CCS Constructors LLC

Supply & Erect Structural Steel and Precast
Crane Service Rigging Pile Driving Heavy Hauling

Erection Plan for Steel Bridge Beam Frames
Craftsbury BO 1449 (34)
4/1/2016

Vermont Agency of Transportation
RECEIVED
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BY: SMC/JDG/WDL DATE: 04/26/2016

Procedure

The erection will be performed utilizing a 90 ton hydraulic Grove TMS900E crane. The crane will be outfitted with all of the manufacturer's supplied counterweights, and will be setup as shown on the attached SK-1. The erection shall not be performed during windy conditions.

Rigging sizes shown are minimums; larger rigging is permissible. Crane radii are shown on drawings and shall not be exceeded without crane capacity verification. It shall be outfitted with rigging shown on the attached rigging chart.

The steel will be delivered to J.P. Carrara's yard in frames from the steel fabricator (total of 3); CCS will then unload and set the frame to relative elevations shown on the Plans.

Erection Plan Drawing Schedule:

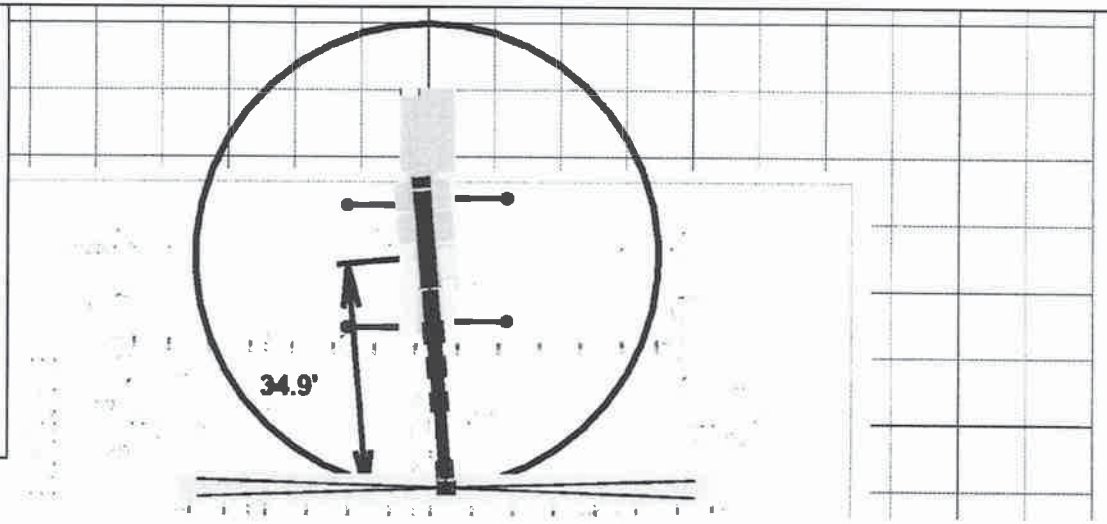
Sketch No. 1 TMS900E Crane Layout
Sketch No. 2 TMS900E Crane Chart
Rigging Chart
Sketch No. 3 Frame blocking sketch

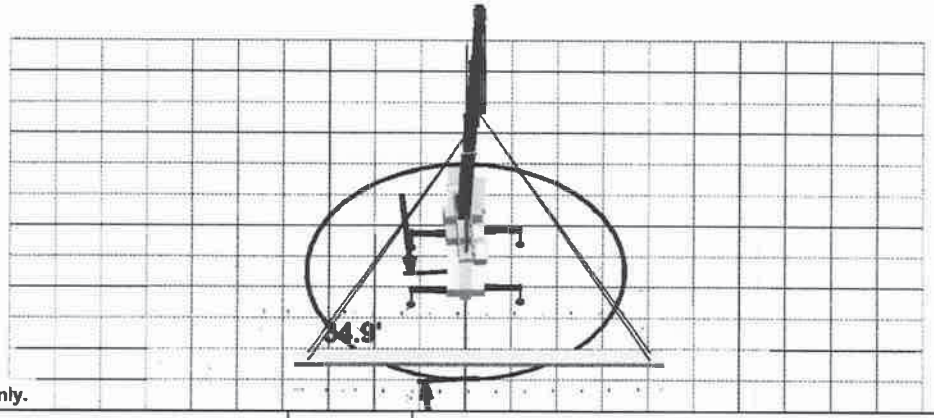
138 Munson Avenue Morrisville, VT 05661
802-888-7701 fax 802-888-4746

Crane
Grove TMS900E w/ Hydraulic Jib
102.4' Main Boom at 67.4°
Base: 100% Outriggers
Counterweight: 31,500 lbs
34.9' Lift Radius (360°)
Crane Capacity at 34.9' = 41,600 lbs

Load	
Load Line	200 lbs
Block	1,800 lbs
Rigging	500 lbs
Total Rigging Weight	**2,500 lbs**
Load	35,000 lbs
Total Load	**37,500 lbs**

90% of capacity
Sling Tension: 20,085 lbs





Not issued for construction. For pre-planning only.

Grid: 10' x 10'

Title	Lift Plan
Project	Craftsbury Carrara Yard
Customer	CCS
Description	Crane Layout
Drawn By	Sam Davis 03/29/2016

Created with 3D Lift Plan *www.3dliftplan.com*

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SK-1

load charts

37 - 142 ft Fixed lengths | 31,500 lbs | 100% 24'-0" | 360

Pounds

Feet	36.8	49.9	63.0	76.1	89.3	102.4	115.5	128.6	141.8
8	*180,000								
10	165,000	136,000	126,000	123,000	81,000				
15	116,000	112,000	105,000	99,000	81,000	59,000			
20	88,700	90,350	89,000	84,000	81,000	57,000	42,400	34,000	
25	69,950	72,200	72,400	71,150	71,000	51,000	42,400	34,000	26,600
30		58,350	57,000	58,150	56,850	46,000	39,800	33,800	26,600
35		48,600	47,550	47,400	46,200	41,600	35,800	32,000	26,600
40			39,750	39,600	38,450	36,200	32,200	29,400	26,600
45			33,550	33,500	32,600	33,600	29,400	27,000	24,800
50			28,300	28,300	29,400	28,600	26,600	24,800	22,800
55				24,250	25,350	24,600	24,800	22,800	21,200
60				22,000	22,150	21,450	21,750	20,300	19,800
65				19,550	19,550	19,400	19,100	18,800	18,200
70					17,300	17,600	16,900	16,750	16,200
75					15,400	15,750	15,200	14,900	14,350
80						14,100	13,750	13,350	12,750
85						12,700	12,350	11,950	11,400
90						11,500	11,150	10,850	10,300
95							10,100	9,770	9,250
100							9,140	8,810	8,290
105								7,950	7,430
110								7,180	6,670
115								6,480	5,980
120									5,340
125									4,760
130									4,230

* Requires special equipment

37 - 142 ft Telescoping | 31,500 lbs | 100% 24'-0" | 360

Pounds

Feet	36.8 - 49.9	49.9 - 63.0	63.0 - 76.1	76.1 - 89.3	89.3 - 102.4	102.4 - 115.5	115.5 - 128.6	128.6 - 141.8
10	74,000	68,000	63,000	62,000				
15	72,000	65,800	60,000	57,000	54,000			
20	70,000	63,000	57,000	52,000	50,000	37,400	28,600	
25	67,000	59,000	55,000	50,000	46,000	37,400	28,600	22,400
30	55,000	55,000	53,000	48,000	41,600	34,000	28,600	20,800
35	45,000	46,000	47,400	46,000	37,800	31,000	27,400	18,800
40		38,850	39,600	38,450	34,600	28,200	25,400	16,800
45		33,200	33,500	32,600	31,800	26,000	23,200	15,200
50		28,300	28,300	27,750	28,600	24,000	21,200	14,000
55			24,250	23,750	24,600	22,800	19,800	12,800
60			21,050	22,150	21,450	20,800	18,400	11,800
65			18,600	19,550	18,800	19,100	17,000	10,800
70				17,300	16,650	16,900	16,000	10,200
75				15,400	15,550	15,050	14,900	9,600
80					13,950	13,450	13,350	9,000
85					12,700	12,100	11,950	8,400
90					11,500	10,900	10,850	8,000
95						9,850	9,770	7,600
100						8,890	8,810	7,200
105							7,950	6,800
110							7,180	6,400
115							6,480	5,980
120								5,340
125								4,760
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900

GROVE
TMS 900E

SK-2

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

GROVE

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Endless Round Slings / Polyester Type - Capacities rated in (lbs).

Color	Vertical	Choker	Basket
Purple	2600	2100	5200
Green	5300	4200	10600
Yellow	8400	6700	16800
Tan	10600	8500	21200
Red	13200	10600	26400
White	16800	13400	33600
Blue	21200	17000	42400
Grey	31000	24800	62000
Brown	53000	42400	106000
Olive	66000	52800	132000

1 part mechanical splice IPS IWRC 6x9 & 6x37 - Rated capacities in lbs.

Hitch Type	Vertical	Choke	Basket	60°	45°	30°
Diameter						
1/2	4,400	3,200	8,800	7,600	6,200	4,400
5/8	6,800	5,000	13,600	11,800	9,600	6,800
3/4	9,800	7,200	19,400	16,800	13,800	9,800
7/8	13,200	9,600	26,000	22,000	18,600	13,200
1	17,000	12,600	34,000	30,000	24,000	17,000
1-1/8	20,000	15,800	42,000	36,000	30,000	20,000
1-1/4	26,000	19,200	52,000	44,000	36,000	26,000
1-3/8	30,000	24,000	62,000	54,000	44,000	30,000
1-1/2	36,000	28,000	74,000	64,000	52,000	36,000
1-3/4	50,000	38,000	98,000	86,000	70,000	50,000
2	64,000	48,000	128,000	110,000	90,000	64,000
Multiplier → → → →				1.00	.75	.60

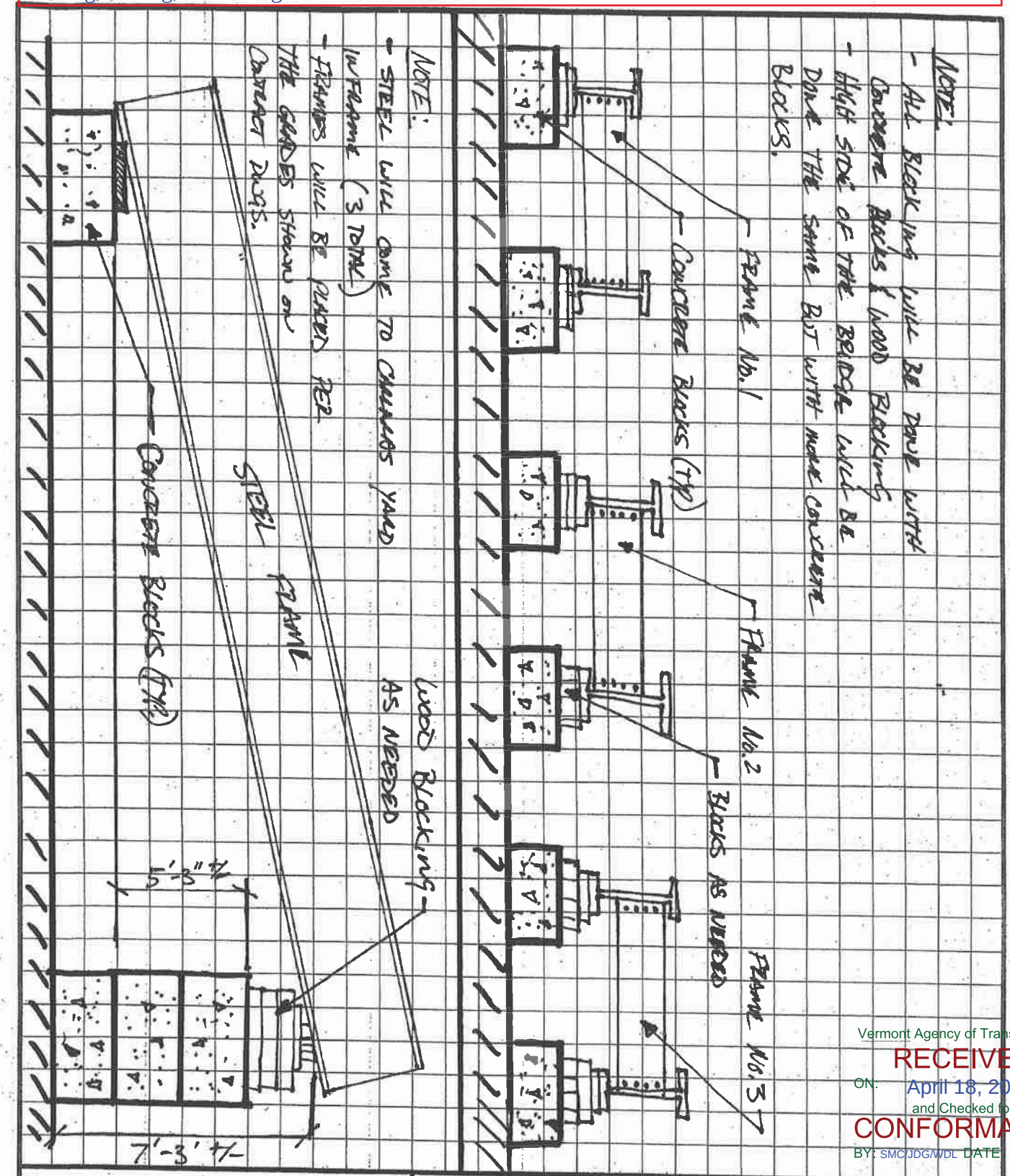
Sling length formula / Distance between pick points x Multiplier = Sling Length

Crosby® Screw Pin Shackles

G-209 / S-209 Screw Pin Anchor Shackles

Nominal Size (in.)	Working Load Limit (t)*	Stock No. G-209	Stock No. S-209	Weight Each (lbs.)	Dimensions (in.) A	B	C	D	E	F	G	H	L	M	P	Tolerance +/- C	A
3/16	1/3	1018357	–	.06	.38	.25	.88	.19	.80	.56	.98	1.47	.16	1.14	.19	.06	.06
1/4	1/2	1018375	1018384	.10	.47	.31	1.13	.25	.78	.61	1.28	1.84	.19	1.43	.25	.06	.06
5/16	3/4	1018393	1018400	.18	.53	.38	1.22	.31	.84	.75	1.47	2.09	.22	1.71	.31	.06	.06
3/8	1	1018419	1018428	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.02	.38	.13	.06
7/16	1-1/2	1018437	1018446	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.37	.44	.13	.06
1/2	2	1018455	1018464	.72	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.06
5/8	3-1/4	1018473	1018482	1.37	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06
3/4	4-3/4	1018491	1018507	2.35	1.25	.88	2.81	.75	2.00	1.81	3.50	4.97	.50	3.97	.81	.25	.06
7/8	6-1/2	1018516	1018525	3.62	1.44	1.00	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	.97	.25	.06
1	8-1/2	1018534	1018543	5.03	1.69	1.13	3.75	1.00	2.69	2.38	4.69	6.56	.56	5.13	1.06	.25	.06
1-1/8	9-1/2	1018552	1018561	7.41	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.71	1.25	.25	.06
1-1/4	12	1018570	1018589	9.50	2.03	1.38	4.69	1.29	3.25	3.00	5.75	8.25	.69	6.25	1.38	.25	.06
1-3/8	13-1/2	1018598	1018605	13.53	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.83	1.50	.25	.13
1-1/2	17	1018614	1018623	17.20	2.38	1.63	5.75	1.54	3.88	3.63	6.88	10.00	.81	7.33	1.62	.25	.13
1-3/4	25	1018632	1018641	27.78	2.88	2.00	7.00	1.84	5.00	4.19	8.86	12.34	1.00	9.06	2.25	.25	.13
2	35	1018650	1018669	45.00	3.25	2.25	7.75	2.06	5.75	4.81	9.97	13.68	1.22	10.35	2.40	.25	.13
2-1/2	55	1018678	1018687	85.75	4.13	2.75	10.50	2.71	7.25	5.69	12.87	17.84	1.38	13.00	3.13	.25	.25

Consider the horizontal stability of the steel frames, particularly in the longitudinal direction, under forming, casting, and curing loads.



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CCS CONSTRUCTORS
138 MUNSON AVE.
MORRISVILLE, VT 05661
PH. 802-888-7701
FX. 802-888-4746

PROJECT NAME: CRAFTSBURY BO 1449 (34)

PROJECT NO.:

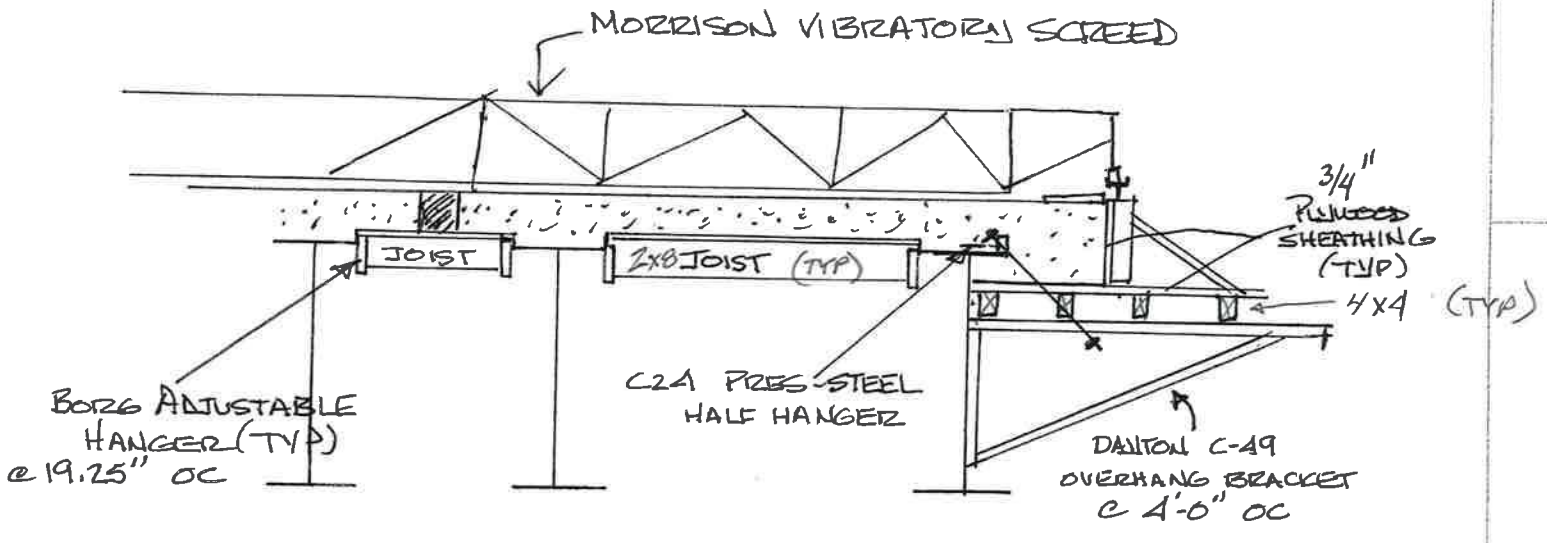
DRAWING NO.: 5k-3

SCALE: NTS

DATE: 3/29/16

DECK FORMING + POUR PROCEDURES 4/1/2016

CRAFTSBURY PBU



NOTES

1.) DECK WILL BE FORMED AND PLACED AS ONE UNIT.
2.) SCREED WILL SPAN ALL (3) PBU'S AND PLACED SIMULTANEOUSLY.
3.) CLOSURE POUR BULKHEAD WILL BE SET TO FINISH DECK GRADE.
4.) ALL FORMWORK WILL BE SUPPORTED OFF THE STRUCTURAL STEEL

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C24 Pres-Steel Half Hanger

C24 45° Pres-Steel Half Hangers are manufactured with a single 1/2" end section welded to a jogged wire strut and are used where conditions prevent the use of standard double-ended hangers.

Standard Style AC hangers measure 12" from the center line of the bolt to the end of the strut. This style hanger is designed to be welded to the rebar stirrups of precast concrete bridge beams.

Standard Style AS hangers measure 6" from the center line of the bolt to the end of the strut. These hangers are designed to be welded to the top surface of steel girders.

Lengths other than standard are available. Contact Dayton Superior for additional information.

Caution: Care must be exercised when welding hangers. Field welding may alter the strength of the wire strut and may limit the hanger to a much lower safe working load than that shown in the chart. Field tests should be conducted to verify actual safe working loads. See related notes on welding in the General and Technical Information Section

Proper welding procedures must be used when welding half hangers, as field welding may limit the safe working load of a hanger to less than the maximum SWL listed Field tests should be conducted to establish the actual safe working load of the hanger.

Hanger Type	Hanger Shape	Standard Length	Maximum SWL
1-AC		12"	3,500 lbs.
1-AS		6"	3,500 lbs.
4-AC		12"	6,000 lbs.
4-AS		6"	6,000 lbs.

Notes:

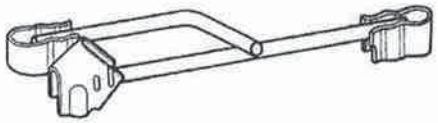
- Safe working load provides a factor of safety of approximately 2 to 1.
- Coil bolt or coil rod must penetrate through the coil nut a minimum of one bolt diameter.
- When used on concrete beams, the safe working load shown is based on normal weight concrete having reached a minimum compressive strength of 5,000 psi.
- Requires a minimum concrete flange thickness of 5".
- For hangers used on concrete beams with conditions not meeting above requirements please contact Dayton Superior Technical Service.
- Longer length strut wire is available on request.

To Order:
Specify: (1) quantity, (2) name, (3) strut length.

Example:
75 pcs. C24 Type 1-AC Pres-Steel Half Hanger, with 18" long strut.

C60 Type 1-4A Combination Pres-Steel Hanger with Supplemental 90° Leg Pres-Steel Half Hanger

Special overhang conditions may require the use of a 90° bolt to support the back end of a bridge overhang bracket. When this situation is encountered the C60 Type 4-A Pres-Steel Hanger may be ordered with a supplemental 90° end clip and strut wire electrically resistance welded to the main support hanger as shown in the sketch.



SWL of Supplemental 90° End is 1,000 lbs. with an approximate factor of safety of 2 to 1.

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CRAFTSBURY PBU's

SERIAL NUMBER: N/A

BORG ADJUSTABLE
JOIST HANGER CO., INC.
P.O. BOX 209
WAYZATA, MN 55391

DATE ISSUED: 05/10/04

NOTES:

SPECIFICATIONS AND STANDARDS

- AISC MANUAL OF STEEL CONSTRUCTION, 9TH EDITION.
- AWS STRUCTURAL WELDING CODE – STEEL, D1.1–94.
- 29 CFR 1926 – OSHA SAFETY AND HEALTH STANDARDS

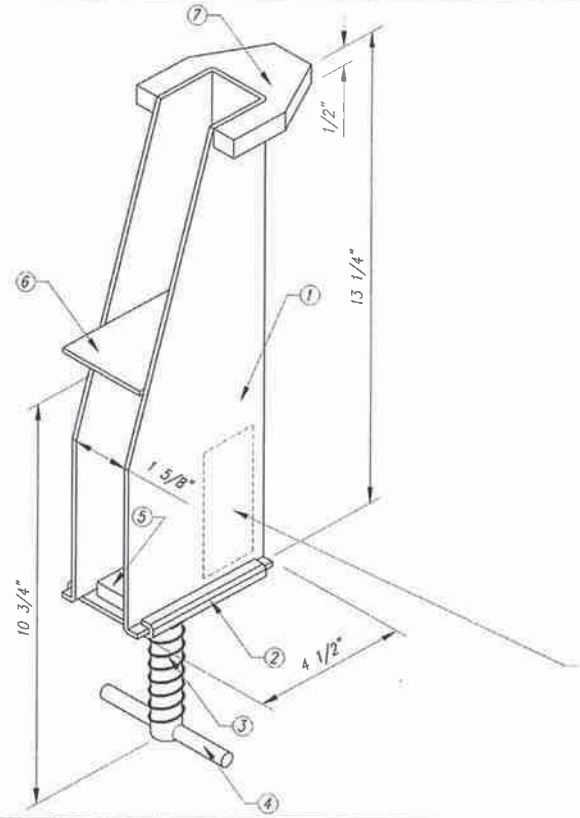
ALLOWABLE LOADS

FORM WEIGHT AND CONCRETE ONLY (PROVIDES 2 TO 1 FACTOR OF SAFETY AGAINST ULTIMATE STRENGTH)	3000 LBS.
FORM WGT., CONCRETE, CONSTRUCTION LIVE LOADS AND IMPACT (PROVIDES 3 TO 1 FACTOR OF SAFETY AGAINST ULTIMATE STRENGTH)	2000 LBS.

STRUCTURAL NOTES

1. ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A1011 (EQUAL OR BETTER).
2. ALL STEEL SHALL BE FREE OF CRACKS, HOLES, DEFORMATIONS, WELDMENTS AND ANY OTHER DEFECT WHICH MAY JEOPORDIZE THE STRUCTURAL INTEGRITY OF THE MEMBER.
3. ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF THE AMERICAN WELDING SOCIETY (AWS).
4. ALL SHOP WELDING SHALL BE E70XX.
5. THIS DRAWING IS INTENDED ONLY TO PROVIDE GENERAL CONFIGURATION AND RATING FOR THIS HANGER ONLY. NOT FOR CONSTRUCTION.

GRAPHICAL DESCRIPTION:



1. BODY
   10 GAUGE STEEL PLATE
2. SLIDE
   10 GAUGE STEEL PLATE
3. COIL ROD (SCREW JACK)
   3/4" COIL ROD w/ 4 1/2 THDS/IN
   10 1/4" LONG
4. HANDLE
   3/8" STEEL ROUND STOCK – 4" LONG
5. COIL BLOCK
   3" x 1 1/2" – 1/2" STEEL BAR
   w/ 0.656" DIA. HOLE PUNCHED IN CENTER
   SPOT WELDED TO SLIDE
6. BEARING PLATE
   4" x 1 1/2" – 3/16" STEEL BAR
7. TOP LIP
   1/2" STEEL BAR CUT TO FORM LIP
   WELDED TO BODY

BORG
WWW.BORGHANGER.COM
800-373-2674
90°

ALL BORG MANUFACTURED HANGERS SHALL BE STAMPED WITH THIS LOGO.

PREPARED BY:

PEM
PROJECT ENGINEERING & MANAGEMENT, INC.
366 JACKSON STREET, SUITE 300
SAINT PAUL, MINNESOTA 55101-1975
PHONE: (651) 209-1167 FAX: (651) 209-1168
www.projecteng.com

SHEET TITLE:

BORG ADJUSTABLE JOIST HANGER
STANDARD HANGER

LICENSURE:

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE _____ REG. NO. _____

C:\ACTIVE_PROJECTS\027001\027001R1.DWG

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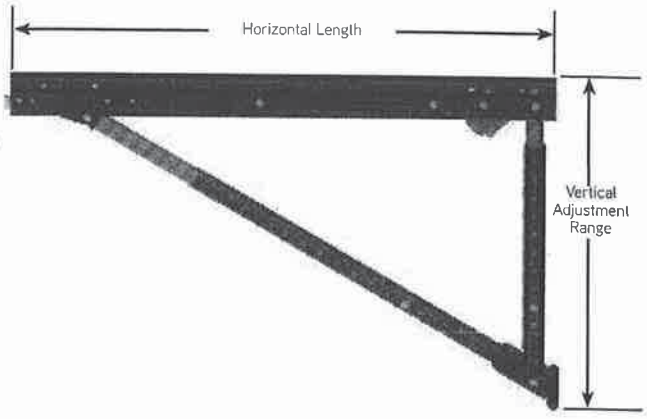
CRAFTSBURY PBU's

DAYTON SUPERIOR

Bridge Overhang Brackets

C49, C49D, C49S and C49JR Bridge Overhang Brackets

Dayton Superior offers the bridge contractor four different versions of the C49 Bridge Overhang Bracket, which allows for maximum adjustability to meet the varied bridge overhang forming requirements on both structural steel and precast/prestressed concrete beams. The C49 is the most versatile overhang bracket available and is used for general conditions.



The C49D version is used on deep beams. The C49D bracket is identical to the C49 bracket, except it uses longer bottom diagonal and vertical legs.

The C49S bracket is a field modified C49. The C49 is modified by removing the inner vertical leg. Using only the outer vertical leg, the bracket can be adjusted to a minimum vertical height of 14". This bracket is ideal for use on shallow steel or concrete beams.

The C49JR is a small bracket used in situations where the horizontal member of the standard C49 Overhang Bracket is too long, due to limited space between twin bridges.

The adjusting nut at the outboard end of the bracket is used to adjust the bracket to grade.

Bracket Type	Vertical Adjustment Range	Horizontal Length
C49	30" - 50"	54"
C49D	50" - 70"	54"
C49S	16" - 28"	54"
C49JR	16" - 28"	27"

Each of these brackets offer the bridge contractor, the ability to easily and quickly preset the brackets to size and shape on the ground, as required for each specific overhang requirement. The adjusting nut and the wide range of adjustability built into the brackets vertical and diagonal legs allow a bracket to be adjusted to fit almost any standard bridge overhang.

Both the vertical and diagonal legs have adjustment holes spaced at 2" increments which allows the legs to be adjusted so the diagonal leg will transfer the construction load to near the bottom flange, which aids in resisting web deflection and bending.

The C54 Extender, C52, C52P and C53 Guardrail Receptacles, and C51 Wall Plate Assemblies add to the versatility of the C49 overhang brackets.

SAFETY NOTE:

Overhang brackets should be adjusted to proper grade during the normal "dry run" operation.

DO NOT attempt an upward adjustment during the concrete pouring operation. Lowering the bracket is permissible during the concrete pour.