



4 Inverness Court East  
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Englewood, CO 80112  
Office: (303) 770-7878  
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## LETTER OF TRANSMITTAL

TO: Steamboat Structures  
96 Perry Park Ave #464  
Larkspur, CO 80118

DATE: 11/10/2021

FILE NO. 016-01

ATTN: Heather Reed

RE: Forest Lakes Bridges

### WE ARE SENDING YOU:

- |   |   |                                  |
|---|---|----------------------------------|
| <input type="checkbox"/> Shop Drawings  | <input type="checkbox"/> Copy of Letter                   | <input type="checkbox"/> Samples |
| <input type="checkbox"/> Specifications | <input type="checkbox"/> Reports                          | <input type="checkbox"/> _____   |
| <input type="checkbox"/> Plans          | <input checked="" type="checkbox"/> Submittal Information |                                  |

SUBMITTED BY: Structures

COPIES	DESCRIPTION	CONTRACTOR
1	Girder Erection Plan	Structures

### THESE ARE TRANSMITTED:

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> For Approval            | <input type="checkbox"/> For Review and Comment | <input type="checkbox"/> Returned for Corrections |
| <input checked="" type="checkbox"/> For Your Use | <input type="checkbox"/> Approved As Submitted  | <input type="checkbox"/> _____                    |
| <input type="checkbox"/> As Requested            | <input type="checkbox"/> Approved As Noted      |   |

### REMARKS:

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cc: File

# ERECTION PLAN

## FOREST LAKES BRIDGE

### GENERAL NOTES:

- THIS BRIDGE ERECTION PLAN ADDRESSES THE GIRDER UNIT ERECTION SEQUENCE FOR THE ABOVE REFERENCE BRIDGE PROJECT.
- ALL WORK TO BE PERFORMED IN ACCORDANCE WITH COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR BRIDGE CONSTRUCTION AND APPLICABLE PROJECT SPECIAL PROVISIONS.
- THE OPERATION AND INSTALLATION NOTES HEREIN ARE OFFERED FOR INFORMATION AND GUIDANCE AND ARE NOT TO BE TAKEN TO INFER THAT THE ENGINEER IS IN ANY WAY INVOLVED IN OR IS RESPONSIBLE FOR THE ACTUAL PLACEMENT, INSTALLATION, OR OPERATION OF THE CRANE IN THE FIELD. PRIOR TO ERECTING GIRDER UNITS, THE CONTRACTOR, ERECTION AND TRANSPORT SUBCONTRACTORS SHALL DEMONSTRATE ADEQUATE UNDERSTANDING OF THIS PLAN AND APPLICABLE REFERENCE DOCUMENTS NOT INCLUDED IN THIS SET.
- SOIL FOR ANY CRANE PAD SHALL BE COMPACTED BY THE CONTRACTOR AND SHALL CONFORM TO AASHTO T180 REQUIREMENTS AND COMPACTED TO 95% PROCTOR. PADS SHALL ALSO, WHERE APPLICABLE, SLOPE AT A 1.5:1 (2:1 PREFERRED, HORIZ:VERT) AWAY FROM THE EDGE OF CRANE PADS. SEE ERECTION NOTES & LIFT CHART SHEET FOR CRANE MAT NOTES AND INFORMATION.
- GIRDER UNITS SHALL CONFORM TO TOLERANCES PER CDOT SPECIFICATION. BEAMS ACCEPTED BY THE OWNER ARE ASSUMED TO MEET THE SPECIFICATIONS.
- GIRDER UNIT ERECTION SCHEDULE SHALL BE PROVIDED BY CONTRACTOR. DETAILED SCHEDULE REGARDING WORKING HOUR RESTRICTIONS, IF APPLICABLE, SHALL BE PROVIDED BY THE CONTRACTOR.
- PERMANENT DIAPHRAGMS ARE REQUIRED AS PER THE CONTRACT DRAWINGS.
- TEMPORARY BRACING IS NOT REQUIRED FOR THE SAFE ERECTION OF THE GIRDER UNITS.
- GIRDER DELIVERY NOTE: CONTRACTOR SHALL PROVIDE A TRANSVERSE LEVEL AREA FOR THE DELIVERY TRUCK. THE GIRDER UNIT SHALL BE IN A PLUMB POSITION BEFORE REMOVING TIE-DOWN HARDWARE AND PICKING THE GIRDER UNIT. ONLY REMOVE TIE-DOWN HARDWARE WHEN SPECIFIED IN THE ERECTION SEQUENCE. REMOVAL OF HARDWARE PRIOR TO ATTACHING CRANE COULD CAUSE THE GIRDER UNITS TO BE UNSTABLE. SLOPED GRADE WILL PRODUCE GIRDER UNIT SWEEP. ON SLOPED GRADES, DUNNAGE OR LEVEL GRADING SHOULD BE USED AND POSITIONED TO PRODUCE LEVEL SUPPORT SYSTEM FOR THE TRUCK AND TRAILER.
- GIRDER UNITS SHALL BE PROPERLY STABILIZED BY TIE-DOWN HARDWARE TO PROVIDE HORIZONTAL AND ROTATIONAL RESTRAINT DURING SHIPMENT, THEN REMOVED PER SEQUENCE.
- GIRDER UNIT ERECTION SHALL NOT PROCEED DURING INCLEMENT WEATHER OR DURING HIGH WINDS. SEE ERECTION NOTES & LIFT CHART SHEET FOR WIND REQUIREMENTS.

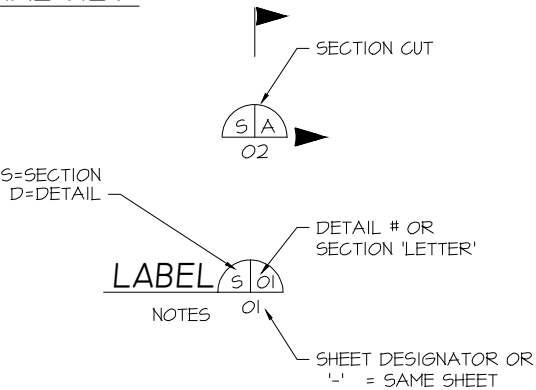
### REFERENCE DOCUMENTS:

- CONTRACT DRAWINGS
- GIRDER SHOP DRAWINGS (CONTECH, LLC)
- CRANE OPERATOR'S MANUAL (WINSLOW, INC.)

### INDEX OF SHEETS:

EP-01	GENERAL NOTES AND INDEX
EP-02	SITE LAYOUT
EP-03	RIGGING PLAN 1
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EP-06	RIGGING PLAN 4
EP-07	ERECTION NOTES & LIFT CHART
EP-08	STAGE 1 ERECTION SEQUENCE
EP-09	STAGE 2 ERECTION SEQUENCE
EP-10	STAGE 2 ERECTION SEQUENCE CONTINUED

### GENERAL KEY:



ISSUED FOR  
CONSTRUCTION

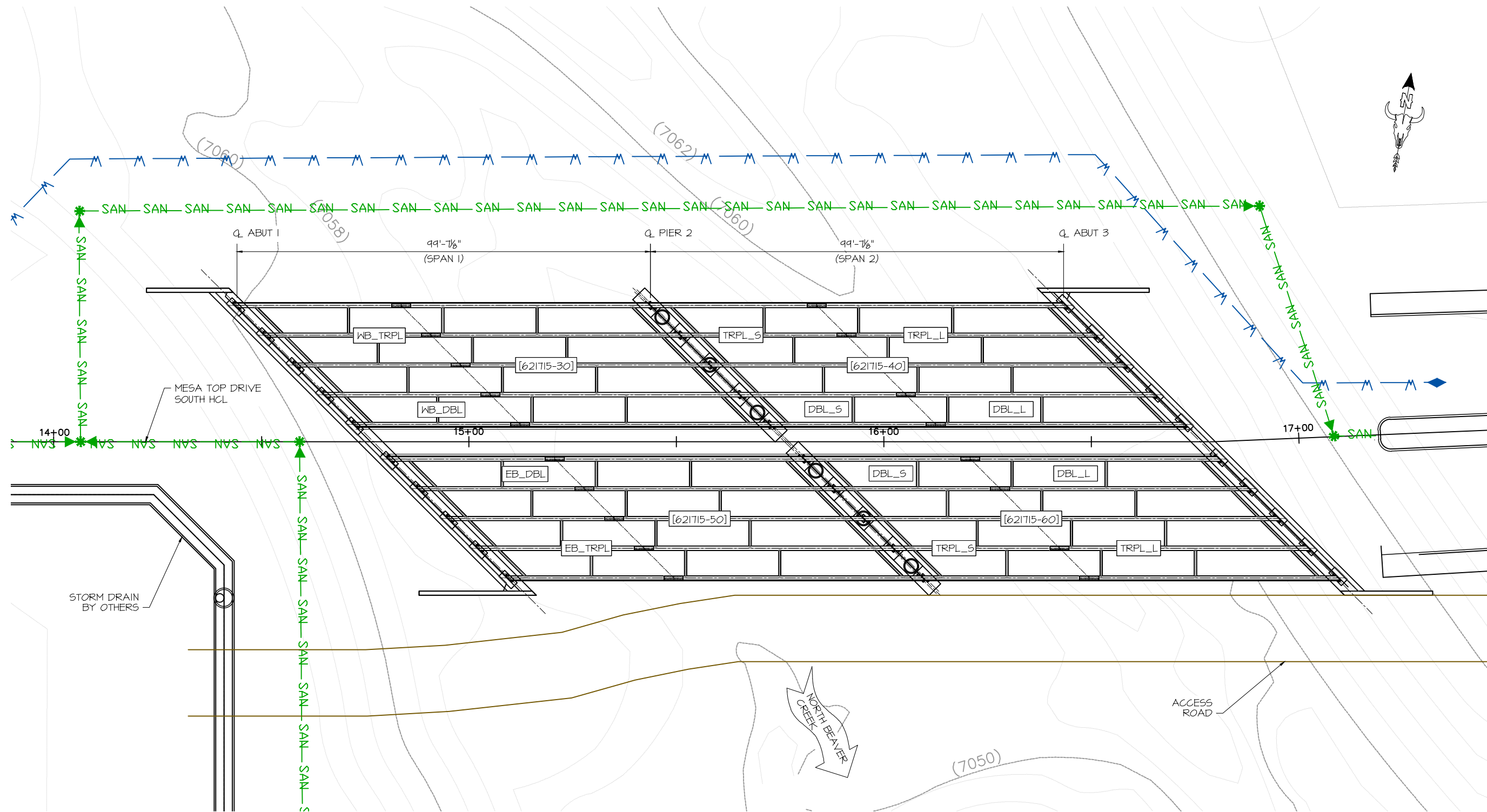


11-08-21

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DESIGNED BY: MTR	PROJECT TITLE FOREST LAKES BRIDGE	PROJECT LOCATION MONUMENT, CO
DRAWN BY: AJM	ERECTION PLAN	STRUCT/JOB:
PROJECT MANAGER: MTR		
DATE: 11/8/21	GENERAL NOTES AND INDEX	SHEET NO. EP-01



### SITE LAYOUT


(MARK NUMBERS HAVE BEEN ASSIGNED TO UNITS IN THIS PLAN FOR SIMPLICITY WITH FIELD COORDINATION. MARK NUMBERS DO NOT MATCH THE SHOP DRAWINGS.)

[621715-XX] - BRIDGE LABEL  
PER CONTECH SHOP DRAWINGS

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CONSTRUCTION



11-08-21

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DESIGNED BY:	MTR
DRAWN BY:	AJM
PROJECT MANAGER:	MTR
DATE:	11/8/21

PROJECT TITLE  
FOREST LAKES BRIDGE

PROJECT LOCATION  
MONUMENT, CO

ERECTION PLAN

SITE LAYOUT

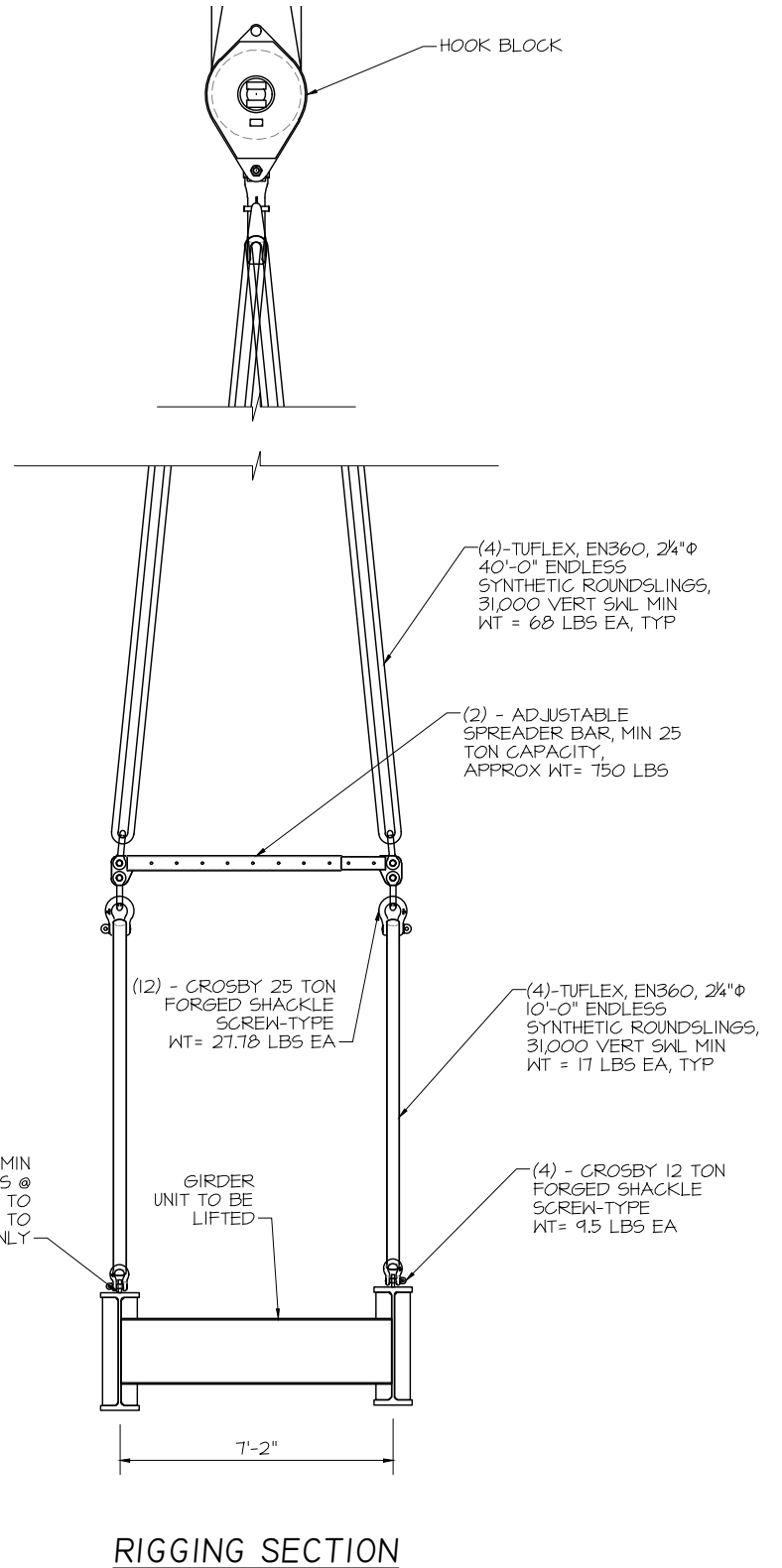
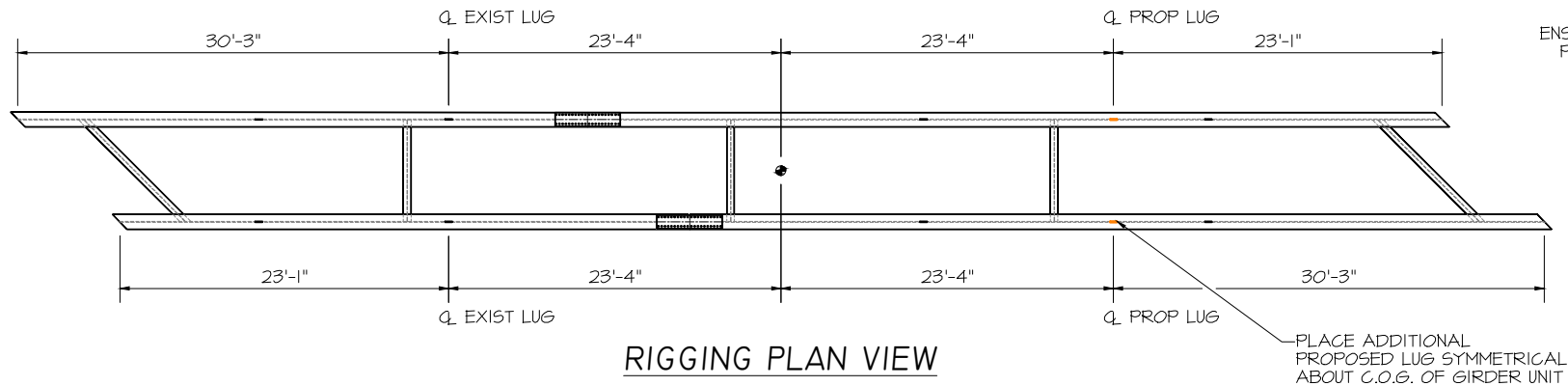
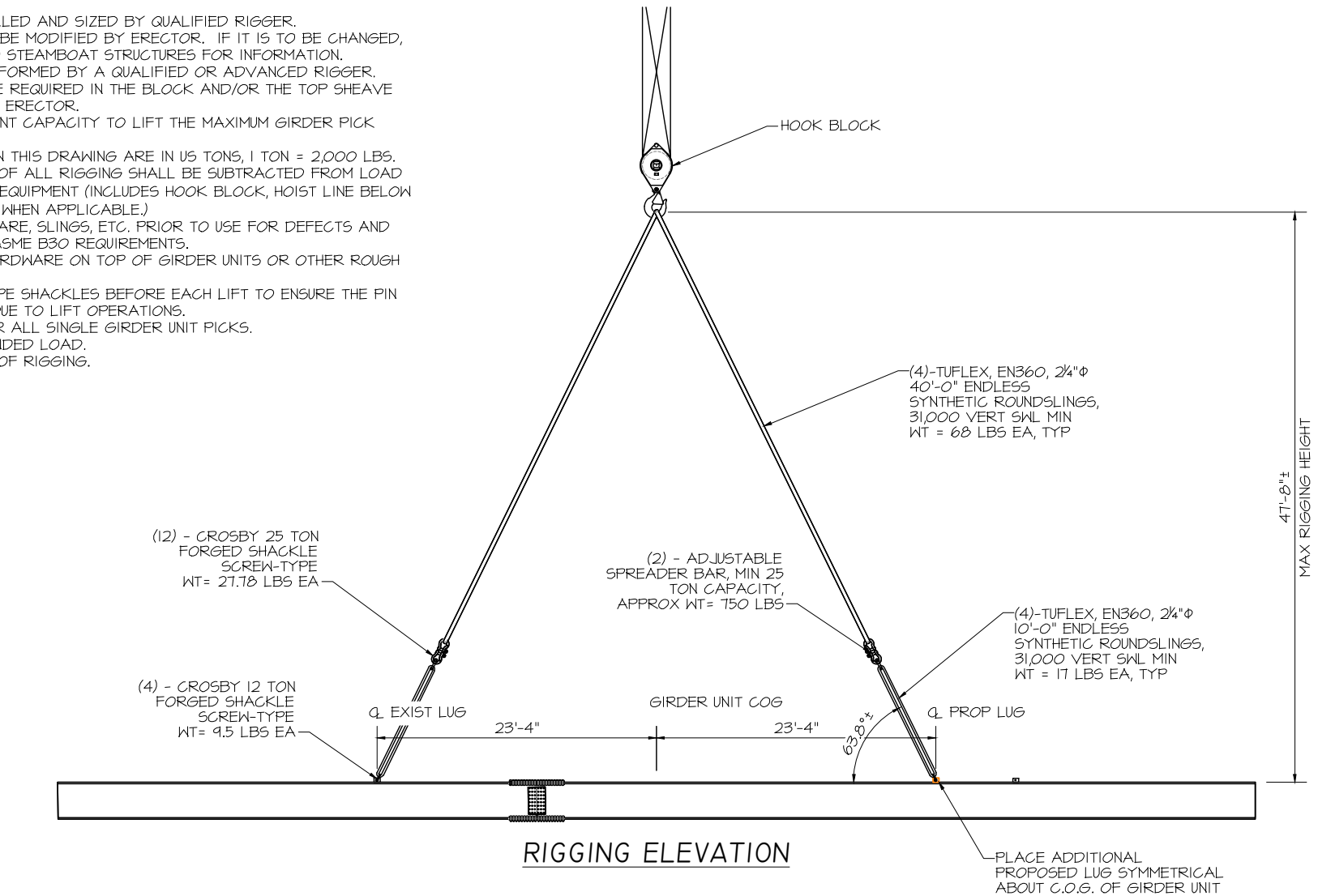
STRUCT/JOB:

SHEET NO.

EP-02

RIGGING NOTES:

1. ALL RIGGING SHALL BE INSTALLED AND SIZED BY QUALIFIED RIGGER.
2. RIGGING CONFIGURATION MAY BE MODIFIED BY ERECTOR. IF IT IS TO BE CHANGED, SUBMIT SKETCH OF CHANGE TO STEAMBOAT STRUCTURES FOR INFORMATION. MODIFICATIONS SHALL BE PERFORMED BY A QUALIFIED OR ADVANCED RIGGER.
3. THE NUMBER OF PARTS OF LINE REQUIRED IN THE BLOCK AND/OR THE TOP SHEAVE SHALL BE DETERMINED BY THE ERECTOR.
4. RIGGING SHALL HAVE SUFFICIENT CAPACITY TO LIFT THE MAXIMUM GIRDER PICK WEIGHT.
5. ALL TONNAGES REFERENCED IN THIS DRAWING ARE IN US TONS, 1 TON = 2,000 LBS.
6. THE TOTAL COMBINED WEIGHT OF ALL RIGGING SHALL BE SUBTRACTED FROM LOAD CAPACITY OF LOAD HOISTING EQUIPMENT (INCLUDES HOOK BLOCK, HOIST LINE BELOW TOP SHEAVE AND STOWED JIB WHEN APPLICABLE.)
7. EXAMINE ALL RIGGING, HARDWARE, SLINGS, ETC. PRIOR TO USE FOR DEFECTS AND REMOVE FROM SERVICE PER ASME B30 REQUIREMENTS.
8. AVOID DRAGGING RIGGING HARDWARE ON TOP OF GIRDER UNITS OR OTHER ROUGH SURFACES.
9. CHECK ALL BOLT & SCREW TYPE SHACKLES BEFORE EACH LIFT TO ENSURE THE PIN HAS NOT BEGUN TO UNSCREW DUE TO LIFT OPERATIONS.
10. TAG LINES SHALL BE USED FOR ALL SINGLE GIRDER UNIT PICKS.
11. NEVER STAND UNDER A SUSPENDED LOAD.
12. DANGER: NEVER EXCEED WLL OF RIGGING.



LIFTING NOTE:

GIRDER CENTER OF GRAVITY IS LOCATED AT THE GEOMETRIC CENTER OF SEGMENTS, TYPICAL.

RIGGING PLAN RP 01

ISSUED FOR CONSTRUCTION



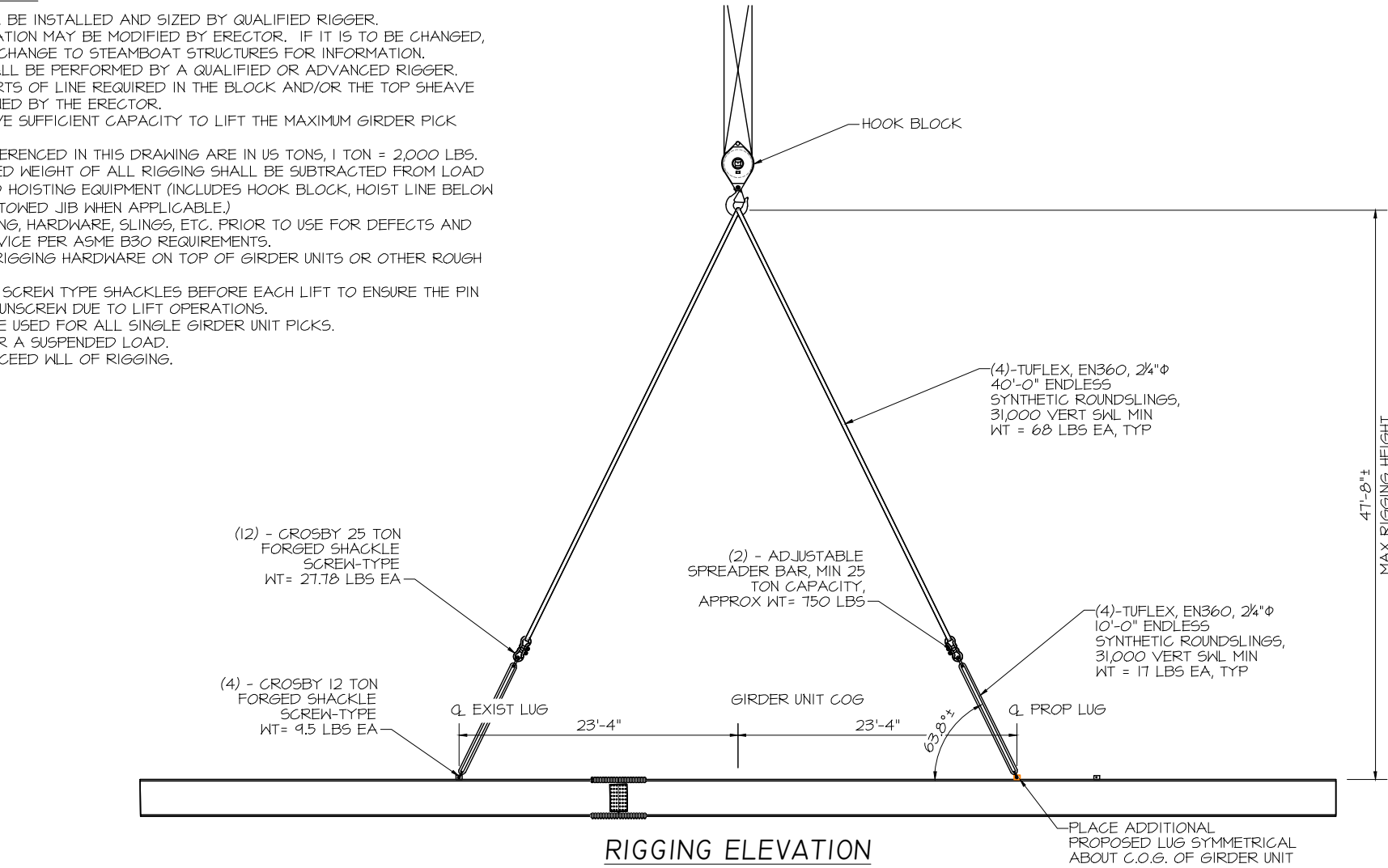
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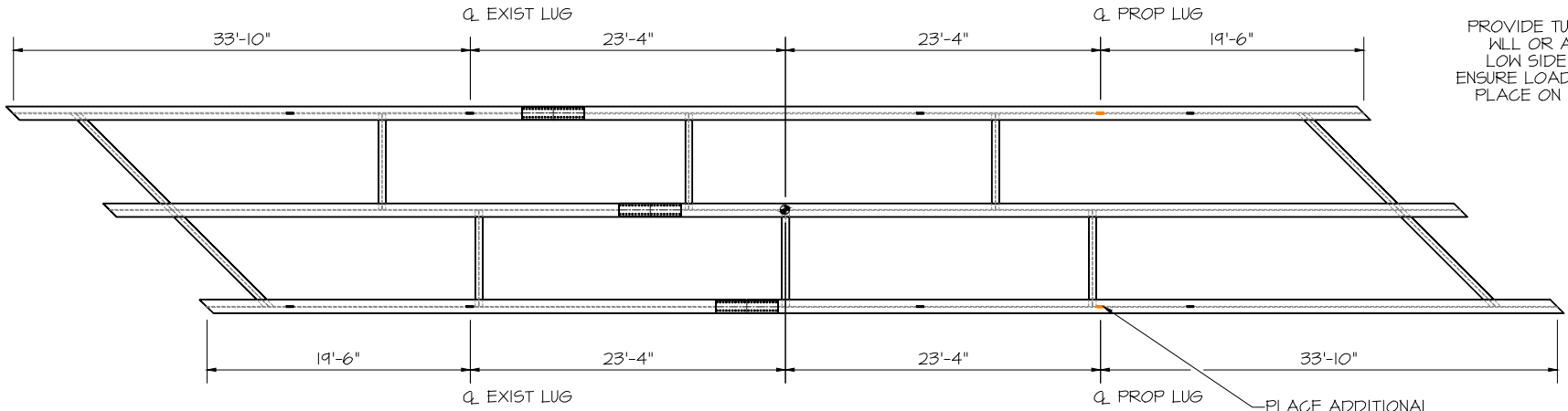
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DRAWN BY:	AJM				
PROJECT MANAGER:	MTR		ERECTION PLAN	STRUCT./JOB:	
DATE:	11/8/21		RIGGING PLAN 1	SHEET NO.	EP-03

RIGGING NOTES:

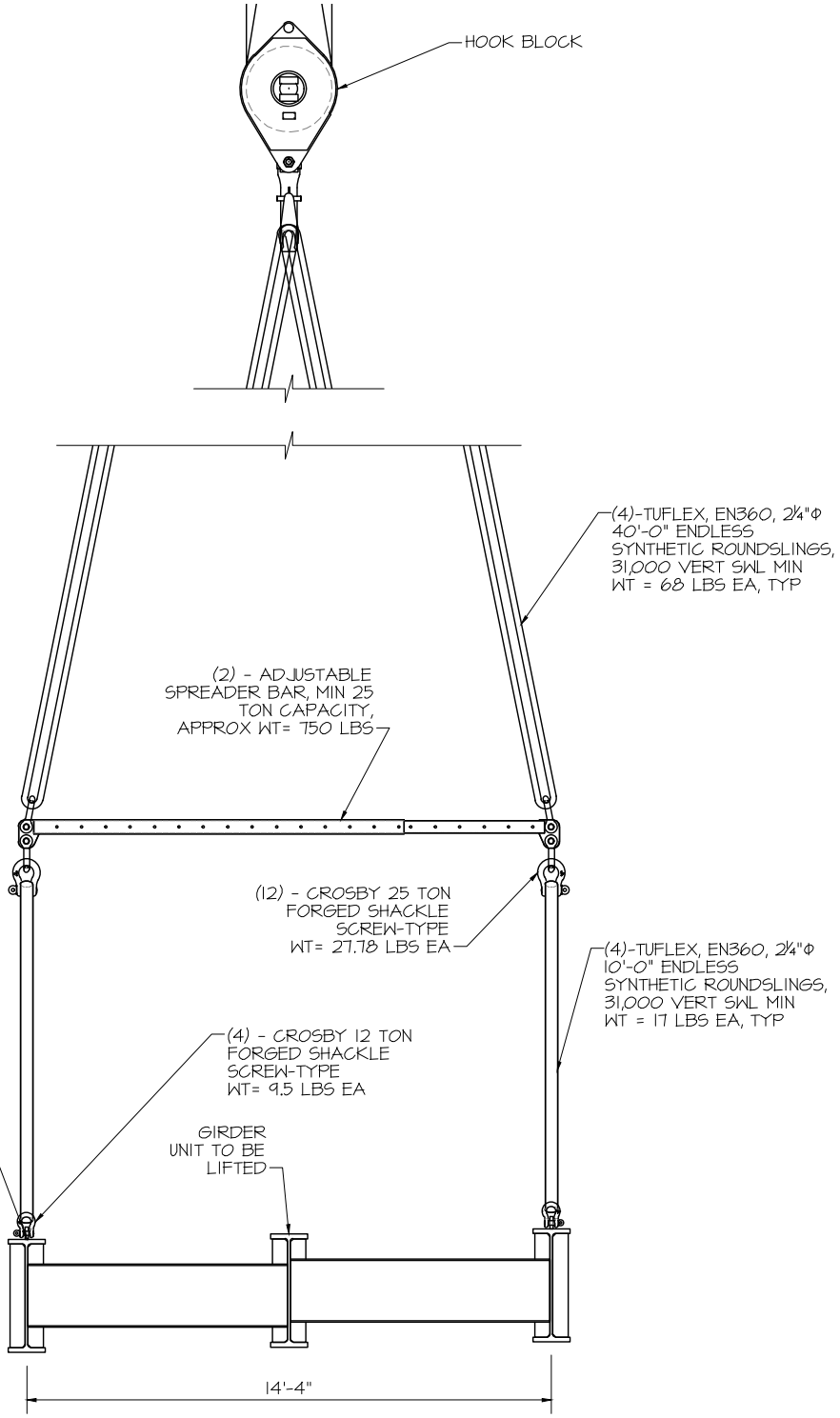
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2. RIGGING CONFIGURATION MAY BE MODIFIED BY ERECTOR. IF IT IS TO BE CHANGED, SUBMIT SKETCH OF CHANGE TO STEAMBOAT STRUCTURES FOR INFORMATION. MODIFICATIONS SHALL BE PERFORMED BY A QUALIFIED OR ADVANCED RIGGER.
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7. EXAMINE ALL RIGGING, HARDWARE, SLINGS, ETC. PRIOR TO USE FOR DEFECTS AND REMOVE FROM SERVICE PER ASME B30 REQUIREMENTS.
8. AVOID DRAGGING RIGGING HARDWARE ON TOP OF GIRDER UNITS OR OTHER ROUGH SURFACES.
9. CHECK ALL BOLT & SCREW TYPE SHACKLES BEFORE EACH LIFT TO ENSURE THE PIN HAS NOT BEGUN TO UNSCREW DUE TO LIFT OPERATIONS.
10. TAG LINES SHALL BE USED FOR ALL SINGLE GIRDER UNIT PICKS.
11. NEVER STAND UNDER A SUSPENDED LOAD.
12. DANGER: NEVER EXCEED WLL OF RIGGING.



RIGGING ELEVATION



RIGGING PLAN VIEW



RIGGING SECTION

LIFTING NOTE:

GIRDER CENTER OF GRAVITY IS LOCATED AT THE GEOMETRIC CENTER OF SEGMENTS, TYPICAL.

RIGGING PLAN RP-02

ISSUED FOR CONSTRUCTION



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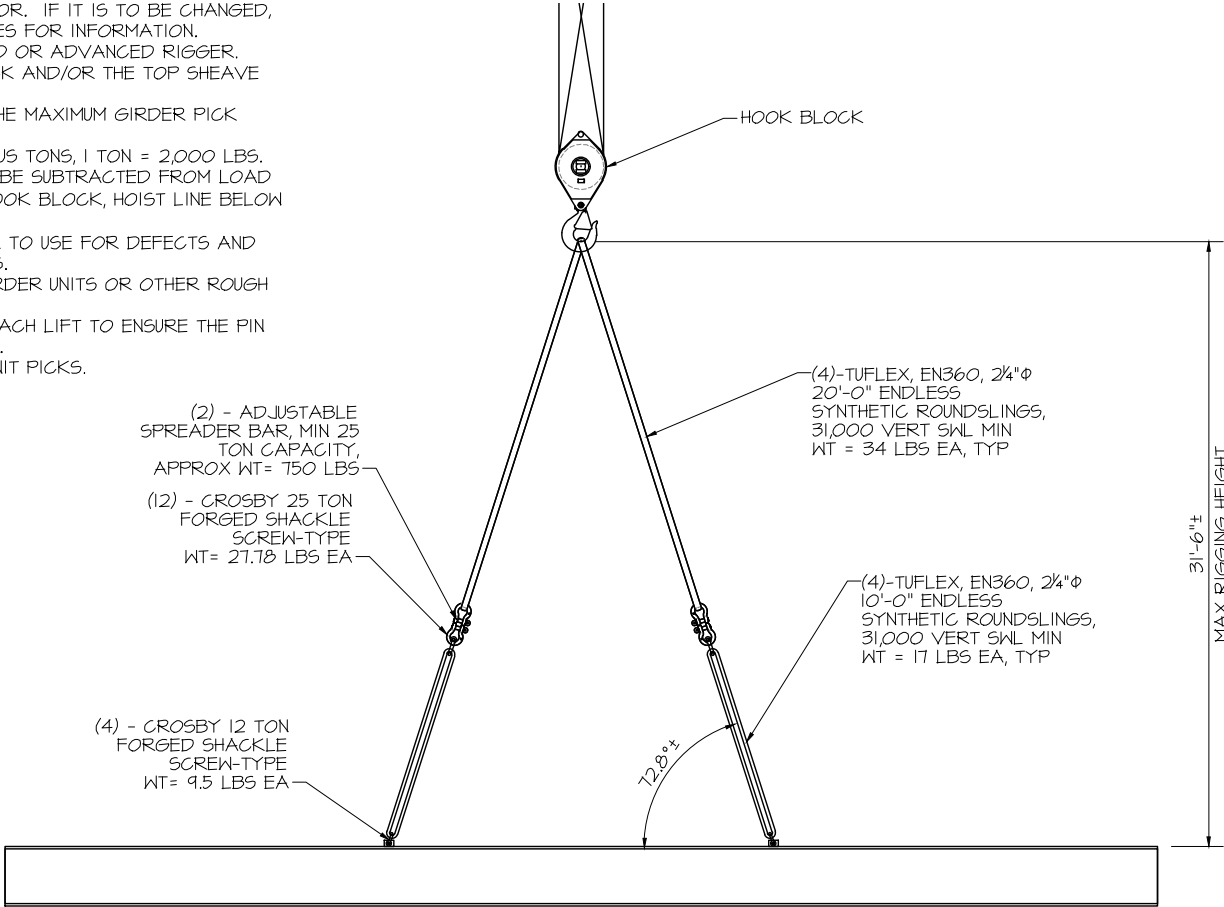


DESIGNED BY:	MTR	PROJECT TITLE	FOREST LAKES BRIDGE	PROJECT LOCATION	MONUMENT, CO
DRAWN BY:	AJM				
PROJECT MANAGER:	MTR		ERECTION PLAN	STRUCT./JOB:	
DATE:	11/8/21		RIGGING PLAN 2	SHEET NO.	EP-04

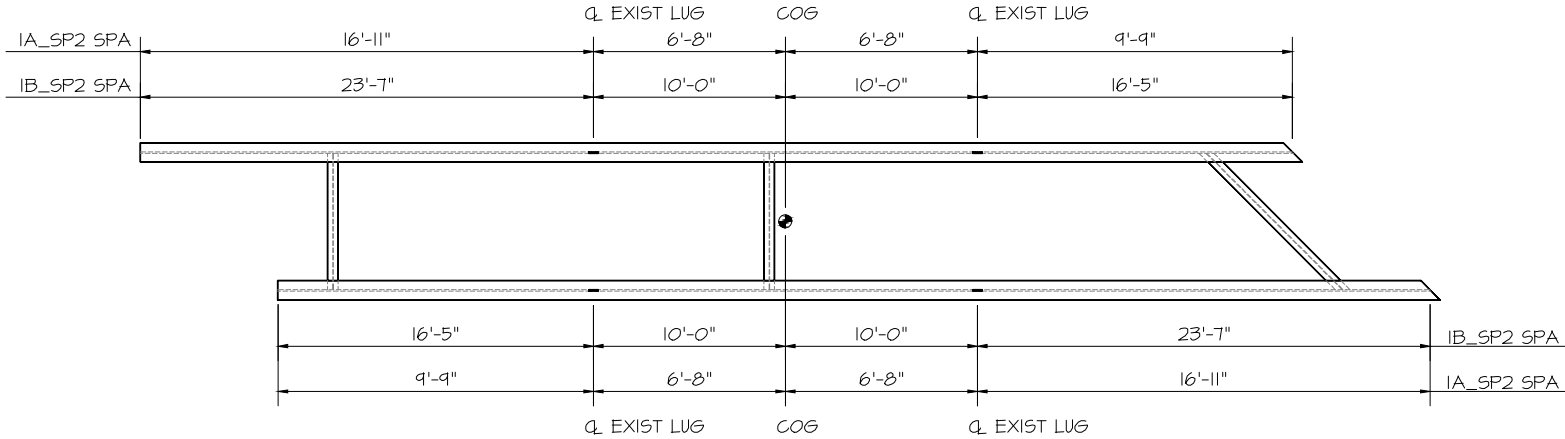


RIGGING NOTES:

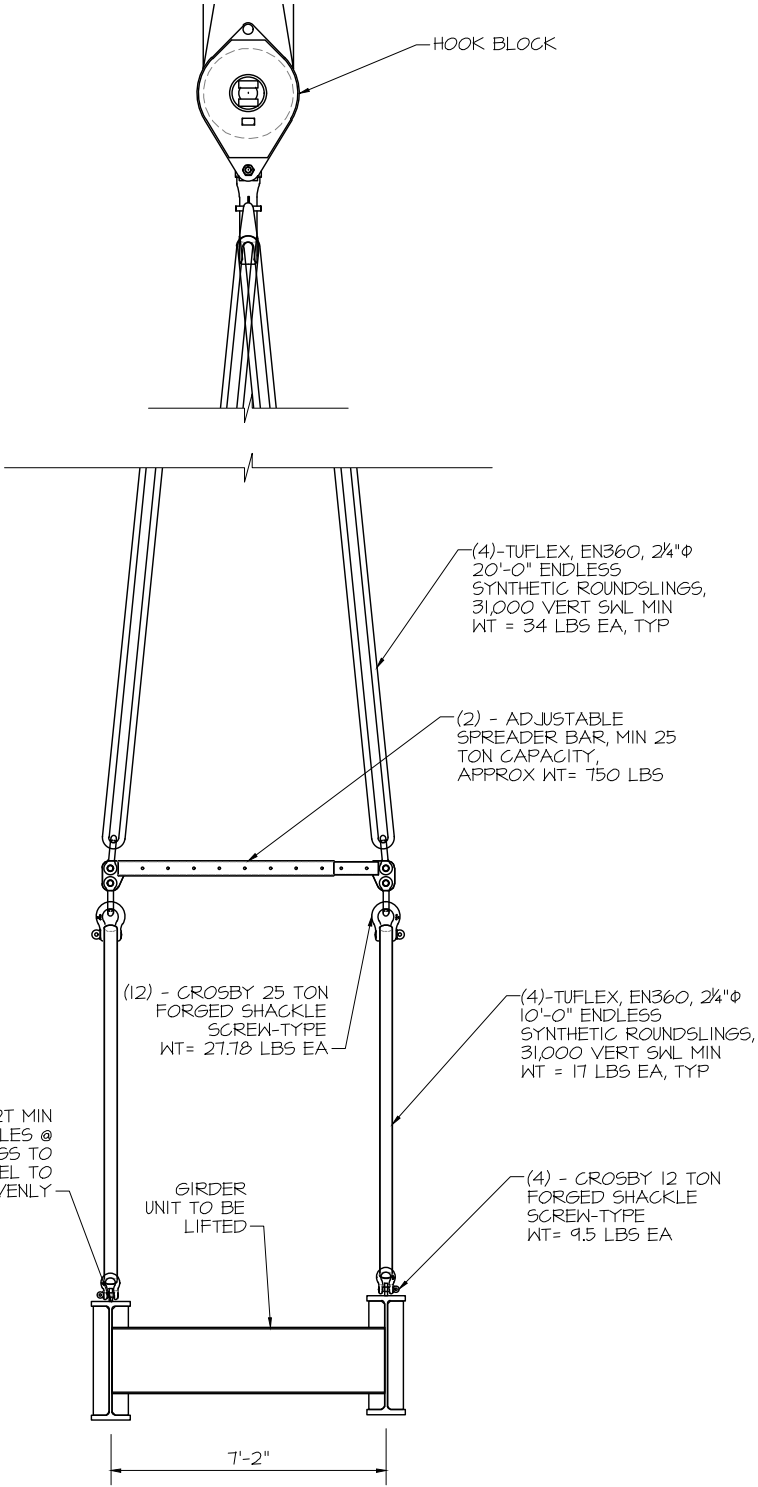
1. ALL RIGGING SHALL BE INSTALLED AND SIZED BY QUALIFIED RIGGER.
2. RIGGING CONFIGURATION MAY BE MODIFIED BY ERECTOR. IF IT IS TO BE CHANGED, SUBMIT SKETCH OF CHANGE TO STEAMBOAT STRUCTURES FOR INFORMATION. MODIFICATIONS SHALL BE PERFORMED BY A QUALIFIED OR ADVANCED RIGGER.
3. THE NUMBER OF PARTS OF LINE REQUIRED IN THE BLOCK AND/OR THE TOP SHEAVE SHALL BE DETERMINED BY THE ERECTOR.
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7. EXAMINE ALL RIGGING, HARDWARE, SLINGS, ETC. PRIOR TO USE FOR DEFECTS AND REMOVE FROM SERVICE PER ASME B30 REQUIREMENTS.
8. AVOID DRAGGING RIGGING HARDWARE ON TOP OF GIRDER UNITS OR OTHER ROUGH SURFACES.
9. CHECK ALL BOLT & SCREW TYPE SHACKLES BEFORE EACH LIFT TO ENSURE THE PIN HAS NOT BEGUN TO UNSCREW DUE TO LIFT OPERATIONS.
10. TAG LINES SHALL BE USED FOR ALL SINGLE GIRDER UNIT PICKS.
11. NEVER STAND UNDER A SUSPENDED LOAD.
12. DANGER: NEVER EXCEED WLL OF RIGGING.



RIGGING ELEVATION



RIGGING PLAN VIEW



RIGGING SECTION

PROVIDE TURNBUCKLE, 12T MIN WLL OR ADD'L SHACKLES @ LOW SIDE RIGGING LEGS TO ENSURE LOAD HANGS LEVEL TO PLACE ON BEARINGS EVENLY

LIFTING NOTE:

GIRDER CENTER OF GRAVITY IS LOCATED AT THE GEOMETRIC CENTER OF SEGMENTS, TYPICAL.

RIGGING PLAN RP-03

ISSUED FOR CONSTRUCTION



11-08-21

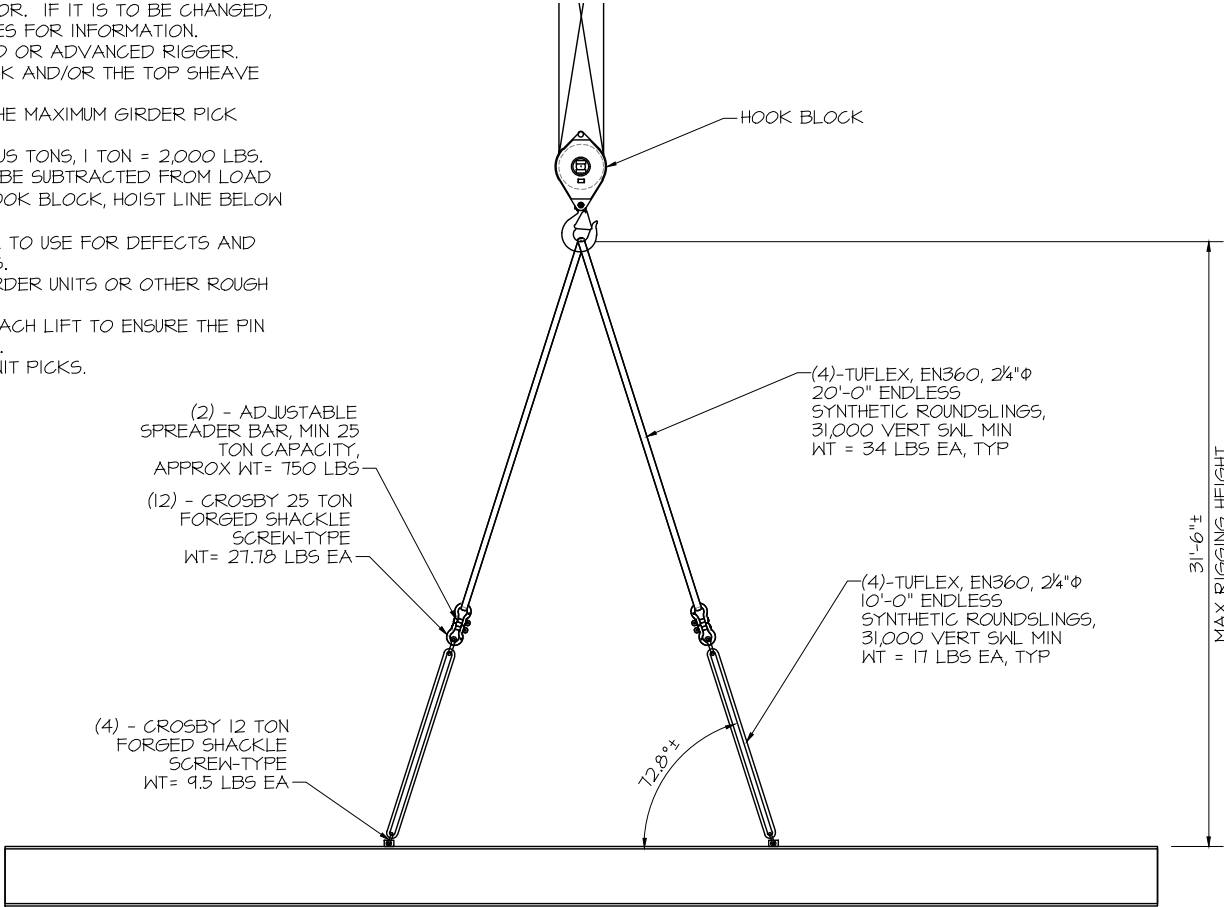
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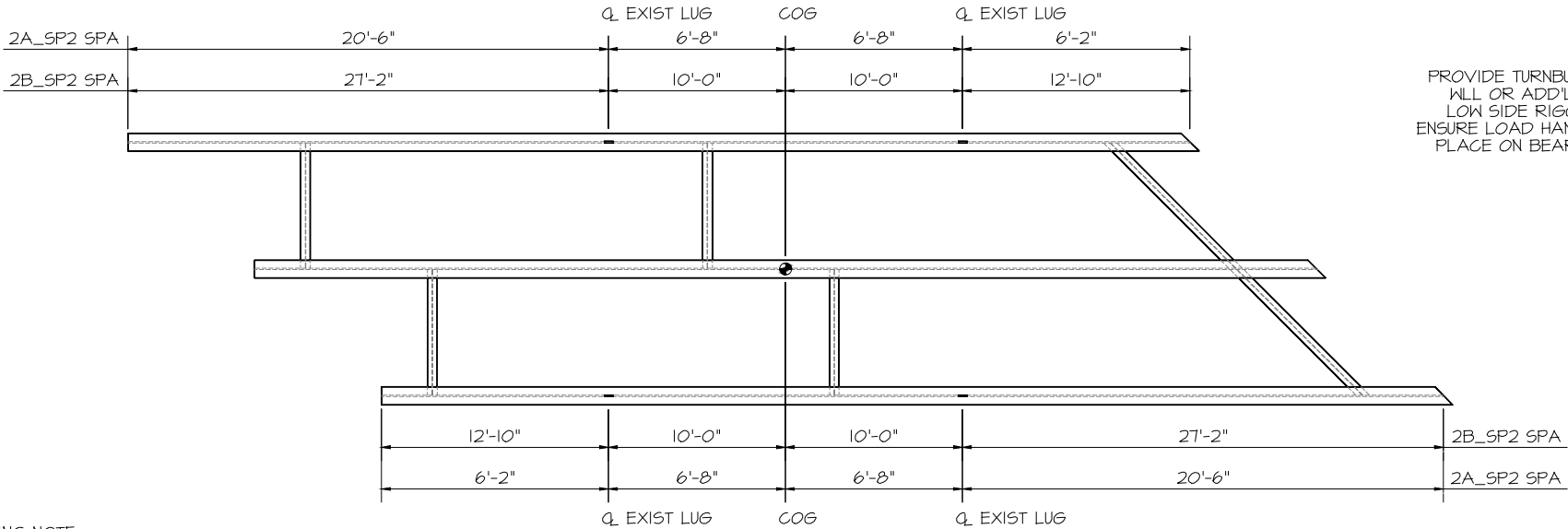
DESIGNED BY:	MTR	PROJECT TITLE	FOREST LAKES BRIDGE	PROJECT LOCATION	MONUMENT, CO
DRAWN BY:	AJM				
PROJECT MANAGER:	MTR		ERECTION PLAN	STRUCT/JOB:	
DATE:	11/8/21		RIGGING PLAN 3	SHEET NO.	EP-05

RIGGING NOTES:

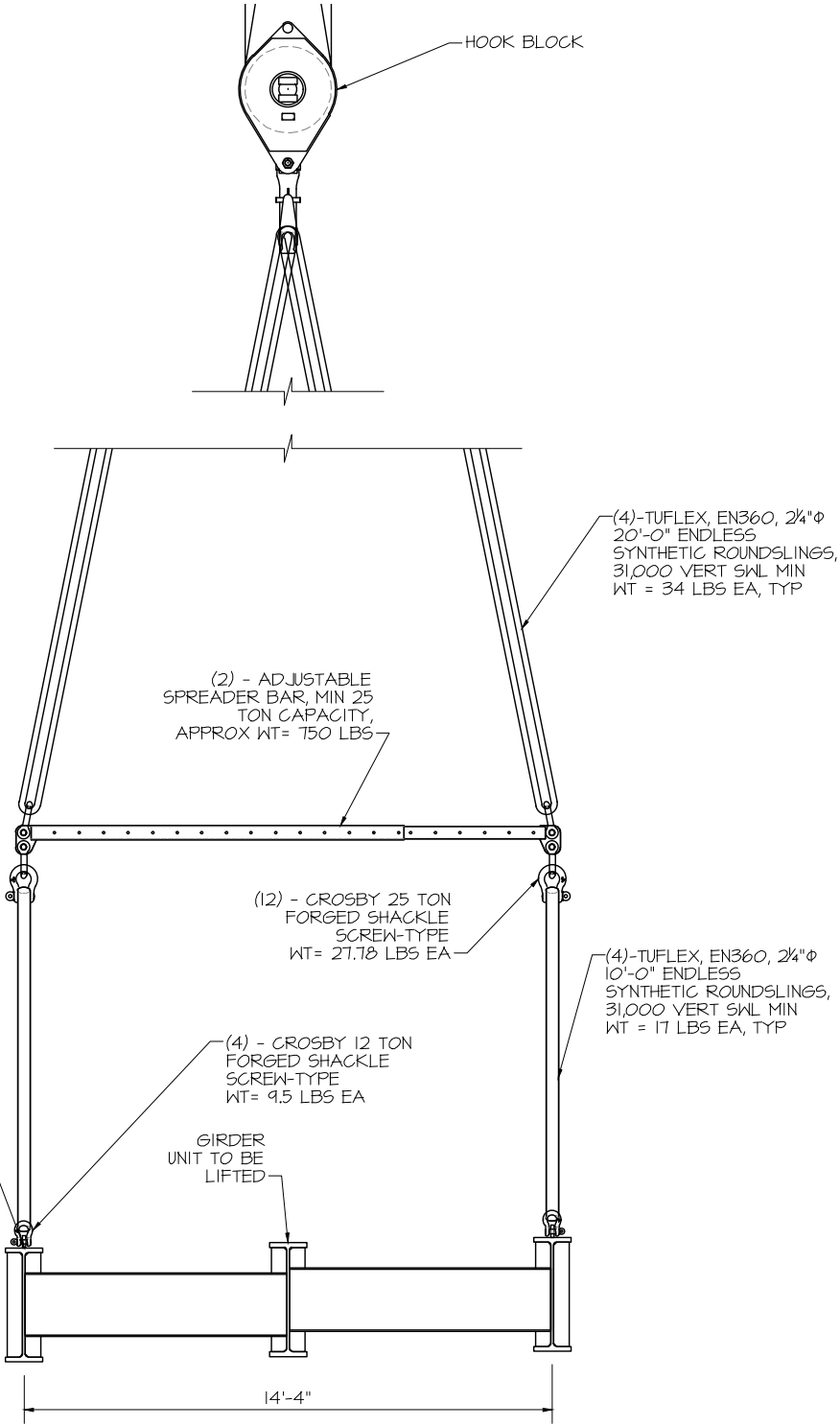
1. ALL RIGGING SHALL BE INSTALLED AND SIZED BY QUALIFIED RIGGER.
2. RIGGING CONFIGURATION MAY BE MODIFIED BY ERECTOR. IF IT IS TO BE CHANGED, SUBMIT SKETCH OF CHANGE TO STEAMBOAT STRUCTURES FOR INFORMATION. MODIFICATIONS SHALL BE PERFORMED BY A QUALIFIED OR ADVANCED RIGGER.
3. THE NUMBER OF PARTS OF LINE REQUIRED IN THE BLOCK AND/OR THE TOP SHEAVE SHALL BE DETERMINED BY THE ERECTOR.
4. RIGGING SHALL HAVE SUFFICIENT CAPACITY TO LIFT THE MAXIMUM GIRDER PICK WEIGHT.
5. ALL TONNAGES REFERENCED IN THIS DRAWING ARE IN US TONS, 1 TON = 2,000 LBS.
6. THE TOTAL COMBINED WEIGHT OF ALL RIGGING SHALL BE SUBTRACTED FROM LOAD CAPACITY OF LOAD HOISTING EQUIPMENT (INCLUDES HOOK BLOCK, HOIST LINE BELOW TOP SHEAVE AND STOWED JIB WHEN APPLICABLE.)
7. EXAMINE ALL RIGGING, HARDWARE, SLINGS, ETC. PRIOR TO USE FOR DEFECTS AND REMOVE FROM SERVICE PER ASME B30 REQUIREMENTS.
8. AVOID DRAGGING RIGGING HARDWARE ON TOP OF GIRDER UNITS OR OTHER ROUGH SURFACES.
9. CHECK ALL BOLT & SCREW TYPE SHACKLES BEFORE EACH LIFT TO ENSURE THE PIN HAS NOT BEGUN TO UNSCREW DUE TO LIFT OPERATIONS.
10. TAG LINES SHALL BE USED FOR ALL SINGLE GIRDER UNIT PICKS.
11. NEVER STAND UNDER A SUSPENDED LOAD.
12. DANGER: NEVER EXCEED WLL OF RIGGING.



RIGGING ELEVATION



RIGGING PLAN VIEW



RIGGING SECTION

PROVIDE TURNBUCKLE, 12T MIN WLL OR ADD'L SHACKLES @ LOW SIDE RIGGING LEGS TO ENSURE LOAD HANGS LEVEL TO PLACE ON BEARINGS EVENLY

RIGGING PLAN RP04

ISSUED FOR CONSTRUCTION



11-08-21

LIFTING NOTE:

GIRDER CENTER OF GRAVITY IS LOCATED AT THE GEOMETRIC CENTER OF SEGMENTS, TYPICAL.

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DESIGNED BY:	MTR	PROJECT TITLE:	FOREST LAKES BRIDGE	PROJECT LOCATION:	MONUMENT, CO
DRAWN BY:	AJM				
PROJECT MANAGER:	MTR		ERECTION PLAN		STRUCT./JOB:
DATE:	11/8/21		RIGGING PLAN 4		SHEET NO.: EP-06

ERECTION EQUIPMENT NOTES:

1. THIS ERECTION MANUAL DOES NOT ADDRESS MANIPULATION STEPS AND PROCEDURES REQUIRED TO OPERATE THE ERECTION EQUIPMENT. ERECTOR SHALL REFER TO THE CRANE OPERATOR'S MANUAL AS NECESSARY.
2. THE CONTRACTOR SHALL VERIFY THAT CRANE MOVEMENT DOES NOT INTERFERE WITH EXISTING FACILITIES, UTILITIES, OR TERRAIN PRIOR TO PROCEEDING WITH GIRDER UNIT ERECTION.
3. GIRDER UNIT ERECTION SHALL NOT PROCEED DURING INCLEMENT WEATHER OR DURING HIGH WINDS (18 MPH+ TYPICAL). REDUCE CRANE LIFT LOAD RATINGS TO ACCOUNT FOR WIND ACTING ON LOAD. CONSULT THE CRANE OPERATOR'S MANUAL FOR REQUIREMENTS WHEN WIND EXCEEDS 18 MPH. DO NOT OPERATE CRANE WHEN WINDS EXCEED 30 MPH. IF WINDS EXCEED 50 MPH LOWER BOOM TO GROUND UNLESS MANUFACTURER'S INSTRUCTIONS INDICATE OTHERWISE. FOR PURPOSES OF THIS PLAN, LIFT ACTIVITIES SHALL BE LIMITED TO 18MPH MAX.
4. CONTRACTOR SHALL PROVIDE A TRANSVERSE LEVEL AREA FOR THE DELIVERY TRUCK. THE GIRDER UNIT SHALL BE IN A PLUMB POSITION BEFORE REMOVING TIE-DOWN HARDWARE AND PICKING THE GIRDER UNIT. SLOPED GRADE WILL PRODUCE OUT OF PLANE BENDING. ON SLOPED GRADES, CRIBBING/DUNNAGE SHOULD BE USED AND POSITIONED TO PRODUCE LEVEL SUPPORT SYSTEM FOR THE TRUCK AND TRAILER.
5. RIGGING SHALL BE PROVIDED BY THE ERECTION SUBCONTRACTOR WITH A MINIMUM SAFE WORKING LOAD CAPABLE OF LIFTING THE CHARTED MAXIMUM LIFT WEIGHT. FURTHER DETAILS REGARDING RIGGING SHALL BE PROVIDED BY THE ERECTION SUBCONTRACTOR IF NOT SPECIFIED ON THE RIGGING PLAN SHEET. THE ERECTION SUBCONTRACTOR IS RESPONSIBLE IN DETERMINING THE HOOK BLOCK SIZE REQUIRED AND NUMBER OF PARTS REQUIRED IN THE LINE TO LIFT THE LOADS.
6. CRANES MAY BE SUBSTITUTED BY CONTRACTOR IF CRANE AVAILABILITY, MECHANICAL FAILURE, OR OTHER CONTINGENCY IS REQUIRED. CRANES SUBSTITUTED SHALL BE OF EQUAL OR BETTER CAPACITY. CONTRACTOR SHALL NOTIFY CONTRACTOR'S EOR OF ANY MODIFICATIONS TO THE CRANES USED.
7. LIFTED LOAD NOT TO EXCEED MAXIMUM LOADS AS PER APPROVED MANUFACTURER'S LOAD CHART.
8. ALL LIFTS SHALL BE PERFORMED ON LEVEL, COMPACTED GRADE WHEN CRANE IS ON SOIL. SEE GENERAL NOTE 4. CRANE SHOULD BE CHECKED FOR LEVEL PERIODICALLY DURING WORK DAY DUE TO POSSIBLE SETTLING OF SOIL. (SOME HYDRAULIC CRANES AUTOMATICALLY LEVEL)
9. ALL CRANES SHALL BE LEVEL WITHIN 1% IN EACH DIRECTION OR PER CRANE OPERATOR'S MANUAL.

CRANE OUTRIGGER PADS:

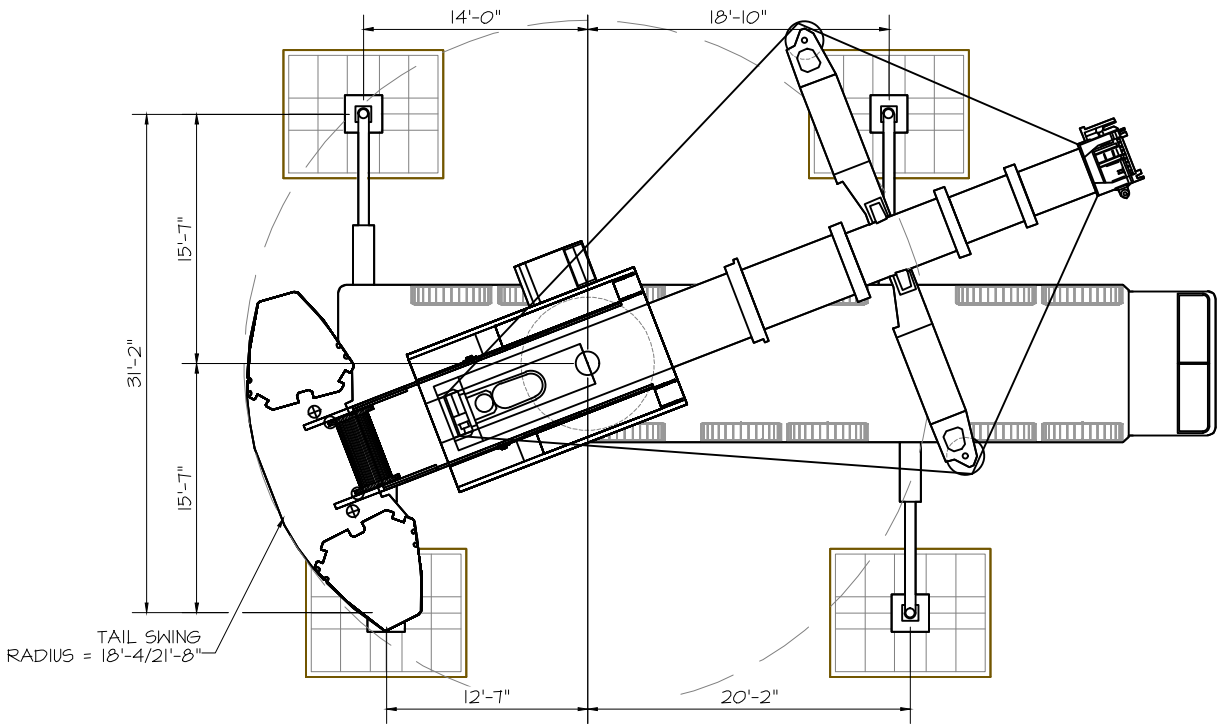
1. CRANE OUTRIGGER FLOATS SHALL BE CENTERED ON OUTRIGGER PADS. DO NOT ECCENTRICALLY LOAD OUTRIGGER PADS. MAX OUT OF TOLERANCE = 1/2 X FLOAT WIDTH (OR DIA).
2. CRANE OUTRIGGER PADS SHALL BE MANUFACTURED OR ENGINEERED AND HAVE SUFFICIENT CAPACITY TO SUPPORT THE MAXIMUM OUTRIGGER REACTION.
3. OUTRIGGER PADS SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS AND SHOULD BE LOAD TESTED FOR GROUND STABILITY AT EACH CRANE SETUP.
4. CRANE OUTRIGGER PADS SHALL BE PROVIDED BY THE ERECTION SUBCONTRACTOR. PAD MAY BE SUBSTITUTED BY THE ERECTOR OF EQUAL OR BETTER CAPACITY/AREA & APPROVAL FROM STEAMBOAT STRUCTURES.
5. OUTRIGGER PADS SHALL MEET OR EXCEED THE AREA SHOWN IN THE LIFT CHART.

LIFT CHART																		
CRANE	MAKE	MODEL	COUNTER WEIGHT (LB)	GIRDER	GIRDER LENGTH (FT)	GIRDER WEIGHT (LB)	PICK LOCATION	BARE PICK AT END	IMPACT LOAD (LB)	RIGGING WEIGHT (LB)	BLOCK & HOIST LINE (LB)	MAX PICK WEIGHT PER CRANE (LB) *	CHART CAPACITY (LB)	% LIFT CHART	RMAX ** (FT)	BOOM LENGTH (FT)	OUTRIGGER REACTION (LBS) ***	OUTRIGGER PAD AREA REQ'D (SQFT)
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	EB_DBL	100.00	53,630	C.o.G.	53,630	5,363	2,032	4,630	65,655	78,000	84%	110	135	307,590	88
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	EB_TRPL	100.00	79,660	C.o.G.	79,660	7,966	2,032	4,630	94,288	110,000	86%	85	135	323,339	92
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	WB_DBL	100.00	53,630	C.o.G.	53,630	5,363	2,032	4,630	65,655	78,000	84%	110	135	307,590	88
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	WB_TRPL	100.00	79,660	C.o.G.	79,660	7,966	2,032	4,630	94,288	110,000	86%	85	135	323,339	92
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	DBL_S	40.00	21,710	C.o.G.	21,710	2,290	2,032	4,630	30,662	57,100	54%	135	152	288,344	82
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	TRPL_S	40.00	32,311	C.o.G.	32,311	3,231	2,032	4,630	42,204	57,100	74%	135	152	294,692	84
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	DBL_L	60.00	31,920	C.o.G.	31,920	3,192	2,032	4,630	41,774	73,000	57%	115	135	294,456	84
CRANE A	LIEBHERR	LTM 1400-7.1	308,600	TRPL_L	60.00	47,349	C.o.G.	47,349	4,735	2,032	4,630	58,746	73,000	80%	115	135	303,790	87

- \* LIFT WEIGHT INCLUDES RIGGING WEIGHT AND A 3% IMPACT LOAD ON GIRDER UNIT WEIGHT FOR FABRICATION TOLERANCES. RIGGING WEIGHT IS SEPARATED FROM HOOK BLOCK & HOIST LINE.  
MAX PICK WEIGHT = [GIRDER UNIT WT] + [IMPACT] + [RIGGING] + [BLOCK & LINE]
- \*\* THE MAXIMUM WORKING RADIUS AT MAX LIFT WEIGHT.
- \*\*\* MIN OUTRIGGER PAD AREA BASED ON MAX OUTRIGGER REACTION & 3500 PSF ALLOWABLE SOIL BEARING PRESSURE.

NOTES ON LIEBHERR LTM1400-7.1 CRANE:

1. CRANE TO BE USED IS LIEBHERR MODEL LTM1400-7.1.
2. CRANE WEIGHT IS 185,000 LB WITHOUT COUNTERWEIGHT.
3. 308,600 LB OF COUNTERWEIGHTS SHALL BE USED FOR ALL LIFTS.
4. ALL LIFTS SHALL BE PERFORMED ON FULLY EXTENDED OUTRIGGERS.
5. ALL LIFTS SHALL BE PERFORMED ON LEVEL, COMPACTED GRADE. SEE GENERAL NOTE 4 AND CRANE OPERATOR'S MANUAL.
6. THE SUPERLIFT ATTACHMENT SHALL BE USED ON ALL LIFTS.



LIEBHERR LTM1400-7.1 PLAN VIEW

ISSUED FOR CONSTRUCTION



11-08-21

REVISONS	DATE	BY	PREPARED FOR:
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DESIGNED BY: MTR

DRAWN BY: AJM

PROJECT MANAGER: MTR

DATE: 11/8/21

PROJECT TITLE: FOREST LAKES BRIDGE

PROJECT LOCATION: MONUMENT, CO

STRUCTUREJOB: ERECTION PLAN

SHEET NO: ERECTION NOTES & LIFT CHART

EP-07



PRE-ERECTION NOTES:

- CONCRETE IN THE SUBSTRUCTURE SHALL REACH 80% COMPRESSIVE STRENGTH PRIOR TO ERECTING GIRDERS.
- CONTRACTOR TO VERIFY NO OVERHEAD OR UNDERGROUND UTILITIES ARE IN CONFLICT WITH CRANE OPERATIONS. COORDINATE UTILITY SHUT-DOWN AS REQ'D FOR CRANE OPERATIONS IF REQUIRED.

STAGE IA ERECTION SEQUENCE:

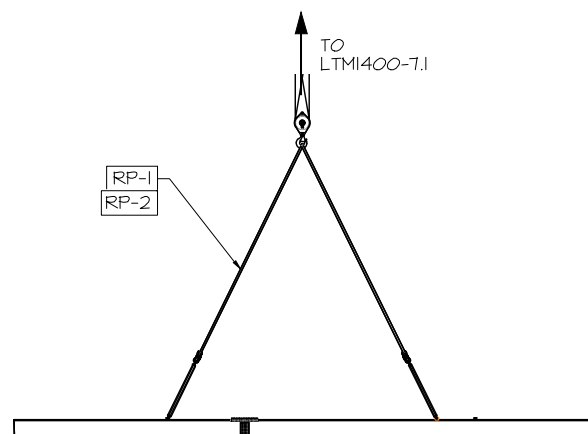
1. PLACE CRANE INTO POSITION AS SHOWN.
2. STAGE GIRDER UNITS AS SHOWN.
3. ATTACH CRANE TO GIRDER UNIT EB\_TRPL AS SHOWN IN THE RIGGING DIAGRAM. REMOVE SLACK FROM RIGGING.
4. LIFT LOAD OFF OF GROUND/DUNNAGE, LIFT ABOVE OBSTRUCTIONS, SWING CRANE TOWARD GIRDER UNIT FINAL POSITION.
5. LOWER GIRDER UNIT ONTO BEARINGS SIMULTANEOUSLY. SLOWLY RELEASE APPROXIMATELY 90% OF THE LOAD FROM CRANE.
6. VERIFY BEARING CONNECTION ALIGNMENT, FINISH INSTALLATION OF BEARINGS.
7. FULLY RELEASE LOAD FROM CRANE. DETACH RIGGING FROM CRANE.
8. REPEAT STEPS 3-7 FOR GIRDER UNIT EB\_DBL.

STAGE IA CONTINUED:

1. REPEAT STEPS 3-7 FOR REMAINING GIRDER UNITS WB\_DBL & WB\_TRPL.



CONTRACTOR/CRANE SUBCONTRACTOR SHALL WATCH CRANE MOVEMENT DURING LIFTING TO VERIFY THE COUNTERWEIGHT DOES NOT OBSTRUCT/CONFLICT WITH EXISTING PIER CAP. REPOSITION CRANE AS NECESSARY TO AVOID IMPACT BETWEEN COUNTERWEIGHT AND CAP.



RIGGING DIAGRAM  
(SEE RIGGING PLAN SHEET)

ISSUED FOR  
CONSTRUCTION



11-08-21

REVISIONS	DATE	BY	PREPARED FOR:
1			
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DESIGNED BY:	MTR
DRAWN BY:	AJM
PROJECT MANAGER:	MTR
DATE:	11/8/21

PROJECT TITLE  
FOREST LAKES BRIDGE

ERECTION PLAN

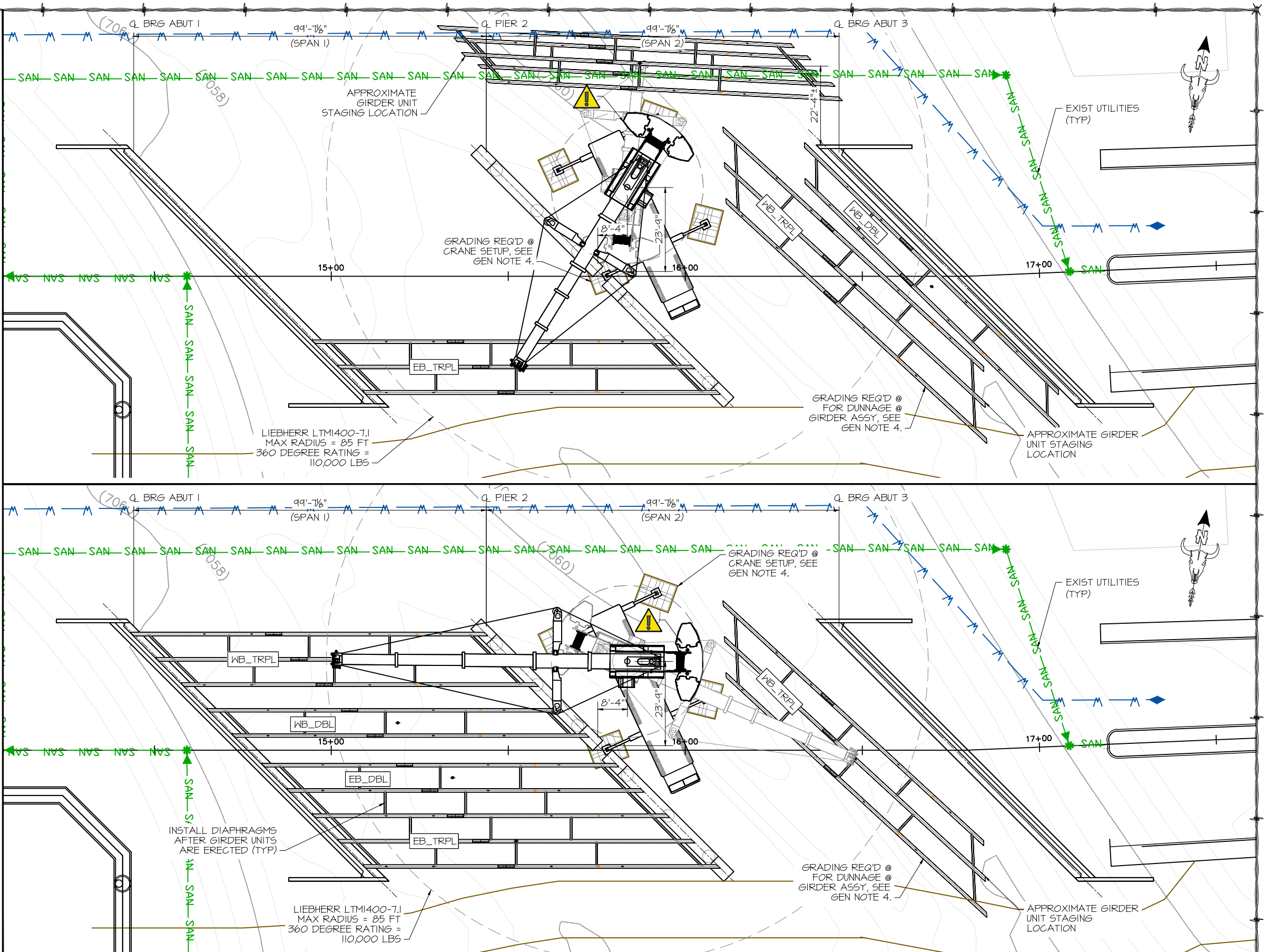
STAGE 1 ERECTION SEQUENCE

PROJECT LOCATION  
MONUMENT, CO

STRUCT/JOB:

SHEET NO.

EP-08

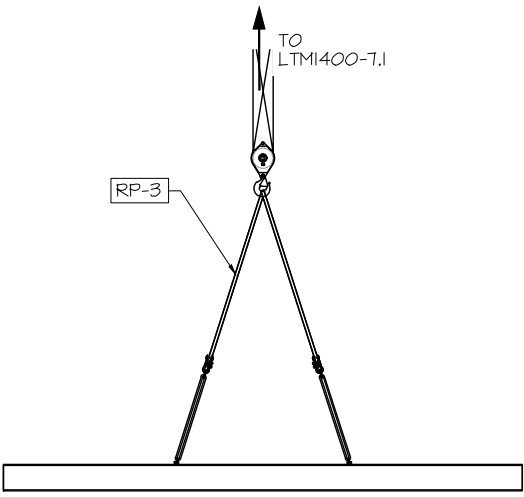


STAGE 2A ERECTION SEQUENCE:

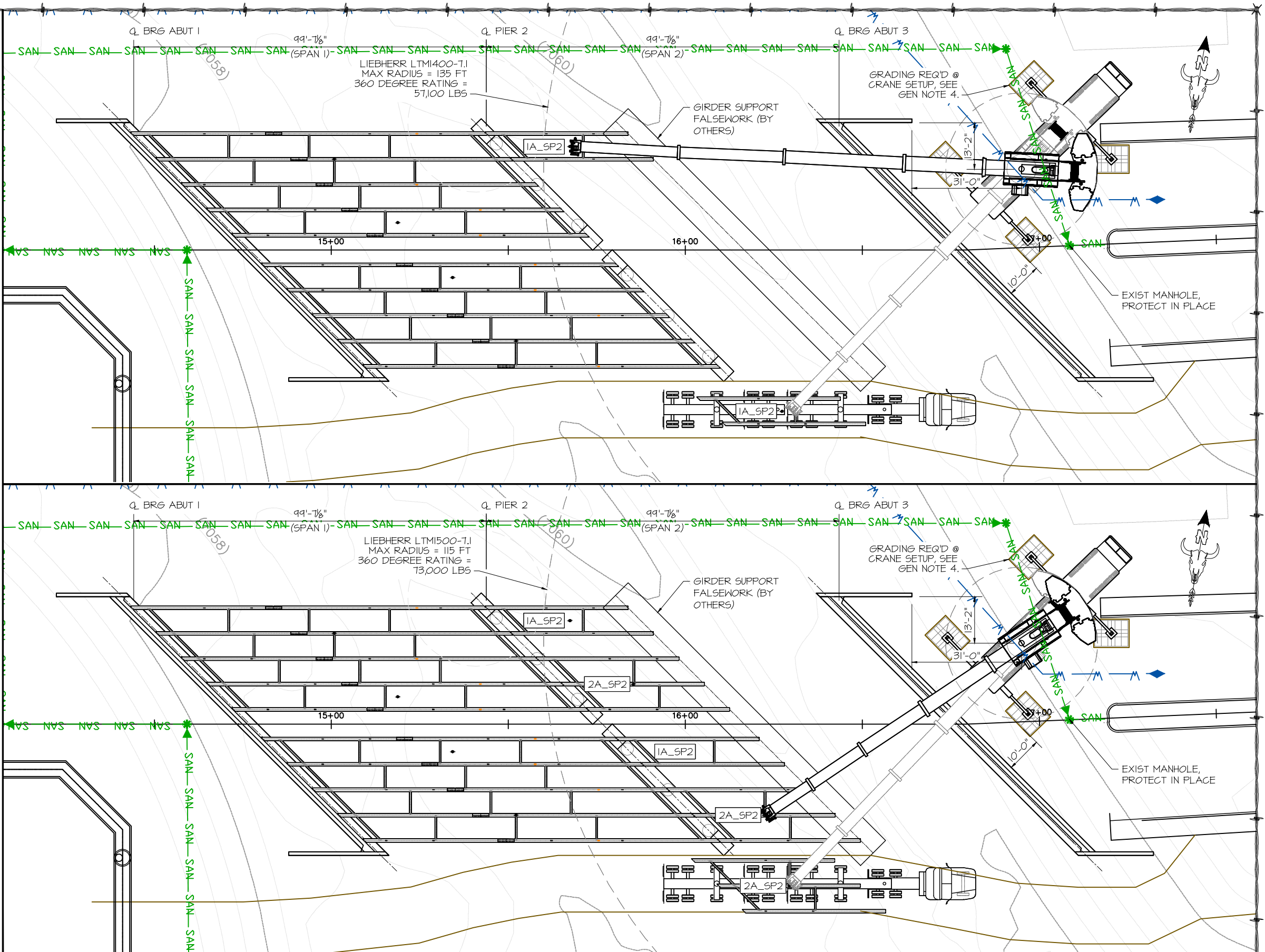
- 1. PLACE CRANE INTO POSITION AS SHOWN.
- 2. ERECT GIRDER FALSEWORK (BY OTHERS.)
- 3. DELIVER GIRDER UNIT AS SHOWN.
- 4. ATTACH CRANE TO GIRDER UNIT AS SHOWN IN THE RIGGING DIAGRAM. REMOVE SLACK FROM RIGGING. DETACH TIE-DOWN HARDWARE. **\*\*IMPORTANT\*\***: DO NOT DETACH UNTIL CRANE LINES ARE TAUT.
- 5. LIFT LOAD OFF OF TRANSPORT TRUCK, LIFT ABOVE OBSTRUCTIONS, SWING CRANE TOWARD GIRDER UNIT FINAL POSITION.
- 6. LOWER GIRDER UNIT ONTO BEARINGS/FALSEWORK SIMULTANEOUSLY. SLOWLY RELEASE APPROXIMATELY 90% OF THE LOAD FROM CRANE.
- 7. VERIFY BEARING CONNECTION ALIGNMENT, FINISH INSTALLATION OF BEARINGS.
- 8. FULLY RELEASE LOAD FROM CRANE. DETACH RIGGING FROM CRANE.

STAGE 2A CONTINUED:

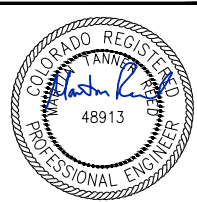
- 1. REPEAT STEPS 3-9 FOR REMAINING 1A\_SP2 & 2A\_SP2 GIRDER UNITS IN SPAN 2 AS SHOWN.



RIGGING DIAGRAM  
(SEE RIGGING PLAN SHEET)



ISSUED FOR  
CONSTRUCTION



REVISIONS	DATE	BY	PREPARED FOR:
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DESIGNED BY: MTR	PROJECT TITLE FOREST LAKES BRIDGE	PROJECT LOCATION MONUMENT, CO
DRAWN BY: AJM	ERECTION PLAN	STRUCT/JOB:
PROJECT MANAGER: MTR	STAGE 2 ERECTION SEQUENCE	SHEET NO. EP-09
DATE: 11/8/21		

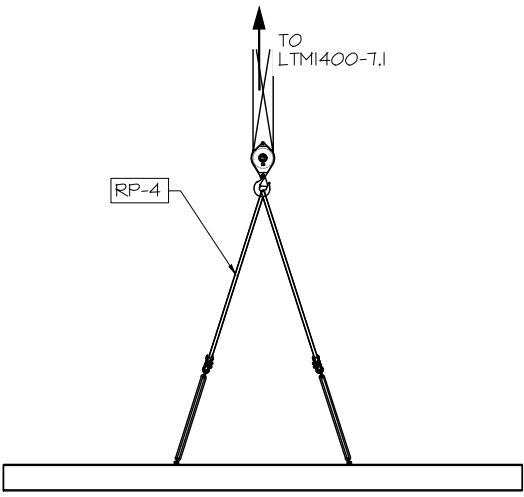
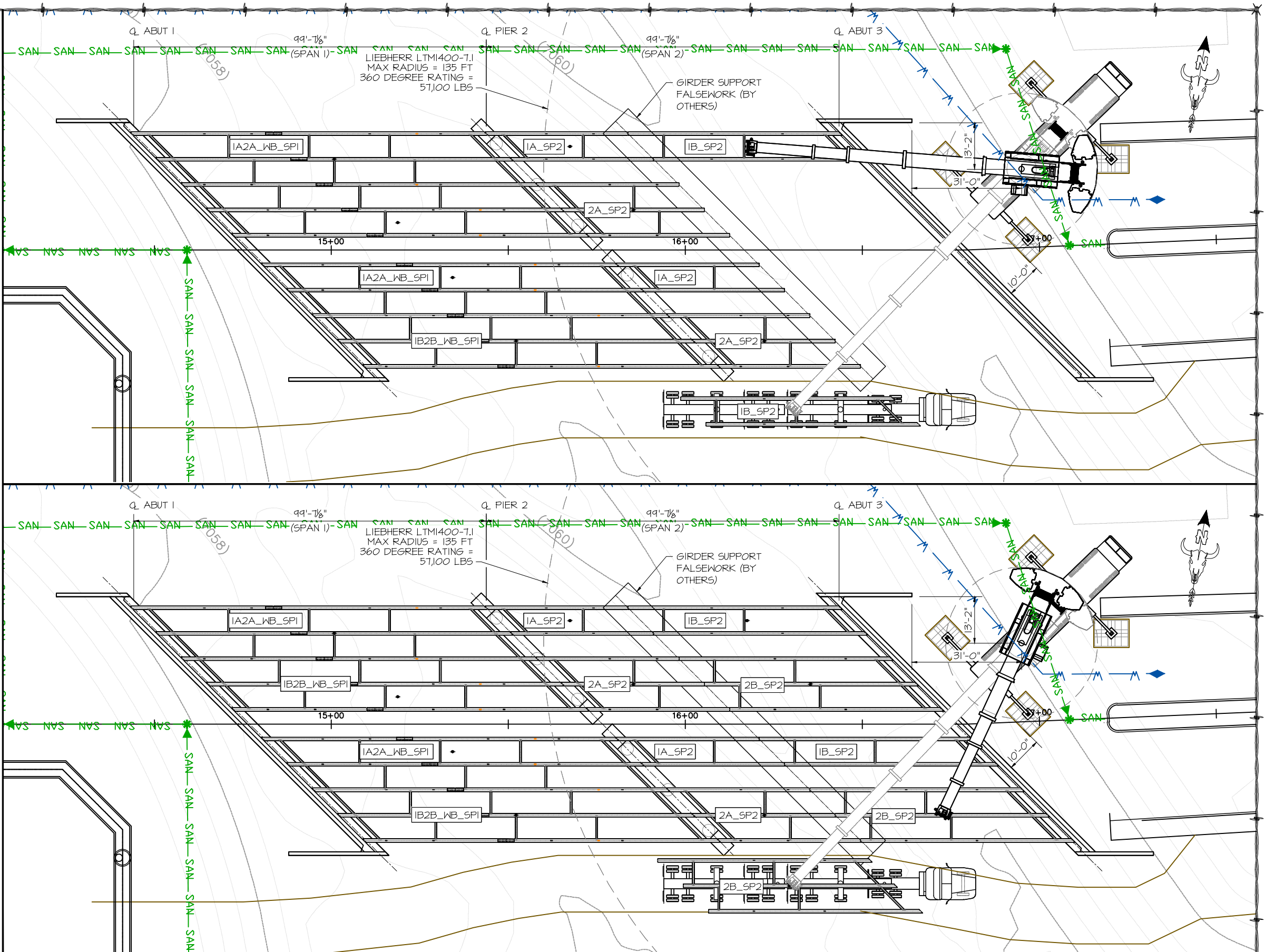


STAGE 2B ERECTION SEQUENCE:

- 1. PLACE CRANE INTO POSITION AS SHOWN.
- 2. ERECT GIRDER FALSEWORK (BY OTHERS.)
- 3. DELIVER GIRDER UNIT AS SHOWN.
- 4. ATTACH CRANE TO GIRDER UNIT AS SHOWN IN THE RIGGING DIAGRAM. REMOVE SLACK FROM RIGGING. DETACH TIE-DOWN HARDWARE. \*\*IMPORTANT\*\*: DO NOT DETACH UNTIL CRANE LINES ARE TAUT.
- 5. LIFT LOAD OFF OF TRANSPORT TRUCK, LIFT ABOVE OBSTRUCTIONS, SWING CRANE TOWARD GIRDER UNIT FINAL POSITION.
- 6. LOWER GIRDER UNIT ONTO BEARINGS/FALSEWORK SIMULTANEOUSLY. SLOWLY RELEASE APPROXIMATELY 90% OF THE LOAD FROM CRANE.
- 7. VERIFY BEARING CONNECTION ALIGNMENT, FINISH INSTALLATION OF BEARINGS.
- 8. FULLY RELEASE LOAD FROM CRANE. DETACH RIGGING FROM CRANE. INSTALL SPLICES.

STAGE 2B CONTINUED:

- 1. REPEAT STEPS 3-4 FOR REMAINING IB\_SP2 & 2B\_SP2 GIRDER UNITS IN SPAN 2 AS SHOWN.



RIGGING DIAGRAM  
(SEE RIGGING PLAN SHEET)

ISSUED FOR  
CONSTRUCTION



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DESIGNED BY:	MTR
DRAWN BY:	AJM
PROJECT MANAGER:	MTR
DATE:	11/8/21

PROJECT TITLE	FOREST LAKES BRIDGE	PROJECT LOCATION	MONUMENT, CO
ERECTION PLAN		STRUCT/JOB:	
STAGE 2 ERECTION SEQUENCE CONTINUED		SHEET NO.	EP-10