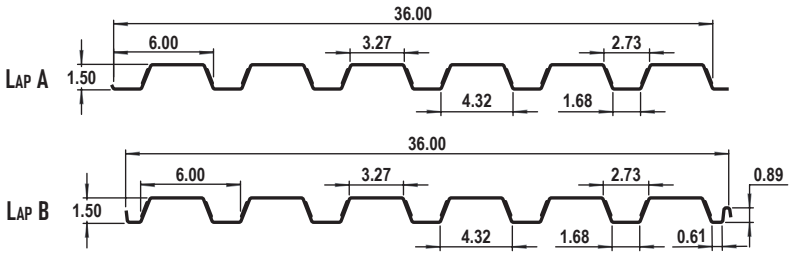
WF-636 COMPOSITE DECK



IMPERIAL

STEEL DECK SECTION PROPERTIES (Per foot of width)							COMPOSITE SLAB PROPERTIES (Per foot of width)				
Base Steel Thickness (in.)	Yield Stress (ksi)	Weight (psf)	Area (in^2)	Section Modulus (in^3) Midspan	Section Modulus (in^3) Support	Deflection Inertia (in^4)	Overall Slab Depth, D (in.) 4.0	4.5	5.0	5.5	6.0
							Slab Weight (psf)				
0.030	40	1.72	0.490	0.183	0.183	0.164	41.7	47.9	54.2	60.4	66.7
0.036	40	2.06	0.588	0.223	0.232	0.206	Concrete Volume ($yd^3/100ft^2$)				
0.048	40	2.72	0.784	0.304	0.314	0.285	0.95	1.10	1.25	1.41	1.56
0.060	40	3.39	0.980	0.383	0.388	0.356					

Maximum Specified Uniformly Distributed Loads (psf)

Slab Depth, D (in.)		4.0			4.5			5.0			5.5			6.0		
Base (in.)	Span (ft)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0.030	5'0"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	5'6"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'0"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'6"	353	353	353	400	400	400	400	400	400	400	400	400	400	400	400
	7'0"	307	307	307	357	357	357	400	400	400	400	400	400	400	400	400
	7'6"	268	268	268	314	314	314	358	358	358	400	400	400	400	400	400
	8'0"	231	231	231	275	275	275	318	318	318	357	357	357	396	396	396
0.036	5'0"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	5'6"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'0"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'6"	377	377	377	400	400	400	400	400	400	400	400	400	400	400	400
	7'0"	332	332	332	386	386	386	400	400	400	400	400	400	400	400	400
	7'6"	296	296	296	344	344	344	392	392	392	400	400	400	400	400	400
	8'0"	265	265	265	308	308	308	352	352	352	395	395	395	400	400	400
0.048	5'6"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'0"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'6"	385	385	385	400	400	400	400	400	400	400	400	400	400	400	400
	7'0"	348	348	348	400	400	400	400	400	400	400	400	400	400	400	400
	7'6"	318	318	318	368	368	368	400	400	400	400	400	400	400	400	400
	8'0"	290	290	290	337	337	337	384	384	384	400	400	400	400	400	400
	8'6"	266	266	266	310	310	310	353	353	353	397	397	397	400	400	400
	9'0"	246	246	246	287	287	287	327	327	327	367	367	367	400	400	400
	9'6"	229	229	229	266	266	266	303	303	303	341	341	341	378	378	378
	10'0"	208	208	208	248	248	248	283	283	283	318	318	318	352	352	352
0.060	5'6"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'0"	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	6'6"	385	385	385	400	400	400	400	400	400	400	400	400	400	400	400
	7'0"	349	349	349	400	400	400	400	400	400	400	400	400	400	400	400
	7'6"	318	318	318	371	371	371	400	400	400	400	400	400	400	400	400
	8'0"	292	292	292	340	340	340	388	388	388	400	400	400	400	400	400
	8'6"	270	270	270	314	314	314	358	358	358	400	400	400	400	400	400
	9'0"	250	250	250	291	291	291	332	332	332	373	373	373	400	400	400
	9'6"	233	233	233	271	271	271	309	309	309	347	347	347	385	385	385
	10'0"	217	217	217	253	253	253	289	289	289	324	324	324	360	360	360
0.030	DP	63.2			89.8			123			163			211		
0.036	DP	67.6			95.9			131			174			225		
0.048	DP	75.7			107			146			194			250		
0.060	DP	82.7			117			160			211			272		

NOTES:
1. One shore support required at midspan in shaded areas.
2. Slab weight of steel deck and concrete slab has been accounted for in the load table.
3. Shoring was based on Light Duty uniform construction live load of ***20 psf***.
4. DP = deflection parameter.
5. See composite slab notes and design example of how to use the load table.
6. Prepared by Dr. R.M. Schuster, Distinguished Professor Emeritus, University of Waterloo.

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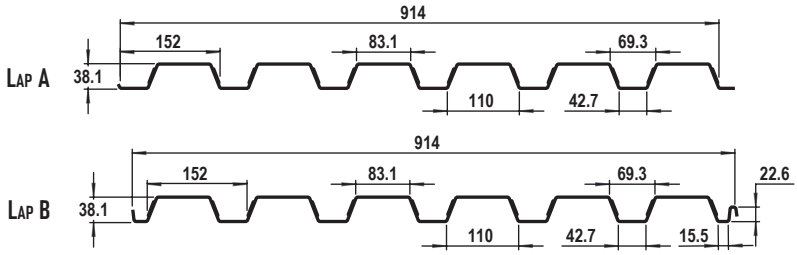
WF-636 COMPOSITE DECK



METRIC

STEEL DECK SECTION PROPERTIES (Per metre of width)							COMPOSITE SLAB PROPERTIES (Per metre of width)				
Base Steel Thickness	Yield Stress	Mass	Area	Section Modulus ($x10^3$ mm^3)		Deflection Inertia	Overall Slab Depth, D (mm)				
							100	110	120	130	140
(mm)	(MPa)	(kg/m^2)	(mm^2)	Midspan	Support	($x10^6$ mm^4)	Slab Weight (kPa)				
0.762	275	8.42	1037	9.82	9.84	0.224	1.88	2.10	2.33	2.55	2.78
0.914	275	10.1	1245	12.0	12.5	0.281	Concrete Volume ($m^3/10m^2$)				
1.22	275	13.3	1659	16.3	16.9	0.390	0.762	0.862	0.962	1.06	1.16
1.52	275	16.6	2074	20.6	20.8	0.487					

Maximum Specified Uniformly Distributed Loads (kPa)

Slab Depth, D (mm)		100			110			120			130			140		
Base (mm)	Span (m)	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0.762	1.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.8	19.0	19.0	19.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.0	15.6	15.6	15.6	17.6	17.6	17.6	19.6	19.6	19.6	20.0	20.0	20.0	20.0	20.0	20.0
	2.2	13.0	13.0	13.0	14.7	14.7	14.7	16.4	16.4	16.4	18.1	18.1	18.1	19.8	19.8	19.8
	2.4	11.0	11.0	11.0	12.5	12.5	12.5	13.9	13.9	13.9	15.4	15.4	15.4	16.8	16.8	16.8
	2.6	9.4	9.4	9.4	10.7	10.7	10.7	11.9	11.9	11.9	13.2	13.2	13.2	14.4	14.4	14.4
0.914	1.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.0	18.9	18.9	18.9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.2	16.2	16.2	16.2	18.3	18.3	18.3	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.4	13.4	13.4	13.4	15.5	15.5	15.5	17.6	17.6	17.6	19.5	19.5	19.5	20.0	20.0	20.0
	2.6	11.2	11.2	11.2	12.9	12.9	12.9	14.7	14.7	14.7	16.5	16.5	16.5	18.3	18.3	18.3
1.22	1.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.4	16.9	16.9	16.9	19.8	19.8	19.8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.6	14.2	14.2	14.2	16.6	16.6	16.6	19.0	19.0	19.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.8	12.0	12.0	12.0	14.1	14.1	14.1	16.2	16.2	16.2	18.2	18.2	18.2	20.0	20.0	20.0
	3.0	9.8	9.8	9.8	12.0	12.0	12.0	13.8	13.8	13.8	15.6	15.6	15.6	17.4	17.4	17.4
1.52	1.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	1.8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.4	19.5	19.5	19.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.6	16.5	16.5	16.5	19.7	19.7	19.7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	2.8	13.2	13.2	13.2	16.7	16.7	16.7	19.4	19.4	19.4	20.0	20.0	20.0	20.0	20.0	20.0
	3.0	10.7	10.7	10.7	14.2	14.2	14.2	16.6	16.6	16.6	18.9	18.9	18.9	20.0	20.0	20.0
0.762	DP	80.6			107			139			176			220		
0.914	DP	86.3			115			148			188			234		
1.22	DP	96.6			128			166			210			261		
1.52	DP	106			140			181			229			285		

NOTES:
1. One shore support required at midspan in shaded areas.
2. Slab weight of steel deck and concrete slab has been accounted for in the load table.
3. Shoring was based on Light Duty uniform construction live load of ***1 kPa***.
4. DP = deflection parameter.
5. See composite slab notes and design example of how to use the load table.
6. Prepared by Dr. R.M. Schuster, Distinguished Professor Emeritus, University of Waterloo.

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NOVEMBER 2024

WF-636 COMPOSITE SLAB
TECHNICAL NOTES (IMPERIAL UNITS)

Material Properties

1. The composite steel deck WF-636 is the WF-636 roof deck with embossments rolled into the web elements to achieve the composite interlocking capacity between the steel deck and concrete.
2. Steel deck section properties were calculated in accordance with CSA S136-16.
3. Steel conforms to ASTM A653 SS Grade 40 with G90 surface coatings.
4. Concrete is based on normal density of 145 pcf and having a minimum compressive strength of 3 ksi.

Load Table

1. Loads are maximum specified uniformly distributed loads resulting from human occupancy and should not be used for concentrated loads.
   Maximum specified load from load table must be ***≥ [LL + (1.25/1.5)DL]***;
   Where LL = specified live load;
   DL = specified dead load;
2. Loads greater than ***400 psf*** are commonly the result of large concentrated moving loads. In such cases, contact ***WESTFORM METALS.***
3. The WF-636 steel deck provides the positive reinforcement for the simply supported composite slab and no additional reinforcing steel is required. To control shrinkage and temperature cracking, it is the responsibility of the design engineer to provide the minimum shrinkage and temperature reinforcement as specified in CSSBI S3-2019.
4. *Shoring requirements shown in shaded areas of the load table were established in accordance with CSSBI 12M-24 and are based on a Light Duty uniform construction live load of **20 psf**. For Medium or Heavy Duty construction live loads contact **WESTFORM METALS** for the maximum unshored spans. Minimum bearing length at end support is 1.5 in. and at mid-support 4 in.*
5. To establish the shear-bond capacity of the composite slab system, laboratory tests were carried out at the Structural Testing and Research laboratory, Cambridge, Ontario in accordance with CSSBI S2-02.
6. Use of deflection parameter, DP

   $$W_d = \frac{DP \times 10^6}{DC \times (L)^3}$$

   where:
   W_d = Maximum specified deflection load in psf
   DP = Deflection parameter from load table
   DC = Deflection constant such as 360
   L = Span length in feet

7. All technical information and load tables were prepared by Dr. R.M. Schuster, P.Eng. Distinguished Professor Emeritus, University of Waterloo, Ontario.

EXAMPLE

Determine the specified uniformly distributed live load that can be placed on the WF-636 composite floor slab, given the following information:

Given:

- Steel deck thickness = 0.048 in.
- Yield stress = 40 ksi
- Overall slab depth = 4.5 in.
- Double span, each = 10 ft
- Specified superimposed dead load, DL = 35 psf

Check Strength:

The maximum specified load in **(psf)** from load table must be ≥ [LL + 0.833(DL)],

where:
LL = specified live load
DL = specified superimposed dead load

From load table under 10 ft span, the maximum specified load is ***248 psf***, therefore,
248 ≥ [LL + 0.833(35)] and solving for LL,

LL = *218 psf*

Since this is in the shaded area, one shore support is required at mid-span in each span.

Note:

The self-weight of the steel deck and concrete slab have already been accounted for in the maximum specified uniformly distributed load given in the composite slab load table.

Check Deflection:

From table DP = 107 and assuming DC = 360

$W_d = 107 \times 10^6/360/(10)^3$ = ***297psf***
Since this is greater than 218 psf, strength controls.

WF-636 COMPOSITE SLAB
TECHNICAL NOTES (METRIC UNITS)

Material Properties

1. The composite steel deck WF-636 is the WF-636 roof deck with embossments rolled into the web elements to achieve the composite interlocking capacity between the steel deck and concrete.
2. Steel deck section properties were calculated in accordance with CSA S136-16.
3. Steel conforms to ASTM A653M SS Grade 275 with Z275 surface coatings.
4. Concrete is based on normal density of 2300 kg/m^3 and having a minimum compressive strength of 20 MPa.

Load Table

1. Loads are maximum specified uniformly distributed loads resulting from human occupancy and should not be used for concentrated loads.
   Maximum specified load from load table must be ***≥ [LL + (1.25/1.5)DL]***;
   Where LL = specified live load;
   DL = specified dead load;
2. Loads greater than ***20 kPa*** are commonly the result of large concentrated moving loads. In such cases, contact ***WESTFORM METALS.***
3. The WF-636 steel deck provides the positive reinforcement for the simply supported composite slab and no additional reinforcing steel is required. To control shrinkage and temperature cracking, it is the responsibility of the design engineer to provide the minimum shrinkage and temperature reinforcement as specified in CSSBI S3-2019.
4. *Shoring requirements shown in shaded areas of the load table were established in accordance with CSSBI 12M-24 and are based on a Light Duty uniform construction live load of **1 kPa**. For Medium or Heavy Duty construction live loads contact **WESTFORM METALS** for the maximum unshored spans. Minimum bearing length at end support is 40 mm and at mid-support 100 mm.*
5. To establish the shear-bond capacity of the composite slab system, laboratory tests were carried out at the Structural Testing and Research laboratory, Cambridge, Ontario in accordance with CSSBI S2-02.
6. Use of deflection parameter, DP

   $$W_d = \frac{DP \times 10^3}{DC \times (L)^3}$$

   where:
   W_d = Maximum specified deflection load in kPa
   DP = Deflection parameter from load table
   DC = Deflection constant such as 360
   L = Span length in meters
7. All technical information and load tables were prepared by Dr. R.M. Schuster, P.Eng. Distinguished Professor Emeritus, University of Waterloo, Ontario.

EXAMPLE

Determine the specified uniformly distributed live load that can be placed on the WF-636 composite floor slab, given the following information:

Given:

- Steel deck thickness = 1.22 mm
- Yield stress = 275 MPa
- Overall slab depth = 120 mm
- Double span, each = 3.0 m
- Specified superimposed dead load, DL = 2.00 kPa

Check Strength:

The maximum specified load in **(kPa)** from load table must be ≥ [LL + 0.833(DL)],

where:
LL = specified live load
DL = specified superimposed dead load

From load table under 3 m span, the maximum specified load is ***13.8 kPa***, therefore,
13.8 ≥ [LL + 0.833(2.00)] and solving for LL,

LL = *12.1 kPa*

Since this is in the shaded area, one shore support is required at mid-span in each span.

Note:

The self-weight of the steel deck and concrete slab have already been accounted for in the maximum specified uniformly distributed load given in the composite slab load table.

Check Deflection:

From table DP = 166 and assuming DC = 360

$W_d = 166 \times 10^3/360/(3)^3$ = ***17.1 kPa***
Since this is greater than 12.1 kPa, strength controls.