Sections

Types of Sections

1-Longitudinal Sections or profile leveling

2-Cross Sections or cross profile

Stations

It is the distance from the point to the starting point of the project.

station = 100 m

zero-station

It is the station of the starting point of the project (0+00).

Types of Stations

1-full-station

The stations of the points lie at distance of 100,200, 300 m , etc.

2- plus-station

The stations of the points lie between the full-station.

Computation of cut &fill in profile leveling

Ground Elevation – grade Elevation = +⟶ cut

Ground Elevation – grade Elevation = − ⟶ Fill

$$slope = \frac{last\ grade\ - first\ grade}{distance}$$

$$Grade_{unknown} = Grade_{known} \pm slope * distance$$

Example

The table below represents elevations of 6 stations for a proposed canal:

Station, km	0+00	0+100	0+200	0+300	0+400	0+500
Elevation, m	10.30	11.47	9.75	8.28	10.5	11.02

The fill depth at station (0+00) and (0+500) are 0.93 m and 0.11, respectively. Calculate cut and fill depths for the other stations with sketches.

Sol:

$$\boldsymbol{Ground\ Elevation\ -Grade\ Elevation = C\ or\ F}$$

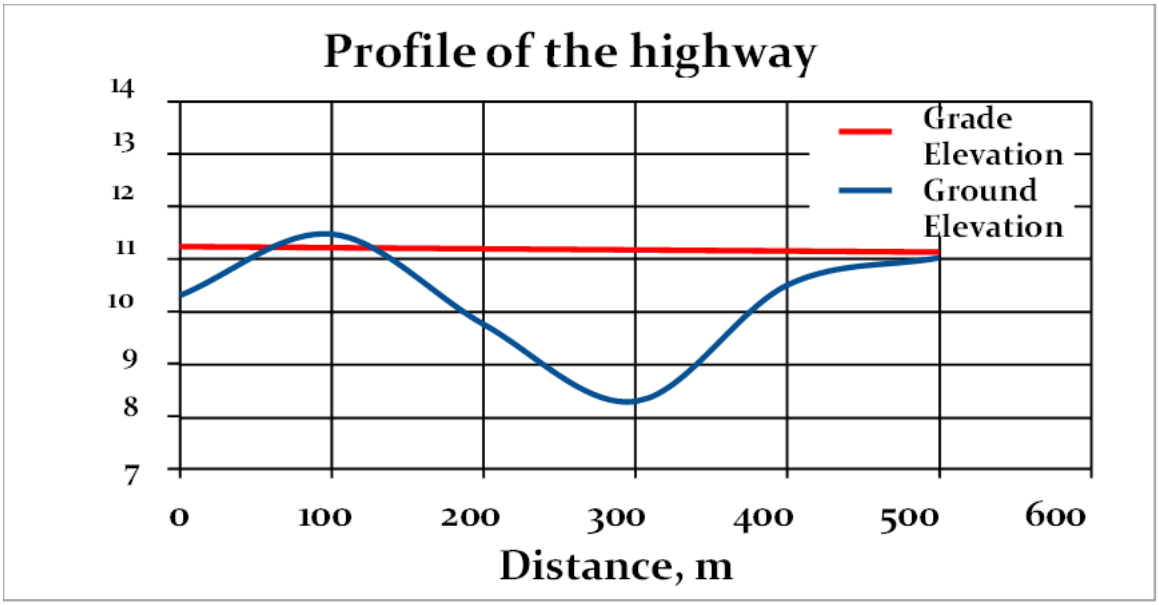
10.3 – Grade (0+00) = -0.93

Grade (0+00) = 11.23

$$slope = \frac{last\ grade\ - first\ grade}{distance}$$

$$= 11.13 - 11.23/500 = -0.0002$$

Station	Distance	Ground	Grade	Cut	Fill
0+00	0	10.3	11.23	0	0.93
0+100	100	11.47	11.21	0.26	0
0+200	100	9.75	11.19	0	1.44
0+300	100	8.28	11.17	0	2.89
0+400	100	10.5	11.15	0	0.65
0+500	100	11.02	11.13	0	0.11



Example

The table below represents elevations of 7 stations for a proposed highway:

Station, km	7+000	7+200	7+400	7+600	7+800	8+000	8+200
Elevation, m	73.03	75.12	78.41	80.02	75.67	72.09	69.13

The cut depth at station (7+600) is 0.2 m. if you know that the slope of the proposed road is 1% upward from first to fourth station and 2% downward from fourth to last station, calculate cut and fill depths for the other stations with sketches.

Sol:

$$\textbf{\textit{Ground Elevation} } - \textbf{\textit{Grade Elevation} } = \textbf{\textit{C or F}}$$

80.02 – Grade (7+600) = 0.2

Grade (7+600) = 79.82

$$\textbf{Next Grade} = \textbf{Preceding Grade} \mp \textbf{Slope} * \textbf{distance}$$

Grade (7+600) = Grade (7+400) + S * d

79.82 = Grade (7+400) + 0.01 * 200 Grade (7+400) = 77.82

Station	Distance	Ground	Grade	Cut	Fill
7+000	0	73.03	73.82	0	0.79
7+200	200	75.12	75.82	0	0.7
7+400	200	78.41	77.82	0.59	0
7+600	200	80.02	79.82	0.2	0
7+800	200	75.67	75.82	0	0.15
8+000	200	72.09	71.82	0.27	0
8+200	200	69.13	67.82	1.31	0