## BENHA UNIVERSITY SHOUBRA FACULTY OF ENGINEERING CIVIL ENGINEERING DEPARTMENT

COMPUTER APPLICATIONS ii 2<sup>nd</sup>YEAR CIVIL 2<sup>nd</sup>TERM (2019-2020)

Assignment (4)

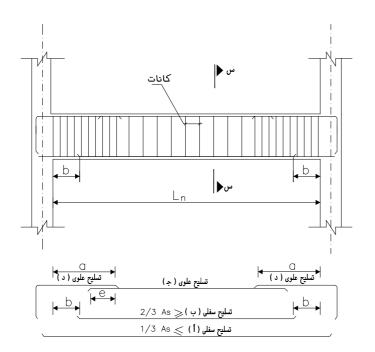
Reinforced Concrete Beams Details

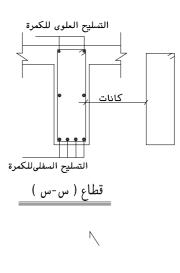
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## Using the beams table and details

- 1- Draw the elevation and sections of Beams B1, B2 and B3 the AutoCAD program.
- 2- Calculate the necessary reinforcement quantities for all beams.
- 3- Draw the bar bending schedule (BBS) for all beams using the AutoCAD program.

The Beam span is 6.0m with width of 0.25m and a depth of 0.60m, assume the column width is 0.50m.





TYPE Length

a Min. 0.15 L<sub>n</sub>

b Max. 0.10 L<sub>n</sub>

e Bigger of (12 **ø** or 25 cm)

Beams' Table :

Beam Type	Bot. Rft.		Top. Rft.		Stirrups/m		Remarks		
	Long	Short	Right	Mid.	Left	Right	Mid.	Left	Kellidiks
	1	·	J	ج	٦	Stir	rups/	m	
В1	2 <b>#</b> 12	2 <b>ø</b> 16	2 <b>ø</b> 12	2 <b>#</b> 12	2 <b>#</b> 12	62/8	5Ø8	628	
В2	2 <b>#</b> 16	2 <b>ø</b> 16	2 <b>ø</b> 16	2 <b>#</b> 12	2 <b>#</b> 16	5 <b>#</b> 10	5Ø8	5 <b>#</b> 10	
В3	2 <b>ø</b> 18	2 <b>ø</b> 18	2 <b>ø</b> 16	2 <b>#</b> 12	2 <b>ø</b> 16	7 <b>#</b> 10	628	7 <b>#</b> 10	

Rebars '	Weight	Diameter	Unit Wt
D:	Unit Wt	Diamotor	(kg/m)
Diameter	(kg/m)	# 16	1.578
# 8	0.394	# 18	1.998
# 10	0.617	# 20	2.466
<b>#</b> 12	0.888	# 22	2.984
# 14	1.208	\$\psi 25	3.853

\* Concrete grade

For Plain Concrete Fcu=20 N/mm^2 For Reinforcing Concrete Fcu=30 N/mm^2

LOCATION	CLEAR COVER
FOUNDATION	75 mm
BEAMS AND COLUMNS	30 mm
SLABS	25 mm

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$$042 \# 12 L = 1.80$$

$$032 \# 12 L = 4.70$$

$$022 \# 16 L = 6.0 - (0.60 + 0.60)$$

$$012 \# 12 L = 6.0 + 0.25 + 0.25$$

## Beam B1 Bar Bending Schedule

SC. 1/100

Bar mark	Type and size	of	No. of bars in each memb.	Total No.	Length	Shape & Dimension	Total Weight (Kg)
	mm				mm		(Kg)
01	<b>#</b> 12	1	2	2	6500	A=6500 ———————————————————————————————————	
02	<b>Ø</b> 16	1	2	2	4800	A=4800 A	
03	<b>#</b> 12	1	2	2	4700	A=4700 	
04	<b>#</b> 12	1	4	4	1800	A=500 B=1300 A	
05	<b>♥</b> 8	1			1620	A=540 B=190 B St = 160 A	

Total Weight								
Diameter	Weight (kg)	Diameter	Weight (kg)					
\$ 8		# 16						
# 12								