

Geology 231 – March 10, 2011

Using the total stations to make a map of a portion of campus

Exercises DUE Tuesday, March 17, 2011

Today's activities will provide you with an opportunity to use the Geoscience Department's total stations to make a digital map of a portion of campus. You will work in two big groups to do the total station work, but I would like everyone to work with only one partner to make your map with the total station data and SURFER software.

The exercise will consist of four basic parts: 1) deciding as a group on how best to map the study area in the time allocated; 2) conducting the surveying using the total station; 3) downloading the data to a computer; and 4) using surfer to make a map of the study area.

Part 1: Setting up the survey: You will be shown the area to be mapped. Take a few minutes to traverse the area, decide as a group where to place the total station and backsights, place stakes in the ground at the appropriate spots for total station and backsights, and make a sketch map in your field notebook of the area to be mapped. Also, you will want to decide on your point ID nomenclature so that each feature to be shot has a unique, recognizable point ID. For example, if you are mapping an area that contains several buildings, sidewalks, and trees, you may want to name your point ID's BD001, BD002, BD003 (for buildings), SW001, SW002, SW003 (for sidewalks) and TR001, TR002, TR003 (for trees). Create a list of codes in your field book as you plan your shoot.

Part 2: Conduct the survey: Before actually doing any shooting, get together with your team and make sure everyone knows what is going on. Decide on the locations for total station "home bases," the location of the stakes and point ID nomenclature. Also, make sure everyone knows how to use the radios and develop a communication system that will work when you are out of earshot.

Set up the total station over the first home point, level it, and set up the job. Detailed directions on how to do this can be found in the document Using the Leica 307 Total Stations available on the G231 home page. Proceed with your shoot. Hint: You will find it very helpful later to mark on your sketch map the approximate location of your individual shots.

Part 3: Downloading the data: When you are completely finished with your field work, take the total station back to the lab. Marc and Zak will download your data to an available computer, then upload it onto the Geology 231 web site. From there, you can download the data yourself and use it to make your map (part 4).

Part 4: Make a map of the study area: Download your total station data file from the Geology 231 website and use SURFER to make a map of your study area. Be sure to show all sidewalks, curbsides, trees, buildings, bushes, and any other important feature from your study area. Be sure your map has a title, legend, north arrow, and scale. It may be useful to color your map.

Hand in your field sketch map, as well as your final computer-generated map at class time on March 17. Please work in groups of two people (maximum) to create one own computer-generated map of the study area.