

September 23, 2011  
Project No. 301699007

Mr. Ronald Evans  
JMA Architecture  
10150 Covington Cross Drive  
Las Vegas, Nevada 89144

Subject: Update of Geotechnical Evaluation Report  
Admin Building at VA Medical Center  
Northeast Corner of Pecos Road and Centennial Parkway  
North Las Vegas, Nevada

Dear Mr. Evans:

At your request, Ninyo & Moore is pleased to provide this update of the referenced geotechnical evaluation report for the subject project. Ninyo & Moore previously performed a geotechnical study for the subject project, which included preparation of the referenced geotechnical evaluation report and addendum. The purposes of this review and update were to evaluate whether the conclusions and recommendations presented in the referenced report remain applicable for design and construction of the proposed project, and to provide updated geotechnical recommendations, as needed.

Since the referenced reports were issued, the project has been revised to include design and construction of a general administration building to be located on the south side of the medical building near the southwest corner. The planned administration building will include tunnel access to the medical building. A three-story section, which includes an approximately 4,500 square-foot basement level, and a single-story section of the administration building are planned. The administration building will be supported by conventional spread foundations with slab-on-grade floors. We understand that underpinning and shoring of the medical building, which is nearing completion, is planned as part of the excavation and construction of the new general administration building. The approximate location of the project site is shown on the attached Figure 1.

## **FIELD EXPLORATION, LABORATORY TESTING, AND SUBSURFACE CONDITIONS**

Ninyo & Moore's additional subsurface exploration of the project site was performed on August 30, 2011. This exploration consisted of drilling, logging, and sampling of three small-diameter exploratory borings in the area of the planned building addition. The borings were advanced to depths ranging from approximately 21 to 31 feet with a truck-mounted Failing 1250 drill rig utilizing 6-inch diameter air-rotary drilling equipment. The purpose of the borings was to evaluate subsurface conditions at the subject site, as well as to collect bulk and relatively undisturbed soil samples for laboratory testing. The approximate locations of the borings are shown on the attached Figure 2.

Laboratory tests were performed on representative soil samples collected from the borings to evaluate in-place moisture content and dry density, gradation, plasticity, consolidation (hydrocollapse) characteristics, expansivity, sodium content, sulfate content, sodium sulfate content, and solubility potential (total salts). The results of the in-place moisture content and dry density tests are provided on the attached boring logs. The tests were performed in general accordance with procedures detailed in the referenced report (Ninyo & Moore, 2006), and the test results are presented in the attached Figures.

## **SUBSURFACE SOILS ENCOUNTERED**

Generalized descriptions of the subsurface soils (fill and native soil) encountered in the exploratory borings are provided in the following sections.

### **Fill**

Apparent fill material was encountered in our exploratory borings. The fill ranged up to approximately 7 feet deep. The encountered fill soils were comprised primarily of clayey gravel with sand and poorly graded gravel with clay and sand.

### **Native Soil**

Native soil was encountered beneath the noted fill and extended to the total depths of our exploratory borings. The encountered native soil consisted primarily of loose to very dense clayey

sand and stiff sandy lean clay. Some of the sand was noted to be slightly gypsiferous and some of the clay soil was noted to be slightly cemented.

## **RECOMMENDATIONS**

### **Lateral Earth Pressures**

Since the referenced reports were issued, local agencies in Southern Nevada have adopted the 2009 International Building Code (IBC) along with amendments to the 2009 IBC. Based on our review of the referenced report, building code, and amendments, revised “active” and “at-rest” dynamic lateral earth pressure resultant forces due to seismic loading are needed.

Ninyo & Moore evaluated “active” and “at-rest” dynamic lateral earth pressures due to seismic loading based on the Southern Nevada Amendments to the 2009 IBC. Ninyo & Moore recommends that retaining walls that are not restrained from movement at the top be designed using an “active” resultant force due to seismic loading as indicated in the equation below:

$$R_{e \text{ (active)}} = 9H^2 \text{ pounds per unit width (in feet) of wall}$$

where H = height of the wall in feet

Ninyo & Moore recommends that retaining walls that are restrained from movement at the top be designed using an “at-rest” resultant force due to seismic loading as indicated in the equation below:

$$R_{e \text{ (at-rest)}} = 24H^2 \text{ pounds per unit width (in feet) of wall}$$

where H = height of the wall in feet

The resultant forces should be applied 0.6H above the base of the wall.

### **Special Inspections**

Special inspections should be performed as indicated in Table 1704.7 of the referenced Southern Nevada Amendments to the 2009 International Building Code (SNBO, 2010). Based on the

results of our laboratory testing and our understanding of the subject project, it is our opinion that the level of special inspection, as indicated in Table 1704.7, should be 4b.

### **Excavations**

Excavations for this project should not undermine existing foundations and should not extend below a plane that extends downward and outward from the bottom outside edge of existing building foundations on a 1:1 (horizontal:vertical) slope or, alternatively, the soils beneath the foundations of the existing building should be appropriately shored during grading and excavation activities. In areas where new building foundations are constructed parallel to existing building foundations, and/or where the 1:1 overexcavation criteria cannot be met, the overexcavations may be performed in relatively small, independent stages to reduce the potential for undermining of existing footings, and the existing building should be monitored for movement. Staged excavations should not remain open for extended periods of time and should be adequately backfilled with structural fill prior to subsequent excavations. If a permanent system to support existing foundations will be constructed, it should be designed and implemented. according to the referenced Addendum Geotechnical Recommendations letter (Ninyo & Moore, 2007).

We strongly emphasize that the contractor for this project should take adequate precautions during construction so that movement of the existing building does not occur. These precautions may include placement of shoring, installation of sacrificial jacks, performance of soil removal adjacent to the foundation in sections, etc. The project's geotechnical consultant should observe the exposed soils during overexcavation along the base of existing footings to assess the suitability and stability of the exposed soil. However, it should be clearly understood that the contractor is responsible for maintaining the stability of the subject building and other improvements, and for any damage that may occur to the building as a result of construction operations. We recommend that the subject building be monitored for possible movement during project construction operations. A scope of services for such monitoring will be provided by Ninyo & Moore upon request.

To avoid damage to any existing wall waterproofing and subdrainage devices that may be present, particular care should be taken by the contractor during overexcavation of soil adjacent to existing structures and during placement of structural fill. Re-waterproofing of basement walls and placement/replacement of subdrainage devices may be needed.

Earthwork access limitations should be anticipated by the contractor due to the depth of recommended soil overexcavation and close proximity of the excavation to existing structures. Manual excavation and utilization of limited access compaction equipment should be anticipated.

### Report Update

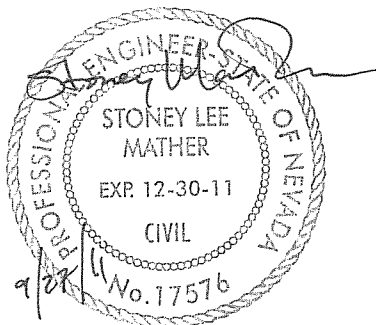
Based on our understanding of the proposed project and our review of the referenced geotechnical evaluation report and addendum, it is our opinion that the geotechnical recommendations previously provided in the report (except as updated in this letter) remain applicable for the project. We appreciate the opportunity to be of service to you on this project.

Respectfully submitted,  
**NINYO & MOORE**



Stoney L. Mather, PE  
Senior Project Engineer

SLM/BLO/ltk



Brad L. Olsen, PE  
Principal Engineer

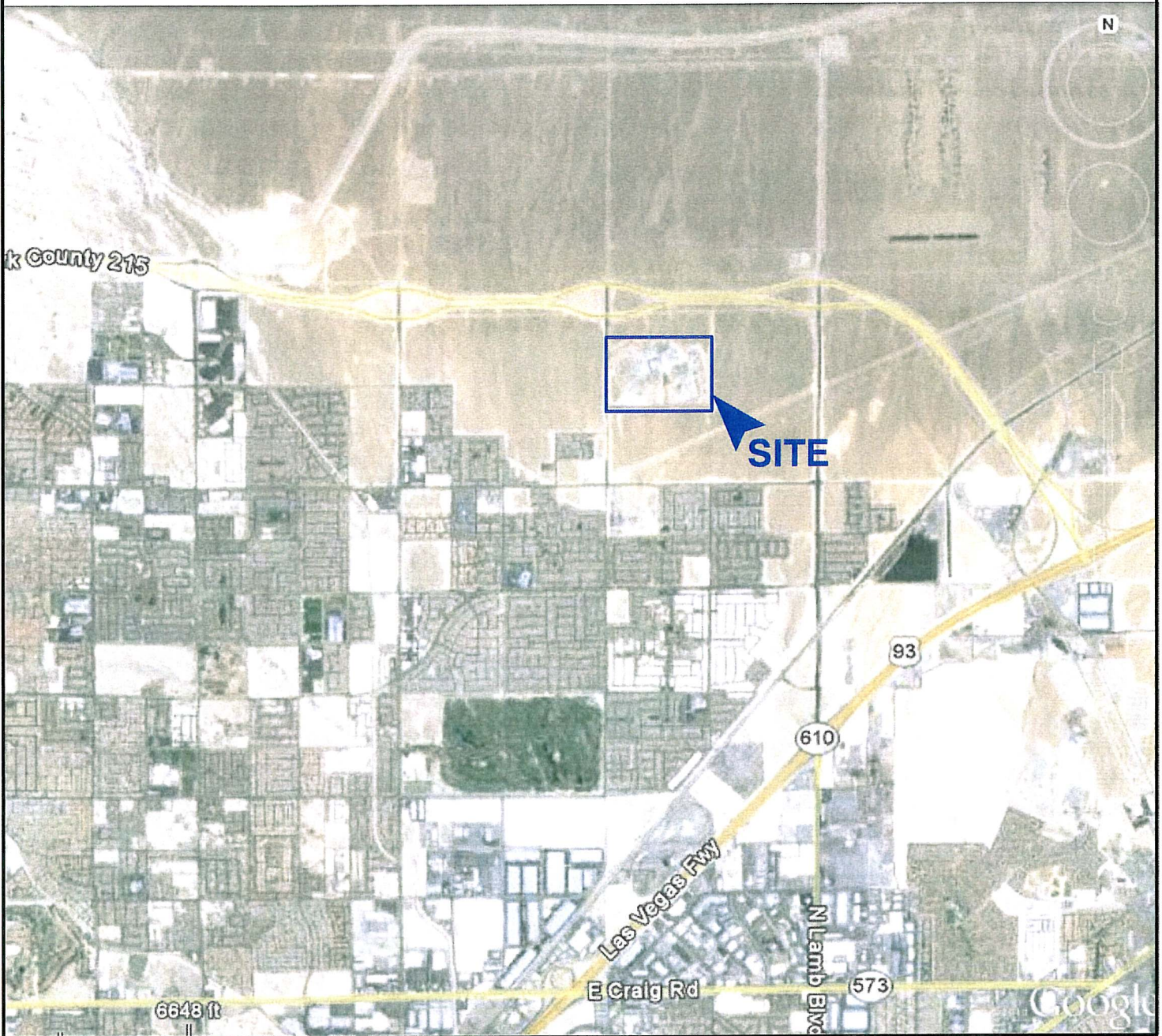
Attachments: Figure 1 – Site and Vicinity  
Figure 2 – Exploratory Borings  
Figure 3 through Figure 8 – Exploratory Boring Logs  
Figure 9 through Figure 14 – Laboratory Test Results  
Laboratory Reports of Chemical Testing

Distribution: (5) Addressee (4 hard copies, 1 via e-mail)

## REFERENCES

- Ninyo & Moore, 2006, Geotechnical Evaluation, Veterans Affairs Medical Center, North Las Vegas, Nevada: dated May 1.
- Ninyo & Moore, 2007, Addendum Geotechnical Recommendations, Temporary Tieback Anchored Soldier Pile Walls and Retaining Walls, Phase II, Foundation Package for Veterans Affairs Medical Center, North Las Vegas, Nevada, VA Project No. 593CA2202B: dated August 1.
- Southern Nevada Building Officials (SNBO), 2010, Southern Nevada Amendments to the 2009 International Building Code: dated July 23.





REFERENCE: GOOGLE EARTH, 2011

SCALE IN FEET



NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE

**Ninyo & Moore**

## SITE AND VICINITY

FIGURE

PROJECT NO.

DATE

ADMIN BUILDING AT VA MEDICAL CENTER  
NORTHEAST CORNER OF PECOS ROAD AND CENTENNIAL PARKWAY  
NORTH LAS VEGAS, NEVADA

301699007

9/11

**1**







DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>8/30/11</u> BORING NO. <u>B-101</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u> SHEET <u>1</u> OF <u>2</u>	METHOD OF DRILLING <u>Failing 1250 air-rotary drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							GC	<b>ASPHALT CONCRETE:</b> Unit is approximately 3 to 3-1/2 inches thick. <b>FILL:</b> Light brown, damp, medium dense, clayey GRAVEL with sand.	
5			8/6" 12/6" 12/6"	11.0	101.6				
			9/6" 9/6"						
10			6/6" 10/6" 4/6"	8.2	101.0		GP-GC	<b>NATIVE SOIL:</b> Light brown, damp, loose to medium dense, poorly graded GRAVEL with clay and sand.	
15			20/6" 40/6" 47/6"	3.5	115.9				
							CL	Very dense. Tan, damp, very stiff, lean CLAY with sand and gravel; very slightly cemented.	
20									

**Ninyo & Moore**


**BORING LOG**

ADMINISTRATION BUILDING AT VA MEDICAL CENTER, NEC OF PECOS ROAD  
AND CENTENNIAL PARKWAY, NORTH LAS VEGAS, NEVADA

PROJECT NO.  
301699007

DATE  
9/11

FIGURE  
3

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>8/30/11</u> BORING NO. <u>B-101</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u> SHEET <u>2</u> OF <u>2</u>	METHOD OF DRILLING <u>Failing 1250 air-rotary drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>	
									DESCRIPTION/INTERPRETATION
20			16/6" 43/6" 50/5"	5.6	113.3		CL	<u>NATIVE SOIL (continued):</u> Tan, damp, very stiff, lean CLAY with sand and gravel; very slightly cemented; sampler refusal after 17 inches.	
25			50/5"	--	--			Slightly cemented; sampler refusal after 5 inches.	
30			31/6" 50/5"	24.4	96.7			Sampler refusal after 11 inches.	
35								Total depth = 30.9 feet. Groundwater not encountered during drilling. Backfilled and patched on 8/30/11.  <u>NOTE:</u> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
40									

**Ningo & Moore**

**BORING LOG**

ADMINISTRATION BUILDING AT VA MEDICAL CENTER, NEC OF PECOS ROAD  
AND CENTENNIAL PARKWAY, NORTH LAS VEGAS, NEVADA

PROJECT NO.  
301699007

DATE  
9/11

FIGURE  
4

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>8/30/11</u> BORING NO. <u>B-102</u> GROUND ELEVATION <u>Not measured</u> SHEET <u>1</u> OF <u>2</u> METHOD OF DRILLING <u>Failing 1250 air-rotary drill rig</u> DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u> SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>	
	Bulk	Driven						DESCRIPTION/INTERPRETATION	
0							GP-GC	<b>ASPHALT CONCRETE:</b> Unit is approximately 2-1/2 to 3 inches thick. <b>FILL:</b> Light brown, damp, dense, poorly graded GRAVEL with clay and sand.	
20/6"				6.8	123.5				
42/6"									
30/6"									
5				11.4	115.4		SC	<b>NATIVE SOIL:</b> Light brown, damp, medium dense, clayey SAND; slightly gypsiferous.	
11/6"									
20/6"									
30/6"									
10				1.3	132.6			Very dense.	
29/6"									
49/6"									
44/6"									
15				8.1	103.0				
15/6"									
34/6"									
34/6"									
20									

**Ninyo & Moore**


**BORING LOG**

ADMINISTRATION BUILDING AT VA MEDICAL CENTER, NEC OF PECOS ROAD  
AND CENTENNIAL PARKWAY, NORTH LAS VEGAS, NEVADA

PROJECT NO.  
301699007

DATE  
9/11

FIGURE  
5

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>8/30/11</u> BORING NO. <u>B-102</u> GROUND ELEVATION <u>Not measured</u> SHEET <u>2</u> OF <u>2</u> METHOD OF DRILLING <u>Failing 1250 air-rotary drill rig</u> DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u> SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>		
	Bulk	Driven						DESCRIPTION/INTERPRETATION		
20			24/6" 35/6" 50/4"	17.7	103.4		SC	<b>NATIVE SOIL (continued):</b> Light brown, damp, very dense, clayey SAND; slightly gypsiferous. Sampler refusal after 16 inches.  Total depth = 21.3 feet. Groundwater not encountered during drilling. Backfilled and patched on 8/30/11.  <b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.		
25										
30										
35										
40										

***Ningo & Moore***

**BORING LOG**

ADMINISTRATION BUILDING AT VA MEDICAL CENTER, NEC OF PECOS ROAD  
AND CENTENNIAL PARKWAY, NORTH LAS VEGAS, NEVADA

PROJECT NO.  
301699007

DATE  
9/11

FIGURE  
6



DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>8/30/11</u> BORING NO. <u>B-103</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u> SHEET <u>1</u> OF <u>2</u>	METHOD OF DRILLING <u>Failing 1250 air-rotary drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GC	<u>ASPHALT CONCRETE:</u> Unit is approximately 2-1/2 to 3 inches thick. <u>FILL:</u> Light brown, damp, medium dense, clayey GRAVEL with sand.	
5			8/6" 9/6" 18/6"	2.7	120.3				
			15/6" 28/6" 30/6"	8.6	120.8		SC	<u>NATIVE SOIL:</u> Light brown, damp, medium dense, clayey SAND; little gravel; slightly gypsiferous.	
10			50/5"					Sampler refusal after 5 inches.	
15			16/6" 22/6" 33/6"	14.1	104.4				
20									

**Ningo & Moore**

**BORING LOG**

ADMINISTRATION BUILDING AT VA MEDICAL CENTER, NEC OF PECOS ROAD  
AND CENTENNIAL PARKWAY, NORTH LAS VEGAS, NEVADA

PROJECT NO.  
301699007

DATE  
9/11

FIGURE  
7

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>8/30/11</u> BORING NO. <u>B-103</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u> SHEET <u>2</u> OF <u>2</u>	METHOD OF DRILLING <u>Failing 1250 air-rotary drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>	
									<b>DESCRIPTION/INTERPRETATION</b>
20			47/6" 50/5"	--	--		SC	NATIVE SOIL (continued): Light brown, damp, dense, clayey SAND; little gravel; slightly gypsiferous. Sampler refusal after 11 inches.	
25			45/6" 50/5"	9.5	111.1			Sampler refusal after 11 inches.	
30			50/5"	--	--			Sampler refusal after 5 inches. Total depth = 30.4 feet. Groundwater not encountered during drilling. Backfilled and patched on 8/30/11.	
35								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
40									

**Ningo & Moore**

**BORING LOG**

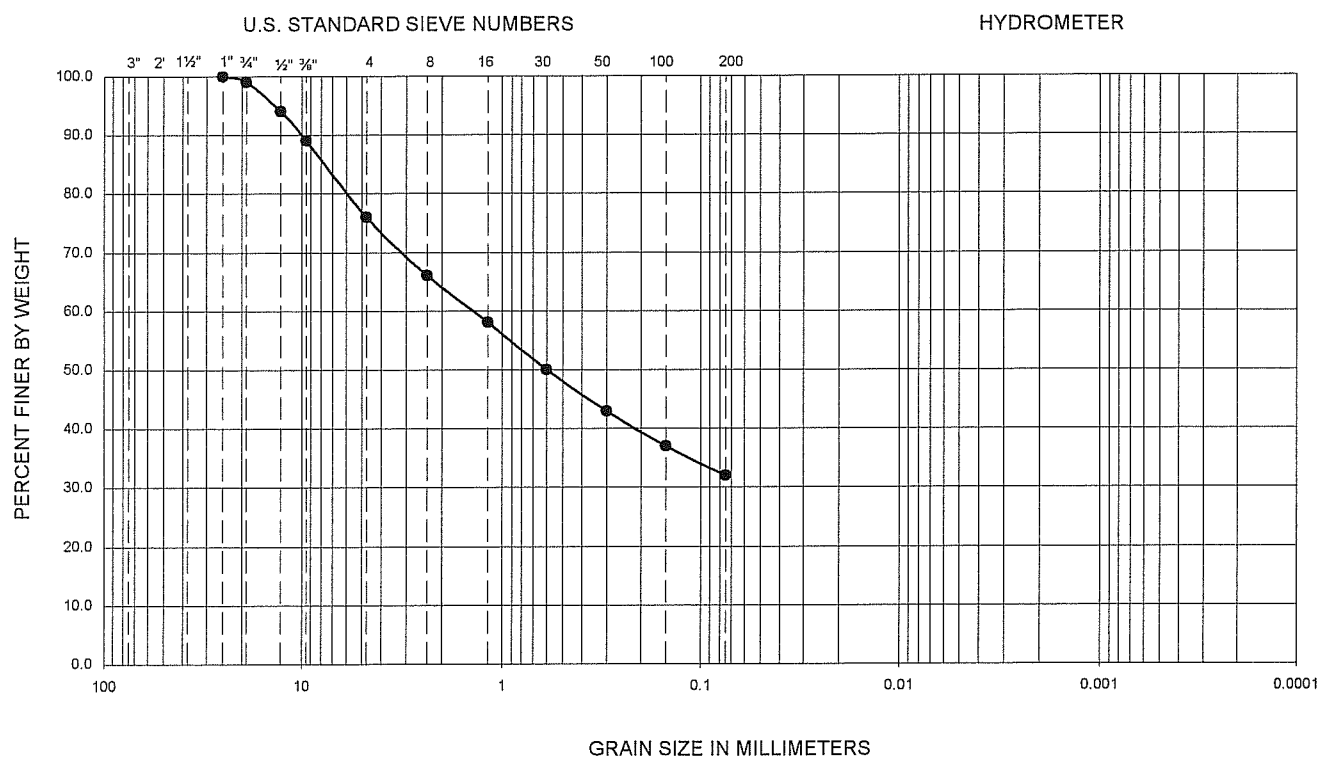
ADMINISTRATION BUILDING AT VA MEDICAL CENTER, NEC OF PECOS ROAD  
AND CENTENNIAL PARKWAY, NORTH LAS VEGAS, NEVADA

PROJECT NO.  
301699007

DATE  
9/11

FIGURE  
8

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



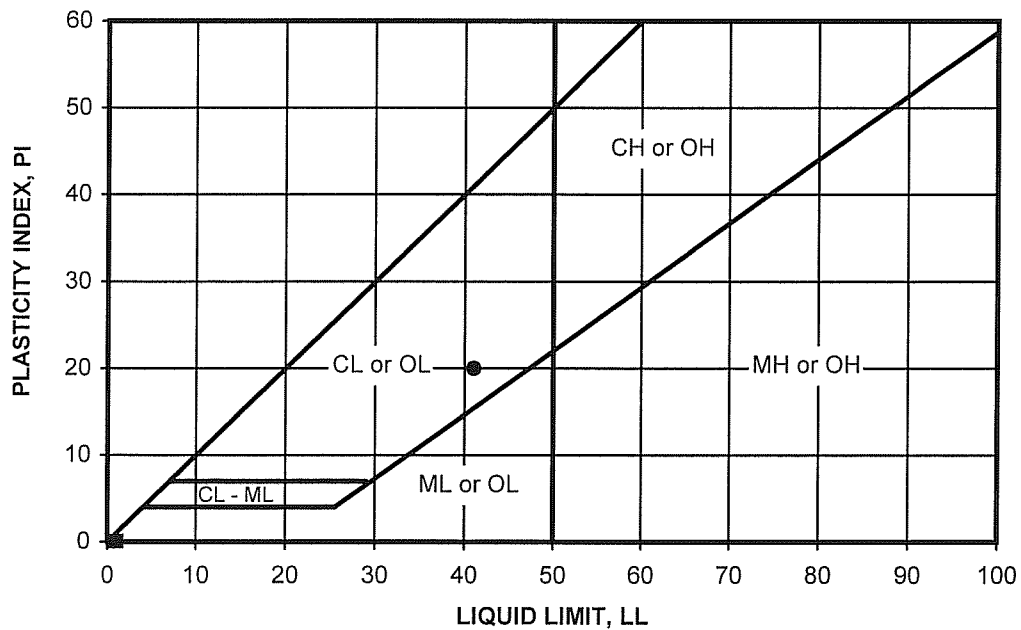
Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	C <sub>u</sub>	C <sub>c</sub>	Passing No. 200 (%)	USCS
●	B-103	15.0-20.0	41	21	20	--	--	--	--	--	32	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

<b><i>Ninyo &amp; Moore</i></b>		<b>GRADATION TEST RESULTS</b>	<b>FIGURE</b>  <b>B-9</b>
PROJECT NO.	DATE	ADMIN BUILDING AT VA MEDICAL CENTER NORTHEAST CORNER OF PECOS ROAD AND CENTENNIAL PARKWAY NORTH LAS VEGAS, NEVADA	
301699007	9/11		

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
•	B-103	15.0-20.0	41	21	20	CL	SC

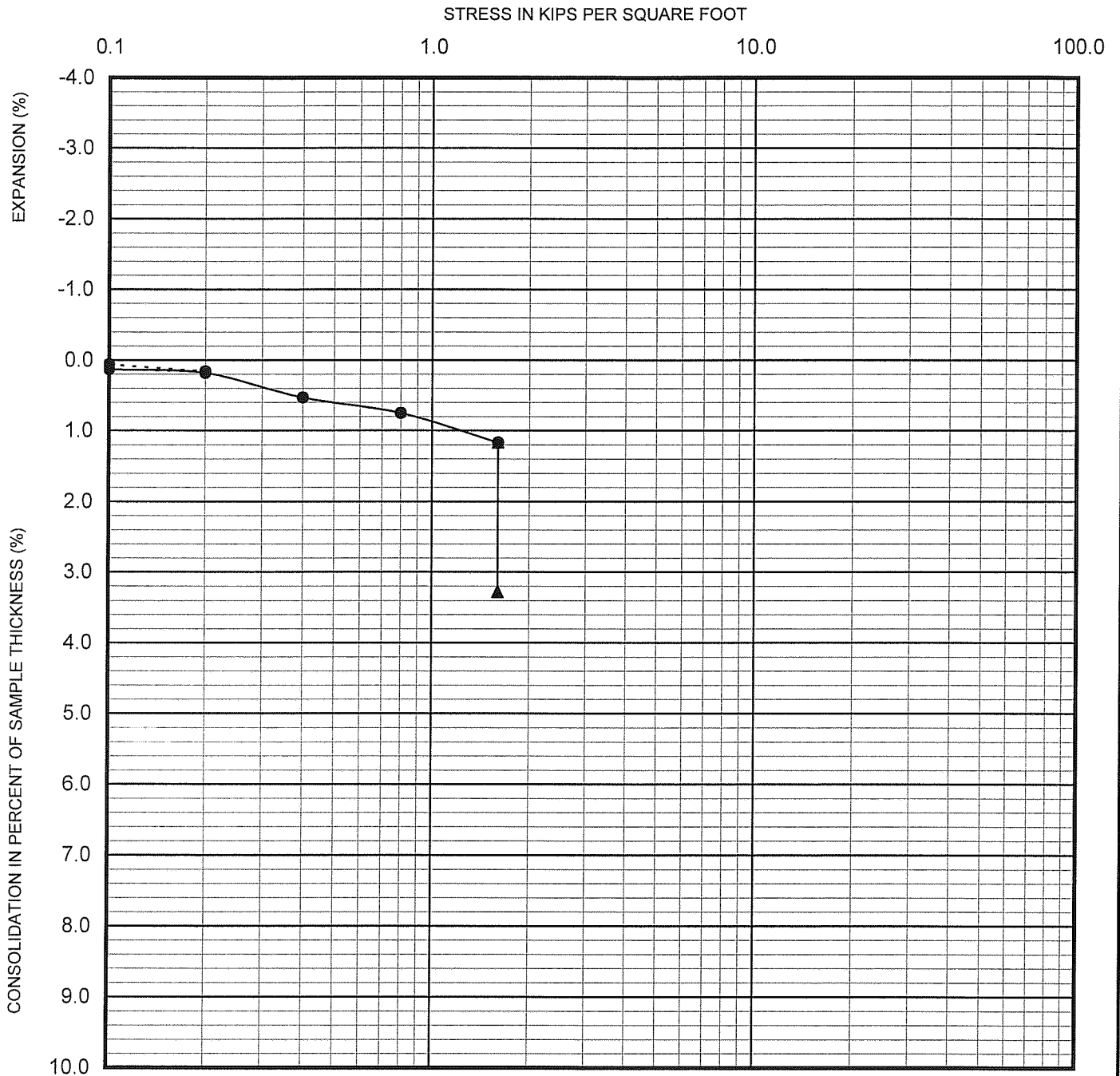
NP - INDICATES NON-PLASTIC



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

<b>Ninyo &amp; Moore</b>		<b>ATTERBERG LIMITS TEST RESULTS</b>		FIGURE
PROJECT NO.	DATE	ADMIN BUILDING AT VA MEDICAL CENTER NORTHEAST CORNER OF PECOS ROAD AND CENTENNIAL PARKWAY NORTH LAS VEGAS, NEVADA		<b>B-10</b>
301699007	9/11			





---●---	Seating Cycle	Sample Location	B-101
—●—	Loading Prior to Inundation	Depth (ft.)	20.0-21.5
—▲—	Loading After Inundation	Soil Type	CL
-▲-	Rebound Cycle		

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 5333

**Ninyo & Moore**

## COLLAPSE POTENTIAL TEST RESULTS

FIGURE

PROJECT NO.

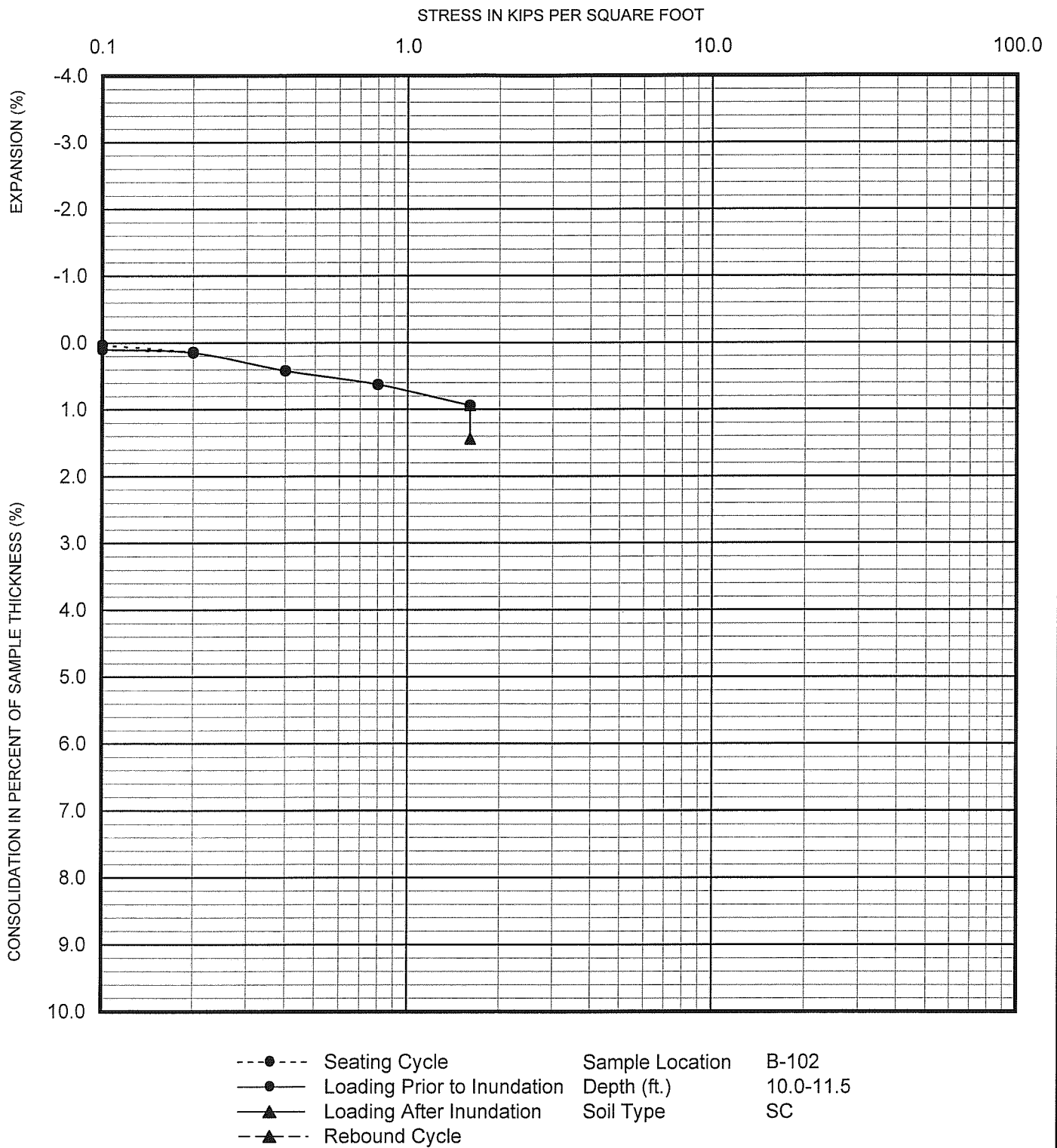
DATE

ADMIN BUILDING AT VA MEDICAL CENTER  
NORTHEAST CORNER OF PECOS ROAD AND CENTENNIAL PARKWAY  
NORTH LAS VEGAS, NEVADA

**B-11**

301699007

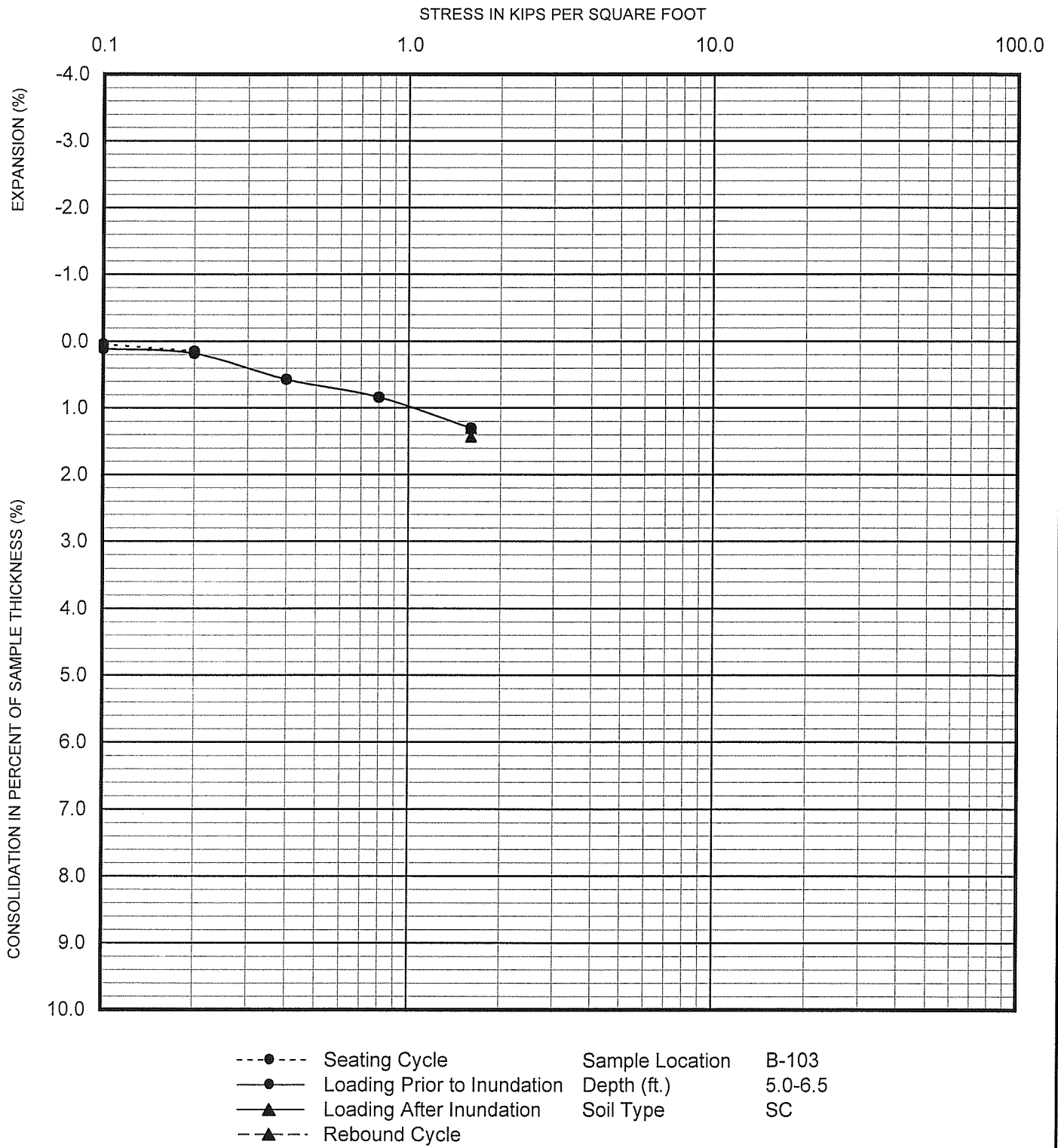
9/11




PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 5333

<b>Ninyo &amp; Moore</b>		<b>COLLAPSE POTENTIAL TEST RESULTS</b>	FIGURE  <b>B-12</b>
PROJECT NO.	DATE		
301699007	9/11		

ADMIN BUILDING AT VA MEDICAL CENTER NORTHEAST CORNER OF PECOS ROAD AND CENTENNIAL PARKWAY NORTH LAS VEGAS, NEVADA
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PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 5333

		COLLAPSE POTENTIAL TEST RESULTS	FIGURE
PROJECT NO.	DATE	ADMIN BUILDING AT VA MEDICAL CENTER NORTHEAST CORNER OF PECOS ROAD AND CENTENNIAL PARKWAY NORTH LAS VEGAS, NEVADA	<b>B-13</b>
301699007	9/11		

SAMPLE LOCATION	DEPTH (FT)	IN-PLACE MOISTURE CONTENT (%)	IN-PLACE DRY DENSITY (PCF)	FINAL MOISTURE CONTENT (%)	SURCHARGE (PSF)	SWELL POTENTIAL* (%)
B-103	5.0-6.5	6.0	120.3	13.8	60	0.9

\* Negative number indicates collapse.

PERFORMED IN GENERAL ACCORDANCE WITH  
SECTION 1803.5.3.2 OF THE SOUTHERN NEVADA AMENDMENTS TO THE 2009 INTERNATIONAL BUILDING CODE

<b><i>Ninyo &amp; Moore</i></b>		<b>SWELL TEST RESULTS</b>	<b>FIGURE</b>  <b>B-14</b>
PROJECT NO.	DATE	ADMIN BUILDING AT VA MEDICAL CENTER NORTHEAST CORNER OF PECOS ROAD AND CENTENNIAL PARKWAY NORTH LAS VEGAS, NEVADA	
301699007	9/11		





## LABORATORY REPORT

**DATE:** September 16, 2011

**REPORT NUMBER:** 11-3906-1A

**CLIENT:** Ninyo & Moore  
6700 Paradise Road, Suite E  
Las Vegas, NV 89119

**PAGE:** 1 of 1

**CLIENT PROJECT:** 301699007

**CLIENT PO #:**

**ANALYST:** SW

**Sampled By:** Client

**Date Sampled:** --

**Time Sampled:** --

**Date Received:** 09/06/11


**Time Received:** 1430

**Sample ID:** B-102 @ 2.0-3.5

Analysis	Result	Unit	Method
Sodium	0.05	%	ASTMD2791
Sulfate	0.10	%	SM4500E
Sodium Sulfate	0.15	%	Calculation
Total Salts (Solubility)	0.37	%	SM2540C

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

**REVIEWED BY:**

  
\_\_\_\_\_  
John Sloan  
Laboratory Director



## LABORATORY REPORT

**DATE:** September 16, 2011

**REPORT NUMBER:** 11-3906-2A

**CLIENT:** Ninyo & Moore  
6700 Paradise Road, Suite E  
Las Vegas, NV 89119

**PAGE:** 1 of 1

**CLIENT PROJECT:** 301699007

**CLIENT PO #:**

**ANALYST:** SW

**Sampled By:** Client

**Date Sampled:** --

**Time Sampled:** --

**Date Received:** 09/06/11


**Time Received:** 1430

**Sample ID:** B-103 @ 2.0-3.5

Analysis	Result	Unit	Method
Sodium	0.02	%	ASTMD2791
Sulfate	0.31	%	SM4500E
Sodium Sulfate	0.07	%	Calculation
Total Salts (Solubility)	0.44	%	SM2540C

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

**REVIEWED BY:**

  
\_\_\_\_\_  
John Sloan  
Laboratory Director