VULCRAFT

A Division of Nucor Corporation

STEEL ROOF AND FLOOR DECK

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A Division of Nucor Corporation

STEEL JOISTS AND JOIST GIRDERS, STEEL ROOF AND FLOOR DECK, COMPOSITE & NON COMPOSITE FLOOR JOISTS

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VULCRAFT
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*STEEL JOISTS, JOIST GIRDERS AND COMPOSITE JOISTS ONLY.

Website Address: www.vulcraft.com

The 65,000-seat multi-purpose Alamo Dome, San Antonio, Texas

408,800 ft² NA G90 Painted White.

Architects: Marmon Barclay Souter Foster Hays and HOK Sports Facilities Group; Structural Engineer: W.E. Simpson Co. Inc.; Project Manager: Day & Zimmermann, Inc.; Structural Contractor: Lyda Incorporated; Steel Fabricators: Crown Steel Inc. and Industrial Mechanical Co.; Steel Erector: John F. Beasley Construction Co.

The 29-story First Indiana Plaza in downtown Indianapolis used 439,440 square feet of Vulcraft 3" composite deck.

Developer: Duke Associates; Architect: CSO Architects, Inc.; Design Architect: 3dI International; Constrction Manager: Duke Construction Management, Inc.; Structural Engineer: Walter P. Moore & Associates; Steel Fabricator: Ferguson Steel Company.

VULCRAFT, a leader in the steel joist and joist girder industry offers a complete range of steel decking at the five strategically located deck manufacturing facilities. The deck is accurately roll formed in varying configurations on the most modern high-speed roll forming equipment available.

Steel roof and floor decks have long been recognized for their economy because of their light weight and high strength-to-weight ratio. They provide a durable and attractive roof or floor system for fast all-weather construction. Steel decks also provide excellent lateral diaphragm action thus reducing the necessity for structural bracing and their incombustible nature assures architects, engineers and owners of excellent fire ratings.

FINISHES:

Vulcraft offers a selection of three finishes: prime painted, galvanized and black (uncoated).

Prime painted - prior to applying a baked-on acrylic medium gray primer, the cold rolled sheet is chemically cleaned and pre-treated. An off-white primer is available at an additional cost.

Galvanized - Vulcraft galvanized decks are supplied from mill coated sheets conforming to ASTM-A653-94, Structural Quality, and Federal Spec. QQ-S-775, and they are offered in two zinc coated finishes.

(1) G-90 - .9 ounce/sq.ft.
(2) G-60 - .6 ounce/sq.ft.

VULCRAFT, a division of Nucor Corporation, has provided this catalog for use by engineers and architects, using Vulcraft steel decks. It includes all products available at the time of printing. We reserve the right to change, revise or withdraw any products or procedures without notice.

The information presented in this catalog has been prepared in accordance with recognized engineering principles and is for general information only. While it is believed to be accurate, this information should not be used or relied upon for any specific application without competent professional examination and verification of its accuracy, suitability and applicability by an engineer, architect or other licensed professional.

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ROOF

NON-COMPOSITE

COMPOSITE

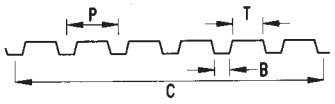
DIAPHRAGM

FRONT COVER PICTURE:

The University of Houston's indoor practice facility can be configured for football, track, tennis, basketball and volleyball.

Development Manager: Hines Interests; Design Architect: HOK Sports Facilities Group; Production Architect: Kendall/Heaton Associates; General Contractor: D.E. Harvey Builders; Steel Fabricator: Eagle Fab; Steel Erector: Postel-Smith, Inc.

TECHNICAL PRODUCT INFORMATION



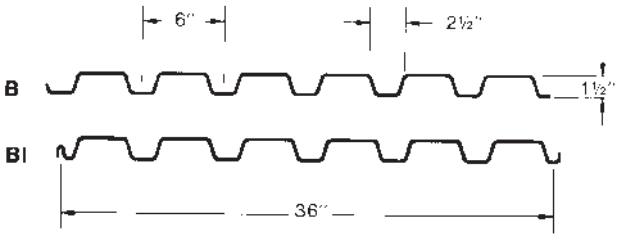
	Deck Type	Gage	Approximate Dimensions in Inches																			
			Indiana				Nebraska				South Carolina				Texas				Alabama / New York			
			C	P	T	B	C	P	T	B	C	P	T	B	C	P	T	B	C	P	T	B
ROOF	1.5B, 1.5BI, 1.5BA, 1.5BIA	24 22 21 20 19 18 16	36 36 36 36 36 36 36	6.00	3.50	1.75	30 36 36 36 36 36 36	6.00	3.50	1.75	36 36 36 36 36 36 36	6.00	3.50	1.75	36 36 36 36 36 36 36	6.00	3.50	1.75	36 36 36 36 36 36 NA	6.00 - -	3.50 - -	1.75 - -
	1.5F	All	30	6.00	4.25	0.50	36	6.00	4.25	0.50	36	6.00	4.25	0.50	36	6.00	4.25	0.50	36	6.00	4.25	0.50
	1.5A	All	36	6.00	5.00	0.38	36	6.00	5.00	0.38	36	6.00	5.00	0.38	36	6.00	5.00	0.38	NA	-	-	-
	3N, 3NI*, 3NA, 3NIA*	All	24	8.00	5.38	1.88	24	8.00	5.38	1.88	24	8.00	5.38	1.88	24	8.00	5.38	1.88	24	8.00	5.38	1.88
	1.0E	All	36	4.00	1.13	1.13	32	4.00	1.01	1.25	33	3.67	0.90	0.90	33	3.67	1.00	1.00	36	4.00	1.13	1.13
NON-COMPOSITE	0.6C and 0.6CSV**	28 26 24 22	NA 30 30 NA	2.50	0.62	0.62	30 36 36 36	3.04	0.63	0.63	30 30 30 30	2.50	0.75	0.75	30 35 35 35	2.50	0.62	0.62	30 30 30 30	2.50	0.75	0.75
	1.0C and 1.0CSV*	All	36	4.00	1.13	1.13	32	4.00	1.25	1.01	33	3.67	0.90	0.90	33	3.67	1.00	1.00	36	4.00	1.13	1.13
	1.3C and 1.3CSV	All	NA	-	-	-	NA	-	-	-	NA	-	-	-	32	4.57	1.06	1.06	NA	-	-	-
	1.5C	24 22 20 18	36 36 36 36	6.00	1.75	3.50	30 36 36 36	6.00	1.75	3.50	36 36 36 36	6.00	1.75	3.50	30 36 36 36	6.00	1.75	3.50	36 36 36 36	6.00	1.75	3.50
	2C	All	36	12.0	5.00	5.00	36	12.0	5.00	5.00	36	12.0	5.00	5.00	36	12.0	5.00	5.00	36	12.0	5.00	5.00
	3C	All	36	12.0	4.75	4.75	36	12.0	4.75	4.75	36	12.0	4.75	4.75	36	12.0	4.75	4.75	36	12.0	4.75	4.75
COMPOSITE	1.5VL and 1.5VLI	All	36	6.00	3.50	1.75	36	6.00	3.50	1.75	36	6.00	3.50	1.75	36	6.00	3.50	1.75	36	6.0	3.50	1.75
	1.5VLR	All	36	6.00	1.75	3.50	36	6.00	1.75	3.50	36	6.00	1.75	3.50	36	6.00	1.75	3.50	36	6.0	1.75	3.50
	2VLI	All	36	12.0	5.00	5.00	36	12.0	5.00	5.00	36	12.0	5.00	5.00	36	12.0	5.00	5.00	36	12.0	5.00	5.00
	3VLI	All	36	12.0	4.75	4.75	36	12.0	4.75	4.75	36	12.0	4.75	4.75	36	12.0	4.75	4.75	36	12.0	4.75	4.75

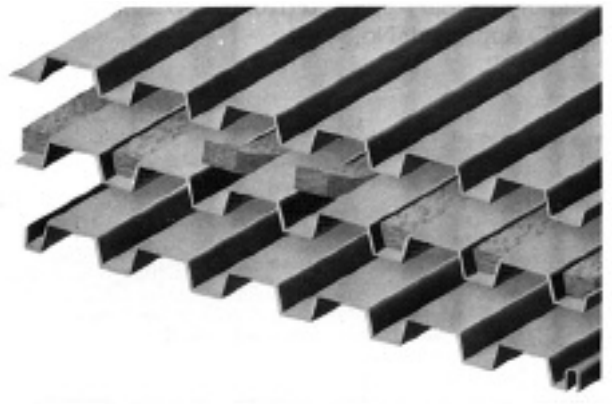
NOTES:
1. * This profile is not available from Indiana..
2. ** This profile is not available from Nebraska.
3. Only Indiana offers 16 gauge for 1.5B, 3N, and 3NA profiles.
4. No profile in 16 gauge is available from Alabama.
5. Cellular deck (not shown) is available only from Nebraska.
6. Gauge thickness of 21 gauge is not recommended

1.5 B, BI, BA, BIA

Maximum Sheet Length 42'-0 — ICBO Approved (No.3415)

Factory Mutual Approved
Deck type & gauge — Max. deck span
1.5B22, 1.5BI22..... 6'-0"
1.5B20, 1.5BI20..... 6'-6"
1.5B18, 1.5BI18..... 7'-5"
FM Approvals No. 0C8A7.AM & 0G1A4.AM





SECTION PROPERTIES

Deck Type	Design Thick.	Weight (PSF) Ptd.	Weight (PSF) Galv.	I in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy KSI
B24	0.0239	1.36	1.46	0.121	0.120	0.131	60
B22	0.0295	1.68	1.78	0.169	0.186	0.192	33
B21	0.0329	1.87	1.97	0.192	0.213	0.221	33
B20	0.0358	2.04	2.14	0.212	0.234	0.247	33
B19	0.0418	2.39	2.49	0.253	0.277	0.289	33
B18	0.0474	2.72	2.82	0.292	0.318	0.327	33
B16	0.0598	3.44	3.54	0.373	0.408	0.411	33

ACOUSTICAL INFORMATION

Deck Type	Absorption Coefficient 125	250	500	1000	2000	4000	Noise Reduction Coefficient*
1.5BA, 1.5BIA	.11	.20	.63	1.04	.66	.36	.65

* Source: Riverbank Acoustical Laboratories — RAL™ A94–185.
Test was conducted with 1.5 inches of 1.65 pcf fiberglass insulation on 3 inch EPS Plaza deck for the SDI.

Type B (wide rib) deck provides excellent structural load carrying capacity per pound of steel utilized, and its nestable design eliminates the need for die-set ends.

1" or more rigid insulation is required for Type B deck.

Acoustical deck (Type BA, BIA) is particularly suitable in structures such as auditoriums, schools, and theatres where sound control is desirable. Acoustic perforations are located in the vertical webs where the load carrying properties are negligibly affected (less than 5%).

Inert, non-organic glass fiber sound absorbing batts are placed in the rib openings to absorb up to 65% of the sound striking the deck.

Batts are field installed and may require separation.

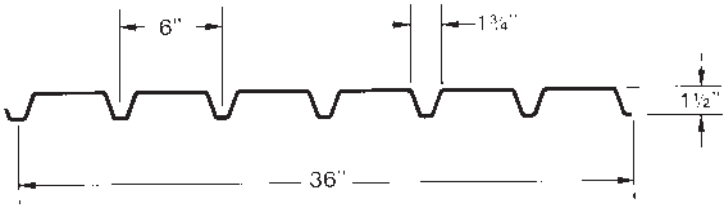
VERTICAL LOADS FOR TYPE 1.5B

No. of Spans	Deck Type	Max. SDI Const. Span	Allowable Total (Dead + Live) Uniform Load (PSF) Span (ft.-in.) C. to C. of Support 5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0
1	B 24	4'-8	66	52	42	36	30	27	24	21	20		
	B 22	5'-7	91	71	57	47	40	34	30	27	24	22	20
	B 21	6'-0	104	81	64	53	44	38	33	29	26	24	22
	B 20	6'-5	115	89	71	58	48	41	36	31	28	25	23
	B 19	7'-1	139	107	85	69	57	48	41	36	32	29	26
	B 18	7'-8	162	124	98	79	65	55	47	41	36	32	29
	B 16	8'-8	206	157	123	99	81	68	58	50	44	39	34
2	B 24	5'-10	126	104	87	74	64	55	47	41	36	32	29
	B 22	6'-11	102	85	71	61	52	46	40	35	32	28	26
	B 21	7'-4	118	97	82	70	60	52	46	41	36	33	29
	B 20	7'-9	132	109	91	78	67	59	51	46	41	36	33
	B 19	8'-5	154	127	107	91	79	69	60	53	48	43	39
	B 18	9'-1	174	144	121	103	89	78	68	60	54	48	44
	B 16	10'-3	219	181	152	130	112	97	86	76	68	61	55
3	B 24	5'-10	130	100	79	65	54	45	39	34	31	27	25
	B 22	6'-11	128	106	89	76	65	57	50	44	39	34	31
	B 21	7'-4	147	122	102	87	75	65	56	49	42	38	34
	B 20	7'-9	165	136	114	97	84	72	61	53	46	41	36
	B 19	8'-5	193	159	134	114	98	84	71	61	53	47	41
	B 18	9'-1	218	180	151	129	111	96	81	69	60	52	46
	B 16	10'-3	274	226	190	162	140	119	100	85	73	64	56

Notes: 1. Load tables are calculated using sectional properties based on the steel design thickness shown in the Steel Deck Institute (SDI) Design Manual.
2. Loads shown in the shaded areas are governed by the live load deflection not in excess of 1/240 of the span. A dead load of 10 PSF has been included.
3 ** Acoustical Deck is not covered under Factory Mutual

1.5 F

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0
ICBO Approved (No.3415)
Factory Mutual Approved
Deck type & gauge — Max. deck span
1.5F22..... 4'-11"
1.5F20..... 5'-5"
1.5F18..... 6'-3"
FM Approvals No. 0C8A7.AM



SECTION PROPERTIES

Deck Type	Design Thick.	Weight (PSF) Ptd.	Weight (PSF) Galv.	I in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy KSI
F22	0.0295	1.63	1.73	0.121	0.112	0.121	33
F21	0.0329	1.82	1.92	0.137	0.127	0.135	33
F20	0.0358	1.99	2.09	0.151	0.139	0.148	33
F19	0.0418	2.32	2.42	0.180	0.166	0.172	33
F18	0.0474	2.64	2.74	0.207	0.190	0.195	33

Type F (intermediate rib) deck is designed to provide the most economical combination of structural load carrying capacity and insulation materials. The rib openings permit fast and easy installation, and the nestable design eliminates the need for die-set ends. 1" rigid insulation is recommended for Type F deck.

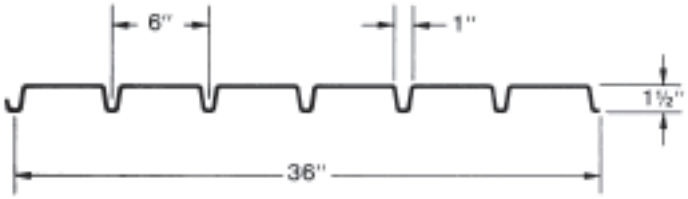
VERTICAL LOADS FOR TYPE 1.5F

No. of Spans	Deck Type	Max. SDI Const. Span	Allowable Total (Dead + Live) Uniform Load (PSF) Span (ft.-in.) C. to C. of Support 4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0
1	F22	4'-9	93	74	60	49	41	35	30	27	23	21	
	F21	5'-1	106	84	68	56	47	40	35	30	26	23	21
	F20	5'-5	116	92	74	61	51	44	38	33	29	25	23
	F19	6'-0	138	109	89	73	61	52	44	38	33	29	26
	F18	6'-5	158	125	101	84	70	59	49	42	36	32	29
2	F22	5'-10	101	80	65	53	45	38	33	29	25	22	20
	F21	6'-2	113	89	72	60	50	43	37	32	28	25	22
	F20	6'-6	123	97	79	65	55	47	40	35	31	27	24
	F19	7'-1	143	113	92	76	64	54	47	41	36	32	28
	F18	7'-8	163	128	104	86	72	62	53	46	41	36	32
3	F22	5'-10	126	100	81	67	56	48	41	36	32	28	25
	F21	6'-2	141	111	90	74	63	53	46	40	35	31	28
	F20	6'-6	154	122	99	82	69	58	50	44	39	34	30
	F19	7'-1	179	142	115	95	80	68	59	51	45	40	35
	F18	7'-8	203	160	130	107	90	77	66	58	51	45	40

Notes: 1. Load tables are calculated using sectional properties based on the steel design thickness shown in the Steel Deck Institute (SDI) Design Manual.
2. Loads shown in the shaded areas are governed by the live load deflection not in excess of 1/240 of the span. A dead load of 10 PSF has been included.

1.5 A

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0
ICBO Approved (No.3415)
Factory Mutual Approved
Deck type & gauge — Max. deck span
1.5A22..... 4'-10"
1.5A20..... 5'-3"
1.5A18..... 6'-0"
FM Approvals No. 0C8A7.AM



SECTION PROPERTIES

Deck Type	Design Thick.	Weight (PSF) Ptd.	Weight (PSF) Galv.	I in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy KSI
A22	0.0295	1.70	1.80	0.112	0.098	0.106	33
A21	0.0329	1.89	1.99	0.127	0.111	0.119	33
A20	0.0358	2.06	2.16	0.140	0.122	0.130	33
A19	0.0417	2.41	2.51	0.167	0.145	0.152	33
A18	0.0474	2.74	2.84	0.192	0.167	0.172	33

Type A (narrow rib) deck provides an economical roof system when utilized with thinner insulation materials. It also allows the maximum area for adhesive contact, and its nestable quality eliminates the need for die-set ends.

1/2" rigid insulation may be used with Type A deck.

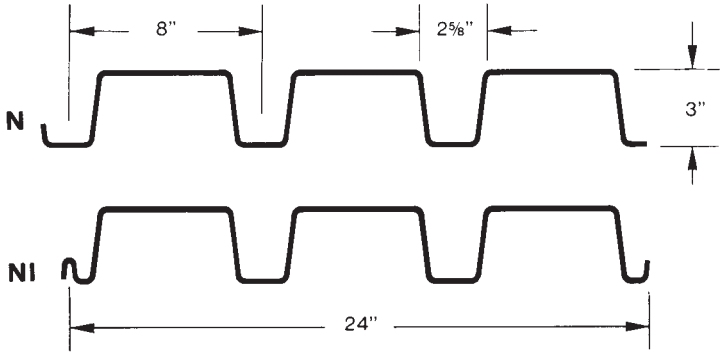
VERTICAL LOADS FOR TYPE 1.5A

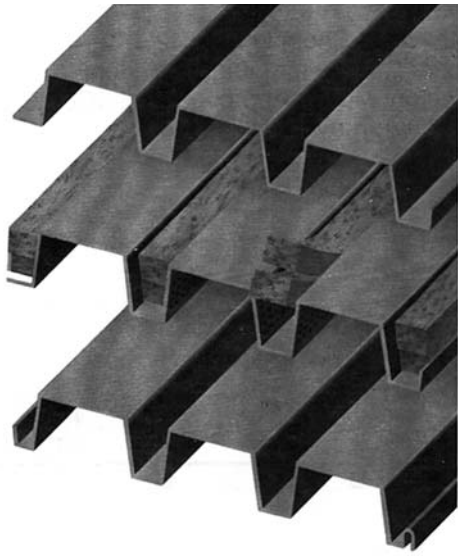
No. of Spans	Deck Type	Max. SDI Const. Span	Allowable Total (Dead + Live) Uniform Load (PSF) Span (ft.-in.) C. to C. of Support 4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0
1	A22	4'-2	82	65	52	43	36	31	27	23	20		
	A21	4'-9	93	73	59	49	41	35	30	26	23	20	18
	A20	5'-2	102	80	65	54	45	39	33	29	25	23	20
	A19	5'-9	121	95	77	64	54	46	39	34	30	27	24
	A18	6'-2	139	110	89	74	62	53	45	40	34	30	27
2	A22	5'-2	88	70	57	47	39	33	29	25	22	20	
	A21	5'-11	99	78	63	52	44	38	32	28	25	22	20
	A20	6'-3	108	86	69	57	48	41	35	31	27	24	21
	A19	6'-10	127	100	81	67	56	48	41	36	32	28	25
	A18	7'-4	143	113	92	76	64	54	47	41	36	32	28
3	A22	5'-2	110	87	71	58	49	42	36	31	28	24	22
	A21	5'-11	124	98	79	66	55	47	40	35	31	27	24
	A20	6'-3	135	107	87	72	60	51	44	39	34	30	27
	A19	6'-10	158	125	101	84	70	60	52	45	40	35	31
	A18	7'-4	179	142	115	95	80	68	59	51	45	40	35

Notes: 1. Load tables are calculated using sectional properties based on the steel design thickness shown in the Steel Deck Institute (SDI) Design Manual.
2. Loads shown in the shaded areas are governed by the live load deflection not in excess of 1/240 of the span. A dead load of 10 PSF has been included.

3 N, NI, NA, NIA

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0
ICBO Approved (No.3415)





SECTION PROPERTIES

Deck Type	Design Thick.	Weight (PSF) Ptd.	Weight (PSF) Galv.	I in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy KSI
N22	0.0295	2.16	2.26	0.772	0.382	0.433	33
N21	0.0329	2.40	2.50	0.876	0.445	0.497	33
N20	0.0358	2.61	2.71	0.964	0.501	0.552	33
N19	0.0418	3.05	3.15	1.153	0.597	0.659	33
N18	0.0474	3.46	3.56	1.334	0.688	0.749	33
N16	0.0598	4.36	4.46	1.745	0.893	0.944	33

Acoustical deck (Type 3 NA, NIA) is paticularly suitable in structures such as auditoriums, schools and theaters where sound control is desirable. Acoutstic perforations are located in the vertical webs where the load carrying properties are negligibly affected (less than 5%).

Inert, non-organic glass fiber sound absorbing batts are placed in the rib openings to absorb up to 70% of the sound striking the deck.

Batts are field installed and may require separation.

ACOUSTICAL INFORMATION

Deck Type	Absorption Coefficient 125	250	500	1000	2000	4000	Noise Reduction Coefficient*
3NA, 3NIA	.14	.36	.89	.95	.53	.34	.70

* Source: Riverbank Acoustical Laboratories — RAL™ A95–21.
Test was conducted with 3 inches of 1.65 pcf fiberglass insulation on 3 inch EPS Plaza deck for the SDI.

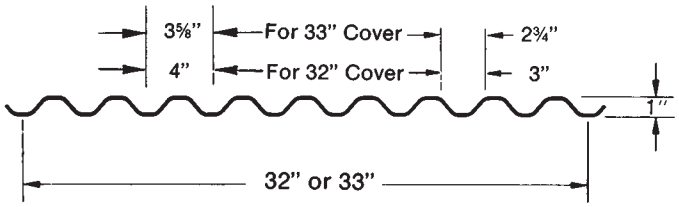
VERTICAL LOADS FOR TYPE 3N

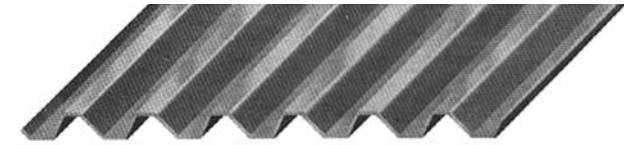
No. of Spans	Deck Type	Max. SDI Const. Span	Allowable Total (Dead + Live) Uniform Load (PSF) Span (ft.-in.) C. to C. of Support 10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	14'-6	15'-0
1	N22	11'-7	51	46	42	38	35	32	30	28	26	24	23
	N21	12'-5	59	53	47	43	39	36	33	30	28	26	25
	N20	13'-2	66	58	52	47	42	38	35	33	30	28	26
	N19	14'-7	79	69	61	55	50	45	41	38	35	32	30
	N18	15'-11	91	80	71	63	57	52	47	43	40	37	34
	N16	18'-6	119	105	93	83	74	66	60	55	50	46	43
2	N22	14'-9	58	52	48	44	40	37	34	32	29	27	26
	N21	15'-9	66	60	55	50	46	42	39	36	34	32	29
	N20	16'-6	74	67	61	56	51	47	44	40	38	35	33
	N19	18'-1	88	80	73	66	61	56	52	48	45	42	39
	N18	19'-5	100	91	83	76	69	64	59	55	51	47	44
	N16	22'-3	126	114	104	95	87	81	74	69	64	60	56
3	N22	14'-9	70	65	60	55	50	46	43	40	37		
	N21	15'-9	83	75	68	63	58	53	49	45	42		
	N20	16'-6	92	83	76	70	64	59	54	50	47		
	N19	18'-1	110	100	91	83	76	70	65	60	56		
	N18	19'-5	125	113	103	94	87	80	74	68	64		
	N16	22'-3	157	143	130	119	109	101	93	86	80		

Notes:
1. Load tables are calculated using sectional properties based on the steel design thickness shown in the Steel Deck Institute (SDI) Design Manual.
2. Loads shown in the shaded areas are governed by the live load deflection not in excess of 1/240 of the span. A dead load of 10 PSF has been included.
3. 3N, NI, NA, NIA are not covered under Factory Mutual.

1.0 E

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0





SECTION PROPERTIES

Deck Type	Design Thick.	Weight (PSF) Ptd.	Weight (PSF) Galv.	I in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy KSI
E26	0.0179	0.96	1.06	0.041	0.067	0.071	60
E24	0.0239	1.28	1.38	0.058	0.098	0.103	60
E22	0.0295	1.57	1.67	0.073	0.130	0.134	60
E20	0.0358	1.91	2.01	0.088	0.167	0.165	60

Type E deck provides a very economical roof deck for use on shorter spans. 1" or more rigid insulation should be used with Type E deck. Installation of rigid insulation should be with mechanical fasteners.

This deck also lends itself for use as a building siding.

VERTICAL LOADS FOR TYPE 1.0E

No. of Spans	Deck Type	Max. SDI Const. Span	Allowable Total (Dead + Live) Uniform Load (PSF) Span (ft.-in.) C. to C. of Support 2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6
1	E26	2'-10	178	107	71	51	39	31	26	22	20	18	16
	E24	3'-5	249	148	97	68	51	40	32	27	24	21	19
	E22	3'-10	316	187	122	85	63	48	39	32	27	24	21
	E20	4'-2	379	224	145	100	73	56	45	37	31	27	24
2	E26	3'-4	273	189	139	107	81	62	49	40	34	29	25
	E24	4'-0	396	275	202	153	111	83	65	52	43	37	32
	E22	4'-6	515	357	263	190	137	102	79	63	52	44	37
	E20	5'-0	634	440	323	227	162	121	94	74	61	51	43
3	E26	3'-4	310	198	128	89	66	51	40	33	28	25	22
	E24	4'-0	469	276	177	122	89	67	53	43	36	31	27
	E22	4'-6	588	344	221	151	109	82	64	52	43	36	31
	E20	5'-0	707	413	264	180	129	97	75	60	50	42	36

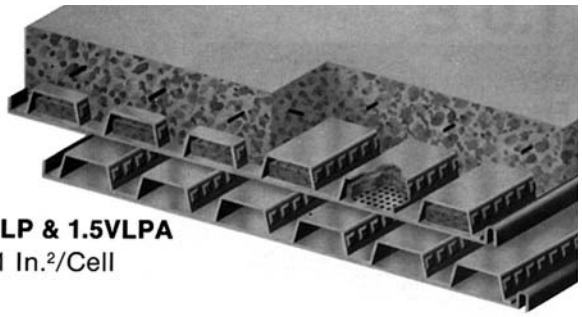
Notes: 1. Load tables are calculated using sectional properties based on the steel design thickness shown in the Steel Deck Institute (SDI) Design Manual.
2. Loads shown in the shaded areas are governed by the live load deflection not in excess of 1/240 of the span. A dead load of 10 PSF has been included.

CELLULAR DECK

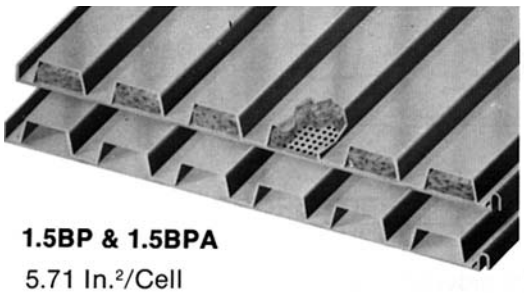
Galvanized Only
For: Electrified Raceways — Canopies — Long Spans
Heavy Forms — Flat Acoustical Ceilings

Vulcraft Cellular Units are approved by U.L. for use as Electrical Raceways.

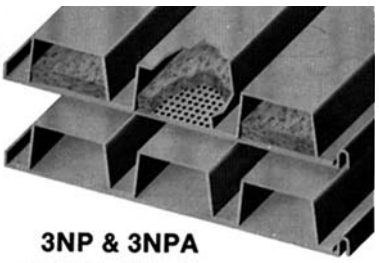
NOTE:
Insulation not installed by Vulcraft.



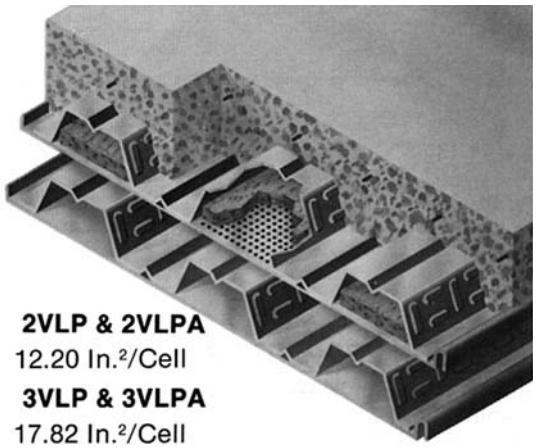
1.5VLP & 1.5VLPA
5.71 In.²/Cell



1.5BP & 1.5BPA
5.71 In.²/Cell



3NP & 3NPA
17.43 In.²/Cell



2VLP & 2VLPA
12.20 In.²/Cell

3VLP & 3VLPA
17.82 In.²/Cell

ACOUSTICAL DATA

Deck Type	Absorption Coefficients 125	250	500	1000	2000	4000	Noise Reduction Coefficient	RAL™ Test No.
1.5BPA	0.34	0.42	0.36	0.22	.017	0.17	0.30 W/O Insulation	A85-154
3NPA	0.40	0.38	0.47	0.19	0.11	0.17	0.30 W/O Insulation	A85-156
1.5VLPA	0.09	0.11	0.25	0.14	0.16	0.28	0.15 W/O Insulation	A86-317
2VLPA	0.12	0.24	0.20	0.14	0.07	0.18	0.15 W/O Insulation	A86-319
3VLPA	0.33	0.31	.030	0.14	0.09	0.01	0.20 W/O Insulation	A86-321
1.5BPA	0.38	0.49	0.63	0.98	0.74	0.54	0.70 W/ Insulation	A85-155
3NPA	0.48	0.56	0.98	0.92	0.72	0.58	0.80 W/ Insulation	A85-157
1.5VLPA	0.14	0.21	0.61	0.99	0.69	0.27	0.65 W/ Insulation	A86-318
2VLPA	0.31	0.41	0.94	0.88	0.56	0.44	0.70 W/ Insulation	A86-320
3VLPA	0.40	0.56	1.07	0.78	0.57	0.35	0.75 W/ Insulation	A86-322

W/Insulation indicates rigid insulation in the cells. Source: Riverbank Acoustical Laboratories.

SECTION PROPERTIES

Deck Type	Hat/Pan Gage	Design Thickness Hat	Pan	Wt PSF	I in^4/ft	SP in^3/ft	SN in^3/ft
1.5VLP and 1.5BP	20/20	.0358	.0358	3.83	.357	.301	.394
	20/18	.0358	.0474	4.36	.388	.310	.413
	18/20	.0474	.0358	4.47	.483	.446	.510
	18/18	.0474	.0474	5.00	.527	.458	.532
	18/16	.0474	.0598	5.56	.567	.468	.556
	16/18	.0598	.0474	5.68	.668	.631	.657
	16/16	.0598	.0598	6.24	.722	.664	.685
2VLP	20/20	.0358	.0358	3.59	.675	.417	.426
	20/18	.0358	.0474	4.10	.726	.425	.441
	18/20	.0474	.0358	4.16	.841	.585	.554
	18/18	.0474	.0474	4.67	.902	.595	.572
	18/16	.0474	.0598	5.22	.960	.606	.589
	16/18	.0598	.0474	5.28	1.083	.741	.709
	16/16	.0598	.0598	5.83	1.153	.754	.731
3VLP	20/20	.0358	.0358	3.75	1.484	.650	.657
	20/18	.0358	.0474	4.26	1.594	.662	.681
	18/20	.0474	.0358	4.36	1.840	.904	.853
	18/18	.0474	.0474	4.88	1.980	.922	.883
	18/16	.0474	.0598	5.43	2.103	.936	.910
	16/18	.0598	.0474	5.54	2.365	1.146	1.094
	16/16	.0598	.0598	6.09	2.517	1.166	1.128
3NP	20/20	.0358	.0358	4.30	1.465	.610	.976
	20/18	.0358	.0474	4.83	1.583	.624	1.017
	18/20	.0474	.0358	5.08	1.979	.892	1.266
	18/18	.0474	.0474	5.61	2.152	.913	1.315
	18/16	.0474	.0598	6.18	2.308	.933	1.367
	16/18	.0598	.0474	6.45	2.750	1.257	1.626
	16/16	.0598	.0598	6.98	2.962	1.285	1.682

Note: These Deck Types are only manufactured at the Nebraska Plant.

SDI Specifications and Commentary

FOR STEEL ROOF DECK

1. Scope

The requirements of this section shall govern only ribbed steel roof deck construction of varying configurations used for the support of roofing materials, design live loads and SDI construction loads shown on page 10.

Commentary: Suspended ceilings, light fixtures, ducts, or other utilities shall not be supported by the steel deck.

2. Materials

2.1 Steel Roof Deck: The steel roof deck units shall be fabricated from steel conforming to Section A3 of the latest edition, (1986) of the American Iron and Steel Institute, Specifications for the Design of Cold-Formed Steel Structural Members. The steel used shall have a minimum yield strength of 33 ksi (230 MPa).

2.2 Tolerances:

Panel length: Plus or minus 1/2 inch (13 mm).

Thickness: Shall not be less than 95% of the design thickness.

Panel cover width: Minus 3/8 inch (10 mm), plus 3/4 inch (20 mm).

Panel camber and/or sweep: 1/4 inch in 10 foot length (6 mm in 3 meters).

Panel end out of square: 1/8 inch per foot (3 mm in 300 mm) of panel width.

Commentary: The above tolerances reflect the fabrication processes for steel deck products. Variation in cover width tolerances may vary due to trucking, storage, handling.

The steel roof deck shall be manufactured from steel conforming to ASTM Designation A611, Grades C, D or E or from A653-94 Structural Quality grade 33 or higher. If the published product literature does not show the uncoated steel thickness in decimal inches (or millimeters) but lists gage or type numbers, then the thickness of steel before coating with paint or metal shall be in conformance with the following table:

Type No.	Design Thickness		Minimum Thickness	
	In.	mm.	In.	mm.
22	0.0295	0.75	0.028	0.70
20	0.0358	0.90	0.034	0.85
18	0.0474	1.20	0.045	1.15
16	0.0598	1.50	0.057	1.45

3. Design

3.1 Stress: The maximum working stress shall not exceed 20 ksi (140 MPa). The unit design stress shall in no case exceed the minimum yield strength of the steel divided by 1.65 for specific design uniform loads. The unit design stress shall be increased 33% for temporary concentrated loads provided the deck thus required is no less than that required for the specific design uniform loads.

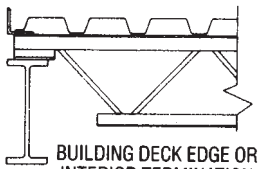
3.2 Section Properties: Structural properties of roof deck sections shall be computed in accordance with the American Iron and Steel Institute (AISI) Specification for the Design of Cold-Formed Steel Structural Members, 1986 edition and Addenda.

Commentary: Arbitrarily assumed effective compression flange widths shall not be allowed. Testing shall not be used in lieu of the above in determination of vertical load carrying capacity of steel deck.

3.3 Moment and Deflection Coefficients: A moment coefficient of 1/8 shall be used for simple and dual equal spans and a moment coefficient of 1/10 shall be used for 3 or more equal spans. Deflection coefficients shall be .013 for simple spans, 0.0054 for double spans and 0.0069 for triple spans.

3.4 Maximum Deflections: Deflection of the deck shall not exceed L/240 under the uniformly distributed design live load. All spans are to be considered center-to-center of supports.

Commentary: The adequacy of deck edge support details should be reviewed. At the building perimeter, or any other deck termination or direction change, occasional concentrated loading of the roof deck could result in temporary differences in deflection between the roof deck and the adjacent stationary building component. Supplemental support such as a perimeter angle may be warranted.



BUILDING DECK EDGE OR INTERIOR TERMINATION CONDITION

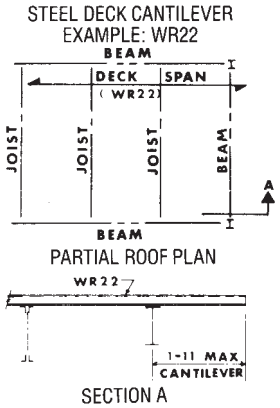
SDI Specifications and Commentary

Recommended Maximum Spans for Construction and Maintenance Loads Standard for 1½ Inch and 3 Inch Roof

	Type	Span Condition	Span Ft.-In.	Span Meters	Max. Recommended Spans Roof Deck Cantilever Ft.-In.	Max. Recommended Spans Roof Deck Cantilever Meters
Narrow Rib Deck	NR22	1	3'-10"	1.15 m	1'-0"	.30 m
	NR22	2 or more	4'-9"	1.45 m		
	NR20	1	4'-10"	1.45 m	1'-2"	.35 m
	NR20	2 or more	5'-11"	1.80 m		
	NR18	1	5'-11"	1.80 m	1'-7"	.45 m
	NR18	2 or more	6'-11"	2.10m		
Intermediate Rib Deck	IR22	1	4'-6"	1.35 m	1'-2"	.35m
	IR22	2 or more	5'-6"	1.65 m		
	IR20	1	5'-3"	1.60 m	1'-5"	.40m
	IR20	2 or more	6'-3"	1.90 m		
Wide Rib Deck	WR22	1	5'-6"	1.65 m	1'-11"	.55 m
	WR22	2 or more	6'-6"	1.75 m		
	WR20	1	6'-3"	1.90 m	2'-4"	.70 m
	WR20	2 or more	7'-5"	2.25 m		
	WR18	1	7'-6"	2.30 m	2'-10"	.85m
	WR18	2 or more	8'-10"	2.70m		
Deep Rib Deck	3DR22	1	11'-0"	3.35 m	3'-5"	1.05 m
	3DR22	2 or more	13'-0"	3.95 m		
	3DR20	1	12'-6"	3.80 m	3'-11"	1.20 m
	3DR20	2 or more	14'-8"	4.45 m		
	3DR18	1	15'-0"	4.55 m	4'-9"	1.45 m
	3DR18	2 or more	17'-8"	5.40 m		

Construction and maintenance loads:
SPANS are governed by a maximum stress of 26 ksi (180 MPa) and a maximum deflection of L/240 with a 200 pound (0.89 kN) concentrated load at midspan on a 1'-0" (300 mm) wide section of deck. If the designer contemplates loads of greater magnitude, spans shall be decreased or the thickness of the steel deck increased as required.

All loads shall be distributed by appropriate means to prevent damage to the completed assembly during construction.



Cantilever loads:
Construction phase load of 10 psf (0.48 kPa) on adjacent span and cantilever, plus 200 pound load (0.89 kN) at end of cantilever with a stress limit of 26 ksi (180 MPa).
Service load of 45 psf (2.15 kPa) on adjacent span and cantilever, plus 100 pound load (0.44 kN) at end of cantilever with a stress limit of 20 ksi (140 MPa).
Deflection limited to L/240 of adjacent span for interior span and deflection at end of cantilever to L/240 of overhang.

Notes:

1. Adjacent span: Limited to those spans shown in Section 3.4 of Roof Deck Specifications. In those instances where the adjacent span is less than 3 times the cantilever span, the individual manufacturer should be consulted for the appropriate cantilever span.

2. Sidelaps must be attached at end of cantilever and at a maximum of 12 inches (300 mm) on center from end.

3. No permanent suspended loads are to be supported by the steel deck.

4. The deck must be completely attached to the supports and at the sidelaps before any load is applied to the cantilever.

4. Installation & Site Storage

4.1 Site Storage: Steel deck shall be stored off the ground with one end elevated to provide drainage, and shall be protected from the elements with a waterproof covering, ventilated to avoid condensation.

4.2 Deck Placement: Place each deck unit on supporting structural frame. Adjust to final position with accurately aligned side laps and ends bearing on supporting members. On joist framing, be sure the appropriate end lap occurs over a top chord angle for proper anchorage.

Commentary: Staggering roof deck end laps is not a recommended practice. The deck capacity is not increased by staggering the end laps, yet layout and erection costs are increased.

4.3 Lapped or Butted Ends: Deck Ends may be either butted or lapped over supports. Standard tolerance for ordered length is plus or minus 1/2 inch (13 mm).

4.4 Anchorage: Roof deck units shall be anchored to supporting members including perimeter support steel and/or bearing walls by either welding or mechanical fasteners, to provide lateral stability to the top flange of the supporting structural members and to resist the following minimum gross uplifts; 45 pounds per square foot (2.15 kPa) for eave overhang; 30 pounds per square foot (1.44 kPa) for all other roof areas. The dead load of the roof deck construction shall be deducted from the above forces. The location and number of fasteners required for satisfactory attachment of deck to supporting structural members are as follows: All side laps plus a sufficient number of interior ribs to limit the spacing between adjacent points of attachment to 18 inches (500 mm). Deck units with spans greater than 5 feet (1.5 m) shall have side laps and perimeter edges (at perimeter support steel) fastened at midspan or 36 inches (1 m) intervals, whichever distance is smaller.

Commentary: The deck should be anchored to act as a working platform and to prevent blow off. The designer should check the appropriate codes for the required uplift loading and show the required anchorage connections on the plans. If no information is shown on the plans, the uplift loads shown in paragraph 4.4 will be assumed. Sidelap fasteners can be welds, screws, crimps (button punching), or other methods approved by the designer. Welding sidelaps on thicknesses 0.028 inches (.7 mm) or less may cause large burn holes and is not recommended. The objective of side lap fastening is to prevent differential sheet deflection. The five foot (1.5 m) limit on side lap spacing is based on experience. The deck erector should not leave unattached deck at the end of the day as the wind may displace the sheets and cause injury to persons or property. In the past, 1 1/2 inches (38 mm) of end bearing was the minimum; this is still a good "rule of thumb" that will, in general prevent slip off. If less than 1 1/2 inches (38 mm) of end bearing is available, or if high support reactions are expected, the design engineer should ask the deck manufacturer to check the deck web stress. In any case, the deck must be adequately attached to the structure to prevent slip off.

The SDI *Diaphragm Design Manual, Second Edition*, should be used to determine fastening requirements if the deck is to be designed to resist horizontal loads. The most stringent requirements, of either section 4.4 or, if applicable, the SDI *Diaphragm Design Manual*, should be used.

4.4a Welding: All field welding of deck shall be in strict accordance with ANSI/AWS D1.3 *Structural Welding Code-Sheet Steel*. Each welder must demonstrate an ability to produce satisfactory welds using a procedure such as shown in the Steel Deck Institute *Manual of Construction with Steel Deck* or as described in ANSI/AWS D1.3. A minimum visible 5/8 inch (15 mm) diameter puddle weld or an elongated weld with an equal perimeter is required. Fillet welds, when used, shall be at least 1 inch (25 mm) long. Weld metal shall penetrate all layers of deck material at end laps and shall have good fusion to the supporting members. Welding washers shall be used on all deck units with a metal thickness less than 0.028 inches (0.7 mm). Welding washers shall be a minimum thickness of 0.056 inches (1.5 mm), 16 gage, and have a nominal 3/8 inch (10 mm) diameter hole. Care shall be exercised in the selection of electrodes and amperage to provide a positive weld and prevent high amperage blow holes.

Commentary: The obligation is placed on the contractor to prepare welding procedure specifications and to qualify them before production use. These procedure specifications must include classification of the filler metal, its size, and for each type of weld, its melting rate or any other suitable means of current control indicative of melting rate, as applicable.

The welder qualification test requires each welder to prove their ability to produce satisfactory welds using these qualified procedures. The fact that the welder may have been successfully qualified on plate or pipe under the provisions of ANSI/AWS D1.1 *Structural*

SDI Specifications and Commentary

Welding Code-Steel, for structural welding, or on plate or pipe under the provisions of other codes governing the welding of specific products, does not qualify the welder for welding sheet steel. The selections of welding rod and amperage are left to the individual welder. Welds are made from the top side of the deck, with the welder immediately following the placement crew. In general, stronger welds are obtained on 0.028 inches (.70 mm) or thicker deck without weld washers. Welds on deck less than 0.028 inches (.70 mm) are stronger with washers.

4.4b Mechanical Fasteners: Mechanical fasteners (powder-actuated, screws, pneumatically driven fasteners, etc.) are recognized as viable anchoring methods, provided the type and spacing of the fasteners satisfy the design criteria. Documentation in the form of test data, design calculations, or design charts should be submitted by the fastener manufacturer as the basis for obtaining approval. The deck manufacturer may recommend additional fasteners to stabilize the given profile against sideslip of any unfastened ribs.

Commentary: The allowable load value per fastener used to determine the maximum fastener spacing is based on a minimum structural support thickness of not less than 1/8 inch (3 mm) and on the fastener providing a 5/16 inch (8 mm) diameter minimum bearing surface (fastener head size).

5. Protective Coatings

5.1 Finishes: All steel to be used for roof deck shall be galvanized, aluminized or prime painted.

The roof deck shall be free of grease and dirt prior to the coating. The primer coat is intended to protect the steel for only a short period of exposure in ordinary atmospheric conditions and shall be considered an impermanent and provisional coating.

Commentary: Field painting of prime painted deck is recommended especially where the deck is exposed. In corrosive or high moisture atmospheres, a galvanized finish is desirable in a G-60 (Z180) or G-90 (Z275) coating. In highly corrosive or chemical atmospheres or where reactive materials could be in contact with the steel deck, special care in specifying the finish should be used. In this case, individual manufacturers should be contacted. See important information Section 4.1 Insulation, page 66.

5.2 Fireproofing: The metal deck manufacturer shall not be responsible for the cleaning of the underside of metal deck to ensure bond of fireproofing. Adherence of fireproofing materials is dependent on many variables; the deck manufacturer (supplier) is not responsible for the adhesion or adhesive ability of the fireproofing.

6. Erection

Deck sheets will be placed in accordance with approved erection layout drawing supplied by the deck manufacturer and in conformance with the deck manufacturer's standards. End joints of sheets shall occur over supports.

Commentary: Openings greater than 25 square feet (2.3 m^2) are generally located and shown on the detailed erection drawings, and deck will be provided to the job in lengths to accommodate the opening. Openings less than 25 square feet (2.3m^2) can be located and shown on the erection drawings and be decked over; the deck erector is to cut these openings as well as provide any skew cutting shown.

It is extreme/y important that deck cantilevers and decked over areas are not overloaded. Openings in the deck and building edges must be protected by using OSHA approved methods.

Openings not shown on the erection drawings, such as those required for stacks, conduits, plumbing, vents, etc. are to be cut, and reinforced if necessary, by the trades requiring the openings. *Refer to the SDI Manual of Construction With Steel Deck* for a reinforcing schedule.

7 . Insulation

Insulation board shall be of sufficient strength and thickness to permit unsupported spans and edges over the deck's rib openings. Cementitious insulating fills shall be poured only over galvanized deck and shall be adequately vented. In all cases, the recommendations of the insulation manufacturer shall be followed.

8.

CAUTION

Steel roof deck may be used in a variety of ways, some of which do not lend themselves to a standard "steel deck" analysis for span and loading. There are, in these cases, other criteria which must be considered besides that given by the Steel Deck Institute. Make sure that this investigation starts with a review of the applicable Codes and that any special conditions are included in the design.

DESIGN EXAMPLE

Given:
A. Joist spacing 6'-0" c. to c.
B. Live load = 30 psf
C. total load = 50 psf
D. 2" total insulation with built up roof.[1]
E. Steel deck diaphragm not required.[2]

1. Refer to Standard Load Tables on pages 3, 4 and 5.

1.1 Enter 50 psf total load at 6'-0" span, 3-span condition.

Select deck types that equal or exceed, the 50 psf required.

From Table:
1.5A20 = 60 psf capacity

1.5F22 = 56 psf capacity

1.5B22 = 89 psf capacity

2. Refer to *Maximum Spans for Construction* and *Maintenance Loads* on pages 3, 4 and 5.

Select deck types that equal or exceed the 6'-0" span required.

From Table:
1.5A20 = 6'-3" span

1.5F20 = 6'-6" span

1.5B22 = 6'-11" span

1.5B22 fulfills requirements most efficiently.

Notes:
1. Refer to Roof Deck Specifications, Section 7–Insulation, page 12. Also refer to insulation manufacturers' recommendations for maximum allowable rib opening.

2. If the steel deck is required to act as a diaphragm, refer to *Steel Deck Institute Diaphragm Design Manual First Edition (DDM01)* and *Second Edition (DDM02)*, publications of the Steel Deck Institute.

SDI Short Form Specifications

FOR STEEL ROOF DECK

PART 1—GENERAL

1.1 Related Documents

A. General provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to work of this section.

1.2 Summary

A. This section shall include all materials, equipment and labor necessary for the installation of steel roof deck in accordance with this specification and design drawings.

B. Related work specified elsewhere.

1. Requirements for structural deck supports, field painting, fireproofing, roof sumps, flashings, drains, collars, gutters, downspouts, insulation and other miscellaneous items are specified elsewhere.

1.3. Submittals

A. General: Submit each item in this section according to the conditions of the contract and Division 1 Specification Section.

B. Product Data: Submit manufacturers' specifications/installation instructions for each steel roof deck type and specified accessories.

C. Shop Drawings: Submit roof deck placement drawings showing layout for each type of deck, anchorage details, sump pans, cut openings and accessories.

D. Welder certification signed by contractor certifying that welders comply with requirements specified under "Quality Assurance", or if mechanical fasteners are used, certification from the manufacturer evidencing compliance of mechanical fasteners with design requirements based upon comprehensive testing.

1.4 Quality Assurance

A. Codes and Standards—Comply with provisions of the following unless otherwise indicated.

1. American Iron and Steel Institute (AISI) Specification for Design of Cold Formed Steel Structural Members, latest edition.

2. American Welding Society (AWS) D1.3 Structural Welding Code/Sheet Metal.

3. Steel Deck Institute (SDI) Design Manual, latest edition.

B. Certify that each welder has satisfactorily passed AWS qualification test for the welding process involved, and, if applicable, has undergone recertification.

1.5 Delivery, Storage and Handling

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage and handling.

B. If ground storage is needed, the deck bundles must be stored off the ground, with one end elevated to provide drainage. Bundles must be protected against condensation with a ventilated waterproof covering. Bundles must be stacked so there is no danger of tipping, sliding, rolling, shifting or material damage. Bundles must be periodically checked for tightness and retightened as necessary (so wind cannot loosen sheets) to prevent damage caused by the wind.

C. Deck bundles placed on the building frame must always be placed near a main supporting beam at a column or wall. In no case are the bundles to be placed on unbolted frames or on unattached and unbridged joists. The structural frame must be properly braced to receive the bundles.

SDI Short Form Specifications

FOR STEEL ROOF DECK

PART 2—PRODUCTS

2.1 A manufacturer offering steel roof deck products to be incorporated into the work must be a member of the Steel Deck Institute.

2.2 Materials

A. Steel roof deck shall be (narrow rib) (intermediate rib) (wide rib) (deep rib) (long span) configuration _____in depth with a design thickness of _____ , and shall be designed in accordance with and comply with the standard load tables of the Roof Deck Specifications of the SDI.

B. Sheet steel for galvanized roof deck and accessories shall conform to ASTM A653-94 Structural Quality grade 33 (230 MPa) or higher.

1. Galvanizing shall conform to ASTM A924-94 with a minimum coating class of G60 (Z180) as defined in A653-94.

C. Sheet steel for primer painted roof deck and/or accessories shall conform to ASTM A611 with a minimum yield strength of 33 ksi (230 MPa).

1. Steel deck shall have a coat of manufacturers standard shop primer paint.

2.3 Accessories

A. The deck manufacturer shall furnish ridge and valley plates, flat plates at change of deck direction and sump pans, as shown on plans to provide a finished surface for the application of roof insulation and roof covering.

PART 3—EXECUTION

3.1 Examine support framing and field conditions for compliance with requirements and installation tolerances and other conditions affecting performance of work of this section. All O.S.H.A., State and Local rules for erection must be followed.

3.2 Preparation

A. Place deck in accordance with approved placement plans.

B. Locate deck bundles to prevent overloading of support members.

3.3 Installation—General

A. Install deck panels and accessories according to SDI Specifications, SDI Manual of Construction with Steel Deck, and in accordance with the placement plans, and requirements of this section.

B. Place deck panels on structural supports and adjust to final position with ends lapped or butted over structural supports with a minimum end bearing of 1.5 inches (40 mm). Attach the deck panels firmly to the supports immediately after placement in order to form a safe working platform.

C. Cut and neatly fit deck and accessories at skew conditions, around openings and other work projecting through or adjacent to the decking. Trades that subsequently cut unscheduled openings through the roof deck are responsible for reinforcing those openings in accordance with the requirements of the Engineer of Record.

3.4 Attachment

A. Anchor deck units to steel supporting members by arc spot puddle welds or approved mechanical fasteners.

1. Arc spot puddle welds shall be 5/8 inch (15 mm) minimum visible diameter with the attachment pattern shown on placement drawings.

2. Mechanical fasteners, either powder actuated, pneumatically driven, or self drilling screws may be used in lieu of welding, provided product data has been submitted and approved.

SDI Short Form Specifications

FOR STEEL ROOF DECK

B. Side lap attachment: Fasten side laps of deck units with spans greater than 5 feet (1.5 m) at mid span or 36" (1 m) intervals, whichever distance is smaller, or as shown on design drawings using one of the following methods:

1. #10 self drilling screws.

2. Crimp or button punching.

3. Arc spot puddle welds $^{5}/_{8}$ inch (15 mm) minimum visible diameter or 1 inch (25 mm) long arc seam or fillet weld.

C. Perimeter Edge Attachment: Fasten perimeter edges of deck units at minimum 36 inches (1 m) intervals or as shown on design drawings using one of the following methods:

1. Arc spot puddle welds $^{5}/_{8}$ inch (15 mm) minimum visible diameter or 1 inch (25 mm) long arc seam or fillet weld.

2. Mechanical fasteners, either powder actuated, pneumatically driven or self drilling screws may be used in lieu of welding, provided product data has been submitted and approved.

D. Anchor accessories to supporting members by arc spot welds or self drilling screws at 12 inches (13 mm) maximum intervals or as shown on design drawings.

3.5 Repairs

A. Before placement of roof insulation and roof covering, the deck shall be inspected for tears, dents or other damage that may prevent the deck from acting as a structural roof base. The need for repair of the damaged deck shall be determined by the Architect or Engineer of Record.

3.6 Construction Guidelines

A. Do not use deck units as a working platform or storage area until units are permanently attached in position.

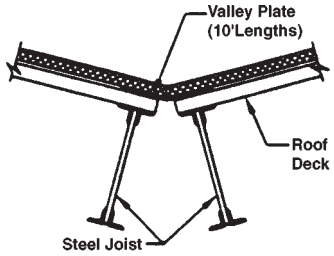
B. Construction loads must not exceed load carrying capacity of deck.

ROOF DECK FIRE RESISTANCE RATINGS

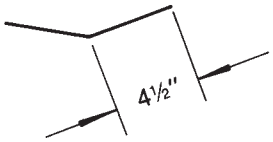
Restrained Assembly Rating	Type of Protection	Type of Insulation	U.L. Design No. (1,2)	Classified Deck Type		Unrestrained Beam Rating
				Form Deck	Roof Deck	
1 Hr.	Exposed Grid	Rigid Insulation	P211+		B, BI, F, A	
			P214+		B, BI, F, A	1 Hr.
			P224+		B, BI, F, A	
			P225+		B, BI, F, A	1,1.5 Hr.
			P227+		B, BI, F, A	1,1.5 Hr.
			P230+		B, BI, F, A	1 Hr.
			P232+		B, BI, F, A	
			P235+		B, BI, F, A	1 Hr.
		Insulating Fill	P214+		B, BI, F, A	1 Hr.
			P231+	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C		1,1.5 Hr.
			P246+	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C		1 Hr.
			P251+	0.6C, 1.0C, 1.3C, 1.5C		1,1.5,2 Hr.
			P255+	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C		1 Hr.
	Gypsum Board	Rigid Insulation	P510+		B, BI, F, A	
		Insulating Fill	P509+	1.3C, 1.3CSV, 1.5C		1 Hr.
	Cementitious	Rigid Insulation	P701*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P711*		B, BI, F, N, NI	1,1.5,2 Hr.
			P715*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P717*		B, BI, N, NI	1,1.5,2 Hr.
	Sprayed Fiber	Rigid Insulation	P801*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P813		B, BI, F, A, N, NI	
			P815*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P816*		B, BI, F, N, NI	1,1.5,2 Hr.
			P817*		B, BI, F, N, NI	1,1.5,2 Hr.
			P818*		B, BI, F, N, NI	1,1.5,2 Hr.
			P819*		B, BI, F, N, NI	1,1.5,2 Hr.
	Unprotected Deck	Insulating Fill	P902	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P907	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P908	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P919	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5 Hr.
			P920	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P921	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P922	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P923	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
1 1/2 Hr.	Exposed Grid	Rigid Insulation	P225+		B, BI, F, A	1,1.5 Hr.
			P227+		B, BI, F, A	1,1.5 Hr.
			P230+		B, BI, F, A	1 Hr.
		Insulating Fill	P231+	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C		1,1.5 Hr.
			P251+	0.6C, 1.0C, 1.3C, 1.5C		1,1.5,2 Hr.
	Metal Lath	Rigid Insulation	P404+		B, BI	
	Gypsum Board	Rigid Insulation	P510+		B, BI, F, A	
	Cementitious	Rigid Insulation	P701*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P711*		B, BI, F, N, NI	1,1.5,2 Hr.
			P715*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P717*		B, BI, N, NI	1,1.5,2 Hr.
	Sprayed Fiber	Rigid Insulation	P801*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P813		B, BI, F, A, N, NI	
			P815*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P816*		B, BI, F, N, NI	1,1.5,2 Hr.
			P817*		B, BI, F, N, NI	1,1.5,2 Hr.
			P818*		B, BI, F, N, NI	1,1.5,2 Hr.
			P819*		B, BI, F, N, NI	1,1.5,2 Hr.
	Unprotected Deck	Insulating Fill	P902	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P907	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P908	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P919	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5 Hr.
			P920	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P921	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P922	1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P923	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
2 Hr.	Exposed Grid	Rigid Insulation	P237+		B, BI, F, A	2 Hr.
		Insulating Fill	P251+	0.6C, 1.0C, 1.3C, 1.5C		1,1.5,2 Hr.
	Metal Lath	Rigid Insulation	P404+		B, BI	
	Gypsum Board	Rigid Insulation	P514+		B, BI, F, A	
	Cementitious	Rigid Insulation	P701		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P711*		B, BI, F, N, NI	1,1.5,2 Hr.
			P715*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P717*		B, BI, N, NI	1,1.5,2 Hr.
	Sprayed Fiber	Rigid Insulation	P801		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P815*		B, BI, F, A, N, NI	1,1.5,2 Hr.
			P816*		B, BI, F, N, NI	1,1.5,2 Hr.
			P817*		B, BI, F, N, NI	1,1.5,2 Hr.
			P818*		B, BI, F, N, NI	1,1.5,2 Hr.
			P819*		B, BI, F, N, NI	1,1.5,2 Hr.
	Unprotected Deck	Insulating Fill	P902	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P907	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P908	0.6C, 1.0C, 1.3C, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P920	1.0C, 1.0CSV,1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P921	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
			P922	1.0C, 1.0CSV,1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.
3 Hr.	Metal Lath	Insulating Fill	P923	0.6C, 0.6CSV, 1.0C, 1.0CSV, 1.3C, 1.3CSV, 1.5C	B, BI, N, NI	1,1.5,2 Hr.

NOTES: 1. Refer to the U.L. "Fire Resistance Directory" for the necessary construction details.
2. Deck finish shall be galvanized unless noted otherwise.
+ Deck finish is not critical for fire resistance when used in P2--, P4--, & P5-- Series designs. Deck finish shall be galvanized or painted.
* Denotes deck finish is critical for fire resistance. Deck finish shall be galvanized or painted. This is a special type of paint and is compatible with the spray-applied fire protection and is U.L. approved for use in the denoted P7-- & P8-- Series designs.

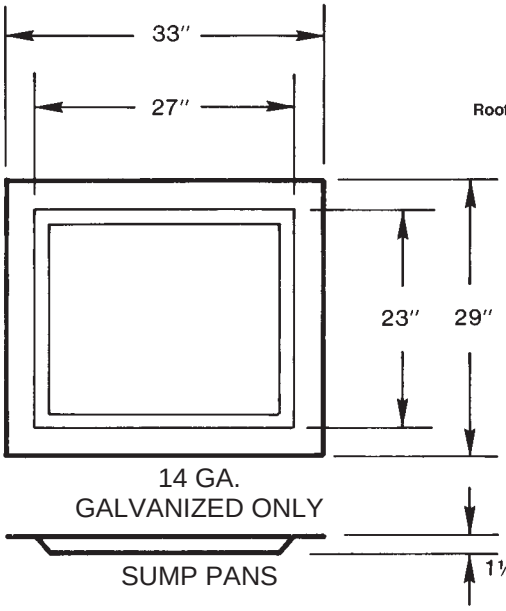
ACCESSORIES



VALLEY DETAIL

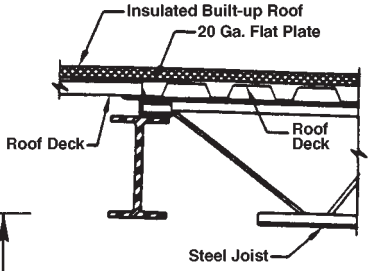


RIDGE OR VALLEY PLATE (20 GA.)
10'-0" LENGTHS
GALVANIZED ONLY

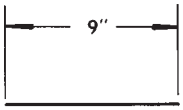


14 GA.
GALVANIZED ONLY

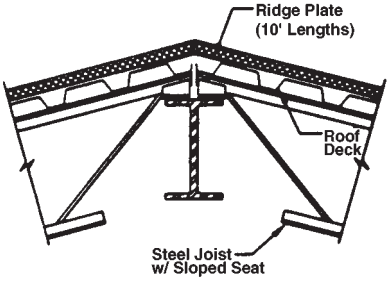
SUMP PANS



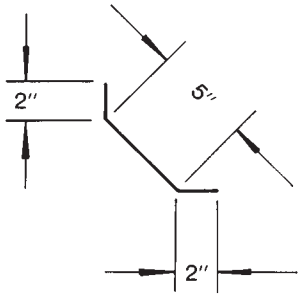
DETAIL WHERE DECK
CHANGES DIRECTION



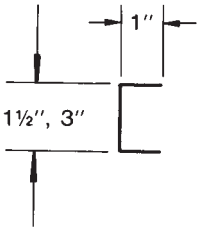
FLAT PLATE (20 GA.)
10'-0" LENGTHS
GALVANIZED ONLY



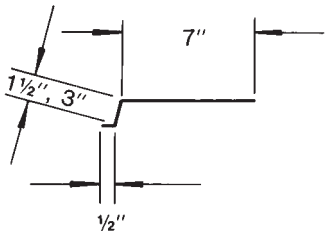
RIDGE DETAIL



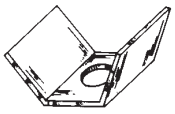
CANT STRIP (20 GA.)
10'-0" LENGTHS
GALVANIZED ONLY



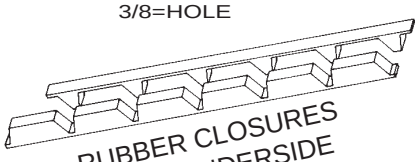
INSIDE OR OUTSIDE CLOSURE (20 GA.)
10'-0" LENGTHS
GALVANIZED ONLY



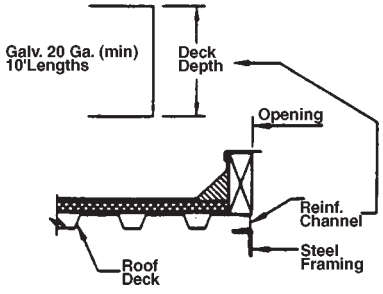
FILLER SHEET (20 GA.)
10'-0" LENGTHS
GALVANIZED ONLY



WELDING WASHER
16 GAUGE
3/8=HOLE



RUBBER CLOSURES
TOP & UNDERSIDE



REINFORCING CHANNEL

CONFORM (TYPE "C")

INDIVIDUAL DECK TABLES

"MAXIMUM CONSTRUCTION CLEAR SPANS"

These tables list the maximum construction clear span based on the S.D.I. criteria as is outlined on the previous four pages.

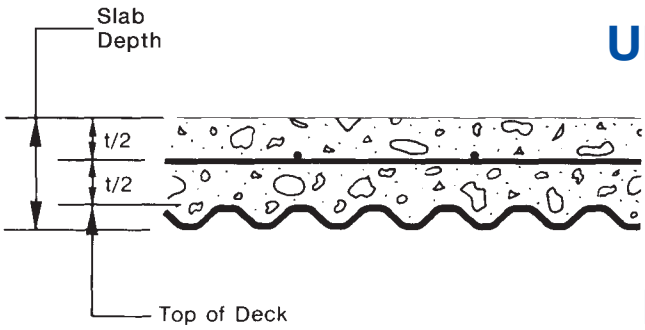
"REINFORCED CONRETE SLAB ALLOWABLE LOADS"

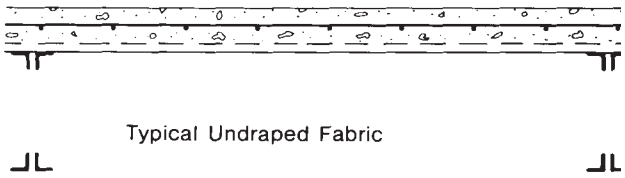
This table shows the load carrying capacity the concrete slab will develop when it is reinforced with welded wire fabric (mesh). For the loads shown in light print, the live loads were calculated with the mesh halfway between the top of the slab and the top of the deck. This is considered "undraped". The loads shown in bold print were calculated using the mesh near the top of the slab as negative reinforcement at the supports and near the bottom of the slab as positive reinforcement between supports. This is called "draped". See illustration below.

"ALLOWABLE UNIFORM LOADS"

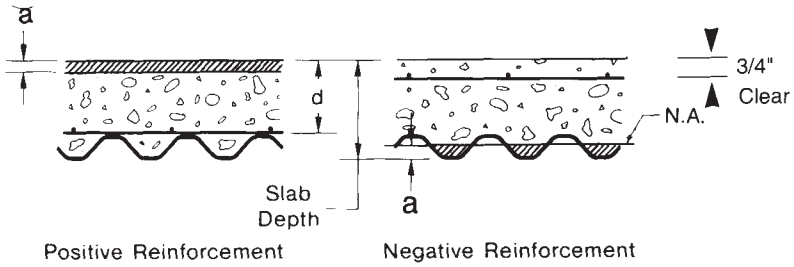
These tables list the uniform allowable load the deck alone will carry. Designers will want to use one of the four categories of load carrying capacities depending on the application.

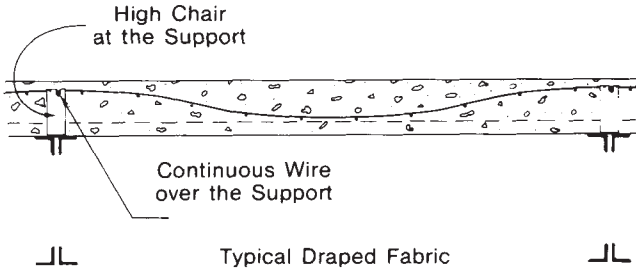
UNDRAPED





DRAPED



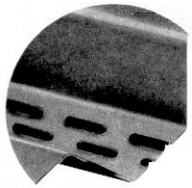


DESIGN NOTES FOR REINFORCED CONCRETE SLABS

1. Slabs that are temporarily shored must have the slab weight deducted from the allowable live load regardless of the type of finish.
2. Finish—Vulcraft painted floor decks can be considered as a permanent form for use in normal building environments. It's structural life would be similar to that of painted roof deck. In high moisture atmospheres, a galvanized finish is recommended. Uncoated decks are not considered as a permanent and the weight of the slab should be deducted from the slab allowable load.
3. Allowable Slab Loads—These tables are based on a three span condition using a moment coefficient of 1/12 as allowed by A.C.I. 318-83 (Sec. 8.3.3) for spans 10 feet or less. A moment coefficient of 1/10 per A.C.I. 318-83 (Sec. 8.3.3) was used for spans over 10 foot. For a two span condition this coefficient should be increased to 1/9 per A.C.I. 318-83 (Sec. 8.3.3) and for one span to 1/8. Other conditions may require further analysis.

f'_c = 3,000 psi	E = 29,500,000 psi	b = 12 in	+ M = 1/16W L^2	+ M_C = T (d-a/2)/12
f_s = 30,000 psi	ϕ = 0.90	p = A_s/bd	- M = 1/12W L^2 (L≤10 ft.)	- M_C = T (d-na)/12
f_y = 60,000 psi	T = $A_s f_y$	a = T/0.85 f'_cb	- M = 1/10W L^2 (L>10 ft.)	M_L = ϕM_C/1.7

4. Use weld patterns A or C from page 36.
5. Yield stress of material is 60,000 psi.

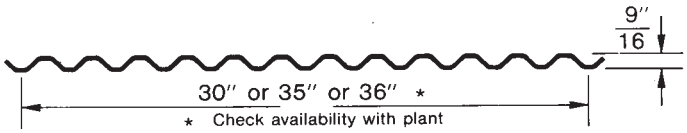


SLOT VENTS Length ≈ 5/8"
(Type 0.6CSV, 1.0CSV, & 1.3CSV)

.6C, 1.0C & 1.3C do not include slot vents in the bottom flute. Check with plant for availability of sidelap vents.

0.6CSV, 1.0CSV & 1.3CSV are the types of deck that should be specified if slot vents in the bottom flute are required. Check with plant for availability of deck types.

0.6 C, CSV CONFORM



MAXIMUM CONSTRUCTION CLEAR SPANS (S.D.I. CRITERIA)

Total Slab Depth	Deck Type	Weight PSF	NW Concrete N=9 145 PCF 1 Span	NW Concrete N=9 145 PCF 2 Span	NW Concrete N=9 145 PCF 3 Span	Weight PSF	LW Concrete N=14 110 PCF 1 Span	LW Concrete N=14 110 PCF 2 Span	LW Concrete N=14 110 PCF 3 Span
2" (t=1 1/2")	0.6C28	23	2- 3	2- 10	2- 11	17	2- 4	3- 0	3- 0
	0.6C26	23	2- 8	3- 5	3- 5	18	2- 9	3- 6	3- 7
	0.6C24	23	3- 4	4- 3	4- 4	18	3- 6	4- 6	4- 7
	0.6C22	23	3- 10	5- 0	5- 1	18	4- 1	5- 4	5- 4
2 1/2" (t=2")	0.6C28	29	2- 2	2- 9	2- 10	22	2- 3	2- 10	2- 11
	0.6C26	29	2- 6	3- 3	3- 4	22	2- 8	3- 5	3- 6
	0.6C24	29	3- 2	4- 1	4- 2	22	3- 4	4- 4	4- 4
	0.6C22	29	3- 8	4- 9	4- 10	23	3- 11	5- 1	5- 2
3" (t=2 1/2")	0.6C28	35	2- 1	2- 8	2- 8	27	2- 2	2- 10	2- 10
	0.6C26	35	2- 5	3- 2	3- 2	27	2- 7	3- 4	3- 4
	0.6C24	35	3- 0	3- 11	4- 0	27	3- 2	4- 2	4- 2
	0.6C22	36	3- 6	4- 7	4- 7	27	3- 9	4- 10	4- 11
3 1/2" (t=3")	0.6C28	41	2- 0	2- 7	2- 7	31	2- 1	2- 9	2- 9
	0.6C26	41	2- 4	3- 0	3- 1	31	2- 6	3- 3	3- 3
	0.6C24	41	2- 10	3- 9	3- 10	32	3- 1	4- 0	4- 1
	0.6C22	42	3- 4	4- 5	4- 5	32	3- 7	4- 8	4- 9
4" (t=3 1/2")	0.6C28	47	1- 11	2- 6	2- 7	36	2- 1	2- 8	2- 8
	0.6C26	47	2- 3	2- 11	3- 0	36	2- 5	3- 2	3- 2
	0.6C24	47	2- 9	3- 8	3- 8	36	3- 0	3- 11	3- 11
	0.6C22	48	3- 2	4- 3	4- 3	36	3- 5	4- 6	4- 7
4 1/2" (t=4")	0.6C28	53	1- 10	2- 5	2- 6	40	2- 0	2- 7	2- 8
	0.6C26	53	2- 2	2- 10	2- 11	40	2- 4	3- 1	3- 1
	0.6C24	53	2- 8	3- 6	3- 7	41	2- 10	3- 9	3- 10
	0.6C22	54	3- 1	4- 1	4- 2	41	3- 4	4- 5	4- 5
5" (t=4 1/2")	0.6C28	59	1- 10	2- 5	2- 5	45	1- 11	2- 6	2- 7
	0.6C26	59	2- 1	2- 9	2- 10	45	2- 3	3- 0	3- 0
	0.6C24	59	2- 7	3- 5	3- 6	45	2- 10	3- 8	3- 9
	0.6C22	60	3- 0	3- 11	4- 0	46	3- 3	4- 3	4- 4

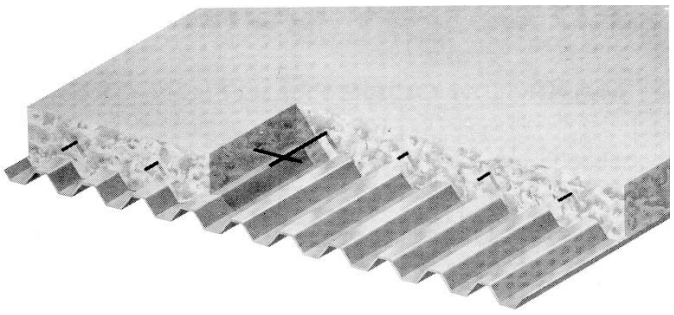
REINFORCED CONCRETE SLAB ALLOWABLE LOADS

Total Slab Depth	Reinforcement W.W.F.	Reinforcement As	Superimposed Uniform Load (psf) — 3 Span Condition; Clear Span (ft.-in.) 2- 0	2- 3	2- 6	2- 9	3- 0	3- 3	3- 6	3- 9	4- 0	4- 6	5- 0
2" (t=1 1/2")	6X6-W1.4XW1.4	0.028*	194	153	124	103	86	74	63				
	6X6-W2.1XW2.1	0.042	285	225	183	151	127	108	93				
	6X6-W2.9XW2.9	0.058	384	304	246	203	171	146	125				
2 1/2" (t=2")	6X6-W1.4XW1.4	0.028*	268	212	172	142	119	102	88	76	67	53	
	6X6-W2.1XW2.1	0.042	396	313	254	210	176	150	129	113	99	78	
	6X6-W2.9XW2.9	0.058	400	400	344	284	239	204	176	153	134	106	
3" (t=2 1/2")	6X6-W1.4XW1.4	0.028*	342	271	219	181	152	130	112	97	86	68	
	6X6-W2.1XW2.1	0.042*	400	400	325	268	226	192	166	144	127	100	
	6X6-W2.9XW2.9	0.058	400	400	400	366	307	262	226	197	173	137	
3 1/2" (t=3")	6X6-W2.1XW2.1	0.042*	400	400	396	327	275	234	202	176	155		
	6X6-W2.9XW2.9	0.058*	400	400	400	400	375	320	276	240	211		
	4X4-W2.9XW2.9	0.087	400	400	400	400	400	400	400	353	310		
4" (t=3 1/2")	6X6-W2.1XW2.1	0.042*	400	400	400	384	322	275	237	206	181		
	6X6-W2.9XW2.9	0.058*	400	400	400	400	400	372	321	280	246		
	4X4-W2.9XW2.9	0.087	400	400	400	400	400	400	400	400	358		
4 1/2" (t=4")	6X6-W2.9XW2.9	0.058*	400	400	400	400	400	400	359	313	275		
	4X4-W2.9XW2.9	0.087	400	400	400	400	400	400	400	400	400		
	4X4-W4.0XW4.0	0.120	400	400	400	400	400	400	400	400	400		
5" (t=4 1/2")	6X6-W2.9XW2.9	0.058*	400	400	400	400	400	400	396	345	303		
	4X4-W2.9XW2.9	0.087*	400	400	400	400	400	400	400	400	400		
	4X4-W4.0XW4.0	0.120	400	400	400	400	400	400	400	400	400		
			0.6C28		0.6C26		0.6C24			0.6C22			

NOTES:
1. * As does not meet A.C.I. criterion for temperature and shrinkage.
2. Recommended conform types are based upon S.D.I. criteria and normal weight concrete.
3. Superimposed loads are based upon three span conditions and A.C.I. moment coefficients.
4. Load values for single span and double spans are to be reduced.
5. Superimposed load values in bold type require that mesh be draped. See page 19.
6. Vulcraft's painted or galvanized form deck can be considered as permanent support in most building applications. See page 19. If uncoated form deck is used, deduct the weight of the slab from the allowable superimposed uniform loads.

SECTION PROPERTIES

Deck Type	Design Thick.	Weight PSF	Ip in^4/ft	In in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy ksi
0.6C28	0.0149	0.76	0.012	0.012	0.035	0.036	60
0.6C26	0.0179	0.91	0.015	0.015	0.043	0.043	60
0.6C24	0.0239	1.21	0.019	0.019	0.057	0.057	60
0.6C22	0.0298	1.49	0.024	0.024	0.070	0.070	60

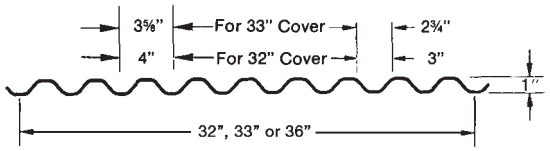


ALLOWABLE UNIFORM LOAD (PSF)

Deck Type	No. of Spans	Design Criteria	Clear Span (ft.-in.) 2- 0	2- 3	2- 6	2- 9	3- 0	3- 3	3- 6	3- 9	4- 0	4- 6	5- 0	5- 6	6- 0
0.6C28	1	Fb = 36,000	210	166	134	111	93	80	69	60	53	41	34	28	23
		DEFL. = l/240	98	69	50	38	29	23	18	15	12	9	6	5	4
		DEFL. = l/180	131	92	67	50	39	31	24	20	16	12	8	6	5
		W1[1]	40	22	10										
	2	Fb = 36,000	216	171	138	114	96	82	71	61	54	43	35	29	24
		DEFL. = l/240	216	166	121	91	70	55	44	36	30	21	15	11	9
		DEFL. = l/180	216	171	138	114	94	74	59	48	39	28	20	15	12
		W1[1]	115	75	48	29	16	6							
	3	Fb = 36,000	270	213	173	143	120	102	88	77	68	53	43	36	30
		DEFL. = l/240	186	130	95	71	55	43	35	28	23	16	12	9	7
		DEFL. = l/180	247	174	127	95	73	58	46	38	31	22	16	12	9
		W1[1]	120	79	51	32	18	8							
0.6C26	1	Fb = 36,000	258	204	165	136	115	98	84	73	65	51	41	34	29
		DEFL. = l/240	123	86	63	47	36	29	23	19	15	11	8	6	5
		DEFL. = l/180	164	115	84	63	49	38	31	25	20	14	10	8	6
		W1[1]	72	47	30	18	10	4							
	2	Fb = 36,000	258	204	165	136	115	98	84	73	65	51	41	34	29
		DEFL. = l/240	258	204	152	114	88	69	55	45	37	26	19	14	11
		DEFL. = l/180	258	204	165	136	115	92	74	60	49	35	25	19	15
		W1[1]	177	124	88	62	44	30	19	11	5				
	3	Fb = 36,000	323	255	206	171	143	122	105	92	81	64	52	43	36
		DEFL. = l/240	232	163	119	89	69	54	43	35	29	20	15	11	9
		DEFL. = l/180	309	217	158	119	92	72	58	47	39	27	20	15	11
		W1[1]	184	129	92	65	46	32	21	12	6				
0.6C24	1	Fb = 36,000	342	270	219	181	152	130	112	97	86	68	55	45	38
		DEFL. = l/240	156	109	80	60	46	36	29	24	19	14	10	7	6
		DEFL. = l/180	208	146	106	80	62	48	39	31	26	18	13	10	8
		W1[1]	128	91	66	48	35	25	17	12	7				
	2	Fb = 36,000	342	270	219	181	152	130	112	97	86	68	55	45	38
		DEFL. = l/240	342	263	192	144	111	87	70	57	47	33	24	18	14
		DEFL. = l/180	342	270	219	181	148	117	93	76	63	44	32	24	19
		W1[1]	287	211	158	120	92	71	55	42	32	17	8		
	3	Fb = 36,000	428	338	274	226	190	162	140	122	107	84	68	57	48
		DEFL. = l/240	294	206	150	113	87	68	55	45	37	26	19	14	11
		DEFL. = l/180	392	275	201	151	116	91	73	59	49	34	25	19	15
		W1[1]	295	217	163	124	96	74	57	44	34	19	9		
0.6C22	1	Fb = 36,000	420	332	269	222	187	159	137	119	105	83	67	56	47
		DEFL. = l/240	197	138	101	76	58	46	37	30	25	17	13	9	7
		DEFL. = l/180	262	184	134	101	78	61	49	40	33	23	17	13	10
		W1[1]	180	132	99	75	58	44	34	26	20	11	5		
	2	Fb = 36,000	420	332	269	222	187	159	137	119	105	83	67	56	47
		DEFL. = l/240	420	332	243	182	140	110	88	72	59	42	30	23	18
		DEFL. = l/180	420	332	269	222	187	147	118	96	79	55	40	30	23
		W1[1]	388	291	223	174	137	110	88	71	57	38	24	15	8
	3	Fb = 36,000	525	415	336	278	233	199	171	149	131	104	84	69	58
		DEFL. = l/240	371	261	190	143	110	86	69	56	46	33	24	18	14
		DEFL. = l/180	495	348	253	190	147	115	92	75	62	43	32	24	18
		W1[1]	399	299	230	179	142	113	91	74	60	39	26	16	9

[1] W1 is the maximum weight of concrete and deck (W1 in Figures 1 and 2 of the SDI Loading Diagrams).

1.0 C, CSV CONFORM



* Check availability with plant

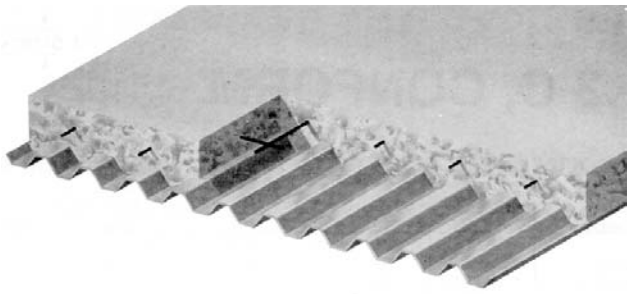
MAXIMUM CONSTRUCTION CLEAR SPANS (S.D.I. CRITERIA)

Total Slab Depth	Deck Type	Weight PSF	NW Concrete N=9 145 PCF			Weight PSF	LW Concrete N=14 110 PCF		
			1 Span	2 Span	3 Span		1 Span	2 Span	3 Span
2 1/2" (t=1 1/2")	1.0C26	25	3- 8	4- 10	4- 10	19	3- 11	5- 1	5- 2
	1.0C24	25	4- 10	6- 5	6- 6	19	5- 3	6- 10	6- 11
	1.0C22	25	5- 11	7- 10	7- 10	20	6- 5	8- 5	8- 6
	1.0C20	26	6- 8	8- 3	8- 3	20	7- 3	9- 0	9- 0
3" (t=2)	1.0C26	31	3- 6	4- 7	4- 8	24	3- 9	4- 10	4- 11
	1.0C24	31	4- 7	6- 1	6- 2	24	4- 11	6- 6	6- 7
	1.0C22	31	5- 7	7- 3	7- 3	24	6- 0	7- 11	7- 11
	1.0C20	32	6- 3	7- 8	7- 8	25	6- 10	8- 5	8- 5
3 1/2" (t=2 1/2")	1.0C26	37	3- 4	4- 5	4- 5	28	3- 7	4- 8	4- 9
	1.0C24	37	4- 4	5- 9	5- 10	29	4- 8	6- 2	6- 3
	1.0C22	37	5- 3	6- 10	6- 10	29	5- 9	7- 6	7- 6
	1.0C20	38	5- 11	7- 3	7- 3	29	6- 5	7- 11	7- 11
4" (t=3")	1.0C26	43	3- 2	4- 2	4- 3	33	3- 5	4- 6	4- 7
	1.0C24	43	4- 2	5- 6	5- 7	33	4- 6	5- 11	6- 0
	1.0C22	43	5- 0	6- 6	6- 6	33	5- 5	7- 1	7- 1
	1.0C20	44	5- 7	6- 11	6- 11	34	6- 1	7- 7	7- 7
4 1/2" (t=3 1/2")	1.0C26	49	3- 1	4- 1	4- 1	37	3- 4	4- 4	4- 5
	1.0C24	49	4- 0	5- 4	5- 4	38	4- 4	5- 9	5- 10
	1.0C22	50	4- 9	6- 3	6- 3	38	5- 3	6- 10	6- 10
	1.0C20	50	5- 4	6- 8	6- 8	38	5- 10	7- 3	7- 3
5" (t=4")	1.0C26	55	2- 11	3- 11	4- 0	42	3- 2	4- 3	4- 3
	1.0C24	55	3- 10	5- 1	5- 2	42	4- 2	5- 7	5- 7
	1.0C22	56	4- 7	6- 0	6- 0	43	5- 0	6- 7	6- 7
	1.0C20	56	5- 2	6- 5	6- 5	43	5- 8	7- 0	7- 0
5 1/2" (t=4 1/2")	1.0C26	61	2- 10	3- 10	3- 10	47	3- 1	4- 1	4- 2
	1.0C24	61	3- 8	4- 11	5- 0	47	4- 0	5- 5	5- 5
	1.0C22	62	4- 5	5- 10	5- 10	47	4- 10	6- 4	6- 4
	1.0C20	62	5- 0	6- 2	6- 2	47	5- 5	6- 9	6- 9

REINFORCED CONCRETE SLAB ALLOWABLE LOADS

Total Slab Depth	Reinforcement		Superimposed Uniform Load (psf) — 3 Span Condition Clear Span (ft.-in.)										
	W.W.F.	As	3- 0	3- 3	3- 6	3- 9	4- 0	4- 6	5- 0	5- 6	6- 0	6- 6	7- 0
2 1/2" (t=1 1/2")	6X6-W1.4XW1.4	0.028*	95	81	70								
	6X6-W2.1XW2.1	0.042	140	119	103								
	6X6-W2.9XW2.9	0.058	189	161	139								
3" (t=2")	6X6-W1.4XW1.4	0.028*	128	109	94	82	72	57					
	6X6-W2.1XW2.1	0.042	190	161	139	121	107	84					
	6X6-W2.9XW2.9	0.058	257	219	189	165	145	114					
3 1/2" (t=2 1/2")	6X6-W2.1XW2.1	0.042*	239	204	176	153	134	106	86	71			
	6X6-W2.9XW2.9	0.058	326	277	239	208	183	145	117	97			
	4X4-W2.9XW2.9	0.087	400	400	350	305	268	212	172	142			
4" (t=3")	6X6-W2.1XW2.1	0.042*	288	246	212	185	162	128	**153**	**126**	**106**	**91**	
	6X6-W2.9XW2.9	0.058*	394	336	289	252	222	175	**205**	**169**	**142**	**121**	
	4X4-W2.9XW2.9	0.087	400	400	400	371	326	257	**298**	**247**	**207**	**177**	
4 1/2" (t=3 1/2")	6X6-W2.1XW2.1	0.042*	338	288	248	216	190	150	**180**	**148**	**125**	**106**	
	6X6-W2.9XW2.9	0.058*	400	394	340	296	260	205	**241**	**199**	**168**	**143**	
	4X4-W2.9XW2.9	0.087	400	400	400	400	383	303	**354**	**292**	**246**	**209**	
5" (t=4")	6X6-W2.9XW2.9	0.058*	400	400	390	339	298	236	**278**	**230**	**193**		
	4X4-W2.9XW2.9	0.087	400	400	400	400	400	348	**400**	**338**	**284**		
	4X4-W4.0XW4.0	0.120	400	400	400	400	400	400	**400**	**400**	**378**		
5 1/2" (t=4 1/2")	6X6-W2.9XW2.9	0.058*	400	400	400	383	337	266	**315**	**260**	**219**		
	4X4-W2.9XW2.9	0.087*	400	400	400	400	400	394	**400**	**384**	**322**		
	4X4-W4.0XW4.0	0.120	400	400	400	400	400	400	**400**	**400**	**400**		
			1.0C26				1.0C24			1.0C22	1.0C20		

NOTES:
1. * As does not meet A.C.I. criterion for temperature and shrinkage.
2. Recommended conform types are based upon S.D.I. criteria and normal weight concrete.
3. Superimposed loads are based upon three span conditions and A.C.I. moment coefficients.
4. Load values for single span and double spans are to be reduced.
5. Superimposed load values in bold type require that mesh be draped. See page 19.
6. Vulcraft's painted or galvanized form deck can be considered as permanent support in most building applications. See page 19. If uncoated form deck is used, deduct the weight of the slab from the allowable superimposed uniform loads.



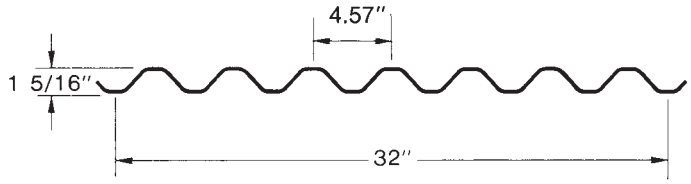
SECTION PROPERTIES

Deck Type	Design Thick.	Weight PSF	Ip in^4/ft	In in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy ksi
1.0C26	0.0179	0.96	0.040	0.042	0.067	0.071	60
1.0C24	0.0239	1.28	0.057	0.059	0.098	0.103	60
1.0C22	0.0298	1.57	0.073	0.073	0.130	0.134	60
1.0C20	0.0358	1.91	0.088	0.088	0.167	0.165	60

ALLOWABLE UNIFORM LOAD (PSF)

Deck Type	No. of Spans	Design Criteria	Clear Span (ft.-in.)												
			3- 0	3- 3	3- 6	3- 9	4- 0	4- 6	5- 0	5- 6	6- 0	6- 6	7- 0	7- 6	8- 0
1.0C26	1	Fb = 36,000	179	152	131	114	101	79	64	53	45	38	33	29	25
		DEFL. = l/240	97	76	61	50	41	29	21	16	12	10	8	6	5
		DEFL. = l/180	129	102	82	66	55	38	28	21	16	13	10	8	7
		W1[1]	52	40	30	23	17	8	3						
	2	Fb = 36,000	189	161	139	121	107	84	68	56	47	40	35	30	27
		DEFL. = l/240	189	161	139	121	101	71	52	39	30	24	19	15	13
		DEFL. = l/180	189	161	139	121	107	84	68	52	40	31	25	20	17
		W1[1]	127	101	80	64	52	33	20	12	5				
	3	Fb = 36,000	237	202	174	151	133	105	85	70	59	50	43	38	33
		DEFL. = l/240	188	148	118	96	79	56	41	30	23	18	15	12	10
		DEFL. = l/180	237	197	158	128	106	74	54	41	31	25	20	16	13
		W1[1]	131	104	83	67	54	35	22	13	6				
1.0C24	1	Fb = 36,000	261	223	192	167	147	116	94	78	65	56	48	42	37
		DEFL. = l/240	138	109	87	71	58	41	30	22	17	14	11	9	7
		DEFL. = l/180	185	145	116	94	78	55	40	30	23	18	15	12	10
		W1[1]	108	87	71	58	48	33	23	15	10	6	3		
	2	Fb = 36,000	275	234	202	176	155	122	99	82	69	59	50	44	39
		DEFL. = l/240	275	234	202	174	143	101	73	55	42	33	27	22	18
		DEFL. = l/180	275	234	202	176	155	122	98	73	57	44	36	29	24
		W1[1]	235	192	159	133	112	81	59	44	32	24	17	12	8
	3	Fb = 36,000	343	293	252	220	193	153	124	102	86	73	63	55	48
		DEFL. = l/240	266	209	167	136	112	79	57	43	33	26	21	17	14
		DEFL. = l/180	343	279	223	181	149	105	77	58	44	35	28	23	19
		W1[1]	241	198	164	137	116	84	61	45	34	25	18	13	9
1.0C22	1	Fb = 36,000	347	295	255	222	195	154	125	103	87	74	64	55	49
		DEFL. = l/240	177	139	112	91	75	53	38	29	22	17	14	11	9
		DEFL. = l/180	236	186	149	121	100	70	51	38	30	23	19	15	12
		W1[1]	164	135	113	95	80	58	43	32	24	18	14	10	8
	2	Fb = 36,000	357	304	263	229	201	159	129	106	89	76	66	57	50
		DEFL. = l/240	357	304	263	219	180	127	92	69	53	42	34	27	23
		DEFL. = l/180	357	304	263	229	201	159	123	92	71	56	45	36	30
		W1[1]	337	284	241	204	175	130	99	77	60	47	38	30	24
	3	Fb = 36,000	447	381	328	286	251	199	161	133	112	95	82	71	63
		DEFL. = l/240	334	263	211	171	141	99	72	54	42	33	26	21	18
		DEFL. = l/180	446	351	281	228	188	132	96	72	56	44	35	29	24
		W1[1]	355	295	248	210	180	132	96	72	56	44	35	29	24
1.0C20	1	Fb = 36,000	445	379	327	285	251	198	160	132	111	95	82	71	63
		DEFL. = l/240	214	168	135	109	90	63	46	35	27	21	17	14	11
		DEFL. = l/180	285	224	179	146	120	84	62	46	36	28	22	18	15
		W1[1]	230	191	161	137	117	85	62	46	36	28	22	18	15
	2	Fb = 36,000	440	375	323	282	248	196	158	131	110	94	81	70	62
		DEFL. = l/240	440	375	323	264	217	152	111	84	64	51	41	33	27
		DEFL. = l/180	440	375	323	282	248	196	148	111	86	67	54	44	36
		W1[1]	420	355	303	262	228	176	138	111	86	68	54	44	36
	3	Fb = 36,000	550	469	404	352	309	244	198	164	138	117	101	88	77
		DEFL. = l/240	403	317	254	206	170	119	87	65	50	40	32	26	21
		DEFL. = l/180	538	423	339	275	227	159	116	87	67	53	42	34	28
		W1[1]	450	381	325	275	227	159	116	87	67	53	42	34	28

[1] W1 is the maximum weight of concrete and deck (W1 in Figures 1 and 2 of the SDI Loading Diagrams).



1.3 C, CONFORM

MAXIMUM CONSTRUCTION CLEAR SPANS (S.D.I. CRITERIA)

Total Slab Depth	Deck Type	Weight PSF	NW Concrete N=9 145 PCF 1 Span	NW Concrete N=9 145 PCF 2 Span	NW Concrete N=9 145 PCF 3 Span	Weight PSF	LW Concrete N=14 110 PCF 1 Span	LW Concrete N=14 110 PCF 2 Span	LW Concrete N=14 110 PCF 3 Span
3.3” (t=2”)	1.3C26	33	4- 6	5- 11	6- 0	25	4- 10	6- 4	6- 5
	1.3C24	34	5- 6	7- 4	7- 5	26	6- 0	7- 11	8- 0
	1.3C22	34	6- 4	8- 3	8- 3	26	6- 11	9- 0	9- 0
	1.3C20	34	7- 1	8- 9	8- 9	26	7- 9	9- 7	9- 7
3.8” (t=2 1/2”)	1.3C26	39	4- 3	5- 8	5- 8	30	4- 7	6- 1	6- 2
	1.3C24	40	5- 2	7- 0	7- 1	30	5- 8	7- 7	7- 8
	1.3C22	40	6- 0	7- 10	7- 10	31	6- 6	8- 6	8- 6
	1.3C20	40	6- 9	8- 4	8- 4	31	7- 4	9- 1	9- 1
4.3” (t=3”)	1.3C26	45	4- 1	5- 5	5- 6	35	4- 5	5- 10	5- 11
	1.3C24	46	4- 11	6- 8	6- 9	35	5- 5	7- 3	7- 4
	1.3C22	46	5- 8	7- 5	7- 5	35	6- 3	8- 2	8- 2
	1.3C20	46	6- 4	7- 11	7- 11	36	7- 0	8- 8	8- 8
4.8” (t=3 1/2”)	1.3C26	51	3- 11	5- 2	5- 3	39	4- 3	5- 8	5- 8
	1.3C24	52	4- 9	6- 5	6- 5	40	5- 2	7- 0	7- 1
	1.3C22	52	5- 5	7- 2	7- 2	40	6- 0	7- 10	7- 10
	1.3C20	52	6- 1	7- 7	7- 7	40	6- 9	8- 4	8- 4
5.3” (t=4”)	1.3C26	57	3- 9	5- 0	5- 1	44	4- 1	5- 5	5- 6
	1.3C24	58	4- 7	6- 2	6- 3	44	5- 0	6- 9	6- 10
	1.3C22	58	5- 2	6- 11	6- 11	44	5- 9	7- 6	7- 6
	1.3C20	58	5- 10	7- 4	7- 4	45	6- 5	8- 0	8- 0
5.8” (t=4 1/2”)	1.3C26	63	3- 7	4- 10	4- 11	48	4- 0	5- 3	5- 4
	1.3C24	64	4- 5	5- 11	6- 0	49	4- 10	6- 6	6- 7
	1.3C22	64	5- 0	6- 8	6- 8	49	5- 6	7- 3	7- 3
	1.3C20	64	5- 7	7- 1	7- 1	49	6- 3	7- 9	7- 9
6.3” (t=5”)	1.3C26	69	3- 6	4- 8	4- 9	53	3- 10	5- 2	5- 2
	1.3C24	70	4- 3	5- 9	5- 10	53	4- 8	6- 4	6- 5
	1.3C22	70	4- 10	6- 6	6- 6	54	5- 4	7- 1	7- 1
	1.3C20	70	5- 5	6- 11	6- 11	54	6- 0	7- 6	7- 6

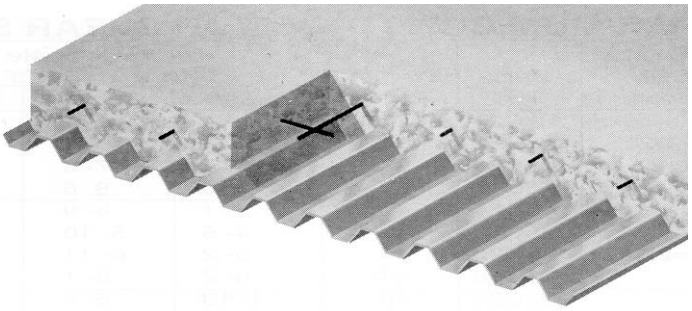
REINFORCED CONCRETE SLAB ALLOWABLE LOADS

Total Slab Depth	Reinforcement W.W.F.	Reinforcement As	Superimposed Uniform Load (psf) — 3 Span Condition, Clear Span (ft.-in.) 4- 0	4- 6	5- 0	5- 6	6- 0	6- 6	7- 0	7- 6	8- 0	8- 6	9- 0
3.3” (t=2”)	6X6-W1.4XW1.4	0.028*	71	56									
	6X6-W2.1XW2.1	0.042	105	83									
	6X6-W2.9XW2.9	0.058	142	113									
3.8” (t=2 1/2”)	6X6-W2.1XW2.1	0.042*	133	105	85	70							
	6X6-W2.9XW2.9	0.058	181	143	116	96							
	4X4-W2.9XW2.9	0.087	265	209	169	140							
4.3” (t=3”)	6X6-W2.1XW2.1	0.042*	161	127	**156**	**129**	**108**	**92**	**79**				
	6X6-W2.9XW2.9	0.058	219	173	**209**	**173**	**145**	**124**	**107**				
	4X4-W2.9XW2.9	0.087	322	255	**309**	**255**	**215**	**183**	**158**				
4.8” (t=3 1/2”)	6X6-W2.1XW2.1	0.042*	188	149	**191**	**158**	**133**	**113**	**98**	**85**			
	6X6-W2.9XW2.9	0.058*	258	204	**258**	**213**	**179**	**153**	**132**	**115**			
	4X4-W2.9XW2.9	0.087	380	300	**383**	**316**	**266**	**226**	**195**	**170**			
5.3” (t=4”)	6X6-W2.1XW2.1	0.058*	296	234	**299**	**247**	**208**	**177**	**153**				
	6X6-W2.9XW2.9	0.087	400	346	**400**	**364**	**306**	**260**	**225**				
	4X4-W4.0XW4.0	0.120	400	400	**400**	**400**	**400**	**347**	**299**				
5.8” (t=4 1/2”)	6X6-W2.9XW2.9	0.058*	334	264	**336**	**278**	**233**	**199**	**172**				
	4X4-W2.9XW2.9	0.087*	400	391	**400**	**400**	**344**	**293**	**253**				
	4X4-W4.0XW4.0	0.120	400	400	**400**	**400**	**400**	**392**	**338**				
6.3” (t=5”)	6X6-W2.9XW2.9	0.058*	373	295	**373**	**308**	**259**	**221**					
	4X4-W2.9XW2.9	0.087*	400	400	**400**	**400**	**382**	**326**					
	4X4-W4.0XW4.0	0.120	400	400	**400**	**400**	**400**	**400**					
			1.3C26		1.3C24		1.3C22		1.3C20				

NOTES:
1. * As does not meet A.C.I. criterion for temperature and shrinkage.
2. Recommended conform types are based upon S.D.I. criteria and normal weight concrete.
3. Superimposed loads are based upon three span conditions and A.C.I. moment coefficients.
4. Load values for single span and double spans are to be reduced.
5. Superimposed load values in bold type require that mesh be draped. See page 19.
6. Vulcraft’s painted or galvanized form deck can be considered as permanent support in most building applications. See page 19. If uncoated form deck is used, deduct the weight of the slab from the allowable superimposed uniform loads.

SECTION PROPERTIES

Deck Type	Design Thick.	Weight PSF	Ip in^4/ft	In in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy ksi
1.3C26	0.0179	0.99	0.070	0.069	0.097	0.098	60
1.3C24	0.0239	1.33	0.093	0.093	0.132	0.132	60
1.3C22	0.0298	1.62	0.115	0.115	0.163	0.162	60
1.3C20	0.0358	1.97	0.140	0.140	0.197	0.197	60

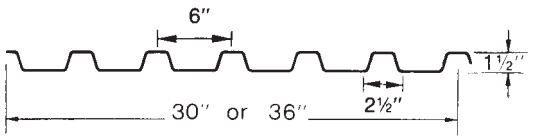


ALLOWABLE UNIFORM LOAD (PSF)

Deck Type	No. of Spans	Design Criteria	Clear Span (ft.-in.) 4- 0	4- 6	5- 0	5- 6	6- 0	6- 6	7- 0	7- 6	8- 0	8- 6	9- 0	9- 6	10.0
1.3C26	1	Fb = 36,000	146	115	93	77	65	55	48	41	36	32	29	26	23
		DEFL. = l/240	72	50	37	28	21	17	13	11	9	7	6	5	5
		DEFL. = l/180	96	67	49	37	28	22	18	15	12	10	8	7	6
		W1[1]	47	32	22	15	10	6	3						
	2	Fb = 36,000	147	116	94	78	65	56	48	42	37	33	29	26	24
		DEFL. = l/240	147	116	88	66	51	40	32	26	21	18	15	13	11
		DEFL. = l/180	147	116	94	78	65	53	43	35	29	24	20	17	15
		W1[1]	110	79	58	43	31	23	17	12	8	5			
	3	Fb = 36,000	184	145	118	97	82	70	60	52	46	41	36	33	29
		DEFL. = l/240	134	94	69	52	40	31	25	20	17	14	12	10	9
		DEFL. = l/180	179	126	92	69	53	42	33	27	22	19	16	13	11
		W1[1]	114	82	60	44	33	24	18	12	8	5	3		
1.3C24	1	Fb = 36,000	198	156	127	105	88	75	65	56	50	44	39	35	32
		DEFL. = l/240	95	67	49	37	28	22	18	14	12	10	8	7	6
		DEFL. = l/180	127	89	65	49	38	30	24	19	16	13	11	9	8
		W1[1]	82	60	44	33	25	19	15	11	8	6	4		
	2	Fb = 36,000	198	156	127	105	88	75	65	56	50	44	39	35	32
		DEFL. = l/240	198	156	117	88	68	53	43	35	29	24	20	17	15
		DEFL. = l/180	198	156	127	105	88	71	57	46	38	32	27	23	20
		W1[1]	178	133	102	79	62	49	39	31	25	20	16	12	10
	3	Fb = 36,000	248	196	158	131	110	94	81	70	62	55	49	44	40
		DEFL. = l/240	180	126	92	69	53	42	34	27	22	19	16	13	12
		DEFL. = l/180	240	168	123	92	71	56	45	36	30	25	21	18	15
		W1[1]	184	137	105	81	64	51	40	32	26	21	17	13	10
1.3C22	1	Fb = 36,000	245	193	156	129	109	93	80	70	61	54	48	43	39
		DEFL. = l/240	118	83	60	45	35	27	22	18	15	12	10	9	8
		DEFL. = l/180	157	110	80	60	47	37	29	24	20	16	14	12	10
		W1[1]	113	84	64	50	39	31	25	20	16	13	10	8	6
	2	Fb = 36,000	243	192	156	129	108	92	79	69	61	54	48	43	39
		DEFL. = l/240	243	192	145	109	84	66	53	43	35	30	25	21	18
		DEFL. = l/180	243	192	156	129	108	88	71	57	47	39	33	28	24
		W1[1]	223	172	136	109	88	72	59	48	40	33	28	23	19
	3	Fb = 36,000	304	240	194	161	135	115	99	86	76	67	60	54	49
		DEFL. = l/240	222	156	114	86	66	52	41	34	28	23	20	17	14
		DEFL. = l/180	296	208	152	114	88	69	55	45	37	31	26	22	19
		W1[1]	240	185	144	114	88	69	55	45	37	31	26	22	19
1.3C20	1	Fb = 36,000	296	233	189	156	131	112	96	84	74	65	58	52	47
		DEFL. = l/240	143	101	73	55	42	33	27	22	18	15	13	11	9
		DEFL. = l/180	191	134	98	74	57	45	36	29	24	20	17	14	12
		W1[1]	147	111	86	68	54	44	36	29	24	20	17	14	12
	2	Fb = 36,000	296	233	189	156	131	112	96	84	74	65	58	52	47
		DEFL. = l/240	296	233	177	133	102	81	64	52	43	36	30	26	22
		DEFL. = l/180	296	233	189	156	131	107	86	70	58	48	40	34	29
		W1[1]	276	213	169	136	111	92	76	64	54	45	38	32	27
	3	Fb = 36,000	369	292	236	195	164	140	121	105	92	82	73	65	59
		DEFL. = l/240	271	190	139	104	80	63	50	41	34	28	24	20	17
		DEFL. = l/180	361	253	185	139	107	84	67	55	45	38	32	27	23
		W1[1]	296	229	182	139	107	84	67	55	45	38	32	27	23

[1] W1 is the maximum weight of concrete and deck (W1 in Figure 1 and 2 of the SDI Loading Diagrams).

1.5 C CONFORM



MAXIMUM CONSTRUCTION CLEAR SPANS (S.D.I. CRITERIA)

Total Slab Depth	Deck Type	Weight PSF	NW Concrete N=9 145 PCF 1 Span	NW Concrete N=9 145 PCF 2 Span	NW Concrete N=9 145 PCF 3 Span	Weight PSF	LW Concrete N=14 110 PCF 1 Span	LW Concrete N=14 110 PCF 2 Span	LW Concrete N=14 110 PCF 3 Span
	1.5C24	37	5- 4	7- 1	7- 2	28	5- 9	7- 8	7- 9
3 1/2”	1.5C22	37	4- 7	6- 1	6- 2	29	5- 0	6- 7	6- 8
(t=2”)	1.5C20	38	5- 5	7- 3	7- 4	29	5- 11	7- 10	7- 11
	1.5C18	38	6- 6	8- 6	8- 10	30	7- 1	9- 3	9- 7
	1.5C24	43	5- 1	6- 9	6- 10	33	5- 6	7- 4	7- 5
4”	1.5C22	43	4- 5	5- 10	5- 11	33	4- 9	6- 4	6- 5
(t=2 1/2”)	1.5C20	44	5- 2	6- 11	7- 0	34	5- 8	7- 6	7- 7
	1.5C18	44	6- 2	8- 1	8- 5	34	6- 9	8- 10	9- 2
	1.5C24	49	4- 10	6- 5	6- 7	38	5- 3	7- 1	7- 2
4 1/2”	1.5C22	49	4- 2	5- 7	5- 8	38	4- 7	6- 1	6- 2
(t=3”)	1.5C20	50	4- 11	6- 8	6- 8	38	5- 5	7- 3	7- 4
	1.5C18	50	5- 10	7- 9	8- 0	39	6- 5	8- 6	8- 9
	1.5C24	55	4- 8	6- 2	6- 4	42	5- 1	6- 10	6- 11
5”	1.5C22	55	4- 0	5- 5	5- 6	42	4- 5	5- 11	5- 11
(t=3 1/2”)	1.5C20	56	4- 9	6- 4	6- 5	43	5- 2	7- 0	7- 1
	1.5C18	56	5- 7	7- 5	7- 8	43	6- 2	8- 2	8- 5
	1.5C24	61	4- 6	5- 11	6- 1	47	4- 11	6- 7	6- 8
5 1/2”	1.5C22	61	3- 11	5- 3	5- 3	47	4- 3	5- 8	5- 9
(t=4”)	1.5C20	62	4- 7	6- 2	6- 3	47	5- 0	6- 9	6- 10
	1.5C18	63	5- 5	7- 2	7- 5	48	6- 0	7- 11	8- 2
	1.5C24	67	4- 4	5- 9	5- 11	51	4- 9	6- 4	6- 6
6”	1.5C22	68	3- 9	5- 1	5- 1	52	4- 2	5- 6	5- 7
(t=4 1/2”)	1.5C20	68	4- 5	5- 11	6- 0	52	4- 10	6- 6	6- 7
	1.5C18	69	5- 3	6- 11	7- 2	53	5- 9	7- 8	7- 11
	1.5C24	73	4- 2	5- 7	5- 9	56	4- 7	6- 2	6- 3
6 1/2”	1.5C22	74	3- 8	4- 11	5- 0	56	4- 0	5- 5	5- 5
(t=5”)	1.5C20	74	4- 3	5- 9	5- 10	57	4- 8	6- 4	6- 5
	1.5C18	75	5- 1	6- 8	6- 11	57	5- 7	7- 5	7- 8

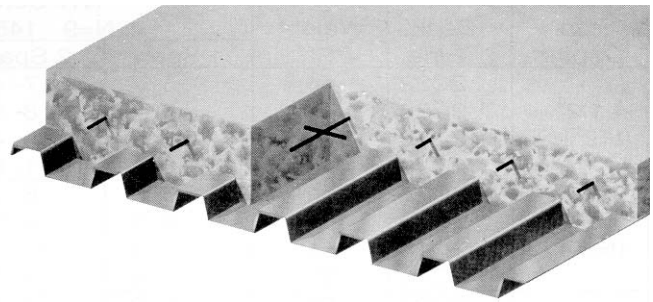
REINFORCED CONCRETE SLAB ALLOWABLE LOADS

Total Slab Depth	Reinforcement W.W.F.	Reinforcement As	Superimposed Uniform Load (psf) — 3 Span Condition, Clear Span (ft.-in.) 4- 0	4- 6	5- 0	5- 6	6- 0	6- 6	7- 0	7- 6	8- 0	8- 6	9- 0
	6X6-W2.1XW2.1	0.042*	108	86									
3 1/2”	6X6-W2.9XW2.9	0.058	147	116									
(t=2)”	4X4-W2.9XW2.9	0.087	214	169									
	6X6-W2.1XW2.1	0.042*	136	108	87	72							
4”	6X6-W2.9XW2.9	0.058	185	147	119	98							
(t=2 1/2”)	4X4-W2.9XW2.9	0.087	272	215	174	144							
	6X6-W2.1XW2.1	0.042*	164	129	**160**	**132**	**111**	**95**	**82**				
4 1/2”	6X6-W2.9XW2.9	0.058*	224	177	**215**	**177**	**149**	**127**	**110**				
(t=3”)	4X4-W2.9XW2.9	0.087	329	260	**318**	**263**	**221**	**188**	**162**				
	6X6-W2.9XW2.9	0.058*	262	207	**264**	**218**	**183**	**156**	**135**	**117**			
5”	4X4-W2.9XW2.9	0.087	387	306	**392**	**324**	**272**	**232**	**200**	**174**			
(t=3 1/2”)	4X4-W4.0XW4.0	0.120	400	400	**400**	**400**	**363**	**310**	**267**	**233**			
	6X6-W2.9XW2.9	0.058*	301	238	**313**	**259**	**217**	**185**	**160**				
5 1/2”	4X4-W2.9XW2.9	0.087	400	351	**400**	**385**	**323**	**275**	**237**				
(t=4”)	4X4-W4.0XW4.0	0.120	400	400	**400**	**400**	**400**	**370**	**319**				
	6X6-W2.9XW2.9	0.058*	339	268	**358**	**296**	**249**	**212**	**183**				
6”	4X4-W2.9XW2.9	0.087*	400	397	**400**	**400**	**370**	**315**	**272**				
(t=4 1/2”)	4X4-W4.0XW4.0	0.120	400	400	**400**	**400**	**400**	**400**	**366**				
	4X4-W2.9XW2.9	0.087*	400	400	**400**	**400**	**400**	**348**					
6 1/2”	4X4-W4.0XW4.0	0.120	400	400	**400**	**400**	**400**	**400**					
(t=5”)	4X4-W5.0XW5.0	0.150	400	400	**400**	**400**	**400**	**400**					
			1.5C24				1.5C18						

NOTES:
1. * As does not meet A.C.I. criterion for temperature and shrinkage.
2. Recommended conform types are based upon S.D.I. criteria and normal weight concrete.
3. Superimposed loads are based upon three span conditions and A.C.I. moment coefficients.
4. Load values for single span and double spans are to be reduced.
5. Superimposed load values in bold type require that mesh be draped. See page 19.
6. Vulcraft’s painted or galvanized form deck can be considered as permanent support in most building applications. See page 19. If uncoated form deck is used, deduct the weight of the slab from the allowable superimposed uniform loads.

SECTION PROPERTIES

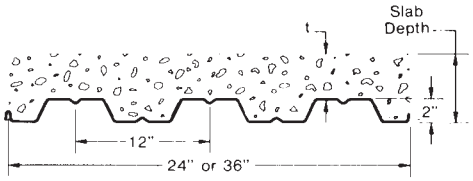
Deck Type	Design Thick.	Weight PSF	Ip in^4/ft	In in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy ksi
1.5C24	0.0239	1.44	0.136	0.108	0.132	0.120	60
1.5C22	0.0295	1.68	0.183	0.155	0.192	0.186	33
1.5C20	0.0358	2.04	0.222	0.201	0.247	0.234	33
1.5C18	0.0474	2.72	0.295	0.289	0.327	0.318	33



ALLOWABLE UNIFORM LOAD (PSF)

Deck Type	No. of Spans	Design Criteria	Clear Span (ft.-in.) 4- 0	4- 6	5- 0	5- 6	6- 0	6- 6	7- 0	7- 6	8- 0	8- 6	9- 0	9- 6	10- 0
1.5C24	1	Fb = 36,000	198	156	127	105	88	75	65	56	50	44	39	35	32
		DEFL. = l/240	139	98	71	54	41	32	26	21	17	15	12	10	9
		DEFL. = l/180	186	130	95	71	55	43	35	28	23	19	16	14	12
		W1[1]	82	60	44	33	25	19	15	11	8	6	4		
	2	Fb = 36,000	180	142	115	95	80	68	59	51	45	40	36	32	29
		DEFL. = l/240	180	142	115	95	80	68	56	46	38	31	26	22	19
		DEFL. = l/180	180	142	115	95	80	68	59	51	45	40	35	30	26
		W1[1]	160	122	95	75	60	48	39	31	25	20	16	12	9
	3	Fb = 36,000	225	178	144	119	100	85	73	64	56	50	44	40	36
		DEFL. = l/240	225	166	121	91	70	55	44	36	29	25	21	18	15
		DEFL. = l/180	225	178	144	119	93	73	59	48	39	33	28	23	20
		W1[1]	172	132	103	81	64	51	40	32	26	21	17	13	10
1.5C22	1	Fb = 20,000	160	126	102	85	71	61	52	46	40	35	32	28	26
		DEFL. = l/240	160	126	96	72	56	44	35	28	23	20	16	14	12
		DEFL. = l/180	160	126	102	85	71	58	47	38	31	26	22	19	16
		W1[1]	57	40	28	20	14	10	6	4					
	2	Fb = 20,000	155	122	99	82	69	59	51	44	39	34	31	27	25
		DEFL. = l/240	155	122	99	82	69	59	51	44	39	34	31	27	25
		DEFL. = l/180	155	122	99	82	69	59	51	44	39	34	31	27	25
		W1[1]	129	94	70	53	40	30	23	17	12	9	6	4	
	3	Fb = 20,000	194	153	124	102	86	73	63	55	48	43	38	34	31
		DEFL. = l/240	194	153	124	102	86	73	61	50	41	34	29	24	21
		DEFL. = l/180	194	153	124	102	86	73	63	55	48	43	38	33	28
		W1[1]	133	97	72	55	41	31	24	18	13	10	7	4	
1.5C20	1	Fb = 20,000	206	163	132	109	91	78	67	59	51	46	41	36	33
		DEFL. = l/240	206	160	116	87	67	53	42	34	28	24	20	17	15
		DEFL. = l/180	206	163	132	109	90	71	57	46	38	32	27	23	19
		W1[1]	87	64	48	36	28	21	16	12	9	7	5	3	
	2	Fb = 20,000	195	154	125	103	87	74	64	55	49	43	39	35	31
		DEFL. = l/240	195	154	125	103	87	74	64	55	49	43	39	35	31
		DEFL. = l/180	195	154	125	103	87	74	64	55	49	43	39	35	31
		W1[1]	175	134	105	83	66	53	42	34	27	22	18	14	11
	3	Fb = 20,000	244	193	156	129	108	92	80	69	61	54	48	43	39
		DEFL. = l/240	244	193	156	129	108	92	76	62	51	43	36	31	26
		DEFL. = l/180	244	193	156	129	108	92	80	69	61	54	48	41	35
		W1[1]	188	145	111	87	68	55	44	35	29	23	19	15	12
1.5C18	1	Fb = 20,000	273	215	174	144	121	103	89	78	68	60	54	48	44
		DEFL. = l/240	273	212	155	116	90	70	56	46	38	31	27	23	19
		DEFL. = l/180	273	215	174	144	119	94	75	61	50	42	35	30	26
		W1[1]	132	99	76	60	47	38	31	25	20	17	14	11	9
	2	Fb = 20,000	265	209	170	140	118	100	87	75	66	59	52	47	42
		DEFL. = l/240	265	209	170	140	118	100	87	75	66	59	52	47	42
		DEFL. = l/180	265	209	170	140	118	100	87	75	66	59	52	47	42
		W1[1]	245	189	150	120	98	80	67	55	46	39	32	27	22
	3	Fb = 20,000	331	262	212	175	147	125	108	94	83	73	65	59	53
		DEFL. = l/240	331	262	212	175	147	125	105	86	71	59	50	42	36
		DEFL. = l/180	331	262	212	175	147	125	108	94	83	73	65	56	48
		W1[1]	263	204	161	130	106	87	72	61	51	43	36	30	25

[1] W1 is the maximum weight of concrete and deck (W1 in Figure 1 of the SDI Loading Diagrams).
Minimum exterior bearing length required is 1.5 inches. Minimum interior bearing length required is 3 inches.



2 C CONFORM

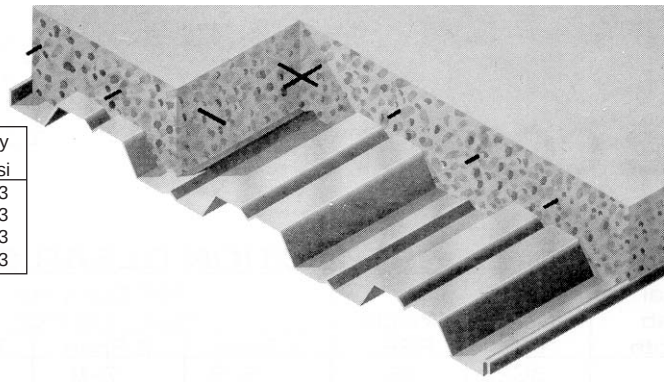
MAXIMUM CONSTRUCTION CLEAR SPANS (S.D.I. CRITERIA)

Total Slab Depth	Deck Type	Weight PSF	NW Concrete N=9 145 PCF 1 Span	NW Concrete N=9 145 PCF 2 Span	NW Concrete N=9 145 PCF 3 Span	Weight PSF	LW Concrete N=14 110 PCF 1 Span	LW Concrete N=14 110 PCF 2 Span	LW Concrete N=14 110 PCF 3 Span
4 1/2" (t=2 1/2")	2C22	44	5- 7	7- 4	7- 8	34	6- 2	8- 3	8- 4
	2C20	45	6- 7	8- 9	9- 0	34	7- 3	9- 7	9- 11
	2C18	45	8- 2	10- 4	10- 8	35	9- 0	11- 3	11- 7
	2C16	46	9- 3	11- 6	11- 11	36	10- 3	12- 6	12- 11
5" (t=3")	2C22	50	5- 4	6- 9	7- 1	39	5- 11	7- 11	8- 0
	2C20	51	6- 3	8- 5	8- 7	39	6- 11	9- 2	9- 6
	2C18	51	7- 9	9- 10	10- 2	40	8- 7	10- 9	11- 2
	2C16	52	8- 10	11- 0	11- 4	40	9- 9	12- 0	12- 5
5 1/2" (t=3 1/2")	2C22	56	5- 2	6- 2	6- 6	43	5- 8	7- 6	7- 8
	2C20	57	6- 0	8- 1	8- 3	43	6- 8	8- 10	9- 1
	2C18	57	7- 5	9- 6	9- 9	44	8- 3	10- 5	10- 9
	2C16	58	8- 5	10- 7	10- 11	45	9- 4	11- 7	12- 0
6" (t=4")	2C22	62	4- 10	5- 9	6- 1	48	5- 6	7- 0	7- 4
	2C20	63	5- 9	7- 9	7- 11	48	6- 5	8- 7	8- 9
	2C18	63	7- 1	9- 1	9- 5	49	7- 11	10- 1	10- 5
	2C16	64	8- 1	10- 2	10- 6	49	9- 0	11- 2	11- 7
6 1/2" (t=4 1/2")	2C22	68	4- 6	5- 4	5- 8	52	5- 3	6- 7	6- 11
	2C20	69	5- 7	7- 6	7- 8	53	6- 2	8- 3	8- 6
	2C18	69	6- 10	8- 10	9- 1	53	7- 7	9- 9	10- 1
	2C16	70	7- 9	9- 10	10- 2	54	8- 8	10- 10	11- 3
7" (t=5")	2C22	74	4- 3	5- 0	5- 3	57	5- 1	6- 2	6- 6
	2C20	75	5- 5	7- 2	7- 2	57	6- 0	8- 0	8- 3
	2C18	75	6- 7	8- 6	8- 10	58	7- 4	9- 5	9- 9
	2C16	76	7- 6	9- 6	9- 10	59	8- 5	10- 6	10- 11

REINFORCED CONCRETE SLAB ALLOWABLE LOADS

Total Slab Depth	Reinforcement W.W.F.	Reinforcement As	Superimposed Uniform Load (psf) — 3 Span Condition; Clear Span (ft.-in.) 5- 0	5- 6	6- 0	6- 6	7- 0	7- 6	8- 0	8- 6	9- 0	9- 6	10- 0
4 1/2" (t=2 1/2")	6X6-W2.1XW2.1	0.042*	84	69									
	6X6-W2.9XW2.9	0.058	114	94									
	4X4-W2.9XW2.9	0.087	167	138									
5" (t=3")	6X6-W2.1XW2.1	0.042*	**153**	**127**	**107**	**91**	**78**						
	6X6-W2.9XW2.9	0.058*	**206**	**170**	**143**	**122**	**105**						
	4X4-W2.9XW2.9	0.087	**305**	**252**	**212**	**180**	**155**						
5 1/2" (t=3 1/2")	6X6-W2.9XW2.9	0.058*	**255**	**211**	**177**	**151**	**130**	**113**	**100**				
	4X4-W2.9XW2.9	0.087	**378**	**313**	**263**	**224**	**193**	**168**	**148**				
	4X4-W4.0XW4.0	0.120	**400**	**400**	**351**	**299**	**258**	**224**	**197**				
6" (t=4")	6X6-W2.9XW2.9	0.058*	**304**	**251**	**211**	**180**	**155**	**135**	**119**	**105**	**94**		
	4X4-W2.9XW2.9	0.087	**400**	**374**	**314**	**267**	**231**	**201**	**177**	**156**	**140**		
	4X4-W4.0XW4.0	0.120	**400**	**400**	**400**	**359**	**309**	**270**	**237**	**210**	**187**		
6 1/2" (t=4 1/2")	6X6-W2.9XW2.9	0.058*	**353**	**292**	**245**	**209**	**180**	**157**	**138**	**122**	**109**	**98**	**88**
	4X4-W2.9XW2.9	0.087*	**400**	**400**	**365**	**311**	**268**	**234**	**205**	**182**	**162**	**146**	**131**
	4X4-W4.0XW4.0	0.120	**400**	**400**	**400**	**400**	**361**	**315**	**277**	**245**	**219**	**196**	**177**
7" (t=5")	4X4-W2.9XW2.9	0.087*	**400**	**400**	**400**	**355**	**306**	**266**	**234**	**207**	**185**	**166**	**150**
	4X4-W4.0XW4.0	0.120	**400**	**400**	**400**	**400**	**400**	**360**	**316**	**280**	**250**	**224**	**202**
	4X4-W5.0XW5.0	0.150	**400**	**400**	**400**	**400**	**400**	**400**	**389**	**344**	**307**	**276**	**249**
			2C22	2C20				2C18			2C16		

NOTES:
1. * As does not meet A.C.I. criterion for temperature and shrinkage.
2. Recommended conform types are based upon S.D.I. criteria and normal weight concrete.
3. Superimposed loads are based upon three span conditions and A.C.I. moment coefficients.
4. Load values for single span and double spans are to be reduced.
5. Superimposed load values in bold type require that mesh be draped. See page 19.
6. Vulcraft's painted or galvanized form deck can be considered as permanent support in most building applications. See page 19. If uncoated form deck is used, deduct the weight of the slab from the allowable superimposed uniform loads.



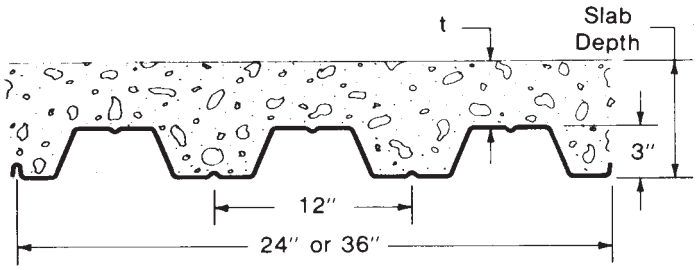
SECTION PROPERTIES

Deck Type	Design Thick.	Weight PSF	Ip in^4/ft	In in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy ksi
2C22	0.0295	1.62	0.338	0.336	0.283	0.287	33
2C20	0.0358	1.97	0.423	0.420	0.367	0.373	33
2C18	0.0474	2.61	0.557	0.557	0.520	0.520	33
2C16	0.0598	3.29	0.704	0.704	0.653	0.653	33

ALLOWABLE UNIFORM LOAD (PSF)

Deck Type	No. of Spans	Design Criteria	Clear Span (ft.-in.) 5- 0	5- 6	6- 0	6- 6	7- 0	7- 6	8- 0	8- 6	9- 0	9- 6	10- 0	10- 6	11- 0
2C22	1	Fb = 20,000	151	125	105	89	77	67	59	52	47	42	38	34	31
		DEFL. = l/240	151	125	103	81	65	53	43	36	30	26	22	19	17
		DEFL. = l/180	151	125	105	89	77	67	58	48	41	34	30	26	22
		W1[1]	60	47	37	29	23	18	14	11	9	7	5	4	3
	2	Fb = 20,000	153	127	106	91	78	68	60	53	47	42	38	35	32
		DEFL. = l/240	153	127	106	91	78	68	60	53	47	42	38	35	32
		DEFL. = l/180	153	127	106	91	78	68	60	53	47	42	38	35	32
		W1[1]	75	66	59	53	48	43	37	31	25	21	17	14	12
	3	Fb = 20,000	191	158	133	113	98	85	75	66	59	53	48	43	40
		DEFL. = l/240	191	158	133	113	98	85	75	66	57	49	42	36	31
		DEFL. = l/180	191	158	133	113	98	85	75	66	59	53	48	43	40
		W1[1]	80	71	63	57	51	46	39	32	26	22	18	15	12
2C20	1	Fb = 20,000	196	162	136	116	100	87	76	68	60	54	49	44	40
		DEFL. = l/240	196	162	128	101	81	66	54	45	38	32	28	24	21
		DEFL. = l/180	196	162	136	116	100	87	72	60	51	43	37	32	28
		W1[1]	89	71	57	46	38	31	26	22	18	15	13	11	9
	2	Fb = 20,000	199	164	138	118	101	88	78	69	61	55	50	45	41
		DEFL. = l/240	199	164	138	118	101	88	78	69	61	55	50	45	41
		DEFL. = l/180	199	164	138	118	101	88	78	69	61	55	50	45	41
		W1[1]	118	105	95	86	78	68	58	49	41	35	30	25	21
	3	Fb = 20,000	249	206	173	147	127	111	97	86	77	69	62	56	51
		DEFL. = l/240	249	206	173	147	127	111	97	85	72	61	52	45	39
		DEFL. = l/180	249	206	173	147	127	111	97	86	77	69	62	56	51
		W1[1]	116	104	93	85	77	71	62	53	45	39	33	28	24
2C18	1	Fb = 20,000	277	229	193	164	141	123	108	96	86	77	69	63	57
		DEFL. = l/240	277	219	169	133	106	87	71	59	50	43	37	32	27
		DEFL. = l/180	277	229	193	164	141	115	95	79	67	57	49	42	37
		W1[1]	145	116	95	79	66	56	47	40	35	30	26	23	20
	2	Fb = 20,000	277	229	193	164	141	123	108	96	86	77	69	63	57
		DEFL. = l/240	277	229	193	164	141	123	108	96	86	77	69	63	57
		DEFL. = l/180	277	229	193	164	141	123	108	96	86	77	69	63	57
		W1[1]	211	190	173	144	121	103	88	76	66	57	49	43	37
	3	Fb = 20,000	347	287	241	205	177	154	135	120	107	96	87	79	72
		DEFL. = l/240	347	287	241	205	177	154	135	112	95	80	69	60	52
		DEFL. = l/180	347	287	241	205	177	154	135	120	107	96	87	79	69
		W1[1]	229	206	186	155	131	112	96	83	71	62	54	47	41
2C16	1	Fb = 20,000	348	288	242	206	178	155	136	121	107	96	87	79	72
		DEFL. = l/240	348	277	214	168	135	109	90	75	63	54	46	40	35
		DEFL. = l/180	348	288	242	206	178	146	120	100	84	72	62	53	46
		W1[1]	192	156	128	107	90	77	66	57	49	43	38	34	30
	2	Fb = 20,000	348	288	242	206	178	155	136	121	107	96	87	79	72
		DEFL. = l/240	348	288	242	206	178	155	136	121	107	96	87	79	72
		DEFL. = l/180	348	288	242	206	178	155	136	121	107	96	87	79	72
		W1[1]	328	268	222	186	158	135	116	101	87	76	67	59	52
	3	Fb = 20,000	435	360	302	258	222	193	170	151	134	121	109	99	90
		DEFL. = l/240	435	360	302	258	222	193	170	142	119	102	87	75	65
		DEFL. = l/180	435	360	302	258	222	193	170	151	134	121	109	99	87
		W1[1]	352	288	238	200	170	145	125	109	95	83	73	64	57

[1] W1 is the maximum weight of concrete and deck (W1 in Figure 1 of the SDI Loading Diagrams).
Minimum exterior bearing length required is 2.0 inches. Minimum interior bearing length required is 4.0 inches.



3 C CONFORM

MAXIMUM CONSTRUCTION CLEAR SPANS (S.D.I. CRITERIA)

Total Slab Depth	Deck Type	Weight PSF	NW Concrete N=9 145 PCF 1 Span	2 Span	3 Span	Weight PSF	LW Concrete N=14 110 PCF 1 Span	2 Span	3 Span
6" (t=3")	3C22	56	5- 9	7- 0	7- 2	43	6- 11	8- 6	8- 7
	3C20	57	7- 9	9- 8	9- 8	43	8- 9	11- 2	11- 6
	3C18	57	9- 7	11- 9	12- 2	44	10- 8	12- 11	13- 5
	3C16	58	10- 10	13- 2	13- 7	45	12- 1	14- 5	14- 11
6 1/2" (t=3 1/2")	3C22	62	5- 3	6- 6	6- 7	48	6- 5	7- 11	8- 0
	3C20	63	7- 2	8- 11	8- 11	48	8- 5	10- 9	10- 11
	3C18	63	9- 2	11- 4	11- 9	49	10- 3	12- 6	12- 11
	3C16	64	10- 5	12- 8	13- 1	49	11- 8	13- 11	14- 5
7" (t=4")	3C22	68	4- 11	6- 1	6- 2	52	6- 0	7- 5	7- 6
	3C20	69	6- 8	8- 4	8- 4	53	8- 1	10- 2	10- 2
	3C18	69	8- 10	11- 0	11- 4	53	9- 10	12- 1	12- 6
	3C16	70	10- 0	12- 3	12- 8	54	11- 2	13- 6	14- 0
7 1/2" (t=4 1/2")	3C22	74	4- 7	5- 8	5- 9	57	5- 8	7- 0	7- 1
	3C20	75	6- 3	7- 10	7- 10	57	7- 8	9- 7	9- 7
	3C18	75	8- 6	10- 7	11- 0	58	9- 6	11- 9	12- 2
	3C16	76	9- 8	11- 10	12- 3	59	10- 10	13- 1	13- 7
8" (t=5")	3C22	80	4- 4	5- 4	5- 5	61	5- 4	6- 7	6- 8
	3C20	81	5- 11	7- 4	7- 4	62	7- 3	9- 1	9- 1
	3C18	81	8- 3	10- 3	10- 8	62	9- 3	11- 5	11- 10
	3C16	82	9- 4	11- 6	11- 11	63	10- 6	12- 9	13- 2

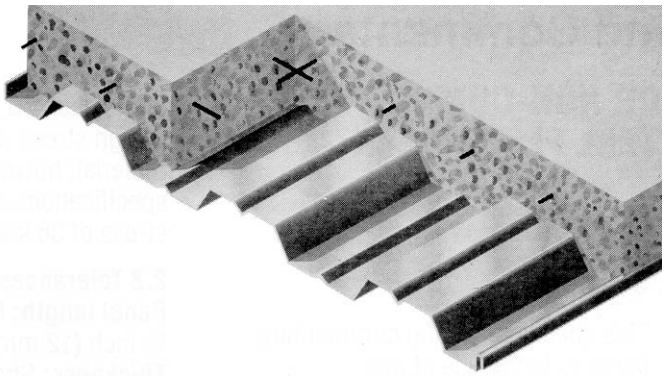
REINFORCED CONCRETE SLAB ALLOWABLE LOADS

Total Slab Depth	Reinforcement W.W.F.	As	Superimposed Uniform Load (psf) — 3 Span Condition, Clear Span (ft.-in.) 6- 6	7- 0	7- 6	8- 0	8- 6	9- 0	9- 6	10- 0	10- 6	11- 0	11- 6
6" (t=3")	6X6-W2.9XW2.9	0.058*	125	108									
	4X4-W2.9XW2.9	0.087	185	160									
	4X4-W4.0XW4.0	0.120	246	212									
6 1/2" (t=3 1/2")	6X6-W2.9XW2.9	0.058*	154	133	116	102							
	4X4-W2.9XW2.9	0.087	229	198	172	151							
	4X4-W4.0XW4.0	0.120	306	264	230	202							
7" (t=4")	6X6-W2.9XW2.9	0.058*	183	158	138	121	107	96					
	4X4-W2.9XW2.9	0.087	273	235	205	180	159	142					
	4X4-W4.0XW4.0	0.120	366	316	275	242	214	191					
7 1/2" (t=4 1/2")	4X4-W2.9XW2.9	0.087*	316	273	238	209	185	165	148	134	121		
	4X4-W4.0XW4.0	0.120	400	368	320	281	249	222	200	180	163		
	4X4-W5.0XW5.0	0.150	400	400	392	345	306	273	245	221	200		
8" (t=5")	4X4-W2.9XW2.9	0.087*	360	310	270	238	210	188	168	152	138	126	115
	4X4-W4.0XW4.0	0.120	400	400	365	321	284	254	228	205	186	170	155
	4X4-W5.0XW5.0	0.150	400	400	400	395	350	312	280	253	229	209	191
			3C20		3C18							3C16	

NOTES:
1. * As does not meet A.C.I. criterion for temperature and shrinkage.
2. Recommended conform types are based upon S.D.I. criteria and normal weight concrete.
3. Superimposed loads are based upon three span conditions and A.C.I. moment coefficients.
4. Load values for single span and double spans are to be reduced.
5. Superimposed load values in bold type require that mesh be draped. See page 19.
6. Vulcraft's painted or galvanized form deck can be considered as permanent support in most building applications. See page 19. If uncoated form deck is used, deduct the weight of the slab from the allowable superimposed uniform loads.

SECTION PROPERTIES

Deck Type	Design Thick.	Weight PSF	Ip in^4/ft	In in^4/ft	Sp in^3/ft	Sn in^3/ft	Fy ksi
3C22	0.0295	1.77	0.760	0.758	0.442	0.457	33
3C20	0.0358	2.14	0.948	0.945	0.570	0.590	33
3C18	0.0474	2.84	1.251	1.251	0.805	0.805	33
3C16	0.0598	3.58	1.580	1.580	1.013	1.013	33



ALLOWABLE UNIFORM LOAD (PSF)

Deck Type	No. of Spans	Design Criteria	Clear Span (ft.-in.) 6- 6	7- 0	7- 6	8- 0	8- 6	9- 0	9- 6	10- 0	10- 6	11- 0	11- 6	12- 0	12- 6
3C22	1	Fb = 20,000	139	120	105	92	82	73	65	59	53	49	45	41	38
		DEFL. = l/240	139	120	105	92	81	68	58	50	43	37	33	29	26
		DEFL. = l/180	139	120	105	92	82	73	65	59	53	49	44	38	34
		W1[1]	47	42	38	34	31	26	22	19	17	14	12	11	9
	2	Fb = 20,000	144	124	108	95	84	75	68	61	55	50	46	42	39
		DEFL. = l/240	144	124	108	95	84	75	68	61	55	50	46	42	39
		DEFL. = l/180	144	124	108	95	84	75	68	61	55	50	46	42	39
		W1[1]	62	56	51	47	43	39	36	34	31	29	26	22	19
	3	Fb = 20,000	180	155	135	119	105	94	84	76	69	63	58	53	49
		DEFL. = l/240	180	155	135	119	105	94	84	76	69	63	58	53	48
		DEFL. = l/180	180	155	135	119	105	94	84	76	69	63	58	53	49
		W1[1]	64	58	52	48	44	40	37	34	32	29	27	25	22
3C20	1	Fb = 20,000	180	155	135	119	105	94	84	76	69	63	57	53	49
		DEFL. = l/240	180	155	135	119	101	85	72	62	54	47	41	36	32
		DEFL. = l/180	180	155	135	119	105	94	84	76	69	62	54	48	42
		W1[1]	71	65	59	54	47	40	35	31	27	24	21	19	16
	2	Fb = 20,000	186	161	140	123	109	97	87	79	71	65	59	55	50
		DEFL. = l/240	186	161	140	123	109	97	87	79	71	65	59	55	50
		DEFL. = l/180	186	161	140	123	109	97	87	79	71	65	59	55	50
		W1[1]	100	91	84	77	72	67	62	58	51	45	39	35	30
	3	Fb = 20,000	233	201	175	154	136	121	109	98	89	81	74	68	63
		DEFL. = l/240	233	201	175	154	136	121	109	98	89	81	74	68	60
		DEFL. = l/180	233	201	175	154	136	121	109	98	89	81	74	68	63
		W1[1]	94	86	79	72	67	62	58	54	50	47	44	38	34
3C18	1	Fb = 20,000	254	219	191	168	149	133	119	107	97	89	81	75	69
		DEFL. = l/240	254	219	191	160	134	112	96	82	71	62	54	47	42
		DEFL. = l/180	254	219	191	168	149	133	119	107	94	82	72	63	56
		W1[1]	139	117	101	87	76	66	58	52	46	41	37	33	30
	2	Fb = 20,000	254	219	191	168	149	133	119	107	97	89	81	75	69
		DEFL. = l/240	254	219	191	168	149	133	119	107	97	89	81	75	69
		DEFL. = l/180	254	219	191	168	149	133	119	107	97	89	81	75	69
		W1[1]	180	166	154	143	129	113	99	87	77	69	61	55	49
	3	Fb = 20,000	318	274	239	210	186	166	149	134	122	111	101	93	86
		DEFL. = l/240	318	274	239	210	186	166	149	134	122	111	101	90	79
		DEFL. = l/180	318	274	239	210	186	166	149	134	122	111	101	93	86
		W1[1]	181	167	154	143	134	122	107	95	84	75	67	60	53
3C16	1	Fb = 20,000	320	276	240	211	187	167	150	135	123	112	102	94	86
		DEFL. = l/240	320	276	240	202	169	142	121	104	89	78	68	60	53
		DEFL. = l/180	320	276	240	211	187	167	150	135	119	104	91	80	71
		W1[1]	182	155	133	116	101	89	79	70	63	56	51	46	42
	2	Fb = 20,000	320	276	240	211	187	167	150	135	123	112	102	94	86
		DEFL. = l/240	320	276	240	211	187	167	150	135	123	112	102	94	86
		DEFL. = l/180	320	276	240	211	187	167	150	135	123	112	102	94	86
		W1[1]	282	256	220	191	167	147	130	115	103	92	82	74	66
	3	Fb = 20,000	400	345	300	264	234	208	187	169	153	140	128	117	108
		DEFL. = l/240	400	345	300	264	234	208	187	169	153	140	128	113	100
		DEFL. = l/180	400	345	300	264	234	208	187	169	153	140	128	117	108
		W1[1]	322	274	237	205	180	158	140	124	111	99	89	80	72

[1] W1 is the maximum weight of concrete and deck (W1 in Figure 1 of the SDI Loading Diagrams).
Minimum exterior bearing length required is 2.5 inches. Minimum interior bearing length required is 5 inches.

SDI Specifications and Commentary

FOR NON-COMPOSITE STEEL FLOOR DECK

1. Scope

This specification and commentary pertains to the use of non-composite steel deck as a form for reinforced concrete slabs.

Commentary: This specification is not intended to cover highway bridges (where AASHTO specifications may govern), siding applications, or exposed roofs. In the past, most of the steel decking used in the manner that this specification covers, was referred to as "centering: however, various roof deck units have successfully been used as non-composite forms. The specification is intended to also include these applications.

2. Materials

2.1 Non-Composite Steel Form Deck: The steel deck units shall be manufactured from steel conforming to ASTM designation A611 Grades C, D, or E, or A653-94 Structural Quality with a minimum yield strength of 33 ksi (230 MPa). The unit design stress shall not exceed the yield strength multiplied by 0.60, with a maximum of 36 ksi (250 MPa).

Commentary: Most of the "centering" materials are offered in A653-94 grade 80 steel (galvanized) or ASTM A611 grade E (uncoated); this steel has a minimum yield strength of 80 ksi (550 MPa) and is generally over 90 ksi (620 MPa). In the past, 30 ksi (210 MPa) design stress was used for grade E material; however, the AISI specifications now allow a design stress of 36 ksi (250 MPa).

2.2 Tolerances:
Panel length: Plus or minus 1/2 inch (12 mm).
Thickness: Shall not be less than 95% of the design thickness.
Panel cover width: Minus 3/8 inch (10 mm), plus 3/4 inch (20 mm).
Panel camber and/or sweep: 1/4 inch in 10 foot lengfh (6mm in 3m).
Panels end out of square: 1/8 inch per foot of panel width (10 mm per m).

Commentary: The above tolerances reflect fabrication practices for steel deck products. Cover width tolerances may vary due to trucking, storage, or handling.

Type (gage)	Design Thickness		Minimum Thickness	
	In.	mm.	In.	mm.
28	0.0149	0.38	0.014	0.35
26	0.0179	0.45	0.017	0.43
24	0.0238	0.60	0.023	0.57
22	0.0295	0.75	0.028	0.71
20	0.0358	0.91	0.034	0.86
18	0.0474	1.20	0.045	1.14
16	0.0598	1.52	0.057	1.44

Finishes available are:

1. Galvanized (Conforming to ASTM A924-94 and or ASTM A653-94);
2. Uncoated (Black);
3. Painted with a shop coat of primer paint (one or both sides).

The uncoated finish is, by custom, referred to as "black" by some users and manufacturers; the use of the word "black" does not refer to paint color on the product.

Centering materials are usually available galvanized or uncoated. When unshored galvanized material is used to support a reinforced concrete slab, the slab load is considered to be permanently carried by the deck. When uncoated or painted deck is used to support a reinforced concrete slab, the form is considered impermanent and the concrete load should be deducted from the load capacity of the reinforced slab.
For any permanent load carrying function, a minimum galvanized coating conforming to ASTM A653-94, G60 (2180) is recommended.

3. Design

3.1 The section properties of the steel deck unit shall be computed in accordance with American Iron and Steel Institute, *Specification for the Design of Cold-Formed Steel Structural Members,* 1986 edition with addenda (AISI Specifications).

3.2 Deck used as a form for structural (reinforced) concrete slab:

3.2a Stress shall not exceed 0.60 times the yield strength, nor exceed 36 ksi (250 MPa) under the combined loads of wet concrete, deck, and the following construction live loads: 20 pounds per square foot (1kPa) uniform load or 150 pound concentrated load on a 1'-0" wide section of deck (2.2 kN per m). **See Figure 1.**

Commentary: The construction loading is intended to simulate the sequence of concrete placement. For single span deck applications, the ability to control the concrete placement may be restricted; a 1.5 factor has been applied to the concrete load to cover this condition. The concrete placement contractor must be made aware of this loading criteria and take care not to exceed them.

3.2b Calculated form deflection shall be based on the load of the wet concrete (as determined by the design slab thickness) and the steel deck, uniformly loaded on all spans, and shall be limited to L/180 or 3/4 inch (20 mm), whichever is smaller. Deflection shall be relative to supporting members. **See Figure 2.**

Commentary: The deflection limits of L/180 and 3/4 inches (20 mm) are intended to be minimum requirements. Architectural or other considerations may influence the designer to use a more stringent limit.

3.2c. The minimum bearing lengths shall be determined in accordance with the AISI Specification; the uniform loading case of wet concrete plus deck plus 20 pounds per square foot (1kPa) construction load shall be used. Minimum bearing shall be 1 1/2 inches (40 mm) unless otherwise shown.

Commentary: Form decks made of grade E steel may have a radius to thickness ratio not covered by the AISI Specification. Experience has shown that 1 1/2 inches (40 mm) of bearing is sufficient for these decks. If less than 1 1/2 inches (40 mm) is available for any form deck, or if high support reactions are expected, the designer should ask the deck manufacturer to check the deck web crippling capacity. In any case, the deck must be adequately attached to the structure to prevent slip off.

3.2d Design of the concrete slabs shall be done in accordance with the ACI 318 Building Code. The concrete cover over the top of the deck shall not be less than 1 1/2 inches (40 mm). Randomly distributed fibers or fibrous add mixes shall not be substituted for welded wire fabric tensile reinforcement.

Commentary: In following the ACI 318 requirements for temperature reinforcement, the designer may eliminate the concrete area that is displaced by the deck ribs. For slabs with total depth of 3 inches (75 mm) or less, the reinforcing mesh may be considered to be at the center of the concrete above the deck. **See Figure 3.** If uncoated or painted deck is used as the form, the load of the concrete slab must be deducted from the calculated capacity of the reinforced concrete slab. If galvanized form is used, the load of the slab is considered to be permanently carried by the deck and need not be deducted from the live load. If temporary shoring is used, the load of the slab must be deducted from the calculated capacity of the reinforced slab regardless of the deck finish.

Except for some diaphragm values, the deck should not be assumed to act compositely with the concrete even though strong chemical bonds can, and do, develop.

4. Installation & Site Storage

4.1 Site Storage: Steel Deck shall be stored off the ground with one end elevated to provide drainage and shall be protected from the elements with a waterproof covering, ventilated to avoid condensation.

4.2 Deck Placement: Place each deck unit on the supporting structural frame. Adjust to final position with accurately aligned side laps and ends bearing on supporting members and attach immediately. On joist framing, be sure the appropriate end joint occurs over a top chord angle for proper anchorage.

Commentary: Staggering deck ends is not a recommended practice. The deck capacity as a form and the load capacity of the non-composite deck/slab system are not increased by staggering the end joints, yet layout and erection costs are increased.

SDI Specifications and Commentary FOR NON-COMPOSITE STEEL FLOOR DECK

4.3 Lapped or Butted Ends: Deck ends may be either butted or lapped over supports.

Commentary: Gaps are acceptable at butted ends. If taping of butted ends is requested, it is not the responsibility of the deck manufacturer.

4.4 Anchorage: Floor deck units shall be anchored to supporting members including perimeter support steel and/or bearing walls by either welding or by mechanical fastening. This shall be done immediately after alignment. Deck units with spans greater than five feet (1.5 m) shall have side laps and perimeter edges (at perimeter support steel) fastened at midspan or 36 inch (1 m) intervals—whichever is smaller.

Commentary: This anchorage may be required to provide lateral stability to the top flange of the supporting structural members.

The deck should be anchored to act as a working platform and to prevent blow off. The frame fastening shown in figure 4 and the side lap fastening of 4.4 ARE MINIMUM REQUIREMENTS. In no case should fasteners to the supports be spaced greater than 36 inches (1 m) on center. The SDI *Diaphragm Design Manual, Second Edition*, should be used to determine fastening requirements when the deck is designed to resist horizontal loads. The most stringent fastening requirements, of this specification or, if applicable, the *SDI Diaphragm Design Manual, Second Edition* should be used. Side lap fasteners can be welds, screws, crimps (button punching), or other methods approved by the designer. Welding side laps on thickness less than 0.028 inches (0.7 mm) may cause large burn holes, and is not recommended. The objective of side lap fastening is to prevent differential sheet deflection during concrete loading, therefore preventing side joints from opening. The five foot (1.5 m) limit on side lap spacing is based on experience.

The deck contractor should not leave unattached deck at the end of the day as the wind may displace the sheets and cause injury to persons or property. If studs are being welded to the top flange of the beams, deck sheets should be butted over the supports.

4.4a Welding: All welding of deck shall be in strict accordance with ANSI/AWS D1.3, *Structural Welding Code-Sheet Steel.* Each welder must demonstrate an ability to produce satisfactory welds using a procedure such as shown in the SDI *Manual of Construction with Steel Deck*, or as described in ANSI/AWS D1.3. Welding washers shall be used on all deck units with metal thickness less than 0.028 inches (0.7 mm). Welding washers shall be a minimum thickness of 0.0598 inches (16 gage, 1.50 mm) and have a nominal 3/8 inch (12 mm) diameter hole. Where welding washers are not used, a minimum visible 5/8 inch (15 mm) diameter arc puddle weld shall be used. Weld metal shall penetrate all layers of deck material at end laps and shall have good fusion to the supporting members. When used, fillet welds shall be at least 1 inch (25 mm) long.

Commentary: The welder may be qualified under ANSI/AWS D1.1, *Structural Welding Code-Steel*, or under the provisions of other codes governing the welding of specific products, but may not be qualified for welding sheet steel. In general, stronger welds are obtained on 0.028 inches (0.7 mm) or thicker deck without weld washers. Welds on deck less than 0.028 inches (0.7 mm) are stronger with washers. The layout, design, numbering or sizing of shear connectors is not the responsibility of the deck manufacturer. If studs are being applied through the deck onto structural steel, the stud welds can be used to replace the puddle welds.

SDI Specifications and Commentary

4.4b Mechanical Fasteners: Mechanical fasteners (powder-actuated, screws, pneumatically driven fasteners, etc.) are recognized as viable anchoring methods, provided the type and spacing of the fasteners satisfy the design criteria. Documentation in the form of test data, design calculations, or design charts should be submitted by the fastener manufacturer as the basis for obtaining approval. The deck manufacturer may recommend additional fasteners to stabilize the given profile against sideslip of any unfastened ribs.

Commentary: The allowable load value per fastener used to deter-mine the maximum fastener spacing is based on a minimum structural support thickness of not less than 1/8 inch (3 mm) and on the fastener providing a 5/16 inch (8 mm) diameter minimum bearing surface (fastener head size).

4.5 Construction Practice

4.5a All deck sheets shall have adequate bearing and fastening to all supports so as not to lose support during construction. Deck areas subject to heavy or repeated traffic, concentrated loads, impact loads, wheel loads, etc. shall be adequately protected by planking or other approved means to avoid overloading and/or damage. Damaged deck (sheets containing distortions or deformations caused by construction practices) shall be repaired, replaced, or shored to the satisfaction of the designer before placing concrete. The cost of repairing, replacing, or shoring of damaged units shall be the liability of the trade contractor responsible for the damage.

Commentary: For temporary construction loads prior to concrete placement, it should be safe to assume that the deck will support a minimum uniform load of 50 psf (2.4 kPa) without further investigation.

4.5b The need for temporary shoring shall be investigated and, if required, it shall be designed and installed in accordance with the applicable AU code and shall be left in place until the slab attains 75% of its specified compressive strength.

4.5c Prior to concrete placement, the steel deck shall be free of soil, debris, standing water, loose mill scale and all other foreign matter.

4.5d Care must be exercised when placing concrete so the deck will not be subjected to any impact that exceeds the design capacity of the deck. Concrete shall be placed from a low level to avoid impact, in a uniform manner, over the supporting structure and spread toward the center of the deck span. If buggies are used to place the concrete, runways shall be planked and the buggies shall only operate on planking. Planks shall be of adequate stiffness to transfer loads to the steel deck without damaging the deck. Deck damage caused by roll bars or careless placement must be avoided.

4.6 Information:

Commentary: Fire ratings, diaphragm design information and reinforced concrete slab capacities are available from most SDI form deck manufacturers.
Steel form deck may be used in a variety of ways, some of which do not lend themselves to a standard "steel deck" analysis for span and loading. In these cases there are other criteria which must be considered besides those given by the Steel Deck Institute. Make sure that this investigation starts with a review of the applicable codes and that any special conditions are included in the design.

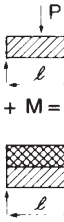
4.7 Fireproofing: The metal deck manufacturer shall not be responsible for ensuring the bonding of fireproofing. Adherence of fireproofing materials is dependent on many variables; the deck manufacturer (supplier) is not responsible for the adhesion or adhesive ability of the fireproofing.

SDI Specifications and Commentary

FIGURE 1

Loading Diagrams and Bending Moments

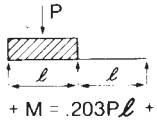
Simple Span Condition



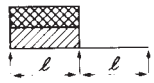
$+ M = .25P\ell + .188W1\ell^2$

$+ M = .125\,(1.5W1 + W2)\ell^2$

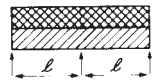
Double Span Condition



$+ M = .203P\ell + .096W1\ell^2$

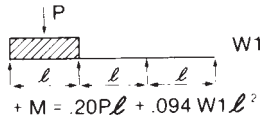


$+ M = .096\,(W1 + W2)\ell^2$

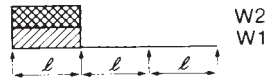


$- M = .125\,(W1 + W2)\ell^2$

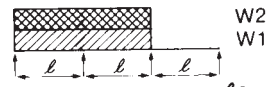
Triple Span Condition



$+ M = .20P\ell + .094\,W1\ell^2$



$+ M = .094\,(W1 + W2)\ell^2$

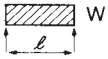


$- M = .117\,(W1 + W2)\ell^2$

FIGURE 2

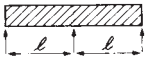
Loading Diagrams and Deflections

Simple Span Condition



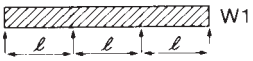
$\triangle = \dfrac{.0130W1\ell^4}{EI}$ (1728)

Double Span Condition



$\triangle = \dfrac{.0054W1\ell^4}{EI}$ (1728)

Triple Span Condition



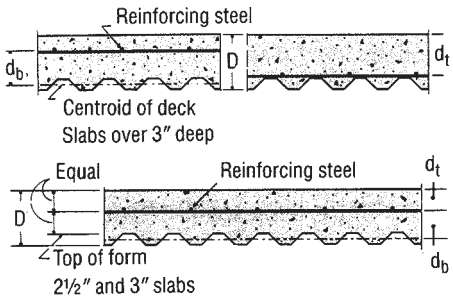
$\triangle = \dfrac{.0069W1\ell^4}{EI}$ (1728)

Note for Figures 1, 2 and 3

P = 150-pound concentrated load
W1 = slab weight + deck weight
W2 = 20 pounds per square foot construction load
ℓ = span length (ft.)

FIGURE 3

Form Deck Typical Slabs

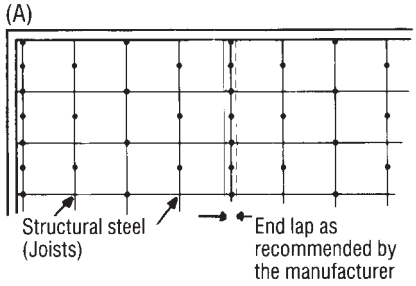


D = Depth of Slab
d_t = Distance from reinforcing steel to top of concrete
d_b = Distance from reinforcing steel to centroid of deck

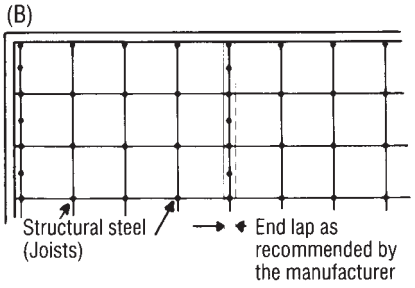
FIGURE 4

Minimum Fastening Patterns

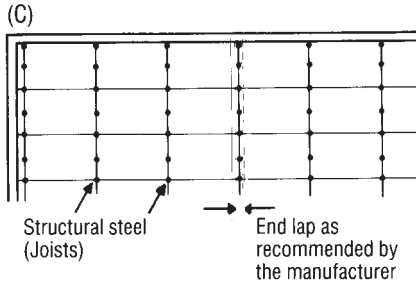
(A)



(B)



(C)



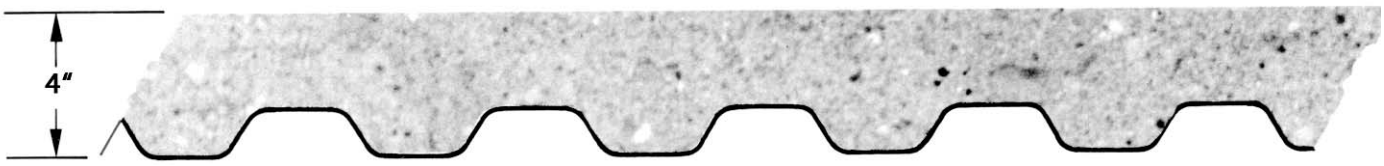
Intermediate side lap attachments not shown. See Section 4.4 Anchorage non-composite steel form deck.

Note:
Fastener patterns A and B are for deck spans up to 4'6". Fastener pattern C is for deck spans from 4'6" to 8'0". If spans exceed 8'0", fastener should be placed so that the average spacing (at supports) is not more than 12".

SDI
Non-Composite Steel
Form Deck Design Example

DESIGN EXAMPLE

1. Deck is to be used as a permanent form for a reinforced concrete slab. Specify the form section properties based on the following conditions:



1.1 Concrete slab is 4" total thickness-150 pcf concrete.

1.2 Deck to be used is nominal 1 3/8" deep, grade E steel conforming to ASTM-A653, Structural Quality.
fy= 80,000 psi
f = 36,000 psi

1.3 Joists at 5'-0" o.c. with 3" flange width (clear span = 4.75 ft.). All sheets of deck can span three or more supports.

1.4 For architectural considerations, the wet load deflection is to be limited to L/240 of the span.

2. Construction Loads
(to find concrete weight, consult manufacturer's catalog).

Concrete weight (typical)	43 psf
Deck weight (estimated)	2 psf
Total wet load (W_1)	45 psf

3. Negative Bending
—M=.117(W_1+W_2) ℓ^2(12)=
.117 (45 + 20) $(4.75)^2$ (12)
—M = 2059 in. lbs.

4 . Positive Bending
+ M = [0.20 Pℓ+ .094 $W_1\ell^2$] 12
+ M = [0.20 x 150 x 4.75 +
0.094 x 45 x $(4.75)^2$] 12
+ M = 2855 in. tbs.

5. Section Moduli
—S (required) =
2059/36,000 = 0.057 $in.^3$
+ S (required) =
2855/36,000 = 0.079 $in.^3$

6. Calculate Required I.
$\Delta = \ell/240 = 4.75 \times 12/240 =$
0.2375 in.

$$\Delta = \frac{0.0069 W_1 \ell^4 (1728)}{EI}$$

$$I = \frac{.0069\ (45)\ (4.75)^4\ 1728}{29.5 \times 10^6 \times .2375}$$

I (required) = 0.039 $in.^4$

7. Summary.
Designer should specify deck based on these properties or specify the performance requirements.

SDI Short Form Specifications

FOR NON-COMPOSITE FORM DECK

PART I-GENERAL

1.1 Related Documents

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 Summary

B. Related Sections

a. This section pertains to non-composite steel form deck.

b. Related Sections

1. Division 3 Section "Cast In Place Concrete" for concrete fill and reinforcing steel.

2. Division 5 Section "Structural Steel" for structural steel supporting the deck.

3. Division 7 section "Insulating Fill".

1.3 Submittals

A. General: Submit each item in this Article according to the conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of decking specified, including dimensions of individual components, profiles, and finishes.

C. Shop Drawings showing location of deck units, anchorage details, and other information required for a thorough review.

D. Product Certificates (if required) signed by the manufacturer of the steel deck, certifying the supplied products comply with specified requirements.

E. Welder Certificates signed by Contractor, certifying that welders comply with requirements specified under "Quality Assurance" Article, or if mechanical fasteners are used, test reports from a qualified independent testing agency evidencing compliance of mechanical fasteners with requirements based on comprehensive testing.

1.4 Quality Assurance

A. Codes and Standards: Comply with applicable provisions of the following specifications:

1. American Iron and Steel Institute (AISI);

2. American Welding Society (ANSI/AWS D1.3 Structural Welding Code/Sheet Steel);

3. Steel Deck institute (SDI).

B. Certify that each welder has satisfactorily passed A.W.S. qualification tests for welding processes involved, and, if applicable, has undergone recertification.

1.5 Delivery, Storage, and Handling

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage and handling.

B. If ground storage is needed, the deck bundles must be stored off the ground, with one end elevated to provide drainage. Bundles must be protected against condensation with a ventilated waterproof covering. Bundles must be stacked so there is no danger of tipping, sliding, rolling, shifting or material damage. Bundles must be periodically checked for tightness and retightened as necessary so wind cannot loosen sheets.

C . Deck bundles placed on the building frame must be placed near a main supporting beam at a column or wall. In no case, are the bundles to be placed on unbolted frames or on unattached and/or unbridged joist. The structural frame must be properly braced to receive the bundles.

PART 2-PRODUCTS

2.1 A manufacturer offering deck products to be incorporated into the work must be a member of the Steel Deck Institute.

2.2 Materials **[The specifier must choose the appropriate section(s) and eliminate those not applicable.]**

A. Sheet steel for deck and accessories shall conform to ASTM A653-94 Structural Quality, minimum yield strength of 33 ksi(230 MPa).

1. Galvanizing shall conform to ASTM A924-94 with a minimum coating class of G60 (Z180) as defined in A653-94.

or

B. Sheet steel for deck and accessories shall conform to ASTM A611 with a minimum yield strength of 33 ksi (230 MPa).

C. The deck type and thickness shall be as shown on the plans.

or

D. The deck shall be _____ with a minimum metal thickness of _____,

or

SDI Short Form Specifications

FOR NON-COMPOSITE FORM DECK

E. The deck shall be selected to provide the load capacities shown on the drawings and as determined using the Steel Deck Institute construction loading criteria.

F. Whenever possible, the deck shall be multi-span and not require shoring during the concrete placement procedure.

2.3 Accessories

A. Pour stops, column closures, end closures, cover plates, and girder fillers shall be the type required by the Steel Deck Institute.

B. Mechanical fasteners or welds are acceptable for accessory attachments.

PART 3 - EXECUTION

3.1 Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work of this section. All O.S.H.A. rules for erection must be followed.

3.2 Preparation

A. Place deck in accordance with approved placement plans.

B. Do not place deck panels on concrete support structure until concrete has cured and is dry.

C. Locate deck bundles to prevent overloading of support members.

3.3 Installation, General

A. Install deck panels and accessories according to Steel Deck Institute specifications and recommendations, and in accordance with the placement plans, and requirements of this Section.

B. Install temporary shoring, if required, before placing deck panels.

C. Place deck panels on structural supports and adjust to final position with ends aligned. Attach firmly to the supports immediately after placement in order to form a safe working platform.

D. Cut and neatly fit deck units and accessories around openings and other work projecting through or adjacent to the decking.

E. Trades that subsequently cut unscheduled openings through the deck are responsible for reinforcing the openings.

3.4 Installation, Form Deck

A. Anchor deck units to steel supporting members by arc spot puddle welds of the following diameter and spacing, or fillet welds of equal strength.

1. For deck units with metal thickness equal to or greater than 0.028 inches (22 gage, 0.7 mm) use 5/8 inch (15 mm) minimum visible diameter welds with the weld pattern shown on the design drawings.

2. For deck units with metal thickness less than 0.028 inches (22 gage, 0.7 mm) weld deck through manufacturer's standard welding washers with the weld pattern shown on the design drawings.

3. Mechanical fasteners, either powder actuated or pneumatically driven, or screws may be used in lieu of welding to fasten deck to supporting framing, provided they have been specifically approved.

4. Fasten side laps and perimeter edges of units between supports at intervals not exceeding 36 inches (1 m) on center, using one of the following methods:

a. #10 self drilling screws;
b. crimp or button punch;
c. arc puddle welds—5/8 inch (15 mm) minimum visible diameter or 1 inch (25 mm) long fillet welds.

B. Install deck ends over supports with a minimum end bearing of 1.5 inches (40 mm).

C. Fasten pour stops and girder fillers to supporting structure according to the manufacturers recommendations.

D. Fasten column closures, cell closures, and Z closures to deck to provide tight fitting closures at open ends of ribs and sides of decking. Fasten cell closures at changes of direction of deck units unless otherwise directed.

3.5 Repairs

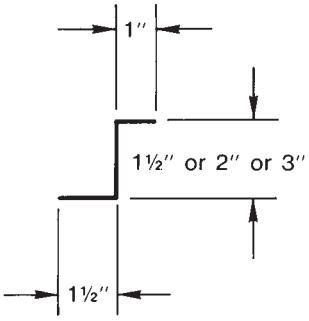
A. Before concrete placement, the deck shall be inspected for tears, dents, or other damage that may prevent the deck from acting as a tight and substantial form. The need for the repair or temporary shoring of the damaged deck shall be determined.

FLOOR-CEILING ASSEMBLIES WITH FORM DECKS

Restrained Assembly Rating	Type of Protection	Concrete Thickness & Type (1)	U.L. Design No. (2,3)	Type of Form Deck	Unrestrained Beam Rating
1 Hr.	Exposed Grid	2 1/2" NW	G256 +	0.6C, 1.0C, 1.3C, 1.5C	1,2,3 Hr.
	Cementitious	2 1/2" NW&LW	G701	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2,3 Hr.
			G705	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
		2 3/4" NW&LW	G702	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
	Sprayed Fiber	2 1/2" NW&LW	G801	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
			G804	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
		2 3/4" NW&LW	G802	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
1 1/2 Hr.	Exposed Grid	2" NW	G229 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2,3 Hr.
		2 1/2" NW	G228 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2 Hr.
			G243 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2 Hr.
		3" NW	G213 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2,3 Hr.
	Gypsum Board	2" NW&LW	G502 +	0.6C, 1.0C, 1.3C, 1.5C	
	Cementitious	2 1/2" NW&LW	G701	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2,3 Hr.
			G705	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
		2 3/4" NW&LW	G702	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
	Sprayed Fiber	2 1/2" NW&LW	G801	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
			G804	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
		2 3/4" NW&LW	G802	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
2 Hr.	Concealed Grid		G023 +	0.6C, 1.0C, 1.3C, 1.5C	2 Hr.
		2 1/2" NW	G031 +	0.6C, 1.0C, 1.3C, 1.5C	3 Hr.
			G036 +	0.6C, 1.0C, 1.3C, 1.5C	3 Hr.
	Exposed Grid	2 1/2" NW	G227 +	0.6C, 1.0C, 1.3C, 1.5C	3 Hr.
			G228 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2 Hr.
			G229 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2,3 Hr.
			G243 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2 Hr.
			G256 +	0.6C, 1.0C, 1.3C, 1.5C	1,2,3 Hr.
		3" NW	G213 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2,3 Hr.
	Gypsum Board	2" NW	G505 +	0.6C, 1.0C, 1.3C, 1.5C	
		2 1/2" NW&LW	G529 +	0.6C, 1.0C, 1.3C, 1.5C	2,3 Hr.
		2 1/2" NW	G514 +	0.6C, 1.0C, 1.3C, 1.5C	3 Hr.
			G523 +	0.6C, 1.0C, 1.3C, 1.5C	2 Hr.
	Cementitious	2 1/2" NW&LW	G701	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2,3 Hr.
			G705	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
		2 3/4" NW&LW	G702	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
	Sprayed Fiber	2 1/2" NW&LW	G801	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
			G804	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
		2 3/4" NW&LW	G802	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
3 Hr.	Concealed Grid	3 1/4" NW	G036 +	0.6C, 1.0C, 1.3C, 1.5C	3 Hr.
		3 1/2" NW	G033 +	0.6C, 1.0C, 1.3C, 1.5C	3 Hr.
	Exposed Grid	3 1/4" NW	G229 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2,3 Hr.
		3 1/2" NW	G213 +	0.6C, 1.0C, 1.3C, 1.5C	1.5,2,3 Hr.
			G256 +	0.6C, 1.0C, 1.3C, 1.5C	1,2,3 Hr.
	Gypsum Board	3 1/4" NW&LW	G529 +	0.6C, 1.0C, 1.3C, 1.5C	3 Hr.
	Cementitious	2 3/4" NW&LW	G701	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2,3 Hr.
			G705	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.
	Sprayed Fiber	2 3/4" NW&LW	G801	0.6C, 1.0C, 1.3C, 1.5C	1,1.5,2 Hr.

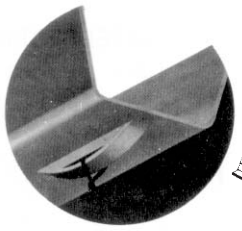
NOTES:
1. Concrete thickness is thickness of slab above deck, in.
2. Refer to the U.L. "Fire Resistance Directory" for the necessary construction details.
3. Deck finish shall be galvanized unless noted otherwise.
   + Denotes deck finish is not critical when used in G0--, G2-- & G5-- Series designs. Deck finish shall be galvanized or painted.

NON-COMPOSITE & COMPOSITE DECK DETAILS

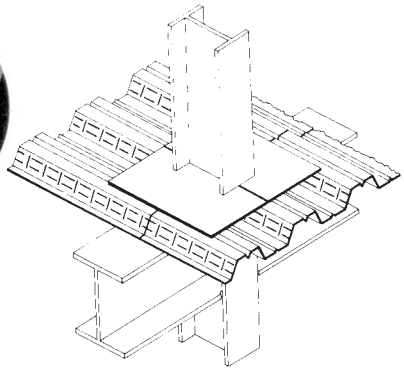


"Z" Closure

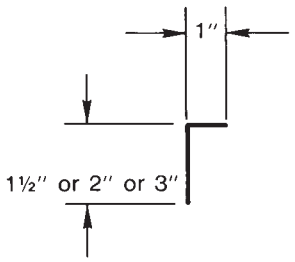
Piercing Type Hanger Tab



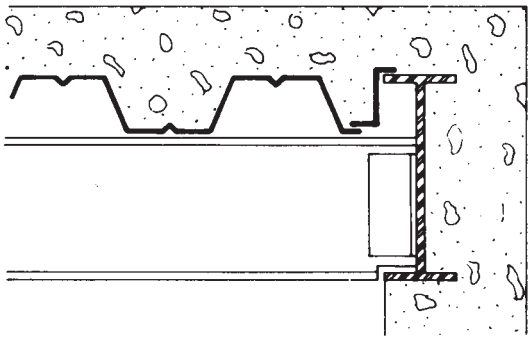
Hanger Tab
Max. Load
60 lbs. per Tab
#12 Wire Minimum



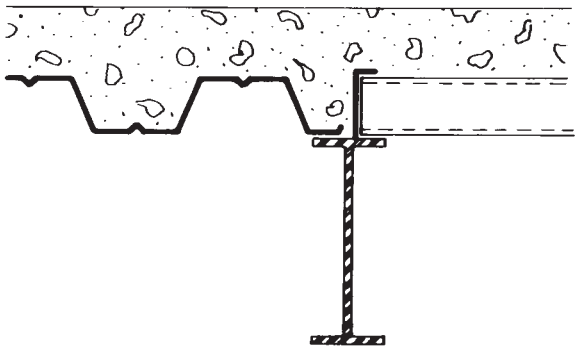
COLUMN CLOSURE



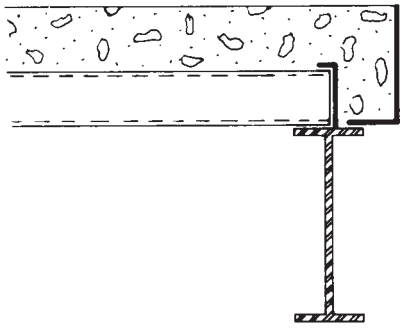
Cell Closure



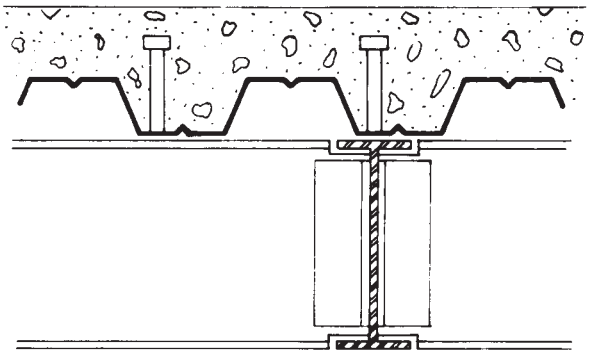
"z" CLOSURE



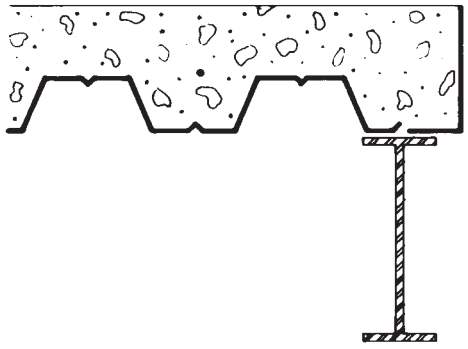
CELL CLOSURE



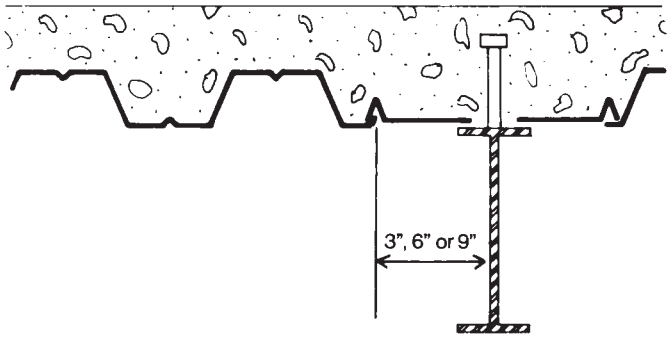
POUR STOP AT END



STUD LOCATIONS



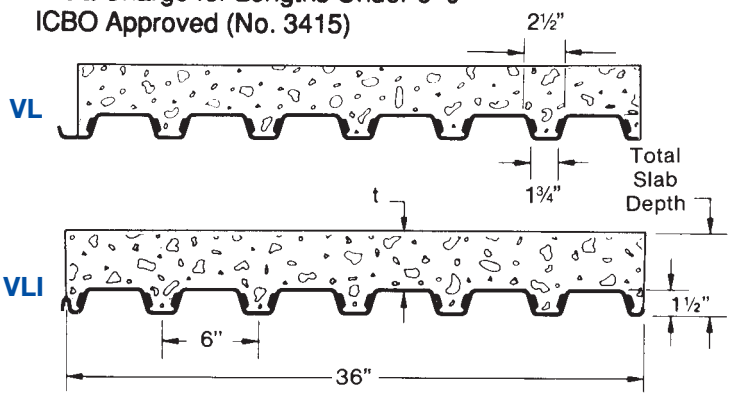
POUR STOP AT SIDE



GIRDER FILLER

1.5 VL, VLI

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0
ICBO Approved (No. 3415)



STEEL SECTION PROPERTIES

Fy= 40 KSI

Deck Type	Design Thick.	Weight PSF	Ip in^4/Ft	In in^4/Ft	Sp in^3/Ft	Sn in^3/Ft
1.5VL22	0.0295	1.78	0.150	0.182	0.178	0.186
1.5VL21	0.0329	1.97	0.174	0.205	0.209	0.215
1.5VL20	0.0358	2.14	0.195	0.222	0.231	0.240
1.5VL19	0.0418	2.49	0.239	0.260	0.274	0.288
1.5VL18	0.0474	2.82	0.282	0.295	0.315	0.327
1.5VL17	0.0538	3.19	0.331	0.335	0.361	0.371
1.5VL16	0.0598	3.54	0.373	0.373	0.404	0.411

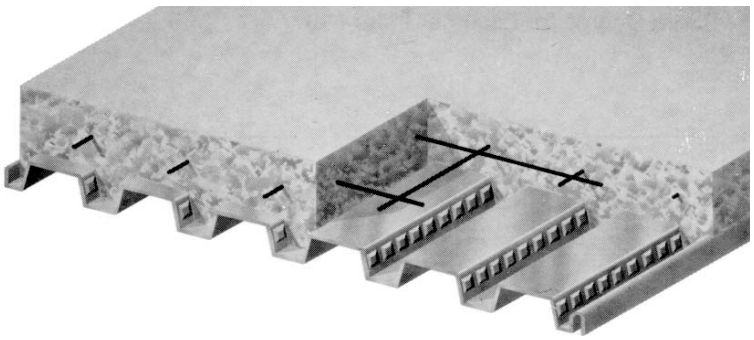
(N=9) NORMAL WEIGHT CONCRETE (145 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span			Superimposed Live Load, PSF Clear Span (ft.-in.)														
		1 Span	2 Span	3 Span	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0
	1.5VL22	5'-2	6'-11	7'-0	314	259	230	206	186	169	154	141	130	120	111	100	87	76	67
3 1/2"	1.5VL21	5'-9	7'-8	7'-9	331	294	243	218	197	179	163	150	138	127	118	104	91	80	70
	1.5VL20	6'-2	8'-3	8'-4	345	306	275	228	206	187	171	157	144	133	124	108	94	82	73
(t=2")	1.5VL19	6'-10	9'-2	9'-4	372	330	296	268	223	203	186	171	157	145	134	116	101	88	78
	1.5VL18	7'-6	9'-11	10'-2	395	351	315	285	260	238	199	182	168	156	142	123	107	94	82
33 PSF	1.5VL17	8'-2	10'-6	10'-10	397	353	316	286	261	239	221	183	169	157	145	131	114	99	87
	1.5VL16	8'-8	11'-0	11'-5	397	353	316	286	261	239	221	205	169	156	145	135	119	105	92
	1.5VL22	4'-11	6'-6	6'-7	342	301	267	240	216	196	179	164	151	139	129	119	111	103	96
4"	1.5VL21	5'-5	7'-3	7'-4	385	318	283	253	229	208	190	174	160	148	137	127	118	110	102
	1.5VL20	5'-10	7'-9	7'-11	400	356	295	264	239	217	198	182	167	155	143	133	124	116	108
(t=2 1/2")	1.5VL19	6'-6	8'-8	8'-10	400	383	344	311	259	235	215	197	182	168	156	145	135	126	115
	1.5VL18	7'-1	9'-5	9'-7	400	400	365	330	301	251	229	211	194	180	167	156	145	136	122
39 PSF	1.5VL17	7'-8	10'-0	10'-4	400	400	366	331	302	277	230	211	195	180	168	156	146	136	128
	1.5VL16	8'-2	10'-6	10'-10	400	400	365	330	301	276	255	211	194	180	167	155	145	136	127
	1.5VL22	4'-8	6'-3	6'-4	392	345	307	275	248	225	205	188	173	159	147	137	127	118	110
4 1/2"	1.5VL21	5'-2	6'-11	7'-0	400	364	324	290	262	238	217	199	183	169	157	145	135	126	117
	1.5VL20	5'-6	7'-5	7'-6	400	400	338	303	274	249	227	208	192	177	164	152	142	132	123
(t=3")	1.5VL19	6'-2	8'-3	8'-4	400	400	393	328	296	269	246	226	208	193	179	166	155	145	135
	1.5VL18	6'-8	8'-11	9'-2	400	400	400	378	315	287	262	241	222	206	191	178	166	155	145
45 PSF	1.5VL17	7'-3	9'-6	9'-10	400	400	400	378	345	287	263	241	223	206	191	178	166	155	146
	1.5VL16	7'-9	10'-0	10'-4	400	400	400	377	344	315	262	240	222	205	190	177	165	155	145
	1.5VL22	4'-6	6'-0	6'-1	400	391	347	311	280	254	232	213	195	180	167	155	143	133	124
5"	1.5VL21	4'-11	6'-8	6'-9	400	400	366	328	297	269	246	225	207	191	177	164	153	142	133
	1.5VL20	5'-3	7'-1	7'-2	400	400	382	343	310	281	257	236	217	200	186	172	160	150	140
(t=3 1/2")	1.5VL19	5'-10	7'-11	8'-0	400	400	400	370	335	304	278	255	235	218	202	188	175	163	153
	1.5VL18	6'-4	8'-7	8'-9	400	400	400	394	356	324	297	272	251	233	216	201	187	175	164
51 PSF	1.5VL17	6'-11	9'-1	9'-5	400	400	400	400	357	325	297	273	251	233	216	201	188	176	164
	1.5VL16	7'-4	9'-7	9'-10	400	400	400	400	388	323	295	271	250	232	215	200	187	175	164
	1.5VL22	4'-4	5'-9	5'-10	400	400	388	348	314	285	260	238	219	202	187	173	160	149	139
5 1/2"	1.5VL21	4'-9	6'-5	6'-6	400	400	400	367	332	301	275	252	232	214	198	184	171	159	148
	1.5VL20	5'-1	6'-10	6'-11	400	400	400	383	346	315	287	263	243	224	208	193	179	167	156
(t=4")	1.5VL19	5'-7	7'-7	7'-8	400	400	400	400	374	340	311	286	263	243	226	210	196	183	171
	1.5VL18	6'-1	8'-3	8'-4	400	400	400	400	399	363	332	305	281	260	241	225	210	196	183
57 PSF	1.5VL17	6'-7	8'-9	9'-0	400	400	400	400	399	363	332	305	281	260	242	225	210	196	184
	1.5VL16	7'-1	9'-2	9'-6	400	400	400	400	400	361	330	303	279	259	240	224	209	195	183
	1.5VL22	4'-2	5'-7	5'-8	400	400	400	385	347	315	288	263	242	223	207	191	178	165	154
6"	1.5VL21	4'-7	6'-2	6'-3	400	400	400	400	367	334	304	279	257	237	220	204	189	176	164
	1.5VL20	4'-10	6'-7	6'-8	400	400	400	400	383	348	318	292	269	248	230	214	199	185	173
(t=4 1/2")	1.5VL19	5'-5	7'-4	7'-5	400	400	400	400	400	377	344	316	291	270	250	233	217	202	189
	1.5VL18	5'-10	7'-11	8'-1	400	400	400	400	400	400	367	337	311	288	267	249	232	217	203
63 PSF	1.5VL17	6'-4	8'-5	8'-8	400	400	400	400	400	400	367	337	311	288	267	249	232	217	204
	1.5VL16	6'-9	8'-10	9'-2	400	400	400	400	400	399	365	335	309	286	266	248	231	216	202

Notes:
1. Minimum exterior bearing length required is 1.5 inches. Minimum interior bearing length required is 3.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

SLAB INFORMATION

Total Slab Depth	Theo. Concrete Volume Yds./ 100 Sq. Ft.	Theo. Concrete Volume Cu. Ft./ Sq. Ft.	Recommended Welded Wire Fabric
3 1/2 "	0.78	0.210	6x6-W1.4xW1.4
4"	0.93	0.252	6x6-W1.4xW1.4
4 1/2"	1.09	0.294	6x6-W1.4xW1.4
4 3/4"	1.16	0.314	6x6-W1.4xW1.4
5"	1.24	0.335	6x6-W2.1xW2.1
5 1/2"	1.40	0.377	6x6-W2.1xW2.1
5 3/4"	1.47	0.398	6x6-W2.1xW2.1
6"	1.55	0.418	6x6-W2.1xW2.1



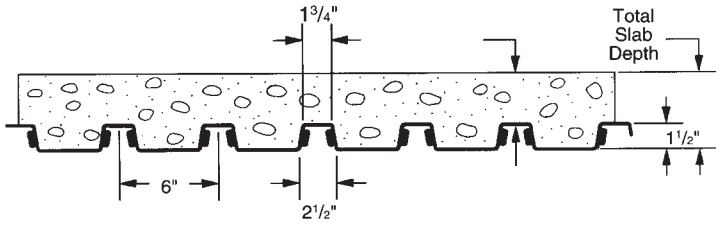
(N=14) LIGHTWEIGHT CONCRETE (110 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span			Superimposed Live Load, PSF Clear Span (ft.-in.)														
		1 Span	2 Span	3 Span	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0
	1.5VL22	5'-7	7'-5	7'-6	278	247	206	185	167	152	139	124	105	89	76	66	57	50	44
3 1/2"	1.5VL21	6'-3	8'-3	8'-5	293	260	233	195	177	161	147	130	110	93	80	69	60	53	46
	1.5VL20	6'-8	8'-11	9'-0	305	271	243	220	185	168	154	135	114	97	83	72	62	54	48
(t=2")	1.5VL19	7'-6	10'-0	10'-1	329	292	262	237	216	198	167	145	122	104	89	77	67	58	51
	1.5VL18	8'-2	10'-8	11'-0	350	311	279	252	230	211	184	153	129	110	94	81	71	62	54
26 PSF	1.5VL17	8'-11	11'-4	11'-8	352	312	280	253	231	212	195	163	137	116	100	86	75	66	58
	1.5VL16	9'-6	11'-10	12'-3	352	312	280	253	231	212	195	171	144	122	105	91	79	69	61
	1.5VL22	5'-4	7'-1	7'-2	324	269	239	215	194	177	161	148	136	126	113	98	85	75	66
4"	1.5VL21	5'-11	7'-11	8'-0	341	303	253	227	205	187	171	157	145	134	119	102	89	78	69
	1.5VL20	6'-4	8'-5	8'-7	355	315	283	237	214	195	178	164	151	140	123	106	92	81	71
(t=2 1/2")	1.5VL19	7'-1	9'-6	9'-7	382	339	304	275	251	211	193	178	164	152	131	113	99	86	76
	1.5VL18	7'-9	10'-2	10'-6	400	360	323	292	266	244	206	189	175	162	139	120	104	91	80
30 PSF	1.5VL17	8'-5	10'-10	11'-2	400	361	324	293	267	245	226	190	175	163	147	127	111	97	85
	1.5VL16	9'-0	11'-4	11'-9	400	360	323	292	266	244	225	209	195	162	151	134	116	102	90
	1.5VL22	5'-1	6'-9	6'-10	372	309	275	246	223	202	185	170	156	145	134	125	116	106	93
4 1/2"	1.5VL21	5'-8	7'-7	7'-8	391	347	290	260	235	214	196	180	166	153	142	132	123	111	97
	1.5VL20	6'-0	8'-1	8'-2	400	361	324	272	246	223	204	188	173	160	149	139	129	114	101
(t=3")	1.5VL19	6'-9	9'-0	9'-2	400	388	348	315	265	242	221	203	188	174	162	151	140	122	107
	1.5VL18	7'-4	9'-9	10'-0	400	400	369	334	305	257	236	217	200	186	173	161	147	129	114
35 PSF	1.5VL17	8'-0	10'-4	10'-8	400	400	370	335	305	280	258	217	200	186	173	161	151	137	120
	1.5VL16	8'-6	10'-10	11'-3	400	400	369	334	304	279	257	239	199	185	172	160	150	140	126
	1.5VL22	5'-0	6'-8	6'-9	396	329	293	263	237	216	197	181	167	154	143	133	124	116	108
4 3/4"	1.5VL21	5'-6	7'-5	7'-6	400	370	309	277	251	228	208	191	177	163	152	141	132	123	114
	1.5VL20	5'-11	7'-11	8'-0	400	385	322	289	262	238	218	200	185	171	159	148	138	129	118
(t=3 1/4")	1.5VL19	6'-7	8'-10	8'-11	400	400	371	336	283	257	235	216	200	185	172	160	150	140	126
	1.5VL18	7'-2	9'-7	9'-9	400	400	393	356	324	274	251	231	213	198	184	171	160	150	133
37 PSF	1.5VL17	7'-9	10'-2	10'-6	400	400	394	356	325	298	251	231	213	198	184	171	160	150	141
	1.5VL16	8'-4	10'-8	11'-0	400	400	392	355	324	297	274	230	212	197	183	171	159	149	140
	1.5VL22	4'-11	6'-6	6'-7	397	350	311	279	252	229	209	192	177	164	152	141	131	123	115
5"	1.5VL21	5'-5	7'-3	7'-4	400	369	328	295	266	242	221	203	188	174	161	150	140	131	122
	1.5VL20	5'-9	7'-9	7'-10	400	400	342	307	278	253	231	212	196	181	168	157	146	137	128
(t=3 1/2")	1.5VL19	6'-5	8'-8	8'-9	400	400	394	332	300	273	250	230	212	197	183	170	159	149	140
	1.5VL18	7'-0	9'-4	9'-7	400	400	400	378	344	291	266	245	226	210	195	182	170	159	150
39 PSF	1.5VL17	7'-7	9'-11	10'-3	400	400	400	378	345	316	266	245	226	210	195	182	170	159	150
	1.5VL16	8'-2	10'-5	10'-9	400	400	400	377	343	315	291	244	225	209	194	181	169	159	149
	1.5VL22	4'-7	6'-2	6'-3	400	400	367	329	297	270	247	227	209	193	179	166	155	145	135
5 3/4"	1.5VL21	5'-2	6'-11	7'-0	400	400	387	347	314	286	261	240	221	205	190	177	165	154	144
	1.5VL20	5'-6	7'-4	7'-5	400	400	400	362	327	298	272	250	231	214	199	185	172	161	151
(t=4 1/4")	1.5VL19	6'-1	8'-2	8'-4	400	400	400	391	354	322	295	271	250	232	215	201	187	175	165
	1.5VL18	6'-7	8'-10	9'-1	400	400	400	400	376	343	314	289	267	247	230	214	200	188	176
46 PSF	1.5VL17	7'-2	9'-5	9'-9	400	400	400	400	400	343	314	289	267	247	230	214	200	188	176
	1.5VL16	7'-8	9'-11	10'-3	400	400	400	400	400	371	312	287	265	246	229	213	199	187	175

Notes:
1. Minimum exterior bearing length required is 1.5 inches. Minimum interior bearing length required is 3.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

1.5 VLR

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0



STEEL SECTION PROPERTIES

Fy= 40 KSI

Deck Type	Design Thick.	Weight PSF	Ip in^4/Ft	In in^4/Ft	Sp in^3/Ft	Sn in^3/Ft
1.5VLR22	0.0295	1.78	0.182	0.150	0.186	0.178
1.5VLR21	0.0329	1.97	0.205	0.174	0.215	0.209
1.5VLR20	0.0358	2.14	0.222	0.195	0.240	0.231
1.5VLR19	0.0418	2.49	0.260	0.239	0.288	0.274
1.5VLR18	0.0474	2.82	0.295	0.282	0.327	0.315
1.5VLR17	0.0538	3.19	0.335	0.331	0.371	0.361
1.5VLR16	0.0598	3.54	0.373	0.373	0.411	0.404

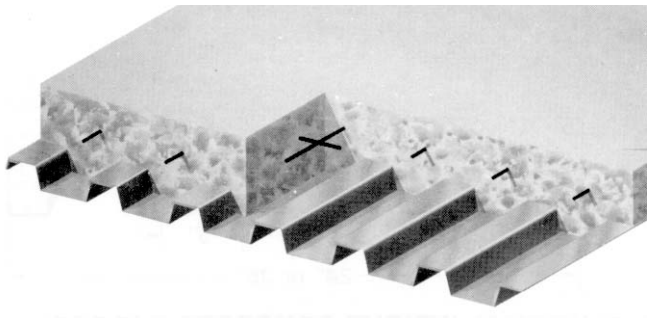
(N=9) NORMAL WEIGHT CONCRETE (145 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span			Superimposed Live Load, PSF Clear Span (ft.-in.)														
		1 Span	2 Span	3 Span	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0
	1.5VLR22	5'-1	6'-9	6'-10	314	255	227	203	183	166	151	138	127	117	108	100	87	76	67
3 1/2"	1.5VLR21	5'-7	7'-6	7'-7	331	294	240	215	194	176	160	147	135	124	115	104	91	80	70
	1.5VLR20	6'-0	8'-0	8'-2	345	306	275	225	203	184	168	154	141	130	120	108	94	82	73
(t=2")	1.5VLR19	6'-9	8'-8	9'-0	372	330	296	268	220	200	182	167	154	142	132	116	101	88	78
	1.5VLR18	7'-3	9'-3	9'-7	395	351	315	285	260	214	195	179	165	152	141	123	107	94	82
38 PSF	1.5VLR17	7'-10	9'-11	10'-3	397	353	316	286	261	239	196	180	166	153	142	131	114	99	87
	1.5VLR16	8'-4	10'-5	10'-10	397	353	316	286	261	239	221	180	165	153	142	132	119	105	92
	1.5VLR22	4'-10	6'-6	6'-7	339	298	264	236	213	193	176	161	148	136	125	116	108	100	92
4"	1.5VLR21	5'-4	7'-2	7'-3	385	315	279	250	225	204	186	171	157	144	134	124	115	107	99
	1.5VLR20	5'-8	7'-7	7'-9	400	356	292	261	236	214	195	179	164	151	140	130	121	112	105
(t=2 1/2")	1.5VLR19	6'-5	8'-3	8'-7	400	383	344	283	255	232	212	194	179	165	153	142	132	123	115
	1.5VLR18	6'-11	8'-10	9'-2	400	400	365	330	272	248	226	207	191	177	164	152	142	132	122
44 PSF	1.5VLR17	7'-5	9'-5	9'-9	400	400	366	331	302	248	227	208	192	177	164	153	142	133	124
	1.5VLR16	7'-11	9'-11	10'-3	400	400	365	330	301	276	226	207	191	176	163	152	142	132	124
	1.5VLR22	4'-8	6'-2	6'-3	389	342	303	271	245	222	202	185	170	156	144	133	124	115	107
4 1/2"	1.5VLR21	5'-1	6'-10	6'-11	400	361	321	287	259	235	214	196	180	166	153	142	132	123	114
	1.5VLR20	5'-5	7'-3	7'-5	400	377	335	300	270	245	224	205	188	174	161	149	139	129	120
(t=3")	1.5VLR19	6'-1	7'-11	8'-2	400	400	393	324	293	266	243	223	205	189	175	163	151	141	132
	1.5VLR18	6'-7	8'-5	8'-9	400	400	400	378	312	284	259	238	219	202	188	174	162	152	142
50 PSF	1.5VLR17	7'-1	9'-0	9'-4	400	400	400	378	345	284	259	238	219	203	188	175	163	152	142
	1.5VLR16	7'-6	9'-6	9'-10	400	400	400	377	344	315	258	237	218	202	187	174	162	151	141
	1.5VLR22	4'-5	6'-0	6'-1	400	387	344	308	277	251	229	209	192	177	164	151	140	130	121
5"	1.5VLR21	4'-10	6'-7	6'-8	400	400	363	325	293	266	243	222	204	188	174	161	150	139	130
	1.5VLR20	5'-3	7'-0	7'-1	400	400	379	339	306	278	253	232	214	197	182	169	157	146	136
(t=3 1/2")	1.5VLR19	5'-10	7'-7	7'-10	400	400	400	367	331	301	275	252	232	214	199	184	172	160	149
	1.5VLR18	6'-3	8'-1	8'-5	400	400	400	391	353	321	293	269	248	229	212	198	184	172	161
56 PSF	1.5VLR17	6'-9	8'-8	8'-11	400	400	400	400	353	321	293	269	248	229	213	198	184	172	161
	1.5VLR16	7'-2	9'-2	9'-5	400	400	400	400	388	320	292	268	247	228	212	197	183	171	160
	1.5VLR22	4'-3	5'-9	5'-10	400	400	385	344	310	281	256	235	216	199	183	170	157	146	136
5 1/2"	1.5VLR21	4'-8	6'-4	6'-5	400	400	400	364	328	298	272	249	229	211	195	181	168	156	145
	1.5VLR20	5'-0	6'-9	6'-10	400	400	400	380	343	311	284	260	239	221	204	190	176	164	153
(t=4")	1.5VLR19	5'-7	7'-4	7'-7	400	400	400	400	371	337	308	282	260	240	222	207	192	179	168
	1.5VLR18	6'-0	7'-10	8'-1	400	400	400	400	395	359	328	301	278	257	238	221	206	193	180
62 PSF	1.5VLR17	6'-6	8'-4	8'-7	400	400	400	400	395	359	328	301	278	257	238	221	206	193	180
	1.5VLR16	6'-11	8'-10	9'-1	400	400	400	400	393	357	327	300	276	255	237	220	205	192	179
	1.5VLR22	4'-2	5'-7	5'-8	400	400	400	382	344	312	284	260	239	220	204	188	175	162	151
6"	1.5VLR21	4'-6	6'-1	6'-2	400	400	400	400	364	330	301	276	254	234	216	201	186	173	161
	1.5VLR20	4'-10	6'-6	6'-8	400	400	400	400	380	345	315	289	265	245	227	210	196	182	170
(t=4 1/2")	1.5VLR19	5'-5	7'-1	7'-3	400	400	400	400	400	374	341	313	288	266	247	229	213	199	186
	1.5VLR18	5'-10	7'-6	7'-10	400	400	400	400	400	398	364	334	308	285	264	245	229	214	200
68 PSF	1.5VLR17	6'-3	8'-1	8'-4	400	400	400	400	400	398	364	334	308	285	264	246	229	214	200
	1.5VLR16	6'-8	8'-6	8'-9	400	400	400	400	400	396	362	332	306	283	262	244	228	213	199

Notes:
1. Minimum exterior bearing length required is 1.5 inches. Minimum interior bearing length required is 3.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

SLAB INFORMATION

Total Slab Depth	Theo. Concrete Volume Yds./ 100 Sq. Ft.	Theo. Concrete Volume Cu. Ft./ Sq. Ft.	Recommended Welded Wire Fabric
3 1/2 "	0.91	0.246	6x6-W1.4xW1.4
4"	1.06	0.287	6x6-W1.4xW1.4
4 1/2"	1.22	0.329	6x6-W1.4xW1.4
4 3/4"	1.30	0.350	6x6-W1.4xW1.4
5"	1.37	0.371	6x6-W2.1xW2.1
5 1/2"	1.53	0.412	6x6-W2.1xW2.1
5 3/4"	1.60	0.433	6x6-W2.1xW2.1
6"	1.68	0.454	6x6-W2.1xW2.1



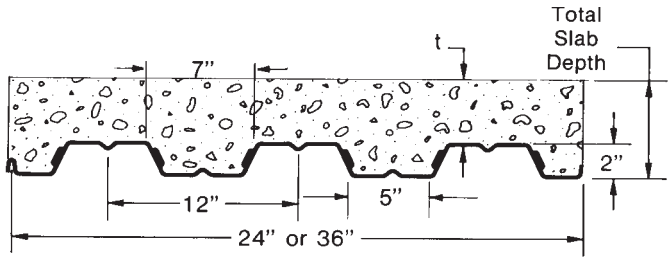
(N=14) LIGHTWEIGHT CONCRETE (110 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span 1 Span	2 Span	3 Span	Superimposed Live Load, PSF Clear Span (ft.-in.) 5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0
	1.5VLR22	5'-6	7'-4	7'-5	278	247	203	182	164	149	136	124	105	89	76	66	57	50	44
3 1/2"	1.5VLR21	6'-1	8'-1	8'-3	293	260	233	193	174	158	144	130	110	93	80	69	60	53	46
	1.5VLR20	6'-7	8'-8	8'-10	305	271	243	220	182	165	151	135	114	97	83	72	62	54	48
(t=2")	1.5VLR19	7'-4	9'-5	9'-9	329	292	262	237	216	180	164	145	122	104	89	77	67	58	51
	1.5VLR18	8'-0	10'-1	10'-5	350	311	279	252	230	211	184	153	129	110	94	81	71	62	54
29 PSF	1.5VLR17	8'-7	10'-9	11'-1	352	312	280	253	231	212	195	163	137	116	100	86	75	66	58
	1.5VLR16	9'-2	11'-4	11'-8	352	312	280	253	231	212	195	171	144	122	105	91	79	69	61
	1.5VLR22	5'-3	7'-0	7'-1	324	267	237	212	192	174	159	146	134	124	113	98	85	75	66
4"	1.5VLR21	5'-10	7'-9	7'-10	341	303	250	225	203	184	168	154	142	131	119	102	89	78	69
	1.5VLR20	6'-3	8'-3	8'-5	355	315	283	234	212	192	176	161	149	137	123	106	92	81	71
(t=2 1/2")	1.5VLR19	7'-0	9'-0	9'-4	382	339	304	275	251	208	191	175	161	149	131	113	99	86	76
	1.5VLR18	7'-7	9'-7	9'-11	400	360	323	292	266	244	203	187	172	160	139	120	104	91	80
34 PSF	1.5VLR17	8'-2	10'-3	10'-7	400	361	324	293	267	245	226	187	173	160	147	127	111	97	85
	1.5VLR16	8'-8	10'-10	11'-2	400	360	323	292	266	244	225	209	172	159	148	134	116	102	90
	1.5VLR22	5'-1	6'-9	6'-10	372	306	272	244	220	200	183	167	154	142	132	122	114	106	93
4 1/2"	1.5VLR21	5'-7	7'-5	7'-6	391	347	288	258	233	212	193	177	163	151	140	130	121	111	97
	1.5VLR20	6'-0	8'-0	8'-1	400	361	324	269	243	221	202	185	171	158	146	136	127	114	101
(t=3")	1.5VLR19	6'-8	8'-8	8'-11	400	388	348	315	263	239	219	201	185	171	159	148	138	122	107
	1.5VLR18	7'-3	9'-3	9'-7	400	400	369	334	305	255	233	214	198	183	170	158	147	129	114
38 PSF	1.5VLR17	7'-10	9'-10	10'-2	400	400	370	335	305	280	233	214	198	183	170	159	148	137	120
	1.5VLR16	8'-3	10'-5	10'-9	400	400	369	334	304	279	257	213	197	182	169	158	147	138	126
	1.5VLR22	5'-0	6'-8	6'-9	396	327	290	260	235	213	195	178	164	152	141	130	121	113	106
4 3/4"	1.5VLR21	5'-5	7'-4	7'-5	400	345	306	275	248	226	206	189	174	161	149	139	129	120	113
	1.5VLR20	5'-10	7'-10	7'-11	400	385	320	287	259	235	215	198	182	168	156	145	135	126	118
(t=3 1/4")	1.5VLR19	6'-7	8'-6	8'-9	400	400	371	336	280	255	233	214	197	183	170	158	147	138	126
	1.5VLR18	7'-1	9'-1	9'-4	400	400	393	356	324	271	248	228	211	195	181	169	158	147	133
41 PSF	1.5VLR17	7'-8	9'-8	10'-0	400	400	394	356	325	298	248	228	211	195	181	169	158	148	138
	1.5VLR16	8'-1	10'-2	10'-7	400	400	392	355	324	297	274	227	210	194	180	168	157	147	138
	1.5VLR22	4'-10	6'-6	6'-7	394	347	308	276	250	227	207	190	175	161	149	139	129	120	112
5"	1.5VLR21	5'-4	7'-2	7'-3	400	366	326	292	264	240	219	201	185	171	159	147	137	128	120
	1.5VLR20	5'-9	7'-8	7'-10	400	400	340	305	275	250	229	210	193	179	166	154	144	134	126
(t=3 1/2")	1.5VLR19	6'-5	8'-4	8'-7	400	400	394	329	298	271	247	227	210	194	180	168	157	146	137
	1.5VLR18	6'-11	8'-11	9'-2	400	400	400	378	317	288	264	242	224	207	192	179	167	157	147
43 PSF	1.5VLR17	7'-6	9'-6	9'-10	400	400	400	378	345	316	264	243	224	207	193	179	168	157	147
	1.5VLR16	7'-11	10'-0	10'-4	400	400	400	377	343	315	263	241	223	206	192	178	167	156	146
	1.5VLR22	4'-8	6'-3	6'-3	400	400	364	326	295	268	244	224	206	191	177	164	153	142	133
5 3/4"	1.5VLR21	5'-1	6'-10	6'-11	400	400	384	345	311	283	259	237	219	202	187	174	162	152	142
	1.5VLR20	5'-5	7'-3	7'-5	400	400	400	360	325	295	270	248	229	211	196	182	170	159	149
(t=4 1/4")	1.5VLR19	6'-1	7'-11	8'-2	400	400	400	388	351	319	292	268	248	229	213	198	185	173	162
	1.5VLR18	6'-7	8'-5	8'-9	400	400	400	400	374	340	311	286	264	245	227	212	198	185	174
50 PSF	1.5VLR17	7'-1	9'-0	9'-4	400	400	400	400	400	340	311	286	264	245	227	212	198	185	174
	1.5VLR16	7'-6	9'-6	9'-10	400	400	400	400	400	371	309	284	263	243	226	211	197	184	173

Notes:
1. Minimum exterior bearing length required is 1.5 inches. Minimum interior bearing length required is 3.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

2 VLI

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0
ICBO Approved (No. 3415)



STEEL SECTION PROPERTIES Fy= 40 KSI

Deck Type	Design Thick.	Weight PSF	Ip in^4/ft	In in^4/ft	Sp in^3/ft	Sn in^3/ft
2VLI22	0.0295	1.62	0.332	0.329	0.274	0.277
2VLI21	0.0329	1.81	0.378	0.375	0.317	0.321
2VLI20	0.0358	1.97	0.418	0.415	0.355	0.360
2VLI19	0.0418	2.30	0.493	0.492	0.435	0.443
2VLI18	0.0474	2.61	0.557	0.557	0.512	0.518
2VLI17	0.0538	2.96	0.633	0.633	0.589	0.589
2VLI16	0.0598	3.29	0.704	0.704	0.653	0.653

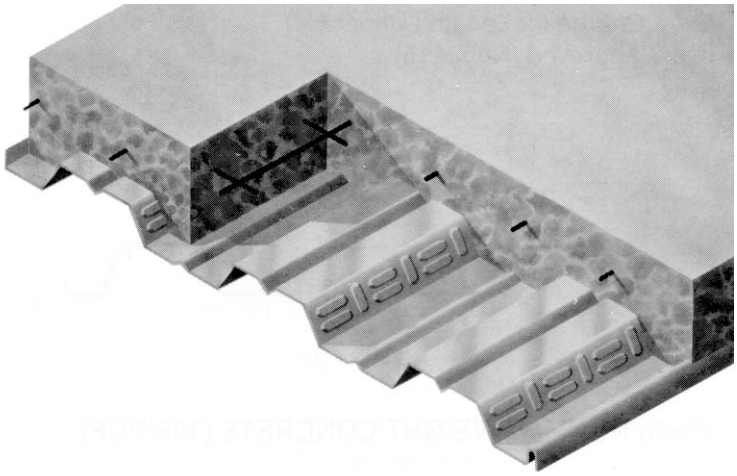
(N=9) NORMAL WEIGHT CONCRETE (145 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span			Superimposed Live Load, PSF Clear Span (ft.-in.)													
		1 Span	2 Span	3 Span	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6
	2VLI22	6'-6	8'-9	8'-10	274	239	211	164	145	129	115	104	94	85	78	71	65	59	54
4"	2VLI21	7'-2	9'-5	9'-8	294	255	224	200	155	138	123	111	100	91	83	76	69	64	58
	2VLI20	7'-8	9'-11	10'-3	310	269	236	210	188	146	130	117	106	96	87	80	73	67	62
(t=2")	2VLI19	8'-8	11'-0	11'-4	344	298	261	231	207	186	169	130	117	106	97	88	81	74	68
	2VLI18	9'-6	11'-10	12'-3	373	324	285	253	228	206	188	172	159	122	112	103	95	87	81
39 PSF	2VLI17	10'-4	12'-7	13'-0	400	351	308	273	245	221	201	184	170	157	120	111	102	94	87
	2VLI16	10'-11	13'-2	13'-5	400	376	330	292	261	235	214	195	180	166	154	118	109	100	93
	2VLI22	6'-2	8'-4	8'-5	319	278	217	190	168	150	134	121	109	99	90	83	76	69	63
4 1/2"	2VLI21	6'-9	8'-11	9'-3	341	297	261	204	180	160	144	129	117	106	97	88	81	74	68
	2VLI20	7'-3	9'-5	9'-9	361	313	275	244	190	169	152	136	123	112	102	93	85	78	72
(t=2 1/2")	2VLI19	8'-2	10'-5	10'-10	400	346	303	268	240	216	168	151	136	124	113	103	94	86	79
	2VLI18	9'-0	11'-3	11'-8	400	376	331	295	264	239	218	200	156	142	130	119	110	102	94
45 PSF	2VLI17	9'-9	12'-0	12'-5	400	400	358	318	284	257	234	214	197	153	140	129	118	109	101
	2VLI16	10'-4	12'-7	13'-0	400	400	383	339	303	274	248	227	209	193	150	137	126	117	108
	2VLI22	5'-11	7'-9	8'-0	364	285	247	217	192	171	153	138	125	113	103	94	86	79	72
5"	2VLI21	6'-5	8'-6	8'-10	389	338	266	233	206	183	164	147	133	121	110	101	92	84	78
	2VLI20	6'-11	9'-0	9'-4	400	356	313	246	217	193	173	156	141	128	116	106	97	89	82
(t=3")	2VLI19	7'-9	10'-0	10'-4	400	394	345	306	273	214	192	172	156	141	128	117	107	99	91
	2VLI18	8'-7	10'-9	11'-2	400	400	377	336	301	273	249	195	178	162	148	136	126	116	107
51 PSF	2VLI17	9'-3	11'-6	11'-10	400	400	400	362	324	293	266	244	192	175	160	147	135	125	116
	2VLI16	9'-10	12'-1	12'-5	400	400	400	386	346	312	283	259	238	187	171	157	144	133	123
	2VLI22	5'-8	7'-2	7'-4	400	320	278	244	216	192	172	155	140	127	116	106	97	89	81
5 1/2"	2VLI21	6'-2	8'-2	8'-5	400	379	298	261	231	205	184	166	150	136	124	113	104	95	87
	2VLI20	6'-7	8'-8	8'-11	400	400	351	276	244	217	194	175	158	143	131	119	109	100	92
(t=3 1/2")	2VLI19	7'-5	9'-7	9'-11	400	400	388	343	271	241	215	193	175	159	144	132	121	111	102
	2VLI18	8'-2	10'-4	10'-8	400	400	400	377	338	306	243	219	199	182	167	153	141	130	121
57 PSF	2VLI17	8'-10	11'-0	11'-5	400	400	400	400	364	329	299	237	215	196	180	165	152	140	130
	2VLI16	9'-4	11'-7	12'-0	400	400	400	400	388	350	318	290	230	210	192	176	162	150	138
	2VLI22	5'-5	6'-8	6'-10	400	355	308	270	239	213	191	172	156	141	129	118	108	99	90
6"	2VLI21	5'-11	7'-11	8'-1	400	381	331	290	256	228	204	184	166	151	137	126	115	105	97
	2VLI20	6'-4	8'-4	8'-7	400	400	350	306	271	241	215	194	175	159	145	132	121	111	102
(t=4")	2VLI19	7'-2	9'-3	9'-7	400	400	400	381	301	267	239	215	194	176	160	146	134	123	113
	2VLI18	7'-10	10'-0	10'-4	400	400	400	400	375	299	269	243	221	202	185	170	157	145	134
63 PSF	2VLI17	8'-6	10'-7	11'-0	400	400	400	400	400	364	331	263	239	218	199	183	169	156	144
	2VLI16	9'-0	11'-2	11'-6	400	400	400	400	400	388	352	322	255	233	213	195	180	166	154
	2VLI22	5'-1	6'-2	6'-4	400	390	339	297	263	234	210	189	171	155	141	129	118	108	99
6 1/2"	2VLI21	5'-9	7'-6	7'-6	400	400	363	318	281	250	224	202	183	166	151	138	126	116	106
	2VLI20	6'-1	8'-1	8'-4	400	400	385	337	297	264	237	213	193	175	159	145	133	122	112
(t=4 1/2")	2VLI19	6'-10	8'-11	9'-3	400	400	400	375	330	293	262	236	213	193	176	161	147	135	124
	2VLI18	7'-7	9'-8	9'-11	400	400	400	400	400	329	296	268	243	222	203	187	172	159	147
69 PSF	2VLI17	8'-2	10'-3	10'-7	400	400	400	400	400	400	320	289	262	239	219	201	185	171	158
	2VLI16	8'-8	10'-9	11'-2	400	400	400	400	400	400	387	309	280	256	234	215	198	183	169

Notes:
1. Minimum exterior bearing length required is 2.0 inches. Minimum interior bearing length required is 4.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

SLAB INFORMATION

Total Slab Depth	Theo. Concrete Volume Yds./ 100 Sq. Ft.	Theo. Concrete Volume Cu. Ft./ Sq. Ft.	Recommended Welded Wire Fabric
4"	0.94	0.253	6x6-W1.4xW1.4
4 1/2"	1.09	0.294	6x6-W1.4xW1.4
5"	1.24	0.336	6x6-W1.4xW1.4
5 1/4"	1.32	0.357	6x6-W1.4xW1.4
5 1/2"	1.40	0.378	6x6-W2.1xW2.1
6"	1.55	0.419	6x6-W2.1xW2.1
6 1/4"	1.63	0.440	6x6-W2.1xW2.1
6 1/2"	1.71	0.461	6x6-W2.1xW2.1



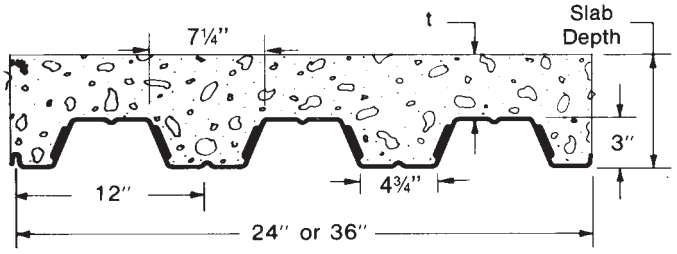
(N=14) LIGHTWEIGHT CONCRETE (110 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span 1 Span	2 Span	3 Span	Superimposed Live Load, PSF Clear Span (ft.-in.) 6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0
	2VLI22	7'-2	9'-6	9'-8	238	209	186	149	133	120	108	98	90	82	75	69	64	59	55
4"	2VLI21	7'-10	10'-2	10'-6	254	223	198	178	142	128	115	105	96	87	80	74	68	63	58
	2VLI20	8'-5	10'-9	11'-1	268	235	209	187	169	135	122	110	101	92	84	78	72	66	61
(t=2")	2VLI19	9'-6	11'-11	12'-4	297	260	230	206	185	168	153	141	111	101	93	86	79	73	68
	2VLI18	10'-6	12'-10	13'-3	324	285	253	227	205	187	171	158	146	136	107	99	92	86	80
30 PSF	2VLI17	11'-5	13'-8	14'-0	352	308	273	245	221	201	184	169	156	145	135	107	99	92	86
	2VLI16	12'-1	14'-4	14'-4	377	330	292	261	235	214	195	179	165	153	143	133	118	98	91
	2VLI22	6'-9	9'-1	9'-3	276	243	195	173	155	139	126	114	104	96	88	81	75	69	64
4 1/2"	2VLI21	7'-5	9'-9	10'-1	295	259	231	185	165	149	134	122	111	102	93	86	79	73	68
	2VLI20	8'-0	10'-4	10'-8	312	273	243	217	196	157	141	128	117	107	98	90	84	77	72
(t=2 1/2")	2VLI19	9'-0	11'-5	11'-9	346	302	268	239	215	195	178	142	129	118	108	100	92	85	79
	2VLI18	10'-0	12'-3	12'-8	376	331	294	264	238	217	199	183	170	136	125	116	107	100	93
35 PSF	2VLI17	10'-10	13'-1	13'-6	400	358	318	284	256	233	213	196	181	168	134	124	115	107	100
	2VLI16	11'-5	13'-8	13'-10	400	384	340	303	273	248	227	208	192	178	166	132	123	114	106
	2VLI22	6'-6	8'-8	8'-10	315	277	222	197	176	159	144	130	119	109	100	92	85	79	73
5"	2VLI21	7'-1	9'-4	9'-8	337	296	263	211	189	169	153	139	127	116	107	98	91	84	78
	2VLI20	7'-7	9'-11	10'-3	355	312	276	248	199	179	161	146	133	122	112	103	95	88	82
(t=3")	2VLI19	8'-7	10'-11	11'-4	394	345	305	272	245	223	178	162	147	135	124	114	105	97	90
	2VLI18	9'-6	11'-10	12'-2	400	377	335	300	272	247	227	209	168	155	143	132	122	114	106
40 PSF	2VLI17	10'-3	12'-7	13'-0	400	400	362	324	292	266	243	223	207	166	153	142	131	122	114
	2VLI16	10'-11	13'-2	13'-5	400	400	387	346	311	283	258	237	219	203	163	151	140	130	121
	2VLI22	6'-4	8'-6	8'-8	334	268	236	209	187	168	152	138	126	116	106	98	90	84	78
5 1/4"	2VLI21	7'-0	9'-2	9'-6	357	314	279	224	200	180	163	148	135	123	113	104	96	89	83
	2VLI20	7'-6	9'-8	10'-0	377	331	293	263	211	190	171	155	142	130	119	110	101	94	87
(t=3 1/4")	2VLI19	8'-5	10'-9	11'-1	400	366	324	289	260	210	189	172	156	143	131	121	111	103	95
	2VLI18	9'-3	11'-7	12'-0	400	400	355	319	288	263	241	195	179	164	151	140	130	121	113
42 PSF	2VLI17	10'-1	12'-4	12'-9	400	400	384	344	310	282	258	237	219	177	163	151	140	130	121
	2VLI16	10'-8	12'-11	13'-3	400	400	400	367	330	300	274	252	232	215	173	160	148	138	128
	2VLI22	6'-3	8'-5	8'-6	353	284	250	222	198	178	161	147	134	122	113	104	96	89	82
5 1/2"	2VLI21	6'-10	9'-0	9'-4	378	332	268	237	212	190	172	156	142	130	120	110	102	94	87
	2VLI20	7'-4	9'-6	9'-10	399	350	310	250	223	201	181	165	150	137	126	116	107	99	92
(t=3 1/2")	2VLI19	8'-3	10'-6	10'-11	400	387	342	306	275	222	200	182	165	151	139	128	118	109	101
	2VLI18	9'-1	11'-4	11'-9	400	400	376	337	305	278	254	206	189	174	160	148	138	128	119
44 PSF	2VLI17	9'-10	12'-1	12'-6	400	400	400	363	328	298	273	251	204	187	172	159	148	137	128
	2VLI16	10'-5	12'-8	13'-1	400	400	400	388	350	317	290	266	246	199	184	170	157	146	136
	2VLI22	5'-11	7'-10	8'-0	380	331	291	258	231	208	188	171	156	143	131	121	112	103	96
6 1/4"	2VLI21	6'-5	8'-7	8'-10	400	355	312	276	247	222	200	182	166	152	140	129	119	110	102
	2VLI20	6'-11	9'-1	9'-4	400	400	329	292	260	234	211	192	175	160	147	135	125	115	107
(t=4 1/4")	2VLI19	7'-10	10'-0	10'-4	400	400	398	356	288	259	233	212	193	176	162	149	137	127	118
	2VLI18	8'-7	10'-10	11'-2	400	400	400	392	355	323	264	240	220	202	187	173	160	149	139
51 PSF	2VLI17	9'-3	11'-6	11'-11	400	400	400	400	381	347	317	259	237	218	201	186	172	160	149
	2VLI16	9'-10	12'-1	12'-6	400	400	400	400	400	369	337	310	253	232	214	198	183	170	158

Notes:
1. Minimum exterior bearing length required is 2.0 inches. Minimum interior bearing length required is 4.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

3 VLI

Maximum Sheet Length 42'-0
Extra Charge for Lengths Under 6'-0
ICBO Approved (No. 3415)



STEEL SECTION PROPERTIES Fy= 40 KSI

Deck Type	Design Thick.	Weight PSF	Ip in^4/Ft	In in^4/Ft	Sp in^3/Ft	Sn in^3/Ft
3VLI22	0.0295	1.77	0.746	0.745	0.429	0.442
3VLI21	0.0329	1.97	0.850	0.848	0.495	0.511
3VLI20	0.0358	2.14	0.938	0.937	0.553	0.572
3VLI19	0.0418	2.50	1.105	1.103	0.677	0.700
3VLI18	0.0474	2.84	1.251	1.251	0.795	0.803
3VLI17	0.0538	3.22	1.421	1.421	0.913	0.913
3VLI16	0.0598	3.58	1.580	1.580	1.013	1.013

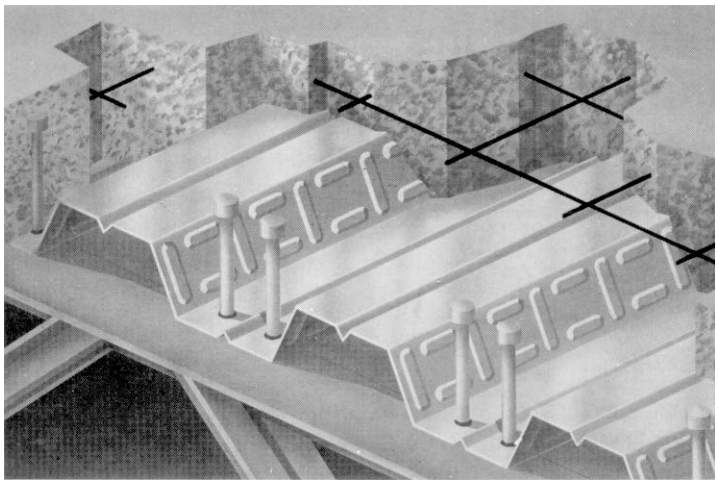
(N=9) NORMAL WEIGHT CONCRETE (145 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span			Superimposed Live Load, PSF Clear Span (ft.-in.)														
		1 Span	2 Span	3 Span	7'-0	7'-6	8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0
	3VLI22	7'-8	9'-7	9'-7	216	195	149	133	120	109	99	90	83	76	70	64	59	54	50
5"	3VLI21	8'-11	11'-3	11'-4	230	206	187	170	128	116	106	96	88	81	74	68	63	58	54
	3VLI20	9'-6	11'-11	12'-4	241	216	196	178	163	150	111	101	93	85	78	72	66	61	57
(t=2")	3VLI19	10'-8	13'-2	13'-7	265	237	214	194	178	163	151	140	102	94	86	79	73	67	62
	3VLI18	11'-8	14'-1	14'-6	289	261	238	218	201	186	173	161	151	142	106	98	92	86	80
44 PSF	3VLI17	12'-7	14'-11	15'-5	309	278	253	231	212	196	182	170	159	150	141	133	97	91	85
	3VLI16	13'-4	15'-8	15'-11	327	294	267	243	223	206	191	178	167	156	147	139	132	96	89
	3VLI22	7'-0	8'-9	8'-9	247	190	170	152	137	124	113	103	94	87	80	73	67	62	57
5 1/2"	3VLI21	8'-4	10'-4	10'-4	262	235	213	162	146	133	120	110	101	92	85	78	72	66	61
	3VLI20	9'-0	11'-5	11'-9	275	247	223	203	186	140	127	116	106	97	89	82	76	70	65
(t=2 1/2")	3VLI19	10'-1	12'-7	13'-0	302	270	244	222	203	186	172	128	117	107	98	90	83	77	71
	3VLI18	11'-1	13'-5	13'-11	330	298	271	248	229	212	197	184	173	130	121	112	105	98	92
50 PSF	3VLI17	11'-11	14'-3	14'-9	352	317	288	263	242	224	208	194	182	171	128	119	111	104	97
	3VLI16	12'-8	15'-0	15'-5	373	335	304	277	255	235	218	203	190	178	168	159	117	109	102
	3VLI22	6'-5	8'-1	8'-1	242	214	191	171	154	140	127	116	106	97	89	82	76	70	65
6"	3VLI21	7'-8	9'-7	9'-7	294	264	204	183	165	149	135	124	113	104	95	88	81	75	69
	3VLI20	8'-7	10'-11	10'-11	309	277	250	228	173	157	143	130	119	109	100	92	85	79	73
(t=3")	3VLI19	9'-8	12'-1	12'-6	339	304	274	249	227	209	157	143	131	120	110	102	94	87	80
	3VLI18	10'-7	12'-11	13'-4	370	334	304	279	257	238	221	207	158	146	136	126	118	110	103
57 PSF	3VLI17	11'-5	13'-9	14'-2	395	356	323	296	272	251	233	218	204	155	144	134	125	117	109
	3VLI16	12'-0	14'-5	14'-11	400	376	341	311	286	264	245	228	213	200	189	141	132	123	115
	3VLI22	6'-0	7'-5	7'-5	268	237	212	190	171	155	141	129	118	108	99	91	84	78	72
6 1/2"	3VLI21	7'-1	8'-10	8'-10	326	254	226	203	183	165	150	137	126	115	106	97	90	83	77
	3VLI20	8'-1	10'-1	10'-1	343	307	278	214	192	174	158	144	132	121	111	103	95	87	81
(t=3 1/2")	3VLI19	9'-3	11'-7	12'-0	377	337	304	276	252	192	175	159	146	134	123	113	104	96	89
	3VLI18	10'-1	12'-5	12'-10	400	371	338	309	285	264	246	189	175	162	151	140	131	122	115
63 PSF	3VLI17	10'-11	13'-3	13'-8	400	395	359	328	302	279	259	242	186	172	160	149	139	130	121
	3VLI16	11'-6	13'-11	14'-4	400	400	378	345	317	293	272	253	237	222	169	157	146	136	128
	3VLI22	5'-7	6'-11	6'-11	295	261	233	209	188	171	155	142	130	119	109	101	93	86	79
7"	3VLI21	6'-7	8'-3	8'-3	316	279	249	223	201	182	165	151	138	127	116	107	99	91	84
	3VLI20	7'-6	9'-5	9'-5	377	338	262	235	212	192	174	159	145	133	122	113	104	96	89
(t=4")	3VLI19	8'-11	11'-3	11'-7	400	370	334	303	234	211	192	175	160	147	135	124	115	106	98
	3VLI18	9'-9	12'-0	12'-5	400	400	371	340	313	290	226	208	192	178	166	154	144	135	126
69 PSF	3VLI17	10'-6	12'-9	13'-2	400	400	394	360	331	306	285	265	204	189	176	164	153	143	134
	3VLI16	11'-1	13'-5	13'-10	400	400	400	379	348	322	298	278	260	200	185	172	161	150	140
	3VLI22	5'-2	6'-6	6'-6	321	285	254	228	205	186	169	154	141	130	119	110	101	93	86
7 1/2"	3VLI21	6'-2	7'-9	7'-9	344	304	271	243	219	198	180	164	150	138	127	117	108	100	92
	3VLI20	7'-1	8'-10	8'-10	400	321	286	256	231	209	190	173	158	145	134	123	114	105	97
(t=4 1/2")	3VLI19	8'-7	10'-10	11'-2	400	400	364	331	255	231	209	191	175	160	147	136	125	116	107
	3VLI18	9'-4	11'-7	12'-0	400	400	400	370	341	269	246	227	210	195	181	168	157	147	138
75 PSF	3VLI17	10'-1	12'-4	12'-9	400	400	400	393	361	334	310	241	223	206	192	179	167	156	146
	3VLI16	10'-8	13'-0	13'-5	400	400	400	400	380	351	325	303	235	218	202	188	175	164	153

Notes:
1. Minimum exterior bearing length required is 2.5 inches. Minimum interior bearing length required is 5.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

SLAB INFORMATION

Total Slab Depth	Theo. Concrete Volume Yds./ 100 Sq. Ft.	Theo. Concrete Volume Cu. Ft./ Sq. Ft.	Recommended Welded Wire Fabric
5"	1.08	0.292	6x6-W1.4xW1.4
5 1/2"	1.23	0.333	6x6-W1.4xW1.4
6"	1.39	0.375	6x6-W1.4xW1.4
6 1/4"	1.47	0.396	6x6-W1.4xW1.4
6 1/2"	1.54	0.417	6x6-W2.1xW2.1
7"	1.70	0.458	6x6-W2.1xW2.1
7 1/4"	1.77	0.479	6x6-W2.1xW2.1
7 1/2"	1.85	0.500	6x6-W2.1xW2.1



(N=14) LIGHTWEIGHT CONCRETE (110 PCF)

Total Slab Depth	Deck Type	SDI Max. Unshored Clear Span 1 Span	2 Span	3 Span	Superimposed Live Load, PSF Clear Span (ft.-in.) 8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	14'-6	15'-0
	3VLI22	9'-1	11'-5	11'-5	141	127	115	83	75	67	60	54	49	45	40				
5"	3VLI21	9'-10	12'-4	12'-9	153	138	125	113	82	74	67	60	54	49	45	41			
	3VLI20	10'-6	13'-0	13'-5	163	147	133	121	110	102	72	65	59	54	49	44	40		
(t=2")	3VLI19	11'-10	14'-4	14'-10	185	166	150	136	124	114	105	97	68	62	57	52	47	43	
	3VLI18	13'-0	15'-4	15'-10	244	222	204	188	174	162	151	142	133	126	119	90	85	79	75
34 PSF	3VLI17	14'-0	16'-3	16'-6	262	238	218	201	185	172	161	150	141	133	126	119	113	85	80
	3VLI16	14'-5	16'-11	16'-11	277	254	234	217	202	189	177	166	157	149	141	134	127	99	94
	3VLI22	8'-5	10'-6	10'-6	161	121	107	95	85	77	69	62	56	51	46	42			
5 1/2"	3VLI21	9'-5	11'-10	12'-2	175	157	142	105	94	84	76	69	62	56	51	47	42		
	3VLI20	10'-0	12'-6	12'-11	186	167	151	138	126	91	82	74	67	61	56	51	46	42	
(t=2 1/2")	3VLI19	11'-3	13'-9	14'-3	211	189	171	155	142	130	120	86	78	71	65	59	54	49	45
	3VLI18	12'-4	14'-8	15'-2	278	253	232	214	198	184	172	161	152	118	110	103	97	91	85
39 PSF	3VLI17	13'-4	15'-7	16'-0	299	272	248	229	211	196	183	171	161	152	143	110	103	97	91
	3VLI16	14'-0	16'-5	16'-5	316	289	267	247	230	215	202	190	179	170	161	153	146	114	107
	3VLI22	7'-9	9'-9	9'-9	154	136	120	107	96	86	78	70	63	57	52	47	43		
6"	3VLI21	9'-0	11'-4	11'-6	196	176	160	118	106	95	86	77	70	64	58	52	48	43	
	3VLI20	9'-7	12'-0	12'-5	209	188	170	155	114	103	93	84	76	69	63	57	52	47	43
(t=3")	3VLI19	10'-9	13'-3	13'-8	237	212	192	174	159	146	107	97	88	80	73	67	61	56	51
	3VLI18	11'-9	14'-2	14'-8	312	284	261	240	223	207	193	181	142	133	124	116	109	102	96
43 PSF	3VLI17	12'-9	15'-1	15'-7	335	305	279	257	237	221	206	192	181	170	132	124	116	109	102
	3VLI16	13'-5	15'-10	16'-0	354	325	299	277	258	241	226	213	201	190	181	143	135	128	121
	3VLI22	7'-6	9'-5	9'-5	162	143	127	113	101	91	82	74	67	60	55	50	45	41	
6 1/4"	3VLI21	8'-10	11'-1	11'-1	207	186	140	125	112	100	90	82	74	67	61	55	50	46	42
	3VLI20	9'-5	11'-10	12'-2	221	198	179	134	120	108	98	88	80	73	66	60	55	50	46
(t=3 1/4")	3VLI19	10'-6	13'-0	13'-6	250	224	202	184	168	154	113	102	93	84	77	70	64	59	54
	3VLI18	11'-6	13'-11	14'-5	329	300	275	253	235	218	204	191	150	140	131	122	115	108	101
46 PSF	3VLI17	12'-5	14'-10	15'-3	354	322	294	271	250	233	217	203	191	150	140	131	122	115	108
	3VLI16	13'-2	15'-6	15'-10	374	343	316	293	272	254	239	225	212	201	190	151	143	135	128
	3VLI22	7'-3	9'-1	9'-1	171	150	134	119	107	96	86	78	70	64	58	52	47	43	
6 1/2"	3VLI21	8'-7	10'-9	10'-9	218	196	147	131	117	106	95	86	78	71	64	58	53	48	44
	3VLI20	9'-2	11'-7	12'-0	232	209	189	141	127	114	103	93	84	77	70	63	58	53	48
(t=3 1/2")	3VLI19	10'-4	12'-10	13'-3	263	236	213	193	176	131	119	108	98	89	81	74	68	62	57
	3VLI18	11'-4	13'-8	14'-2	346	316	289	267	247	230	215	170	158	147	138	129	121	113	107
48 PSF	3VLI17	12'-2	14'-7	15'-0	372	338	310	285	263	245	228	214	201	158	147	138	129	121	114
	3VLI16	12'-11	15'-3	15'-7	393	360	332	308	286	268	251	236	223	211	169	159	150	142	134
	3VLI22	6'-7	8'-3	8'-3	196	173	153	137	122	110	99	89	81	73	66	60	55	49	45
7 1/4"	3VLI21	7'-10	9'-9	9'-9	216	190	169	151	135	121	109	99	90	81	74	67	61	55	50
	3VLI20	8'-8	11'-1	11'-2	267	240	182	163	146	131	118	107	97	88	80	73	66	61	55
(t=4 1/4")	3VLI19	9'-9	12'-2	12'-7	302	271	244	222	168	151	137	124	112	102	93	85	78	71	65
	3VLI18	10'-8	13'-0	13'-6	398	362	332	306	284	264	211	196	182	169	158	148	139	130	123
55 PSF	3VLI17	11'-6	13'-10	14'-4	400	388	355	327	302	281	262	245	195	181	169	158	148	139	131
	3VLI16	12'-2	14'-7	15'-1	400	400	381	353	329	307	288	271	256	207	194	183	173	163	154

Notes:
1. Minimum exterior bearing length required is 2.5 inches. Minimum interior bearing length required is 5.0 inches. If these minimum lengths are not provided, web crippling must be checked.
2. Always contact Vulcraft when using loads in excess of 200 psf. Such loads often result from concentrated, dynamic, or long term load cases for which reductions due to bond breakage, concrete creep, etc. should be evaluated.
3. All fire rated assemblies are subject to an upper live load limit of 250 psf.
4. Inquire about material availability of 17, 19 & 21 gage.

SDI Specifications and Commentary

FOR COMPOSITE STEEL FLOOR DECK

1. Scope

This specification pertains to composite steel floor deck. Composite steel floor deck is cold formed steel deck which acts as a permanent form and as the positive bending reinforcement for the structural concrete. When suitably fastened, the steel deck also acts as a working platform for the various trades. After the concrete hardens, the steel deck and the concrete are interlocked by the shape of the deck, mechanical means, surface bond, or by a combination of these means.

2. Materials

2.1 Composite Steel Deck: Composite steel floor deck shall be fabricated from steel conforming to Section A3 of the latest edition (1986 and addenda), of the American Iron and Steel Institute, *Specification for the Design of Cold-Formed Steel Structural Members*, (AISI Specifications). The steel used shall have a minimum yield point of 33 ksi (230 MPa).

2.1a Tolerances:

Panel length: Plus or minus 1/2 inch (12 mm).

Thickness: Shall not be less than 95% of the design thickness.

Panel cover width: minus 3/8 inch (10 mm), plus 3/4 inch (20 mm).

Panel camber and/or Sweep: 1/4 inch in 10 foot length (6 mm in 3m).

Panel end out of square: 1/8 inch per foot of panel width (10 mm per m).

Commentary: Most composite steel floor deck is manufactured from steel conforming to ASTM Designation A611, Grades C and D or from A653-94, Structural Quality. If the published product literature does not show the uncoated steel thickness in decimal inches (or millimeters), but lists gage or type numbers, then the thickness of steel before coating with paint or metal shall be in conformance with the following table:

Type No.	Design Thickness		Minimum Thickness	
	In	mm	In	mm
22	0.0295	0.75	0.028	0.71
21	0.0329	0.84	0.031	0.79
20	0.0358	0.91	0.034	0.86
19	0.0418	1.06	0.040	1.01
18	0.0474	1.20	0.045	1.14
17	0.0538	1.37	0.051	1.30
16	0.0598	1.52	0.057	1.44

The tolerances reflect fabrication processes for steel deck products. Variation in cover width tolerances may vary due to trucking, storage or handling.

2.1b Finish: The finish on the steel composite deck shall be as specified by the designer and be suitable for the environment of the structure.

Commentary: Since the composite deck is the positive bending reinforcement for the slab, it must be designed to last the life of the structure; a minimum recommended finish is a galvanized coating as defined in ASTM A653-94, G60 (Z180).

2.2 Concrete: Concrete shall be in accordance with the applicable sections of chapters 3, 4 and 5 of the ACI 318 *Building Code Requirements for Reinforced Concrete*. Minimum compressive strength (f'c) shall be 3 ksi (20 MPa) or as required for fire ratings or durability. Admixtures containing chloride salts shall not be used.

Commentary: The use of admixtures containing chloride salts is not allowed because the salts may corrode the steel deck which has been designed as the slab reinforcement.

3. Design (Deck as a Form)

3.1 The section properties for the steel floor deck (as a form in bending) shall be computed in accordance with the AISI Specifications,

3.2 Bending stress in the deck shall not exceed 0.6 times the yield strength with a maximum of 36 ksi (250 MPa) under the combined loads of wet concrete, deck, and the following construction live loads: 20 pounds per square foot uniform load (1 kPa) or 150 pound concentrated load on a 1'0" wide section of deck (2.2 kN per m). **See Figure 1.**

FOR COMPOSITE STEEL FLOOR DECK

Commentary: The loading shown in Figure 1 is representative of the sequential loading of wet concrete on the form. The 150 pound load is the arithmetic result of 200 lb. (man's weight) x 3/4. The philosophy here is to allow a 1/3 increase in stress due to the temporary nature of a man load. Decreasing the load by 25% is the mathematical equivalent of allowing a 33% increase in stress. Also the 150 pound load is considered to be applied in a one foot width but experience has shown that a greater distribution really occurs. For single span deck applications the ability to control the concrete placement may be restricted and a 1.5 factor has been applied to the concrete load to cover this condition. (The metric equivalent of the 150 pound load over a foot of width is 2.2 kN over a meter of width.)

3.3 Calculated theoretical deflections of the deck, as a form, shall be based on the load of the concrete (as determined by the design slab thickness) and the load from the steel deck, uniformly loaded on all spans, and shall be limited to L/180 or 3/4 inch (20 mm), whichever is smaller. Deflections shall be relative to supporting members.
See Figure 2.

Commentary: The deflection calculations do not take into account construction loads since these are considered as temporary loads. The deck is designed to always be in the elastic range so removal of temporary loads should allow the deck to recover. The structural steel also deflects under the loading of the wet concrete. The designer is urged to check the deflection of the total system especially if composite beams and girders are being used.

3.4 Minimum bearing lengths shall be determined in accordance with the AISI Specification; a uniform loading case of wet concrete, plus deck, plus 20 psf (1 kPa) construction load shall be used.
See Figure 3.

Commentary: In the past, 1 1/2 inches (40 mm) of end bearing was the minimum; this is still a good "rule of thumb" that will, in general, prevent slip off. If less than 1 1/2 inches (40 mm) of end bearing is available, or if high support reactions are expected, then the designer should ask the deck manufacturer to check the deck web crippling strength. In any case, the deck must be adequately attached to the structure to prevent slip off.

4. Installation & Site Storage

4.1 Site Storage: Steel Deck shall be stored off the ground with one end elevated to provide drainage and shall be protected from the elements with a water-proof covering, ventilated to avoid condensation.

4.2 Deck Placement: Place each deck unit on supporting structural frame. Adjust to final position with accurately aligned side laps and ends bearing on supporting members.

Commentary: Staggering floor deck end joints is not a recommended practice. The deck capacity as a form and the load capacity of the composite deck/slab system are not increased by staggering the ends, yet layout and erection costs are increased.

4.3 Butted Ends: Deck sheets shall be butted over supports. Standard tolerance for ordered length is plus or minus 1/2 inch (12 mm).
Commentary: Lapping composite deck ends can be difficult because shear lugs (web embossment) or profile shape can prevent a tight metal to metal fit. The space between sheets can make welded attachments more difficult. Gaps are acceptable at butted ends. If taping of butted ends is requested, it is not the responsibility of the deck manufacturer.

4.4 Anchorage: Floor Deck units shall be anchored to supporting members including perimeter support steel and/or bearing walls by either welding or by mechanical fastening. This shall be done immediately after alignment. Deck units with spans greater than five feet (1.5 m) shall have side laps and perimeter edges (at perimeter support steel) fastened at midspan or 36 inch (1 m) intervals, whichever distance is smaller.
Commentary: This anchorage may be required to provide lateral stability to the top flange of the supporting structural members. The deck should be anchored to act as a working platform and to prevent blow off. Side lap fasteners can be welds, screws, crimps (button punching), or other methods approved by the designer. Welding side laps on thicknesses 0.028 inches (0.7 mm) or less may cause

large burn holes, and is not recommended. The objective of side lap fastening is to prevent differential sheet deflection during concrete placing and therefore prevent side joints from opening. The five foot (1.5 m) limit on side lap spacing is based on experience. The deck contractor should not leave unattached deck at the end of the day, as the wind may displace the sheets and cause injury to persons or property. The *SDI Diaphragm Design Manual, Second Edition,* should be used to determine fastening requirements if the deck will be designed to resist horizontal loads. The most stringent requirements, of either section 4.4 or, if applicable, the *SDI Diaphragm Design Manual*, should be used.

4.4a Welding: All welding of deck shall be in strict accordance with ANSI/AWS D1.3 Structural Welding Code-Sheet Steel. Each welder must demonstrate an ability to produce satisfactory welds using a procedure such as shown in the *SDI Manual of Construction with Steel Deck* or as described in ANSI/AWS D1.3. A minimum visible 5/8 inch (15 mm) diameter puddle weld or equivalent is required at all edge ribs, plus a sufficient number of interior ribs to provide a maximum average spacing of 12 inches (300 mm). The maximum spacing between adjacent points of attachment shall not exceed 18 inches (460 mm). Fillet welds, when used, shall be at least 1 inch (25 mm) long. Weld metal shall penetrate all layers of deck material at end laps and shall have good fusion to the supporting members. Welding washers shall be used on all deck units with a metal thickness less than 0.028 inches (0.7 mm). Welding washers shall be a minimum thickness of 0.056 inches (1.5 mm, 16 gage) and have a nominal 3/8 inch (10 mm) diameter hole.

Commentary: The welder may be qualified on plate or pipe under ANSI/AWS Dl.1, *Structural Welding Code-Steel*, or under the provisions of other codes governing the welding of specific products, but may not be qualified for welding sheet steel. The layout, design, numbering or sizing of shear connectors is not the responsibility of the deck manufacturer. If studs are being applied through the deck onto structural steel, the stud welds can be used to replace the puddle welds. In general, stronger welds are obtained on 0.028 inches (0.7 mm) or thicker deck without weld washers. Welds on deck less than 0.028 inches (0.7 mm) are stronger with washers.

4.4b Mechanical Fasteners: Mechanical fasteners (powder-actuated, screws, pneumatically driven fasteners, etc.) are recognized as viable anchoring methods, provided the type and spacing of the fasteners satisfies the design criteria. Documentation in the form of test data, design calculations, or design charts should be submitted by the fastener manufacturer as the basis for obtaining approval. The deck manufacturer may recommend additional fasteners to stabilize the given profile against sideslip of unfastened ribs.

Commentary: The allowable load value per fastener used to determine the maximum fastener spacing is based on a minimum structural support thickness of not less than 1/8 inch (3 mm) and on the fastener providing a 5/16 inch (8 mm) diameter minimum bearing surface (fastener head size).

5. Design Deck and Concrete As A Composite Unit

5.1 General: The composite slab shall be designed as a reinforced concrete slab with the steel deck acting as the positive reinforcement. Slabs shall be designed as simple or continuous spans under uniform loads.

Commentary: High concentrated loads, diaphragm loads, etc. require additional analysis. Horizontal load capacities can be checked by referring to the *SDI Diaphragm Design Manua*l, Second Edition.
Most published live load tables are based on simple span analysis of the composite system; that is, the slab is assumed to crack over each support. If the designer wants a continuous slab, then negative reinforcing should be designed using conventional reinforced concrete design techniques. The welded wire mesh, chosen for temperature reinforcing (Section 5.5), does not usually supply enough area for continuity. The deck is not considered to be compression reinforcing.

SDI Specifications and Commentary

FOR COMPOSITE STEEL FLOOR DECK

Care should be used during the placement of loads on rolled-in hanger tabs for the support of ceilings so that approximate uniform loading is maintained. The individual manufacturer should be consulted for allowable loading on single rolled-in hanger tabs. Improper use of rolled-in hanger tabs could result in the overstressing of such tabs and/or the overloading of the composite deck slab.

5.2 Testing: The deck manufacturer shall have performed, under the supervision of a professional engineer, a sufficient number of tests on the composite deck slab system to have verified composite behavior. The tests shall have been performed on deck with a coating/finish that is acceptable for the application and as supplied. Based on the test information the design load rationale shall be established by: (1) elastic flexural analysis, (2) ultimate strength analysis.

5.2a Load Determination—Elastic Flexural Analysis. This method of load determination is to be used if there are no shear studs, or less than the minimum number of shear studs as required by the American Institute of Steel Construction (AISC) Specifications, on the beams perpendicular to the deck. Under the combined stresses caused by the superimposed (live) load and locked in form load, the tensile stress of the deck between permanent supports shall not exceed 0.60 times the yield strength of the steel or 36 ksi (250 MPa). The allowable load so determined may be increased by 10% if temperature and shrinkage reinforcement conforming to Section 5.5 of this specification is included in the system. Either allowable stress design (ASD) or load resistance factor design (LRFD) may be used to determine the load capacities.

5.2b Load Determination—Ultimate Strength Analysis. This method of load determination is to be used if there are shear studs on the beams perpendicular to the deck in sufficient quantity to meet the minimum requirements of the American Institute of Steel Construction (AISC) Specifications or, if tests on a particular deck profile have shown that the deck is capable of developing the full ultimate moment without shear studs. Using standard reinforced concrete design procedures the allowable superimposed load shall be found by using appropriate load resistance design (LRFD) factors to deduct the moment caused by the slab and deck weight from the calculated ultimate moment. Additional load reduction factors may be required if the number of shear studs used in the actual construction is less than needed to develop the ultimate capacity of the deck/slab. Mn=0.85 As Fy (d-a/2), the ultimate moment, where As=steel deck area in square inches per foot of width (sq. mm per m); Fy=the steel yield strength (not to exceed 60 ksi, 415 MPa); d = the distance, inches (mm), from the top of the slab to the centroid of the steel deck; a=AsFy/(0.85f'cb), inches (mm); and b is 12 inches (or 1 meter).

Commentary: By using one (or both) of the appropriate analysis techniques, the deck manufacturer determines the live loads that can be applied to the composite deck slab combination. The results are usually published as uniform load tables. The manufacturer may instead publish loads based on the results of a "shear bond" testing program and these loads would also be appropriate. For most applications, the deck thickness and profile is selected so that shoring is not required; the live load capacity of the composite system is usually more than adequate for the superimposed (live) loads. In calculating the section properties of the deck (under section 3.1 of these specifications), the AISI provisions may require that compression zones in the deck be reduced to an "effective width:' but as tensile reinforcement, the total area of the cross section may be used. Coatings other than those tested may be investigated, and if there is evidence that their performance will be better than that of the tested product, additional testing may not be required. For example, it is well accepted that deck with light tight rust provides better shear bond than galvanized, therefore tested galvanized load capacities may be used for rusted decking.

5.3 Concrete: Concrete for composite slabs must be of structural quality as shown in ACI 318. Stresses in the concrete shall not exceed those allowed in ACI 318. However, if allowable stress design (ASD) is used, then the compressive stress in the concrete shall not exceed 0.45 f'c.

Commentary: Load tables are generally calculated by using a concrete strength of 3 ksi (20 MPa). Composite slab capacities are not greatly affected by variations in concrete strength; but, if the strength falls below 3 ksi (20 MPa), it would be advisable to check shear stud strengths. Fire rating requirements may dictate the minimum concrete strength.

5.3a Minimum Cover: The minimum concrete above the top of the floor deck shall be 2 inches (50 mm). When additional (negative bending) reinforcement is placed in the slab, the minimum cover of concrete above the reinforcing shall be 3/4 inch (20 mm).

5.4 Deflection: Deflection of the composite slab shall not exceed L/360 under the superimposed load.

Commentary: Live load deflections are seldom a design factor. The deflection of the slab/deck combination can best be predicted by using the average of the cracked and untracked moments of inertia as determined by the transformed section method of analysis.

5.5 Temperature and Shrinkage reinforcement, consisting of welded wire fabric or reinforcing bars, shall have a minimum area of 0.00075 times the area of concrete above the deck (per foot or per meter of width), but shall not be less than the area provided by 6 x 6-W1.4 x W1.4 welded wire fabric. For those products so manufactured, shear transfer wires welded to the top of the deck may be considered to act as shrinkage or temperature reinforcement.

Commentary: If welded wire mesh is used with a steel area given by the above formula, it will generally not be sufficient to be the total negative reinforcement; however, the mesh has shown that it does a good job of crack control especially if kept near the top of the slab (3/4 inch to 1 inch cover, 20 to 25 mm).

6. Construction Practice

All deck sheets shall have adequate bearing and fastening to all supports so as not to lose support during construction. Deck areas subject to heavy or repeated traffic, concentrated loads, impact loads, wheel loads, etc. shall be adequately protected by planking or other approved means to avoid overloading and/or damage. Damaged deck (sheets containing distortions or deformations caused by construction practices) shall be repaired, replaced, or shored to the satisfaction of the designer before placing concrete. The cost of repairing, replacing, or shoring of damaged units shall be the liability of the trade contractor responsible for the damage.

Commentary: For temporary construction loads prior to concrete placement, it should be safe to assume that the deck will support a minimum uniform load of 50 psf (2.4 MPa) without further investigation.

6.1 The need for temporary shoring shall be investigated and, if required, it shall be designed and installed in accordance with the applicable ACI code and shall be left in place until the slab attains 75% of it's specified compressive strength.

6.2 Prior to concrete placement, the steel deck shall be free of soil, debris, standing water, loose mill scale and all other foreign matter.

6.3 Care must be exercised when placing concrete so that the deck will not be subjected to any impact that exceeds the design capacity of the deck. Concrete shall be placed from a low level to avoid impact, and in a uniform manner over the supporting structure and spread toward the center of the deck span. If buggies are used to place the concrete, runways shall be planked and the buggies shall only operate on planking. Planks shall be of adequate stiffness to transfer loads to the steel deck without damaging the deck. Deck damage caused by roll bars or careless placement must be avoided.

SDI Specifications and Commentary

FOR COMPOSITE STEEL FLOOR DECK

7. Additional Information and Comments

7.1 Parking Garages: Composite floor deck has been used successfully in many parking structures around the country; however, the following precautions should be observed:

1. slabs should be designed as continuous spans with negative bending reinforcing over the supports;

2. additional reinforcing should be included to deter cracking caused by large temperature differences and to provide load distribution; and,

3. in areas where salt water; either brought into the structure by cars in winter or carried by the wind in coastal areas, may deteriorate the deck, protective measures must be taken. The top surface of the slab must be effectively sealed so that the salt water cannot migrate through the slab to the steel deck. A minimum G90 (Z275) galvaniz-Ing is recommended, and, the exposed bottom surface of the deck should be protected with a durable paint.

The protective measures must be maintained for the life of the building. If the protective measures cannot be assured, the steel deck can be used as a stay in place form and the concrete can be reinforced with mesh or bars as required.

7.2 Cantilevers: When cantilevers are encountered, the deck acts only as a permanent form; top reinforcing steel must be proportioned by the designer.

7.3 Composite Beams and Girders: Most composite floor deck sections are suitable for use with composite beams. The AISC Specification specifically provides for the use of deck in this type of construction.

7.4 Fire Ratings: Many fire rated assemblies that use composite floor decks are available. Consult a SDI member manufacturer for a list of ratings.

7.5 Fireproofing: The metal deck manufacturer shall not be responsible for ensuring the bonding of fireproofing. The adherence of fireproofing materials is dependent on many variables; the deck manufacturer (supplier) is not responsible for the adhesion or adhesive ability of the fireproofing.

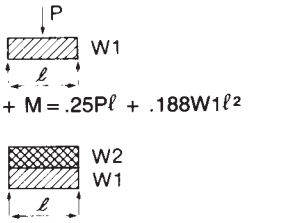
7.6 Dynamic Loads: Dynamic loading, e.g., fork lifts, can, over a period of time, interfere with the mechanical bond between the concrete and deck which achieves its composite action via web indents. Reinforcing steel running perpendicular to the deck span and placed on top of the deck ribs is often used with this type of loading to distribute concentrated loads.

7.7 Other Criteria: Composite Steel floor deck may be used in a variety of ways, some of which do not lend themselves to a standard "steel deck" analysis for span and loading. There are, in these cases, other criteria which must be considered besides that given by the Steel Deck Institute. Make sure this investigation starts with a review of the applicable Codes and that any special conditions are included in the design.

FIGURE 1

Loading Diagrams and Bending Moments

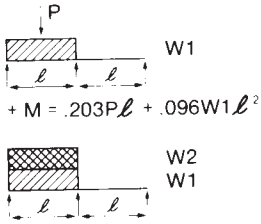
Simple Span Condition



$+ M = .25P\ell + .188W1\ell^2$

$+ M = .125\,(1.5W1 + W2)\ell^2$

Double Span Condition

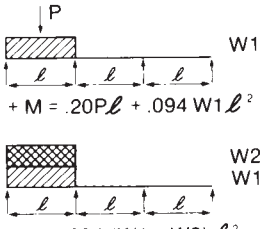


$+ M = .203P\ell + .096W1\ell^2$

$+ M = .096\,(W1 + W2)\ell^2$

$- M = .125\,(W1 + W2)\ell^2$

Triple Span Condition



$+ M = .20P\ell + .094\,W1\ell^2$

$+ M = .094\,(W1 + W2)\ell^2$

$- M = .117\,(W1 + W2)\ell^2$

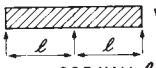
FIGURE 2

Loading Diagrams and Deflections

Simple Span Condition

$$\Delta = \frac{.0130W1\ell^4}{EI} \quad (1728)$$

Double Span Condition



$$\Delta = \frac{.0054W1\ell^4}{EI} \quad (1728)$$

Triple Span Condition

$$\Delta = \frac{.0069W1\ell^4}{EI} \quad (1728)$$

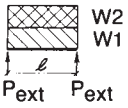
Note for Figures 1, 2 and 3

P = 150-pound concentrated load
W1 = slab weight + deck weight
W2 = 20 pounds per square foot construction load
ℓ = span length (ft.)

FIGURE 3

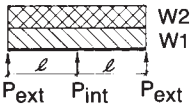
Loading Diagrams and Support Reactions

Simple Span Condition



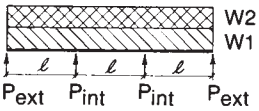
$P_{ext} = .5\,(W1 + W2)\ell$

Double Span Condition



$P_{ext} = .375\,(W1 + W2)\ell$
$P_{int} = 1.25\,(W1 + W2)\ell$

Triple Span Condition



$P_{ext} = .4\,(W1 + W2)\ell$
$P_{int} = 1.1\,(W1 + W2)\ell$

COMPOSITE

SDI Composite Steel Floor Deck

DESIGN EXAMPLE

Given:

A. Bay Size = 26' x 26'
B. Superimposed loads = 155 psf
C. Fire rating required = 2 hour
D. Concrete cover required on deck = 3 1/4" lightweight
E. Composite beam construction.
F. Temporary shoring not desired.

1 Review deck manufacturer's literature for available deck types.

In shoring tables, choose deck that will not require temporary shoring during construction.

Check the allowable superimposed load tables for the required loading.

2 Review deck manufacturer's literature for combinations that meet requirements.

13'-0" Beam Spacing

Embossed Deck: Formed and reinforced with 3"x 0.0474" design thickness composite steel deck. Determine required shrinkage and temperature reinforce-ment. Multi-span sheets require no temporary shoring.

8'-8" Beam Spacing

Embossed Deck: Formed and reinforced with 2"x 0.0358" design thickness composite steel deck. Determine required shrinkage and temperature reinforcement.

6'-6" Beam Spacing

Embossed Deck: Formed and reinforced with 1½"x 0.0295" design thickness composite steel deck. Determine required shrinkage and temperature reinforcement.

Note: For all the above, **no spray-applied fireproofing** of the deck is required for a 2-hour rating.

3 Factors that should be considered in selecting composite floor deck systems:

Compatibility of deck to total structure.

Hanging requirements.

Rib width-to-height ratio to determine stud values.

Compatibility of coating to stud welding.

Electrical requirements.

Future flexibility.

Deck material and erection costs. (Obtain from Steel Deck Institute member companies.)

Overall floor depth.

Cost of temporary shoring, if shored forming is selected.

Deck fireproofing cost, if protected deck is selected.

Concrete availability and cost: (lightweight) (semi-lightweight) (regular weight).

Concrete volume required.

Various beam spacings.

Total material cost.

Steel erection cost.

Steel fireproofing cost.

REVIEW OF PRODUCT LITERATURE SHOWS THAT 8'-8" BEAM SPACING MEETS REQUIREMENTS MOST EFFICIENTLY.

SDI Short Form Specifications

FOR COMPOSITE FLOOR DECK

PART 1 - GENERAL

1.1 Related Documents

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 Summary

B. Related Sections

a. This section pertains to composite steel floor deck.

b. Related Sections

1. Division 3 Section "Cast In Place Concrete" for concrete fill and reinforcing steel.

2. Division 5 Section "Structural Steel" for structural steel supporting the deck.

1.3 Submittals

A. General: Submit each item in this Article according to the conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of decking specified, including dimensions of individual components, profiles, and finishes.

C. Shop Drawings showing location of deck units, anchorage details, and other information required for a thorough review.

D. Product Certificates (if required) signed by the manufacturer of the steel deck certifying that the supplied products comply with specified requirements.

E. Welder Certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" Article, or if mechanical fasteners are used, test reports from a qualified independent testing agency evidencing compliance of mechanical fasteners with requirements based on comprehensive testing.

1.4 Quality Assurance

A. Codes and Standards: Comply with applicable provisions of the following specifications:

1. American Iron and Steel Institute (AISI);

2. American Welding Society (ANSI/AWS D1.3 Structural Welding Code/Sheet Steel);

3. Steel Deck Institute (SDI).

B. Certify that each welder has satisfactorily passed A.W.S. qualification tests for welding processes involved, and, if applicable, has undergone recertification.

C. Fire Resistance Assemblies: Provide steel deck units listed by Underwriters Laboratories (UL) in the "Fire Resistance Directory" for design number _____ . (If a fire rated assembly is required.)

1. Identify steel deck bundles with labels bearing the U.L. mark.

1.5 Delivery, Storage, and Handling

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage and handling.

B. If ground storage is needed, the deck bundles must be stored off the ground, with one end elevated to provide drainage. Bundles must be protected against condensation with a ventilated waterproof covering. Bundles must be stacked so there is no danger of tipping, sliding, rolling, shifting or material damage. Bundles must be periodically checked for tightness, and retightened as necessary so wind cannot loosen sheets.

C. Deck bundles placed on the building frame must be placed near a main supporting beam at a column or wall. In no case are the bundles to be placed on unbolted frames or on unattached and/or unbridged joists. The structural frame must be properly braced to receive the bundles.

PART 2 - PRODUCTS

2.1 A manufacturer offering deck products to be incorporated into the work must be a member of the Steel Deck Institute.

2.2 Materials **[The specifier must choose the appropriate section(s) and eliminate those not applicable.]**

A. Sheet steel for deck and accessories shall conform to ASTM A653-94 Structural Quality with a minimum yield strength of 33 ksi (230 MPa).

1. Galvanizing shall conform to ASTM A924-94 with a minimum coating class of G60 (Z180) as defined in ASTM A653-94.

or

B. Sheet steel for deck and accessories shall conform to ASTM A611 with a minimum yield strength of 33 ksi (230 MPa).

C. The deck type and thickness shall be as shown on the plans.

or

D. The deck shall be _____ with a minimum metal thickness of _____.

or

SDI Short Form Specifications

FOR COMPOSITE FLOOR DECK

E. The deck shall be selected to provide the load capacities shown on the drawings and as determined using the Steel Deck Institute construction loading criteria.

F. Whenever possible, the deck shall be multi-span and not require shoring during the concrete placement procedure.

G. The deck type provided shall be capable of supporting the superimposed live loads as shown on the plans.

2.3 Accessories

A. Pour stops, column closures, end closures, cover plates, and girder fillers shall be the type required by the Steel Deck Institute.

B. Mechanical fasteners or welds are acceptable for accessory attachments.

PART 3 - EXECUTION

3.1 Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work of this section. All O.S.H.A. rules for erection must be followed.

3.2 Preparation

A. Place deck in accordance with approved placement plans.

B. Do not place deck panels on concrete support structure until concrete has cured and is dry.

C. Locate deck bundles to prevent overloading of support members.

3.3 Installation, General

A. Install deck panels and accessories according to Steel Deck Institute specifications and recommendations, and in accordance with the placement plans, and requirements of this Section.

B. Install temporary shoring, if required, before placing deck panels.

C. Place deck panels on structural supports and adjust to final position with ends aligned. Attach firmly to the supports immediately after placement in order to form a safe working platform.

D. Cut and neatly fit deck units and accessories around openings and other work projecting through or adjacent to the decking.

E. Trades that subsequently cut unscheduled openings through the deck are responsible for reinforcing the openings.

3.4 Installation, Floor Deck

A. Anchor floor deck units to steel supporting members by arc spot puddle welds of the following diameter and spacing or fillet welds of equal strength.

1. **Weld diameter:** minimum visible 5/8 inch (15 mm).
2. **Weld spacing:** Weld edge ribs of panels at each support. Space additional welds an average of 12 inches (300 mm) apart but not more than 18 inches (460 mm).
3. Mechanical fasteners, either powder actuated or pneumatically driven, or screws may be used in lieu of welding to fasten deck to supporting framing, provided they have been specifically approved.
4. Fasten side laps and perimeter edges of units between supports at intervals not exceeding 36 inches (1 m) on center, using one of the following methods:
   - **a.** #10 self drilling screws;
   - **b.** crimp or button punch;
   - **c.** arc puddle welds 5/8 inch (15 mm) minimum visible diameter, or 1 inch (25 mm) long fillet welds.

B. End Bearing: Install deck ends over supports with a minimum end bearing of 1.5 inches (40 mm).

C. Pour Stops and Girder Fillers: Fasten pour stops and girder fillers to supporting structure according to the manufacturers recommendations.

D. Floor Deck Closures: Fasten column closures, cell closures, and Z closures to deck to provide tight fitting closures at open ends of ribs and sides of decking. Fasten cell closures at changes of direction of floor deck units unless otherwise directed.

3.5 Repairs

A. Before concrete placement, the deck shall be inspected for tears, dents, or other damage that may prevent the deck from acting as a tight and substantial form. The need for the repair or temporary shoring of the damaged deck shall be determined.

FLOOR-CEILING ASSEMBLIES WITH COMPOSITE DECK

Vulcraft Decks have been tested by Underwriters Laboratories Inc. for their Fire Resistance Ratings. In as much as new listings are continually being added, please contact the factory if your required design is not listed below. The cellular decks listed comply with U.L. 209 for use as Electrical Raceways.

Restrained Assembly Rating	Type of Protection	Concrete Thickness & Type (1)	U.L. Design No. (2,3,4)	Classified Deck Type		Unrestrained Beam Rating
				Fluted Deck	Cellular Deck (5)	
3/4 Hr.	Unprotected Deck	2 1/2" LW	D914 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1 Hr.
			D916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
1 Hr.	Exposed Grid	2 1/2" NW	D216 +	1.5VL,1.5VLI,2VLI,3VLI	2VLP, 3VLP	2,3 Hr.
	Cementitious	2" NW&LW	D743 #	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" NW&LW	D703 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1.5 Hr.
			D712 *	3VLI	3VLP	2 Hr.
			D722 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2 Hr.
			D739 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3,4 Hr.
			D759	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
	Sprayed Fiber	2" NW&LW	D859 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" NW&LW	D832 *	1.5VLI,2VLI,3VLI	3VLP	1,1.5,2,3 Hr.
			D847 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,3 Hr.
			D858 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,4 Hr.
			D871 *	2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
	Unprotected Deck	2 1/2" LW	D902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			D914 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1 Hr.
			D916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			D918 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			D919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
		3 1/2" NW	D902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			D916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			D918 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			D919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
1 1/2 Hr.	Gypsum Board	2 1/2" NW	D502 *	1.5VL,1.5VLI,2VLI,3VLI	2VLP, 3VLP	1.5,2 Hr.
	Cementitious	2" NW&LW	D743 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" NW&LW	D703 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1.5 Hr.
			D712 *	3VLI	3VLP	2 Hr.
			D722 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2 Hr.
			D739 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3,4 Hr.
			D759	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
	Sprayed Fiber	2" NW&LW	D859 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" NW&LW	D832 *	1.5VLI,2VLI,3VLI	3VLP	1,1.5,2,3 Hr.
			D847 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,3 Hr.
			D858 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,4 Hr.
			D871 *	2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
	Unprotected Deck	3" LW	D902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			D916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			D919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
		4" NW	D902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			D916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			D918 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			D919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
2 Hr.	Exposed Grid	2 1/2" NW	D216 +	1.5VL,1.5VLI,2VLI,3VLI	2VLP, 3VLP	2,3 Hr.
	Gypsum Board	2 1/2" NW	D502 +	1.5VL,1.5VLI,2VLI,3VLI	2VLP, 3VLP	1.5,2 Hr.
	Cementitious	2" NW&LW	D743 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" LW	D746 *	1.5VLI		1,1.5,2,3 Hr.
			D752 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2, Hr.
		2 1/2" NW&LW	D703 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1.5 Hr.
			D712 *	3VLI	3VLP	2 Hr.
			D716 *	1.5VLI,2VLI,3VLI	2VLP, 3VLP	1.5,2 Hr.
			D722 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2 Hr.
			D739 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3,4 Hr.
			D745 *	2VLI,3VLI		1,1.5,2, Hr.
			D750 *	1.5VLI,2VLI,3VLI		1.5,2 Hr.
			D755	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			D759	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			D760 *	2VLI,3VLI		1,1.5,2,3,4 Hr.
		2 1/2" NW	D730 *	2VLI,3VLI	2VLP, 3VLP	1.5,2 Hr.
			D742 *	1.5VLI,2VLI,3VLI		1,1.5 Hr.

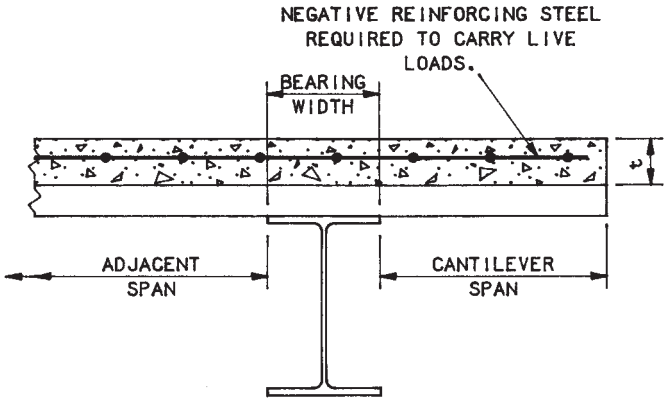
Restrained Assembly Rating	Type of Protection	Concrete Thickness & Type (1)	U.L. Design No. (2,3,4)	Classified Deck Type		Unrestrained Beam Rating
				Fluted Deck	Cellular Deck (5)	
2 Hr. (continued)	Sprayed Fiber	2" NW&LW	859 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" NW&LW	822 *	2VLI,3VLI	2VLP, 3VLP	1 Hr.
			825 *	1.5VLI,2VLI,3VLI	2VLP, 3VLP	1,1.5,2 Hr.
			831 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2 Hr.
			832 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			833 *	1.5VLI,2VLI,3VLI	2VLP, 3VLP	1.5 Hr.
			847 *	2VLI,3VLI	3VLP	1,1.5,3 Hr.
			858 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,4 Hr.
			861 *	12VLI,3VLI		1,1.5 Hr.
			870 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,2 Hr.
			871 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" LW	862 *	2VLI,3VLI		1 Hr.
		2 1/2" NW	864 *	3VLI	3VLP	1.5 Hr.
		3 1/4" LW	860 *	2VLI,3VLI		1,1.5,2 Hr.
	Unprotected Deck	3 1/4" LW	733 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5Hr.
			826 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2 Hr.
			840 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			907 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,2 Hr.
			913 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1 Hr.
			916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			918 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			920 #	2VLI,3VLI	2VLP, 3VLP	1.5 Hr.
		4 1/2" NW	902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			918 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
3 Hr.	Exposed Grid	3 1/4" NW	216 +	1.5VL,1.5VLI,2VLI,3VLI	2VLP, 3VLP	2,3 Hr.
	Cementitious	2" NW&LW	743 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" LW	746 *	1.5VLI		1,1.5,2,3 Hr.
		2 1/2" NW&LW	703 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1.5 Hr.
			708 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1.5,3 Hr.
			739 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3,4 Hr.
			755	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			759	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			760 *	2VLI,3VLI		1,1.5,2,3,4 Hr.
		3 1/4" LW	754 *	1.5VLI,2VLI,3VLI		1.5,2 Hr.
		3 1/4" NW	742 *	1.5VLI,2VLI,3VLI		1,1.5 Hr.
	Sprayed Fiber	2" NW&LW	859 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" NW&LW	816 *	1.5VLI,2VLI,3VLI	2VLP, 3VLP	1.5,2 Hr.
			831 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2 Hr.
			832 *	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			833 *	1.5VLI,2VLI,3VLI	2VLP, 3VLP	1.5 Hr.
			858	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,4 Hr.
			871 *	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,3 Hr.
		2 1/2" NW	864	3VLI	3VLP	1.5 Hr.
		3 1/4" LW	860 *	2VLI,3VLI		1,1.5,2 Hr.
	Unprotected Deck	4 3/16" LW	902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			918 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
		5 1/4" NW	902 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			916 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3 Hr.
			918 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
			919 #	1.5VL,1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5 Hr.
4 Hr.	Cementitious	2 1/2" NW&LW	760	2VLI,3VLI		1,1.5,2,3,4 Hr.
			739	1.5VLI,2VLI,3VLI	1.5VLP, 2VLP, 3VLP	1,1.5,2,3,4 Hr.
		3 1/4" LW	754	1.5VLI,2VLI,3VLI		1.5,2 Hr.
	Sprayed Fiber	2 1/2" NW&LW	858	2VLI,3VLI	2VLP, 3VLP	1,1.5,2,4 Hr.
		3 1/4" LW	860	2VLI,3VLI		1,1.5,2 Hr.

NOTES:
1. Concrete thickness is thicness of slab above deck, in.
2. Refer to the U.L. "Fire Resistance Directory" for the necessary construction details.
3. Cellular deck finish shall be galvanized.
4. Fluted deck finish shall be galvanized unless noted otherwise.
   + Denotes fluted deck finish is not critical when used in D2-- & D5-- Series designs. Deck finish shall be galvanized or phosphatized/painted.
   * Fluted deck finish is critical for fire resitance. Fluted deck finish shall be galvanized or phospatized/painted. This paint is a special type of paint and is compatible with the spray-applied fire protection and is U.L. approved for use in the denoted D7-- & D8-- Series designs.
   # Denotes fluted deck finish is not critical for fire resistance. Fluted deck finish shall be galvanized or phosphatized/painted.
5. Vulcraft cellular deck units are approved by U.L. for use as electrical raceways under U.L Standard 209.

Maximum Cantilever Spans

For Vulcraft Composite Floor Decks
Under Construction Loading

Deck	Es=29500KSI t	W=W+Wc, PSF W	22	21	20	19	18	17	16
1.5VL	2.00	33	2'-0	2'-3	2'-6	2'-10	3'-2	3'-6	3'-9
	2.50	39	1'-11	2'-2	2'-5	2'-9	3'-1	3'-4	3'-8
	3.00	45	1'-11	2'-2	2'-4	2'-8	2'-11	3'-3	3'-6
	3.50	51	1'-10	2'-1	2'-3	2'-7	2'-10	3'-2	3'-5
	4.00	57	1'-10	2'-0	2'-2	2'-6	2'-9	3'-1	3'-3
	4.50	63	1'-9	2'-0	2'-2	2'-6	2'-9	3'-0	3'-2
1.5VLR	2.00	38	1'-10	2'-2	2'-4	2'-8	3'-0	3'-4	3'-7
	2.50	44	1'-10	2'-1	2'-3	2'-7	2'-11	3'-2	3'-6
	3.00	50	1'-9	2'-0	2'-2	2'-6	2'-10	3'-1	3'-4
	3.50	56	1'-9	2'-0	2'-2	2'-5	2'-9	3'-0	3'-3
	4.00	62	1'-8	1'-11	2'-1	2'-5	2'-8	2'-11	3'-2
	4.50	68	1'-8	1'-11	2'-1	2'-4	2'-7	2'-10	3'-1
2VLI	2.00	39	2'-8	3'-0	3'-4	3'-11	4'-4	4'-9	5'-1
	2.50	45	2'-7	2'-11	3'-2	3'-9	4'-2	4'-7	4'-11
	3.00	51	2'-6	2'-10	3'-1	3'-7	4'-0	4'-5	4'-9
	3.50	57	2'-6	2'-9	3'-0	3'-6	3'-11	4'-3	4'-7
	4.00	63	2'-5	2'-8	2'-11	3'-5	3'-9	4'-1	4'-5
	4.50	69	2'-4	2'-7	2'-10	3'-4	3'-8	4'-0	4'-3
3VLI	2.00	44	3'-9	4'-2	4'-6	5'-2	5'-8	6'-2	6'-8
	2.50	50	3'-7	4'-0	4'-4	5'-0	5'-6	5'-11	6'-4
	3.00	57	3'-6	3'-11	4'-2	4'-10	5'-3	5'-9	6'-1
	3.50	63	3'-5	3'-9	4'-1	4'-8	5'-1	5'-6	5'-11
	4.00	69	3'-4	3'-8	3'-11	4'-6	4'-11	5'-4	5'-9
	4.50	75	3'-3	3'-7	3'-10	4'-5	4'-10	5'-2	5'-7



1. Allowable bending stress of 0.6 Fy.
2. Assumed bearing width for web crippling:
   1.5VL & VLR 3"
   2VL 4"
   3VL 6"
3. Cantilever deflection is based on a fixed end cantilever. Limited to ℓ/120.
4. Loading conditions:
   a) Conc. + Deck + 20 PSF
   or
   b) Conc. + Deck + 150 lbs. Concentrated Load.
5. If cantilever span exceeds 1/3 of the adjacent span contact Vulcraft

COMPOSITE

WEB CRIPPLING EXAMPLE

GIVEN: 3VLI20 Deck carrying a 6 1/2" total depth slab, normal weight concrete, joists at 8'-0" (C. to C.)
CHECK: Web crippling for 2" bearing at wall and 5" intermediate bearing.

Single Span

from page 56 figure 3

P_{EXT} = 0.5 (w1+w2) l
= 0.5 (63+20) 8
= 332 >296 (from Web Crippling table)
= N.G.

Any simple spans will have to have the bearing increased.

Double Span

P_{EXT} = 0.375 (w1+w2) l
= 249 < 296 OK

P_{INT} = 1.25 (w1+w2) l
= 830 < 1127 OK

Triple Span

P_{EXT} = 0.4 (w1+w2) l
= 266 < 296 OK

P_{INT} = 1.1 (w1+w2) l
= 730 < 1127 OK

If there are any simple spans, the length of the bearing will have to be increased to 2 1/2". All other conditions are adequate.

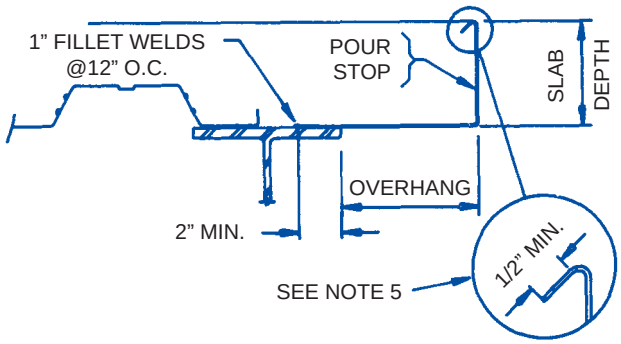
WEB CRIPPLING VALUES

Deck Type	React. Type	Allowable Reactions (lbs/ft) Bearing Length (inches) 1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0
	EXT.	437	500	574	648	721	795	847	847	847
1.5VL22	INT.	906	1000	1124	1249	1373	1498	1587	1587	1587
	EXT.	530	590	673	756	839	922	978	978	978
1.5VL21	INT.	1169	1257	1405	1553	1701	1849	1951	1951	1951
	EXT.	615	676	762	853	944	1035	1095	1095	1095
1.5VL20	INT.	1416	1524	1663	1831	1999	2168	2279	2279	2279
	EXT.	812	884	955	1068	1175	1283	1348	1348	1348
1.5VL19	INT.	1999	2132	2266	2459	2669	2880	3008	3008	3008
	EXT.	1133	1223	1314	1428	1564	1700	1777	1777	1777
1.5VL18	INT.	2627	2786	2944	3110	3359	3609	3750	3750	3750
	EXT.	1610	1727	1844	1961	2123	2298	2388	2388	2388
1.5VL17	INT.	3445	3633	3820	4008	4225	4520	4670	4670	4670
	EXT.	2122	2264	2405	2547	2689	2906	3004	3004	3004
1.5VL16	INT.	4310	4525	4739	4954	5169	5447	5603	5603	5603
	EXT.	196	225	258	291	324	357	390	423	489
2VLI22	INT.	413	456	513	570	627	683	740	797	911
	EXT.	239	267	304	342	379	417	454	492	567
2VLI21	INT.	535	576	644	712	779	847	915	983	1119
	EXT.	279	307	346	387	428	470	511	552	635
2VLI20	INT.	651	700	764	841	919	996	1073	1151	1305
	EXT.	371	404	436	488	537	586	635	684	782
2VLI19	INT.	922	984	1046	1135	1232	1329	1426	1523	1717
	EXT.	519	561	603	655	717	780	842	905	1029
2VLI18	INT.	1216	1289	1363	1439	1555	1670	1786	1901	2132
	EXT.	741	795	849	903	977	1058	1138	1219	1381
2VLI17	INT.	1598	1685	1772	1859	1960	2096	2233	2370	2643
	EXT.	979	1044	1110	1175	1241	1341	1439	1537	1733
2VLI16	INT.	2002	2102	2202	2301	2401	2531	2687	2844	3157
	EXT.	187	214	245	277	308	339	371	402	465
3VLI22	INT.	401	442	497	553	608	663	718	773	883
	EXT.	229	256	292	327	363	399	435	471	543
3VLI21	INT.	522	562	628	694	760	826	893	959	1091
	EXT.	269	296	333	373	413	453	492	532	612
3VLI20	INT.	637	685	748	824	900	975	1051	1127	1278
	EXT.	361	393	424	474	522	570	617	665	760
3VLI19	INT.	909	969	1030	1118	1214	1309	1405	1500	1691
	EXT.	508	549	590	641	702	763	824	885	1007
3VLI18	INT.	1203	1275	1348	1424	1538	1652	1767	1881	2109
	EXT.	729	782	835	888	961	1040	1120	1199	1358
3VLI17	INT.	1587	1673	1759	1846	1946	2081	2217	2353	2624
	EXT.	966	1031	1095	1160	1225	1323	1420	1517	1711
3VLI16	INT.	1993	2093	2192	2291	2390	2519	2675	2831	3143

SDI POUR STOP SELECTION TABLE

SLAB DEPTH (Inches)	OVERHANG (INCHES) 0	1	2	3	4	5	6	7	8	9	10	11	12
	POUR STOP TYPES												
4.00	20	20	20	20	18	18	16	14	12	12	12	10	10
4.25	20	20	20	18	18	16	16	14	12	12	12	10	10
4.50	20	20	20	18	18	16	16	14	12	12	12	10	10
4.75	20	20	18	18	16	16	14	14	12	12	10	10	10
5.00	20	20	18	18	16	16	14	14	12	12	10	10	
5.25	20	18	18	16	16	14	14	12	12	12	10	10	
5.50	20	18	18	16	16	14	14	12	12	12	10	10	
5.75	20	18	16	16	14	14	12	12	12	12	10	10	
6.00	18	18	16	16	14	14	12	12	12	10	10	10	
6.25	18	18	16	14	14	12	12	12	12	10	10		
6.50	18	16	16	14	14	12	12	12	12	10	10		
6.75	18	16	14	14	14	12	12	12	10	10	10		
7.00	16	16	14	14	12	12	12	12	10	10	10		
7.25	16	16	14	14	12	12	12	10	10	10			
7.50	16	14	14	12	12	12	12	10	10	10			
7.75	16	14	14	12	12	12	10	10	10	10			
8.00	14	14	12	12	12	12	10	10	10				
8.25	14	14	12	12	12	10	10	10	10				
8.50	14	12	12	12	12	10	10	10					
8.75	14	12	12	12	12	10	10	10					
9.00	14	12	12	12	10	10	10						
9.25	12	12	12	12	10	10	10						
9.50	12	12	12	10	10	10							
9.75	12	12	12	10	10	10							
10.00	12	12	10	10	10	10							
10.25	12	12	10	10	10								
10.50	12	12	10	10	10								
10.75	12	10	10	10									
11.00	12	10	10	10									
11.25	12	10	10										
11.50	10	10	10										
11.75	10	10											
12.00	10	10											

TYPES	DESIGN THICKNESS
20	0.0358
18	0.0474
16	0.0598
14	0.0747
12	0.1046
10	0.1345



NOTES: The above Selection Table is based on the following criteria:

1. Normal weight concrete (150 PCF).
2. Horizontal and vertical deflection is limited to 1/4" maximum for concrete dead load.
3. Design stress is limited to 20 KSI for concrete dead load temporaily increased by one-third for the construction live load of 20 PSF.
4. Pour Stop Selection Table does not consider the effect of the performance, deflection, or rotation of the pour stop support which may include both the supporting composite deck and/or the frame.
5. Vertical leg return lip is recommended for type 16 and higher.
6. This selection is not meant to replace the judgement of experienced Structural Engineers and shall be considered as a reference only.

SDI reserves the right to change any information in this selection without notice.

SDI
Code of Recommended Standard Practice

FOR COMPOSITE DECK, FORM DECK, AND ROOF DECK CONSTRUCTION

1. General

1.1 Scope: This code is intended to promote safety and quality construction in accordance with good engineering practice. It is designed to assist in the preparation of the sales contract by providing contract details which can be adopted by reference.

1.2 Application: This code shall govern where building codes, architects' and engineers' plans and specifications or contracts are not complete or clear. There shall be no conflict between this code and any legal building regulation; it shall only supplement and amplify such laws.

1.3 Design: In the absence of ordinances or specifications to the contrary, design shall be in accordance with the current Specifications of the Steel Deck Institute. Steel roof deck and floor deck, both composite and non-composite, may be used in a variety of ways, some of which do not lend themselves to a standard "steel deck" analysis for span and loading. There are, in these cases, other criteria which must be considered besides that given by the Steel Deck Institute. Make sure that this investigation starts with a review of the applicable Codes and that any special conditions are included in the design.

1.4 Plans and Specifications for Bidding: Plans and specifications shall clearly show details and shall be complete as to the extent of deck and accessories to be furnished by the seller.

1.5 Responsibility for Design: When details of design are specified, the seller shall assume no responsibility other than to furnish materials as specified. When details of design are not specified, the seller shall furnish all materials required in accordance with Section 1.3 of this code.

2. Bidding

2.1 Base Bids:

2.1.1 Roof Deck: Base bids shall include roof deck as shown in plan on structural drawings. Base bid shall also include ridge and valley plates and sump pans per architectural drawings and specifications. No other deck or accessories shall be included unless specified.

2.1.2 Composite Floor Deck and Non-Composite Form Deck: Base bids shall include deck as shown in plan and only those accessories specifically designated on the structural drawings and called for in the appropriate division of the specifications. No other deck or accessories shall be included unless specified.

2.2 Incomplete Plans and Specifications: Incomplete plans and specifications shall be bid on the basis that the seller shall provide material in agreement with the provisions of this code.

2.3 Special Details: Any material required to support the steel deck shall not be included. The design of deck supports shall be the responsibility of the architect and/or engineer of record. Deck shall be furnished in sheet lengths of 6 feet (2.0 m) or greater. Any deck sheets requiring lengths less than 6 feet (2.0 m) shall be field cut by others unless special arrangements are made with individual manufacturers.

3. Drawings and Specifications

3.1 Furnished by Buyer: The buyer shall furnish complete architectural plans and specifications, structural steel drawings, and purlin placing plans, all correctly dimensioned.

3.2 Furnished by Seller: The seller shall furnish erection layouts clearly showing the location of all sheets. The seller shall also furnish as many prints as may be reasonably necessary, but the tracing shall remain the property of the seller.

3.3 Discrepancies: The architect's plans shall be assumed to be correct in the absence of written notice from the buyer to the contrary. When structural steel or purlin placing plans do not agree with the architect's plans, the structural plans shall be considered as a written notice of change of plans.

3.4 Approval: The erection layouts shall be submitted to the buyer for approval unless the buyer instructs the seller to submit same directly to the architect or waives his right of approval. The buyer (or architect) shall return one copy marked with his approval or with such corrections as he may deem necessary. The seller shall not start shop work prior to final approval of his drawings unless such approval is waived.

The deck manufacturer is not responsible for putting a professional seal or signature on erection drawings. Erection drawings are made to show the deck products as an overlay on the structural or architectural plans and as such the drawings are trying to meet the job requirements set forth by the designer. If the deck manufacturer were to check and seal erection drawings, it would subvert that important function.

3.5 Changes by Buyer After Approval: When any changes are made by the buyer after approval or when any extra materials are required, the cost of such changes and extra materials shall be paid by the buyer at a price agreed upon between the buyer and seller.

4. Collateral Material

Although certain collateral materials are not supplied by the steel deck manufacturer, it is the desire of the Steel Deck Institute to have certain principles followed in specifying and furnishing these collateral materials in order to provide a satisfactory deck assembly. This code is not intended to encroach upon the standard practices of the related industries, but is intended to supplement and amplify specifications pertaining to their products.

4.1 Insulation: All steel roof decks shall be covered with a material of sufficient insulating value to prevent condensation under normal occupancy conditions. Insulation shall be adequately attached to the steel roof deck by adhesives or mechanical fasteners. Insulation materials shall be protected from the elements at all times during their storage and installation.

The following paragraph 11.3, Phenolic Foams has been extracted, with permission, from the Annual Book of ASTM Standards, copyright American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

11.3 PHENOLIC FOAMS may contain some compounds which may promote corrosion in the presence of liquid water. As far as can be ascertained, there are currently no directly applicable ASTM corrosion tests for phenolic foams. An attempt will be made to develop a meaningful corrosion test and will be incorporated into the standard when it becomes available. When it is anticipated that the foam will be in direct contact with metal, *the foam supplier shall provide the proper installation procedure.*

4.2 Acoustical Batts: When open rib acoustical deck is provided, sound absorbing acoustical glass fiber batts shall be installed in the field by the roofing contractor. Batts shall be shipped and stored at the jobsite in such a manner as to ensure protection until installation. If acoustical batts become wet, they shall be allowed to thoroughly dry without being compressed before installation.

4.3 Roof Coverings: A suitable roof covering shall be applied over the insulation.

4.4. Sheet Metal Work: All closures, flashing, etc., used in roof deck construction, unless otherwise specified, shall be detailed and furnished by the sheet metal contractor.

4.5 Field Painting: Any field painting or touch-up of abrasions or deterioration of the primer coat or other protective finishes shall be the responsibility of the buyer.

4.6. Shear Connectors: The layout, design, numbering or sizing of shear connectors is not the responsibility of the deck manufacturer.

5. Construction Practice

The Steel Deck Institute recommendations for site storage, installation, and construction practices are addressed specifically in the appropriate deck specifications in this design manual and are an integral part of this Code of Recommended Standard Practice.

DIAPHRAGM SHEAR STRENGTH AND STIFFNESS

The following information is based upon the **Steel Deck Institute's Second Edition of the Diaphragm Design Manual** prepared by Larry D. Luttrell, Ph.D., P.E. Dr. Luttrell has been involved in testing of diaphragms at West Virginia University since 1965.

The following limiting conditions are taken from this book. "The quality of a diaphragm can be limited by inattention to detail particularly at end and edge terminations."

End Laps

"At interior positions, panels must be sufficiently overlapped to provide adequate distances for the connector used. A minimum end distance for fasteners used should be one inch requiring an end lap not less than two inches. Within the system, end laps may be staggered or on a continuous line without particular effect on the diaphragm strength. However, greater care must be exercised in making connections through multiple layers of deck at the panel corners on the end lap. If panels are butted at their ends rather than end lapped, as is common with floor decks, then each panel must be individually connected at its ends with the specified pattern."

Side Laps

"The overlapping edges of panels should be in close contact to allow minimum eccentricity of fasteners in the lap. When **stitch fasteners** connect adjacent panels between supports, equivalent or superior fasteners should be used on the edgemost panel at the diaphragm perimeter. Otherwise shear strength along the first interior sidelap may exceed that along the perimeter member and thus diminish the contribution of the stitch fasteners."

Welds

"Welds should be made by qualified operators following AWS D1.3 specifications. Approximate checks on weld quality can be made by placing one end of a long panel over a support and attaching it only to that support with two welds six inches apart. The far end of the panel can be moved in the diaphragm plane by a workman until shear distress is noted in the weld. The welds should be sufficient to cause local distortions in the panel around both the welds and should show good perimeter contact between welds and the panel. For 22, 20, and 18 gage panels, the weld should not shear across its contact plane on structural supports else the welding temperature may have been too low for adequate penetration."

Screws

"Screws must be installed using properly calibrated tools to avoid overdriving which can strip the threads at sidelaps or sever the screw when it is placed into heavier substrata."

Power Driven Fasteners

"The fasteners must be installed following the manufacturer's recommendations. Care must be exercised in setting the driving force to obtain the proper depth of penetration. Once driven properly, these nail-like fasteners are very resistant to extraction by uplift forces. In uplift test on sheet materials, the usual mode of failure is one of tearing the seat around the head or washer leaving the fastener in place."

Split Panels

"Finishing out a diaphragm at its edge may require a split panel at what usually is a higher shear zone in the structure. Formulas of this section may be used to evaluate this special case noting the partial panel width. Such a partial panel should be connected in every valley at all supports regardless of adjacent fastener patterns. Extra stitch connectors should be considered at the split panel sidelap."

Longitudinal Edges

"In applications where joists terminate on a shear wall, the edge-most diaphragm panel may not contact the wall. If intermediate stitch fasteners have been required on sidelaps, similar intermediate stitch fasteners must exist at the edge. These can be accomodated by installing a block-like spacer on the wall, to match the joist elevation, and then making connections to the block."

Mixed Panel Lengths

"When decks are installed with multiple spans, occasional shorter panels may be required. In a large diaphragm area, the shear strength can be determined satisfactorily by using the typical three span panel length."

Load Tables

The following load tables are based upon Vulcraft's various types of steel floor and roof deck.

The Steel deck Institute has done testing that allows prediction of deck-fill combinations. One combination is lightweight insulating fill. Type I fill, with vermiculite aggregate, 2½ inches deep, has been shown to exhibit some greater strength than a bare diaphragm while Type II with a rigid insulation board imbedded with two or more inches of vermiculite concrete over the top has an even higher value.

Both lightweight and normal weight structural concrete on composite and non-composite deck are presented here. A minimum value for 2½ inches of concrete over the top of the deck has been computed in the tables.

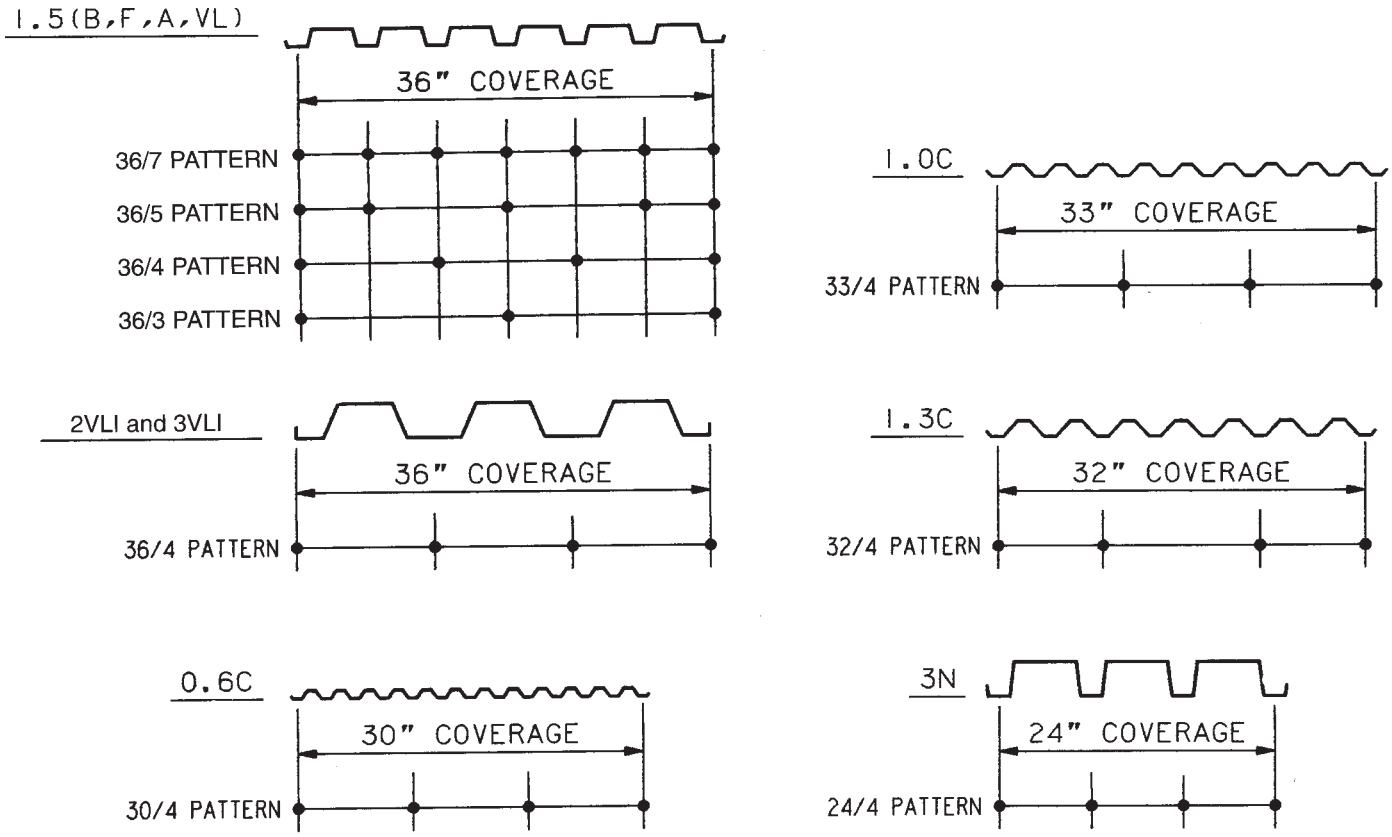
On some of the light-gage shallow decks, you will notice that as the spans get long the shear strength reaches some maximum value. This is caused from "plate-like shear buckling". As the thickness of the deck gets smaller and the spans get longer for shallow decks, buckling can result as the shear strength increases. See Section 2.4 Stability Checks of DDM02.

This catalog is not presented as an alternative to the use of the Second Edition of the Diaphragm Desing Manual (DDM02), but as an extension to it for our decks. We have given you the shear strength and stiffness of our various decks, but not the backup data behind these calculations. DDM02 does a good job of supplying that information. We hope that you will contact the SDI about ordering your own copy of DDM02. Steel Deck Institute, P.O. Box 25, Fox River Grove, IL 60021-0025.

These tables were derived making the following assumptions.

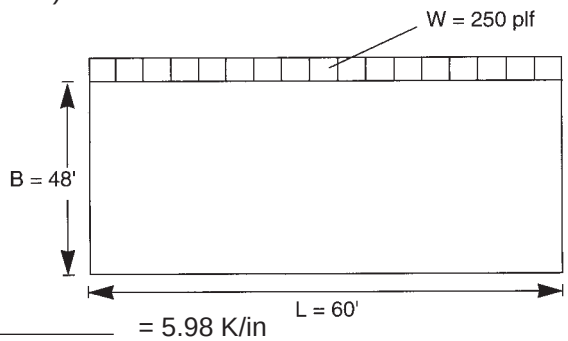
1. The number of fasteners are the same at both end members and interior supports. Example: 36/7 means 36 inch wide deck with 7 fasteners per support. One in each flute.
2. The number of intermediate sidelap stitch connectors is assumed to be the same as the number of extreme edge fasteners.
3. The values printed have the factor of safety applied. 3.25 for filled diaphragms, 2.75 when any of a bare diaphragm is welded, and 2.35 when a bare diaphragm is mechanically fastened.
4. All values are for a three span condition. Greater values are available for a 1 or 2 span condition since you will have more fasteners to count in the calculation of strength.
5. Where welded sidelaps are shown, either use a 5/8" puddle weld or a 3/8" x 1¼" arc seam weld. The Steel Deck Institute recommends not welding the sidelaps if the thickness of the deck is 0.0295" or less.
6. Where welds are shown at the supports, the Steel Deck Institute recommends using welding washers only on deck thicknesses less than 0.028". These should be 16 gage with a 3/8" hole in them.
7. Lightweight fill (vermiculite) should be placed only on slot vented deck (type CSV).
8. For roof deck and composite floor deck the steel yield point is taken as 33ksi. For form deck it is taken as 80ksi.
9. The column with the asterisk above it contains the number of sidelap fasteners per span. That is, if the line that is selected has 4 under the asterisk and the span is five feet, then it will be one fastener per foot in the sidelap.
10. The tables already have considered a stress increase of 1.33 for short-term or wind loading. The values are not to be increased again.
11. The Steel Deck Institute does not recognize button punched sidelaps, with interlocking deck, as a valid sidelap fastener for developing diaphragm shear strength.

TYPICAL FASTENER LAYOUT



DIAPHRAGM SHEAR STRENGTH AND STIFFNESS DESIGN EXAMPLE

For roof plan shown, calculate the deflection of diaphragm ($\Delta_{\text{℄}}$ center line).



Joist spacing = 5'-0"
Deck: 1.5B 22 (WR) in 15'-0" panels
(3 span condition)
Fasteners: Support – 36/3 pattern
W/ 5/8" puddle welds
Sidelap – 1 #10 TEK

From strength tables $K_1 = 0.617$

$$G' = \frac{K_2}{3.78 + \frac{0.3D_B}{\text{Span}} + 3K_1 \text{ Span}} = \frac{870}{3.78 + \frac{0.3(2209)}{5} + 3(0.617)(5)} = 5.98 \text{ K/in}$$

$$\Delta_{\text{℄}} = \frac{WL^2}{8xBxG'} = \frac{0.250\,(60)^2}{8\,(48)\,(5.98)} = 0.39 \text{ in}$$

Strength Check

$R = WL/2 = \frac{250\,(60)}{2} = 7500$ lbs $\quad S = \frac{7500}{48} = 156$ plf < 191 plf (from strength tables) OK

1.5 (B, BI) 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 3/4" puddle welds

SIDELAP FASTENERS: welded[1]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	500	435	378	334	299	270	246	226	208	193	180	168	158	140	0.486
	1	627	550	488	439	394	356	325								0.288
	2	740	655	586	529	481	441	404	371	344	319	298	280	249		0.204
	3	839	750	675	613	560	515	477	443	411	359	316	280	249	202	0.159
	4	925	834	757	691	634	585	543	478	412	359	316	280	249	202	0.129
36/7	5	999	909	831	763	703	651	561	478	412	359	316	280	249	202	0.109
	6	1063	976	897	828	767	668	561	478	412	359	316	280	249	202	0.095
	7	1117	1034	957	888	808	668	561	478	412	359	316	280	249	202	0.084
	8	1164	1084	1010	942	808	668	561	478	412	359	316	280	249	202	0.075
	9	1204	1129	1058	991	808	668	561	478	412	359	316	280	249	202	0.068
	10	1239	1168	1100	997	808	668	561	478	412	359	316	280	249	202	0.062
	11	1268	1202	1138	997	808	668	561	478	412	359	316	280	249	202	0.057
		DB = 129							K2 = 870							
	0	443	389	346	309	276	249	227	208	192	178	166	155	145	129	0.583
	1	548	489	439	398	364	335	306								0.319
	2	633	573	521	476	438	404	375	350	327	304	284	266	249		0.220
	3	701	643	590	544	504	468	436	408	383	359	316	280	249	202	0.168
	4	755	700	650	604	562	525	492	462	412	359	316	280	249	202	0.135
36/5	5	798	747	700	655	614	577	543	478	412	359	316	280	249	202	0.114
	6	832	786	741	699	659	622	561	478	412	359	316	280	249	202	0.098
	7	860	818	777	737	699	663	561	478	412	359	316	280	249	202	0.086
	8	882	844	806	769	733	668	561	478	412	359	316	280	249	202	0.077
	9	900	866	831	797	763	668	561	478	412	359	316	280	249	202	0.069
	10	915	885	853	821	789	668	561	478	412	359	316	280	249	202	0.063
	11	928	900	871	841	808	668	561	478	412	359	316	280	249	202	0.058
		DB = 758							K2 = 870							
	0	339	298	265	233	208	188	170	156	143	133	123	115	107	95	0.729
	1	439	394	356	324	296	273	249								0.359
	2	514	470	430	396	366	339	316	295	277	259	242	226	213		0.238
	3	569	528	490	456	425	397	372	350	330	311	295	280	249	202	0.178
	4	610	573	538	505	475	447	421	398	377	357	316	280	249	202	0.142
36/4	5	640	608	576	546	517	490	464	441	412	359	316	280	249	202	0.118
	6	663	635	606	579	552	526	501	478	412	359	316	280	249	202	0.101
	7	680	656	631	605	580	556	533	478	412	359	316	280	249	202	0.089
	8	694	672	650	627	604	582	560	478	412	359	316	280	249	202	0.079
	9	704	685	666	645	624	604	561	478	412	359	316	280	249	202	0.071
	10	713	696	679	660	641	622	561	478	412	359	316	280	249	202	0.064
	11	720	705	689	673	655	638	561	478	412	359	316	280	249	202	0.059
		DB = 1072							K2 = 870							
	0	283	253	228	207	185	167	151	138	127	117	109	101	95	83	0.972
	1	356	327	301	278	258	240	224								0.409
	2	403	378	354	332	312	293	276	260	246	233	222	211	200		0.259
	3	432	412	391	372	353	335	318	303	288	275	262	250	240	202	0.189
	4	452	435	418	401	384	368	352	337	323	309	297	280	249	202	0.149
36/3	5	465	451	437	422	408	393	379	365	351	338	316	280	249	202	0.123
	6	474	463	451	439	426	413	400	387	375	359	316	280	249	202	0.105
	7	481	472	462	451	440	428	417	405	394	359	316	280	249	202	0.091
	8	486	478	470	460	451	441	430	420	410	359	316	280	249	202	0.081
	9	490	483	476	468	459	451	441	432	412	359	316	280	249	202	0.073
	10	493	487	481	474	466	459	450	442	412	359	316	280	249	202	0.066
	11	495	490	485	479	472	465	458	450	412	359	316	280	249	202	0.060
		DB = 2209							K2 = 870							

* = number of sidelap fasteners per span

[1] The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_B}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet

1.5 (B, BI, F, A) 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds[1]

SIDELAP FASTENERS: welded[2]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	413	359	313	276	247	223	203	186	172	160	149	139	130	116	0.486
	1	539	473	421	379	342	309	282								0.288
	2	647	575	516	467	426	391	361	332	308	286	267	251	236		0.204
	3	739	665	601	548	502	463	429	399	373	349	316	280	249	202	0.159
	4	817	742	677	621	572	530	493	460	412	359	316	280	249	202	0.129
36/7	5	881	809	744	687	636	592	552	478	412	359	316	280	249	202	0.109
	6	934	866	803	746	695	649	561	478	412	359	316	280	249	202	0.095
	7	978	914	854	798	747	668	561	478	412	359	316	280	249	202	0.084
	8	1015	956	898	844	794	668	561	478	412	359	316	280	249	202	0.075
	9	1046	991	937	885	808	668	561	478	412	359	316	280	249	202	0.068
	10	1072	1021	970	921	808	668	561	478	412	359	316	280	249	202	0.062
	11	1093	1047	1000	953	808	668	561	478	412	359	316	280	249	202	0.057
		DB =129			DF = 226			DA =356		K2 = 870						
	0	366	322	286	255	228	206	188	172	159	147	137	128	120	106	0.583
	1	469	419	378	343	314	289	267								0.319
	2	548	499	456	418	385	357	332	310	291	273	255	240	225		0.220
	3	609	562	520	482	448	417	390	366	344	325	307	280	249	202	0.168
	4	654	612	572	535	501	470	442	417	394	359	316	280	249	202	0.135
36/5	5	689	651	614	579	547	516	488	462	412	359	316	280	249	202	0.114
	6	716	682	649	616	585	556	528	478	412	359	316	280	249	202	0.098
	7	736	707	677	647	618	590	561	478	412	359	316	280	249	202	0.086
	8	753	727	699	672	645	619	561	478	412	359	316	280	249	202	0.077
	9	766	743	718	693	669	644	561	478	412	359	316	280	249	202	0.069
	10	776	756	734	711	688	665	561	478	412	359	316	280	249	202	0.063
	11	785	766	747	726	705	668	561	478	412	359	316	280	249	202	0.058
		DB = 758			DF = 886			DA = 974		K2 = 870						
	0	280	247	219	193	172	155	141	129	119	110	102	95	89	78	0.729
	1	377	340	308	281	258	238	220								0.359
	2	446	410	378	349	324	301	281	264	248	234	220	206	194		0.238
	3	493	461	431	404	378	355	334	315	297	282	267	254	242	202	0.178
	4	525	498	472	446	422	399	378	359	341	324	309	280	249	202	0.142
36/4	5	549	526	502	479	457	436	416	396	379	359	316	280	249	202	0.118
	6	565	546	526	505	485	465	446	428	411	359	316	280	249	202	0.101
	7	578	561	544	526	508	490	472	455	412	359	316	280	249	202	0.089
	8	587	573	558	542	526	509	493	477	412	359	316	280	249	202	0.079
	9	594	582	569	555	540	526	511	478	412	359	316	280	249	202	0.071
	10	600	589	578	565	552	539	526	478	412	359	316	280	249	202	0.064
	11	604	595	585	574	562	551	538	478	412	359	316	280	249	202	0.059
		DB = 1072			DF =1216			DA = 1282		K2 = 870						
	0	234	209	189	171	153	138	125	114	105	97	90	84	78	69	0.972
	1	304	281	260	240	223	208	195								0.409
	2	344	325	307	289	273	258	244	231	219	208	198	189	180		0.259
	3	368	353	338	323	309	295	281	269	257	246	235	225	216	200	0.189
	4	383	371	359	347	334	322	310	298	287	276	266	256	247	202	0.149
36/3	5	392	383	373	363	353	342	331	321	311	301	291	280	249	202	0.123
	6	399	391	383	375	366	357	348	338	329	320	311	280	249	202	0.105
	7	403	397	391	384	376	368	360	352	344	336	316	280	249	202	0.091
	8	407	402	396	390	384	377	370	363	356	348	316	280	249	202	0.081
	9	409	405	400	395	390	384	378	372	365	359	316	280	249	202	0.073
	10	411	408	404	399	394	389	384	378	373	359	316	280	249	202	0.066
	11	413	410	406	402	398	394	389	384	379	359	316	280	249	202	0.060
		DB = 2209			DF = 2428			DA = 2442		K2 = 870						

* = number of sidelap fasteners per span

1 A 3/8" x 1 1/4" arc seam weld shall be used with F deck or A deck

2 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

1.5 (B, F, A) 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds[1]

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	413	359	313	276	247										0.486
	1	476	416	369	327	293	265	242								0.377
	2	535	470	418	376	339	307	280	257	238	221	206	193	182		0.309
	3	590	521	466	420	382	349	319	293	271	252	235	220	207	185	0.261
	4	642	570	511	462	421	387	357	328	304	282	264	247	233	202	0.226
36/7	5	689	615	554	503	459	422	391	363	337	313	293	275	249	202	0.199
	6	732	658	595	541	496	457	423	394	368	344	316	280	249	202	0.178
	7	772	697	633	578	531	490	455	424	397	359	316	280	249	202	0.161
	8	809	734	669	613	565	523	486	453	412	359	316	280	249	202	0.147
	9	842	768	704	647	597	554	515	478	412	359	316	280	249	202	0.136
	10	873	800	736	678	628	583	544	478	412	359	316	280	249	202	0.126
	11	901	830	766	708	657	612	561	478	412	359	316	280	249	202	0.117
				DB =129		DF = 226			DA =356		K2 = 870					
	0	366	322	286	255	228										0.583
	1	419	371	333	301	274	248	226								0.434
	2	466	417	376	341	312	287	264	243	225	209	195	182	171		0.345
	3	508	458	415	379	348	321	298	277	257	239	223	209	197	176	0.287
	4	545	495	452	414	382	353	328	307	287	270	252	236	222	199	0.245
36/5	5	577	528	485	447	413	384	358	335	314	296	280	264	248	202	0.214
	6	604	558	515	477	443	412	386	362	340	321	303	280	249	202	0.190
	7	629	584	542	504	470	439	412	387	365	345	316	280	249	202	0.171
	8	650	607	567	530	496	465	437	411	388	359	316	280	249	202	0.155
	9	669	628	589	553	519	488	460	434	411	359	316	280	249	202	0.142
	10	685	646	609	574	541	510	482	456	412	359	316	280	249	202	0.131
	11	699	663	627	593	561	530	502	476	412	359	316	280	249	202	0.122
				DB = 758		DF = 886			DA = 974		K2 = 870					
	0	280	247	219	193	172										0.729
	1	331	295	265	240	218	197	179								0.509
	2	375	338	306	279	256	236	218	200	184	171	159	149	140		0.392
	3	412	375	342	314	290	268	249	233	217	202	188	176	166	148	0.318
	4	443	407	375	346	321	298	278	261	245	231	217	203	191	171	0.268
36/4	5	468	434	403	374	349	326	305	287	270	255	241	229	217	194	0.231
	6	490	458	427	400	374	351	330	311	294	278	264	251	239	202	0.203
	7	507	478	449	422	397	374	353	333	316	300	285	271	249	202	0.182
	8	522	495	468	442	418	395	374	354	336	320	305	280	249	202	0.164
	9	535	510	484	460	436	414	393	374	356	339	316	280	249	202	0.149
	10	546	522	499	475	453	431	411	392	374	357	316	280	249	202	0.137
	11	555	533	511	489	468	447	427	408	390	359	316	280	249	202	0.127
				DB = 1072		DF =1216			DA = 1282		K2 = 870					
	0	234	209	189	171	153										0.972
	1	273	248	226	208	191	177	164								0.617
	2	303	279	258	239	222	207	193	181	170	159	148	138	130		0.452
	3	325	304	284	265	248	233	219	206	195	184	175	165	155	138	0.357
	4	343	323	305	287	271	255	241	228	216	206	196	186	178	161	0.295
36/3	5	356	339	322	306	290	275	261	248	236	225	215	205	196	180	0.251
	6	367	351	336	321	306	292	279	266	254	243	232	222	213	197	0.219
	7	375	361	348	334	320	307	294	281	270	259	248	238	229	202	0.194
	8	381	370	357	344	332	319	307	295	284	273	263	253	244	202	0.174
	9	387	376	365	353	342	330	319	307	296	286	276	266	249	202	0.158
	10	391	382	372	361	350	339	329	318	308	297	288	278	249	202	0.144
	11	395	386	377	368	358	348	338	327	318	308	298	280	249	202	0.133
				DB = 2209		DF = 2428			DA = 2442		K2 = 870					

* = number of sidelap fasteners per span

1 A 3/8" x 1 1/4" arc seam weld shall be used with F deck or A deck

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1* SPAN}, \text{ Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

1.5 (B, F, A) 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.35

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	283	246	214	189	169										0.551
	1	355	311	276	248	223	202	184								0.416
	2	419	371	332	299	273	250	229	210	195	181	169	158	149		0.334
	3	475	425	383	347	317	292	270	251	233	217	203	190	179	160	0.279
	4	524	473	429	392	359	332	308	287	268	252	236	222	209	187	0.239
36/7	5	566	515	471	432	399	369	343	321	301	283	267	253	239	202	0.210
	6	602	553	509	469	435	404	377	353	332	313	296	280	249	202	0.187
	7	633	586	542	503	468	437	409	384	361	341	316	280	249	202	0.168
	8	659	614	572	534	499	467	439	413	390	359	316	280	249	202	0.153
	9	682	639	599	562	527	495	467	440	412	359	316	280	249	202	0.140
	10	701	661	623	587	553	521	492	466	412	359	316	280	249	202	0.129
	11	718	681	644	609	576	545	517	478	412	359	316	280	249	202	0.120
				DB =129		DF = 226		DA =356		K2 = 870						
	0	250	220	196	175	156										0.661
	1	310	276	249	225	206	189	173								0.476
	2	358	324	295	270	248	229	213	198	186	172	161	151	142		0.371
	3	397	364	334	308	285	265	247	231	217	205	193	183	172	154	0.304
	4	427	396	368	342	319	298	279	262	247	233	221	210	199	181	0.258
36/5	5	452	423	396	371	348	327	308	290	274	260	247	234	223	202	0.224
	6	471	445	420	396	373	353	333	316	299	284	271	258	246	202	0.198
	7	487	463	440	417	396	375	356	339	322	307	293	280	249	202	0.177
	8	499	478	457	435	415	396	377	360	343	328	314	280	249	202	0.160
	9	509	490	471	451	432	413	395	378	362	347	316	280	249	202	0.146
	10	518	500	483	465	447	429	412	395	380	359	316	280	249	202	0.135
	11	525	509	493	476	459	443	426	410	395	359	316	280	249	202	0.125
				DB = 758		DF = 886		DA = 974		K2 = 870						
	0	191	169	150	132	118										0.827
	1	248	223	201	183	168	155	141								0.555
	2	291	266	244	224	207	192	179	167	157	147	137	128	121		0.418
	3	322	299	278	258	241	225	211	198	187	176	167	159	151	135	0.335
	4	345	325	305	286	269	253	239	226	214	203	192	183	175	160	0.280
36/4	5	362	344	326	309	293	277	263	250	237	226	216	206	197	181	0.240
	6	375	359	343	328	312	298	284	271	259	247	236	226	217	200	0.210
	7	385	371	357	343	329	315	302	289	277	266	255	245	236	202	0.187
	8	392	380	368	355	342	329	317	305	294	282	272	262	249	202	0.168
	9	398	388	377	365	353	342	330	319	308	297	287	277	249	202	0.153
	10	403	394	384	374	363	352	341	331	320	310	300	280	249	202	0.140
	11	407	399	390	381	371	361	351	341	331	322	312	280	249	202	0.130
				DB = 1072		DF =1216		DA = 1282		K2 = 870						
	0	160	143	129	117	105										1.102
	1	202	185	171	157	146	136	127								0.667
	2	228	214	200	188	176	166	156	148	140	132	126	119	114		0.479
	3	245	233	222	210	200	190	180	171	163	156	148	142	136	125	0.373
	4	255	246	237	227	217	208	199	191	183	175	168	161	155	144	0.306
36/3	5	263	255	247	239	231	223	214	207	199	192	185	178	172	160	0.259
	6	268	262	255	248	241	234	226	219	212	205	199	192	186	175	0.225
	7	272	267	261	255	249	242	236	229	223	217	210	204	199	187	0.198
	8	275	270	266	260	255	249	244	238	232	226	220	215	209	198	0.177
	9	277	273	269	265	260	255	250	245	239	234	229	223	218	202	0.161
	10	279	275	272	268	264	259	255	250	245	241	236	231	226	202	0.147
	11	280	277	274	271	267	263	259	255	250	246	242	237	233	202	0.135
				DB = 2209		DF = 2428		DA = 2442		K2 = 870						

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1* SPAN}, \text{ Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

1.5 (B, BI) 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 3/4" puddle welds

SIDELAP FASTENERS: welded[1]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	601	523	457	404	362	327	298	273	252	234	218	204	192	171	0.537
	1	754	661	587	528	475	430	393								0.317
	2	889	787	704	636	579	531	488	449	415	386	361	338	318		0.225
	3	1009	901	812	737	673	619	573	533	496	462	432	384	342	277	0.174
	4	1112	1003	910	830	762	703	652	608	566	493	433	384	342	277	0.142
36/7	5	1201	1093	999	917	845	783	728	656	566	493	433	384	342	277	0.120
	6	1278	1173	1079	995	922	857	770	656	566	493	433	384	342	277	0.104
	7	1343	1243	1150	1067	993	916	770	656	566	493	433	384	342	277	0.092
	8	1400	1304	1214	1133	1058	916	770	656	566	493	433	384	342	277	0.082
	9	1448	1357	1272	1191	1109	916	770	656	566	493	433	384	342	277	0.074
	10	1489	1404	1322	1245	1109	916	770	656	566	493	433	384	342	277	0.068
	11	1525	1446	1368	1293	1109	916	770	656	566	493	433	384	342	277	0.062
					DB = 97						K2 = 1056					
	0	532	468	417	374	334	302	275	252	233	216	201	188	177	157	0.644
	1	659	587	528	479	438	402	370								0.352
	2	761	689	626	572	526	486	451	421	394	368	344	322	303		0.242
	3	843	773	710	654	606	562	524	491	461	434	410	384	342	277	0.184
	4	908	842	781	726	676	631	591	556	523	493	433	384	342	277	0.149
36/5	5	960	899	841	787	738	693	652	615	566	493	433	384	342	277	0.125
	6	1001	945	891	840	792	748	707	656	566	493	433	384	342	277	0.108
	7	1034	984	934	886	840	796	756	656	566	493	433	384	342	277	0.094
	8	1061	1015	970	925	881	839	770	656	566	493	433	384	342	277	0.084
	9	1083	1042	1000	958	917	877	770	656	566	493	433	384	342	277	0.076
	10	1101	1064	1025	987	948	910	770	656	566	493	433	384	342	277	0.069
	11	1116	1082	1047	1011	975	916	770	656	566	493	433	384	342	277	0.063
					DB = 567						K2 = 1056					
	0	408	359	320	283	252	228	207	190	175	162	150	140	131	116	0.805
	1	528	474	428	389	356	328	302								0.395
	2	618	565	517	476	440	408	380	355	333	313	293	274	258		0.261
	3	685	635	590	548	511	477	447	420	396	374	354	336	320	277	0.195
	4	733	689	647	608	571	537	507	479	453	429	408	384	342	277	0.156
36/4	5	770	731	693	656	621	589	558	530	504	479	433	384	342	277	0.130
	6	797	763	729	696	663	632	602	575	548	493	433	384	342	277	0.111
	7	818	788	758	728	698	669	640	614	566	493	433	384	342	277	0.097
	8	834	808	782	754	727	699	673	647	566	493	433	384	342	277	0.086
	9	847	824	800	776	751	726	701	656	566	493	433	384	342	277	0.078
	10	857	837	816	794	771	748	725	656	566	493	433	384	342	277	0.071
	11	865	848	829	809	788	767	745	656	566	493	433	384	342	277	0.065
					DB = 802						K2 = 1056					
	0	340	304	274	249	225	203	184	169	155	143	133	124	116	102	1.074
	1	429	394	362	335	310	288	269								0.450
	2	484	454	426	399	375	352	332	313	296	281	266	253	242		0.285
	3	520	495	471	447	424	403	383	364	346	330	315	301	288	265	0.208
	4	543	523	503	482	462	442	423	405	388	372	357	342	329	277	0.164
36/3	5	559	543	526	508	490	473	455	438	422	407	392	378	342	277	0.135
	6	570	557	542	527	512	496	481	465	450	436	422	384	342	277	0.115
	7	579	567	555	542	529	515	501	487	474	460	433	384	342	277	0.100
	8	585	575	565	554	542	530	518	505	493	480	433	384	342	277	0.089
	9	589	581	572	563	553	542	531	520	508	493	433	384	342	277	0.080
	10	593	586	578	570	561	552	542	532	521	493	433	384	342	277	0.072
	11	596	590	583	576	568	559	551	542	532	493	433	384	342	277	0.066
					DB = 1652						K2 = 1056					

* = number of sidelap fasteners per span

1 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_B}{SPAN} + 3*K_1* SPAN}, \text{ Kips/inch}$$

SPAN is in feet

1.5 (B, BI, F, A) 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds[1]

SIDELAP FASTENERS: welded[2]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	496	431	377	333	298	270	246	226	208	193	180	169	158	141	0.537
	1	647	568	505	455	412	373	341								0.317
	2	777	691	619	560	511	469	433	401	371	345	322	303	285		0.225
	3	888	798	722	658	603	556	515	479	448	421	394	370	342	277	0.174
	4	981	891	813	746	687	636	591	552	517	487	433	384	342	277	0.142
36/7	5	1058	971	894	825	764	711	663	621	566	493	433	384	342	277	0.120
	6	1122	1040	964	896	834	779	730	656	566	493	433	384	342	277	0.104
	7	1175	1098	1025	959	897	842	770	656	566	493	433	384	342	277	0.092
	8	1219	1147	1079	1014	954	899	770	656	566	493	433	384	342	277	0.082
	9	1256	1190	1125	1063	1005	916	770	656	566	493	433	384	342	277	0.074
	10	1287	1226	1165	1106	1050	916	770	656	566	493	433	384	342	277	0.068
	11	1313	1257	1200	1145	1091	916	770	656	566	493	433	384	342	277	0.062
				DB = 97		DF = 169		DA = 266		K2 = 1056						
	0	439	386	344	308	276	249	227	208	192	178	166	155	146	130	0.644
	1	563	504	454	412	377	347	321								0.352
	2	659	599	547	502	463	428	399	372	349	328	308	289	272		0.242
	3	731	675	624	578	537	501	468	439	413	390	369	350	333	277	0.184
	4	786	735	687	642	602	564	531	500	473	447	424	384	342	277	0.149
36/5	5	828	782	738	696	656	620	586	555	526	493	433	384	342	277	0.125
	6	859	819	779	740	703	667	634	603	566	493	433	384	342	277	0.108
	7	884	849	813	777	742	708	676	646	566	493	433	384	342	277	0.094
	8	904	872	840	807	775	743	713	656	566	493	433	384	342	277	0.084
	9	919	892	862	833	803	773	744	656	566	493	433	384	342	277	0.076
	10	932	907	881	854	827	799	770	656	566	493	433	384	342	277	0.069
	11	942	920	897	872	847	821	770	656	566	493	433	384	342	277	0.063
				DB = 567		DF = 663		DA = 728		K2 = 1056						
	0	336	296	264	233	208	188	171	156	144	133	124	116	108	96	0.805
	1	453	408	370	337	309	285	265								0.395
	2	535	492	454	419	389	362	338	317	298	280	265	250	235		0.261
	3	592	554	518	485	454	426	401	378	357	338	321	305	291	265	0.195
	4	631	598	566	536	507	480	454	431	409	389	371	354	338	277	0.156
36/4	5	659	631	603	576	549	523	499	476	455	434	416	384	342	277	0.130
	6	679	655	631	607	583	559	536	514	493	473	433	384	342	277	0.111
	7	694	674	653	631	610	588	567	546	526	493	433	384	342	277	0.097
	8	705	688	670	651	631	612	592	573	554	493	433	384	342	277	0.086
	9	713	699	683	666	649	631	614	596	566	493	433	384	342	277	0.078
	10	720	707	694	679	663	648	631	615	566	493	433	384	342	277	0.071
	11	726	714	702	689	675	661	646	631	566	493	433	384	342	277	0.065
				DB = 802		DF = 909		DA = 959		K2 = 1056						
	0	281	251	226	206	186	167	152	139	128	118	110	102	96	85	1.074
	1	365	337	312	289	268	250	234								0.450
	2	414	391	369	348	328	310	293	277	263	250	237	226	216		0.285
	3	442	424	406	388	371	354	338	323	308	295	282	271	260	240	0.208
	4	460	446	431	416	401	386	372	358	344	332	319	307	296	276	0.164
36/3	5	471	460	448	436	423	411	398	385	373	361	349	338	327	277	0.135
	6	479	470	460	450	440	429	417	406	395	384	374	363	342	277	0.115
	7	484	477	469	461	452	442	433	423	413	403	393	384	342	277	0.100
	8	488	482	476	469	461	453	444	436	427	418	409	384	342	277	0.089
	9	491	486	481	475	468	461	454	446	438	430	423	384	342	277	0.080
	10	494	489	485	479	474	468	461	454	448	441	433	384	342	277	0.072
	11	496	492	488	483	478	473	467	461	455	449	433	384	342	277	0.066
				DB = 1652		DF = 1816		DA = 1827		K2 = 1056						

* = number of sidelap fasteners per span

1 A 3/8" x 1 1/4" arc seam weld shall be used with F deck or A deck

2 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

1.5 (B, F, A) 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds[1]

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	496	431	377	333	298										0.537
	1	573	500	443	395	354	321	292								0.417
	2	644	566	504	453	410	371	339	312	288	268	250	234	220		0.341
	3	711	628	561	506	460	422	386	355	328	305	285	267	252	225	0.288
	4	773	687	616	557	508	466	431	398	368	343	320	300	283	253	0.250
36/7	5	830	742	668	606	554	510	471	438	408	380	355	333	314	277	0.220
	6	883	793	717	653	598	551	511	476	445	417	390	366	342	277	0.197
	7	931	841	764	698	641	592	549	512	479	450	424	384	342	277	0.178
	8	975	885	808	740	682	631	586	547	513	482	433	384	342	277	0.163
	9	1015	927	849	781	721	668	622	582	546	493	433	384	342	277	0.150
	10	1052	965	887	819	758	705	657	615	566	493	433	384	342	277	0.138
	11	1085	1000	924	855	794	739	691	648	566	493	433	384	342	277	0.129
				DB = 97		DF = 169		DA = 266		K2 = 1056						
	0	439	386	344	308	276										0.644
	1	504	447	400	362	329	300	274								0.479
	2	561	502	452	411	376	346	320	294	272	253	236	221	208		0.381
	3	612	552	500	457	419	387	359	334	312	290	271	254	239	214	0.316
	4	656	596	544	499	460	426	396	370	347	326	306	287	270	242	0.271
36/5	5	694	636	584	539	498	463	432	404	379	357	337	320	301	270	0.236
	6	728	672	621	575	534	498	465	436	410	387	366	347	330	277	0.210
	7	757	703	653	608	567	530	497	467	440	416	394	374	342	277	0.189
	8	783	731	683	638	598	561	527	496	469	444	421	384	342	277	0.171
	9	805	756	710	666	626	589	555	524	496	470	433	384	342	277	0.157
	10	824	778	734	692	652	615	581	550	522	493	433	384	342	277	0.145
	11	842	798	756	715	676	640	606	575	546	493	433	384	342	277	0.134
				DB = 567		DF = 663		DA = 728		K2 = 1056						
	0	336	296	264	233	208										0.805
	1	399	355	319	289	264	239	217								0.563
	2	452	407	368	336	308	284	263	243	224	208	194	182	170		0.432
	3	496	451	412	379	349	323	301	281	263	245	229	214	202	180	0.351
	4	533	490	451	417	386	360	336	314	295	278	263	247	233	208	0.295
36/4	5	564	523	485	451	420	393	368	346	326	308	291	277	263	236	0.255
	6	589	551	515	482	451	423	398	375	354	336	318	303	288	263	0.224
	7	611	575	541	509	479	451	426	402	381	362	344	327	312	277	0.200
	8	629	596	564	533	504	476	451	428	406	386	368	351	335	277	0.181
	9	644	614	583	554	526	499	474	451	429	409	391	373	342	277	0.165
	10	657	629	600	573	546	520	496	473	451	431	412	384	342	277	0.151
	11	668	642	616	589	564	539	515	492	471	451	432	384	342	277	0.140
				DB = 802		DF = 909		DA = 959		K2 = 1056						
	0	281	251	226	206	186										1.074
	1	328	298	272	250	230	213	198								0.682
	2	364	336	310	288	267	249	233	218	205	193	180	168	158		0.499
	3	391	366	342	319	299	280	264	248	235	222	211	200	189	169	0.394
	4	412	389	367	346	326	308	291	275	261	248	236	225	215	197	0.325
36/3	5	428	408	388	368	349	331	315	299	285	271	259	248	237	218	0.277
	6	441	423	405	386	369	352	336	321	306	293	280	269	258	238	0.241
	7	451	435	418	402	385	369	354	339	325	312	300	288	277	256	0.214
	8	459	445	430	415	399	385	370	356	342	329	317	305	294	274	0.192
	9	465	452	439	425	411	398	384	370	357	345	333	321	310	277	0.174
	10	470	459	447	435	422	409	396	383	371	359	347	336	325	277	0.159
	11	475	465	454	442	431	419	406	395	383	371	360	349	338	277	0.146
				DB = 1652		DF = 1816		DA = 1827		K2 = 1056						

* = number of sidelap fasteners per span

1 A 3/8" x 1 1/4" arc seam weld shall be used with F deck or A deck

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1*SPAN}\ , \text{Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

1.5 (B, F, A) 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.35

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
36/7	0	343	298	261	230	206										0.607
	1	430	377	335	301	272	246	224								0.458
	2	508	450	403	363	331	303	279	257	238	221	206	194	182		0.368
	3	577	515	464	422	385	354	328	305	284	265	247	232	219	196	0.307
	4	636	574	521	475	436	403	374	348	326	306	288	271	255	228	0.264
	5	687	625	572	525	484	448	417	390	365	344	324	307	291	261	0.231
	6	731	671	617	570	528	491	458	429	403	380	359	340	323	277	0.206
	7	768	711	658	611	569	531	497	466	439	414	392	372	342	277	0.185
	8	800	746	695	648	606	567	533	501	473	447	424	384	342	277	0.169
	9	828	776	727	682	640	601	566	534	505	479	433	384	342	277	0.155
	10	851	803	756	712	671	633	598	566	536	493	433	384	342	277	0.143
	11	871	826	782	740	700	662	627	595	565	493	433	384	342	277	0.133
				DB = 97		DF = 169		DA = 266		K2 = 1056						
36/5	0	303	267	238	213	191										0.729
	1	376	335	302	274	250	230	211								0.524
	2	435	394	358	327	301	278	258	241	225	211	197	184	174		0.409
	3	482	442	406	374	346	322	300	281	264	248	235	222	210	188	0.336
	4	519	481	447	415	387	361	339	318	300	283	268	254	242	220	0.284
	5	548	514	481	450	422	397	373	352	333	315	299	285	271	248	0.247
	6	572	540	510	481	453	428	405	383	363	345	328	313	299	274	0.218
	7	591	562	534	506	480	456	433	411	391	373	356	340	325	277	0.195
	8	606	580	554	529	504	480	458	437	417	398	381	365	342	277	0.177
	9	618	595	571	548	524	502	480	459	440	421	404	384	342	277	0.161
	10	628	607	586	564	542	521	500	480	461	443	425	384	342	277	0.149
	11	637	618	598	578	558	537	518	498	480	462	433	384	342	277	0.138
				DB = 567		DF = 663		DA = 728		K2 = 1056						
36/4	0	232	205	182	161	144										0.911
	1	301	271	244	222	204	188	173								0.612
	2	353	323	296	272	251	233	217	203	191	179	168	157	148		0.461
	3	391	363	337	314	292	273	256	241	227	214	203	193	183	164	0.370
	4	419	394	370	348	327	308	290	274	259	246	234	222	212	194	0.308
	5	440	418	396	375	355	337	319	303	288	274	262	250	239	219	0.265
	6	455	436	417	398	379	362	345	329	314	300	287	275	264	243	0.232
	7	467	450	433	416	399	382	366	351	337	323	310	298	286	265	0.206
	8	476	462	446	431	415	400	385	370	356	343	330	318	306	277	0.186
	9	483	471	457	443	429	415	401	387	374	361	348	336	325	277	0.169
	10	489	478	466	453	440	427	414	402	389	376	364	353	342	277	0.155
	11	494	484	473	462	450	438	426	414	402	390	379	368	342	277	0.143
				DB = 802		DF = 909		DA = 959		K2 = 1056						
36/3	0	194	174	156	142	128										1.215
	1	245	225	207	191	177	165	154								0.736
	2	277	260	243	228	214	201	190	179	169	161	152	145	138		0.528
	3	297	283	269	255	243	230	219	208	198	189	180	172	165	152	0.411
	4	310	299	287	275	264	253	242	232	222	213	204	196	188	174	0.337
	5	319	310	300	290	280	270	260	251	242	233	224	216	209	194	0.285
	6	325	318	310	301	292	284	275	266	258	249	241	233	226	212	0.248
	7	330	324	317	310	302	294	286	279	271	263	256	248	241	227	0.219
	8	334	328	322	316	310	303	296	289	282	274	267	261	254	241	0.196
	9	336	332	327	321	315	309	303	297	290	284	278	271	265	253	0.177
	10	338	334	330	325	320	315	309	304	298	292	286	280	274	263	0.162
	11	340	336	333	329	324	319	314	309	304	299	293	288	282	271	0.149
				DB = 1652		DF = 1816		DA = 1827		K2 = 1056						

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

1.5 (B, BI) 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 3/4" puddle welds

SIDELAP FASTENERS: welded[1]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
36/7	0	783	681	599	530	474	429	392	360	332	309	288	270	253	226	0.618
	1	981	860	764	687	622	564	515								0.364
	2	1158	1024	916	827	753	690	637	587	544	506	473	444	418		0.258
	3	1312	1172	1056	958	876	806	745	693	647	604	565	531	500	434	0.200
	4	1447	1305	1184	1080	991	915	849	791	740	695	655	600	536	434	0.163
	5	1563	1422	1299	1192	1099	1018	947	884	829	771	678	600	536	434	0.138
	6	1663	1526	1403	1295	1199	1114	1040	973	885	771	678	600	536	434	0.119
	7	1748	1617	1497	1388	1291	1205	1127	1027	885	771	678	600	536	434	0.105
	8	1821	1696	1580	1473	1376	1288	1205	1027	885	771	678	600	536	434	0.094
	9	1884	1766	1654	1550	1454	1366	1205	1027	885	771	678	600	536	434	0.085
	10	1938	1827	1720	1619	1525	1434	1205	1027	885	771	678	600	536	434	0.077
	11	1985	1881	1779	1682	1590	1434	1205	1027	885	771	678	600	536	434	0.071
		DB = 63								K2 = 1398						
36/5	0	693	610	543	489	439	397	362	332	307	285	266	249	234	208	0.741
	1	858	765	688	624	570	524	484								0.403
	2	991	896	815	745	685	632	587	547	513	482	450	423	398		0.277
	3	1097	1005	924	851	788	732	682	638	599	565	533	505	480	430	0.211
	4	1182	1096	1016	944	879	821	769	723	681	643	609	578	536	434	0.170
	5	1249	1170	1094	1024	960	902	848	800	756	716	678	600	536	434	0.143
	6	1303	1230	1160	1093	1031	973	920	870	825	771	678	600	536	434	0.123
	7	1346	1280	1215	1152	1093	1036	983	934	885	771	678	600	536	434	0.108
	8	1381	1322	1262	1203	1146	1092	1040	992	885	771	678	600	536	434	0.096
	9	1409	1356	1301	1247	1193	1141	1091	1027	885	771	678	600	536	434	0.087
	10	1433	1385	1335	1284	1234	1184	1137	1027	885	771	678	600	536	434	0.079
	11	1453	1409	1363	1316	1269	1223	1177	1027	885	771	678	600	536	434	0.073
		DB = 372								K2 = 1398						
36/4	0	531	467	416	372	332	300	273	250	231	214	199	186	174	155	0.926
	1	687	616	557	507	464	427	396								0.453
	2	804	735	673	619	572	531	494	462	434	408	384	360	339		0.300
	3	891	827	767	713	665	621	582	547	515	487	461	437	416	376	0.224
	4	955	897	842	791	743	699	659	622	589	558	531	505	482	434	0.179
	5	1002	951	902	854	808	766	726	689	655	623	594	567	536	434	0.149
	6	1038	993	949	905	863	822	784	747	713	681	652	600	536	434	0.127
	7	1065	1026	987	947	908	870	833	798	765	733	678	600	536	434	0.111
	8	1086	1052	1017	981	946	910	876	842	810	771	678	600	536	434	0.099
	9	1103	1073	1042	1010	977	944	912	880	850	771	678	600	536	434	0.089
	10	1116	1090	1062	1033	1003	973	943	914	884	771	678	600	536	434	0.081
	11	1127	1104	1079	1053	1026	998	970	942	885	771	678	600	536	434	0.074
		DB = 526								K2 = 1398						
36/3	0	443	397	357	325	297	268	243	223	205	190	177	165	155	137	1.235
	1	558	513	472	436	404	375	350								0.516
	2	630	591	554	520	488	458	432	407	385	365	347	330	314		0.326
	3	677	645	613	582	552	524	498	473	450	429	410	391	375	344	0.238
	4	707	681	654	627	601	575	550	527	505	484	464	445	428	396	0.188
	5	728	707	684	661	638	615	592	571	549	529	510	491	474	434	0.155
	6	743	725	706	687	666	646	626	606	586	567	549	531	514	434	0.132
	7	753	739	723	706	688	670	652	634	616	599	581	564	536	434	0.115
	8	761	749	735	721	706	690	674	657	641	625	609	593	536	434	0.102
	9	768	757	745	733	719	705	691	676	662	647	632	600	536	434	0.091
	10	772	763	753	742	730	718	705	692	679	665	651	600	536	434	0.083
	11	776	768	759	750	739	728	717	705	693	681	668	600	536	434	0.076
		DB = 1084								K2 = 1398						

* = number of sidelap fasteners per span

1 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_B}{SPAN} + 3*K_1* SPAN}, \text{ Kips/inch}$$

SPAN is in feet

1.5 (B, BI, F, A) 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds[1]

SIDELAP FASTENERS: welded[2]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
36/7	0	644	560	492	435	390	353	322	296	273	254	237	222	208	186	0.618
	1	839	737	656	590	536	487	445								0.364
	2	1009	896	804	728	663	609	563	523	484	451	421	396	373		0.258
	3	1152	1036	937	854	782	721	668	622	582	546	514	483	455	407	0.200
	4	1273	1157	1056	968	892	826	768	717	672	632	596	564	535	434	0.163
	5	1373	1261	1160	1071	992	922	861	806	757	713	674	600	536	434	0.138
	6	1456	1349	1251	1163	1083	1011	947	890	838	771	678	600	536	434	0.119
	7	1525	1425	1331	1244	1165	1092	1027	968	885	771	678	600	536	434	0.105
	8	1582	1489	1400	1316	1238	1166	1100	1027	885	771	678	600	536	434	0.094
	9	1630	1544	1460	1380	1304	1233	1168	1027	885	771	678	600	536	434	0.085
	10	1670	1591	1513	1436	1363	1294	1205	1027	885	771	678	600	536	434	0.077
	11	1704	1631	1558	1486	1416	1349	1205	1027	885	771	678	600	536	434	0.071
						DB = 63		DF = 111		DA = 175		K2 = 1398				
36/5	0	570	501	446	402	361	326	297	273	252	234	218	204	192	171	0.741
	1	731	654	589	535	489	450	417								0.403
	2	855	778	710	652	601	556	517	483	453	426	402	378	356		0.277
	3	949	876	810	751	698	650	608	570	537	506	479	454	432	393	0.211
	4	1020	954	892	834	781	733	689	649	613	581	551	524	499	434	0.170
	5	1074	1015	958	903	852	804	760	720	683	649	617	588	536	434	0.143
	6	1116	1063	1011	960	912	866	823	783	745	710	678	600	536	434	0.123
	7	1148	1102	1055	1008	963	919	877	838	801	766	678	600	536	434	0.108
	8	1173	1132	1090	1048	1006	965	925	887	851	771	678	600	536	434	0.096
	9	1193	1157	1119	1081	1042	1004	966	930	885	771	678	600	536	434	0.087
	10	1210	1178	1144	1108	1073	1037	1002	967	885	771	678	600	536	434	0.079
	11	1223	1194	1164	1132	1099	1066	1033	1000	885	771	678	600	536	434	0.073
					DB = 372		DF = 435		DA = 478		K2 = 1398					
36/4	0	436	384	342	306	273	247	224	206	190	176	164	153	143	127	0.926
	1	588	530	480	438	402	371	344								0.453
	2	695	639	589	544	505	470	439	411	386	364	344	326	308		0.300
	3	768	719	672	629	589	553	520	491	464	439	417	396	377	345	0.224
	4	819	777	735	695	658	623	590	559	531	506	482	460	439	403	0.179
	5	855	819	783	747	712	679	648	618	590	564	539	517	495	434	0.149
	6	881	851	819	788	756	725	696	667	640	615	590	567	536	434	0.127
	7	900	874	847	819	791	763	736	709	683	658	635	600	536	434	0.111
	8	915	893	869	845	819	794	769	744	720	696	673	600	536	434	0.099
	9	926	907	886	865	842	819	796	773	751	729	678	600	536	434	0.089
	10	935	918	900	881	861	840	819	798	777	756	678	600	536	434	0.081
	11	942	927	911	894	877	858	839	820	800	771	678	600	536	434	0.074
					DB = 526		DF = 597		DA = 630		K2 = 1398					
36/3	0	364	326	294	267	244	220	200	183	169	156	145	136	127	113	1.235
	1	474	438	404	375	348	325	304								0.516
	2	537	507	478	451	426	402	380	360	341	324	308	294	281		0.326
	3	574	551	527	504	481	459	438	419	400	383	366	351	337	311	0.238
	4	597	578	560	540	521	502	483	465	447	430	414	399	385	358	0.188
	5	611	597	582	566	549	533	516	500	484	468	453	439	425	398	0.155
	6	621	610	598	584	570	556	542	527	513	499	485	471	458	433	0.132
	7	629	619	609	598	586	574	562	549	536	523	511	498	486	434	0.115
	8	634	626	617	608	598	588	577	566	554	543	531	520	509	434	0.102
	9	638	631	624	616	607	598	589	579	569	559	548	538	528	434	0.091
	10	641	635	629	622	615	607	599	590	581	572	562	553	536	434	0.083
	11	643	638	633	627	621	614	606	599	591	583	574	566	536	434	0.076
					DB = 1084		DF = 1192		DA = 1199		K2 = 1398					

* = number of sidelap fasteners per span

1 A 3/8" x 1 1/4" arc seam weld shall be used with F deck or A deck

2 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

1.5 (B ,F, A) 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds[1]

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
	0	644	560	492	435	390										0.618
	1	745	651	577	518	464	420	384								0.479
	2	840	738	657	590	536	488	445	410	379	352	329	309	291		0.392
	3	928	820	732	661	601	551	507	467	432	402	376	352	332	297	0.331
	4	1009	897	805	728	664	610	563	523	485	451	422	396	373	334	0.287
36/7	5	1085	969	873	793	725	667	617	574	536	501	468	440	414	371	0.253
	6	1153	1037	938	855	783	722	669	623	582	547	515	483	455	408	0.226
	7	1216	1100	999	913	839	775	720	671	628	590	556	526	496	434	0.205
	8	1274	1158	1057	969	893	827	769	718	673	632	597	565	536	434	0.187
	9	1326	1212	1111	1022	944	876	816	763	716	674	636	600	536	434	0.172
	10	1374	1262	1161	1072	993	923	862	807	758	714	675	600	536	434	0.159
	11	1417	1308	1209	1119	1040	969	906	850	799	754	678	600	536	434	0.148
				DB = 63		DF = 111		DA = 175		K2 = 1398						
	0	570	501	446	402	361										0.741
	1	655	581	521	471	429	394	359								0.551
	2	731	654	590	536	490	451	417	387	358	333	311	292	274		0.438
	3	797	719	653	596	547	505	469	437	409	382	357	335	316	282	0.364
	4	855	778	711	652	601	557	518	484	453	426	402	379	357	319	0.311
36/5	5	906	830	763	704	651	605	564	528	496	467	442	418	397	356	0.272
	6	950	877	811	751	698	651	609	571	537	507	480	455	432	393	0.241
	7	988	918	854	795	742	694	650	612	577	545	516	490	467	425	0.217
	8	1021	955	892	835	782	733	690	650	614	581	552	524	500	434	0.197
	9	1049	987	927	871	819	771	727	686	650	616	586	557	532	434	0.180
	10	1075	1016	958	904	853	805	761	721	684	649	618	589	536	434	0.166
	11	1097	1041	986	934	884	837	794	753	716	681	649	600	536	434	0.154
				DB = 372		DF = 435		DA = 478		K2 = 1398						
	0	436	384	342	306	273										0.926
	1	519	462	415	376	343	314	286								0.647
	2	589	530	480	438	402	371	344	320	296	275	256	240	226		0.497
	3	647	589	538	494	456	422	393	367	344	324	303	284	267	238	0.403
	4	695	640	589	545	505	470	439	411	387	364	345	327	308	275	0.340
36/4	5	735	683	634	590	550	514	482	453	427	403	382	362	345	312	0.293
	6	769	719	673	630	590	554	521	491	464	440	417	397	378	345	0.258
	7	796	751	707	665	626	590	557	527	499	474	451	429	410	375	0.230
	8	819	777	736	696	658	623	590	560	532	506	482	460	440	404	0.208
	9	839	800	761	723	687	653	621	591	562	536	512	490	469	431	0.189
	10	855	820	783	748	713	680	648	619	591	565	540	517	496	434	0.174
	11	869	836	803	769	736	704	674	644	617	591	566	543	522	434	0.161
				DB = 526		DF = 597		DA = 630		K2 = 1398						
	0	364	326	294	267	244										1.235
	1	427	388	355	325	300	278	258								0.784
	2	474	438	405	375	348	325	304	285	268	253	238	223	209		0.574
	3	510	477	446	417	390	366	344	324	306	290	275	262	249	224	0.453
	4	537	507	479	451	426	402	380	360	341	324	309	294	281	257	0.374
36/3	5	558	532	506	480	456	433	411	391	373	355	339	324	310	285	0.318
	6	574	551	527	504	481	460	439	419	401	383	367	352	337	311	0.277
	7	587	566	545	524	503	482	463	444	425	408	392	377	362	336	0.245
	8	597	579	560	541	521	502	483	465	447	431	415	400	385	359	0.220
	9	605	589	572	554	537	519	501	484	467	451	435	420	406	379	0.200
	10	612	597	582	566	550	533	517	500	484	469	454	439	425	399	0.183
	11	617	604	591	576	561	546	530	515	500	485	470	456	443	417	0.168
				DB = 1084		DF = 1192		DA = 1199		K2 = 1398						

* = number of sidelap fasteners per span

1 A 3/8" x 1 1/4" arc seam weld shall be used with F deck or A deck

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

1.5 (B, F, A) 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.35

Fastener Layout	*	SPAN (FT.-IN.) 3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0	7'-6	8'-0	8'-6	9'-0	10'-0	K1
36/7	0	454	395	347	307	275										0.699
	1	570	500	444	399	362	328	299								0.527
	2	673	596	533	481	438	402	371	342	316	295	275	258	243		0.423
	3	764	682	615	558	510	469	434	404	377	352	329	309	291	261	0.353
	4	842	760	689	629	578	533	495	461	431	405	382	360	340	304	0.303
	5	910	828	757	695	641	593	552	516	483	455	429	406	385	348	0.266
	6	967	888	817	755	699	650	606	568	533	503	475	450	427	388	0.236
	7	1017	941	872	809	753	702	657	617	581	548	519	492	468	426	0.213
	8	1059	987	920	858	802	751	705	664	626	592	561	533	508	434	0.194
	9	1096	1028	963	903	847	796	750	708	669	634	602	573	536	434	0.178
	10	1127	1063	1001	943	889	838	791	749	710	674	641	600	536	434	0.164
	11	1154	1094	1036	979	926	876	830	787	748	711	678	600	536	434	0.152
				DB = 63		DF = 111		DA = 175		K2 = 1398						
36/5	0	402	353	315	283	254										0.839
	1	498	444	400	362	331	304	281								0.603
	2	576	521	474	433	398	368	342	319	298	280	262	246	232		0.471
	3	638	585	537	496	459	426	397	372	349	329	311	294	280	251	0.386
	4	687	637	591	550	512	478	448	421	397	375	355	337	320	292	0.327
	5	726	680	637	596	559	525	494	466	441	417	396	377	359	328	0.284
	6	757	715	675	636	600	567	536	507	481	457	435	415	396	363	0.251
	7	782	744	707	671	636	603	573	544	518	494	471	450	430	396	0.224
	8	802	768	734	700	667	636	606	578	552	527	504	483	463	427	0.203
	9	819	788	756	725	694	664	636	608	582	558	535	513	493	434	0.186
	10	832	804	776	747	718	689	662	635	610	586	563	542	521	434	0.171
	11	843	818	792	765	738	711	685	660	635	612	589	568	536	434	0.158
				DB = 372		DF = 435		DA = 478		K2 = 1398						
36/4	0	308	271	241	215	193										1.049
	1	399	358	324	295	270	248	230								0.704
	2	468	427	392	360	333	309	288	269	252	238	224	210	197		0.530
	3	518	481	446	415	387	362	339	319	300	284	269	255	243	220	0.425
	4	555	522	490	460	433	407	384	363	343	326	309	295	281	257	0.355
	5	582	553	524	497	471	446	423	402	382	363	346	331	316	290	0.304
	6	603	577	552	527	502	479	456	435	416	397	380	364	349	322	0.267
	7	618	596	574	551	528	506	485	465	446	427	410	394	379	351	0.237
	8	630	611	591	571	550	530	510	490	472	454	437	421	406	378	0.213
	9	640	623	605	587	568	549	531	512	495	478	461	445	430	402	0.194
	10	648	633	617	600	583	566	549	532	515	498	483	467	452	425	0.178
	11	654	641	627	612	596	580	564	548	532	517	502	487	472	434	0.164
				DB = 526		DF = 597		DA = 630		K2 = 1398						
36/3	0	257	230	207	188	172										1.398
	1	324	298	274	253	235	218	204								0.846
	2	366	344	322	302	284	267	251	237	224	213	202	192	183		0.607
	3	393	375	356	338	321	305	290	276	262	250	239	228	218	201	0.473
	4	411	396	380	365	349	335	320	307	294	282	270	259	249	231	0.387
	5	423	410	397	384	371	358	345	332	320	308	297	286	276	257	0.328
	6	431	421	410	399	387	376	364	352	341	330	319	309	299	281	0.285
	7	437	429	420	410	400	390	379	369	358	348	338	329	319	301	0.251
	8	442	435	427	419	410	401	392	382	373	363	354	345	336	319	0.225
	9	445	439	433	425	418	410	402	393	385	376	368	359	351	334	0.204
	10	448	443	437	431	424	417	410	402	394	387	379	371	363	348	0.186
	11	450	446	441	435	429	423	416	410	403	396	388	381	374	359	0.171
				DB = 1084		DF = 1192		DA = 1199		K2 = 1398						

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.78 + \frac{0.3*D_X}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet

Substitute D_B, D_F, or D_A for D_X

3 (N, NI) ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 3/4" puddle welds

SIDELAP FASTENERS: welded[1]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	15'-0	K1
Type 22	0	105	96	89	82	76	71	66	61	57	54	50	47	44	38	1.093
	2	223	208	194												0.357
	3	282	264	247	232	218	206	195	185	176						0.267
	4	342	319	300	282	266	251	238	226	215	205	196	187	179	165	0.213
24/4	5	401	375	352	332	313	297	281	268	255	243	232	222	213	197	0.177
	6	456	431	405	382	361	342	325	309	294	281	269	258	247	228	0.152
	7	501	477	454	432	408	387	368	350	334	319	305	293	281	260	0.133
	8	543	517	494	473	453	432	411	391	373	357	342	328	315	291	0.118
	9	582	556	532	509	489	469	451	433	413	395	378	363	349	323	0.106
	10	619	592	567	544	523	503	484	467	450	433	415	398	383	355	0.097
	11	653	626	601	578	556	535	516	498	481	464	449	433	416	385	0.088
		D3N = 653								K2 = 870						
Type 20	0	130	120	111	103	96	89	83	78	73	69	64	60	57	50	1.208
	2	272	254	238												0.392
	3	343	321	301	283	267	252	239	227	215						0.293
	4	415	388	364	343	324	306	291	276	263	251	240	229	220	202	0.234
24/4	5	486	455	427	403	381	361	342	326	310	296	283	271	260	240	0.195
	6	548	521	491	463	437	415	394	375	358	342	327	314	301	278	0.167
	7	602	573	546	521	494	469	446	425	405	387	371	356	342	316	0.146
	8	652	622	594	568	544	522	498	474	453	433	415	398	382	354	0.130
	9	699	668	639	612	587	564	542	522	500	479	459	440	423	392	0.117
	10	743	712	682	654	628	604	582	561	541	523	502	482	464	430	0.106
	11	785	752	722	694	668	643	620	598	577	558	540	523	504	468	0.097
		D3N = 488								K2 = 1056						
Type 18	0	176	163	151	141	132	123	116	109	102	96	91	86	81	73	1.390
	2	361	337	316												0.449
	3	453	424	398	375	354	335	317	301	287						0.336
	4	546	511	480	452	427	405	384	366	349	333	318	305	292	270	0.268
24/4	5	638	598	562	530	501	475	452	430	410	392	375	359	345	319	0.223
	6	713	677	644	608	575	546	519	494	472	451	432	414	398	368	0.191
	7	782	744	710	678	648	616	586	559	533	510	489	469	451	418	0.167
	8	848	808	772	738	707	678	652	623	595	569	546	524	503	467	0.148
	9	909	868	831	796	763	733	705	679	654	628	603	579	556	516	0.133
	10	967	925	886	850	817	786	756	729	703	679	657	633	609	565	0.121
	11	1020	978	939	902	868	836	805	777	750	725	702	680	659	615	0.111
		D3N = 321								K2 = 1398						
Type 16	0	225	208	194	181	170	159	149	141	133	125	119	112	107	96	1.555
	2	453	423	397												0.506
	3	567	530	498	469	443	420	398	379	361						0.378
	4	681	638	600	565	535	507	481	458	437	418	400	383	367	340	0.302
24/4	5	791	745	701	661	626	594	564	538	513	491	470	450	433	400	0.251
	6	881	837	797	758	717	681	647	617	589	564	540	518	498	461	0.215
	7	967	920	877	838	802	768	730	696	665	637	610	586	563	522	0.188
	8	1048	999	954	913	874	839	806	775	741	710	680	653	628	583	0.167
	9	1124	1074	1027	984	944	906	872	839	809	781	751	721	693	644	0.150
	10	1195	1144	1096	1051	1010	971	935	901	869	840	812	785	759	705	0.137
	11	1261	1210	1161	1116	1073	1033	996	961	928	897	867	840	814	765	0.125
		D3N = 226								K2 = 1764						

* = number of sidelap fasteners per span

1 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 3NI deck.

$$G' = \frac{K_2}{4.31 + \frac{0.3*D_{3N}}{SPAN} + 3*K_1* SPAN}, \text{ Kips/inch}$$

SPAN is in feet

3 (N, NI) ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDELAP FASTENERS: welded[1]

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	15'-0	K1
Type 22	0	86	80	73	68	63	59	54	51	47	44	41	39	36	32	1.093
	2	205	191	179												0.357
	3	264	247	231	218	205	194	184	174	166						0.267
	4	324	303	284	268	253	239	227	216	205	196	187	179	172	158	0.213
24/4	5	379	358	337	318	300	284	270	257	245	234	224	214	206	190	0.177
	6	423	403	384	367	348	330	313	298	284	272	260	249	239	221	0.152
	7	464	443	423	405	388	373	356	339	324	310	297	285	273	253	0.133
	8	502	480	460	441	423	407	392	377	364	348	333	320	307	285	0.118
	9	537	514	494	474	456	439	423	408	394	381	369	355	341	316	0.106
	10	568	546	525	506	487	470	453	438	423	410	397	385	373	348	0.097
	11	597	575	555	535	516	499	482	466	451	437	424	411	399	376	0.088
		D3N = 653								K2 = 870						
Type 20	0	107	99	92	85	79	74	69	64	60	57	53	50	47	42	1.208
	2	250	233	218												0.392
	3	321	300	281	265	250	236	224	213	203						0.293
	4	392	367	345	325	307	291	276	262	250	239	228	219	210	193	0.234
24/4	5	455	432	408	385	364	345	328	312	298	284	272	261	250	231	0.195
	6	508	484	461	441	421	399	379	361	345	330	316	303	291	269	0.167
	7	557	532	508	486	466	448	430	411	392	375	360	345	332	307	0.146
	8	603	576	552	529	508	489	470	453	437	421	404	387	372	345	0.130
	9	644	618	593	570	548	528	508	490	474	458	443	429	413	383	0.117
	10	682	656	631	607	585	564	545	526	509	492	476	462	448	421	0.106
	11	717	691	666	642	620	599	579	560	542	525	509	493	479	452	0.097
		D3N = 488								K2 = 1056						
Type 18	0	145	134	125	116	108	101	95	89	84	79	75	70	67	60	1.390
	2	330	308	289												0.449
	3	422	395	371	349	330	313	297	282	269						0.336
	4	514	482	453	427	404	383	364	346	330	316	302	289	278	257	0.268
24/4	5	591	561	534	505	478	453	431	411	392	375	359	344	331	306	0.223
	6	660	628	599	572	548	524	498	475	454	434	416	399	383	355	0.191
	7	723	690	660	631	605	581	558	537	515	493	473	454	436	405	0.167
	8	782	748	717	687	660	634	611	588	567	548	530	509	489	454	0.148
	9	836	802	770	739	711	685	660	637	615	594	575	557	540	503	0.133
	10	886	851	819	788	759	732	707	683	660	639	619	599	581	548	0.121
	11	931	897	865	834	805	777	751	726	703	681	660	640	622	587	0.111
		D3N = 321								K2 = 1398						
Type 16	0	184	171	159	148	139	130	122	115	109	103	97	92	87	79	1.555
	2	412	385	362												0.506
	3	526	493	463	437	413	391	371	353	337						0.378
	4	639	600	564	533	504	478	454	433	413	395	378	363	348	322	0.302
24/4	5	729	693	660	629	595	565	537	512	489	468	448	430	413	383	0.251
	6	814	775	739	706	676	648	620	591	565	541	518	498	478	444	0.215
	7	893	852	815	780	747	717	690	664	639	614	589	565	544	505	0.188
	8	966	924	885	849	815	783	754	726	701	676	654	633	609	566	0.167
	9	1033	990	950	913	878	845	815	786	759	734	710	687	666	626	0.150
	10	1094	1051	1011	973	938	904	873	843	815	789	764	740	718	677	0.137
	11	1150	1107	1067	1029	993	959	927	897	868	841	815	791	767	725	0.125
		D3N = 226								K2 = 1764						

* = number of sidelap fasteners per span

1 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 3NI deck.

$$G' = \frac{K_2}{4.31 + \frac{0.3*D_{3N}}{SPAN} + 3*K_1*SPAN}, \text{ Kips/inch}$$

SPAN is in feet

3N ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.75

Fastener Layout	*	SPAN (FT.-IN.) 8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	15'-0	K1
Type 22	2	144	134	125												0.587
	3	173	161	150	141	132	124	117	111	105						0.477
	4	202	188	176	165	155	146	138	131	124	118	112	107	102	93	0.402
24/4	5	231	215	202	189	178	168	159	151	143	136	130	124	119	109	0.347
	6	259	242	227	214	201	190	180	171	163	155	148	141	135	124	0.305
	7	288	269	253	238	224	212	201	191	182	173	166	158	152	139	0.272
	8	317	297	278	262	247	234	222	211	201	192	183	175	168	155	0.246
	9	346	324	304	286	271	256	243	231	220	210	201	192	184	170	0.224
	10	373	351	330	311	294	278	264	251	240	229	219	209	201	185	0.206
	11	395	375	355	335	317	300	285	271	259	247	236	227	217	201	0.191
				D3N = 653						K2 = 870						
Type 20	2	177	165	154												0.648
	3	212	198	185	173	163	154	145	137	130						0.526
	4	247	231	216	203	191	180	171	162	154	146	139	133	127	116	0.443
24/4	5	282	264	247	232	219	207	196	186	177	169	161	154	147	135	0.382
	6	317	297	278	262	247	234	222	210	200	191	182	174	167	154	0.337
	7	352	329	309	291	275	260	247	235	224	213	204	195	187	172	0.300
	8	387	362	340	321	303	287	272	259	247	236	225	216	207	191	0.271
	9	422	395	372	350	331	314	298	284	270	258	247	237	227	210	0.247
	10	451	428	403	380	359	340	323	308	294	281	268	257	247	228	0.227
	11	477	454	432	409	387	367	349	332	317	303	290	278	267	247	0.210
				D3N = 488						K2 = 1056						
Type 18	2	237	221	207												0.745
	3	284	265	248	233	219	207	196	186	177						0.605
	4	330	308	289	272	257	242	230	218	207	198	189	180	172	158	0.509
24/4	5	376	352	330	311	294	278	263	250	238	227	217	208	199	183	0.440
	6	423	396	372	350	331	313	297	283	269	257	246	235	225	208	0.387
	7	469	439	413	389	368	348	331	315	300	287	274	263	252	233	0.345
	8	515	483	454	428	405	384	364	347	331	316	303	290	278	257	0.312
	9	555	526	495	467	442	419	398	379	362	346	331	317	305	282	0.284
	10	592	562	535	506	479	454	432	411	393	376	360	345	331	307	0.261
	11	627	596	568	542	516	490	466	444	424	405	388	372	358	331	0.242
				D3N = 321						K2 = 1398						
Type 16	2	301	281	263												0.836
	3	359	336	315	296	279	264	250	237	226						0.679
	4	418	391	367	345	326	308	292	278	265	252	241	231	221	203	0.572
24/4	5	476	446	419	394	373	353	335	319	304	290	277	265	254	235	0.494
	6	535	501	471	444	419	397	377	359	343	327	313	300	288	266	0.434
	7	593	556	523	493	466	442	420	400	382	365	349	335	321	297	0.388
	8	648	611	575	542	513	487	463	441	421	402	385	369	355	328	0.350
	9	695	659	626	591	560	531	505	481	459	439	421	404	388	359	0.319
	10	740	703	670	639	606	576	548	522	498	477	457	438	421	390	0.293
	11	784	746	711	679	649	620	590	563	537	514	493	473	455	422	0.271
				D3N = 226						K2 = 1764						

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{4.31 + \frac{0.3*D_{3N}}{SPAN} + 3*K_1* SPAN}, \text{ Kips/inch}$$

SPAN is in feet

3N ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDELAP FASTENERS: #10 TEK screws

Factor of safety = 2.35

Fastener Layout	*	SPAN (FT.-IN.) 8'-0	8'-6	9'-0	9'-6	10'-0	10'-6	11'-0	11'-6	12'-0	12'-6	13'-0	13'-6	14'-0	15'-0	K1
Type 22	2	127	118	110												0.627
	3	160	150	140	132	124	117	111	105	100						0.503
	4	194	181	170	160	151	143	135	129	122	117	111	106	102	94	0.420
24/4	5	228	213	200	188	178	168	160	152	145	138	132	126	121	112	0.360
	6	259	245	230	217	205	194	184	175	167	160	153	146	140	130	0.315
	7	284	270	258	245	232	220	209	199	190	181	174	166	160	148	0.281
	8	308	294	280	268	257	246	233	222	212	203	194	186	179	166	0.253
	9	330	315	302	289	277	266	256	246	235	225	215	206	198	184	0.230
	10	351	336	322	309	297	285	275	265	256	246	236	226	217	202	0.211
	11	370	355	341	328	315	304	293	282	273	264	255	246	237	220	0.195
				D3N = 653						K2 = 870						
Type 20	2	156	145	136												0.691
	3	197	184	172	162	153	145	137	130	124						0.554
	4	238	223	209	197	186	176	167	158	151	144	138	132	126	116	0.463
24/4	5	279	261	245	231	218	207	196	187	178	170	163	156	149	138	0.397
	6	314	299	282	266	251	238	226	215	206	196	188	180	173	160	0.348
	7	345	328	313	299	284	269	256	244	233	223	213	204	196	182	0.309
	8	374	356	340	326	312	299	286	272	260	249	238	229	220	203	0.279
	9	401	383	366	351	337	324	311	300	287	275	264	253	243	225	0.253
	10	426	408	391	375	360	347	334	322	310	300	289	277	266	247	0.232
	11	450	431	414	398	383	369	355	343	331	320	310	300	290	269	0.214
				D3N = 488						K2 = 1056						
Type 18	2	211	197	184												0.795
	3	265	248	232	219	206	195	185	176	168						0.638
	4	319	299	281	264	250	237	225	214	204	195	186	178	171	158	0.532
24/4	5	373	350	329	310	293	278	264	251	240	229	219	210	202	187	0.457
	6	416	395	376	356	337	319	304	289	276	264	253	242	233	215	0.400
	7	457	435	414	396	379	361	343	327	312	299	286	275	264	244	0.356
	8	495	472	451	431	413	396	381	365	348	333	319	307	295	273	0.320
	9	531	507	485	465	446	428	412	397	382	368	353	339	326	302	0.291
	10	564	540	518	497	477	459	442	426	411	397	384	371	357	331	0.267
	11	595	571	548	527	507	488	470	454	438	424	410	397	385	360	0.247
				D3N = 321						K2 = 1398						
Type 16	2	269	252	236												0.890
	3	338	316	297	280	264	250	237	226	215						0.714
	4	406	380	358	337	319	302	287	273	261	249	238	228	219	203	0.596
24/4	5	471	445	418	395	374	354	337	321	306	293	281	269	258	239	0.512
	6	525	499	475	452	428	407	387	369	352	337	323	310	297	276	0.449
	7	576	548	523	499	478	458	436	416	398	380	365	350	337	312	0.399
	8	624	595	569	544	521	500	480	462	443	424	407	391	376	349	0.359
	9	670	640	612	586	563	540	520	500	482	466	449	431	415	385	0.327
	10	712	681	653	627	602	579	557	537	519	501	484	469	454	422	0.300
	11	751	720	692	665	639	616	594	573	553	535	518	501	486	457	0.277
				D3N = 226						K2 = 1764						

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{4.31 + \frac{0.3*D_{3N}}{SPAN} + 3*K_1* SPAN}, \text{ Kips/inch}$$

SPAN is in feet

0.6C, 1.0C, & 1.3C DECK WITH NORMAL WEIGHT CONCRETE ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: Welds with welding washers Wconc = 145 PCF f'c = 3000 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener Layout	*	SPAN (FT.-IN.) 1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 28	0	1873	1782	1728	1691	1665	1646	1630	1618			0.620
	1	1939	1832	1767	1724	1693	1670	1652	1638	1626	1617	0.433
	2	2005	1881	1806	1757	1721	1695	1674	1658	1644	1633	0.333
30/4 for 0.6C	3	2070	1930	1846	1790	1750	1720	1696	1677	1662	1649	0.271
33/4 for 1.0C	4	2136	1979	1885	1822	1778	1744	1718	1697	1680	1666	0.228
	5	2202	2028	1925	1855	1806	1769	1740	1717	1698	1682	0.197
				K2 = 440					K3 = 2380			
Type 26	0	1981	1863	1792	1745	1711	1686	1666	1651			0.681
	1	2060	1922	1839	1784	1745	1716	1693	1674	1659	1647	0.476
30/4 for 0.6C	2	2139	1981	1887	1824	1779	1745	1719	1698	1681	1666	0.365
33/4 for 1.0C	3	2218	2040	1934	1863	1813	1775	1745	1722	1702	1686	0.297
32/4 for 1.3C	4	2297	2100	1982	1903	1847	1804	1772	1745	1724	1706	0.250
	5	2376	2159	2029	1942	1880	1834	1798	1769	1745	1726	0.216
				K2 = 530					K3 = 2380			
Type 24	0	2225	2046	1938	1867	1816	1777	1748	1724			0.783
	1	2330	2125	2002	1920	1861	1817	1783	1755	1733	1714	0.548
30/4 for 0.6C	2	2436	2204	2065	1972	1906	1856	1818	1787	1762	1741	0.421
33/4 for 1.0C	3	2541	2283	2128	2025	1951	1896	1853	1819	1790	1767	0.342
32/4 for 1.3C	4	2646	2362	2192	2078	1997	1936	1888	1850	1819	1793	0.288
	5	2752	2441	2255	2130	2042	1975	1923	1882	1848	1820	0.249
				K2 = 700					K3 = 2380			

0.6C, 1.0C, & 1.3C DECK WITH NORMAL WEIGHT CONCRETE ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws Wconc = 145 PCF f'c = 3000 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener Layout	*	SPAN (FT.-IN.) 1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 28	0	1782	1713	1673	1645	1626	1611	1600	1591			0.705
	1	1847	1763	1712	1678	1654	1636	1622	1610	1601	1594	0.474
	2	1913	1812	1751	1711	1682	1660	1644	1630	1619	1610	0.357
30/4 for 0.6C	3	1979	1861	1791	1744	1710	1685	1666	1650	1637	1626	0.286
33/4 for 1.0C	4	2044	1910	1830	1777	1738	1710	1687	1670	1655	1643	0.239
	5	2110	1960	1870	1809	1767	1734	1709	1689	1673	1659	0.205
				K2 = 440					K3 = 2380			
Type 26	0	1835	1754	1705	1672	1649	1631	1618	1607			0.768
	1	1914	1813	1752	1712	1683	1661	1644	1631	1620	1610	0.517
30/4 for 0.6C	2	1993	1872	1800	1751	1717	1691	1670	1654	1641	1630	0.389
33/4 for 1.0C	3	2072	1932	1847	1791	1750	1720	1697	1678	1663	1650	0.312
32/4 for 1.3C	4	2151	1991	1894	1830	1784	1750	1723	1702	1684	1670	0.261
	5	2230	2050	1942	1870	1818	1779	1749	1725	1706	1689	0.224
				K2 = 530					K3 = 2380			
Type 24	0	1945	1836	1771	1727	1696	1672	1654	1640			0.888
	1	2050	1915	1834	1780	1741	1712	1689	1671	1657	1644	0.597
30/4 for 0.6C	2	2156	1994	1897	1832	1786	1752	1725	1703	1685	1671	0.450
33/4 for 1.0C	3	2261	2073	1960	1885	1831	1791	1760	1735	1714	1697	0.361
32/4 for 1.3C	4	2367	2152	2024	1938	1877	1831	1795	1766	1743	1723	0.301
	5	2472	2231	2087	1991	1922	1870	1830	1798	1772	1750	0.259
				K2 = 700					K3 = 2380			

$$G' = \frac{K_2}{3.20 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

0.6C, 1.0C, & 1.3C DECK WITH LIGHTWEIGHT CONCRETE ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: Welds with welding washers Wconc = 110 PCF f'c = 3000 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener Layout	*	SPAN (FT.-IN.) 1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 28	0	1361	1270	1216	1179	1153	1134	1119	1106			0.620
	1	1427	1320	1255	1212	1181	1158	1140	1126	1114	1105	0.433
	2	1493	1369	1294	1245	1210	1183	1162	1146	1132	1121	0.333
30/4 for 0.6C	3	1558	1418	1334	1278	1238	1208	1184	1165	1150	1137	0.271
33/4 for 1.0C	4	1624	1467	1373	1311	1266	1232	1206	1185	1168	1154	0.228
	5	1690	1517	1413	1343	1294	1257	1228	1205	1186	1170	0.197
				K2 = 440					K3 = 2380			
Type 26	0	1469	1351	1280	1233	1199	1174	1154	1139			0.681
	1	1548	1410	1327	1272	1233	1204	1181	1162	1147	1135	0.476
30/4 for 0.6C	2	1627	1469	1375	1312	1267	1233	1207	1186	1169	1154	0.365
33/4 for 1.0C	3	1706	1529	1422	1351	1301	1263	1233	1210	1190	1174	0.297
32/4 for 1.3C	4	1785	1588	1470	1391	1335	1292	1260	1233	1212	1194	0.250
	5	1864	1647	1517	1430	1368	1322	1286	1257	1233	1214	0.216
				K2 = 530					K3 = 2380			
Type 24	0	1713	1534	1427	1355	1304	1265	1236	1212			0.783
	1	1818	1613	1490	1408	1349	1305	1271	1243	1221	1202	0.548
30/4 for 0.6C	2	1924	1692	1553	1460	1394	1345	1306	1275	1250	1229	0.421
33/4 for 1.0C	3	2029	1771	1616	1513	1439	1384	1341	1307	1279	1255	0.342
32/4 for 1.3C	4	2135	1850	1680	1566	1485	1424	1376	1338	1307	1281	0.288
	5	2240	1929	1743	1619	1530	1463	1411	1370	1336	1308	0.249
				K2 = 700					K3 = 2380			

0.6C, 1.0C, & 1.3C DECK WITH LIGHTWEIGHT CONCRETE ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws Wconc = 110 PCF f'c = 3000 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener Layout	*	SPAN (FT.-IN.) 1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 28	0	1270	1202	1161	1133	1114	1099	1088	1079			0.705
	1	1335	1251	1200	1166	1142	1124	1110	1099	1089	1082	0.474
	2	1401	1300	1239	1199	1170	1149	1132	1118	1107	1098	0.357
30/4 for 0.6C	3	1467	1349	1279	1232	1198	1173	1154	1138	1125	1114	0.286
33/4 for 1.0C	4	1532	1398	1318	1265	1226	1198	1175	1158	1143	1131	0.239
	5	1598	1448	1358	1297	1255	1222	1197	1177	1161	1147	0.205
				K2 = 440					K3 = 2380			
Type 26	0	1323	1242	1193	1160	1137	1119	1106	1095			0.768
	1	1402	1301	1240	1200	1171	1149	1132	1119	1108	1098	0.517
30/4 for 0.6C	2	1481	1360	1288	1239	1205	1179	1159	1142	1129	1118	0.389
33/4 for 1.0C	3	1560	1420	1335	1279	1239	1208	1185	1166	1151	1138	0.312
32/4 for 1.3C	4	1639	1479	1382	1318	1272	1238	1211	1190	1172	1158	0.261
	5	1718	1538	1430	1358	1306	1268	1238	1213	1194	1177	0.224
				K2 = 530					K3 = 2380			
Type 24	0	1433	1324	1259	1215	1184	1161	1142	1128			0.888
	1	1538	1403	1322	1268	1229	1200	1178	1159	1145	1132	0.597
30/4 for 0.6C	2	1644	1482	1385	1320	1274	1240	1213	1191	1173	1159	0.450
33/4 for 1.0C	3	1749	1561	1448	1373	1319	1279	1248	1223	1202	1185	0.361
32/4 for 1.3C	4	1855	1640	1512	1426	1365	1319	1283	1254	1231	1211	0.301
	5	1960	1719	1575	1479	1410	1358	1318	1286	1260	1238	0.259
				K2 = 700					K3 = 2380			

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.20 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

0.6C & 1.0C DECK WITH TYPE I INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: Welds f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)								K1	
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	0.6CSV	1.0CSV
Type 28	0	502	411	356	320	294	274	259	247		0.620	0.563
	1	568	460	396	353	322	299	281	267	255	0.433	0.394
weld washers	2	633	509	435	385	350	323	303	286	273	0.333	0.303
30/4 for 0.6C	3	699	559	474	418	378	348	325	306	291	0.271	0.246
33/4 for 1.0C	4	765	608	514	451	406	373	347	326	309	0.228	0.207
	5	830	657	553	484	434	397	368	345	326	0.197	0.179
				K2 = 440					K3 = 260			
Type 26	0	609	491	421	373	340	314	295	279		0.681	0.619
	1	688	551	468	413	374	344	321	303	288	0.476	0.432
weld washers	2	767	610	515	452	407	374	347	326	309	0.365	0.332
30/4 for 0.6C	3	846	669	563	492	441	403	374	350	331	0.297	0.270
33/4 for 1.0C	4	925	728	610	531	475	433	400	374	352	0.250	0.227
	5	1004	788	658	571	509	463	426	398	374	0.216	0.196
				K2 = 530					K3 = 260			
Type 24	0	853	674	567	495	444	406	376	352		0.783	0.711
	1	959	753	630	548	490	446	411	384	362	0.548	0.498
weld washers	2	1064	833	694	601	535	485	446	416	390	0.421	0.383
30/4 for 0.6C	3	1170	912	757	654	580	525	482	447	419	0.342	0.311
33/4 for 1.0C	4	1275	991	820	706	625	564	517	479	448	0.288	0.262
	5	1381	1070	883	759	670	604	552	510	477	0.249	0.226
				K2 = 700					K3 = 260			
Type 22	0	666	534	455	402	364	336	314	296		0.875	0.795
	1	796	632	533	467	420	385	357	335	317	0.611	0.556
5/8" spot welds	2	926	729	611	532	476	433	400	374	353	0.470	0.427
30/4 for 0.6C	3	1056	827	689	597	531	482	444	413	388	0.382	0.347
33/4 for 1.0C	4	1186	924	767	662	587	531	487	452	424	0.321	0.292
	5	1316	1022	845	727	643	580	531	491	459	0.277	0.252
				K2 = 870					K3 = 260			

1.3C DECK WITH TYPE I INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: Welds f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)										
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 26	0	640	514	439	389	353	326	305	288			0.596
	1	719	574	486	428	387	356	331	312	296	283	0.425
weld washers	2	798	633	534	468	421	385	358	336	318	303	0.330
32/4 for 1.3C	3	877	692	581	507	454	415	384	359	339	322	0.270
	4	956	751	629	547	488	444	410	383	361	342	0.228
	5	1035	811	676	586	522	474	437	407	382	362	0.198
				K2 = 530					K3 = 260			
Type 24	0	900	709	595	519	464	423	392	366			0.685
	1	1005	788	658	572	510	463	427	398	374	355	0.489
weld washers	2	1111	868	722	624	555	503	462	430	403	381	0.380
32/4 for 1.3C	3	1216	947	785	677	600	542	497	461	432	407	0.311
	4	1322	1026	848	730	645	582	532	493	461	434	0.263
	5	1427	1105	911	782	690	621	567	524	489	460	0.228
				K2 = 700					K3 = 260			
Type 22	0	701	560	475	419	379	349	325	306			0.765
	1	831	657	553	484	435	397	369	346	327	311	0.546
5/8" spot welds	2	961	755	631	549	490	446	412	385	362	343	0.424
32/4 for 1.3C	3	1091	852	709	614	546	495	455	424	398	376	0.347
	4	1221	950	787	679	602	544	499	463	433	408	0.293
	5	1351	1048	866	744	658	593	542	502	468	441	0.254
				K2 = 870					K3 = 260			
Type 20	0	814	645	543	476	427	391	363	340			0.846
	1	971	763	638	555	495	450	416	388	365	346	0.603
5/8" spot welds	2	1129	881	733	634	563	510	468	435	408	386	0.468
32/4 for 1.3C	3	1287	1000	827	712	630	569	521	483	451	425	0.383
	4	1445	1118	922	791	698	628	574	530	494	465	0.324
	5	1603	1237	1017	870	766	687	626	577	537	504	0.281
				K2 = 1056					K3 = 260			

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.20 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

0.6C & 1.0C DECK WITH TYPE I INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)								K1	
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	0.6CSV	1.0CSV
Type 28	0	409	341	301	273	254	239	228	219		0.705	0.641
	1	475	391	340	306	282	264	250	239	230	0.474	0.431
	2	541	440	379	339	310	289	272	258	248	0.357	0.324
30/4 for 0.6C	3	606	489	419	372	338	313	294	278	265	0.286	0.260
33/4 for 1.0C	4	672	538	458	405	367	338	316	298	283	0.239	0.217
	5	738	588	498	438	395	363	338	318	301	0.205	0.186
				K2 = 440					K3 = 260			
Type 26	0	464	382	333	301	277	260	246	236		0.768	0.698
	1	543	442	381	340	311	290	273	259	248	0.517	0.470
	2	622	501	428	380	345	319	299	283	270	0.389	0.354
30/4 for 0.6C	3	701	560	476	419	379	349	325	307	291	0.312	0.284
33/4 for 1.0C	4	780	619	523	459	413	378	352	330	313	0.261	0.237
	5	859	679	570	498	447	408	378	354	334	0.224	0.203
				K2 = 530					K3 = 260			
Type 24	0	573	464	399	356	324	301	283	268		0.888	0.808
	1	679	544	462	408	370	341	318	300	285	0.597	0.543
	2	784	623	526	461	415	380	353	332	314	0.450	0.409
30/4 for 0.6C	3	890	702	589	514	460	420	388	363	343	0.361	0.328
33/4 for 1.0C	4	995	781	652	566	505	459	423	395	371	0.301	0.274
	5	1101	860	715	619	550	499	459	427	400	0.259	0.235
				K2 = 700					K3 = 260			
Type 22	0	676	541	460	407	368	339	317	299		0.992	0.902
	1	806	639	538	472	424	388	360	338	320	0.666	0.606
	2	936	736	616	537	480	437	404	377	355	0.502	0.456
30/4 for 0.6C	3	1066	834	694	602	535	486	447	416	391	0.402	0.366
33/4 for 1.0C	4	1196	931	772	667	591	534	490	455	426	0.336	0.305
	5	1326	1029	851	732	647	583	534	494	462	0.288	0.262
				K2 = 870					K3 = 260			

1.3C DECK WITH TYPE I INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)										
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 26	0	485	398	346	311	287	268	253	242			0.672
	1	564	458	394	351	320	298	280	266	254	244	0.462
	2	643	517	441	390	354	327	306	289	276	264	0.352
32/4 for 1.3C	3	722	576	488	430	388	357	332	313	297	284	0.284
	4	801	635	536	469	422	386	359	337	319	303	0.238
	5	880	695	583	509	456	416	385	360	340	323	0.205
				K2 = 530					K3 = 260			
Type 24	0	602	486	416	370	337	312	292	277			0.777
	1	707	565	479	422	382	351	327	308	293	280	0.534
	2	813	644	543	475	427	391	363	340	322	306	0.407
32/4 for 1.3C	3	918	723	606	528	472	430	398	372	350	333	0.329
	4	1024	802	669	581	517	470	433	403	379	359	0.276
	5	1129	881	732	633	562	509	468	435	408	385	0.237
				K2 = 700					K3 = 260			
Type 22	0	711	567	481	424	383	352	329	309			0.868
	1	841	665	559	489	439	401	372	349	329	313	0.596
	2	971	762	637	554	495	450	415	388	365	346	0.454
32/4 for 1.3C	3	1101	860	715	619	550	499	459	427	400	378	0.367
	4	1231	957	794	684	606	548	502	466	436	411	0.307
	5	1361	1055	872	749	662	596	545	505	471	443	0.265
				K2 = 870					K3 = 260			
Type 20	0	833	659	555	485	436	398	369	346			0.956
	1	991	778	650	564	503	458	422	394	370	351	0.657
	2	1149	896	744	643	571	517	475	441	413	390	0.500
32/4 for 1.3C	3	1307	1015	839	722	639	576	527	488	456	430	0.404
	4	1465	1133	934	801	706	635	580	536	500	469	0.339
	5	1623	1251	1029	880	774	695	633	583	543	509	0.292
				K2 = 1056					K3 = 260			

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.20 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

0.6C & 1.0C DECK WITH TYPE II INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: Welds f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)								K1	
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	0.6CSV	1.0CSV
Type 28	0	585	493	439	402	376	357	342	329		0.620	0.563
	1	650	543	478	435	404	381	364	349	337	0.433	0.394
weld washers	2	716	592	518	468	433	406	385	369	355	0.333	0.303
30/4 for 0.6C	3	781	641	557	501	461	431	407	389	373	0.271	0.246
33/4 for 1.0C	4	847	690	596	534	489	455	429	408	391	0.228	0.207
				K2 = 440					K3 = 260			
Type 26	0	692	574	503	456	422	397	377	362		0.681	0.619
	1	771	633	551	495	456	427	404	385	370	0.476	0.432
weld washers	2	850	692	598	535	490	456	430	409	392	0.365	0.332
30/4 for 0.6C	3	929	752	645	574	524	486	456	433	413	0.297	0.270
33/4 for 1.0C	4	1008	811	693	614	558	516	483	456	435	0.250	0.227
				K2 = 530					K3 = 260			
Type 24	0	936	757	650	578	527	489	459	435		0.783	0.711
	1	1041	836	713	631	572	528	494	467	444	0.548	0.498
weld washers	2	1147	915	776	683	617	568	529	498	473	0.421	0.383
30/4 for 0.6C	3	1252	994	839	736	662	607	564	530	502	0.342	0.311
33/4 for 1.0C	4	1358	1073	903	789	708	647	599	561	530	0.288	0.262
				K2 = 700					K3 = 260			
Type 22	0	749	617	537	484	447	418	396	379		0.875	0.795
	1	879	714	615	549	502	467	440	418	400	0.611	0.556
5/8" spot welds	2	1009	812	693	614	558	516	483	457	435	0.470	0.427
30/4 for 0.6C	3	1139	909	771	680	614	565	526	496	471	0.382	0.347
33/4 for 1.0C	4	1269	1007	849	745	670	613	570	535	506	0.321	0.292
				K2 = 870					K3 = 260			

1.3C DECK WITH TYPE II INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: Welds f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)										
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 26	0	723	597	522	471	435	409	388	371			0.596
	1	802	656	569	511	469	438	414	395	379	366	0.425
weld washers	2	881	715	616	550	503	468	440	418	400	385	0.330
32/4 for 1.3C	3	960	775	664	590	537	497	467	442	422	405	0.270
	4	1038	834	711	629	571	527	493	466	443	425	0.228
	5	1117	893	759	669	605	557	519	489	465	444	0.198
				K2 = 530					K3 = 260			
Type 24	0	983	792	678	601	547	506	474	449			0.685
	1	1088	871	741	654	592	546	509	481	457	437	0.489
weld washers	2	1193	950	804	707	637	585	545	512	486	463	0.380
32/4 for 1.3C	3	1299	1029	867	760	682	625	580	544	514	490	0.311
	4	1404	1108	931	812	728	664	615	575	543	516	0.263
	5	1510	1187	994	865	773	704	650	607	572	543	0.228
				K2 = 700					K3 = 260			
Type 22	0	783	642	558	502	461	431	408	389			0.765
1	913	740	636	567	517	480	451	428	409	393	0.546	
5/8" spot welds	2	1043	837	714	632	573	529	495	467	445	426	0.424
32/4 for 1.3C	3	1173	935	792	697	629	578	538	506	480	458	0.347
	4	1303	1033	870	762	684	626	581	545	516	491	0.293
	5	1433	1130	948	827	740	675	625	584	551	523	0.254
				K2 = 870					K3 = 260			
Type 20	0	896	727	626	558	510	474	445	423			0.846
	1	1054	846	720	637	578	533	498	470	448	429	0.603
5/8" spot welds	2	1212	964	815	716	645	592	551	518	491	468	0.468
32/4 for 1.3C	3	1370	1082	910	795	713	651	603	565	534	508	0.383
	4	1528	1201	1005	874	781	711	656	612	577	547	0.324
	5	1686	1319	1100	953	848	770	709	660	620	587	0.281
			K2 = 1056					K3 = 260				

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.20 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

0.6C & 1.0C DECK WITH TYPE II INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5"" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)								K1	
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	0.6CSV	1.0CSV
Type 28	0	492	424	383	356	337	322	311	302		0.705	0.641
	1	558	473	423	389	365	347	333	321	312	0.474	0.431
30/4 for 0.6C	2	623	522	462	422	393	371	354	341	330	0.357	0.324
33/4 for 1.0C	3	689	572	501	454	421	396	376	361	348	0.286	0.260
	4	754	621	541	487	449	421	398	380	366	0.239	0.217
				K2 = 440					K3 = 260			
Type 26	0	547	465	416	383	360	343	329	318		0.768	0.698
	1	626	524	463	423	394	372	355	342	331	0.517	0.470
30/4 for 0.6C	2	705	583	511	462	428	402	382	365	352	0.389	0.354
33/4 for 1.0C	3	783	643	558	502	462	431	408	389	374	0.312	0.284
	4	862	702	606	541	495	461	434	413	395	0.261	0.237
				K2 = 530					K3 = 260			
Type 24	0	656	547	482	438	407	384	365	351		0.888	0.808
	1	761	626	545	491	452	423	401	383	368	0.597	0.543
30/4 for 0.6C	2	867	705	608	544	497	463	436	414	397	0.450	0.409
33/4 for 1.0C	3	972	784	671	596	543	502	471	446	425	0.361	0.328
	4	1078	863	735	649	588	542	506	477	454	0.301	0.274
				K2 = 700					K3 = 260			
Type 22	0	758	624	543	489	451	422	399	382		0.992	0.902
	1	888	721	621	554	506	471	443	421	402	0.666	0.606
30/4 for 0.6C	2	1018	819	699	619	562	519	486	460	438	0.502	0.456
33/4 for 1.0C	3	1148	916	777	684	618	568	530	499	473	0.402	0.366
	4	1278	1014	855	749	674	617	573	538	509	0.336	0.305
			K2 = 870					K3 = 260				

1.3C DECK WITH TYPE II INSULATING FILL
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws f'c = 125 PSI

SIDELAP FASTENERS: #10 TEK screws t=2.5"" (min.) Factor of safety = 3.25

Fastener		SPAN (FT.-IN.)										
Layout	*	1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	K1
Type 26	0	568	481	429	394	369	351	336	324			0.672
	1	647	540	476	433	403	380	362	348	337	327	0.462
	2	726	599	524	473	437	410	389	372	358	347	0.352
32/4 for 1.3C	3	805	659	571	512	471	439	415	396	380	366	0.284
	4	884	718	618	552	505	469	441	419	401	386	0.238
	5	963	777	666	591	538	499	468	443	423	406	0.205
						K2 = 530					K3 = 260	
Type 24	0	684	568	499	452	419	394	375	359			0.777
	1	790	647	562	505	464	434	410	391	376	363	0.534
	2	895	726	625	558	509	473	445	423	404	389	0.407
32/4 for 1.3C	3	1001	806	688	610	555	513	480	454	433	415	0.329
	4	1106	885	752	663	600	552	515	486	462	442	0.276
	5	1212	964	815	716	645	592	551	518	491	468	0.237
					K2 = 700					K3 = 260		
Type 22	0	793	650	564	507	466	435	411	392			0.868
	1	923	747	642	572	521	484	455	431	412	396	0.596
	2	1053	845	720	637	577	533	498	470	447	428	0.454
32/4 for 1.3C	3	1183	943	798	702	633	581	541	509	483	461	0.367
	4	1313	1040	876	767	689	630	585	548	518	493	0.307
	5	1443	1138	954	832	744	679	628	587	554	526	0.265
					K2 = 870					K3 = 260		
Type 20	0	916	742	637	568	518	481	452	429			0.956
	1	1073	860	732	647	586	540	505	476	453	433	0.657
	2	1231	979	827	726	654	599	557	524	496	473	0.500
32/4 for 1.3C	3	1389	1097	922	805	721	659	610	571	539	512	0.404
	4	1547	1216	1016	884	789	718	663	618	582	552	0.339
	5	1705	1334	1111	963	857	777	715	666	625	591	0.292
					K2 = 1056					K3 = 260		

* = number of sidelap fasteners per span

$$G' = \frac{K_2}{3.20 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

1.5, 2, & 3 COMPOSITE DECK WITH NORMAL WEIGHT CONCRETE
ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds Wconc = 145 PCF f'c = 3000 PSI

SIDELAP FASTENERS: Welded[1] t=2.5" (min.) Factor of safety = 3.25

Fastener Layout	*	SPAN (FT.-IN.) 6'-0	7'-0	8'-0	9'-0	10'-0	11'-0	12'-0	13'-0	14'-0	15'-0	K1
Type 22	0	1641	1622	1608	1597	1588	1581	1575	1570	1566	1562	0.729
	1	1708										0.359
	2	1775	1737	1708	1686							0.238
	3	1842	1794	1759	1731	1709	1691	1675				0.178
	4	1909	1852	1809	1775	1749	1727	1709	1693	1680	1669	0.142
36/4	5	1976	1909	1859	1820	1789	1763	1742	1724	1709	1696	0.118
	6	2042	1966	1909	1865	1829	1800	1776	1755	1738	1722	0.101
	7	2109	2024	1959	1909	1869	1836	1809	1786	1766	1749	0.089
	8	2176	2081	2009	1954	1909	1873	1843	1817	1795	1776	0.079
	9	2243	2138	2059	1998	1949	1909	1876	1848	1824	1803	0.071
	10	2310	2195	2110	2043	1990	1946	1909	1879	1852	1829	0.064
				K2 = 870					K3 = 2380			
Type 20	0	1668	1645	1628	1615	1604	1596	1588	1582	1577	1572	0.805
	1	1748										0.395
	2	1828	1783	1748	1722							0.261
	3	1909	1852	1809	1775	1749	1727	1709				0.195
	4	1989	1920	1869	1829	1797	1771	1749	1731	1715	1701	0.156
36/4	5	2069	1989	1929	1882	1845	1815	1789	1768	1749	1733	0.130
	6	2150	2058	1989	1936	1893	1858	1829	1805	1784	1765	0.111
	7	2230	2127	2050	1990	1941	1902	1869	1842	1818	1797	0.097
	8	2310	2196	2110	2043	1990	1946	1910	1879	1852	1829	0.086
	9	2390	2265	2170	2097	2038	1990	1950	1916	1887	1862	0.078
	10	2471	2333	2230	2150	2086	2034	1990	1953	1921	1894	0.071
				K2 = 1056					K3 = 2380			
Type 18	0	1715	1686	1663	1646	1633	1621	1612	1604	1597	1591	0.926
	1	1819										0.453
	2	1923	1864	1820	1785							0.300
	3	2028	1954	1898	1855	1820	1792	1768				0.224
	4	2132	2043	1976	1924	1883	1849	1820	1797	1776	1758	0.179
36/4	5	2236	2132	2054	1994	1945	1906	1873	1845	1821	1800	0.149
	6	2340	2222	2133	2063	2008	1963	1925	1893	1865	1842	0.127
	7	2445	2311	2211	2133	2070	2019	1977	1941	1910	1883	0.111
	8	2549	2400	2289	2202	2133	2076	2029	1989	1955	1925	0.099
	9	2653	2490	2367	2272	2196	2133	2081	2037	1999	1967	0.089
	10	2757	2579	2445	2341	2258	2190	2133	2085	2044	2008	0.081
				K2 = 1398					K3 = 2380			
Type 16	0	1763	1727	1700	1679	1662	1648	1636	1626	1618	1611	1.036
	1	1892										0.509
	2	2021	1948	1893	1850							0.337
	3	2149	2058	1989	1936	1893	1858	1829				0.252
	4	2278	2168	2086	2022	1970	1929	1894	1864	1839	1817	0.201
36/4	5	2407	2279	2182	2108	2048	1999	1958	1923	1894	1868	0.168
	6	2536	2389	2279	2193	2125	2069	2022	1983	1949	1920	0.144
	7	2664	2499	2375	2279	2202	2139	2087	2042	2004	1971	0.126
	8	2793	2610	2472	2365	2279	2209	2151	2102	2059	2023	0.112
	9	2922	2720	2569	2451	2357	2280	2215	2161	2114	2074	0.100
	10	3050	2830	2665	2537	2434	2350	2280	2220	2170	2126	0.091
				K2 = 1764					K3 = 2380			

* = number of sidelap fasteners per span

1 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5VLI, 2VLI and 3VLI.

$$G' = \frac{K_2}{3.50 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

1.5, 2, & 3 COMPOSITE DECK WITH LIGHTWEIGHT CONCRETE ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds Wconc = 110 PCF f'c = 3000 PSI

SIDELAP FASTENERS: Welded[1] t=2.5" (min.) Factor of safety = 3.25

Fastener Layout	*	SPAN (FT.-IN.) 6'-0	7'-0	8'-0	9'-0	10'-0	11'-0	12'-0	13'-0	14'-0	15'-0	K1
Type 22	0	1129	1110	1096	1085	1076	1069	1063	1058	1054	1050	0.729
	1	1196										0.359
	2	1263	1225	1196	1174							0.238
	3	1330	1282	1247	1219	1197	1179	1163				0.178
	4	1397	1340	1297	1263	1237	1215	1197	1182	1168	1157	0.142
36/4	5	1464	1397	1347	1308	1277	1252	1230	1212	1197	1184	0.118
	6	1530	1454	1397	1353	1317	1288	1264	1243	1226	1210	0.101
	7	1597	1512	1447	1397	1357	1324	1297	1274	1254	1237	0.089
	8	1664	1569	1497	1442	1397	1361	1331	1305	1283	1264	0.079
	9	1731	1626	1548	1486	1437	1397	1364	1336	1312	1291	0.071
	10	1798	1684	1598	1531	1478	1434	1398	1367	1340	1317	0.064
				K2 = 870					K3 = 2380			
Type 20	0	1156	1133	1116	1103	1092	1084	1076	1070	1065	1061	0.805
	1	1236										0.395
	2	1316	1271	1237	1210							0.261
	3	1397	1340	1297	1263	1237	1215	1197				0.195
	4	1477	1408	1357	1317	1285	1259	1237	1219	1203	1189	0.156
36/4	5	1557	1477	1417	1371	1333	1303	1277	1256	1237	1221	0.130
	6	1638	1546	1477	1424	1381	1346	1317	1293	1272	1253	0.111
	7	1718	1615	1538	1478	1430	1390	1357	1330	1306	1285	0.097
	8	1798	1684	1598	1531	1478	1434	1398	1367	1340	1318	0.086
	9	1878	1753	1658	1585	1526	1478	1438	1404	1375	1350	0.078
	10	1959	1821	1718	1638	1574	1522	1478	1441	1409	1382	0.071
				K2 = 1056					K3 = 2380			
Type 18	0	1203	1174	1152	1134	1121	1109	1100	1092	1085	1079	0.926
	1	1307										0.453
	2	1412	1352	1308	1273							0.300
	3	1516	1442	1386	1343	1308	1280	1256				0.224
	4	1620	1531	1464	1412	1371	1337	1309	1285	1264	1246	0.179
36/4	5	1724	1620	1542	1482	1433	1394	1361	1333	1309	1288	0.149
	6	1829	1710	1621	1551	1496	1451	1413	1381	1353	1330	0.127
	7	1933	1799	1699	1621	1559	1507	1465	1429	1398	1371	0.111
	8	2037	1888	1777	1690	1621	1564	1517	1477	1443	1413	0.099
	9	2141	1978	1855	1760	1684	1621	1569	1525	1487	1455	0.089
	10	2246	2067	1933	1829	1746	1678	1621	1573	1532	1496	0.081
				K2 = 1398					K3 = 2380			
Type 16	0	1251	1215	1188	1167	1150	1136	1124	1114	1106	1099	1.036
	1	1380										0.509
	2	1509	1436	1381	1338							0.337
	3	1637	1546	1477	1424	1381	1346	1317				0.252
	4	1766	1656	1574	1510	1459	1417	1382	1352	1327	1305	0.201
36/4	5	1895	1767	1670	1596	1536	1487	1446	1411	1382	1356	0.168
	6	2024	1877	1767	1681	1613	1557	1510	1471	1437	1408	0.144
	7	2152	1987	1864	1767	1690	1627	1575	1530	1492	1459	0.126
	8	2281	2098	1960	1853	1767	1697	1639	1590	1547	1511	0.112
	9	2410	2208	2057	1939	1845	1768	1703	1649	1603	1562	0.100
	10	2538	2318	2153	2025	1922	1838	1768	1709	1658	1614	0.091
				K2 = 1764					K3 = 2380			

* = number of sidelap fasteners per span

1 The shaded values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button punched sidelaps with 1.5VLI, 2VLI and 3VLI.

$$G' = \frac{K_2}{3.50 + 3*K_1* \text{SPAN}} + K_3, \text{ Kips/inch}$$

SPAN is in feet

NOTES

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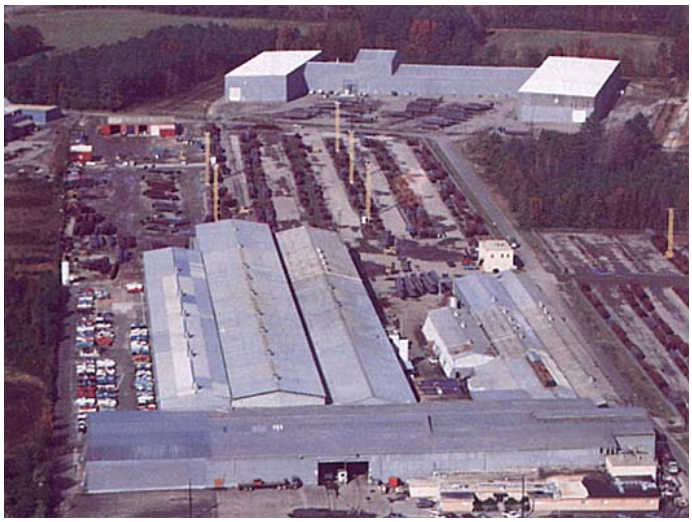

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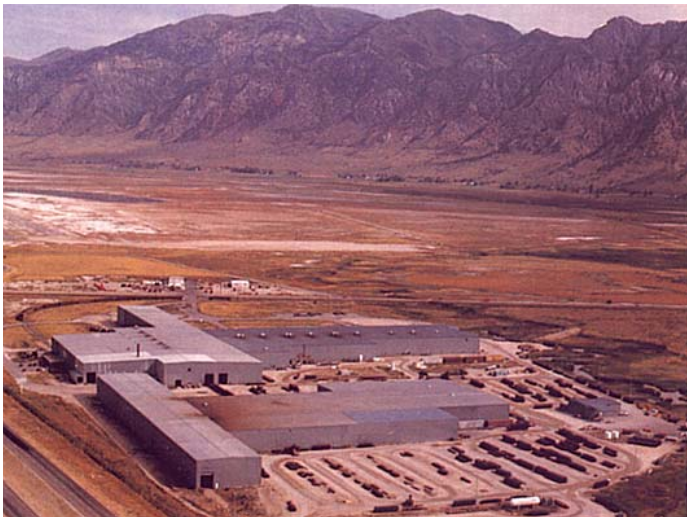

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