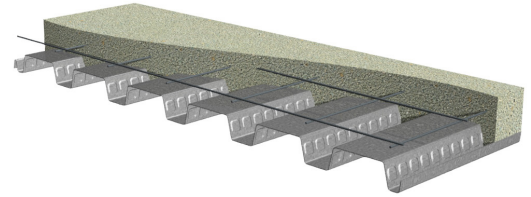


# 1.5VL-36/1.5VLI-36 COMPOSITE DECKS GRADE 50 STEEL

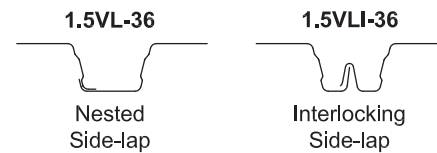
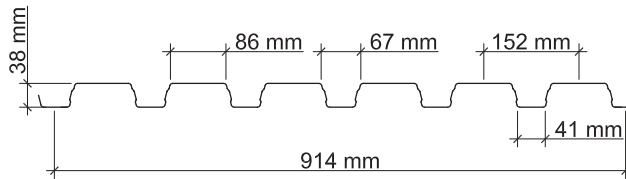
Metric  
LSD

## 1.5VL COMPOSITE DECKS

- 1.5VL-36 Deck used with Side-lap Screws
- 1.5VLI-36 Deck used with TSWs or BPs



## Nominal Dimensions



## Section Properties

Deck Gage	Deck Weight $w_{dd}$ (kg/m <sup>2</sup> )	Base Metal Thickness $t$ (mm)	Yield Strength $F_y$ (MPa)	Effective Moment of Inertia at Service Load* $I_d = (2I_e + I_y)/3$		Effective Section Modulus* at $F_y = 345$ MPa		Factored Moment*		Vertical Web Shear* $\phi V_n$ (kN)
				$I_{d+}$ (mm <sup>4</sup> x10 <sup>3</sup> )	$I_{d-}$ (mm <sup>4</sup> x10 <sup>3</sup> )	$S_{e+}$ (mm <sup>3</sup> x10 <sup>3</sup> )	$S_{e-}$ (mm <sup>3</sup> x10 <sup>3</sup> )	$\phi M_{n+}$ (N-m)	$\phi M_{n-}$ (N-m)	
22	7.81	0.75	345	211.7	243.1	9.09	9.62	2818	2987	50
20	9.76	0.91	345	269.0	296.3	12.04	12.31	3735	3819	60
18	12.69	1.20	345	378.3	396.0	16.45	17.10	5104	5305	79
16	16.11	1.52	345	497.1	501.2	21.13	21.61	6558	6706	98

\*Physical Properties per meter (m) of width

## Factored Reactions at Supports Based on Web Crippling, $\phi R_n$ (kN/m)

Deck Gage	Bearing Length of Webs (mm)											
	One-Flange Loading						Two-Flange Loading					
	End Bearing				Interior Bearing		End Bearing				Interior Bearing	
	40	50	75	100	75	100	40	50	75	100	75	100
22	16.3	17.5	20.2	22.1	28.2	30.7	15.7	16.6	18.6	20.1	34.9	38.2
20	23.2	24.9	28.6	31.2	40.6	43.9	23.7	25.0	27.9	30.0	50.7	55.2
18	38.9	41.6	47.3	51.4	68.4	73.4	42.7	45.0	49.7	53.1	86.6	93.5
16	59.5	63.5	71.9	77.4	105.2	112.1	69.0	72.4	79.6	84.4	134.4	144.1

## Standard Features

- ASTM A653/A653M SS GR50 Min., with Z275/G90 galvanized or ZF75/A25 galvanized
- Standard lengths – 1.83 m to 12.8 m
- ULC Listed
- Cold-formed steel deck conforms to CAN/CSA S136-16 and meets the guidelines of CSSBI 12M-2018.

## Optional Features

- Inquire regarding cost and lead times for:
  - Short cuts < 1.83 m
  - Sheet Lengths > 12.8 m
  - Alternative metallic and painted finishes
- Factory Hanger Tabs

# 1.5VL-36/1.5VLI-36 COMPOSITE DECK-SLABS

## NORMAL WEIGHT CONCRETE (2325 kg/m<sup>3</sup>)

Metric  
LSD

Slab Depth		Maximum Unshored Spans			Composite Deck-Slab Properties				
Total (mm)	Topping (mm)	Deck Gage	Maximum Unshored Construction Clear Span (mm)			Concrete + Deck (kPa)	Deflection $I_d = (I_{cr} + I_u)/2$ (mm <sup>4</sup> × 10 <sup>9</sup> /m)	Moment $\phi M_{no}$ (kN-m/m)	Shear $\phi V_{no}$ (kN/m)
			1	2	3				
90	52	22	2190	2575	2540	1.6	3707.46	11.61	41
		20	2375	2953	3029	1.6	3994.95	13.68	41
		18	2645	3464	3317	1.6	4479.16	17.30	41
		16	2877	3798	3563	1.6	4935.24	20.88	41
125	87	22	1919	2255	2210	2.4	9834.40	19.55	65
		20	2073	2601	2642	2.4	10556.44	23.22	65
		18	2313	3056	2901	2.4	11779.29	29.73	65
		16	2522	3390	3124	2.4	12947.02	36.31	65
150	112	22	1786	2092	2057	2.9	16911.76	25.74	84
		20	1930	2415	2438	3.0	18092.77	30.67	84
		18	2156	2838	2703	3.0	20106.68	39.46	84
		16	2352	3161	2913	3.0	22049.57	48.44	84

**Note:**

- Maximum unshored spans do not consider web-crippling. Required bearing should be determined based on specific span conditions.

### Superimposed Factored Load, $\phi W_n$ , / Deflection at L/360 (kPa)

NWC (2325 kg/m<sup>3</sup>),  $f'_c = 20$  MPa

Total Slab Depth	Deck Gage	Span (mm)							
		1200	1500	1800	2100	2400	2700	3000	3600
90	22	62.5/93.1	39.3/47.6	26.7/27.6	19.1/17.3	14.1/11.6	10.8/8.1	8.3/5.9	5.2/3.4
	20	66.6/100.3	46.6/51.3	31.7/29.7	22.8/18.7	17/12.5	13/8.8	10.2/6.4	6.4/3.7
	18	66.5/112.5	52.8/57.6	40.7/33.3	29.4/21	22/14	16.9/9.9	13.3/7.2	8.6/4.2
	16	66.5/123.9	52.8/63.4	43.6/36.7	35.8/23.1	26.9/15.5	20.8/10.9	16.5/7.9	10.8/4.5
125	22	104.7/246.9	66.5/126.4	45.3/73.2	32.5/46.1	24.2/30.8	18.5/21.6	14.4/15.8	9.1/9.1
	20	104.7/265.1	79.5/135.7	54.3/78.5	39.1/49.5	29.3/33.1	22.5/23.3	17.6/16.9	11.3/9.8
	18	104.6/295.8	83.1/151.4	68.7/87.6	50.9/55.2	38.3/37	29.6/26	23.4/18.9	15.3/10.9
	16	104.6/325.1	83/166.4	68.7/96.3	58.4/60.6	47.4/40.6	36.8/28.5	29.2/20.8	19.3/12
150	22	136.1/424.7	87.8/217.4	59.9/125.8	43/79.2	32/53.1	24.6/37.3	19.2/27.1	12.2/15.7
	20	136.1/454.3	105.3/232.6	72/134.6	51.9/84.7	38.9/56.8	29.9/39.9	23.6/29.1	15.2/16.8
	18	136.1/504.8	108.1/258.5	89.5/149.6	67.8/94.2	51/63.1	39.5/44.3	31.3/32.3	20.6/18.7
	16	136/553.6	108.1/283.5	89.4/164	76.1/103.3	63.5/69.2	49.4/48.6	39.3/35.4	26.1/20.5

**Notes:**

- The composite deck-slab design is based on tested performance and engineering analysis in accordance Section 7.6.1 of CSSBI 12M-2018.
- For high loads long term concrete creep should be considered.
- Use Composite Deck-Slab Strength Web Based Solutions for alternate slabs.

# 1.5VL-36/1.5VLI-36 COMPOSITE DECK-SLABS

## LIGHT WEIGHT CONCRETE (1840 kg/m<sup>3</sup>)

Metric  
LSD

Slab Depth		Maximum Unshored Spans				Composite Deck-Slab Properties			
Total (mm)	Topping (mm)	Deck Gage	Maximum Unshored Construction Clear Span (mm)			Concrete + Deck (kPa)	Deflection $I_d = (I_{cr} + I_u)/2$ (mm <sup>4</sup> × 10 <sup>9</sup> /m)	Moment $\phi M_{no}$ (kN-m/m)	Shear $\phi V_{no}$ (kN/m)
			1	2	3				
90	52	22	2332	2751	2718	1.3	3210.30	11.25	46
		20	2554	3134	3239	1.3	3471.68	13.22	46
		18	2840	3674	3562	1.3	3908.06	16.65	46
		16	3084	4002	3764	1.3	4314.57	20.03	46
100	62	22	2246	2644	2616	1.4	4379.26	13.24	53
		20	2444	3025	3117	1.5	4732.37	15.62	53
		18	2720	3548	3411	1.5	5321.27	19.77	53
		16	2957	3877	3647	1.5	5870.80	23.91	53
120	82	22	2101	2467	2438	1.8	7505.34	17.89	68
		20	2270	2837	2895	1.8	8096.70	21.18	68
		18	2530	3330	3173	1.8	9086.55	26.98	68
		16	2754	3676	3411	1.9	10017.66	32.80	68

**Note:**

- Maximum unshored spans do not consider web-crippling. Required bearing should be determined based on specific span conditions.

### Superimposed Factored Load, $\phi W_n$ , / Deflection at L/360 (kPa)

LWC (1840 kg/m<sup>3</sup>),  $f'_c = 25$  MPa

Total Slab Depth	Deck Gage	Span (mm)							
		1200	1500	1800	2100	2400	2700	3000	3600
90	22	60.9/80.6	38.4/41.3	26.2/23.8	18.8/15	14/10.1	10.8/7	8.4/5.1	5.4/3
	20	71.8/87.1	45.4/44.6	31/25.8	22.4/16.2	16.8/10.9	12.9/7.6	10.2/5.6	6.6/3.2
	18	75/98.1	57.6/50.2	39.5/29.1	28.5/18.3	21.5/12.3	16.6/8.6	13.2/6.3	8.6/3.6
	16	75/108.3	59.6/55.4	47.7/32.1	34.6/20.2	26.1/13.5	20.3/9.5	16.1/6.9	10.7/4
100	22	71.7/109.9	45.2/56.3	30.9/32.6	22.2/20.5	16.6/13.7	12.7/9.6	10/7	6.4/4.1
	20	84.9/118.8	53.7/60.8	36.7/35.2	26.5/22.2	19.8/14.8	15.3/10.4	12/7.6	7.8/4.4
	18	86.5/133.6	68.4/68.4	46.9/39.5	34/24.9	25.6/16.7	19.8/11.7	15.7/8.5	10.3/4.9
	16	86.4/147.4	68.8/75.5	57/43.7	41.5/27.5	31.3/18.4	24.3/12.9	19.3/9.4	12.8/5.5
120	22	97.1/188.5	61.3/96.5	41.9/55.8	30.2/35.1	22.6/23.6	17.3/16.5	13.6/12	8.8/6.9
	20	111.3/203.3	73/104.1	50/60.2	36.1/37.9	27.1/25.4	20.9/17.8	16.5/13	10.8/7.5
	18	111.3/228.1	88.6/116.8	64.3/67.6	46.6/42.6	35.1/28.5	27.3/20	21.6/14.6	14.3/8.4
	16	111.3/251.5	88.5/128.8	73.4/74.5	57.1/46.9	43.2/31.4	33.6/22.1	26.8/16.1	17.9/9.3

**Notes:**

- The composite deck-slab design is based on tested performance and engineering analysis in accordance Section 7.6.1 of CSSBI 12M-2018.
- For high loads long term concrete creep should be considered.
- Use Composite Deck-Slab Strength Web Based Solutions for alternate slabs.

# 1.5VL-36/1.5VLI-36 COMPOSITE DECK-SLABS

Metric  
LSD

## 1.5VL-36/1.5VLI-36 Composite Deck-Slab Information

Total Slab Depth (mm)	Cover Depth (mm)	Theoretical Concrete Volume (m <sup>3</sup> /m <sup>2</sup> )	Min. A <sub>s</sub> for T&S (mm <sup>2</sup> /m)	Recommended WWR for Temperature and Shrinkage
<b>Normal Weight Concrete (2325 kg/m<sup>3</sup>)</b>				
90	52	0.064	60	152x152-MW9.1xMW9.1
100	62	0.077	60	152x152-MW9.1xMW9.1
115	77	0.090	60	152x152-MW9.1xMW9.1
125	87	0.102	81	152x152-MW13.3xMW13.3
140	102	0.115	126	152x152-MW18.7xMW18.7
150	112	0.128	150	152x152-MW25.8xMW25.8
<b>Light Weight Concrete (1840 kg/m<sup>3</sup>)</b>				
90	52	0.064	60	152x152-MW9.1xMW9.1
100	62	0.077	60	152x152-MW9.1xMW9.1
115	77	0.090	60	152x152-MW9.1xMW9.1
120	82	0.096	66	152x152-MW11.1xMW11.1
125	87	0.102	81	152x152-MW13.3xMW13.3
145	107	0.122	141	152x152-MW22.6xMW22.6

### Notes:

1. Recommended temperature and shrinkage reinforcement in accordance with CSSBI S3-08, Table 2.

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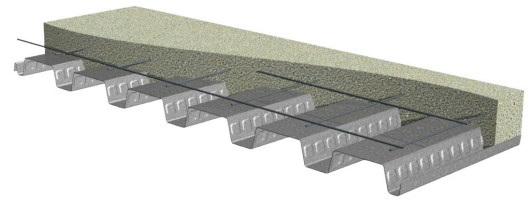
# 1.5VL-36/1.5VLI-36 COMPOSITE DECKS

## GRADE 50 STEEL

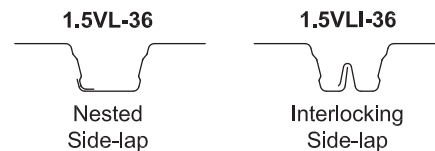
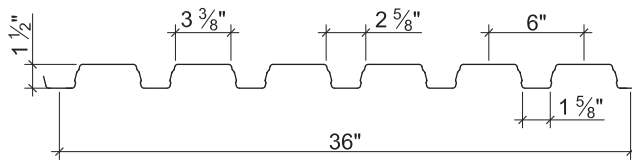
Imperial  
LSD

### 1.5VL COMPOSITE DECKS

- 1.5VL-36 Deck used with Side-lap Screws
- 1.5VLI-36 Deck used with TSWs or BPs



### Nominal Dimensions



### Section Properties

Deck Gage	Deck Weight $w_{dd}$ (psf)	Base Metal Thickness $t$ (in.)	Yield Strength $F_y$ (ksi)	Effective Moment of Inertia at Service Load $I_d = (2I_e + I_o)/3$		Effective Section Modulus at $F_y = 50$ ksi		Factored Moment		Vertical Web Shear $\phi V_n$ (lb/ft)
				$I_{d+}$ (in <sup>4</sup> /ft)	$I_{d-}$ (in <sup>4</sup> /ft)	$S_{e+}$ (in <sup>3</sup> /ft)	$S_{e-}$ (in <sup>3</sup> /ft)	$\phi M_{n+}$ (lb-ft/ft)	$\phi M_{n-}$ (lb-ft/ft)	
22	1.6	0.0295	50	0.155	0.178	0.169	0.179	634	671	3398
20	2.0	0.0358	50	0.197	0.217	0.224	0.229	840	859	4105
18	2.6	0.0474	50	0.277	0.290	0.306	0.318	1148	1193	5388
16	3.3	0.0598	50	0.364	0.367	0.393	0.402	1474	1508	6734

### Factored Reactions at Supports Based on Web Crippling, $\phi R_n$ (lb/ft)

Deck Gage	Bearing Length of Webs											
	One-Flange Loading						Two-Flange Loading					
	End Bearing				Interior Bearing		End Bearing				Interior Bearing	
	1 1/2"	2"	3"	4"	3"	4"	1 1/2"	2"	3"	4"	3"	4"
22	1098	1207	1389	1517	1945	2103	1061	1143	1281	1377	2407	2617
20	1567	1717	1969	2140	2792	3005	1605	1723	1921	2057	3494	3782
18	2626	2863	3261	3519	4707	5029	2894	3092	3423	3637	5966	6410
16	4023	4369	4949	5304	7241	7685	4679	4977	5477	5783	9253	9874

### Standard Features

- ASTM A653/A653M SS GR50 Min., with Z275/G90 galvanized or ZF75/A25 galvanized
- Standard lengths – 6'-0" to 42'-0"
- ULC Listed
- Cold-formed steel deck conforms to CAN/CSA S136-16 and meets the guidelines of CSSBI 12M-2018.

### Optional Features

- Inquire regarding cost and lead times for:
  - Short cuts < 6'-0"
  - Sheet Lengths > 42'-0"
  - Alternative metallic and painted finishes
- Factory Hanger Tabs



# 1.5VL-36/1.5VLI-36 COMPOSITE DECK-SLABS

## NORMAL WEIGHT CONCRETE (145 pcf)

Slab Depth		Maximum Unshored Spans			Composite Deck-Slab Properties				
Total	Topping	Deck Gage	Maximum Unshored Construction Clear Span			Concrete + Deck (psf)	Deflection $I_d = (I_{cr} + I_u)/2$ (in <sup>4</sup> /ft)	Moment $\phi M_{no}$ (kip-ft/ft)	Shear $\phi V_{no}$ (kip/ft)
			1	2	3				
3½"	2"	22	7'-3"	8'-6"	8'-4"	32.2	2.64	2.57	2.82
		20	7'-10"	9'-9"	10'-0"	32.6	2.85	3.03	2.82
		18	8'-9"	11'-5"	10'-11"	33.2	3.19	3.83	2.82
		16	9'-6"	12'-6"	11'-9"	33.9	3.52	4.63	2.82
5"	3½"	22	6'-3"	7'-4"	7'-3"	50.3	7.62	4.51	4.60
		20	6'-9"	8'-6"	8'-7"	50.7	8.18	5.36	4.60
		18	7'-7"	9'-11"	9'-6"	51.3	9.12	6.87	4.60
		16	8'-3"	11'-1"	10'-2"	52.0	10.02	8.39	4.60
6"	4½"	22	5'-10"	6'-10"	6'-8"	62.4	13.11	5.93	5.98
		20	6'-4"	7'-10"	8'-0"	62.8	14.02	7.07	5.98
		18	7'-0"	9'-3"	8'-10"	63.4	15.57	9.10	5.98
		16	7'-8"	10'-4"	9'-6"	64.1	17.06	11.18	5.98

**Note:**

- Maximum unshored spans do not consider web-crippling. Required bearing should be determined based on specific span conditions.

Total Slab Depth		Deck Gage	Superimposed Factored Load, $\phi W_n$ / Deflection at L/360 (psf)							NWC (145 pcf), $f'_c = 3000$ psi
Span (ft-in.)			4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	
3½"	22	1245/1804	782/923	531/534	379/336	281/225	213/158	165/115	102/66	
	20	1369/1944	928/995	632/576	453/362	337/243	258/170	201/124	127/72	
	18	1368/2179	1086/1115	809/645	584/406	437/272	336/191	265/139	171/80	
	16	1367/2401	1085/1229	897/711	712/448	535/300	414/210	327/153	214/88	
5"	22	2192/5206	1380/2665	939/1542	673/971	500/650	382/457	297/333	187/192	
	20	2238/5585	1651/2859	1127/1654	811/1042	606/698	465/490	365/357	234/206	
	18	2237/6228	1777/3188	1461/1845	1056/1162	794/778	614/546	485/398	317/230	
	16	2236/6842	1776/3503	1469/2027	1250/1276	984/855	763/600	606/437	401/253	
6"	22	2886/8955	1819/4585	1239/2653	890/1670	663/1119	507/786	396/573	251/331	
	20	2913/9574	2183/4902	1492/2836	1075/1786	804/1196	619/840	486/612	314/354	
	18	2912/10630	2314/5443	1915/3149	1406/1983	1058/1328	819/933	648/680	426/393	
	16	2911/11651	2313/5965	1914/3452	1629/2174	1316/1456	1023/1022	813/745	540/431	

**Notes:**

- The composite deck-slab design is based on tested performance and engineering analysis in accordance Section 7.6.1 of CSSBI 12M-2018.
- For high loads long term concrete creep should be considered.
- Use Composite Deck-Slab Strength Web Based Solutions for alternate slabs.

# 1.5VL-36/1.5VLI-36 COMPOSITE DECK-SLABS

## LIGHT WEIGHT CONCRETE (115 pcf)

Imperial  
LSD

			Maximum Unshored Spans			Composite Deck-Slab Properties			
Slab Depth		Deck Gage	Maximum Unshored Construction Clear Span			Concrete + Deck (psf)	Deflection $I_d = (I_{cr} + I_u)/2$ (in <sup>4</sup> /ft)	Moment $\phi M_{no}$ (kip-ft/ft)	Shear $\phi V_{no}$ (kip/ft)
Total	Topping		1	2	3				
3½"	2"	22	7'-8"	9'-1"	8'-11"	25.9	2.34	2.50	3.26
		20	8'-5"	10'-4"	10'-8"	26.3	2.53	2.94	3.26
		18	9'-4"	12'-1"	11'-9"	26.9	2.84	3.71	3.26
		16	10'-2"	13'-2"	12'-5"	27.6	3.14	4.46	3.26
4"	2½"	22	7'-4"	8'-7"	8'-6"	30.7	3.46	3.08	3.90
		20	8'-0"	9'-10"	10'-2"	31.1	3.74	3.63	3.90
		18	8'-10"	11'-7"	11'-1"	31.7	4.20	4.61	3.90
		16	9'-8"	12'-8"	11'-11"	32.4	4.63	5.58	3.90
4¾"	3¼"	22	6'-11"	8'-1"	7'-11"	37.8	5.76	4.08	4.94
		20	7'-5"	9'-3"	9'-6"	38.2	6.21	4.83	4.94
		18	8'-3"	10'-11"	10'-5"	38.8	6.96	6.16	4.94
		16	9'-0"	12'-1"	11'-2"	39.5	7.67	7.50	4.94

**Note:**

- Maximum unshored spans do not consider web-crippling. Required bearing should be determined based on specific span conditions.

		Superimposed Factored Load, $\phi W_n$ , / Deflection at L/360 (psf)								LWC (115 pcf), $f'_c = 4000$ psi
Total Slab Depth	Deck Gage	Span (ft-in.)								
		4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	12'-0"	
3½"	22	1220/1595	769/816	524/472	376/297	280/199	215/140	168/102	106/59	
	20	1439/1724	909/882	621/510	447/321	335/215	257/151	202/110	130/63	
	18	1594/1940	1153/993	790/574	572/362	430/242	332/170	263/124	172/71	
	16	1593/2141	1268/1096	957/634	694/399	523/267	406/188	322/137	213/79	
4"	22	1500/2366	946/1211	645/701	464/441	346/295	265/207	207/151	132/87	
	20	1777/2554	1123/1307	768/756	554/476	415/319	319/224	251/163	162/94	
	18	1909/2869	1434/1469	984/850	712/535	536/358	415/251	328/183	216/106	
	16	1908/3164	1518/1620	1198/937	869/590	656/395	510/277	405/202	269/117	
4¾"	22	1991/3934	1257/2014	858/1165	618/734	462/491	355/345	278/251	179/145	
	20	2367/4240	1498/2170	1025/1256	740/791	556/530	429/372	338/271	220/157	
	18	2423/4753	1922/2433	1320/1408	957/886	721/594	559/417	444/304	293/176	
	16	2422/5238	1928/2682	1598/1552	1174/977	887/654	691/459	550/335	367/194	

**Notes:**

- The composite deck-slab design is based on tested performance and engineering analysis in accordance Section 7.6.1 of CSSBI 12M-2018.
- For high loads long term concrete creep should be considered.
- Use Composite Deck-Slab Strength Web Based Solutions for alternate slabs.

# 1.5VL-36/1.5VLI-36 COMPOSITE DECK-SLABS

Imperial  
LSD

## 1.5VL-36/1.5VLI-36 Composite Deck-Slab Information

Total Slab Depth (in.)	Cover Depth (in.)	Theoretical Concrete Volume (yd <sup>3</sup> /100 ft <sup>2</sup> )	Min. A <sub>s</sub> for T&S (in. <sup>2</sup> )	Recommended WWR for Temperature and Shrinkage
<b>Normal Weight Concrete (145 pcf)</b>				
3½	2	0.78	0.028	6x6-W1.4xW1.4
4	2½	0.94	0.028	6x6-W1.4xW1.4
4½	3	1.09	0.028	6x6-W1.4xW1.4
5	3½	1.24	0.038	6x6-W2.1xW2.1
5½	4	1.40	0.060	6x6-W2.9xW2.9
6	4½	1.55	0.074	6x6-W4.0xW4.0
<b>Light Weight Concrete (110 pcf)</b>				
3½	2	0.78	0.028	6x6-W1.4xW1.4
4	2½	0.94	0.028	6x6-W1.4xW1.4
4½	3	1.09	0.028	6x6-W1.4xW1.4
4¾	3¼	1.17	0.031	6x6-W1.7xW1.7
5	3½	1.24	0.038	6x6-W2.1xW2.1
5¾	4¼	1.48	0.067	6x6-W3.5xW3.5

### Notes:

1. Recommended temperature and shrinkage reinforcement in accordance with CSSBI S3-08, Table 2.

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