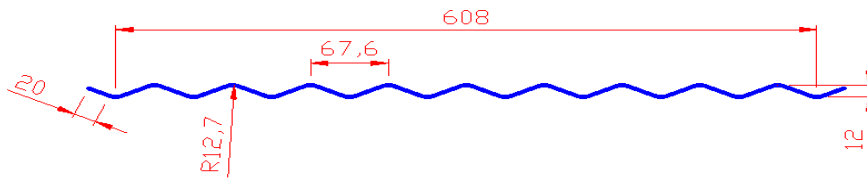
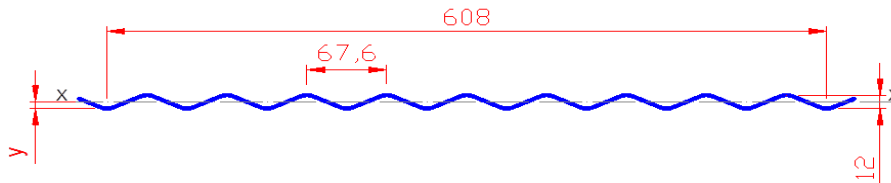


Properties of Wave Section-Narrow Rib



Properties of Section



Thickness 1 mm

Area of section	A =	7.052	cm ²
Centroid	y =	0.66612	cm
Moment of Inertia	I _x =	1.1836	cm ⁴ / m

Thickness 2 mm

Area of section	A =	14.111	cm ²
Centroid	y =	0.713	cm
Moment of Inertia	I _x =	2.407	cm ⁴ / m

Thickness 1.2 mm

Area of section	A =	8.463	cm ²
Centroid	y =	0.67547	cm
Moment of Inertia	I _x =	1.4238	cm ⁴ / m

Thickness 2.5 mm

Area of section	A =	17.645	cm ²
Centroid	y =	0.736	cm
Moment of Inertia	I _x =	3.045	cm ⁴ / m

Thickness 1.5 mm

Area of section	A =	10.580	cm ²
Centroid	y =	0.68949	cm
Moment of Inertia	I _x =	1.7877	cm ⁴ / m

Thickness 3 mm

Area of section	A =	21.180	cm ²
Centroid	y =	0.760	cm
Moment of Inertia	I _x =	3.709	cm ⁴ / m

Thickness 1.7 mm

Area of section	A =	11.993	cm ²
Centroid	y =	0.69883	cm
Moment of Inertia	I _x =	2.0333	cm ⁴ / m

Thickness 3.5 mm

Area of section	A =	24.717	cm ²
Centroid	y =	0.783	cm
Moment of Inertia	I _x =	4.402	cm ⁴ / m

For Upper Position

$$Z_u = I_x / (1.27 - y) \quad \text{cm}^3$$

For Lower Position

$$Z_l = I_x / y \quad \text{cm}^3$$

Structure Design

- Using Simple beam with single span.
- Using Continuous beam with two span.
- Using Continuous beam with three span.

Main Office : 40 El-Kayed Gohar st., Mansheya Soghra, Alexandria, (Egypt) - Tel.: (+203)4848506 - Fax.: (+203)4877552

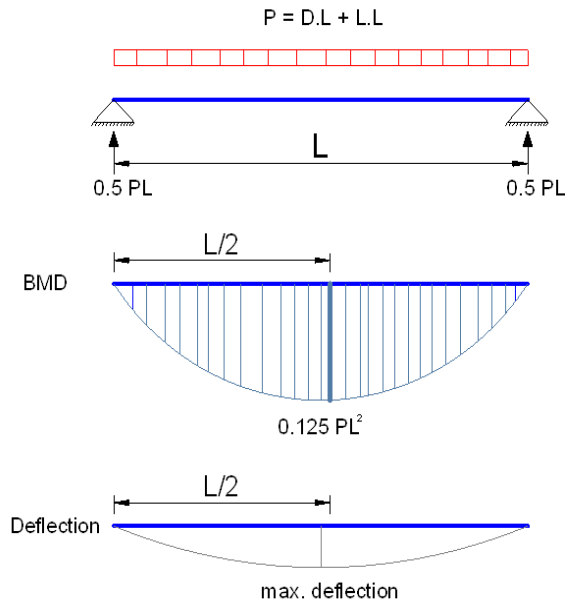
Contact Office : 69 Abou Daoud El - Zahry st., Nasr City Cairo (Egypt) - Tel.: (+202) 22737651 - Fax.: (+202) 22730879

Factory : Desert Road Km. 21 Mergham, Alexandria (Egypt) - Tel.: (+203) 2020158 - 2020159 - Fax.: (+203) 2023640

Website : www.alexform.com

E-mail : alexform@alexform.com

Simple Beam



Allowable Stress

$$P = F_b * Z_{U \text{ or } L} / 0.125 L^2$$

Maximum deflection

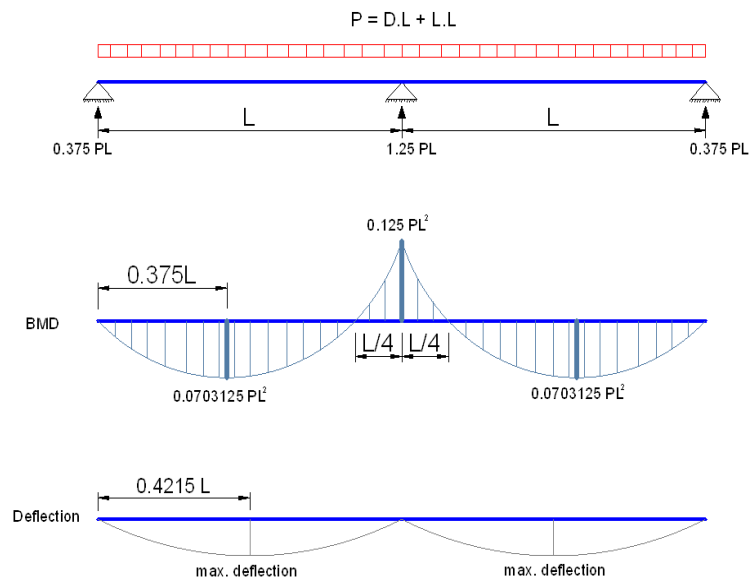
$$y_{\max} \leq L / 200$$

$$P = 76.8 * EI / 200 L^3$$

$$y_{\max} \leq L / 300$$

$$P = 76.8 * EI / 300 L^3$$

Continuous Beam with two Spans



Allowable Stress

$$P = F_b * Z_{U \text{ or } L} / 0.125 L^2$$

Maximum deflection

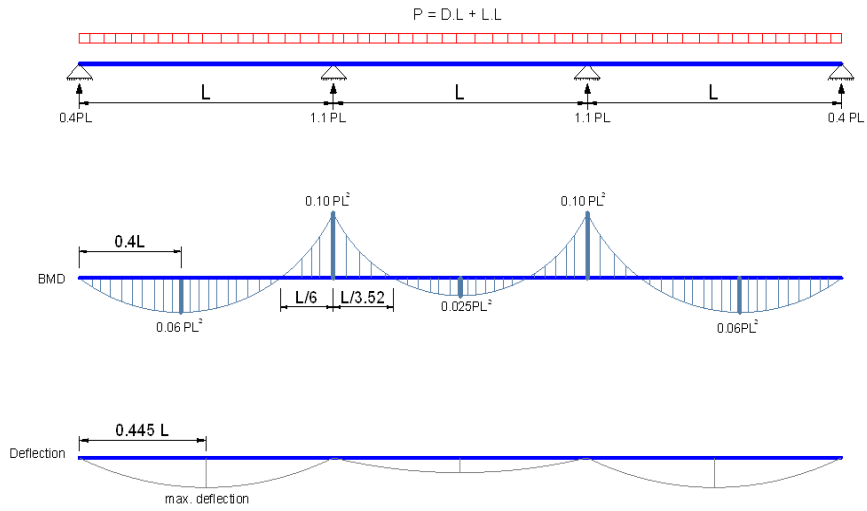
$$y_{\max} \leq L / 200$$

$$P = 185 * EI / 200 L^3$$

$$y_{\max} \leq L / 300$$

$$P = 185 * EI / 300 L^3$$

Continuous Beam with three Spans



Allowable Stress

$$P = F_b * Z_{U \text{ or } L} / 0.10 L^2$$

Maximum deflection

$$y_{\max} \leq L / 200$$

$$P = 145.27 * EI / 200 L^3$$

$$y_{\max} \leq L / 300$$

$$P = 145.27 * EI / 300 L^3$$

Table of Maximum Load

Data :

Steel Grade st.37
 F_b (t/cm²) = 1.4 E_s (t/cm²) = 2100

Span m		1.5	2	2.5	3	3.5	4	4.5	5
t	max. load	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²
1	stress	88.4	49.8	31.8	22.1	16.2	12.4	9.8	8.0
	L/ 200	28.3	11.9	6.1	3.5	2.2	1.5	1.0	0.8
	L/ 300	18.9	8.0	4.1	2.4	1.5	1.0	0.7	0.5
1.2	stress	104.9	59.0	37.8	26.2	19.3	14.8	11.7	9.4
	L/ 200	34.0	14.4	7.3	4.3	2.7	1.8	1.3	0.9
	L/ 300	22.7	9.6	4.9	2.8	1.8	1.2	0.8	0.6
1.5	stress	129.1	72.6	46.5	32.3	23.7	18.1	14.3	11.6
	L/ 200	42.7	18.0	9.2	5.3	3.4	2.3	1.6	1.2
	L/ 300	28.5	12.0	6.2	3.6	2.2	1.5	1.1	0.8
1.7	stress	144.8	81.5	52.1	36.2	26.6	20.4	16.1	13.0
	L/ 200	48.6	20.5	10.5	6.1	3.8	2.6	1.8	1.3
	L/ 300	32.4	13.7	7.0	4.0	2.5	1.7	1.2	0.9
2	stress	168.1	94.5	60.5	42.0	30.9	23.6	18.7	15.1
	L/ 200	57.5	24.3	12.4	7.2	4.5	3.0	2.1	1.6
	L/ 300	38.3	16.2	8.3	4.8	3.0	2.0	1.4	1.0
2.5	stress	205.9	115.8	74.1	51.5	37.8	29.0	22.9	18.5
	L/ 200	72.8	30.7	15.7	9.1	5.7	3.8	2.7	2.0
	L/ 300	48.5	20.5	10.5	6.1	3.8	2.6	1.8	1.3
3	stress	243.0	136.7	87.5	60.8	44.6	34.2	27.0	21.9
	L/ 200	88.6	37.4	19.1	11.1	7.0	4.7	3.3	2.4
	L/ 300	59.1	24.9	12.8	7.4	4.7	3.1	2.2	1.6
3.5	stress	279.8	157.4	100.7	70.0	51.4	39.4	31.1	25.2
	L/ 200	105.2	44.4	22.7	13.1	8.3	5.5	3.9	2.8
	L/ 300	70.1	29.6	15.1	8.8	5.5	3.7	2.6	1.9

Table of Maximum Load

Data :

Steel Grade st.37

F_b (t/cm²) = 1.4

E_s (t/cm²) = 2100

Span m		1.5	2	2.5	3	3.5	4	4.5	5
t	max. load	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²
1	stress	88.4	49.8	31.8	22.1	16.2	12.4	9.8	8.0
	L/ 200	68.1	28.7	14.7	8.5	5.4	3.6	2.5	1.8
	L/ 300	45.4	19.2	9.8	5.7	3.6	2.4	1.7	1.2
1.2	stress	104.9	59.0	37.8	26.2	19.3	14.8	11.7	9.4
	L/ 200	81.9	34.6	17.7	10.2	6.5	4.3	3.0	2.2
	L/ 300	54.6	23.0	11.8	6.8	4.3	2.9	2.0	1.5
1.5	stress	129.1	72.6	46.5	32.3	23.7	18.1	14.3	11.6
	L/ 200	102.9	43.4	22.2	12.9	8.1	5.4	3.8	2.8
	L/ 300	68.6	28.9	14.8	8.6	5.4	3.6	2.5	1.9
1.7	stress	144.8	81.5	52.1	36.2	26.6	20.4	16.1	13.0
	L/ 200	117.0	49.4	25.3	14.6	9.2	6.2	4.3	3.2
	L/ 300	78.0	32.9	16.9	9.8	6.1	4.1	2.9	2.1
2	stress	168.1	94.5	60.5	42.0	30.9	23.6	18.7	15.1
	L/ 200	138.5	58.4	29.9	17.3	10.9	7.3	5.1	3.7
	L/ 300	92.3	39.0	19.9	11.5	7.3	4.9	3.4	2.5
2.5	stress	205.9	115.8	74.1	51.5	37.8	29.0	22.9	18.5
	L/ 200	175.3	73.9	37.9	21.9	13.8	9.2	6.5	4.7
	L/ 300	116.9	49.3	25.2	14.6	9.2	6.2	4.3	3.2
3	stress	243.0	136.7	87.5	60.8	44.6	34.2	27.0	21.9
	L/ 200	213.5	90.1	46.1	26.7	16.8	11.3	7.9	5.8
	L/ 300	142.3	60.0	30.7	17.8	11.2	7.5	5.3	3.8
3.5	stress	279.8	157.4	100.7	70.0	51.4	39.4	31.1	25.2
	L/ 200	253.3	106.9	54.7	31.7	19.9	13.4	9.4	6.8
	L/ 300	168.9	71.2	36.5	21.1	13.3	8.9	6.3	4.6


Table of Maximum Load

Data :

Steel Grade st.37

F_b (t/cm²) = 1.4

E_s (t/cm²) = 2100



Span m		1.5	2	2.5	3	3.5	4	4.5	5
t	P	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²	kg/m ²
1	stress	110.6	62.2	39.8	27.6	20.3	15.5	12.3	10.0
	L/ 200	53.5	22.6	11.6	6.7	4.2	2.8	2.0	1.4
	L/ 300	35.7	15.0	7.7	4.5	2.8	1.9	1.3	1.0
1.2	stress	131.2	73.8	47.2	32.8	24.1	18.4	14.6	11.8
	L/ 200	64.3	27.1	13.9	8.0	5.1	3.4	2.4	1.7
	L/ 300	42.9	18.1	9.3	5.4	3.4	2.3	1.6	1.2
1.5	stress	161.3	90.7	58.1	40.3	29.6	22.7	17.9	14.5
	L/ 200	80.8	34.1	17.5	10.1	6.4	4.3	3.0	2.2
	L/ 300	53.9	22.7	11.6	6.7	4.2	2.8	2.0	1.5
1.7	stress	181.0	101.8	65.2	45.3	33.3	25.5	20.1	16.3
	L/ 200	91.9	38.8	19.8	11.5	7.2	4.8	3.4	2.5
	L/ 300	61.3	25.8	13.2	7.7	4.8	3.2	2.3	1.7
2	stress	210.1	118.2	75.6	52.5	38.6	29.5	23.3	18.9
	L/ 200	108.8	45.9	23.5	13.6	8.6	5.7	4.0	2.9
	L/ 300	72.5	30.6	15.7	9.1	5.7	3.8	2.7	2.0
2.5	stress	257.4	144.8	92.7	64.3	47.3	36.2	28.6	23.2
	L/ 200	137.6	58.1	29.7	17.2	10.8	7.3	5.1	3.7
	L/ 300	91.8	38.7	19.8	11.5	7.2	4.8	3.4	2.5
3	stress	303.8	170.9	109.4	76.0	55.8	42.7	33.8	27.3
	L/ 200	167.6	70.7	36.2	21.0	13.2	8.8	6.2	4.5
	L/ 300	111.7	47.1	24.1	14.0	8.8	5.9	4.1	3.0
3.5	stress	349.8	196.8	125.9	87.5	64.2	49.2	38.9	31.5
	L/ 200	198.9	83.9	43.0	24.9	15.7	10.5	7.4	5.4
	L/ 300	132.6	55.9	28.6	16.6	10.4	7.0	4.9	3.6