Department of Civil Engineering
American Society of Civil Engineering
Student Chapter

2019 Ohio Valley Student Conference

Thursday, April 11-Friday, April 12, 2019

2019 Surveying Competition

Overview

A total of four (4) surveying competition events have been designed for college level engineering students who are studying surveying methods and analysis of error. These rules have been developed such that student survey teams will not necessarily have an advantage if they have more superior equipment than another team. The events have been developed so that teams can achieve the desired results with a minimal amount of surveying equipment and supplies. The survey events will include:

- Instrument Set-up
- Profile Leveling
- Differential Leveling
- Traverse

Each of the events will be performed at Portage Lakes State Beach on Friday, April 12th in the immediate vicinity of the concrete canoe competition.

Permitted Equipment

The following equipment will be permitted at the surveying competition: total stations, prisms, automatic levels, leveling rods, turning points, tapes, rules, and calculators with trigonometry functions. Teams should note that the competition events can be successfully completed with other types of levels, theodolites, and taping techniques. Drawing supplies such as pencils, engineer scales, protractors, timely templates are also permitted. The following equipment will not be permitted at the surveying competition: data collectors, GPS, computers (laptops, tablets, phone, or otherwise), programmable calculators, robotic total stations, and digital levels. Please note, no equipment will be provided by the host school.

Rules

Registration forms for each of the three events are enclosed below, and for each event the school name and crew member names should be completed. Each team is required to bring a printed version of the registration forms to the event and submit it to OVSC survey staff. On the morning of the event, there will be a survey meeting at 7:30 am at Portage Lakes. Each school shall send two representatives to the morning survey meeting along with

their completed registration materials. After registration these forms will serve as your field notes for each event and will be submitted by your crew immediately upon the completion of each event to the Post Judge at the stage area.

Each school will be limited to one team per school, and schools will determine their own crews for each event. A maximum of three persons to a crew are permitted, and individual teams will decide who will participate in which events. Each event is scheduled for one hour, and they will begin promptly at 8:00 am. At the end of each hour, teams will be directed to end their event, submit their survey results on their form to the Post Judge at the stage area, and then move on to the next event immediately.

Coaching by instructors or others once the surveying event begins is an unfair advantage, and is not permitted. Once on the site, students are on their own. Safety equipment used and required will be at the discretion of each school.

Scoring

Scoring is provided on each event form seen below. Results for each individual event will be provided, but the team with the highest overall number of points at the end of the competition will be the overall winner of the surveying competition.

Acknowledgements

These rules and procedures are based on previous OVSC and other surveying competitions, modified as appropriate for the specifics of this year's challenge.

Survey Area

The approximate competition area (shown below) is Portage Lakes State Beach and will be utilized for the survey events. Judges reserve the right to modify the area between now and the day of the event to accommodate any changing conditions or OVSC coordination needs.

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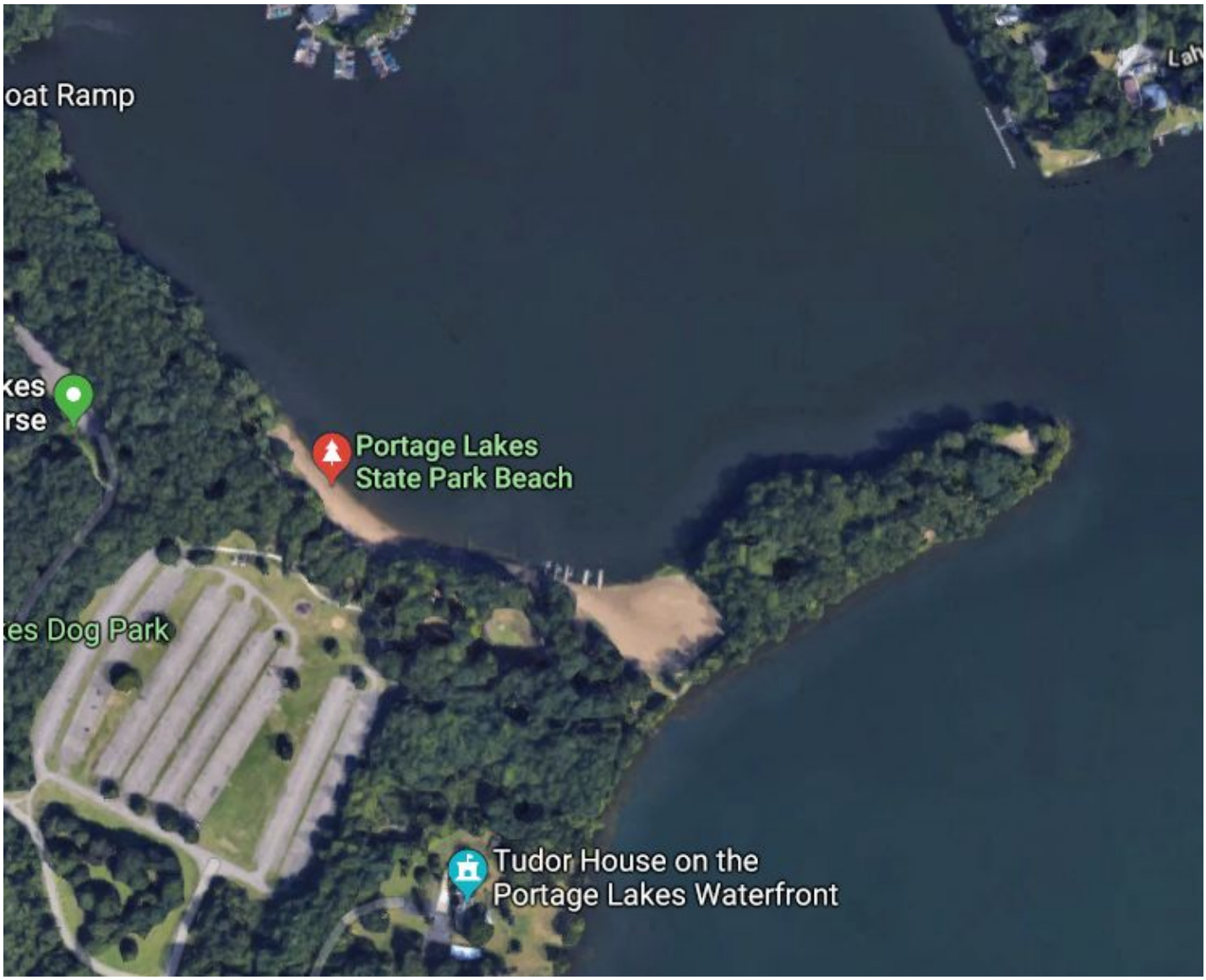

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INSTRUMENT SET-UP EVENT (Timed)

Objective

To set-up a total prism or theodolite over a point and meeting the plummet and leveling requirements in a minimum amount of time. All members of the schools are encouraged to participate. An average of the crew times will be used for final scoring.

Route Site

Location of the Set-up Site can be found by referring to the aerial photo provided on the day of the event.

Crew Size

Instrument Set-Up Crews will consist of a maximum of three members.

Survey Instruments

Total Station with prisms preferred or Theodolite with plummet.

Maximum Time

(1) Hour Scheduled. Participants' elapsed times will be recorded by judge.

Scoring

At the initial of start by the judge the participant will be clocked and a time recorded by judge after completion. Judge will check instrument for plumbness over point and levelness of instrument. If the set-up of the instrument does not meet the judging requirement, the clock will restart and the participant may continue. Judges will subtract time from 200 to compute your score. A Team Score will be an average of the participants' scores.

Submit Set-up time results to Post Judge at the Stage Area.

College School Name:
College Faculty Name and Email Member:

Crew Member 1:	**E-Mail:**	**Time:**
Crew Member 2:	**E-Mail:**	**Time:**
Crew Member 3:	**E-Mail:**	**Time:**

Final Averaged Time from those above:
Final Averaged Score:

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PROFILE LEVELING EVENT

Objective

Beginning at a known benchmark #1 , with a given elevation of 302 meters (to be confirmed), follow the Profile Leveling Survey as marked along a strip 10' from EP. Along the strip (4) stations will be marked. Using the notes below enter the stations and elevation values of those designated stations recording your measured elevations. A total of (4) elevations will be evaluated. Use the field notes form below and circle on your notes and label those (4) results to help those evaluating. When submitting a time is recorded.

Leveling Site

Location of the Profile Sites (2) can be found by referring to an aerial photo posted on the day of the event.

Crew Size

Profile Leveling Crews will consist of a maximum of three members.

Survey Instruments

Automatic Level, Level Rod, Stable Turning Points or Devices, and Rule.

Maximum Time

(1) Hour Limit; Beginning times and submission times are of record and will be used to help evaluate teams that might tie.

Scoring

Elevation values will be scored according to how many one-hundredths your results vary from the correct elevations. Perfect Score equals 200 points

Submit Profile Leveling Field Notes below to the Post Judge at the Stage Area.

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College Name:_____

Crew Member:_____
Crew Member:_____
Crew Member:_____

Start Time:_____**site judge recorded**
Submission Time:_____**submission judge recorded**

PROFILE LEVELING FIELD NOTES for SITE

STATION	BS (+)	HI	FS (-)	SS	ELEVATION
BM #1 (USGS)					757.20

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DIFFERENTIAL LEVELING EVENT

Objective

Beginning at a known benchmark #1 , with a given elevation of 302 meters (to be confirmed), complete a leveling circuit (loop) to a point #4 (Monument) where an elevation needs to be determined and recorded. Along the way other points, point #3 and point #4 (Low water marks) will need to have their elevations determined and recorded. Use the field notes form below and submit to the post judge at the stage area where a time will be recorded. Circle and label your (4) results on the Field Leveling Notes to help the evaluators.

Leveling Sites

Location of the (1) Leveling Site can be found by referring to the aerial.

Crew Size

Crews will consist of a maximum of three members.

Survey Instruments

Automatic Level, Level Rod, Stable Turning Point Devices

Maximum Time

(1) Hour Limit; Beginning times and submission times are of record and will be used to help evaluate teams that might tie.

Scoring

Elevation values will be scored according to how many one-hundredths your results vary from the correct elevations. A perfect score equals 200 points..

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Submit Differential Field Notes below to the Post Judge at the Stage Area.

College Name:

Crew Member:
Crew Member:
Crew Member:

Start Time: **Site judge recorded:**
Submission Time: **Submission judge recorded:**

LEVELING FIELD NOTES for SITE

POINT #	BS (+)	HI	BS (-)	ELEVATION	DESCRIPTION
				757.20’	USGS BM

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TRAVERSE EVENT

Objective

To measure 4 angles and 4 distances around a closed polygon course course by occupying the (4) points provided on the ground.

Traverse Site

Location of the Traverse Sites can be found by referring to the aerial the morning of the event. You will be measuring 1 of 3 traverse sites: the ZIPPY SITE, the LEBRON SITE, or the RUBBER SITE.

Crew Size

Crews will consist of a maximum of three members.

Survey Instruments

Total Station with prisms preferred or Theodolite and Taping Tools.

Maximum Time

(1) Hour Limit; Beginning times and submission times are of record and will be used to help evaluate teams that might tie.

Scoring

Angle values will be scored according to how many seconds your results vary from the correct values. Distance values will be scored, and a point deducted for each .01' of error. Perfect score equals 200 points.

Submit Traverse Field Notes below to the Post Judge at the Stage Area.

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College Name:

Crew Member:
Crew Member:
Crew Member:

Start Time: **Site judge recorded:**
Submission Time: **Submission judge recorded:**

You will be assigned to one of the three traverse sites on the day of the event:

"ZIPPY" **"LEBRON"** **"RUBBER"**

TRAVERSE NOTES for TRAVERSE

Backsight No.	Occupation No.	Foresight No.	Interior Angle	Horiz. Distance	FS Description
4	1	2			
1	2	3			
2	3	4			
3	4	1			

Scope:

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SURVEYING EVENT SCHEDULE

Each Event is Scheduled for ONE HOUR and order is subject to change.

UNIVERSITY	INSTRUMENTAL	PROFILE	DIFFERENTIAL	TRAVERSE
University of Akron	1nd Event	2nd Event	3rd Event	4th Event
Cincinnati State Community College	1nd Event	2nd Event	3rd Event	4th Event
Cleveland State	1nd Event	2nd Event	3rd Event	4th Event
Ohio State University	2nd Event	3rd Event	4th Event	1nd Event
Ohio University	2nd Event	3rd Event	4th Event	1nd Event
University of Cincinnati	3rd Event	4th Event	1nd Event	2nd Event
University of Louisville	3rd Event	4th Event	1nd Event	2nd Event
University of Pittsburgh	4th Event	1nd Event	2nd Event	3rd Event
Western Kentucky University	4th Event	1nd Event	2nd Event	3rd Event

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SURVEYING COMPETITION SCORES

UNIVERSITY	INSTRUMENT	PROFILE	DIFFERENTIAL	TRAVERSE	TOTAL& PLACE
University of Akron					
Cincinnati State Community College					
Cleveland State					
Ohio State University					
Ohio University					
University of Cincinnati					
University of Louisville					
University of Pittsburgh					
Western Kentucky University					

***** Please submit any questions regarding these rules to ovsc2019@zips.uakron.edu with "Competition Name_RFI" in subject line *****