Basic and Laser Surveying
1989 Overholt Drainage School
March 6-10
Brown/Galehouse

DIRECT ELEVATION SURVEYING

The Laser system with Lenker rod may be used to read elevations directly and avoid some of the note reduction (subtraction and calculations).

Field Book Headings

Record the date, location, weather, kind of survey, people and their job, Lenker rod, laser grade, height, and direction. The column headings would be.

STA	CONST	ELEV	GRADE ELEV	CUT	REF
BM#1	1050.	1056.27			

Setting Up and Recording Elevations

1. Select the transmitter location so the height when set up is no more than the maximum rod length (15') above the lowest point to be surveyed.

2. Set up the transmitter following the procedure for the system. Use a firm base and set the tripod solidly.

3. Set the transmitter grade level (0.00%).

4. Take the Lenker rod to the bench mark and find the plane of light with the rod receiver. Lock the sections.

5. Move the Lenker tape until the units digit, tenths, and hundreds of feet of the bench mark elevation are opposite the rod receiver pointer and lock the tape. Unlock the sections.

   Note: With a bench mark elevation of 1056.27', set 6.27 at the rod receiver pointer and use 1050 as a constant (CONST) to be added to the rod readings at each location.

6. Check the reading a second time. Be sure the tape is locked. An error in setting the tape will mean an error in all of the readings from then on. It is good practice to record the rod reference reading in the REF column or as a note, this will allow you to check if the tape has slipped or moved while taking rod readings.

7. Move Lenker rod to next location or station and find the plane of light.

8. Read the tape at the rod receiver pointer.

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9. Record the rod receiver pointer reading plus the elevation constant in the elevation column.

Note: The rod sections may be moved or the rod receiver moved as long as the tape remains locked as in Item 5. Adjustments of five feet to the readings will have to be made if the reading exceeds the 15' point on a 15' tape.

Note: The circuit should be closed by checking back on the bench mark.

Example: SAMPLE FIELD BOOK PAGE AND CUT SHEET
(Bench mark elevation is 100.00 feet)

John Smith Farm
SW 1/4, SE 1/2, Sec 10, T84N, R24W
June 4, 1988 J. Jones
Warm, Cloudy, Still R. Smith

STA	CONST	ELEV	GRADE ELEV	CUT	REF
BM# 1	100.	100.00			5.36
0+00		96.31	93.50	2.81	
1+00		97.29	93.70	3.59	
2+00		97.92	93.90	4.02	
2+50		97.20	94.00	3.20	
3+00		98.15	94.10	4.05	
TP# 1 4+00		98.40	94.30	4.10	7.24
5+00		98.61	94.50	4.11	
6+00		98.79	94.70	4.09	
7+00		98.85	94.90	3.95	
TP# 2 7+40		98.91	94.98	3.93	6.25
BM# 1		99.98			

This example shows a field book page for direct elevation surveying. The features that are different are the absence of the BS, HI, and FS columns, the addition of the constant column which is optional, and the addition of a reference column to record a reading to determine any unplanned movement of the tape. I have underlined the rod reading in the elevation column.

* U.S. Government Printing Office : 1989 - 241-792/80741