Vermont Agency of Transportation
Reviewed by:
Date: JUN 15 2016
☐ CONFORMING
☐ CONFORMING AS NOTED
☒ NON-CONFORMING - RESUBMIT

J. A. McDONALD, INC.
P.O. Box 132, Lyndon Center, VT 05850 (802) 626-5201
E-Mail jamcdonaldinc@charter.net

CLARENDON BRO 1443(48)
BRIDGE #11
ERECTION PLAN
General Requirements and Sequence

Digitally signed by Andy White
Date: 2016.06.07 08:17:01 -04'00'

The erection shall not be performed during windy or heavy rain conditions. A Liebherr LTM1220-5.2, 220 Ton Hydraulic Crane outfitted with 163,100 lbs of counterweights and a Grove GMK5275 275 Ton Hydraulic Crane outfitted with 112,400 lbs of counterweights will be used for the erection of precast bridge abutments and NEXT Beams components. Approach slabs will be set by JA McDonald and a Link-Belt RTC 8050 50 Ton Hydraulic Crane. Cranes are to be positioned as shown in the attached sketches SK-1.0, 2.0, 3.0, & 4.0. Prior to crane mobilization, JA McDonald will meet with property owners to coordinate and ensure owner access as noted in the approved Traffic Control Plan.

The Liebherr will be set-up on the north side of the bridge behind proposed abutment #2 and set abutment designated in JP Carrara's shop drawings as C-AB2 (Reference Sketch SK-2.0) . The Grove will set-up on the south side behind proposed abutment #1 and set abutment designated in JP Carrara's shop drawing as C-AB1(Reference Sketch SK-1.0). Both cranes will be used to set the three NEXT beams designated as C-NB1, C-NB2 and C-NB3. The Liebherr will pick the NEXT beams off the transport trailer and set the beam on a preassembled XPS-60 shoring tower (as shown on Sketch 3.0).

The shoring tower will be installed following stream bed reconstruction, behind the Phase II Temporary Stream Relocation Barrier (refer to Temporary Stream Relocation Plan) Both cranes will then pick and set the NEXT beam onto the abutments in their final position (Reference Sketch SK-3.0).

Precast bridge abutment C-AB2, NEXT Beams C-NB1 thru C-NB3 will be delivered to the north side of Bridge 11. Precast bridge abutment C-AB1 will be delivered to the south side of Bridge 11. Approach slabs will be delivered to their respective side Reference for information and component designation is made from Carrara's precast shop drawings of the bridge abutments, Next Beams and approach slabs. The maximum permissible crane radius for unloading and setting the precast bridge components shown shall not be exceeded.

The precast bridge components shall be picked and installed according to the manufacturer's requirements and project specifications. Each prestressed NEXT beam and approach slabs is to be picked from 4 locations as shown on the manufacture's shop drawings.

Prestressed NEXT beams shall be delivered to the north side of the bridge. Trailers will be backed into position adjacent to the Liebherr LTM1220-5.2 Crane. Rigging will be attached to the NEXT Beam prior to removal of the rigging securing the beam to the trailer. The crane will then pick the beam off the trailer allowing the tractor/trailer to pull away. The crane will swing and set the NEXT Beam on the preassembled XPS-60 shoring tower (as shown on Sketch SK-3.0, Station ± 11+75 Left) and wood cribbing behind abutment #2(Station ± 12+44 Left). The temporary shoring tower and cribbing noted will be located such that the bearing points of the NEXT Beams are consistent with the lifting loops. Both cranes will pick and set the beam in its final position. This sequence will be repeated beginning with C-NB3, then C-NB2 and finishing with C-NB1.

Reference attached sheets for component sequence, weights and permissible crane radius.

Attached Shoring Tower analysis by AH Harris.
It is attached for convenience only; the shoring tower calculations are by others.

CCS CONSTRUCTORS, INC.

STATE OF VERMONT ANDREW D. WHITE NO. 9030 STRUCTURAL LICENSED PROFESSIONAL ENGINEER

General:
1. Show overhead utilities on plan sheets
2. Specify requirements for outrigger supports
3. Specify rigging for approach slabs

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CLARENDON BRO 1443(48)
ERECTION PLAN

STATE OF VERMONT ANDREW D. WHITE NO. 9030 STRUCTURAL LICENSED PROFESSIONAL ENGINEER

Erection Sequence for Bridge #11
Reference JP Carrara's Shop Drawings for "Mark" Designation

ABUTMENT #1 Grove GMK5275 Reference Sketche SK-1.0

Mark	Description	Weight (Tons)	Crane Radius (Feet)	
C-AB1	Abutment #1	57.71	35	104.2' boom, capacity= 124.0 kips

ABUTMENT #2 Liebherr LTM 1220-5.2 Reference Sketch SK-2.0

Mark	Description	Weight (Tons)	Crane Radius (Feet)	
C-AB2	Abutment #2	59.32	40	86' boom, capacity= 125.3 kips

PRESTRESSED NEXT BEAMS Reference Sketch SK-3.0

		Weight(TN)/Radius(FT)				
		Liebherr LTM1220-5.2			Grove GMK5275	
Mark	Description	Initial	Tower 4	Final	Final	
C-NB3	East Fascia Beam	59.42/40	59.42/40	29.71/40	29.71/50	see SK3.1
C-NB2	Interior Beam	59.42/40	59.42/40	29.71/40	29.71/50	for crane usage
C-NB1	West Fascia Beam	59.42/40	59.42/40	29.71/40	29.71/50	

APPROACH SLABS Abutment #1 LinkBelt RTC8050 Reference Sketch SK-4.0

Mark	Description	Weight (Tons)	Crane Radius (Feet)	
C-AS1	Approach Slab	6.45	40	80' boom, capacity= 21.5 kips
C-AS2	Approach Slab	6.45	40	
C-AS3	Approach Slab	6.45	40	
C-AS4	Approach Slab	6.45	40	

APPROACH SLABS Abutment #2 LinkBelt RTC8050 Reference Sketch SK-4.0

Mark	Description	Weight (Tons)	Crane Radius (Feet)
C-AS1	Approach Slab	6.45	40
C-AS2	Approach Slab	6.45	40
C-AS3	Approach Slab	6.45	40
C-AS4	Approach Slab	6.45	40

Per Contract Plans General Note 43 on Sheet 3/59, backfill shall be limited to a height of 3' below the bridge seat during erection of the NEXT beams. This needs to be clear in this plan.

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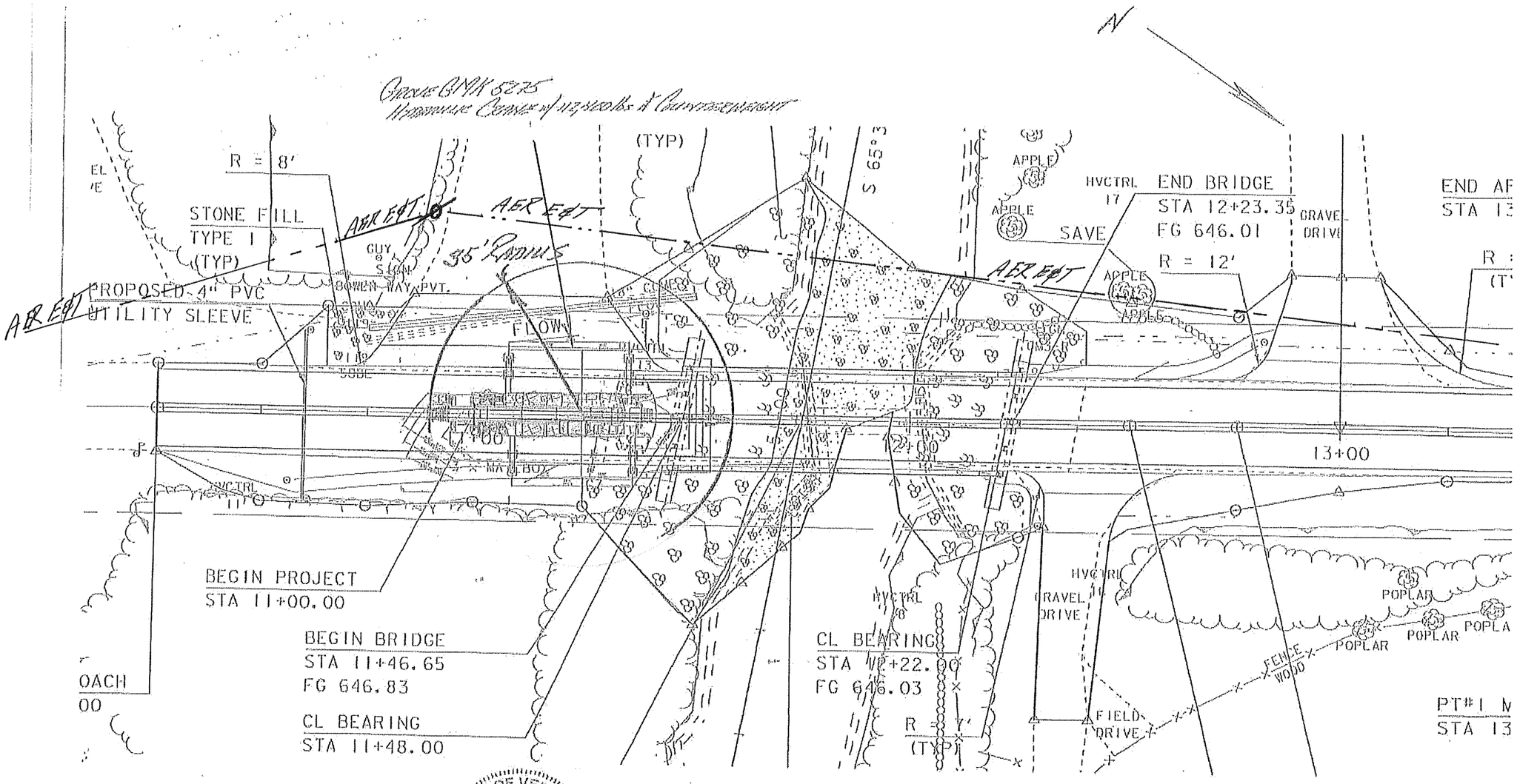

STATE OF VERMONT
ANDREW D. WHITE
NO. 9030
STRUCTURAL
LICENSED
PROFESSIONAL ENGINEER

SCALE 1" = 20'

CLARENDON BRO 1443(48) ERECTION PLAN ABUTMENT #1 SK-1.0

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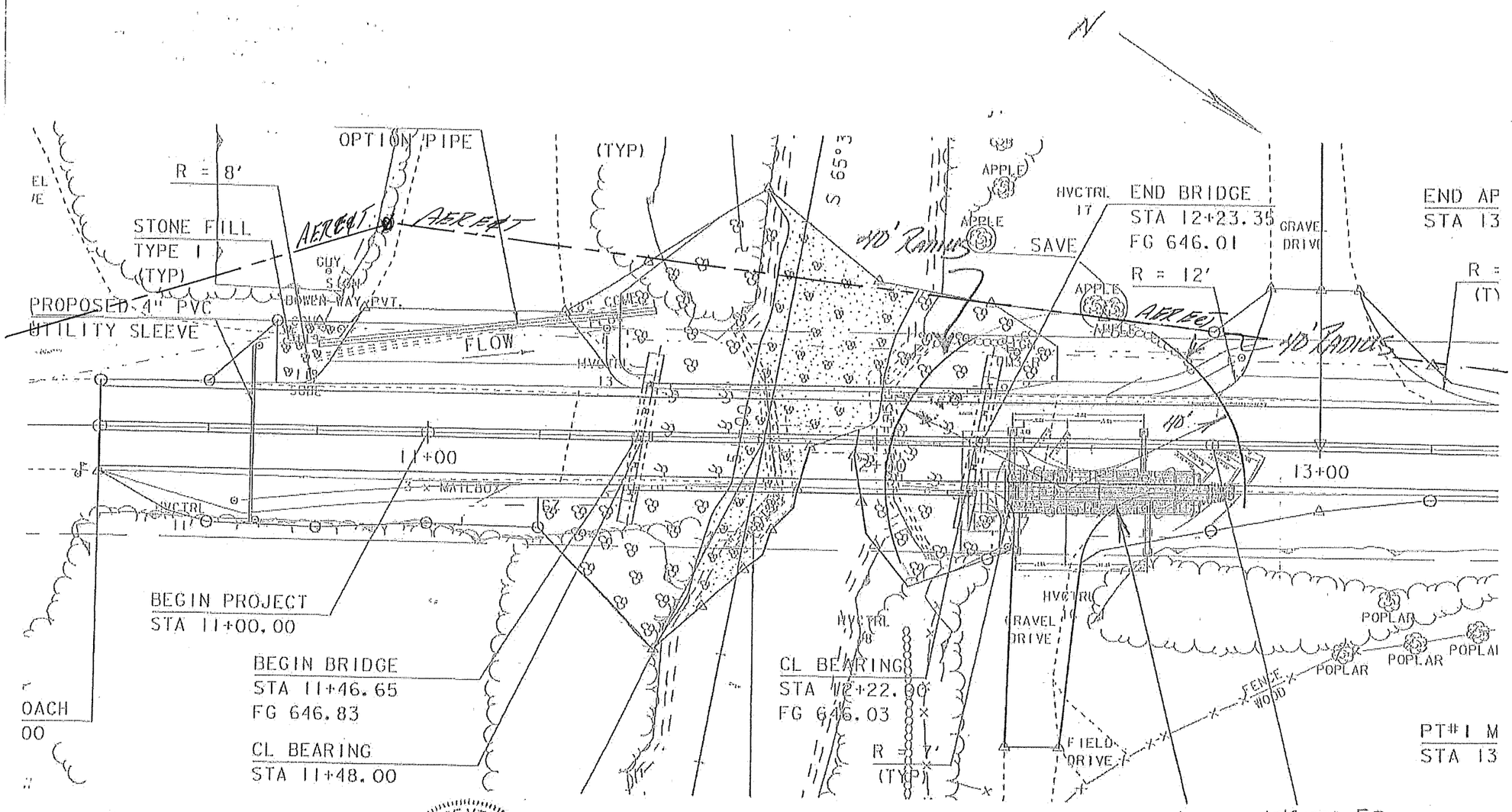
REV 1.0 – SHOW OVERHEAD UTILITIES



STATE OF VERMONT
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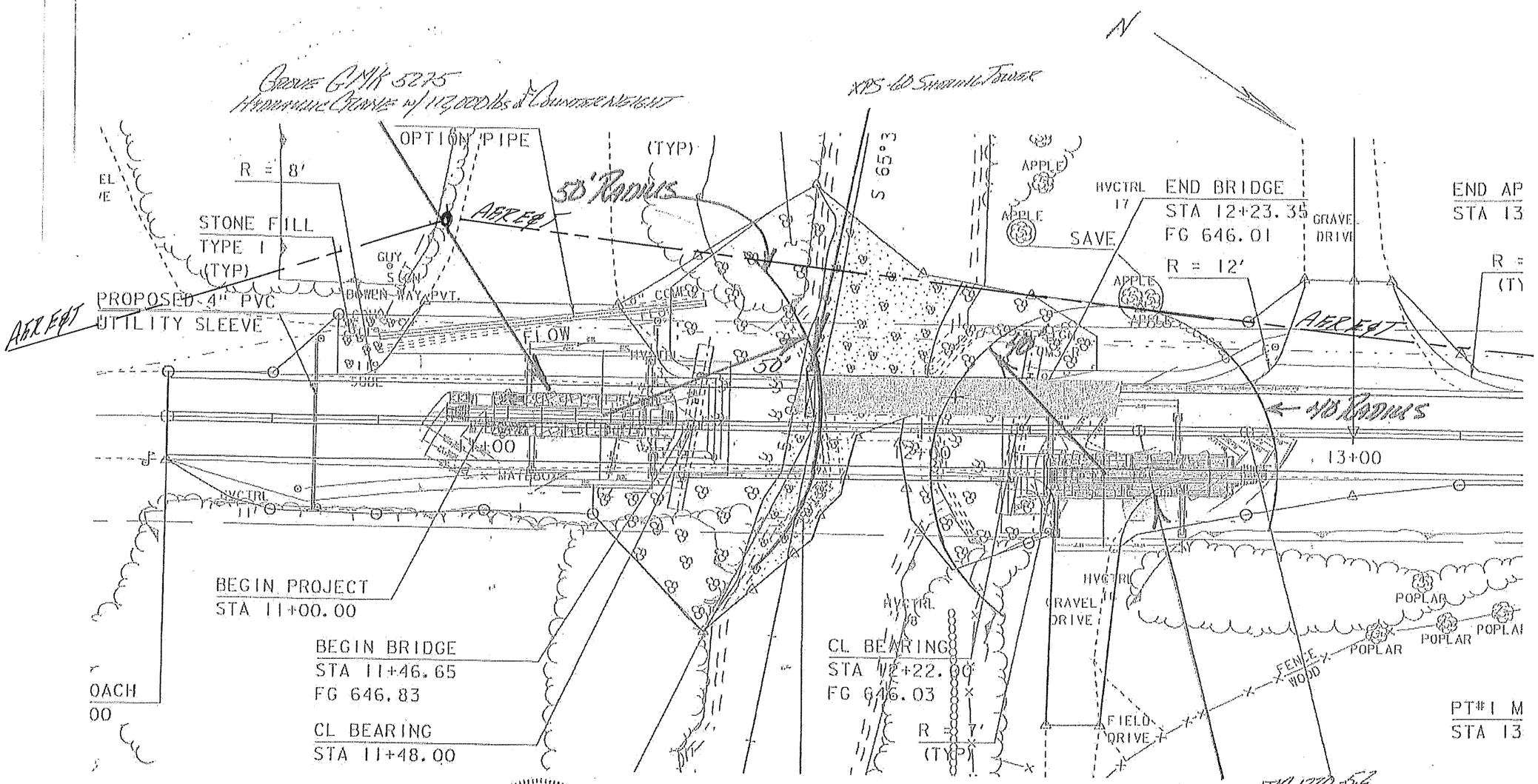

STATE OF VERMONT
ANDREW D. WHITE
NO. 9030
STRUCTURAL
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Scale 1" = 20'

Clarendon BRO 1443(48) Erection Plan Next Beams

SK 3.0

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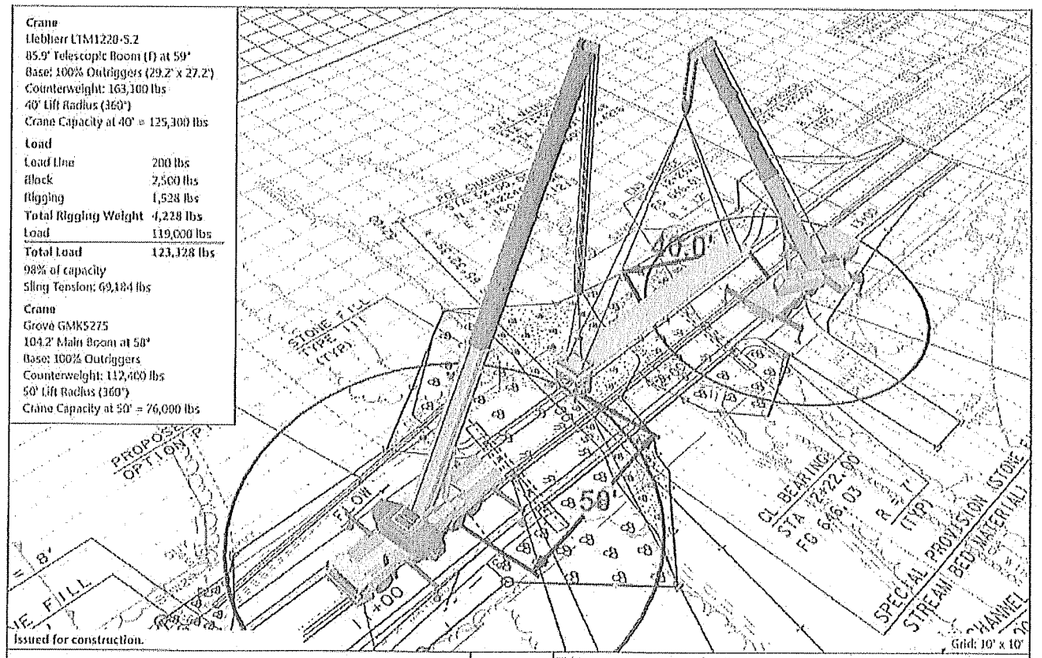
Rev 1.0 Show Overhead Utilities



Issued for construction.

SK3.1

Title	Lift Plan
Project	Clarendon
Customer	JAM
Description	Next Beams
Drawn By	Sam Davis 06/06/2016

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

SHEETH SK3.1

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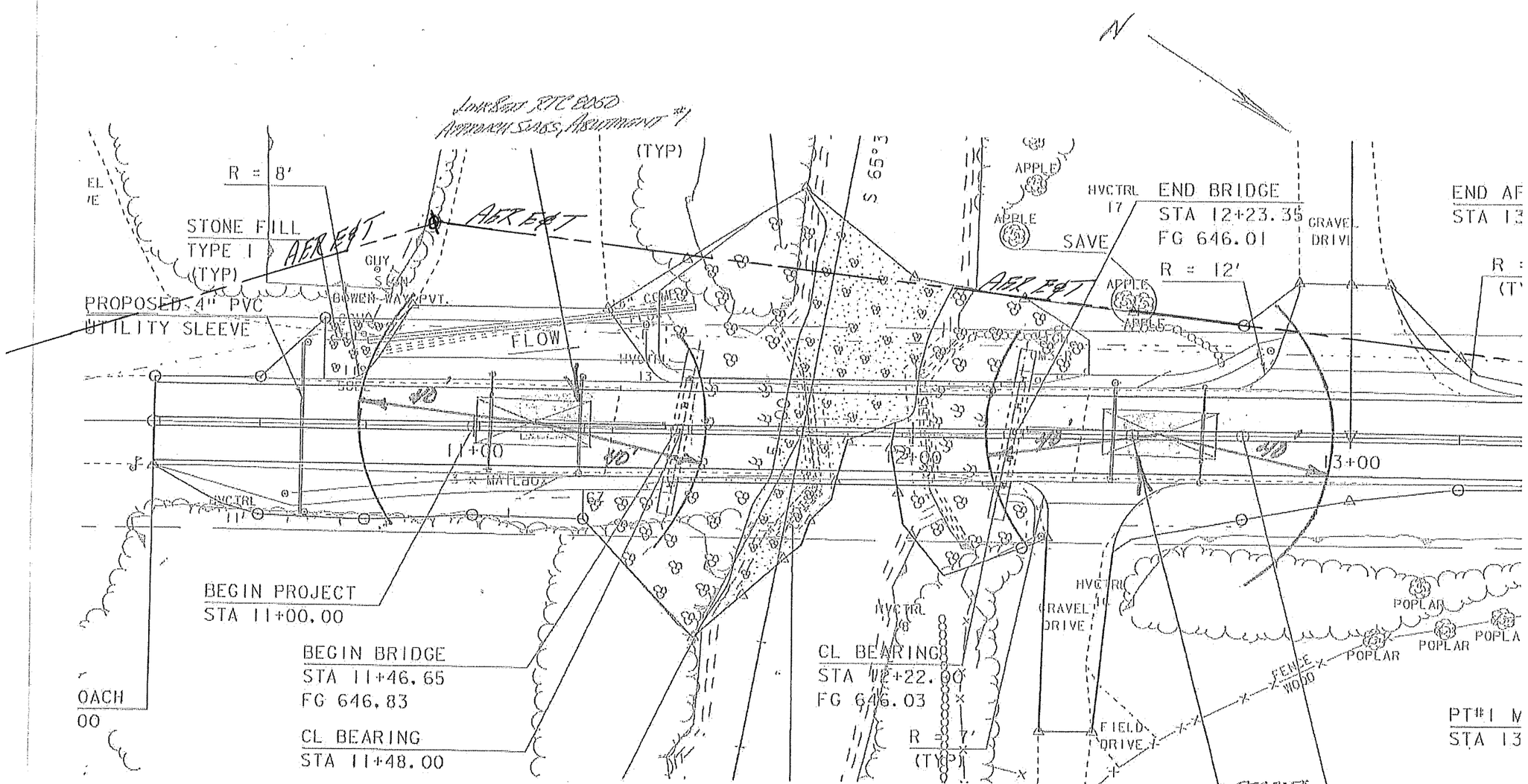
STATE OF VERMONT
REGISTERED
NO. 9030
STRUCTURAL
LICENSED
PROFESSIONAL ENGINEER

http://www.3dliftplan.com/Print/LiftPlan.aspx

6/6/



STATE OF VERMONT
ANDREW D. WHITE
NO. 9030
STRUCTURAL
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PROFESSIONAL ENGINEER

SCALE 1" = 20'

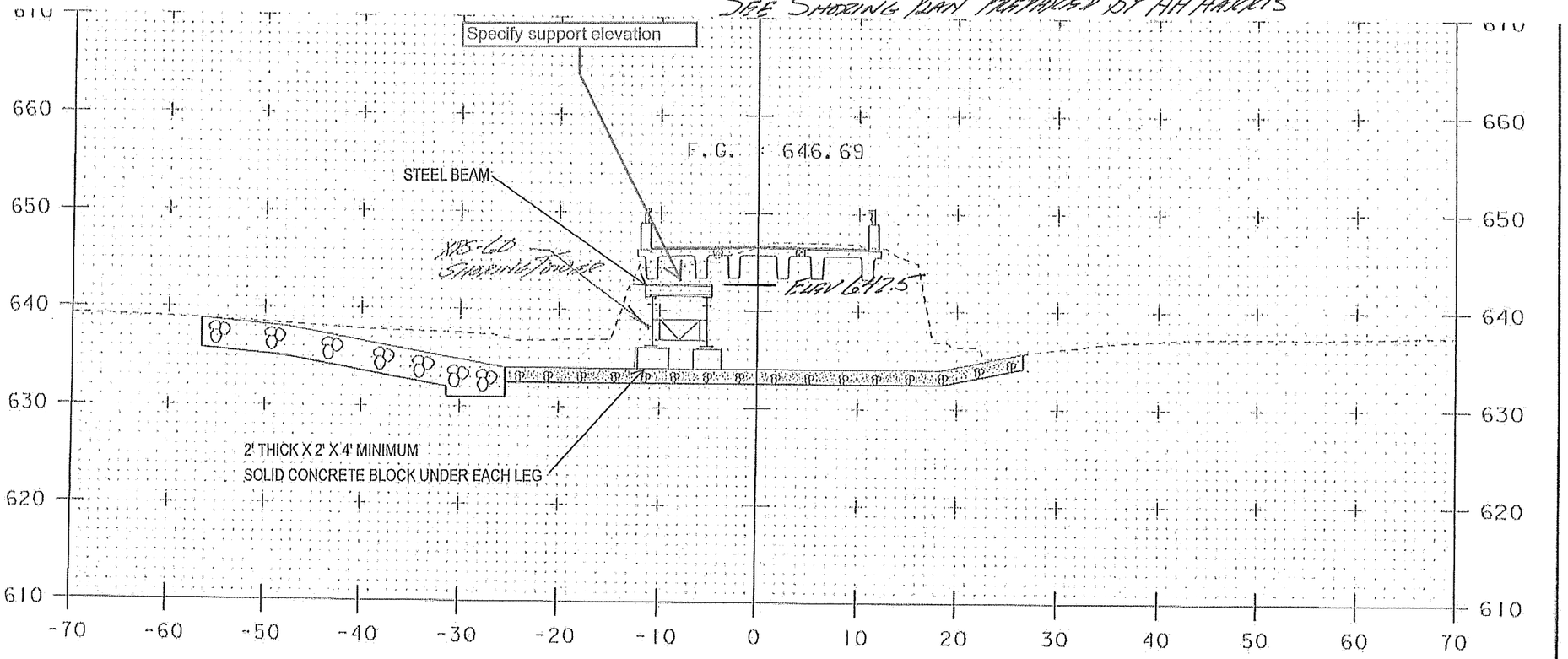
CLARENDON BRO 1443(48) ERECTION PLAN APPROACH SLABS

SK-4.0

CCS CONSTRUCTORS, INC.

REV 1.0 SHOW OVERHEAD UTILITIES

SEE SHORING PLAN PREPARED BY AH HARRIS



NOTE: FOUR SHORING TOWER FOUNDATION BLOCKS SHALL BE LEVEL
AND SHORING TOWER SHALL BE PLUMB FOR SUPPORTING NEXT BEAM WEIGHT.

11+75

STATE OF VERMONT
ANDREW B. WHITE
NO. 9030
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PROFESSIONAL ENGINEER

SK-5

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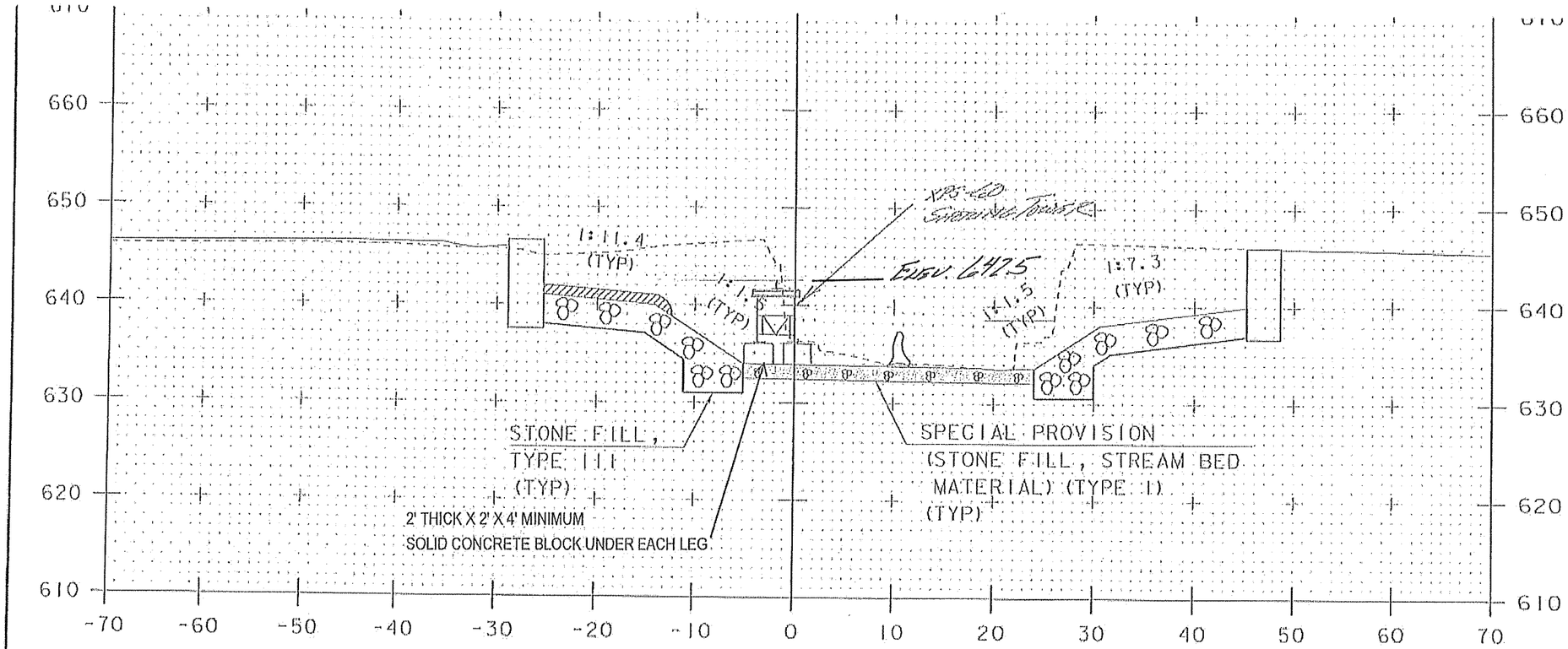
REV 1.8 SHORING SUPPORT ELEV.



NOTE: FOUR SHORING TOWER FOUNDATION BLOCKS SHALL BE LEVEL
AND SHORING TOWER SHALL BE PLUMB FOR SUPPORTING NEXT BEAM WEIGHT.

51+10

STATE OF VERMONT
ANDREW D. WHITE
NO. 9030
STRUCTURAL
LICENSED
PROFESSIONAL ENGINEER

SK-6

CCS CONSTRUCTORS, INC.

Rev 1.0. Specify Support Elev

Abutment General Note #5 on Sheet C1 of the approved fabrication drawings states that vertical forces are to be applied to the lifting loops. The fabricator's lifting loop design for the abutments does not appear to account for horizontal lifting forces. If sling angles less than 90 degrees to the horizontal are required, provide documentation from the fabricator that this is acceptable with supporting design calculations stamped by a PE if necessary.

Rigging List

Project Clarendon
Customer JAM
Description Abutments

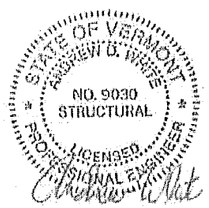
Grove GMK5275

104.2' Main Boom at 67.4°
Base: 100% Outriggers
Counterweight: 142,400 lbs
35' Lift Radius (360°)
Crane Capacity at 35' = 124,000 lbs

Item	Capacity	Weight	Qty	Total Weight
Hoist Line		200 lbs	1	200 lbs
Block		2,500 lbs	1	2,500 lbs
Hook			1	
Tuffy Flexi-Grip 40' Black V-90000#	45 t	194 lbs	2	387 lbs
Crosby Shackle G-209 2"	35 t	45 lbs	2	90 lbs
Total Rigging Weight				3,177 lbs
Load				115,400 lbs
Total Load				118,577 lbs

96% of capacity

The abutments have 4 lifting loops but only two straps and shackles are specified in the rigging lists. Provide more information on how the abutments are rigged.



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Rigging List

Project Clarendon
Customer JAM
Description Abutments

Liebherr LTM 1220-5.2

85.9' Telescopic Boom (T) at 59°
Base: 100% Outriggers (29.2' x 27.2')
Counterweight: 163,100 lbs
40' Lift Radius (360°)
Crane Capacity at 40' = 125,300 lbs

Item	Capacity	Weight	Qty	Total Weight
Hoist Line		200 lbs	1	200 lbs
Block		2,500 lbs	1	2,500 lbs
Hook			1	
Tuffy Flexi-Grip 40' Black V-90000#	45 t	194 lbs	2	387 lbs
Crosby Shackle G-209 2"	35 t	45 lbs	2	90 lbs
Total Rigging Weight				3,177 lbs
Load				118,640 lbs
Total Load				121,817 lbs

97% of capacity

CCS CONSTRUCTORS, INC.

Rigging List

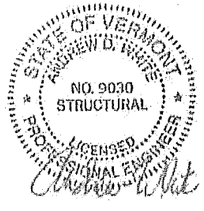
Project Clarendon
Customer JAM Description Next Beams

Liebherr LTM 1220-5.2

85.9' Telescopic Boom (1) at 59°Base: 100%
Outriggers (29.2' x 27.2') Counterweight: 163,100 lbs
40' Lift Radius (360°)
Crane Capacity at 40' = 125,300 lbs

Item	Capacity	Weight	Qty	Total Weight
Hoist Line		200 lbs	1	200 lbs
Block		2,500 lbs	1	2,500 lbs
Tuffy Flexi-Grip 40' Black V-53000#	26.5 t	118 lbs	4	471 lbs
Crosby Shackle G-209 2"	35 t	45 lbs	4	180 lbs
Crosby Link A-342 1-3/4"	42.45 t	25 lbs	4	101 lbs
Crosby Shackle G-209 2"	35 t	45 lbs	4	180 lbs
1.5" x 25' Steel Chokers	74t	104	4	416
Crosby Shackle G-209 2"	35T	45	4	180
Total Rigging Weight				**4,228 lbs**
Load				119,000 lbs
Total Load				123,328 lbs

99% of capacity



CCS CONSTRUCTORS, INC.

Rigging List

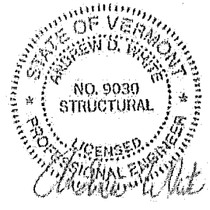
Project Clarendon
Customer JAM
Description Next Beams

Grove GMK5275

119.1' Main Boom at 62.7°
Base: 100% Outriggers
Counterweight: 112,000 lbs
42' Lift Radius (360°)
Crane Capacity at 42' = 88,000 lbs

Item	Capacity	Weight	Qty	Total Weight
Hoist Line		200 lbs	1	200 lbs
Block		2,500 lbs	1	2,500 lbs
Hook			1	
Tuffy Flexi-Grip 20' Black V-53000#	26.5 t	59 lbs	2	118 lbs
Crosby Shackle G-209 1-3/4"	25 t	28 lbs	2	56 lbs
Total Rigging Weight				**2,874 lbs**
Load				59,500 lbs
Total Load				**62,374 lbs**

89% of capacity



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GMK5275 with 112,000 lb counterweights

load charts

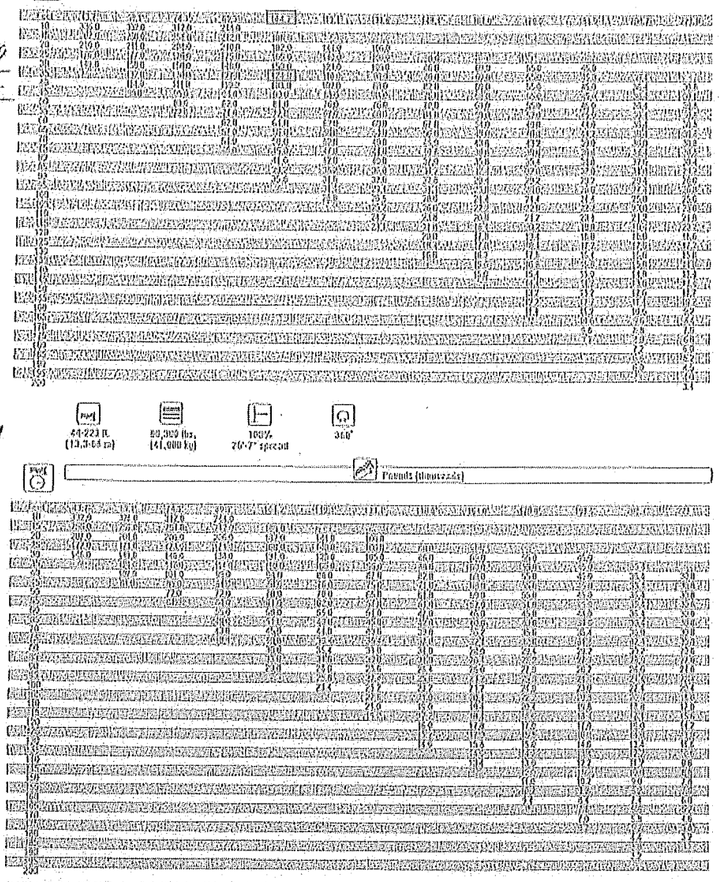
Assumment #1 Mark C-A81
Next Exams Mark C-A83, C-A82, C-A81

44-223 ft. (13.3-68 m) | 112,308 lbs. (51,000 kg) | 100% 26'-7" spread | 360°

Pounds (thousands)

104.2' boom,
capacity= 124.0 kips

Assumment #2
Next Exams



44-223 ft. (13.3-68 m) | 80,909 lbs. (41,000 kg) | 100% 26'-7" spread | 360°

Pounds (thousands)

GMK5275

Loads greater than 227,000 lb. can only be lifted with outriggers repositioned
Loads greater than 335,000 lb. can only be lifted with special equipment

GROVE

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.

Lifting capacities
Forces de levage

Assessment #2 LTM 1220-5.2

T

86' boom,
capacity= 125.3 kips

LICCON2

85%

A	12'	16'	20'	24'	28'	32'	36'	40'	44'	48'	52'	56'	60'	64'	68'	A
10	533.5	285.4	295.4	295.4												10
11	332.0	285.4	295.4	296.4												11
12	310	285.4	295.4	295.4	288.4											12
13	322	285.4	295.4	294	283.3											13
14	302	285.4	288.2	282.5	278.1											14
15	283.8	282.0	271.9	265.0	263.3											15
16	268.3	268.3	258.4	251.9	247.9	246.5										16
17	256	256	246.1	242.0	237.8	230.5										17
18	246.3	246.3	239.0	233.4	227.9	221.0										18
19	237.3	237.3	231.2	224.8	219.3	214.1	199									19
20	229.0	229.3	222.0	216.9	211.0	207.2	194.3									20
22	215.1	214.0	208.6	203	197.6	193	187.0	180.7								22
24	198.7	198.7	195.0	190.4	185.3	183.7	177.9	170.6								24
26	185.6	185.6	184.1	179.3	176.0	172.0	166.2	161.1	110.8							26
28	172.5	172.5	173.0	169.4	166.7	163.2	159.4	152.9	109.1							28
30	159.6	159.6	164	160.5	158.4	154.7	150.9	144.3	107.3	80.4						30
32	149.9	149.4	155.2	152.9	150.9	147.1	143.1	119.6	104.3	80.0						32
34	120.0	120.0	146.9	144.9	143.4	139.0	136.2	116.3	100.9	97	72.5					34
36	101.1	101.1	139.0	138.1	136.9	133.5	129.9	110.8	97.0	94.0	71.6					36
38			131.4	131.7	130.9	127.6	124.2	106.3	94.0	82.0	70.2					38
40			123.6	125.7	125.3	122.1	118.7	102	92.3	80.6	69.0	58.6				40
45			104.9	112.2	112.9	110.2	107.1	92.7	89	75.4	66	55.8	47.2			45
50			70.0	99.7	101.0	100.1	97.0	84.3	79.6	70.0	61.3	53	45.2			50
55				88.9	90.2	90	87.6	77.3	73.7	66.2	57.8	50.5	43.1	36		55
60				74	80	78.9	77.4	71.2	68.3	62	54.6	47.9	41.6	35		60
65					71.6	70.9	69.1	66.9	63.3	58.1	51.7	45.5	39.5	33		65
70					64.8	63.9	62.2	61.2	59	55	49	43.3	37.4	31		70
75					54.7	57.9	56.4	56	55	51.2	46.5	41.1	35.7	29		75
80						52.9	53.4	52.9	51.4	48.2	44.2	39.1	34	28		80
85						48.6	50.1	48.6	47.1	45.5	42.1	37.3	32.4	27		85
90						44.2	46.7	44.7	43.2	43.5	40.1	35.6	30.9	26		90
95							42.9	41.2	40.4	40.6	38.1	34	29.5	25		95
100							39.2	38.1	38	37.4	36.3	32.5	28.3	24		100
105							36.5	35.3	36.1	34.6	34.2	31.1	27.1	23		105
110								32.6	33.5	32.1	32.2	29.8	25.9	22		110
115								30.9	31.2	30.5	30	28.6	24.8	21		115
120								22.2	29.1	28.9	27.8	27.3	23.8	20		120
125									27.2	27	25.8	25.5	22.9	19		125
130									24.3	25.3	24.2	23.7	22	18		130
135									19.1	23.8	23.1	22.1	21.1	17		135
140										22.3	21.8	20.6	20.2	16		140
145										19	20.3	19.1	19.2	15		145
150											19.1	17.8	18.1	14		150
155											17.9	16.7	16.8	13		155
160											16	15.6	15.7	12		160
165												14.5	14.7	11		165
170												13.2	13.7	10		170
175												9.1	12.7	9		175
180													11.8	8		180
185													9.5	7		185

Main Boom Lift Capacity Charts - Imperial

RADIUS (Centerline of Rotation to Centerline of Load)	Boom Length (ft)										
	10	15	20	25	30	35	40	45	50	55	60
10	100,000	78,400	72,600								10
12	77,800	73,100	65,900	60,600	57,300						
15	63,200	63,000	57,500	46,000	37,800	35,400					15
20	50,300	50,100	47,650	39,200	37,200	34,400	32,600				
25	39,000	38,900	38,500	37,900	37,900	34,200	28,200	24,000	19,500		25
30	31,000	31,000	31,000	31,000	31,000	30,600	27,500	23,500	19,500		30
35			26,100	26,500	26,700	26,500	22,000	19,900	16,300		35
40			20,800	21,200	21,300	21,500	17,400	17,400	16,200		40
45				17,100	17,300	17,400	17,500	15,500	14,600		45
50				13,900	14,200	14,300	14,400	13,100	13,200		50
55					11,900	12,100	12,200	12,200	12,100		55
60					10,000	10,200	10,300	10,300	10,000		60
65						8,600	8,700	8,800	8,800		65
70						7,300	7,500	7,600	7,600		70
75							6,400	6,500	6,500		75
80							5,400	5,500	5,600		80
85								4,700	4,800		85
90								4,000	4,100		90
95									3,500		95
100									2,900		100

80' boom,
capacity= 21.5 kips

Insert RC 8650 Approach Sheet

This information is not for crane operation. Operator must refer to the in- cab information for crane operation. Rated lifting capacities shown on fully extended outriggers do not exceed 85% of the tipping loads and on tires do not exceed 75% of the tipping loads.

CHAIN SLING CAPACITIES (LBS.) - CHAIN GR-8 - ASME B30.9 DESIGN FACTOR 4/1

CHAIN SIZE (IN.)						Crosby OR ALLOY	
CHAIN GR - 8 DESIGN FACTOR 4/1 (4 - (GR8))	VERTICAL (SINGLE LEG)	TWO LEG OR BASKET HITCH	60 DEGREE SLING ANGLE	45 DEGREE SLING ANGLE	30 DEGREE SLING ANGLE	SINGLE LEG MASTER LINK SIZE (IN.)	DOUBLE LEG MASTER LINK SIZE (IN.)
1/4	3600	7200	6250	5100	3550	1/2	1/2
3/8	7100	14200	12300	10000	7100	3/4	3/4
1/2	12000	24000	20750	16950	12000	7/8	1
5/8	18100	36200	31350	25600	18100	1	1-1/4
3/4	24300	54600	49050	40000	28300	1-1/4	1-1/2
7/8	34200	68400	59200	48350	34200	1-1/2	1-3/4
1	47200	95400	82600	67450	47150	---	---
1-1/4	72300	144600	125200	102200	72300	---	---

HORIZONTAL ANGLE	CAPACITY % OF SINGLE LEG
90	200%
60	173%
45	141%
30	100%

A CHAIN GRAB HOOK APPLICATION WILL RESULT IN A 30% REDUCTION OF CHAIN CAPACITY OF A SINGLE LEG. THE HORIZONTAL ANGLE MUST BE GREATER THAN 30 DEGREES.

TRIPLE LEG SLINGS HAVE 50% MORE CAPACITY THAN DOUBLE LEG ONLY IF THE CENTER OF GRAVITY IS IN CENTER OF CONNECTION POINT AND LEGS ARE ADJUSTED PROPERLY (EQUAL SHARE OF THE LOAD).

QUAD LEG SLINGS OFFER IMPROVED STABILITY BUT DO NOT PROVIDE INCREASED LIFTING CAPACITY.

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 (Tons)	Stock No. G-209	Stock No. S-209	Weight Each (lbs.)	Dimensions (in.) A	B	C	D	E	F	G	H	J	M	P	Tolerance ± C	A
3/16	1/2	1018357	–	.09	.38	.25	.03	.19	.50	.06	.88	1.47	.16	1.11	.19	.06	.01
1/4	1/2	1018375	1018364	.19	.47	.31	.13	.25	.78	.81	1.23	1.91	.19	1.43	.25	.06	.01
5/16	3/4	1018393	1018382	.19	.53	.39	1.22	.31	.91	.75	1.47	2.29	.22	1.71	.31	.06	.09
3/8	1	1018419	1018438	.31	.66	.44	1.41	.38	1.03	.91	1.78	2.49	.25	2.02	.38	.13	.03
7/16	1-1/2	1018437	1018456	.38	.75	.59	1.03	.41	1.19	1.06	2.03	2.91	.31	2.37	.44	.13	.09
1/2	2	1018455	1018491	.72	.91	.63	1.69	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.09
5/8	3-1/2	1018473	1018482	1.37	1.06	.78	2.34	.63	1.63	1.59	2.94	4.19	.44	3.34	.69	.13	.09
3/4	4-3/4	1018491	1018507	2.35	1.25	.88	2.81	.75	2.00	1.81	3.59	4.97	.50	3.97	.81	.25	.09
7/8	6-1/2	1018510	1018525	3.62	1.44	1.09	3.31	.88	2.25	2.09	4.03	5.63	.75	4.50	.97	.25	.09
1	8-1/2	1018531	1018543	5.00	1.69	1.13	3.75	1.00	2.69	2.38	4.69	6.50	.56	5.13	1.06	.25	.09
1-1/8	9-1/2	1018552	1018561	7.41	1.81	1.25	4.28	1.13	2.81	2.63	5.16	7.47	.63	5.71	1.25	.25	.09
1-1/4	12	1018570	1018589	9.50	2.03	1.38	4.69	1.25	3.22	3.00	5.75	8.25	.69	6.25	1.38	.25	.09
1-3/8	13-1/2	1018598	1018605	13.65	2.25	1.50	5.25	1.42	3.63	3.31	6.56	9.19	.75	6.81	1.50	.25	.13
1-1/2	17	1018611	1018623	17.20	2.38	1.63	5.75	1.54	4.03	3.63	6.63	10.00	.81	7.50	1.62	.25	.13
1-3/4	25	1018632	1018641	27.00	2.69	2.00	7.00	1.81	5.00	4.19	8.63	12.31	.69	9.69	2.25	.25	.13
2	33	1018650	1018669	45.00	3.25	2.25	7.75	2.00	5.75	4.81	9.97	13.69	.72	10.35	2.46	.25	.13
2-1/2	55	1018678	1018697	85.75	4.13	2.78	10.50	2.71	7.25	5.69	12.97	17.81	.88	13.69	3.19	.28	.25

Kane Engineering, Inc.
34 Twin Maple Road
Bolton , Ma 01740
Tele No 978-634-1054

CLIENT: J A McDonald
PROJECT: Clarendon VT

JOB NO.	SUBJECT	DATE	BY	CHECKE
16-117	Support of existing girder	5/23/2016	MWK	

SUMMARY

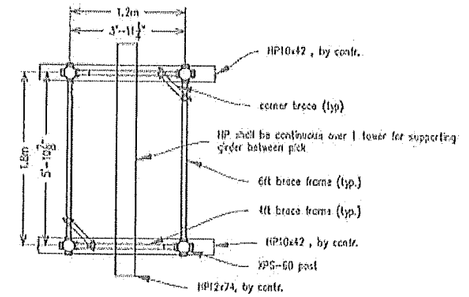
Bearing Beam	HP	12 x 74		
Load	P_1 =	59.42 kip		
Span	L =	6.0 ft		
Grade	F_y =	36 ksi		
Bending	F_b =	23.76 ksi	.66 F y	
Moment	M =	89.13 ft-kip	= $P_1 L_b$ / 4	
Sx actual	S_x =	93.8 in³		
Sx req'd	$S_{x req}$ =	45.02 in³	= (M · 12) / F_b	OK
Shear allow	F_v =	11.88 ksi	= 0.33F_y	
Shear actual	f_v =	4.53 ksi		OK

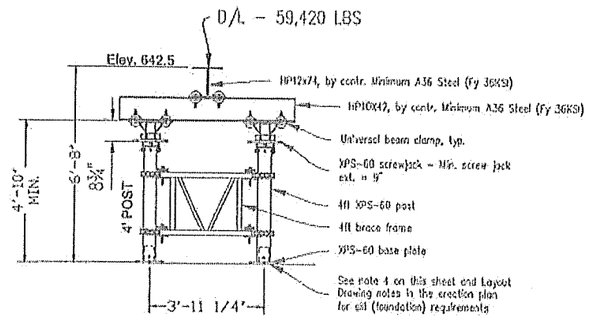
Cap Beam	HP	10 x 42		
Load	P_2 =	29.93 kip		
Span	L =	4.0 ft		
Grade	F_y =	36 ksi		
Bending	F_b =	23.76 ksi	.66 Fy	
Moment	M =	29.93 ft-kip	= $P_2 L_b$ / 4	
S x actual	S_x =	43.4 in³		
S x req'd	$S_{x req}$ =	15.12 in³	= M · 12 / F_b	OK
Shear allow	F_v =	11.88 ksi		
Shear actual	f_v =	4.09 ksi	= R_{CB} / (ht $_w$)	OK

Check Leg Load	F_{leg} =	15.05 kip	includes bm(s) self wt.
	F_{allow} =	60 kip	OK

CONCLUSION: XPS-60 is adequate to support a point load = 59.4 kip

SHT. | OF





SHORING PLAN & SECTION

This drawing is provided as a service to illustrate the assembly of Harris' products only. It is not intended to be fully directive nor to cover engineering details of such products or equipment or materials not furnished by A.H. Harris nor the interconnection therewith. Inasmuch as A.H. Harris does not control jobsite assembly or procedures, grade or quality of material or equipment supplied by others, it is the responsibility of the contractor to integrate this drawing into a composite drawing suitably complete for construction purposes consistent with safe practice and overall project objectives.

General Notes – Shoring

1. All dimensions and details shown on this layout must be checked and verified by the contractor before proceeding with the work.
2. Design load was provide by the contractor
3. The shoring system as shown has been designed with the assumption that adequate lateral restraint will be provided by the contractor.
4. Sufficient site must be provided to properly distribute the loads imposed by the shoring legs onto the ground or supporting foundation to ensure adequate stability for the shoring system.
5. All stringers, ledgers, or other equipment bearing on A.H. Harris equipment must be centered directly over the shoring legs.
6. When establishing deck elevations, allow for the take-up of material and lumber compression.
9. The shoring equipment erected by the information shown on this drawing must also be in accordance with the following Scaffolding & Shoring Institute publications:
   a. Steel Frame Shoring Safety Rules
   b. Recommended Steel Frame Shoring Erection Procedures
   c. Single Post Shore Safety Rules
   The above publications shall be considered to be an integral part of this drawing.
10. The approximate amounts of screw jack extension have been noted. These extensions may require adjustment due to field conditions. However, the maximum screw jack extensions for this layout are limited to 30 inches at the top or bottom.
11. The maximum XPS-60 Shoring safe working load is 60,000 pounds per leg
12. All steel beam stringers must be clamped to the heads with beam clamps or in another approved manner.
15. This print is the property of A.H. Harris & Sons, Inc. and is furnished for the exclusive use of our customer for this specific project. This drawing and the information contained hereon shall not be copied for used by others without the express written consent of A.H. Harris & Sons, Inc.

Michael W. Kane
STATE OF VERMONT
MICHAEL W. KANE
NO. 16999
Structural
LICENSED
PROFESSIONAL ENGINEER
5/23/16

CONTRACTOR NOTE:
All equipment supplied by A.H. Harris, while under the control of our customer, shall not be modified UNLESS:
1) It is specifically required by our drawings, or
2) Written authorization has been obtained from an A.H. Harris representative prior to any modification.
Equipment altered in any way (by cutting, drilling, welding, etc.) shall result in damages charged up to the full replacement cost of the damaged component(s).

DRAWING STATUS
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- ☐ ISSUED FOR INFORMATIONAL PURPOSES ONLY.
- ☐ ISSUED FOR ARCHITECT APPROVAL.
- ☐ ISSUED FOR CONTRACTOR APPROVAL.
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HARRIS
FORMWORK SOLUTIONS
17 COMMERCIAL AVE ALBANY, NY 12205
518-438-3976

XPS-60 LAYOUT
J.A. McDONALD
BRIDGE 11 WALKER MTN RD
CLARENDON, VT

DRAWN BY	DATE	PROJECT NUMBER
FFF	5/23/16	NYR-16-058
CHECKED BY	DATE	DRAWING NUMBER
-	-	NYR-16-058-XPS1