

State of Vermont
Highway Division
Project Delivery Bureau
Structures Design Section
National Life Building – Drawer 33
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Agency of Transportation

April 14, 2015

Contractor: T. Buck

Project Name: Burke BRF 0269(13)

Structure Identification: VT 114, Bridge #13

In response to RFI2, note 3 has been updated to include both Level 1 (Black) and Level 1(Epoxy). An updated sheet is attached.

Sincerely,



Project Manager

Cc. Kevin McClure, Resident Engineer
Ron Gray, Regional Construction Engineer
Jim Wild, Concrete Fabrication Inspector

ABUTMENT & APPROACH SLAB GENERAL NOTES

- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
- MIN. CONCRETE STRENGTH AT STRIPPING SHALL BE 4,000 PSI (UNLESS NOTED OTHERWISE).
- REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) LEVEL II (DUAL COATED) (ASTM A-1025) OR LEVEL I (BLACK STEEL), (AS NOTED ON SHOP DRAWINGS). **OR LEVEL I (EPOXY)**
- THE TOP OF PRECAST CONCRETE UNITS SHALL RECEIVE A SMOOTH FLOAT FINISH (UNLESS NOTED OTHERWISE).
- SHEAR KEY SURFACES SHALL BE SAND BLASTED CLEAN. REINFORCING STEEL PROJECTING FROM APPROACH SLABS WILL BE COVERED DURING SAND BLASTING SO THAT COATING IS NOT DAMAGED.
- APPROACH SLABS SHALL BE HANDLED AND ERECTED 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 5th POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC. ONCE ABUTMENTS HAVE BEEN ERECTED, CUT LIFTING LOOPS AT RECESS, EPOXY PAINT AND PATCH AS REQUIRED (BY OTHERS).
- ABUTMENTS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. THE PINS OF THE SHACKLES SHALL BE PLACED THROUGH THE LIFTING LOOPS. SEE DETAIL, SHEET C1. VERTICAL FORCES ONLY SHALL BE APPLIED TO THE LIFTING LOOPS. ABUTMENTS SHALL BE STORED & TRANSPORTED WITH TIMBER SUPPORTS AT 5th POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC. ONCE ABUTMENTS 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:
APPROACH SLABS: J.P.C. BRIDGE MIX #445MSCC
ABUTMENTS: J.P.C. BRIDGE MIX #445MSCC
- 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 POLY WILL BE PLACED OVER THE UNIT. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED. CURING SHALL CONTINUE UNTIL STRIPPING STRENGTH HAS BEEN ACHIEVED.

SHEAR KEY SURFACES SHALL HAVE 1/8" COARSE AGGREGATE EXPOSED WITH A PROFILE SIMILAR TO ICRI ROUGHNESS PLAQUE CSP #7 COPYRIGHT 1997.

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 T-HIRE 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".
- THE TOP OF BEAMS SHALL RECEIVE A SMOOTH SCREED (UNLESS NOTED OTHERWISE).
- SHEAR KEY SURFACES SHALL BE SAND BLASTED TO 1/8" AMPLITUDE.
- BEAMS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. RIGGING SHALL BE CONFIGURED SUCH THAT EQUAL AND VERTICAL 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. TIMBER SUPPORTS SHALL BE PLACED WITHIN CLOSE PROXIMITY TO THE SHIPPING SLEEVE LOCATION AS SHOWN BELOW, 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.
NEXT BEAM MIX #430M WITH 5 GALLONS OF CORROSION INHIBITOR
- 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 10°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.
- CONTRACTOR SHALL PROVIDE APPROPRIATE FIELD 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: 0.211 IN²
TENSION: 44,000 LB. EACH STRAND
GRIP-TO-SLIP: 252'-0" = 252.00'
Es = 28,500,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)
EXAMPLE:
$$\Delta = \frac{PL}{AE} = \frac{(44,000 - 3,000) \times 252.00 \times 12}{0.211 \times 28,500,000} = 20.041"$$

THEREFORE: (TOLERANCES ± 5%)
Δ UPPER LIMIT = 1.05 x 20.041" = 21.05" = 21"
Δ LOWER LIMIT = 0.95 x 20.041" = 19.04" = 19"
EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:
$$\Delta P = \frac{0.5 \times 41,000}{20.041} = 1,023 \text{ LBS.}$$

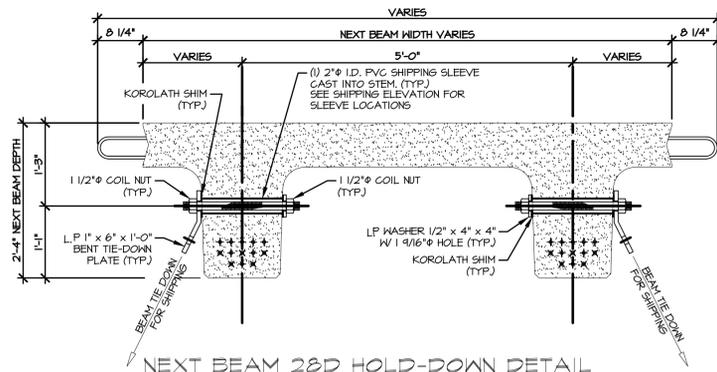
TOTAL TENSIONING FORCE = 44,000 + 1,023 = 45,023 LBS.
ADDITIONALLY, INCREASED ELONGATION AND THE CORRESPONDING FORCE DUE TO FORM SHORTENING SHALL BE ACCOUNTED FOR IN THE CALCULATIONS USED FOR CONSTRUCTION PER PROVISION PCI MNL 116 5.3.13.

STRAND TENSIONING PROCEDURE:

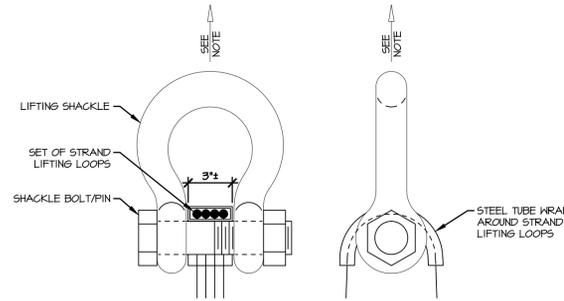
- PULL EACH STRAND INITIALLY TO 3,000* LBS. AND MARK STRAND.
- THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,023* LBS. AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 19" AND 21".
*NOTE: FORCES READ ON STRESSING JACK GAUGES MUST BE MADE TO CORRESPOND TO ABOVE VALUES BASED ON CALIBRATION DATA FOR SPECIFIC JACK USED.
- 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.

DRAWING INDEX

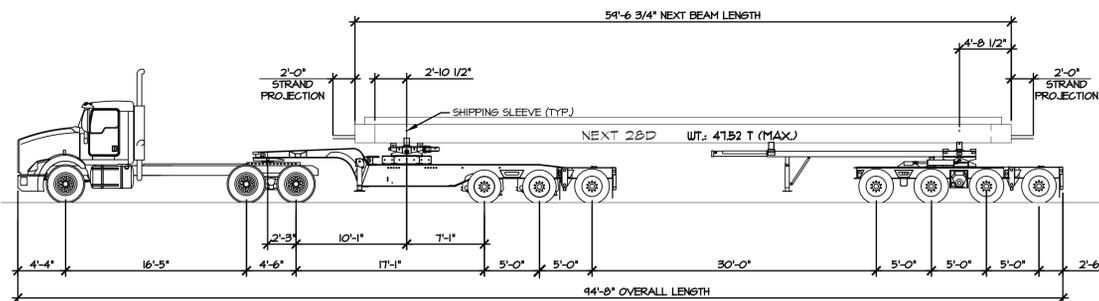
SHT. #	DRAWING TITLE	REV. #	REV. DATE
C1	COVER SHEET	2	04-03-15
F1	PRECAST ABUTMENT APPROACH SLAB & NEXT BEAM LAYOUT	2	04-03-15
F2	PRECAST ABUTMENT # 1 ELEVATION & SECTIONS	2	04-03-15
F3	PRECAST ABUTMENT # 2 ELEVATION	2	04-03-15
F4	TRANSVERSE SECTIONS & DETAILS	2	04-03-15
AB1	PRECAST ABUTMENT FLANS & SECTION	2	04-03-15
AB2	PRECAST ABUTMENT # 1 DETAILS	2	04-03-15
AB3	PRECAST ABUTMENT # 2 DETAILS	2	04-03-15
AB4	PRECAST ABUTMENT # 3 DETAILS	2	04-03-15
AB5	PRECAST ABUTMENT # 4 DETAILS	2	04-03-15
AS1	PRECAST APPROACH SLAB DETAILS	2	04-03-15
AS2	PRECAST APPROACH SLAB DETAILS	2	04-03-15
AS3	PRECAST APPROACH SLAB DETAILS	2	04-03-15
NB1A	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB1B	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB1C	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB1D	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB2A	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB2B	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB2C	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB3A	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB3B	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB3C	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
NB3D	PRESTRESSED NEXT BEAM DETAILS	2	04-03-15
M1	MATERIALS LIST	2	04-03-15
M2	MATERIALS LIST	2	04-03-15
M3	MATERIALS LIST	2	04-03-15



NEXT BEAM 28D HOLD-DOWN DETAIL FOR SHIPPING
3/4" x 1'-0"



LIFTING SHACKLE DETAILS
N.T.S.



SHIPPING ELEVATION
N.T.S.

01-22-15 REVISED

APPROVAL STAMP:

J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010		T. BUCK CONSTRUCTION, INC CONTRACTOR AUBURN, MAINE	
STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF CALEDONIA		DATE: MAR 26, 2015	SCALE: NOTED
TOWN OF BURKE VERMONT ROUTE 114 BRIDGE NO.: 13 PROJECT NO.: BRP 0269(13)		CHKD: --	DFTM: JDK
COVER SHEET		JOB NO: 23454-015	DWG. NO: C1

Vermont Agency of Transportation
RECEIVED
CK'D BY _____ OK'D BY _____
April 6, 2015
RESUBMIT No Approved AsNoted
BY Rob Young DATE 04/13/2015

SHOP DRAWING REVIEW

REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.

REJECTED REVISE AND RESUBMIT APPROVED AS NOTED

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THEIR WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING THEIR WORK IN A SAFE AND SATISFACTORY MANNER.

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Manchester, NH 03101
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Job Number: 120121
Reviewed by: SRB
Date: 04/10/2015