

Vermont Agency of Transportation

RECEIVED

ON: May 26, 2015

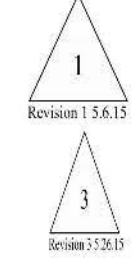
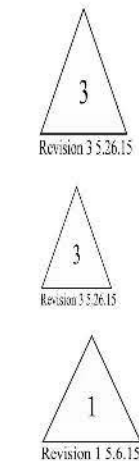
and Checked for

CONFORMANCE

BY: Jennifer Fitch DATE: 05/28/2015

ABUTMENT, WING WALL & APPROACH SLABS GENERAL NOTES

- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI. ABUTMENT & WING WALLS = 5,000 PSI. APPROACH SLABS = 4,000 PSI.
- MIN. CONCRETE STRENGTH FOR HANDLING OF WING WALLS AND APPROACH SLABS SHALL BE 3,500 PSI (UNLESS NOTED OTHERWISE).
- MIN. CONCRETE STRENGTH FOR HANDLING OF ABUTMENTS SHALL BE 5,000 PSI.
- ALL REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) LEVEL II (DUAL COATED).
- THE TOP OF ABUTMENTS SHALL RECEIVE A RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE (UNLESS NOTED OTHERWISE).
- THE TOP OF WING WALLS AND APPROACH SLABS SHALL RECEIVE A SMOOTH SCREED FINISH (UNLESS NOTED OTHERWISE).
- SHEAR KEY SURFACES SHALL BE SAND 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. P510.02 AND P510.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #445MSCC
APPROACH SLABS: J.P.C. BRIDGE MIX #445MSCC
ABUTMENTS: J.P.C. BRIDGE MIX #425M-NO DCI
- 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.
- ABUTMENT POST-TENSIONING SEQUENCE:
A. ERECT PRECAST CONCRETE ABUTMENTS AND INSTALL TRANSVERSE STRANDS.
B. APPLY EPOXY BONDING COMPOUND TO MATCH CAST FACES OF VERTICAL CONSTRUCTION JOINTS.
C. TENSION STRANDS TO 3 KIPS.
D. CHECK ALIGNMENT OF PILE CAP ELEMENTS.
E. POST-TENSION STRANDS TO 32 KIPS.



NEXT BEAM GENERAL NOTES

- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 10,000 PSI.
- MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 7,500 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).
- ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
- THE TOP OF BEAMS SHALL RECEIVE A SMOOTH SCREED FINISH (UNLESS NOTED OTHERWISE).
- SHEAR KEY SURFACES SHALL BE ROUGHENED 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. P510.02 AND P510.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #430M W/5 GAL 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 50°. 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 GROUDED AND/OR EPOXIED SHEAR KEYS. J.P. CARRARA & SONS, INC. SHALL NOT BE HELD LIABLE FOR PROBLEMS ASSOCIATED WITH MOISTURE INFILTRATING GROUDED 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 IN²
TENSION: 44,000 LB. EACH STRAND
GRIP-TO-GRIP: 252'-0" = 252.00'
Es = 28,500,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

EXAMPLE:
$$\Delta = \frac{PL}{AE} = \frac{(44,000 - 3,000) \times 252.00 \times 12}{0.217 \times 28,500,000} = 20.047"$$

THEREFORE: (TOLERANCES ± 5%)
 Δ UPPER LIMIT = 1.05 x 20.047" = 21.05" = 21"
 Δ LOWER LIMIT = 0.95 x 20.047" = 19.04" = 19"

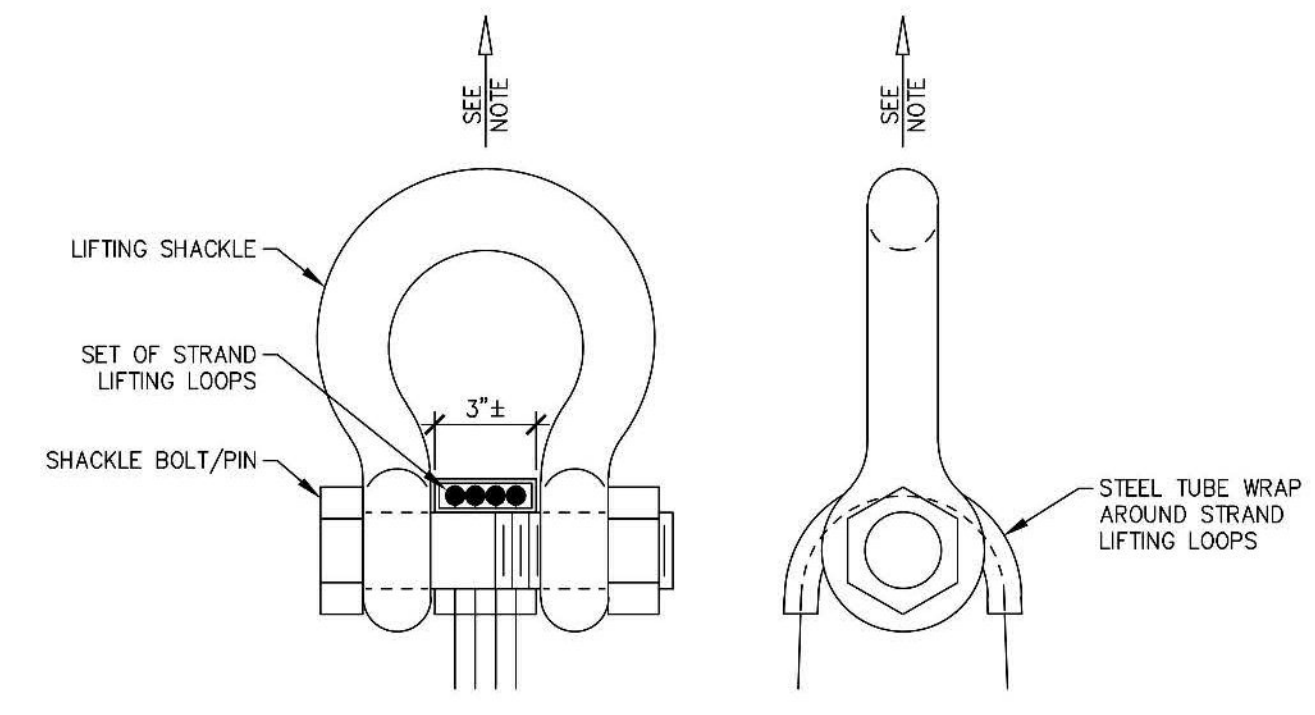
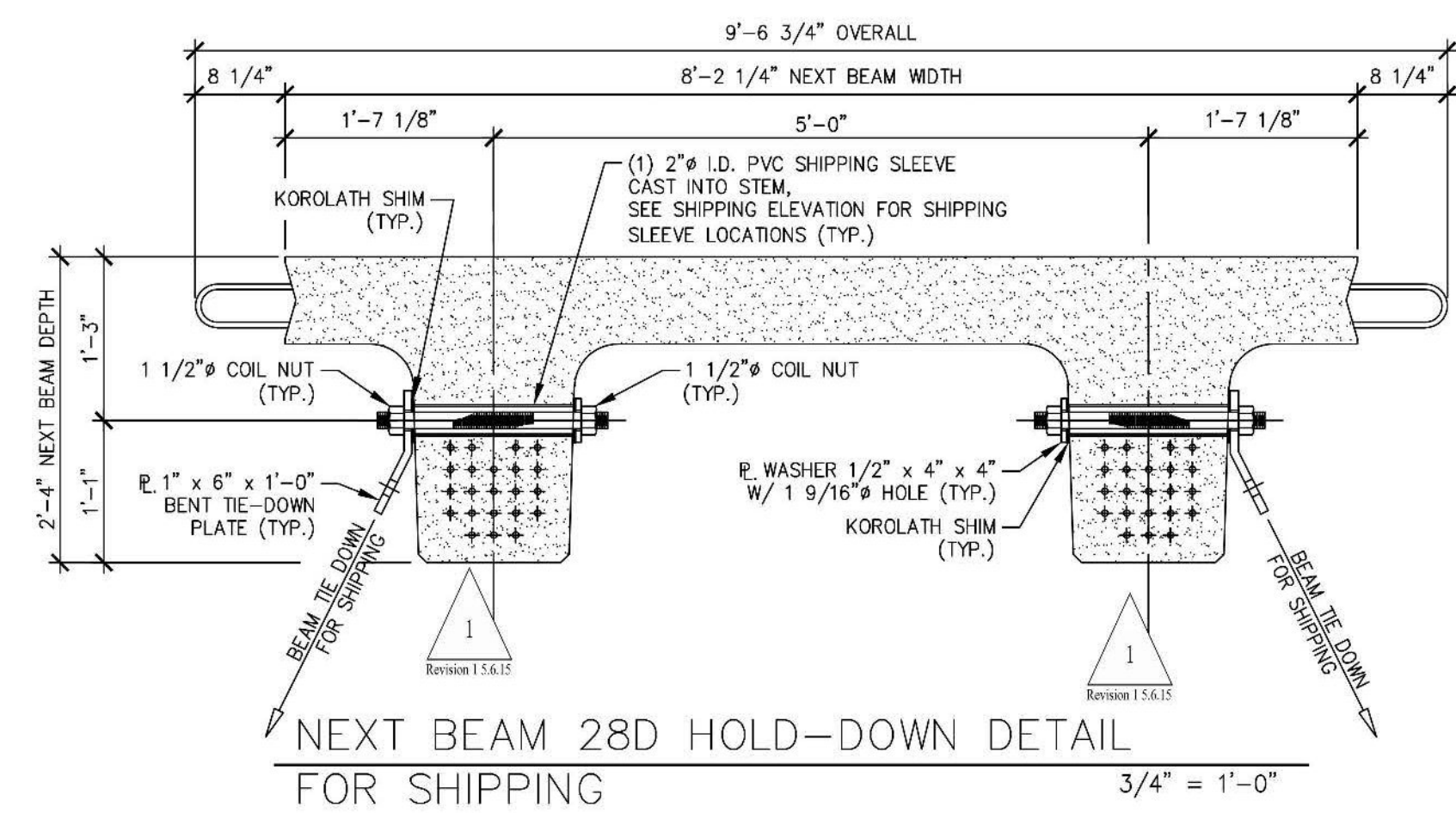
EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:
$$\Delta P = \frac{0.5 \times 41,000}{20.047} = 1,023 \text{ LBS.}$$

TOTAL TENSIONING FORCE = 44,000 + 1,023 = 45,023 LBS.

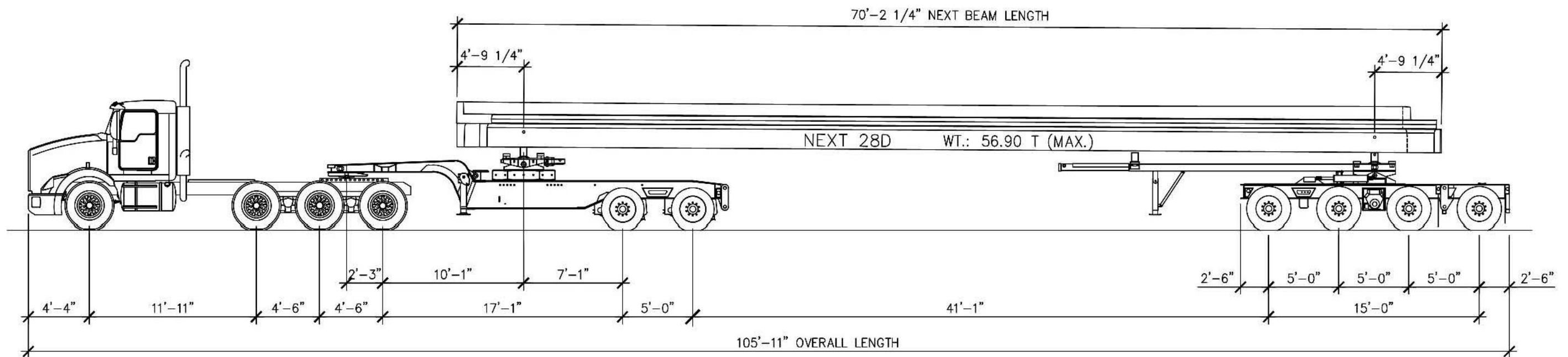
ADDITIONALLY, INCREASED ELONGATION AND THE CORRESPONDING FORCE DUE TO FORM SHORTENING SHALL BE ACCOUNTED FOR IN THE CALCULATIONS USED FOR CONSTRUCTION PER PROVISION PCI MNL 116 5.3.11.3.

STRAND TENSIONING PROCEDURE:

- PULL EACH STRAND INITIALLY TO 3,000* LBS. AND MARK STRAND.
 - THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,023* 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.



LIFTING SHACKLE DETAILS N.T.S.



SHIPPING ELEVATION N.T.S.

DRAWING INDEX			
SHT. #	DRAWING TITLE	REV. #	REV. DATE
C1	COVER SHEET	1	5/26/15
F1	PRECAST ABUTMENT LAYOUT	1	5/26/15
F2	ABUTMENT #1 ELEVATIONS	1	5/26/15
F3	ABUTMENT #2 ELEVATIONS	1	5/26/15
F4	PRESTRESSED NEXT BEAM & APPROACH SLAB LAYOUT	1	5/26/15
F5	TRANSVERSE SECTION & DETAILS	1	5/26/15
NB1	PRESTRESSED NEXT BEAM DETAILS	1	5/26/15
NB2	PRESTRESSED NEXT BEAM DETAILS "CT-NB1"	1	5/26/15
NB2.1	PRESTRESSED NEXT BEAM DETAILS "CT-NB1"	1	5/26/15
NB3	PRESTRESSED NEXT BEAM DETAILS "CT-NB2"	1	5/26/15
NB3.1	PRESTRESSED NEXT BEAM DETAILS "CT-NB2"	1	5/26/15
NB3.2	PRESTRESSED NEXT BEAM DETAILS "CT-NB2"	1	5/26/15
NB4	PRESTRESSED NEXT BEAM DETAILS "CT-NB3"	1	5/26/15
NB4.1	PRESTRESSED NEXT BEAM DETAILS "CT-NB3"	1	5/26/15
NB4.2	PRESTRESSED NEXT BEAM DETAILS "CT-NB3"	1	5/26/15
AS1	PRECAST APPROACH SLAB DETAILS "CT-AS1"	1	5/26/15
AS2	PRECAST APPROACH SLAB DETAILS "CT-AS2"	1	5/26/15
AS3	PRECAST APPROACH SLAB DETAILS "CT-AS3"	1	5/26/15
AS4	PRECAST APPROACH SLAB DETAILS "CT-AS4"	1	5/26/15
AS5	PRECAST APPROACH SLAB DETAILS "CT-AS5"	1	5/26/15
AB1	PRECAST ABUTMENT PLAN, SECTION & DETAILS	1	5/26/15
AB2	PRECAST ABUTMENT DETAILS "CT-AB2"	1	5/26/15
AB3	PRECAST ABUTMENT DETAILS "CT-AB1"	1	5/26/15
AB3.1	PRECAST ABUTMENT DETAILS "CT-AB1" & "CT-AB4"	1	5/26/15
AB4	PRECAST ABUTMENT DETAILS "CT-AB3"	1	5/26/15
AB5	PRECAST ABUTMENT DETAILS "CT-AB4"	1	5/26/15
WW1	PRECAST WINGWALL DETAILS "CT-WW1"	1	5/26/15
WW2	PRECAST WINGWALL DETAILS "CT-WW2"	1	5/26/15
WW3	PRECAST WINGWALL DETAILS "CT-WW3"	1	5/26/15
WW4	PRECAST WINGWALL DETAILS "CT-WW4"	1	5/26/15
M1	MATERIALS LIST (NEXT BEAMS)	1	5/26/15
M2	MATERIALS LIST (ABUTMENTS, WINGWALLS & APPROACH SLABS)	1	5/26/15

DESIGN LIVE LOAD: HL-93

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.

RECORDED REVISED AND RESUBMITTED FURNISH AS CORRECTED

CONTRACTOR'S 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 HIS WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING HIS WORK IN A SAFE AND SATISFACTORY MANNER.

401 DK Drive
Building 100, Suite 200
South Burlington, VT 05403
802.497.6100

Job Number: 57632.00
Reviewed By: E.F. LAWES
Date: May 27, 2015

RESUBMITTED (4)
5-26-15
J. P. CARRARA & SONS, INC.
MIDDLEBURY, VT 05753

APPROVAL STAMP:

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

SCHULTZ CONSTRUCTION
CONTRACTOR
BALLSTON SPA, NY

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF RUTLAND

TOWN OF CASTLETON
VT ROUTE 30 (RURAL MINOR ARTERIAL)
BRIDGE NO.: 93 PROJECT NO.: BRF 015-2(10)

DATE: MAY 06, 2015
SCALE: NOTED
CHKD: R.M. DFTM: PSS
JOB NO: 23456-015
DWG. NO: C1

