



American Society of Civil Engineers

2007 Ohio Valley Regional Conference **Surveying Competition Outline**

Event Description:

This event requires a three (3) person team (maximum number of personnel per team) to demonstrate proficiency with the techniques of land surveying as applied to construction layout. Participation in this event is limited to one (1) team per college/university. Previous instruction and experience in the use of conventional surveying equipment is strongly recommended. Experience with the elements of coordinate geometry (COGO) and trigonometry as applied in the instance of preparing construction stakeout notes from site plans is also strongly recommended.

On the morning of the event, two hours before the team's scheduled "start-time", each team will be given a proposed construction site plan showing the detailed location of various building elements including stake location tolerances. Team starting times will be determined by a lottery system. The team will also be permitted to familiarize themselves with the construction site. The team will prepare construction hard copy staking notes on the media provided by the Surveying Competition Committee prior to proceeding to the field. Electronic field books, data collectors, controllers hand held calculators with insert surveying cards (COGO, etc.) are **NOT** permitted. Solutions **MUST** be determined by applying traditional trigonometry and coordinate geometry using conventional hand-held calculators. Allow two (2) hours for field staking note preparation.

Each team will be assigned a site with two (2) existing reference points which define the site's base-line. Each team will stake the location of the required construction elements in relation to their assigned baseline. Each team will also be required to determine the vertical location (elevation) of the two reference points on their assigned site. The field staking notes complete with the elevations of the reference points shall be submitted at the completion of the project layout.

Time:

Field Note Preparation & Site Orientation:	2:00 hours
Field – Construction Layout:	50 Minutes (maximum)

Judging Criteria:

Total Points Per Team: 100 Points (Maximum)

Point Breakdown:

1. Proper Use and Care of Equipment & Safety Practices (10%).
2. Correct Field Solution: Horizontal Location of Building Elements (60%).
Correct Elevation of Reference Points (30%).

*Shortest Field Staking Time will be used as a tie-breaker.

Materials Provided: Problem Statement, Site Plan, Instructions and Staking Materials (Colored Wire Flags).

Materials to Bring: This is a project-oriented problem; therefore, the field methods may vary amongst the teams. The use of traditional surveying equipment (transits/theodolites/total station, tapes, prisms, prism poles, conventional optical levels, level rods), including appropriate safety equipment, is recommended. Examples of appropriate safety equipment include eye protection for the staking crew person, safety vests and protective head and foot-ware. Digital levels, robotic total stations, GPS – RTK receivers are **NOT** permitted.

Possible staking methods include radial staking by transits/theodolites/total station either electronically or by direct taping or layout by double (two-tape) method. Leveling must be performed by optical level using HI method of note-taking. Obviously, several turning points will be required in the level circuit.

Site Description:

Each construction site is located in a level grassy lawn area approximately 55 feet by 75 feet. The reference bench mark is not directly visible and is located between 250 and 450 feet away from the construction site. Although the actual site is a grassy lawn area, it is assumed that this is a construction area and that the staking material would be traditional hard-wood stakes. Therefore, a safety of the survey crew on the construction site is the consideration.