

Quantity Surveying of R.C. Skeleton, Masonry and Backfill

Dr. Karim Helmi

## R.C. Skeleton

- Slabs
- Beams
- Columns





## Slabs

- Area of roof multiplied by the slab thickness
- Deduct openings and stairs
- In case of different thickness calculate each are independently and multiply each are by its thickness



### Flat Slabs



#### Beams







### Example



	Dime	nsions			Reinfor	cement	
Beam	W	H Support		Top int. support	Bottom	Hanging	Stirrups
B1	0.25	0.60	2 Ø12	-	3 <i>ф</i> 16	2 Ø12	Φ 8 @20 cm
B2	0.25	0.60	2 <i>¢</i> 16	-	4 Ø16	2 <i>ф</i> 12	Φ 8 @20 cm
В3	0.25	0.60	2 ¢12	2¢16	2¢16	2 <i>ф</i> 12	Φ 8 @20 cm

## Example



#### Example Slab



Slab Length =  $4 \times 3 + 0.1 + 0.1 = 12.20$  m Slab width = 5 + 0.1 + 0.1 + 0.5 = 5.70 m

Item	Description	No.	L	W	Н	Add	Deduct	Total
n	Slab	1	12.20	5.70	0.10	6.954		
c.								
R. Kel								
S								

#### **Example Beams**



Beams axes 1, 2, 3 and 4 L= 5 - 0.3 - 0.3 = 4.40 m Beams axes A and B between axes 1&2 and 3&4 L= 4 - 0.2 - 0.1 = 3.70 m Beams axes A and B between axes 2 & 3 L= 4 - 0.2 - 0.2 = 3.60 m

Item	Description	No.	L	W	Η	Add	Deduct	Total
R.C. keleton	Slab	1	12.20	5.70	0.10	6.954		
	Beams axes 1, 2, 3 and 4	4	4.40	0.25	0.50	2.200		
	Beams axes A and B between axes 1&2 and 3&4	4	3.70	0.25	0.50	1.850		
S	Beams axes A and B between axes 2 & 3	2	3.60	0.25	0.50	0.900		

#### **Example Columns**



Item	Description	No.	L	W	Н	Add	Deduct	Total
leton	Slab	1	12.20	5.70	0.10	6.954		
	Beams axes 1, 2, 3 and 4	4	4.40	0.25	0.50	2.200		
Ske	Beams axes A and B between axes 1&2 and 3&4	4	3.70	0.25	0.50	1.850		
Ū	Beams axes A and B between axes 2 & 3	2	3.60	0.25	0.50	0.900		
R.	Columns	8	0.40	0.30	4.05	3.888		
							-	11.904

### Masonry



## Masonry

- Masonry is calculated as volume or area depending on the thickness of the wall and specifications
- Length and height are calculated as shown
- Openings like windows and doors are then deducted





### Parapets



#### Parapets

- Parapets are constructed at the outer edges of the roof slab and roof openings
- Parapet height is usually 1 meter for accessible roofs and from 20 to 50 cm for non-accessible roofs
- Parapet length is calculated along he centerline of the wall or by dividing the wall into sections at each intersection



## Example



- All external walls are 20 cm thick and all internal walls and parapet are 10 cm thick
- Roof finishing level +3.7 m
- Window W1 is 1.50 x 1.0 m
- Window W2 is 1.50 x 0.5 m
- Door D1 is 1.0 x 2.2 m
- Door D2 is 3.0 x 2.5 m
- Roof parapet height is 50 cm





#### Wall height = 3.7 +1.1 - 0.15 - 0.40 - 0.10 - 0.60 = 3.55 m

Item	Description	Unit	No.	L	W	Н	Add	Deduct	Total
щ	Walls on axes 1 and 4		2	4.40	0.20	3.55	6.248		
	Walls axes A and B between axes 1&2 and 3&4		4	3.70	0.20	3.55	10.508		
20 6	Walls axes A and B between axes 2 & 3		2	3.60	0.20	3.55	5.112		
ury (	Windows W1	m <sup>3</sup>	5	1.50	0.20	1.00		1.500	
ISOT	Windows W2		1	1.50	0.20	0.50		0.150	
W <sup>8</sup>	Doors D1		1	1.00	0.20	230		0.460	
	Doors D2		1	3.00	0.20	2.50		1.500	
									18.178



Item	Description	Unit	No.	L
. uo	Beams axes 1, 2, 3 and 4		4	4.4(
R.C.	Beams axes A and B between axes 1&2 and 3&4	m <sup>3</sup>	4	3.70
H Sk	Beams axes A and B between axes 2 & 3		2	3.60

Wall between axes A &B & between axes 1 & 2 L = 4 - 0.1 - 0.1 = 3.8 m

Item	Description	Unit	No.	L	W	Н	Add	Deduct	Total
tsonry 10 cm	Walls on axis 2		1	4.40		3.55	15.620		
	Wall between axes A and B & between axes 1 & 2		1	3.80		4.05	15.390		
	Beam on axis 1 projection	111-	1	0.05		0.50		0.025	
Ŭ,	Doors D1		2	1.00		2.30		4.600	



## Backfill



# Backfill

- Backfill is used to bury excavated earth after construction of foundations or after laying pipes or cables
- Backfill could also be used to raise the level of the ground floor
- Backfill used to raise ground floor level is calculated by multiplying the area of the flooring by the difference between the ground level and the required level

# Backfill

- Backfill is used to bury excavated earth after construction of foundations or after laying pipes or cables is calculated by subtracting the volume of the items constructed or laid in the ground from the excavation
- For foundations backfill is calculated as follows
  - Back fill = Excavation Plain concrete reinforced concrete for foundations (footings and ties) – columns to the ground level – walls to the ground level

#### Backfill Example

Item	Description	Unit	No.	L	W
R.C. Skeleton	Columns	m <sup>3</sup>	8	0.40	0.30
		1			
TT 4		TT • 4	NT I	L	W
ltem	Description	Unit	N0.	-	• •
item	Walls on axes 1 and 4	Unit	<b>No.</b> 2	4.40	0.20
asonry 0 cm	Walls on axes 1 and 4   Walls axes A and B between axes 1&2 and 3&4	m <sup>3</sup>	<b>No.</b>	<u>4.40</u> 3.70	0.20

Description

Walls on axis 2

Wall between axes A and B & between axes 1 & 2

Item

Masonry 10 cm



Item	Description	Unit	No.	L	W	Н	Add	Deduct	Total
	Excavation						38.676		
	Plain Concrete	]						5.274	
	R.C. Foundations	]						8.196	
. III	Columns	]	8	0.40	0.30	0.55		0.528	
ck f	Walls on axes 1 and 4	m <sup>3</sup>	2	4.40	0.20	0.55		0.968	
Ba	Wall on axis 2	]	1	4.40	0.10	0.55		0.242	
	Walls axes A and B between axes 1&2 and 3&4		4	3.70	0.20	0.55		1.628	
	Walls axes A and B between axes 2 & 3		2	3.60	0.20	0.55		0.792	
	Wall between axes A and B & between axes 1 & 2		1	3.80	0.10	0.55		0.209	
									21 072

Unit

m<sup>2</sup>

No.

1

L

4.40

3.80

W