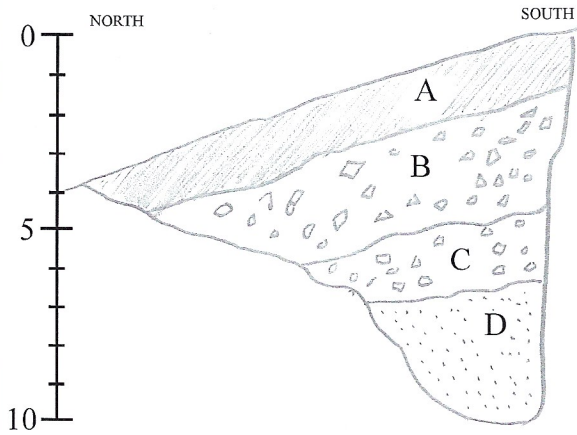


SOIL DESCRIPTIONS

Test Pit 1



A - DARK BROWN SANDY SILT (ML) dry, loose, porous with many rootlets (topsoil)

A<sub>1</sub> - LIGHT BROWN with gravel

A<sub>2</sub> - with coarse gravel and roots

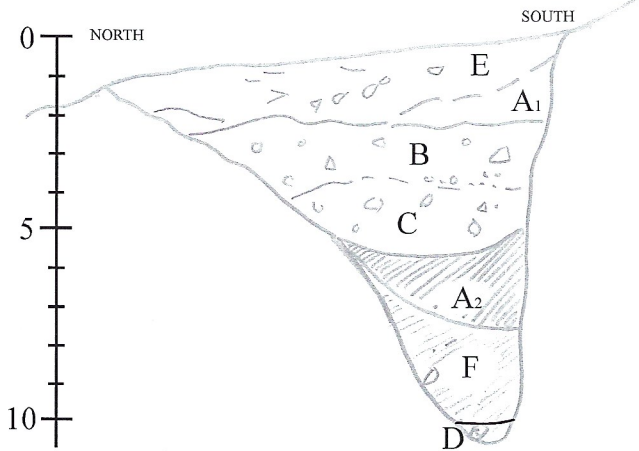
A<sub>3</sub> - no gravel

B - BROWN SANDY SILT (ML) with angular and subangular gravels. dry, stiff, porous with roots and rootlets

C - GRAY BROWN SANDY SILT (ML) with angular and subangular rock fragments. dry, stiff, porous with fine rootlets, (debris flow)

D - MOTTLED RED-YELLOW-BROWN SANDSTONE fine grained, low hardness, friable, highly weathered sandstone of the Franciscan Complex

Test Pit 2

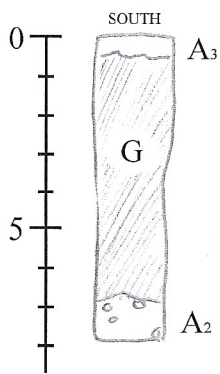


E - BROWN SILTY GRAVEL (GM) dry, stiff, porous, with wood, and glass debris (fill)

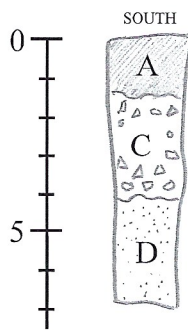
F - DARK BROWN SANDY CLAY (CL) with gravel. stiff, slightly moist, non-porous

G - MOTTLED GRAY-BROWN-RED SANDY CLAY (CH) dry to moist, stiff, plastic (colluvium)

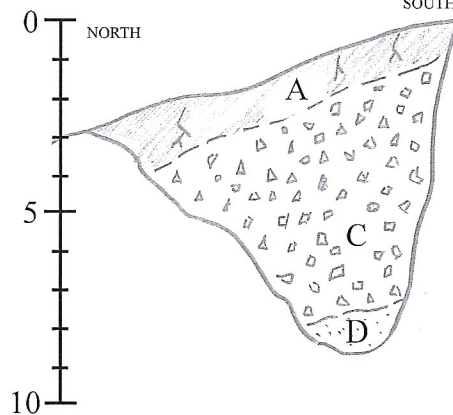
Test Pit 3



Test Pit 4



Test Pit 5



SCALE: 1 INCH = 5 FEET  
HORIZONTAL AND VERTICAL

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Job No: 731.8.1  
Date: 05-20-2019  
Appr: BFP

LOG OF TEST PITS  
1 THROUGH 5  
FREMONT ROAD RESIDENCE  
54 FREMONT ROAD  
SAN RAFAEL, CALIFORNIA

PLATE

**2**

# UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			TYPICAL NAMES		
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN No. 200 SIEVE	<b>GRAVEL</b>  MORE THAN HALF OF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE	CLEAN GRAVEL WITH LESS THAN 5% FINES	GW		WELL GRADED GRAVEL, GRAVEL-SAND MIXTURE
		GRAVEL WITH OVER 12% FINES	GP		POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURE
		GRAVEL WITH OVER 12% FINES	GM		SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
		GRAVEL WITH OVER 12% FINES	GC		CLAYEY GRAVEL, GRAVEL-SAND-CLAY MIXTURE
	<b>SAND</b>  MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE	CLEAN SAND WITH LESS THAN 5% FINES	SW		WELL GRADED SAND, GRAVELLY SAND
		CLEAN SAND WITH LESS THAN 5% FINES	SP		POORLY GRADED SAND, GRAVELLY SAND
		SAND WITH OVER 12% FINES	SM		SILTY SAND, GRAVEL-SAND-SILT MIXTURE
		SAND WITH OVER 12% FINES	SC		CLAYEY SAND, GRAVEL-SAND-CLAY MIXTURE
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN No. 200 SIEVE	<b>SILT AND CLAY</b>  LIQUID LIMIT LESS THAN 50	SILT AND CLAY	ML		INORGANIC SILT, ROCK FLOUR, SANDY OR CLAYEY SILT WITH LOW PLASTICITY
		SILT AND CLAY	CL		INORGANIC CLAY OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAY (LEAN)
		SILT AND CLAY	OL		ORGANIC CLAY AND ORGANIC SILTY CLAY OF LOW PLASTICITY
	<b>SILT AND CLAY</b>  LIQUID LIMIT GREATER THAN 50	SILT AND CLAY	MH		INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOIL, ELASTIC SILT
		SILT AND CLAY	CH		INORGANIC CLAY OF HIGH PLASTICITY, GRAVELLY, SANDY OR SILTY CLAY (FAT)
		SILT AND CLAY	OH		ORGANIC CLAY OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILT
<b>HIGHLY ORGANIC SOILS</b>			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

### KEY TO TEST DATA

- |                |                      |       |                                   |
|----------------|----------------------|-------|-----------------------------------|
| El             | Expansion Index      | TxUU  | Unconsolidated Undrained Triaxial |
| Consol         | Consolidation        | TxCU  | Consolidated Undrained Triaxial   |
| LL             | Liquid Limit (in %)  | DSCD  | Consolidated Drained Direct Shear |
| PL             | Plastic Limit (in %) | FVS   | Field Vane Shear                  |
| PI             | Plasticity Index     | LVS   | Laboratory Vane Shear             |
| SA             | Sieve Analysis       | UC    | Unconfined Compression            |
| G <sub>s</sub> | Specific Gravity     | UC(P) | Laboratory Penetrometer           |
| ■              | "Undisturbed" Sample |       |                                   |
| □              | Bulk Sample          |       |                                   |

- |      |        |
|------|--------|
| 320  | (2600) |
| 320  | (2600) |
| 2750 | (2000) |
| 470  |        |
| 700  |        |
| 2000 | *      |
| 700  | *      |

Shear Strength, psf  
Confining Pressure, psf

Notes: (1) All strength tests on 2.8" or 2.4" diameter samples unless otherwise indicated.

\* Compressive Strength

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Date: 05-22--19

Appr: *BSF*

SOIL CLASSIFICATION CHART  
AND KEY TO TEST DATA  
FREMONT ROAD RESIDENCE  
SAN RAFAEL, CALIFORNIA

PLATE

3



**A: CONSOLIDATION OF SEDIMENTARY ROCKS;** usually determined from unweathered samples.

Largely dependent on cementation

1. U = unconsolidated
2. P = poorly consolidated
3. M = moderately consolidated
4. W = well consolidated

**B: BEDDING OF SEDIMENTARY ROCKS**

Splitting Property	Thickness (in feet)	Stratification
1. Massive	Greater than 4.0 ft	very thick bedded
2. Blocky	2.0 to 4.0 ft	thick bedded
3. Slabby	0.2 to 2.0 ft	thin bedded
4. Flaggy	0.05 to 0.2 ft	very thin bedded
5. Shaly or platy	0.01 to 0.05 ft	laminated
6. Papery	Less than 0.01 ft	thinly laminated

**C: FRACTURING**

Intensity	Size of Pieces (in feet)
1. Very little fractured	Greater than 4.0 ft
2. Occasionally fractured	1.0 to 4.0 ft
3. Moderately fractured	0.5 to 1.0 ft
4. Closely fractured	0.1 to 0.5 ft
5. Intensely fractured	0.05 to 0.1 ft
6. Crushed	Less than 0.05 ft

**D: HARDNESS**

1. **Soft** - Reserved for plastic material alone.
2. **Low hardness** - can be gouged deeply or carved easily with a knife blade.
3. **Moderately hard** - can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and is readily visible after the powder has been blow away.
4. **Hard** - can be scratched with difficulty; scratch produces little powder and is often faintly visible
5. **Very hard** - cannot be scratched with knife blade; leaves a metallic streak

**E: STRENGTH**

1. **Plastic** - of very low strength.
2. **Friable** - Crumbles easily by rubbing with fingers.
3. **Weak** - An unfractured specimen of such material will crumble under light hammer blows.
4. **Moderately strong** - Specimen will withstand a few heavy hammer blows before breaking.
5. **Strong** - Specimen will withstand a few heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.
6. **Very strong** - Specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.

**F: WEATHERING** - The physical and chemical disintegration and decomposition of rocks and minerals by natural processes such as oxidation, reduction, hydration, solution, carbonation, and freezing and thawing

1. **Deep** - Moderate to complete mineral decomposition; extensive disintegration; deep and thorough discoloration; many fractures, all extensively coated or filled with oxides, carbonates and/or clay or silt.
2. **Moderate** - Slight change or partial decomposition of minerals; little disintegration; cementation little to unaffected. Moderate to occasional intense discoloration. Moderately coated fractures.
3. **Little** - No megascopic decomposition of minerals; little or no effect on normal cementation. Slight and intermittent, or localized discoloration. Few stains on fracture surfaces.
4. **Fresh** - Unaffected by weathering agents. No disintegration or discoloration.

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--	---	--	------------------------------

<u>PIT NUMBER</u>	<u>DEPTH</u>	<u>TEST TYPE*</u>	<u>TEST RESULTS</u>
1	1.0	UC(P)	4500+
	2.0	UC(P)	4500+
	3.0	UC(P)	4500+
	4.0	UC(P)	4500+
	4.5	-200	50.2
	4.5	FS	30
	5.0	UC(P)	4500+
	6.0	UC(P)	4500+
	7.0	UC(P)	4500+
	7.5	-200	42.2
	7.5	FS	25
2	1.0	UC(P)	4500+
	2.0	UC(P)	1700
	3.0	UC(P)	4500+
	4.0	UC(P)	4500+
	5.0	UC(P)	4500+
	5.0	-200	34.8
	5.0	FS	30
	6.0	UC(P)	4500+
	6.0	UC(P)	4500+
	10.5	UC(P)	4500+
3	4.0	FS	60

\*Test Type

- M Moisture Content (percent of dry weight)
- MD Moisture Content (percent of dry weight)/dry density (pounds per cubic foot)
- UC(P) Penetrometer - strength indicator (pounds per square foot)
- UC Unconfined Compression (pounds per square foot)
- 200 Percent Passing No. 200 sieve by weight
- FS Percent Free Swell

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LABORATORY TEST DATA

FREMONT ROAD RESIDENCE  
SAN RAFAEL, CALIFORNIA

PLATE

**5a**

<u>PIT NUMBER</u>	<u>DEPTH</u>	<u>TEST TYPE*</u>	<u>TEST RESULTS</u>
4	1.0	UC(P)	4500+
	2.0	UC(P)	3200
	3.0	UC(P)	4500+
	3.0	-200	43.3
	3.0	FS	30
	4.0	UC(P)	4500+
	5.0	UC(P)	4500+
	6.0	UC(P)	4500+
5	7.0	UC(P)	4500+
	5.0	FS	20

\*Test Type

- M Moisture Content (percent of dry weight)
- MD Moisture Content (percent of dry weight)/dry density (pounds per cubic foot)
- UC(P) Penetrometer - strength indicator (pounds per square foot)
- UC Unconfined Compression (pounds per square foot)
- 200 Percent Passing No. 200 sieve by weight
- FS Percent Free Swell

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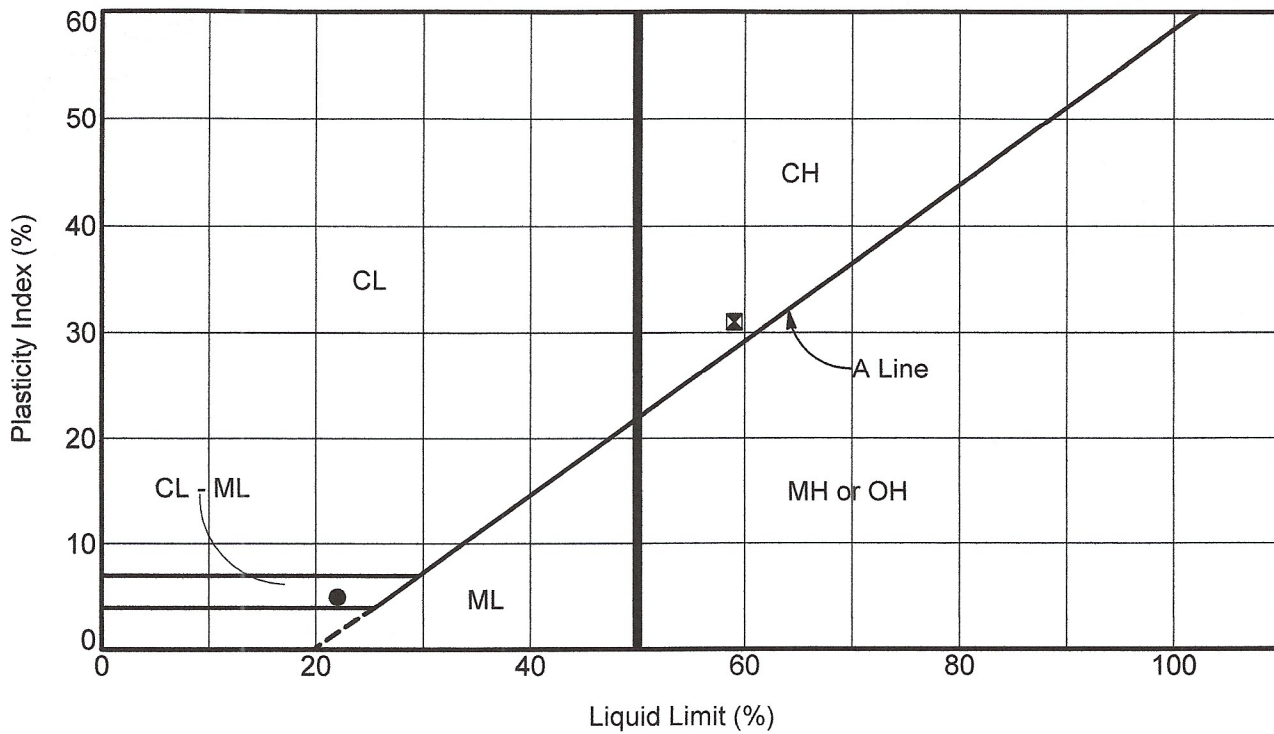
LABORATORY TEST DATA

FREMONT ROAD RESIDENCE  
SAN RAFAEL, CALIFORNIA

PLATE

**5b**





ASTM D 4318-98

Symbol	Classification and Source	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Free Swell (%)
●	RED-BROWN SANDY SILT (ML), with gray clay (CL) Test Pit 2 at 10.5 feet	22	17	5	--
☒	MOTTLED GRAY-ORANGE SANDY CLAY (CH) Test Pit 3 at 4.0 feet	59	28	31	60

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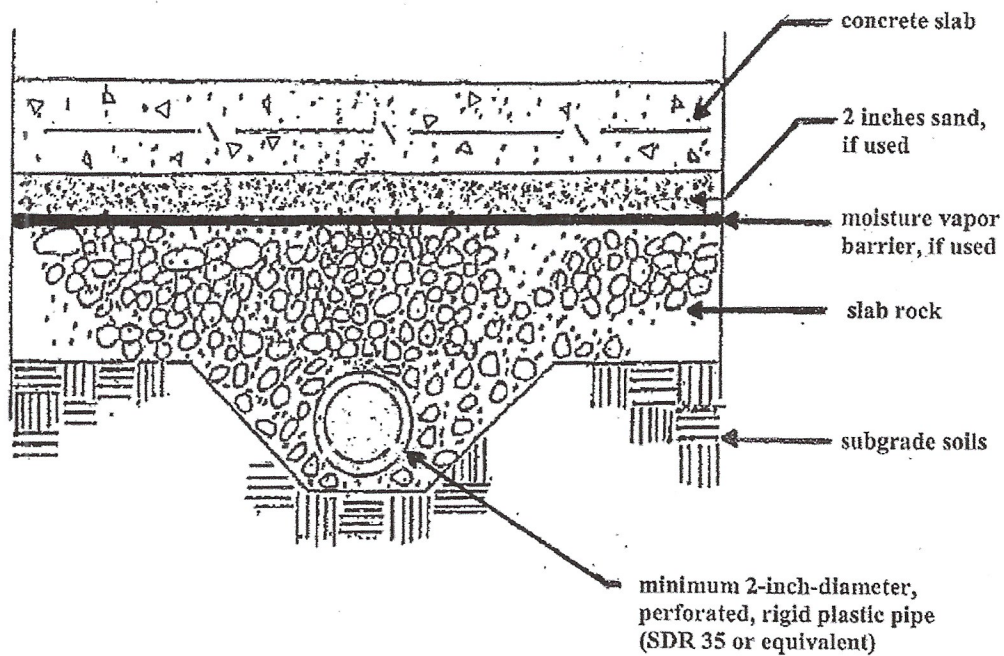
Appr: BFS

ATTERBERG LIMITS TEST RESULTS

FREMONT ROAD RESIDENCE  
SAN RAFAEL, CALIFORNIA

PLATE

**6**



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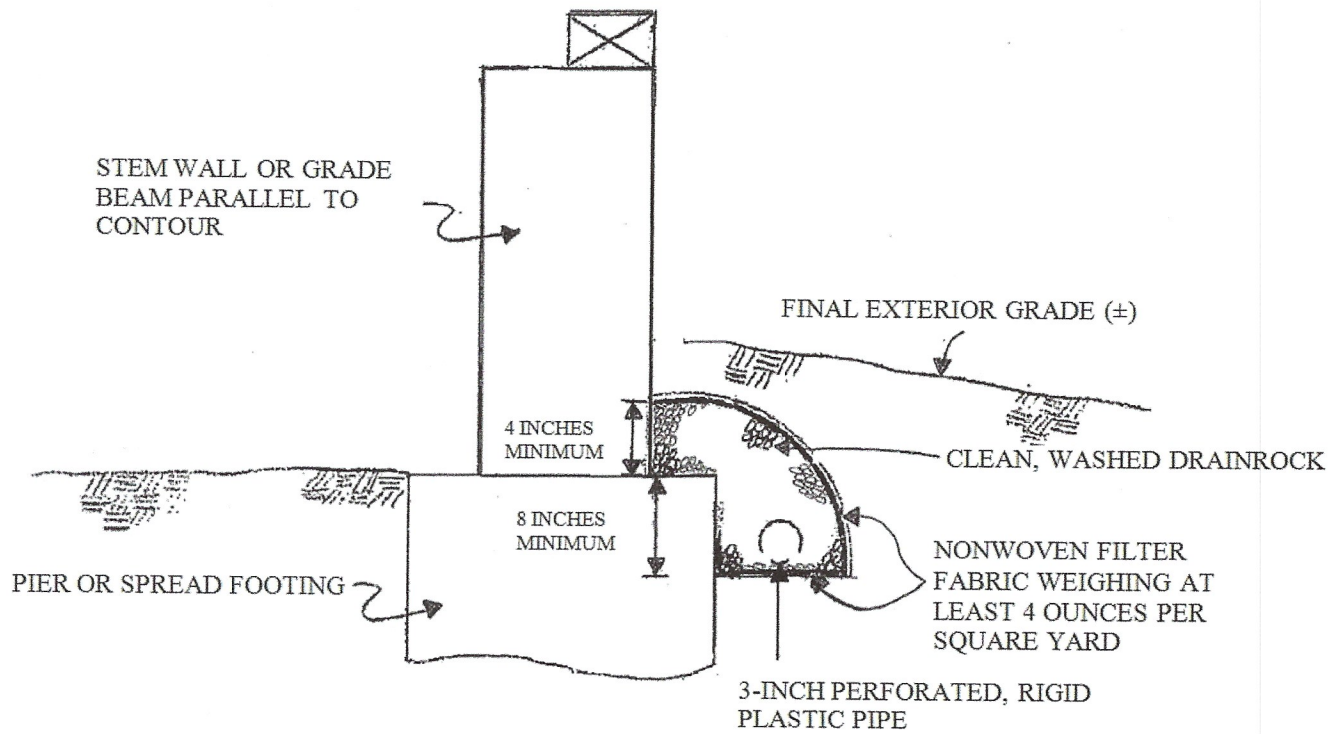
Appr: BFP

**TYPICAL CROSS SECTION  
UNDERSLAB SUBDRAIN**

FREMONT ROAD RESIDENCE  
54 FREMONT ROAD  
SAN RAFAEL, CALIFORNIA

PLATE

**7**



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TYPICAL CROSS SECTION  
FOUNDATION SUBDRAIN

FREMONT ROAD RESIDENCE  
54 FREMONT ROAD  
SAN RAFAEL, CALIFORNIA

PLATE

8