

6. ALL ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. ALL WASHERS SHALL BE 3/8" PLATE (MINIMUM). PAYMENT FOR DRILLING AND GROUTING OF ANCHOR BOLTS SHALL BE INCLUDED IN ITEM 900.620 SPECIAL PROVISION (BEARING DEVICE ASSEMBLY, PREFORMED FABRIC PAD).
7. ALTERNATE BEARING DESIGNS MAY BE SUBMITTED FOR APPROVAL.
8. DESIGN CRITERIA
 - a. MINIMUM PREFORMED FABRIC PAD ALLOWABLE DESIGN ROTATION = 0.015 RADIANS
 - b. FABRIC PAD DESIGN LOAD PER BEARING AT ABUTMENTS
 $R_{OL} = 42.3$ KIPS
 $R_{LL} = 55.1$ KIPS
9. ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A DIRECTION ARROW THAT POINTS UP-STATION. ALL MARKS SHALL BE PERMANENT AND BE VISIBLE AFTER THE BEARING IS INSTALLED.

LUMBER AND TIMBER

1. ALL WOOD CONSTRUCTION SHALL COMPLY WITH THE AASHTO SPECIFICATIONS AND THE 2005 NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS).
2. ALL LUMBER AND TIMBER SHALL BE SAWN TO THE ACTUAL DIMENSIONS GIVEN IN THE PLANS, UNLESS OTHERWISE NOTED. SIZES ARE GIVEN AS WxD, WHERE W=WIDTH AND D=DEPTH.
3. UNLESS OTHERWISE NOTED, ALL EXISTING MEMBERS SHOWN TO BE REPLACED ARE TO BE REPLACED "IN-KIND" WITH NEW MEMBERS IDENTICAL IN DIMENSIONS AND CONFIGURATIONS AS THE ORIGINAL MEMBERS (INCLUDING MORTISES, TENONS, HOUSINGS, HOLES, FIT TOLERANCES, SURFACE (DRESSED OR ROUGH), ETC.).
4. SEE TABLE OF "MATERIALS FOR LUMBER AND TIMBER" ON SHEET 25 FOR SPECIES, STRESS GRADE, PRESERVATIVE TREATMENT AND FINISH. SUBSTITUTIONS OF OTHER SPECIES OR GRADE REQUIRE PRIOR APPROVAL BY THE ENGINEER AND MUST MEET OR EXCEED THE MINIMUM DESIGN VALUES GIVEN IN THE TABLE ON SHEET 25 FOR THE SPECIFIED MATERIAL.
5. SIZES GIVEN IN THE PLANS FOR EXISTING TIMBER MEMBERS ARE APPROXIMATE AND VARY FROM MEMBER TO MEMBER, AND ALONG THE LENGTH OF A GIVEN MEMBER. CONTRACTOR SHALL FIELD VERIFY ALL LUMBER AND TIMBER DIMENSIONS AND SIZES REQUIRED FOR REPLACEMENT OF OR CONNECTION TO EXISTING MEMBERS.
6. THE MAXIMUM IN-PLACE MOISTURE CONTENT (MC) OF LUMBER AND TIMBER SHALL BE IN ACCORDANCE WITH SUBSECTION 709.01(b) UNLESS OTHERWISE NOTED.
 - A. PEGS AND FREE TENONS: $MC \leq 12\%$
 - B. PATCHES AT EXISTING MEMBERS: MC TO MATCH EXISTING MEMBER WITHIN 3% AT TIME OF REPAIR, BUT NOT TO EXCEED 16%.
 - C. WEARING SURFACE TIMBERS MAY BE GREEN OAK.
7. EACH PIECE OF NEW LUMBER AND TIMBER SHALL BE GRADED BY A RECOGNIZED LUMBER GRADING AGENCY. INDIVIDUAL PIECES SHALL NOT BE STAMPED WITH A GRADE STAMP ASIDE FROM WEARING SURFACE BOARDS, WHICH SHALL BE PLACED WITH THE STAMP DOWN. MATERIAL CERTIFICATIONS SHALL BE SUBMITTED FOR ALL WOOD IN ACCORDANCE WITH SECTION 709.
8. ALL FIELD CUTS AND BORINGS OF TREATED WOOD SHALL BE TREATED WITH TWO COATS OF COPPER NAPHTHENATE SOLUTION LIBERALLY APPLIED PER SECTION 522.
9. SPECIES IDENTIFICATION OF A LIMITED NUMBER OF SAMPLES OF EXISTING TIMBERS INDICATED EASTERN SPRUCE FOR THE TRUSS BOTTOM CHORD; EASTERN HEMLOCK FOR THE ARCHES, TRUSS DIAGONALS, TRUSS POSTS AND TRUSS TOP CHORD; AND A MIXTURE OF EASTERN SPRUCE AND EASTERN HEMLOCK AT THE FLOOR BEAMS.
10. CUT MORTISE & TENON JOINTS TO LEAVE 1/4" CLEAR BETWEEN TENON END AND MORTISE BOTTOM TO ALLOW FOR SHRINKAGE. DIMENSION SHOWN ON DRAWINGS IS FOR END OF TENON.
11. TIMBER PAINTING, FIRE RETARDANT SHALL BE CLEAR IN COLOR.

FASTENERS FOR LUMBER AND TIMBER

1. EXCEPT AS SPECIFIED IN THE STRUCTURAL STEEL NOTES, PAYMENT FOR STRUCTURAL LUMBER AND TIMBER AND NON-STRUCTURAL LUMBER QUANTITIES SHALL BE FULL COMPENSATION FOR DETAILING, FURNISHING, TRANSPORTING, HANDLING, PLACING AND INSTALLING NEW AND REUSED TIMBER CONNECTORS AND PEGS WHICH ARE USED TO CONNECT NEW LUMBER AND TIMBER MEMBERS WITH EXISTING LUMBER AND TIMBER MEMBERS.
2. EXCEPT AS SPECIFIED IN THE STRUCTURAL STEEL NOTES, DETAILING, FURNISHING, TRANSPORTING, HANDLING, AND INSTALLING NEW AND REUSED TIMBER CONNECTORS, PEGS, AND SHIMS WHICH ARE USED TO CONNECT EXISTING LUMBER AND TIMBER MEMBERS SHALL BE CONSIDERED INCIDENTAL TO THE WORK REQUIRED FOR ITEM 900.645 SPECIAL PROVISION (REHABILITATING COVERED BRIDGE SUPERSTRUCTURE).
3. UNLESS OTHERWISE NOTED, ALL JOINERY AND FASTENERS IN MEMBERS TO BE REPLACED SHALL MATCH THE EXISTING JOINERY AND FASTENERS, INCLUDING ALL BOLTS, PEGS, NAILS, SCREWS, MORTISES, TENONS, HOUSINGS, KEYS, ETC.
4. PEGS SHALL BE ROUND WHITE OAK PEGS OF CLEAR MATERIAL WITH SLOPE OF GRAIN NOT GREATER THAN 1:15.
5. KEYS AND WEDGES SHALL BE WHITE OAK OF CLEAR MATERIAL WITH SLOPE OF GRAIN NOT GREATER THAN 1:10.

6. BOLTS SHALL BE ASTM A307 WITH HEX HEADS PER SUBSECTION 714.04.
7. THREADED ROD SHALL BE ASTM A572 GRADE 50.
8. NUTS FOR BOLTS AND THREADED ROD SHALL BE HEX NUTS TO AASHTO M 291 PER SUBSECTION 714.04.
9. WASHERS SHALL BE PROVIDED UNDER ALL BOLT HEADS AND NUTS THAT WOULD OTHERWISE BE IN CONTACT WITH TIMBER. "STANDARD WASHERS" SHALL BE STANDARD FLAT WASHERS TO ASTM F844. "MALLEABLE IRON WASHERS" SHALL HAVE OUTSIDE DIAMETER OF 3" FOR 3/4" BOLTS, 3 1/2" FOR 7/8" BOLTS, AND 4" FOR 1" BOLTS. USE WASHER STYLE INDICATED IN PLANS (MALLEABLE IRON WASHERS, IF STYLE NOT INDICATED).
10. SCREWS SHALL BE SELF-TAPPING STRUCTURAL SCREWS WITH 1.5" MINIMUM THREAD LENGTH, MINIMUM BENDING YIELD STRENGTH (Fyb) OF 160,000 PSI, AND MINIMUM UNTHREADED SHANK DIAMETER AND LENGTH AS INDICATED IN THE DRAWINGS. USE SCREWS WITH COUNTERSINKING STYLE HEADS, UNLESS OTHERWISE NOTED. "FLATHEAD SCREWS" SHALL HAVE A FLAT OR WASHER-STYLE HEAD WITH A MINIMUM DIAMETER OF 0.50". SCREWS SHALL BE GALVANIZED, OR COATED WITH ALTERNATE FINISH WITH DEMONSTRATED CORROSION RESISTANCE AT LEAST EQUIVALENT TO THAT OF GALVANIZED. COUNTERSINKING SCREWS SHALL BE TIMBERLOK BY FASTENMASTER, OR APPROVED EQUAL. FLATHEAD SCREWS SHALL BE HEADLOK BY FASTENMASTER, OR APPROVED EQUAL.
11. NAILS AND SPIKES SHALL BE COMMON NAILS UNLESS NOTED OTHERWISE. PREDRILL LEAD HOLES FOR SPIKES IN ACCORDANCE WITH THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS).
12. LAG SCREWS SHALL BE FULL-BODY DIAMETER LAG SCREWS OF LOW TO MEDIUM CARBON STEEL. PREDRILL LEAD HOLES FOR LAG SCREWS IN ACCORDANCE WITH THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS) FOR LUMBER AND TIMBER CONNECTIONS.
13. STEEL PLATES FOR LUMBER AND TIMBER CONNECTIONS NOT INCLUDED IN ITEM 506.60, STRUCTURAL STEEL, SHALL BE AASHTO M270 GRADE 36.
14. HOLES FOR PEGS SHALL BE BORED WITH A BIT OF THE SAME DIAMETER AS THE PEG TO PROVIDE A FRICTION FIT. PEGS SHALL BE DRIVEN IN A MANNER WHICH AVOIDS SPLITTING THE PEG OR THE CONNECTED MEMBERS. PEGS SHALL BE DIPPED IN BOILED LINSEED OIL, MINERAL OIL, OR AN APPROVED WAX PRIOR TO DRIVING. SAW OFF ALL PEGS FLUSH WITH SURFACE.
15. LAG BOLTS AND NUTS SHALL BE TIGHTENED SNUGLY BUT NOT SO TIGHTLY AS TO CAUSE CRUSHING OF THE WOOD UNDER THE WASHER OR PLATE.
16. UNLESS OTHERWISE NOTED, ALL STEEL CONNECTION HARDWARE AND FABRICATED MATERIALS SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 709.01(h), EXCEPT THAT STAINLESS STEEL FASTENERS SHALL BE USED TO CONNECT MEMBERS CONTAINING ALKALINE COPPER QUAT (ACQ) PRESERVATIVE. MALLEABLE IRON WASHERS SHALL BE GALVANIZED.

REHABILITATING COVERED BRIDGE SUPERSTRUCTURE

1. CONTRACTOR SHALL HAVE THE OPTION OF SHORING THE SUPERSTRUCTURE IN PLACE UNDER ALTERNATE A IN-PLACE REHABILITATION OR REMOVING AND RESETING THE SUPERSTRUCTURE UNDER ALTERNATE B RELOCATED REHABILITATION. THE CONTRACTOR SHALL BID BOTH ALTERNATES.
2. ITEM 900.645 SPECIAL PROVISION (REHABILITATING COVERED BRIDGE SUPERSTRUCTURE) SHALL INCLUDE ALL COSTS ASSOCIATED WITH REPAIRS AND ALTERATIONS TO EXISTING MEMBERS; ALL COSTS ASSOCIATED WITH FASTENERS PER NOTE 2 UNDER "FASTENERS FOR LUMBER AND TIMBER" THIS SHEET; TEMPORARY BRACING, SHORING, BLOCKING; ALL LABOR, MATERIALS AND SUBMITTALS REQUIRED FOR THE REHABILITATION WORK (EXCEPT AS SPECIFIED BY OTHER CONTRACT ITEMS); STRAIGHTENING, PLUMBING, AND RE-ALIGNING THE TRUSSES AND RESTORING CAMBER.
3. BOTH TIMBER TRUSSES HAVE EXTENSIVE DETERIORATION THAT REDUCES THEIR SPANNING CAPACITY. THE DOWNSTREAM TRUSS HAS LITTLE TO NO SPANNING CAPACITY, AND IS LIKELY BEING SUPPORTED BY THE FLOOR FRAMING AND EXISTING STEEL BEAMS. THE EXISTING TRUSSES, ROOF FRAMING, TIE BEAMS, UPPER LATERAL BRACING, AND KNEE BRACES SHALL BE REHABILITATED IN ACCORDANCE WITH THE PLANS PRIOR TO REMOVING THE EXISTING STEEL BEAMS, OR ALTERNATE MEANS OF SUPPORTING AND STABILIZING THE TRUSSES SHALL BE PROVIDED DURING BEAM REMOVAL AND INSTALLATION.
4. STRUCTURAL TIMBER AND LUMBER CONSTRUCTION SHALL BE PERFORMED IN A "NO LOAD" CONDITION WHERE PRACTICAL. CONTRACTOR SHALL AVOID UNNECESSARY DISASSEMBLY OF THE TIMBER TRUSSES. DISASSEMBLY SHALL BE LIMITED TO ONLY THOSE JOINTS WHERE NECESSARY TO MAKE THE SPECIFIED REPAIRS.
5. CONTRACTOR AND RESIDENT ENGINEER SHALL JOINTLY INSPECT ALL TIMBER AND LUMBER MEMBERS AT THE TIME OF CONSTRUCTION (INCLUDING HIDDEN SURFACES OF JOINTS AS THEY ARE EXPOSED DURING CONSTRUCTION) TO IDENTIFY ADDITIONAL MEMBERS TO BE REPLACED OR REPAIRED.
6. CONTRACTOR AND RESIDENT ENGINEER SHALL JOINTLY INSPECT ALL EXISTING METAL FASTENERS AND CONNECTIONS FOR CORROSION AND TIGHTNESS TO IDENTIFY ADDITIONAL FASTENERS TO BE REPLACED.
7. CONTRACTOR MAY TEMPORARILY SUPPORT OR BRACE THE TIMBER TRUSSES OFF THE EXISTING OR NEW STEEL BEAMS AND FLOOR FRAMING DURING REHABILITATION OF THE TRUSSES. CONSTRUCTION DRAWINGS OF TEMPORARY SUPPORT DETAILS SHALL BE SUBMITTED TO THE AGENCY FOR APPROVAL IN ACCORDANCE WITH SUBSECTION 105.03. ALL TEMPORARY SUPPORTS SHALL BE REMOVED PRIOR TO OPENING THE BRIDGE TO VEHICULAR TRAFFIC. COST SHALL BE INCLUDED IN ITEM 900.645 SPECIAL PROVISIONS (REHABILITATING COVERED BRIDGE SUPERSTRUCTURE).

8. THE ARCHES SHALL BE REINSTATED AS LOAD BEARING ELEMENTS AFTER THE TRUSSES ARE ALREADY SPANNING AND SUPPORTING THEIR OWN SELF-WEIGHT WITH ALL TRUSS JOINTS IN TIGHT BEARING.
9. EXISTING HOLES, MORTISES, AND HOUSINGS IN MEMBERS TO REMAIN SHALL NOT BE ENLARGED UNLESS SPECIFICALLY NOTED IN THE DRAWINGS. DOWEL HOLES IN EXISTING TIMBERS THAT ARE OVERSIZED OR DISTORTED SHALL BE PLUGGED WITH AN APPROVED WOOD EPOXY AND REDRILLED AS APPROVED BY THE RESIDENT ENGINEER. COST FOR REPAIRS SHALL BE PAID UNDER ITEM 900.620 SPECIAL PROVISION (WOOD EPOXY REPAIRS).
10. ALL ABANDONED BOLT AND PEG HOLES SHALL BE FILLED WITH WOOD PLUGS TREATED WITH COPPER NAPHTHENATE SOLUTION IN ACCORDANCE WITH SUBSECTION 522.13(a)(1). WOOD PLUGS SHALL BE ROUND HARDWOOD DOWELS, $MC \leq 19\%$, GENTLY DRIVEN TO A FRICTION FIT WITHOUT SPLITTING TIMBER. CUT PROTRUDING PLUGS FLUSH WITH SURFACE. COST SHALL BE INCLUDED UNDER ITEM 900.645 SPECIAL PROVISION (REHABILITATING COVERED BRIDGE SUPERSTRUCTURE).
11. NEW AND EXISTING COVERED BRIDGE UNTREATED LUMBER AND TIMBER, INCLUDING SIDING, SHALL BE CLEANED AND COATED WITH INSECTICIDE/FUNGICIDE AND A CLEAR FIRE RETARDANT. COST SHALL BE INCLUDED UNDER THE APPROPRIATE ITEM 660.20 TIMBER PAINTING, FIRE RETARDANT OR ITEM 660.30 TIMBER PAINTING, INSECTICIDE/FUNGICIDE.
12. EXISTING TRUSS CAMBER IS APPROXIMATELY 5/8". CAMBER AT REHABILITATED TRUSSES SHALL BE 5/8" \pm 1/8".

METAL ROOFING NOTES

1. DETAILS OF REPLACEMENT METAL ROOFING SHALL MATCH EXISTING METAL ROOFING.
2. REPLACEMENT ROOFING SHALL BE PAID UNDER ITEM 661.10 METAL ROOFING.

SIDING REPLACEMENT NOTES

1. ALL EXISTING SIDING AT PORTALS AND EXTERIOR FASCIA SHALL BE REMOVED FROM THE BRIDGE AND REPLACED IN ITS ENTIRETY. ALL PROTRUDING NAILS REMAINING IN THE SIDING SUPPORT MEMBERS SHALL BE REMOVED PRIOR TO INSTALLATION OF NEW SIDING.
2. NEW SIDING SHALL BE FREE OF LOOSE OR MISSING KNOTS, CUPS, SPLITS, AND BREAKS.

SEQUENCE OF WORK

1. SUBMIT PLANS AND DESIGN CALCULATIONS FOR THE PROPOSED METHOD OF WORK FOUR (4) WEEKS PRIOR TO COMMENCEMENT OF THE WORK IN ACCORDANCE WITH SECTION 105.
2. RECOMMENDED SEQUENCE OF WORK FOR IN-PLACE REHABILITATION
 - REMOVE THE EXISTING ROOFING, SIDING, RAILINGS, AND WEARING SURFACE.
 - INSTALL TEMPORARY SHORING TO SUPPORT THE EXISTING TRUSSES AS NEEDED TO COMPLETE THE TRUSS REHABILITATION.
 - REPLACE/REPAIR TRUSS MEMBERS, ROOF FRAMING, TIE BEAMS, UPPER LATERAL BRACES, KNEE BRACES, AND FLOOR BEAMS AS DETAILED IN THE PLANS. REINSTATE THE ARCHES AS LOAD-BEARING ELEMENTS AFTER THE TRUSSES ARE ALREADY SPANNING AND SUPPORTING THEIR OWN SELF-WEIGHT WITH ALL TRUSS JOINTS IN TIGHT BEARING.
 - JACK AND BRACE THE EXISTING STRUCTURE AS NEEDED TO STRAIGHTEN, RELEASE STRESSES, PLUMB AND RE-ALIGN THE TRUSSES. SHIMMING OF THE EXISTING TRUSSES WITH HARDWOOD SHIMS MAY BE REQUIRED.
 - AFTER COMPLETION OF THE ABOVE REHABILITATION, REMOVE TEMPORARY TRUSS SUPPORTS. SHORE OR MOVE THE SUPERSTRUCTURE AS NEEDED TO REMOVE THE EXISTING STEEL BEAMS AND INSTALL THE NEW STEEL BEAMS.
 - SEAT THE SUPERSTRUCTURE ON TOP OF THE NEW STEEL BEAMS, SHIMMING TO ENSURE FLOOR BEAMS BEAR EVENLY ON BOTH TRUSSES AND ALL BEAMS. REMOVE SHORING.
 - CUT NOTCHES IN UNDERSIDE OF THE INTERMEDIATE FLOOR BEAMS AND INSTALL THE NEW THREADED ROD ASSEMBLIES.
 - COMPLETE REMAINING REPAIRS TO DECKING, SIDING, AND ROOFING.
 - REOPEN BRIDGE TO TRAFFIC.

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