



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**

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.

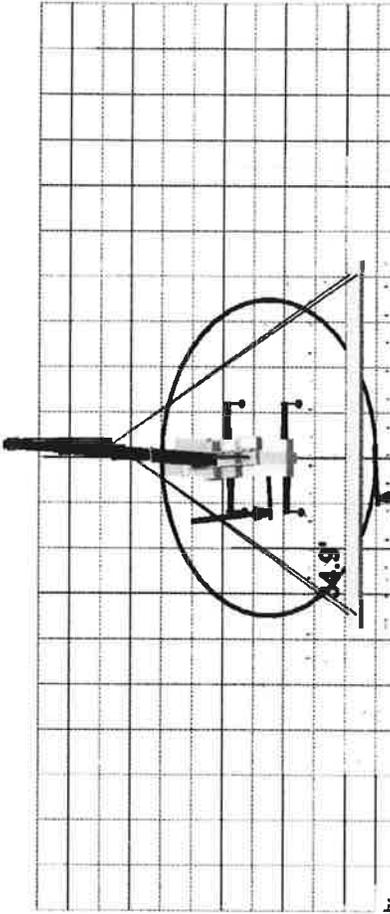
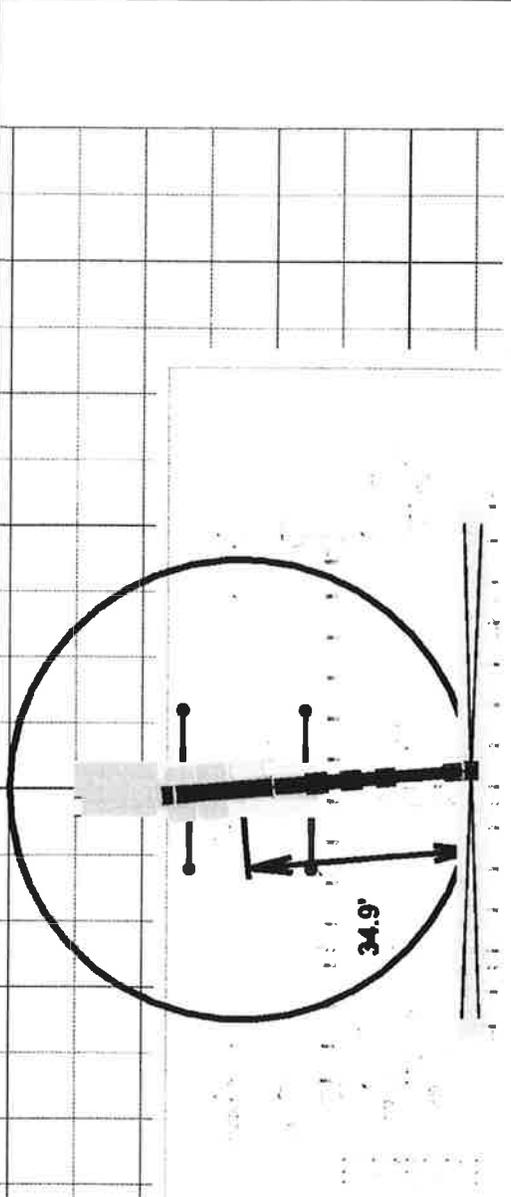
The steel will be delivered to J.P. Carrara's yard in frames from the steel fabricator (total of 3); CCS will then unload and set the frame to relative elevations shown on the Plans.

Erection Plan Drawing Schedule:

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

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

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								
15	116,000								
20	88,700								
25	69,950								
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									
105									
110									
115									
120									
125									
130									

* 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	65,000	60,000	57,000				
20	70,000	63,000	57,000	52,000				
25	67,000	59,000	55,000	50,000				
30	55,000	55,000	53,000	48,000				
35	45,000	46,000	47,400	46,000				
40		38,850	39,600	38,450				
45		33,200	33,600	32,600				
50		28,300	28,300	27,750				
55			24,250	23,750				
60			21,050	22,150				
65			18,600	19,550				
70				17,300				
75				15,400				
80								
85								
90								
95								
100								
105								
110								
115								
120								
125								
130								

GROVE
TMS 900E

900

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.

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						
Diameter	Vertical	Choke	Basket	60°	45°	30°
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						

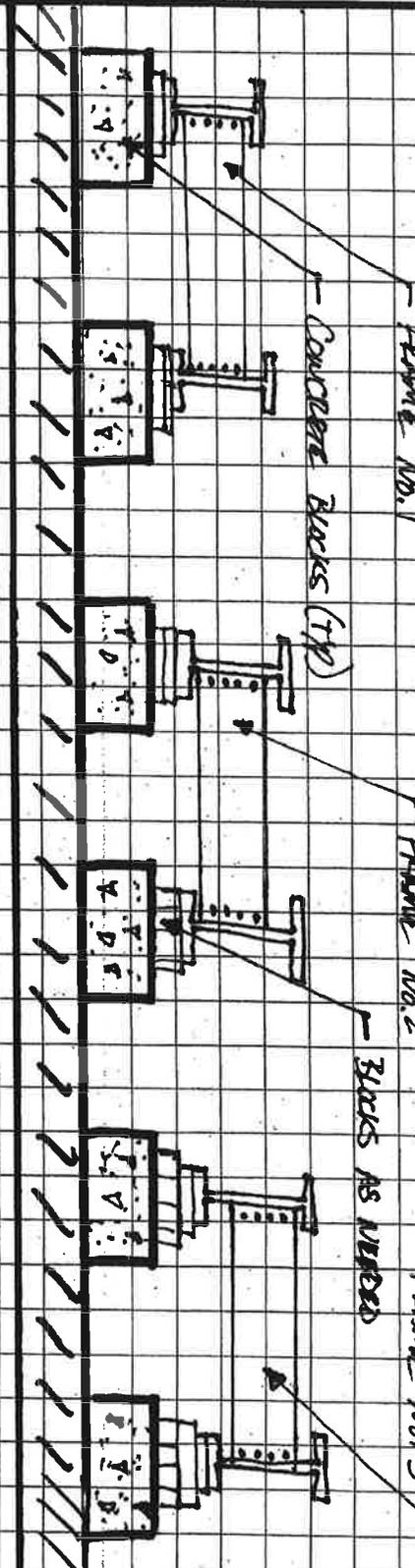
Crosby® Screw Pin Shackles

G-209 / S-209 Screw Pin Anchor Shackles

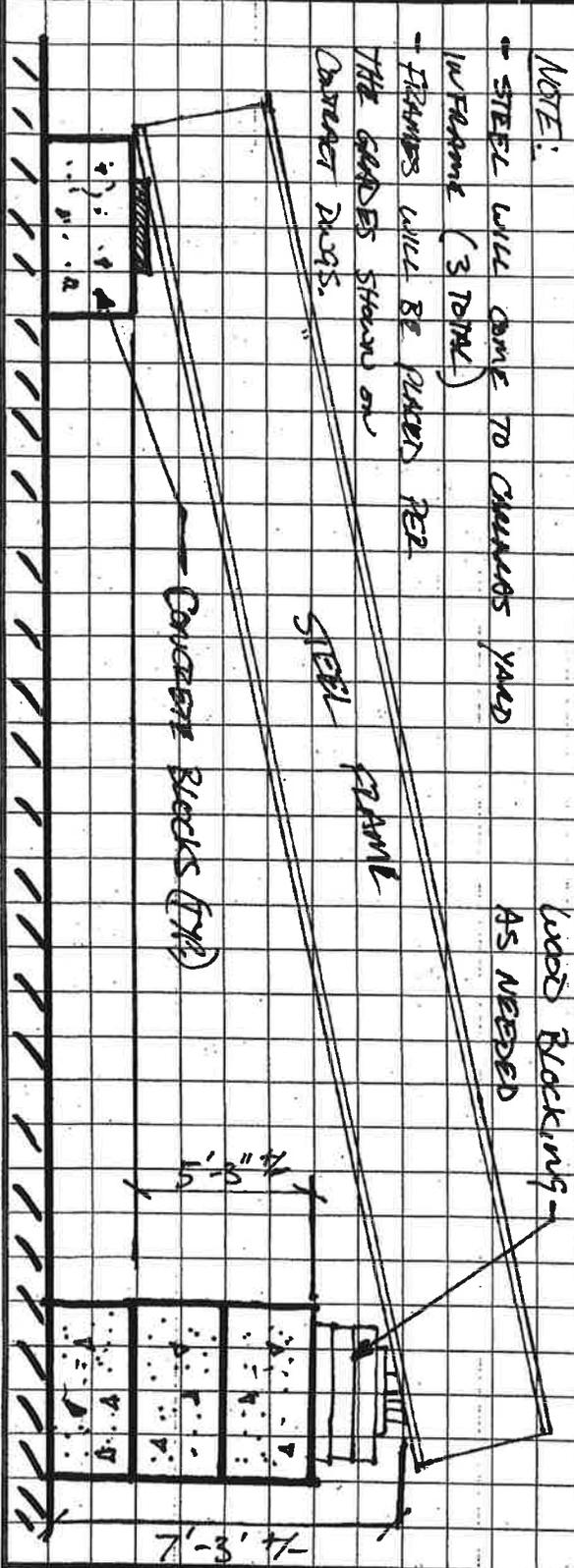
Nominal Size (in.)	Working Load Limit (T)	Stock No.		Weight Each (lbs.)	Dimensions (in.)													Tolerance +/-	
		G-209	S-209		A	B	C	D	E	F	G	H	L	M	P	C	A		
3/16	1/3	1018357	-	.06	38	25	.86	19	80	.56	98	147	16	114	19	06	06		
1/4	1/2	1018375	1018384	.10	47	31	1.13	25	78	.61	128	184	19	143	25	06	06		
5/16	3/4	1018393	1018400	.18	53	38	1.22	.31	84	.75	147	2.09	22	171	31	06	06		
3/8	1	1018419	1018428	.31	86	44	1.44	.38	103	.91	178	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	08		
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	1.89	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	106	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	125	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	138	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	150	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	162	25	13		
1-3/4	25	1018632	1018641	27.76	2.88	2.00	7.00	1.84	5.00	4.19	8.86	12.34	100	9.08	2.25	25	13		
2	35	1018650	1018669	45.00	3.25	2.25	7.75	2.08	5.75	4.81	9.97	13.68	122	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	12.67	17.84	138	13.00	3.13	25	25		



- NOTE:**
- ALL BLOCKING WILL BE DONE WITH CONCRETE BLOCKS & WOOD BLOCKING
 - HIGH SIDE OF THE BRIDGE WILL BE DONE THE SAME BUT WITH MORE CONCRETE BLOCKS.



- NOTE:**
- STEEL WILL COME TO CHANGERS YARD IN FRAME (3 TOTAL)
 - FRAMES WILL BE RAISED PER THE GRADERS SHOW ON DANGER DIGGS.



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.
 SK-3

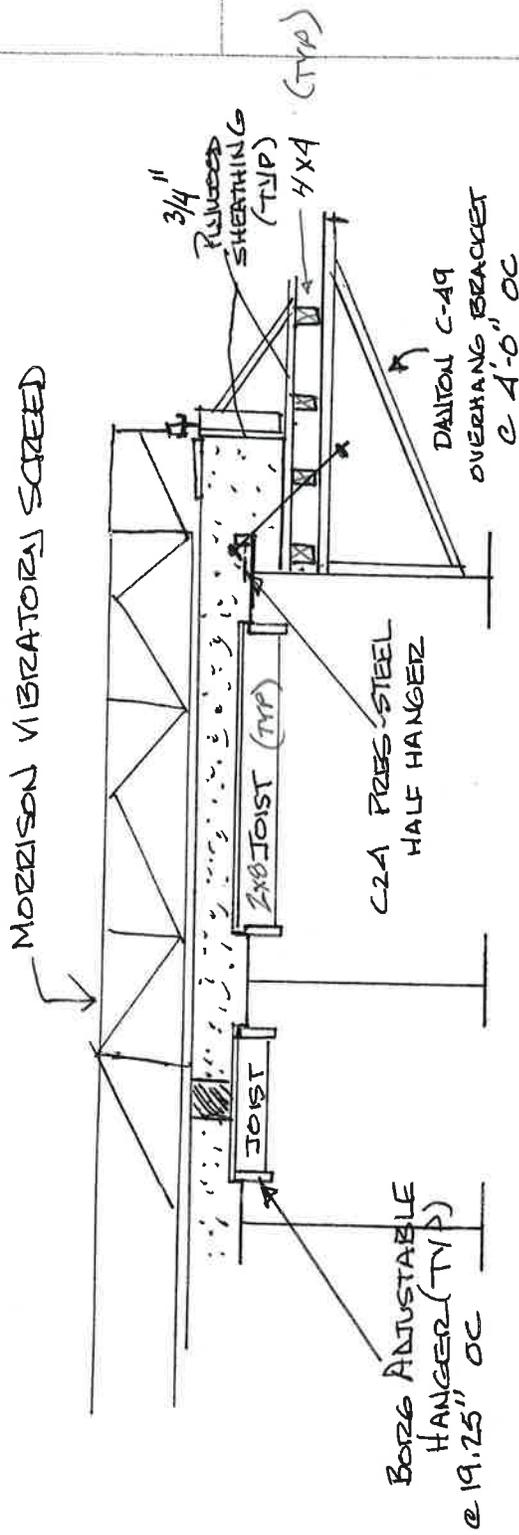
SCALE NTS

DATE 3/29/16

DECK FORMING + POUR PROCEDURES 4/1/2016

CRAFTSBURY PBSU

10F4



NOTES

- 1) DECK WILL BE FORMED AND PLACED AS ONE UNIT.
- 2) SCREEN WILL SPAN ALL (3) PBSU'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



Exterior Hangers

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:

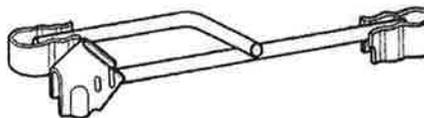
- Safe working load provides a factor of safety of approximately 2 to 1.
- Coil bolt or coil rod must penetrate through the coil nut a minimum of one bolt diameter.
- When used on concrete beams, the safe working load shown is based on normal weight concrete having reached a minimum compressive strength 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.

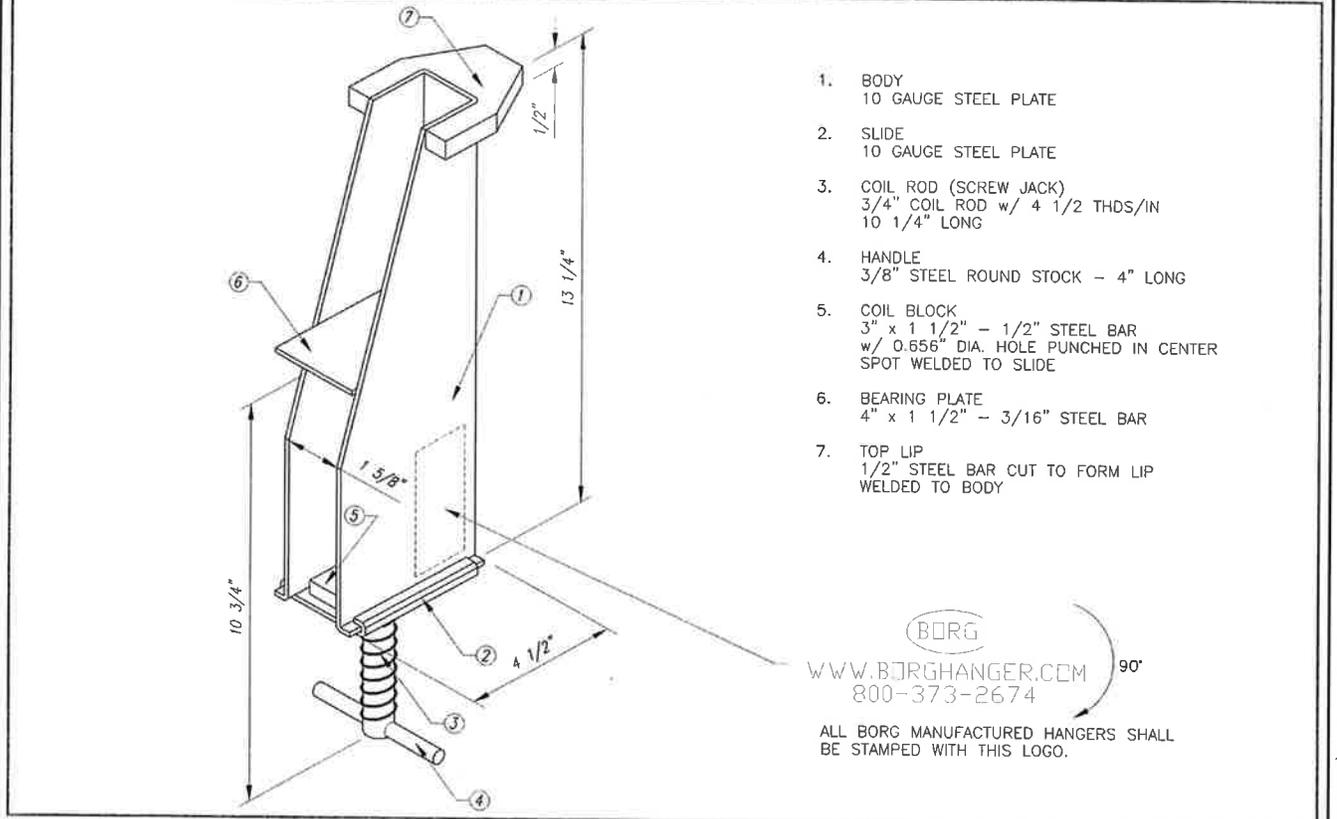
Exterior Hangers

SERIAL NUMBER:	BORG ADJUSTABLE JOIST HANGER CO., INC. P.O. BOX 209 WAYZATA, MN 55391	DATE ISSUED:
N/A		05/10/04

NOTES:

<p><u>SPECIFICATIONS AND STANDARDS</u></p> <ul style="list-style-type: none"> - AISC <u>MANUAL OF STEEL CONSTRUCTION</u>, 9TH EDITION. - AWS <u>STRUCTURAL WELDING CODE - STEEL</u>, D1.1-94. - 29 CFR 1926 - <u>OSHA SAFETY AND HEALTH STANDARDS</u> <p><u>ALLOWABLE LOADS</u></p> <table style="width:100%;"> <tr> <td style="width:70%;">FORM WEIGHT AND CONCRETE ONLY (PROVIDES 2 TO 1 FACTOR OF SAFETY AGAINST ULTIMATE STRENGTH)</td> <td style="text-align: right;">3000 LBS.</td> </tr> <tr> <td>FORM WGT., CONCRETE, CONSTRUCTION LIVE LOADS AND IMPACT (PROVIDES 3 TO 1 FACTOR OF SAFETY AGAINST ULTIMATE STRENGTH)</td> <td style="text-align: right;">2000 LBS.</td> </tr> </table>	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.	<p><u>STRUCTURAL NOTES</u></p> <ol style="list-style-type: none"> 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.
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.				

GRAPHICAL DESCRIPTION:



<p>PREPARED BY:</p> <div style="text-align: center;"> PROJECT ENGINEERING & MANAGEMENT, INC. <small>ENGINEERS ARCHITECTS SURVEYORS</small> 366 JACKSON STREET, SUITE 300 SAINT PAUL, MINNESOTA 55101-9775 PHONE: (651) 209-1167 FAX: (651) 209-1168 www.projecteng.com </div>	<p>SHEET TITLE:</p> <p style="text-align: center; font-size: 1.2em;">BORG ADJUSTABLE JOIST HANGER STANDARD HANGER</p>	<p>LICENSURE:</p> <p>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.</p> <p>DATE _____ REG. NO. _____</p>
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Bridge Overhang Brackets

C49, C49D, C49S and C49JR Bridge Overhang Brackets

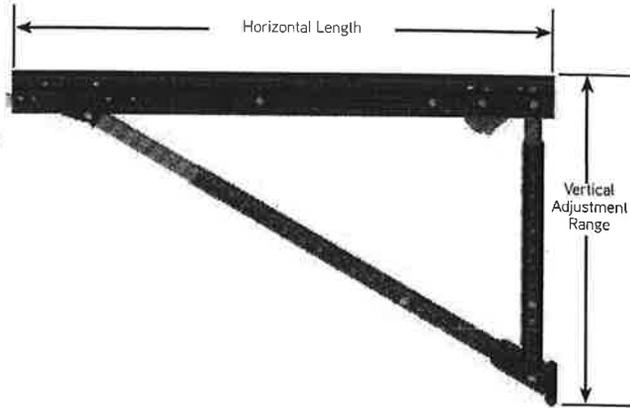
Dayton Superior offers the bridge contractor four different versions of the C49 Bridge Overhang Bracket, which allows for maximum adjustability to meet the varied bridge overhang forming requirements on both structural steel and precast/prestressed concrete beams. The C49 is the most versatile overhang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

Bridge Overhang Brackets

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.