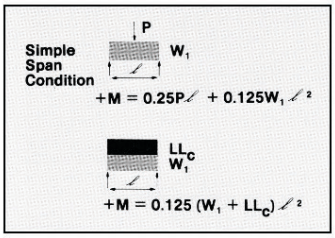
Commentary & Load Tables

This commentary describes the development of the maximum unshored clear span lengths for the cellular deck as forms to support the concrete. The commentary also describes the development of the capacity of the concrete slab reinforced by the cellular deck. Both the maximum unshored span lengths and the superimposed slab capacities shown were calculated using the U.S. Customary (English) units. These were then "soft" converted to System International (SI) metric units.

Form Spans

The maximum unshored span lengths are based on the design criteria established by the Steel Deck Institute (SDI) in its "Design Manual for Composite Decks, Form Decks, and Roof Decks."

The loading combinations and magnitudes shown are taken from this Standard. It recognizes the need to design for both concentrated and uniform loading during the placement of concrete. The loading condition which produces the worst stress condition is assumed to control. Maximum unshored span lengths are calculated for single, dual and triple span conditions. All sectional properties of the N-R-G-FLOR+ were calculated in accordance with the American Iron and Steel Institute's (AISI) "Specification for the Design of Cold Formed Steel Structural Members." The maximum unshored span lengths published in the N-R-G-FLOR+ load tables are clear spans; Cordeck recommends that clear spans be used in determining the requirements for shoring. The following sets of diagrams and equations summarize the loading criteria.



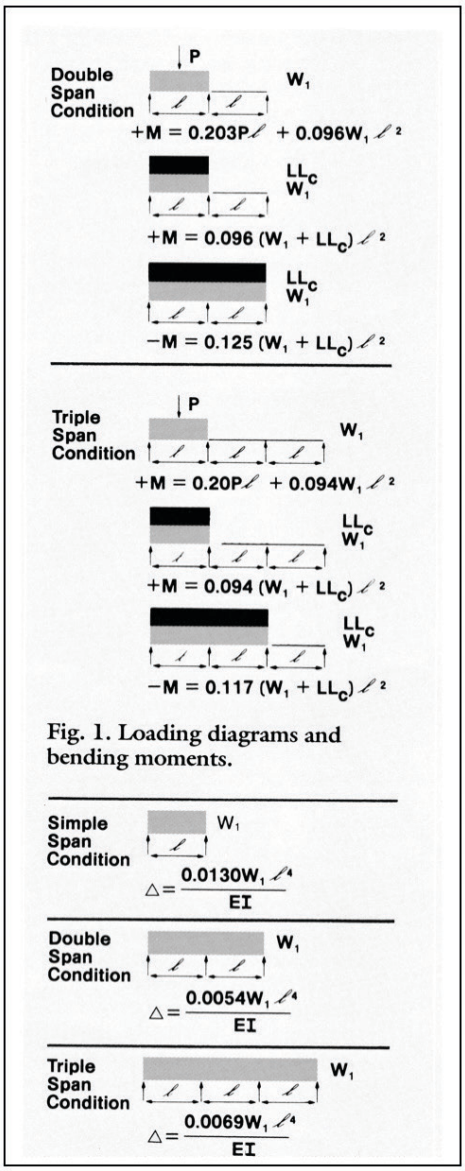


Fig. 1. Loading diagrams and bending moments.

Fig.2. Loading diagrams and deflections.

Where: P = 150 pound concentrated live load applied to a 1 foot width

W1 = Concrete dead weight combined with the deck dead weight

LL_c = The construction live load defined to be 20 PSF

E = Modulus of elasticity (29,500,000 PSI)

I = Moment of inertia (In4 /ft.)

ℓ = Span length in feet

Slab Capacities

The superimposed capacities in the N-R-G-FLOR+ load tables are based on single span design determined using one or more of the following:

1. Standard for the Structural Design of Composite Slabs published by the Technical Council for Codes and Standards of the American Society of Civil Engineers. The criteria recommends a maximum span to depth ratio of 22 for simply supported spans unless the deflection calculations are preformed to satisfy a particular service condition. The ASCE Criteria also suggests that the average of cracked and uncracked moment of inertia based on a transformation to concrete properties be used for deflection calculations. The average of cracked and uncracked composite moment of inertia transformed to steel properties for N-R-G-FLOR+ profiles are provided in tables, Pg. 5.

These moments of inertia transformed to steel properties can be readily converted to moments of inertia transformed to concrete properties by multiplication by the applicable modular ratio (N).

The live load equation from the ASCE Criteria is as follows:

$$LL = \frac{1}{1.7}\left[\frac{2V_u}{L} - 1.4(\gamma W_1 + W_3)\right]$$

$$Vu = \theta\left[d\left(\frac{4mpd}{L} + 12k\sqrt{f'_c}\right) + \frac{\gamma W_1 L}{2}\right]$$

d = Effective slab depth (distance from extreme concrete compression fiber to centroidal axis of the full cross-section of the steel deck), inches.

f'_c = Specified compressive strength of concrete , PSI.

k = Ordinate intercept of the reduced experimental shear-bond line.
L = Length of span, feet.
LL = Allowable superimposed live load for service conditions, PSF.
m = Slope of the reduced experimental shear-bond line.
Vu = Ultimate shear capacity, PLF width.
W_1 = Weight of slab, PSF.
W_3 = Dead load applied to slab, exclusive of W_1 PSF.
γ= Coefficient for proportion of dead load added upon removal of shore (= 0.625 for center shore; = 0 for no shoring).
Φ= Strength reduction factor (Ø= 0.8 for shear-bond).
p = Reinforcement ratio of steel deck area to effective concrete area A_s/bd.

2. West Virginia University Composite Slab Studies are based on the following:

Flexural Capacity
The bending strength capacity M_{et} is based on linear strain and is limited by the first yield stress f_y on the deck surface. The yield stress actually developed depends on shear transfer efficiency along the shear span as indicated by K. The location of a neutral surface at y_{cc} is determined as well as the neutral surface y_{sb} for the full steel section. The use of these dimensions leads to a stress distribution over the section. The theoretical bending capacity M_{et} is modified to $M_t=KM_{et}$ where K accounts for the effective bond or anchorage development over the shear span L. $K=K_3/(K_1+K_2)$ with K_3 measuring the influence of the panel width, K_1 the effect of steel deck depth, and K_2 the influence of embossments in the webs. When the bond factor K=1.0, the steel deck experiences yield stresses which may extend above the lower surface. The flexural capacity is limited by yielding in the steel; this may be followed by the loss of bond at the interface. When K<1.0, the flexural capacity is controlled by bond with steel stresses being lower than yield.

Composite steel deck slabs have their tension reinforcement principally on the lower surface rather than having the steel encased in concrete as with reinforcing in conventional slabs. Thus the bending capacity is limited by the ability of the deck to transfer the developed tension forces to the concrete. This transfer condition is similar to the bond stress or anchorage for reinforcing bars where forces must be transferred along the embedded length. The embossing patterns in bars are standardized and the bars must be totally encased in concrete. With deck reinforcement however, embossment patterns are nonstandard, the reinforcement is not encased, and bond transfer along a shear span is complex.

Applications
The formulas are limited to galvanized steel with embossment patterns having height, P_h, between 0.035 and 0.105 inches. Concrete compressive strengths are limited between 2500 psi and 6000 psi. The nominal moment strength equation for M_n confirmed by test shall represent the profile. The nominal shear strength, V_n, is

$$V_n = 12\ (M_n)/L'$$

The nominal uniform load capacity is given by V_n and the nominal superimposed slab capacity W is given by $2\ Ø\ V_n/1.6L^2$. Further explanation of these formulations is contained in ASCE's "Standard for the Structural Design of Composite Slabs" published by Technical Council for Codes and Standards.

Design Equations
The shear transfer anchorage forces are developed along the shear span on the steel section depth and on the types of embossments. The calculated bending moment M_n is

Mn = 12KMet/Cs where

K=K3/(K1 + K2)

K_3 establishes the increase in efficiency, with increasing slab width, of average, bond transfer per cell. With N=12 B_d/C_s being the number of cells in the test slab width

$$K_3=0.87+0.06888(N)- 0.00222(N)^2=1.4$$

K_1 measures the influence of the steel section depth on bond development along the shear span

$$K_1=[^dd/7.8]^{0.5}$$

K_2 is an indicator of mechanical bond performance along shear span and depends on the type of embossment patterns used.

$$K_2= \frac{D_w^{0.8}\ (K_3/SS1)}{1.0+60\ (P_h^2 P_s^{1/3})}$$

$$SS1=(3L_n/70)\ (L_n-14)+3.6$$

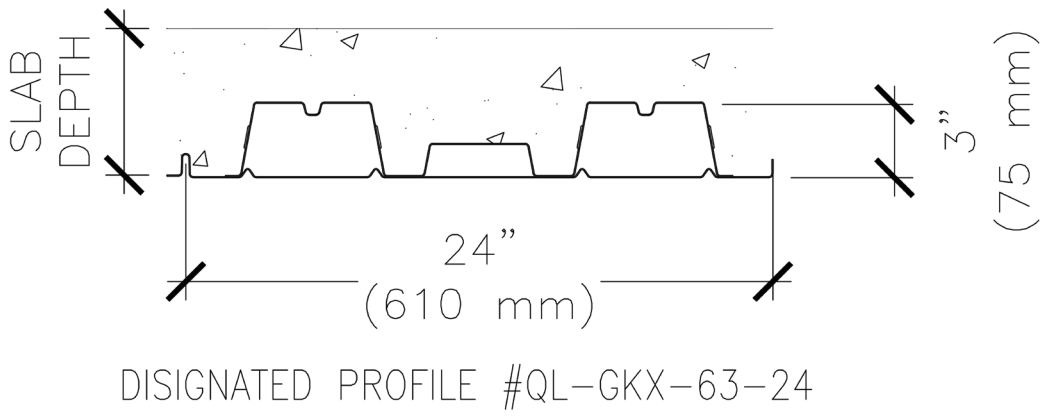
$$P_s=12\ L_e/s$$

Cs = Width of repeating pattern (pitch), inches
L = Shear span, inches
Le = Embossment length, inches
L,Ln = Deck clear span, feet
Met = Bending moment at first yield, FT-LB/FT
K,K_1,K_2,K_3 = Relaxation Constants
Mn = Nominal bending strength, FT-LB/FT
Ph = Embossment pattern height, inches
Ps = Embossment intensity factor (12Le/S)
S = Embossment spacing, inches
SS1 = Span curvature factor
Vn = Nominal vertical shear capacity PLF
Ø = .75

3. ICC-ES Legacy Report ESR-1460 published by ICC Evaluation Service, Inc. a subsidiary of the International Conference of Building Officials.

4. Load testing to confirm the performance predicted by the standards.

N-R-G-FLOR+ Cellular Raceway



N-R-G-FLOR+ Composite Floor Deck Normal Weight Concrete (145 PCF/2323 kg/m^3)

Total Slab Depth D	Slab Dead Load	Concrete Usage	Deck Gage	Maximum Unshored Clear Spans (ft. in. /mm)			Superimposed Slab Capacities (psf/kPa)												
in	psf	CY/100 SF	GAGE	1	2	3	Clear Span (ft. in./mm)												
mm	kg/m^2	m^3/100 m^2	mm	Span	Span	Span	9'-0" 2700	9'-6" 2850	10'-0" 3000	10'-6" 3150	11'-0" 3300	11'-6" 3450	12'-0" 3600	12'-6" 3750	13'-0" 3900	13'-6" 4050	14'-0" 4200	14'-6" 4350	15'-0" 4500
			20/20	9'-2"	10'-8"	10'-8"	n/a	n/a	193	180	169	160	151	143	136	129	123	117	112
			0.909/0.909	2794	3226	3226	n/a	n/a	9.24	8.62	8.09	7.66	7.23	6.85	6.51	6.18	5.89	5.6	5.36
			18/20	11'-0"	12'-2"	12'-2"	n/a	n/a	n/a	196	185	163	154	145	138	131	124	119	113
			1.204/0.909	3353	3708	3708	n/a	n/a	n/a	9.38	8.86	7.8	7.37	6.94	6.61	6.27	5.94	5.7	5.41
5 1/2"	54	1.214	18/18	11'-1"	12'-6"	12'-6"	n/a	n/a	n/a	n/a	196	173	163	154	146	138	132	125	120
140	264	10.00	1.204/1.204	3378	3810	3810	n/a	n/a	n/a	n/a	9.38	8.28	7.8	7.37	6.99	6.61	6.32	5.99	5.75
			16/18	12'-3"	13'-8"	13'-8"	n/a	n/a	n/a	n/a	200	189	179	157	149	141	134	128	122
			1.524/1.204	3734	4140	4140	n/a	n/a	n/a	n/a	9.58	9.05	8.52	7.52	7.13	6.75	6.42	6.13	5.84
			16/16	12'-6"	13'-10"	13'-10"	n/a	n/a	n/a	n/a	n/a	199	187	177	156	148	141	134	128
			1.524/1.524	3810	4191	4191	n/a	n/a	n/a	n/a	n/a	9.53	8.95	8.47	7.47	7.09	6.75	6.42	6.13
			20/20	9'-0"	10'-4"	10'-4"	n/a	n/a	n/a	n/a	189	178	169	160	152	144	137	131	125
			0.909/0.909	2743	33150	3150	n/a	n/a	n/a	n/a	9.05	8.52	8.09	7.66	7.28	6.89	6.56	6.27	5.99
			18/20	10'-8"	12'-0"	12'-0"	n/a	n/a	n/a	n/a	194	182	172	163	154	146	139	133	127
			1.204/0.909	3251	3658	3658	n/a	n/a	n/a	n/a	9.29	8.71	8.24	7.8	7.37	6.99	6.66	6.37	6.08
6"	60	1.369	18/18	10'-9"	11'-9"	11'-9"	n/a	n/a	n/a	n/a	n/a	193	182	172	163	155	147	140	134
150	293	11.27	1.204/1.204	3277	3581	3581	n/a	n/a	n/a	n/a	n/a	9.24	8.71	8.24	7.8	7.42	7.04	6.7	6.42
			16/18	12'-2"	13'-4"	13'-4"	n/a	n/a	n/a	n/a	n/a	n/a	200	176	167	158	150	143	136
			1.524/1.204	3708	4064	4064	n/a	n/a	n/a	n/a	n/a	n/a	9.58	8.43	8	7.57	7.18	6.85	6.51
			16/16	12'-3"	13'-6"	13'-6"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	185	176	166	158	150	143
			1.524/1.524	3734	4115	4115	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.86	8.43	7.95	7.57	7.18	6.85
			20/20	8'-6"	10'-0"	10'-0"	n/a	n/a	n/a	n/a	n/a	196	185	175	166	158	151	144	138
			0.909/0.909	2591	3658	3658	n/a	n/a	n/a	n/a	n/a	9.38	8.86	8.38	7.95	7.57	7.23	6.89	6.61
			18/20	10'-3"	11'-6"	11'-6"	n/a	n/a	n/a	n/a	n/a	200	189	179	170	161	153	146	140
			1.204/0.909	3124	3505	3505	n/a	n/a	n/a	n/a	n/a	9.58	9.05	8.57	8.14	7.71	7.33	6.99	6.7
6 1/2"	66	1.523	18/18	10'-4"	11'-4"	11'-4"	n/a	n/a	n/a	n/a	n/a	n/a	200	189	179	170	162	154	147
165	322	12.53	1.204/1.204	3150	3454	3454	n/a	n/a	n/a	n/a	n/a	n/a	9.58	9.05	8.57	8.14	7.76	7.37	7.04
			16/18	11'-8"	13'-0"	13'-0"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	194	183	174	165	157	150
			1.524/1.204	3556	3962	3962	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.29	8.76	8.33	7.9	7.52	7.18
			16/16	11'-8"	13'-2"	13'-2"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	193	183	173	165	157
			1.524/1.524	3556	4013	4013	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.24	8.76	8.28	7.9	7.52

(n/a) indicates Slab Capacities in excess of 200 p.s.f. (9.58 kPa). Contact Cordeck for information regarding dynamic loads.

NOTE 1. The above maximum unshored clear span lengths are governed by the following - (a) a deflection limitation of :/180 not to exceed 3/4" (19mm) relative to the supports; (b) a yield strength of 37ksi (255MPa) minimum [Design Stress = 22.2 ksi (153 MPa)]; (c) the web crippling design equations contained in 1986 Specification for the Design of Cold Formed Steel Structural Members published by AISI.

NOTE 2. Total superimposed slab loading is limited to 200 p.s.f. (9.58kPa); greater magnitudes usually indicate heavy concentrated moving loads which may require additional reinforcement. This type of loading should be thoroughly investigated.

NOTE 3. Cordeck reserves the right to change any of the design information and/or the specifications/notes pertaining to its products without notice.

NOTE 4. No information presented herein should be used to replace the judgment of experienced structural engineers.

NOTE 5. Chloride add mixtures or add mixtures containing chloride salts shall not be added under any circumstances to the concrete. Such additives have proved deleterious to steel and steel finish.

Sectional Properties

Designated profile #QL-GKX-63-24

GAGE	THICKNESS **in.** mm	WEIGHT **psf** kg/m^2	I_f **in^4/ft** 10^6mm^4/m	I_d **in^4/ft** 10^6mm^4/m	S_p **in^3/ft** 10^3mm^3/m	S_n **in^3/ft** 10^3mm^3/m
	.0358/.0358	**3.69**	**1.485**	**1.355**	**0.552**	**0.657**
20/20	0.909/0.909	18.02	2.028	1.850	29.69	35.33
	.0474/.0358	**4.38**	**1.827**	**1.665**	**0.760**	**0.847**
18/20	1.204/0.909	21.39	2.495	2.274	40.85	45.54
	.0474/.0474	**4.93**	**1.990**	**1.869**	**0.783**	**0.894**
18/18	1.204/1.204	24.07	2.717	2.552	42.09	48.06
	.0600/.0474	**5.61**	**2.337**	**2.186**	**0.955**	**1.085**
16/18	1.524/1.204	27.39	3.191	2.986	51.34	58.33
	.0600/.0600	**6.16**	**2.500**	**2.402**	**0.977**	**1.135**
16/16	1.524/1.524	30.08	3.414	3.281	52.53	61.02

N-R-G-FLOR+ Composite Floor Deck Light Weight Concrete (110 PCF/1760 kg/m^3)

Total Slab Depth D	Slab Dead Load	Concrete Usage	Deck Gage	Maximum Unshored Clear Spans (ft. in. /mm)			Superimposed Slab Capacities (psf/kPa)												
in	psf	CY/100 SF	GAGE	1	2	3	Clear Span (ft. in./mm)												
mm	kg/m^2	m^3/100 m^2	mm	Span	Span	Span	9'-0" 2700	9'-6" 2850	10'-0" 3000	10'-6" 3150	11'-0" 3300	11'-6" 3450	12'-0" 3600	12'-6" 3750	13'-0" 3900	13'-6" 4050	14'-0" 4200	14'-6" 4350	15'-0" 4500
			20/20	10'-1"	11'-7"	11'-7"	n/a	n/a	n/a	183	172	162	153	145	138	131	125	120	115
			0.909/0.909	3073	3531	3531	n/a	n/a	n/a	8.76	8.24	7.76	7.33	6.94	6.61	6.27	5.99	5.75	5.51
			18/20	12'-1"	13'-3"	13'-3"	n/a	n/a	n/a	196	185	174	165	148	140	133	127	121	116
			1.204/0.909	3683	4039	4039	n/a	n/a	n/a	9.38	8.86	8.33	7.9	7.09	6.7	6.37	6.08	5.79	5.55
5 1/2"	42	1.214	18/18	12'-2"	13'-6"	13'-6"	n/a	n/a	n/a	n/a	196	185	175	157	149	141	134	128	122
140	205	10.00	1.204/1.204	3708	4115	4115	n/a	n/a	n/a	n/a	9.38	8.86	8.38	7.52	7.13	6.75	6.42	6.13	5.84
			16/18	13'-6"	14'-9"	14'-9"	n/a	n/a	n/a	n/a	200	189	178	169	161	153	136	130	124
			1.524/1.204	4115	4496	4496	n/a	n/a	n/a	n/a	9.58	9.05	8.52	8.09	7.71	7.33	6.51	6.22	5.94
			16/16	13'-7"	15'-0"	15'-0"	n/a	n/a	n/a	n/a	n/a	199	187	177	168	160	143	137	130
			1.524/1.524	4140	4572	4572	n/a	n/a	n/a	n/a	n/a	9.53	8.95	8.47	8.04	7.66	6.85	6.56	6.22
			20/20	9'-8"	11'-4"	11'-4"	n/a	n/a	n/a	n/a	192	181	171	162	154	147	140	134	128
			0.909/0.909	2946	3454	3454	n/a	n/a	n/a	n/a	9.19	8.67	8.19	7.76	7.37	7.04	6.7	6.42	6.13
			18/20	12'-0"	13'-1"	13'-1"	n/a	n/a	n/a	n/a	n/a	195	175	165	157	149	142	136	130
			1.204/0.909	3658	3988	3988	n/a	n/a	n/a	n/a	n/a	9.34	8.38	7.9	7.52	7.13	6.8	6.51	6.22
6"	47	1.369	18/18	11'-8"	13'-0"	13'-0"	n/a	n/a	n/a	n/a	n/a	n/a	185	175	166	157	150	143	137
150	229	11.27	1.204/1.204	3556	3962	3962	n/a	n/a	n/a	n/a	n/a	n/a	8.86	8.38	7.95	7.52	7.18	6.85	6.56
			16/18	13'-6"	14'-6"	14'-6"	n/a	n/a	n/a	n/a	n/a	n/a	200	189	180	171	153	146	139
			1.524/1.204	4115	4420	4420	n/a	n/a	n/a	n/a	n/a	n/a	9.58	9.05	8.62	8.19	7.33	6.99	6.66
			16/16	13'-6"	15'-0"	15'-0"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	199	189	180	161	153	146
			1.524/1.524	4115	4572	4572	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.53	9.05	8.62	7.71	7.33	6.99
			20/20	9'-6"	11'-1"	11'-1"	n/a	n/a	n/a	n/a	200	189	179	169	161	153	146	140	134
			0.909/0.909	2896	3378	3378	n/a	n/a	n/a	n/a	9.58	9.05	8.57	8.09	7.71	7.33	6.99	6.7	6.42
			18/20	11'-4"	12'-8"	12'-8"	n/a	n/a	n/a	n/a	n/a	194	183	173	164	156	149	142	136
			1.204/0.909	3454	3835	3835	n/a	n/a	n/a	n/a	n/a	9.29	8.76	8.28	7.85	7.47	7.13	6.8	6.51
6 1/4"	49	1.446	18/18	11'-7"	13'-0"	13'-0"	n/a	n/a	n/a	n/a	n/a	n/a	193	183	173	165	157	149	143
160	239	11.90	1.204/1.204	3531	3962	3962	n/a	n/a	n/a	n/a	n/a	n/a	9.24	8.76	8.28	7.9	7.52	7.13	6.85
			16/18	12'-9"	14'-2"	14'-2"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	198	177	168	160	152	145
			1.524/1.204	3886	4318	4318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.48	8.47	8.04	7.56	7.28	6.94
			16/16	13'-1"	14'-4"	14'-4"	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	197	176	167	159	152
			1.524/1.524	3988	4369	4369	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.43	8.43	8	7.61	7.28

(n/a) indicates Slab Capacities in excess of 200 p.s.f. (9.58 kPa). Contact Cordeck for information regarding dynamic loads.

NOTE 1. The above maximum unshored clear span lengths are governed by the following - (a) a deflection limitation of :/180 not to exceed 3/4" (19mm) relative to the supports; (b) a yield strength of 37ksi (255MPa) minimum [Design Stress = 22.2 ksi (153 MPa)]; (c) the web crippling design equations contained in 1986 Specification for the Design of Cold Formed Steel Structural Members published by AISI.

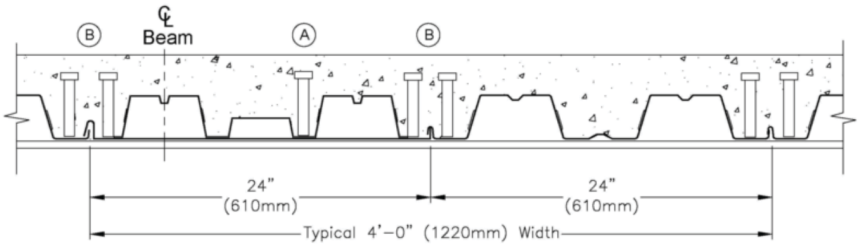
NOTE 2. Total superimposed slab loading is limited to 200 p.s.f. (9.58kPa); greater magnitudes usually indicate heavy concentrated moving loads which may require additional reinforcement. This type of loading should be thoroughly investigated.

NOTE 3. Cordeck reserves the right to change any of the design information and/or the specifications/notes pertaining to its products without notice.

NOTE 4. No information presented herein should be used to replace the judgment of experienced structural engineers.

NOTE 5. Chloride add mixtures or add mixtures containing chloride salts shall not be added under any circumstances to the concrete. Such additives have proved deleterious to steel and steel finish.

Shear Stud Data



Shear Stud Values

Length Of 3/4" (19mm) Dia. Stud	Number of Studs Per Rib	Allowable Stud Shear Values KIPS (kN) STUDS			
		Normal Weight Concrete 145pcf (2323 kg/m³)		Lightweight Concrete 110pcf (1760 kg/m³)	
		A	B	A	B
4 1/2" 114mm	1	**4.43** 19.70	**8.60** 38.30	**3.68** 16.40	**7.14** 31.70
	2	**3.13** 13.90	**6.08** 27.10	**2.60** 11.60	**5.05** 22.40
	3	-	**4.97** 22.10	-	**4.12** 18.30
5" 127mm	1	**5.91** 26.30	**11.47** 51.10	**4.91** 21.80	**9.52** 42.30
	2	**4.18** 18.60	**8.11** 36.10	**3.47** 15.40	**6.73** 29.90
	3	-	**6.62** 29.50	-	**5.50** 24.40
5 1/2" 140mm	1	**7.39** 32.90	**11.50** 51.20	**6.13** 27.20	**9.54** 42.40
	2	**5.22** 23.20	**10.14** 45.10	**4.34** 19.30	**8.41** 37.40
	3	-	**8.28** 36.90	-	**6.87** 30.50

Moments of Inertia

NORMAL WEIGHT CONCRETE, N = 9

GAGE mm	SLAB DEPTH (inches) (mm)		
	5.50 140	6.00 150	6.50 165
20/20 0.909/0.909	14.45 19.73	18.21 24.87	22.57 30.82
18/20 1.204/0.909	15.12 20.65	19.09 26.07	23.69 32.35
18/18 1.204/1.204	16.52 22.56	20.80 28.40	25.74 35.15
16/18 1.524/1.204	17.10 23.35	21.55 29.43	26.71 36.47
16/16 1.524/1.524	18.36 25.07	23.08 31.52	28.55 38.99
16/16 1.524/1.524	10.79 14.73	14.41 19.68	18.74 25.59
18/16 1.204/1.524	16.83 22.98	21.22 28.98	26.33 35.96
16/18 1.524/1.204	16.29 22.24	20.64 28.19	25.72 35.12
16/16 1.524/1.524	17.51 23.91	22.11 30.19	27.48 37.53

$$I_d = \frac{(\text{Cracked} + \text{Uncracked})}{2} \text{ in}^4 \qquad 10^6 \text{mm}^4/\text{m width}$$

LIGHTWEIGHT CONCRETE, N = 14

GAGE mm	SLAB DEPTH (inches) (mm)		
	5.50 140	6.00 150	6.25 160
20/20 0.909/0.909	11.65 15.91	14.65 20.00	16.33 22.30
18/20 1.204/0.909	12.19 16.65	15.35 20.96	17.12 23.38
18/18 1.204/1.204	13.38 18.27	16.79 22.93	18.70 25.54
16/18 1.524/1.204	13.86 18.93	17.38 23.73	19.37 26.45
16/16 1.524/1.524	14.97 20.44	18.65 25.47	20.76 28.35

These values are transformed to steel properties. They can be converted to concrete properties by multiplying by the applicable modular ratio.

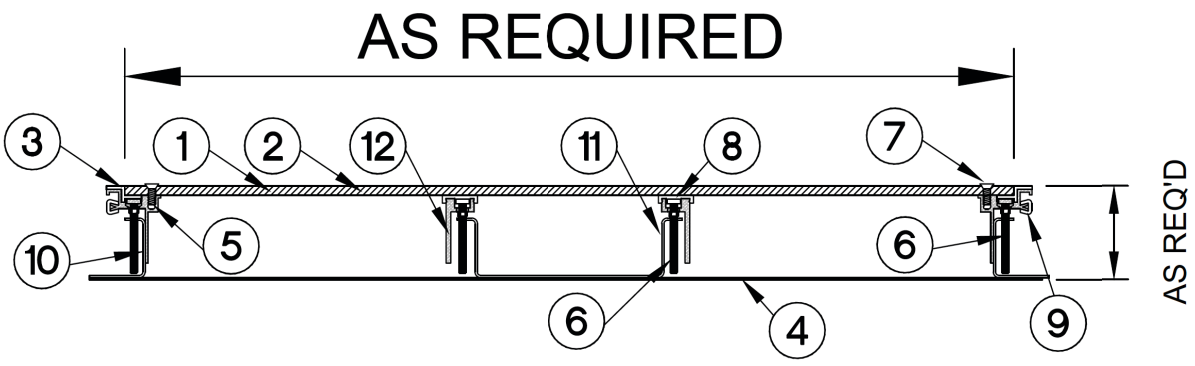
Designing The Tapway Trench Header System

Tapway Trench Capacities (all capacities shown are gross area) square inches 10^3 square million

Capacity	Total Capacity Using Z-Partitions (in²) 2 1/4" Deep	(in²) 2 1/2" Deep	(in²) 2 3/4" Deep	(in²) 3" Deep	(in²) 3 1/4" Deep	(in²) 3 1/2" Deep	(in²) 4" Deep	(in²) 6" Deep
12" (304.8 mm) Trench								
1 Compartment	20.7	23.5	26.2	28.9	31.7	34.4	39.9	61.8
2 Compartment	19.9	22.7	25.4	28.1	30.8	33.5	39.0	60.9
3 Compartment	19.2	21.9	24.6	27.3	30.0	32.7	38.0	59.9
18" (457.2 mm) Trench								
1 Compartment	32.3	36.5	40.7	45.0	49.2	53.4	61.9	95.8
2 Compartment	31.6	35.8	40.0	44.2	48.5	52.7	61.1	95.0
3 Compartment	30.8	35.0	39.2	43.4	47.6	51.8	60.2	94.1
24" (609.6 mm) Trench								
1 Compartment	43.9	49.7	55.4	61.1	66.9	72.6	84.0	129.9
2 Compartment	43.2	48.9	54.7	60.4	66.1	71.8	83.2	129.1
3 Compartment	42.4	48.1	53.8	59.5	65.2	70.9	82.3	128.2
30" (762 mm) Trench								
1 Compartment	55.5	62.7	69.9	77.2	84.4	91.6	106.1	163.9
2 Compartment	54.7	61.9	69.1	76.3	83.5	90.7	105.2	163.0
3 Compartment	54.1	61.3	68.5	75.7	82.9	90.1	104.5	162.4
36" (914.4 mm) Trench								
1 Compartment	67.1	75.9	84.6	93.3	102.0	110.8	128.2	198.0
2 Compartment	66.4	75.1	83.8	92.5	101.2	109.9	127.3	197.1
3 Compartment	65.7	74.4	83.1	91.8	100.5	109.2	126.6	196.5

NOTES: Cover Plate thickness for all these numbers is 1/4" or 6.35 mm thick

: These values are the gross area values



STYLE: (BOTTOMLESS TRENCH) ALSO AVAILABLE IN FULL AND INTERMITTENT BOTTOM

CALLOUTS FOR TAPWAY TRENCH

1. $\frac{1}{4}$" (6.4mm thick roller leveled steel coverplate
2. $\frac{3}{8}$" (9.5 mm) thick steel covers available.
3. Vinyl trim - factory installed for carpet or tile.
4. N-R-G+ Decking below.
5. Aluminum side rail with continuous screw slot.
6. Leveling Screw with locknut
7. Coverplate hold down screw.
8. Z-divider vinyl trim.
9. Alignment key.
10. Trench screen extrusion support.
11. U-Partition.
12. Aluminum partition extrusion.