December 16, 2005
W.O. 5840

APPENDIX A

FIELD EXPLORATION PROCEDURES

TEST PIT LOG 1

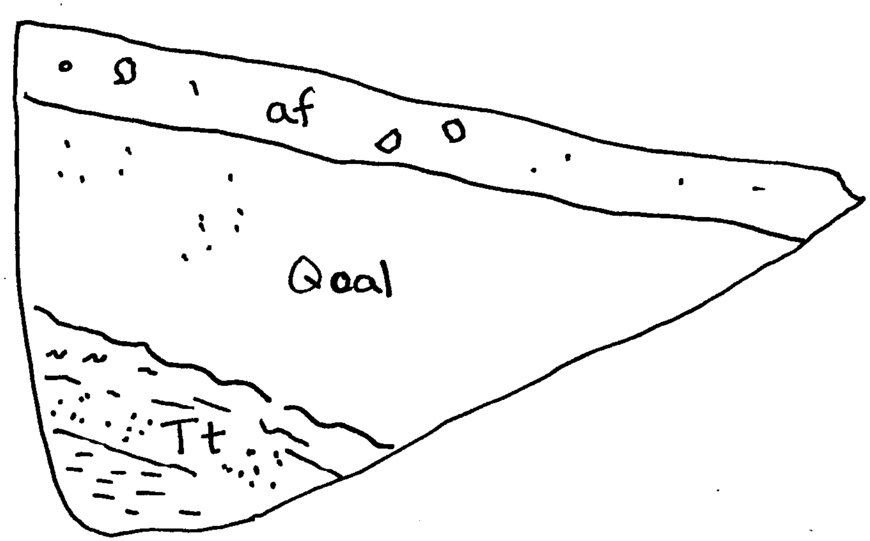
GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH | ELEVATION: | WORK ORDER NO.: 5840
ADDRESS: | LOGGED BY: LT | DATE: 11-05

Depth	Material Type	Material Description	Comments
0-2'	Fill	Brown, silty SAND with rock and AC fragments (damp, loose).	@12', N40W/36NE
2-9'	Old Alluvium	Brown, silty, fine SAND/SILT, damp to moist, loose to medium dense, porous.	TP-1@ 6 feet. Dry Density = 103pcf. Moisture = 22.9%.
@7'	Stiff Clay	(highly expansive).	
9-13'	Topanga Formation	Buff rust and olive brown x-bedded.	

Scale: H: 1"=5' V: 1"=5' Pit Orient.: ____ Natural Slope: Angle T. D

Illustration



TEST PIT LOG 2

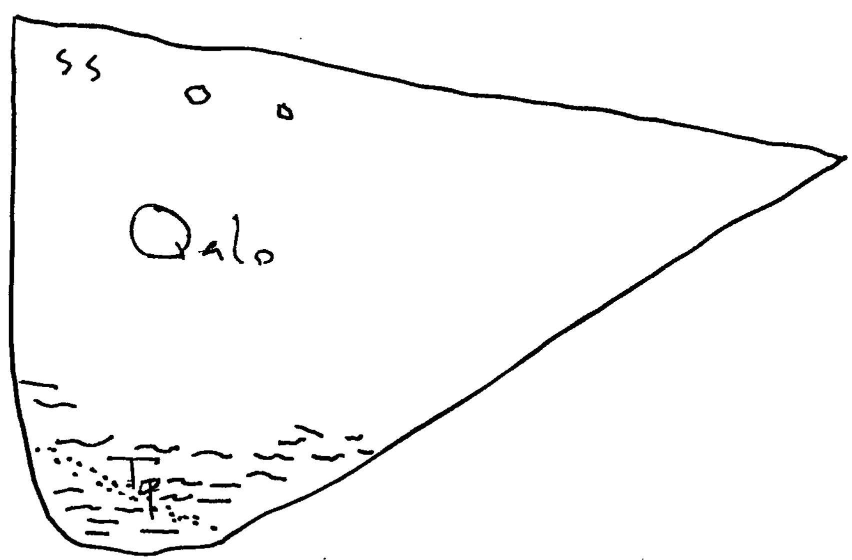
GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH ELEVATION: WORK ORDER NO.: 5840
ADDRESS: LOGGED BY: LT DATE: 11-05

Depth	Material Type	Material Description	Comments
0-11'	Old Alluvium	Brown, clayey fine SAND, damp, loose to medium dense, slightly porous, loose with rodent burrows in upper 3' scattered volcanic PEBBLES and COBBLES throughout (more competent from 3')	@13', N55W/28NE TP-2@ 5 feet. Dry Density = 97.8pcf. Moisture = 24.1%.
11-14'	Topanga Formation	Pale, olive brown, clayey SILTSTONE, light brown siltstone and minor orange, fine SANDSTONE (interbedded).	TP-2@ 8 feet. Dry Density = 103.4pcf. Moisture = 21.2%.

Scale: H: 1"=5' V: 1"=5 Pit Orient.: ____ Natural Slope: Angle T. D

Illustration



TEST PIT LOG 3

GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH | ELEVATION: | WORK ORDER NO.: 5840

ADDRESS: | LOGGED BY: LT | DATE: 11-05

Depth	Material Type	Material Description	Comments
0-6'	Topsoil / Old Alluvium	Dark brown, sandy, silty CLAY, dense, soft, upper 1 to 2', porous, moist, stiff to hard from 2'-6', scattered carbonate matters.	@6' N75W/46NE. @8' on shale N60W/48NE.
6-9'	Topanga Formation	Light brown, clayey SILTSTONE to SHALE.	

Scale: H:___ V: ___ Pit Orient.: N10E Natural Slope: Angle T. D

Illustration

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TEST PIT LOG 4

GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH
ELEVATION: ____
WORK ORDER NO.: 5840
ADDRESS:
LOGGED BY: LT
DATE: 11-05

Depth	Material Type	Material Description	Comments
0-6'	Old Alluvium	Dark yellowish brown, sandy, silty CLAY (dense to moist, loose to medium dense), slightly to moderately porous.	TP-4@ 5 feet. Dry Density = 100.9pcf. Moisture = 23.9%.
6-9'		Yellowish brown, clayey to silty fine SAND (moist, medium dense). Varies to silt, friable.	TP-@ 7 feet. Dry Density = 99.7 pcf. Moisture = 23.2%.
9-12'	Basal Old Alluvium	PEBBLES and COBBLES to 6" diameter in yellowish brown, clayey to silty SAND. Clasts are mostly basalt.	
12-14'	Topanga Formation	Pale, olive brown to light brown clayey SILTSTONE, very fractured, bedding is not distinct here, very moist.	

Scale: H:____ V:____ Pit Orient.:____ Natural Slope: Angle T. D

Illustration

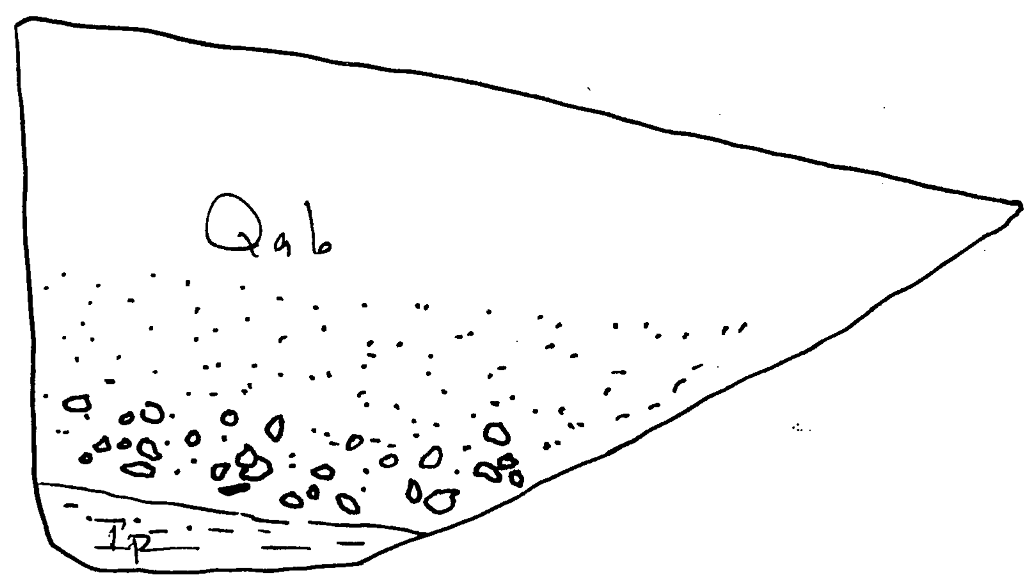

Plate TP-4

TEST PIT LOG 5

GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH ELEVATION: ____ WORK ORDER NO.: 5840
ADDRESS: LOGGED BY: LT DATE: 11-05

Depth	Material Type	Material Description	Comments
0-2'	Topsoil	Dark brown, sandy, silty CLAY, damp, loose.	@ 4' N50W, 58NE.
2-5'	Topanga Formation	Pale olive brown SILTSTONE, weathered, calcium, carbonate coating fractures.	

Scale: H:___ V: ___ Pit Orient.: ___ Natural Slope: Angle T. D

Illustration

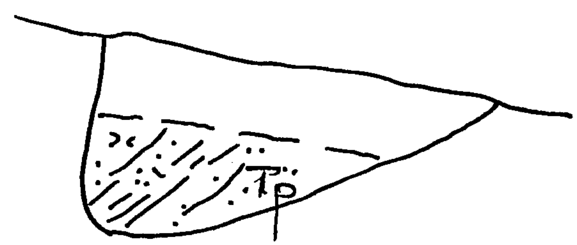

Plate TP-5

TEST PIT LOG 6

GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH ELEVATION: ______ WORK ORDER NO.: 5840
ADDRESS: LOGGED BY: LT DATE: 11-05

Depth	Material Type	Material Description	Comments
0-3'	Topsoil	Dark brown, sandy, silty CLAY, (damp, loose upper 12" to moist, stiff), porous.	@4', N50W/62NE.
3-5'	Topanga Formation	Pale beige, silty SANDSTONE with light olive brown SILTSTONE/SHALE.	

Scale: H:___ V: ____ Pit Orient.: ____ Natural Slope: Angle T. D

Illustration

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TEST PIT LOG 7

GEOSOILS CONSULTANTS, INC.

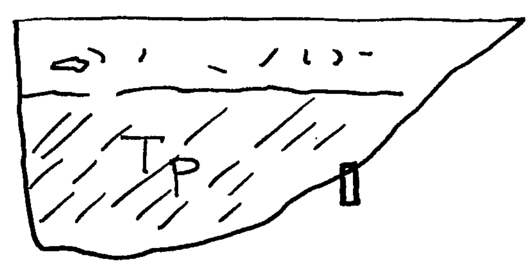
CLIENT: DAN SMITH ELEVATION: ______ WORK ORDER NO.: 5840

ADDRESS: LOGGED BY: LT DATE: 11-05

Depth	Material Type	Material Description	Comments
0-2'	Topsoil	Dark yellowish brown, silty CLAY, damp, loose, porous, dessication cracks, rootlets, rodent burrows.	@4', N55W/58NE. @5',N45W/52NE. Drive Sample @4'. Bulk Sample @5. TP-7@ 4 feet. Dry Density = 91.2pcf. Moisture = 29.0%.
2-6'	Topanga Formation	Pale olive brown and rust laminated SHALE, very moist, medium fractured, few carbonate coatings, few buff siltstone intbeds.	

Scale: H:___ V: ____ Pit Orient.: ____ Natural Slope: Angle T. D

Illustration



TEST PIT LOG 8

GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH
ELEVATION: ____
WORK ORDER NO.: 5840
ADDRESS:
LOGGED BY: LT
DATE: 11-05

Depth	Material Type	Material Description	Comments
0-1'	Fill	Brown, clayey, silty SAND (dense, loose).	@7', N65W/45NE.
1-5'	Topsoil	Dark brown, slightly sandy, silty CLAY, moist, very stiff to hard, not visibly porous, scattered carbonate veinlets 4-5'.	Bulk @3'.
5-8'	Topanga Formation	Olive and brown SHALE, moist, fresh, dense. Few buff siltstone thin intbeds.	

Scale: H:___ V:___ Pit Orient.:___ Natural Slope: Angle T. D

Illustration

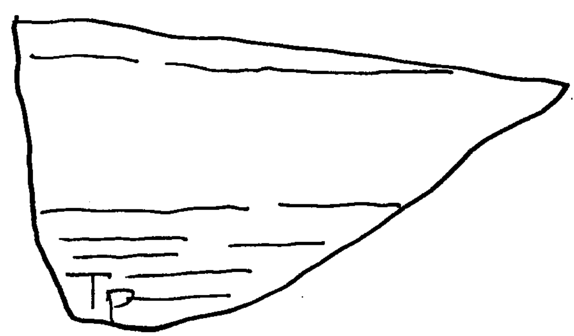


Plate TP-8

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TEST PIT LOG 9

GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH
ELEVATION: ____
WORK ORDER NO.: 5840
ADDRESS:
LOGGED BY: LT
DATE: 11-05

Depth	Material Type	Material Description	Comments
0-3'	Topsoil	Dark, yellowish brown, clayey SILT and fine SAND, damp, loose, very porous, abundant rootlets.	Drive Sample @4'.
3-9'	Old Alluvium	Dark brown, sandy, silty CLAY, moist, very stiff to hard, few carbonate veinlets @5' to 6', not visibly porous, dense.	Drive Sample @6'. TP-9@ 4 feet. Dry Density = 104.8pcf. Moisture = 22.5%. TP-9@ 6 feet. Dry Density = 104.3pcf. Moisture = 22.9%.
9-11'	Topanga Formation	Pale olive brown and rust SILTSTONE to SHALE, laminated, poorly fissile, bedding dips to northeast.	

Scale: H:____ V:____ Pit Orient.:____ Natural Slope: Angle T. D

Illustration

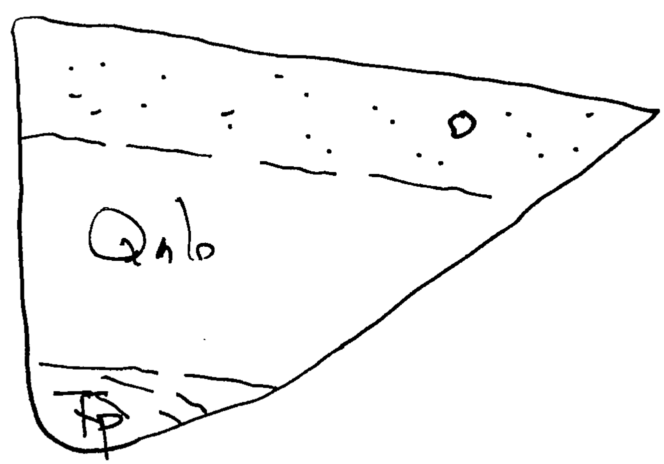

Plate TP-9

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TEST PIT LOG 10

GEOSOILS CONSULTANTS, INC.

CLIENT: DAN SMITH
ELEVATION: ____
WORK ORDER NO.: 5840
ADDRESS:
LOGGED BY: LT
DATE: 11-05

Depth	Material Type	Material Description	Comments
0-3'	Topsoil	Dark brown, sandy, silty CLAY (damp, soft and porous to stiff), rodent burrows, roots, some desiccation cracks/shears.	@5', N50W/65NE.
3-6'	Topanga Formation	Olive brown and rust, laminated SHALE, calcified and punky, very fractured and weathered, few rootlets.	Drive Sample @ 5'. TP-10@ 5 feet. Dry Density = 107.2pcf. Moisture = 19.0%.

Scale: H:___ V: ___ Pit Orient.: ___ Natural Slope: Angle T. D

Illustration

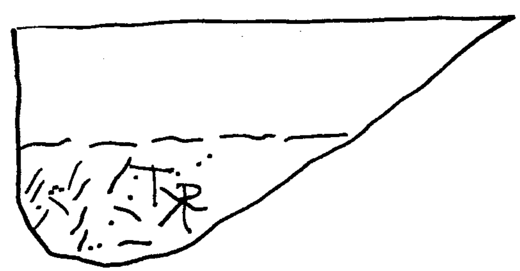


Plate TP-1(

December 16, 2005
W.O. 5840

APPENDIX B

LABORATORY TESTING PROCEDURES AND RESULTS

APPENDIX B

LABORATORY TESTING PROCEDURES AND RESULTS

Moisture-Density

The field moisture content and dry unit weights were determined for each undisturbed ring sample obtained from our subsurface exploration. Once the dry unit weights had been determined, in-place densities of underlying soil profile were estimated. In those cases where ring samples were obtained, the moisture content and dry unit weights are presented on the Test Pit (Plates TP-1 through TP-10).

Compaction Tests

Four compaction tests were performed to determine the moisture density relationship of the typical native soils encountered on the site. The laboratory standard used was in accordance with ASTM Test Designation D-1557-00. A summary of the compaction test results is shown in Table B-1 below.

TABLE B-1
COMPACTION TEST RESULTS

Trench No. and Sample Depth	Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
TP-1 @ 3'	Dark brown, clayey, sandy SILT.	109.5	18.0
TP-2 @ 4'	Orange-brown, clayey SILT.	102.5	24.5
TP-7 @ 5'	Medium brown SILTSTONE.	96.0	28.0
TP-8 @ 3'	Dark brown, slightly sandy CLAY.	106.5	21.0

Consolidation Tests

Six consolidation tests were performed on selected ring samples. The samples were inundated at an approximate load of one ton per square foot to monitor the hydroconsolidation. Loads were applied to the samples in several increments in geometric progression and resulting deformations were recorded at selected time intervals. Results of the consolidation tests are presented on Plates C-1 through C-6.

Appendix B

Expansion Index Tests

To determine the expansion potential of the on-site native soils, an expansion index test was conducted in accordance with the 1997 Uniform Building Code Standard 18-2. The test results indicate an expansion index of 55 to 151 (within the medium to very high expansion index range). The final foundation design for the proposed structures should be based on the expansion potential of surficial site soils at the completion of grading, which will require additional testing at that time.

Sulphate Test

No sulphate testing was performed. This will be performed at completion of grading.

Direct Shear Tests

A shear test was performed in a strain-control type Direct Shear Machine. The samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: cohesion (c), and angle of internal friction (ϕ) for peak and residual strength conditions. The sample was tested in an artificially saturated condition. The results are plotted and a linear approximation is drawn of the failure curve. Results are shown on the Shear Test Diagram included within this appendix, as Plates SH-1 through SH-4.

Plates SH-1 and SH-2 represent represent tests upon undisturbed natural samples. Plates SH-3 and SH-4 represent shear tests upon remolded samples.

LABORATORY RESULTS

Dan Smith
W.O.: 5840

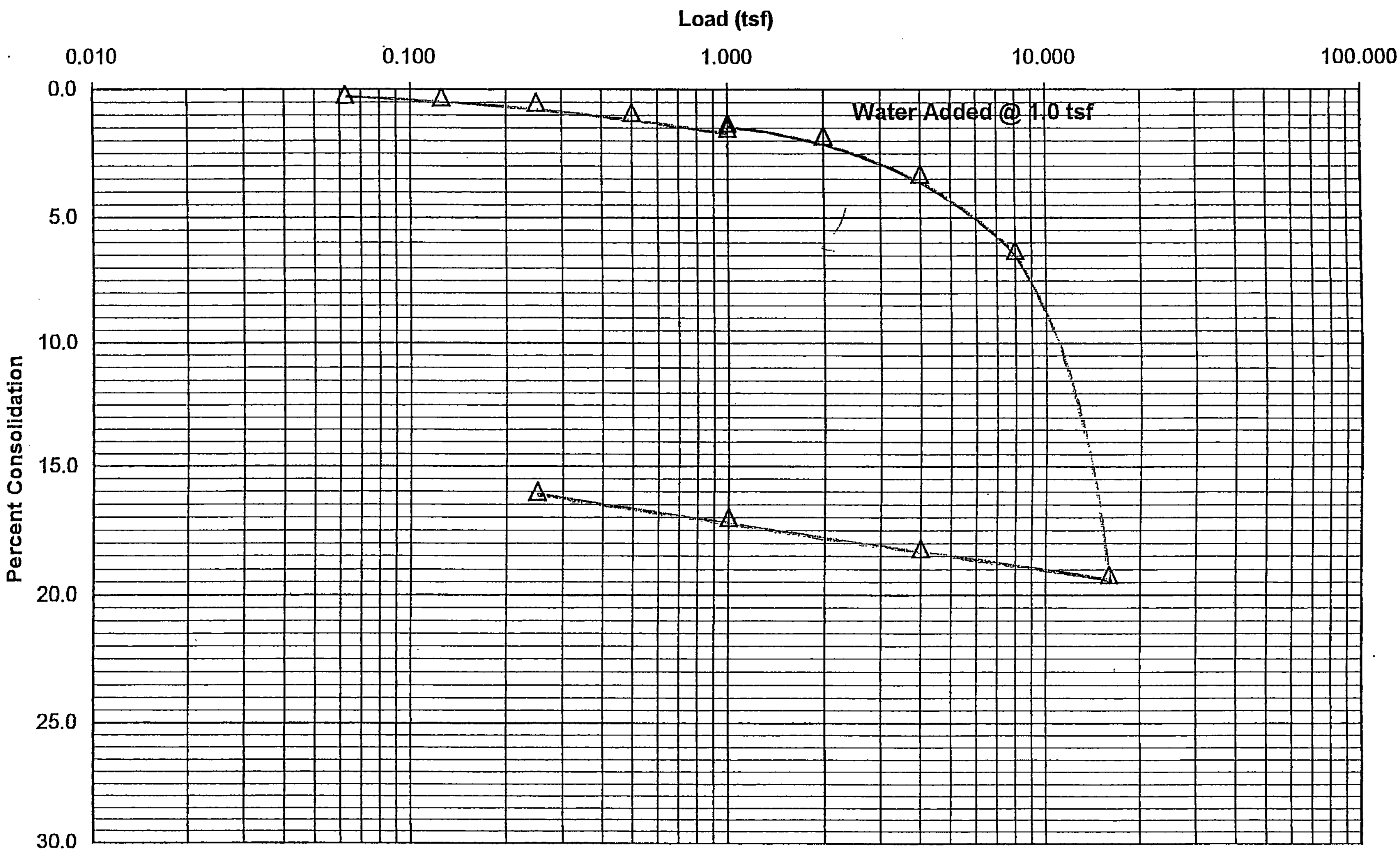
Date of Test: 12/05

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 22.9 After: 23.8

Sample(in.)
Height: 1.00 Diameter: 2.36



P-1 @ 6.0'
Dark-brown CLAY.

Consolidation Diagram

C5840.1

Plate C-1

Dan Smith
W.O.: 5840

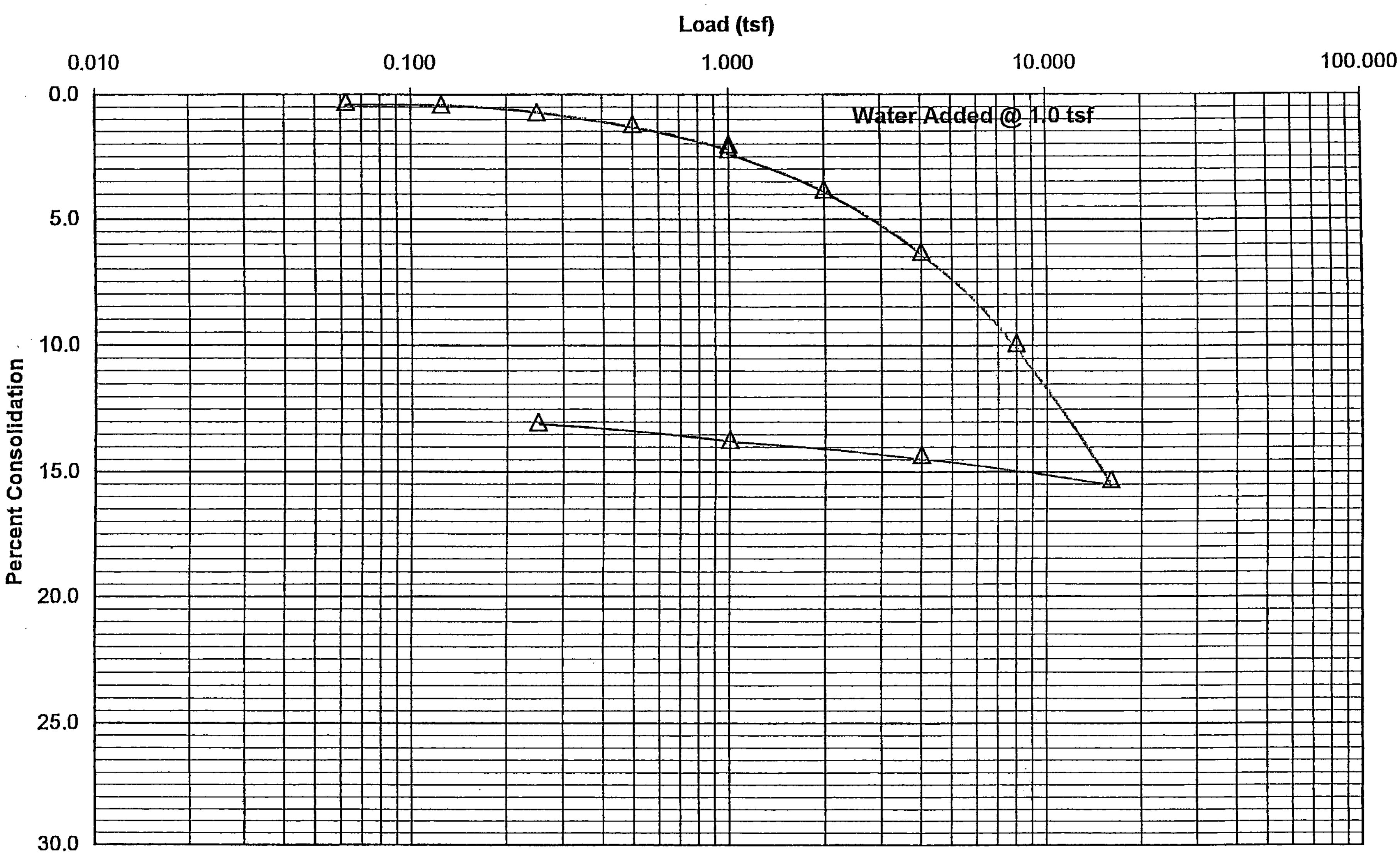
Date of Test: 12/05

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 24.1 After: 28.2

Sample(In.)
Height: 1.00 Diameter: 2.36



P-2 @ 5.0'
Orange-brown, slightly sandy, sandy, silty CLAY.

Consolidation Diagram

C5840.2

Plate C-2

Jan S...
W.O.: 5840

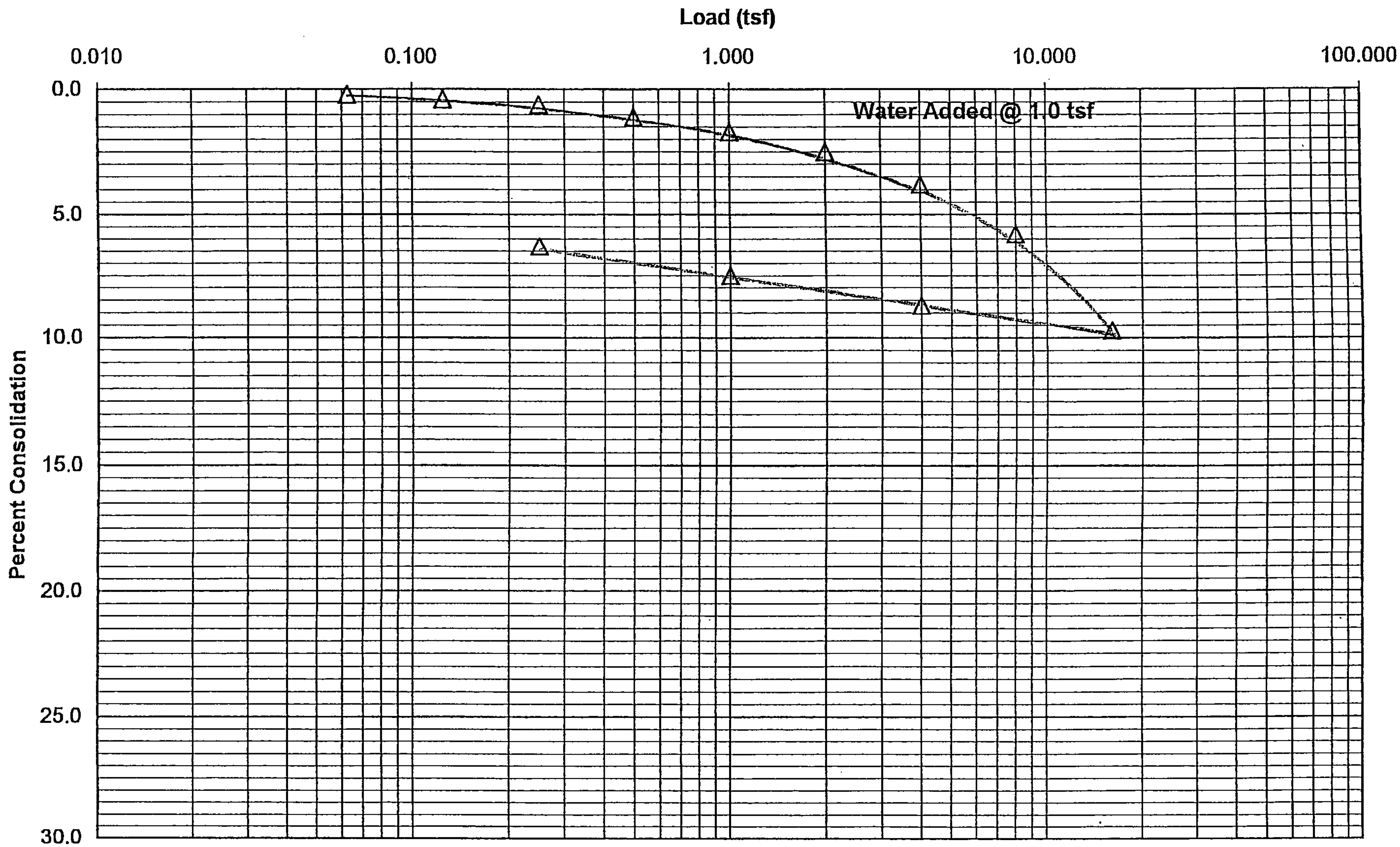
Date of Test: 12/05

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 21.2 After: 24.0

Sample(in.)
Height: 1.00 Diameter: 2.36



P-2 @ 8.0'
Orange-brown, slightly sandy, sandy, silty CLAY.

Consolidation Diagram

C5840.3

Plate C-3

Dan Smith
W.O.: 5840

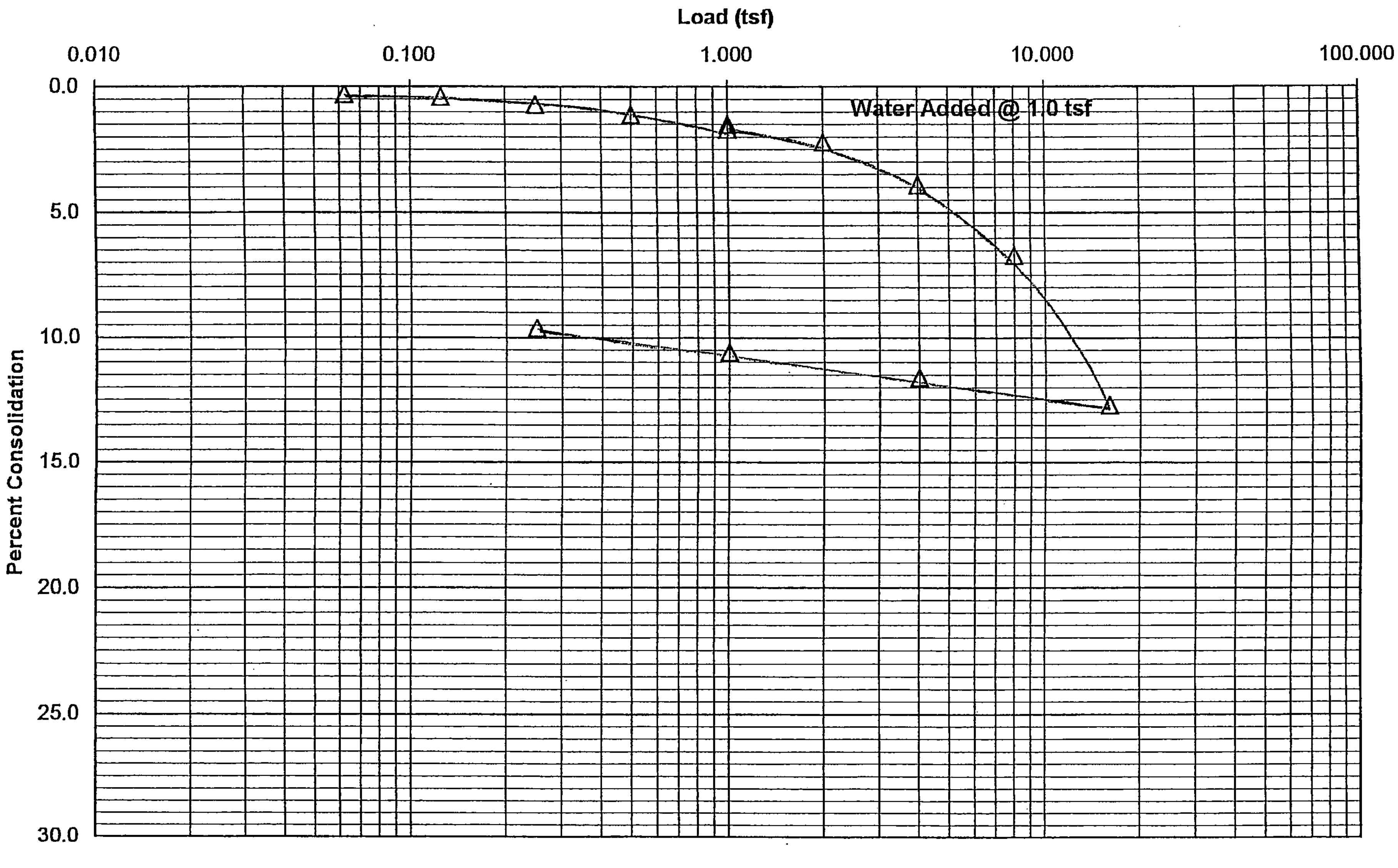
Date of Test: 12/05

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 23.9 After: 24.7

Sample(in.)
Height: 1.00 Diameter: 2.36



P-4 @ 5.0'
Dark-brown CLAY.

Consolidation Diagram

C5840.4

Plate C-4

Dan Smith
W.O.: 5840

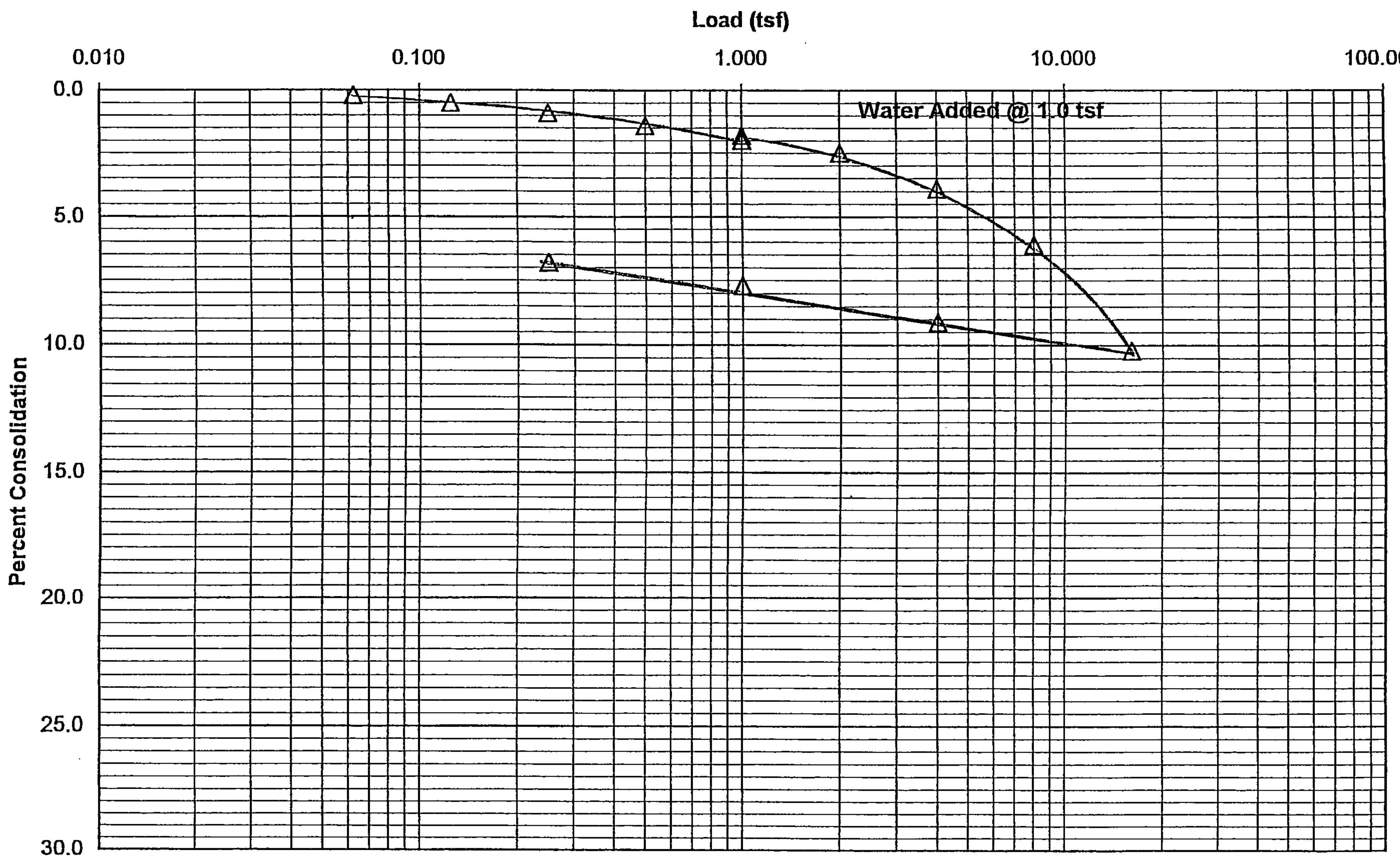
Date of Test: 12/05

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 23.2 After: 25.8

Sample(in.)
Height: 1.00 Diameter: 2.36



P-4 @ 7.0'
Brown, silty, CLAY.

Consolidation Diagram

C5840.5

Plate C-5

Dan Smith
W.O.: 5840

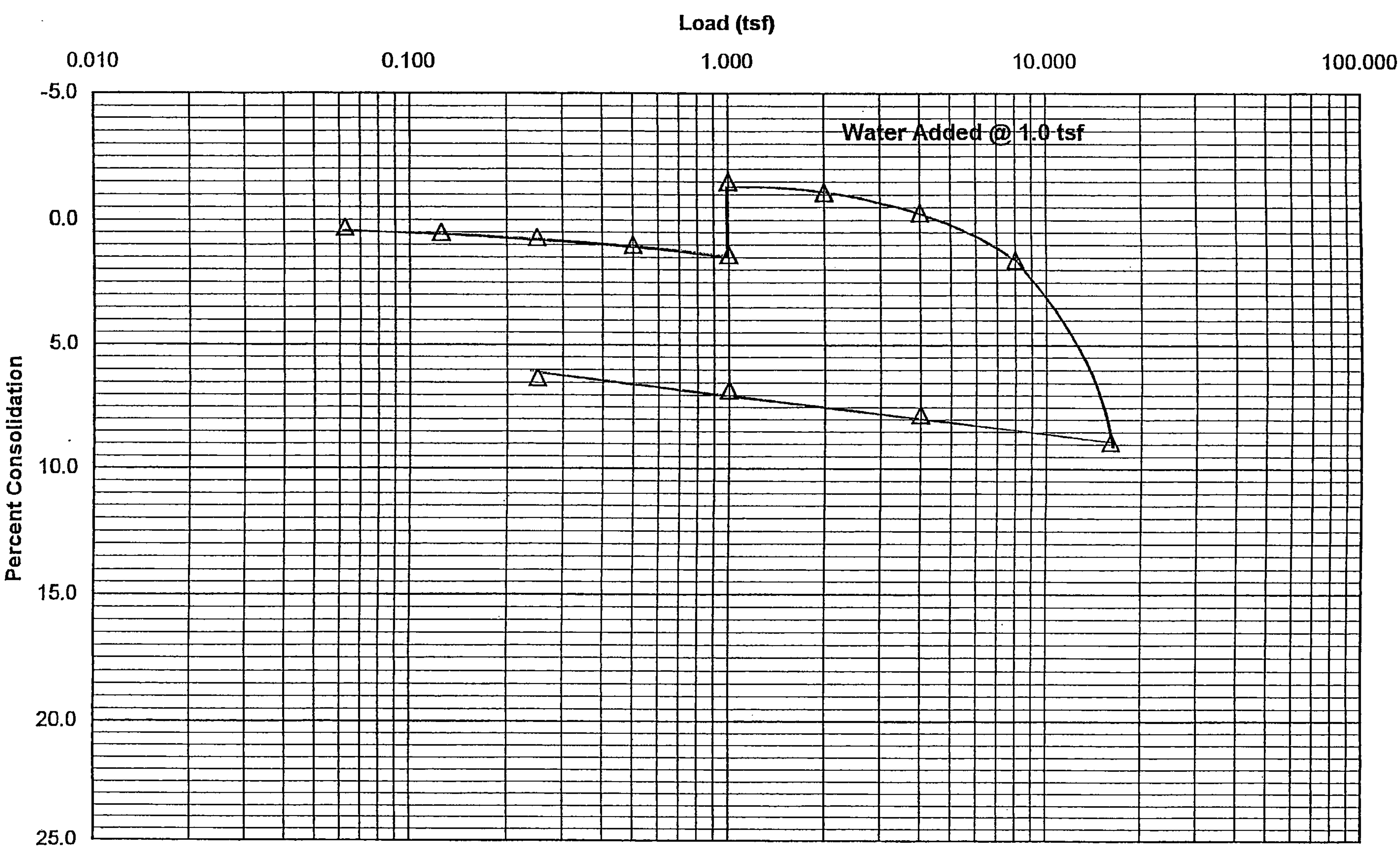
Date of Test: 12/05

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 22.9 After: 24.5

Sample(in.)
Height: 1.00 Diameter: 2.36



P-9 @ 6.0'
Brown, slightly sandy, CLAY.

Consolidation Diagram

C5840.6

Plate C-6

Dan Smith
W.O.: 5840

Date of Test: 12/05

Sample: P-7 @ 4.0'

GeoSoils Consultants, Inc.

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PLATE SH-1

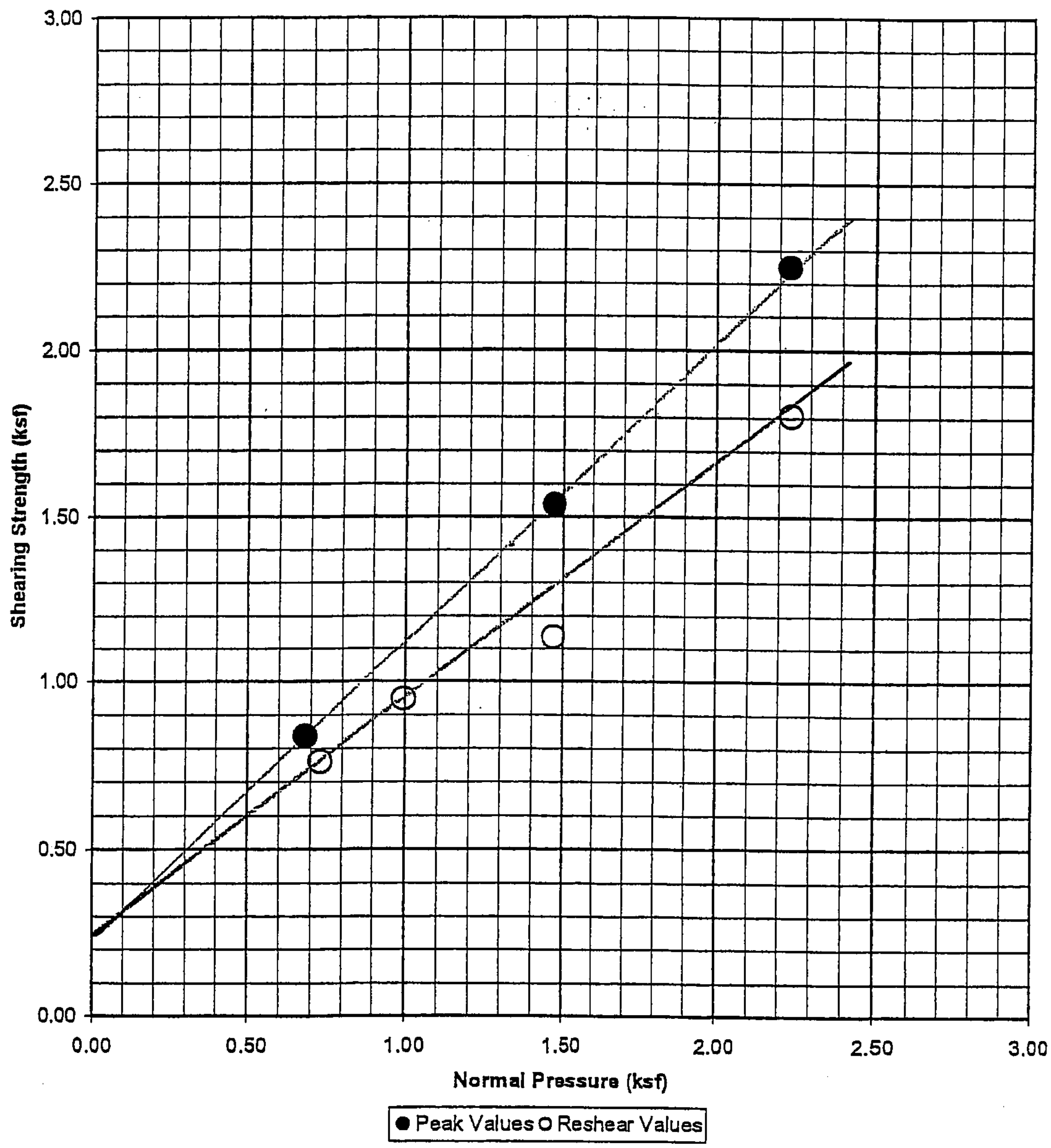
Shear Test Diagram

Peak

C(psf): **250** Phi (degrees): **43.0**

Reshear

C(psf): **250** Phi (degrees): **37.0**



Undisturbed **Natural** Shear-Saturated

Brown CLAYSTONE.

30.2% Saturated Moisture Content

Dan Smith
W.O.: 5840

Date of Test: 12/05

Sample: P-10 @ 5.0'

GeoSoils Consultants, Inc.

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PLATE SH-2

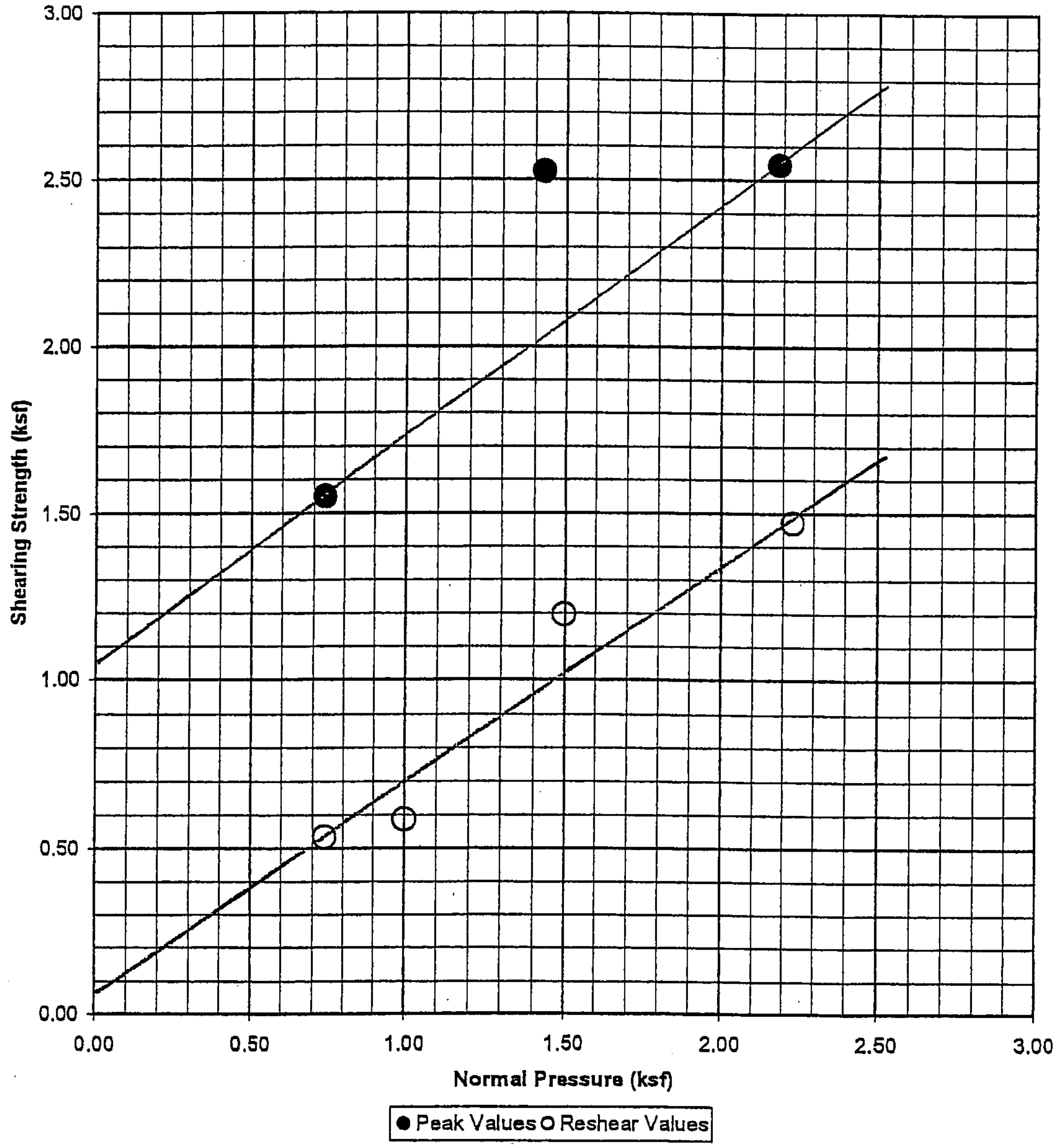
Shear Test Diagram

Peak

C(psf): 1050 Phi (degrees): 36.0

Reshear

C(psf): 70 Phi (degrees): 34.0



Undisturbed **Natural** Shear-Saturated

Brown, slightly sandy, clayey SILTSTONE.

27.2% Saturated Moisture Content

Dan Smith
W.O.: 5840

Date of Test: 12/05

Sample: P-2@ 4.0'

GeoSoils Consultants, Inc.

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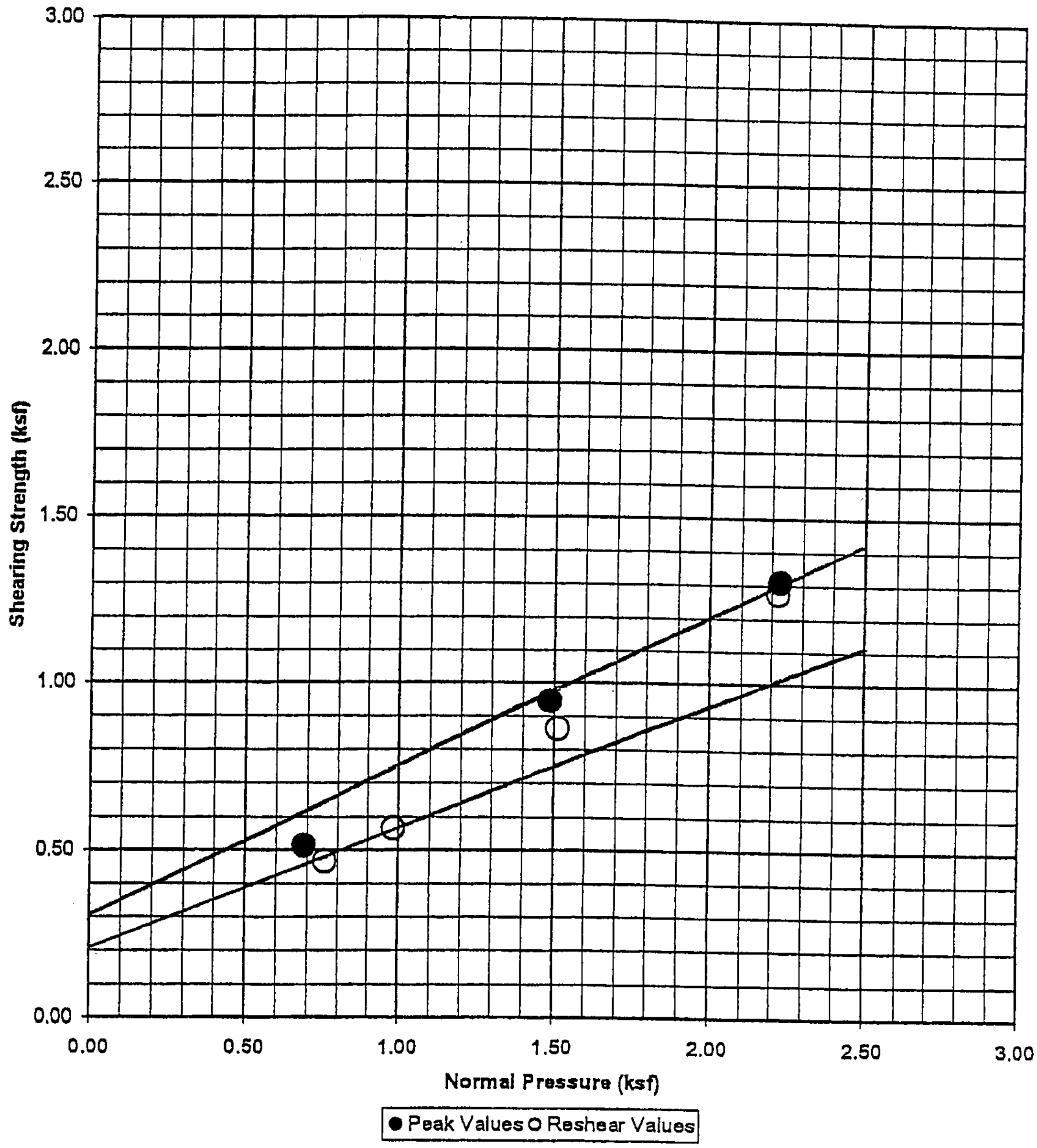
PLATE SH-3

Shear Test Diagram

Peak
C(psf): **300** Phi (degrees): **25.5**

Reshear
C(psf): **200** Phi (degrees): **21.0**



Sample **Remolded** to 90% Relative Density, Saturated.
Remolded Dry Density = 92.3 PCF

Orange-brown, clayey SILT.

MAX: 102.5 PCF: 24.5%

33.7% Saturated Moisture Content

Dan Smith
W.O.: 5840

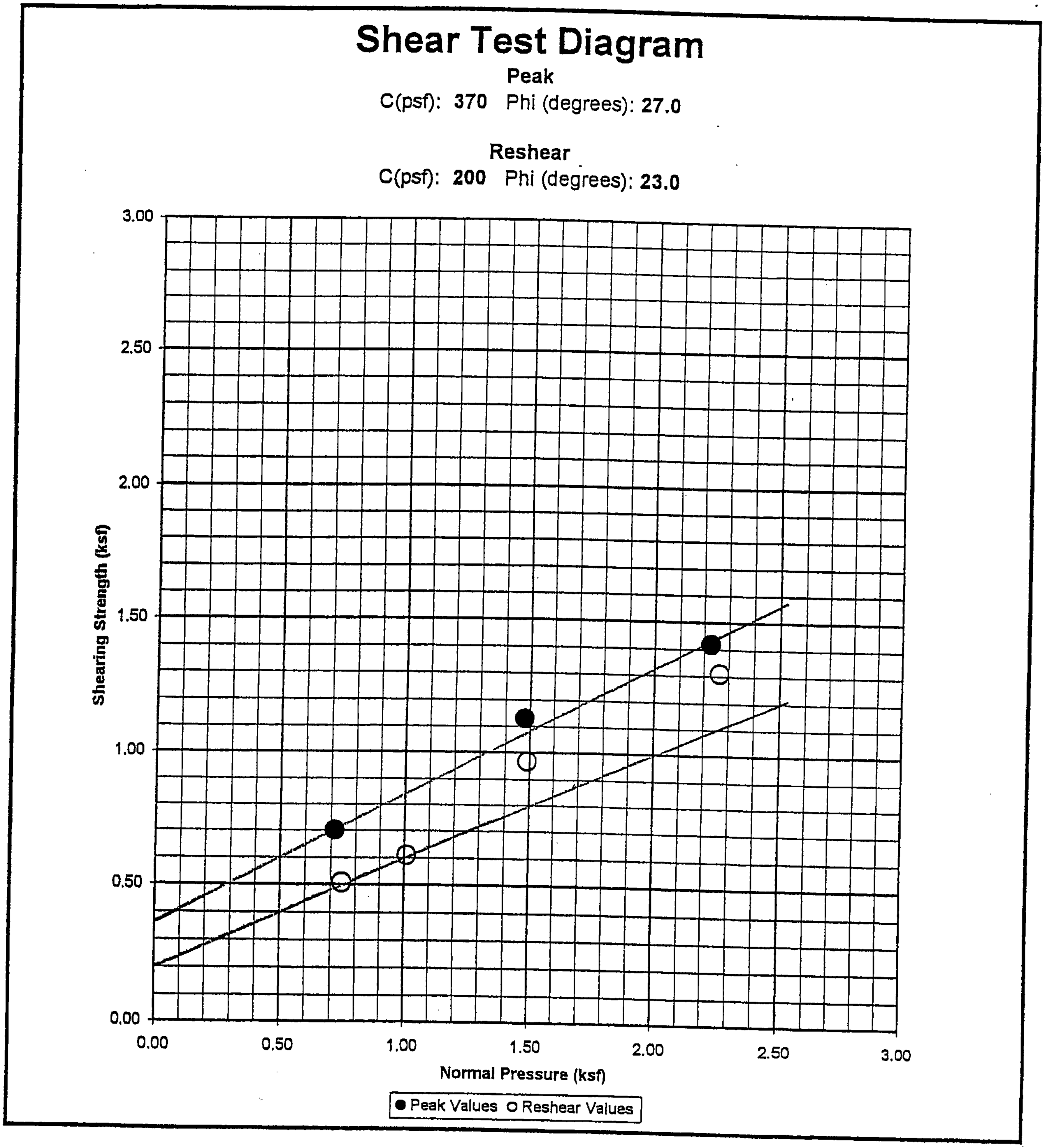
Date of Test: 12/05

Sample: P-7 @ 5.0'

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

PLATE SH-4



Sample Remolded to 90% Relative Density, Saturated.
Remolded Dry Density = 86.4 PCF

Medium-brown, clayey SILT.

MAX: 96.0 PCF: 28.0%

38.5% Saturated Moisture Content

December 16, 2005
W.O. 5840

APPENDIX C

SEISMIC ANALYSIS

December 16, 2005
W.O. 5840

APPENDIX C

SEISMIC ANALYSIS

EQSEARCH PROGRAM

EQSEARCH is a computer program written in Summit Software's BetterBASIC. EQSEARCH effectively performs searches of a historical-earthquake catalog using an abbreviated (\Magnitude 4.0 and greater, and latitude ranging from 30.0 to 36.5 degrees) and supplemented from the California Division of Mines and Geology computerized earthquake catalog for the State of California. Search parameters (i.e., geographic limits, limiting dates, and limiting magnitudes) are specified and one of 14 available acceleration-attenuation relations is selected by the user. The selected attenuation-relation is used to estimate the peak horizontal ground acceleration that may have occurred at the specified site based on each earthquakes found in the specified search area. Site-specific peak horizontal acceleration probability of exceedance is also estimated from the historical search. For each historical earthquake in the search area, EQSEARCH prints latitude, longitude, date, depth, Richter magnitude, computed site-acceleration, computed site Modified Mercalli Intensity, and the approximate earthquake to site distance in both miles and kilometers. Data files needed to generate an epicenter map and a seismic recurrence curve are also created by EQSEARCH. To obtain the epicenter map and recurrence curve from the data files, the GRAPHER program (by Golden Software, Inc., is needed.

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*   E Q S E A R C H     *
*                       *
*    Version 3.00       *
*                       *
*************************
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 5840

DATE: 12-15-2005

JOB NAME: Historical Seismic Hazard Analysis for the Smith Project

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 5.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 34.1407
SITE LONGITUDE: 118.7386

SEARCH DATES:
START DATE: 1850
END DATE: 2005

SEARCH RADIUS:
100.0 mi
160.9 km

ATTENUATION RELATION: 25) Campbell & Bozorgnia (1997 Rev.) - Soft Rock
UNCERTAINTY (M=Median, S=Sigma): S Number of Sigmas: 1.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: 1 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 3.0

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	34.2130	118.5370	01/17/1994	123055.4	18.0	6.70	0.308	IX	12.5(20.2)
GSP	34.3260	118.6980	01/17/1994	233330.7	9.0	5.60	0.149	VIII	13.0(20.9)
DMG	34.3000	118.6000	04/04/1893	1940 0.0	0.0	6.00	0.187	VIII	13.5(21.8)
PAS	33.9440	118.6810	01/01/1979	231438.9	11.3	5.00	0.085	VII	14.0(22.5)
DMG	33.9500	118.6320	08/31/1930	04036.0	0.0	5.20	0.095	VII	14.5(23.3)
GSP	34.3050	118.5790	01/29/1994	112036.0	1.0	5.10	0.087	VII	14.5(23.4)
GSB	34.3010	118.5650	01/17/1994	204602.4	9.0	5.20	0.092	VII	14.9(23.9)
GSP	34.3690	118.6720	04/26/1997	103730.7	16.0	5.10	0.074	VII	16.2(26.1)
GSP	34.2310	118.4750	03/20/1994	212012.3	13.0	5.30	0.087	VII	16.3(26.2)
GSP	34.3770	118.6980	01/18/1994	004308.9	11.0	5.20	0.079	VII	16.5(26.5)
GSB	34.3790	118.7110	01/19/1994	210928.6	14.0	5.50	0.100	VII	16.5(26.6)
PAS	33.9190	118.6270	01/19/1989	65328.8	11.9	5.00	0.066	VI	16.6(26.7)
MGI	34.0000	118.5000	11/19/1918	2018 0.0	0.0	5.00	0.065	VI	16.7(26.9)
DMG	34.0000	118.5000	08/04/1927	1224 0.0	0.0	5.00	0.065	VI	16.7(26.9)
DMG	34.0650	119.0350	02/21/1973	144557.3	8.0	5.90	0.124	VII	17.7(28.5)
GSP	34.3780	118.6180	01/19/1994	211144.9	11.0	5.10	0.065	VI	17.8(28.6)
MGI	34.0000	119.0000	12/14/1912	0 0 0.0	0.0	5.70	0.106	VII	17.8(28.7)
GSP	34.3940	118.6690	06/26/1995	084028.9	13.0	5.00	0.059	VI	17.9(28.9)
DMG	34.3080	118.4540	02/09/1971	144346.7	6.2	5.20	0.059	VI	19.9(32.1)
DMG	34.4110	118.4010	02/09/1971	14 041.8	8.4	6.40	0.098	VII	26.8(43.2)
DMG	34.4110	118.4010	02/09/1971	141028.0	8.0	5.30	0.041	V	26.8(43.2)
DMG	34.4110	118.4010	02/09/1971	14 244.0	8.0	5.80	0.061	VI	26.8(43.2)
DMG	34.4110	118.4010	02/09/1971	14 1 8.0	8.0	5.80	0.061	VI	26.8(43.2)
MGI	34.0000	118.3000	09/03/1905	540 0.0	0.0	5.30	0.040	V	26.9(43.3)
MGI	34.0800	118.2600	07/16/1920	18 8 0.0	0.0	5.00	0.030	V	27.7(44.5)
T-A	34.0000	118.2500	03/26/1860	0 0 0.0	0.0	5.00	0.027	V	29.6(47.6)
T-A	34.0000	118.2500	01/10/1856	0 0 0.0	0.0	5.00	0.027	V	29.6(47.6)
DMG	33.8500	118.2670	03/11/1933	1425 0.0	0.0	5.00	0.022	IV	33.6(54.1)
MGI	34.1000	118.1000	07/11/1855	415 0.0	0.0	6.30	0.056	VI	36.6(58.9)
PAS	34.0730	118.0980	10/04/1987	105938.2	8.2	5.30	0.025	V	36.9(59.4)
DMG	33.7830	118.2500	11/14/1941	84136.3	0.0	5.40	0.026	V	37.3(60.1)
DMG	34.1000	119.4000	05/19/1893	035 0.0	0.0	5.50	0.028	V	37.9(61.0)
PAS	34.0610	118.0790	10/01/1987	144220.0	9.5	5.90	0.038	V	38.1(61.3)
PAS	33.6710	119.1110	09/04/1981	155050.3	5.0	5.30	0.023	IV	38.8(62.5)
DMG	34.5190	118.1980	08/23/1952	10 9 7.1	13.1	5.00	0.017	IV	40.4(65.0)
DMG	34.7000	119.0000	10/23/1916	254 0.0	0.0	5.50	0.024	V	41.4(66.6)
DMG	33.7830	118.1330	10/02/1933	91017.6	0.0	5.40	0.021	IV	42.6(68.5)
GSP	34.2620	118.0020	06/28/1991	144354.5	11.0	5.40	0.021	IV	42.9(69.0)
MGI	34.0000	118.0000	12/25/1903	1745 0.0	0.0	5.00	0.015	IV	43.3(69.7)
DMG	33.9860	119.4750	08/06/1973	232917.0	16.9	5.00	0.015	IV	43.4(69.9)
DMG	34.0000	119.5000	02/18/1926	1818 0.0	0.0	5.00	0.014	IV	44.6(71.8)
DMG	33.7500	118.0830	03/11/1933	230 0.0	0.0	5.10	0.015	IV	46.2(74.4)
DMG	33.7500	118.0830	03/11/1933	323 0.0	0.0	5.00	0.013	III	46.2(74.4)
DMG	33.7500	118.0830	03/11/1933	910 0.0	0.0	5.10	0.015	IV	46.2(74.4)
DMG	33.7500	118.0830	03/11/1933	2 9 0.0	0.0	5.00	0.013	III	46.2(74.4)
DMG	33.7500	118.0830	03/13/1933	131828.0	0.0	5.30	0.017	IV	46.2(74.4)
T-A	34.8300	118.7500	11/27/1852	0 0 0.0	0.0	7.00	0.064	VI	47.6(76.6)
DMG	34.2000	117.9000	08/28/1889	215 0.0	0.0	5.50	0.019	IV	48.1(77.4)
DMG	33.7000	118.0670	03/11/1933	51022.0	0.0	5.10	0.013	III	49.1(78.9)
DMG	33.7000	118.0670	03/11/1933	85457.0	0.0	5.10	0.013	III	49.1(78.9)
DMG	34.8000	119.1000	09/05/1883	1230 0.0	0.0	6.00	0.027	V	49.9(80.4)
DMG	34.5000	119.5000	06/29/1926	2321 0.0	0.0	5.50	0.018	IV	50.0(80.5)
DMG	34.5000	119.5000	08/05/1930	1125 0.0	0.0	5.00	0.012	III	50.0(80.5)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.6830	118.0500	03/11/1933	658 3.0	0.0	5.50	0.018	IV	50.5(81.3)
DMG	34.3670	119.5830	07/01/1941	75054.8	0.0	5.90	0.024	V	50.7(81.5)
DMG	34.8670	118.9330	09/21/1941	1953 7.2	0.0	5.20	0.013	III	51.3(82.6)
DMG	34.9000	118.9000	10/23/1916	244 0.0	0.0	6.00	0.024	V	53.2(85.6)
DMG	34.9000	118.9500	08/01/1952	13 430.0	0.0	5.10	0.011	III	53.8(86.6)
T-A	34.9200	118.9200	05/23/1857	0 0 0.0	0.0	5.00	0.010	III	54.8(88.2)
T-A	34.9200	118.9200	01/20/1857	0 0 0.0	0.0	5.00	0.010	III	54.8(88.2)
DMG	33.6170	118.0170	03/14/1933	19 150.0	0.0	5.10	0.011	III	54.9(88.4)
DMG	34.1180	119.7020	07/05/1968	04517.2	5.9	5.20	0.012	III	55.1(88.6)
PAS	34.9430	118.7430	06/10/1988	23 643.0	6.8	5.40	0.014	IV	55.4(89.1)
DMG	34.9320	118.9760	03/01/1963	02557.9	13.9	5.00	0.010	III	56.3(90.6)
DMG	34.9500	118.8670	07/21/1952	121936.0	0.0	5.30	0.013	III	56.3(90.7)
PAS	34.3470	119.6960	08/13/1978	225453.4	12.8	5.10	0.011	III	56.5(90.9)
DMG	34.9410	118.9870	11/15/1961	53855.5	10.7	5.00	0.010	III	57.0(91.8)
DMG	33.6170	117.9670	03/11/1933	154 7.8	0.0	6.30	0.027	V	57.1(91.9)
DMG	33.5750	117.9830	03/11/1933	518 4.0	0.0	5.20	0.011	III	58.3(93.9)
T-A	34.5000	119.6700	06/01/1893	12 0 0.0	0.0	5.00	0.009	III	58.6(94.3)
GSP	34.1400	117.7000	02/28/1990	234336.6	5.0	5.20	0.011	III	59.3(95.5)
DMG	35.0000	118.8330	07/23/1952	181351.0	0.0	5.20	0.011	III	59.6(95.9)
DMG	35.0000	118.8330	07/23/1952	75319.0	0.0	5.40	0.012	III	59.6(95.9)
DMG	34.9830	118.9830	05/23/1954	235243.0	0.0	5.10	0.010	III	59.8(96.2)
DMG	35.0000	119.0000	02/16/1919	1557 0.0	0.0	5.00	0.009	III	61.2(98.4)
DMG	35.0000	119.0000	07/21/1952	12 531.0	0.0	6.40	0.027	V	61.2(98.4)
DMG	35.0000	119.0170	07/21/1952	115214.0	0.0	7.70	0.074	VII	61.4(98.8)
DMG	35.0000	119.0170	01/12/1954	233349.0	0.0	5.90	0.018	IV	61.4(98.8)
MGI	34.3000	119.8000	07/03/1925	1638 0.0	0.0	5.30	0.011	III	61.6(99.1)
DMG	34.3000	119.8000	06/29/1925	144216.0	0.0	6.25	0.023	IV	61.6(99.1)
MGI	34.3000	119.8000	07/03/1925	1821 0.0	0.0	5.30	0.011	III	61.6(99.1)
DMG	35.0000	119.0330	07/21/1952	12 2 0.0	0.0	5.60	0.014	IV	61.6(99.2)
DMG	33.2910	119.1930	10/24/1969	82912.1	10.0	5.10	0.009	III	64.2(103.3)
T-A	34.4200	119.8200	00/00/1862	0 0 0.0	0.0	5.70	0.014	IV	64.6(104.0)
DMG	34.3000	117.6000	07/30/1894	512 0.0	0.0	6.00	0.017	IV	65.9(106.1)
DMG	35.1330	118.7670	07/21/1952	194122.0	0.0	5.50	0.011	III	68.5(110.3)
DMG	34.2700	117.5400	09/12/1970	143053.0	8.0	5.40	0.010	III	69.0(111.1)
MGI	33.8000	117.6000	04/22/1918	2115 0.0	0.0	5.00	0.007	II	69.3(111.5)
DMG	35.1500	118.6330	01/27/1954	141948.0	0.0	5.00	0.007	II	69.9(112.6)
MGI	34.0000	117.5000	12/16/1858	10 0 0.0	0.0	7.00	0.034	V	71.5(115.1)
DMG	34.3000	117.5000	07/22/1899	2032 0.0	0.0	6.50	0.022	IV	71.6(115.2)
DMG	35.1830	118.6500	07/21/1952	151358.0	0.0	5.10	0.007	II	72.1(116.1)
GSP	35.1490	119.1040	05/28/1993	044740.6	21.0	5.20	0.008	II	72.6(116.9)
DMG	33.2670	119.4500	11/18/1947	2159 3.0	0.0	5.00	0.007	II	72.9(117.2)
DMG	34.0000	120.0170	04/01/1945	234342.0	0.0	5.40	0.009	III	73.8(118.7)
DMG	35.2170	118.8170	07/23/1952	1317 5.0	0.0	5.70	0.011	III	74.4(119.8)
DMG	35.2330	118.5330	07/21/1952	174244.0	0.0	5.10	0.007	II	76.3(122.8)
DMG	34.2000	117.4000	07/22/1899	046 0.0	0.0	5.50	0.009	III	76.6(123.2)
DMG	33.6990	117.5110	05/31/1938	83455.4	10.0	5.50	0.009	III	76.7(123.4)
DMG	35.3000	118.8000	12/23/1905	2223 0.0	0.0	5.00	0.006	II	80.1(128.9)
DMG	35.3110	118.4990	07/25/1952	1313 8.2	2.8	5.00	0.005	II	81.9(131.9)
DMG	35.3150	118.5160	07/25/1952	194323.7	11.2	5.70	0.009	III	82.1(132.0)
MGI	34.1000	117.3000	07/15/1905	2041 0.0	0.0	5.30	0.007	II	82.3(132.4)
DMG	35.3170	118.4940	07/25/1952	19 944.6	5.5	5.70	0.009	III	82.4(132.6)
DMG	33.7000	117.4000	05/13/1910	620 0.0	0.0	5.00	0.005	II	82.5(132.8)
DMG	33.7000	117.4000	05/15/1910	1547 0.0	0.0	6.00	0.012	III	82.5(132.8)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.7000	117.4000	04/11/1910	757 0.0	0.0	5.00	0.005	II	82.5(132.8)
DMG	35.3330	118.6000	07/31/1952	12 9 9.0	0.0	5.80	0.010	III	82.7(133.1)
DMG	35.3330	118.9170	08/22/1952	224124.0	0.0	5.80	0.010	III	82.9(133.5)
GSP	35.2100	118.0660	07/11/1992	181416.2	10.0	5.70	0.009	III	83.1(133.8)
DMG	35.3670	118.5830	07/23/1952	03832.0	0.0	6.10	0.012	III	85.1(137.0)
DMG	35.3670	118.5830	07/23/1952	31923.0	0.0	5.00	0.005	II	85.1(137.0)
DMG	34.0000	117.2500	07/23/1923	73026.0	0.0	6.25	0.014	IV	85.7(137.9)
DMG	35.3830	118.8500	07/29/1952	7 347.0	0.0	6.10	0.012	III	86.0(138.4)
DMG	35.4000	118.8170	07/29/1952	8 146.0	0.0	5.10	0.005	II	87.1(140.1)
DMG	33.9000	117.2000	12/19/1880	0 0 0.0	0.0	6.00	0.010	III	89.6(144.2)
DMG	34.2000	117.1000	09/20/1907	154 0.0	0.0	6.00	0.010	III	93.7(150.8)
DMG	35.5000	118.7000	01/06/1905	1430 0.0	0.0	5.00	0.004	I	93.9(151.1)
DMG	32.8170	118.3500	12/26/1951	04654.0	0.0	5.90	0.009	III	94.1(151.4)
PAS	32.9710	117.8700	07/13/1986	1347 8.2	6.0	5.30	0.005	II	95.0(152.8)
DMG	34.7000	120.3000	01/12/1915	431 0.0	0.0	5.50	0.006	II	96.9(156.0)
DMG	34.7000	120.3000	07/31/1902	920 0.0	0.0	5.50	0.006	II	96.9(156.0)
MGI	34.6000	120.4000	08/01/1902	330 0.0	0.0	6.30	0.011	III	99.8(160.7)
MGI	34.6000	120.4000	07/28/1902	657 0.0	0.0	6.30	0.011	III	99.8(160.7)

****

-END OF SEARCH- 124 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1850 TO 2005

LENGTH OF SEARCH TIME: 156 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 12.5 MILES (20.2 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.7

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.308 g

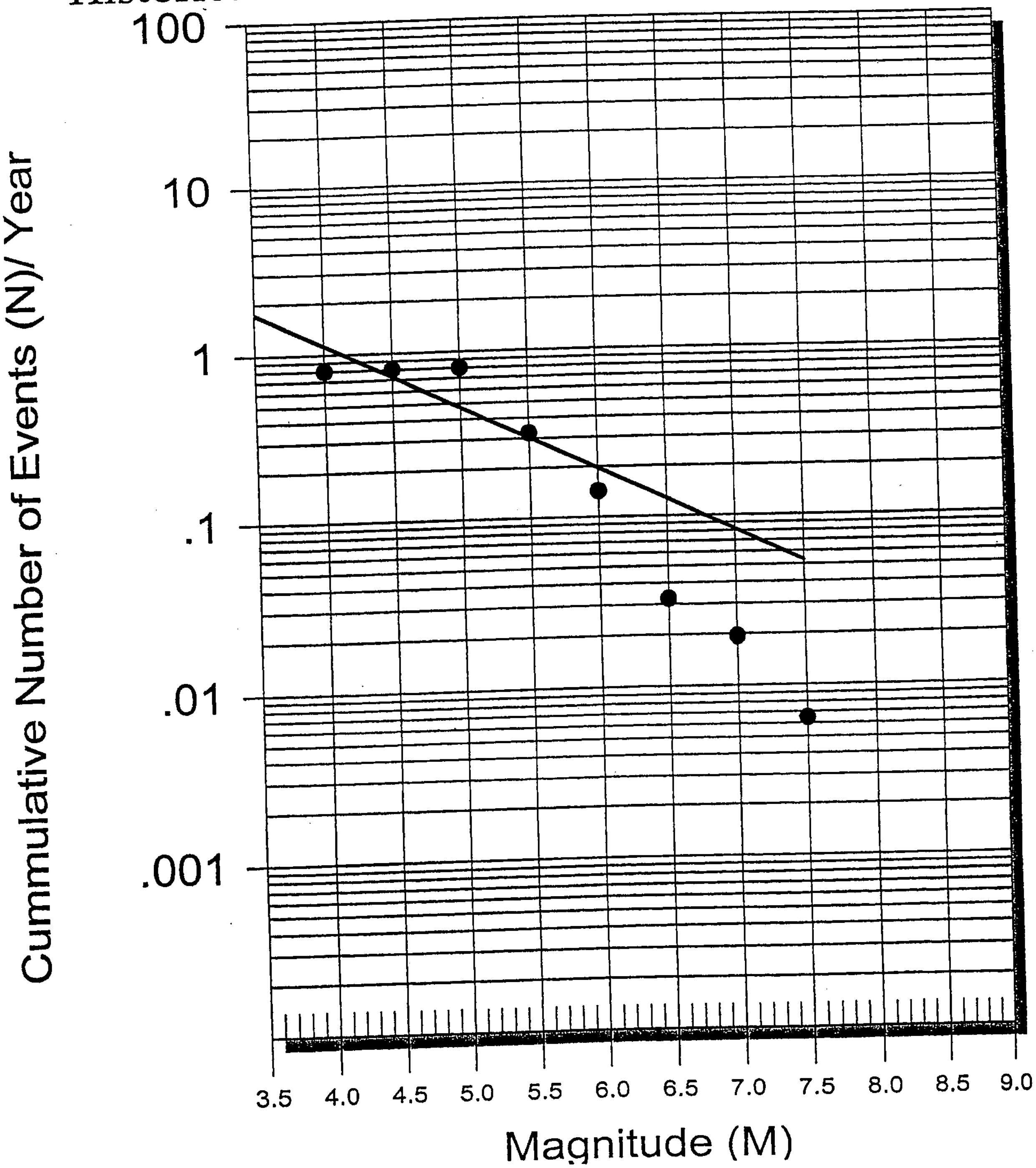
COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 1.568
b-value= 0.379
beta-value= 0.873

TABLE OF MAGNITUDES AND EXCEEDANCES:

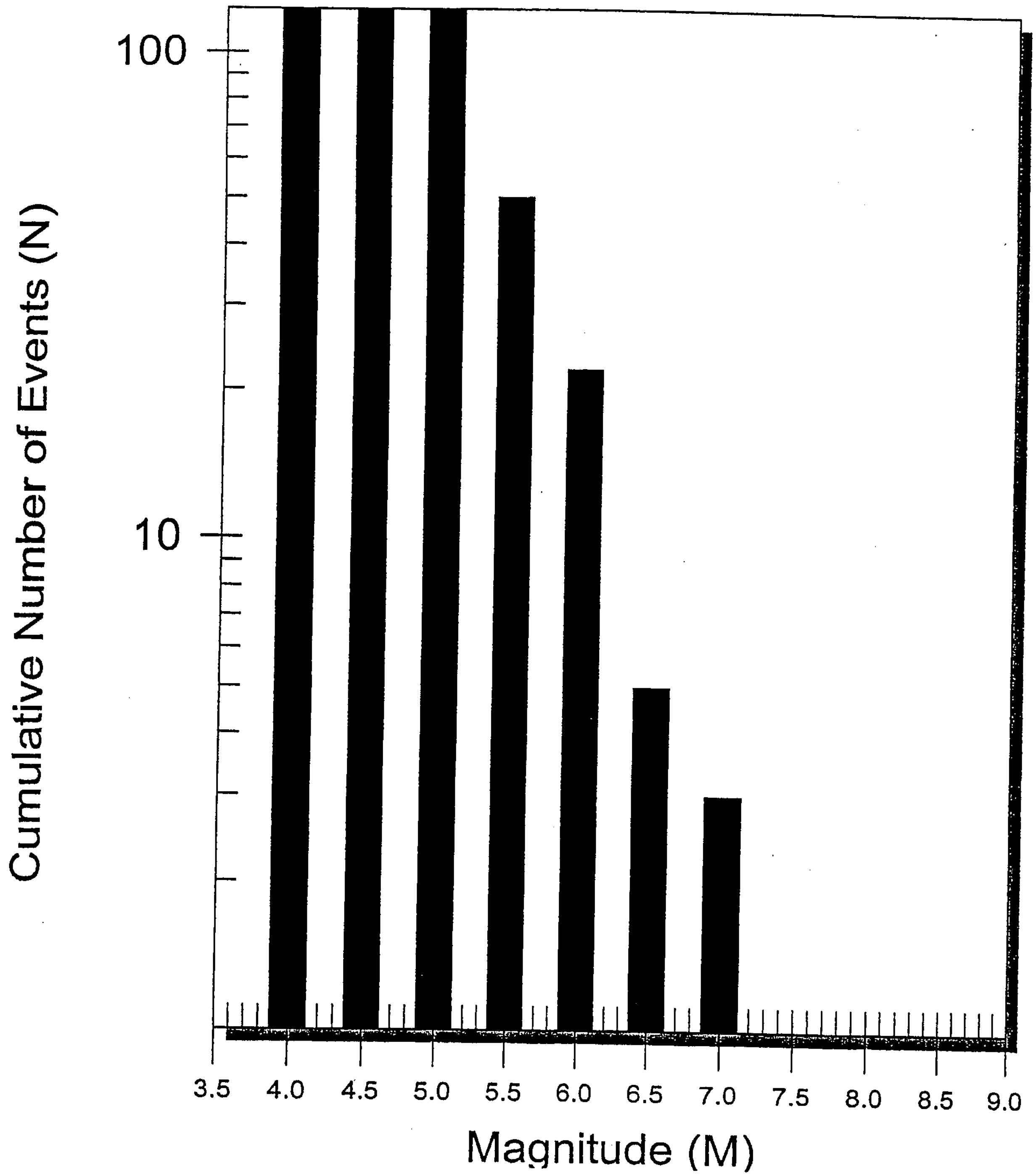
Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	124	0.79487
4.5	124	0.79487
5.0	124	0.79487
5.5	50	0.32051
6.0	22	0.14103
6.5	5	0.03205
7.0	3	0.01923
7.5	1	0.00641

EARTHQUAKE RECURRENCE CURVE

Historical Seismic Hazard Analysis for Smith

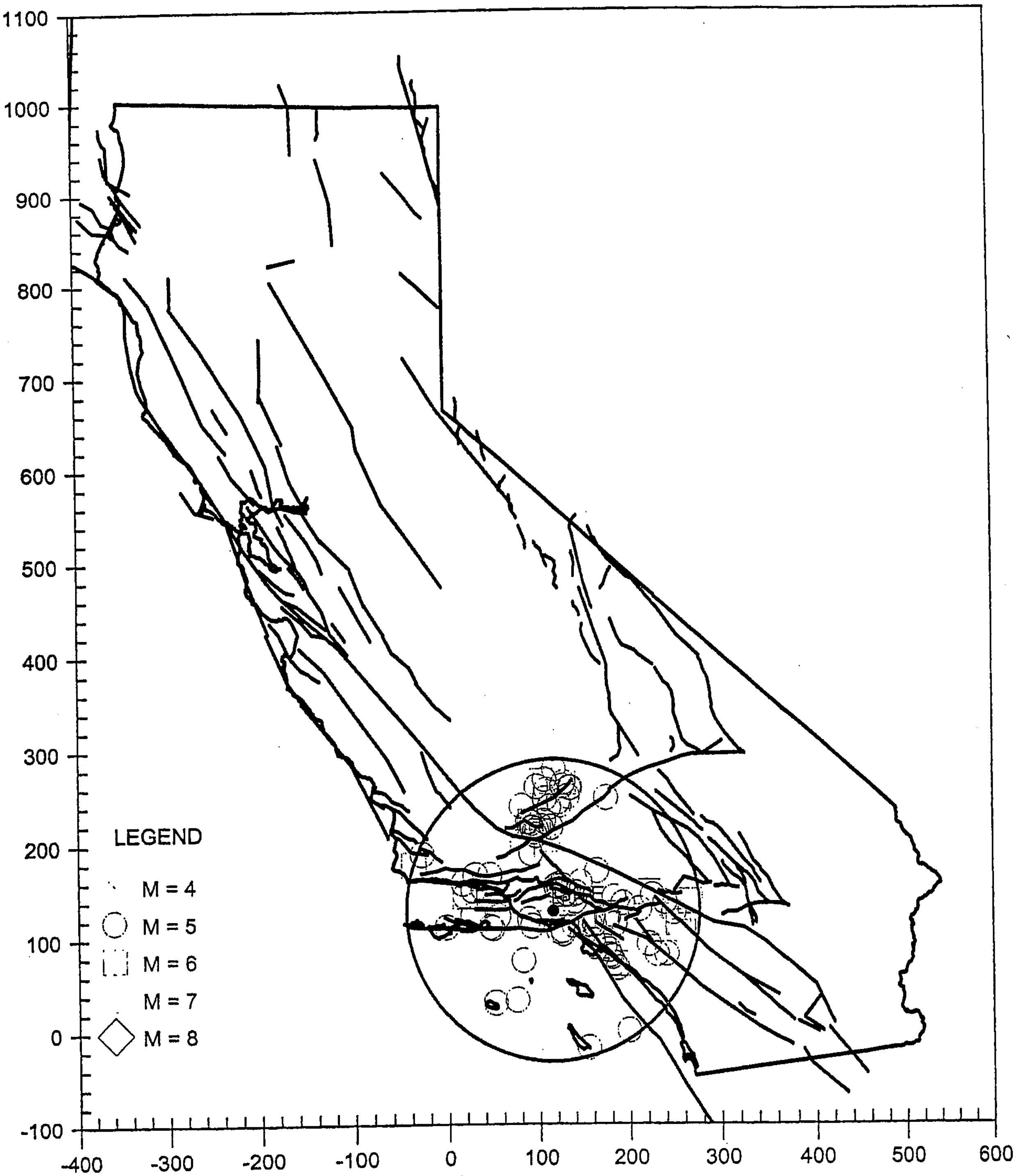


Number of Earthquakes (N) Above Magnitude (M)
Historical Seismic Hazard Analysis for Smith



EARTHQUAKE EPICENTER MAP

Historical Seismic Hazard Analysis for Smith



Appendix C

EQFAULT PROGRAM

EQFAULT is a computer program written in Summit Software's BetterBASIC. EQFAULT effectively performs deterministic seismic hazard analyses using approximately 200 digitized California faults as earthquake sources. The program estimates the closest distance between each fault and a user-specified site (given as latitude/longitude). If a fault is found to be within a user-selected radius, the program estimates peak horizontal ground acceleration that may occur at the site from "maximum credible" and "maximum probable" earthquakes on that fault. Site acceleration in percent gravity (g's) is computed by any of the 14 user-selected acceleration-attenuation relations that are contained in EQFAULT. Site-Modified-Mercalli-Intensities are also predicted (based on the peak acceleration) for each earthquake event. Data files needed to generate a fault-model map and a comparison plot of earthquake accelerations are also created by EQFAULT. To obtain the fault-model map and comparison plot from the data files, the GRAPHER program (by Golden Software, Inc.) is needed.

A file (CDMGFLTE.DAT), produced by the California Division of Mines and Geology, of digitized, late-Quarternary, California faults (each with assigned "maximum credible" and "maximum probable" earthquake magnitudes) is presently available for use with EQUFAULT. In recognition of the potential for differing professional opinions regarding which faults to consider and what magnitudes should be assigned to each, instructions are given so that the user can generate his own fault-data file. This user's manual contains individual data sheets for each of the faults contained in the CDMGFLTE.DAT data-file and a 1:750,000-scale map of digitized fault points.

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*                      *
*     E Q F A U L T    *
*                      *
*     Version 3.00     *
*                      *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 5840

DATE: 12-15-2005

JOB NAME: Smith

CALCULATION NAME: Deterministic Seismic Hazard Analysis for the Smith Project

FAULT-DATA-FILE NAME: CDMGFLTE.DAT

SITE COORDINATES:
SITE LATITUDE: 34.1407
SITE LONGITUDE: 118.7386

SEARCH RADIUS: 100 mi

ATTENUATION RELATION: 15) Campbell & Bozorgnia (1997 Rev.) - Soft Rock
UNCERTAINTY (M=Median, S=Sigma): S   Number of Sigmas: 1.0
DISTANCE MEASURE: cdist
SCOND: 0
Basement Depth: 5.00 km   Campbell SSR: 1   Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: CDMGFLTE.DAT

MINIMUM DEPTH VALUE (km): 3.0

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT MAXIMUM EARTHQUAKE MAG. (Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
MALIBU COAST	6.4(10.3)	6.7	0.652	X
ANACAPA-DUME	7.8(12.5)	7.3	0.666	XI
SANTA MONICA	10.5(16.9)	6.6	0.368	IX
SIMI-SANTA ROSA	11.7(18.8)	6.7	0.341	IX
NORTHRIDGE (E. Oak Ridge)	13.8(22.2)	6.9	0.311	IX
PALOS VERDES	15.7(25.3)	7.1	0.278	IX
SANTA SUSANA	15.8(25.5)	6.6	0.225	IX
OAK RIDGE (Onshore)	16.0(25.7)	6.9	0.264	IX
HOLSER	18.6(30.0)	6.5	0.173	VIII
HOLLYWOOD	18.9(30.4)	6.4	0.160	VIII
SIERRA MADRE (San Fernando)	19.9(32.0)	6.7	0.180	VIII
SAN CAYETANO	20.2(32.5)	6.8	0.188	VIII
VERDUGO	21.7(34.9)	6.7	0.161	VIII
NEWPORT-INGLEWOOD (L.A.Basin)	22.3(35.9)	6.9	0.167	VIII
SAN GABRIEL	22.9(36.8)	7.0	0.174	VIII
COMPTON THRUST	26.1(42.0)	6.8	0.136	VIII
VENTURA - PITAS POINT	27.4(44.1)	6.8	0.127	VIII
SIERRA MADRE	27.7(44.6)	7.0	0.142	VIII
OAK RIDGE(Blind Thrust Offshore)	29.5(47.5)	6.9	0.123	VII
RAYMOND	29.5(47.5)	6.5	0.091	VII
CHANNEL IS. THRUST (Eastern)	30.8(49.5)	7.4	0.160	VIII
ELYSIAN PARK THRUST	31.1(50.0)	6.7	0.099	VII
SANTA YNEZ (East)	31.8(51.1)	7.0	0.118	VII
MONTALVO-OAK RIDGE TREND	31.8(51.2)	6.6	0.088	VII
M.RIDGE-ARROYO PARIDA-SANTA ANA	34.4(55.4)	6.7	0.084	VII
RED MOUNTAIN	37.0(59.5)	6.8	0.081	VII
CLAMSHELL-SAWPIT	39.7(63.9)	6.5	0.057	VI
SAN ANDREAS - 1857 Rupture	40.8(65.6)	7.8	0.155	VIII
SAN ANDREAS - Mojave	40.8(65.6)	7.1	0.090	VII
SAN ANDREAS - Carrizo	40.9(65.9)	7.2	0.097	VII
WHITTIER	42.6(68.6)	6.8	0.065	VI
SANTA CRUZ ISLAND	45.7(73.5)	6.8	0.058	VI
BIG PINE	48.1(77.4)	6.7	0.050	VI
GARLOCK (West)	48.7(78.4)	7.1	0.070	VI
SAN JOSE	49.0(78.8)	6.5	0.041	V
PLEITO THRUST	49.8(80.2)	7.2	0.070	VI
CHINO-CENTRAL AVE. (Elsinore)	54.9(88.4)	6.7	0.040	V
CUCAMONGA	55.3(89.0)	7.0	0.050	VI
NORTH CHANNEL SLOPE	56.1(90.3)	7.1	0.053	VI
SANTA YNEZ (West)	56.5(91.0)	6.9	0.047	VI

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
NEWPORT-INGLEWOOD (Offshore)	60.5(97.4)	6.9	0.042	VI
WHITE WOLF	62.9(101.2)	7.2	0.048	VI
ELSINORE-GLEN IVY	66.1(106.3)	6.8	0.034	V
SANTA ROSA ISLAND	67.3(108.3)	6.9	0.034	V
SAN ANDREAS - Southern	70.3(113.1)	7.4	0.053	VI
SAN ANDREAS - San Bernardino	70.3(113.1)	7.3	0.049	VI
SAN JACINTO-SAN BERNARDINO	70.8(113.9)	6.7	0.028	V
CLEGHORN	73.8(118.8)	6.5	0.022	IV
CORONADO BANK	76.1(122.4)	7.4	0.047	VI
LOS ALAMOS-W. BASELINE	83.6(134.5)	6.8	0.022	IV
NORTH FRONTAL FAULT ZONE (West)	85.5(137.6)	7.0	0.025	V
SAN JACINTO-SAN JACINTO VALLEY	86.3(138.9)	6.9	0.025	V
ELSINORE-TEMECULA	86.7(139.5)	6.8	0.023	IV
GARLOCK (East)	89.1(143.4)	7.3	0.034	V
HELENDALE - S. LOCKHARDT	91.8(147.7)	7.1	0.027	V
LENWOOD-LOCKHART-OLD WOMAN SPRGS	93.2(150.0)	7.3	0.032	V
LIONS HEAD	94.0(151.2)	6.6	0.016	IV
SAN JUAN	98.6(158.7)	7.0	0.022	IV
SAN LUIS RANGE (S. Margin)	98.8(159.0)	7.0	0.020	IV

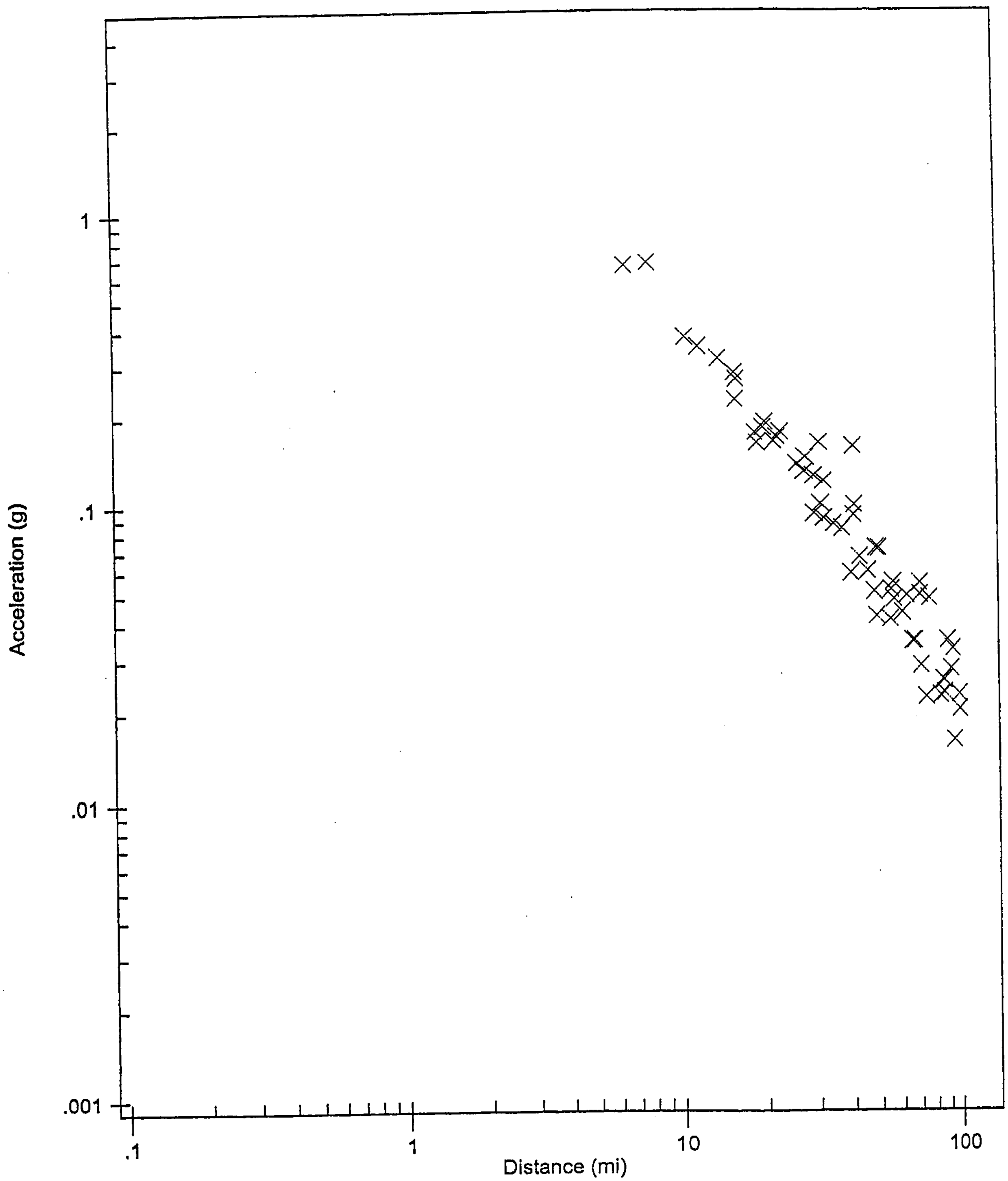
-END OF SEARCH- 59 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

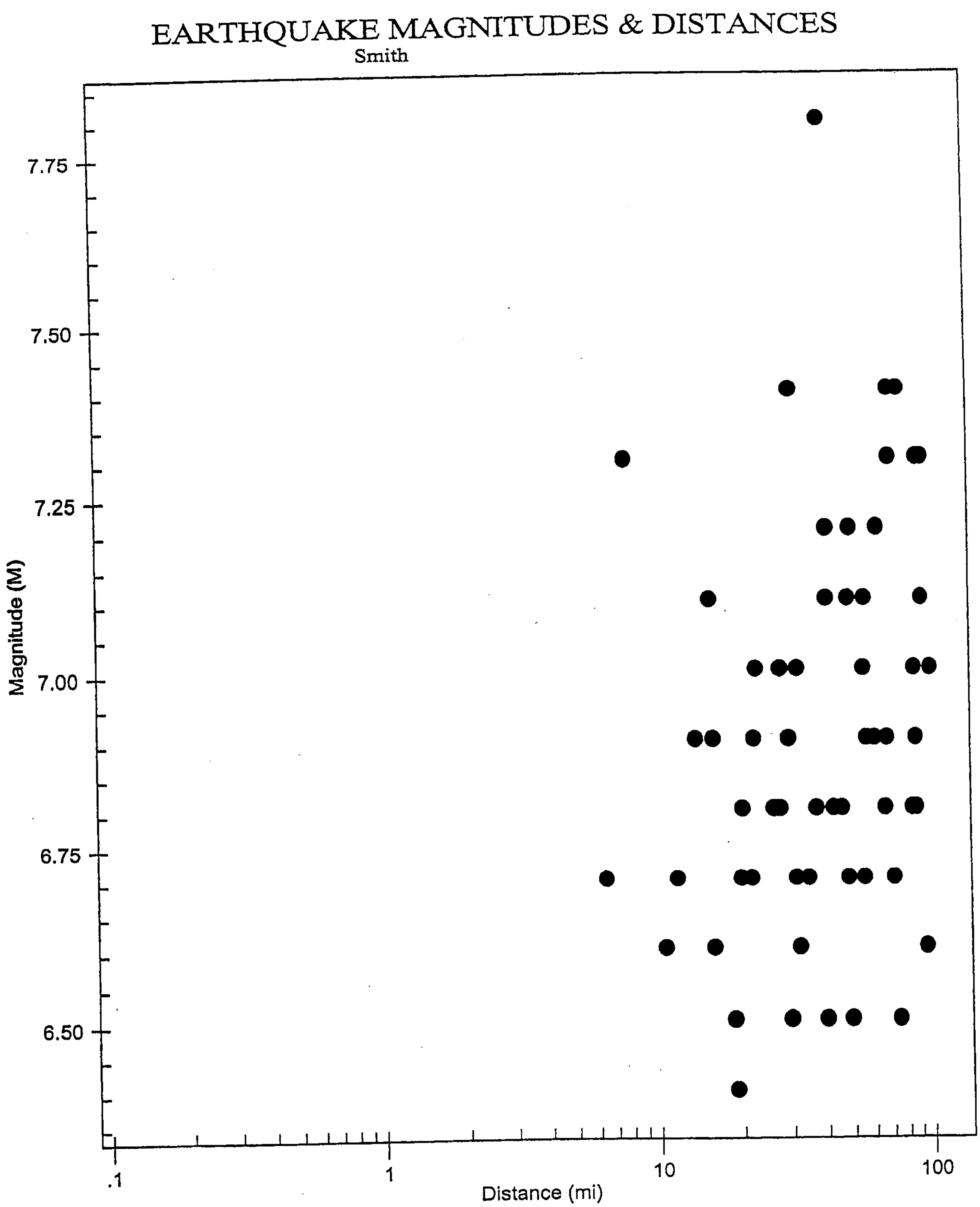
THE MALIBU COAST FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 6.4 MILES (10.3 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.6656 g

MAXIMUM EARTHQUAKES

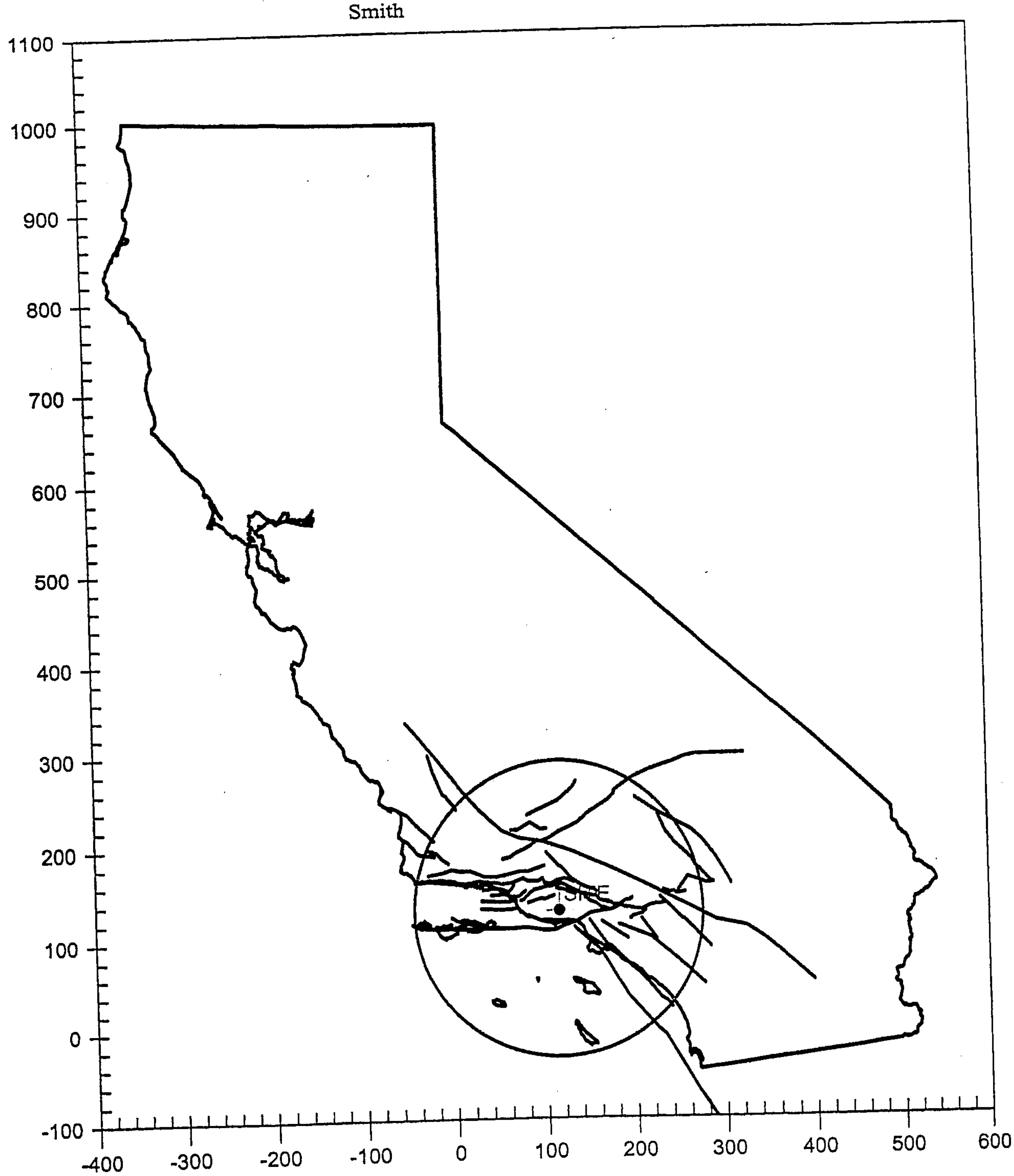
Smith




EARTHQUAKE MAGNITUDES & DISTANCES
Smith
7.75
7.50
7.25
7.00
6.75
6.50
Magnitude (M)
.1
1
10
100
Distance (mi)

CALIFORNIA FAULT MAP

Smith



FRISKSP RESULTS

The following description of FRISKSP was taken from the FRISKSP users manual:

FRISKSP is a computer program for the probabilistic estimation of seismic hazard using three-dimensional faults as earthquake sources. The program uses a seismotectonic source model, which can consist of up to 100 faults, to estimate seismic hazard at a selected site. Although the program originated from Robin McGuire's original FRISK program (McGuire, 1978), it has been substantially rewritten so that FRISKSP has the capability to:

* analyze dipping fault planes with up to ten subsurface inflections,
* use either "characteristic" or truncated exponential earthquake magnitude distributions,
* model fault ruptures using either area, length-width, or length, versus magnitude relations, and
* utilize several of the more recently developed peak acceleration- and pseudo-relative-velocity-attenuation relations.

The computation of attenuated ground motion is based on the closest distance between the site and various measures of fault-plane rupture for each fault in the source model.

FRISK (McGuire, 1978) was first published by the United States Geological Survey for use on mainframe computers. With the widespread acceptance of the IBM-PC microcomputer (and compatibles) as the defacto standard for practicing engineers, the original mainframe version of FRISK was adapted and compiled in 1988, by Thomas F. Blake, to run on the IBM microcomputer. That adapted IBM-PC release of FRISK was named FRISK89 (Black, 1989c). Modifications of FRISK89 performed from 1989 through 1993 resulted in the development of FRISKSP (up to Version 2.01). In 1994, FRISKSP was substantially modified by Dr. Robert T. Sewell under contract for Thomas F. Blake. Dr. Sewell's modifications included addition of the dipping fault capabilities, addition of the "characteristic" earthquake distribution, the rupture versus magnitude relation modifications, and the general recoding of program blocks as subroutines for ease of modification. The current version of FRISKSP (Version 3.00) combines the ability to compute peak acceleration and pseudo-relative-velocity in one program, whereas those functions were previously performed separately by FRISK89 and FRISKSP (Version 2.01).

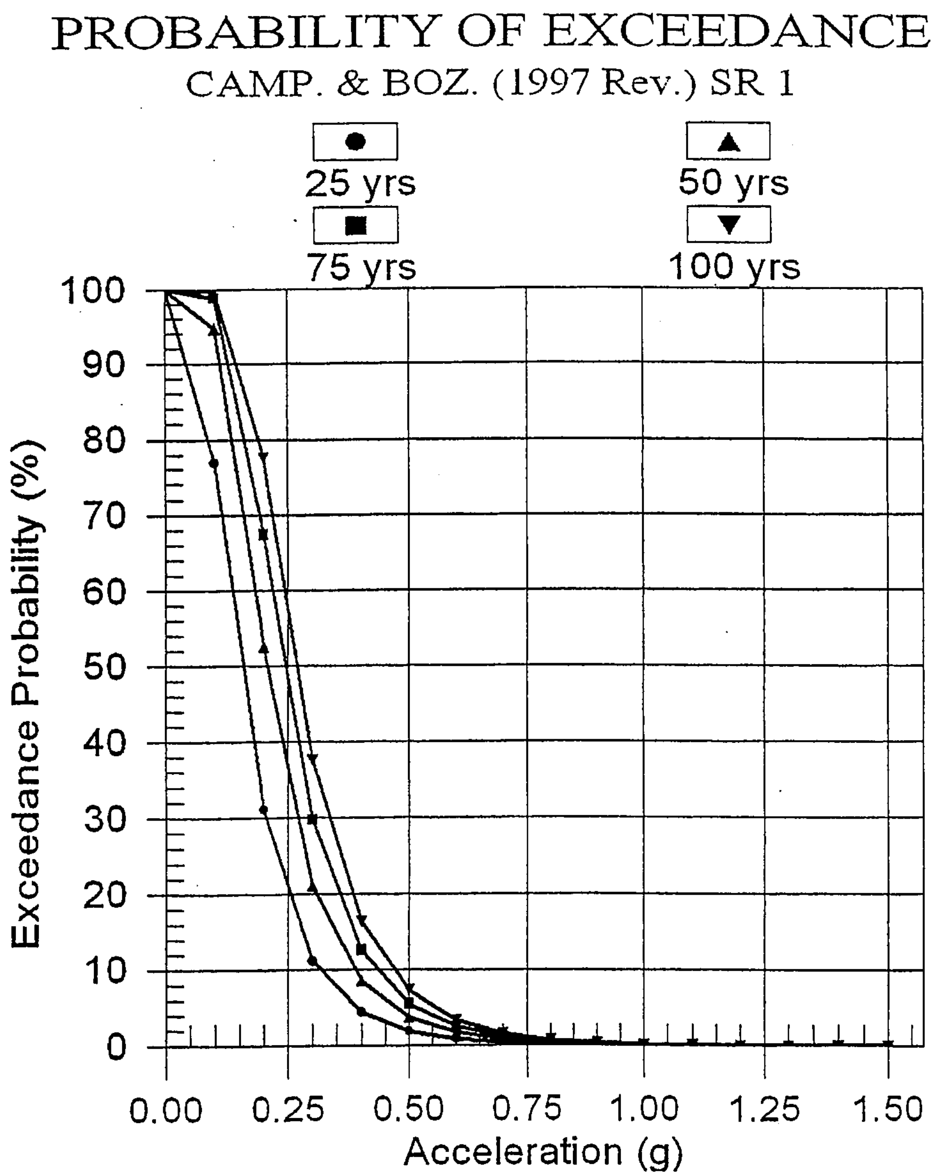
```
*******************************************
*                                         *
*         FRISKSP - IBM-PC VERSION        *
*                                         *
*  Modified from *FRISK* (McGuire 1978)   *
*   To Perform Probabilistic Earthquake   *
*  Hazard Analyses Using Multiple Forms   *
* of Ground-Motion-Attenuation Relations  *
*                                         *
*   Modifications by:  Thomas F. Blake    *
*               - 1988-2000 -             *
*                                         *
*              VERSION 4.00               *
*            (Visual Fortran)             *
*******************************************
```

```
TITLE: Probabilistic Seismic Hazard Analysis for the Smith Project

IPR_FILE
 0

IPLOT
 0

SITE CONDITION
 0.00

BASEMENT     DEPTH (km)
 5.00

RHGA FACTOR      RHGA DIST (km)
    1.000             0.000

NFLT  NSITE   NPROB   NATT    LCD
35      1       2       6      1

  0.0000    3.0000    1.0000     37          0

PROBLEM DATA:

CAMP. & BOZ. (1997 Rev.) SR 1    AMPLITUDES:
    15        0.100     0.200     0.300     0.400     0.500     0.600     0.700     0.800     0.900
1.000
              1.100     1.200     1.300     1.400     1.500

     MAGNITUDE WEIGHTING FACTORS:     MWF:   0    MWF MAGNITUDE:      0.00

CAMP. & BOZ. (1997 Rev.) SR 2    AMPLITUDES:
    15        0.100     0.200     0.300     0.400     0.500     0.600     0.700     0.800     0.900
1.000
              1.100     1.200     1.300     1.400     1.500

     MAGNITUDE WEIGHTING FACTORS:     MWF:   3    MWF MAGNITUDE:      7.50

 RISKS SPECIFIED:
   5     0.013900  0.010000  0.005000  0.002105  0.001000

 SITE COORDINATES:
  1    -118.7386   34.1407

RUPTURE AREA VS. MAGNITUDE:
 ----------------------------------------------------------------------------
```

PROBABILITY OF EXCEEDANCE vs. ACCELERATION

MEAN + 1 SIGMA

(Non Magnitude-Weighted)



Probability of Exceedance vs. Acceleration

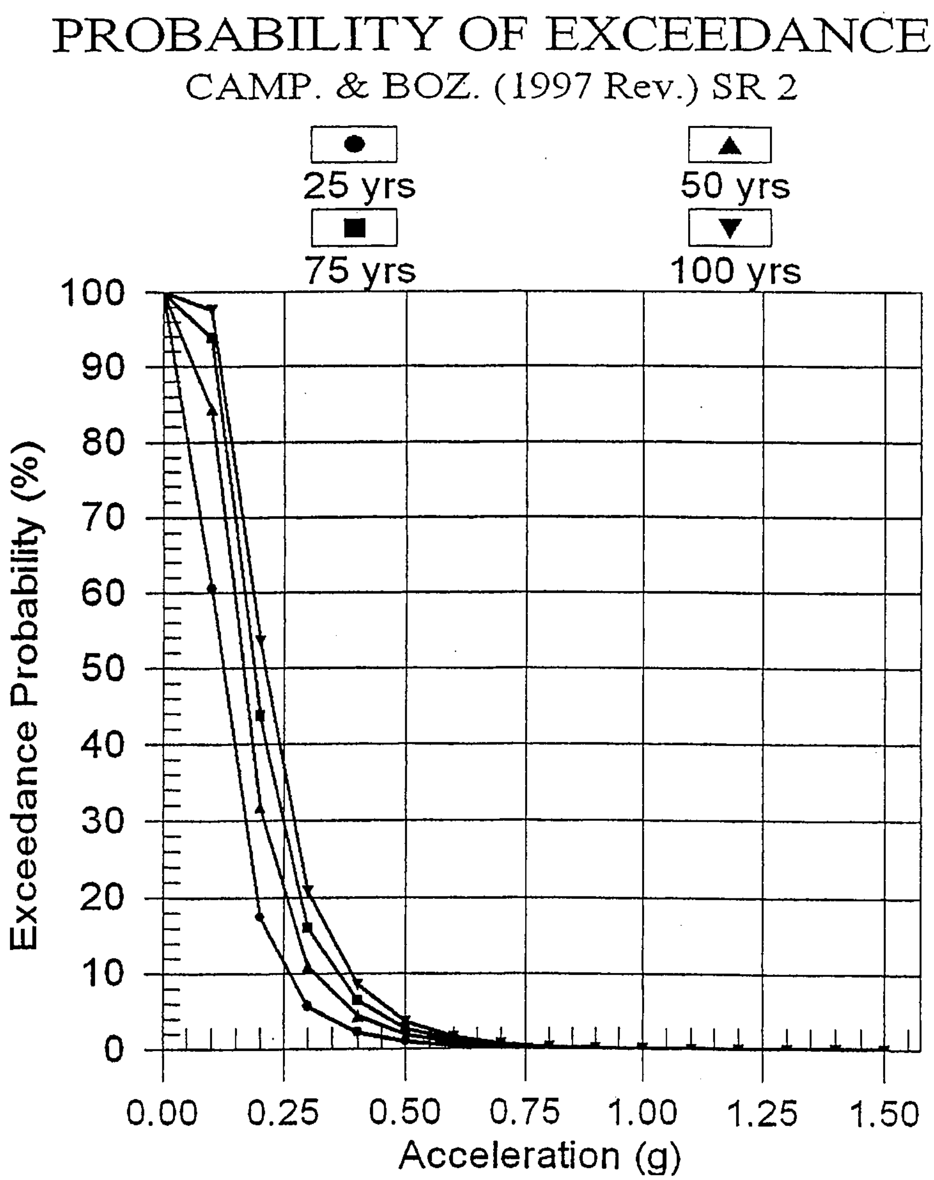
10% in 50 years = 0.38g
10% in 100 years = 0.47g

W.O. 5840
Smith

PROBABILITY OF EXCEEDANCE vs. ACCELERATION

MEAN + 1 SIGMA

(Magnitude-Weighted, M = 7.5)



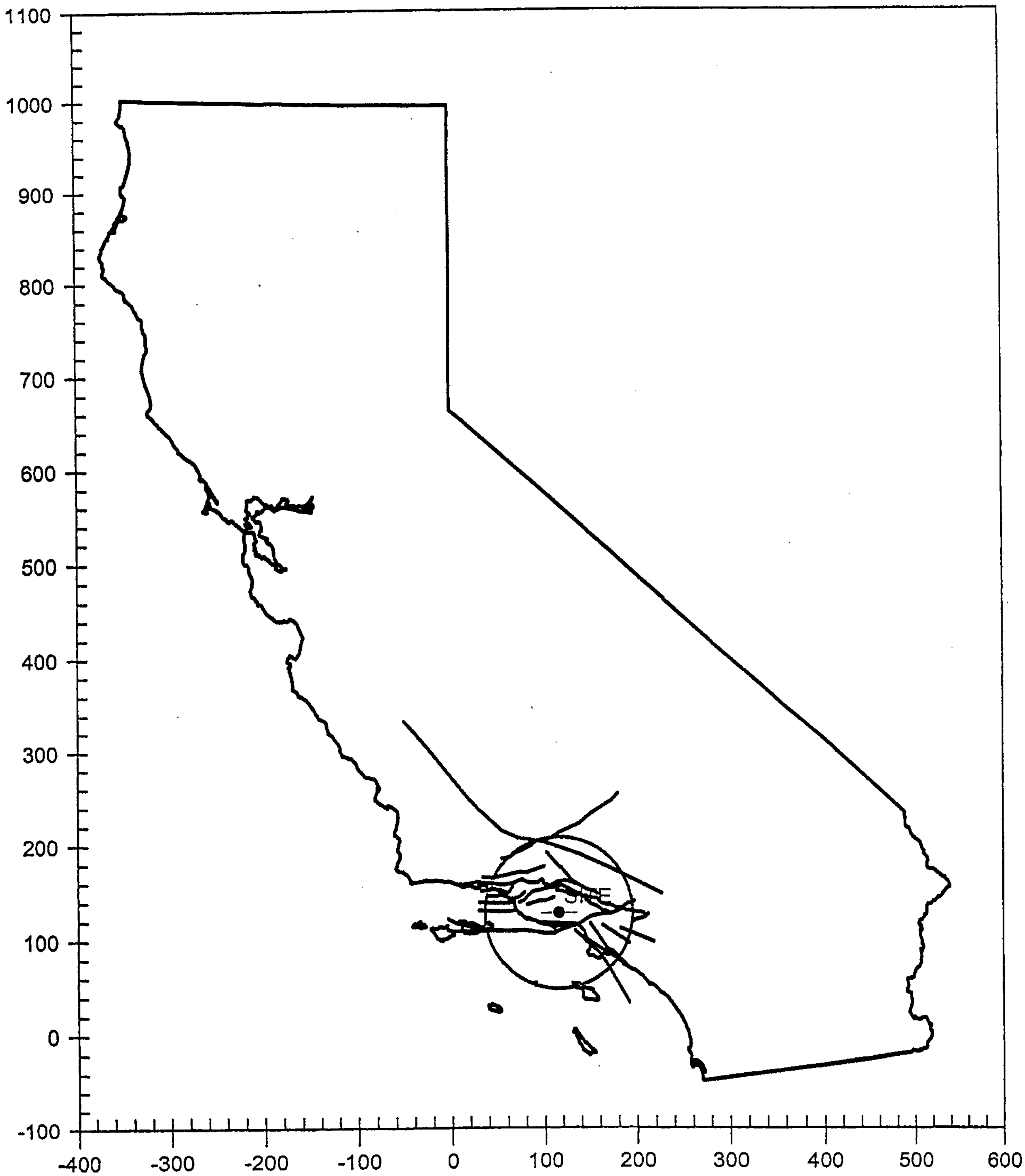
Probability of Exceedance vs. Acceleration

10% in 50 years = 0.31g
10% in 100 years = 0.39g

W.O. 5840
Smith

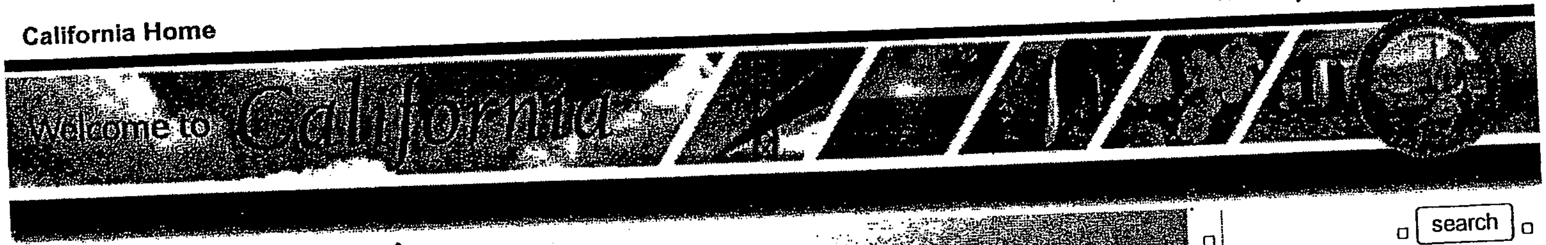
CALIFORNIA FAULT MAP

Probabilistic Seismic Hazard Analysis for the Smith Project



Thursday, December 15, 2005

California Home



My CA   This Site   search

California Geological Survey

Department of Conservation

California Geological Survey

- Probablistic Seismic Hazards Assessment Page
- Earthquakes (Recent & Historic)
- California Fault Database
- Loss Estimation
- Aquist-Priolo Earthquake Fault Zoning Act
- Seismic Shaking Hazard Maps of California

CGS Links

- About Us
- Contact Us
- Jobs
- Site Map
- Help/FAQ

Probabilistic Seismic Hazards Mapping Ground Motion Page

User Selected Site

Longitude	-118.7386
Latitude	34.1407

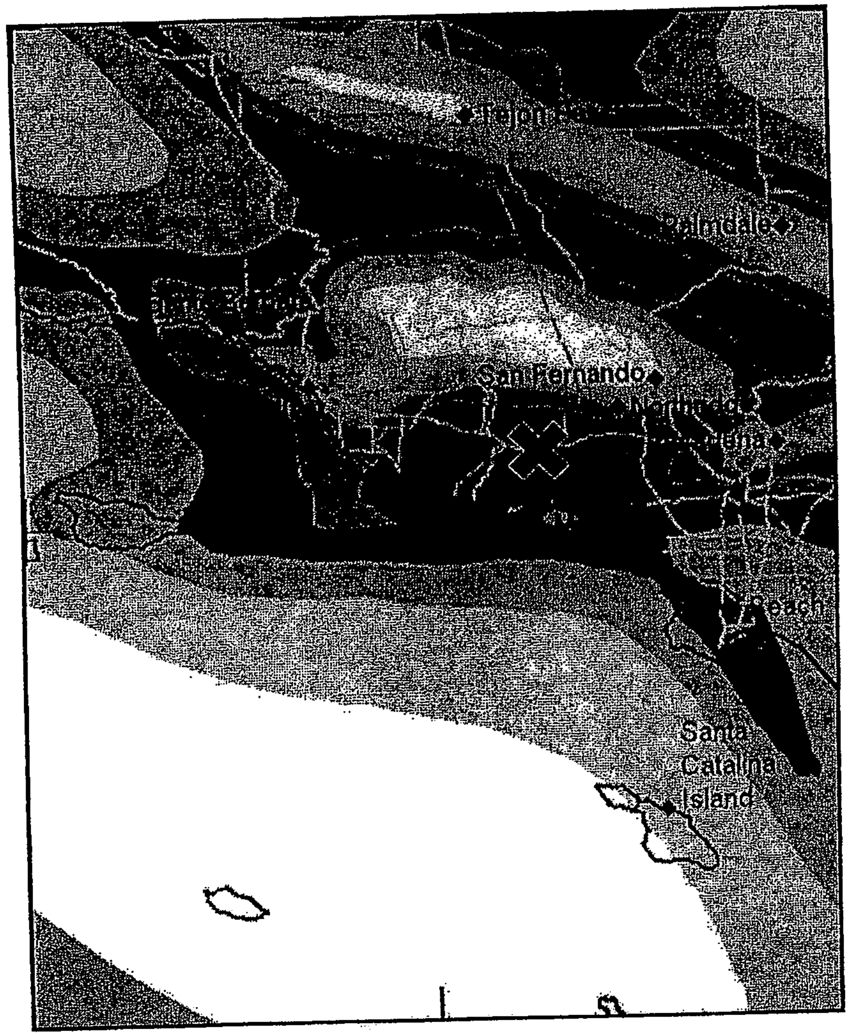
Ground Motions for User Selected Site

Ground motions (10% probability of being exceeded in 50 years) are expressed as a fraction of the acceleration due to gravity (g). Three values of ground motion are shown, peak ground acceleration (Pga), spectral acceleration(Sa) at short (0.2 second) and moderately long (1.0 second) periods. Ground motion values are also modified by the local site soil conditions. Each ground motion value is shown for 3 different site conditions: firm rock (conditions on the boundary between site categories B and C as defined by the building code), soft rock (site category C) and alluvium (site category D).

Ground Motion	Firm Rock	Soft Rock	Alluvium
Pga	0.409	0.409	0.446

Sa 0.2 sec	0.992	0.994	1.093
Sa 1.0 sec	0.371	0.457	0.547

NEHRP Soil Corrections were used to calculate Soft Rock and Alluvium. *Ground Motion values were interpolated from a grid (0.05 degree spacing) of calculated values. Interpolated ground motion may not equal values calculated for a specific site, therefore these values are not intended for design or analysis.*



Shaking (%g)
Pga (Peak Ground Acceleration)
Firm Rock
- < 10%
- 10 - 20%
- 20 - 30%
- 30 - 40%
- 40 - 50%
- 50 - 60%
- 60 - 70%
- 70 - 80%
- > 80%

The unit "g" is acceleration of gravity.

December 16, 2005
W.O. 5840

APPENDIX D

1997 UNIFORM BUILDING CODE

SEISMIC DESIGN PARAMETERS

December 16, 2005
W.O. 5840

APPENDIX D

1997 UNIFORM BUILDING CODE SEISMIC DESIGN PARAMETERS

UBCSEIS

The UBCSEIS program was written by Thomas F. Blake to read a fault-data file and computed the distances between a site and each of the faults in that data file. For each distance computed, UBCSEIS selects the corresponding Uniform Building Code seismic coefficients and constructs a design response spectrum.

UBCSEIS, a computer program for the estimation of Uniform Building Code seismic design coefficients from a California fault-data file, performs fault searches using a modified version of the fault-data file for the State of California that was recently compiled by the California Division of Mines and Geology (CDMG). Most of the original fault data are available from CDMG through their web site at:

http://www.consrv.ca.gov/dmg/shezp/fltindex.htm.

UBCSEIS – GENERAL PROCEDURES

1. The program searches for the fault-data file to compute the distances to nearby faults.
2. For each fault, the distance between the fault and the site is computed. As specified by the Uniform Building Code, the closest distance between the site and the surface projection of the fault plane is used. Note that the down-dip fault coordinates should be limited so that the fault plane does not project below a depth of 10 km to be consistent with the Uniform Building Code.
3. After computing the site-to-fault distances, the program selects the closest Type A, Type B and Type C faults.
4. The corresponding N_a, N_v, C_a, and C_v coefficients for each Type A, Type B, and Type C fault types.
5. In order to construct a design spectrum, the T_s and T_o coefficients are computed in conjunction with the largest of the N_a, N_v, C_a, and C_v coefficients.

```
***********************
*                     *
*     U B C S E I S   *
*                     *
*     Version  1.03   *
*                     *
***********************
```

COMPUTATION OF 1997
UNIFORM BUILDING CODE
SEISMIC DESIGN PARAMETERS

JOB NUMBER: 5840 DATE: 12-15-2005

JOB NAME: Smith Project

FAULT-DATA-FILE NAME: CDMGUBCR.DAT

SITE COORDINATES:
SITE LATITUDE: 34.1407
SITE LONGITUDE: 118.7386

UBC SEISMIC ZONE: 0.4

UBC SOIL PROFILE TYPE: SC

NEAREST TYPE A FAULT:
NAME: SAN ANDREAS - 1857 Rupture
DISTANCE: 65.5 km

NEAREST TYPE B FAULT:
NAME: ANACAPA-DUME
DISTANCE: 8.0 km

NEAREST TYPE C FAULT:
NAME: □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
DISTANCE: 99999.0 km

SELECTED UBC SEISMIC COEFFICIENTS:
Na: 1.0
Nv: 1.1
Ca: 0.40
Cv: 0.60
Ts: 0.605
To: 0.121

```
*********************************************************************
* CAUTION:  The digitized data points used to model faults are      *
*           limited in number and have been digitized from small-   *
*           scale maps (e.g., 1:750,000 scale).  Consequently,      *
*           the estimated fault-site-distances may be in error by   *
*           several kilometers.  Therefore, it is important that    *
*           the distances be carefully checked for accuracy and     *
*           adjusted as needed, before they are used in design.     *
*********************************************************************
```

SUMMARY OF FAULT PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE (km)	SOURCE TYPE (A,B,C)	MAX. MAG. (Mw)	SLIP RATE (mm/yr)	FAULT TYPE (SS,DS,BT)
ANACAPA-DUME	8.0	B	7.3	3.00	DS
MALIBU COAST	8.2	B	6.7	0.30	DS
SANTA MONICA	14.8	B	6.6	1.00	DS
SIMI-SANTA ROSA	17.5	B	6.7	1.00	DS
SANTA SUSANA	23.2	B	6.6	5.00	DS
OAK RIDGE (Onshore)	23.7	B	6.9	4.00	DS
PALOS VERDES	25.2	B	7.1	3.00	SS
HOLSER	28.5	B	6.5	0.40	DS
HOLLYWOOD	28.9	B	6.5	1.00	DS
SIERRA MADRE (San Fernando)	29.9	B	6.7	2.00	DS
SAN CAYETANO	30.6	B	6.8	6.00	DS
VERDUGO	32.2	B	6.7	0.50	DS
NEWPORT-INGLEWOOD (L.A.Basin)	34.3	B	6.9	1.00	SS
SAN GABRIEL	36.7	B	7.0	1.00	SS
SIERRA MADRE (Central)	43.4	B	7.0	3.00	DS
VENTURA - PITAS POINT	43.5	B	6.8	1.00	DS
RAYMOND	47.2	B	6.5	0.50	DS
SANTA YNEZ (East)	50.1	B	7.0	2.00	SS
M.RIDGE-ARROYO PARIDA-SANTA ANA	53.7	B	6.7	0.40	DS
RED MOUNTAIN	57.7	B	6.8	2.00	DS
CLAMSHELL-SAWPIT	63.6	B	6.5	0.50	DS
SAN ANDREAS - 1857 Rupture	65.5	A	7.8	34.00	SS
ELSINORE-WHITTIER	68.5	B	6.8	2.50	SS
SANTA CRUZ ISLAND	73.4	B	6.8	1.00	DS
BIG PINE	77.4	B	6.7	0.80	SS
SAN JOSE	78.2	B	6.5	0.50	DS
GARLOCK (West)	78.3	A	7.1	6.00	SS
PLEITO THRUST	80.0	B	6.8	2.00	DS
CHINO-CENTRAL AVE. (Elsinore)	88.8	B	6.7	1.00	DS
CUCAMONGA	89.0	A	7.0	5.00	DS
SANTA YNEZ (West)	90.9	B	6.9	2.00	SS
NEWPORT-INGLEWOOD (Offshore)	97.4	B	6.9	1.50	SS
WHITE WOLF	104.3	B	7.2	2.00	DS
ELSINORE-GLEN IVY	106.3	B	6.8	5.00	SS
SANTA ROSA ISLAND	108.3	B	6.9	1.00	DS
SAN ANDREAS - Southern	113.1	A	7.4	24.00	SS
SAN JACINTO-SAN BERNARDINO	113.8	B	6.7	12.00	SS
CLEGHORN	118.8	B	6.5	3.00	SS
CORONADO BANK	122.4	B	7.4	3.00	SS
LOS ALAMOS-W. BASELINE	133.7	B	6.8	0.70	DS
NORTH FRONTAL FAULT ZONE (West)	135.4	B	7.0	1.00	DS
SAN JACINTO-SAN JACINTO VALLEY	138.9	B	6.9	12.00	SS
ELSINORE-TEMECULA	139.4	B	6.8	5.00	SS
GARLOCK (East)	143.3	A	7.3	7.00	SS
HELENDALE - S. LOCKHARDT	147.7	B	7.1	0.60	SS
LENWOOD-LOCKHART-OLD WOMAN SPRGS	150.0	B	7.3	0.60	SS

SUMMARY OF FAULT PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE (km)	SOURCE TYPE (A,B,C)	MAX. MAG. (Mw)	SLIP RATE (mm/yr)	FAULT TYPE (SS,DS,BT)
LIONS HEAD	151.0	B	6.6	0.02	DS
SAN JUAN	158.7	B	7.0	1.00	SS
SAN LUIS RANGE (S. Margin)	158.9	B	7.0	0.20	DS
ROSE CANYON	165.1	B	6.9	1.50	SS
CASMALIA (Orcutt Frontal Fault)	168.1	B	6.5	0.25	DS
So. SIERRA NEVADA	169.7	B	7.1	0.10	DS
GRAVEL HILLS - HARPER LAKE	171.4	B	6.9	0.60	SS
SAN JACINTO-ANZA	173.5	A	7.2	12.00	SS
NORTH FRONTAL FAULT ZONE (East)	178.1	B	6.7	0.50	DS
ELSINORE-JULIAN	180.1	A	7.1	5.00	SS
BLACKWATER	185.2	B	6.9	0.60	SS
PINTO MOUNTAIN	185.8	B	7.0	2.50	SS
LOS OSOS	188.3	B	6.8	0.50	DS
LANDERS	188.6	B	7.3	0.60	SS
LITTLE LAKE	191.4	B	6.7	0.70	SS
CALICO - HIDALGO	192.3	B	7.1	0.60	SS
JOHNSON VALLEY (Northern)	193.7	B	6.7	0.60	SS
HOSGRI	196.9	B	7.3	2.50	SS
EMERSON So. - COPPER MTN.	207.1	B	6.9	0.60	SS
RINCONADA	208.3	B	7.3	1.00	SS
BURNT MTN.	214.8	B	6.5	0.60	SS
TANK CANYON	215.6	B	6.5	1.00	DS
EUREKA PEAK	215.8	B	6.5	0.60	SS
SAN JACINTO-COYOTE CREEK	218.9	B	6.8	4.00	SS
PISGAH-BULLION MTN.-MESQUITE LK	220.6	B	7.1	0.60	SS
EARTHQUAKE VALLEY	225.3	B	6.5	2.00	SS
PANAMINT VALLEY	231.9	B	7.2	2.50	SS
OWL LAKE	236.4	B	6.5	2.00	SS
OWENS VALLEY	238.2	B	7.6	1.50	SS
ELSINORE-COYOTE MOUNTAIN	254.8	B	6.8	4.00	SS
SAN JACINTO - BORREGO	256.5	B	6.6	4.00	SS
SAN ANDREAS (Creeping)	266.4	B	5.0	34.00	SS
DEATH VALLEY (South)	268.4	B	6.9	4.00	SS
INDEPENDENCE	269.2	B	6.9	0.20	DS
DEATH VALLEY (Graben)	277.5	B	6.9	4.00	DS
HUNTER MTN. - SALINE VALLEY	285.9	B	7.0	2.50	SS
SUPERSTITION MTN. (San Jacinto)	288.9	B	6.6	5.00	SS
BRAWLEY SEISMIC ZONE	292.7	B	6.5	25.00	SS
ELMORE RANCH	292.8	B	6.6	1.00	SS
SUPERSTITION HILLS (San Jacinto)	294.9	B	6.6	4.00	SS
ELSINORE-LAGUNA SALADA	306.4	B	7.0	3.50	SS
DEATH VALLEY (Northern)	317.5	A	7.2	5.00	SS
BIRCH CREEK	317.5	B	6.5	0.70	DS
IMPERIAL	321.9	A	7.0	20.00	SS
WHITE MOUNTAINS	327.2	B	7.1	1.00	SS
ROUND VALLEY (E. of S.N.Mtns.)	345.6	B	6.8	1.00	DS

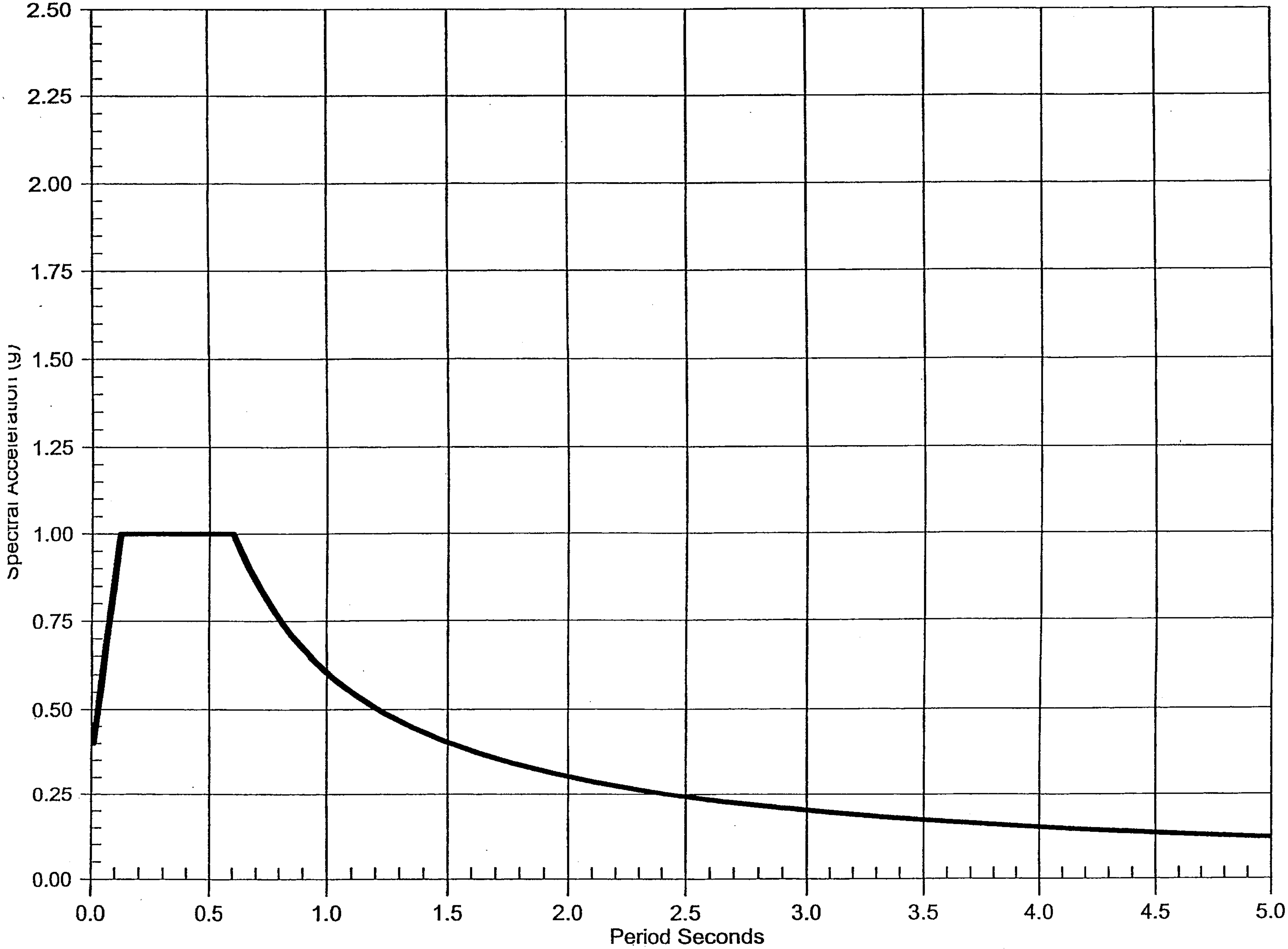
SUMMARY OF FAULT PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE (km)	SOURCE TYPE (A,B,C)	MAX. MAG. (Mw)	SLIP RATE (mm/yr)	FAULT TYPE (SS,DS,BT)
DEEP SPRINGS	349.2	B	6.6	0.80	DS
ORTIGALITA	352.8	B	6.9	1.00	SS
CALAVERAS (So.of Calaveras Res)	356.0	B	6.2	15.00	SS
MONTEREY BAY - TULARCITOS	356.5	B	7.1	0.50	DS
PALO COLORADO - SUR	357.1	B	7.0	3.00	SS
FISH SLOUGH	358.9	B	6.6	0.20	DS
DEATH VALLEY (N. of Cucámongo)	366.2	A	7.0	5.00	SS
HILTON CREEK	369.3	B	6.7	2.50	DS
QUIEN SABE	369.7	B	6.5	1.00	SS
ZAYANTE-VERGELES	387.1	B	6.8	0.10	SS
HARTLEY SPRINGS	389.5	B	6.6	0.50	DS
SAN ANDREAS (1906)	392.3	A	7.9	24.00	SS
SARGENT	392.8	B	6.8	3.00	SS
MONO LAKE	423.2	B	6.6	2.50	DS
SAN GREGORIO	431.4	A	7.3	5.00	SS
MONTE VISTA - SHANNON	442.4	B	6.5	0.40	DS
HAYWARD (SE Extension)	443.4	B	6.5	3.00	SS
GREENVILLE	444.8	B	6.9	2.00	SS
ROBINSON CREEK	452.6	B	6.5	0.50	DS
CALAVERAS (No.of Calaveras Res)	463.4	B	6.8	6.00	SS
HAYWARD (Total Length)	463.4	A	7.1	9.00	SS
ANTELOPE VALLEY	490.5	B	6.7	0.80	DS
CONCORD - GREEN VALLEY	512.2	B	6.9	6.00	SS
GENOA	512.4	B	6.9	1.00	DS
RODGERS CREEK	550.0	A	7.0	9.00	SS
WEST NAPA	551.6	B	6.5	1.00	SS
POINT REYES	566.4	B	6.8	0.30	DS
HUNTING CREEK - BERRYESSA	575.6	B	6.9	6.00	SS
MAACAMA (South)	612.9	B	6.9	9.00	SS
COLLAYOMI	630.6	B	6.5	0.60	SS
BARTLETT SPRINGS	635.7	A	7.1	6.00	SS
MAACAMA (Central)	654.1	A	7.1	9.00	SS
MAACAMA (North)	714.1	A	7.1	9.00	SS
ROUND VALLEY (N. S.F.Bay)	722.2	B	6.8	6.00	SS
BATTLE CREEK	757.3	B	6.5	0.50	DS
LAKE MOUNTAIN	780.2	B	6.7	6.00	SS
GARBERVILLE-BRICELAND	796.1	B	6.9	9.00	SS
MENDOCINO FAULT ZONE	850.7	A	7.4	35.00	DS
LITTLE SALMON (Onshore)	859.6	A	7.0	5.00	DS
CASCADIA SUBDUCTION ZONE	863.2	A	8.3	35.00	DS
MAD RIVER	863.8	B	7.1	0.70	DS
McKINLEYVILLE	874.0	B	7.0	0.60	DS
FICKLE HILL	875.7	B	6.9	0.60	DS
TRINIDAD	875.9	B	7.3	2.50	DS
TABLE BLUFF	879.8	B	7.0	0.60	DS
LITTLE SALMON (Offshore)	893.3	B	7.1	1.00	DS
BIG LAGOON - BALD MTN.FLT.ZONE	913.1	B	7.3	0.50	DS

****

DESIGN RESPONSE SPECTRUM

Seismic Zone: 0.4 Soil Profile: SC W.O. 5840 - Smith



Hydrology and Water Quality

- On-site Hydrology Study and Report

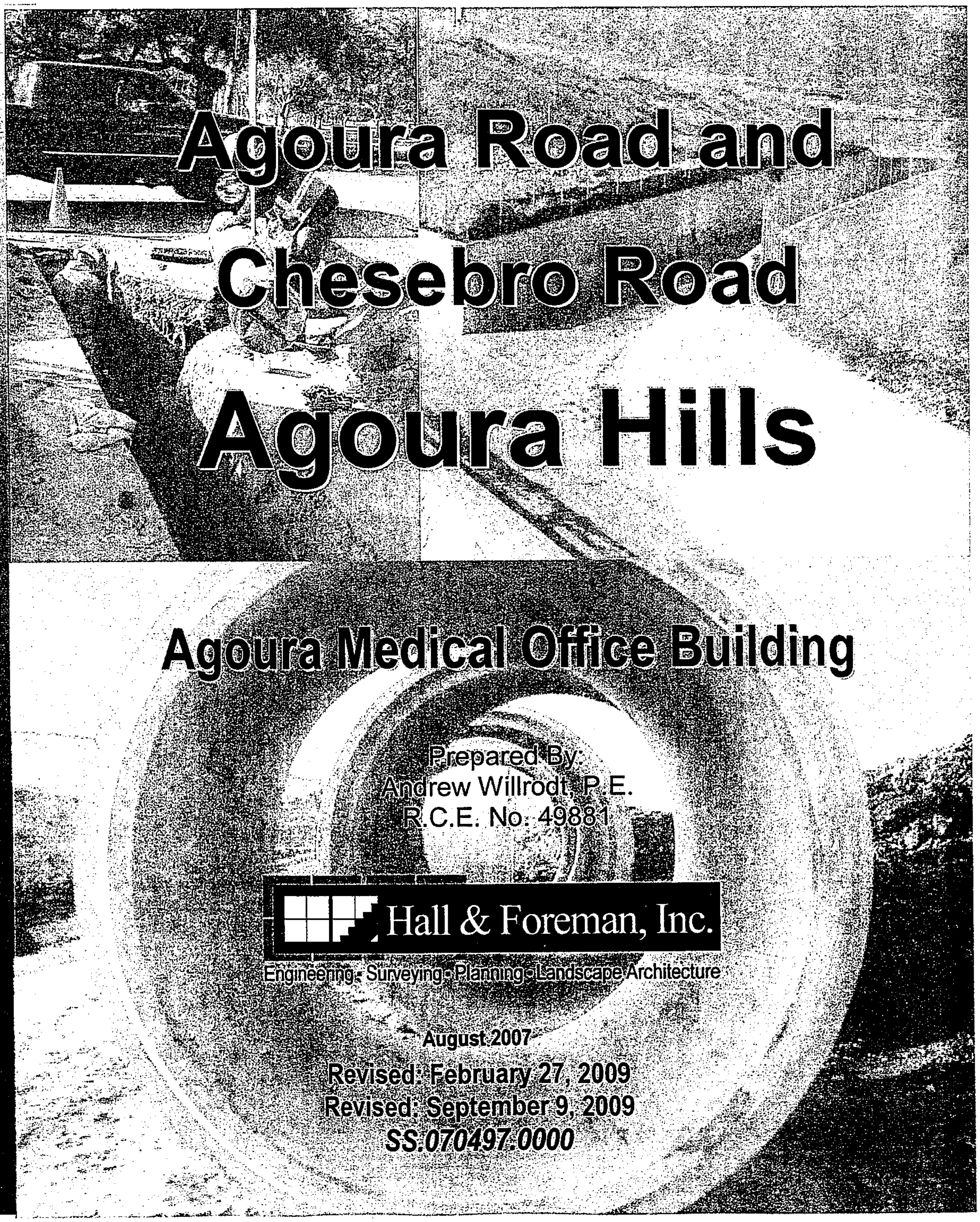
APPENDIX E

REGISTERED PROFESSIONAL ENGINEER
ANDREW JEFFERSON WILLRODT
No. C49881
Exp: 09-30-10
CIVIL
STATE OF CALIFORNIA

9-9-09

SEP 2 5 2009

On-Site Hydrology Study and Report



Agoura Road and Chesebro Road

Agoura Hills

Agoura Medical Office Building

Prepared By:
Andrew Willrodt, P.E.
R.C.E. No. 49881

Hall & Foreman, Inc.
Engineering · Surveying · Planning · Landscape Architecture

August 2007
Revised: February 27, 2009
Revised: September 9, 2009
SS:070497.0000

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TABLE OF CONTENTS

1.0 INTRODUCTION

This report presents the onsite hydrology analysis for the proposed Agoura Medical Office Building. The 1.82 acre site is located in the City of Agoura Hills at the northwest corner of Chesebro Road and Agoura Road and consists of a three level medical office building, underground parking, landscaping, private on-site storm drains and stormwater quality treatment features. See the Vicinity Map, Figure 1 and the Post-Development Hydrology Map, Figure 3 in the Appendix.

2.0 OBJECTIVE

The purpose of this report is to analyze the subject Medical Office project with respect to hydrology storm water runoff and specifically to determine if any on-site storm water detention is required for site development.

3.0 EXISTING CONDITIONS

The existing site is vacant land with the entire site slopping northerly to an existing wall at the north property line. At the low point adjacent to the wall there is an 8" nominal diameter opening, where the site's storm drain flows routes to a concrete valley gutter on the adjacent property. The entire site is 2% impervious. See Pre-Development Hydrology Map, Figure 2 in the Appendix.

4.0 EXISTING STORM DRAINS

As shown on the Pre Development Hydrology Map, Figure 2, there is an existing 15" C.M.P culvert under Chesebro Road that has been abandoned and does not contribute run-on to this site.

The 8" hole in the wall at the northerly property line, noted in item 3.0 is the only existing functional drainage outfall system on the site.

See the "Pre-Development Hydrology Map" (Figure 2) in the Appendix and the "LACDPW Maintained Storm Drains" in the Attachments.

5.0 HYDROLOGIC ANALYSIS AND CALCULATIONS

Hydrology analysis of the project was performed utilizing the Los Angeles County Department of Public Work's hydrologic method, revised in 2006. That method includes new Isohyetal Maps and a new "Tc_Calc_Depth.xls" program. Drainage sub-areas are created and graphically illustrated on Hydrology Maps found in the Appendix.

The site is situated close to the 50-year Isohyet 7.48. (See attached "Calabasas, 50 year Isohyet Map 1-H1.25" in the Attachments). The Soil Classification in the project area is 036. The proportion Impervious for the Pre-Development is "Vacant Area, 02 and for the Post-Development is "Major Medical Health Care Facilities," 74% impervious. See the LACDPW charts "Proportion Impervious Data" in the Attachments.

5.1 On-Site Pre- Development Hydrology

The site is currently vacant and composed of two sub-areas totaling 2.29 acres. The on-site area is designated Sub area A1; and the off-site area is designated Sub area A2. The off-site area extends to the centerlines of the streets, based on the potential of sheet flowing across to the site. This total area produces 9.19 cfs for a 50 year event. See Figure 2 in the Appendix.

With an emphasis on detention requirements we considered the existing undeveloped on-site area that falls within the proposed back of the proposed curb line, Sub-area A1, 1.78 acres, the 50-year event to the existing 8" diameter hole in the north wall generates a flow rate of 7.14 cfs. Sub-area A2, is a 0.51 acre area that generates a 50 year event flow rate of 2.05 cfs. This area currently runs onto the site, but will ultimately flow and remain within the Chesebro Road's curb & gutter (via proposed street improvements) that convey this run-off north on Chesebro Road. In summary, combining sub-areas A1 and A2 totals 2.29 acres, and produces a "clear flow" and "burn flow" peak flow rates of 9.19 cfs for a 50 year event from this site.

For purposes of determining on-site detention requirements we have considered the smaller tributary area (Sub-area A1), thus yielding a more conservative comparison for post development flow rate.

See the Pre-Development Map, Figure 3 and the "TcCalcResults_09-09-09.xls" calculations found in the Appendix.

5.2 On-Site Post-Development Hydrology

The site will consist of three medical office buildings, underground parking, private storm drain systems and landscaping. The site is composed of sub-areas A1-A4. Sub-drainage areas A2 thru A4, comprising a proposed 50 year flow rate of 3.77 cfs will be released to the existing 8" outlet on the northerly wall. Noting this flow rate is significantly less (i.e. 59 % less) than the existing 50 year flow rate of 9.19 cfs currently being released thru the existing 8" outlet on the northerly wall.

Sub-area A1, comprising 0.83 acre, is the upper level area of site which will be composed of the building roof tops and landscape vegetative areas that are located south and east of the building. This sub-area will flow to the proposed retention trenches located on-site via swale and gravel trench features. The 50-year storm event generates a flow rate of 3.33 cfs.

Sub-area A2, comprising 0.65 acre, is primarily composed of the upper level parking of the project site. It also contains a minor portion of the site's landscape area and the hardscape at the entrance of the building. This sub-area will also flow to the existing 8" outlet on the northerly wall via on-site pavement gutters and swale features. The 50-year storm event generates a flow rate of 2.61 cfs.

Sub-area A3, comprising 0.25 acre, is the lower area which will be composed of landscaping and parking areas. This area will flow to the adjoining property to the north via the existing 8" diameter hole on the northerly wall. The 50-year event generates a flow rate of 1.00 cfs.

Sub-area A4, comprising 0.04 acre, is the drive-ramp that leads vehicles to the lower parking area. This area will flow to building's basement collection system. For conservatism of the on-site hydrology we have analyzed this area A4 as routing ultimately to sub-area A3, which is flowing to the existing 8" diameter hole in the northerly wall eventually. The 50-year event generates a flow rate of 0.16 cfs.

Sub-area A5, comprising 0.18 acre, is basically the off-site areas of Chesebro Road and Agoura Roads that currently drain onto the site through un-improved shoulder conditions; and through the proposed public street improvements these area will drain directly down to the intersection of Dorothy and Chesebro Road. The 50-year event generates a flow rate of 0.72 cfs.

See the Post-Development Hydrology Map, Figure 4 and the "TcCalcResults_09-09-09.xls" calculations in the Appendix.

6.0 RETENTION REQUIREMENTS

The City of Agoura Hills municipal Code requirements stipulates two drainage "quantity" criterion be met. (1) The site's post-construction 50 year storm runoff shall not exceed that of the site's 50-year pre-construction runoff; and (2) for this project, the site's post development release through the existing 8" outlet on the northerly wall shall not exceed the site's pre-construction run-off through the same existing outlet. A comparison of the 50-year event post and pre-development runoffs was performed.

Conservatively, for pre-development runoff determinations, we have excluded the 0.51 acre of area run-off originating from the unimproved curb and gutter conditions along Agoura Road and Chesebro Road, per Figure 3. This predevelopment on-site area of 1.78 acres yields a 50 year event peak flow rate of 7.14 cfs.

As described in section 5.0 above and specifically through the use of on-site retention swales and gravel trenches, the site's total post-development on-site runoff area is the 3.77 cfs of which is all released through the existing 8" outlet on the northerly wall. Therefore both criteria have been met. No drainage releases to Chesebro Road.

Because the site will retain a portion of the on-site drainage flows, specifically sub-area A1, the on-site improvements will include a collection of swales and gravel infiltration trench features design to initially retain the drainage run-off volumes and then release the stored drainage to the underlying soils. Sub Area A1 generates a 50-year storm drain volume of 0.35 acre-feet or 15,300 cf. Assuming gravel void ratios of 0.35 to 0.40 this corresponds to a gravel volume of 38,000 to 44,000 cf. For purposes of on-site design we have provided for some 5,600 sf of trench areas which correspond to an average trench depth of 7.5 to 8 feet required for this on-site retention storage requirement.

See Pre and Post Development Hydrology Maps, Figures 3 and 4 and the Tc Calculator data and results in the Appendix.

7.0 OFF-SITE IMPACTS

As a result of the proposed project grading improvements all of the existing on-site storm water flows released off-site will reduced significantly below the site pre-construction condition. The drainage released thru the Sub-drainage Area A5, 0.20 acres, will stay within the Chesebro rights-of-way via newly constructed curb and gutters. The ability to retain a portion of the on-site storm drainage (i.e. sub-area A1, 0.83 acres) through proposed infiltration trenches and as a direct result; the site's storm water released will be reduced to the adjoining tract to the north and ultimately out onto the Dorothy. The reduction of the flow to the northerly property will be a significant reduction of storm water effluent running through the adjoining property as result of this proposed project.

Because of the existing crown conditions in Chesebro Road, as on-site storm water outfalls into the new curb and gutter along Chesebro, it will sheet flow across the Chesebro road pavement surface and into the eastside curb and gutter of Chesebro and ultimately flow northerly into an existing curb basin inlet at the intersection of Dorothy Drive and Chesebro Road (existing inlet is located at the southeast quadrant of intersection).

See the Appendix Item "Flow Master Calculation for Curb & Gutter Conveyance along Chesebro" for the hydraulic calculation demonstrating that the resulting storm water effluent (existing Chesebro component + proposed on-site component) stays well within the existing curb and gutter features of Chesebro Road.

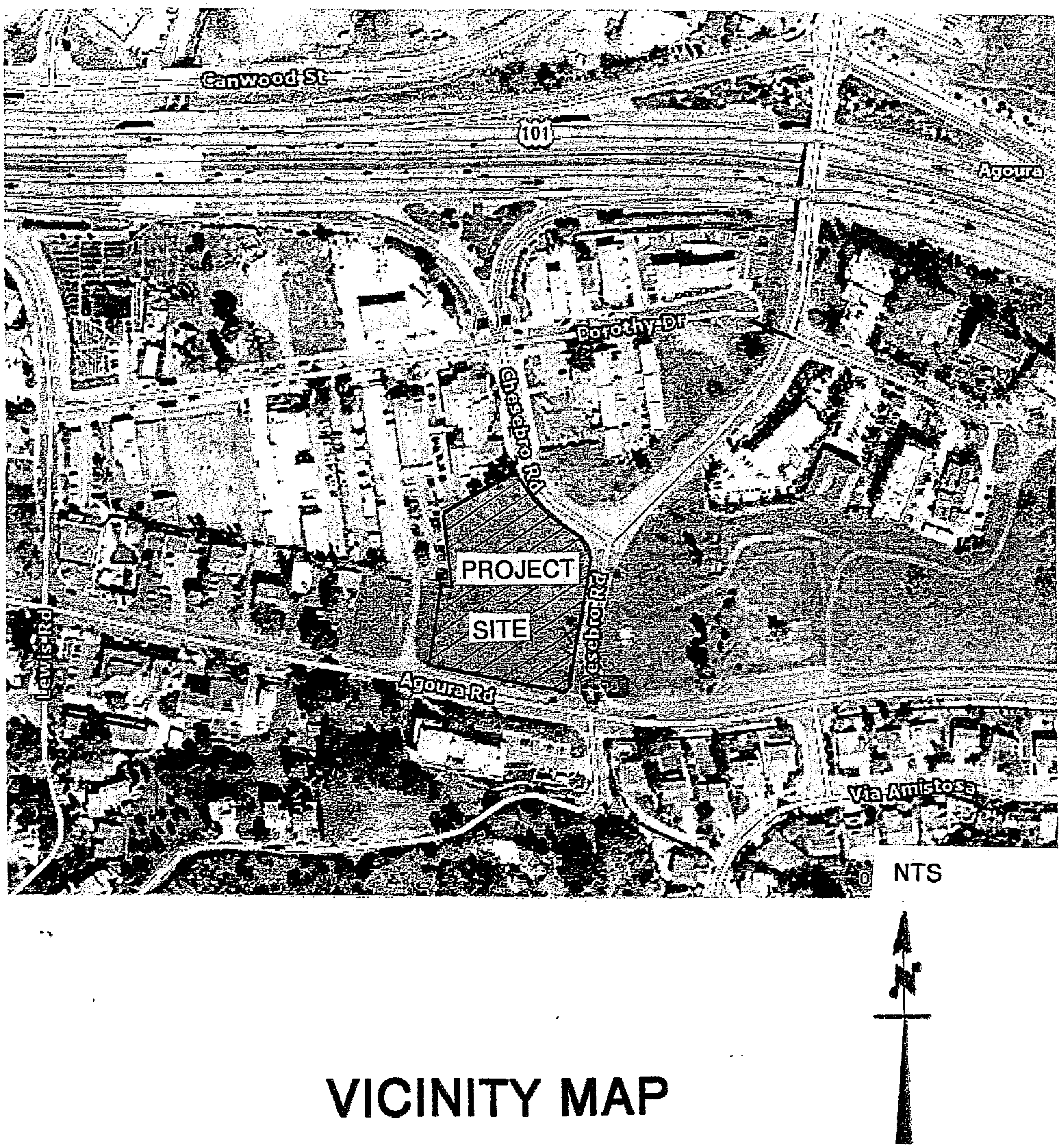
8.0 SUMMARY AND CONCLUSIONS

To comply with the City of Agoura Hills' development requirements, the post-development runoff shall not exceed that of the pre-development, a comparison of the post and pre development 50-year event runoffs was performed.

The result of that comparison concluded the post-development 50-year event runoff will be less than half of the pre-development 50-year event runoff. This conclusion is mainly due the use of on-site swales and gravel infiltration trench features designed to initially retain the drainage run-off volumes and then release the stored drainage to the underlying soils. Also, contributing to reduced storm drain flow rates was the significant flattening of grades for the post development area. Conversely, the existing steep grades and sloping of the site coupled with the type of soil that applies to the pre-development hydrology calculation has contributed to larger pre-development storm water flow rate.

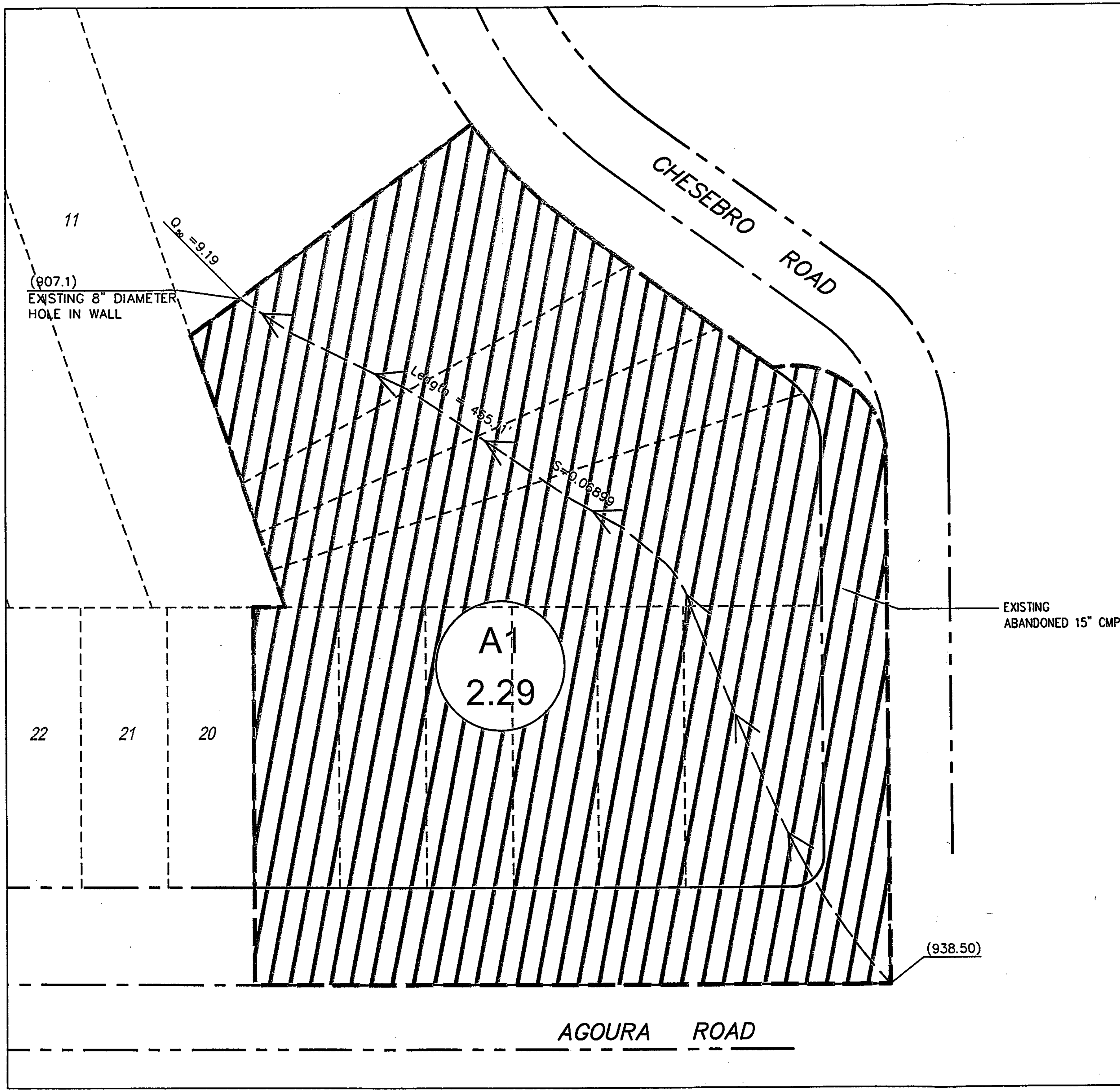
APPENDIX

FIGURE 1



VICINITY MAP

HYDROLOGY MAP FOR
PRE-DEVELOPMENT CONDITION
AGOURA MEDICAL PARTNERS, LLC
MEDICAL OFFICE BUILDING
SWC OF AGOURA RD AND CHESEBRO RD.
AGOURA HILLS, CALIFORNIA



LEGEND

A1 — SUBAREA
2.30 — ACREAGE
Q_{50} — FLOW RATE FOR 50-YR STORM
CFS — CUBIC FEET PER SECOND
→ — FLOW DIRECTION
[dashed box] — SUBAREA DIVISION

SUBAREA FLOW INFORMATION:

SUBAREA	AREA	PERCENT IMPERVIOUS	FLOW LENGTH	FLOW SLOPE	INTENSITY (IN./HR.)	T'c	Q_{50} PEAK FLOW
A1	2.29 AC.	0.02	455.11 FT	0.069	4.46	5.00 MIN.	9.19 CFS

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I CONSTRUCTION GROUP
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CALABASAS, CA 91302
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FAX: (818) 222-4331

ENGINEER:
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25152 SPRINGFIELD COURT, SUITE 350
SANTA CLARITA, CA 91355
(661) 284-7400
(661) 284-7401
CONTACT: ANDREW J. WILLRODT

GRAPHIC SCALE 1"= 50'
0 25 50 100

FIGURE 2

Hall & Foreman, Inc.
Civil Engineering • Planning • Surveying • Public Works
20950 Warner Center Lane, Ste. A • Woodland Hills, CA 91367 • (818) 251-1200

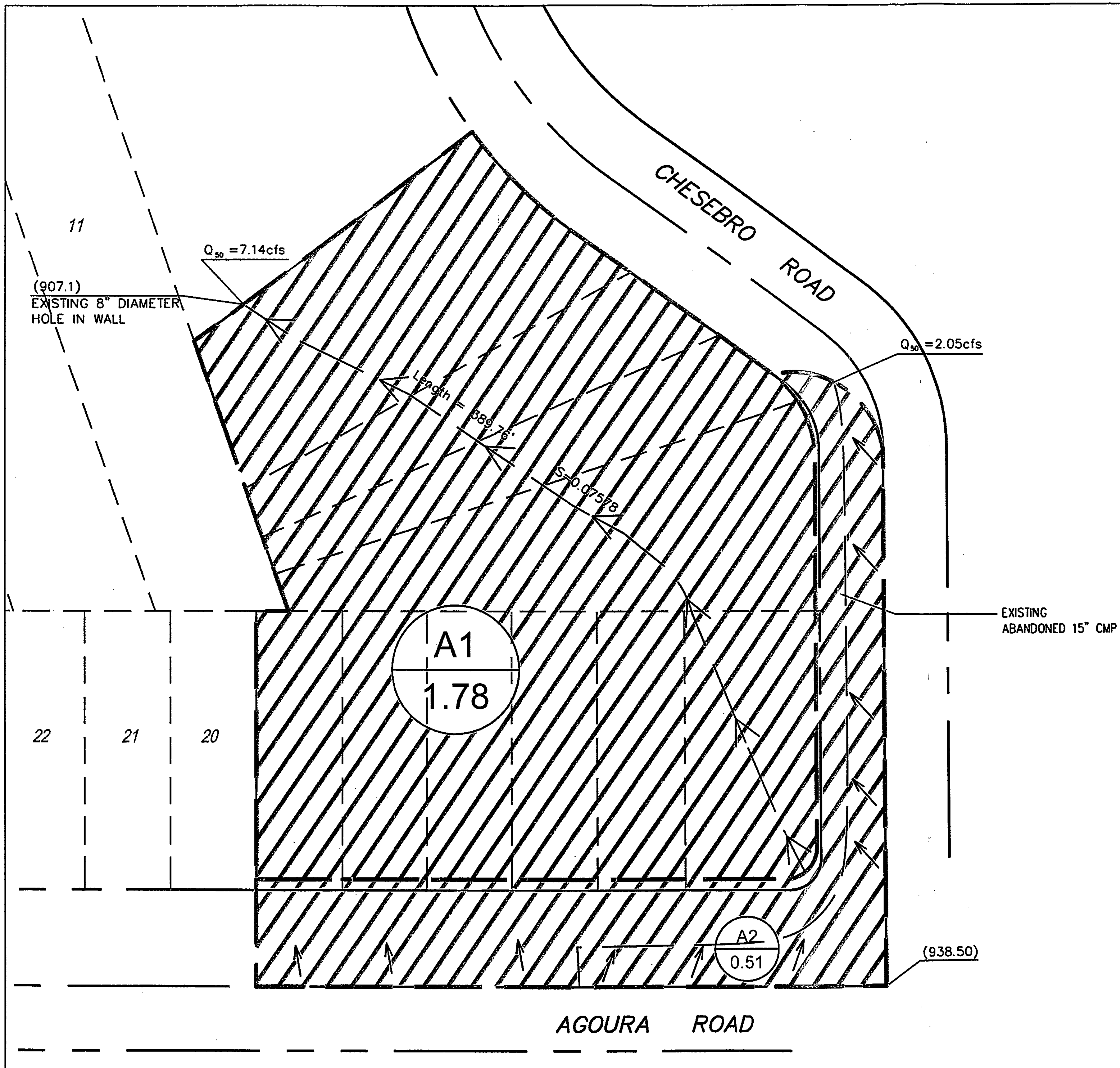
Drawing Title:
PRE DEVELOPEMENT HYDROLOGY MAP – A
AGOURA MEDICAL OFFICE BUILDING

Prepared for:
I Construction Group
23945 Calabasas Road, Suite 111
Calabasas, CA 91302
Telephone: (818) 222-4990
Fax: (818) 222-4331

Work Order ss.070497.0000
Date: 09-09-09
Scale: 1" = 50'
Designed: HC
Drawn: JC
Checked: AW
Page 1 of 1 Pages

Drawing Name: L:\07497\Eng\07497\Hm\Hydrology Report\03_Exhibit Adjustments for Submittal_09-09-09\01_d07497_PreDevelopment_A.dwg
Last Opened: Sep 09, 2009 – 11:21am by JCruz

HYDROLOGY MAP FOR PRE-DEVELOPMENT CONDITION AGOURA MEDICAL PARTNERS, LLC MEDICAL OFFICE BUILDING SWC OF AGOURA RD AND CHESEBRO RD. AGOURA HILLS, CALIFORNIA



LEGEND

- A1 — SUBAREA
- 1.94 — ACREAGE
- Q_{50} — FLOW RATE FOR 50-YR STORM
- CFS — CUBIC FEET PER SECOND
- → — FLOW DIRECTION
- - - - — SUBAREA DIVISION

SUBAREA FLOW INFORMATION:

SUBAREA	AREA	PERCENT IMPERVIOUS	FLOW LENGTH	FLOW SLOPE	INTENSITY (IN./HR.)	T'c	Q_{50} PEAK FLOW
A1	1.78 AC.	0.02	389.76 FT	0.076	4.46	5.00 MIN.	7.14 CFS
A2	0.51 AC.	0.02	386.59 FT	0.055	4.46	5.00 MIN.	2.05 CFS

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(661) 284-7401
CONTACT: ANDREW J. WILLRODT

GRAPHIC SCALE 1"= 50'
0 25 50 100

FIGURE 3

Hall & Foreman, Inc.
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Drawing Title: *PRE DEVELOPEMENT HYDROLOGY MAP - B AGOURA MEDICAL OFFICE BUILDING*

Prepared for:
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Calabasas, CA 91302
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Work Order: ss.070497.0000
Date: 09-09-09
Scale: 1" = 50'
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Drawn: JC
Checked: AW
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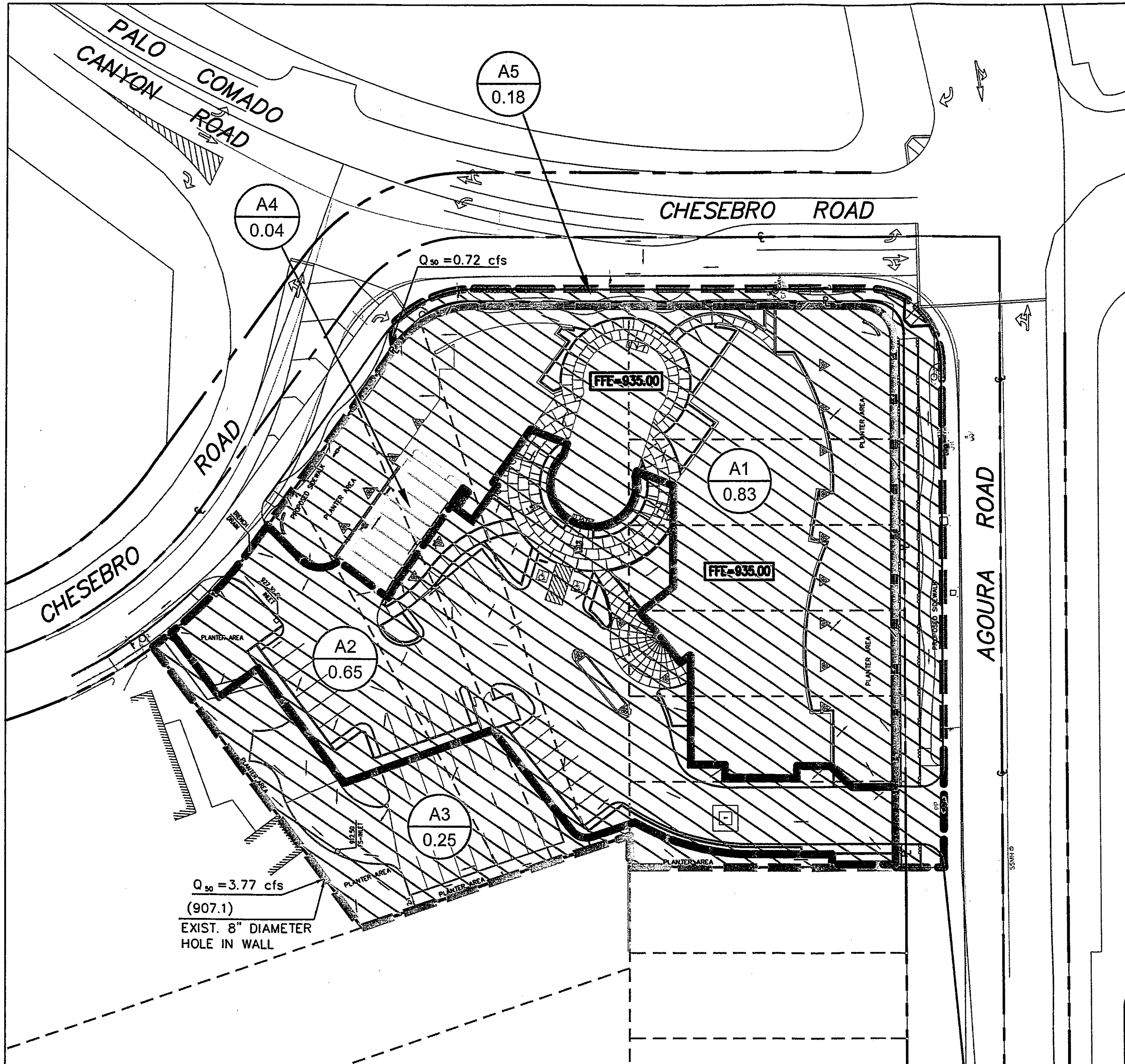
HYDROLOGY MAP FOR POST-DEVELOPMENT CONDITION
AGOURA MEDICAL PARTNERS, LLC
MEDICAL OFFICE BUILDING
SWC OF AGOURA RD AND CHESEBRO RD.
AGOURA HILLS, CALIFORNIA



LEGEND

- SSMH — SEWER MANHOLE
- WM — WATER METER
- WV — WATER VALVE
- PP — POWER POLE
- SIGN
- FH — FIRE HYDRANT
- GUY WIRE
- CATV — CABLE TV BOX
- CFS — CUBIC FEET PER SECOND
- A1 / 0.97 — SUBAREA / ACRES
- FLOW DIRECTION
- SUBAREA DIVISION

SUBAREA FLOW INFORMATION:

SUBAREA	AREA	PERCENT IMPERVIOUS	FLOW LENGTH	FLOW SLOPE	INTENSITY (IN./HR.)	T'c	Q_{50} PEAK FLOW
A1	0.83 AC.	0.63	514.77 FT	0.0286	4.46	5.00 MIN.	3.33 CFS
A2	0.65 AC.	0.78	356.92 FT	0.0326	4.46	5.00 MIN.	2.61 CFS
A3	0.25 AC.	0.60	283.83 FT	0.0715	4.46	5.00 MIN.	1.00 CFS
A4	0.04 AC.	0.95	68.74 FT	0.1500	4.46	5.00 MIN.	0.16 CFS
A5	0.18 AC.	0.95	520.25 FT	0.0383	4.46	5.00 MIN.	0.72 CFS

GRAPHIC SCALE 1" = 50'
0 25 50 100

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FIGURE 4

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Drawing Title: *POST DEVELOPMENT HYDROLOGY MAP AGOURA MEDICAL OFFICE BUILDING*

Prepared for:
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Checked: AW
Page 1 of 1 Pages

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Last Opened: Sep 09, 2009 - 4:02pm by JCruz

Pre-Development Drainage Flow Rate Calculation

I Construction Group
Agoura Medical Office Building
SWC of Agoura Hills Road and Chesebro Road, Agoura Hills, California 91301

Hydrology Data for Pre-Development Condition - 50-Year Storm Event

Data for Figure 2

Project	Drainage Subarea	Area (acres)	Percent Impervious	Frequency (Year)	Soil Type	Length (feet)	Slope (feet/feet)	Isohyet (inches)	T'c-calculated (minutes)	Intensity (in./hr)	Undeveloped Cu	Developed Cd	Flow Rate (cfs)	Volume (acre-feet)
Medical Plaza	A1	2.30	0.02	50	36	455.11	0.069	7.48	5.00	4.46	0.90	0.90	9.24	0.49

Data for Figure 3

Project	Drainage Subarea	Area (acres)	Percent Impervious	Frequency (Year)	Soil Type	Length (feet)	Slope (feet/feet)	Isohyet (inches)	T'c-calculated (minutes)	Intensity (in./hr)	Undeveloped Cu	Developed Cd	Flow Rate (cfs)	Volume (acre-feet)
Medical Plaza	A1	1.79	0.02	50	36	402.06	0.076	7.48	5.00	4.46	0.90	0.90	7.19	0.38
Medical Plaza	A2	0.51	0.02	50	36	385.20	0.055	7.48	5.00	4.46	0.90	0.90	2.05	0.11

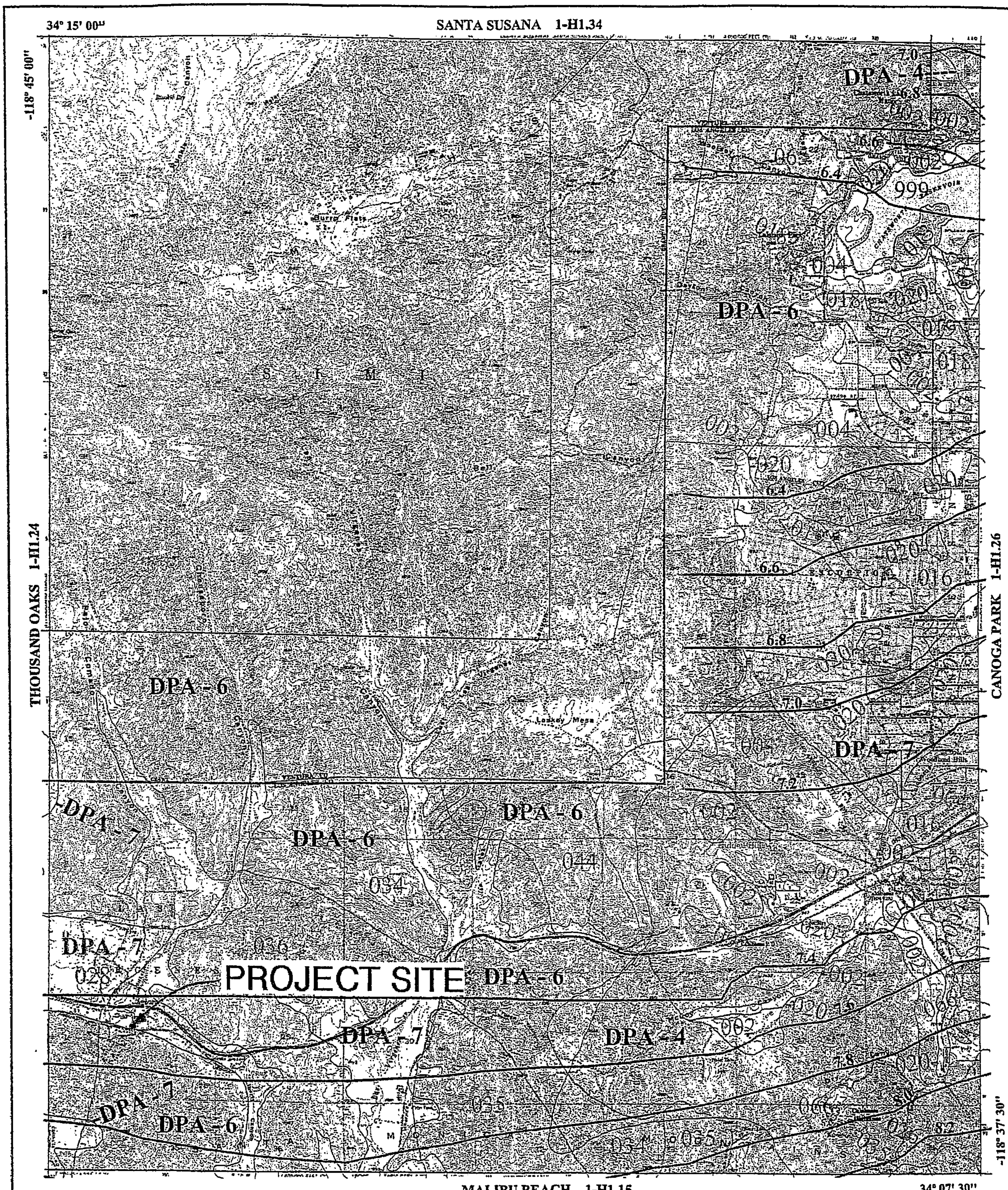
Post-Development Drainage Flow Rate Calculation

I Construction Group
Agoura Medical Office Building
SWC of Agoura Hills Road and Chesebro Road, Agoura Hills, California 91301

Hydrology Data for Post-Development Condition - 50-Year Storm Event

Project	Drainage Subarea	Area (acres)	Percent Impervious	Frequency (Year)	Soil Type	Length (feet)	Slope (feet/feet)	Isohyet (inches)	T'c-calculated (minutes)	Intensity (in./hr)	Undeveloped Cu	Developed Cd	Flow Rate (cfs)	Volume (acre-feet)
Medical Plaza	A1	0.83	0.63	50	36	514.77	0.02864	7.48	5.00	4.46	0.90	0.90	3.33	0.35
Medical Plaza	A2	0.65	0.79	50	36	356.92	0.03256	7.48	5.00	4.46	0.90	0.90	2.61	0.31
Medical Plaza	A3	0.25	0.59	50	36	283.83	0.07152	7.48	5.00	4.46	0.90	0.90	1.00	0.10
Medical Plaza	A4	0.04	0.95	50	36	68.74	0.15000	7.48	5.00	4.46	0.90	0.90	0.16	0.02
Medical Plaza	A5	0.18	0.95	50	36	520.25	0.03825	7.48	5.00	4.46	0.90	0.90	0.72	0.10

ATTACHMENTS



N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

CALABASAS
50-YEAR 24-HOUR ISOHYET

1-H1.25

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Soil Identification Table

Number	Name	Original Name
2	ALTAMONT CLAY LOAM	A
3	CHINO SILT LOAM	CS-1
4	DIABLO CLAY LOAM	DY
5	HANFORD FINE SANDY LOAM	HF
6	HANFORD FINE SANDY LOAM	HF-1
7	HANFORD GRAVELLY SANDY LOAM	HG
8	HANFORD SILT LOAM	HN
9	MONTEZUMA CLAY ADOBE	M
10	OAKLEY FINE SAND	OS
11	PLACENTIA LOAM	PL
12	RAMONA CLAY LOAM	RC- 1
13	RAMONA LOAM	RO
14	RAMONA SANDY LOAM	RS
15	TUJUNGA FINE SANDY LOAM	TF
16	YOLO LOAM	Y
17	YOLO CLAY LOAM	YC
18	YOLO FINE SANDY LOAM	YF
19	YOLO GRAVELLY SANDY LOAM	YG
20	YOLO SANDY LOAM	YS
21	SANTA MONICA MOUNTAINS	SMM-1
22	SANTA MONICA MOUNTAINS	SMM-2
23	SANTA MONICA MOUNTAINS	SMM-3
24	SANTA MONICA MOUNTAINS	SMM-4
25	SANTA MONICA MOUNTAINS	SMM-5
26	SANTA MONICA MOUNTAINS	SMM-6
27	SANTA MONICA MOUNTAINS	SMM-7
28	SANTA MONICA MOUNTAINS	SMM-8
29	SANTA MONICA MOUNTAINS	SMM-9
30	SANTA MONICA MOUNTAINS	SMM-10
31	SANTA MONICA MOUNTAINS	SMM- 11
32	SANTA MONICA MOUNTAINS	SMM-12
33	SANTA MONICA MOUNTAINS	SMM-13
34	SANTA MONICA MOUNTAINS	SMM-14
35	SANTA MONICA MOUNTAINS	SMM-15
36	SANTA MONICA MOUNTAINS	SMM-16
37	SANTA MONICA MOUNTAINS	SMM- 17
38	SANTA MONICA MOUNTAINS	SMM- 18

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

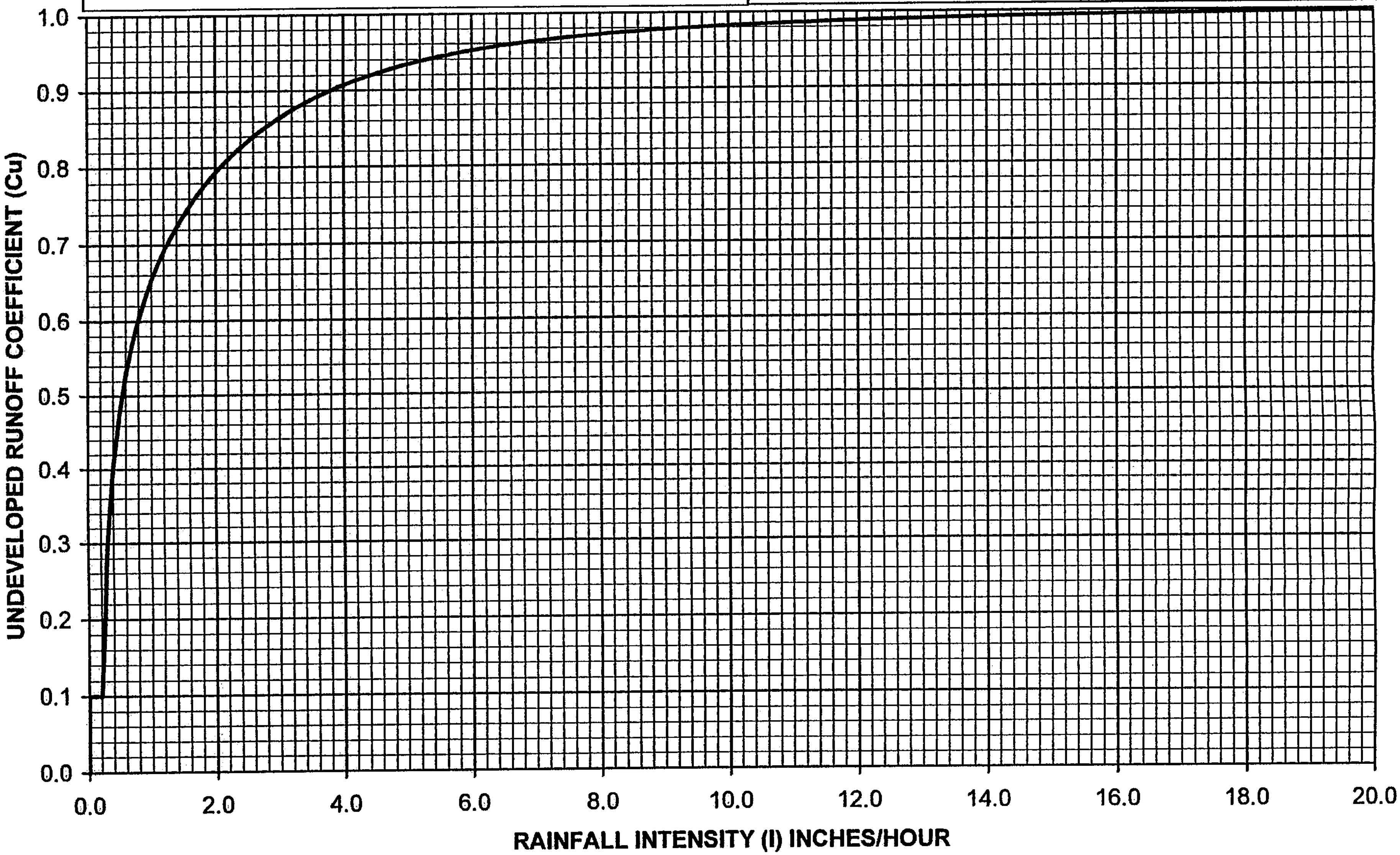
Where: C_D = Developed Runoff Coefficient

IMP = Proportion Impervious

C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

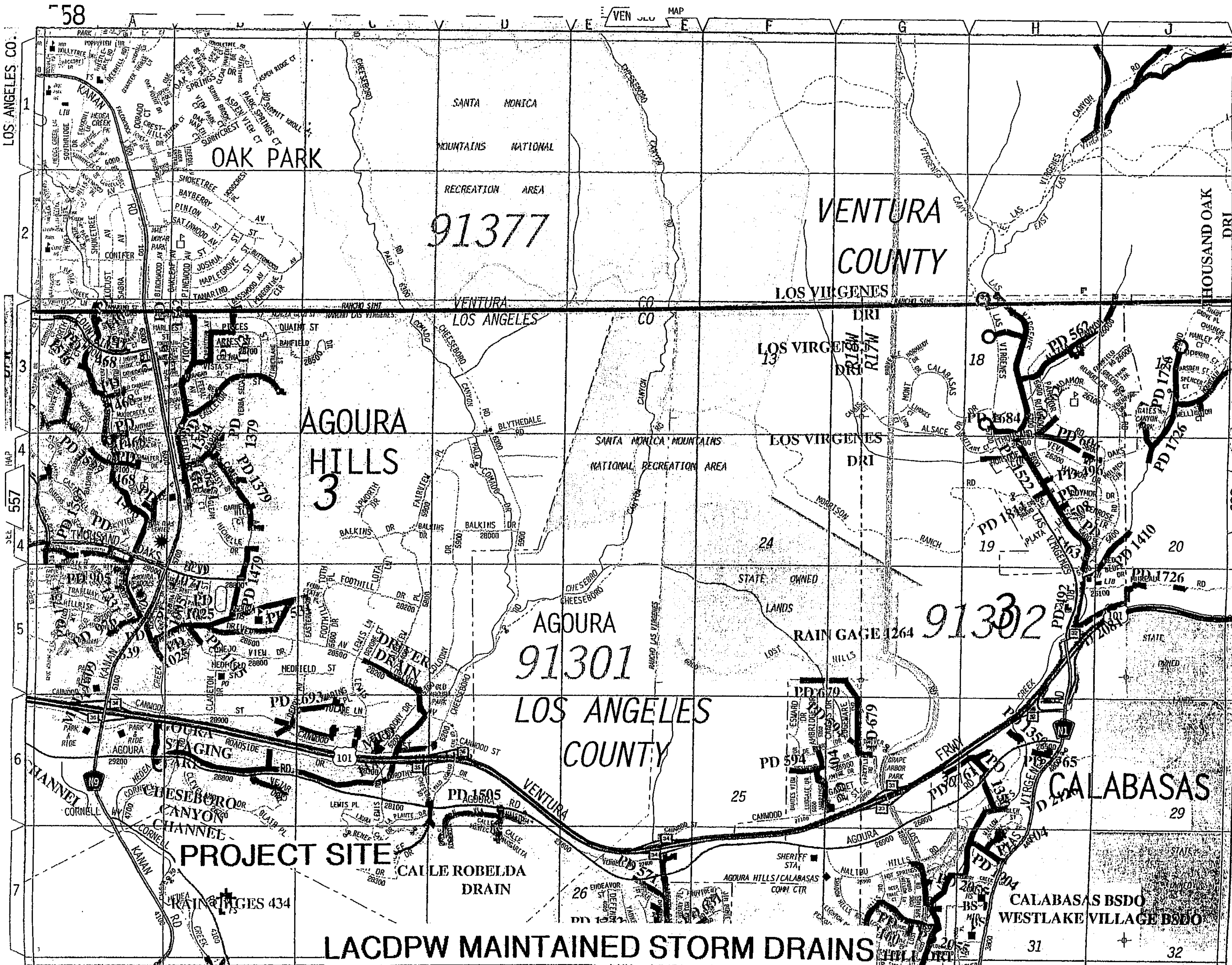
RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 036



Proportion Impervious Data

Code	Land Use Description	% Impervious
1111	High-Density Single Family Residential	42
1112	Low-Density Single Family Residential	21
1121	Mixed Multi-Family Residential	74
1122	Duplexes, Triplexes and 2-or 3-Unit Condominiums and Townhouses	55
1123	Low-Rise Apartments, Condominiums, and Townhouses	86
1124	Medium-Rise Apartments and Condominiums	86
1125	High-Rise Apartments and Condominiums	90
1131	Trailer Parks and Mobile Home Courts, High-Density	91
1132	Mobile Home Courts and Subdivisions, Low-Density	42
1140	Mixed Residential	59
1151	Rural Residential, High-Density	15
1152	Rural Residential, Low-Density	10
1211	Low- and Medium-Rise Major Office Use	91
1212	High-Rise Major Office Use	91
1213	Skyscrapers	91
1221	Regional Shopping Center	95
1222	Retail Centers (Non-Strip With Contiguous Interconnected Off-Street	96
1223	Modern Strip Development	96
1224	Older Strip Development	97
1231	Commercial Storage	90
1232	Commercial Recreation	90
1233	Hotels and Motels	96
1234	Attended Pay Public Parking Facilities	91
1241	Government Offices	91
1242	Police and Sheriff Stations	91
1243	Fire Stations	91
1244	Major Medical Health Care Facilities	74
1245	Religious Facilities	82
1246	Other Public Facilities	91
1247	Non-Attended Public Parking Facilities	91
1251	Correctional Facilities	91
1252	Special Care Facilities	74
1253	Other Special Use Facilities	86
1261	Pre-Schools/Day Care Centers	68
1262	Elementary Schools	82
1263	Junior or Intermediate High Schools	82
1264	Senior High Schools	82
1265	Colleges and Universities	47
1266	Trade Schools and Professional Training Facilities	91
1271	Base (Built-up Area)	65
1271.01	Base High-Density Single Family Residential	42
1271.02	Base Duplexes, Triplexes and 2-or 3-Unit Condominiums and T	55

Code	Land Use Description	% Impervious
1271.03	Base Government Offices	91
1271.04	Base Fire Stations	91
1271.05	Base Non-Attended Public Parking Facilities	91
1271.06	Base Air Field	45
1271.07	Base Petroleum Refining and Processing	91
1271.08	Base Mineral Extraction - Oil and Gas	10
1271.09	Base Harbor Facilities	91
1271.10	Base Navigation Aids	47
1271.11	Base Developed Local Parks and Recreation	10
1271.12	Base Vacant Undifferentiated	1
1272	Vacant Area	2
1273	Air Field	45
1274	Former Base (Built-up Area)	65
1275	Former Base Vacant Area	2
1276	Former Base Air Field	91
1311	Manufacturing, Assembly, and Industrial Services	91
1312	Motion Picture and Television Studio Lots	82
1313	Packing Houses and Grain Elevators	96
1314	Research and Development	91
1321	Manufacturing	91
1322	Petroleum Refining and Processing	91
1323	Open Storage	66
1324	Major Metal Processing	91
1325	Chemical Processing	91
1331	Mineral Extraction - Other Than Oil and Gas	10
1332	Mineral Extraction - Oil and Gas	10
1340	Wholesaling and Warehousing	91
1411	Airports	91
1411.01	Airstrip	10
1412	Railroads	15
1412.01	Railroads-Attended Pay Public Parking Facilities	91
1412.02	Railroads-Non-Attended Public Parking Facilities	91
1412.03	Railroads-Manufacturing, Assembly, and Industrial Services	91
1412.04	Railroads-Petroleum Refining and Processing	91
1412.05	Railroads-Open Storage	66
1412.06	Railroads-Truck Terminals	91
1413	Freeways and Major Roads	91
1414	Park-and-Ride Lots	91
1415	Bus Terminals and Yards	91
1416	Truck Terminals	91
1417	Harbor Facilities	91
1418	Navigation Aids	47
1420	Communication Facilities	82
1420.01	Communication Facilities-Antenna	2


558
© 2002 Thomas Bros. Maps
LOS ANGELES CO.
OAK PARK
SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
91377
VENTURA COUNTY
LOS VIRGENES DRI
AGOURA HILLS 3
AGOURA 91301
LOS ANGELES COUNTY
RAIN GAGE 1264
91302
CALABASAS
PROJECT SITE
CALLE ROBELDA DRAIN
CHESEBORO CANYON CHANNEL
AGOURA STAGING AREA
DRIVER DRAIN
RAIN GAGES 434
CALABASAS BSDO
WESTLAKE VILLAGE BSDO
LACDPW MAINTAINED STORM DRAINS
PD 1379
PD 1479
PD 1504
PD 1505
PD 1025
PD 693
PD 679
PD 594
PD 562
PD 1726
PD 1410
PD 1522
PD 1684
PD 1904
PD 1354
PD 1765
SEE 557 MAP
SEE 559 MAP

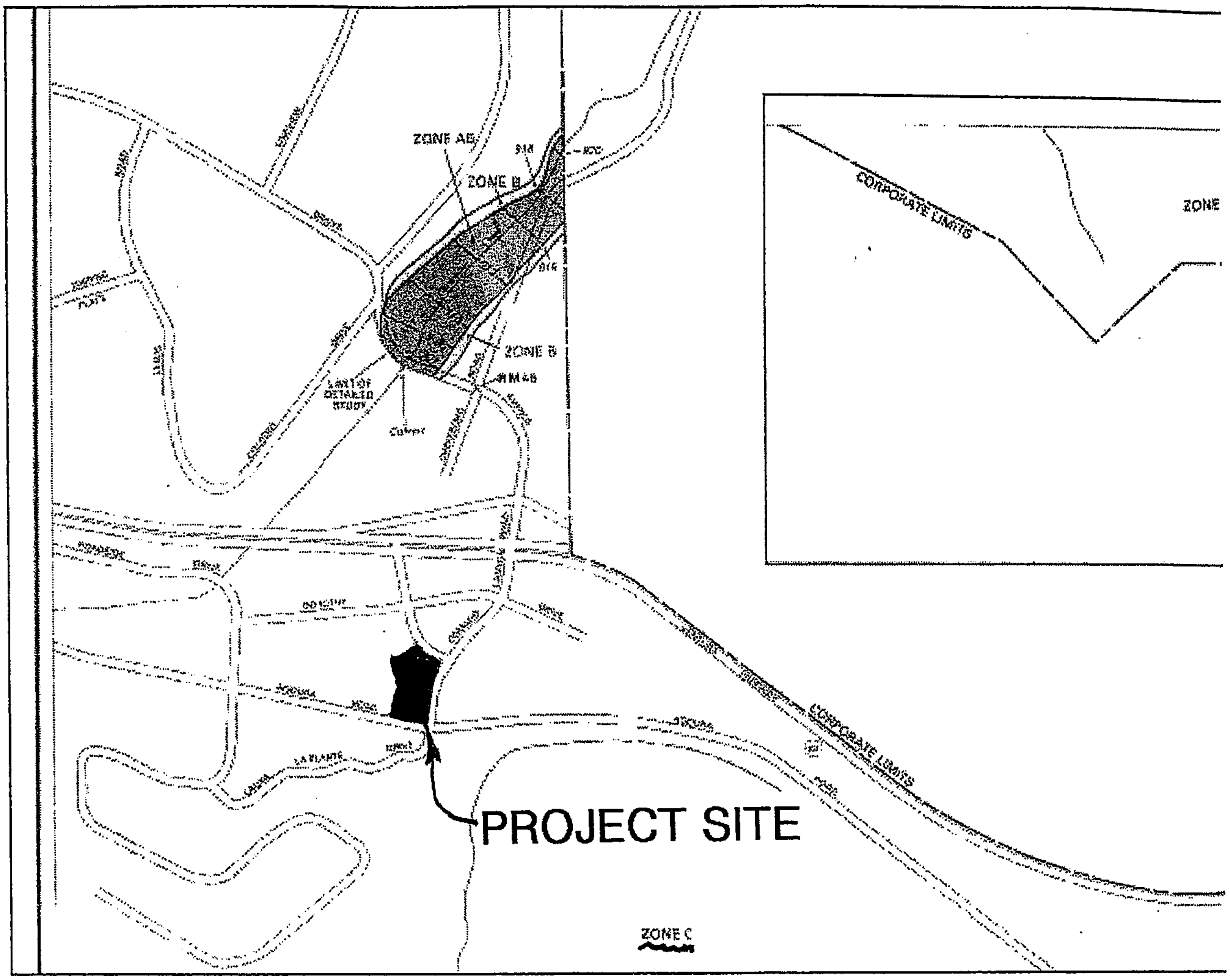
FEMA MSC Viewer

Scale: 13 %

Help

Zoom Win | Pan | Zoom In | Zoom Out | 1:1 Zoom In | MAX Zoom Out

Make a FIRMette



FIRM MAP

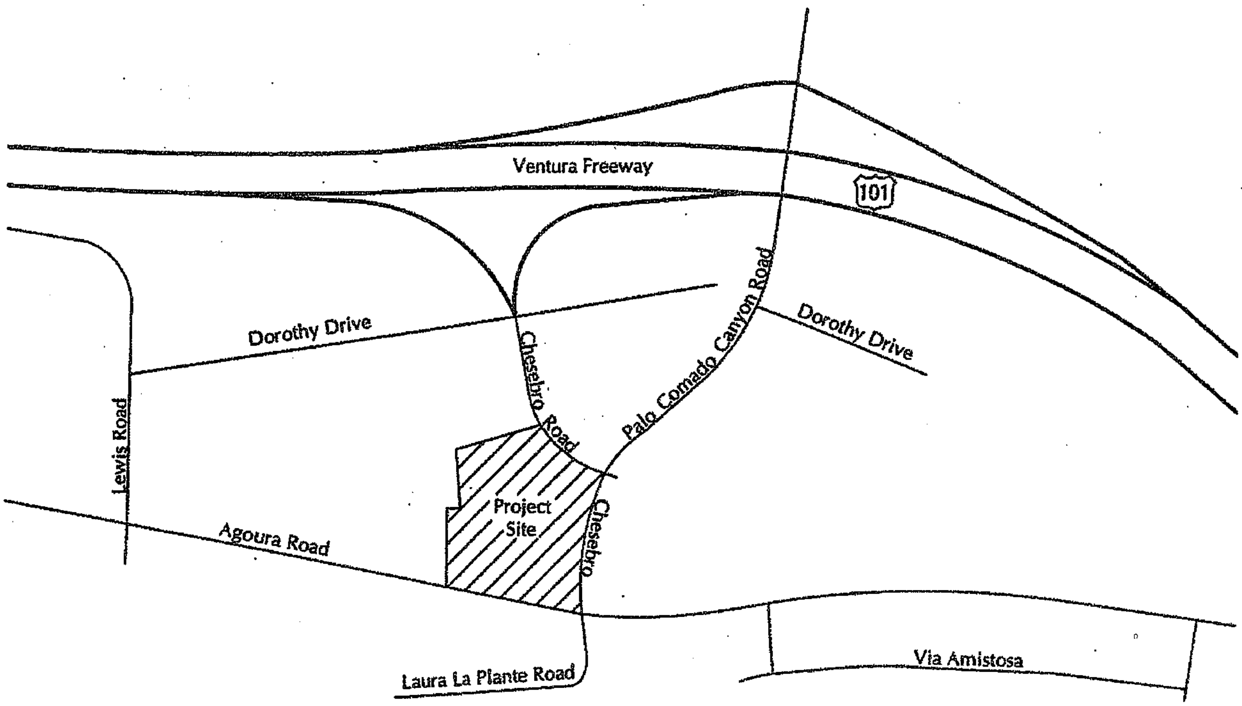
Transportation/ Traffic

- Traffic & Circulation Study

APPENDIX F

AGOURA MEDICAL OFFICE PROJECT
CITY OF AGOURA HILLS, CALIFORNIA

REVISED TRAFFIC AND CIRCULATION STUDY



August 27, 2008 | ATE Project #08007

Prepared for:

Agoura Medical Partners LLC
23945 Calabasas Road, Suite 111
Agoura Hills, CA 91302

ASSOCIATED TRANSPORTATION ENGINEERS
100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110-1686 • (805) 687-4418 • FAX (805) 682-8509

ASSOCIATED TRANSPORTATION ENGINEERS
100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110 • (805) 687-4418 • FAX (805) 682-8509

Since 1978

Richard L. Pool, P.E.
Scott A. Schell, AICP PTP

August 27, 2008 08007R02.WPD

Dr. Daniel C. Smith, DDS
Agoura Medical Partners LLC
23945 Calabasas Road, Suite 111
Agoura Hills, CA 91302

REVISED TRAFFIC AND CIRCULATION STUDY FOR THE AGOURA MEDICAL OFFICE PROJECT, CITY OF AGOURA HILLS, CALIFORNIA

Associated Transportation Engineers has revised the following traffic and circulation study for the Agoura Medical Office Project, proposed in the City of Agoura Hills. This report was revised to address comments made in a letter by City of Agoura Hills staff on July 16, 2008.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP
Principal Transportation Planner

CONTENTS

TABLES

FIGURES

INTRODUCTION

The following study contains an analysis of the potential traffic and circulation impacts associated with the Agoura Medical Office Project. The report provides information regarding existing and future traffic conditions within the project study-area, and recommends improvements where necessary. The report reviews the site access and circulation system and provides an analysis of the project's consistency with the policies outlined in the Congestion Management Program (CMP). This revised report also addresses the comments from City staff on July 16, 2008.

PROJECT DESCRIPTION

The project is proposing to construct a 40,733 square-foot medical office facility on a vacant lot located on the northwest corner of the Agoura Road/Chesebro Road intersection. Figure 1 shows the location of the project site within the City of Agoura Hills. Access to the site would be provided via one driveway on Agoura Road and one driveway on Chesebro Road. A total of 210 parking spaces would be provided for the site in a surface lot and a subterranean parking garage. Figure 2 illustrates the project site plan.

EXISTING CONDITIONS

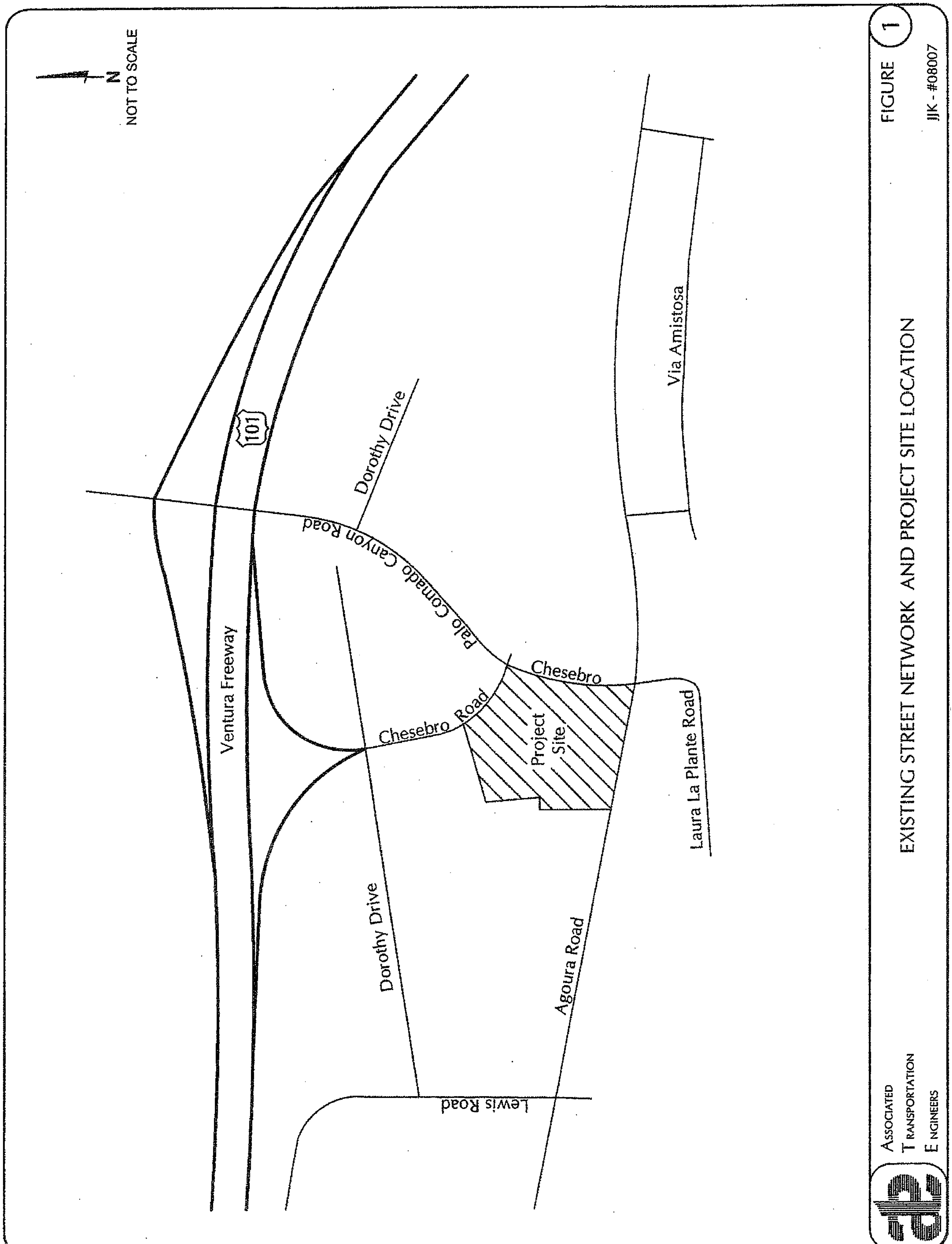
Street Network

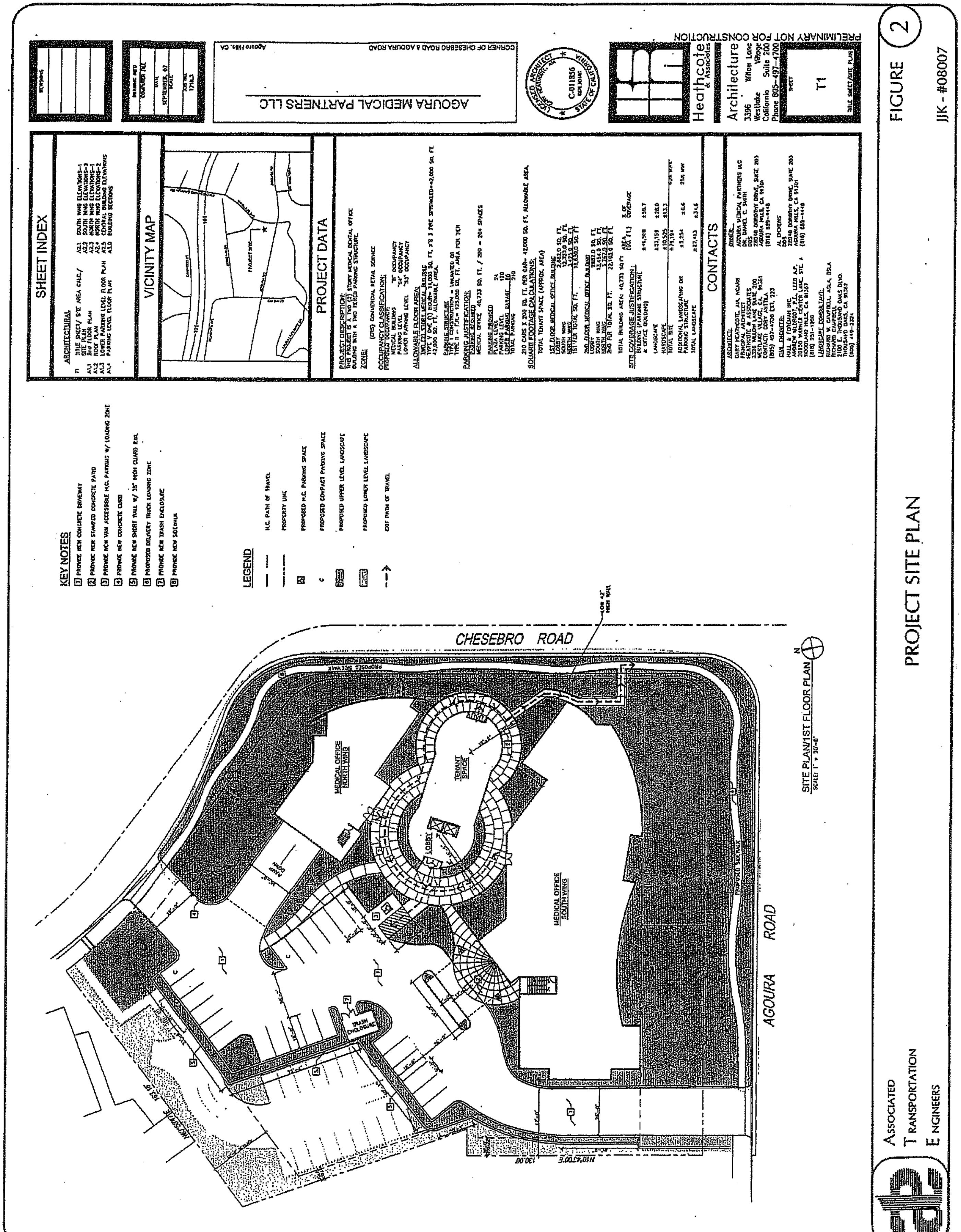
The project site is served by a network of highways, arterial streets and collector streets as illustrated in Figure 1. The following text provides a brief description of the major components of the study-area street network.

U.S. Highway 101, located north of the project site, is a multi-lane interstate highway serving the Pacific coast between Los Angeles and the state of Washington. This highway is the principal route between the City of Agoura Hills and the adjacent cities of Thousand Oaks and Westlake Village to the north, and the cities of Calabasas, Hidden Hills, and Los Angeles to the south. Access between the site and U.S. Highway 101 is provided via the Palo Comado-Chesebro Road interchange. The ramp intersections at this interchange are controlled by stop-signs.

Agoura Road, located along the project's southern frontage, is a 2-lane east-west arterial roadway that extends between Las Virgenes Road on the east and South Westlake Boulevard on the west. Within the study area, the Agoura Road/Lewis Road intersection is controlled by stop-signs on the Lewis Road approach and the Agoura Road/Chesebro Road intersection is controlled by all-way stop-signs.

Palo Comado Canyon Road, located northeast of the project, is an 2-lane north-south arterial roadway that extends north from the intersection of Chesebro Road to the intersection of Driver Avenue/Chesebro Road located north of U.S. Highway 101.


N
NOT TO SCALE
Ventura Freeway
101
Dorothy Drive
Palo Comado Canyon Road
Chesebro
Chesebro Road
Project Site
Via Amistosa
Laura La Plante Road
Dorothy Drive
Agoura Road
Lewis Road
Associated Transportation Engineers
EXISTING STREET NETWORK AND PROJECT SITE LOCATION
FIGURE 1
JJK - #08007


AGOURA MEDICAL PARTNERS LLC
SHEET INDEX
VICINITY MAP
PROJECT DATA
CONTACTS
KEY NOTES
LEGEND
PRELIMINARY NOT FOR CONSTRUCTION
Heathcote & Associates
Architecture
CHESEBRO ROAD
AGOURA ROAD
MEDICAL OFFICE NORTH WING
MEDICAL OFFICE SOUTH WING
TENANT SPACE
LOBBY
SITE PLAN/1ST FLOOR PLAN
PROJECT SITE PLAN
FIGURE 2
JJK - #08007
ASSOCIATED
TRANSPORTATION
ENGINEERS

Chesebro Road, located along the project's north and east frontages, is a 2-lane arterial roadway that extends north from Agoura Road to the Dorothy Drive/U.S. Highway 101 Southbound Ramps intersection. Within the study area, the U.S. Highway 101 Southbound Ramps/Chesebro Road/Dorothy Drive and Chesebro Road/Agoura Road intersections are controlled by all-way stop-signs. The intersection of Chesebro Road/Palo Comado Canyon Road is two-way stop controlled with stop-signs at the eastbound and westbound approaches.

Lewis Road, located west of the project, is a 2-lane north-south local roadway that extends between Roadside Drive and Laura La Plante Road. Within the study area, Lewis Road is controlled by stop-signs at the Agoura Road intersection.

Intersection Operations

Because traffic flow on urban arterial roadways is most constrained at intersections, detailed traffic flow analyses focus on the operating conditions of critical intersections during peak travel periods. In rating intersection operations, "Levels of Service" (LOS) A through F are used, with LOS A indicating free flow operations and LOS F indicating congested operations (more complete definitions of levels of service are included in the Technical Appendix). The City of Agoura Hills considers LOS C as the minimum acceptable operating standard for intersections.

Figure 3 shows the study-area intersections, the existing traffic controls, and the intersection lane geometries. Existing peak hour volumes at study-area intersections were collected during January 2008 for this study (traffic count data is contained in the Technical Appendix for reference). Existing A.M. and P.M. peak hour traffic volumes for the study-area intersections are shown on Figure 4. Levels of service were calculated for the unsignalized intersections using the methodology outlined in the Highway Capacity Manual (HCM) [1]. Table 1 lists the existing levels of service for the study-area intersections (calculation worksheets are contained in the Technical Appendix).

---

1 2000 Highway Capacity Manual, Transportation Research Board, National Research Council, 2000.

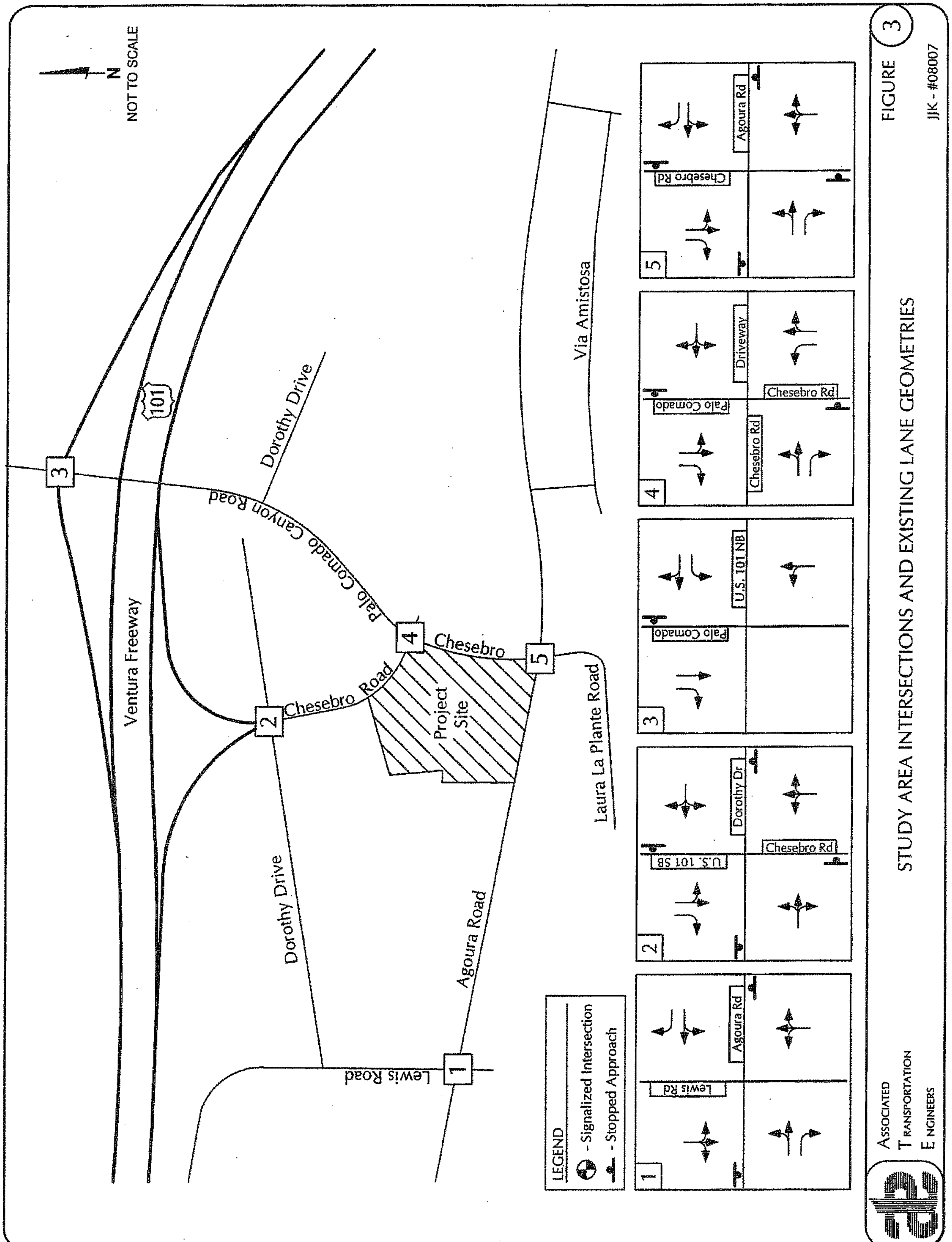


FIGURE 3

STUDY AREA INTERSECTIONS AND EXISTING LANE GEOMETRIES

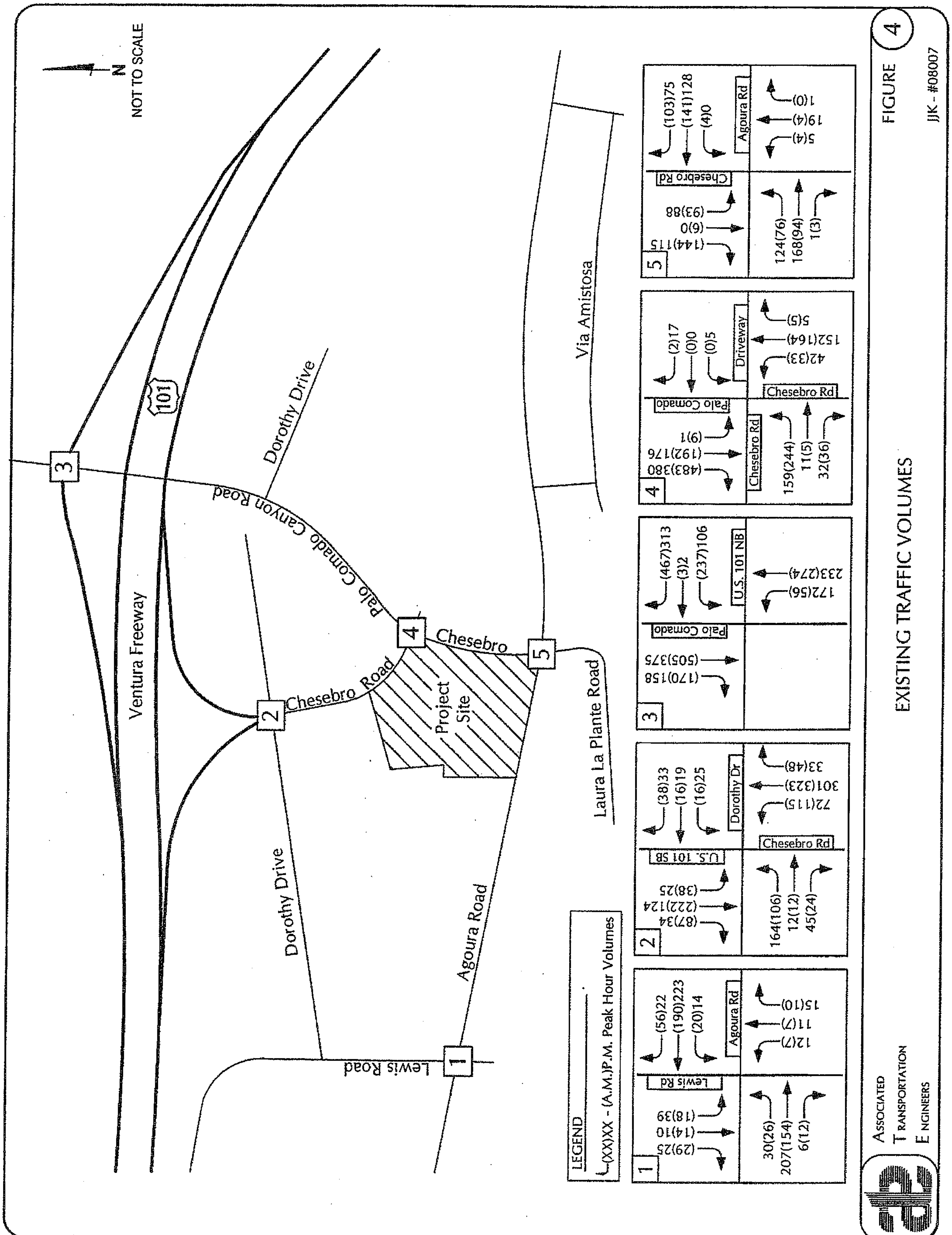

N
NOT TO SCALE
Ventura Freeway
101
Dorothy Drive
Palo Comado Canyon Road
Chesebro Road
Chesebro
Via Amistosa
Laura La Plante Road
Project Site
Agoura Road
Lewis Road
LEGEND
(XX)XX - (A.M.)P.M. Peak Hour Volumes
1
Lewis Rd
Agoura Rd
(29)25
(14)10
(18)39
30(26)
207(154)
6(12)
(56)22
(190)223
(20)14
12(7)
11(7)
15(10)
2
U.S. 101 SB
Dorothy Dr
Chesebro Rd
(87)34
(222)124
(38)25
164(106)
12(12)
45(24)
(38)33
(16)19
(16)25
72(115)
301(323)
33(48)
3
Palo Comado
U.S. 101 NB
(170)158
(505)375
(467)313
(3)2
(237)106
172(56)
233(274)
4
Palo Comado
Driveway
Chesebro Rd
(483)380
(192)176
1(6)
159(244)
11(5)
32(36)
(2)17
(0)0
(0)5
42(33)
152(164)
5(5)
5
Chesebro Rd
Agoura Rd
(144)115
(6)0
(93)88
124(76)
168(94)
1(3)
(103)75
(141)128
(4)0
5(4)
19(4)
1(0)
EXISTING TRAFFIC VOLUMES
FIGURE 4
JJK - #08007
Associated Transportation Engineers

Table 1
Existing Intersection Levels of Service

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Delay	LOS	Delay	LOS
Lewis Road/Agoura Road	8.6 sec	LOS A	8.7 sec	LOS A
U.S. 101 SB Ramps/Chesebro Road/Dorothy Drive	15.8 sec	LOS C	13.2 sec	LOS B
U.S. 101 NB Ramps/Palo Comado Canyon Road	**>50 sec**	**LOS F**	16.3 sec	LOS C
Chesebro Road/Palo Comado Canyon Road	19.5 sec	LOS C	16.7 sec	LOS C
Chesebro Road/Agoura Road	9.5 sec	LOS A	10.8 sec	LOS B

N/A = V/C increase not applicable at LOS C or greater.
Bold Values exceed City's LOS C standard.

The data presented in Table 1 show the U.S. 101 NB Ramps/Palo Comado Canyon Road intersection operates at LOS F during the A.M. peak hour, which exceeds the City's LOS C standard. The remaining intersections operate at LOS C or better during the A.M. and P.M. peak hour periods.

THRESHOLDS OF SIGNIFICANCE

The City of Agoura Hills considers LOS C or better acceptable for intersection operations. A significant impact would occur when a proposed project increases traffic demand by 2% or greater (V/C increase $\geq$ 0.02) at a facility that would operate at LOS D or worse with project-added traffic volumes.

PROJECT-SPECIFIC ANALYSIS

Trip Generation

Trip generation estimates were calculated for the Agoura Medical Office Project based on the rates presented in the Institute of Transportation Engineers (ITE) trip generation manual for Medical Office uses (Land-Use Code #720).[2] Table 2 summarizes the average daily, A.M., and P.M. peak hour trip generation estimates for the proposed project (a project trip generation worksheet is included in the Technical Appendix for reference).

[2] Trip Generation, Institute of Transportation Engineers, 7th Edition, 2003.

Table 2
Project Trip Generation

Land Use	Size	ADT		A.M. Peak Hour		P.M. Peak Hour	
		Rate	Trips	Rate	Trips	Rate	Trips
Medical Office	40,733 SF	36.13	1,472	2.48	101	3.72	152

The data presented in Table 2 show that the proposed project would generate 1,472 average daily trips, 101 A.M. peak hour trips, and 152 P.M. peak hour trips.

Trip Distribution

Project-generated traffic was distributed and assigned to the adjacent street network based on percentages shown in Table 3 and presented on Figure 5. The trip distribution percentages were developed based on existing traffic patterns observed in the study area, input from City staff, and consideration of the most logical travel routes for drivers accessing the proposed development. Figure 6 shows the peak hour project-added traffic volumes.

Table 3
Project Trip Distribution

Origin/Destination	Direction	Percent
U.S. Highway 101 East of Palo Comado Canyon Road	East	40%
U.S. Highway 101 West of Chesebro Road	West	30%
Palo Comado Canyon Road North of U.S. Highway 101	North	15%
Agoura Road East of Chesebro Road	East	5%
Agoura Road West of Lewis Road	West	10%
Total		**100%**

Roadway Operations

City staff requested that the study include traffic volume data for Agoura Road west of the proposed project driveway, with and without the proposed project. ATE collected 24-hour data on Agoura Road west of the proposed project driveway on Tuesday August 19, 2008 (count data is contained in the Technical Appendix for reference). The data show that Agoura Road currently carries 5,600 ADT west of the project site driveway. The project is forecast to add 150 ADT to the roadway for a total of 5,750 ADT under Existing + Project conditions. This level of traffic is well within the carrying capacity of this arterial roadway.

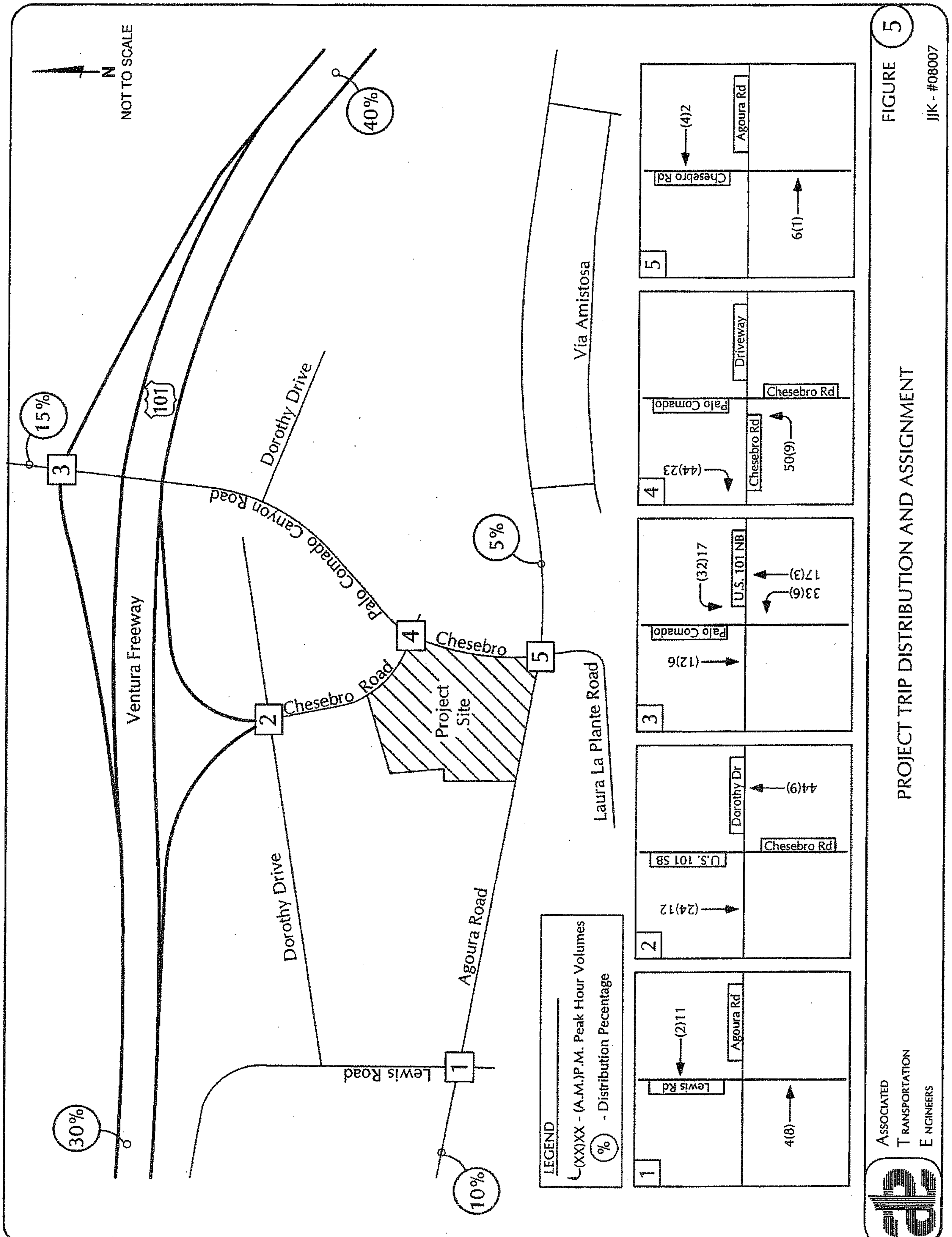


FIGURE 5

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Intersection Operations

Levels of service were calculated for the study-area intersections using the Existing + Project traffic volumes presented on Figure 6. Tables 4 and 5 compare the Existing and Existing + Project levels of service and identify project-specific impacts based on City thresholds.

Table 4
Existing and Existing + Project A.M. Peak Hour Levels of Service

Intersection	Existing		Existing + Project		Project Added	
	Control Delay	LOS	Control Delay	LOS	% Increase	Impact?
Lewis Road/Agoura Road	8.6 sec	A	8.6 sec	A	N/A	NO
U.S. 101 SB Ramps/Chesebro/Dorothy	15.8 sec	C	16.7 sec	C	N/A	NO
U.S. 101 NB Ramps/Palo Comado Canyon	**>50 sec**	**F**	**>50sec**	**F**	**3.0%**	**YES**
Chesebro Road/Palo Comado Canyon	19.5 sec	C	20.3 sec	C	N/A	NO
Chesebro Road/Agoura Road	9.5 sec	A	9.6 sec	A	N/A	NO

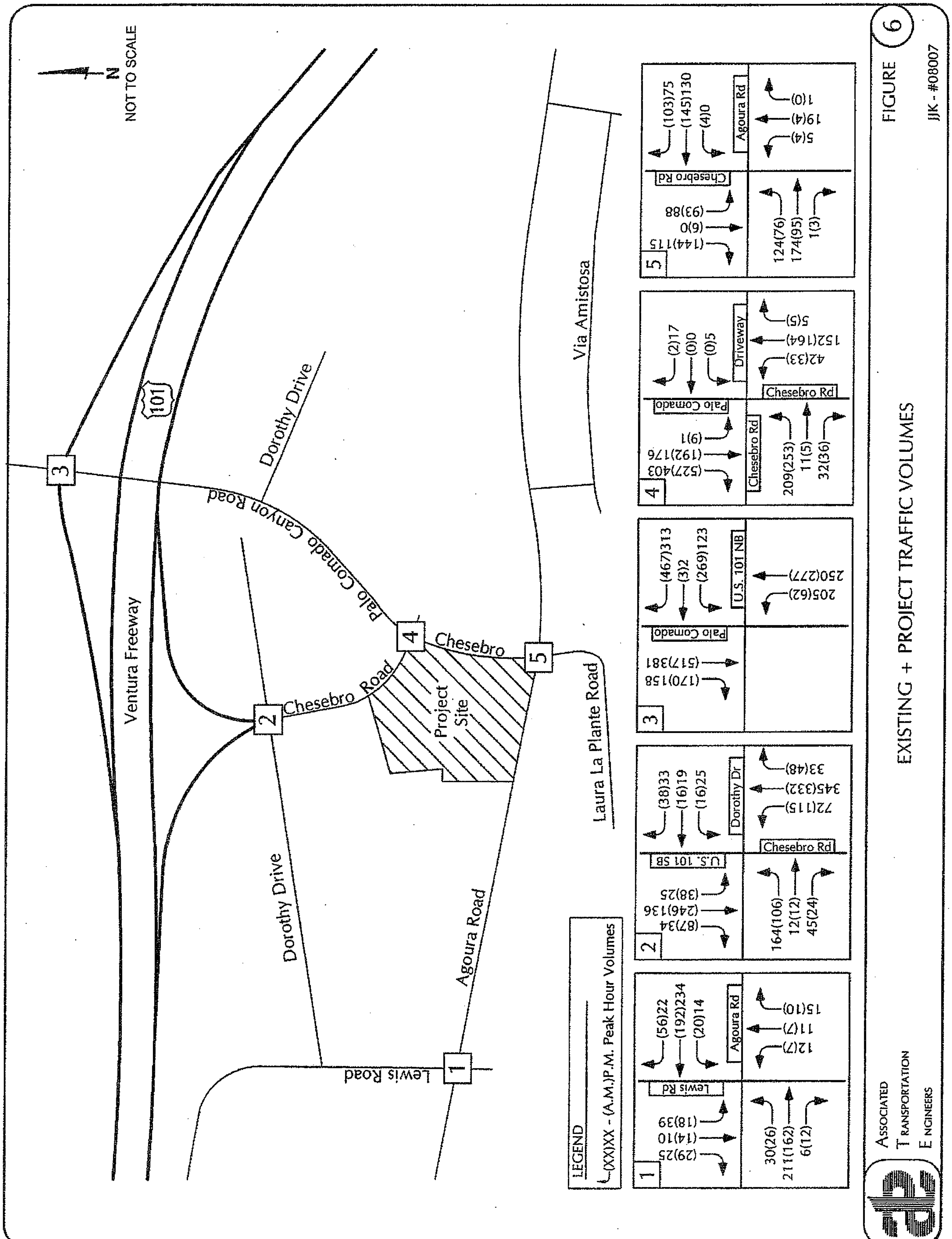
N/A = V/C increase not applicable at LOS C or better.
Bold Values exceed City's LOS C standard.

Table 5
Existing and Existing + Project P.M. Peak Hour Levels of Service

Intersection	Existing		Existing + Project		Project Added	
	Control Delay	LOS	Control Delay	LOS	% Increase	Impact?
Lewis Road/Agoura Road	8.7 sec	B	8.7 sec	B	N/A	NO
U.S. 101 SB Ramps/Chesebro/Dorothy	13.2 sec	B	14.8 sec	B	N/A	NO
U.S. 101 NB Ramps/Palo Comado Canyon	16.3 sec	C	21.7 sec	C	N/A	NO
Chesebro Road/Palo Comado Canyon	16.7 sec	C	20.3 sec	C	N/A	NO
Chesebro Road/Agoura Road	10.8 sec	B	11.0 sec	B	N/A	NO

N/A = V/C increase not applicable at LOS C or greater.
Bold Values exceed City's LOS C standard.

The data presented in Tables 4 and 5 indicate that most of the study-area intersections would operate at LOS C or better with Existing + Project traffic. The U.S. 101 NB Ramps/Palo Comado Canyon Road intersection currently operates at LOS F. The project would increase traffic at this location by 3.0%, which is considered a significant impact based on the City's traffic impact threshold. Improvements for this intersection are reviewed in the Mitigation Measures section of this report.


N
NOT TO SCALE
Ventura Freeway
101
Dorothy Drive
Dorothy Drive
Palo Comado Canyon Road
Via Amistosa
Chesebro Road
Chesebro
Project Site
Laura La Plante Road
Agoura Road
Lewis Road
1
2
3
4
5
LEGEND
(XX)XX - (A.M.)P.M. Peak Hour Volumes
1
Lewis Rd
Agoura Rd
(56)22
(192)234
(20)14
(29)25
(14)10
(18)39
30(26)
211(162)
6(12)
12(7)
11(7)
15(10)
2
U.S. 101 SB
Dorothy Dr
Chesebro Rd
(38)33
(16)19
(16)25
(87)34
(246)136
(38)25
164(106)
12(12)
45(24)
72(115)
345(332)
33(48)
3
Palo Comado
U.S. 101 NB
(467)313
(3)2
(269)123
(170)158
(517)381
205(62)
250(277)
4
Palo Comado
Driveway
Chesebro Rd
Chesebro Rd
(2)17
(0)0
(0)5
(527)403
(192)176
(9)1
209(253)
11(5)
32(36)
42(33)
152(164)
5(5)
5
Chesebro Rd
Agoura Rd
(103)75
(145)130
(4)0
(144)115
(6)0
(93)88
124(76)
174(95)
1(3)
5(4)
19(4)
1(0)
EXISTING + PROJECT TRAFFIC VOLUMES
FIGURE 6
JJK - #08007
Associated Transportation Engineers

CUMULATIVE ANALYSIS

Cumulative traffic volumes were forecast assuming development of the approved and pending projects proposed within the City of Agoura Hills and the adjacent areas of Los Angeles County (a copy of the City's approved and pending projects list is contained in the Technical Appendix for reference). Trip generation estimates were developed for the cumulative projects using the rates presented in the ITE Trip Generation Report (see Technical Appendix for the trip generation worksheet). The cumulative trips were distributed to the study area street network based on the land use patterns within the City of Agoura Hills, traffic patterns observed in the study area, distribution data contained in traffic studies completed for other projects, and consideration of the most logical travel routes for drivers accessing each development. The cumulative traffic volume forecasts are presented on Figure 7 and the Cumulative + Project volumes are shown on Figure 8.

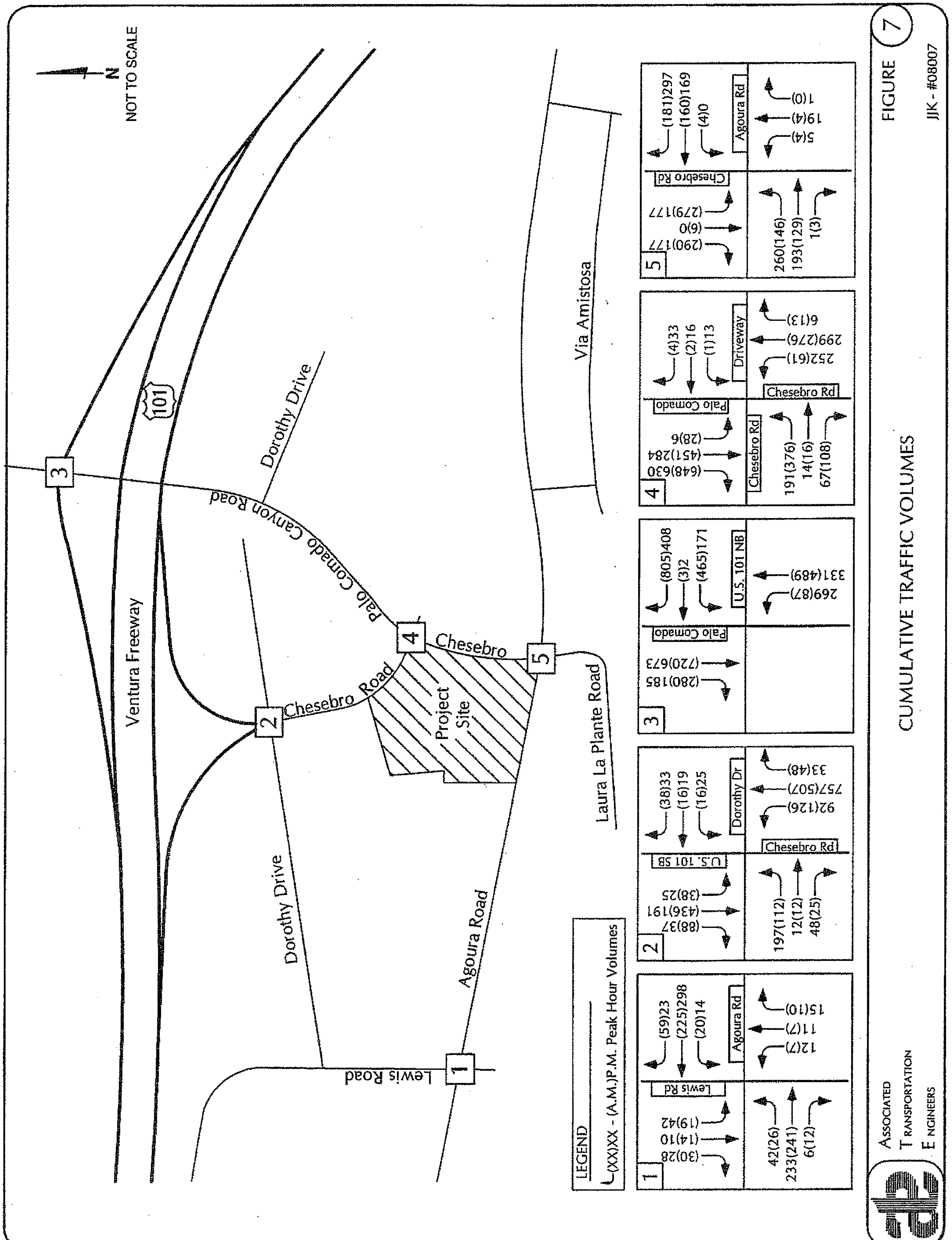
Intersection Operations

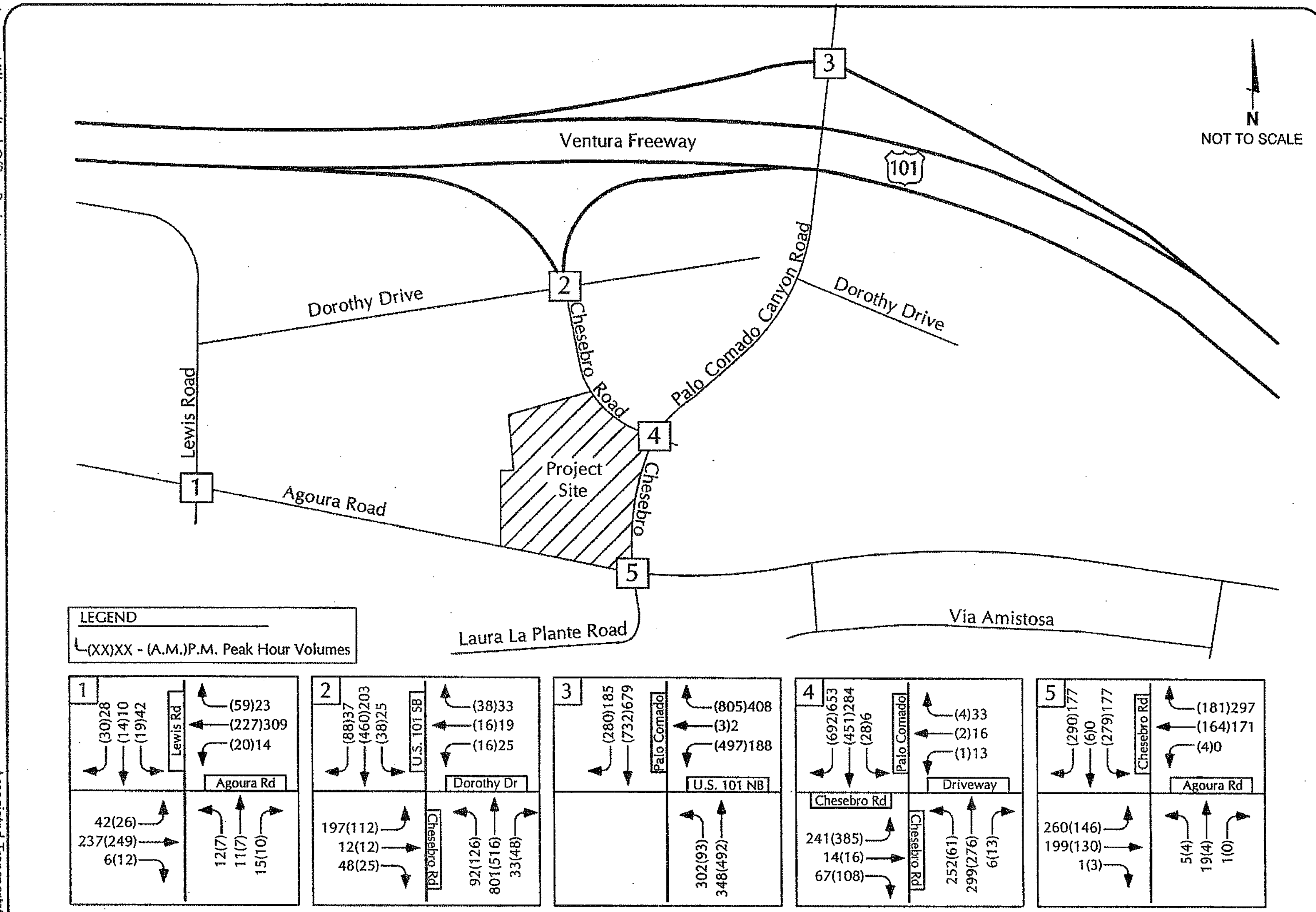
Levels of service were calculated for the study-area intersections using the Cumulative and Cumulative + Project volumes presented on Figures 7 and 8. Tables 6 and 7 compare the Cumulative and Cumulative + Project levels of service and identify cumulative impacts based on City thresholds.

Table 6
Cumulative and Cumulative + Project A.M. Peak Hour Levels of Service

Intersection	Cumulative		Cumulative + Project		Project Added	
	Control Delay	LOS	Control Delay	LOS	% Increase	Impact?
Lewis Road/Agoura Road	9.1 sec	A	9.1 sec	A	N/A	NO
U.S. 101 SB Ramps/Chesebro/Dorothy	**>50sec**	**F**	**>50sec**	**F**	**2.2%**	**YES**
U.S. 101 NB Ramps/Palo Comado Canyon	**>50sec**	**F**	**>50sec**	**F**	1.8%	NO
Chesebro Road/Palo Comado Canyon	**>50sec**	**F**	**>50sec**	**F**	**2.6%**	**YES**
Chesebro Road/Agoura Road	14.9 sec	B	14.9 sec	B	N/A	NO

N/A = V/C increase not applicable at LOS C or greater.
Bold Values exceed City's LOS C standard.


N
NOT TO SCALE
Ventura Freeway
101
Dorothy Drive
Palo Comado Canyon Road
Via Amistosa
Chesebro Road
Chesebro
Project Site
Laura La Plante Road
Dorothy Drive
Agoura Road
Lewis Road
1
2
3
4
5
LEGEND
(XX)XX - (A.M.)P.M. Peak Hour Volumes
1
Lewis Rd
Agoura Rd
(30)28
(14)10
(19)42
(59)23
(225)298
(20)14
42(26)
233(241)
6(12)
12(7)
11(7)
15(10)
2
U.S. 101 SB
Dorothy Dr
Chesebro Rd
(88)37
(436)191
(38)25
(38)33
(16)19
(16)25
197(112)
12(12)
48(25)
92(126)
757(507)
33(48)
3
Palo Comado
U.S. 101 NB
(280)185
(720)673
(805)408
(3)2
(465)171
269(87)
331(489)
4
Palo Comado
Chesebro Rd
Driveway
Chesebro Rd
(648)630
(451)284
(28)9
(4)33
(2)16
(1)13
191(376)
14(16)
67(108)
252(61)
299(276)
6(13)
5
Chesebro Rd
Agoura Rd
(290)177
(9)0
(279)177
(181)297
(160)169
(4)0
260(146)
193(129)
1(3)
5(4)
19(4)
1(0)
CUMULATIVE TRAFFIC VOLUMES
FIGURE 7
JJK - #08007
Associated
Transportation
Engineers



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CUMULATIVE + PROJECT TRAFFIC VOLUMES

FIGURE 8

JJK - #08007

Table 7
Cumulative and Cumulative + Project P.M. Peak Hour Levels of Service

Intersection	Cumulative		Cumulative + Project		Project Added	
	Control Delay	LOS	Control Delay	LOS	% Increase	Impact?
Lewis Road/Agoura Road	9.0 sec	A	9.1 sec	A	N/A	NO
U.S. 101 SB Ramps/Chesebro/Dorothy	**>50sec**	**F**	**>50sec**	**F**	**3.8%**	**YES**
U.S. 101 NB Ramps/Palo Comado Canyon	**>50sec**	**F**	**>50sec**	**F**	**3.5%**	**YES**
Chesebro Road/Palo Comado Canyon	**>50sec**	**F**	**>50sec**	**F**	**4.0%**	**YES**
Chesebro Road/Agoura Road	24.5 sec	C	**25.6**	**D**	1.0 %	NO

N/A = V/C increase not applicable at LOS C or greater.
Bold Values exceed City's LOS C standard.

The data presented in Tables 6 and 7 indicate that the intersections of U.S. 101 SB Ramps/Chesebro Road/Dorothy Drive, U.S. 101 NB Ramps/Palo Comado Canyon Road, and Chesebro Road/Palo Comado Canyon Road are forecast to operate at LOS F under Cumulative and Cumulative + Project conditions. The project would increase the volumes at these three intersections by more than 2%, which is considered a significant cumulative impact based on the City's thresholds. Improvement measures that would mitigate the impacts are provided in the Mitigations section of this traffic study.

SITE ACCESS AND CIRCULATION

Access to the project site is provided by one driveway on Chesebro Road and one driveway on Agoura Road. The driveways provide access to the on-site parking areas. The driveways provide the minimum 26' drive aisle required by City Code (Section 9654.3. Design Standards).

Chesebro Road Driveway

The primary project driveway is located on the south side of Chesebro Road between the intersections of Dorothy Drive to the north and Palo Comado Canyon Road to the east. The Chesebro Road cross-section allows full access at the driveway (right- and left-turns inbound and outbound). The driveway provides access to the on-site parking areas and the parking garage, and connects with the project driveway on Agoura Road.

A level of service and gap analysis was completed assuming the Cumulative + Project volumes to assess operations at the project driveway (LOS worksheets are contained in the Technical Appendix for reference). Delays at the Chesebro Road driveway are forecast to be in the LOS A range for left-turns inbound to the site during the peak hour periods and LOS C range for left- and right-turn outbound vehicles from the site. The results show that there would be sufficient gaps for traffic to enter and exit the proposed driveway under Cumulative + Project conditions.

Agoura Road Driveway

The second project driveway is located on the north side of Agoura Road between the intersections of Lewis Road to the west and Chesebro Road to the east. The Agoura Road cross-section allows full access at the driveway (right- and left-turns inbound and outbound). The project driveway extends north from Agoura Road providing access to the on-site parking area and connects with the project driveway on Chesebro Road.

A level of service and gap analysis was completed using Cumulative + Project volumes to assess operations at the driveway intersection. Delays would be in the LOS A range for left-turns inbound to the site during the peak hour periods and LOS B range for left- and right-turn outbound vehicles from the site during the peak hour periods. The results show that there would be sufficient gaps for traffic to enter and exit the proposed driveway under Cumulative + Project conditions.

Frontage Improvements

The Agoura Medical Center project will implement frontage improvements on Agoura Road and Chesebro Road. These improvements will change the lane geometry at the Chesebro Road/Agoura Road and Chesebro Road/Palo Comado Canyon Road intersections. ATE reviewed the existing and cumulative volumes at the intersections to determine the lane geometry that will be required to accommodate future traffic.

Figure 9 shows a schematic of the frontage improvements and the lane geometry proposed for these two intersections. The frontage improvements include widening the west side of Chesebro Road which will provide a southbound left-turn lane at the Agoura Road intersection and bike lanes on both sides of Chesebro Road.

The frontage improvements also include reconfiguring the Chesebro Road/Palo Comado Canyon Road intersection to provide separate left-turn lanes on the northbound and southbound approaches, and the eastbound approach would be improved to provide a left-through lane and a right-turn lane.

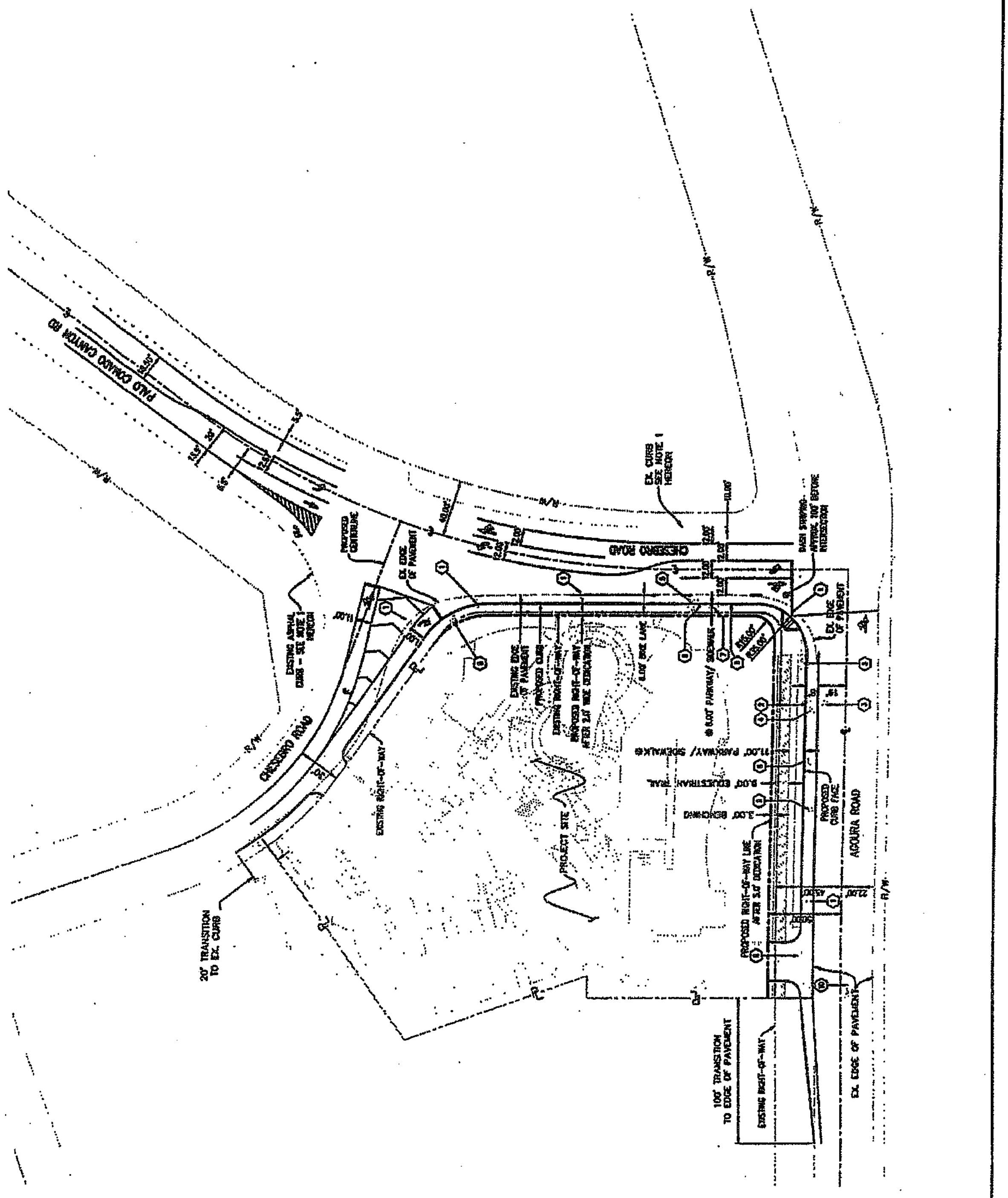

FIGURE 9

PROJECT FRONTAGE IMPROVEMENTS

JJK - #08007

ASSOCIATED TRANSPORTATION ENGINEERS

PARKING

The project provides 24 surface level parking spaces and 186 garage parking spaces for a total of 210 parking spaces (including 7 handicapped spaces). The City of Agoura Hills Municipal Code requires a minimum of 5 spaces for each 1,000 square feet of gross floor area for medical office land use and requires 7 handicapped parking spaces for developments providing between 201 and 300 parking spaces (Section 9654.6. Parking Allocation). The project has a gross floor area of 40,733 square feet and is required to provide 204 on-site parking spaces. The project's 210 on-site and 7 handicap parking spaces satisfy the City Code requirements.

MITIGATIONS

Project-Specific Mitigations

Palo Comado Canyon Road/U.S. 101 Northbound Ramps (A.M. peak hour): Currently this intersection operates at LOS F and the project would exceed the City's impact threshold by increasing the traffic volume 2%. The intersection is controlled by a stop sign on the westbound approach. The need for a traffic signal was evaluated based on Caltrans' traffic signal warrant criteria available in the California MUTCD[3] (signal warrant worksheets are included in the Technical Appendix for reference). The analysis found that the Cumulative+Project traffic volumes at this location would satisfy both the peak hour and estimated average daily traffic warrants. Signalization of the intersection and restriping the westbound approach to provide one left-through lane and one right-turn lane would result in LOS C (ICU 0.76) during the A.M. peak hour, reducing the project's impact to a level of insignificance. The existing and mitigated lane geometries are shown below in Table 8.

Table 8
Palo Comado Canyon Road/U.S. 101 NB Ramps Intersection Geometry

Scenario	Control Type	Northbound	Southbound	Westbound
Existing Geometry	Stop Sign	LT	T R	L TR
Mitigated Geometry	Signal	LT	T R	LT R

City staff has indicated that several improvement options for the intersection are being evaluated as part of the proposed Abraham Joshua Heschel Day School project located northeast of the Palo Comado Canyon Road/U.S. 101 Northbound Ramps intersection. Improvement options include installation of a signal, widening of the overpass and/or intersection approaches or construction of a roundabout as shown on Figure 10. Widening of the U.S. Highway 101 overpass at Palo Comado Canyon Road would require a Caltrans Project Study Report to assess alternatives. The project would be required to contribute its proportionate share to any improvement that will be elected for this intersection.

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3 California Manual on Uniform Traffic Control Devices, Caltrans, September 2006