

RENAUD BROS., INC.

283 Fort Bridgeman Road #2, Vernon, VT 05354

phone (802) 257-7383

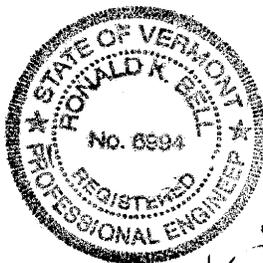
fax (802) 257-7308

Marlboro BRF 010-1 (43) RIGGING PLAN

This rigging plan utilizes the DEMAG AC-120. We have previously submitted both pictorially the AC-120 and the AC-160, but only showing the AC-120 capacities on the plan. Our crane schedule has been very dynamic over the last month and for see it being this way right up until October 1st. We have shown again the AC-120 being used to set the beams as this will be the worst case scenario. We have added concrete blocks to the plan to distribute the load near the abutment. The blocks have put the load path below the abutment. Outrigger point loads and distribution calculations are included. Sketches' showing how the centerline of gravity is measured on the paired beams is included. Also the stability analysis has been shown for the paired beams.

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Ronald K. Bell

MARLBORO RIGGING PLAN
OUT RIGGER SURCHARGE
FOR AC-120

MOMENT ABOUT REAR OUT RIGGERS
SOLVE FOR FRONT OUT RIGGER LOAD

$$\begin{aligned} M_R = & (34k)(66' + 10.83') + (26.46k)(3.92') - (83.8k)(6.7') - (26.46k)(3.75') \\ & - 2612 \qquad \qquad \qquad + 104 \qquad \qquad \qquad - 562 \qquad \qquad \qquad - 99 \\ & - (26.46k)(9.17') - (26.46k)(15.75') - (26.46k)(21.17') + (k)(25.08') \\ & - 243 \qquad \qquad \qquad - 417 \qquad \qquad \qquad - 560 \end{aligned}$$

$$M_R = (-4493 + 104) = -4389 + 25.08k = 0$$

$$\begin{aligned} x &= 4389 / 25.08 \\ x &= 175k \end{aligned}$$

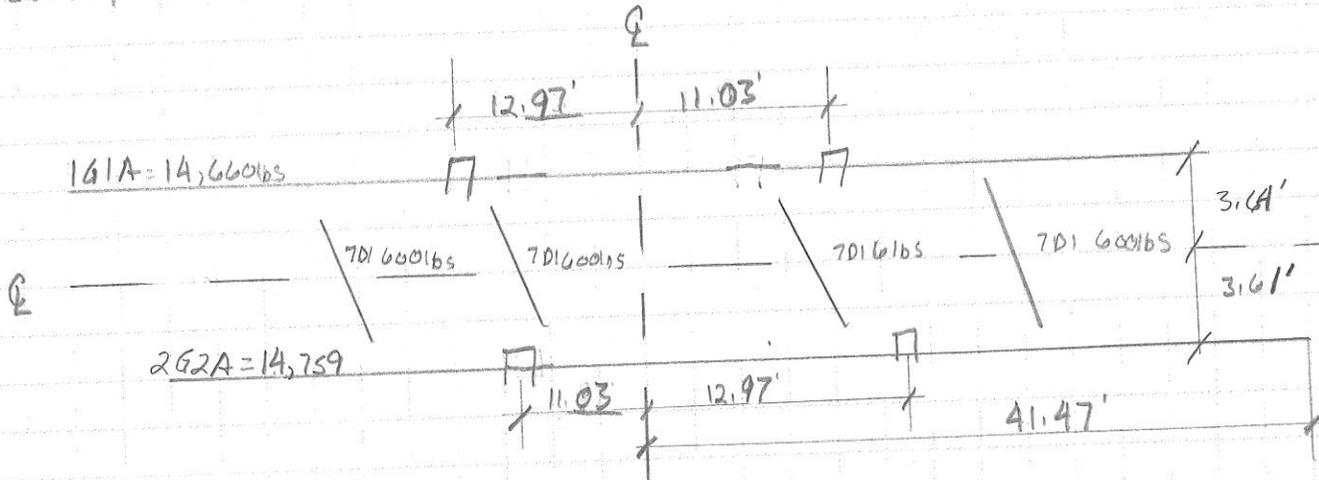
$$175k / 2 = 87.5k / \text{OUT RIGGER}$$

6'x6' CONCRETE PAD

$$\frac{87.5k}{6' \times 6'} = 2,431 \text{ PSF}$$

MARLBORO RIGGING PLAN
 PAIRED BRAM WEIGHTS
 CENTER LINE OF BRAMS
 ▭ = BRAM CLAMP

1G1A & 2G2A



BALANCE POINT

$$M = (14660 + 14759)(K) - (14759)(7.25)$$

$$K = 3.64'$$

$$7.25' - 3.64' = 3.61'$$

0.03' NEGLIGIBLE DIFFERENCE

HORIZONTAL CENTERLINE

$$\text{PAIRED LENGTH } 81' + 1.94' \text{ OFFSET} = 82.94'$$

$$Q \text{ OF PAIRED BRAMS } 82.94'/2 = 41.47' \text{ FROM LONG END}$$

OFFSET FOR BRAM CLAMPS FROM Q

$$K + 1.94/2 \text{ FOR LONG SIDES}$$

$$K - 1.94/2 \text{ FOR SHORT SIDES}$$

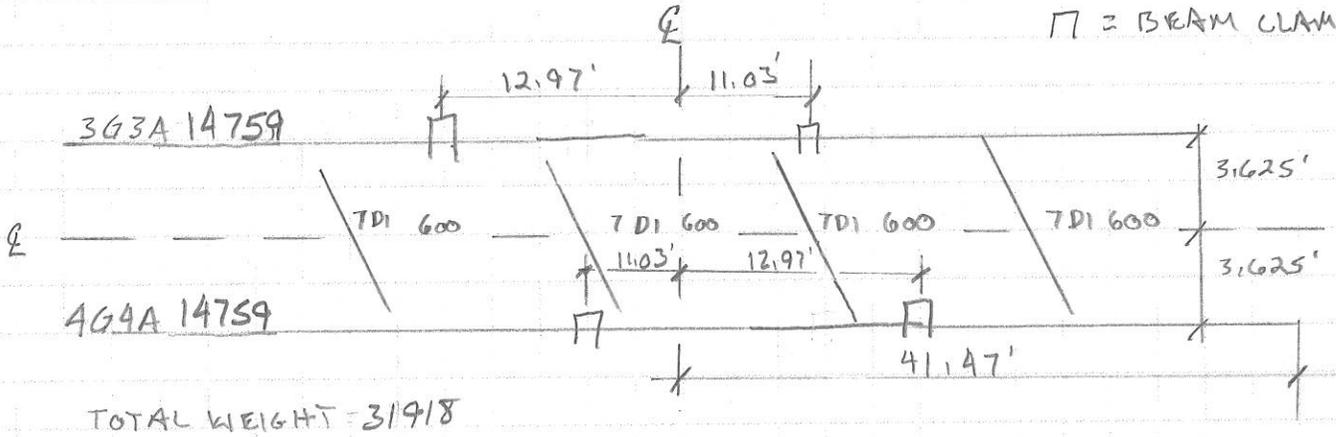
USE 12' FOR K

$$12.97' \text{ FOR LONG SIDE}$$

$$11.03' \text{ FOR SHORT SIDE}$$

3G3A & 4G4A

MARLBORO RIGGING PLAN
PAIRED BEAMS WEIGHTS
CENTER OF GRAVITY
□ = BEAM CLAMP



PAIRED BEAM LENGTH $81' + 1.94' \text{ OFFSET} = 82.94'$

☐ OF PAIRED BEAMS $82.94' / 2 = 41.47'$

OFFSET FOR BEAM CLAMPS

USE 12' FOR X

$X + (1.94/2)$ FOR LONG SIDES

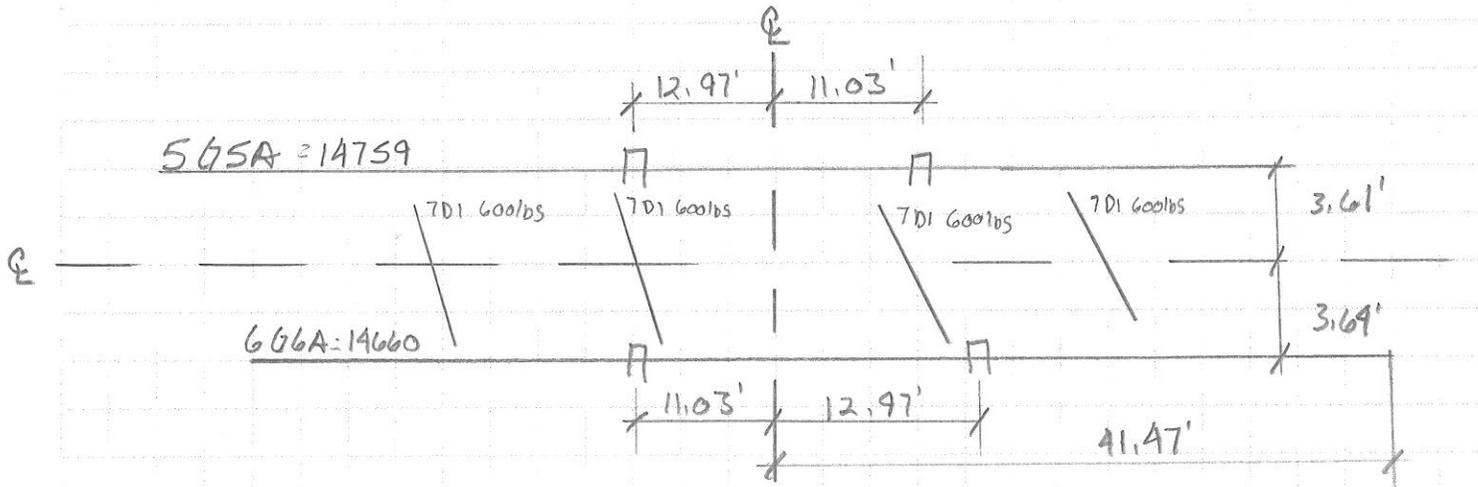
$X - (1.94/2)$ FOR SHORT SIDES

$12' + 0.97' = 12.97'$ FROM PAIR ☐

$12' - 0.97' = 11.03'$ FROM PAIR ☐

MARLBORO RIGGING PLAN
 PAIRED BEAM WEIGHTS
 CENTERLINE OF BEAMS
 ▭ = BEAM CLAMP

5G5A & 6G6A



BALANCE POINT

$$M = (14759 + 14660)(x) - (14759)(7.25')$$

$$x = 3.64'$$

$$7.25' - 3.64' = 3.61' \quad 0.03' \text{ NEGLIGABLE DIFFERENCE}$$

HORIZONTAL CENTERLINE

$$\text{PAIRED LENGTH } 81' + 1.94' \text{ OFFSET} = 82.94'$$

$$Q \text{ OF PAIRED BEAMS } 82.94' / 2 = 41.47' \text{ FROM LONG END}$$

OFFSET FOR BEAM CLAMPS FROM Q

$$x + 1.94/2 \text{ FOR LONG SIDES}$$

$$x - 1.94/2 \text{ FOR SHORT SIDES}$$

USE 12' FOR X

12.97' FOR LONG SIDE

11.03' FOR SHORT SIDE

Charlie Ezequelle

From: Brian Tupper [btupper@cascobaysteel.com]
Sent: Friday-July 25-2014 6:42 AM
To: Charlie Ezequelle
Subject: RE: Marlboro BRF 010-1 (43) - Rigging Plan

Yes, final tensioning will be done here in our shop prior to shipping of any diaphragms being shop installed in paired units.

Thank you,

Brian C. Tupper
Sales & Estimating Manager
(P) 207-780-6722
(F) 207-780-6726
(Cell) 207-415-4787

E-mail: btupper@cascobaysteel.com



www.cascobaysteel.com

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From: Charlie Ezequelle [<mailto:cezequelle@gmail.com>]
Sent: Thursday, July 24, 2014 9:05 AM
To: Brian Tupper
Subject: Marlboro BRF 010-1 (43) - Rigging Plan

Hi Brian,

Attached is the comments back from our rigging plan can you help us with questions 2 and 3, (seem like the same question).

Thanks,

Charlie Ezequelle

Renaud Bros., Inc.

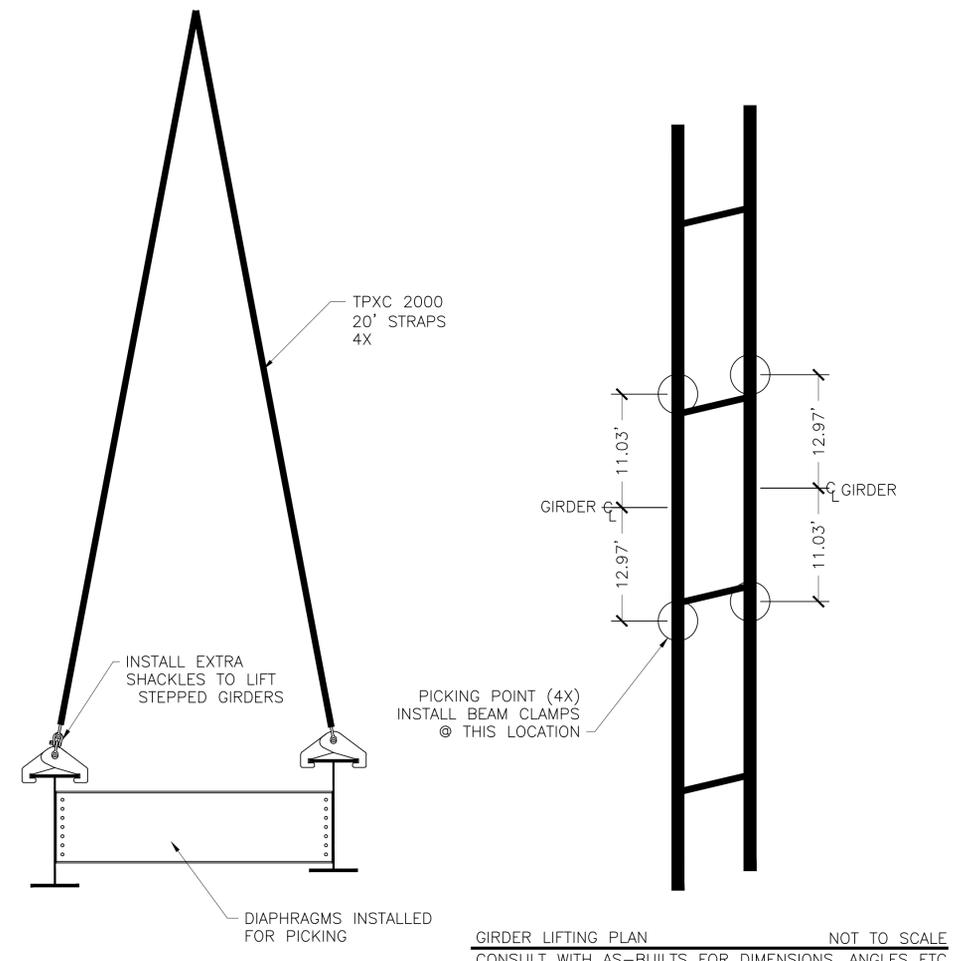
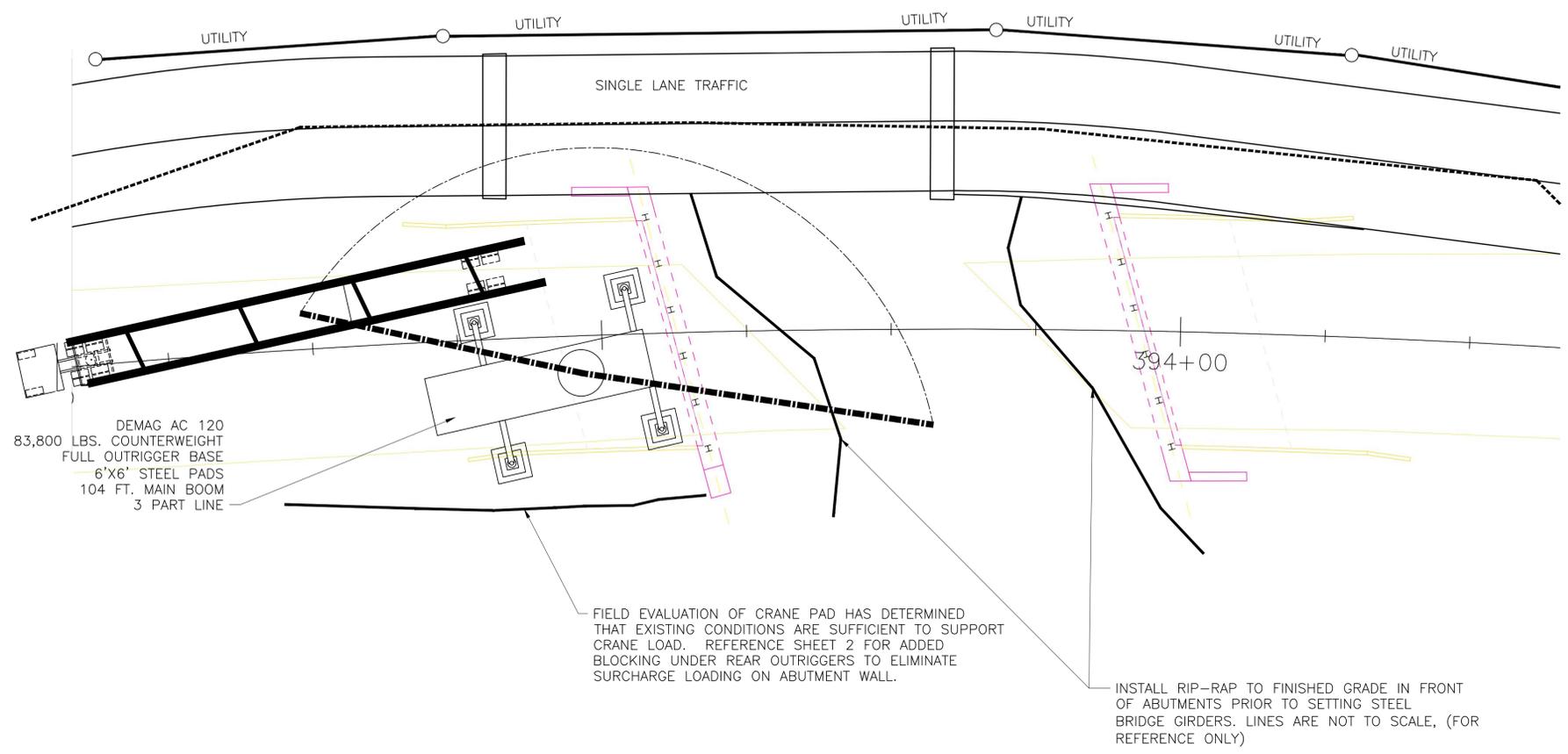
283 Fort Bridgman Road #2,
Vernon, VT 05354

Office: 802.257.7383

Phone: 802.365.1944

Fax: 802.257.7308

Email: CEzequelle@Gmail.com



RIGGING SECTION
DRAWING NOT TO SCALE

STEEL GIRDER LIFTING SCHEDULE						
PIECEMARK	MAXIMUM SET RADIUS*	PIECE WEIGHT	BLOCK WEIGHT	RIGGING WEIGHT	TOTAL LOAD WEIGHT	MAXIMUM CRANE CAPACITY
1G1A/ 2G2A	*66'-0"	31,819 LBS.	1,500	500 LBS.	33,819 LBS.	35,600 LBS.
3G3A/ 4G4A	*66'-0"	31,918 LBS.	1,500	500 LBS.	33,918 LBS.	35,600 LBS.
5G5A/ 6G6/A	*66'-0"	31,819 LBS.	1,500	500 LBS.	33,819 LS.	35,600 LBS.
7D1	**99'-0"	600 LBS.	1,500	100 LBS.	2,200 LBS.	9,900 LBS.

*MAXIMUM DISTANCE IS FIGURED FOR SETTING GIRDERS & DIAPHRAGMS. SHORTER RADII' WILL RESULT IN INCREASED CRANE CAPACITY. ALL GIRDER RADII' ARE FIGURED FOR A 104' MAIN BOOM LENGTH.
 **119.1' MAIN BOOM LENGTH REQUIRED FOR SETTING DIAPHRAGMS.

RIGGING SCHEDULE			
LOCATION	RIGGING DESC.	QTY. REQ.	RATING
GIRDERS	20' TPXC-2000 STRAPS	4	20,000 LBS./EA.
	12 TON SHACKLES	4	24,000 LBS./EA.
	15 TON BEAM CLAMPS	4	30,000 LBS./EA.
DIAPHRAGMS	20' TPXC-2000 STRAPS	1	20,000 LBS./EA.

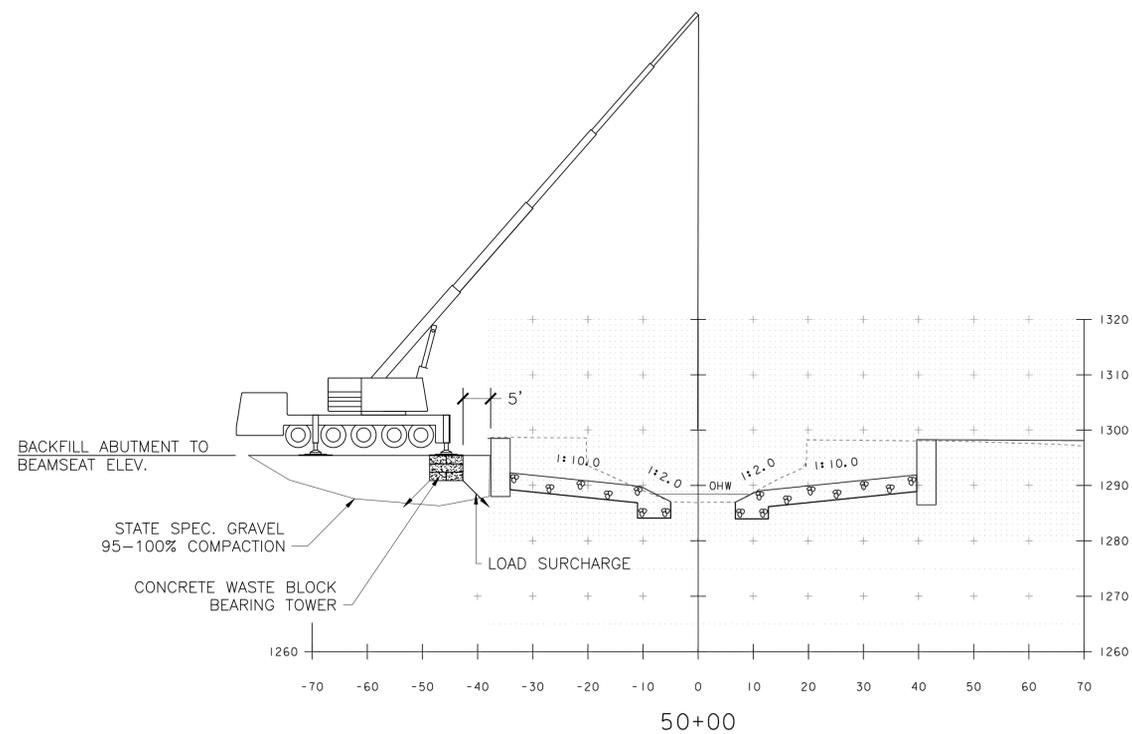
NOTES:

- 1) STEEL MANUFACTURER IS RESPONSIBLE FOR TRUCKING, AND ENSURING THAT GIRDERS ARE SHIPPED IN A MANNER THAT PROVIDES STABILITY, PREVENTS DAMAGE AND CONFORMS TO STATE AND LOCAL D.O.T. RULES AND REGULATIONS.
- 2) GIRDERS WILL BE SHIPPED AND SET IN PAIRS, WITH THE DIAPHRAGMS INSTALLED AT THE STEEL MANUFACTURER. GIRDERS WILL BE SET STARTING FROM THE DOWNSTREAM SIDE, AND WORKING UPSTREAM. DIAPHRAGM BOLTS FOR SHIPPED PAIRS SHALL BE TENSIONED AT THE STEEL MANUFACTURE'S FACILITY
- 3) TEMPORARY BRACING IS NOT REQUIRED TO SET THE GIRDERS. ALL DIAPHRAGMS SHALL BE IN PLACE PRIOR TO SETTING EACH PAIR OF GIRDERS.
- 4) UTILITY LINES ARE ON OPPOSITE SIDE OF THE BRIDGE FROM WORK AREA. ALL WORK AROUND UTILITY LINES SHALL REMAIN OUTSIDE THE ACCEPTABLE LIMITS SET FORTH BY OSHA REGULATIONS.
- 5) CRANE BASE: CRANE SHALL SET 5' MIN. BACK FROM ABUTMENT (SEE SECTION SHEET 2). CRANE SHALL SET ON STATE SPECIFICATION GRAVEL AND BE COMPACTED A MIN. OF 95-100%. RIVER SIDE OF ABUTMENT SHALL BE FILLED TO CONSTRUCTION PLAN SPECIFIED GRADE WITH RIP RAP MATERIALS. DOWN STREAM BANK BESIDE CRANE SHALL BE SHORED ADEQUATELY WITH RIP-RAP AND/OR CONCRETE BLOCKING TO ENSURE A STABLE BASE.
- 6) TAG LINES SHALL BE USED AT ALL TIMES TO GUIDE EACH PICK.

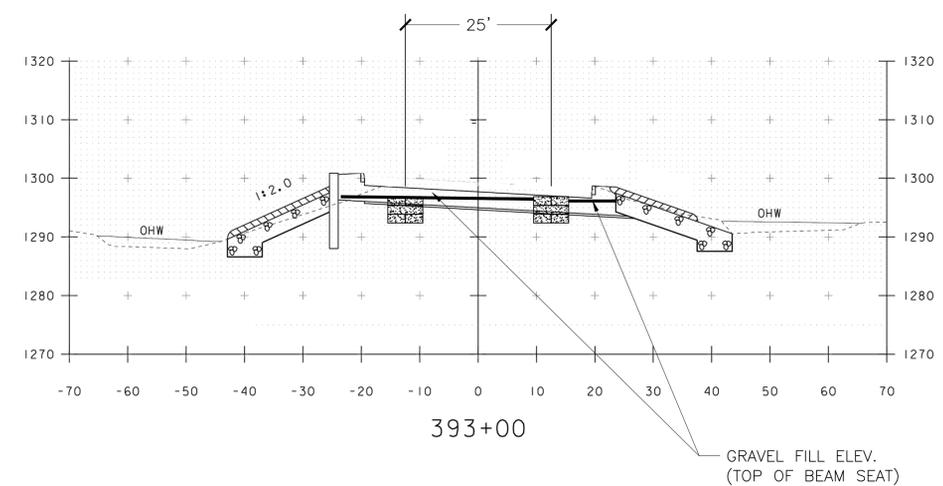
SHEET NAME:
RIGGING PLAN

REV. NO.	DATE:		PROJECT NAME: MARLBORO	SHEET NO. 7	
1	7/17/14		PROJECT NO: BRF-010(43)		
2	7/30/2014		DRAWN BY: A.D.	CHK'D BY: M.S.	DATE: 6/30/2014

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RIGGING ELEVATION
DO NOT SCALE



SECTION- CONCRETE TOWERS
CRANE NOT SHOWN FOR CLARITY
DO NOT SCALE

REVIEWER NOTE:

- 1) CONCRETE WASTE BLOCKS HAVE BEEN ADDED TO ELIMINATE THE SURCHARGE LOAD AGAINST THE BACK OF THE ABUTMENT.
- 2) BLOCK TOWER WILL BE 4'-6" IN HEIGHT. EDGE OF TOWER WILL BE AT 5' FROM REAR OF ABUTMENT WALL.
- 3) BACKFILL BEHIND THE ABUTMENT WILL BE AT OR BELOW THE ELEVATION OF THE BEAM SEATS.

SHEET NAME:
RIGGING PLAN

REV. NO.	DATE:
1	7/17/14
2	7/30/2014

B. I. RENAUD BROS. INC.
STEEL SALES & FABRICATION
VERNON VT, USA
283 FT. BRIDGMAN RD. VERNON VT., 05354
PH. (802) 257-7383 FAX (802) 257-7308

PROJECT NAME: MARLBORO		
PROJECT NO: BRF-010(43)		
DRAWN BY: A.D.	CHK'D BY: M.S.	DATE: 6/30/2014

SHEET NO.

8