

Paragraphs of road works and bill of quantities:

A- Preparing the site:

- 1- Providing the appropriate place and the necessary requirements for the engineering and administrative staff.
- 2- Providing private places and accommodation for the machinery.
- 3- Providing and preparing the necessary mechanisms to complete the work.

B - Leveling works (M^2 , M^3): The leveling includes earth for digging the road according to the required longitudinal and transverse section and removing the old paving, if any, and the roots and roots of trees, rubble, organic materials and concrete castings, If any, it also includes filling the road with clean dirt in layers, the thickness of which does not exceed (25) cm, with a good compaction.

C- A layer under the foundation (subbase gravel): it is a layer consisting of gravel, sand, and soft materials, and it is calculated as (m^2 , m^3).

D- Tiling layers: 1- Foundation layers

- ☐ Crushed gravel (m^2)
- ☐ Concrete layer (m^2).
- ☐ Asphalt layer (m^2)

C- The first coating (m^2):

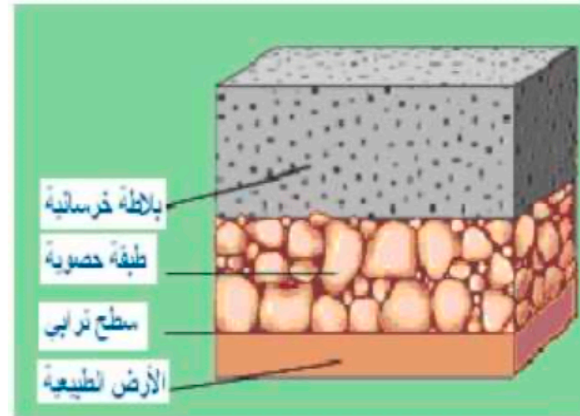
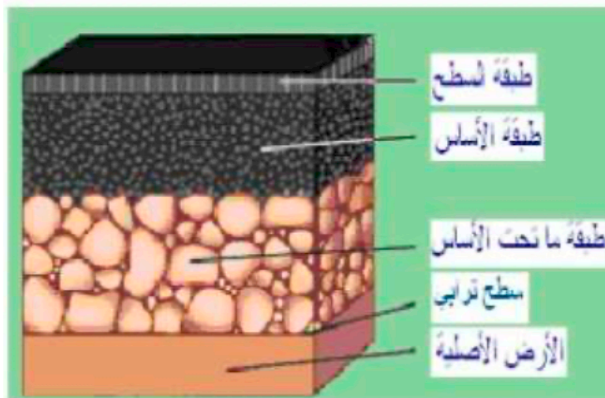
1- (Prime coat): asphalt with oil, with a volumetric ratio of (1.5-1.5) to be sprayed at a rate of (0.5-1.5 liters / m^2), and this percentage depends on

The nature and roughness of the surface when the temperature of the atmosphere is not less than (15) degrees, but its temperature is from (60-85), then it is left for a period of not less than (24) hours before tiling, the benefits of (prime coat):

- ☐ Preventing the evaporation of water to a layer beneath the foundation.
- ☐ Filling the capillary voids
- ☐ Covering and bonding the loose particles
- ☐ Increasing the adhesion strength between the base layers and the sub-base layer.

- 2- (tack coat) adhesion layer: asphalt with gasoline with a volumetric ratio of (1-2) to be used between the paving layers and sprayed at a rate of (0.15-0.5 liters / m^2), and the temperature of the mixture should be between (60-85)

The weather should not be less than (15) and leave for two hours



H- Kerbstone (M.I).

G - Concrete under the side molds (m.l., m²).

D - the concrete the waterwheel adjacent to the side formwork (m.l).

Concrete supporting the side pier (m.l, m²)



R - Pavement works: -

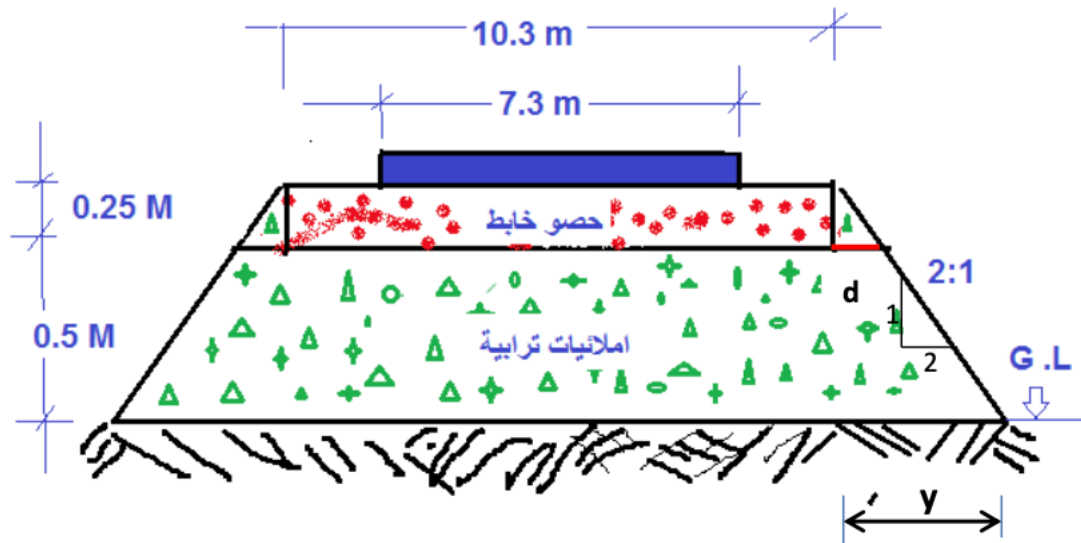
1- Earth fillings: - soil, then gravel or subbase that are directly embedded, and it is measured in (m², m³).

2- The walkway land:

- ☐ Asphalt layers.
- ☐ Ordinary concrete.

□ Concrete slabs.

Example: A street with a length of (10) km, and according to the section below, calculate the amount of asphalt, the amount of subbase, and the amount of earthen fillers, calculate the cost of the project After making a table of quantities, if you know that the price of a cubic meter of earthen spells is (10) thousand dinars, and the price of one square meter of gravel thickness (25 cm) for (3000) dinars and asphalt thickness (10 cm) for (20000) dinars.



Solution

The amount of asphalt = $10 \times 7.3 \times 1000 = 73000 \text{ m}^2$

The amount of gravel = $10.3 \times 10000 = 103000 \text{ m}^2$

The amount of sub-base = $((\text{Upper base} + \text{lower base})/2) \times \text{height} \times \text{length of the road}$
 top base = $10.3 + 2 \times (0.25) \times 2 = 11.3 \text{ meters}$

The lower base = $10.3 + 2 \times (0.75) \times 2 = 13.3 \text{ meters}$
 The amount of earthen fillings = $(13.3 + 11.3)/2 \times 0.5 \times 10000 = 61500 \text{ m}^3$

The two small triangles = $1/2 \times 2 \times 0.25 \times 0.25 \times 2 \times 10000 = 1250 \text{ m}^3$

Total fillings = $61500 + 1250 = 62750 \text{ m}^3$

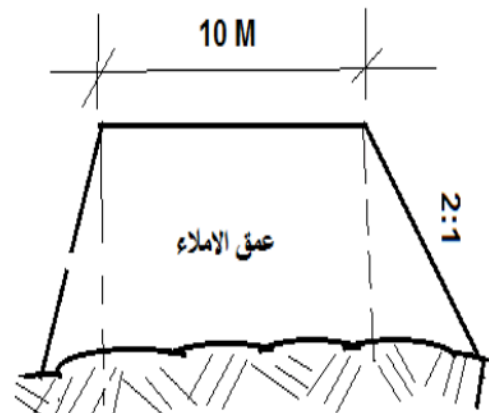
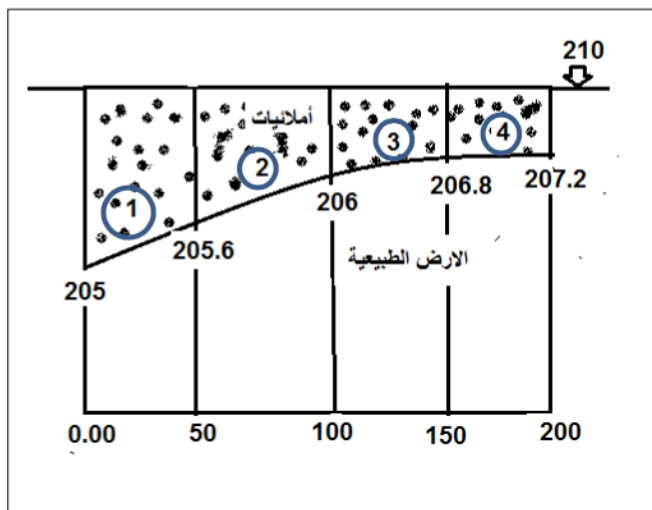
	items	unit	Single price	Quantity	wholesale price
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Class: 4th

1.	Settlement and preparation of the site				
2.	The amount of earthen fillings	m ³	10000	62570	627500000
3.	subbase	m ³	3000	103000	77250000
4.	asphalt	m ³	20000	73000	146000000
	total				850750000

Example 2): A road with a length of (200) meters, and according to the adjacent section, calculate the amount of earthen work and the total.

السرانية الحنية:



Solution :

Calculate the average depth for each section:

$$\text{معدل عمق الاملاء (1)} = (205.6 + 205) / 2 - 210 = - 4.7\text{m}$$

$$\text{معدل عمق الاملاء (2)} = (206 + 205.6) / 2 - 210 = - 4.2\text{m}$$

$$\text{معدل عمق الاملاء (3)} = (206.8 + 206) / 2 - 210 = - 3.6\text{m}$$

$$\text{معدل عمق الاملاء (4)} = (207.2 + 206.8) / 2 - 210 = - 3\text{m}$$

$$\text{حجم المقطع (1)} = (4.7 * 10 + 2 * 1/2 * 9.4 * 4.7) * 50 = 4559\text{m}^3$$

$$\text{حجم المقطع (2)} = (4.2 * 10 + 2 * 1/2 * 8.4 * 4.2) * 50 = 3864\text{m}^3$$

$$\text{حجم المقطع (3)} = (3.6 * 10 + 2 * 1/2 * 7.2 * 3.6) * 50 = 3096\text{m}^3$$

$$\text{حجم المقطع (4)} = (3 * 10 + 2 * 1/2 * 6 * 3) * 50 = 2400\text{m}^3$$

$$\text{المجموع الكلي للإملاءات الترابية} = 13919\text{m}^3$$