

**ABUTMENT & WING WALL GENERAL NOTES**

- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
- MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 3,500 PSI.
- REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) LEVEL II (DUAL COATED) OR EPOXY COATED (AS NOTED ON SHOP DRAWINGS).
- THE TOP OF ABUTMENTS SHALL RECEIVE A RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE (UNLESS NOTED OTHERWISE).
- THE TOP OF WING WALLS SHALL RECEIVE A SMOOTH FLOAT FINISH (UNLESS NOTED OTHERWISE).
- SHEAR KEY SURFACES SHALL BE BLASTED CLEAN.
- PRECAST CONCRETE UNITS SHALL BE HANDLED AND ERECTED USING THE LIFTING INSERTS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. NON-PRESTRESSED UNITS SHALL BE STORED & TRANSPORTED WITH TIMBER SUPPORTS AT 5th POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
- MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. PS10.02 AND PS10.05 RESPECTIVELY.  
 DESIGN MIX:  
 WING WALLS: J.P.C. BRIDGE MIX #445M5CC  
 APPROACH SLABS: J.P.C. BRIDGE MIX #445M5CC  
 ABUTMENTS: J.P.C. BRIDGE MIX #445M5CC
- 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 PRECAST CONCRETE UNITS ARE FINISHED, A COVER OF RIGID INSULATION AND POLY WILL BE PLACED OVER THE UNIT. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED.
- ERECT PRECAST CONCRETE ABUTMENTS, AND POST-TENSION CENTER TENDON TO APPROXIMATELY 5,000 LBS.  
 GROUT SHEAR KEY.  
 ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI; POST-TENSION TENDONS TO 32,000 LBS.

~~10. SILANE SEALER SHALL BE SHOP APPLIED BY OTHERS TO ALL EXPOSED PRECAST CONCRETE WITH THE EXCEPTION OF THE BOTTOM OF THE PRECAST NEXT BEAMS BETWEEN DRIP NOTCHES.~~

**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-615 (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 EPOXY PAINTED.
- ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
- THE TOP OF BEAMS SHALL RECEIVE A SMOOTH FLOAT FINISH (UNLESS NOTED OTHERWISE).
- SHEAR KEY SURFACES SHALL RECEIVE A ROUGHENED SURFACE.
- BEAMS 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 BEAM. 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. PS10.02 AND PS10.05 RESPECTIVELY.  
 DESIGN MIX: J.P.C. BRIDGE MIX #430M
- 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, A COVER OF INSULATED POLY. THE DESIRED CURING TEMPERATURE RANGE SHALL NOT DROP BELOW 70°. 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.
- 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.

**EXAMPLE PRESTRESSING STRAND ELONGATION CALC. AND TENSIONING**  
(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: 252'-0" = 252.00'  
 $E_s = 28,600,000$  PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND POOL ACTUALLY USED)

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

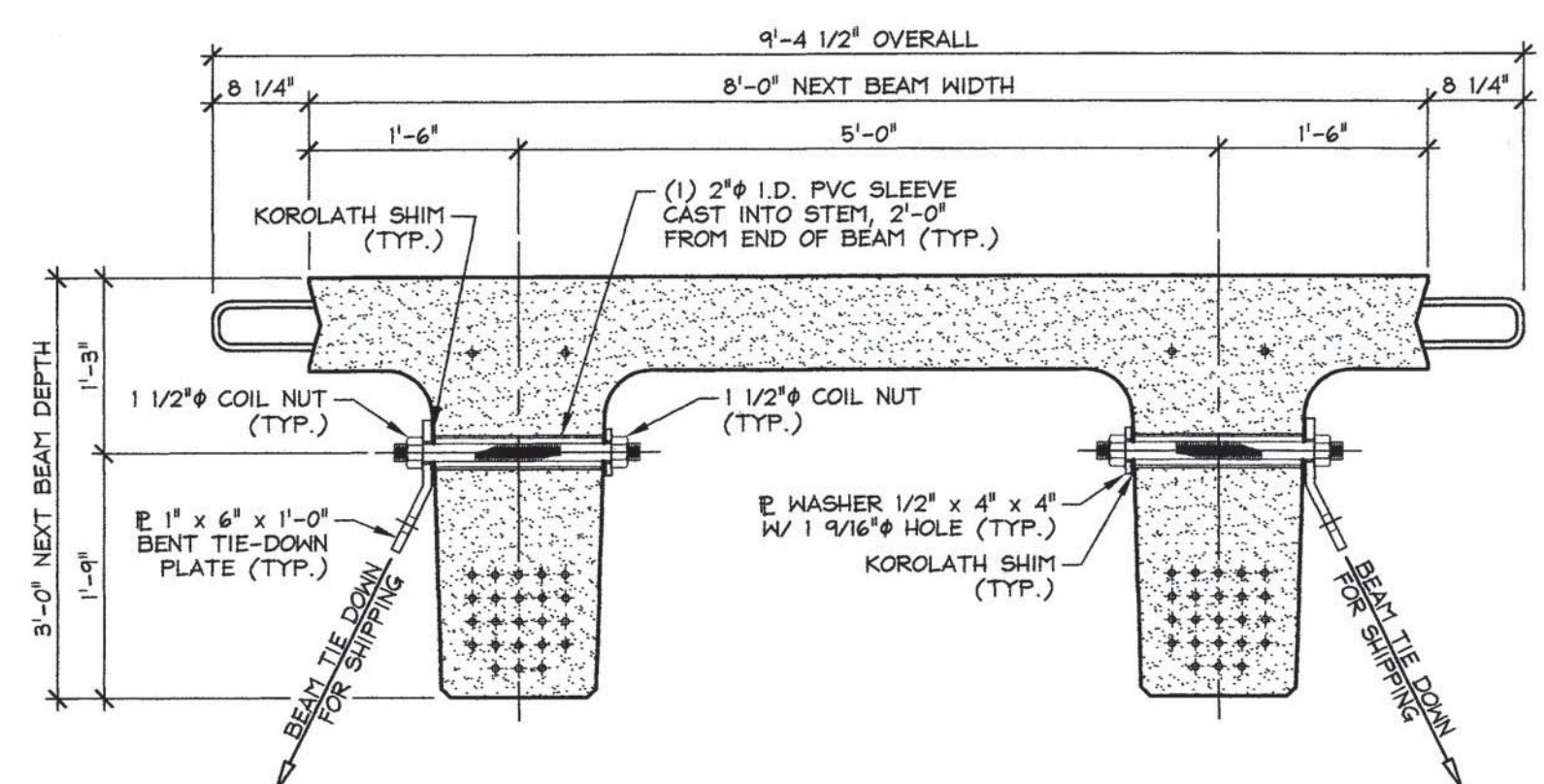
**STRAND TENSIONING PROCEDURE:**

- 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 SEATING. IT MUST BE BETWEEN 19' & 21'.
- \*NOTE: FORCES READ ON STRESSING JACK GAUGES MUST BE MADE TO CORRESPOND TO ABOVE VALUES BASED ON CALIBRATION DATA FOR SPECIFIC JACK USED.

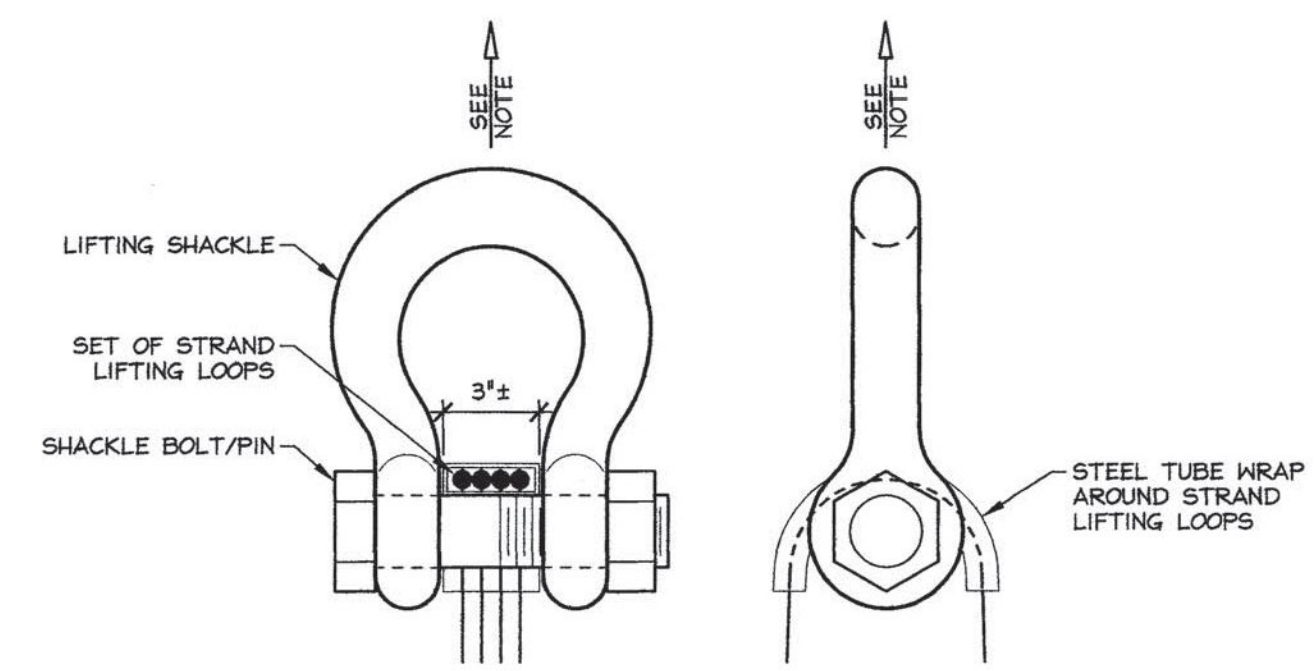
**DRAWING INDEX**

SHT. #	DRAWING TITLE	REV. #	REV. DATE
C1	COVER SHEET	1	1-16-14
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F3	ABUTMENT DETAILS	1	1-16-14
F4	TRANSVERSE SECTIONS & DETAILS	1	1-16-14
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NB2	PRESTRESSED NEXT BEAM DETAILS "W-NB1"	1	1-16-14
NB3	PRESTRESSED NEXT BEAM DETAILS "W-NB3"	1	1-16-14
AS1	PRECAST APPROACH SLAB DETAILS "W-AS1"		
AS2	PRECAST APPROACH SLAB DETAILS "W-AS2" & "W-AS3"		
AB1	PRECAST ABUTMENT PLAN, SECTION & DETAILS	1	1-16-14
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WV1	PRECAST WING WALL DETAILS "W-WV1" & "W-WV2"	1	1-16-14
M1	MATERIALS LIST	1	1-16-14

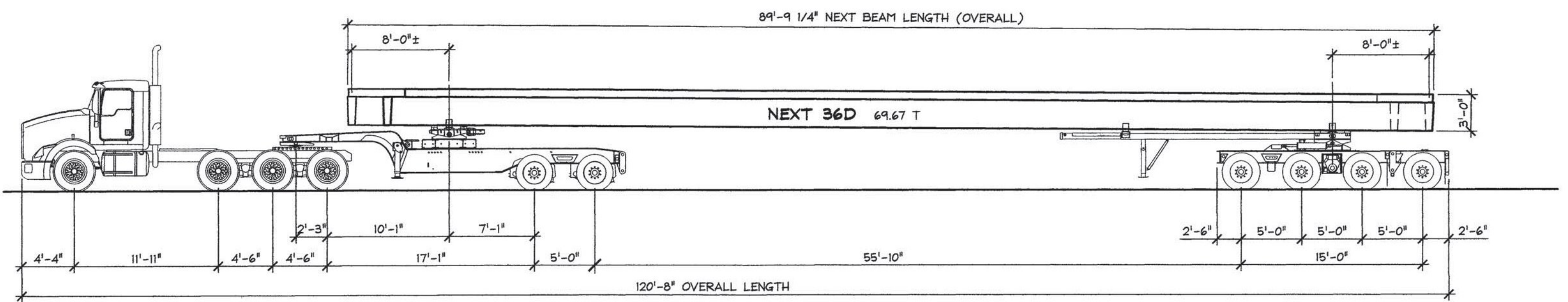
DESIGN LIVE LOAD: HL-93



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



LIFTING SHACKLE DETAILS  
N.T.S.



SHIPPING ELEVATION  
N.T.S.

1-16-14 REVISED AS NOTED

APPROVAL STAMP:

**Vermont Agency of Transportation**  
**RECEIVED**  
 CK'D BY JDG/JW OK'D BY WDL  
 January 27, 2014  
 RESUBMIT No Approved AsNoted  
 BY KMH DATE 02/10/2014

**J.P. CARRARA & SONS INC.** MILLER CONSTRUCTION, INC.  
 Precast & Prestress Manufacturer CONTRACTOR  
 2464 GAGE ST., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010 BARNARD, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF WINDSOR DATE: DEC. 18, 2013  
 SCALE: NOTED

TOWN OF BARNARD VT ROUTE 12, MAJOR COLLECTOR CHKD: - DFTM: B.L.  
 BRIDGE NO.: 25 PROJECT NO.: ER BRF 0241(39) JOB NO: 23413-013

COVER SHEET DWG. NO: C1