The Geo-Institute

of the American Society of Civil Engineers

Presents

The Competition Rules for the 17th *Annual* National

GeoPREDICTION at

2026 Geo-Congress - Salt Lake City, UT

Important Dates

GeoPrediction Reports Due……………………....………….January 9, 2026 6:00PM EST

Invitation to GeoPrediction Finale………..…………………………...…. February 6, 2026

2026 Geo-Congress…………………………………...….……………March 9 – 12, 2026

Geo-Congress 2026 Information……………….…….……………https://www.geocongress.org/

GeoPrediction Presentations……………………..……...……………………..March 10, 2026

17th Annual National GeoPrediction Rules – 2026 Geo-Congress

1. Objective: The objective of the GeoPrediction competition is to develop an accurate prediction of geotechnical behavior given information regarding subsurface, boundary, and initial conditions, as well as the geotechnical/structural/hydraulic loading. The GeoPrediction competition may involve using available geotechnical software, empirical correlations, or developing a simple but accurate computer code for making this prediction.

For the 2026 GeoPrediction, the competing teams will develop estimated capacities of auger-cast piles that were subjected to full scale axial load testing.

2. Geotech data: Input data for the problem including problem description, cross sections, and soil information are found on the following sheets.

3. Eligibility: A GeoPrediction team will consist of one or two students. Teams of two can include two undergraduate students, or one undergraduate and one graduate student. Two graduate students cannot form a team. However, graduate students can submit their own prediction. Students must be enrolled during the Spring 2026 Semester or Quarter.

4. Submittal: Each GeoPrediction team will submit a GeoPrediction Report that will, at a minimum, contain the following information.

a. The Report shall be no more than three (3) pages long (not including any references and title page). One inch margins, single spacing, and 12 point Time New Roman font are required.
b. Include the provided Table 1 (completed) in your report.
c. The Report shall contain the methods (assumptions, correlations, analytical procedures, numerical procedures, computers software, etc.) that the team employed to develop the GeoPrediction. Methods must be referenced properly.
d. The cover page must include the name of the institution; names, email addresses, and status (i.e., graduate or undergraduate) of each team member; as well as the name and contact information of the faculty that advised the team in developing their prediction.
e. Submit your report electronically in PDF format to Dr. Matthew Sleep (sleepmw@uc.edu) by 6pm Eastern Standard Time on January 9, 2026 with the subject line "2026 Geo-Congress GeoPrediction Submittal – *School Name*". Sender will receive confirmation of receipt by email. Late submissions are not accepted. If you do not receive a confirmation email within 24 hours of submission, please re-send the information.

5. Judging: The submitted GeoPrediction reports will be judged and ranked by an anonymous panel of faculty and engineers. Initial judging will be based on criterial (a) through (d) below.

a.	Format, length, grammar, English usage	10%
b.	Clarity of technical presentation	15%
c.	Logical and concise use of appropriate geotechnical methods and principles	15%
d.	Accuracy of GeoPrediction	30%
e.	Presentation at the 2026 Geo-Congress	30%

6. Selection: The winning team will receive the prestigious Mohr's Circle Award. Up to fifteen (15) teams may be invited to the GeoPrediction Presentation based on the ranking of their GeoPrediction reports. The selected teams will be notified by February 6, 2026. The top teams (based total score of items a-d listed in section #5) will receive partial reimbursement for student registration and travel (amount to be determined) for up to two team members.

7. Presentations: Teams invited to present their GeoPrediction Results will prepare an 8 - minute (maximum) presentation that describes their methods and GeoPrediction for viewing by judges and the public. The order and location of the presentations will be determined at the conference site. It is expected that a room with a projector and computer will be used for these presentations.

As noted in Item 5, the Presentation will constitute the final 30% of each invited team's final GeoPrediction score.

8. Questions: Questions should be emailed to Matthew Sleep (sleepmw@uc.edu). It is anticipated that these questions will be uploaded for all to review at the GeoWorld Website (TBD).

Project Description

A large, constructed work is to be founded on auger cast piles. Prior to construction, pile capacities were determined using conventional axial load tests. Your task is to predict the axial capacity of two different piles. Both piles are 18" in diameter. One pile (1) is 63' in length and the other (2) is 45' in length. To aid in your prediction, both SPT and CPT data has been provided from the project site. The location of both the SPT and CPT are shown in Figure 1 as the 'Soil Boring Location.' You must complete Table 1 and include it in your submitted report.

Note that in Table 1 both the 'true' capacity and the Davisson Offset Limit Criteria[2] are required. More value will be placed on your estimate of 'true' capacity. As discussed in UFC 3-220-20[1], many methods to interpret load tests have been proposed. For these load tests, the 'true' capacity will be defined as the 'plunging of the test shaft.'

Table 1. Pile capacity table to be included in your report (completed)

Pile	'True' Capacity (kips)	Davisson Offset Limit Criteria Predicted Capacity (kips)
1 – 63' in length		
2 – 45' in length		

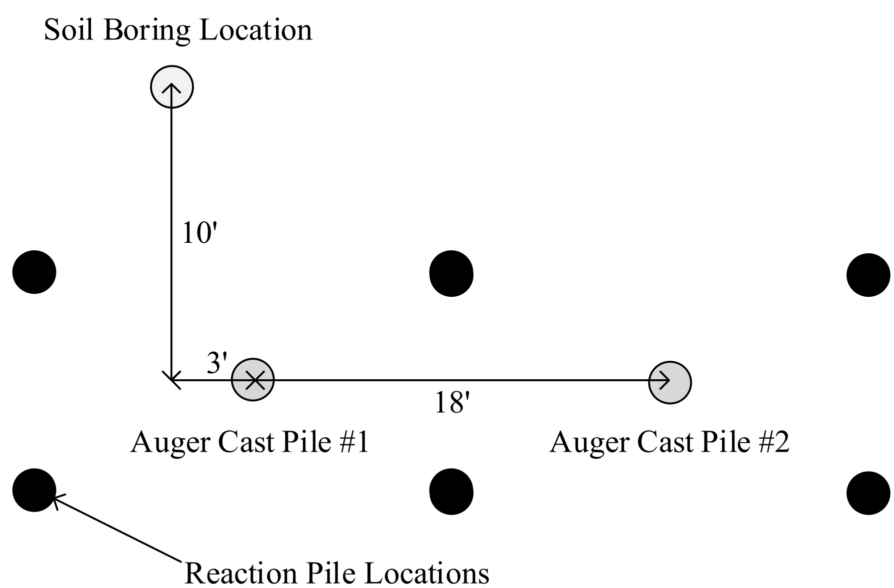


Figure 1 – Plan view of auger cast test piles, reaction piles, and soil boring at project site

[1] - U.S. Department of Defense (DoD). **2025.** *Unified Facilities Criteria (UFC): Foundations and Earth Structures (Design Manual 7.2)*, UFC 3-220-20, published January 16, 2025, 724 pp., Whole Building Design Guide, National Institute of Building Sciences.
[2] - Davisson, M.T. **1972**. "High Capacity Piles." In Proc. Soil Mechanics Lecture Series on Innovations in Foundation Construction, American Society of Civil Engineers, ASCE, Illinois Section, Chicago, IL, 81-112.

Table 2. Properties of Auger Cast Pile #1

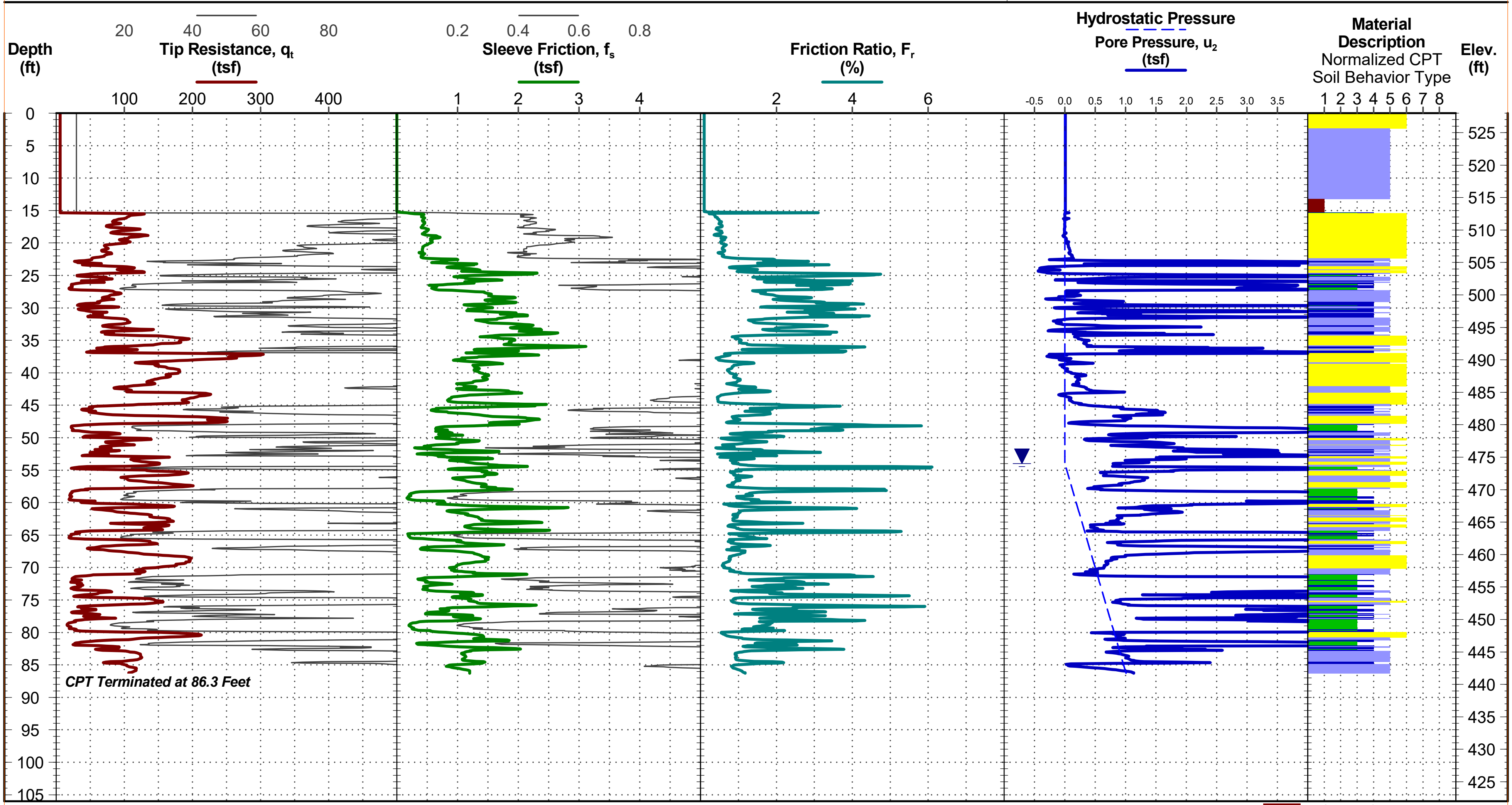
Pile Type	Auger Cast Pile	
Shape	18” Diameter - Circular	
Original Pile Length	63’	ft
Elevation at Ground Surface of Pile	531.0	ft
Pile Projection Above Surface Elevation	1.0	ft
Pile Modulus of Elasticity	4,188,627	psi

Table 3. Properties of Auger Cast Pile #2

Pile Type	Auger Cast Pile	
Shape	18” Diameter - Circular	
Original Pile Length	45’	ft
Elevation at Ground Surface of Pile	531.0	ft
Pile Projection Above Surface Elevation	1.0	ft
Pile Modulus of Elasticity	4,488,184	psi

CPT LOG NO. 1

TEST LOCATION:



CPT sensor calibration reports available upon request.

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

WATER LEVEL OBSERVATION

54 ft estimated water depth
(used in normalizations and correlations;
See Supporting Information)

SITE:

Note: Stabilized water depth after drilling of 41'

GRAPHIC LOG	DEPTH / Surface Elev.: 528.0 (Ft.) / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
	ASPHALT OVER AGGREGATE BASE (12 INCHES) 1.0 / 527							
	FILL - LEAN CLAY, with fine sand, trace gravel, cinders and brick fragments, brown			X	50	6-8-7 N=15	11	
	3.5 / 524.5 **FILL - SAND**, with light gray limestone fragments, fine grained, brown			X	33	50/3"		
		5						
	6.0 / 522 **FILL - LEAN CLAY**, with fine sand, trace brick and limestone fragments			X	5	17-5-3 N=8	13	
				X	44	4-6-3 N=9	19	
	11.0 / 517	10						

SITE:

Surface Elev.: 528.0 (Ft.)

DEPTH	GRAPHIC LOG / DESCRIPTION	ELEVATION (Ft.)
11.0		517
	SAND, trace black cinders, fine grained, brown, medium dense (Possible Fill)	
21.0		507
	LEAN CLAY WITH SILT, trace sand, brown, soft (Lakebed)	
23.5		504.5
	SILT, trace sand, brown, medium dense	
26.0		502
	SILTY CLAY, occasional silty sand seams, brownish gray, soft (Lakebed)	
36.5		491.5
	SILTY SAND, fine grained, brown, medium dense	
41.0		[illegible]
	SILTY CLAY, brownish gray, medium stiff (Lakebed)	
43.0		[illegible]
	SILTY SAND, fine grained, gray, medium dense	
46.0		[illegible]
	SILTY CLAY, trace sand, gray, medium stiff to stiff (Lakebed)	

FIELD TEST RESULTS	LABORATORY HP (tsf)
6-7-8 N=15	
4-5-6 N=11	
4-6-6 N=12	
4-7-8 N=15	
3-3-4 N=7	
4-6-7 N=13	
4-6-7 N=13	0.16 (T)
4-6-5 N=11	0.18 (T)
5-7-9 N=16	
5-7-7 N=14	
4-15-15 N=30	
6-16-12 N=28	
2-3-7 N=10	0.15 (T)
3-6-9 N=15	
6-8-9 N=17	0.15 (T)
4-3-5 N=8	
3-4-5	

DEPTH (Ft.): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

SITE:

LOCATION See Exploration Plan

Surface Elev.: 528.0 (Ft.)

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)
		SILTY CLAY, trace sand, gray, medium stiff to stiff (Lakebed) *(continued)*	
	56.0		472
		SILTY SAND, fine grained, gray, medium dense	
	58.5		469.5
		SILTY CLAY, trace sand, gray, soft to stiff (Lakebed)	
	63.5		464.5
		SILT, trace sand, gray, medium dense	
	69.5		458.5
		LEAN CLAY WITH SILT, trace sand, gray, soft to stiff (Lakebed)	
	73.5		454.5
		SILTY CLAY, trace sand, gray, soft to stiff (Lakebed)	
	81.0		447
		SILT, trace sand, gray, medium dense	
	86.0		442
		LEAN CLAY WITH SILT, trace sand, gray, soft to stiff (Lakebed)	
	90.0		438
		Boring Terminated at 90 Feet	

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	LABORATORY HP (tsf)
			N=9	
55		X	1-4-8 N=12	
		X	3-5-6 N=11	
60		X	0-3-4 N=7	
		X	3-5-6 N=11	
65		X	4-4-6 N=10	
		X	3-6-8 N=14	
70		X	3-6-8 N=14	
		X	5-5-7 N=12	
75		X	2-8-9 N=17	
		X	4-4-7 N=11	
80		X	3-3-8 N=11	
		X	4-6-11 N=17	
85		X	5-5-6 N=11	
		X	8-14-14 N=28	
90		X	4-7-11 N=18	0.2 (T)