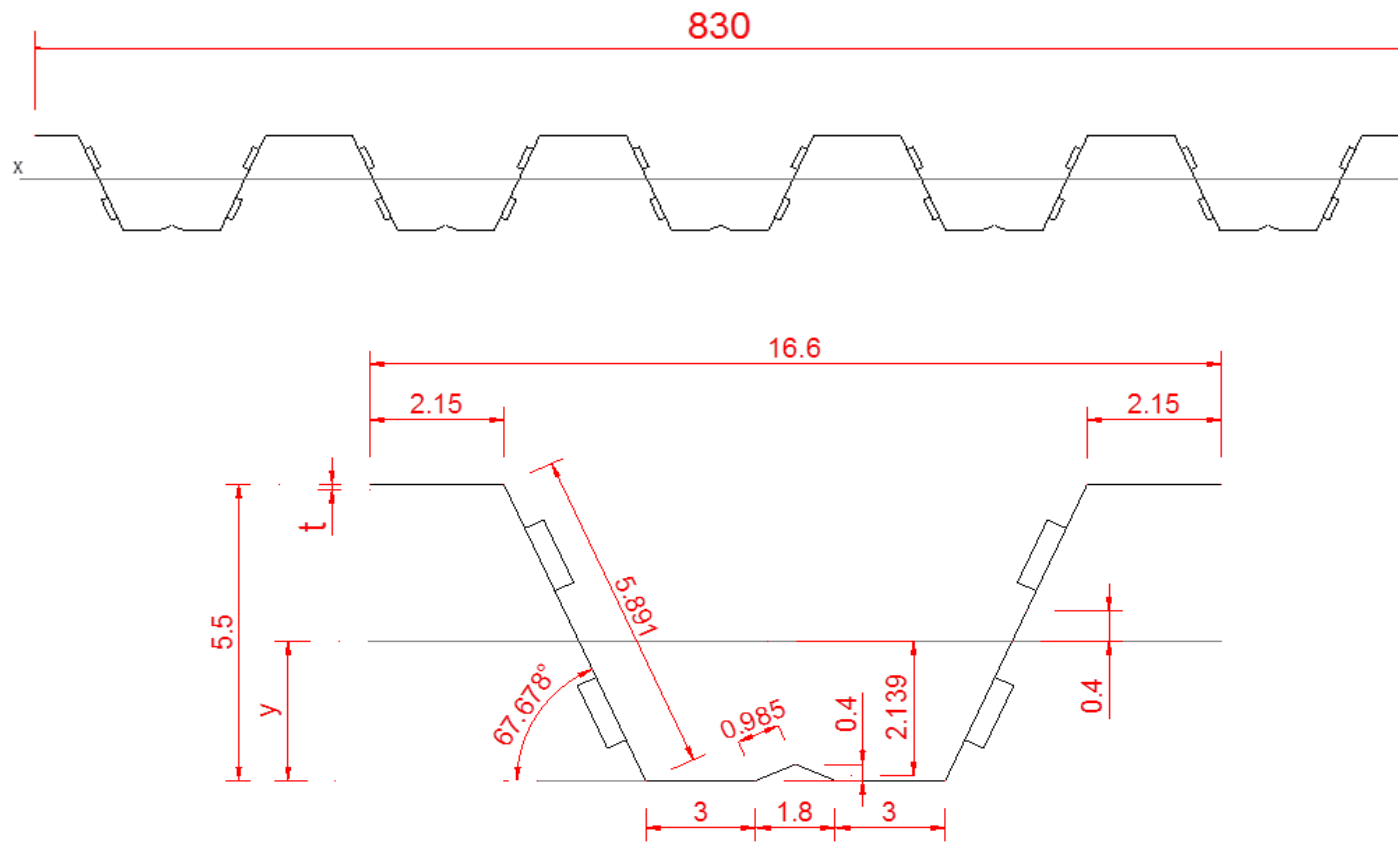


## Properties of Corrugated Sheet



### Properties of Section

Area of section	$A = 5 \cdot 2 \cdot (2.15 + 5.891 + 3 + 0.99) \cdot t \cdot 1.17645$	$\text{cm}^2$
Centroid	$y = 5.5 - (10 \cdot t \cdot (3/2 \cdot t + 0.985 \cdot 4 + 5.891 \cdot 5.5/2 + 2.15 \cdot (5.5 - t/2))) / A$	$\text{cm}$
Moment of Inertia	$I_x = 5.0853 \cdot t^3 + 660.969 \cdot t$	$\text{cm}^4 / \text{m}$

### For Upper Position

$$Z_u = I_x / (5.5 - y) \quad \text{cm}^3$$

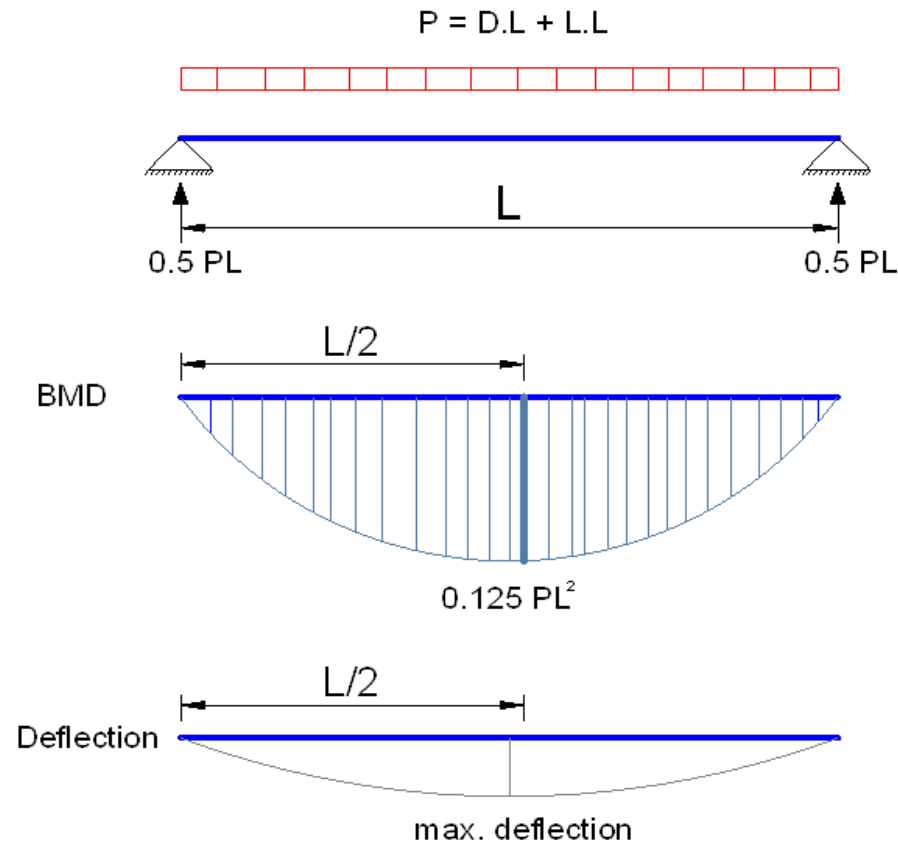
### For Lower Position

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

### Structure Design

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

## Simple Beam



### Allowable Stress

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

### Maximum deflection

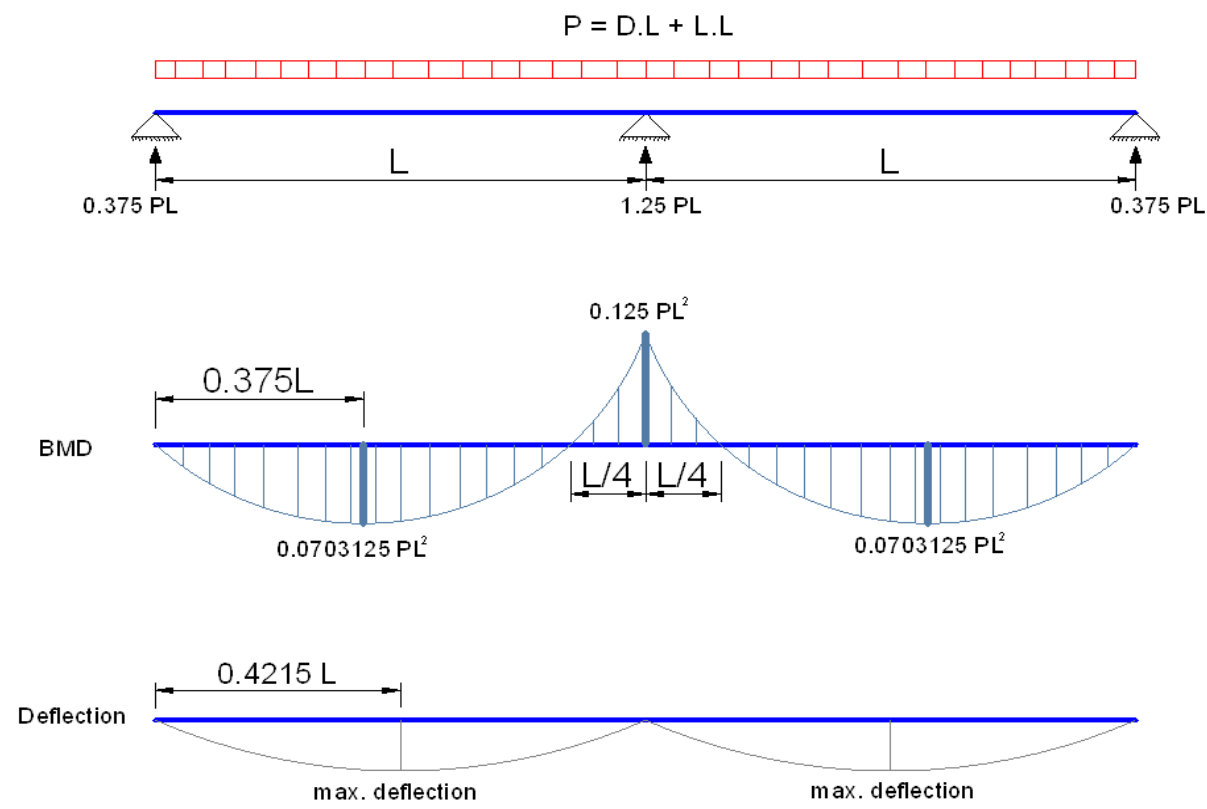
$$y_{\text{max}} \leq L / 200$$

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

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

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

## Continuous Beam with two Spans



### Allowable Stress

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

### Maximum deflection

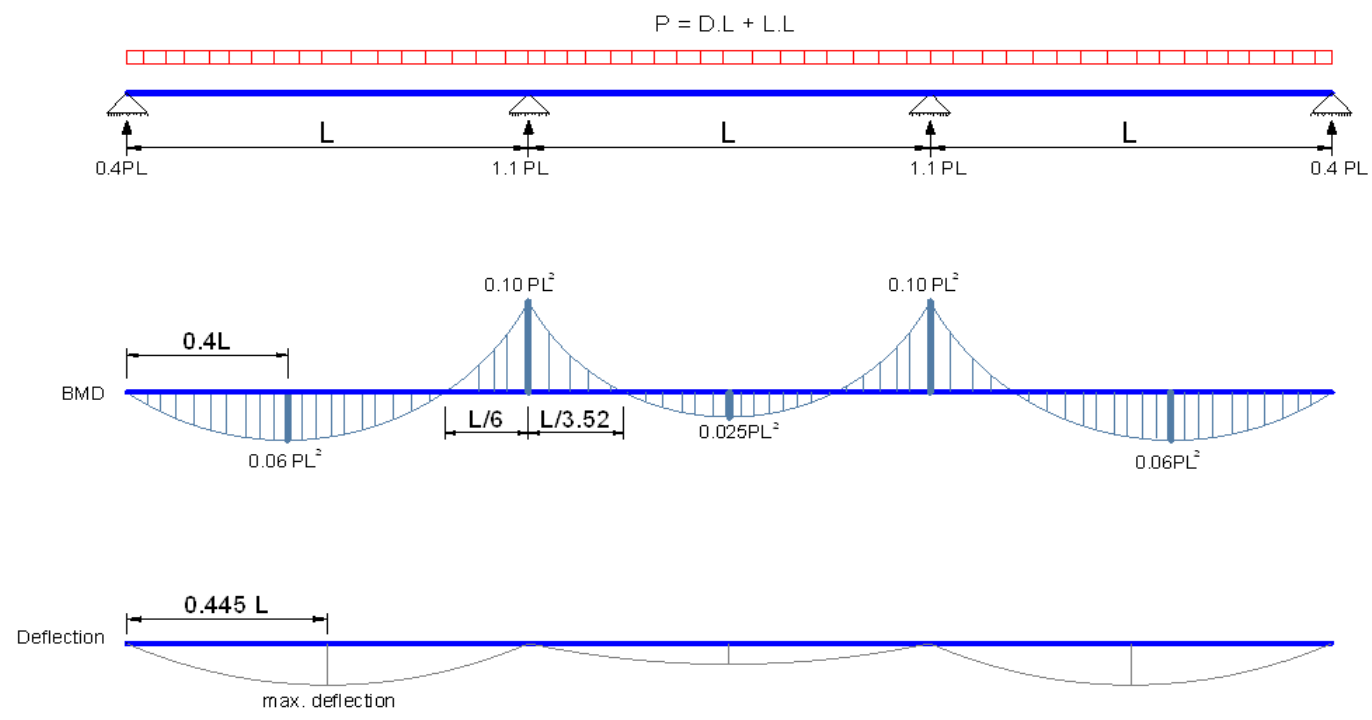
$$y_{\text{max}} \leq L / 200$$

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

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

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

**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/cm<sup>2</sup>) = 1.4       $E_s$  (t/cm<sup>2</sup>) = 2100

Span m		1.5	1.8	2	2.5	3	3.5	4	4.5	5
t	max. load	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>
<b>0.5</b>	stress	4.711	3.271	2.650	1.696	1.178	0.865	0.662	0.523	0.424
	L/ 200	7.897	4.570	3.331	1.706	0.987	0.622	0.416	0.292	0.213
	L/ 300	5.264	3.047	2.221	1.137	0.658	0.414	0.278	0.195	0.142
<b>0.7</b>	stress	6.597	4.581	3.711	2.375	1.649	1.212	0.928	0.733	0.594
	L/ 200	11.055	6.398	4.664	2.388	1.382	0.870	0.583	0.409	0.298
	L/ 300	7.370	4.265	3.109	1.592	0.921	0.580	0.389	0.273	0.199
<b>0.8</b>	stress	7.540	5.236	4.241	2.714	1.885	1.385	1.060	0.838	0.679
	L/ 200	12.635	7.312	5.330	2.729	1.579	0.995	0.666	0.468	0.341
	L/ 300	8.423	4.875	3.554	1.819	1.053	0.663	0.444	0.312	0.227
<b>0.9</b>	stress	8.483	5.891	4.772	3.054	2.121	1.558	1.193	0.943	0.763
	L/ 200	14.214	8.226	5.997	3.070	1.777	1.119	0.750	0.526	0.384
	L/ 300	9.476	5.484	3.998	2.047	1.185	0.746	0.500	0.351	0.256
<b>1</b>	stress	9.426	6.546	5.302	3.394	2.357	1.731	1.326	1.047	0.848
	L/ 200	15.794	9.140	6.663	3.411	1.974	1.243	0.833	0.585	0.426
	L/ 300	10.529	6.093	4.442	2.274	1.316	0.829	0.555	0.390	0.284
<b>1.2</b>	stress	11.314	7.857	6.364	4.073	2.829	2.078	1.591	1.257	1.018
	L/ 200	18.953	10.968	7.996	4.094	2.369	1.492	0.999	0.702	0.512
	L/ 300	12.636	7.312	5.331	2.729	1.579	0.995	0.666	0.468	0.341
<b>1.5</b>	stress	14.147	9.824	7.958	5.093	3.537	2.598	1.989	1.572	1.273
	L/ 200	23.693	13.711	9.996	5.118	2.962	1.865	1.249	0.878	0.640
	L/ 300	15.795	9.141	6.664	3.412	1.974	1.243	0.833	0.585	0.426

### Table of Maximum Load

**Data :**

Steel Grade st.37  
 $F_b$  (t/cm<sup>2</sup>) = 1.4       $E_s$  (t/cm<sup>2</sup>) = 2100

Span m		1.5	1.8	2	2.5	3	3.5	4	4.5	5
t	max. load	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>
<b>0.5</b>	stress	4.711	3.271	2.650	1.696	1.178	0.865	0.662	0.523	0.424
	L/ 200	19.022	11.008	8.025	4.109	2.378	1.497	1.003	0.705	0.514
	L/ 300	12.681	7.339	5.350	2.739	1.585	0.998	0.669	0.470	0.342
<b>0.7</b>	stress	6.597	4.581	3.711	2.375	1.649	1.212	0.928	0.733	0.594
	L/ 200	26.631	15.411	11.235	5.752	3.329	2.096	1.404	0.986	0.719
	L/ 300	17.754	10.274	7.490	3.835	2.219	1.398	0.936	0.658	0.479
<b>0.8</b>	stress	7.540	5.236	4.241	2.714	1.885	1.385	1.060	0.838	0.679
	L/ 200	30.435	17.613	12.840	6.574	3.804	2.396	1.605	1.127	0.822
	L/ 300	20.290	11.742	8.560	4.383	2.536	1.597	1.070	0.751	0.548
<b>0.9</b>	stress	8.483	5.891	4.772	3.054	2.121	1.558	1.193	0.943	0.763
	L/ 200	34.240	19.815	14.445	7.396	4.280	2.695	1.806	1.268	0.924
	L/ 300	22.827	13.210	9.630	4.931	2.853	1.797	1.204	0.845	0.616
<b>1</b>	stress	9.426	6.546	5.302	3.394	2.357	1.731	1.326	1.047	0.848
	L/ 200	38.045	22.017	16.050	8.218	4.756	2.995	2.006	1.409	1.027
	L/ 300	25.364	14.678	10.700	5.479	3.170	1.997	1.338	0.939	0.685
<b>1.2</b>	stress	11.31	7.86	6.36	4.07	2.83	2.08	1.59	1.26	1.02
	L/ 200	45.656	26.421	19.261	9.8617	5.707	3.5939	2.4076	1.691	1.2327
	L/ 300	30.437	17.614	12.841	6.5745	3.8047	2.3959	1.6051	1.1273	0.8218
<b>1.5</b>	stress	14.15	9.82	7.96	5.09	3.54	2.60	1.99	1.57	1.27
	L/ 200	57.074	33.029	24.078	12.328	7.1342	4.4927	3.0097	2.1138	1.541
	L/ 300	38.049	22.019	16.052	8.2186	4.7561	2.9951	2.0065	1.4092	1.0273

## Table of Maximum Load

**Data :**

Steel Grade st.37  
 $F_b$  (t/cm<sup>2</sup>) = 1.4       $E_s$  (t/cm<sup>2</sup>) = 2100

Span m		1.5	1.8	2	2.5	3	3.5	4	4.5	5
t	P	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>	kN/m <sup>2</sup>
<b>0.5</b>	stress	5.89	4.09	3.31	2.12	1.47	1.08	0.83	0.65	0.53
	L/ 200	14.937	8.644	6.301	3.226	1.867	1.176	0.788	0.553	0.403
	L/ 300	9.958	5.763	4.201	2.151	1.245	0.784	0.525	0.369	0.269
<b>0.7</b>	stress	8.25	5.73	4.64	2.97	2.06	1.51	1.16	0.92	0.74
	L/ 200	20.912	12.102	8.822	4.517	2.614	1.646	1.103	0.775	0.565
	L/ 300	13.941	8.068	5.881	3.011	1.743	1.097	0.735	0.516	0.376
<b>0.8</b>	stress	9.42	6.54	5.30	3.39	2.36	1.73	1.33	1.05	0.85
	L/ 200	23.899	13.831	10.082	5.162	2.987	1.881	1.260	0.885	0.645
	L/ 300	15.933	9.220	6.722	3.441	1.992	1.254	0.840	0.590	0.430
<b>0.9</b>	stress	10.60	7.36	5.96	3.82	2.65	1.95	1.49	1.18	0.95
	L/ 200	26.887	15.560	11.343	5.808	3.361	2.116	1.418	0.996	0.726
	L/ 300	17.925	10.373	7.562	3.872	2.241	1.411	0.945	0.664	0.484
<b>1</b>	stress	11.78	8.18	6.63	4.24	2.95	2.16	1.66	1.31	1.06
	L/ 200	29.875	17.289	12.603	6.453	3.734	2.352	1.575	1.106	0.807
	L/ 300	19.917	11.526	8.402	4.302	2.490	1.568	1.050	0.738	0.538
<b>1.2</b>	stress	14.14	9.82	7.96	5.09	3.54	2.60	1.99	1.57	1.27
	L/ 200	35.851	20.747	15.125	7.744	4.481	2.822	1.891	1.328	0.968
	L/ 300	23.901	13.831	10.083	5.163	2.988	1.881	1.260	0.885	0.645
<b>1.5</b>	stress	17.68	12.28	9.95	6.37	4.42	3.25	2.49	1.96	1.59
	L/ 200	44.817	25.936	18.907	9.680	5.602	3.528	2.363	1.660	1.210
	L/ 300	29.878	17.290	12.605	6.454	3.735	2.352	1.576	1.107	0.807