

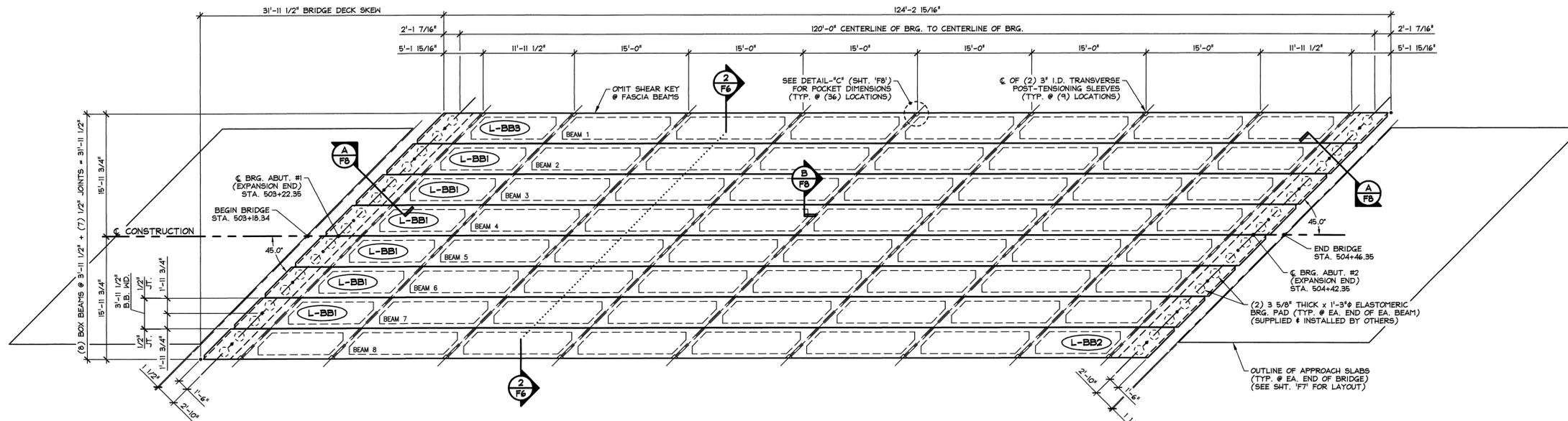
1 PRECAST ABUTMENT & WING WALL LAYOUT
 F1
 1/8" = 1'-0"

ABUTMENT & WING WALL GENERAL NOTES

1. MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
2. MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 3,500 PSI (UNLESS NOTED OTHERWISE).
3. REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) LEVEL 1 (EPOXY COATED) OR LEVEL 1 (BLACK STEEL) (AS NOTED ON SHOP DRAWINGS).
4. SEE INDIVIDUAL ABUTMENT DRAWINGS FOR CONCRETE FINISHES AND EXTENT OF WATERPROOF SEALER APPLICATION.
5. SEE INDIVIDUAL WING WALL DRAWINGS FOR CONCRETE FINISHES AND EXTENT OF WATERPROOF SEALER APPLICATION. CONCRETE MUST ACHIEVE 80% OF THE SPECIFIED DESIGN STRENGTH (4,000 PSI) PRIOR TO APPLICATION OF SEALER.
6. 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 6th POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
7. MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. P510.02 AND P510.05 RESPECTIVELY.
 DESIGN MIX:
 WING WALLS: J.P.C. BRIDGE MIX #445MSCC
 ABUTMENTS: J.P.C. BRIDGE MIX #445MSCC
8. QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
9. 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.
10. ABUTMENT POST-TENSIONING SEQUENCE:
 A. ERECT PRECAST CONCRETE ABUTMENTS, AND POST-TENSION CENTER TENDON TO APPROXIMATELY 5,000 LBS.
 B. EPOXY SHEAR KEY (AS REQUIRED) (BY OTHERS).
 C. ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI; POST-TENSION TENDONS TO 32,000 LBS.

6-16-15 REVISE WATERPROOFING NOTE
 4-27-15 GENERAL REVISIONS

APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer <small>244 CASE STR., WOODBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010</small>		J.A. McDONALD, INC. CONTRACTOR <small>LYNDON CENTER, VERMONT</small>	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ADDISON		DATE: FEB. 6, 2015	
	TOWN OF LINCOLN TH 1 (RURAL MAJOR COLLECTOR) OVER NEW HAVEN RIVER BRIDGE NO.: 19 PROJECT NO.: BRP 0188 (B)		SCALE: NOTED	
	PRECAST ABUTMENT & WING WALL LAYOUT		CHKD: M.W. DFTM: B.L. JOB NO: 23459-015 DWG. NO: F1	



1 PRESTRESSED BOX BEAM LAYOUT
1/8" = 1'-0"

- ### BOX BEAM GENERAL NOTES
- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 8,000 PSI.
 - MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 6,000 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 BOX BEAM (UNLESS NOTED OTHERWISE) AND EPOXY PAINTED.
 - ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4" (UNLESS NOTED OTHERWISE).
 - THE TOP OF BEAMS SHALL RECEIVE A TRANSVERSE RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE (UNLESS NOTED OTHERWISE).
 - SEE INDIVIDUAL BOX BEAM DRAWINGS FOR CONCRETE FINISHES AND EXTENT OF WATERPROOF SEALER APPLICATION. CONCRETE MUST ACHIEVE 80% OF THE SPECIFIED DESIGN STRENGTH (6,400 PSI) PRIOR TO APPLICATION OF SEALER.
 - SHEAR KEY SURFACES SHALL BE SAND BLASTED CLEAN.
 - 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 SLAB. THE PINS OF THE SHACKLES SHALL BE PLACED THROUGH THE LIFTING LOOPS. SEE DETAIL, SHEET 'FB'. BEAMS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 2'-0" OF THE BEAM ENDS, SET PERPENDICULAR TO BEAM SPAN, UNLESS APPROVED BY J.P. CARRARA & SONS, INC. ONCE BOX BEAMS 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 #426M (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 BEAM IS FINISHED, COVER WITH INSULATED POLY. THE DESIRED CURING TEMPERATURE RANGE SHALL NOT DROP BELOW 70°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.
 - TRANSVERSE POST-TENSIONING SEQUENCE:
 - ERECT BOX BEAMS, AND POST-TENSION TENDONS TO APPROXIMATELY 5,000 LBS.
 - GROUT SHEAR KEYS.
 - ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1,500 PSI; POST TENSION TENDONS TO 47,000 LBS.
 - OWNER SHALL PROVIDE APPROPRIATE WATERPROOFING TO GROUTED AND/OR EPOXYED SHEAR KEYS. J.P. CARRARA & SONS, INC. SHALL NOT BE HELD LIABLE FOR PROBLEMS ASSOCIATED WITH MOISTURE INFILTRATING GROUTED AND/OR EPOXYED 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 = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

EXAMPLE:

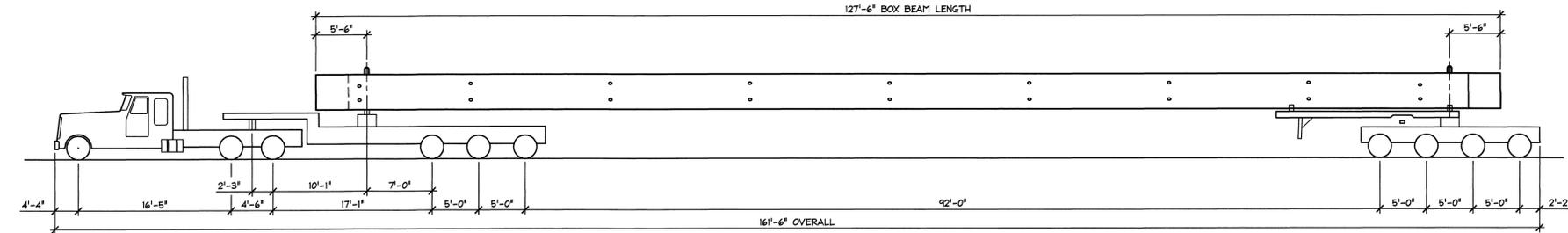
$$\Delta = \frac{PL}{AE} = \frac{(44,000 - 3,000) \times 252.00 \times 12}{0.217 \times 28,600,000} = 19.977'$$
 THEREFORE: (TOLERANCES ± 5%)
 Δ UPPER LIMIT = 1.05 x 19.977' = 20.98' = 21'
 Δ LOWER LIMIT = 0.95 x 19.977' = 18.98' = 19'

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

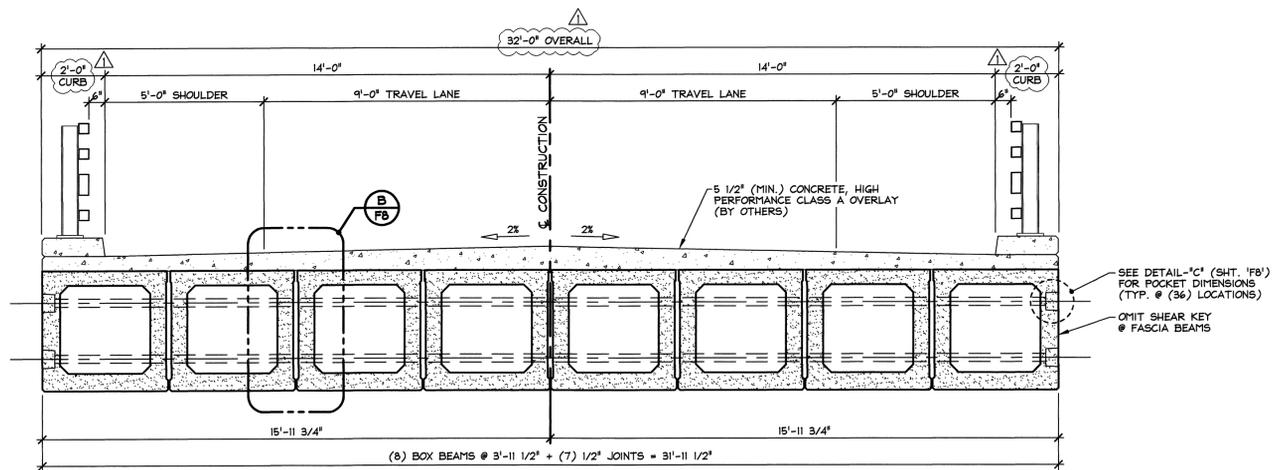
TOTAL TENSIONING FORCE = 44,000 + 1,026 = 45,026 LBS.

- ### 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" 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.

DESIGN LIVE LOAD: HL-9B



SHIPPING DETAIL
N.T.S.

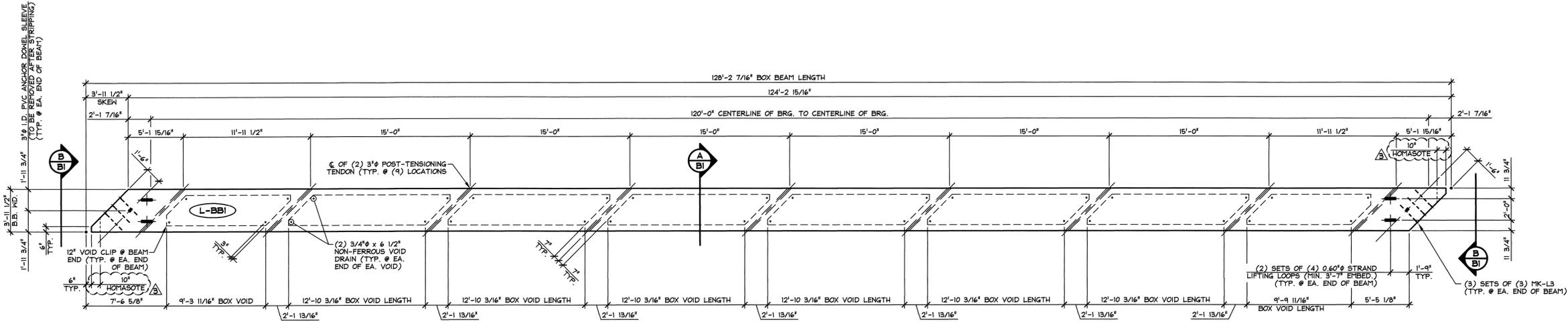


2 TRANSVERSE BOX BEAM SECTION
3/8" = 1'-0"

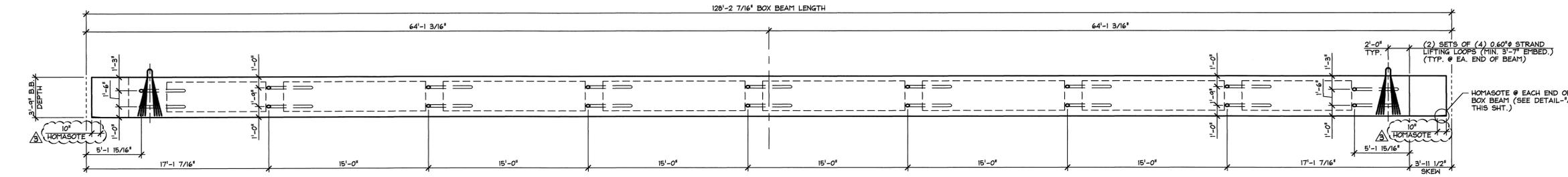
- 6-17-15 ADD WATERPROOFING NOTE
- 5-11-15 REVISED AS NOTED
- 4-27-15 REVISED AS NOTED

APPROVAL STAMP:

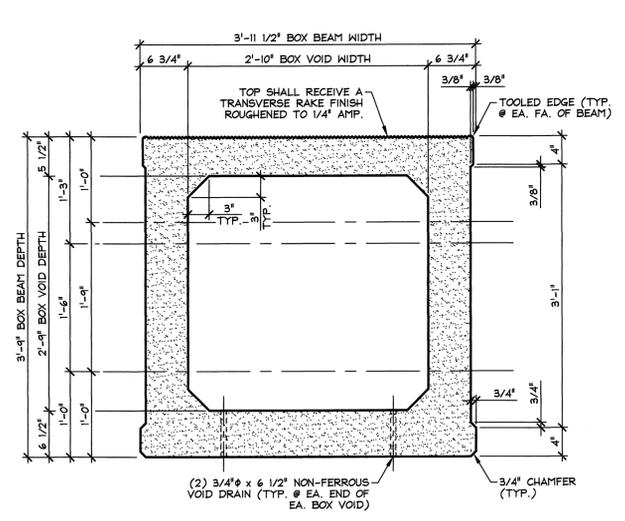
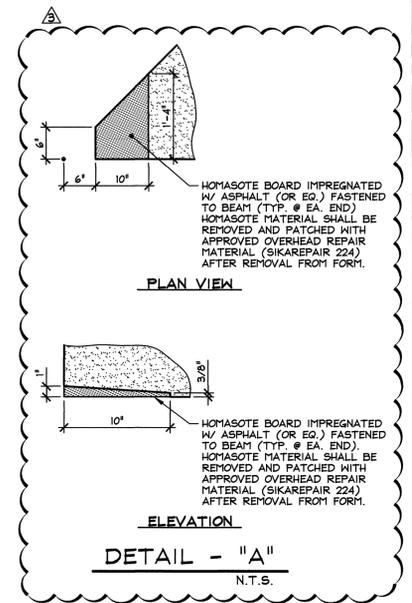
J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer <small>284 GSE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010</small>	J.A. McDONALD, INC. CONTRACTOR LYNDON CENTER, VERMONT
	DATE: FEB. 6, 2015 SCALE: NOTED
STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ADDISON	CHKD: M.W. DFTM: B.L. JOB NO: 23459-015
TOWN OF LINCOLN TH 1 (RURAL MAJOR COLLECTOR) OVER NEW HAVEN RIVER BRIDGE NO.: 19 PROJECT NO.: BRP 0188 (8)	DWG. NO: F6
PRESTRESSED BOX BEAM LAYOUT & SECTION	



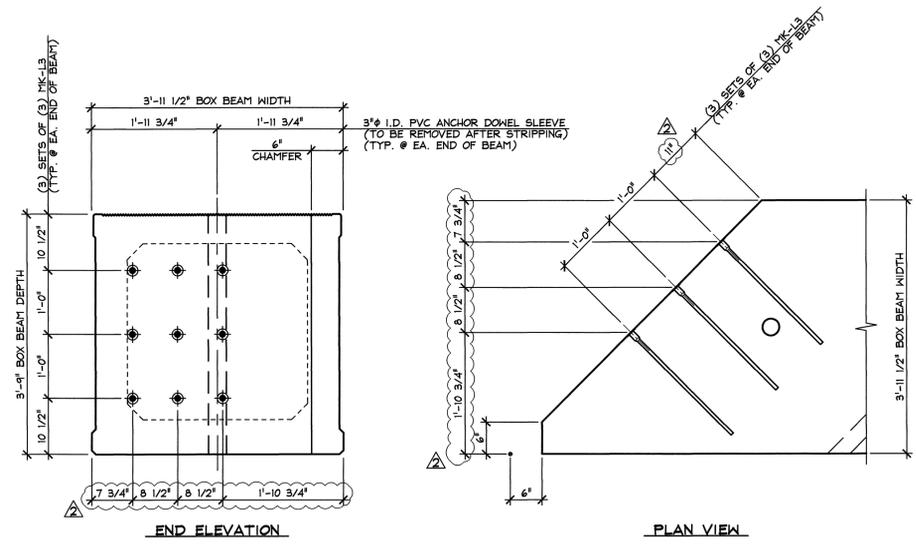
1 DIMENSIONAL PLAN VIEW IN FORM
 3/16" = 1'-0"



2 DIMENSIONAL ELEVATION
 3/16" = 1'-0"



A DIMENSIONAL SECTION
 1" = 1'-0"



B BEAM END DETAILS
 3/4" = 1'-0"

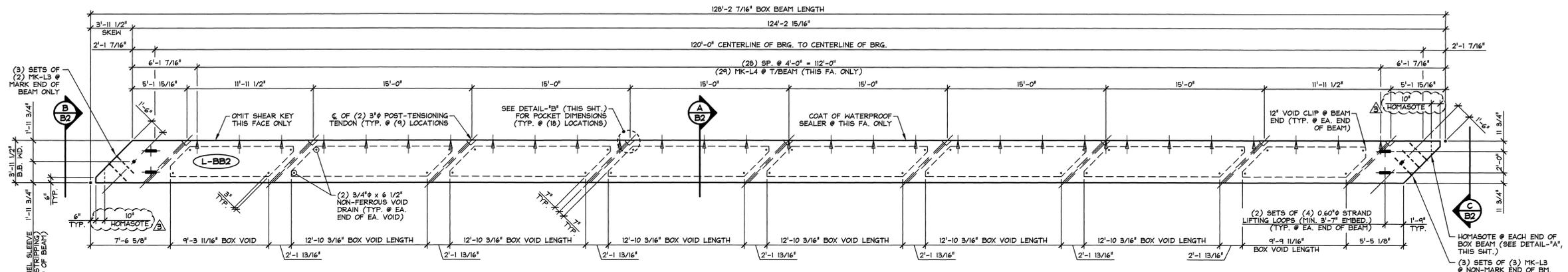
SHOP NOTE:
 F_{cd} = 8,000 PSI
 F_{ci} = 6,000 PSI
 MIX #426M (NO DCI)

MATERIAL LIST / BOX BEAM			
ITEM	MARK	DESCRIPTION	QTY.
1			
2			
3	MK-L3	DAYTON #5 x 2'-3" D-101-A STRAIGHT DONEL BAR SPLICER (STAINLESS STEEL CLAD)	18
4			
5			
6		3/4" x 6 1/2" NON-FERROUS VOID DRAIN	32
7		2'-10" x 2'-9" x 9'-9 1/16" BOX VOID	2
8		2'-10" x 2'-9" x 12'-10 3/16" BOX VOID	6
9		SET OF (4) 0.60" STRAND LIFTING LOOPS	4
10			

- △ 6-17-15 REVISE HOMASOTE DETAIL
- △ 5-11-15 REVISED AS NOTED
- △ 4-27-15 GENERAL REVISIONS

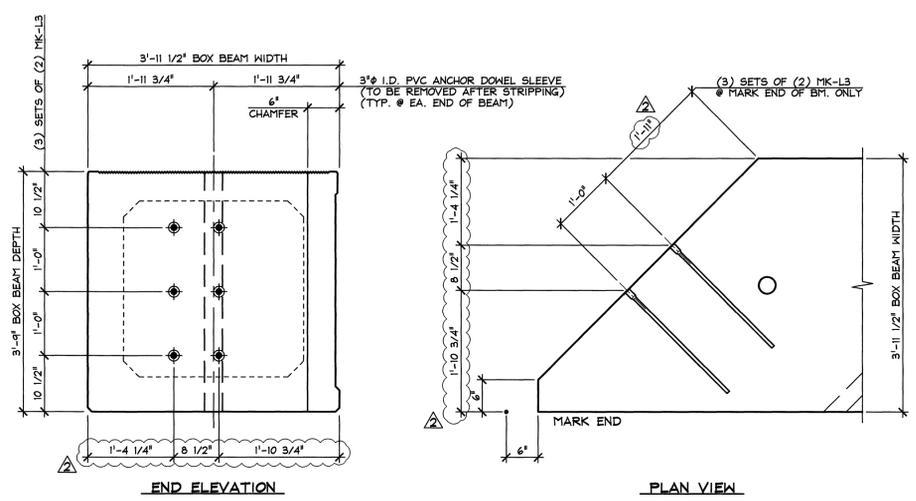
APPROVAL STAMP:

J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer <small>244 GSE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010</small>	J.A. McDONALD, INC. CONTRACTOR LYNDON CENTER, VERMONT
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TOWN OF LINCOLN TH 1 (RURAL MAJOR COLLECTOR) OVER NEW HAVEN RIVER BRIDGE NO.: 19 PROJECT NO.: BRF 0188 (8)	DWG. NO: B1
PRESTRESSED BOX BEAM DIMENSIONAL DETAILS	

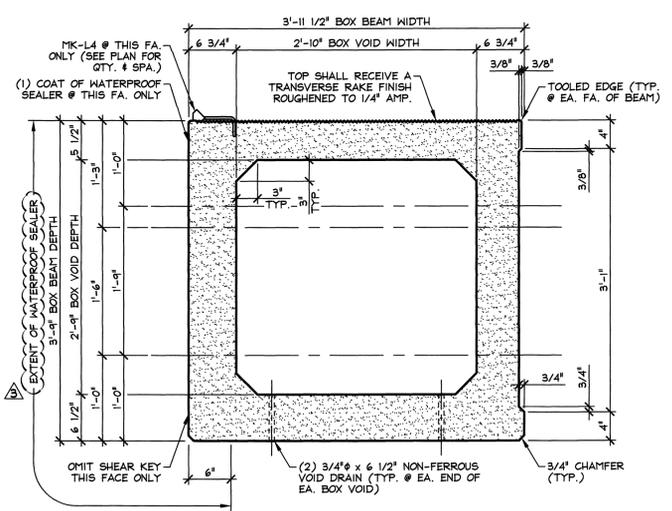
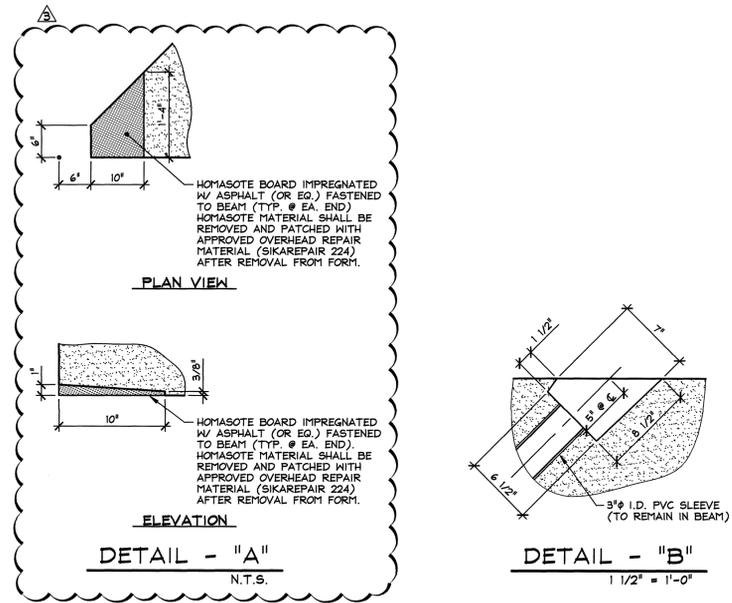


1 DIMENSIONAL PLAN VIEW IN FORM
B2
 3/16" = 1'-0"

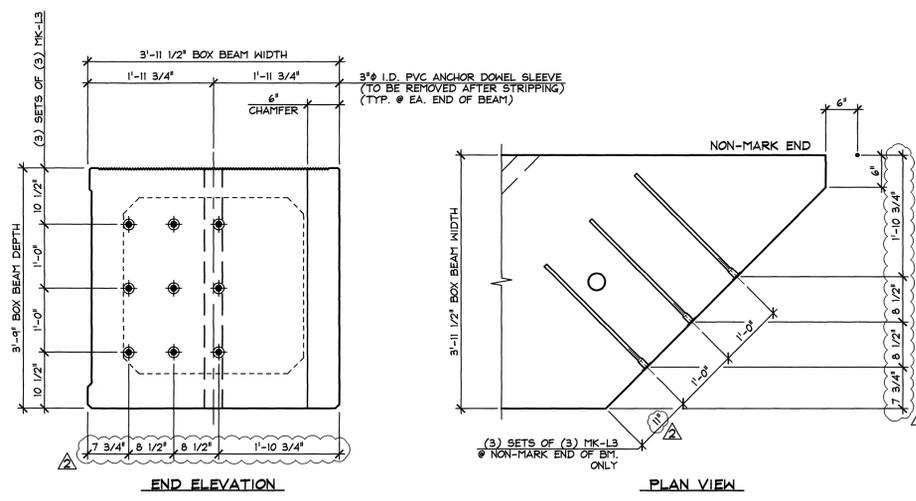
SHOP NOTE:
 SEE "2/B1" FOR BEAM ELEVATION FOR POST-TENSIONING TENDON VERTICAL LOCATIONS.



B BEAM END DETAILS
B2
 3/4" = 1'-0"



A DIMENSIONAL SECTION
B2
 1" = 1'-0"



C BEAM END DETAILS
B2
 3/4" = 1'-0"

SHOP NOTE:
 f'c = 8,000 PSI
 f'st = 6,000 PSI
 MIX #426M (NO DCI)

MATERIAL LIST / BOX BEAM				
ITEM	MARK	DESCRIPTION	QTY.	
1				
2				
3	MK-L3	DAYTON #5 x 2'-3" D-101-A STRAIGHT DOWEL BAR SPICER (STAINLESS STEEL CLAD)	15	
4	MK-L4	DAYTON C-24 TYPE 4-APR DECK FORM HANGER (GALV.)	29	
5				
6		3/4" x 6 1/2" NON-FERROUS VOID DRAIN	32	
7		2'-10" x 2'-9" x 9'-9 11/16" BOX VOID	2	
8		2'-10" x 2'-9" x 12'-10 3/16" BOX VOID	6	
9		SET OF (4) 0.60" STRAND LIFTING LOOPS	4	
10				

- 6-17-15 REVISE HOMASOTE DETAIL & WATERPROOFING
- 5-11-15 REVISED AS NOTED
- 4-27-15 GENERAL REVISIONS

APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2444 CASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010	J.A. McDONALD, INC. CONTRACTOR LYNDON CENTER, VERMONT
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	PRESTRESSED BOX BEAM DIMENSIONAL DETAILS	DWG. NO: B2

