

- SOLID SLAB GENERAL NOTES**
- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 8,000 PSI.
  - MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 5,500 PSI.
  - REINFORCING STEEL SHALL BE GR-60, ASTM A-955 (AASHTO M31), LEVEL III STAINLESS STEEL.
  - 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 SOLID SLABS USING AN ABRASIVE WHEEL (UNLESS NOTED OTHERWISE) AND TWO PART EPOXY PAINTED.
  - ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4" (U.N.O.).
  - THE TOP OF SLABS SHALL RECEIVE A SMOOTH SCREED FINISH (UNLESS NOTED OTHERWISE).
  - SHEAR KEY SURFACES SHALL BE SAND BLASTED CLEAN FOR A ROUGHENED SURFACE WITH 1/8" AMPLITUDE.
  - SLABS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. RIGGING SHALL BE CONFIGURED SUCH THAT EQUAL FORCES ARE APPLIED TO EACH OF THE TWO LIFTING LOOPS AT EACH END OF THE SLAB. 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. SLABS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 2'-0" OF THE SLAB ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC. ONCE SLABS HAVE BEEN ERECTED, CUT LIFTING LOOPS AT RECESS, EPOXY PAINT AND PATCH AS REQUIRED (BY OTHERS).
  - MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. PS10.02 AND PS10.05 RESPECTIVELY.  
DESIGN MIX: J.P.C. BRIDGE MIX #430M ROCK  
AIR 5% - 9%  
SPREAD 20" - 28"  
APPROVAL DATE SEPT. 14, 2017
  - QUALITY CONTROL AND REPAIR 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 THE SOLID SLABS ARE FINISHED, A COVER OF POLY WILL BE PLACED OVER THE UNITS IN A MANNER THAT WILL NOT DISTURB THE FINISH AND REMAIN UNTIL DESIGN STRENGTH IS ACHIEVED. THE TEMPERATURE SHALL BE RECORDED BY AUTOMATIC SENSOR INSTRUMENT ON GRAPH CHART AND WILL CONTINUE UNTIL RELEASE STRENGTH IS ACHIEVED. THE CHART SHALL BE MARKED AND PROVIDED TO THE QA INSPECTOR. THE UNITS SHALL NOT BE EXPOSED TO A TEMPERATURE DIFFERENTIAL BETWEEN THE SURFACE OF THE HARDENED CONCRETE AND THE AMBIENT STORAGE ENVIRONMENT OF GREATER THAN 40°F AT ANY TIME. UNITS SHALL NOT BE EXPOSED TO AMBIENT TEMPERATURES LESS THAN 36°F UNTIL THE DESIGN STRENGTH IS ACHIEVED. CURING ENDS WHEN DESIGN STRENGTH IS REACHED.

**EXAMPLE PRESTRESSING STRAND ELONGATION CALC. AND TENSIONING**  
PER PCI MNL. 116, SECTION 5.2 (NOT TO BE USED FOR CONSTRUCTION)

SIZE & GRADE: 0.60" x 270 KSI  
AREA: 0.217 IN<sup>2</sup>  
TENSION: 44,000 LB. EACH STRAND  
GRIP-TO-GRIP: 189'-0" = 189.00'  
E<sub>s</sub> = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS, VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

EXAMPLE:  
 $\Delta = \frac{PL}{AE} = \frac{(44,000 - 3,000) \times 189.00 \times 12}{0.217 \times 28,600,000} = 14.983'$   
 $\Delta = \frac{AE}{E_s} = \frac{0.217 \times 28,600,000}{14,983} = 414.983'$

THEREFORE: (TOLERANCES ± 5%)  
Δ UPPER LIMIT = 1.05 x 14.983' = 15.73' = 15 3/4"  
Δ LOWER LIMIT = 0.95 x 14.983' = 14.23' = 14 1/4"

EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:  
 $\Delta P = \frac{0.5 \times 41,000}{14,983} = 1,368$  LBS.

TOTAL TENSIONING FORCE = 44,000 + 1,368 = 45,368 LBS.

**STRAND TENSIONING PROCEDURE:**

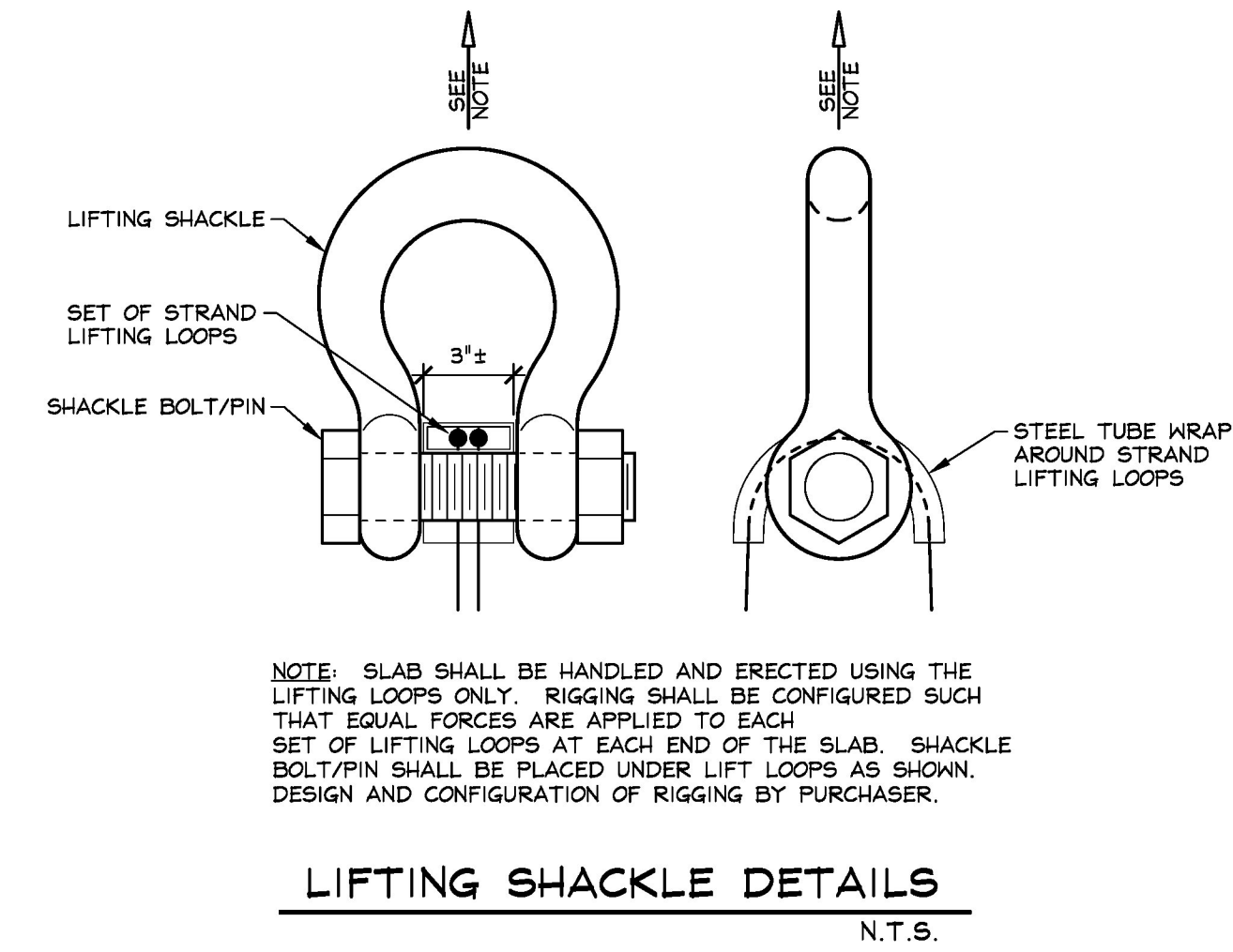
- PULL EACH STRAND INITIALLY TO 3,000\* LBS. AND MARK STRAND.
- THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,368\* LBS. AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 14 1/4" AND 15 3/4".

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

Summary of Estimated Solid Slab Beam Midspan Cambers  
Reference JPC Camber/Deflection Tables for each Beam

SS Beam No.	CL to CL Bearing Span Length	Estimated Midspan Camber			Camber Tolerance +/-	Min/Max Allowable Camber at Release		Min/Max Allowable Camber at Erection*		Min/Max Allowable Camber at Final	
		Release (in.)	Erection (in.)	Final (in.)		(-)	(+)	(-)	(+)	(-)	(+)
1	31.98	0.76	1.36	1.81	-0.40	0.36	1.16	0.96	1.76	1.41	2.21
2	32.45	0.89	1.59	2.13	-0.41	0.41	1.30	1.18	2.00	1.72	2.54
3	32.89	0.91	1.63	2.17	-0.42	0.42	1.33	1.21	2.04	1.76	2.59
4	33.33	0.93	1.66	2.21	-0.42	0.42	1.35	1.24	2.08	1.79	2.64
5	33.78	0.95	1.69	2.26	-0.43	0.43	1.37	1.26	2.12	1.83	2.68
6	34.22	0.96	1.72	2.30	-0.43	0.43	1.40	1.29	2.16	1.86	2.73
7	34.66	0.98	1.75	2.34	-0.44	0.44	1.42	1.32	2.19	1.90	2.78
8	35.11	1.00	1.79	2.38	-0.44	0.44	1.45	1.34	2.23	1.93	2.82
9	35.56	1.02	1.82	2.42	-0.45	0.45	1.47	1.37	2.27	1.97	2.87
10	36.00	1.04	1.85	2.46	-0.48	0.48	1.51	1.37	2.33	1.98	2.93
11	39.03	1.15	2.05	2.71	-0.50	0.50	1.65	1.55	2.55	2.21	3.21
12	42.06	1.25	2.23	2.92	-0.50	0.50	1.75	1.73	2.73	2.42	3.42
13	44.67	1.33	2.35	3.06	-0.50	0.50	1.83	1.85	2.85	2.56	3.56
14	46.45	0.94	1.66	2.09	-0.50	0.50	1.44	1.16	2.16	1.59	2.59

\*Erection Time Step is assumed to occur approximately 30 to 60 days after release.



Vermont Agency of Transportation  
**RECEIVED**  
CK'D BY Stephen Coley OK'D BY Rob Young  
February 13, 2017  
RESUBMIT No Approved  
BY Rob Young DATE 02/13/2017

Production/Record Set  
2.13.18  
J.P. CARRARA & SONS, INC.  
MIDDLEBURY, VT 05753

APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2484 CASE ST., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010	Cold River Bridges CONTRACTOR Walpole, New Hampshire
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF WINDSOR	DATE: JAN. 18, 2018 SCALE: NOTED
	WOODSTOCK VILLAGE TH 1/US 4 (CLASS 1) VILLAGE PRINCIPAL ARTERIAL BRIDGE NO.: 51 PROJECT NO.: BF 020-2 (43)	CHKD: A.S. DFTM: T.D. JOB NO: 23522-017
	<b>SECTIONS &amp; DETAILS</b>	DWG. NO: <b>F2</b>