



1 F2 PRESTRESSED SOLID SLAB & PRECAST APPROACH SLAB LAYOUT
1/4" = 1'-0"

SOLID SLAB GENERAL NOTES

- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 9,000 PSI.
- MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 6,000 PSI.
- REINFORCING STEEL SHALL BE GR-520, ASTM A965 M, STAINLESS STEEL (2304 DUPLEX (UNS-S32304)) (AS NOTED ON SHOP DRAWINGS).
- 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 SOLID SLABS USING AN ABRASIVE WHEEL (UNLESS NOTED OTHERWISE) AND TWO PART EPOXY PAINTED.
- ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
- THE TOP OF SLABS SHALL RECEIVE A SMOOTH FLOAT FINISH (UNLESS NOTED OTHERWISE).
- SHEAR KEY SURFACES SHALL BE SAND BLASTED CLEAN FOR A ROUGHENED SURFACE.
- 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 MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. THE PINS OF THE SHACKLES SHALL BE PLACED THROUGH THE LIFTING LOOPS. SEE DETAIL, SHEET "F3". 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 SLABS 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. P510.02 AND P510.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #430M NO-DCI
SUBMITTAL DATE DEC. 20, 2016
- QUALITY CONTROL AND REPAIR PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.

- CURING METHOD: EITHER OF THE METHODS DESCRIBED BELOW MAY BE EMPLOYED AT THE FABRICATORS OPTION.
MOISTURE & HEAT RETENTION: AS SOON AS THE TOP OF THE UNITS ARE FINISHED A COVER OF POLY AND A LAYOUT OF RIGID INSULATION WILL BE PLACED OVER THE UNIT IN A MANNER THAT WILL NOT DISTURB THE FINISH.
LOW-PRESSURE LIVE STEAM PER 510.10(b): AS SOON AS THE TOP OF THE UNITS ARE FINISHED A COVER OF POLY WILL BE PLACED OVER THE UNIT IN A MANNER THAT WILL NOT DISTURB THE FINISH. ONCE INITIAL SET IS ATTAINED, LIVE STEAM SHALL HEAT THE ENCLOSURE AT A RATE NOT TO EXCEED 40°F PER HOUR. THE PEAK INTERNAL CONCRETE TEMPERATURE SHALL NOT EXCEED 160°F.
FOR EITHER METHOD, THE INTERNAL CONCRETE AND AMBIENT ENCLOSURE TEMPERATURE SHALL BE RECORDED BY AN AUTOMATIC SENSOR INSTRUMENT FOR EACH 100 FEET OF THE CASTING BED UNTIL RELEASE STRENGTH IS ACHIEVED AND THE UNITS ARE DETENSIONED. A CHART OF THE TEMPERATURE DATA SHALL BE LABELED AND PROVIDED TO THE QA INSPECTOR AT THE COMPLETION OF THE CURING PERIOD.
THE UNITS SHALL NOT BE EXPOSED TO A TEMPERATURE DIFFERENTIAL BETWEEN THE SURFACE OF THE HARDENED CONCRETE AND THE AMBIENT STORAGE ENVIRONMENT OF GREATER THAN 40°F AT ANY TIME. UNITS SHALL NOT BE EXPOSED TO AMBIENT TEMPERATURES LESS THAN 34°F UNTIL THE DESIGN STRENGTH IS ACHIEVED.
- OWNER SHALL PROVIDE APPROPRIATE WATERPROOFING TO GROUDED SHEAR KEYS. J.P. CARRARA & SONS, INC. SHALL NOT BE HELD LIABLE FOR PROBLEMS ASSOCIATED WITH MOISTURE INFILTRATING GROUDED 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: 189'-0" = 189.00'
Es = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)
EXAMPLE:
 $\Delta = \frac{PL}{AE} = \frac{(44,000 - 3,000) \times 189.00 \times 12}{0.217 \times 28,600,000} = 14.983'$
THEREFORE: (TOLERANCES ± 5%)
 Δ UPPER LIMIT = 1.05 x 14.983' = 15.73' = 15 3/4"
 Δ LOWER LIMIT = 0.95 x 14.983' = 14.23' = 14 1/4"
EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:
 $\Delta P = \frac{0.5 \times 41,000}{14.983} = 1,368$ LBS.
TOTAL TENSIONING FORCE = 44,000 + 1,368 = 45,368 LBS.

STRAND TENSIONING PROCEDURE:

- PULL EACH STRAND INITIALLY TO 3,000* LBS. AND MARK STRAND.
- THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,368* LBS. AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 14 1/4" AND 15 3/4".

*NOTE: FORCES READ ON STRESSING JACK GAUGES MUST BE MADE TO CORRESPOND TO ABOVE VALUES BASED ON CALIBRATION DATA FOR SPECIFIC JACK USED.

APPROACH SLAB GENERAL NOTES

- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
- MIN. CONCRETE STRENGTH FOR HANDLING SHALL BE 3,500 PSI (UNLESS NOTED OTHERWISE).
- REINFORCING STEEL SHALL BE GR-520, ASTM A965 M, STAINLESS STEEL (2304 DUPLEX (UNS-S32304)) (AS NOTED ON SHOP DRAWINGS).
- THE TOP OF APPROACH SLABS SHALL RECEIVE A SMOOTH SCREED FINISH (UNLESS NOTED OTHERWISE).
- APPROACH SLABS SHALL BE HANDLED AND ERECTED USING THE LIFTING INSERTS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 70°. APPROACH SLABS SHALL BE STORED & TRANSPORTED WITH TIMBER SUPPORTS AT 54" POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC. INSERT POCKETS TO BE GROUDED AFTER INSTALLATION (BY OTHERS).
- MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. P540.02 AND P540.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #445NSCC
APPROVAL DATE JUNE 6, 2016
- QUALITY CONTROL AND REPAIR 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 SLAB IS FINISHED, A COVER OF POLY WILL BE PLACED OVER THE SLAB. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED. AMBIENT ENCLOSURE TEMPERATURE SHALL BE MONITORED. UNITS SHALL NOT BE EXPOSED TO A TEMPERATURE DIFFERENTIAL GREATER THAN 40°F FOR LONGER THAN 30 MINUTES WHICH WILL BE NECESSARY TO REMOVE THE SURFACE RETARDER AND ACHIEVE THE DESIRED KEYWAY FINISH. UNITS SHALL NOT BE EXPOSED TO A TEMPERATURE LESS THAN 34°F UNTIL DESIGN STRENGTH IS ACHIEVED.
- SHEAR KEY SURFACES SHALL BE ROUGHENED TO PROVIDE AN 1/8" AMPLITUDE EXPOSED AGGREGATE PROFILE. FABRICATOR MAY UTILIZE A SURFACE RETARDER WITH WATER BLAST, SAND BLAST, OR A COMBINATION OF BOTH TO ACHIEVE THE DESIRED SHEAR KEY SURFACE FINISH.

T.Y. LIN INTERNATIONAL

THE STAMPED DOCUMENTS ARE HEREBY:
 APPROVED
 APPROVED AS NOTED
 REVISE AND RESUBMIT
 SEE TRANSMITTAL FOR ADDITIONAL INFORMATION AS APPLICABLE.
 THIS REVIEW IS FOR GENERAL CONFORMANCE WITH DESIGN CONCEPT ONLY. ANY DEVIATION FROM THE PLANS OR SPECIFICATIONS NOT CLEARLY NOTED BY THE CONTRACTOR HAS NOT BEEN REVIEWED. REVIEW BY THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF THE CONTRACTUAL RESPONSIBILITY FOR ANY ERRORS OR DEVIATION FROM THE CONTRACT REQUIREMENTS.

Vermont Agency of Transportation
RECEIVED
 CK'D BY T.Y. Lin International OK'D BY J. Olund
 January 24, 2017
 RESUBMIT No Approved
 BY D. Borneau DATE 01/25/17

1-24-17 REVISED AS NOTED
 1-3-17 REVISED AS NOTED

APPROVAL STAMP:

J.P. CARRARA & SONS INC.
 Precast & Prestress Manufacturer
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STATE OF VERMONT AGENCY OF TRANSPORTATION
 COUNTY OF ORLEANS
 VILLAGE OF BARTON
 TH 2 (GLOVER ROAD), RURAL MAJOR COLLECTOR
 BRIDGE NO.: 20 PROJECT NO.: BHF 0286(5)
PRESTRESSED SOLID SLAB & PRECAST APPROACH SLAB LAYOUT

J.P. SICARD, INC.
 CONTRACTOR
 BARTON, VERMONT
 DATE: NOV. 18, 2016
 SCALE: NOTED
 CHKD: A.S. DFTM: B.L.
 JOB NO: 23498-016
 DWG. NO: **F2**
 GLOVER ROAD