

ABUTMENT & APPROACH SLAB 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 II (DUAL COATED) (AS NOTED ON SHOP DRAWINGS).
4. THE TOP OF ABUTMENTS SHALL RECEIVE A SMOOTH FLOAT FINISH (UNLESS NOTED OTHERWISE).
5. SHEAR KEY SURFACES SHALL BE SAND BLASTED CLEAN.
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 54" POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
7. MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. F510.02 AND F510.05 RESPECTIVELY.
- DESIGN MIX:
APPROACH SLABS: J.P.C. BRIDGE MIX #448MSCC
ABUTMENTS: J.P.C. BRIDGE MIX #448MSCC
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 RIGID INSULATION AND POLY WILL BE PLACED OVER THE UNIT. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED.
10. TRANSVERSE POST-TENSIONING SEQUENCE:
A. ERECT PRECAST ABUTMENTS.
B. EPOXY CONSTRUCTION JOINT.
C. POST TENSION TENDONS TO 32,000 LBS.

VOIDED SLAB GENERAL NOTES

1. MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 7,500 PSI.
2. MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 5,000 PSI.
3. REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) LEVEL II (DUAL COATED).
4. PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M203) AND SHALL CONSIST OF 0.60"φ x 270 KSI 7-WIRE LOW RELAXATION STRANDS.
5. 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.)
6. ENDS OF PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH END OF VOIDED SLABS (UNLESS NOTED OTHERWISE) AND EPOXY PAINTED.
7. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
8. THE TOP OF SLABS SHALL RECEIVE A SMOOTH FLOAT FINISH (UNLESS NOTED OTHERWISE).
9. SHEAR KEY SURFACES SHALL BE SAND BLASTED CLEAN.
10. 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 PINS OF THE SHACKLES SHALL BE PLACED THROUGH THE LIFTING LOOPS. SEE DETAIL, SHEET 'F5'. 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 VOIDED SLABS HAVE BEEN ERECTED, CUT LIFTING LOOPS AT RECESS, EPOXY PAINT AND PATCH AS REQUIRED (BY OTHERS)).
11. MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. F510.02 AND F510.05 RESPECTIVELY.
- DESIGN MIX: J.P.C. BRIDGE MIX #426M (NO DCI)
12. QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
13. CURING METHOD: AS SOON AS THE TOP OF SLAB IS FINISHED, A COVER OF 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 PERIMPHRY OF THE CASTING BED. MAXIMUM CURING TEMPERATURE SHALL NOT EXCEED PCI SPECIFIED LIMITS.
14. TRANSVERSE POST-TENSIONING SEQUENCE:
A. ERECT VOIDED SLABS.
B. GROUT SHEAR KEYS.
C. ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1,500 PSI, POST TENSION TENDONS TO 32,000 LBS.
15. 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"φ x 270 KSI
AREA: 0.217 IN²
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 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:
$$\Delta P = \frac{0.5 \times 41,000}{19.977} = 1,026 \text{ LBS.}$$

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

STRAND TENSIONING PROCEDURE:

1. PULL EACH STRAND INITIALLY TO 3,000* LBS. AND MARK STRAND.
2. 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.

DRAWING INDEX

SHT. #	DRAWING TITLE	REV. #	REV. DATE
C1	COVER SHEET	1	7-1-14
F1	PRECAST ABUTMENT LAYOUT		
F2	PRECAST ABUTMENT ELEVATIONS		
F3	PRESTRESSED VOIDED SLAB & PRECAST APPROACH SLAB LAYOUT		
F4	PRESTRESSED VOIDED SLAB & PRECAST APPROACH SLAB SECTIONS		
F5	SUPERSTRUCTURE SECTIONS & DETAILS	1	7-1-14
SS1	PRESTRESSED VOIDED SLAB DETAILS "R-SS3"		
SS2	PRESTRESSED VOIDED SLAB DETAILS "R-SS4"		
SS3	PRESTRESSED VOIDED SLAB DETAILS "R-SS5"		
SS4	PRESTRESSED VOIDED SLAB DETAILS "R-SS6"		
SS5	PRESTRESSED VOIDED SLAB DETAILS "R-SS1"		
SS6	PRESTRESSED VOIDED SLAB DETAILS "R-SS2"		
AS1	PRECAST APPROACH SLAB DETAILS "R-AS1" & "R-AS2"	1	7-1-14
AS2	PRECAST APPROACH SLAB DETAILS "R-AS5" & "R-AS6"	1	7-1-14
AS3	PRECAST APPROACH SLAB DETAILS "R-AS3" & "R-AS4"	1	7-1-14
AB1	PRECAST ABUTMENT DETAILS "R-AS1"	1	7-1-14
AB2	PRECAST ABUTMENT DETAILS "R-AS2"	1	7-1-14
AB3	PRECAST ABUTMENT DETAILS "R-AS3"	1	7-1-14
AB4	PRECAST ABUTMENT DETAILS "R-AS4"	1	7-1-14
M1	MATERIALS LIST		

DESIGN LIVE LOAD: HL-93

Vermont Agency of Transportation

RECEIVED

23430-14 Forest St_Rutland_rev14.pdf

CK'D BY M. Umberger OK'D BY C. Carlson

July 1, 2014

RESUBMIT No Approved
BY C. Carlson DATE 07/08/2014

7-1-14 REVISED AS NOTED

APPROVAL STAMP:	J.P. CARRARA & SONS INC. THE BELDEN COMPANY, INC.	
	Precast & Prestress Manufacturer CONTRACTOR	
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	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF RUTLAND	
CITY OF RUTLAND		DATE: APR. 25, 2014
ROUTE NO.: TH 13 (FOREST STREET) - URBAN COLLECTOR		SCALE: NOTED
BRIDGE NO.: 14 PROJECT NO.: BRP 3000(18)		CHKD: M.D. DFTM: B.L.
COVER SHEET		JOB NO: 23430-014
		DWG. NO: C1