September 20, 1977

W. Darwin Myers
Contra Costa County
Planning Department
P.O. BOX 951
Martinez, CA 94553

Dear Darwin:

We are placing on open file the following report, reviewed and approved by the County of Contra Costa in compliance with the Alquist-Priolo Special Studies Zones Act:

Fault evaluation and foundation investigation for specialty shops, San Ramon, California; by Kaldvear and Associates; August 22, 1977.

Sincerely yours,

Earl W. Hart
Office of the State Geologist
CEG 935

cc: A-P file
TO: File #2086-77

FROM: Darwin Myers
Planning Geologist
RG 3164, EG 946

DATE: September 15, 1977

SUBJECT: Adequacy of Geologic Report

Pursuant to the requirements of the Alquist-Priolo Act, the applicant for 2086-77 has submitted a geologic report prepared by Peter Kaldveer and Associates (report dated August 22, 1977). The investigation was conducted under the direct field supervision of a registered geologist, and the resulting report generally follows the guidelines promulgated by the California Division of Mines and Geology.

The proposed project is the construction of a one-story, wood-frame building of approximately 6900 square feet which is to be used for specialty shops. The investigation consisted of 144 lineal feet of trenching, analysis of several sets of aerial photographs, review of previous literature and a reconnaissance of the site and surrounding area. It is pertinent to note that the property is on the edge of the Special Study Zone and no published map show a fault trace through the subject property.

I have carefully reviewed the report. The trench log indicates that the site is underlain by thick fill. Thus the exploratory trench only provided information on foundation conditions on the subject property (apparently the fill was emplaced concurrently with the grading done for I-680). There was no record of the extent of previous grading on site in County maintained files. Considering the size and location of the proposed project, it is my opinion that the report satisfies the requirements of the Alquist-Priolo Act. The building permit can be cleared when the requirements of Planning, Building Inspection, and other responsible agencies have been satisfied.

DM/ed

cc: Mike Cleary, Peter Kaldveer & Assoc.
    Bill Mauerhan
    /Earl W. Hart
    Jim Searfus
FAULT EVALUATION
AND
FOUNDATION INVESTIGATION
FOR
SPECIALTY SHOPS
SAN RAMON, CALIFORNIA
August 22, 1977
K239-6, O 7779

Rinker Development Corporation
P.O. Box 2480
Newport Beach, California

Attention: Mr. Bill Mauerhan
Manager - Engineering

RE: FAULT EVALUATION AND
FOUNDATION INVESTIGATION
SPECIALTY SHOPS
SAN RAMON, CALIFORNIA

Gentlemen:

In accordance with your request, we have performed a fault evaluation and foundation investigation for the subject development. The accompanying report presents the results of our literature review, field investigation, laboratory tests and engineering analysis. The geotechnical conditions are discussed and appropriate conclusions and recommendations for the project are presented.

We refer you to the text of the report for detailed recommendations. If you have any questions concerning our findings, please call us.

Very truly yours,

PETER KALDVEER AND ASSOCIATES

J. Michael Cleary
C.E.G. No. 352

Peter Kaldveer

JMC/PK: lah
Copies: Addressee (4)
William Charles Glass, Architect (2)
Lloyd McVicker, Structural Engineer (2)
FAULT EVALUATION
AND
FOUNDATION INVESTIGATION

For
SPECIALTY SHOPS
SAN RAMON, CALIFORNIA

To
Rinker Development Corporation
P.O. Box 2480
Newport Beach, California

August 1977
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INTRODUCTION

In this report, we present the results of our fault evaluation and foundation investigation for the proposed Specialty Shops to be located on the east side of San Ramon Valley Boulevard just north of Alcosta Boulevard in San Ramon, California. The location of the above site is shown on the Vicinity and Geologic Map, Figure 1, and the Site Plan, Figure 2. As indicated on Figure 1, the site is located within the Alquist-Priolo Act Special Studies Zone Boundary for the Calaveras Fault. The purposes of this investigation were to (1) evaluate potential for surface rupture at the site and to determine, from a fault hazard standpoint, the suitability of the site for the proposed development and (2) evaluate the foundation materials and provide recommendations concerning the soil and foundation engineering aspects of the development.

Based on our conversations with you, it is our understanding that the complex will consist of a one-story, wood-frame building with a slab-on-grade floor, a paved parking lot and access driveways. Maximum interior column loads will be about 25 kips for dead plus live loads. Maximum dead plus live wall loads will be approximately 1.2 kips per lineal foot. A moderate amount of earthwork will be required to develop the site.

SCOPE

The scope of our work included the following:

1. Review of published geologic information pertinent to the site including aerial photographs and geologic reports for nearby sites.

2. A reconnaissance of the site and surrounding area by our consulting engineering geologist.

3. Excavation and logging of an exploratory trench across the site.

4. Laboratory testing of samples obtained from the exploratory trench and borings.

5. Geotechnical engineering analyses of the field, office and laboratory data.

6. The preparation of this report.
The data obtained and the analyses performed were for the purpose of determining the suitability of the site for the proposed development from a fault hazard standpoint and providing design and construction criteria for site earthwork, building foundations, slab-on-grade floors and pavements.

This report has been prepared for the exclusive use of Rinker Development Corporation for specific application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made. In the event that any changes in the nature, design or location of the building are planned, the conclusions and recommendations in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

SITE INVESTIGATION

A subsurface investigation was performed on August 11, 1977. The subsurface investigation consisted of the excavation and logging of a 2-foot wide, 145-foot long exploratory trench which varied from 8 to 16 feet deep. The exploratory trench was logged to a scale of 1 inch = 5 feet. The location of the exploratory trench is shown on the Site Plan. The log of the exploratory trench and details regarding the field investigation are included in Appendix A. Our laboratory tests are discussed in Appendix B.

A reconnaissance of the site and surrounding area was performed by our consulting engineering geologist on August 11, 1977. The reconnaissance consisted of an examination of pavements, sidewalks and buildings located adjacent to the site for evidence of any unusual distress or offset which could be due to faulting.

Four sets of color and black and white stereoscopic aerial photographs were studied for evidence of fault related lineations on or projecting onto the site. These photographs were taken in 1960, 1965, 1968 and 1973 and had scales ranging from 1 inch = 1000 feet to 1 inch = 2700 feet. In addition, various other published and unpublished sources containing geologic data were reviewed. This review included the Contra Costa County Seismic Safety Element. We also searched for other geotechnical consultants' reports for this area but did not find any that were sufficiently close to the site to be useful in locating the Calaveras Fault. A bibliography of the published data and aerial photographs used to develop site information for our studies is included in Appendix E.

A. Surface

The site is trapezoidal in shape, essentially level and has maximum plan dimensions of about 160 by 190 feet. The site is currently vacant and at the time of our field investigation supported a moderate weed growth.
B. Subsurface

The surface materials encountered in the exploratory trench generally consisted of stiff, sandy and silty clay fill and medium dense, clayey and silty sand fill which extended to a depth of about one foot. These soils contained a low to moderate plasticity and potential for expansion. The surface fill materials were underlain by various zones of stiff to very stiff, silty and clayey fill as well as medium dense to dense, sandy fill which contained many utility lines as well as pieces of concrete and wood. Some of the more clayey fill materials possessed a high plasticity and potential for expansion. At a depth of about 8 feet in the east end of the trench, what appeared to be an old asphaltic concrete roadway was encountered. The fill materials extended to the bottom of the trench in all locations except at the west end where the trench was extended to a depth of 16 feet. At this location, the fill extended to a depth of 11 to 12 feet and the materials encountered below the fill layer were stiff, silty clay natural soils. A detailed description of the materials encountered in the exploratory trench are presented on the log of the trench in Appendix A.

The attached trench log and related information depict subsurface conditions only at the specific location shown on the Site Plan and on the particular date designated on the log. Also, the passage of time may result in changes in the subsurface conditions due to environmental changes. The location of the trench was approximately determined by taping and should be considered accurate only to the degree implied by the method used.

C. Groundwater

No free groundwater was encountered in the exploratory trench at the time of excavation. However, the trench was backfilled one day after excavation. It should be noted that the trench may not have been left open for a sufficient period of time to establish equilibrium groundwater conditions. In addition, fluctuations in the groundwater level may occur due to variations in rainfall, temperature and other factors not evident at the time measurements were made.

D. Geology

The community of San Ramon lies within the northwest-southeast trending alluvial-filled San Ramon Valley. The alluvium is derived largely from the highly sheared and folded Upper Tertiary sedimentary rocks of the branch of the Diablo Range to the west and the Dougherty Hills to the east. The site itself is situated on the western margin of the alluvial fill and is probably underlain by up to 50 feet of older alluvial deposits which consist largely of sandy and silty clay.
E. Faults

1. Calaveras Fault

As mentioned previously, the site is located in close proximity to the Calaveras Fault. Therefore, an area reconnaissance, inspection of an exploratory trench and a review of aerial photographs and other published and unpublished geologic data were performed with regard to the location of the Calaveras Fault. Information obtained from each portion of this investigation is presented below.

a. Surface Reconnaissance

During the site reconnaissance, a number of cracked and displaced curbs and sidewalks were observed along Alcosta and San Ramon Valley Boulevards. None of these cracks and displacements, however, showed any consistent offset pattern which would be expected if caused by fault movement. The expansive nature of the upper soils underlying the curbs and sidewalks and local backfill settlement around storm drain facilities is the probable cause for their distress.

b. Inspection of Exploratory Trench

The only portion of the trench which extended below the existing fill material was at the west end of the trench. In this location, the trench extended approximately four to five feet into the natural materials. The natural materials consisted of two feet of topsoil followed by three feet of sandy and silty clay alluvial soils. However, these materials indicated no evidence with regard to the presence or absence of the fault.

c. Review of Aerial Photographs

Aerial photographs of the San Ramon Valley area were reviewed during our study and revealed the fault to be located as shown on the State of California Special Studies Zone Map of the Dublin 7.5 Minute Quadrangle. The review did show a northwest-southeast trending alignment of color tonal changes passing through the site from the hills to the valley center. The orientation of this alignment and the lack of supporting evidence leads us to conclude it is not a fault related feature but is probably related to changes in the characteristics of soil and vegetation cover.

d. Geophysical Evaluation

During an on-site discussion with Mr. Darwin Myers, Contra Costa County Geologist, it was agreed that further subsurface investigation of faulting by means of geophysical techniques would probably be ineffective due to the site's proximity to the I-680 freeway and the presence of numerous buried utility lines on the property.
e. Review of Published Data

Published data indicates that the San Ramon Valley is bounded on the west by the Calaveras Fault System. The Calaveras Fault is part of a major structural feature extending from at least Cordelia on the north to Hollister on the south where it joins the San Andreas Fault System. Historic displacement has occurred on the Calaveras Fault in the vicinity of San Ramon (1861 earthquake) and the fault is considered active.

The state of California Special Studies Zone Map, Dublin 7.5 Minute Quadrangle indicates that the nearest branch of the Calaveras Fault lies about 500 feet west of the site.

2. Other Faults

The Pleasanton Fault runs along the eastern side of the San Ramon Valley approximately 6000 feet east of the site. Creep is believed to be occurring on portions of this fault and therefore this fault is considered active. In addition, the active Hayward and San Andreas Fault Zones lie approximately 7 and 26 miles southwest of the site, respectively.

F. Seismicity

Due to the presence of the various active faults in the vicinity, the site, like the entire Bay Area, is in a region having high seismic activity. Although research on earthquake prediction has greatly increased in recent years, seismologists have not yet reached the point where they can accurately predict when and where an earthquake will occur. Nevertheless, on the basis of current technology, it is reasonable to assume that the proposed structure will be subjected to at least one moderate to severe earthquake that will cause strong shaking of the site.

EVALUATION AND CONCLUSIONS – FAULT HAZARD

Based on our investigation, we conclude that from a fault hazard standpoint, the site is suitable for the proposed development. Our evaluation of the available geotechnical information on the Calaveras Fault indicates that there is not a significant hazard due to surface rupturing or fault offset within the site under consideration. Although this area lies within the Alquist-Priolo Special Studies Zone, our studies indicate that the likelihood that a branch of the Calaveras Fault exists within the site boundaries is extremely remote.
CONCLUSIONS AND RECOMMENDATIONS - FOUNDATIONS

From a soil and foundation engineering standpoint, it is our opinion that the site is suitable for the proposed development. However, all of the conclusions and recommendations presented in this report should be incorporated in the design and construction of the project to avoid possible soil and foundation problems. The heterogeneous character of the fill materials underlying the site is the primary consideration for foundation design at the site. These materials could settle as building loads are placed on them. In order to minimize possible damage to the proposed building, we recommend that the materials be removed to a depth of six feet below the building and replaced with engineered fill. Detailed earthwork and foundation recommendations for use in design and construction of the project are presented below.

We recommend that our firm be provided the opportunity for a general review of the final design and specifications in order that the earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications. If our firm is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

A. Earthwork

1. Clearing and Site Preparation

The site should be cleared of all obstructions including buried utility lines, and debris. Holes resulting from the removal of underground obstructions that extend below the proposed finish grade should be cleared and backfilled with suitable material compacted to the requirements given below under Item A.5, "Compaction". We recommend that the backfilling operations for any excavations to remove deleterious material be carried out under the observation of the soil engineer, so that these excavations will be properly backfilled.

After clearing, the portions of the site containing surface vegetation or organic laden topsoil should be stripped to an appropriate depth to remove these materials. At the time of our field investigation, we estimated that a stripping depth of approximately 3 inches would be required. The amount of actual stripping should be determined in the field by the soil engineer at the time of construction. The cleared and stripped materials should be removed from the site or stockpiled for later use in landscaping, if desired.

2. Excavation of Existing Fill Materials

The existing fill materials should be removed to a depth of six feet below the proposed building and to at least five feet horizontally beyond the limits of
of the structure. This excavation should then be filled with compacted, engineered fill in accordance with the recommendations presented below under Item A.4, "Material for Fill" and Item A.5, "Compaction". Those portions of the excavated existing fill materials which conform to the recommendations presented below under Item A.4, "Material for Fill" can be used as fill.

3. Subgrade Preparation

After the site has been properly cleared and stripped and the necessary excavations made, the exposed soils in those areas to receive structural fill, slabs-on-grade or pavements should be scarified to a depth of 6 inches, moisture conditioned to slightly above optimum water content and compacted to the requirements for structural fill.

4. Material for Fill

On-site soils below the stripped layer which have an organic content of less than 3 percent by volume and have a plasticity index of 12 or less can be used as fill. However, any fill placed at the site, including on-site soils, should not contain rocks or lumps larger than 6 inches in greatest dimension with not more than 15 percent larger than 2.5 inches. In addition, the required import fill should be predominantly granular with a plasticity index of 12 or less.

5. Compaction

All structural fill should be compacted to at least 95 percent relative compaction as determined by ASTM Test Designation D 1557-70. Fill material should be spread and compacted in lifts not exceeding 8 inches in uncompacted thickness. We should note that if construction proceeds during the wet winter months, it may require time to dry the on-site clayey soils to be used as fill since their moisture content will probably be appreciably above optimum.

6. Trench Backfill

Pipeline trenches should be backfilled with fill placed in lifts not exceeding 8 inches in uncompacted thickness. If on-site soil is used, the material should be compacted to at least 85 percent relative compaction by mechanical means only. Imported sand may also be used for backfilling trenches provided it is compacted to at least 90 percent relative compaction. If imported sand is used, sufficient water should be added during the trench backfilling operations to prevent the soil from "bulking" during compaction. In all footing, slab and pavement areas, the upper 3 feet of trench backfill should be compacted to at least 90 percent relative compaction for on-site soils, and 95 percent where imported sand backfill is used. In addition, the upper 6 inches of all trench backfill in pavement areas should be compacted to at least 95 percent relative compaction.
As noted above, if any construction proceeds during or shortly after the wet winter months, it may require time to dry the on-site clayey soils to be used as trench backfill since their moisture content will probably be appreciably above optimum.

7. Drainage

Positive surface gradients should be provided adjacent to the building so as to direct surface water away from foundations and slabs toward suitable discharge facilities. Ponding of surface water should not be allowed adjacent to the structure or on pavements.

8. Construction Observation

The analysis and recommendations submitted in this report are based in part upon the data obtained from the one exploratory trench. The nature and extent of variations beyond this trench may not become evident until construction. If variations then become apparent, it will be necessary to re-evaluate the recommendations of this report. We should note that large pieces of wood, concrete or asphalt will likely be present in the excavation below the proposed building.

We recommend that our firm be retained to provide soil engineering services during the excavation and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications and recommendations and to allow design changes in the event that subsurface conditions differ from that anticipated prior to the start of construction.

9. Guide Specifications

All earthwork should be performed in accordance with the Guide Specifications – Site Earthwork presented in Appendix C. It should be pointed out, however, that these specifications are only general in nature and the actual job specifications should also incorporate all requirements contained in this report.

B. Foundations

1. Footings

We recommend that the building be supported on conventional continuous and isolated spread footings bearing on the compacted fill. All footings should be founded at least 16 inches below lowest adjacent finished grade. In addition, footings located adjacent to other footings or utility trenches should have their bearing surfaces situated below an imaginary 1.5 horizontal to 1 vertical plane projected upward from the bottom edge of the adjacent footings or utility trench.
At the above depths, the footings may be designed for an allowable bearing pressure of 2000 pounds per square foot due to dead loads, 2500 pounds per square foot due to dead plus live loads and 3500 pounds per square foot for all loads including wind or seismic. These allowable bearing pressures are net values; therefore, the weight of the footing can be neglected for design purposes. Footings should not, however, have a width of less than 12 inches.

All continuous footings should be designed with adequate top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. Any visible cracks in the bottoms of the footing excavations should be closed by wetting prior to construction of the foundations. To assure that footings are founded on appropriate material, it is essential that we inspect the footing excavations prior to placing reinforcing steel or concrete.

Settlements under building loads are expected to be within tolerable limits for the proposed structure.

2. Slabs-on-Grade

We recommend that slabs-on-grade be supported directly on the compacted fill. Prior to final construction of the slab, the subgrade surface should be proof-rolled to provide a smooth, firm surface for slab support. Slab reinforcing should be provided in accordance with the anticipated use and loading of the slab.

In areas where floor wetness would be undesirable, 4 inches of free draining, rounded gravel should be placed beneath the floor slab to serve as a capillary barrier between the subgrade soil and the slab. In order to minimize vapor transmission, an impermeable membrane should be placed over the gravel. The membrane should be covered with 2 inches of sand to protect it during construction. The sand should be lightly moistened just prior to placing the concrete.

3. Lateral Loads

Lateral load resistance for the building and walls may be developed in friction between the foundation bottom and the supporting subgrade. A friction coefficient of 0.35 is considered applicable. As an alternative, a passive resistance equal to an equivalent fluid weighing 300 pounds per cubic foot acting against the foundations may be used. If the foundations are poured neat against the soil, friction and passive resistance may be used in combination.
C. Pavements

On the basis of our experience in this area, we estimate that the surface materials at the site will have an "R" value of about 20. Combining this information with an appropriate traffic index for the proposed parking areas and access road, we have developed the following alternative pavement sections using Procedure 301-F of the State of California Department of Public Works, Division of Highways. We have included pavement designs for pavement lives of 1 to 5 years, 6 to 10 years and 11 to 20 years.

RECOMMENDED PAVEMENT DESIGN ALTERNATIVES

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<tr>
<th>Location</th>
<th>Anticipated Pavement Life (Years)</th>
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<th>Aggregate Base Class 2 (Inches)</th>
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<td>6 to 10</td>
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<td>1 to 5</td>
<td>2.0</td>
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The traffic indices used in our pavement designs are considered reasonable values for the proposed development and should provide the indicated pavement lives with only a normal amount of flexible maintenance. Selection of the design traffic parameters, however, was based on engineering judgement and not on an equivalent wheel load analysis developed from a traffic study or furnished to us.

Asphaltic concrete, aggregate base and preparation of the subgrade should conform to and be placed in accordance with the Guide Specifications - Asphalt Paving presented in Appendix D.

* * * * * * * * * * *
EXPLANATION & GEOLOGIC SYMBOLS

- Calaveras Fault Traces, dashed where approximately located, dotted where concealed. 1861 reported surface rupture location on map
- Special Studies Boundary
- Contact Between Major Geologic Units
- Major Roads
- Quaternary Alluvial Deposits
- Upper Tertiary Sedimentary Rocks

Reference: Contra Costa County Geological Map, 1976 & Dublin Quad, Alquist Priolo Special Studies Map
Approximately 165' to Alcosta Boulevard

LEGEND
- Approximate Location of Exploratory Trench

Base: "Service and Specialty Shop Building, Preliminary Site Development Plan", prepared by William Charles Glass, dated June 6, 1977

San Ramon, California

SPECIALTY SHOPS

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<td>August 1977</td>
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APPENDIX A - FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using a truck-mounted, continuous flight auger. One 24-inch wide, 150-foot long exploratory trench was excavated on August 11, 1977. This trench varied from 8 to 16 feet deep. The location of this exploratory trench is shown on the Site Plan, Figure 2. The materials encountered in the trench were continuously logged in the field by our representative. The soils are described in accordance with the Unified Soil Classification System (ASTM D-2487). The log of the trench as well as a key for the classification of the soil (Figure A-1) are included as part of this appendix.

Representative soil samples were obtained from the exploratory trench at selected depths appropriate to the soil investigation. All samples were transmitted to our laboratory for evaluation and appropriate testing.

The trench log shows our interpretation of the subsurface conditions at the date and location indicated, and it is not warranted that they are representative of subsurface conditions at other locations and times.
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<th>PRIMARY DIVISIONS</th>
<th>GROUP SYMBOL</th>
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<td>GRAVELS</td>
<td>GW</td>
<td>Well graded gravels, gravel-sand mixtures, little or no fines.</td>
</tr>
<tr>
<td></td>
<td>GP</td>
<td>Poorly graded gravels or gravel-sand mixtures, little or no fines.</td>
</tr>
<tr>
<td></td>
<td>GM</td>
<td>Silty gravels, gravel-sand-silt mixtures, non-plastic fines.</td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>Clayey gravels, gravel-sand-clay mixtures, plastic fines.</td>
</tr>
<tr>
<td></td>
<td>SW</td>
<td>Well graded sands, gravelly sands, little or no fines.</td>
</tr>
<tr>
<td></td>
<td>SP</td>
<td>Poorly graded sands or gravelly sands, little or no fines.</td>
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<tr>
<td></td>
<td>SM</td>
<td>Silty sands, sand-silt mixtures, non-plastic fines.</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>Clayey sands, sand-clay mixtures, plastic fines.</td>
</tr>
<tr>
<td>SANDS</td>
<td>ML</td>
<td>Inorganic silts and very fine sands, rock flour, silt, or clayey fine sands or clayey silts with slight plasticity.</td>
</tr>
<tr>
<td></td>
<td>CL</td>
<td>Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.</td>
</tr>
<tr>
<td></td>
<td>OL</td>
<td>Organic silts and organic silty clays of low plasticity.</td>
</tr>
<tr>
<td></td>
<td>MH</td>
<td>Inorganic silts, micaceous or diatomaceous fine sandy or siltary clays, elastic silts.</td>
</tr>
<tr>
<td></td>
<td>CH</td>
<td>Inorganic clays of high plasticity, fat clays.</td>
</tr>
<tr>
<td></td>
<td>OH</td>
<td>Organic clays of medium to high plasticity, organic silts.</td>
</tr>
<tr>
<td></td>
<td>Pt</td>
<td>Peat and other highly organic soils.</td>
</tr>
</tbody>
</table>

### DEFINITION OF TERMS

<table>
<thead>
<tr>
<th>U.S. STANDARD SERIES SIEVE</th>
<th>CLEAR SQUARE SIEVE OPENINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>40</td>
<td>3&quot;</td>
</tr>
<tr>
<td>10</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

### GRAIN SIZES

<table>
<thead>
<tr>
<th>SANDS AND GRAVELS</th>
<th>BLOWS/FOOT†</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY LOOSE</td>
<td>0 - 4</td>
</tr>
<tr>
<td>LOOSE</td>
<td>4 - 10</td>
</tr>
<tr>
<td>MEDIUM DENSE</td>
<td>10 - 30</td>
</tr>
<tr>
<td>DENSE</td>
<td>30 - 50</td>
</tr>
<tr>
<td>VERY DENSE</td>
<td>OVER 50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SILTS AND CLAYS</th>
<th>STRENGTH†</th>
<th>BLOWS/FOOT†</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY SOFT</td>
<td>0 - 1/4</td>
<td>0 - 2</td>
</tr>
<tr>
<td>SOFT</td>
<td>1/4 - 1/2</td>
<td>2 - 4</td>
</tr>
<tr>
<td>FIRM</td>
<td>1/2 - 1</td>
<td>4 - 8</td>
</tr>
<tr>
<td>STIFF</td>
<td>1 - 2</td>
<td>8 - 16</td>
</tr>
<tr>
<td>VERY STIFF</td>
<td>2 - 4</td>
<td>16 - 32</td>
</tr>
<tr>
<td>HARD</td>
<td>OVER 4</td>
<td>OVER 32</td>
</tr>
</tbody>
</table>

### RELATIVE DENSITY

†Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

### CONSISTENCY

†Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

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Peter Kaldveer and Associates

Geotechnical Consultants

KEY FOR CLASSIFICATION OF SOIL
Unified Soil Classification System (ASTM D-2487)

SPECIALTY SHOPS
San Ramon, California

<table>
<thead>
<tr>
<th>PROJECT NO.</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>K239-6</td>
<td>August 1977</td>
</tr>
</tbody>
</table>

Figure A-1
NOTES:

1. The stratification lines represent the approximate boundaries between soil types and the transitions may be gradual.

2. All trench materials were fill except those materials below 11 feet deep between 125 and 138 feet.

Laboratory Test Results:

<table>
<thead>
<tr>
<th>Test</th>
<th>W/C</th>
<th>LL</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Content</td>
<td>W/C</td>
<td>Liquid Limit</td>
<td>Plasticity Index</td>
</tr>
<tr>
<td>Passing #200 Sieve</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approximate Location of:

- Gas Lines
- Electric Lines
- Jar Samples

Peter Kaldveer and Associates
Geotechnical Consultants

EXPLORATORY TRENCH LOG
SPECIALTY SHOPS
San Ramon, California

PROJECT NO: K239-6
DATE: August 1977
Trench No. 1
APPENDIX B - LABORATORY INVESTIGATION

The laboratory testing program was directed toward a quantitative and qualitative evaluation of the physical and mechanical properties of the soils underlying the site.

The natural water content was determined on 24 samples of the materials recovered from the borings; these water contents are recorded on the trench log at the appropriate sample location.

Atterberg Limit determinations were performed on four samples of the subsurface soils to determine the range of water content over which these materials exhibit plasticity. The Atterberg Limits are used to classify the soils in accordance with the Unified Soil Classification System and to indicate the soil's expansion potential. The results of these tests are presented on Figure B-1 and on the log of the trench at the appropriate sample location.

The percent passing the #200 sieve was determined on three samples of the subsurface soils to aid in the classification of these soils; the results of these tests are shown on Figure B-1 and on the trench log at the appropriate sample location.
The image contains a graph showing the relationship between Plasticity Index (%) and Liquid Limit (%). The key symbol, sample location (feet from east end), sample depth (feet), natural water content (%), liquid limit (%), plasticity index (%), liquidity index (%), passing No. 200 sieve (%), and unified soil classification symbol are listed in a table. The key symbols correspond to points on the graph:

- ◢: 14 1 8 41 23 -0.4 54 CL
- ◢: 92 1 6 31 7 -2.6 27 SM
- ◢: 20 4 11 38 21 -0.3 51 CL
- △: 114 3 18 51 34 +0.02 73 CH

The graph and table are used to determine the soil type based on the Atterberg limits and plasticity chart. The text at the bottom of the image provides the name of the company, Peter Kaldveer and Associates, and notes that they are geotechnical consultants located in San Ramon, California. The project number, date, and figure reference are also listed.
APPENDIX C
GUIDE SPECIFICATIONS - SITE EARTHWORK
FOR
SPECIALTY SHOPS
SAN RAMON, CALIFORNIA

1. GENERAL
A. Scope of Work

These specifications and applicable plans pertain to and include all site earthwork including, but not limited to, the furnishing of all labor, tools, and equipment necessary for site clearing and stripping, disposal of excess materials, excavation, preparation of foundation materials for receiving fill, and placement and compaction of fill to the lines and grades shown on the project grading plans.

B. Performance

The Contractor warrants all work to be performed and all materials to be furnished under this contract against defects in materials or workmanship for a period of _____ year(s) from the date of written acceptance of the entire construction work by the Owner.

Upon written notice of any defect in materials or workmanship during said _____ year period, the Contractor shall, at the option of the Owner, repair or replace said defect and any damage to other work caused by or resulting from such defect without cost to the Owner. This shall not limit any rights of the Owner under the "acceptance and inspection" clause of this contract.

The Contractor shall be responsible for the satisfactory completion of all site earthwork in accordance with the project plans and specifications. This work shall be observed and tested by a representative of Peter Kaldveer and Associates, hereinafter known as the Soil Engineer. Both the Soil Engineer and the Architect/Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by the Soil Engineer and the Architect/Engineer. No deviation from the specifications shall be made except upon written approval of the Soil Engineer or Architect/Engineer.

No site earthwork shall be performed without the physical presence or approval of the Soil Engineer. The Contractor shall notify the Soil Engineer at least twenty-four hours prior to commencement of any aspect of the site earthwork.
The Soil Engineer shall be the Owner's representative to observe the grading operations during the site preparation work and the placement and compaction of fills. He shall make enough visits to the site to familiarize himself generally with the progress and quality of the work. He shall make a sufficient number of tests and/or observations to enable him to form an opinion regarding the adequacy of the site preparation, the acceptability of the fill material, and the extent to which the compaction of the fill, as placed, meets the specification requirements. Any fill that does not meet the specification requirements shall be removed and/or recompacted until the requirements are satisfied.

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal work hours.

Any construction review of the Contractor's performance conducted by the Soil Engineer is not intended to include review of the adequacy of the Contractor's safety measures in, on or near the construction site.

Upon completion of the construction work, the Contractor shall certify that all compacted fills and foundations are in place at the correct locations, have the correct dimensions, are plumb, and have been constructed in accordance with sound construction practice. In addition, he shall certify that the materials used are of the types, quantity and quality required by the plans and specifications.

C. Site and Foundation Conditions

The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the soil report titled "Fault Evaluation and Foundation Investigation, Specialty Shops, San Ramon, California", dated August 22, 1977.

The Contractor shall not be relieved of liability under the contract for any loss sustained as a result of any variance between conditions indicated by or deduced from the soil report and the actual conditions encountered during the course of the work.

The Contractor shall, upon becoming aware of surface and/or subsurface conditions differing from those disclosed by the original soil investigation, promptly notify the Owner as to the nature and extent of the differing conditions, first verbally to permit verification of the conditions, and then in writing. No claim by the Contractor for any conditions differing from those anticipated in the plans and specifications and disclosed by the soil investigation will be allowed unless the Contractor has so notified the Owner, verbally and in writing, as required above, of such changed conditions.
D. Dust Control

The Contractor shall assume responsibility for the alleviation or prevention of any dust nuisance on or about the site or off-site borrow areas. The Contractor shall assume all liability, including court costs of co-defendants, for all claims related to dust or wind-blown materials attributable to his work.

II. DEFINITION OF TERMS

STRUCTURAL FILL - All soil or soil-rock material placed at the site in order to raise grades or to backfill excavations, and upon which the Soil Engineer has made sufficient tests and/or observations to enable him to issue a written statement that, in his opinion, the fill has been placed and compacted in accordance with the specification requirements.

ON-SITE MATERIAL - Material obtained from the required site excavations.

IMPORT MATERIAL - Material obtained from off-site borrow areas.


DEGREE OF COMPACTION - The ratio, expressed as a percentage, of the in-place dry density of the compacted fill material to the maximum dry density of the same material as determined by ASTM Test Designation D 1557-70.

III. SITE PREPARATION

A. Clearing and Grubbing

The Contractor shall accept the site in its present condition and shall remove from the area of the designated project earthwork all obstructions including buried utility lines, any debris and any other matter determined by the Soil Engineer to be deleterious. Such material shall become the property of the Contractor and shall be removed from the site. Holes resulting from the removal of underground obstructions that extend below finish grades shall be cleared and backfilled with structural fill.

B. Stripping

Where vegetation exists, the site shall be stripped to a minimum depth of 3 inches or to such greater depth as the Soil Engineer in the field may consider as being advisable to remove all surface vegetation and organic laden topsoil. Stripped topsoil with an organic content in excess of 3 percent by volume shall be stockpiled for possible use in landscaped areas.
IV. EXCAVATION

All excavation shall be performed to the lines and grades and within the tolerances specified on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the specifications. The Contractor shall assume full responsibility for the stability of all temporary construction slopes at the site.

V. SUBGRADE PREPARATION

Surfaces to receive compacted fill, and those on which concrete slabs and pavements will be constructed, shall be scarified to a minimum depth of 6 inches and compacted. All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill material shall be approved by the Soil Engineer prior to the placement of any fill material.

VI. GENERAL REQUIREMENTS FOR FILL MATERIAL

All fill material must be approved by the Soil Engineer. The material shall be a soil or soil-rock mixture which is free from organic matter or other deleterious substances. The fill material shall not contain rocks or rock fragments over 6 inches in greatest dimension and not more than 15 percent shall be over 2.5 inches in greatest dimension. Some larger rocks may be incorporated into the lower portions of the fill if the rocks are widely spaced and if the spacing method is approved by the Soil Engineer. On-site material having an organic content of less than 3 percent by volume and having a plasticity index of 12 or less is suitable for use as fill.

All imported fill material shall be non-expansive with a plasticity index of 12 or less.

VII. PLACING AND COMPACTING FILL MATERIAL

All structural fill shall be compacted by mechanical means to produce a minimum degree of compaction of 95 percent as determined by ASTM Test Designation D 1557-70. Field density tests shall be performed in accordance with either ASTM Test Designation D 1556-64 (Sand-Cone Method) or ASTM Test Designation D 2922-71 and D 3017-72 (Nuclear Probe Method). The locations and number of field density tests shall be determined by the Soil Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work shall be judged by the Soil Engineer.
VIII. TRENCH BACKFILL

Pipeline trenches shall be backfilled with compacted structural fill placed in lifts not exceeding 8 inches in uncompacted thickness. If on-site soil is used, the material shall be compacted by mechanical means to a minimum degree of compaction of 85 percent. Imported sand may also be used for backfilling trenches provided it is compacted to at least 90 percent. If imported sand backfilling is used, sufficient water shall be added during the trench backfilling operations to prevent the soil from bulking during compaction. In all building pad and pavement areas, the upper 3 feet of trench backfill shall be compacted to a minimum degree of compaction of 90 percent for on-site soils and 95 percent where imported sand backfill is used.

IX. TREATMENT AFTER COMPLETION OF EARTHWORK

After the earthwork operations have been completed and the Soil Engineer has finished his observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the Soil Engineer.

It shall be the responsibility of the Contractor to prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.
1. GENERAL

This portion of the work shall include all labor, materials, tools and equipment necessary for and incidental to the completion of the pavement shown on the plans and as herein specified.

II. DEFINITION OF TERMS

PAVEMENT - Both asphalt concrete, and aggregate base materials.

SUBGRADE - That portion of the construction on which asphalt concrete and aggregate base is to be placed.


III. MATERIALS

A. Asphalts:

(1) Asphalt for prime coat and tack coat shall be liquid asphalt, grade RC-70 conforming to the provisions of Section 93 of the Standard Specifications.

(2) Paving asphalt to be mixed with aggregate shall be steam refined asphalt conforming to the provisions of Section 92 of the Standard Specifications for viscosity grade AR 4000.

B. Mineral Aggregate for Asphalt Concrete:

Type B Aggregate as specified in the Standard Specifications, Section 39, 3/4 inch maximum size, medium grading.

IV. CONSTRUCTION

A. Subgrade Preparation:

The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades and dimensions given on the plans. After this has been accomplished, the areas shall be proof-rolled to locate isolated unstable areas. The Contractor shall furnish an approved
50-ton pneumatic tired roller or some other approved equipment for this purpose. The weight for proof-rolling shall be as specified by the Engineer. Unsuitable areas shall be stabilized by recompaction or excavation and replacement of materials. The upper 6 inches of the subgrade soil shall be compacted to a density not less than 95 percent of that obtained in the laboratory according to test Method ASTM D1557-70.

B. Aggregate Base:

Aggregate base shall be spread and compacted in conformance with Standard Specifications Section 26 for Class 2 Aggregate Base. Finished aggregate base shall have the minimum depth shown and finished grade shall not vary more than 0.05 foot above or below the established grade. The aggregate base shall be compacted to a density not less than 95 percent of that obtained in the laboratory according to test Method ASTM D 1557-70.

C. Prime Coat:

Apply prime coat at an approximate toal rate of 0.25 gallons per square yard to all areas receiving asphalt concrete. Conform to Section 39 of Standard Specifications.

D. Tack Coat:

Apply a "tack coat" to all vertical faces, against which asphalt concrete is to be placed. Apply at a rate of from 0.02 gallon to 0.10 gallon per square yard. Conform to Section 39 of Standard Specifications.

E. Seal Coat:

Seal coat shall be SS-1h emulsified asphalt, conforming to the requirements of Sections 37 and 94 of the Standard Specifications, diluted with an equal amount of water and applied at the rate of 0.10 gallon of the diluted emulsion per square yard of surface. The surface shall be free of dust and loose material prior to application.

F. Asphalt Concrete:

Asphalt concrete shall be spread and compacted on the prepared base in conformance with the lines, grades and dimensions shown on the drawing and as specified in Section 39 of the Standard Specifications. In addition to the compaction requirements described in section 39 of the Standard Specifications, each layer of asphaltic concrete (surface or base) shall be compacted to a density no less than 95 percent of that obtained in the laboratory according to California Test Method No. 304.

G. Improper Workmanship

Cracks, settling of surface, improper drainage and sloppy connection to previously laid surfaces will be construed as improper workmanship and will not be acceptable.
APPENDIX E - BIBLIOGRAPHY

California Division of Mines and Geology, undated, Geologic Map of Contra Costa County; CDMG Journal, Volume 54, No. 4, Plate 5.


Ford, R. S., 1969. Groundwater Geology of Livermore Valley, Urban Environmental Geology in the San Francisco Bay Region by San Francisco Section of AEG.

Helley, E.J.; Lajoie, K.R.; and Burke, D.B., 1972. Geologic Map of Late Cenozoic Deposits, Alameda County, California, Basic Data Contribution 48 of San Francisco Bay Region Environment and Resources Planning Study.


The following aerial photographs were studied at the U.S. Geological Survey Library, Menlo Park:

GS-VACY 1-8, 9 and 10 taken July 7, 1960 at a scale of 1 inch = 2700 feet
ALA-10-156 and 157 taken May 16, 1965 at a scale of 1 inch = 1000 feet
GS-VBZJ 2-222 and 223 taken April 27, 1968 at a scale of 1 inch = 2600 feet
CC3526-3-116, 117, 118, 205 and 206 taken May 2, 1973 at a scale of 1 inch = 1100 feet