Safety Notes and Product Application

Dayton Superior strives to ensure that all products supplied from its manufacturing plants meet or exceed the safety requirements inherent in the proper use of its products. However, the performance of a product can be greatly affected by the manner in which the product is used. It is imperative that the user be instructed in the proper installation and use of the products displayed in this handbook prior to job application.

Product production runs are constantly sampled and tested to assure the user a high standard of quality. Samples are tested in Dayton Superior test facility or at independent testing laboratories. The safe working loads listed in this handbook were determined from the results of the testing programs and other sources.

The safety factor to be applied to a particular product is a variable dependent on the degree of hazard or risk involved in the application of the product. Job site conditions can often increase the degree of risk. Concentrated loads, such as construction materials stacked on the formwork, unsymmetrical placement of concrete, uplift, impact of machine delivered concrete, use of motorized carts, and formwork height, are examples that produce high risk factors. The user must adjust the safety factors accordingly to accommodate these risks.

Dayton Superior publishes the safe working loads and the associated minimum safety factors of its products and strongly advises that the minimum safety factors displayed in the table below not be compromised. When there are unusual job conditions, such as mentioned above, the minimum safety factors must be increased by the user. Refer to the provisions of the American National Standards Institute (ANSI A 10.9), the Occupational Safety and Health Administration (OSHA) Act, Part 1910 and 1926 and the American Concrete Institute (ACI) *Recommended Practice for Concrete Formwork* (ACI 347) when considering product safety factors.

Minimum Safety Factors of Formwork Accessories		
Accessory	**Safety Factor**	**Type of Construction**
Form Tie	**2.0 to 1**	**All applications.**
Form Anchor	**2.0 to 1**	**Formwork supporting form weight and concrete pressures only.**
Form Anchor	**3.0 to 1**	**Formwork supporting form weight, concrete, construction live loads and impact.**
Form Hangers	**2.0 to 1**	**All applications.**
Anchoring Inserts (Used as Form Ties)	**2.0 to 1**	**Precast concrete panels when used as formwork**

Dayton Superior Technical Services

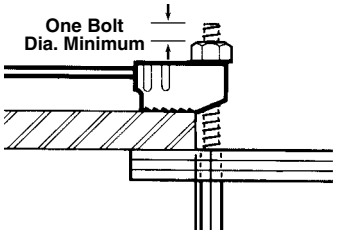
Dayton Superior maintains two strategically located technical service departments that are well staffed with trained personnel to service inquiries, take-offs and details for the users of Dayton Superior quality bridge deck accessories. See the back cover for addresses and phone numbers.

General and Technical Information

Safe Working Load Considerations

All safe working loads shown in this handbook were established with the following factors considered:

1. All safe working loads shown in this handbook are based on the item being new or in "as new" condition. The safe working load is considered to be the greatest load that should be applied to a product.
2. All hangers shall have full bearing under the end section and shall be used only on the size beam for which they are manufactured.
3. Hangers must be correctly positioned on top of the beam so that the Coil Bolts or Coil Rods are the proper distance from the edge of the beam flange. This is normally ⅜" from the beam flange to the centerline of a ½" Coil Bolt or Coil Rod. Improper positioning of the hanger can seriously compromise the hanger's safe working load. Refer to the various product application sketches in this handbook.
4. Coil Nuts must have full bearing on hanger end sections. Use caution to ensure that the hangers and related hardware are not subjected to side loading.
5. All Coil Bolts, Coil Rods and related hardware shall be of proper length, diameter and capacity.
6. All Coil Bolts and Coil Rods must fully penetrate and extend through the Coil Nuts a minimum of one diameter (½" for a ½" diameter Coil Bolt or Coil Rod). Note sketch.
7. A qualified person must calculate all hanger and bracket live and dead loads. Refer to American Concrete Institute ACI 347.
8. When hangers and related items are electro-plated or hot-dip zinc galvanized, they must be properly baked to relieve hydrogen embrittlement. Failure to do so may result in a drastic reduction of the product's safe working load.



9. Extreme caution must be used when field welding. Welding may reduce material integrity and result in product failure. Dayton Superior recommends the use of a certified welder with a good working knowledge of materials, heat treatment and welding procedures. Since Dayton Superior is not able to control field conditions or workmanship, Dayton Superior DOES NOT guarantee any product altered after leaving the factory.
10. Impact wrenches are not to be used to tighten Coil Bolts or Coil Rods that are part of the bridge deck forming system.

The user of Dayton Superior products must evaluate the product application, determine the appropriate safety factor, calculate the applied loads and control all field conditions to prevent application of loads in excess of the products' safe working loads.

Hanger Considerations When Suspending Overhang Brackets

Dayton Superior recommends that interlock type hangers, i.e., a C-60 Type 4-A Pres-Steel Hanger, be used to suspend bridge overhang brackets when a finishing machine is supported on the overhang formwork. The user shall install the overhang brackets, hangers and form materials in such a manner that the Coil Bolts or Coil Rods make a 45° ± 5° angle with the top surface of the bridge beam.

Qualified personnel must accurately calculate the hanger and overhang bracket spacing so that the applied load passing through the Coil Bolt or Coil Rod is equal to, or less than the safe working load of the hanger.

Interior span loads must be calculated to determine the proper hanger spacing. When calculating interior span loads, always add a minimum of 50 pounds per square foot live load to the dead weight of the concrete.

Safety Concerns

Incorrect use of hangers; insufficient bolt penetration through a coil nut; or altering a hanger in any way can result in premature failure and expose workers to unsafe conditions.

Reusable bridge deck forming accessories such as coil bolts, coil rods, etc., are subject to wear, misuse, overloading, corrosion, deformation, alteration and other factors that may affect safe working loads.

It is the responsibility of the user to continually inspect reusable accessories for wear and/or misuse and to discard them if wear or misuse is detected. Do not straighten bent forming accessories – discard them. Discard any reusable forming accessory that has been subjected to 70% or more of ultimate load of the product. Such items may have been stretched to a point where they have become brittle hard.

Dayton Superior recommends that all users of Dayton Superior deck forming products establish a quality control program to monitor and inspect their deck forming accessories. The frequency of inspections is best determined by the user and is dependent on the type of product use, frequency of use, duration of use and the environmental conditions during use.

The user of Dayton Superior products must evaluate the product application, determine appropriate safety factor, calculate the applied loads and control all field conditions to prevent application of loads in excess of the products' safe working loads.

Vertical Load for Design of Slab Forms

DESIGN LOAD — Based on 150 lbs. per Cubic Foot Concrete										
Slab Thickness, Inches	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**
Pounds per Square Foot (See Note 1)	**75**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**
Pounds per Square Foot (See Note 2)	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**	**325**

Note 1: Includes weight of concrete and reinforcing steel plus construction live load of 50 psf; weight of formwork not included.
Note 2: Includes weight of concrete and reinforcing steel plus construction live load of 75 psf; weight of formwork not included.

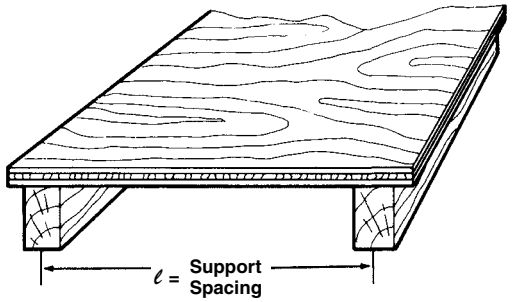
The American Concrete Institute publication, *Recommended Practice for Concrete Formwork*, (ACI 347) recommends that a minimum live load of 50 pounds per square foot (psf) be used in calculating formwork design loads. However, several states require higher live loads.

The American Concrete Institute publication, *Formwork for Concrete (ACI SP-4)* is a good reference for general formwork design, planning, materials, accessories, loading and pressure information, design tables and much more. Available from American Concrete Institute, P.O. Box 9094 Farmington Hills, MI 48333.

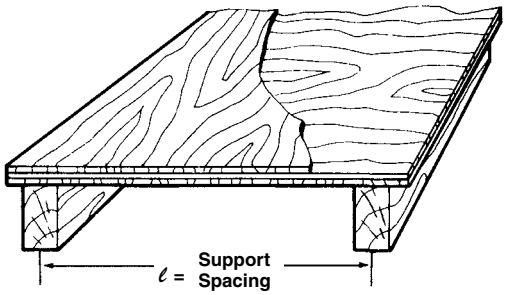
General and Technical Information

Technical Data — Plywood

Data based on information supplied by the American Plywood Association. For plywood used with face grain parallel to spacing, the tabulated spacings may be used with Plyform Class 1, Structural 1, Exterior A-B, Exterior B-B, Exterior B-C or equivalent grades of plywood. For face grain perpendicular to spacing, tabulated spacings are suitable only for use with Plyform Class 1 or Structural 1 grades or their equivalent.



Plywood used the strong way
(Face Grain parallel to spacing)

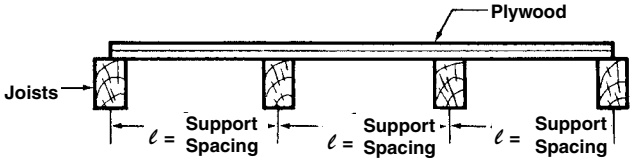


Plywood used the weak way
(Face Grain perpendicular to spacing)

Plywood Data					
Thick-ness	Approximate Weight lbs.		Plies	Minimum Bending Radii	
	4x8 Sheet	Square Foot		Across Grain	Parallel to Grain
½"	48	1.5	3	6 Ft.	12 Ft.
⅝"	58	1.8	5	8 Ft.	16 Ft.
¾"	70	2.2	5	12 Ft.	20 Ft.
1"	96	3.0	5	—	—

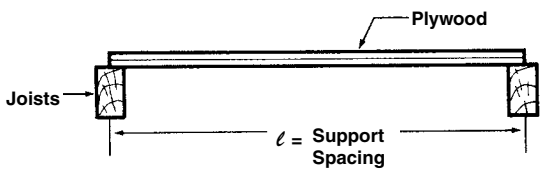
Safe Spacing in Inches of Support for Plywood Sheathing, Continuous Over Three or More Spaces								
Design Load of Concrete Pounds per Square Foot	f = 1,900 psi; Rolling Shear = 72 psi E = 1,500,000 psi							
	Sanded, Face Grain Parallel to Spacing				Sanded, Face Grain Perpendicular to Spacing			
	½" (3 Ply)	⅝" (5 Ply)	¾" (5 Ply)	1" (5 Ply)	½" (3 Ply)	⅝" (5 Ply)	¾" (5 Ply)	1" (5 Ply)
75	20"	23"	26"	31"	10"	14"	18"	25"
100	18"	21"	24"	29"	9"	13"	17"	23"
125	16"	20"	23"	27"	8"	12"	15"	22"
150	15"	18"	21"	26"	8"	11"	14"	21"
175	15"	17"	20"	25"	7"	10"	14"	20"
200	14"	17"	19"	24"	7"	10"	13"	19"
225	13"	16"	18"	23"	7"	10"	13"	18"
250	13"	15"	17"	23"	7"	10"	12"	17"
275	12"	15"	17"	22"	6"	9"	11"	16"
300	12"	15"	17"	22"	6"	9"	11"	16"

Maximum deflection is ℓ /360, but not more than 1/16".



Safe Spacing in Inches of Support for Plywood Sheathing, Single Spacing								
Design Load of Concrete Pounds per Square Foot	f = 1,900 psi; Rolling Shear = 72 psi E = 1,500,000 psi							
	Sanded, Face Grain Parallel to Spacing				Sanded, Face Grain Perpendicular to Spacing			
	½" (3 Ply)	⅝" (5 Ply)	¾" (5 Ply)	1" (5 Ply)	½" (3 Ply)	⅝" (5 Ply)	¾" (5 Ply)	1" (5 Ply)
75	16"	19"	22"	26"	8"	11"	15"	21"
100	14"	17"	20"	25"	7"	10"	13"	19"
125	13"	16"	18"	23"	7"	9"	12"	18"
150	12"	15"	17"	22"	6"	9"	12"	17"
175	12"	14"	16"	21"	6"	8"	11"	16"
200	11"	14"	16"	20"	6"	8"	11"	15"
225	10"	12"	15"	19"	6"	8"	10"	14"
250	10"	12"	14"	18"	6"	8"	10"	14"
275	10"	12"	14"	18"	5"	7"	9"	14"
300	10"	12"	14"	18"	5"	7"	9"	13"

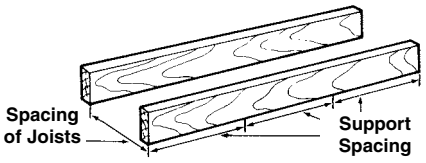
Maximum deflection is ℓ /360, but not more than 1/16".



General and Technical Information

DAYTON SUPERIOR

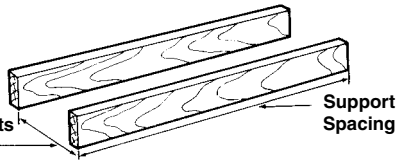
Technical Data — Joists



Safe Spacing, Inches, of Supports for Joists, Continuous Over Three or More Spans Based on use of No. 2 Grade Southern Pine or Douglas Fir-Larch						
Uniform Load, Pounds per Linear Foot (Equals Design Load, Pounds per Square Foot Times Spacing of Joists in feet.)	F'_b varies with member		E' = 1,400,000 psi		F'_v = 225 psi	
	Nominal Size Lumber, bxh (S4S) 19% Maximum Moisture Content					
	2x4	2x6	2x8	4x2	4x4	6x2
	F'b psi					
	1625	1440	1310	1790	1625	1650
75	81"	114"	140"	49"	100"	57"
100	76"	106"	131"	45"	93"	52"
125	69"	100"	124"	41"	88"	48"
150	63"	93"	117"	39"	84"	45"
175	58"	86"	109"	37"	81"	43"
200	55"	81"	102"	35"	79"	41"
225	52"	76"	96"	34"	76"	40"
250	49"	72"	91"	33"	74"	38"
275	47"	69"	87"	32"	71"	37"
300	45"	66"	83"	31"	68"	36"
325	43"	63"	80"	29"	65"	35"
350	42"	62"	77"	29"	64"	34"
375	40"	59"	74"	27"	61"	33"
400	39"	57"	72"	27"	59"	32"
450	36"	54"	68"	25"	56"	30"
500	35"	51"	64"	24"	53"	29"
550	33"	49"	61"	23"	50"	27"
600	32"	47"	59"	22"	48"	26"

Note: F'_b and F'_v shown above includes a 25% increase because of short term loading conditions. Horizontal shear stress adjustment assumes members have no splits, checks or shakes.

Support spacings are governed by bending, shear or deflection. Maximum deflection is ℓ/270 of spacing, but not more than ¼". Contact Dayton Superior for safe spacings of supports for joist or studs used over two spans.



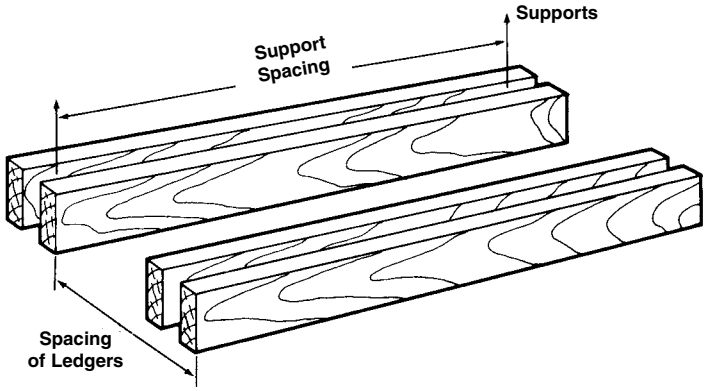
Safe Spacing, Inches, of Supports for Joists, Single Span Based on use of No. 2 Grade Southern Pine or Douglas Fir-Larch						
Uniform Load, Pounds per Linear Foot (Equals Design Load, Pounds per Square Foot Times Spacing of Joists in feet.)	F'_b varies with member		E' = 1,400,000 psi		F'_v = 225 psi	
	Nominal Size Lumber, bxh (S4S) 19% Maximum Moisture Content					
	2x4	2x6	2x8	4x2	4x4	6x2
	F'b psi					
	1625	1440	1310	1790	1625	1650
75	69"	97"	120"	40"	86"	46"
100	64"	91"	111"	36"	80"	42"
125	59"	86"	105"	34"	75"	39"
150	56"	82"	101"	32"	72"	37"
175	52"	77"	97"	30"	69"	35"
200	49"	72"	91"	29"	67"	33"
225	46"	68"	86"	28"	64"	32"
250	44"	65"	81"	27"	62"	31"
275	42"	62"	78"	26"	60"	30"
300	40"	59"	74"	25"	59"	29"
325	38"	57"	71"	24"	57"	28"
350	37"	55"	69"	24"	56"	28"
375	36"	53"	66"	23"	54"	27"
400	35"	51"	64"	23"	53"	27"
450	33"	48"	61"	22"	50"	25"
500	31"	46"	58"	21"	47"	25"
550	29"	44"	55"	20"	45"	24"
600	28"	42"	52"	19"	43"	23"

Note: F'_b and F'_v shown above includes a 25% increase because of short term loading conditions. Horizontal shear stress adjustment assumes members have no splits, checks or shakes.

Support spacings are governed by bending, shear or deflection. Maximum deflection is ℓ/270 of spacing, but not more than ¼". Contact Dayton Superior for safe spacings of supports for joist or studs used over two spans.

General and Technical Information

Technical Data — Ledgers



Safe Spacing, Inches, of Supports for Double Ledgers, Single Span Based on use of No. 2 Grade Southern Pine or Douglas Fir-Larch					
Uniform Load, Pounds per Linear Foot (Equals Design Load, Pounds per Square Foot, Times Spacing of Ledgers in feet.)	F'_b varies with member		E' = 1,400,000 psi	F'_v = 225 psi	
	Nominal Size Lumber, bxh S4S 19% Maximum Moisture Content				
	2x4	2x6	2x8	2x10	2x12
	F'b psi				
	1625	1440	1310	1150	1090
600	40"	59"	74"	89"	105"
800	35"	51"	64"	77"	91"
1000	31"	46"	58"	69"	81"
1200	28"	42"	52"	63"	74"
1400	26"	39"	49"	58"	69"
1600	24"	36"	45"	54"	64"
1800	23"	34"	43"	51"	61"
2000	22"	32"	41"	49"	58"
2200	21"	31"	39"	46"	55"
2400	20"	30"	37"	44"	53"
2600	19"	28"	36"	43"	50"
2800	18"	27"	34"	41"	49"
3000	18"	26"	33"	40"	47"
3200	17"	26"	32"	38"	45"
3400	17"	25"	31"	37"	44"
3600	16"	24"	30"	36"	43"
3800	16"	23"	29"	35"	42"
4000	15"	23"	29"	34"	41"

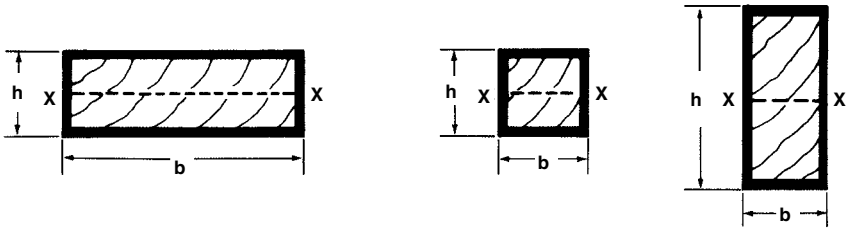
Note: **F'_b and F'_v shown above includes a 25% increase because of short term loading conditions.**
Horizontal shear stress adjustment assumes members have no splits, checks or shakes.

Support spacings are governed by bending, shear or deflection. Maximum deflection is ℓ /270 of spacing, but not more than ¼".
Contact Dayton Superior for safe spacings of supports for joist or studs used over two spans.

DAYTON SUPERIOR

Technical Data — Lumber

X—X = Neutral Axis



Lumber Properties								
Nominal Size in Inches, *bxh*	American Standard Sizes in Inches, *bxh* S4S* 19% Maximum Moisture	Area of section A = *bh*, sq. in.		Moment of Inertia, in.^{4} $I = \frac{bh^3}{12}$		Section Modulus, in.^{3} $S = \frac{bh^2}{6}$		Board Feet per Linear Foot of Piece
		Rough	S4S	Rough	S4S	Rough	S4S	
4x1	3½ x ¾	3.17	2.62	0.20	0.12	0.46	0.33	⅓
6x1	5½ x ¾	4.92	4.12	0.31	0.19	0.72	0.52	½
8x1	7¼ x ¾	6.45	5.44	0.41	0.25	0.94	0.68	⅔
10x1	9¼ x ¾	8.20	6.94	0.52	0.32	1.20	0.87	⅝
12x1	11¼ x ¾	9.95	8.44	0.63	0.39	1.45	1.05	1
4x2	3½ x 1½	5.89	5.25	1.30	0.98	1.60	1.31	⅔
6x2	5½ x 1½	9.14	8.25	2.01	1.55	2.48	2.06	1
8x2	7¼ x 1½	11.98	10.87	2.64	2.04	3.25	2.72	1½
10x2	9¼ x 1½	15.23	13.87	3.35	2.60	4.13	3.47	1⅔
12x2	11¼ x 1½	18.48	16.87	4.07	3.16	5.01	4.21	2
2x4	1½ x 3½	5.89	5.25	6.45	5.36	3.56	3.06	⅔
2x6	1½ x 5½	9.14	8.25	24.10	20.80	8.57	7.56	1
2x8	1½ x 7¼	11.98	10.87	54.32	47.63	14.73	13.14	1⅓
2x10	1½ x 9¼	15.23	13.87	111.58	98.93	23.80	21.39	1⅔
2x12	1½ x 11¼	18.48	16.87	199.31	177.97	35.04	31.64	2
3x4	2½ x 3½	9.25	8.75	10.42	8.93	5.75	5.10	1
3x6	2½ x 5½	14.77	13.75	38.93	34.66	13.84	12.60	1½
3x8	2½ x 7¼	19.36	18.12	87.74	79.39	23.80	21.90	2
3x10	2½ x 9¼	24.61	23.12	180.24	164.89	38.45	35.65	2½
3x12	2½ x 11¼	29.86	28.12	321.96	296.63	56.61	52.73	3
4x4	3½ x 3½	13.14	12.25	14.39	12.50	7.94	7.15	1⅓
4x6	3½ x 5½	20.39	19.25	53.76	48.53	19.12	17.65	2
4x8	3½ x 7¼	26.73	25.38	121.17	111.15	32.86	30.66	2⅔
4x10	3½ x 9¼	33.98	32.38	248.91	230.84	53.10	49.91	3⅓
6x3	5½ x 2½	14.77	13.75	8.48	7.16	6.46	5.73	1½
6x4	5½ x 3½	20.39	19.25	22.33	19.65	12.32	11.23	2
6x6	5½ x 5½	31.64	30.25	83.43	76.26	29.66	27.73	3
6x8	5½ x 7½	42.89	41.25	207.81	193.36	54.51	51.56	4
8x8	7½ x 7½	58.14	56.25	281.69	263.67	73.89	70.31	5⅓

***Roughdry sizes are ⅛" larger, both dimensions.**

Properties of American Standard Board, Plank Dimension
and Timber Sizes Commonly used for Formwork Construction.
Based on data supplied by the National Forest Products Association.

General and Technical Information

Representative Working Stress Values (PSI) for Lumber at 19 Percent Moisture Content, Continuing or Prolonged Reuse

PROPERTIES / LUMBER SPECIES AND GRADE	Extreme Fiber Bending	Compression ⊥ To Grain	Compression ∥ To Grain	Horizontal Shear	Modules of Elasticity
REDWOOD					
Range, all grades	225-2025	425-650	475-2250		800,000-1,400,000
No. 2, 4x4 and smaller	1385	650	1425	160	1,200,000
Constr., 4x4 and smaller	825	425	925		900,000
DOUGLAS FIR-LARCH					
Range, all grades	275-2250	625	900-2550		1,300,000-1,900,000
No. 2, 4x4 and smaller	1350	625	2025	190	1,600,000
Constr., 4x4 and smaller	1000	625	1650		1,500,000
SPRUCE-PINE-FIR					
Range, all grades	275-1875	425	750-2100		1,100,000-1,500,000
No. 2, 4x4 and smaller	1310	425	1725	140	1,400,000
Constr., 4x4 and smaller	1000	425	1400		1,300,000
HEM-FIR					
Range, all grades	250-2100	405	850-2250		1,100,000-1,600,000
No. 2, 4x4 and smaller	1275	405	1950	150	1,300,000
Constr., 4x4 and smaller	975	405	1550		1,300,000
SOUTHERN PINE					
Range, all grades	275-2050	565	950-1800		1,100,000-1,600,000
No. 2, 4x4 and smaller	1300	565	1650	180	1,400,000
Constr., 4x4 and smaller	1000	565	1700		1,300,000
ADJUSTMENT FOR MOISTURE CONTENT GREATER THAN 19 PERCENT: Use percentage shown (also applies to wood used wet)	85%**	67%	80%	97%*	90%
INCREASE FOR LOAD DURATION OF 7 DAYS OR LESS	25%	0%	25%	25%	0%

Note: Derived from National Design Specifications for Wood Construction. Horizontal Shear Stress adjustment assumes members have no splits checks or shakes.

*When $(F_b)(C_f) \leqq 1150$ psi, $C_m=1.0$

**When $(F_c)(C_f) \leqq 750$ psi, $C_m=1.0$

Formulas Used to Calculate Safe Support Spacings of Joists and Ledgers

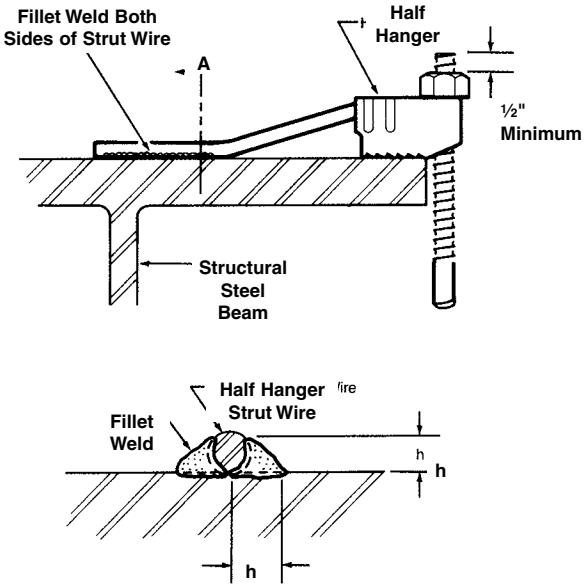
To Check	for Single Span Beam	for Two-Span Beam	for Three or More Span Beam
$\triangle_{max} = \ell/360$	$\ell = 1.37\sqrt[3]{\frac{EI}{w}}$	$\ell = 1.83\sqrt[3]{\frac{EI}{w}}$	$\ell = 1.69\sqrt[3]{\frac{EI}{w}}$
$\triangle_{max} = \ell/270$	$\ell = 1.51\sqrt[3]{\frac{EI}{w}}$	$\ell = 2.02\sqrt[3]{\frac{EI}{w}}$	$\ell = 1.86\sqrt[3]{\frac{EI}{w}}$
$\triangle_{max} = 1/16$ in.	$\ell = 2.75\sqrt[4]{\frac{EI}{w}}$	$\ell = 3.43\sqrt[4]{\frac{EI}{w}}$	$\ell = 3.23\sqrt[4]{\frac{EI}{w}}$
$\triangle_{max} = 1/8$ in.	$\ell = 3.27\sqrt[4]{\frac{EI}{w}}$	$\ell = 4.08\sqrt[4]{\frac{EI}{w}}$	$\ell = 3.84\sqrt[4]{\frac{EI}{w}}$
$\triangle_{max} = 1/4$ in.	$\ell = 3.90\sqrt[4]{\frac{EI}{w}}$	$\ell = 4.85\sqrt[4]{\frac{EI}{w}}$	$\ell = 4.57\sqrt[4]{\frac{EI}{w}}$
BENDING	$\ell = 9.80\sqrt{\frac{fS}{w}}$	$\ell = 9.80\sqrt{\frac{fS}{w}}$	$\ell = 10.95\sqrt{\frac{fS}{w}}$
HORIZONTAL SHEAR	$\ell = \frac{16Hbh}{w} + 2h$	$\ell = \frac{192Hbh}{15w} + 2h$	$\ell = \frac{40Hbh}{3w} + 2h$

ℓ = safe spacing of supports, in.
h = depth of section, in.
I = moment of inertia, in.^{4}
$\triangle$ = deflection, in.
w = load, lbs. per linear ft.
E = modulus of elasticity, psi
b = width of section, in.
S = section modulus, in.^{3}
f = extreme fiber stress, psi
H = horizontal shear stress, psi

DAYTON SUPERIOR

Technical Data — Welding of Half Hangers

Several styles of Half Hangers are manufactured by Dayton Superior for use in special cases requiring one-sided forming. Half Hangers may generally be welded to structural steel beams or rebar stirrups, however, preheat and other quality control procedures may be required in order to develop a sound weld. **It is recommended that the user contact his local welding supply dealer for assistance in determining the required welding procedures.**

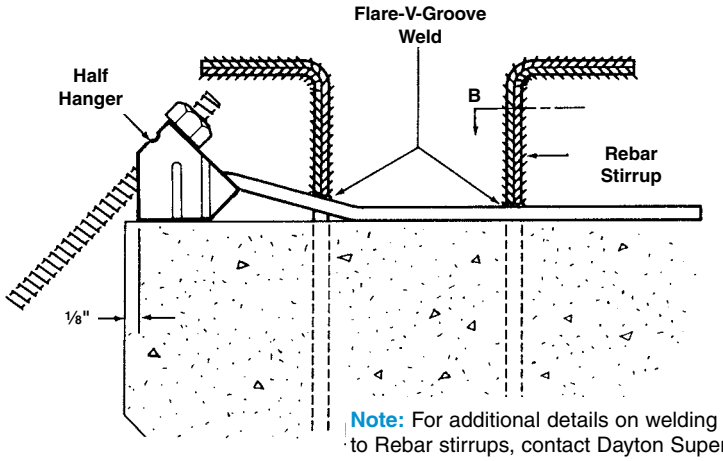


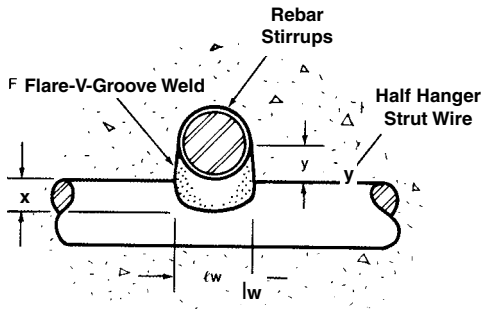
Section A

Warning: Since welding may alter the wire strut or rebar stirrup, the charts shown below should only be used as a general guide in determining the approximate strength of the welded connection. Field tests should be performed on installed Half Hangers so that actual safe working loads may be established, since actual safe working loads may be less than the maximum safe working loads shown in this handbook. Failure to perform field tests may result in premature and unexpected failures.

h Fillet Weld Size	Safe Working Load Per Linear Inch of Weld
1/8"	1,500 lbs.
3/16"	2,300 lbs.
1/4"	3,100 lbs.
5/16"	3,900 lbs.
3/8"	4,700 lbs.
7/16"	5,500 lbs.

Note: Place half the required length of weld on each side of the strut wire. Minimum length of weld is 4 h. The user should add ¼" to the weld length for starting and stopping the arc. S.W.L. provides a factor of safety of approximately 2 to 1.





Section B

Note: For additional details on welding Pres-Steel Hangers to Rebar stirrups, contact Dayton Superior Technical Service Department.

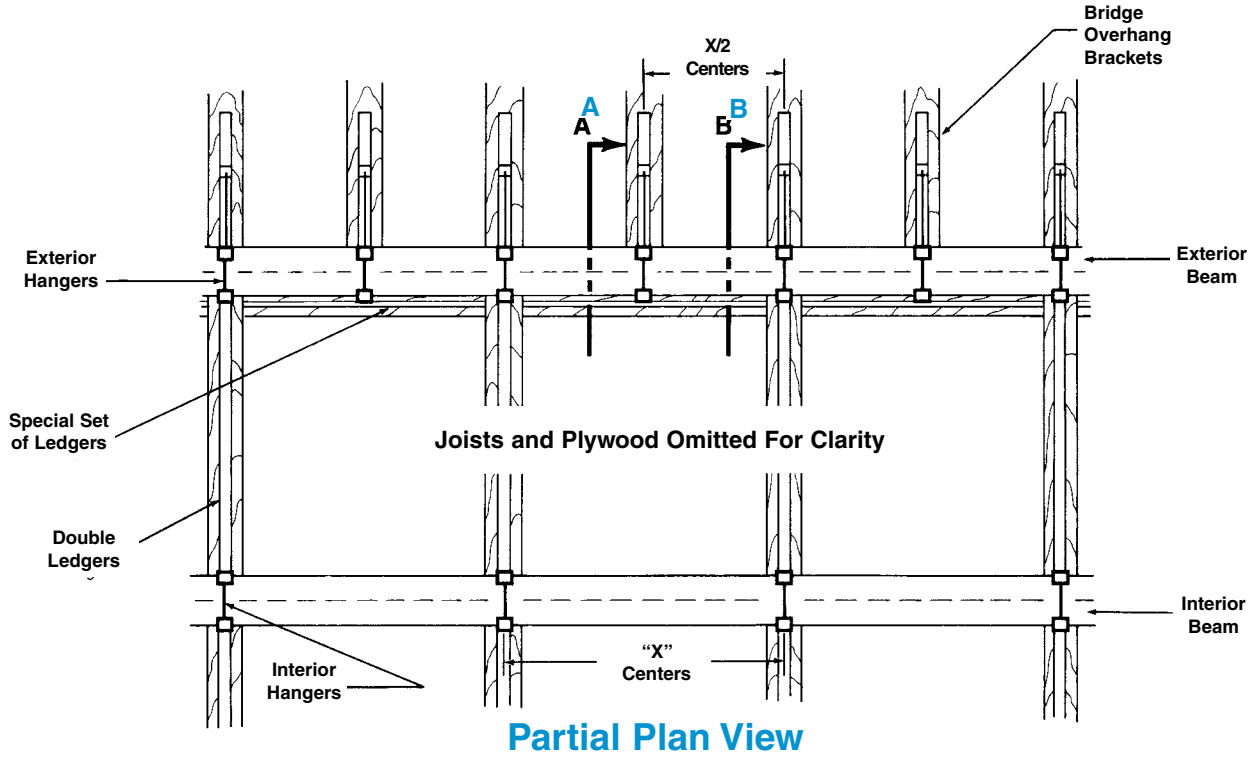
Safe Working Load Per Weld						
Rebar Stirrup Size	ℓw Weld Length	Y Minimum	.375" Diameter Strut (x = 3/16" Min.)		.440" Diameter Strut (x = 7/32" Min.)	
			Grade 40 Stirrup	Grade 60 Stirrup	Grade 40 Stirrup	Grade 60 Stirrup
#4	1/2"	1/4"	1,350 lbs.	1,800 lbs.	1,600 lbs.	2,100 lbs.
#5	5/8"	5/16"	1,700 lbs.	2,200 lbs.	2,000 lbs.	2,600 lbs.
#6	3/4"	3/8"	2,050 lbs.	2,650 lbs.	2,400 lbs.	3,100 lbs.

Note: Values are based on the use of E70 series electrodes for welding to Grade 40 stirrups and E90 series Electrodes for Grade 60 stirrups. S.W.L. provides a factor of safety of approximately 2 to 1.

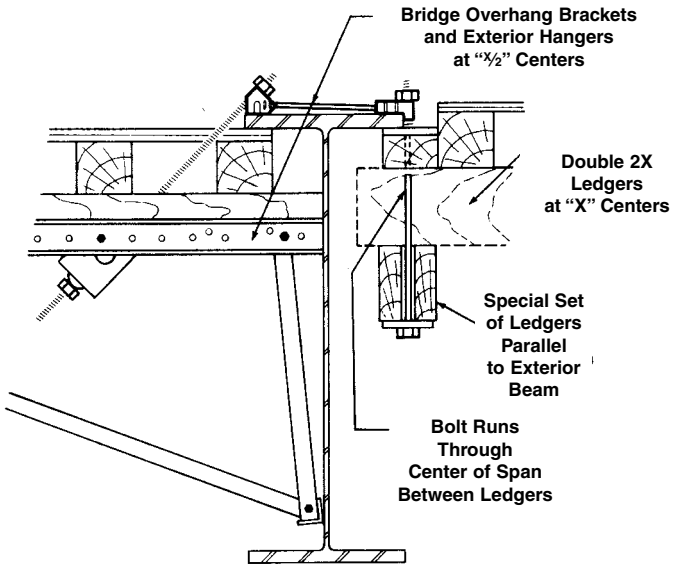
Reference: *Structural Welding Code — Reinforcing Steel,* American Welding Society, Miami, Florida *Standard Specifications for Highway Bridges,* American Association of State Highway and Transportation Officials, Washington, D.C. *P.C.I. Design Handbook, Edition 4, Chicago, IL.*

General and Technical Information

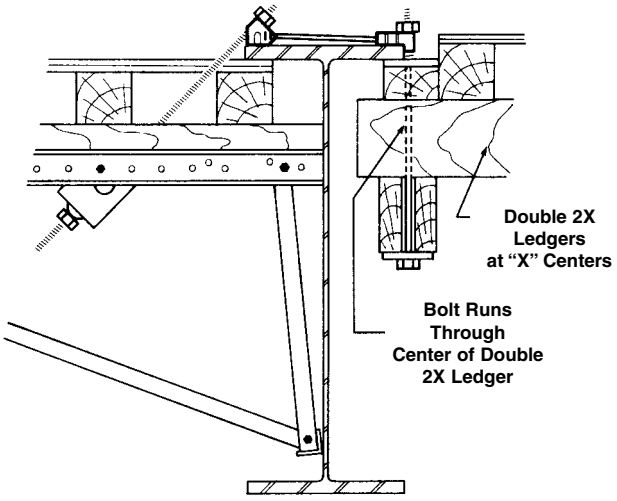
Exterior Hangers Spaced at Different Centers from Interior Hangers



Partial Plan View



Section View – "A"



Section View – "B"

These sketches illustrate one method of supporting the bridge deck formwork when exterior hangers are to be spaced at different centers from the interior hangers. This method requires an additional set of special ledgers which runs parallel to the exterior beam and supports the joist carrying ledgers.

Notes & Sketches