

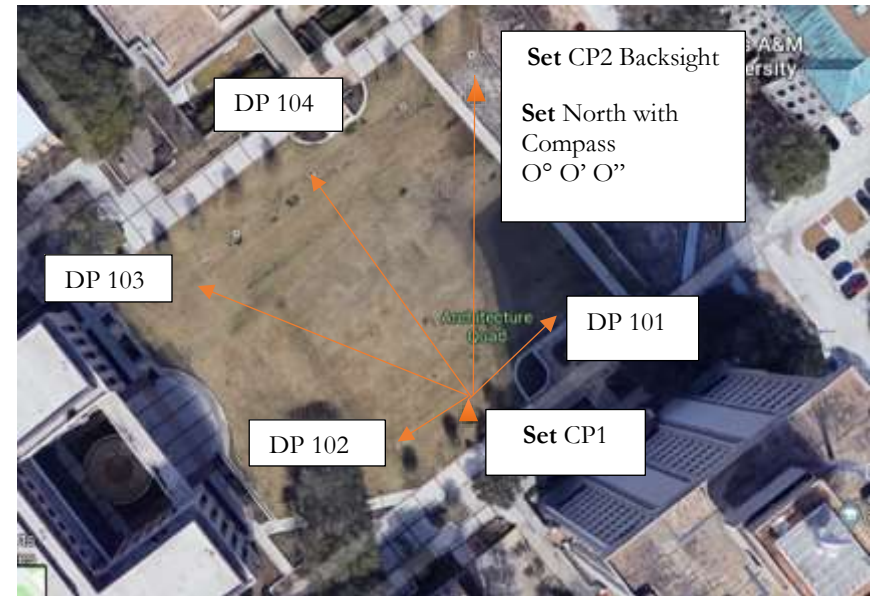
LAB 01– TRADITIONAL SURVEYING AND RTK GPS

Grading: 100 points

LEARNING OUTCOMES

Purpose: Set two Stations CP1 and CP2 Nails

1. **Use** RTK-GPS to **Collect** Northing, Easting, and Elevation on 2 Control Points and 4 Drainage Points
2. **Use** a Total Station to Check RTK-GPS N, E, Elev by:
 - a. **Set** Total Station on CP 1
 - b. **Backsight** CP2 (Set at Due North) with O° O' O"
 - c. **Record** Angle (Azimuth and Distance) to Each Point
 - d. **Compute** ΔN , ΔE and add to CP1 Northing and Easting
3. **Use** a Level to Check RTK-GPS by:
 - a. **Set** Level between CP1 and CP2
 - b. **Compute** Level Height of Instrument (HI) Elevation; then Measure Elevation of CP2 DP 101-104



(20pts) RTK GPS -Purpose: Collect **6 POINTS** with **FIXED** Solution

Step	Action
1	Start GPS, Start RTK, Make Job. Default Coordinate System
2	Survey, Measure Points, FIXED Only!!; Complete Table

STA	Northing (meters)	Easting (meters)	Elev (meters)	Desc.
1	3112349.7762 m	1083062.7918 m	103.1706 m	CP
2	3112377.4441 m	1083062.8660 m	103.1884 m	CP
101	3112357.4590 m	1083081.1760 m	102.7367 m	DP
102	3112335.4326 m	1083056.2996 m	103.2978 m	DP
103	3112319.1579 m	1083037.1226 m	104.0465 m	DP
104	3112374.9406 m	1083071.1165 m	103.4576 m	DP

(30pts) Total Station- Purpose: Collect Angle, Distance, and **Compute** ΔN , ΔE , Sta-Northing & Easting; **Check** with RTK-GPS


Step	Action
1	Set Total Station on CP#1
2	Make Job; Survey Setup: Set Az= 0.000 Backsight CP2; Survey CP2 101-104
3	Compute: ($\Delta N = \cos(AZ) * \text{Dist}$, $\Delta E = \sin(AZ) * \text{Dist}$); (StaNorth = CP1N+ ΔN) (StaEast =CP1E + ΔE)

STA	Angle Azimuth	Distance	Δ Northing	Δ Easting	Northing	Easting
1	0.000	0.0000	-	-	3112349.7762 m	1083062.7918 m
2	0.000	27.6810 m	27.6810 m	0 m	3112377.4572 m	1083062.7918 m
101	66 D 54 M	19.9559 m	-19.9489 m	-0.5299 m	3112376.92735 m	1083062.262 m
102	204 D 9 M	15.7023 m	-14.34476484 m	-6.386700791 m	3112362.583 m	1083055.875 m
103	219 D 40 M	39.9285 m	-31.03027252 m	-25.12781923 m	3112331.553 m	1083030.747 m
104	298 D 30 M	52.1396 m	24.4780595 m	-46.03653431 m	3112356.031 m	1082984.71 m

Copy CP1: Northing, Easting

(25 pts) Level- Purpose: Check RTK-GPS Elevations using Level.

Step	Action
1	Set Level where you can see CP1-2 and DP 101-104
2	BackSight CP1 Record BS Rod Height (Middle Mark)
3	Add BS to ELEV Compute HI
4	ForeSight CP2 Record FS Rod Height (Middle Mark)
5	Subtract FS from HI Compute Elevation of CP2
6	Repeat Step 4-6 for DP101-104

STA	BS (+)	HI	FS (-)	ELEV	Desc.
<i>Ex.</i>	<i>2.0</i>	<i>202.0m</i>		<i>200m</i>	<i>BM</i>
<i>Ex</i>	<i>X</i>	<i>202.0 m</i>	<i>1.5 m</i>	<i>200.5m</i>	<i>NAIL</i>
STA	BS (+)	HI	FS (-)	ELEV	Desc.
CP1	1.65 m	104.8206 m		103.1706 m	Nail
CP2		104.8206 m	1.57 m	103.2506 m	Nail
DP101		104.8206 m	2.13 m	102.6906 m	Drainage
DP102		104.8206 m	1.57 m	103.2506 m	Drainage
DP103		104.8206 m	0.81 m	104.0106 m	Drainage
DP104		104.8206 m	1.40 m	103.4206 m	Drainage
CP1		104.8206 m	1.66 m	103.1606 m	Drainage

Copy CP1: Elevation