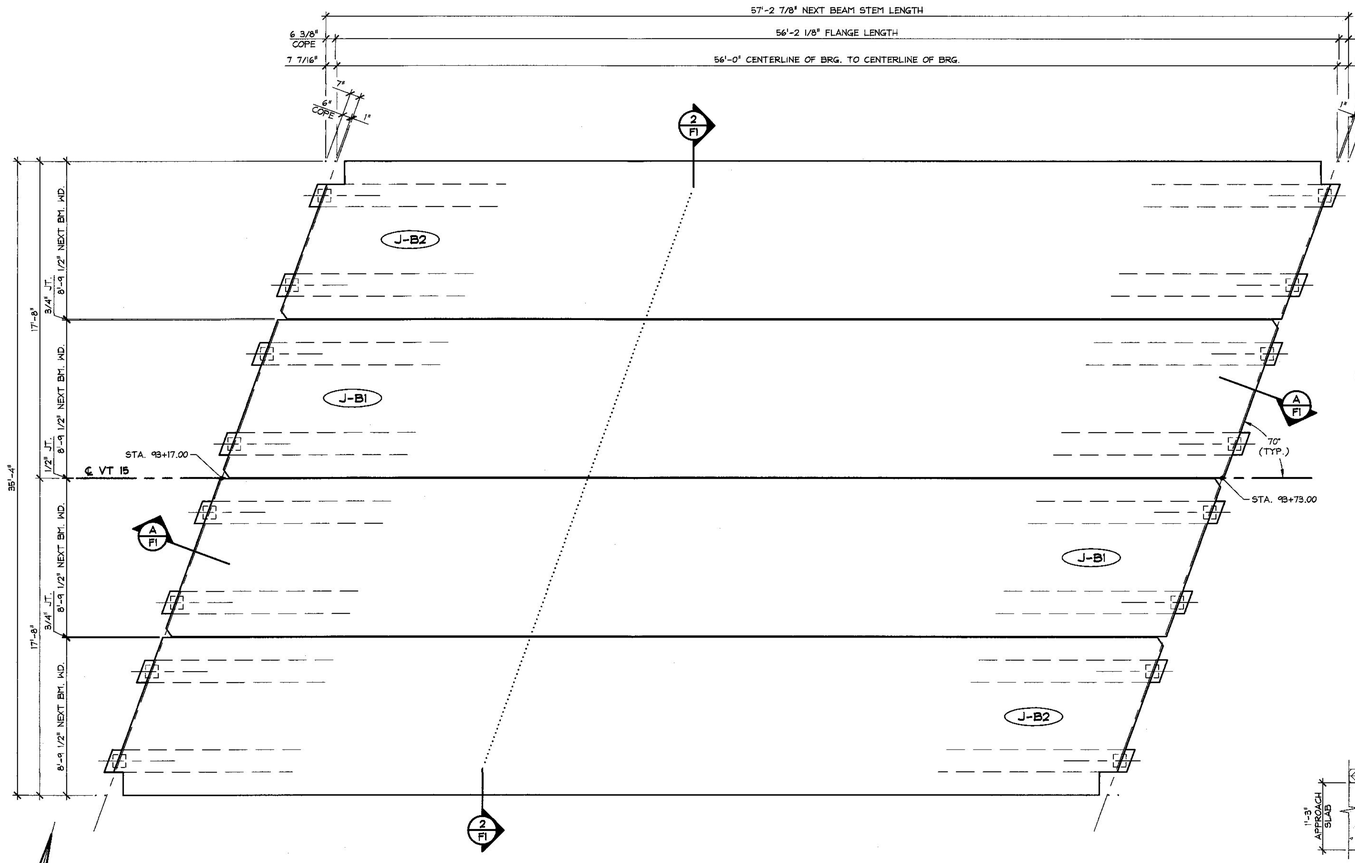
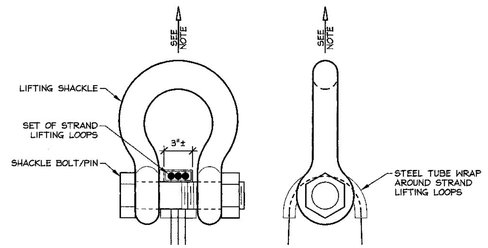


1 F1 PRESTRESSED NEXT BEAM LAYOUT

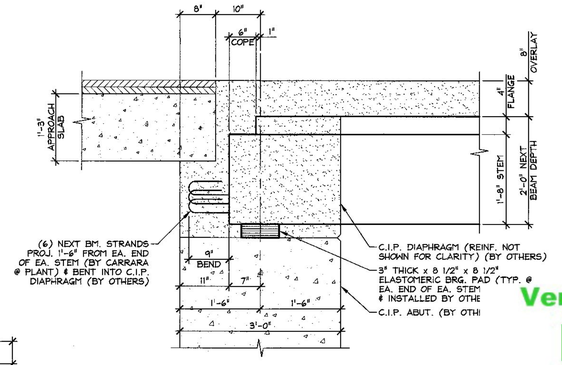
1/4" = 1'-0"



NOTE: BEAMS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. RIGGING SHALL BE CONFIGURED SUCH THAT EQUAL FORCES ARE APPLIED TO EACH SET OF LIFTING LOOPS AT EACH END OF THE BEAM. SHACKLE BOLT/PIN SHALL BE PLACED UNDER LIFT LOOPS AS SHOWN. DESIGN AND CONFIGURATION OF RIGGING BY PURCHASER.

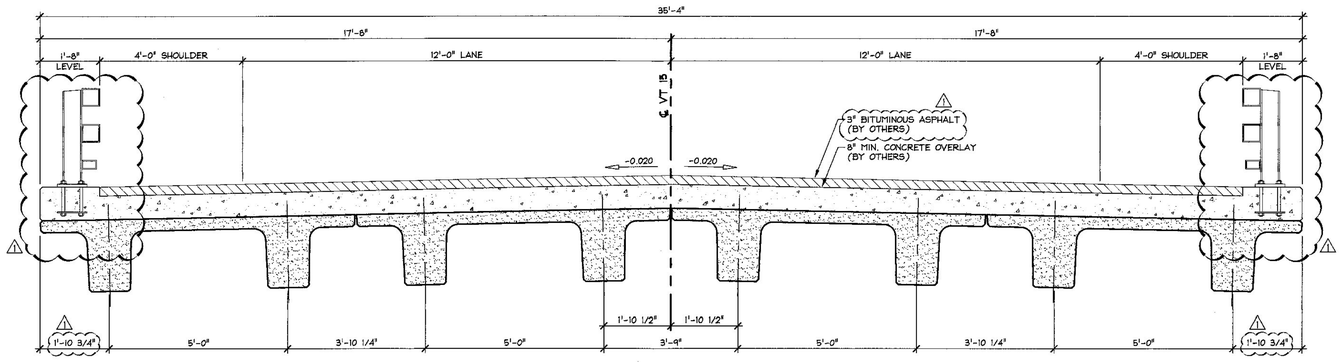
LIFTING SHACKLE DETAILS

N.T.S.



A F1 BEARING SECTION

1/4" = 1'-0"



2 F1 TRANSVERSE SECTION

1/2" = 1'-0"

GENERAL NOTES

1. MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 10,000 PSI.
2. MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 6,500 PSI.
3. REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) AND SHALL BE LEVEL II (DUAL COATED).
4. PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M203) AND SHALL CONSIST OF 0.60"ø x 270 KSI 7-WIRE LOW RELAXATION STRANDS.
5. PRESTRESSING STRANDS SHALL EACH BE PULLED TO HAVE A NET TENSION OF 44.0 K AFTER ACCOUNTING FOR CHUCK SLIPPAGE. TENSION SHALL BE VERIFIED BY MEASURING STRAND ELONGATION. (SEE EXAMPLE ELONGATION CALCULATION AND TENSIONING PROCEDURE, THIS SHEET.)
6. ENDS OF PRESTRESSING STRANDS SHALL BE CUT 3"± FROM END OF BEAM STEMS (UNLESS NOTED AS PROJECTING STRANDS, SEE BEAM DETAILS).
7. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
8. THE TOP OF BEAMS SHALL RECEIVE A TRANSVERSE RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE.
9. BEAMS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. **THE PINS OF THE SHACKLES SHALL BE PLACED THOUGH THE LIFTING LOOPS. SEE DETAIL, THIS SHEET.** BEAMS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 2'-0" OF THE BEAM ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
10. MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. PS10.02 AND PS10.05 RESPECTIVELY.

    DESIGN MIX: J.P.C. BRIDGE MIX #430M
11. QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
12. CURING METHOD: AS SOON AS THE TOP OF BEAM IS FINISHED, AN INSULATED TARP WILL BE PLACED OVER THE BEAM. THE AMBIENT ENCLOSURE AND INTERNAL CONCRETE TEMPERATURE SHALL BE RECORDED BY AUTOMATIC SENSOR INSTRUMENTS ON GRAPH CHARTS, SPACED NOT MORE THAN 100' APART AND WILL CONTINUE UNTIL RELEASE STRENGTH IS ACHIEVED. RADIANT EXTERNAL HEAT SHALL BE APPLIED IF NECESSARY TO MAINTAIN CURING ENVIRONMENT TEMPERATURE AND/OR TO ACHIEVE THE NECESSARY DETENSIONING STRENGTH. EACH CHART SHALL BE MARKED.
13. COLD WEATHER STORAGE PROVISIONS: IN THE EVENT THAT AMBIENT TEMPERATURES IMMEDIATELY FOLLOWING DETENSIONING ARE MORE THAT 40°F BELOW THE INTERIOR CONCRETE TEMPERATURE AS MEASURED BY AUTOMATIC SENSORS, THE BEAMS SHALL BE RE-COVERED AND THE ENCLOSURE ENVIRONMENT MAINTAINED WITHIN 40°F OF THE BEAM TEMPERATURE FOR A MINIMUM OF 48 HOURS IN ACCORDANCE WITH PCI MNL 116 4.19.1.6 AND ACI 306 3.4.4.

EXAMPLE PRESTRESSING STRAND ELONGATION CALC. AND TENSIONING

(NOT TO BE USED FOR CONSTRUCTION)

SIZE & GRADE: 0.60"ø x 270 KSI
AREA: 0.217 IN^2
TENSION: 44,000 LB. EACH STRANDS
GRIP-TO-GRIP: 252'-0" = 252.00'
Es = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

EXAMPLE:

$$\Delta = \frac{PL}{AE} = \frac{(44{,}000 - 3{,}000) \times 252.00 \times 12}{0.217 \times 28{,}600{,}000} = 19.98"$$

THEREFORE: (TOLERANCES ± 5%)
Δ UPPER LIMIT = 1.05 x 19.98" = 20.98" = 21"
Δ LOWER LIMIT = 0.95 x 19.98" = 18.98" = 18"

EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:

$$\Delta P = \frac{0.5 \times 41{,}000}{19.98} = 1{,}026 \text{ LBS.}$$

TOTAL TENSIONING FORCE = 44,000 + 1,026 = 45,026 LBS.

STRAND TENSIONING PROCEDURE:

1. PULL EACH STRAND INITIALLY TO 3,000# LBS. AND MARK STRAND.
2. THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,026# LBS. AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 18" & 21".

NOTE: FORCES READ ON STRESSING JACK GAUGES MUST BE MADE TO CORRESPOND TO ABOVE VALUES BASED ON CALIBRATION DATA FOR SPECIFIC JACK USED.

Vermont Agency of Transportation
RECEIVED
NEXT Beam Fabrication Resubmittal_Approved 11.21.14.pdf

CK'D BY CLB OK'D BY HIS

November 20, 2014

RESUBMIT NO Approved

BY C. CARLSON DATE 11/21/14

⚠ 11-5-14 REVISED AS NOTED

APPROVAL STAMP:

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010

A.L. ST. ONGE
CONTRACTOR
MONTOMERY, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF LAMOILLE

DATE: SEPT. 30, 2014
SCALE: NOTED

CITY OF JOHNSON
ROUTE NO: VT 15 (MINOR ARTERIAL)
BRIDGE NO.: 32 PROJECT NO.: BRF 030-2(26)

CHKD: - DFTM: B.L.
JOB NO: 23442-014

COVER SHEET

DWG. NO: F1

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