

Longitudinal section

Longitudinal section: It is a graph with two axes: the horizontal axis represents distances, and the vertical axis represents levels. It has a horizontal scale and a vertical scale.

Steps for drawing a longitudinal section

A- Horizontal axis

1- Calculating the length of the horizontal axis (the length of the project in the map)

$$\text{length of the horizontal axis} = \frac{\text{Project length in the ground (last distance) (M)}}{\text{scale factor (M)}}$$

2- Locate each point on the horizontal axis

$$\text{The distance between one point and the next} = \frac{\text{point distance (M)}}{\text{scale factor (M)}}$$

3- We write in the horizontal axis the number of each point, the distance of each point, and the level of each point.

B- vertical axis

- 1- It **starts** from a level lower than the lowest level and **ends** with a level higher than the highest level.
- 1- The levels are added on the vertical axis depending on the **scale drawing**.
- 2- Each point is placed the value of its level.

Calculate the number of cuts and fulling

Calculation methods Cut and filling quantities are divided into three types

- 1- Horizontal longitudinal section (One level for the project)
- 2- The longitudinal section has a slope (It gives one level ... and the required slope for the project (up or down) and writes the slope percentage)
- 3- Longitudinal section with longitudinal and lateral inclinations (Inclination + slope + lateral slope)

Steps for calculating cut and filling

- 1- Construction level office below the horizontal axis
- 2- Projecting construction points at each point
- 3- Calculation of cut depth or full height =

Point level - construction level

(+) cut

(-) fill

- 4- Connecting a vertical column from each point to the construction line.
- 5- It will produce a number of shapes (triangles and trapezoids).

The area of a triangle is half the base times the height

The area of a trapezoid is one-half (base 1 + base 2) times the height

note:

1 -The base is the depth of the cut or the height of the full

2- The height is the difference between the distance of the end of the shape - the distance of the beginning of the shape

6- We calculate the cut volume = the total cut area in the width of the project

7- We calculate the full volume = the total full area in the width of the project

Example:

I made a longitudinal budget and the readings were

2.7, 2.2, 1.5, 1.9, 2.5, 3.2, 3.7, 2.8, 3.9, 2.4

If you know that the *third and sixth* points are rotation and the distance between the points is equal to 30 meters

1- the points levels

2- the longitudinal segment if the horizontal scale is 1:1000 and the vertical is 1:50

3- the amount of cut and full to make the road at a level of 40 and a width of 20 meters.

soul:

Number of points = number of readings-number of rotation points = 10-2=8

point	Distans	B.S	I.F.S	F.S	H.I	RL	construction level	Remark	cut	full	AREA CUT	AREAFULL	
1	0	2.7			43.3	40.6	40		0.6		25.5		trapezoid
2	30		2.2			41.1	40		1.1		43.5		trapezoid
3	60	1.9		1.5	43.7	41.8	40	T. P	1.8		45		trapezoid
4	90		2.5			41.2	40		1.2		25.5		trapezoid
5	120		3.2			40.5	40		0.5		7.5		triangle
6	150	2.8		3.7	42.8	40	40	T.P (B.M)	0			16.5	triangle
7	180		3.9			38.9	40			1.1		13.75	triangle
8	210			2.4		40.4	40		0.4		1		triangle
SUM		7.4		7.6		-0.2					148	30.25	



