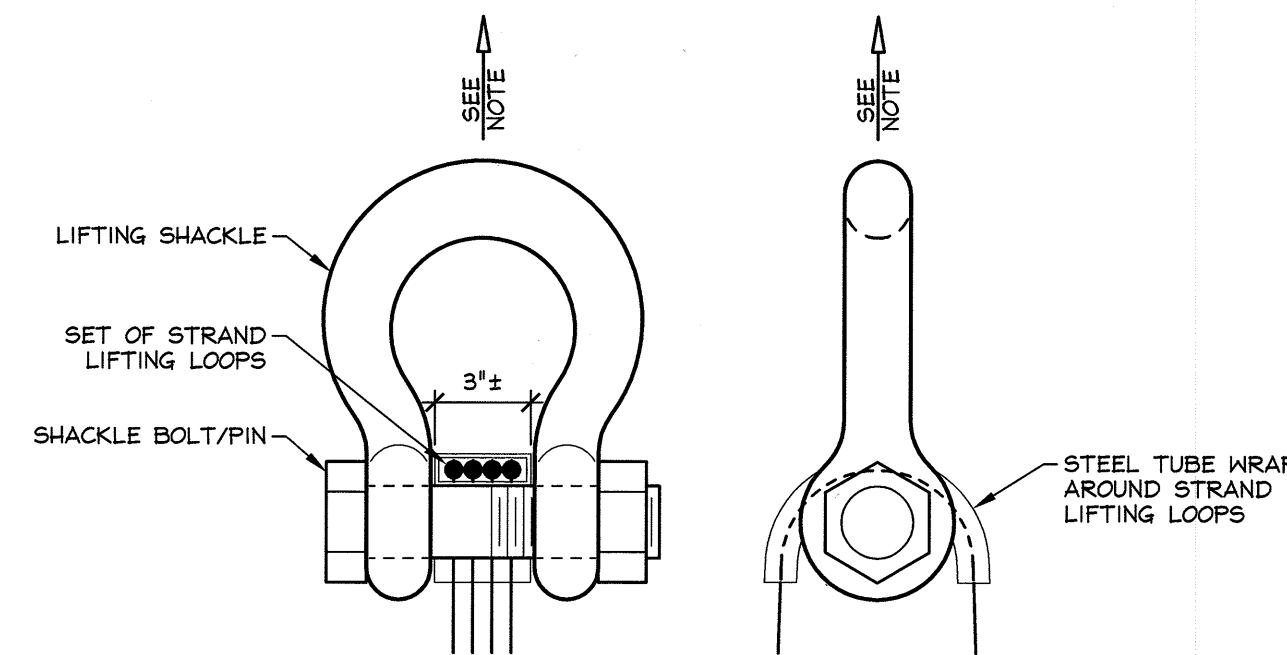


**MODIFIED NEXT BEAM 36D HOLD-DOWN
DETAIL FOR SHIPPING**
3/4" = 1'-0"



LIFTING SHACKLE DETAILS
N.T.S.

- ABUTMENT GENERAL NOTES**
- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
 - MIN. CONCRETE STRENGTH FOR HANDLING SHALL BE 5,000 PSI (UNLESS NOTED OTHERWISE).
 - REINFORCING STEEL SHALL BE GR-60, ASTM A-616 (AASHTO M31) LEVEL I (BLACK) OR ASTM A-1055 (LEVEL II DUAL COATED) (AS NOTED ON SHOP DRAWGS).
 - THE TOP OF ABUTMENTS SHALL RECEIVE A RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE (UNLESS NOTED OTHERWISE).
 - ABUTMENTS SHALL BE HANDLED AND ERCTED USING THE LIFTING LOOPS ONLY. RIGGING SHALL BE CONFIGURED SUCH THAT EQUAL AND VERTICAL FORCES ARE APPLIED TO EACH OF THE LIFTING LOOPS AT EACH END OF THE ABUTMENT. THE PINS OF THE SHACKLES SHALL BE PLACED THROUGH THE LIFTING LOOPS. SEE DETAIL; THIS SHEET. ABUTMENTS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 2'-0" OF THE ABUTMENT ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
 - MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. P540.02 AND P540.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #425M-NO DCI
APPROVAL DATE: MARCH 21, 2015
 - QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
 - CURING METHOD: AS SOON AS THE TOP OF ABUTMENTS IS FINISHED, A COVER OF POLY WILL BE PLACED OVER THE ABUTMENT. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED. AMBIENT ENCLOSURE TEMPERATURE SHALL BE MONITORED. UNITS SHALL NOT BE EXPOSED TO TEMPERATURE DIFFERENTIAL GREATER THAN 40°F. UNITS SHALL NOT BE EXPOSED TO TEMP < 36° UNTIL DESIGN STRENGTH IS ACHIEVED.
 - DUNNAGE IS LOCATED UNDER LIFTER POSITIONS.

- APPROACH SLAB GENERAL NOTES**
- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
 - MIN. CONCRETE STRENGTH FOR HANDLING SHALL BE 3,000 PSI (UNLESS NOTED OTHERWISE).
 - REINFORCING STEEL SHALL BE GR-60, ASTM A-1055 (AASHTO M31) LEVEL II (DUAL COATED) (AS NOTED ON SHOP DRAWINGS).
 - THE TOP OF APPROACH SLABS SHALL RECEIVE A SMOOTH SCREED FINISH (UNLESS NOTED OTHERWISE).
 - APPROACH SLABS SHALL BE HANDLED AND ERCTED USING THE LIFTING INSERTS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. APPROACH SLABS SHALL BE STORED & TRANSPORTED WITH TIMBER SUPPORTS AT 6" POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
 - MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. P540.02 AND P540.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #445M-SCC
APPROVAL DATE: MARCH 26 2015
 - QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
 - CURING METHOD: AS SOON AS THE TOP OF APPROACH SLABS ARE FINISHED, A COVER OF POLY WILL BE PLACED OVER THE APPROACH SLAB. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED. UNITS SHALL NOT BE EXPOSED TO TEMPERATURE DIFFERENTIAL GREATER THAN 40°F. UNITS SHALL NOT BE EXPOSED TO TEMP < 36° UNTIL DESIGN STRENGTH IS ACHIEVED.
 - SHEAR KEY SURFACES SHALL BE ROUGHENED TO PROVIDE AN 1/8" AMPLITUDE EXPOSED AGGREGATE PROFILE. FABRICATOR MAY UTILIZE A SURFACE RETARDER WITH WATER BLAST, SAND BLAST, OR A COMBINATION OF BOTH TO ACHIEVE THE DESIRED SHEAR KEY SURFACE FINISH. PROJECTING REINFORCEMENT TO BE SHIELDED FROM DAMAGE; ANY INADVERTENT DAMAGE TO EPOXY COATING SHALL BE TOUCHED UP W/ 2-PART KITS FROM DUAL COATED BAR SUPPLIER.
 - DUNNAGE IS LOCATED UNDER LIFTER POSITIONS.

- NEXT BEAM GENERAL NOTES**
- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 10,000 PSI.
 - MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 8,000 PSI.
 - REINFORCING STEEL SHALL BE GR-60, ASTM A-1055 (AASHTO M31) LEVEL II (DUAL COATED).
 - PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M203) AND SHALL CONSIST OF 0.60" x 270 KSI 7-WIRE LOW RELAXATION STRANDS.
 - 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.)
 - ENDS OF PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH END OF NEXT BEAM STEMS (UNLESS NOTED OTHERWISE) AND COATED WITH TWO PART EPOXY PAINT SYSTEM.
 - ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4" (UNLESS NOTED OTHERWISE).
 - THE TOP OF BEAMS SHALL RECEIVE A SMOOTH SCREED FINISH (UNLESS NOTED OTHERWISE).
 - SHEAR KEY SURFACES SHALL BE ROUGHENED TO PROVIDE AN 1/8" AMPLITUDE EXPOSED AGGREGATE PROFILE. PROJECTING REINFORCEMENT TO BE SHIELDED FROM DAMAGE; ANY INADVERTENT DAMAGE TO EPOXY COATING SHALL BE TOUCHED UP W/ 2-PART KITS FROM DUAL COATED BAR SUPPLIER.
 - BEAMS SHALL BE HANDLED AND ERCTED USING THE LIFTING LOOPS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. THE PINS OF THE SHACKLES SHALL BE PLACED THROUGH 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.
 - MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. P510.02 AND P510.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #430M
APPROVAL DATE: MARCH 21, 2015
 - QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
 - CURING METHOD: AS SOON AS THE TOP OF BEAM IS FINISHED, COVER WITH INSULATION AND POLY. THE DESIRED CURING TEMPERATURE RANGE SHALL NOT DROP BELOW 50°F. THE 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. EACH CHART SHALL BE MARKED WITH THE CASTING DATED AND LOCATION OF THE RECORDER. IF NECESSARY TO MAINTAIN CASTING BED TEMPERATURE PRIOR TO CONCRETE PLACEMENT OR TO ACCELERATE EARLY AGE STRENGTH GAIN, EXTERNAL RADIANT HEAT MAY BE EMPLOYED VIA HOT WATER DUCTS BENEATH AND WITHIN THE PERIPHERY OF THE CASTING BED. MAXIMUM CURING TEMPERATURE SHALL NOT EXCEED PCI SPECIFIED LIMITS. UNITS SHALL NOT BE EXPOSED TO TEMPERATURE DIFFERENTIAL GREATER THAN 40°F. UNITS SHALL NOT BE EXPOSED TO TEMP < 36° UNTIL DESIGN STRENGTH IS ACHIEVED.
 - OWNER SHALL PROVIDE APPROPRIATE WATERPROOFING TO GROUTED AND/OR EPOXIED SHEAR KEYS. J.P. CARRARA & SONS, INC. SHALL NOT BE HELD LIABLE FOR PROBLEMS ASSOCIATED WITH MOISTURE INFILTRATING GROUTED AND/OR EPOXIED SHEAR KEYS.
 - MANUFACTURING TOLERANCES SHALL COMPLY WITH PCI MNL-116.
 - TARGET CAMBER FROM THE CALCULATIONS PROVIDED BY CARRARA IS 3/4"

**EXAMPLE PRESTRESSING STRAND
ELONGATION CALC. AND TENSIONING**
(NOT TO BE USED FOR CONSTRUCTION)

SIZE & GRADE: 0.60" x 270 KSI
AREA: 0.217 IN²
TENSION: 44,000 LB. EACH STRAND
GRIP-TO-GRIP: 252'-0" = 252.00'
E_s = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

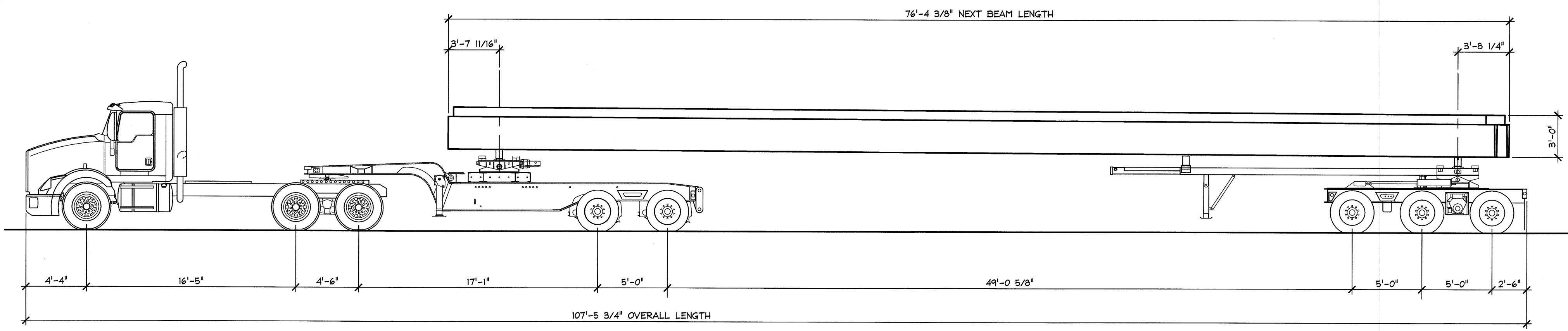
EXAMPLE:
 $\Delta = \frac{PL}{AE} = \frac{(44,000 - 3,000) \times 252.00 \times 12}{0.217 \times 28,600,000} = 19.977'$
THEREFORE: (TOLERANCES ± 5%)
 Δ UPPER LIMIT = 1.05 x 19.977' = 20.98' = 21'
 Δ LOWER LIMIT = 0.95 x 19.977' = 18.98' = 19'

EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:
 $\Delta P = \frac{0.5 \times 41,000}{19.977} = 1,026$ LBS.

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

ADDITIONALLY, INCREASED ELONGATION AND THE CORRESPONDING FORCE DUE TO FORM SHORTENING SHALL BE ACCOUNTED FOR IN THE CALCULATIONS USED FOR CONSTRUCTION PER PROVISION PCI MNL-116 5.3.11.3.

- STRAND TENSIONING PROCEDURE:**
- PULL EACH STRAND INITIALLY TO 3,000# LBS. AND MARK STRAND.
 - THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,026# LBS. AND MEASURE ELONGATION AFTER BEATING. IT MUST BE BETWEEN 19' AND 21'.
 - STRANDS IN BOTTOM TWO ROWS SHALL BE RE-PULLED TO VERIFY SHORTENING EFFECT OF SELF STRESSING BED. RE-PULL FORCE SHALL NOT INCLUDE OVER-PULL FOR SHORTENING.
 - STRANDS SHALL BE DETENSIONED WITH A TORCH PER SEQUENCE ON DETENSIONING SCHEDULE SHOWN ON THE SHOP DRAWINGS.



SHIPPING ELEVATION
3/16" = 1'-0"

APPROVAL STAMP: 3/11/16 REVISED AS PER ENGINEERS COMM. T.D.

Vermont Agency of Transportation
RECEIVED
CK'D BY SC, TM OK'D BY G. Laroche
March 18, 2016
RESUBMIT No Approved AsNoted
BY K. Higgins DATE 3/28/2016

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

J.A. McDonald, Inc.
CONTRACTOR
LYNDON CENTER, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF RUTLAND

TOWN OF CLARENDON
WALKER MOUNTAIN ROAD, TH #3, RURAL COLLECTOR
BRIDGE NO.: 11 PROJECT NO.: BRO 1443(48)

DATE: JAN. 8, 2016
SCALE: NOTED
CHKD: B.C. DFTM: T.D.
JOB NO: 23476-015
DWG. NO: C1

COVER SHEET