY** - gray, wet, stiff
				10		21			
						22			
						23			
						24			
						25			same
				10		26			
						27			
						28			
						29			
						30			same
				25		31			
						32			**SANDY CLAY WITH GRAVEL** - gray, wet, very stiff
						33			
						34			
						35			
						36		CH	
						37			
						38			
						39			
						40			**SILTY CLAY** - brown, wet, very stiff
				16		41			
						42			BOTTOM OF BORING K-1 @ 41.5 FEET
						43			
						44			
						45			

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling

SURFACE ELEVATION: **feet ****
TOTAL DEPTH: **41.5 feet**
GROUND WATER DEPTH: ▽ **20.0 feet at time of drilling**
▼ **feet**

LOGGED BY: **B. Anderson**
EQUIPMENT: **Hollow Auger**
DIAMETER of BORING: **6 inches**
DATE DRILLED: **4-26-00**

KLEINFELDER

PROJECT NUMBER **41-4584-01** DATE **JUN 2000**

LOG OF EXPLORATION BORING K-1

South Sonoma Business Park
Highway 116
Cotati, California

PLATE **2**

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample				
						1		CL	SILTY CLAY WITH SAND - brown, moist, medium stiff
107	18.1	0.4	LL=46, PI=25, See Plate 13	8		2			CLAY WITH SAND - olive-gray, moist, stiff
113	16.3		UC, see Plate 9	17		3			same, very stiff
						4			
						5			gray sandy clay, moist, very stiff, coarse sand
102	19.8	2.4	TxUU, see Plate 9	20		6			
						7			
						8			
						9			
						10			same
115	16.0			13		11			
						12			
						13			
						14		CL	
						15			gray silty clay, moist, stiff
						16			
				9		17			
						18			
						19			▽
						20			
						21			same
				10		22			
						23			
						24			
						25			
						26			auger spoils same as above
				13		27			BOTTOM OF BORING K-2 @ 26.5 FEET
						28			
						29			
						30			
						31			
						32			
						33			
						34			
						35			
						36			
						37			
						38			
						39			
						40			
						41			
						42			
						43			
						44			
						45			

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling

SURFACE ELEVATION: **feet ****
TOTAL DEPTH: **26.5 feet**
GROUND WATER DEPTH: ▽ **19.0 feet at time of drilling**
▽ **feet**

LOGGED BY: **B. Anderson**
EQUIPMENT: **Solid Auger**
DIAMETER of BORING: **4 inches**
DATE DRILLED: **4-26-00**

KLEINFELDER

PROJECT NUMBER 41-4584-01 DATE JUN 2000

LOG OF EXPLORATION BORING K-2

South Sonoma Business Park
Highway 116
Cotati, California

PLATE 3

1 of 1

LABORATORY				FIELD		Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample				
						1			SILTY CLAY - dark brown, moist, medium stiff
102	20.7	0.7	LL = 35, PI = 17, See Plate 13 UC, see Plate 9	8		2			
						3			
				10		4			
						5			same, stiff to very stiff
				17		6			
						7			
						8			
						9			
						10			
100	22.9			13		11			same, stiff
						12			
						13			
						14		CL	
						15			▽ same, stiff, wet
				8		16			
						17			
						18			
						19			
						20			
				14		21			gray silty clay, wet
						22			
						23			
						24			
						25			
				13		26			same on auger
						27			BOTTOM OF BORING K-3 @ 26.5 FEET No Free Water Encountered
						28			
						29			
						30			
						31			
						32			olive-brown silty clay
						33			
						34			
						35			
						36			
						37			
						38			
						39			
						40			
						41			
						42			
						43			
						44			
						45			

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling

SURFACE ELEVATION: feet **
TOTAL DEPTH: 26.5 feet
GROUND WATER DEPTH: ▽ 15.0 feet at time of drilling
▼ feet

LOGGED BY: B. Anderson
EQUIPMENT: Solid Auger
DIAMETER of BORING: 4 inches
DATE DRILLED: 4-26-00

KLEINFELDER

PROJECT NUMBER 41-4584-01 DATE JUN 2000

LOG OF EXPLORATION BORING K-3

South Sonoma Business Park
Highway 116
Cotati, California

PLATE 4

LABORATORY				FIELD						
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample	Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
						1			SILTY CLAY WITH SAND - gray, moist, medium stiff
						2			
106	19.7	1.1	UC, see Plate 9	8		3			same
						4			
109	18.2	2.6	TXUU, see Plate 10	8		5			same on auger
				12		6			
						7			
						8			
						9			
						10			same
104	21.2			16		11			
						12			
						13			
						14			
						15			
				10		16		CL	▽olive-gray silty clay, wet, stiff
						17			
						18			
						19			
						20			
				18		21			gray silty clay (spoils), wet, very stiff
						22			
						23			
						24			
						25			
				13		26			same on auger
						27			
						28			
						29			
						30			
				16		31			same
						32			BOTTOM OF BORING K-4 @ 31.5 FEET
						33			
						34			
						35			
						36			
						37			
						38			
						39			
						40			
						41			
						42			
						43			
						44			
						45			

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling

SURFACE ELEVATION: **feet ****
TOTAL DEPTH: **31.5 feet**
GROUND WATER DEPTH: ▽ **15.5 feet at time of drilling**
▼ **feet**

LOGGED BY: **B. Anderson**
EQUIPMENT: **Solid Auger**
DIAMETER of BORING: **4 inches**
DATE DRILLED: **4-26-00**

KLEINFELDER

PROJECT NUMBER 41-4584-01 DATE JUN 2000

LOG OF EXPLORATION BORING K-4

South Sonoma Business Park
Highway 116
Cotati, California

PLATE **5**

LABORATORY				FIELD						
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample	Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
				10		1 2 3		CL	SILTY CLAY - brown, moist, medium stiff
				10		4 5			SILTY CLAY - gray, moist, medium stiff
96	19.7			13		6			same
94	24.1					7 8 9 10			
97	25.4	2.1	UC, see Plate 10	13		11 12 13 14			increasing in sand content
				18		15 16 17 18 19 20		CL	gray-brown silty clay, wet, very stiff
				16		21 22 23 24			dark gray silty clay, wet, very stiff
				13		25 26 27 28 29			same
				13		30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45			same BOTTOM OF BORING K-5 @ 31.5 FEET

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling

SURFACE ELEVATION: feet **
TOTAL DEPTH: 31.5 feet
GROUND WATER DEPTH: ▽ 14.0 feet at time of drilling
▼ feet

LOGGED BY: T.W.
EQUIPMENT: Solid Auger
DIAMETER of BORING: 4 inches
DATE DRILLED: 5-2-00

KLEINFELDER

PROJECT NUMBER 41-4584-01 DATE JUN 2000

LOG OF EXPLORATION BORING K-5

South Sonoma Business Park
Highway 116
Cotati, California

PLATE 6

LABORATORY				FIELD						
Dry Density (pcf)	Moisture Content (%)	Shear Strength (ksf)	Other Tests	Blows/ft. *	Sample	Depth (feet)	Lithology Symbol	U.S.C.S. Designation	SOIL DESCRIPTION
						1			**CLAY** - dark brown, moist, medium stiff
						2		CL	
			LL=58,	8		3			
			PI=24,			4			
			see Plate 13	16		5		CL	**SANDY CLAY** - brown, moist, stiff
100	23.3	1.6	%-#200=40%			6			
			UC, see	9		7			**SILTY CLAY** - light brown, with variable sand content, wet, stiff
			Plate 10			8			
						9			
						10			▽
						11			
93	29.9		UC, see	13		12		CL	
			Plate 10			13			
						14			
						15			same, very little sand content, wet, medium stiff
				8		16			
						17			
						18			
						19			**SILTY CLAY** - dark gray, wet, very stiff
						20			
						21			
				25		22			
						23			
						24			
						25			
				9		26			same on auger
						27			
						28			
						29			
						30		CL	
				16		31			same
						32			
						33			
						34			
						35			
						36			
						37			
						38			
						39			
						40			
				13		41			same on auger
						42			BOTTOM OF BORING K-6 @ 41.5 FEET
						43			
						44			
						45			

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling

SURFACE ELEVATION: **feet ****

TOTAL DEPTH: **41.5 feet**

GROUND WATER DEPTH: ▽ **10.0 feet at time of drilling**

▼ **feet**

LOGGED BY: **T.W.**

EQUIPMENT: **Solid Auger**

DIAMETER of BORING: **4 inches**

DATE DRILLED: **5-2-00**

KLEINFELDER

PROJECT NUMBER **41-4584-01** DATE **JUN 2000**

LOG OF EXPLORATION BORING K-6

South Sonoma Business Park
Highway 116
Cotati, California

PLATE **7**

1 of 1

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS				DESCRIPTIVE NAMES
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

FIELD SAMPLING

- MODIFIED CALIFORNIA SAMPLE
- DISTURBED, BAG OR BULK SAMPLE
- STANDARD PENETRATION TEST
- SHELBY TUBE SAMPLE
- 3-1/2" I.D. CONTINUOUS CORE SAMPLE
- UNRETAINED PORTION OF SAMPLE
- WATER LEVEL OBSERVED IN BORING (at given post-drilling time)
- WATER LEVEL OBSERVED IN BORING (at time of drilling)

LABORATORY TESTS

LL	LIQUID LIMIT
PI	PLASTICITY INDEX
SA	SIEVE ANALYSIS
#200	PERCENT PASSING #200 SIEVE
RV	RESISTANCE VALUE
EI	EXPANSION INDEX
DS	DIRECT SHEAR
Tx/UU	TRIAXIAL SHEAR-UNCONSOLIDATED UNDRAINED
UC	UNCONFINED COMPRESSION
CT	COMPACTION TEST
PP	POCKET PENETROMETER SHEAR STRENGTH (tsf)

NOTES: Blow counts represent the number of blows of a 140-pound hammer falling 30-inches required to drive a sampler the last 12-inches of an 18-inch penetration. The blow counts have been converted to standard N-value blow counts.

The lines separating strata on the logs represent approximate boundaries only. The actual transition may be gradual. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil strata and groundwater observed at the boring location on the date of drilling only.

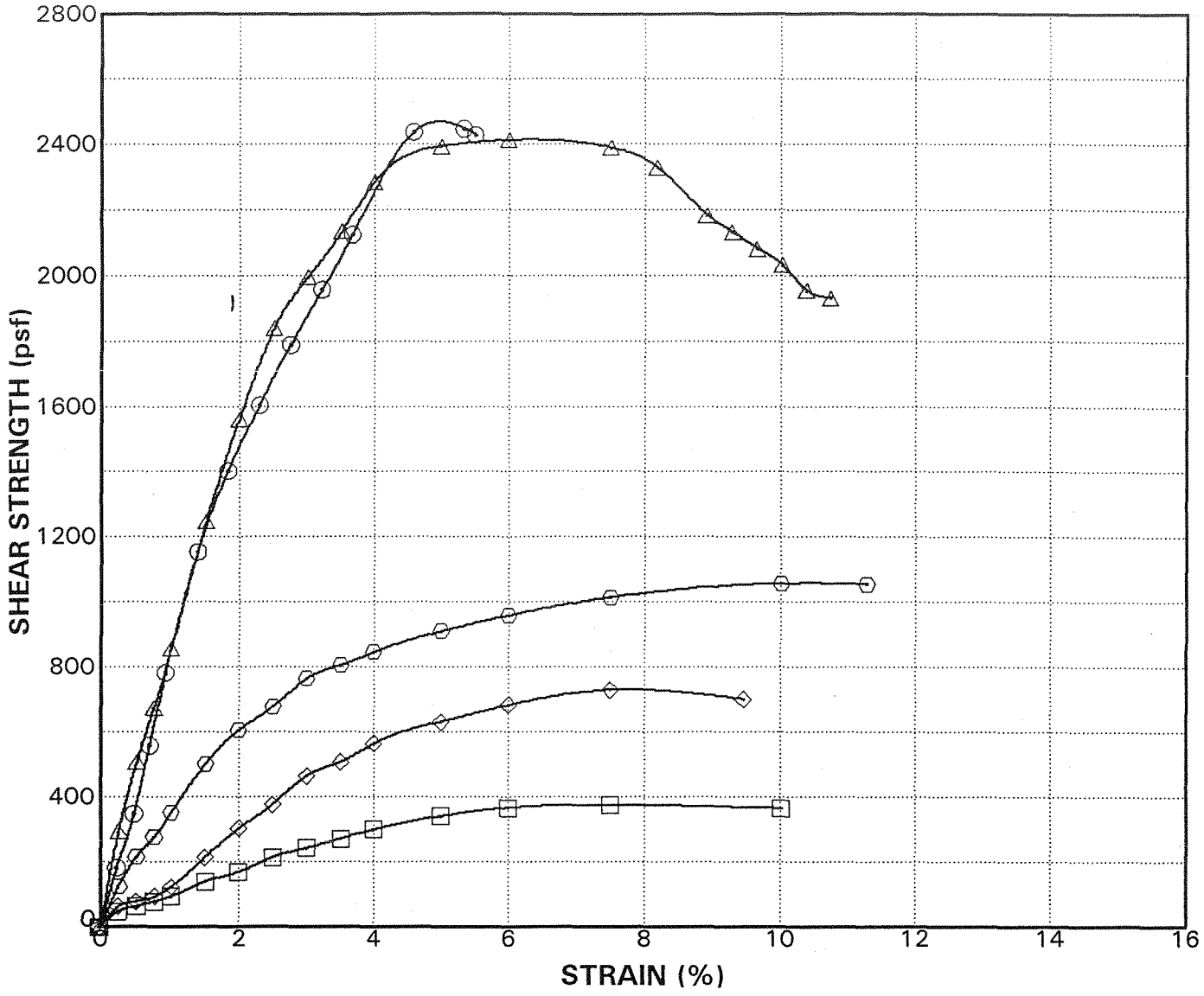
KLEINFELDER

PROJECT NUMBER 41-4584-01 DATE JUN 2000

BORING LOG LEGEND

South Sonoma Business Park
Highway 116
Cotati, California

PLATE 8



Sample Source	Classification	Type of Test	Confinement Pressure (psf)	Ultimate Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
⊙ K-1 @ 5.5'	LIGHT BROWN SANDY CLAY	UC	--	2444	5	110	17.2
⊡ K-2 @ 2.0'	BROWN SANDY CLAY	UC	--	374	8	107	18.1
△ K-2 @ 6.0'	LIGHT BROWN SANDY CLAY	TX/UU	600	2409	6	102	19.8
◇ K-3 @ 2.0'	BROWN SANDY CLAY	UC	--	728	8	102	20.7
⊙ K-4 @ 2.5'	LIGHT BROWN SANDY CLAY	UC	--	1056	10	106	19.7

UC = Unconfined Compression

TX/UU = Unconsolidated Undrained Triaxial

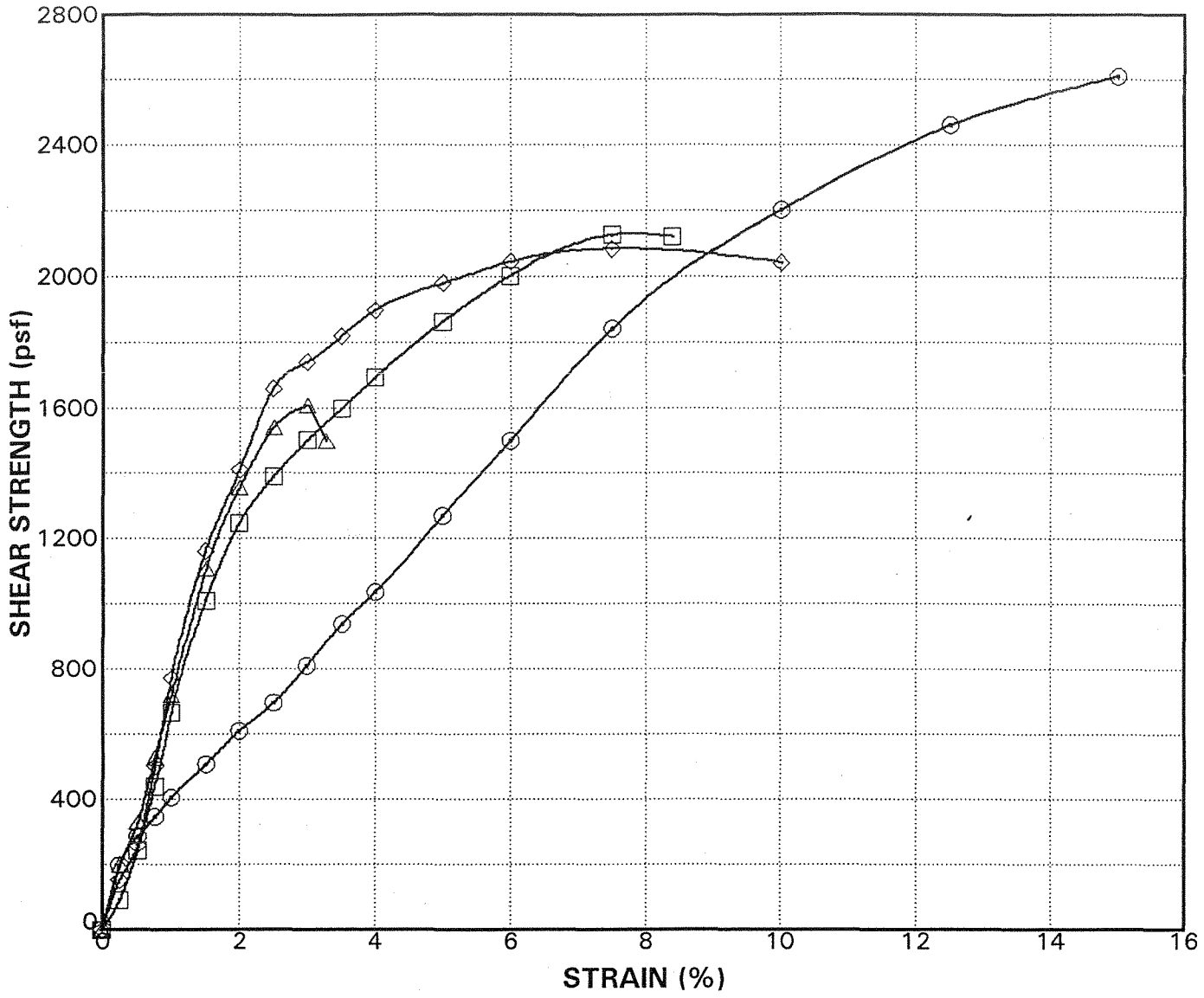
KLEINFELDER

PROJECT NUMBER 41-4584-01 DATE JUN 2000

STRENGTH TEST DATA

South Sonoma Business Park
Highway 116
Cotati, California

PLATE 9



Sample Source	Classification	Type of Test	Confinement Pressure (psf)	Ultimate Strength (psf)	Strain (%)	Dry Density (pcf)	Moisture Content (%)
⊙ K-4 @ 4.0'	LIGHT BROWN SANDY CLAY	TX/UU	400	2607	15	109	18.2
⊡ K-5 @ 11.0'	LIGHT BROWN SANDY CLAY	UC	--	2124	8	97	25.4
△ K-6 @ 4.0'	LIGHT BROWN SANDY CLAY	UC	--	1605	3	100	23.3
◇ K-6 @ 11.0'	LIGHT BROWN SANDY CLAY	UC		2082	8	93	29.9

UC = Unconfined Compression

TX/UU = Unconsolidated Undrained Triaxial

KLEINFELDER

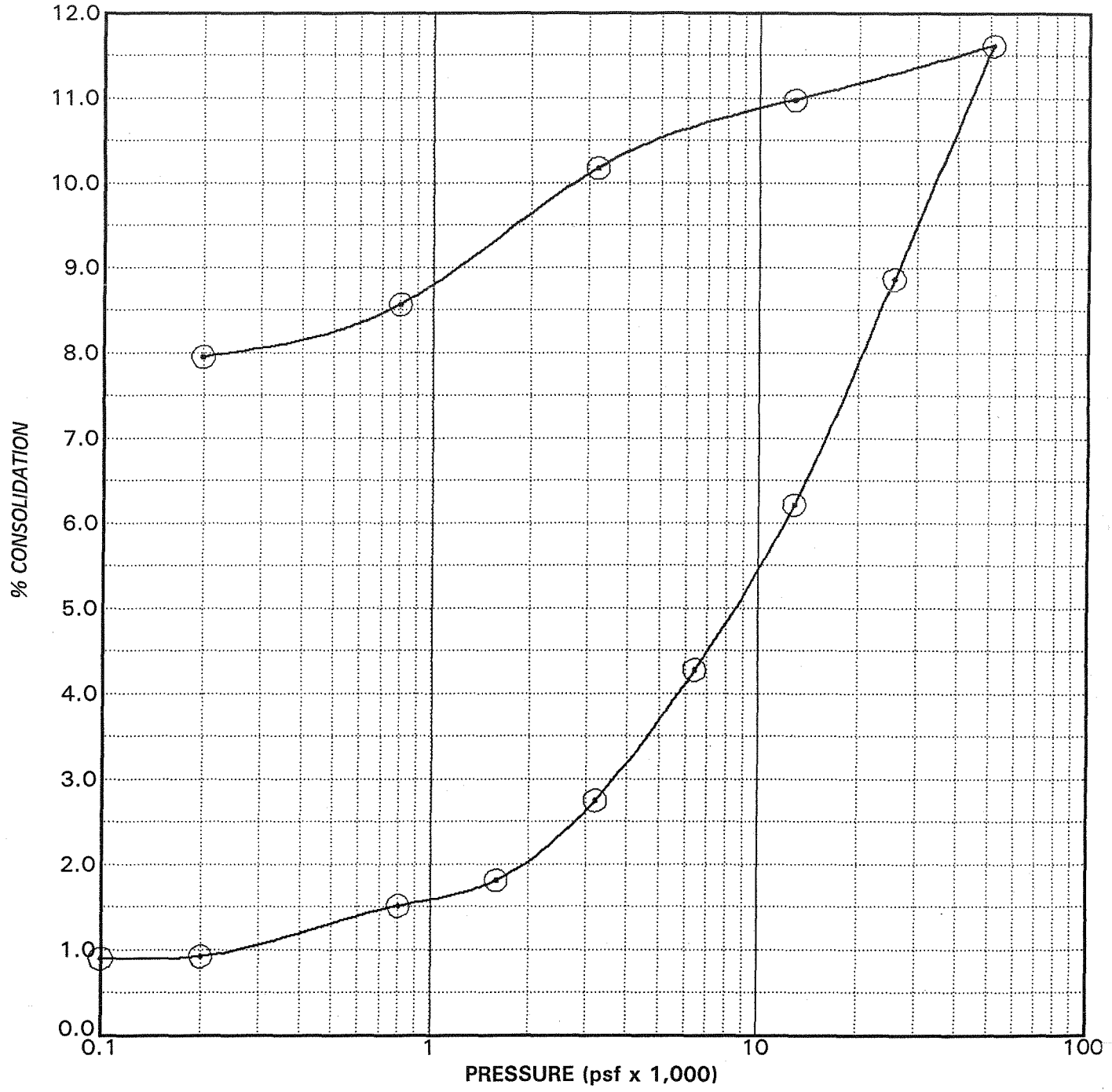
PROJECT NUMBER 41-4584-01 DATE JUN 2000

STRENGTH TEST DATA

South Sonoma Business Park
Highway 116
Cotati, California

PLATE 10

% CONSOLIDATION - PRESSURE CURVE



Reference: ASTM D 2435

Type of specimen			Before Test				After Test		
Diameter (in.) **2.43**	Height (in.) **0.80**		Moisture Content	wo	**20.8**	%	wf	**19.2**	%
Overburden Press., Po		psf	Void Ratio	eo	**0.653**		ef	**0.521**	
Preconsol Press., Pc		psf	Saturation	So	**86**	%	Sf	**100**	
Compression Index, Cc			Dry Density	d	**102**	pcf	d	**111**	pcf
LL	PL		PI				Gs		

Class: **LIGHT BROWN SANDY CLAY**

Source: **K-1 @ 11.0'**

KLEINFELDER ASSOCIATES
Santa Rosa, California

Job No: 41-4584-01
Job Id: SOUTK
Appr:
Drwn: LTS
Date: MAY 2000

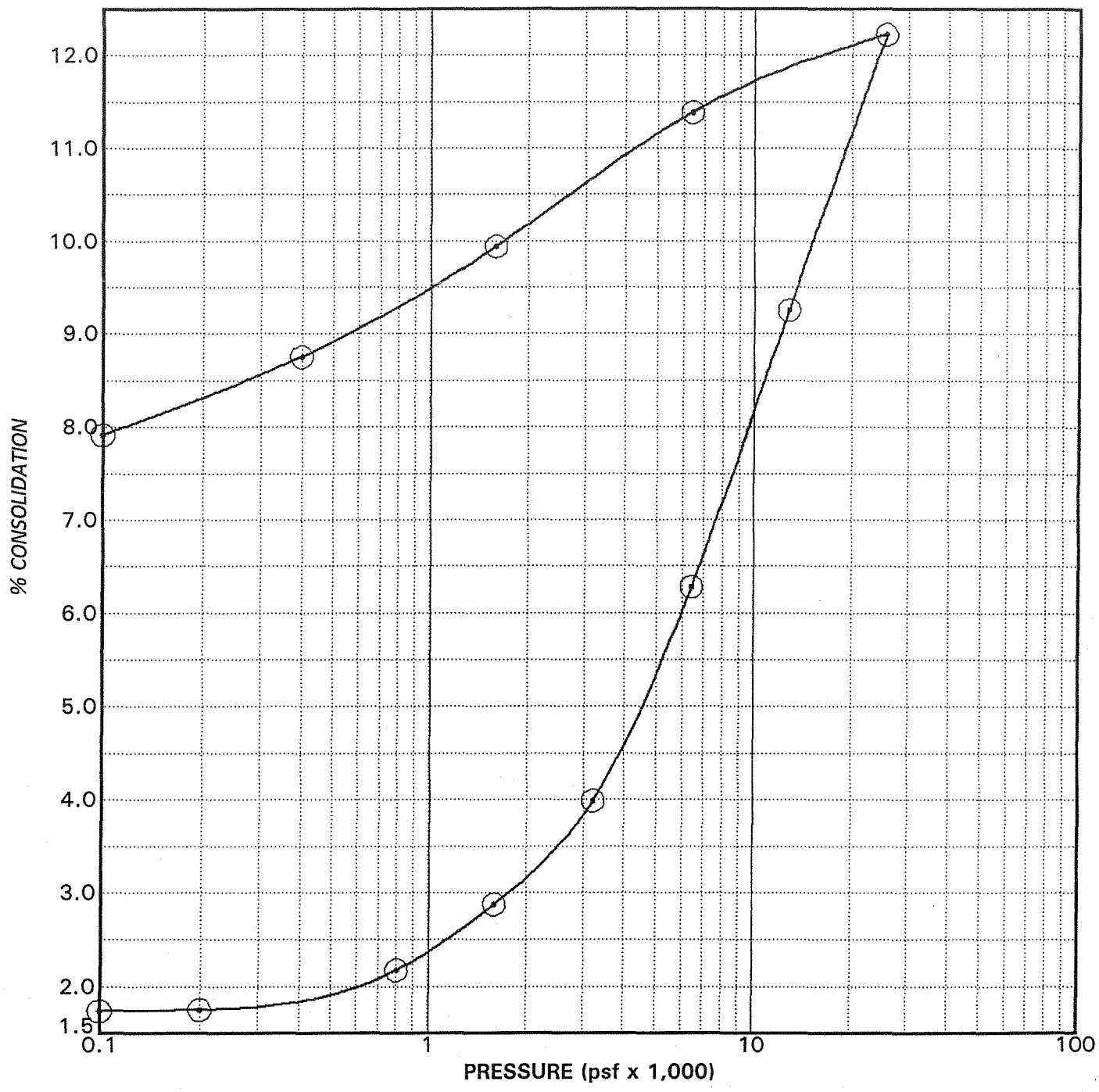
CONSOLIDATION TEST DATA

SOUTH SONOMA BUSINESS PARK
HIGHWAY 116
COTATI, CALIFORNIA

PLATE

11

% CONSOLIDATION - PRESSURE CURVE



Reference: ASTM D 2435

Type of specimen			Before Test				After Test			
Diameter (in.) 2.43	Height (in.) 0.80		Moisture Content	wo	24.1	%	wf	22.1	%
Overburden Press., Po		psf	Void Ratio	eo	0.794		ef	0.652	
Preconsol Press., Pc		psf	Saturation	So	82	%	Sf	100	%
Compression Index, Cc			Dry Density	d	94	pcf	d	102	pcf
LL	PL		PI		Gs				

Class: **LIGHT BROWN SANDY CLAY** Source: **K-5 @ 6.0'**

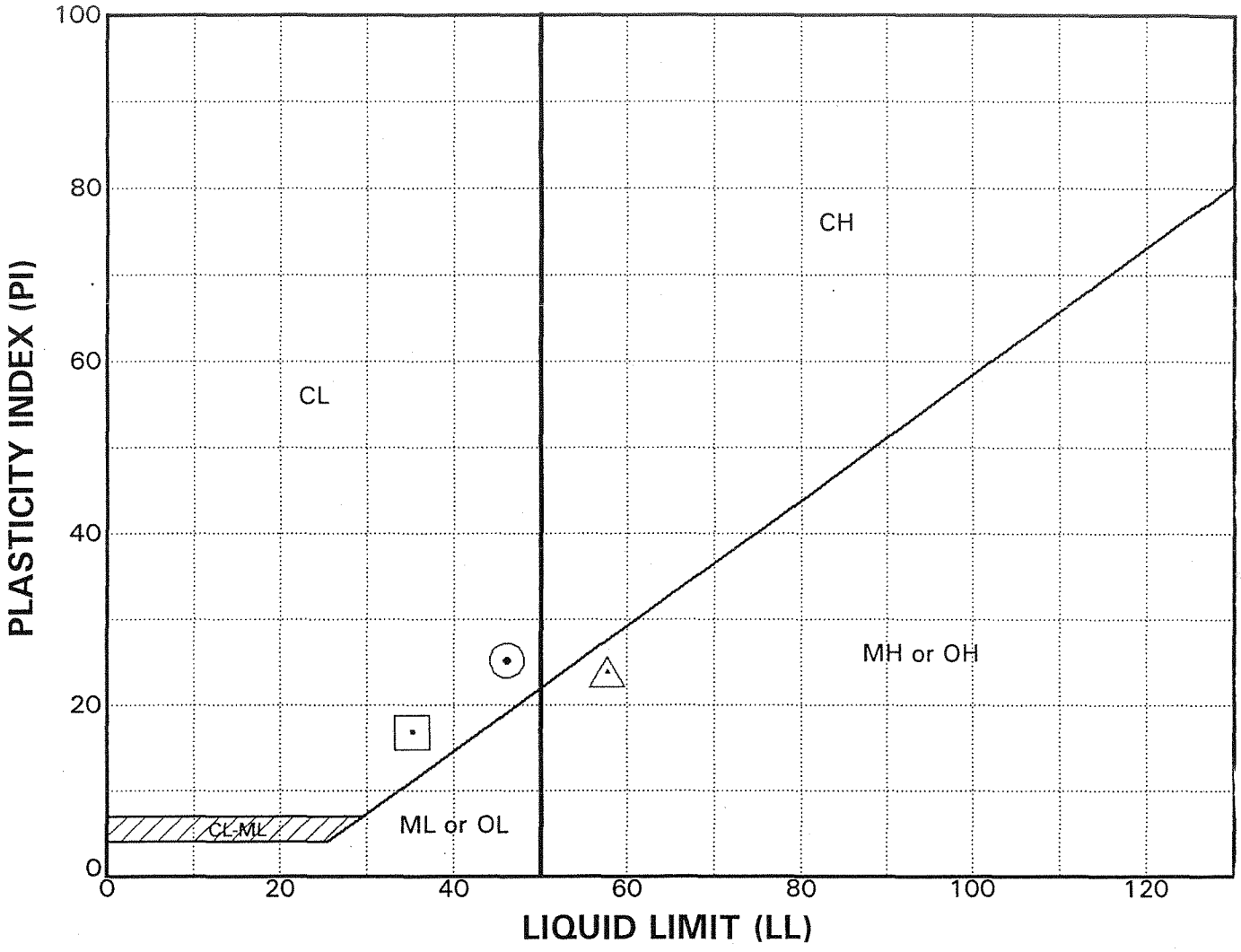
KLEINFELDER ASSOCIATES
Santa Rosa, California

Job No: 41-4584-01
Job Id: SOUTK
Appr:
Drwn: LTS
Date: MAY 2000

CONSOLIDATION TEST DATA

SOUTH SONOMA BUSINESS PARK
HIGHWAY 116
COTATI, CALIFORNIA

PLATE **12**



SAMPLE SOURCE	CLASSIFICATION	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	% PASSING #200 SIEVE
⊙ K-2 @ 4.0'	LIGHT BROWN SANDY LEAN CLAY	46	21	25	--
⊡ K-3 @ 1.5'	BROWN SANDY LEAN CLAY	35	18	17	
△ K-6 @ 2.0'	BROWN SANDY ELASTIC SILT	58	34	24	

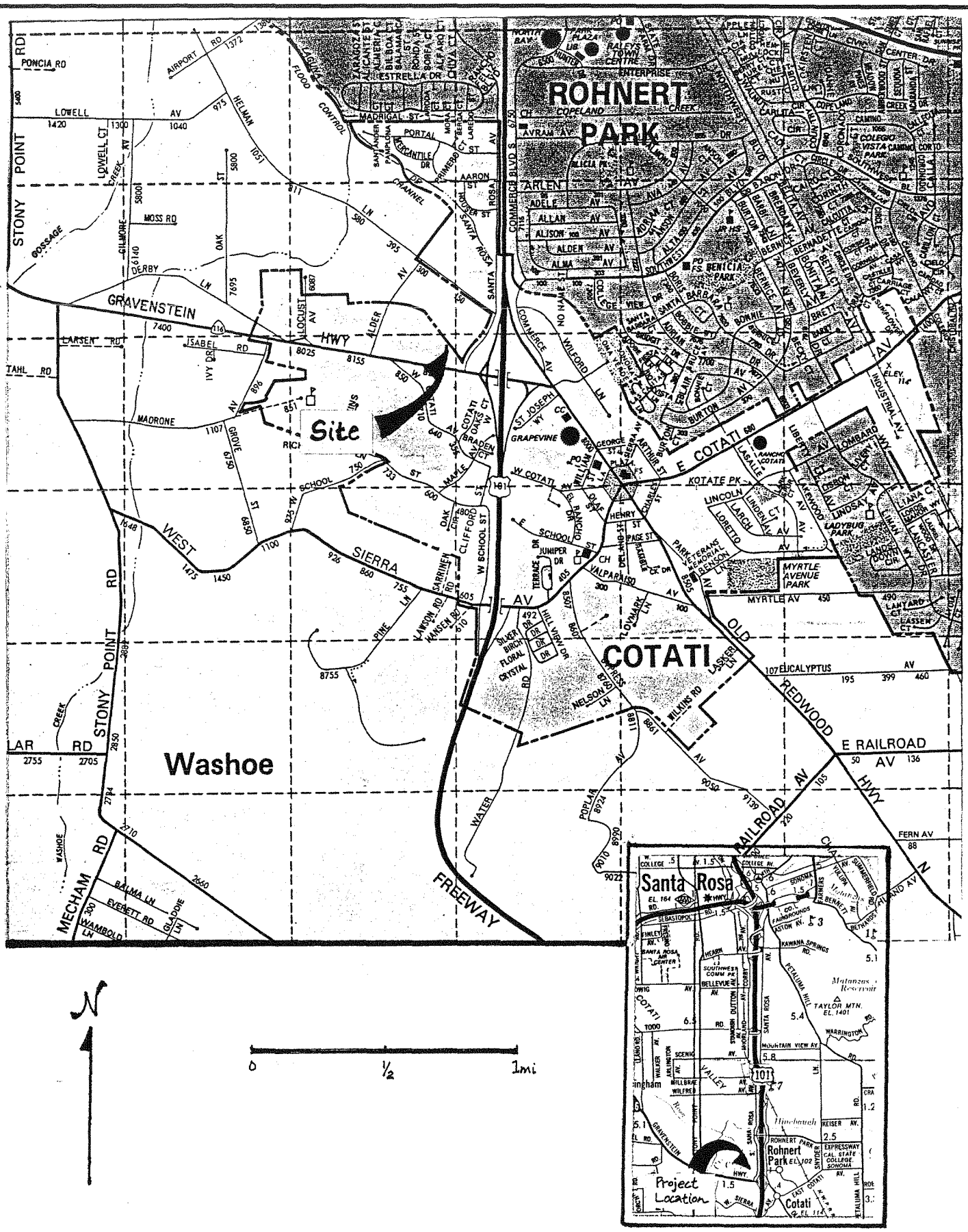
KLEINFELDER

PROJECT NUMBER 41-4584-01 DATE JUN 2000

PLASTICITY CHART

South Sonoma Business Park
Highway 116
Cotati, California

PLATE 13



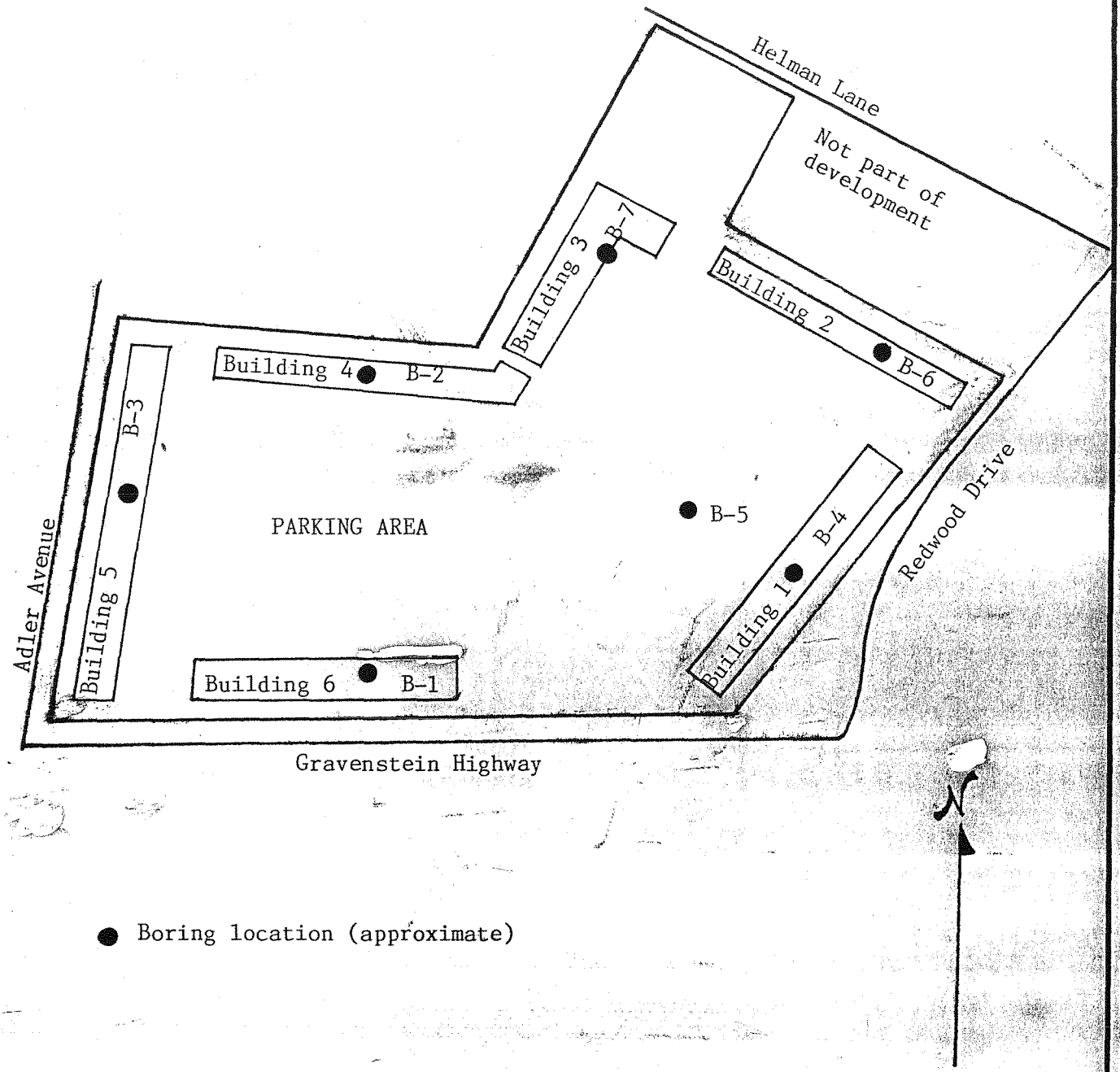
J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
MATERIALS TESTING — LAND AND WATER RESOURCES

PROJECT NO. 41-1262-01

LOCATION MAP

Factory Stores Outlet
Cotati, California

PLATE
1



● Boring location (approximate)

BUILDING AND SITE PLAN NOT TO SCALE.

J. H. KLEINFELDER & ASSOCIATES GEOTECHNICAL CONSULTANTS — MATERIALS TESTING	FACTORY STORES OUTELT COTATI, CALIFORNIA
PREPARED BY: DATE:	
CHECKED BY: DATE:	PROJECT NO. 41-1262-01 PLATE NO. 2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		LTR	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel sand mixtures, little or no fines.
		GP	Poorly-graded gravels or gravel sand mixture, little or no fines.
		GM	Silty gravels, gravel-sand-clay mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well-graded sands or gravelly sands, little or no fines.
		SP	Poorly-graded sands or gravelly sands, little or no fines.
		SM	Silty sands, sand-silt mixtures.
		SC	Clayey sands, sand-clay mixtures.

MAJOR DIVISIONS		LTR	DESCRIPTION
FINE GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silt-clays of low plasticity
	SILTS AND CLAYS LL>50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils.

Standard penetration split spoon sample

Modified California sampler

Shelby tube sample

Water level observed in boring

* No recovery

NFWE No free water encountered

NOTE: The lines separating strata on the logs represent approximate boundaries only. The actual transition may be gradual. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

J.H. KLEINFELDER & ASSOCIATES GEOTECHNICAL CONSULTANTS • MATERIALS TESTING	Factory Stores Outlet Cotati, California **BORING LOG LEGEND**	PLATE 3
PREPARED BY: DATE:		
CHECKED BY: DATE:	PROJECT NO. 41-1262-01	

JHK & A Form M12

Depth In Feet	Dry Density lb/ft³	Moisture Content %	Blow/ Ft.	Sample No.	USCS	DESCRIPTION
0					SM	SAND: Silty, slightly clayey, orange-brown, moist, medium dense. (Fill)
1						
2	97.6	20.0	15	1	CL	Clay: silty, sandy, gravelly, brown, moist, stiff.
3						
4						
5	112.5	16.2	23	4	CL	Clay: Silty, sandy, grey, moist, stiff.
6						
7						
8			32	7		Very stiff.
9						
10						
11						
12						
13			29	12		
14						Test boring terminated at 13 1/2 feet. No free groundwater encountered. No sidewall caving noted. January 26, 1988
15						

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. 41-1262-01

LOG OF BORING NO. 1

Factory Stores Outlet
Cotati, California

PLATE 4

Depth In Feet	Dry Density lb/ft³	Moisture Content %	Blow/ Ft.	Sample No.	USCS	DESCRIPTION
0					CL	Clay: Silty, sandy, brown, very moist to wet, soft.
1			2	1		
2						
3					CL	Clay: Silty, sandy, grey, moist, stiff.
4	111.9	16.1	12	3		
5						
6					CL	Clay: Silty, brown, moist, stiff.
7	95.3	28.0	18	6		
8						
9						
10			28	9		Very stiff.
11						
12						
13			15	12		
14						Boring terminated at 13 1/2 feet. Free groundwater measured at 9 1/2 feet immediately following drilling. No sidewall caving noted. January 26, 1988
15						
16						

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. 41-1262-01

LOG OF BORING NO. 2

Factory Stores Outlet
Cotati, California

PLATE 5

Depth In Feet	Dry Density lb/ft³	Moisture Content %	Blow/ Ft.	Sample No.	USCS	DESCRIPTION
0					CL	Clay: Silty, sandy, brown, wet, very soft.
1						
2			2	1		
3						
4						Clay: Silty, sandy, grey-brown, moist, stiff.
5	112.0	16.6	37	4		Slightly moist, very stiff.
6						
7						
8			22	7		some concentrated lenses of sand.
9						
10						
11						
12						
13			21	12		brown, no sand.
14						Boring terminated at 13 1/2 feet. No sidewall caving observed. No free groundwater encountered. January 26, 1988
15						
16						

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. 41-1262-01

LOG OF BORING NO. 3

Factory Stores Outlet
Cotati, California

PLATE 6

Depth In Feet	Dry Density lb/ft³	Moisture Content %	Blow/ Ft.	Sample No.	USCS	DESCRIPTION
0					CL	Clay: sandy, silty, brown, wet, soft.
1			2	1		
2						light brown, moist, stiff
						possibly perched groundwater table.
3						
4	105.3	19.0	39	3		very stiff
5						
6						
7			16	6		wet, stiff
8						
9						
10			30	9		very stiff
11						
12						
13			25	12		
14						Test boring terminated at 13 1/2 feet. Free groundwater encountered at 2 1/2 feet immediately following drilling. No sidewall caving noted. January 26, 1988
15						

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. 41-1262-01

LOG OF BORING NO. 4

Factory Stores Outlet
Cotati, California

PLATE 7

Depth In Feet	Dry Density lb/ft³	Moisture Content %	Blow/ Ft.	Sample No.	USCS	DESCRIPTION
0					CL	Clay: silty, sandy, dark brown, wet, soft.
1						possibly perched groundwater table.
2						stiff
3						
4	105.0	21.2	26	3		
5						Test boring terminated at 4 1/2 feet. Free groundwater at 1 foot. No sidewall caving noted. January 26, 1988
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

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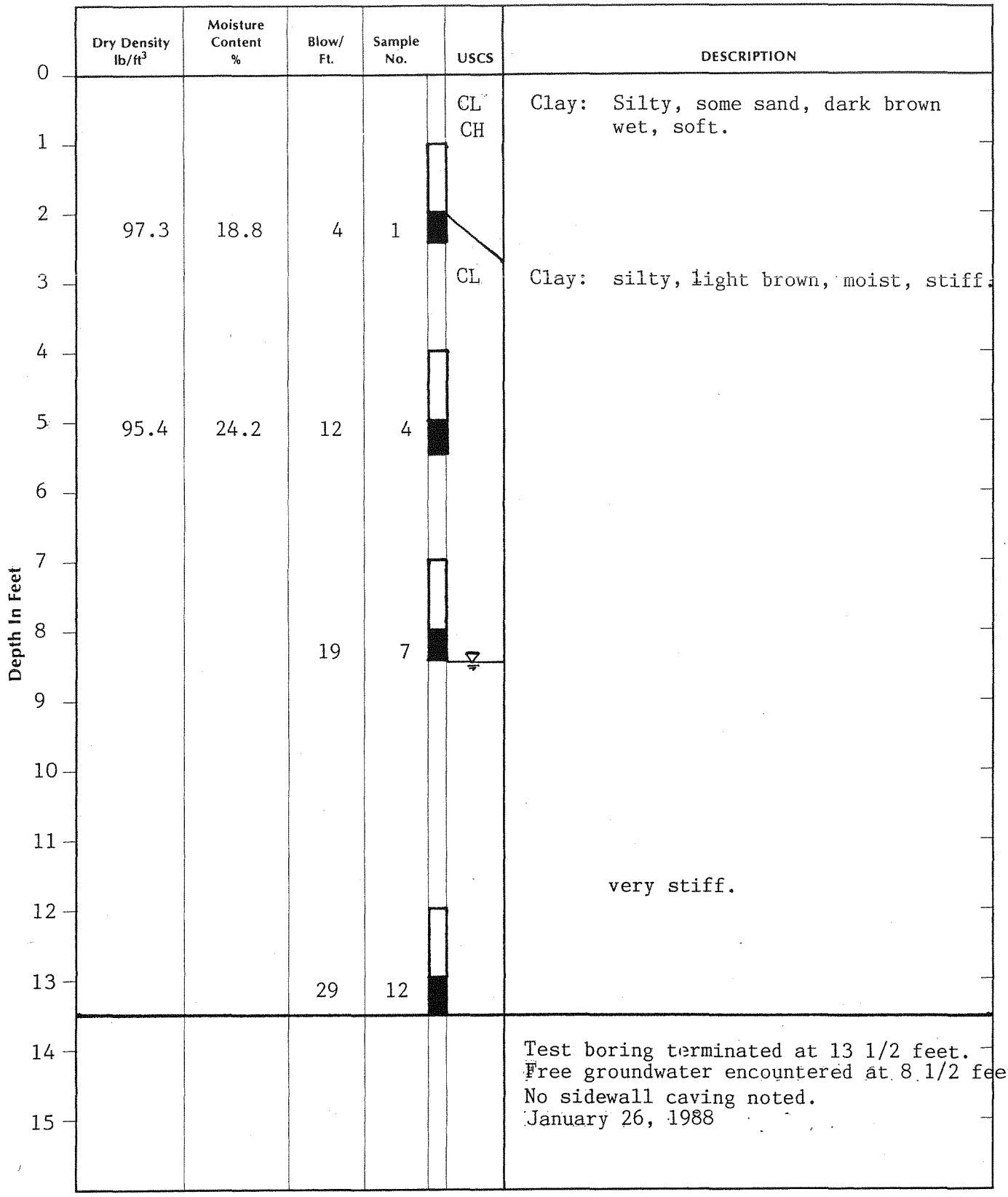
PROJECT NO. 41-1262-01

LOG OF BORING NO. 5

Factory Stores Outlet
Cotati, California

PLATE 8



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PROJECT NO. 41-1262-01

LOG OF BORING NO. 6

Factory Stores Outlet
Cotati, California

PLATE 9

Depth In Feet	Dry Density lb/ft³	Moisture Content %	Blow/ Ft.	Sample No.	USCS	DESCRIPTION
0					CL	Clay: Silty, sandy, dark brown, wet, soft.
1	95.2	24.7	4	1		
2						
3						
4	99.8	24.1	25	3	CL	Clay: Silty, sandy, light brown, slightly moist, very stiff.
5						
6						
7			29	6		
8						
9						
10			22	9		very sandy, wet, stiff
11						
12						
13			35	12		
14						Test boring terminated at 13 1/2 feet. Free groundwater encountered at 8 feet. No sidewall caving noted. January 26, 1988
15						

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PROJECT NO. 41-1262-01

LOG OF BORING NO. 7

Factory Stores Outlet
Cotati, California

PLATE 10

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PROJECT NO. 41-1262-01

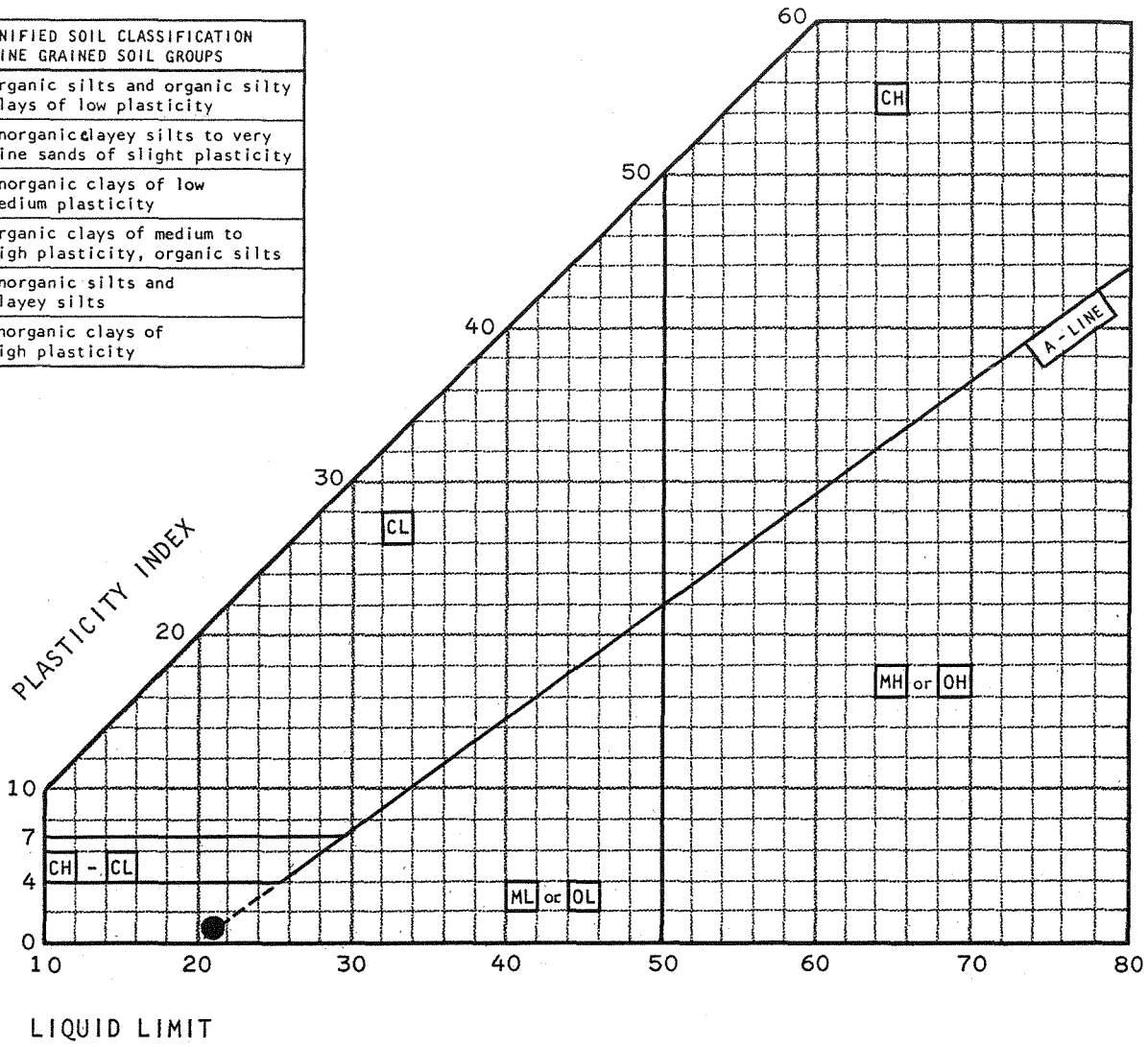
Factory Stores Outlet
Cotati, California

LABORATORY TESTS

BORING NO.	SAMPLE NO.	DRY UNIT WEIGHT lb/ft³	MOISTURE CONTENT % OF DRY WEIGHT	GRADING ANALYSES						HYDROMETER ANALYSES			ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH kips/ft²
				SIEVE SIZE - PERCENT PASSING											
				1"	3/4"	4	10	40	200	SILT SIZE	CLAY SIZE	COLLOIDS	L.L.	P.I.	
B-1	1	97.6	20.0												0.6
B-1	4	112.5	16.2												
B-2	3	111.9	16.1												5.3
B-2	6	95.3	28.0												
B-3	4	112.0	16.6												
B-4	3	105.3	19.0												5.1
B-5	Bulk														4.0
B-5	3	105.0	21.2										21	1	
B-6	1	97.3	18.8												
B-6	4	95.4	24.2												1.1
B-7	1	95.2	24.7												
B-7	3	99.8	24.1												0.3

PLATE 11

GROUP SYMBOL	UNIFIED SOIL CLASSIFICATION FINE GRAINED SOIL GROUPS
OL	Organic silts and organic silty clays of low plasticity
ML	Inorganic clayey silts to very fine sands of slight plasticity
CL	Inorganic clays of low medium plasticity
OH	Organic clays of medium to high plasticity, organic silts
MH	Inorganic silts and clayey silts
CH	Inorganic clays of high plasticity



TEST SYMBOL	BORING NO.	SAMPLE NO.	LIQUID LIMIT	PLASTICITY INDEX	CLASSIFICATION
●	B-5	Bulk	21	1	Clay: silty, sandy, dark brown, soft(CL)

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PROJECT NO. 41-1262-01

Factory Stores Outlet
Cotati, California

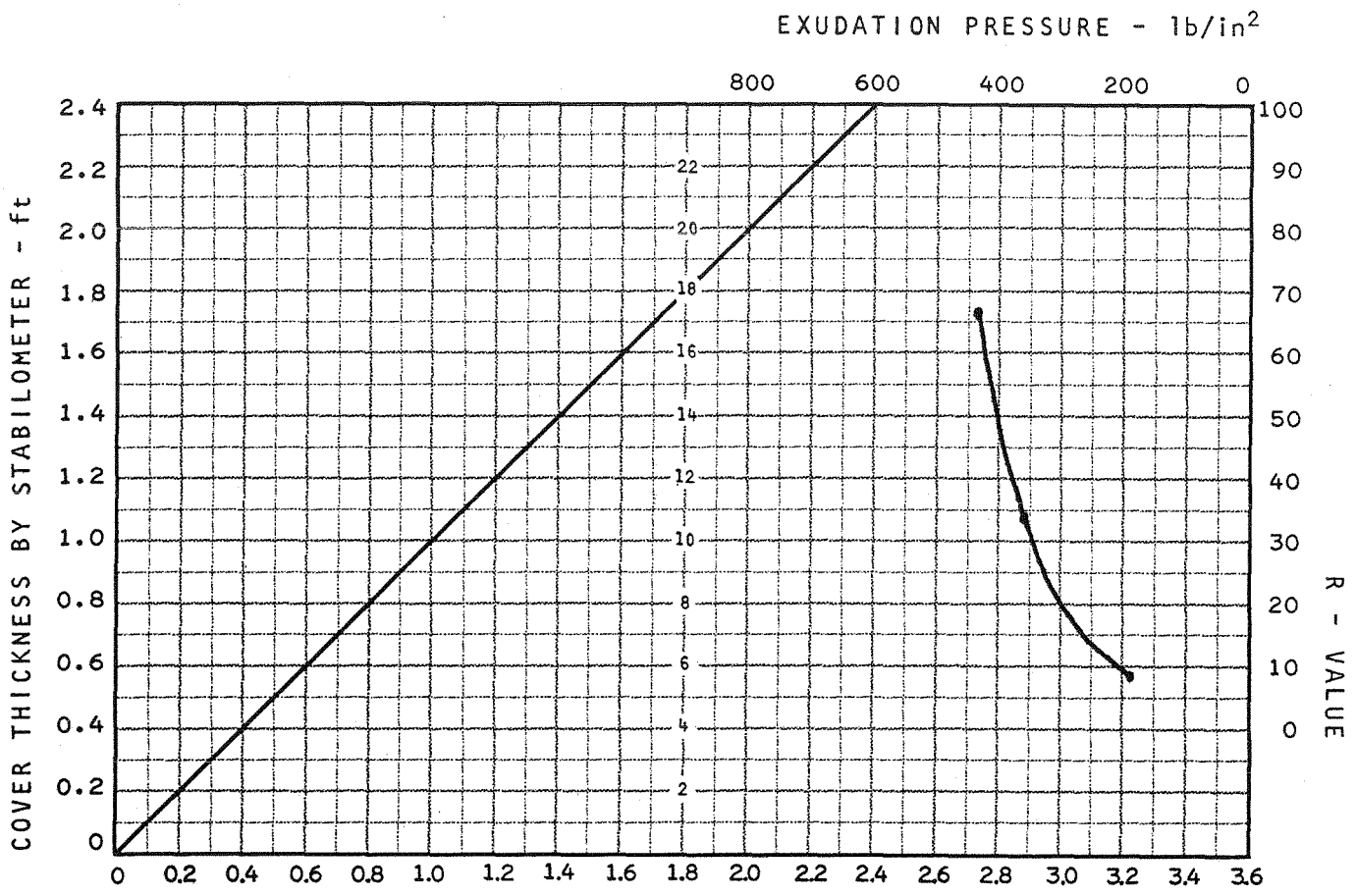
PLASTICITY CHART

PLATE 12

SAMPLE LOCATION: B-5 Bulk samples of near surface soils.

SAMPLE DESCRIPTION: Silty, sandy clay (CL)

DATE SAMPLED: January 26, 1988



SPECIMEN	A	B	C
EXUDATION PRESSURE, lb/in²	190	360	430
EXPANSION DIAL (.0001")			
EXPANSION PRESSURE, lb/ft²	0	35	170
RESISTANCE VALUE, R	8	34	67
% MOISTURE AT TEST	14.1	12.3	10.4
DRY DENSITY AT TEST, lb/ft³	114.5	114.0	116.0
R VALUE AT 300 lb/in² EXUDATION PRESSURE		20	
R VALUE BY EXPANSION PRESSURE (TI =)			

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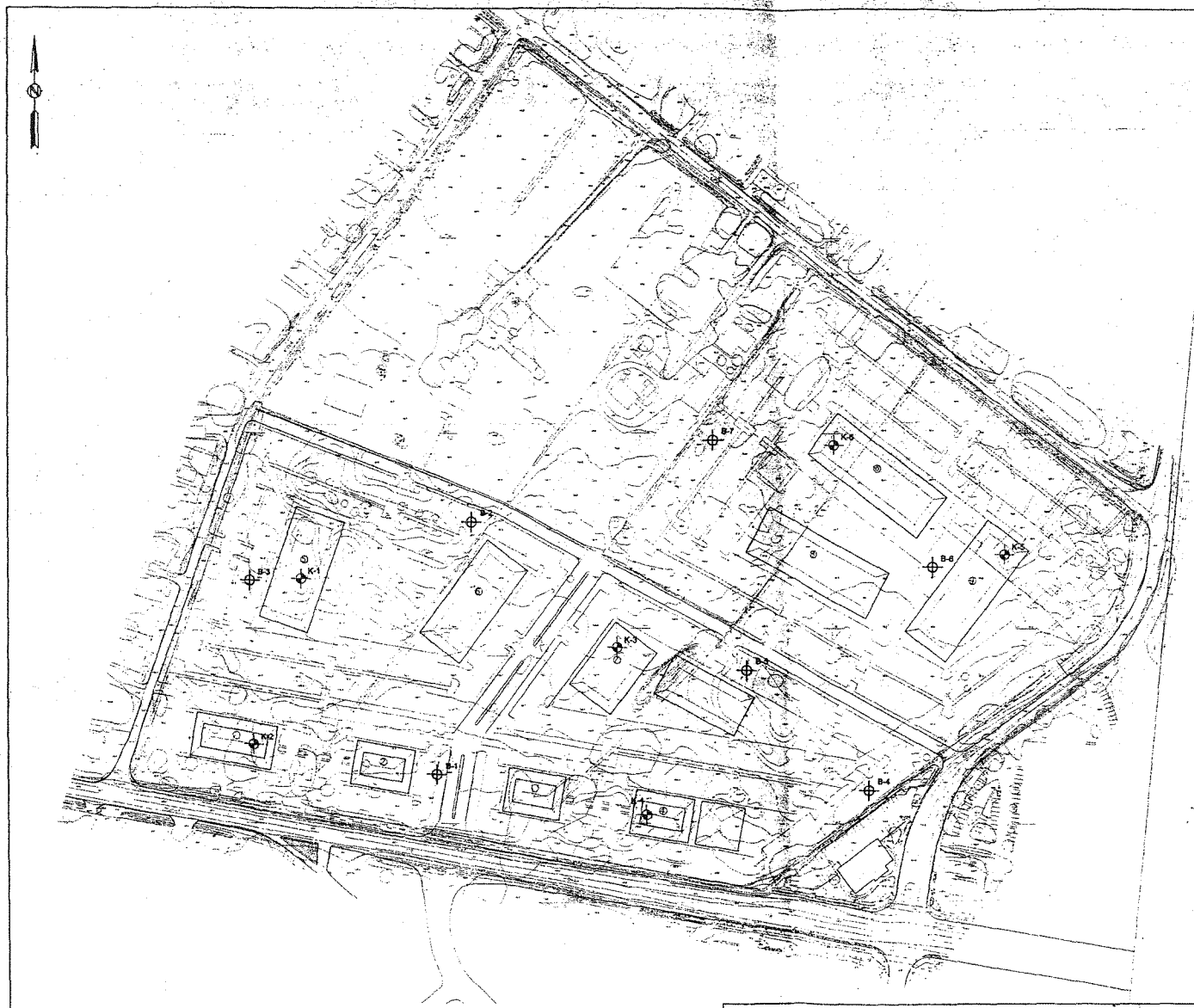
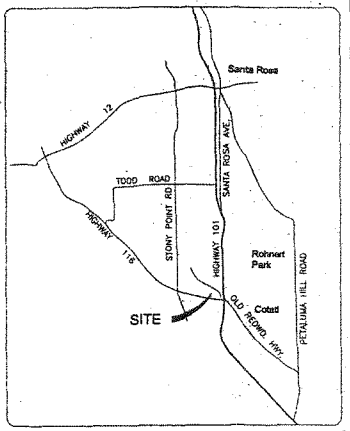
PROJECT NO. 41-1262-01

Factory Stores Outlet
Cotati, California

RESISTANCE VALUE

PLATE 13





LOCATION MAP
NOT TO SCALE

EXPLANATION

K-5 Test Boring Location

B-1 Previous Test Boring Location

100 50 0 100
Scale Feet

KLEINFELDER

PROJECT NO. 41-4584-01 DATE MAY 2000

SITE PLAN

South Sonoma Business Park
Highway 116
Cotati, California

PLATE
1