



CCS Constructors LLC

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

Erection Plan for Steel Bridge Girders Stowe Bridge BRF 0235 (11)

1/29/2015

Procedure

The erection will be performed utilizing two truck cranes: a 275-ton hydraulic Grove **GMK 5275**, and a 90-ton hydraulic Grove **TMS 900E**. Both cranes are to be outfitted with all of the manufacturer's supplied counterweights, and are to setup as shown on the layout drawing, drawing No. 1. The erection shall not be performed during windy conditions.

Rigging sizes shown are minimums; larger rigging is permissible. Crane radii are shown on layout drawing No. 1 and shall not be exceeded without crane capacity verification. The **GMK5275** is to be used to pick and set girders. It shall be outfitted with 40'- 1 1/4" min. diameter cables and a 40' HSS8x8x1/4 spreader beam with 4- 25 ton shackles supporting 25-ton beam clamps at each end, as shown in SK-1.

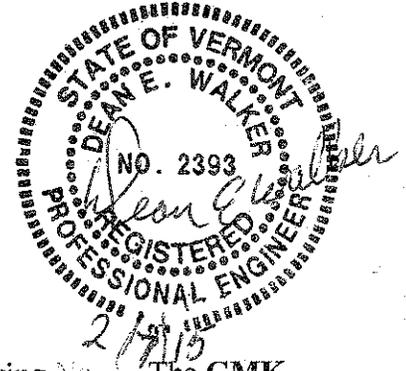
Bolts shall be installed and torqued according to the project specifications. All nuts at the anchor bolts, including the nuts above the bottom flange, shall be fully tightened before slackening hoist lines at the setting crane (**GMK 5275**).

Erection Plan Drawing Schedule:

Drawing No. 1 Crane and girder layout
Sketch SK-1 Rigging for girder pick
Sketch SK-2 Holding location and temporary top flange chain detail

STEP #1: Set Girder G3A:

Girder **G3A** is to be positioned next to the **GMK5275** as shown in drawing No. 1. The **GMK 5275** is to pick and set the girder **G3A** using the rigging described above and shown in SK-1, and is to remain hooked on. The **TMS 900E** is to hook on to the top flange at 52'-0" from the abutment 2 end of the girder (42'-6" from the center of the abutment 2 bearing) with a single 25-ton beam clamp, as shown in SK-2. The top flange of girder **G3A** is to be chained to the adjacent girder anchor bolts under the lower nuts at both ends (bearing locations) as shown in sketch SK-2 for lateral stability. Once the holding crane has applied tension for maintaining the girder camber and the four chain binders are in place, the **GMK 5275** may unhook. The **TMS 900E** is to remain hooked on.





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STEP #2: Set Girder G4A:

Girder **G4A** is to be positioned next to crane as shown in drawing No. 1. The **GMK 5275** is to pick and set the girder **G4A** using the same rigging described above and shown in SK-1, and is to remain hooked on. A telescoping forklift, large excavator (already on-site,) is to set three diaphragms minimum, which connect **G4A** and **G3A** together. (The machine used shall have capacity to lift over 300 lbs at the diaphragm installation location.) The diaphragms closest to the ends of the girders are required as well as either the center-span diaphragm (3 diaphragms total installed) or two other intermediate diaphragms (4 diaphragms total installed). Once all connection bolts at the required diaphragms have been installed snug-tight, both cranes may gradually and simultaneously slacken hoist lines and unhook. After the cranes unhook, the chain binders are no longer required and may be removed.

The remaining diaphragms between girders **G3A** and **G4A** shall be installed with all bolts snug-tight prior to ending work for the day or proceeding onto the next step.

STEP #3: Set Girder G5A:

Girder **G5A** is to be positioned next to the **GMK5275** as shown in drawing No. 1. The **GMK 5275** is to pick and set the girder **G5A** using the same rigging described above and shown in SK-1, and is to remain hooked on. The **TMS 900E** is to set three diaphragms minimum, which connect **G4A** and **G5A** together. Similarly to step #2, the diaphragms closest to the ends of the girders are required as well as either the center-span diaphragm (3 diaphragms total installed) or two other intermediate diaphragms (4 diaphragms total installed). Once all connection bolts at the required diaphragms have been installed snug-tight, the **GMK 5275** may unhook.

The remaining diaphragms between girders **G4A** and **G5A** shall be installed with all bolts snug-tight prior to ending work for the day or proceeding on to the next step.

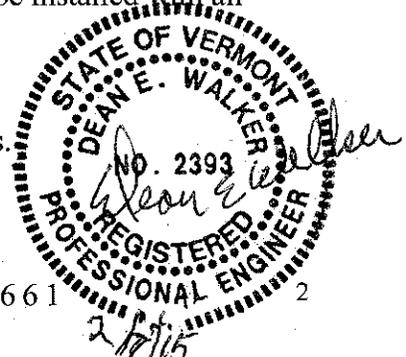
STEP #4: Set Girder G2A & G1A:

Girder **G2A** is to be positioned next to the **GMK5275** as shown in drawing No. 1. The **GMK 5275** is to pick and set the girder **G2A** using the same rigging described above and shown in SK-1, and is to remain hooked on. The **TMS 900E** is to set three diaphragms minimum, which connect **G3A** and **G2A** together. Similarly to the previous steps, the diaphragms closest to the ends of the girders are required as well as either the center-span diaphragm (3 diaphragms total installed) or two other intermediate diaphragms (4 diaphragms total installed). Once all connection bolts at the required diaphragms have been installed snug-tight, the **GMK 5275** may unhook.

The remaining diaphragms between girders **G3A**, **G2A** and **G1A** shall be installed with all bolts snug-tight prior to ending work for the day.

STEP #5: Complete installation of bolts:

See the project drawings and specifications for bolt torque requirements.



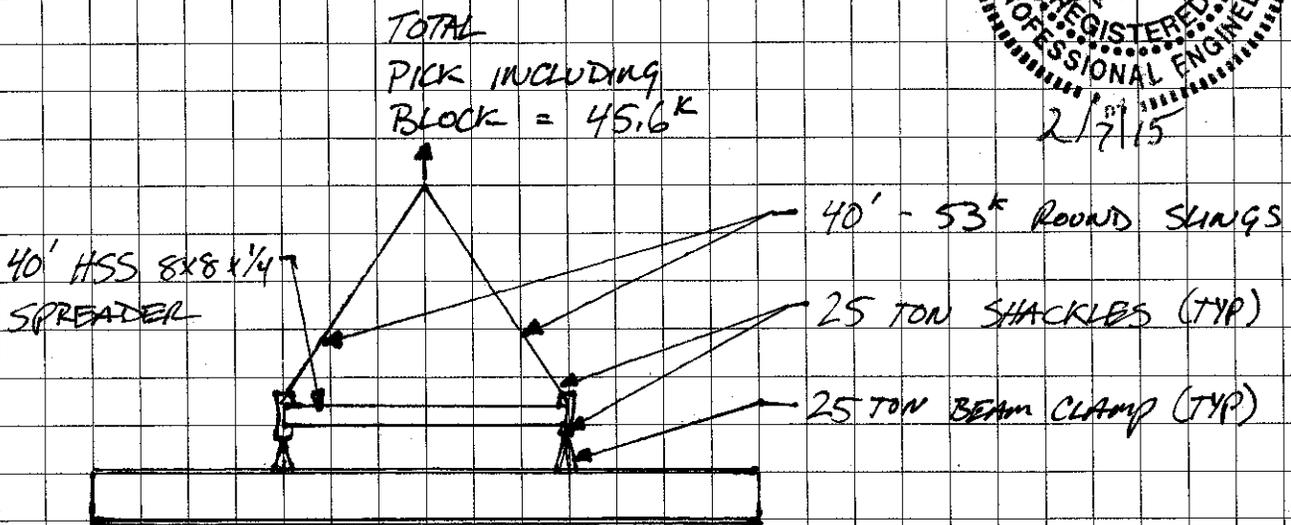
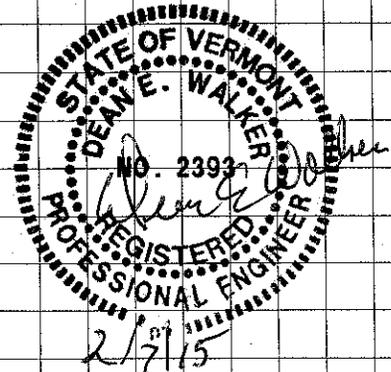
GIMK 5275 GIRDER PICK!

GIRDER WT = 39.7K

RIGGING USED!

25 TON BEAM CLAMPS	$0.3^k \times 2 = 0.6^k$
25 TON SHACKLES	$0.03^k \times 6 = 0.2^k$
HSS 8x8x1/4 SPREADER	= 1.6K
40' x 53 ^k ROUND SLINGS	= .4K
CRAWL BLOCK	= 2.5K
LOAD LINE	= 0.6K
TOTAL	= 5.9K

CRANE CAPACITY @ 133.4' OF BOOM, 169,700 lbs OF COUNTERWEIGHTS
R = 90' = 45K



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

PROJECT NAME

STOWE BRF 0235 (11)

PROJECT NO.

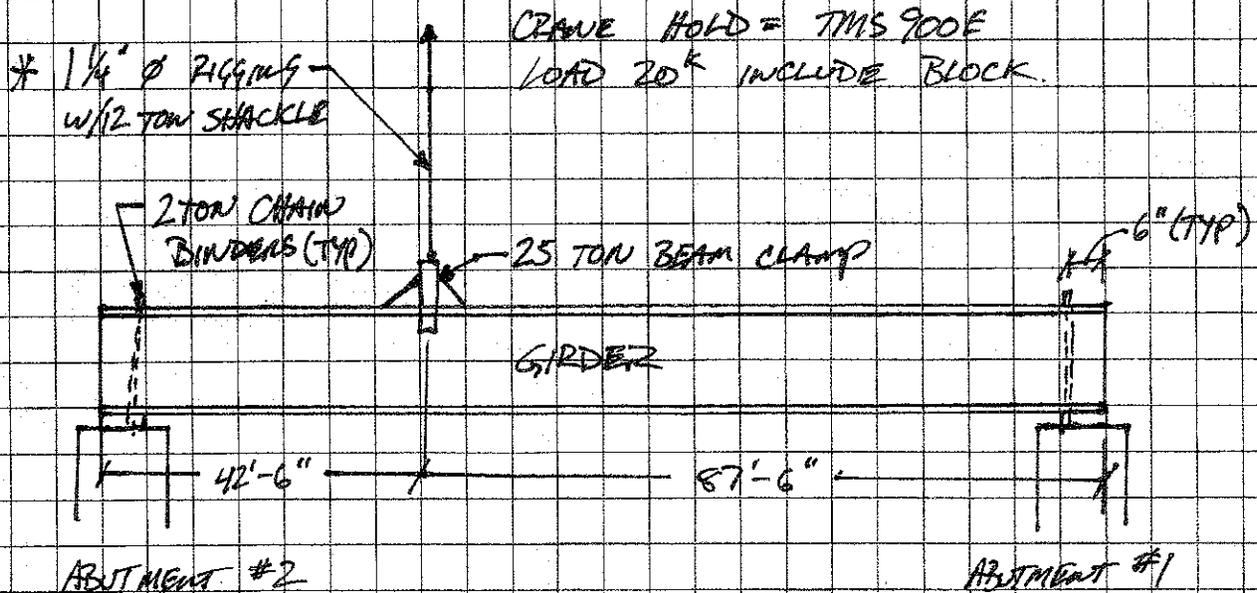
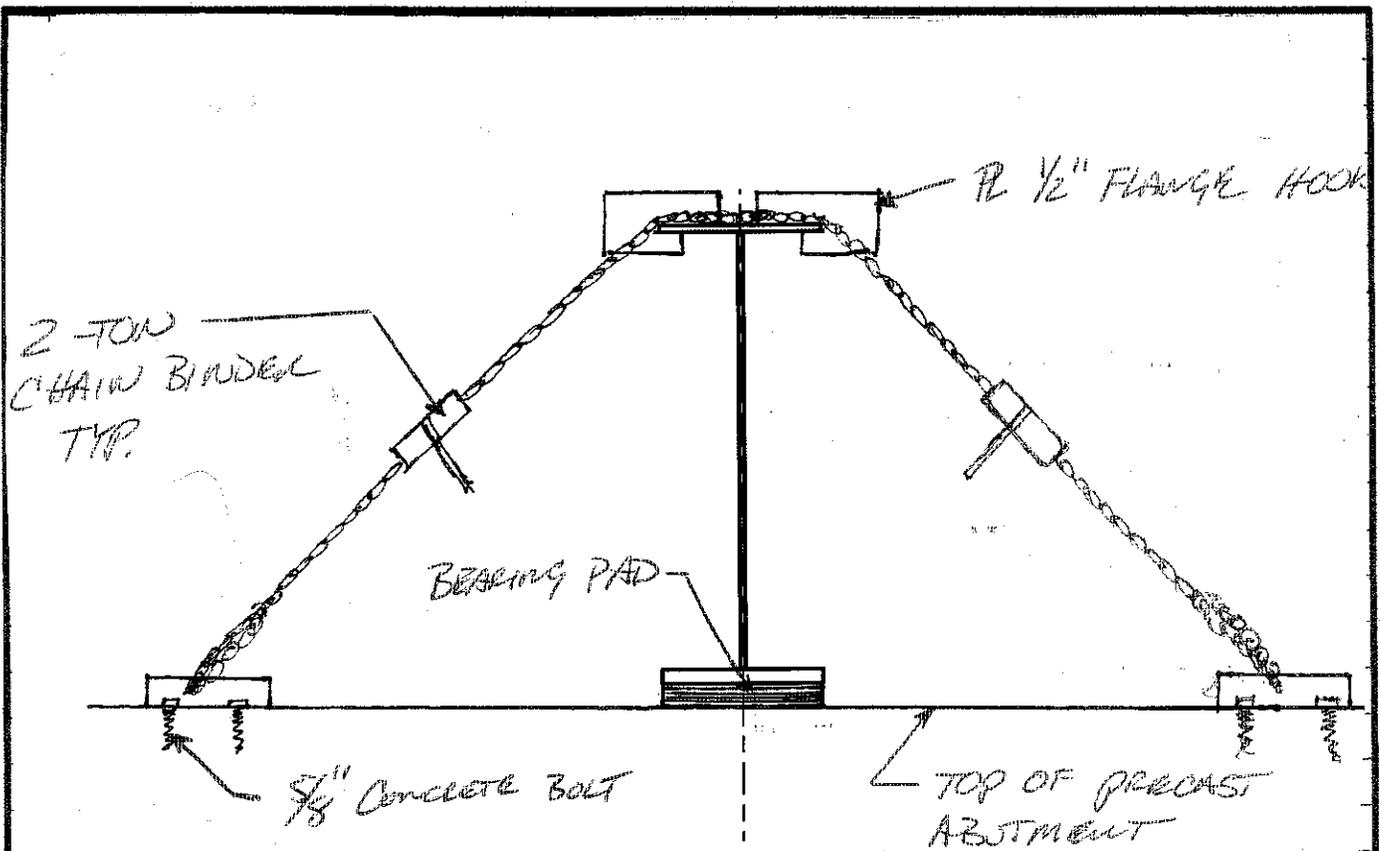
GIRDER PICK RIGGING

DRAWING NO.

SCALE NTS

DATE 1/29/15

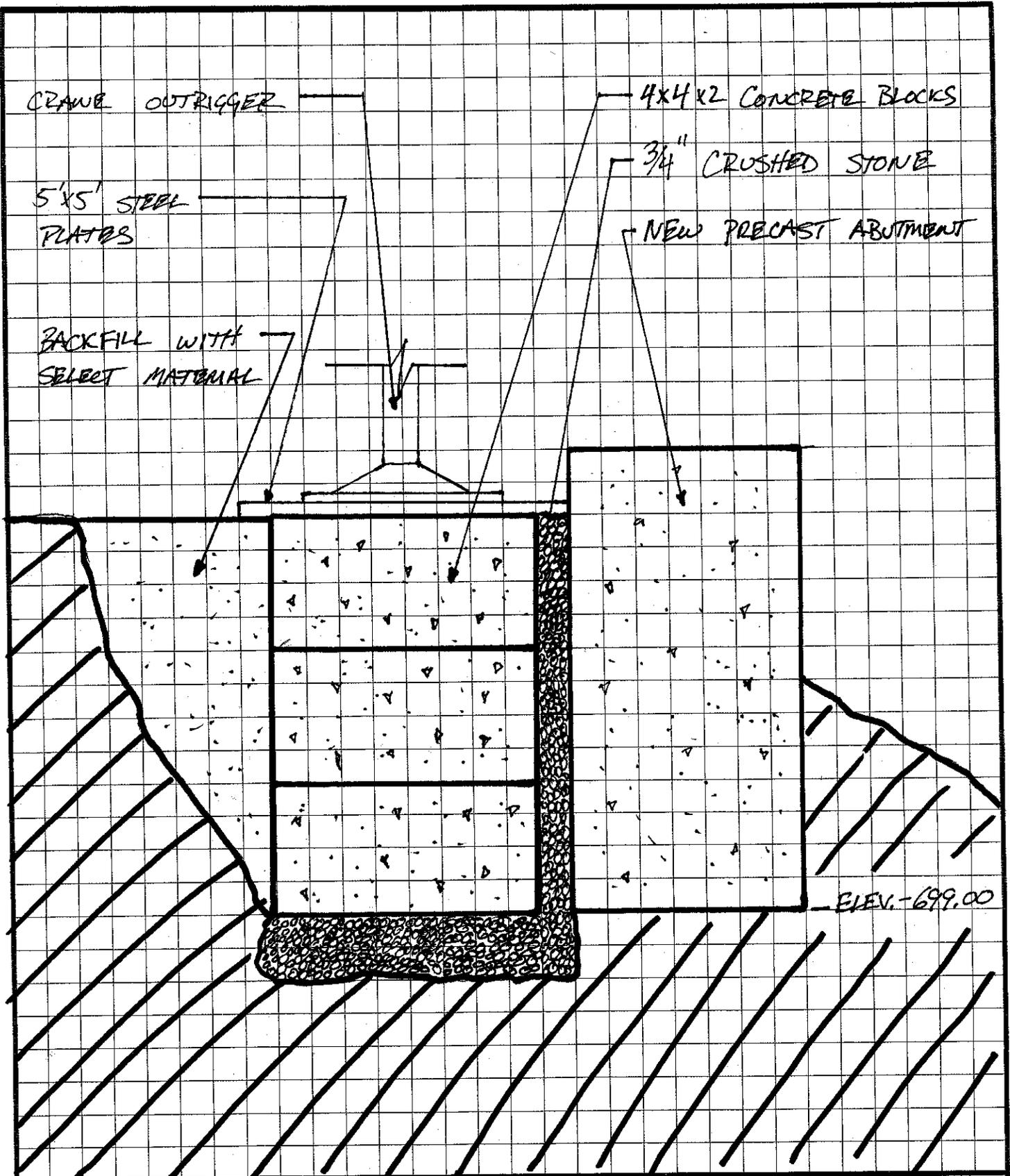
SK-1



GIRDER ELEVATION
N.T.S.

* MINIMUM, LARGER SIZE PERMISSIBLE

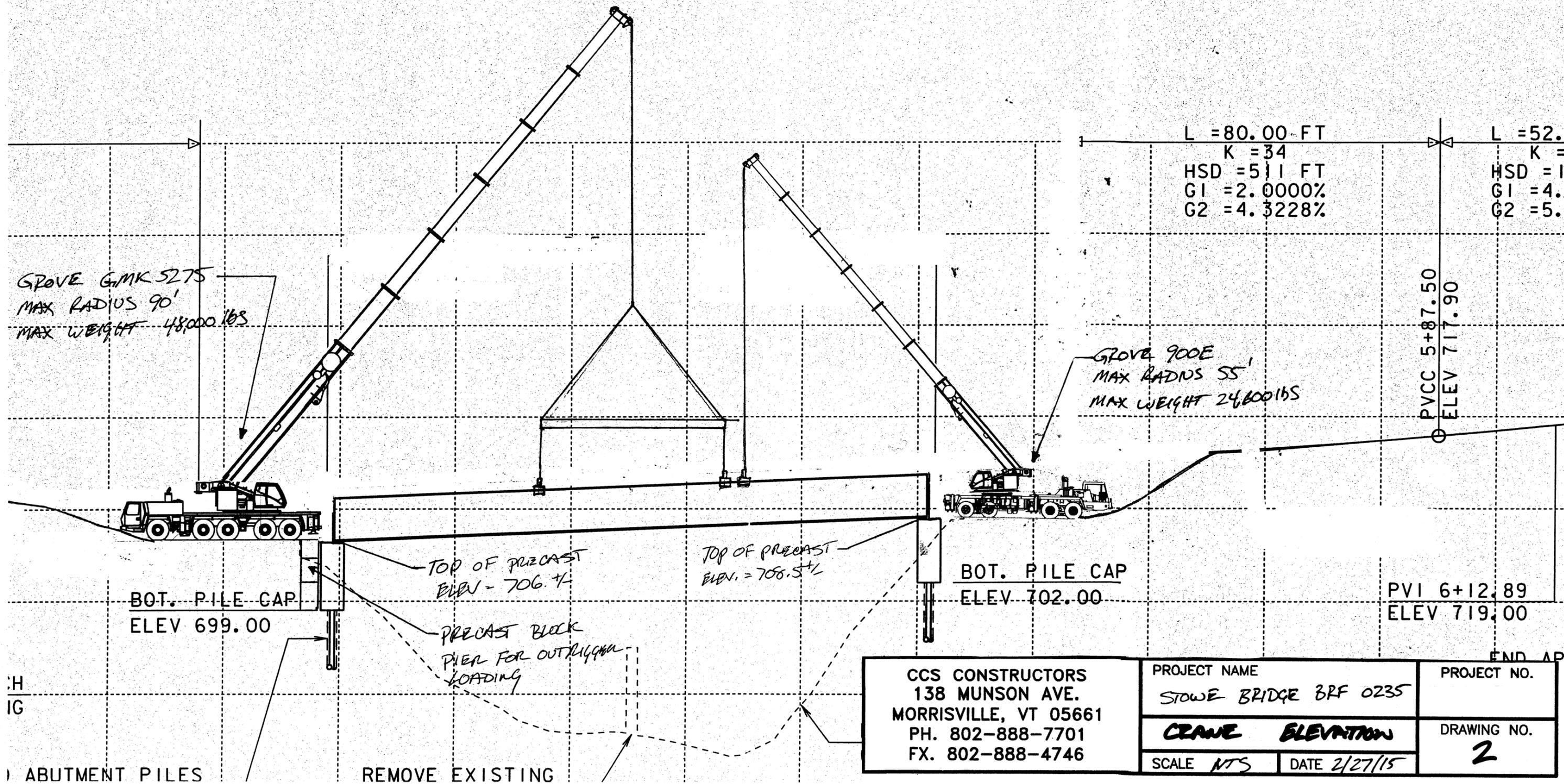
CCS CONSTRUCTORS 138 MUNSON AVE. MORRISVILLE, VT 05661 PH. 802-888-7701 FX. 802-888-4746	PROJECT NAME	PROJECT NO.
	STOWE BRG 0235 (U)	
	GIRDER TOP FLANGE STABILIZATION	DRAWING NO.
SCALE WTS	DATE 1/29/15	SK-2



ELEV. - 699.00

CCS CONSTRUCTORS 138 MUNSON AVE. MORRISVILLE, VT 05661 PH. 802-888-7701 FX. 802-888-4746	PROJECT NAME		PROJECT NO.
	STOWE BRIDGE BRP 0235		DRAWING NO.
	SCALE NTS	DATE 2/27/15	SK-3

VT108_Proposed



GROVE GMK 5275
 MAX RADIUS 90'
 MAX WEIGHT 48,000 LBS

GROVE 900E
 MAX RADIUS 55'
 MAX WEIGHT 24,800 LBS

L = 80.00 FT	L = 52.00 FT
K = 34	K = 1
HSD = 5.11 FT	HSD = 1
G1 = 2.0000%	G1 = 4.0000%
G2 = 4.3228%	G2 = 5.0000%

PVCC 5+87.50
 ELEV 717.90

PVI 6+12.89
 ELEV 719.00

BOT. PILE CAP
 ELEV 699.00

TOP OF PRECAST
 ELEV = 706.5'

TOP OF PRECAST
 ELEV. = 706.5'

BOT. PILE CAP
 ELEV 702.00

PRECAST BLOCK
 PIER FOR OUTRIGGER
 LOADING

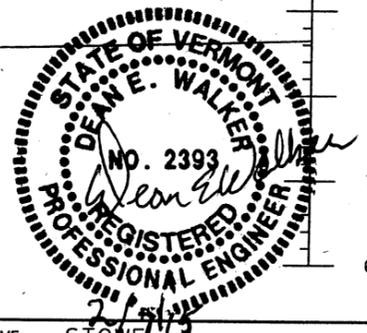
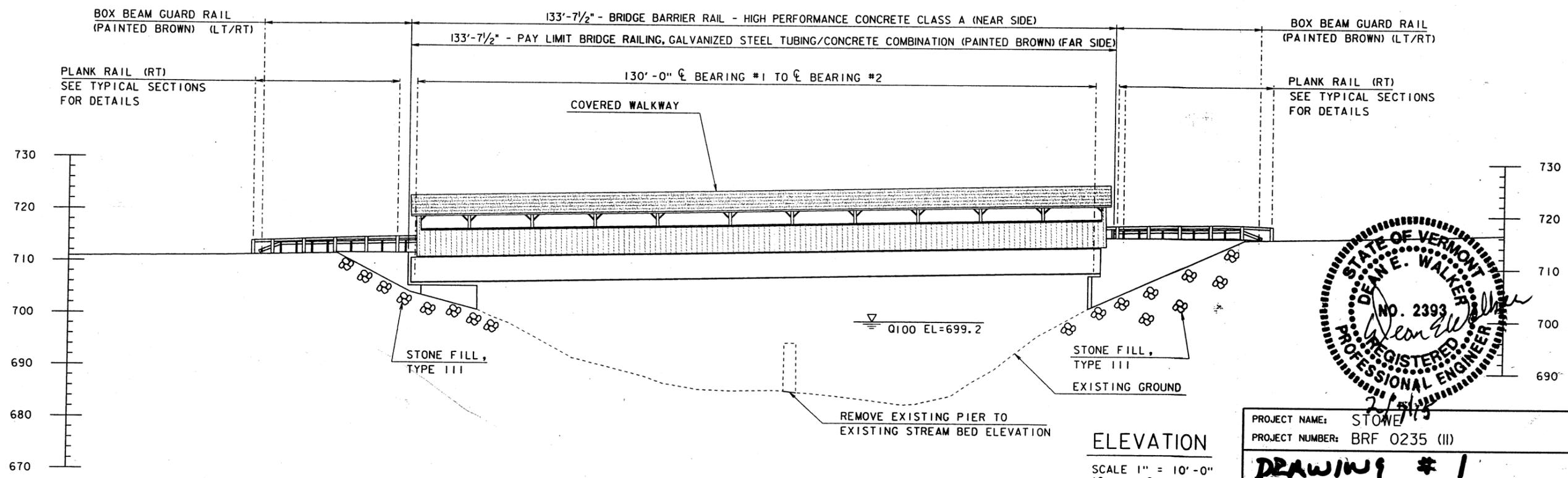
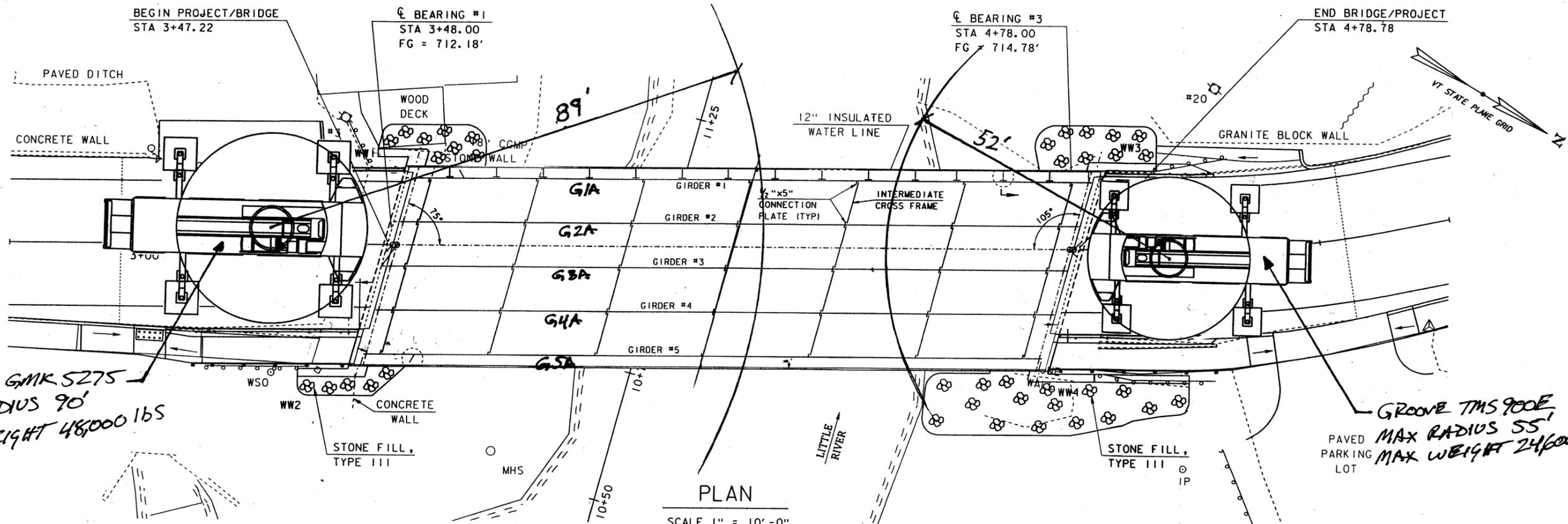
H
 IG

ABUTMENT PILES

REMOVE EXISTING

END AD

CCS CONSTRUCTORS 138 MUNSON AVE. MORRISVILLE, VT 05661 PH. 802-888-7701 FX. 802-888-4746	PROJECT NAME	PROJECT NO.
	STOWE BRIDGE BRP 0235	
	CRANE ELEVATION	DRAWING NO.
SCALE NTS	DATE 2/27/15	2



PROJECT NAME: STONE
PROJECT NUMBER: BRF 0235 (II)

DRAWING # 1
CRANE LOCATION PLAN

load charts

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

Pounds

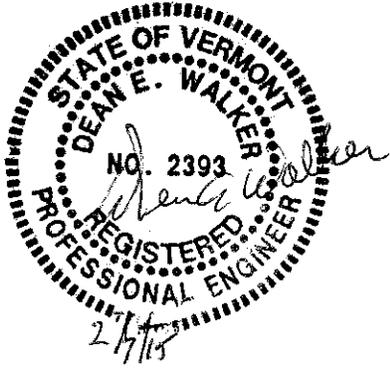
Feet	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	
8	180,000																									
10	155,000	48,000																								
15	116,000	112,000	105,000																							
20	88,000	90,000	98,000	84,000																						
25	69,900	72,200	72,400	71,150	71,000																					
30	57,000	57,000	57,000	57,100	58,000	57,000																				
35	46,800	47,500	47,400	47,400	46,200	41,600																				
40	38,700	38,700	38,600	38,450	36,200	32,600	29,400																			
45	33,500	33,500	33,500	33,500	32,600	33,600	29,400	27,000																		
50	28,500	28,500	28,200	28,200	28,400	28,600	28,600	28,800	26,800																	
55	24,200	24,200	24,200	24,200	24,600	24,600	24,600	24,800	22,800	21,200																
60	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	19,800	19,800	18,800															
65	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	16,800	16,200														
70	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	14,900	14,350												
75	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	13,750	13,350	12,950											
80	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,350	11,950	11,550	11,150										
85	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,150	10,750	10,350	9,950	9,550									
90	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,150	9,750	9,350	8,950	8,550	8,150								
95	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,350	8,950	8,550	8,150	7,750	7,350								
100	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	8,650	8,250	7,850	7,450	7,050	6,650								
105	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,050	7,650	7,250	6,850	6,450	6,050								
110	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,550	7,150	6,750	6,350	5,950	5,550								
115	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,150	6,750	6,350	5,950	5,550	5,150								
120	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	6,850	6,450	6,050	5,650	5,250	4,850								
125	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,550	6,150	5,750	5,350	4,950	4,550								
130	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,250	5,850	5,450	5,050	4,650	4,250								

* Requires special equipment

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

Pounds

Feet	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	
8	180,000																									
10	155,000	48,000																								
15	116,000	112,000	105,000																							
20	88,000	90,000	98,000	84,000																						
25	69,900	72,200	72,400	71,150	71,000																					
30	57,000	57,000	57,000	57,100	58,000	57,000																				
35	46,800	47,500	47,400	47,400	46,200	41,600																				
40	38,700	38,700	38,600	38,450	36,200	32,600	29,400																			
45	33,500	33,500	33,500	33,500	32,600	33,600	29,400	27,000																		
50	28,500	28,500	28,200	28,200	28,400	28,600	28,600	28,800	26,800																	
55	24,200	24,200	24,200	24,200	24,600	24,600	24,600	24,800	22,800	21,200																
60	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	19,800	19,800	18,800															
65	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	16,800	16,200													
70	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	15,400	14,900	14,350											
75	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	14,100	13,750	13,350	12,950										
80	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,350	11,950	11,550	11,150									
85	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,150	10,750	10,350	9,950	9,550								
90	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,150	9,750	9,350	8,950	8,550								
95	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,700	9,350	8,950	8,550	8,150	7,750								
100	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	8,650	8,250	7,850	7,450	7,050								
105	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,050	7,650	7,250	6,850	6,450								
110	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,900	7,550	7,150	6,750	6,350	5,950								
115	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,150	6,750	6,350	5,950	5,550								
120	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	6,850	6,450	6,050	5,650	5,250								
125	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,900	6,550	6,150	5,750	5,350	4,950								
130	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,600	6,250	5,850	5,450	5,050	4,650								

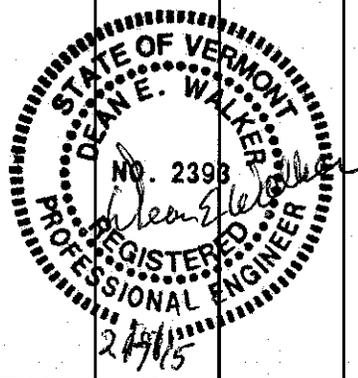


TMS900E

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

	Crane with 169 700 lbs (77 t) counterweight								
	Outrigger base - length 28.1 ft - width 26.6 ft								
	Main boom - fixed length in ft								
	117.1	117.2	118.0	119.1	132.0	132.4	133.4	134.5	
Tel. sec. I	0.00	0.00	0.00	0.50	0.00	0.00	0.50	1.00	
Tel. sec. II	0.00	0.00	0.50	0.50	0.00	0.50	0.50	0.50	
Tel. sec. III	0.00	0.50	0.50	0.50	0.00	0.50	0.50	0.50	
Tel. sec. IV	0.50	0.50	0.50	0.50	1.00	0.50	0.50	0.50	
Tel. sec. V	1.00	0.50	0.50	0.50	1.00	0.50	0.50	0.50	
Tel. sec. VI	1.00	1.00	0.50	0.00	1.00	1.00	0.50	0.00	
Slewing range	360°								
Radius in feet	Lifting capacities in 1000 lbs								
20.0	62.0	76.0	116.0	144.0	61.0	78.0	106.0	106.0	
25.0	55.0	67.0	108.0	140.0	56.0	71.0	106.0	106.0	
30.0	49.0	60.0	98.0	129.0	51.0	64.0	101.0	105.0	
35.0	43.6	55.0	90.0	118.0	46.0	58.0	94.0	96.0	
40.0	38.8	50.0	82.0	108.0	41.2	53.0	87.0	88.0	
45.0	35.6	46.0	76.0	99.0	38.0	49.0	81.0	80.0	
50.0	32.8	41.8	71.0	92.0	35.2	45.0	76.0	73.0	
55.0	30.2	38.6	66.0	85.0	32.6	42.0	72.0	67.0	
60.0	28.0	36.0	62.0	79.0	30.4	39.4	67.0	61.0	
65.0	26.2	33.8	58.0	72.0	28.6	37.0	63.0	56.0	
70.0	24.6	32.0	55.0	66.0	26.8	35.0	60.0	52.0	
75.0	22.6	30.2	51.0	61.0	25.0	33.2	57.0	48.0	
80.0	20.6	28.6	48.0	55.0	23.2	31.4	54.0	45.0	
85.0	19.4	27.2	46.0	51.0	20.8	30.0	51.0	41.0	
90.0	18.4	25.8	42.6	46.0	19.4	28.6	48.0	38.4	
95.0	17.4	24.8	40.2	42.4	18.4	27.4	44.0	36.2	
100.0	16.6	23.4	38.2	37.2	17.4	26.2	40.8	34.0	
105.0					16.4	25.2	37.6	32.0	
110.0					15.6	24.2	34.8	30.2	
115.0					14.8	23.4	30.4	28.0	
SLI Code	2200								
Max. permitted windspeed	14 m/s		11 m/s		9 m/s		12 m/s		9 m/s



Sam Davis

From: compucrane@manitowoc.com
Sent: Tuesday, February 17, 2015 10:38 AM
To: sam@ccscraneservice.com
Subject: Outrigger Pad Load Query

GMK5275 w/ Main Boom Only - English Outrigger Pad Loads

Always confirm that the lifted load and configuration are approved in the load chart.

Boom Length: 133.4 ft [50-50-50-50-50-50]

Counterweight: 169700# Cwt

Outriggers: 28.1 x 26.6

Load Radius: 90 ft

Load Weight: 45600 lbs

Slew Angle: 0° = Directly Over Rear

17960 lbs Fwd-Lt

17960 lbs Fwd-Rt

153545 lbs Aft-Lt

153545 lbs Aft-Rt

Slew Angle: 45° = Over Rear Left Outrigger

66475 lbs Fwd-Lt

4285 lbs Fwd-Rt

193875 lbs Aft-Lt

78560 lbs Aft-Rt

Slew Angle: 90° = Directly Over Left Side

126150 lbs Fwd-Lt

28665 lbs Fwd-Rt

170920 lbs Aft-Lt

17365 lbs Aft-Rt

Slew Angle: 135° = Over Front Left Outrigger

161270 lbs Fwd-Lt

77700 lbs Fwd-Rt

99085 lbs Aft-Lt

5145 lbs Aft-Rt

Slew Angle: 180° = Directly Over Front

136860 lbs Fwd-Lt

136860 lbs Fwd-Rt

34645 lbs Aft-Lt

34645 lbs Aft-Rt

Slew Angle: 225° = Over Front Right Outrigger

77700 lbs Fwd-Lt

161270 lbs Fwd-Rt

5145 lbs Aft-Lt

99085 lbs Aft-Rt

Slew Angle: 270° = Directly Over Right Side

28665 lbs Fwd-Lt

126150 lbs Fwd-Rt

17365 lbs Aft-Lt

170920 lbs Aft-Rt

Slew Angle: 315° = Over Rear Right Outrigger

4285 lbs Fwd-Lt

66475 lbs Fwd-Rt

78560 lbs Aft-Lt

193875 lbs Aft-Rt

Maximum Outrigger Pad Loads

161270 lbs Fwd-Lt

161270 lbs Fwd-Rt

193875 lbs Aft-Lt

193875 lbs Aft-Rt

Compu-Crane Support

Manitowoc Cranes – Shady Grove

T 1.800.348.0620

Integrity, Commitment to Stakeholders, and Passion for Excellence.