### Sawn Timber Trail Bridge

#### BRIDGE LOCATION
- Trail No.
- Backwall
- Stringer (Rt-To-Left)
- Length
- Span
- Clear Width
- Pedestrian Load
- Snow Load

<table>
<thead>
<tr>
<th>STRINGERS</th>
<th>DECK</th>
<th>BACKWALL</th>
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</thead>
<tbody>
<tr>
<td>SPECIES</td>
<td>SIZE</td>
<td>MATERIAL</td>
</tr>
<tr>
<td>SPECIES</td>
<td>SIZE</td>
<td>TREATMENT</td>
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<td>SIZE</td>
<td>TREATMENT</td>
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</tbody>
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**NOTES:**
- **Abutment Material Type:** SS = Solid Sawn, GLU = Glulam, CONC = Concrete
- **Hardware Coating Type:** GALV = Galvanized, UNC = Uncoated, WEA = Weathering Steel

### Diagram
- **Approach Not Shown for Clarity**
- **Railway Shown See Sheet 4 for Details**
- **Trail Bridge W/Railing System**

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**U.S. Department of Agriculture**
**Forest Service**
**Standard Trail Plan**

**Section:** 962 - Sawn Timber Trail Bridge

**Drawing No.:** STD_962-10-01
NOTES:

1. ALL DIMENSIONS IN TABLE-1 ARE NOMINAL (ROUGH SAWN). THE MINIMUM STRINGER DEPTH FOR BRIDGES WITH A PEDESTRIAN RAILING SYSTEM IS 15-1/2 INCHES. BRIDGES WITH STRINGER DEPTHS LESS THAN 15-1/2 INCHES SHALL HAVE CURVES ONLY. THE MINIMUM NUMBER OF STRINGERS IS THREE.

2. FASTEN DECK PLANKS TO STRINGERS WITH TWO ROWS 5/16-INCH DIAMETER X 2-INCH RING SHANK NAILS PER PLANK AT EACH STRINGER, ALTERNATE SIDES.

3. FASTEN RUNNING PLANKS TO DECK WITH 40d (5-INCH RING SHANK) NAILS AT 24-INCH SPACING, ALTERNATE SIDES WITH TWO AT EACH END.

4. PROVIDE A MINIMUM 1/2-INCH SPACE BETWEEN BLOCKING AND BACKWALL FOR AIR CIRCULATION.

5. SPlice RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR TWO POST SPACES. DO NOT LOCATE MORE THAN ONE RAIL SPlice AT ANY ONE POST.


7. WOOD BLOCKING SHALL BE BOLTED TO STRINGERS WITH STEEL ANGLES, OR SUSPENDED IN STEEL HANGERS THAT ARE Nailed TO BLOCKS AND STRINGER SIDES.

ELEVATION
GRADE SHOWN = 0.05%, RUNNING PLANKS NOT SHOWN FOR CLARITY.

TABLE-1: SOLID SAWN STRINGER SIZE REQUIREMENTS - LRFD

**STRINGER SPAN (FEET)**

<table>
<thead>
<tr>
<th><strong>PEDESTRIAN LIVE LOAD</strong></th>
<th><strong>GROUND SNOW LOAD</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>TIMBER SPECIES - DOUGLAS FIR - LARCH</strong></td>
<td><strong>GROUNd SNOW LOAD</strong></td>
</tr>
<tr>
<td><strong>GRADE - NO.1</strong></td>
<td><strong>Pounds per square foot</strong></td>
</tr>
<tr>
<td>10</td>
<td>90</td>
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<tr>
<td>15</td>
<td>16</td>
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<td>20</td>
<td>20</td>
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<td>30</td>
<td>30</td>
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</table>

INSTALL BRACING WITHIN A DISTANCE OF THE DEPTH OF THE BEAM FROM THE CENTERLINE OF BEARING. BRACING REQUIRED AT MID-SPAN FOR SPANS OVER 20 FEET LONG.

**STRINGER SIDE SHALL BE THE LARGER OF THE PEDESTRIAN OR GROUND SNOW LOAD SIZE REQUIRED FOR THE SITE CONDITIONS.

**STRINGER LENSHE IS EQUAL TO STRINGER SPAN PLUS ONE FOOT.**

**REQUIRES REGIONAL BRIDGE ENGINEER APPROVAL.**
GENERAL NOTES:
SPECIFICATIONS: MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR CONSTRUCTION OF BRIDGES ON FEDERAL HIGHWAY PROJECTS (F-P-05) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.

BRIDGE: SOLID SAWN TIMBER MEMBERS SHALL COMPLY WITH THE REQUIREMENTS OF THE CURB & CONNECTING DECKS FOR THE SPECIES, TYPE, AND GRADE SPECIFIED BELOW.

DECK PLANKS, CURBS, SILLS, & BACKING BLOCKS:
- COASTAL REGION: REDWOOD, LEADING TO SAWN NO. 3 GRADE, GRADE RATING - WPA, WILDer
- RUNNING PLANKS:
  - COASTAL REGION: REDWOOD, LEADING TO SAWN NO. 3 GRADE, GRADE RATING - WPA, WILDer
- RAILS & POSTS (SEE PROJECT CRITERIA)
  - TREATED: REDWOOD, SAWN NO. 3 GRADE, GRADE RATING - WPA, WILDer
  - TREATED: REDWOOD, SAWN NO. 3 GRADE, GRADE RATING - WPA, WILDer
  - TREATED: REDWOOD, SAWN NO. 3 GRADE, GRADE RATING - WPA, WILDer

TREATMENT: SEE PROJECT CRITERIA FOR TREATMENT REQUIREMENTS. TREATMENT MUST MEET THE REQUIREMENTS OF THE CURRENT EDITION OF THE AMERICAN WOOD PROTECTION ASSOCIATION (AWPA) SPECIFICATIONS USING THE TREATMENT MATERIALS LISTED BELOW. TREATMENT WILL COMPLY WITH THE REQUIREMENTS OF THE CURRENT EDITION OF THE AMERICAN WOOD PRESERVATION INSTITUTE (AWPI) "BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS."

STRINGERS, DECKING, RUNNING PLANKS, & RAILING SYSTEM, IF TREATED:
- AWPA USE CATEGORY SYSTEM (UC) FOR USE CATEGORY 39 ABOVE GROUND-EXPOSED (UC39)
- FENITRICOLOXYDE BONE IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHALENE (CIN) IN LIGHT OIL (TYPE C SOLVENT)
- SILL, BACKING PLANKS, CIRCS, & TIMBER WALLS, IF TREATED:
  - AWPA USE CATEGORY SYSTEM (UC) FOR USE CATEGORY 45 GROUND CONTACT-HEAVY DUTY (UC45)
  - FENITRICOLOXYDE BONE IN HEAVY OIL (TYPE A SOLVENT)
  - COPPER NAPHTHALENE (CIN) IN HEAVY OIL (TYPE A SOLVENT)

FIELD TREATMENT: COPPER NAPHTHALENE (CIN) SOLUTION SHALL BE FURNISHED FOR FIELD TREATMENT. ALL BARRIERS AND FIELD CURBS APPROVED BY THE CURB & CONNECTING DECKS FOR THE SPECIES, TYPE, AND GRADE SPECIFIED ABOVE. TREATED BARRIERS AND FIELD CURBS MUST BE CAREFULLY TRIMMED AND GIVEN THREE COAT OF FIELD TREATMENT SOLUTION. THE APPROVED FIELD CURBS OF BOLT OR NAIL HEADS IS RECOMMENDED, THE HEADS SHOULD BE FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.

STEEL: WILDer, 870, OR HISTORIC STEEL WILDer SHALL MEET THE REQUIREMENTS OF 870, GRADE 50. WILDer, 870, OR HISTORIC STEEL WILDer SHALL MEET THE REQUIREMENTS OF 870, GRADE 50. WILDer, 870, OR HISTORIC STEEL WILDer SHALL MEET THE REQUIREMENTS OF 870, GRADE 50.

WHEN THE STRUCTURAL STEEL IS TO BE WELDED, THE WELDING PROCEDURE SHALL BE IN ACCORDANCE WITH AWS D1.1 AND SHALL BE BASED ON THE SPECIFICATIONS OF THE WELDING PROCEDURE.

FABRICATION: SUBMIT SHOP DRAWINGS FOR ALL BRIDGE COMPONENTS (EXCEPT TIMBER RUNNING PLANKS). SHOW ALL DIMENSIONS AND FABRICATION DETAILS FOR ALL CUT OR BURST TIMBER. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THE PLANS.
GENERAL NOTES:

SPECIFICATIONS: MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (4703) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.

TENSION & LIMITS: SOLID SAWN TIMBER MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF THE GRADE RATING AGENCY FOR THE SPECIES, TYPE, AND GRADE SPECIFIED BELOW.

DECK PLANKS, CURBS, SILLS, & BACKING PLANKS RUNNING PLANKS:
- SOUTHERN PINE, NO. 2 GRADE GRADE RATING AGENCY = SPB
- SOUTHERN PINE, NO. 3 GRADE GRADE RATING AGENCY = SPB

RAILS & POSTS (SEE PROJECT CRITERIA):
- UNTREATED
- SOUTHERN PINE, S4S, NO. 1 GRADE GRADE RATING AGENCY = SPB
- WHITE OAK, S4S, SELECT STRUCTURAL GRADE GRADE RATING AGENCY = NECMA
- TREATED
- SOUTHERN PINE, S4S, NO. 1 GRADE GRADE RATING AGENCY = SPB

TREATMENT: SEE PROJECT CRITERIA FOR MATERIALS IDENTIFIED TO BE TREATED AND FOR TREATMENT TYPE. PRESERVATIVE TREATMENT SHALL BE IN ACCORDANCE WITH THE CURRENT AMERICAN WOOD PROTECTION ASSOCIATION (AWPA) SPECIFICATIONS USING THE TREATMENT MATERIALS LISTED BELOW. TREATMENT WILL COMPLY WITH THE REQUIREMENTS OF THE CURRENT EDITION OF WESTERN WOOD PRESERVERS INSTITUTE (WWPI) "BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS".

STRINGERS, DECKING, RUNNING PLANKS, & RAILING SYSTEM
- AWPA USE CATEGORY SYSTEM (UI) FOR USE CATEGORY 3B ABOVE GROUND-EXPOSED (OSB)
- FENLONCHLORPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHALENE (CNA) IN LIGHT OIL (TYPE C SOLVENT)
- SILLS, BACKING PLANKS, CURBS, & TIMBER WALLS, IF TREATED
- AWPA USE CATEGORY SYSTEM (UI) FOR USE CATEGORY 49 GROUND CONTACT-HEAVY DUTY (C49)
- FENLONCHLORPHENOL IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHALENE (CNA) IN HEAVY OIL (TYPE A SOLVENT)

FIELD TREATMENT: COPPER NAPHTHALENE (C49 SOLUTION) SHALL BE FURNISHED FOR FIELD TREATING GROUND-EXPOSED, ALL ABRASIONS, AND FIELD CURBS APPROVED BY THE CURB INSTRUCTORS. THE HOLES SHALL BE CAREFULLY TRIMMED AND GIVEN THREE BRUSH COATS OF THE FIELD TREATMENT SOLUTION WHERE APPROVED. FIELD SANDING OF HOLES OR NAIL HOLES AS REQUIRED. THE HOLES SHALL BE FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.

HARDWARE AND STRUCTURAL STEEL: SEE PROJECT DESIGN CRITERIA FOR STEEL HARDWARE. HARDWARE USED OR SUPPLIED BY THE CONTRACTOR SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 56, WITH NUTS AND BOLTS CONFORMING TO ASTM A325, GRADE A. A WEATHERING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 50K, WITH NUTS AND BOLTS CONFORMING TO ASTM A325, TYPE 3. USE MALLEABLE IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.

WHEN STRUCTURAL STEEL IS TO BE HEATED, THE WELDING PROCEDURE SHALL BE IN ACCORDANCE WITH AWS D1.1 AND SHALL BE SUITABLE FOR THE GRADE OF STEEL AND INTENDED USE ON SERVICE.

FABRICATION: SUBMIT SHOP DRAWINGS FOR ALL BRIDGE COMPONENTS (EXCEPT TIMBER RUNNING PLANKS). SHOW ALL DIMENSIONS AND FABRICATION DETAILS FOR ALL CUT OR BORED TIMBER. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THE PLANS.
GLU-LAM/SAWN TIMBER SILL
CONNECTION DETAIL

BACKING PLANK STIFFENERS NOT SHOWN FOR CLARITY

** TIMBER SILL CAN BE EITHER 12" X 12" SOLID SAWN 10 3/4" X 12" GLUE-LAMINATED,
BUILT-UP 3" X 12", 4" X 12", & 6" X 12" TREATED MEMBERS.

** SEE STANDARD DRAWINGS 965-10, 965-20, 965-30, & 965-40 FOR FOUNDATION
ALTERNATIVES.

CONCRETE SILL
CONNECTION DETAIL

NOTES:
SPECIFICATIONS, MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN
ACCORDANCE WITH THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND
BRIDGES ON FEDERAL HIGHWAY PROJECTS (FHWA-03) AND STANDARD SPECIFICATIONS
FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.

CONCRETE: USE STRUCTURAL CONCRETE WITH 7 SACK MINIMUM MIX APPROVED BY THE C.O.,
CONCRETE SHALL RECEIVE A TUNNELled SURFACE FINISH. CONCRETE SHALL HAVE 45-55
ENTRAPPED AIR MAXIMUM SIZE AGGREGATE SHALL BE 3/4-INCH AND CONCRETE SLUMP
SHALL NOT EXCEED 4-INCHES.

REINFORCING STEEL: PROVIDE REINFORCING STEEL THAT CONFORMS TO ASTM A615 (ASHPM)
MAXIMUM-MEAN MODULUS OF ELASTICITY 60. PROVIDE 2-INCH CLEAR CONCRETE COVER FOR ALL REBAR.
UNLESS NOTED OTHERWISE ON THE PLANS.

TREATED TIMBER & LUMBER: SEE SHEET 3 FOR PROJECT DESIGN CRITERIA AND
GENERAL NOTES.

LAG SCREW INSTALLATION: PRE-DRIVE LAG SCREW HOLES USING TWO DIAMETERS, ONE FOR
THE SHANK AND ONE FOR THE THREADS. THE LEAD HOLE FOR THE SHANK IS TO BE
1/16-INCH LARGER THAN THE SHANK DIAMETER AND IS TO BE DURED TO THE DEPTH OF
REINFORCEMENT OF THE SHANK. THE LEAD HOLE FOR THE THREADED PORTION IS TO BE 1/16-
INCH OF THE BOLT DIAMETER AS SHOWN ON THE PLANS AND IT TO BE BORED AT LEAST TO THE
LENGTH OF THE THREADS. DO NOT DRIVE LAG SCREWS WITH A HAMMER.

MATERIAL = 1/2" STEEL PLATE 436

SIDE VIEW

END VIEW