

GENERAL NOTES:

- ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION 2006 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2006 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.
- DIMENSIONS ARE HORIZONTAL OR VERTICAL IN MILLIMETERS AT 20 °C, UNLESS NOTED OTHERWISE.
- CONTRACTOR IS TO MAINTAIN ACCESS TO THE EXISTING DRY HYDRANT 10+0.80 LT. AT ALL TIMES. ANY DAMAGE TO THE EXISTING DRY HYDRANT SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AND PAID FOR BY THE CONTRACTOR.
- BRIDGE 2 WILL BE CLOSED TO ALL PEDESTRIANS AND VEHICULAR TRAFFIC DURING CONSTRUCTION. THE CRAFTSBURY TOWN CLERK SHALL BE NOTIFIED AT (802) 586-2823 TWO WEEKS PRIOR TO THE CLOSING OF THE BRIDGE. ALL ON-PROJECT SIGNS AND BARRICADES AS REQUIRED BY THE RESIDENT ENGINEER WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE INCIDENTAL TO ITEM 64.1.10, "TRAFFIC CONTROL". ALL OFF-PROJECT SIGNING WILL BE THE RESPONSIBILITY THE TOWN.

DESIGN

- THE BRIDGE IS DESIGNED FOR HL-93 LIVE LOAD WITH NO ALLOWANCE FOR FUTURE PAVEMENT.

CONSTRUCTION

- IN-STREAM CONSTRUCTION: PERMITS DESIGNATE AND LIMIT THE PERIOD FOR IN-STREAM CONSTRUCTION. THE AGENCY OF NATURAL RESOURCES MUST APPROVE ANY DEVIATION FROM THIS PERIOD IN WRITING.

EARTHWORK

- ITEM 52.9.15 "REMOVAL OF STRUCTURE": WILL INCLUDE THE REMOVAL OF THE "BAILEY" BRIDGE. SEE SPECIAL PROVISIONS.
- ITEM 52.9.20 "PARTIAL REMOVAL OF STRUCTURE": WILL INCLUDE THE REMOVAL OF THE EXISTING BRIDGE SUPERSTRUCTURE. SEE SPECIAL PROVISIONS.
- THE EXISTING WINGWALLS AND ABUTMENTS AT ABUTMENT NO. 1 AND NO. 2 SHALL BE REMOVED UNDER THE ITEM "UNCLASSIFIED CHANNEL EXCAVATION." ALL PORTIONS OF THE EXISTING STRUCTURE NOT REMOVED UNDER "UNCLASSIFIED CHANNEL EXCAVATION" SHALL BE REMOVED AND THE WORK WILL BE INCIDENTAL TO THE ITEM "PARTIAL REMOVAL OF STRUCTURE."
- ABUTMENT STONE FILL: PLACE STONE FILL UNDER THE BRIDGE BEFORE PLACING THE PRESTRESS UNITS.
- THE CONTRACTOR MAY SUBSTITUTE SUBBASE MATERIAL FOR THE SAND BORROW SHOWN ON THE PLANS. THE SUBBASE MATERIAL SHALL BE THE TYPE SPECIFIED IN THE CONTRACT AND SHALL BE PLACED TO MEET THE SUBBASE SPECIFICATIONS. IF SUBBASE IS PLACED IN LIEU OF SAND BORROW, A GEOTEXTILE MEETING THE REQUIREMENTS OF ITEM 6.49.11 "GEOTEXTILE FOR ROAD BED SEPARATOR" SHALL BE PLACED BETWEEN THE SUBGRADE AND THE SUBBASE MATERIAL. ALL COSTS ASSOCIATED WITH THE SUBSTITUTION INCLUDING THE GEOTEXTILE SHALL BE INCIDENTAL TO 203.31 "SAND BORROW".

STEEL PILING

- THE FACTORED AXIAL COMPRESSIVE LOAD IS 368 KN PER PILE. THE RESISTANCE FACTOR FOR DYNAMIC PILE LOAD TESTING IS 0.65. USING THIS RESISTANCE FACTOR, THE REQUIRED NOMINAL DRIVING RESISTANCE IS 567 KN PER PILE.
- THE ESTIMATED PILE DEPTH TO ACHIEVE THE REQUIRED NOMINAL DRIVING RESISTANCE IS 30 M. ADDITIONAL PILING MAY BE REQUIRED IF THE DRIVING RESISTANCE IS NOT ACHIEVED IN 30 M.
- DRIVE THE TEST PILE TO THE REQUIRED NOMINAL DRIVING RESISTANCE OR 30 M, WHICHEVER OCCURS FIRST. THE MINIMUM TIME BETWEEN THE END OF INSTALLATION OF ALL PILES AT AN ABUTMENT AND RESTRIKING SHALL BE 72 HOURS.
- IF THE REQUIRED NOMINAL DRIVING RESISTANCE IS NOT ACHIEVED AT RESTRIKE, THEN SUBMIT RESULTS OF THE PILE DRIVING ANALYSIS TO THE STRUCTURES SECTION AND ALLOW THREE BUSINESS DAYS FOR EVALUATION. IF ADDITIONAL PILING IS REQUIRED, AN ADDITIONAL DYNAMIC LOAD TEST WILL BE REQUIRED AND PAID FOR UNDER ITEM 505.45 "DYNAMIC PILE LOAD TEST."
- IF A TEST PILE IS USED FOR PRODUCTION, THEN IT SHALL BE AN EXTERIOR PILE. WARM-UP THE PILE HAMMER ON THE OPPOSITE EXTERIOR PILE BEFORE RE-STRIKING THE EXTERIOR TEST PILE.
- PILING DRIVEN BELOW 20 M DEPTH SHALL BE DRIVEN WITH A PILE DRIVING HAMMER, NOT A VIBRATORY HAMMER. FINAL DRIVING RESISTANCE SHALL BE DETERMINED WITH THE APPROVED PILE DRIVING HAMMER REGARDLESS OF THE LENGTH OF PILE DRIVEN.
- DRIVING POINT REINFORCEMENT SHALL NOT BE REQUIRED FOR THIS PROJECT.

STRUCTURAL CONCRETE

- ITEM 50.1.32 "CONCRETE, HIGH PERFORMANCE CLASS AA": USE HPC AA FOR THE DECK OVERLAY AND CURBS.
- ITEM 50.1.34 "CONCRETE, HIGH PERFORMANCE CLASS B": USE HPC B FOR THE APPROACH SLABS, ABUTMENTS, AND ALL OTHER SUBSTRUCTURE COMPONENTS.

- ITEM 507.15 "REINFORCING STEEL": USE UNCOATED REINFORCEMENT FOR THE ABUTMENTS.
- ITEM 507.17 "EPOXY COATED REINFORCING STEEL": USE COATED REINFORCEMENT FOR THE DECK OVERLAY, CURBS, AND APPROACH SLABS.
- CONCRETE JOINTS: CONSTRUCT CONCRETE JOINTS AS INDICATED ON THE PLANS OR DIRECTED BY THE RESIDENT ENGINEER.
- CHAMFERS: CHAMFER ALL EXPOSED EDGES OF CONCRETE WITH 25 MM X 2.5MM CHAMFERS, UNLESS OTHERWISE NOTED. ROUND THE TOP INSIDE CORNER OF CURBS WITH A 15MM RADIUS.
- SCORE MARKS: CONSTRUCT SCORE MARKS AS INDICATED ON THE PLANS OR AS DIRECTED BY THE RESIDENT ENGINEER.
- ITEM 514.10 WATER REPELLENT, SILANE: APPLY REPELLENT TO ALL EXPOSED SURFACES OF CONCRETE ON THE BRIDGE, INCLUDING THE BRIDGE DECK, EXCEPT THE BOTTOM OF THE SUPERSTRUCTURE BETWEEN THE DRIP NOTCHES. APPLY REPELLENT TO TOP OF APPROACH SLAB.

PRESTRESSED CONCRETE

- ITEM 510.22 "PRESTRESSED CONCRETE VOIDED SLABS": PRESTRESSED PRECAST MEMBERS SHALL:
  - CONFORM TO SECTION 510 "PRESTRESSED CONCRETE".
  - BE 540MM X 1220MM VOIDED SLABS.
  - USE CONCRETE WITH  $f'c = 45 \text{ MPa}$  AND  $f_c = 30 \text{ MPa}$ .
  - BE DESIGNED FOR AN AASHTO MS 22.5 LIVE LOAD.
  - CONTAIN CONTINUOUS VOIDS EXCEPT AS SHOWN IN THE PLAN DETAIL.
  - HAVE VOID DRAINS AT THE ENDS OF EACH VOID. THE VOID DRAINS SHALL BE 18MM DIAMETER, NON-FERROUS, AND CLEANED AFTER ERECTION.
  - CONTAIN PRESTRESSING STRANDS WHICH ARE 15.2 MM DIAMETER, 1860 MPa, LOW-RELAXATION STRANDS PULLED TO 75% OF THEIR YIELD.
  - HAVE THE ENDS OF THE STRANDS RECESSED AND GROUTED ACCORDING TO STANDARD PRACTICE.
  - HAVE THE TOP SURFACE RAKED TO UNIFORM ROUGHNESS WITH AVERAGE AMPLITUDE OF 6MM.
  - INCLUDE COLD POURED JOINT FILLER, AND TRANSVERSE TENDONS.
- THE FABRICATOR MAY, WITH THE APPROVAL OF THE PROJECT MANAGER, ALTER THE DESIGN AS DETAILED TO MEET THE PLANT'S PRESTRESSING OPERATION AND MATERIAL REQUIREMENTS. AN ALTERNATE STRAND CONFIGURATION MAY BE SUBMITTED FOR APPROVAL, PROVIDED THE DESIGN IS STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT, AND THAT THE DESIGN MEETS ALL OF THE APPLICABLE DESIGN CRITERIA, LOADINGS AND CODES.
- THE CONTRACTOR SHALL NOTIFY THE VTRANS MATERIALS & RESEARCH STRUCTURAL CONCRETE ENGINEER TWO WEEKS BEFORE THE PRESTRESS FABRICATOR CONSTRUCTS THE UNITS TO ALLOW FOR TIMELY INSPECTION OF THE PRESTRESSED CONCRETE UNITS.
- ITEM 510.22 "PRESTRESSED CONCRETE VOIDED SLABS" TRANSVERSE TENDONS:
  - GALVANIZE PLATES AND CHUCKS AFTER FABRICATION ACCORDING TO AASHTOM 232/M 232M.
  - INSTALL TRANSVERSE TENDONS BEFORE PLACING MORTAR AND CASTING THE CONCRETE DECK OVERLAY.
- ITEM 510.24 "GROUTING SHEAR KEYS": FILL THE JOINTS BETWEEN THE VOIDED SLABS WITH MORTAR, TYPE IV, AS DESCRIBED IN SUBSECTION 510.13.

6. SERVICE LOADS	540x1220
MEMBER MOMENT	463 kN*m
DECK MOMENT	199 kN*m
SUPERIMPOSED DEAD LOAD MOMENT	0 kN*m
LIVE LOAD & IMPACT MOMENT	644 kN*m
DEAD LOAD REACTION	155 kN
LIVE LOAD & IMPACT REACTION	362 kN
TOTAL REACTION	517 kN
FINAL CAMBER	14 mm

PROPOSED CONSTRUCTION SEQUENCE FOR PRESTRESSED VOIDED SLABS

- LAY OUT WORKING LINES:
  - LAY OUT WORKING LINES FOR THE ENTIRE BRIDGE WIDTH ON THE BEAM SEAT.
  - MEASURE ALL WORKING LINES FROM A COMMON WORKING POINT.
  - BASE THE WORKING LINES ON THE NOMINAL BEAM WIDTHS.
- VERIFY BEAM SEAT ELEVATIONS:
  - MEASURE ELEVATIONS AT BEAM SEATS.
  - IF SEATS ARE HIGH, GRIND TO CORRECT ELEVATIONS.
  - IF SEATS ARE LOW, SHIM TO CORRECT ELEVATIONS.
  - INSTALL BEARINGS.

- ERECT BEAMS:
  - PLACE BEAMS TO FIT WITHIN THE WORKING LINES.
  - AS WORK PROGRESSES, INSTALL HARDWOOD WEDGES BETWEEN ADJACENT BEAMS TO MAINTAIN PROPER JOINT OPENING (A MINIMUM OF ONE WEDGE AT EACH TRANSVERSE TENDON).
  - DRILL ANCHOR BOLT HOLES.
  - PLACE ANCHOR BOLTS.
  - GROUT ANCHOR BOLTS IN ABUTMENT.
- INSTALL BACKER ROD: PLACE FILLER BELOW THE KEYWAY BOTTOM, AS SHOWN ON THE PLANS.
- INSTALL TRANSVERSE TENDONS:
  - FEED TENDONS THROUGH DUCTS.
  - VERIFY THAT HARDWOOD WEDGES ARE IN PLACE AS REQUIRED TO PREVENT SLIPPAGE OF BEAMS.
  - USING A CALIBRATED JACK, POST-TENSION TENDONS TO APPROXIMATELY 13.3kN TO REMOVE SAG IN THE TENDON AND TO SEAT THE CHUCK.
- GROUT SHEAR KEYS:
  - CLEAN JOINTS WITH AN OIL FREE AIR-BLAST IMMEDIATELY BEFORE GROUT PLACEMENT. VERIFY THAT THE BACKER ROD IS STILL IN PLACE.
  - FOLLOW MANUFACTURERS RECOMMENDATIONS FOR ADDITIONAL JOINT PREPARATION AND GROUT PLACEMENT.
  - CAREFULLY ROD JOINTS TO ELIMINATE ANY POSSIBILITY OF VOIDS.
- POST-TENSION TRANSVERSE TENDONS:
  - GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 10 MPa, BASED ON THE MANUFACTURER'S RECOMMENDATIONS, PRIOR TO STRESSING.
  - PROVIDE APPROPRIATE CUBE MOLDS AS DESCRIBED IN AASHTO T106 FOR 3 SETS OF 3 DAY CUBES, 3 SETS OF 28 DAY CUBES AND AT A MINIMUM OF 3 MORE CUBES TO TEST FOR THE 10MPa MINIMUM COMPRESSIVE STRENGTH.
  - POST-TENSION TENDONS TO 13.3.4 kN USING A CALIBRATED JACK OPERATED BY QUALIFIED PERSONNEL.
- END DETAILS:
  - GROUT ANCHOR BOLTS INTO THE SLEEVES IN THE PRESTRESSED UNITS AT THE FIXED ENDS. BEFORE THE GROUT CURES, PLACE THE WASHER PLATE, AND INSTALL THE NUT ON TOP AND TIGHTEN.
  - PLACE THE COLD POURED JOINT SEALER IN THE SLEEVES IN THE PRESTRESSED UNITS AT THE EXPANSION ENDS. PLACE THE WASHER PLATE AND INSTALL THE NUT ON TOP. HAND TIGHTEN AND THEN LOOSEN 1/2 TURN.
  - GROUT OVER THE NUT AND BOLT IN THE ANCHOR BOLT BLOCK OUTS ON THE FIXED ENDS. FILL THE ANCHOR BOLT BLOCK OUTS ON THE EXPANSION ENDS WITH COLD POURED JOINT SEALER.
- FINISH WORK:
  - REMOVE WEDGES, AND PATCH DECK OVERLAY AND FASCIA BEAMS AT TRANSVERSE TENDONS.
  - SATURATE THE PRESTRESSED UNITS WITH WATER FOR TWELVE HOURS PRIOR TO PLACING OF THE CONCRETE DECK OVERLAY.
  - REMOVE ANY FREE STANDING WATER IMMEDIATELY BEFORE PLACING THE DECK OVERLAY.

← BOTH TEST PILES FAIL TO ACHIEVE THE REQUIRED CAPACITY. ALL 16 PILES WERE EXTENDED AT THE DIRECTION OF STRUCTURES.

FINAL PILE LENGTH 38.1M (125 FT)

GENERAL NOTES

PROJECT NAME:	CRAFTSBURY
PROJECT NUMBER:	BRO 1449 (24)
FILE NAME:	96J310\str\sj310gen.dgn
PROJECT LEADER:	R. WHITCOMB
DESIGNED BY:	W. LAMMER
PLOT DATE:	05-JUN-2009
DRAWN BY:	W. LAMMER
CHECKED BY:	T. LACKEY
SHEET	3 OF 47