

Levelling Problem Solutions by Civil Thinking

- 2.5 Prepare a set of profile leveling notes for the survey in Figure 2-34. In addition to computing all elevations, show the arithmetic check and the resulting error in closure.

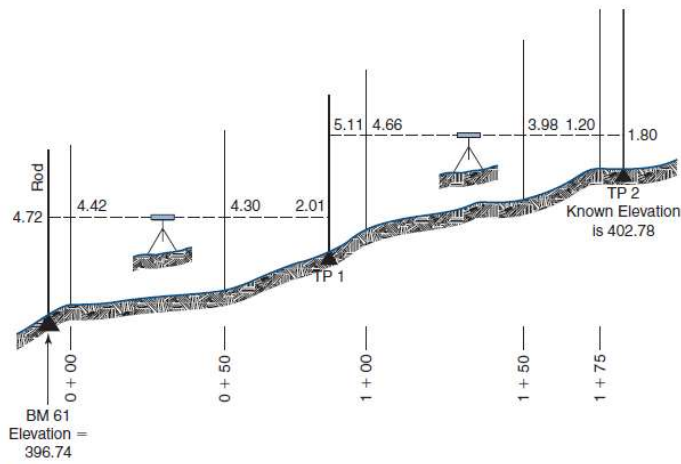
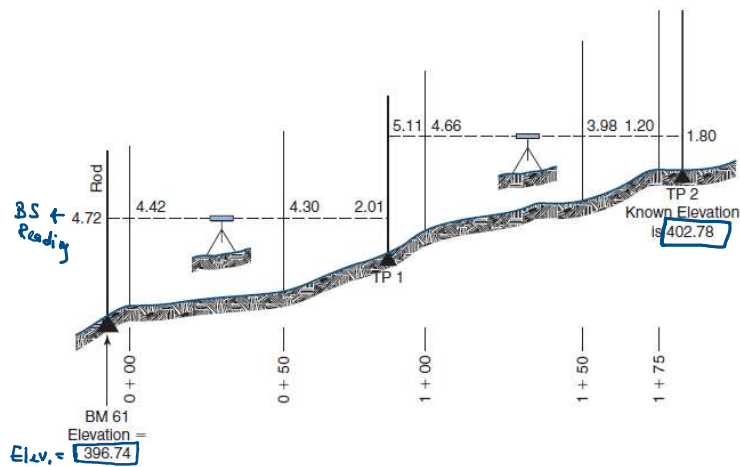


FIGURE 2-34

Solution :



formula 8:

$$H.I. = (\text{Elevation} + B.S.) \text{ of Bench mark}$$

$$\text{Elevation} = H.I. - I.S. = H.I. - f.s.$$

Arithmetic closure check

$$B.S. = \sum B.S.$$

station	B.S.	H.I.	I.S.	F.S.	Elevation
BM #61	4.72	$396.74 + 4.72 = 401.46$			396.74
0+00			4.42		$401.46 - 4.42 = 397.04$
0+50			4.30		$401.46 - 4.30 = 397.16$
TP #1	5.11	$397.16 + 5.11 = 402.27$		2.01	$402.27 - 2.01 = 400.26$
1+00			4.66		$400.26 - 4.66 = 395.60$
1+50			3.98		$400.26 - 3.98 = 396.28$
1+75			1.20		$400.26 - 1.20 = 399.06$

1+50		3.98		$404.56 - 3.98 = 400.58$
1+75		1.20		$404.56 - 1.20 = 403.36$
TP#2			1.00	$404.56 - 1.00 = 403.56$
Arithmetic closure check:	$\Sigma B.S. = 4.72 + 5.11 = 9.83$		$\Sigma F.S. = 2.01 + 1.00 = 3.01$	

$$E = 402.76 - 402.78 = -0.02 \text{ (small error } \Rightarrow \text{ No need for adjustments)}$$

Actual Elev. of TP#2

$$BM \text{ Elev.} + \Sigma B.S. - \Sigma F.S. = \text{Final Elevation}$$

$$396.74 + 9.83 - 3.01 = 402.76$$

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