

PRECAST ABUTMENTS AND POST-TENSIONING

24. WATERSTOPS SHALL BE PLACED AT THE JOINT BETWEEN THE PRECAST ABUTMENTS AND THE CAST-IN-PLACE CONCRETE BEAM-END CLOSURE POURS. THIS WORK SHALL BE PAID FOR UNDER THE APPROPRIATE PRECAST CONCRETE ABUTMENT PAY ITEM.
25. IF VERTICAL CONSTRUCTION JOINTS ARE REQUIRED BY THE CONTRACTOR FOR SHIPPING OF THE ABUTMENTS THEN THE SECTIONS SHALL BE KEYED AND MATCH CAST. A JOINT DETAIL SHALL BE SHOWN ON THE FABRICATION DRAWINGS.
26. POST-TENSIONING AND ASSOCIATED ITEMS ARE ONLY REQUIRED IF THE PRECAST ABUTMENT IS CONSTRUCTED OF MORE THAN ONE UNIT. ANY POST-TENSIONING STRANDS AND CONDUIT SHALL ADHERE TO THE REQUIREMENTS OF SECTION 510 - PRESTRESSED CONCRETE. GALVANIZED ANCHOR ASSEMBLIES, CONDUIT, AND POST-TENSIONING STRANDS SHALL BE INCLUDED UNDER THE APPROPRIATE PRECAST CONCRETE ABUTMENT PAY ITEM. POST-TENSIONING STRANDS SHALL BE COVERED WITH SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF THE STRAND, EXCEPT AT ANCHORAGE LOCATIONS.
27. GALVANIZE ANCHOR ASSEMBLIES AFTER FABRICATION ACCORDING TO AASHTO M232M/M232.
28. DESIGN VALUES: (ABUTMENTS AND APPROACH SLABS)
- A. CONCRETE COMPRESSIVE STRENGTH: $f'_c = 5,000$ PSI.
 - B. POST-TENSIONING STRANDS: 0.5 INCH DIAMETER, 270 KSI, LOW RELAXATION 7-WIRE STRANDS.
 - C. ASSUMED MODULUS OF ELASTICITY IS 28,500 KSI.
 - D. THERE SHALL BE TWO STRANDS PER CONDUIT.
 - E. JACKING FORCE PER STRAND: 32 KIPS
29. THE CONCRETE FOR THE ABUTMENT #1 AND ABUTMENT #2 PILE CAVITIES SHALL MEET THE REQUIREMENTS OF ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)".
30. THE CORRUGATED STEEL PIPE SHALL BE TYPE 1 AND SHALL MEET THE REQUIREMENTS OF SUBSECTION 711.01 AND AASHTO M289. ALL COSTS ASSOCIATED WITH PLACING THE CORRUGATED STEEL PIPE SHALL BE INCLUDED UNDER THE APPROPRIATE PRECAST CONCRETE ABUTMENT PAY ITEM.
31. PROPOSED SEQUENCE OF CONSTRUCTION:
- A. PREPARE AND GRADE FOUNDATION TO REQUIRED ELEVATION.
 - B. PRE-EXCAVATE PILES FOR ABUTMENT #2.
 - C. DRIVE PILES.
 - D. PLACE GEOTEXTILE FOR ROADBED SEPARATOR UNDER ABUTMENTS, BACKFILL TO BOTTOM OF ABUTMENT ELEVATION, AND WRAP GEOTEXTILE FOR ROADBED SEPARATOR OVER THE BACKFILL.
 - E. PLACE PRECAST ABUTMENTS AND INSTALL TRANSVERSE STRANDS (IF MORE THAN ONE UNIT IS USED)
 - F. APPLY EPOXY BONDING COMPOUND TO MATCH CAST FACES OF VERTICAL CONSTRUCTION JOINT.
 - G. USE A CALIBRATED JACK TO TENSION TO 3 KIPS TO REMOVE SAG IN STRANDS.
 - H. CHECK ALIGNMENT OF PRECAST ABUTMENT ELEMENTS.
 - I. STRESS POST-TENSIONING STRANDS USING A CALIBRATED JACK.
 - J. FILL PILE CAVITIES WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)".
 - K. BACKFILL MAY BE COMPLETED AFTER SPLICE CONNECTOR GROUT HAS REACHED 85% OF 5,000 PSI.
32. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED TO THE VTRANS PROJECT MANAGER FOR APPROVAL.

NEXT D BEAMS

33. NEXT D BEAMS ARE A NON-PROPRIETARY SHAPE DEVELOPED BY PCI NORTHEAST (PCINE). STANDARDIZED SECTION PROPERTIES AND DETAILS MAY BE FOUND AT <http://www.pcine.org>.
34. DESIGN VALUES:
- A. CONCRETE DESIGN COMPRESSIVE STRENGTH: $f'_c = 10,000$ PSI.
 - B. CONCRETE COMPRESSIVE STRENGTH AT RELEASE: $f'_{ci} = 8,000$ PSI.
 - C. PRESTRESSING STRANDS: 0.6 INCH DIAMETER, 270 KSI, LOW-RELAXATION 7-WIRE STRANDS.
 - D. ASSUMED MODULUS OF ELASTICITY: 28,500 KSI.
 - E. THE JACKING FORCE PER STRAND: 44 KIPS.
 - F. SERVICE LOADS:
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| MEMBER MOMENT | 743.2 K-FT |
| SUPERIMPOSED DEAD LOAD MOMENT | 277.3 K-FT |
| LIVE LOAD AND IMPACT MOMENT | 434.6 K-FT |
| PEDESTRIAN LIVE LOAD MOMENT | 40.4 K-FT |
| DEAD LOAD REACTION | 72.9 KIPS |
| LIVE LOAD AND IMPACT REACTION | 51.8 KIPS |
| PEDESTRIAN LIVE LOAD REACTION | 2.9 KIPS |
| TOTAL REACTION | 127.6 KIPS |
| CAMBER AT RELEASE | 1 $\frac{3}{8}$ INCHES |
| ERECTION CAMBER | 2 $\frac{1}{2}$ INCHES |
| RESIDUAL CAMBER | 2 $\frac{13}{16}$ INCHES |
| FINAL CAMBER | 1 $\frac{1}{8}$ INCHES |
- DIMENSION TOLERANCES SHOULD BE INCLUDED IN FABRICATION DRAWINGS.
35. ENDS OF FLANGES IN CONTACT WITH GROUT SHALL BE SANDBLASTED PRIOR TO DELIVERY AND POWER WASHED WITH WATER PRIOR TO ERECTION OF THE BEAMS.
36. FILL THE FLANGE TO FLANGE CONNECTION WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)".
37. METHOD OF FORMING FLANGE CONNECTION SHALL BE DETERMINED BY THE CONTRACTOR. THE FORMS SHALL BE REMOVABLE AND ABLE TO ACCOMMODATE DIFFERENTIAL CAMBER. FORM SUPPORTS SHALL NOT PENETRATE THROUGH THE TOP OF THE POUR UNLESS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL NOT DRILL INTO NEXT BEAMS.
38. THE FABRICATOR MAY ALTER THE DESIGN AS DETAILED IN THESE PLANS TO ACCOMMODATE THE FABRICATOR'S SPECIFIC OPERATION. THIS ALTERATION MUST BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT, MEET THE ABOVE CRITERIA, AND SHALL BE APPROVED BY THE PROJECT MANAGER.
39. PROPOSED SEQUENCE OF CONSTRUCTION:
- A. LAY OUT WORKING LINES THE ENTIRE WIDTH OF THE BRIDGE ALONG CENTERLINE OF BEARING, MEASURED FROM A SINGLE WORKING POINT. THE WORKING LINES SHALL BE BASED ON THE NOMINAL BEAM WIDTHS.
 - B. VERIFY THE BEAM SEAT ELEVATIONS AND TAKE CORRECTIVE ACTION IF NECESSARY.
 - C. INSTALL BEARINGS.
 - D. ERECT THE BEAMS TO FIT WITHIN THE WORKING LINES.
 - E. ADJUST BEAMS TO FIT SNUG AGAINST 1/2" CORK ON INTERIOR OF CHEEK WALLS.
 - F. CONSTRUCT FORMS FOR THE FLANGE CONNECTION POUR AND BEAM-END CLOSURE POUR.
 - G. GROUT CONNECTIONS BETWEEN BEAM FLANGES, APPLY LONGITUDINAL GROOVES IN ACCORDANCE WITH SECTION 509, AND CURE.
 - H. COMPLETE BEAM-END CLOSURE POUR TO TOP OF DECK, APPLY LONGITUDINAL GROOVES IN ACCORDANCE WITH SECTION 509, AND CURE.
40. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED TO THE VTRANS PROJECT MANAGER FOR APPROVAL.

H-PILES

41. TO PREVENT DAMAGE TO THE PILES, PILE SHOES ARE REQUIRED AND SHALL CONFORM TO SUBSECTION 505.04 (f).
42. THE TOPS OF THE PILES AFTER DRIVING SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN THREE INCHES. THE PILE ORIENTATION SHALL NOT VARY BY MORE THAN FIVE DEGREES. THE CONTRACTOR SHALL DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER HOW THE TOLERANCES WILL BE MET. THESE MEASURES SHALL BE DEMONSTRATED IN A SUBMITTAL TO BE ACCEPTED BEFORE PILE DRIVING COMMENCES.
43. THE PILES SHALL BE DRIVEN TO A NOMINAL PILE DRIVING RESISTANCE (RNDR) OF 268 KIPS, AS DETERMINED BY THE RESULTS OF DYNAMIC TESTING, AND AS INTERPRETED BY THE ENGINEER, AND TO A MINIMUM DEPTH OF 16 FEET BELOW THE BOTTOM OF THE PRECAST ABUTMENT. NO PILE SPLICES SHALL BE ALLOWED ABOVE THIS DEPTH.
44. TO ENSURE THAT THE NOMINAL CAPACITY HAS BEEN ATTAINED AND TO PREVENT THE OVERSTRESSING OF THE PILES DURING DRIVING OPERATIONS, DYNAMIC TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SUBSECTION 505.04. A MINIMUM OF ONE DYNAMIC PILE TEST SHALL BE CONDUCTED ON THE FIRST PILE DRIVEN FOR EACH SUBSTRUCTURE UNIT, FOR A TOTAL OF TWO TESTS. MORE TESTS MAY BE ORDERED BY THE ENGINEER. ADDITIONAL TEST(S) ORDERED BY THE ENGINEER WILL BE PAID FOR AT THE UNIT PRICE BID FOR CONTRACT ITEM 505.45.
45. STRESSES IN THE PILE DURING DRIVING SHALL NOT EXCEED THE MAXIMUM DRIVING STRESS. THE MAXIMUM DRIVING STRESS SHALL BE DETERMINED AS 90 PERCENT OF THE PILE STEEL STRENGTH MULTIPLIED BY A RESISTANCE FACTOR OF 1.00.
46. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED TO BE AS SHOWN ON THE BORING LOGS. THE ACTUAL IN PLACE LENGTH MAY VARY.
47. DUE TO THE PROXIMITY OF AN ADJACENT BUILDING AND THE PRESENCE OF THE EXISTING ABUTMENT TO REMAIN IN PLACE, THE CONTRACTOR MAY PRE-EXCAVATE THE FOUNDATION MATERIALS PRIOR TO DRIVING ABUTMENT #2 PILES IN ORDER TO MEET THE REQUIREMENTS OF SPECIAL PROVISION (CONSTRUCTION AND VIBRATION CRACK MONITORING). THIS WORK SHALL BE COMPLETED PRIOR TO THE BRIDGE CLOSURE PERIOD. REFERENCE TRAFFIC CONTROL SHEET 20 FOR ADDITIONAL INFORMATION.
48. PAYMENT FOR PRE-EXCAVATION FOR PILES SHALL BE UNDER ITEM 900.640, "SPECIAL PROVISION (PRE-EXCAVATION OF INTEGRAL ABUTMENT PILES)".
49. A MINIMUM OF 4 OF THE 6 ABUTMENT #2 PILES SHALL BE INSTALLED PRIOR TO THE BRIDGE CLOSURE PERIOD UTILIZING ONE-WAY ALTERNATING TRAFFIC. SEE TRAFFIC CONTROL SHEET 20 FOR ADDITIONAL INFORMATION.

MISCELLANEOUS

50. THE CONSTRUCTION OF THE CAST-IN-PLACE CONCRETE RETAINING WALL AND ABUTMENT #2 OCCURS IN CLOSE PROXIMITY TO THE BASEMENT OF THE ADJACENT ABUTMENT AT THE NORTHEAST CORNER OF THE BRIDGE. VIBRATION AND CRACK MONITORING SHALL BE REQUIRED AND PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (CONSTRUCTION VIBRATION AND CRACK MONITORING)".
51. ALL STEEL COMPONENTS OF APPROACH RAILING AND GUARDRAIL SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. COMPONENTS SHALL BE POWDER COATED BLACK IN ACCORDANCE WITH ASTM D 7803.

