



August 24, 2017

Project No.: VT-25400-01

Attention: Joshua Koenig-Brown
Oxnard Union High School District
309 South K Street, Building C
Oxnard, CA 93030

Project: Oxnard High School Pool Repairs
3400 West Gonzales Road
Oxnard, California

Subject: Potential Effects of Groundwater During Pool Repair Operations

- Reference:
1. Earth Systems Consultants Southern California, June 25, 1992, Geotechnical Engineering Report for the New Oxnard High School, Gonzales Road between Patterson Road and Victoria Avenue, Oxnard, California (Job No. B-19531-V1).
 2. Earth Systems Consultants Southern California, March 5, 1998, Re-Evaluation of Groundwater Levels and New Recommendations, Oxnard High School Pool Facility, Oxnard, California (Job No. SS-19531-V9).
 3. Earth Systems Consultants Southern California, April 16, 1998, Final Check Groundwater Levels, Oxnard High School Pool Facility, Oxnard, California (Job No. SS-19531-V9).

Introduction and Scope of Services

It is currently proposed to perform repairs to the Oxnard High School swimming pool facility. Issues that have been observed include spalling of the concrete decking and deterioration of the gunite within the pool bottom. A significant concern exists that when the pool is emptied when groundwater is at high elevations, buoyant forces may cause the pool to "float". If groundwater is shallow enough to cause these issues, dewatering will be required, and permits may need to be required to discharge the pumped groundwater into the detention basin south of the football field.

The scope of services provided by Earth Systems Southern California (Earth Systems) that resulted in this report included review of the referenced geotechnical reports prepared during the design stage and those prepared during pool construction, drilling three new borings in the grass areas to the south, west, and north of the pool complex to measure current groundwater elevations, researching guidelines to determine whether a permit will be required by the LARWQCB to discharge groundwater into the detention basin, and preparing a report summarizing the findings.

Historical Data Pertaining to Depths to Groundwater

Review of the referenced reports indicates that significant fluctuations in groundwater depths have occurred over time at the subject site. When borings were advanced in April 1992 during studies that resulted in the referenced Geotechnical Engineering Report, groundwater depths ranged from 19.5 and 20.5 feet below natural grades in those borings (B-14, B-15, and B16) that were closest to the pool.

The pool was not constructed until 1998. Two test pits (BP-1 and BP-2) were excavated on March 2, 1998, and groundwater was encountered at depths ranging from 11 to 14.9 feet below the ground surface that existed at that time. It was estimated that groundwater had risen approximately 10 feet between April 1992 and March 1998. A third test pit (not numbered) was excavated on April 16, 1998, immediately before construction began, and encountered groundwater at a depth of 11.75 feet. Although grades were raised approximately 2 feet during pool construction, dewatering was necessary for the surge pit and the deepest section of the pool. Hydrostatic relief valves were recommended, but it is unknown if these were installed.

Current Depths to Groundwater

On August 14, 2017, three borings were advanced to the south, west, and north of the existing facility to measure current depths to groundwater. The relative elevations of the three borings varied, but when standardized using a manometer device accurate to hundredths of a foot. Groundwater elevations were measured using an electronic device that had equal accuracy. Measured groundwater depths ranged from 25.77 to 26.40 feet below the existing pool deck surface.

Discussion

Review of historical rainfall data indicates that the winter of 1997-1998 was an exceptionally wet year. It is likely that the rainfall of that year was the primary cause of the rise in the groundwater. Conversely, despite the relatively wet winter of 2016-2017, it followed several years of drought, and those years of drought are probably related to the current depths to groundwater being deeper than even those measured in 1992.

Because the current groundwater levels are significantly deeper than even the deepest part of the pool bottom, it is anticipated that dewatering will not be necessary assuming that draining and repairing the pool gunite surfaces can be accomplished before the next rainy season.

If the repairs cannot be completed prior to the next rainy season, it may be prudent to measure depths to groundwater again. If groundwater rises significantly, dewatering may become necessary. Discussions with environmental professionals indicate that it is likely that it would be necessary to obtain a discharge permit from the Los Angeles Regional Water Quality Control Board if water is pumped for dewatering to the detention basin south of the campus football field.

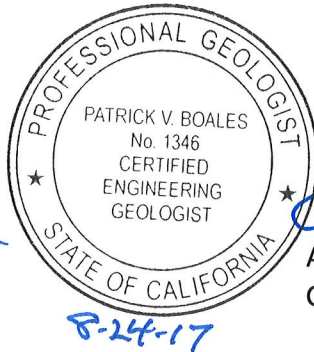
Closure

We have appreciated the opportunity to be of service to you on this project. Please call if you have any questions, or if we can be of further service.

Respectfully submitted,

EARTH SYSTEMS SOUTHERN CALIFORNIA

Patrick V. Boales
Patrick V. Boales
Engineering Geologist



Anthony P. Mazzei
Anthony P. Mazzei
Geotechnical Engineer



Attach: Site Plan Showing New Boring Locations
Logs of New Borings

Copies: 3 - OUHSD, Attention: Koenig-Brown (2 via US mail, 1 via email)
1 - Project File



 Approximate Boring Location



Approximate Scale: 1" = 40'

SITE PLAN

Oxnard High School Pool Repairs
Oxnard, California



Earth Systems
Southern California

August 2017

VT-25400-01



BORING NO: B-1 PROJECT NAME: Oxnard High School Pool Repair PROJECT NUMBER: VT-25400-01 BORING LOCATION: Per Plan	DRILLING DATE: August 14, 2017 DRILL RIG: Mobile B-61 DRILLING METHOD: 6.0" Hollow Stem Auger LOGGED BY: SC
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Vertical Depth	Sample Type			PENETRATION RESISTANCE (BLOWS/6")	SYMBOL	USCS CLASS	UNIT DRY WT. (pcf)	MOISTURE CONTENT (%)	DESCRIPTION OF UNITS
	Bulk	SPT	Mod. Calif.						
0						SM			<p>ALLUVIUM: Yellowish brown silty fine sand; medium dense; dry to damp.</p> <p>ALLUVIUM: Yellowish brown well graded sand; some silt; scattered gravel; medium dense; dry to damp.</p> <p>ALLUVIUM: Medium brown well graded sand; some silt; scattered gravel; medium dense; damp to moist.</p> <p>Becoming coarser grained; moist.</p>
5									
10						SM			
15						SM			
20								▼	
25									<p>Total Depth: 20.0 feet.</p> <p>Groundwater Depth 19.77 feet.</p> <p>Ground Elevation below pool deck: 6.44 feet.</p> <p>Groundwater Depth below pool deck: 26.21 feet.</p>
30									
35									

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.



BORING NO: B-2				DRILLING DATE: August 14, 2017					
PROJECT NAME: Oxnard High School Pool Repair				DRILL RIG: Mobile B-61					
PROJECT NUMBER: VT-25400-01				DRILLING METHOD: 6.0" Hollow Stem Auger					
BORING LOCATION: Per Plan				LOGGED BY: SC					
Vertical Depth	Sample Type			PENETRATION RESISTANCE (BLOWS/6"	SYMBOL	USCS CLASS	UNIT DRY WT. (pcf)	MOISTURE CONTENT (%)	DESCRIPTION OF UNITS
	Bulk	SPT	Mod. Calif.						
0						SM			ALLUVIUM: Medium brown silty sand; medium dense; damp to moist.
5						SM			ALLUVIUM: Yellowish brown silty sand; fine grained; some gravels; medium dense; damp to moist.
10						SM			ALLUVIUM: Yellowish brown silty sand; fine to medium grained; with gravel; medium dense; damp to moist.
15						SM			ALLUVIUM: Yellowish brown silty sand; fine to medium grained; with gravel; medium dense; damp to moist.
20						SM			Increasing gravel content; moist.
25						SM			ALLUVIUM: Grayish brown silty sand with gravel; medium dense; wet.
30									Total Depth: 25.0 feet. Groundwater Depth 21.94 feet. Ground elevation below pool deck: 4.46 feet. Groundwater Depth below pool deck: 26.40 feet.
35									

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.



BORING NO: B-3	DRILLING DATE: August 14, 2017
PROJECT NAME: Oxnard High School Pool Repair	DRILL RIG: Mobile B-61
PROJECT NUMBER: VT-25400-01	DRILLING METHOD: 6.0" Hollow Stem Auger
BORING LOCATION: Per Plan	LOGGED BY: SC

Vertical Depth	Sample Type			PENETRATION RESISTANCE (BLOWS/6")	SYMBOL	USCS CLASS	UNIT DRY WT. (pcf)	MOISTURE CONTENT (%)	DESCRIPTION OF UNITS
	Bulk	SPT	Mod. Calif.						
0						SM			ALLUVIUM: Medium brown silty sand to sandy silt; medium dense; damp to moist.
5						SM			ALLUVIUM: Yellowish brown well graded slightly silty sand; scattered gravel; medium dense; damp to moist.
10									
15						SM			ALLUVIUM: Yellowish brown well graded slightly silty sand; scattered gravel; medium dense; damp to moist.
20									
25									Becoming moist.
30									
35									Total Depth: 30.0 feet. Groundwater Depth 26.35 feet. Ground elevation above pool deck: 0.58 feet. Groundwater Depth below pool deck: 25.77 feet.

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.