

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2011 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2014 AASHTO LFRD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.
2. ALL PRECAST CONCRETE ELEMENTS TO BE FABRICATED TO THE SPECIFIED DIMENSIONS WITHIN THE TOLERANCES DICTATED IN THE PRECAST/PRESTRESSED CONCRETE INSTITUTE TOLERANCE MANUAL FOR PRECAST AND PRESTRESSED CONCRETE CONSTRUCTION, MNL 135-00, AND ITS LATEST REVISIONS.
3. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES FAHRENHEIT UNLESS NOTED OTHERWISE.
4. NO ADJUSTMENTS TO THE BITUMINOUS WEARING SURFACE ON THE BRIDGE SHALL BE MADE TO ACCOUNT FOR THE DIFFERENCE BETWEEN BEAM CAMBER AND THE THEORETICAL ROADWAY PROFILE. THE WEARING SURFACE SHALL BE SHIMMED TRANSVERSELY AS NECESSARY TO ACCOUNT FOR POTENTIAL DIFFERENTIAL CAMBER OF THE ADJACENT BEAMS.

TRAFFIC CONTROL

5. TRAFFIC MANAGEMENT WILL BE ACCOMPLISHED USING AN OFF-SITE DETOUR ON I-89 DURING A FOUR WEEK BRIDGE CLOSURE PERIOD. A BICYCLE DETOUR VIA LOCAL ROADS WILL BE SIGNED AS SHOWN. REFER TO THE TRAFFIC CONTROL SHEET FOR ADDITIONAL TRAFFIC CONTROL NOTES.

EARTHWORK

6. THE REMOVAL OF EXISTING STRUCTURES WILL BE PAID FOR UNDER ITEM 529.15, 'REMOVAL OF STRUCTURE'. THIS WORK SHALL INCLUDE REMOVAL OF THE ENTIRE SUPERSTRUCTURE AND ANY PORTIONS OF THE EXISTING ABUTMENTS THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION.
7. ITEM 900.608, "SPECIAL PROVISION (STONE FILL, STREAM BED MATERIAL) (TYPE II)" SHALL BE PLACED UNDER THE BRIDGE, AS SHOWN IN THE PLANS, BEFORE THE NEW RIGID FRAMES ARE SET.

CONCRETE

8. ALL LIFTING POINTS IN THE SUPERSTRUCTURE SHALL BE REMOVABLE TO THE MINIMUM CLEAR COVER FOR REINFORCING STEEL SPECIFIED IN THE PLANS. THE LIFTING POINTS SHALL BE DETAILED IN THE FABRICATION DRAWING. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE PRECAST ITEM.
9. ALL RECESSED LIFTING POINTS AND BLOCKOUTS SHALL BE FILLED WITH A TYPE IV MORTAR PER SUBSECTION 707.03 PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE PRECAST ITEM.
10. THE METHOD OF FORMING FOR SUBSEQUENT POURS AFTER PLACING PRECAST/PRESTRESSED SUPERSTRUCTURE UNITS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR IS ENCOURAGED TO WORK WITH THE FABRICATOR IF ADDITIONAL SUPPORTS ARE REQUIRED. IN NO CASE SHALL THE CONTRACTOR ATTACH ADDITIONAL FORM OR SCREED SUPPORTS BY DRILLING OR SIMILAR MEANS INTO ANY PRECAST/PRESTRESSED SUPERSTRUCTURE UNIT.
11. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE UNDERSIDE OF THE FRAME ROOF BETWEEN DRIP NOTCHES.
12. ALL EXPOSED EDGES SHALL HAVE A 1"X1" CHAMFER UNLESS OTHERWISE NOTED.
13. HIGH PERFORMANCE CONCRETE, RAPID SET SHALL BE WET-CURED UNTIL IT HAS OBTAINED THE FOLLOWING COMPRESSIVE STRENGTH AS VERIFIED BY TESTING OF FIELD CYLINDERS:
 - FRAME SECTION AND APPROACH SLAB CLOSURE POURS: 4,000 PSI
 - PILE CAVITIES: 24 HOURS OR DESIGN STRENGTH, WHICHEVER OCCURS SOONER
 - PILE CAP CLOSURE POURS: 4,000 PSI

REINFORCING STEEL

14. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE CONCRETE REINFORCING STEEL INSTITUTE.
15. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE "VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL" AVAILABLE ON THE AGENCY WEBSITE. A MINIMUM OF TWO TEST SECTIONS ARE REQUIRED FOR EACH SIZE, BRAND, AND GRADE OR TYPE OF REINFORCING. SEE THE MANUAL FOR ACCEPTABLE DIMENSIONS OF TEST SECTIONS. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.
16. ALL REINFORCING STEEL IN THE RIGID FRAME AND CURB ATTACHED TO THE RIGID FRAME SHALL MEET THE REQUIREMENTS OF SECTION 507 FOR "REINFORCING STEEL, LEVEL I (EPOXY COATED)" AND WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM. ALL REINFORCING STEEL IN THE RIGID FRAME CLOSURE POUR SHALL MEET THE REQUIREMENTS OF SECTION 507 FOR "REINFORCING STEEL, LEVEL I (EPOXY COATED)" AND WILL BE PAID FOR UNDER ITEM 507.11 "REINFORCING STEEL, LEVEL I"
17. ALL REINFORCING STEEL IN THE APPROACH SLABS SHALL MEET THE REQUIREMENTS OF SECTION 507 FOR "REINFORCING STEEL, LEVEL I (EPOXY COATED)" AND WILL BE INCLUDED IN THE UNIT PRICE BID. ALL REINFORCING STEEL IN THE APPROACH SLAB CLOSURE POURS SHALL MEET THE REQUIREMENTS OF SECTION 507 FOR "REINFORCING STEEL, LEVEL I (EPOXY COATED)" AND WILL BE PAID FOR UNDER ITEM 507.11 "REINFORCING STEEL, LEVEL I".

18. ALL REINFORCING STEEL IN THE PILE CAP SHALL MEET THE REQUIREMENTS OF SECTION 507 FOR "REINFORCING STEEL, LEVEL I" AND WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.
19. CUTTING AND REPAIRING DAMAGED AREAS OF COATED REINFORCING STEEL SHALL BE PERFORMED IN ACCORDANCE WITH SUBSECTION 507.04.
20. REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE:
 SPACING: +/- 1 INCH
 CLEARANCE: +/- 1/4 INCH

PRECAST PILE CAPS

21. IF A VERTICAL CONSTRUCTION JOINT IS REQUIRED BY THE CONTRACTOR FOR SHIPMENT OF THE PILE CAPS, THE SECTIONS SHALL BE JOINED WITH CLOSURE POUR DETAILED ON THE PILE CAP REINFORCING PLAN SHEET.
22. ITEM 524.21, JOINT SEALER, POLYURETHANE, SHALL BE APPLIED TO THE FAR FACE OF ALL VERTICAL CONSTRUCTION JOINTS.

PRECAST RIGID FRAME

23. THE PILE CAPS ARE DESIGNED FOR THE REACTIONS AND BEHAVIOR SUMMARIZED BELOW. IF THE PROPOSED FRAME REACTIONS AND GEOMETRY VARY BEYOND THE LIMITS DEFINED BELOW, THE FABRICATOR SHALL ASSUME DESIGN RESPONSIBILITY OF THE FOUNDATION, DESIGN THE NECESSARY REVISIONS TO THE FOUNDATION, AND SUBMIT STRUCTURAL CALCULATIONS FOR THE REVISED DESIGN IN ACCORDANCE WITH SUBSECTION 540.04.
 - a. FRAME STIFFNESS: WHEN MODELING THE STIFFNESS OF THE FRAME FOR PURPOSES OF DESIGNING THE PILES AND PILE CAPS, THE FRAME LEG WAS ASSUMED TO HAVE A MINIMUM THICKNESS OF 12 INCHES. IF THE FABRICATOR'S PROPOSED LEG THICKNESS IS LESS THAN 12 INCHES, THE FABRICATOR SHALL ASSUME DESIGN RESPONSIBILITY OF THE PILES AND PILE CAP.
 - b. FRAME REACTIONS AT TOP OF PEDESTAL: THE FOUNDATION WAS DESIGNED FOR A MAXIMUM UN-FACTORED REACTIONS OF:
 - STRUCTURE DEAD LOAD: 6.5 KIPS PER FOOT OF FRAME
 - LIVE LOAD: 5.5 KIPS PER FOOT OF FRAME
 - EARTH PRESSURE & LIVE LOAD SURCHARGE ON FRAME: 2.0 KIPS PER FOOT OF FRAME
 - LIVE LOAD SURCHARGE & EARTH PRESSURE ON PILE CAP: 1.6 KIPS PER FOOT OF FRAME
 - c. TOP OF PILE CAP: THE PILE CAP IS DESIGNED FOR THE DIMENSIONS SHOWN IN THE PLANS. IF THE PROPOSED FABRICATOR'S DESIGN REQUIRES A HIGHER PEDESTAL ELEVATION, THE FABRICATOR SHALL ASSUME DESIGN RESPONSIBILITY OF THE PILE CAP.
24. THE PRECAST FRAME AND WINGWALLS SHALL BE DESIGNED BY THE PRECAST FABRICATOR, INCLUDING THE ANCHORAGE AND CONNECTIONS BETWEEN ELEMENTS. ALL ELEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATIONS. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND CALCULATIONS TO THE ENGINEER IN ACCORDANCE WITH SECTION 105.
25. DESIGN CRITERIA:
 - LIVE LOAD = HL-93
 - UNIT WEIGHT OF BACKFILL = 140 LBS/CF
 - ACTIVE EARTH PRESSURE COEFFICIENT FOR BACKFILL $K_a = 0.28$
 - AT REST EARTH PRESSURE COEFFICIENT FOR BACKFILL $K_o = 0.44$
 - PASSIVE EARTH PRESSURE COEFFICIENT FOR BACKFILL $K_p = 3.53$
26. THE FABRICATOR SHALL SUPPLY THE STATE WITH THE LRRF LOAD RATING FACTORS FOR THE FRAME TO COMPLETE THE LOAD RATING TABLE ON THE PRELIMINARY INFORMATION SHEET.
27. CLEAR COVER ON THE REINFORCING STEEL SHALL BE ACCORDING TO THE FOLLOWING TABLE UNLESS NOTED OTHERWISE:

LOCATION	CLEAR COVER (INCHES)
UNDERSIDE OF FRAME ROOF	1.5
EXPOSED TO EARTH OR WEATHER	2.0
TOP OF FRAME AND APPROACH SLABS	2.5
DIRECT EXPOSURE TO DEICING SALTS (FRAME FASCIA AND CURB)	3.0
CAST AGAINST EARTH	3.0

28. THE LUMP SUM COST FOR ITEM 540.10 "PRECAST CONCRETE STRUCTURE (RIGID FRAME AND WINGWALLS)" SHALL INCLUDE THE PRECAST RIGID FRAME, WINGWALLS, AND MECHANICAL CONNECTIONS.
29. THE PRECAST STRUCTURE DETAILS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND CONFIGURATION WILL BE DEPENDENT ON THE FABRICATOR. THE INSIDE CLEAR DIMENSION OF THE PILE CAP SHALL BE A MINIMUM OF 23 FEET AND THE THICKNESS OF THE ROOF SLAB SHALL BE NO MORE THAN 18 INCHES.
30. THE USE OF EQUIPMENT AND THE METHOD OF BACKFILLING AROUND THE BURIED STRUCTURE SHALL BE IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATIONS. CARE SHALL BE TAKEN WHEN BACKFILLING AGAINST JOINT SEALING MATERIALS.
31. NO HOLES SHALL BE DRILLED IN THE RIGID FRAME OR ARCH WITHOUT THE APPROVAL OF THE FABRICATOR AND THE AGENCY.

32. JOINTS BETWEEN ALL ABUTING PRECAST UNITS SHALL BE WATERTIGHT AND MECHANICALLY CONNECTED.
33. REINFORCING STEEL FROM THE DECK OF THE FRAME INTO THE BRIDGE CURB SHALL BE CONTINUOUS AND NEITHER SPLICED NOR JOINED WITH A MECHANICAL CONNECTOR.

APPROACH SLAB AND SUPERSTRUCTURE LONGITUDINAL CLOSURE POURS

34. THE CONCRETE EDGES ALONG THE LONGITUDINAL CLOSURE POURS SHALL BE TREATED TO PROVIDE A ROUGHENED/ EXPOSED AGGREGATE SURFACE. THAT AMPLITUDE OF THE EXPOSED AGGREGATE SHALL BE A MINIMUM OF 1/8" AND BE COMPLETED PRIOR TO ERECTION OF THE BEAMS. THE FABRICATOR SHALL INDICATE THE METHOD USED TO ACHIEVE THIS PROFILE ON THE FABRICATION DRAWING AND METHOD USED TO PROTECT THE REINFORCING STEEL.
35. THE CONCRETE FOR LONGITUDINAL CLOSURE POURS SHALL BE ITEM 900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)" AND WILL BE PAID UNDER ITEM 900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)".
36. THE LONGITUDINAL CLOSURE POUR CONCRETE SHALL OBTAIN A STRENGTH OF 4,000 PSI PRIOR TO ANY VEHICULAR LOADING.

APPROACH SLABS

37. APPROACH SLAB CONCRETE STRENGTH: $f_c = 5,000$ PSI.
38. CORRUGATED POST-TENSIONING DUCTS IN THE PRECAST APPROACH SLABS FOR DOWEL CONNECTIONS SHALL BE CONSTRUCTED FROM EITHER POLYETHYLENE OR POLYPROPYLENE. THE DUCT SHALL HAVE A MINIMUM MATERIAL THICKNESS OF 0.080 IN. +/- 0.010 IN. AND SHALL HAVE A WHITE COATING ON THE OUTSIDE OR SHALL BE OF WHITE MATERIAL WITH UNTRAVIOLET STABILIZERS ADDED. POLYETHYLENE DUCT SHALL BE FABRICATED FROM RESINS MEETING OR EXCEEDING THE REQUIREMENTS OF ASTM D 3350 WITH A CELL CLASSIFICATION OF 345464A. POLYPROPYLENE DUCT SHALL BE FABRICATED FROM RESINS MEETING OR EXCEEDING THE REQUIREMENTS OF ASTM D 4101 WITH A CELL CLASSIFICATION RANGE OF PP0340B44544 TO PP340B65884. ALL COSTS ASSOCIATED WITH PLACING THE DUCT WILL BE INCLUDED IN THE BID PRICE FOR THE APPROPRIATE PRECAST APPROACH SLAB OPTION.
39. GROUT USED TO FILL DOWEL DUCTS IN THE PRECAST APPROACH SLABS FOR DOWEL CONNECTIONS SHALL BE MORTAR, TYPE IV IN ACCORDANCE WITH SECTION 540 - PRECAST CONCRETE. ALL COSTS ASSOCIATED WITH PROVIDING AND PLACING GROUT FOR THE APPROACH SLAB DOWEL CONNECTIONS WILL BE INCLUDED IN THE BID PRICE FOR THE APPROPRIATE PRECAST APPROACH SLAB OPTION.

H-PILES

40. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED AS SHOWN ON THE BORING LOGS. THE ACTUAL IN PLACE LENGTHS MAY VARY.
41. THE PILES SHALL BE HP 12 X 63 ORIENTED FOR STRONG AXIS BENDING AT BOTH ABUTMENTS.
42. TO PREVENT DAMAGE TO THE PILES, PILE SHOES ARE REQUIRED FOR DRIVEN PILES AND SHALL CONFORM TO SUBSECTION 505.04 (f).
43. THE PILES AT BOTH ABUTMENTS SHALL BE DRIVEN TO A NOMINAL AXIAL PILE DRIVING RESISTANCE (RNRD) OF 219 KIPS USING A PILE RESISTANCE FACTOR OF 0.65, PROVIDED A MINIMUM PENETRATION OF 25 FEET BELOW THE BOTTOM OF PILE CAP HAS BEEN ACHIEVED.
44. A MINIMUM OF ONE DYNAMIC PILE TEST SHALL BE CONDUCTED ON PILES AT EACH ABUTMENT.
45. THE TOPS OF THE PILES AFTER DRIVING OR PLACEMENT SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN 3 INCHES. THE PILE ORIENTATION SHALL NOT VARY BY MORE THAN 5 DEGREES. THE CONTRACTOR SHALL DEMONSTRATE HOW THE TOLERANCES WILL BE MET TO THE SATISFACTION OF THE ENGINEER. THESE MEASURES SHALL BE DEMONSTRATED IN A SUBMITTAL TO BE ACCEPTED BEFORE PILE DRIVING COMMENCES.

MISCELLANEOUS

46. EPSC EXISTING CONDITIONS SHEET AND EPSC PLAN SHEET HAVE BEEN INCLUDED AS A REFERENCE FOR SUBMITTALS.
47. ITEM 404.65 "EMULSIFIED ASPHALT" IS TO BE APPLIED AT A RATE OF 0.080 GAL/SY BETWEEN SUCCESSIVE COURSES OF PAVEMENT AND ON ALL COLD PLANED SURFACES OR AS DIRECTED BY THE ENGINEER.
48. ITEM 520.10, "MEMBRANE WATERPROOFING, SPRAY APPLIED" SHALL BE APPLIED TO THE BRIDGE DECK AS PER THE MANUFACTURER'S INSTRUCTIONS AND EXTEND ONTO THE APPROACH SLABS 2 FEET BEYOND THE BEGIN BRIDGE/END OF BRIDGE.

PROJECT NAME: RICHMOND	
PROJECT NUMBER: BF 0284(28)	
FILE NAME: s13c070gen	PLOT DATE: 06-OCT-2016
PROJECT LEADER: R. YOUNG	DRAWN BY: W. LAMMER
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GENERAL NOTES	SHEET 3 OF 54