

PROJECT NOTES

GENERAL

1.

ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2011, AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION, AND ITS 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.

THE BRIDGE IS DESIGNED FOR HL-93 LIVE LOAD WITH A 7 INCH ALLOWANCE FOR FUTURE AGGREGATE SURFACE COURSE.
4.

ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS UNLESS OTHERWISE DESIGNATED BY THE TOWN OR NEGOTIATED BY THE CONTRACTOR WITH APPROPRIATE LANDOWNERS.
5.

ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES FAHRENHEIT UNLESS NOTED OTHERWISE.
6.

ITEM 529.15 “REMOVAL OF STRUCTURE” IS FOR THE COMPLETE REMOVAL AND DISPOSAL OF THE EXISTING BRIDGE SUBSTRUCTURE AND SUPERSTRUCTURE, INCLUDING ALL BRIDGE RAIL, BEARINGS, AND ANCHOR BOLTS, WHERE THE REMOVAL IS OUTSIDE OF THE AREAS COVERED BY ANY OF THE EXCAVATION ITEMS.
7.

THE EXISTING BRIDGE CONTAINS STRUCTURAL STEEL. THE STRUCTURAL STEEL MAY BE PAINTED WITH A MATERIAL THAT MAY CONTAIN LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. THE REMOVED STRUCTURAL STEEL IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL IDEMNIFY AND HOLD THE STATE, ITS OFFICERS, AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR’S USE OR DISPOSITION OF THE REMOVED EXISTING STRUCTURAL STEEL.
8.

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL BURIED AND AERIAL UTILITIES AND POLES PRIOR TO STARTING WORK. SOME UTILITIES HAVE BEEN RELOCATED DURING THE PREPARATION OF THE PLANS AND THE CONTRACTOR WILL NEED TO COORDINATE WITH ALL UTILITY OWNERS TO CONFIRM ACTUAL LOCATION PRIOR TO CONSTRUCTION. SEE THE UTILITY SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
9.

NO SUBSTITUTION FOR PRECAST CONCRETE WILL BE PERMITTED.

EARTHWORK AND RELATED ITEMS

10.

STONE FILL, TYPE III SHALL BE PLACED IN FRONT OF THE ABUTMENTS BEFORE THE NEW BEAMS ARE SET.

TRAFFIC MAINTENANCE DURING CONSTRUCTION

11.

THE CONTACTOR SHALL IMPLEMENT THE ROAD CLOSURE, AS SHOWN ON THE PLANS.
12.

THE CONTRACTOR SHALL NOTIFY THE TOWN A MINIMUM OF TWO (2) WEEKS PRIOR TO CLOSING THE ROAD.
13.

FULL ACCESS TO ALL SIDE ROADS AND DRIVES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED AT ALL TIMES. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 641.10, “TRAFFIC CONTROL”.
14.

THE DETOUR FOR THE BRIDGE CLOSURE IS THE RESPONSIBILITY OF THE TOWN.
15.

UNLESS COVERED UNDER INDIVIDUAL PAY ITEMS OR NOTED OTHERWISE, ALL COSTS FOR TEMPORARY TRAFFIC CONTROL DEVICES WILL BE CONSIDERED TO BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR TRAFFIC CONTROL, ITEM 641.10, “TRAFFIC CONTROL”. THIS INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING ITEMS:

TEMPORARY TRAFFIC BARRIERS  
RETROREFLECTIVE DRUMS  
TYPE III BARRICADES  
SIGNS  
SIGN POSTS

TEMPORARY TRAFFIC BARRIER SHALL BE FURNISHED IN ACCORDANCE WITH SECTION 621.

16.

ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE “MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES” (MUTCD) AND THE “STANDARD HIGHWAY SIGNS AND MARKINGS” BOOK (SHSM) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).

CONCRETE

17.

ITEM 514.10, “WATER REPELLENT, SILANE” SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES ON THE BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE, WITH THE EXCEPTION OF THE UNDERSIDE OF THE BOX BEAMS BETWEEN THE DRIP NOTCHES.
18.

ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI).
19.

ALL PRECAST SUBSTRUCTURE CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 540-PRECAST CONCRETE.
20.

ALL REINFORCEMENT IN THE PILE CAP AND WINGWALLS SHALL BE REINFORCING STEEL, LEVEL I IN ACCORDANCE WITH SECTION 507. ALL REINFORCING STEEL IN THE BOX BEAMS SHALL BE REINFORCING STEEL, LEVEL II IN ACCORDANCE WITH SECTION 507. PAYMENT FOR REINFORCING STEEL WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE SECTION 510 OR 540 CONTRACT ITEM.
21.

THE COST FOR THE PRECAST CONCRETE CURBS SHALL BE INCLUDED IN ITEM 510.21, “PRESTRESSED CONCRETE BOX BEAMS (BI-36)”. THE CURBS SHALL BE CAST AT THE FABRICATION PLANT FOR THE BOX BEAMS IN ACCORDANCE WITH SECTION 540.

PRECAST ABUTMENTS AND POST-TENSIONING

22.

IF VERTICAL CONSTRUCTION JOINTS ARE REQUIRED BY THE CONTRACTOR FOR SHIPMENT OF THE ABUTMENTS, THEN THE SECTIONS SHALL BE KEYED AND MATCH CAST. A JOINT DETAIL SHALL BE SHOWN ON THE FABRICATION DRAWINGS.
23.

POST-TENSIONING AND ASSOCIATED ITEMS ARE ONLY REQUIRED IF THE PILE CAP 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 ITEM 540.10, “PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 1)” OR “PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 2)” AS APPROPRIATE. 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.
24.

GALVANIZE ANCHOR ASSEMBLIES AFTER FABRICATION ACCORDING TO AASHTO M23 2M/M 232.
25.

DESIGN VALUES

A.

CONCRETE COMPRESSIVE STRENGTH: f’c =5000 PSI.

B.

POST-TENSIONING STRANDS: 0.5 INCH DIAMETER, 270 KSI, LOW RELAXATION 7-WIRE STRANDS.

C.

ASSUMED MODULUS OF ELASTICITY IS 28500 KSI.

D.

THERE SHALL BE 2 STRANDS PER CONDUIT.

E.

THE JACKING FORCE PER STRAND = 32 KIPS.
26.

THE CONCRETE FOR THE ABUTMENT NO. 1 AND ABUTMENT NO. 2 PILE CAVITIES SHALL MEET THE REQUIREMENTS OF ITEM 900.608, “SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)”.
27.

PROPOSED SEQUENCE OF CONSTRUCTION:

A.

PREPARE AND GRADE FOUNDATION TO REQUIRED ELEVATION.

B.

DRIVE PILES.

C.

PLACE PRECAST ABUTMENTS AND INSTALL TRANSVERSE STRANDS (IF MORE THAN ONE UNIT).

D.

APPLY EPOXY TO MATCH CAST FACES OF VERTICAL CONSTRUCTION JOINT.

E.

USE A CALIBRATED JACK TO TENSION TO 3 KIPS TO REMOVE SAG IN STRANDS.

F.

CHECK ALIGNMENT OF PILE CAP ELEMENTS.

G.

STRESS POST-TENSIONING STRANDS USING A CALIBRATED JACK OPERATED BY QUALIFIED PERSONNEL WHO HAVE PREVIOUS EXPERIENCE IN POST-TENSIONING.

H.

FILL PILE CAVITIES WITH ITEM 900.608, “SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)”.

I.

PLACE PRECAST WINGWALLS AND GROUT SPLICE CONNECTORS.

J.

BACKFILL MAY BE COMPLETE AFTER SPLICE CONNECTOR GROUT HAS REACHED 85% OF 5,000 PSI.
28.

ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED FOR APPROVAL BY THE PROJECT MANAGER.

PRESTRESSED BOX BEAMS

29.

ITEM 510.21 “PRESTRESSED CONCRETE BOX BEAMS” SHALL:

A.

CONFORM TO SECTION 510 “PRESTRESSED CONCRETE”.

B.

HAVE THE ENDS OF THE STRANDS RECESSED AND GROUTED ACCORDING TO STANDARD PRACTICE.

C.

INCLUDE COLD POURED JOINT FILLER, AND TRANSVERSE TENDONS.

D.

GALVANIZE TRANSVERSE TENDON PLATES AND CHUCKS AFTER FABRICATION ACCORDING TO AASHTO M 232M/M 232.
30.

ITEM 510.24 “GROUTING SHEAR KEYS”: FILL THE JOINTS BETWEEN THE BEAMS WITH MORTAR, TYPE IV, AS SPECIFIED IN SUBSECTION 510.13.

PRESTRESSED BOX BEAMS (CONT.)

31.

DESIGN VALUES

A.

CONCRETE: f’c = 6.0 KSI AND f’ci = 4.8 KSI

B.

LIVE LOAD: AASHTO HL-93

C.

PRESTRESSING STRANDS: 0.6” DIAMETER, 270 KSI, LOW-RELAXATION 7-WIRE STRANDS PULLED TO 75% OF THEIR ULTIMATE TENSILE STRENGTH.

D.

POST-TENSIONING STRANDS: 0.6” DIAMETER, 270 KSI, LOW-RELAXATION 7-WIRE STRANDS.

E.

THE ASSUMED MODULUS OF ELASTICITY FOR THE STRAND IS 28,500 KSI.

F.

THERE SHALL BE (1) STRAND PER TRANSVERSE TIE AT THE END DIAPHRAGM LOCATIONS AND (2) STRANDS PER TRANSVERSE TIE AT THE CENTER DIAPHRAGM.

G.

TRANSVERSE TENDONS SHALL BE COVERED BY SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSIVE INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF THE STRAND. TIES SHALL BE TENSIONED TO 47 KIPS FOR EACH 0.6” DIAMETER STRAND.

H.

SERVICE LOADS

MEMBER MOMENT

228.4

K-FT

283.5

K-FT

SUPERIMPOSED DEAD LOAD MOMENT

241.3

K-FT

241.3

K-FT

LIVE LOAD & IMPACT MOMENT

284.6

K-FT

287.7

K-FT

DEAD LOAD REACTION

35.8

K

40.5

K

LIVE LOAD & IMPACT REACTION

45.8

K

44.1

K

TOTAL REACTION

81.6

K

84.6

K

RELEASE CAMBER

1.05

IN

0.70

IN

FINAL CAMBER

1.28

IN

0.78

IN
32.

THE FABRICATOR MAY, WITH THE APPROVAL OF THE ENGINEER, ALTER THE DESIGN AS DETAILED TO MEET THE PLANT’S PRESTRESSING OPERATION AND MATERIAL REQUIREMENTS. ALTERNATE STRAND, TRANSVERSE TIE AND CROSS-SLOPE CONFIGURATIONS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL. ANY DESIGN CHANGES SHALL MEET ALL OF THE APPLICABLE DESIGN CRITERIA, LOADINGS AND CODES; AND SHALL BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT.
33.

THE PRECASTER SHALL SANDBLAST SHEAR KEY FACES PRIOR TO DELIVERY.
34.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGN OF ALL LIFTING POINTS, POST TENSIONING ELEMENTS IN THE ANCHORAGE ZONE AND ADDITIONAL REINFORCEMENT IN THE ANCHORAGE ZONE (REQUIRED FOR SPLITTING, BURSTING SPALLING, ETC.) INCLUDING THE LOCAL ZONE (REGION IMMEDIATELY SURROUNDING THE POST TENSIONING DEVICE). THE CONTRACTOR IS RESPONSIBLE FOR CONSIDERATION OF ADDITIONAL STRESSES DUE TO HANDLING. DESIGN MUST CONFORM TO AASHTO LRFD SPECIFICATIONS.
35.

ANCHORING ASSEMBLIES, CONDUITS, GROUT FOR THE CONDUIT, MECHANICAL CONNECTORS, AND POST TENSIONING STRANDS SHALL BE INCLUDED IN ITEM 510.21, “PRESTRESSED CONCRETE BOX BEAMS”.

PROPOSED CONSTRUCTION SEQUENCE FOR PRESTRESSED BOX BEAMS

36.

LAYOUT WORKING LINES:

A.

LAYOUT WORKING LINES FOR THE ENTIRE BRIDGE WIDTH ON THE BEAM SEAT.

B.

MEASURE ALL WORKING LINES FROM A COMMON WORKING POINT.

C.

BASE THE WORKING LINES ON THE NOMINAL BEAM WIDTHS.
37.

VERIFY BEAM SEAT ELEVATIONS:

A.

MEASURE ELEVATIONS AT BEAM SEATS.

B.

IF SEATS ARE HIGH OR LOW, TAKE CORRECTIVE ACTION.

C.

INSTALL BEARINGS.
38.

ERECT BEAMS:

A.

PLACE BEAMS TO FIT WITHIN THE WORKING LINES.

B.

AS WORK PROGRESSES, INSTALL HARDWOOD WEDGES BETWEEN ADJACENT BEAMS TO MAINTAIN PROPER JOINT OPENING (A MINIMUM OF ONE WEDGE AT EACH TRANSVERSE TENDON).

C.

DRILL ANCHOR BOLT HOLES

D.

PLACE ANCHOR BOLTS.
39.

INSTALL BACKER ROD: PLACE FILLER BELOW THE KEYWAY BOTTOM, AS SHOWN ON THE PLANS.
40.

INSTALL TRANSVERSE TENDONS:

A.

FEED TENDONS THROUGH DUCTS.

B.

VERIFY THAT HARDWOOD WEDGES ARE IN PLACE AS REQUIRED TO PREVENT SLIPPAGE OF BEAMS.

C.

USING A CALIBRATED JACK, POST-TENSION TENDONS TO APPROXIMATELY 5 KIPS TO REMOVE SAG IN THE TENDON AND TO SEAT THE CHUCK.
41.

GROUT SHEAR KEYS:

A.

CLEAN JOINTS WITH AN OIL FREE AIR-BLAST IMMEDIATELY BEFORE GROUT PLACEMENT. VERIFY THAT THE BACKER ROD IS STILL IN PLACE.

B.

FOLLOW MANUFACTURER’S RECOMMENDATIONS FOR ADDITIONAL JOINT PREPARATION AND GROUT PLACEMENT.

C.

CAREFULLY ROD JOINTS TO ELIMINATE ANY POSSIBILITY OF VOIDS.

| REVISION                     | DESCRIPTION      | DATE                     |
|------------------------------|------------------|--------------------------|
| △                            | REVISED NOTE 29D | 12/3/2013                |
| PROJECT NAME: GUILFORD       |                  |                          |
| PROJECT NUMBER: BRO 1442(3)  |                  |                          |
| FILE NAME: z10J064pn.dgn     |                  | PLOT DATE: 12/3/2013     |
| PROJECT LEADER: S.E. BURBANK |                  | DRAWN BY: E.A FIALA      |
| DESIGNED BY: J.T. KLEIN      |                  | CHECKED BY: S.E. BURBANK |
| PROJECT NOTES (1 OF 2)       |                  | SHEET 5 OF 42            |