

To:	Tom Afschar, AIA, CASp	From:	Chris Zadoorian
Company:	City of Santa Monica Architecture Services	Date:	May 8, 2012
Address:	1437 4 th Street, Suite 300 Santa Monica, CA 90401		
cc:	n/a		
GDI Project:	SMonica-10-01		
RE:	Proposed Santa Monica Pico Branch Library		

Original File Name	Date	Document Title
SMonica-10-01-100810-geor.doc	10/8/10	Report of Geotechnical Engineering Services; Proposed Santa Monica Pico Branch Library; Virginia Avenue Park; Santa Monica, California; Special Provisions Number 2119

Addendum Number	Date	Description
1	10/27/11	Geotechnical Recommendations for Temporary Excavations
2	5/8/12	Response to Geotechnical Comments, City of Santa Monica Review Sheet (attached)

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Attachments

Six copies submitted

Document ID: SMonica-10-01-050812-geot-2.doc

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May 8, 2012

City of Santa Monica
Architecture Services
1437 4th Street, Suite 300
Santa Monica, CA 90401

Attention: Mr. Tom Afschar, AIA. CASp

Addendum 2
Response to Geotechnical Comments
City of Santa Monica Review Sheet
Proposed Santa Monica Pico Branch Library
Virginia Avenue Park
Santa Monica, California
Building & Safety # 12PC0040
GeoDesign Project: SMonica-10-01

INTRODUCTION

We performed a geotechnical investigation for the proposed Santa Monica Pico Branch Library to be constructed within Virginia Avenue Park located at the northwest corner of Pico Boulevard and Cloverfield Boulevard in Santa Monica, California. The results of our investigation were submitted in a report dated October 8, 2010 and in an addendum dated October 27, 2011.

LOR Geotechnical Group, Inc. (LOR), acting as a review consultant for the City of Santa Monica, issued comments to our report in a Geotechnical Review Sheet dated February 16, 2012 (LOR Project No. 62739.246).

LOR's comments are presented below followed by our responses.

LOR REVIEW COMMENT 1

A tabulation of recorded peak ground accelerations from nearby recording stations for major events affection Santa Monica shall be summarized in tabular form. This tabulation shall include the identification of the recording station, peak ground acceleration, event, date of event, epicenter distances, magnitudes, and distance between recording stations and the site. A map showing the locations of the stations and the site shall also be included (Section 3.3 of the Guidelines for Geotechnical Reports, City of Santa Monica, dated March 2010).

GEODESIGN, INC. RESPONSE TO LOR REVIEW COMMENT 1

As indicated in Section 3.3 of the *Guidelines for Geotechnical Reports, City of Santa Monica (March 2010)*, only the Northridge event needs to be considered. The Northridge earthquake was a magnitude 6.7 earthquake that occurred in Northridge, California, on January 17, 1994.

Recorded peak ground accelerations from recording stations within a 5-mile radius for the Northridge earthquake are summarized in Table 1. Table 1 includes the identification of the recording station, peak ground acceleration, epicenter distances, and distance between recording stations and the site.

A map that shows the location of the recording stations is included as Figure A-1 (Attachment A).

Table 1. Strong Motion Recordings for the Northridge Earthquake

Recording Station Number	Location of Station	Peak Acceleration	Distance from Epicenter (miles)	Distance Between Site and Recording Station (miles)
47	8505 Saran Drive, Plaza Del Rey	0.144	18.4	4.7
54	3960 Centinela Street, Los Angeles	0.447	15.8	2.4
638	Los Angeles-Brentwood VA	0.188	11.1	2.7
663	10751 Wilshire Boulevard	0.393	11.9	3
5082	Wadsworth VA Hospital	0.389	12	2.2
5263	10660 Wilshire Boulevard	1.055	12	3.1
5277	12121 Wilshire Boulevard	0.325	12.3	1.5
5284	Lowe Residence	0.525	13	1.7
5292	Los Angeles 2121 Avenue of the Stars	0.411	12.9	3.7
5456	10920 Wilshire Boulevard	0.249	11.9	2.7
24231	Los Angeles 7-story UCLA Math/Science Building	0.29	11.3	3.4
24332	Los Angeles 3-story commercial building	0.33	12.5	3.5
24389	Century City - LACC North	0.27	12.5	3.9

Table 1. Strong Motion Recordings for the Northridge Earthquake (continued)

Recording Station Number	Location of Station	Peak Acceleration	Distance from Epicenter (miles)	Distance Between Site and Recording Station (miles)
24390	Century City – LACC South	0.35	12.5	3.9
24538	City Hall Grounds	0.93	14.4	1.7
24643	Los Angeles 19-story office building	0.32	12.5	3.6
24670	I10/405 interchange bridge	1.830 (structure)	13.8	1.8
24688	UCLA Grounds	0.66	11.3	3.4

LOR REVIEW COMMENT 2

The boring logs should identify the native soil contact.

GEODESIGN, INC. RESPONSE TO LOR REVIEW COMMENT 2

We have revised the boring logs to clearly identify the contact between the fill materials and native soils. The logs are included in Attachment B.

LOR REVIEW COMMENT 3

The report should evaluate the temporary stability during grading, foundation construction, and retaining wall excavations as outline in Section 3.8.8 of the current city guidelines (March 2010).

GEODESIGN, INC. RESPONSE TO LOR REVIEW COMMENT 3

GENERAL

In a letter dated October 27, 2011, we provided recommendations for slot-cutting to allow the required temporary excavations adjacent to the existing Thelma Terry Community Center building. However, at that time, it was our understanding, based on conceptual sketches you provided, that the new library footings would be a maximum depth of approximately 2 feet below the bottom of the adjacent community center building footings.

On April 26, 2012 you provided us with an updated sketch that indicates the new library footings will extend a maximum depth of approximately 5.5 feet below the bottom of the Thelma Terry Community Center building foundation. Figures A-2 and A-3 depict the current proposed conditions.

The on-site soils consist of silty sand and will stand vertically for this depth when considering the loading applied from the Thelma Terry Community Center building and temporary shoring will be required to construct the necessary excavation.

Temporary shoring may consist of soldier piles and timber lagging and should be designed to limit the lateral deflection to ¼ inch or less at the top of the shoring.

Soldier piles may be installed in a manner so that they can also serve to underpin the existing Thelma Terry Community Center building foundation or the shoring may be designed to resist surcharge loading from the existing foundation.

Groundwater is not anticipated to impact the shoring installation.

DESIGN LATERAL EARTH PRESSURES

Cantilevered shoring should be designed to resist a triangular lateral earth pressure distribution, where the maximum value is 30H pounds per square foot (psf). For cantilevered shoring design, where the surface at the top of the shoring is sloped, the recommended lateral earth pressures should be increased as indicated in Table 2.

Table 2. Temporary Shoring – Lateral Earth Pressures

Slope Inclination at Top of Shoring (horizontal to vertical)	Increase in Lateral Earth Pressure (percent)
1:1	200
1.5:1	165
2:1	150

If soldier piles are not designed to provide vertical support for the existing Thelma Terry Community Center building, the lower approximately 4 feet of the new below-grade library wall should be designed to resist an additional pressure of 1,500 psf resulting from the existing foundation.

SOLDER PILES, TEMPORARY AND PERMANENT SUPPORT OF EXISTING FOUNDATION

For the design of soldier piles spaced at least 2 diameters on centers, the allowable lateral bearing value (passive value) of the native soils below the level of excavation may be assumed to be 300 psf per foot of depth, up to a maximum of 6,000 psf. The recommended value may be doubled for the case of isolated piles as allowed per the current city guidelines (March 2010).

If the embedded portion of the soldier pile shaft is filled with lean-mix concrete with a minimum compressive strength of 2,000 pounds per square inch, then the effective width of the soldier pile shaft for use in developing passive resistance may be assumed to be twice the diameter of the shaft. If the embedded portion of the soldier pile shaft is filled with other materials (such as low strength sand-cement slurry), the effective width of the soldier pile should be limited to be the diagonal dimension of the soldier pile beam.

Solider piles a minimum of 30 inches in diameter and extending 20 feet below the bottom of the excavation may be designed to resist axial loading assuming 4 kips per foot of embedment below the bottom of the excavation.

Caving may be encountered during the drilling of the solider piles. The shoring contractor should provide mitigation measures for caving that may include the use of drilling fluid and/or steel casing.

TIMBER LAGGING

Continuous lagging will be required between the soldier piles. The soldier piles should be designed for the full anticipated lateral pressure; however, the pressure on the lagging will be less due to arching in the soils. For clear spans of up to 6 feet, we recommend that the lagging be designed for a triangular distribution of earth pressure where the maximum pressure is 400 psf at the mid-line between soldier piles and 0 psf at the soldier piles.

If the solider piles are not designed as permanent elements, a uniform surcharge pressure equal to 1,500 psf should be applied to shoring to account for the surcharge loading from the adjacent foundation.

LIBRARY PARTIAL BELOW-GRADE WALL

If the solider piles are not designed as permanent elements, a uniform surcharge pressure equal to 1,500 psf should be applied to the permanent below-grade wall below the bottom of the Thelma Terry Community Center foundation level.

DOCUMENTATION OF EXISTING CONDITIONS AND MONITORING OF SHORING SYSTEM

It would be prudent to perform an existing condition survey for the existing Thelma Terry Community Center building prior to construction, including mapping and photographing of existing cracks and other prominent conditions.

Monitoring of the existing building and the deflection of the shoring system should be on-going during construction until such time that the new foundations, slab on grade, and partial below-grade wall are complete.



It is our pleasure to provide continued geotechnical consultation services for the proposed Santa Monica Pico Branch Library. Please contact us with any questions or comments regarding this addendum.

Sincerely,

GeoDesign, Inc.

Viola C. Lai w/ permission MLB

Viola C. Lai
Project Engineer



Christopher J. Zadoorian, G.E.
Principal Engineer



VCL:CJZ:kt

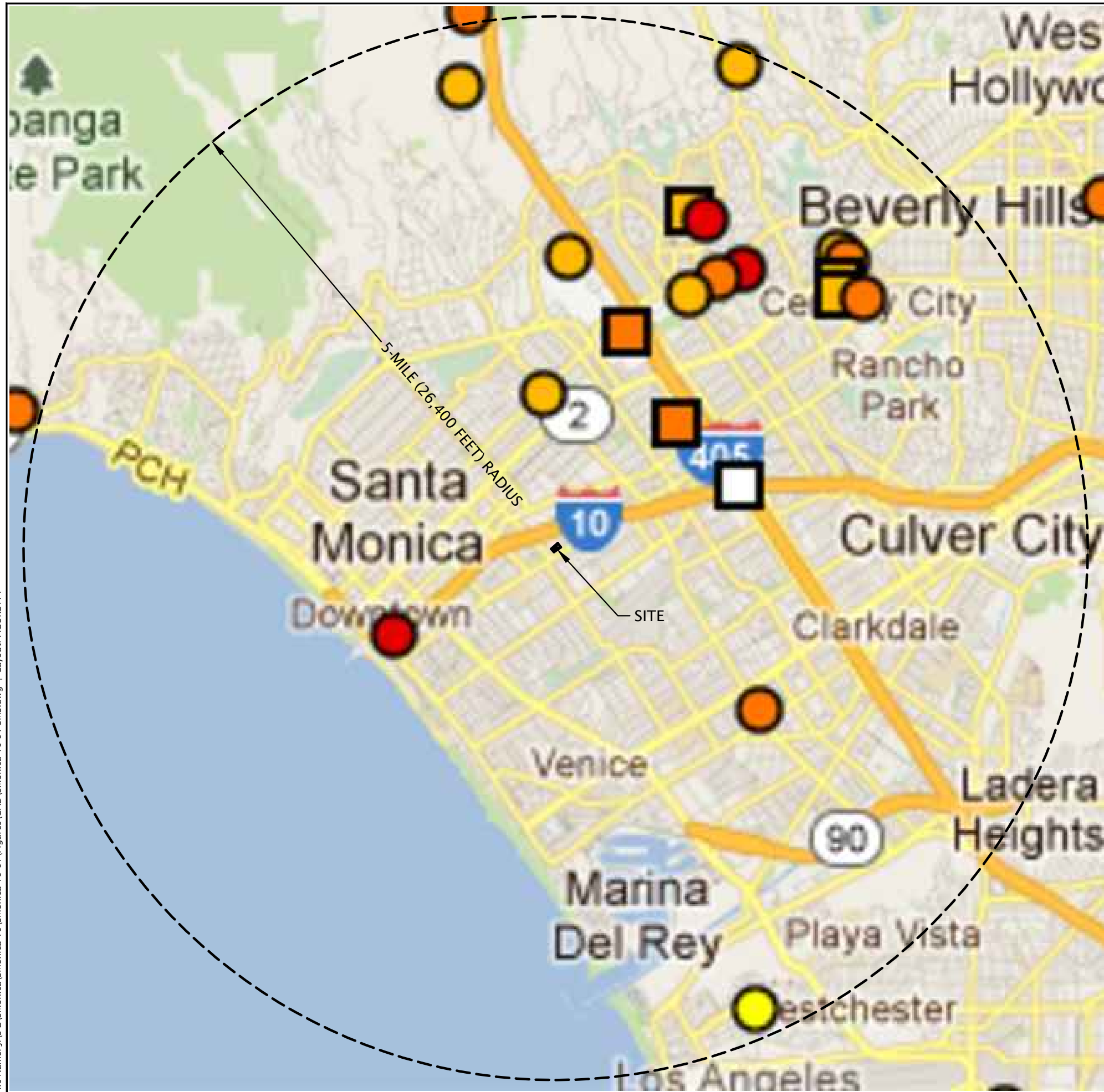
Attachments

Six copies submitted

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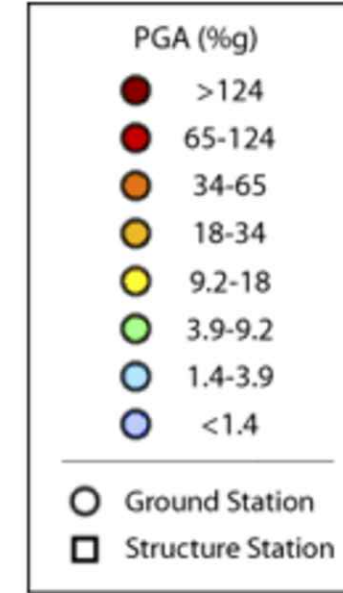
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ATTACHMENT A

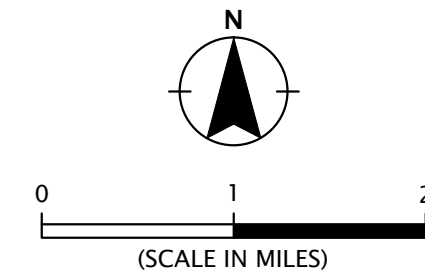


LEGEND:

- ◆ SITE
- 5-MILE RADIUS FROM CENTER OF SITE

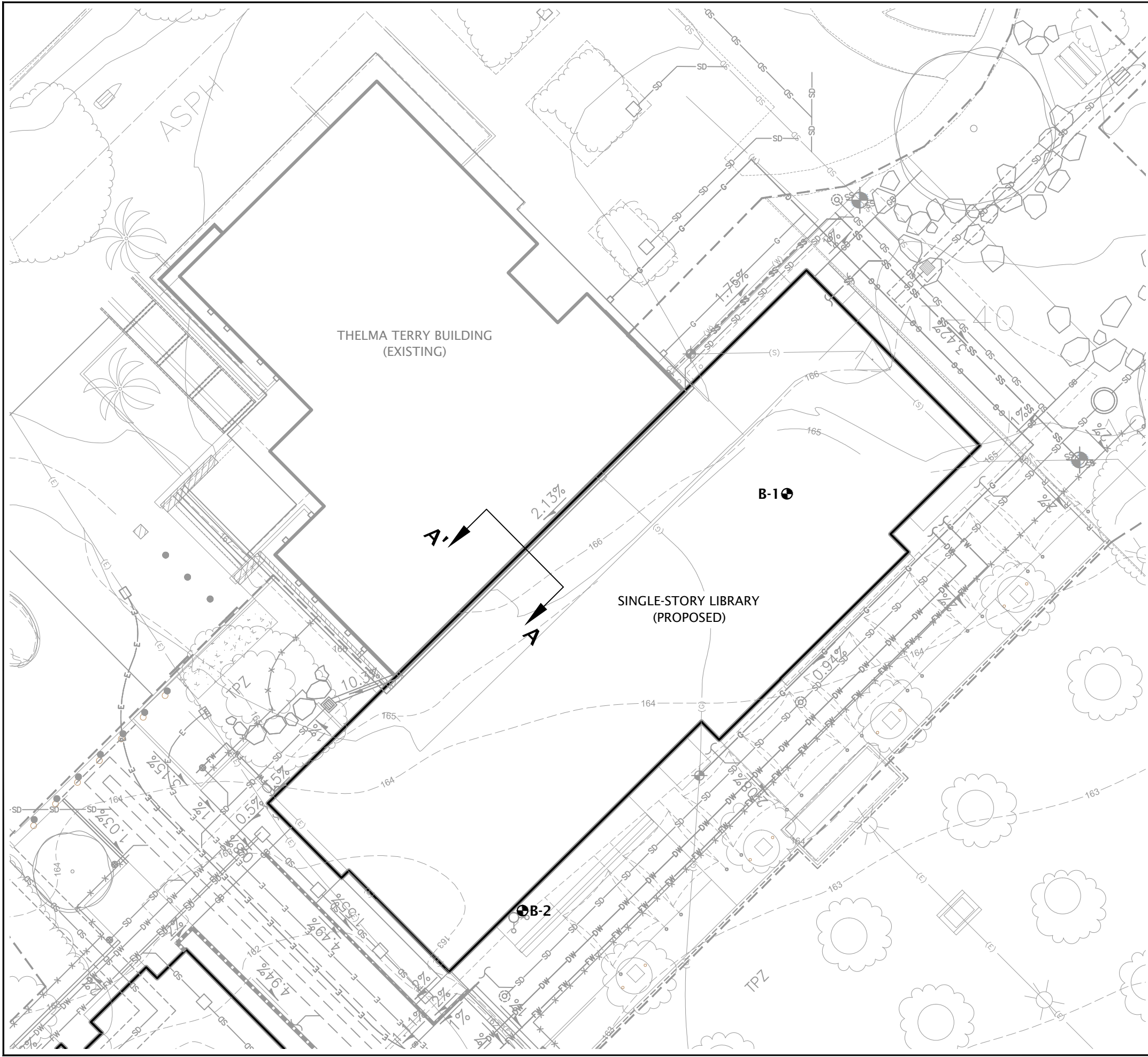




Note: Station locations are approximate when viewed at high zoom levels.

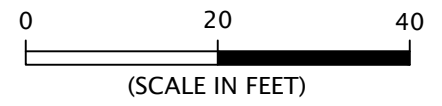
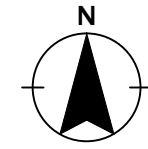


SITE PLAN BASED ON IMAGE OBTAINED FROM
 CENTER FOR ENGINEERING STRONG MOTION DATA
 APRIL 18, 2012

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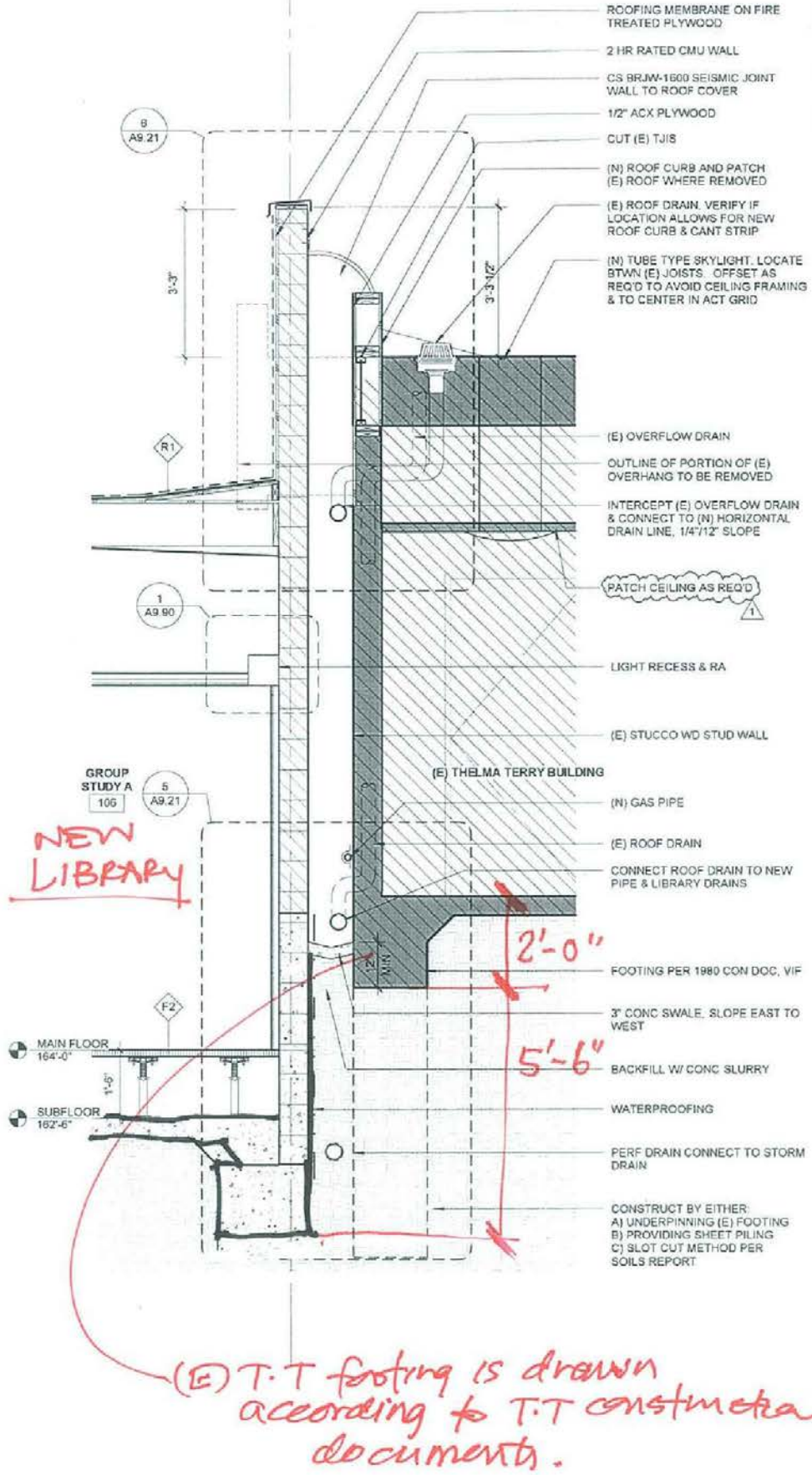
LEGEND:
 B-1  BORING
 A  A' TYPICAL CROSS SECTION




SITE PLAN BASED ON DRAWING PROVIDED BY
 CITY OF SANTA MONICA ARCHITECTURAL SERVICES
 OCTOBER 19, 2011

<p>SITE PLAN</p>	<p>SMONICA-10-01</p>	<p>GEODESIGN 2121 S Towne Centre Place - Suite 130 Anaheim CA 92806 Off 714.634.3701 Fax 714.634.3711</p>
<p>PROPOSED PICO BRANCH LIBRARY SANTA MONICA, CA</p>	<p>MAY 2012</p>	<p>FIGURE A-2</p>

Printed By: aday | Print Date: 5/8/2012 9:57:13 AM
 File Name: J:\S-Z\SMonica\SMonica-10-01\Figures\CAD\SMonica-10-01-DET01.dwg | Layout: FIGURE A-3



 2121 Towne Centre Place - Suite 130 Anaheim CA 92806 Off 714.634.3701 Fax 714.634.3711	SMONICA-10-01	TYPICAL CROSS SECTION A-A'	
	MAY 2012	PROPOSED PICO BRANCH LIBRARY SANTA MONICA, CA	FIGURE A-3

ATTACHMENT B

BORING LOG SMONICA-10-01-B1_4.GPJ GEODESIGN.GDT PRINT DATE: 5/7/12:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	INSTALLATION AND COMMENTS
0.0		ASPHALT CONCRETE (4 inches).	167.0 166.7 0.3			Hand augered to 5.0 feet.
2.5		Medium dense, light brown, fine SAND with silt (SP-SM); moist - FILL. CONTACT FILL/NATIVE AT 2.0 FEET Medium dense, red-brown, fine SAND with silt (SP-SM); moist (Qom).	165.0 2.0			
5.0		becomes dense, fine to medium at 10.0 feet		DD	DS	36-50/3' ▲ Sample on large root - could be inflated blow count. DD = 117 pcf
10.0		Very dense, red-brown, fine to medium SAND (SP), minor silt; moist.	152.5 14.5	DD		78 ▲ DD = 108 pcf
15.0		becomes yellow-brown, fine to coarse at 25.0 feet		DD		26-50/5' ▲ DD = 97 pcf
20.0		Very dense, yellow-brown, fine SAND with silt (SP-SM); moist.	138.0 29.0	DD		28-50/4' ▲ DD = 98 pcf
25.0				DD		37-50/3' ▲ DD = 100 pcf
30.0						

DRILLED BY: JDK Drilling, Inc.

LOGGED BY: SFK

COMPLETED: 07/22/10

BORING METHOD: hollow-stem auger (see report text)

BORING BIT DIAMETER: 7-inch



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SMONICA-10-01

BORING B-1

MAY 2012

PROPOSED PICO BRANCH LIBRARY
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FIGURE B-1

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	INSTALLATION AND COMMENTS
30.0		(continued from previous page)		DD		DD = 88 pcf
32.5						
35.0				DD		DD = 88 pcf
37.5		<p>Exploration completed at a depth of 36.5 feet.</p> <p>Groundwater seepage not observed to the depth explored.</p> <p>Caving not observed.</p>	130.5 36.5			
40.0						
42.5						
45.0						
47.5						
50.0						
52.5						
55.0						
57.5						
60.0						

DRILLED BY: JDK Drilling, Inc.

LOGGED BY: SFK

COMPLETED: 07/22/10

BORING METHOD: hollow-stem auger (see report text)

BORING BIT DIAMETER: 7-inch



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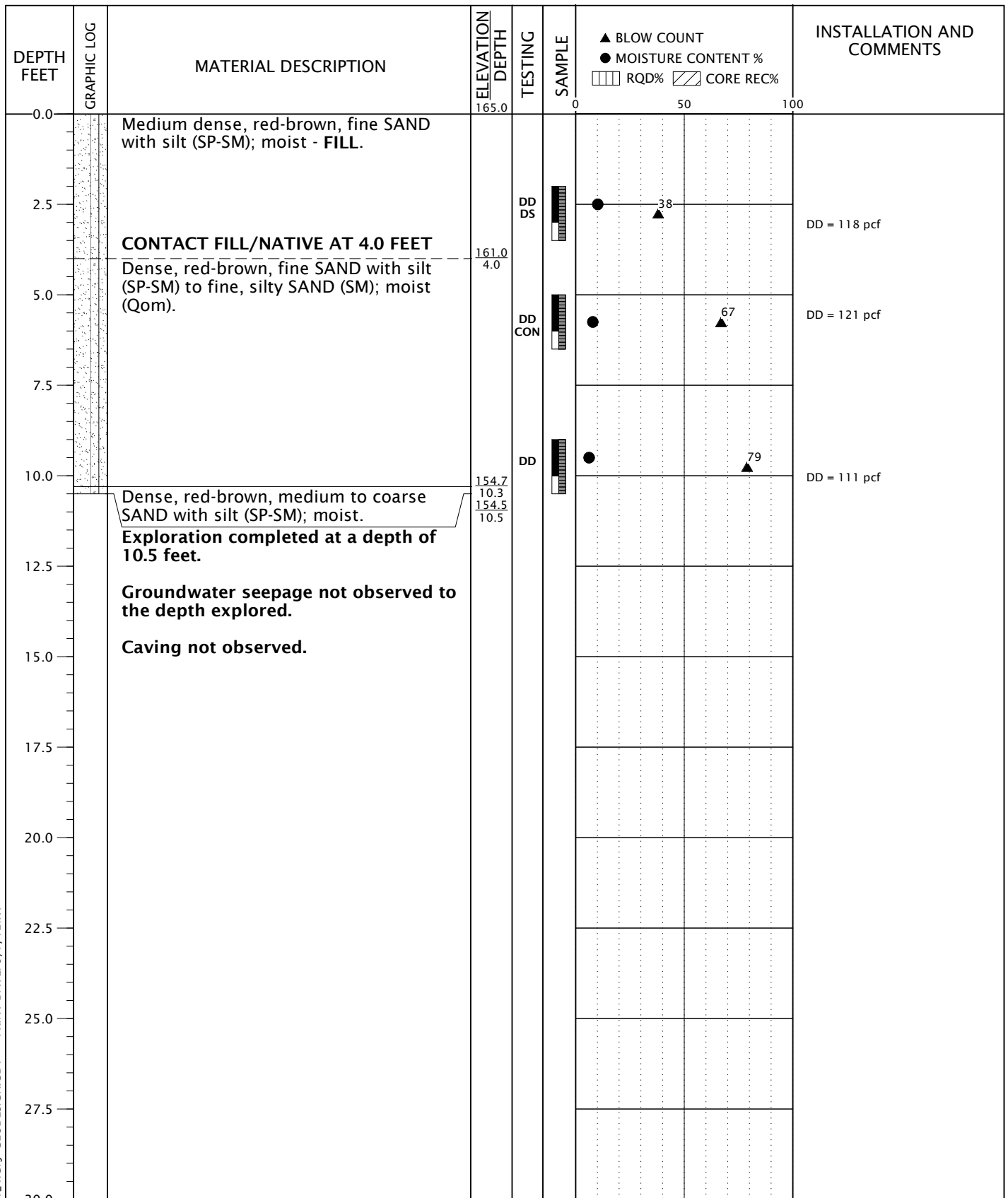
BORING B-1
(continued)

PROPOSED PICO BRANCH LIBRARY
SANTA MONICA, CA

FIGURE B-1

BORING LOG SMONICA-10-01-B1_4.GPJ GEODESIGN.GDT PRINT DATE: 5/7/12:KT

BORING LOG SMONICA-10-01-B1_4.GPJ GEODESIGN.GDT PRINT DATE: 5/7/12:KT



DRILLED BY: JDK Drilling, Inc.

LOGGED BY: SFK

COMPLETED: 07/22/10

BORING METHOD: hollow-stem auger (see report text)

BORING BIT DIAMETER: 7-inch



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BORING B-2

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FIGURE B-2

BORING LOG SMONICA-10-01-B1_4.GPJ GEODESIGN.GDT PRINT DATE: 5/7/12:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	INSTALLATION AND COMMENTS
0.0		ASPHALT CONCRETE (3 to 4 inches).	162.0 161.7			
0.3		Medium dense, light brown, silty SAND (SM); moist - FILL.	0.3			
2.5		CONTACT FILL/NATIVE AT 2.0 FEET	160.0			
2.5		Dense, red-brown, fine SAND with silt (SP-SM); moist (Qom).	2.0			
5.0				DD		DD = 102 pcf
7.5						
10.0		trace clay at 10.0 feet		DD		DD = 107 pcf
12.5						
14.0			148.0			
15.0		Very dense, red-brown, fine to medium SAND (SP), minor silt; moist.	14.0	DD		DD = 104 pcf
17.5						
20.0		trace silt at 20.0 feet		DD		DD = 100 pcf
22.5						
25.0				DD		DD = 96 pcf
27.5						
30.0						

DRILLED BY: JDK Drilling, Inc.

LOGGED BY: SFK

COMPLETED: 07/22/10

BORING METHOD: hollow-stem auger (see report text)

BORING BIT DIAMETER: 7-inch



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MAY 2012

BORING B-3

PROPOSED PICO BRANCH LIBRARY
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FIGURE B-3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % ▨ RQD% ▩ CORE REC%	INSTALLATION AND COMMENTS
30.0		minor silt at 30.0 feet					
32.5							
35.0							
37.5		Exploration completed at a depth of 36.5 feet. Groundwater seepage not observed to the depth explored. Caving not observed.	125.5 36.5				
40.0							
42.5							
45.0							
47.5							
50.0							
52.5							
55.0							
57.5							
60.0							

DRILLED BY: JDK Drilling, Inc.

LOGGED BY: SFK

COMPLETED: 07/22/10

BORING METHOD: hollow-stem auger (see report text)

BORING BIT DIAMETER: 7-inch



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MAY 2012

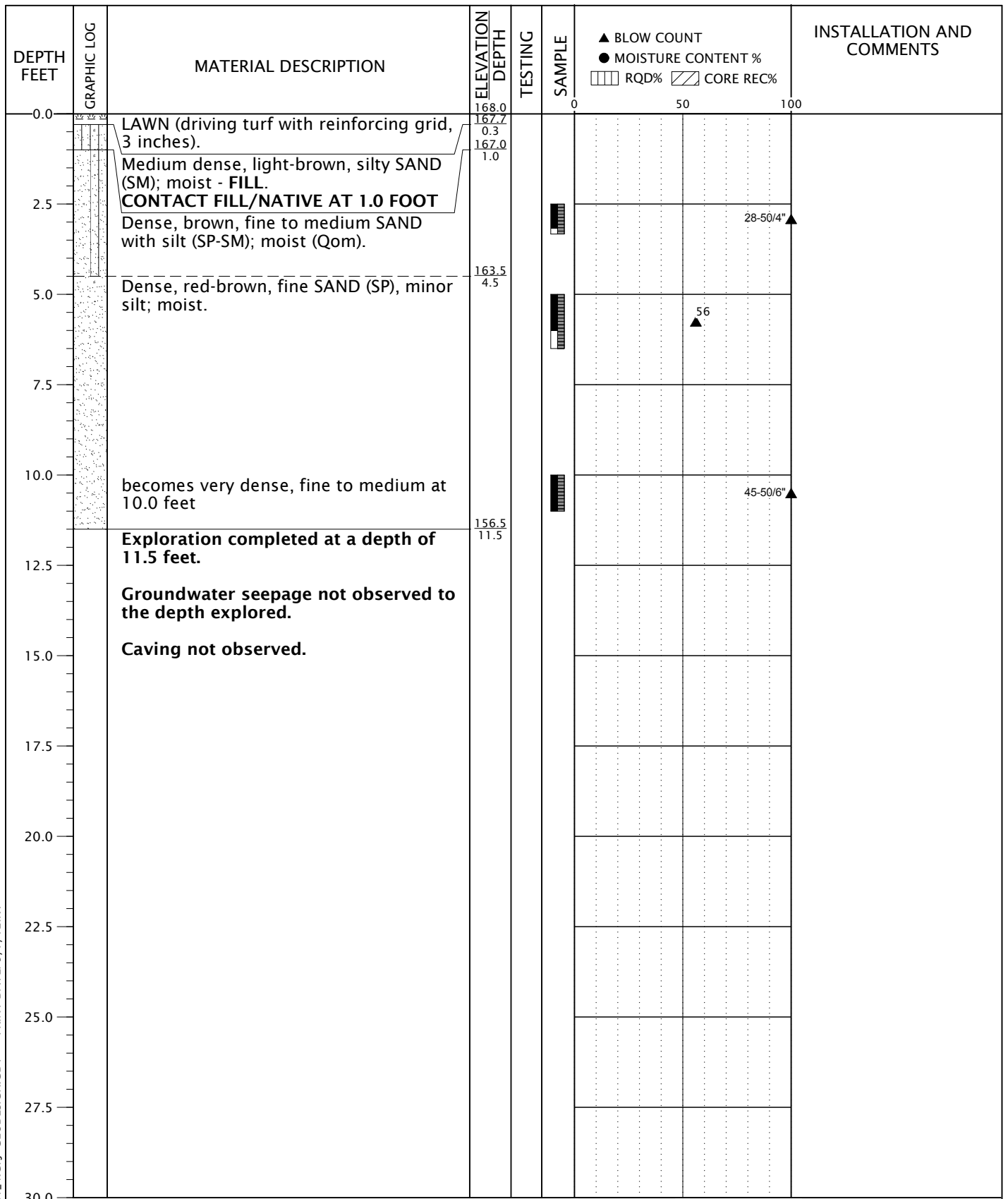
BORING B-3
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FIGURE B-3

BORING LOG SMONICA-10-01-B1_4.GPJ GEODESIGN.GDT PRINT DATE: 5/7/12:KT

BORING LOG SMONICA-10-01-B1_4.GPJ GEODESIGN.GDT PRINT DATE: 5/7/12:KT



DRILLED BY: JDK Drilling, Inc.

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COMPLETED: 07/22/10

BORING METHOD: hand-auger (see report text)

BORING BIT DIAMETER: 7-inch



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BORING B-4

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FIGURE B-4