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 (91-33) AND STANDARD SPECIFICATIONS FOR
CONSTRUCTION OF TRAIL AND BRIDGES ON FEDERAL PROJECTS.
LOG MEMBERS: LOGS USED FOR STRINGERS SHALL BE DOUGLAS FIR OR WESTERN LARCH WITH
MINIMUM, MID-SPAN LOG DIAMETER AS NOTED FOR THE VARIOUS SPANS AND DESIGN
LOADING. NATIVE TREES TO BE USED FOR BRIDGE STRINGERS SHALL BE STRAIGHT-SIDED AND
FREE OF DECIFCT AND NO STORNGERS SHALL BE CHOSN FROM TREES WITH RELATIVELY
FEW BRANCHES, AND HAVE NO KNOT GREATER THAN 1/8 THUP IN DIAMETER. LOGS SHALL BE
PACED AT EACH TO CREATE A LEVEL RAILING SURFACE AT SUPPORTS TAKING CARE TO AVOID OVR
CUTTING HEMP LEAVES SURFACE OF LOGS TO PROVIDE A LEVEL RAIL DECK REFER TO
PLANS FOR HEH DETAILS.
TIMBER & LUMBER: SOUlD SAWS TIMBER STRINGERS SHALL CONFORM TO THE REQUIREMENTS
OF THE TIMBER RULES AGENCY FOR THE SPECIES, TYPE AND GRADE SPECIFIED BELOW.

DECK PLANKS, SILLS, AND BACKING PLANKS
= COASTAL DOUGLAS FIR = HARDWOOD = RAIL LARCH N.1
GRADE, GRADING RULES AGENCY = WPWA, WOLB
RALS & POSTS (SEE PROJECT CRITERIA)
SAWN = TREATED
- HARDWOOD, S 4.5, 4.1 GRADE GRADING RULES AGENCY = WPWA, WOLB
- WESTERN RED CEDAR, S4 stripe STRUCTURAL GRADE, GRADING RULES
AGENCY = WPWA, WOLB
SAWN = TREATED
- BRAH = S 4.5, 4.1 GRADE GRADING RULES AGENCY = WPWA, WOLB
- LODGE POLE PIN, PEELED AND GROOVED, GRADING RULES AGENCY = NLSA

TREATMENT: SEE PROJECT CRITERIA FOR MEMBERS IDENTIFIED TO BE TREATED AND FOR
PREVENTIVE TREATMENT SHALL BE IN ACCORDANCE WITH THE CURRNT
AMERICAN WOOD PRESERVATION INSTITUTE (AWPI) TREATMENT PRACTICES.

STRINGERS & RAILING SYSTEM, IF TREATED
- (VARAIN USE CATEGORY SYSTEM) (1) FOR USE CATEGORY 50 ABOVE GROUNDDUP (UCS)
- (FENACRCHORPHRIEN) IN LIGHT OIL (TYPE A SOLENT)
- COPPER NAPHTHALENE (CNA) IN LIGHT OIL (TYPE A SOLENT)
- SILLS, DECK PLANKS, CRI, & TIMBER WALLS, IF TREATED
- (VARAIN USE CATEGORY 50) (1) FOR USE CATEGORY 48 (CONE CONTACT-HIGH DUTY (UC)
- (FENACRCHORPHRIEN) IN HEAVY OIL (TYPE A SOLENT)
- COPPER NAPHTHALENE (CNA) IN HEAVY OIL (TYPE A SOLENT)

FIELD TREATMENT: COPPER NAPHTHALENE (CNA SOLUTION) SHALL BE FURNISHED FOR FIELD
TREATMENTS OF WOOD, ALL SILLING AND FIELD CATER = APPROVED BY THE O.B.O.
- STRINGERS TO BE CAREFULLY TRAINED AND GIVEN THREE BRUSH COATS OF THE FIELD TREATMENT
SOLUTION WHERE APPROVED, FIELD DRILLING OF SCREW OR NAIL HOLES IS
REQUIRED, THE HOLES SHALL BE FILLED WITH PREVENTIVE MIXTURE TO INHIBIT THE
FASTENERS.

THE ENDS OF TREATED STRINGERS (REFER TO PROJECT DESIGN CRITERIA), SHALL ALSO RECEIVE THREE BRUSH COATS OF THE FIELD TREATMENT
PILOT INTO INSTALLATION OF THE BACKING PLANKS.

HARDWARE AND STRUCTURAL STEEL: SEE PROJECT DESIGN CRITERIA FOR STEEL HARDWARE
FINISH. GALVANIZED OR UNFINISHED HARDWARE SHALL MEET THE REQUIREMENTS OF
ASME A210, GRADE 36, WITH NUTS AND BOLTS CONFORMING TO ASTM A325, GRADE 5.90
WEATHERING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF ASME M70,
GRADE C, WITH CONFORMING TO ASTM A525, TYPE 3. USE MALLEABLE
IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.

FOR LAG SCREWS DRILL HOLES 1/4-INCH LARGER THAN LAG SCREW DIAMETER FOR
SHEET 3 OF 4

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

SECTION 961 - LOG STRINGER TRAIL BRIDGE

SHEET

DRAWING NO

TRANSMITTED TO

NOT TO SCALE

STD_961-10-03a

1
ABUTMENT CONNECTION DETAIL
BACKING PLANK STEIFFENER NOT SHOWN FOR CLARITY

*TIMBER SILL CAN BE EITHER 1 1/2" X 12" SOLID SAWN, 10 3/4" X 12" GLUE-LAMINATED, BUILT-UP 3" X 12", 4" X 12", 6" X 12" TREATED WOODS, OR LOG SILL. SEE LOG SILL NOTCHING DETAIL.

**SEE STANDARD DRAWINGS 985-10, 985-20, 985-30, & 985-40 FOR FOUNDATION ALTERNATIVES

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

HARDWARE AND STRUCTURAL STEEL: SEE SUPERSTRUCTURE DRAWINGS FOR PROJECT DESIGN CRITERIA AND GENERAL NOTES.

TREATED TIMBER & LUMBER: REFER TO THE GENERAL NOTES ON THE SUPERSTRUCTURE DRAWINGS FOR TREATED TIMBER & LUMBER SPECIFICATIONS AND FIELD TREATING OF WOOD.

LAG SCREW INSTALLATION: PRE-BORE 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" LARGE THAN THE SHAFT DIAMETER AND IS TO BE BORED TO THE DEPTH OF PENETRATION OF THE SHANK. THE LEAD HOLE FOR THE THREADED PORTION IS TO BE 2/3 OF THE SCREW DIAMETER AS SHOWN ON THE PLANS AND IS TO BE BORED AT LEAST TO THE LENGTH OF THE THREADS. DO NOT DRIVE LAG SCREWS WITH A HAMMER.

BACKWALL DETAIL

NOTCH SILL TO PROVIDE FLAT BEARING SURFACE

LOG SILL NOTCHING DETAIL

1/2 MINIMUM
24" MINIMUM

2" MINIMUM
<table>
<thead>
<tr>
<th>STRUCTURE NUMBER</th>
<th>BRIDGE LOCATION</th>
<th>RAILING SYSTEM/CURB</th>
<th>RUNNING PLANK</th>
<th>STILL</th>
<th>APPROACHES</th>
<th>HARDWARE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SPECIES</td>
<td>TYPE</td>
<td>HEIGHT</td>
<td>MATERIAL</td>
<td>TREATMENT YES</td>
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</tr>
</tbody>
</table>

**RAILING SYSTEM/CURB MATERIAL TYPE:** R = ROUND LOG, D = DIMENSIONAL LUMBER
**ACREMENT MATERIAL TYPE:** SS = SOLID SAWN, GLU = GLUE-LAM, CONG = CONCRETE
**HARDWARE COATING TYPE:** GALV = GALVANIZED, UNC = UNCOATED, HEAT = HEAT TREATED

**TRAIL BRIDGE W/RAILING SYSTEM**

- RAILING SYSTEM
- RUNNING PLANKS
- RAIL SPIKE
- END POST
- BACKWALL
- DECK PLANKS
- TIMBER SHIMS
- SILL

APPROACH NOT SHOWN FOR CLARITY
GENERAL NOTES:

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

LOG MEMBERS: LOGS USED FOR STRINGERS SHALL BE DOUGLAS FIR OR WESTERN LARCH WITH MINIMUM TEEPEE, 350-SPAN LOG DIAMETER AS NOTED FOR THE VARIOUS SPANS AND DESIGN LOADS. NATIVE TREES TO BE USED FOR BRIDGE STRINGERS SHALL BE STRAIGHT, SOUND, AND FREE OF DEFECTS AND Holes. STRINGERS SHALL BE CHOPPED FROM TREES WITH RELATIVELY FEW LINES AND HAVE NO KNOT GREATER THAN 3-INCH IN DIAMETER. LOGS SHALL BE DRESSED AT ENDS TO CREATE A LEVEL SEATING SURFACE AT SUPPORTS TO AVOID OVER CUTTING. HEWN UPPER SURFACE OF LOGS TO PROVIDE A LEVEL SEATING SURFACE TO ALLOW FOR HEWN DETAILS.

TIMBER & LUMBERS: SOLID SAWN TIMBER MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF THE GRADING RULES AGENCY FOR THE SPECIES, TYPE, AND GRADE SPECIFIED BELOW.

DECK PLANKS, SILLS, AND BACKING PLANKS
- COASTAL REGION DOUGLAS FIR - LARCH ROUGH SAWN NO.1 GRADE, GRADING RULES AGENCY = WAPA, WCBIR
- RUNNING PLANKS
- COASTAL REGION DOUGLAS FIR - LARCH ROUGH SAWN NO.2 GRADE, GRADING RULES AGENCY = WAPA, WCBIR

RAILS & POSTS: SEE PROJECT CRITERIA
- SAWN - UNTREATED
- REDWOOD, SAWN, NO.1 GRADE, GRADING RULES AGENCY = RED
- WESTERN REDCEDAR, SAWN, SEASON STRUCTURAL GRADE GRADING RULES AGENCY = WAPA, WCBIR
- SAWN - TREATED
- HEW - FIR/DOUGLAS FIR, SAWN, NO.1 GRADE, GRADING RULES AGENCY = WAPA, WCBIR

POLES: COOT VEIN, PEEL AND DRIED, GRADING RULES AGENCY = NORA

TREATMENT: SEE PROJECT CRITERIA FOR MEMBERS 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 (WPI)'S "TREATMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS".

STRINGERS, DECKING, RUNNING PLANKS, & RAILING SYSTEM: F TREATED
- AWPA USE CATEGORY SYSTEM (UC) FOR USE CATEGORY 39: ABOVE GROUND-EXPOSED (UC39)
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHAETHATE (CNP) IN LIGHT OIL (TYPE C SOLVENT)
- SAWN, BACKING PLANKS, CRIBS, & TIMBER WALLS, F TREATED
- AWPA USE CATEGORY SYSTEM (UC) FOR USE CATEGORY 4B: GROUND CONTACT-HEAVY DUTY (UC4B)
- PENTACHLOROPHENOL IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHAETHATE (CNP) IN HEAVY OIL (TYPE A SOLVENT)

FIELD TREATMENT: COPPER NAPHAETHATE (2% SOLUTION) SHALL BE FURNISHED FOR FIELD TREATMENT OF WOOD. ALL CLARIFICATION AND FIELD TREATMENT APPROVED BY THE L.R.D. - SHALL BE CAREFULLY TRAINED AND THEN THREE BRUSH COATS OF THE FIELD TREATMENT SOLUTION WHERE APPROVED. FIELD DRILLING OF BOLT SCREW OR NAIL HOLES IS REQUIRED. THE HOLES SHALL BE FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.

THE ENDS OF UNTREATED LOG STRINGERS (REFER TO THE PROJECT DESIGN CRITERIA) SHALL ALSO RECEIVE THREE BRUSH COATS OF THE FIELD TREATMENT PRIOR TO INSTALLATION OF THE BACKING PLANKS.

HARDWARE AND STRUCTURAL STEEL: SEE PROJECT CRITERIA FOR STEEL HARDWARE FINISH, GALVANIZED OR UNFINISHED. HARDWARE SHALL MEET THE REQUIREMENTS OF ASTM A570, GRADE 36, WITH NUTS AND BOLTS CONFORMING TO ASTM A325, GRADE A. HEATING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF ASTM A570, GRADE 50, WITH BOLTS AND NUTS CONFORMING TO ASTM A325, TYPE 3. USE MALLEABLE IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.

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

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

TIMBER TO BE USED FOR STRINGERS SHALL BE PEELED AND THEN HAVE AN ADDITIONAL 1/2-INCH OF THE OUTER SAPWOOD REMOVED PRIOR TO BEING USED FOR STRINGERS.
GENERAL NOTES:

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

LOG MEMBERS: LOGS USED FOR STRINGERS SHALL BE DOUGLAS FIR OR WESTERN LARCH WITH MINIMUM 3 IN. (75MM) DIAMETER AS NOTED FOR THE VARIOUS SPANS AND DECK TIMBER. NAIL TIMBERS TO BE USED FOR BRIDGE STRINGERS SHALL BE STRAIGHT, SOUND, AND FREE OF DEFECTS AND NOT STRINGERS SHALL BE CHOSEN FROM TIMBERS WITH RELATIVELY FEW LUGS, AND HAVE NO KNOT OF LUGS GREATER THAN 3 INCH IN DIAMETER. LOGS SHALL BE CAPPED AT ENDS TO CREATE A LEVEL SEATING SURFACE AT SUPPORTS TAKING CARE TO AVOID CUTTING. HEAVILY UNEVEN SURFACE OF LOGS TO PROVIDE A LEVEL SEATING SURFACE REFLECTS TO PLANS FOR HINT Details.

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

DECK PLANKS, SILLS, AND BACKING TIMBERS
- SOUTHERN PINE NO. 2 GRADE, GRADE RULES AGENCY — SPR
- RUNNINg PLANKS
  - SOUTHERN PINE NO. 2 GRADE, GRADE RULES AGENCY — SPR
- RAILS & POSTS (SEE PROJECT CRITERIA)
  - SAWN — UNTREATED
  - BALSAM, PECAN, S4S, NO. 1 GRADE, GRADE RULES AGENCY — SPR
  - WHITE OAK, S4S, SELECT STRUCTURAL GRADE, GRADE RULES AGENCY — NELMA
  - SAWN — TREATED
  - SOUTHERN PINE, S4S, NO. 2 GRADE, GRADE RULES AGENCY — SPR
  - POLES
  - SOUTHERN PINE, FEEDER AND DRIED GRADE, GRADE RULES AGENCY — SPR

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

STRINGERS, DECKING, RUNNING PLANKS, & RAILING SYSTEM, IF TREATED
- AWPA CAT E GOVERNMENT SYSTEM (UG) FOR USE CATEGORY GB ABOVE GROUND-EXPOSED (UG30)
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHALENE (CNC) IN LIGHT OIL (TYPE C SOLVENT)
- SILLS, BACKING PLANKS, CROSSES, & TIMBER WALLS, IF TREATED
- AWPA CAT E GOVERNMENT SYSTEM (UG) FOR USE CATEGORY GB GROUND-CONTACT—HEAVY DUTY (UG40)
- PENTACHLOROPHENOL IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHALENE (CNC) IN HEAVY OIL (TYPE A SOLVENT)

FIELD TREATMENT: COPPER NAPHTHALENE (CNC SOLUTION) SHALL BE FURNISHED FOR FIELD TREATMENT OF WOOD. ALL REPAIRS AND FIELD CUTS, EXCEPT THE CUTS APPROVED BY THE Engineer, SHALL BE CAREFULLY TRIMMED AND CHISELED, AND THREE BRUSH COATS OF THE FIELD TREATMENT SOLUTION, WHERE APPLIED. FIELD DRILLING OF HOLES, SCREW OR NAIL HOLES IS REQUIRED. THE HOLES SHALL BE FILLED WITH PRESERVATIVE PRIOR TO INSERTING FASTENERS.

THE END OF UNTREATED LOG SPRINGS (REFER TO THE PROJECT DESIGN CRITERIA), SHALL ALSO RECEIVE THREE BRUSH COATS OF THE FIELD TREATMENT PRIOR TO INSTALLATION OF THE BACKING PLANKS.

HARDWARE AND STRUCTURAL STEEL: SEE PROJECT DESIGN CRITERIA FOR STEEL HARDWARE AND STRUCTURAL BRIDGE AND RAILING HARDWARE. HARDWARE SHALL MEET THE REQUIREMENTS OF ASTM A300, GRADE 50, WITH NUTS AND BOLTS COMPLIANT TO ASTM A325, GRADE 4. THE WEATHERING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF ASTM A 570, GRADE 50, WITH NUTS AND BOLTS COMPLIANT TO ASTM A325, TYPE 3. USE MILLED-IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.

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

FABRICATION: SUBMIT SHOP DRAWINGS FOR ALL MANUFACTURED BRIDGE COMPONENTS (EXCEPT STRINGER RUNNING PLANKS). SHOW ALL DIMENSIONS AND FABRICATION DETAILS. ALL NEW OR METAL AND WELDING DETAILS SHALL NOT BE ALLORED. ALL OTHER DETAILS NOTED ON THE PLANS.

TIMBERS TO BE USED FOR STRINGERS SHALL BE FEEDER AND THEN HAVE AN ADDITIONAL 1/2 INCH OF THE OUTER SAPWOOD REMOVED PRIOR TO BEING USED FOR STRINGER.
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 (FHP-20) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND BRIDGES ON FEDERAL PROJECTS.

HARDWARE AND STRUCTURAL STEEL: SEE SUPERSTRUCTURE DRAWINGS FOR PROJECT DESIGN CRITERIA AND GENERAL NOTES.

TREATED TIMBERS & LUMBER: REFER TO THE GENERAL NOTES ON THE SUBSTRUCTURE DRAWINGS FOR TREATED TIMERS & LUMBER SPECIFICATIONS AND FIELD TREATING OF WOOD.

LUG SCREW INSTALLATION: PRE-BORE LUG 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 DRILED TO THE DEPTH OF PEFERATION OF THE SHAKE. THE LEAD HOLE FOR THE THREADED PORTION IS TO BE 7/8-INCH OF THE SILL DIAMETER AS SHOWN ON THE PLANS AND IS TO BE SILLED AT LEAST TO THE LENGTH OF THE THREADS. DO NOT DRIVE LUG SCREWS WITH A HAMMER.

DECK SECTION W/ POLE RAILING SYSTEM

**MINIMUM CLEAR WIDTH (INSIDE FACE TO INSIDE FACE) IS CONTROLLED BY END POSTS REFER TO TYPICAL END POST CONNECTION DETAILS ON THIS SHEET.

ELEVATION—END POST

END VIEW—DECK SECTION W/ END POSTS

TYPICAL END POST CONNECTION DETAILS

LOG STRINGER BRIDGE ABUTMENT CONNECTION DETAILS

ELEVATION

LOG STRINGER DAPPING

MAXIMUM DEPTH OF DAM TAIL NOT EXCEED 10 PERCENT OF LOG DIAMETER OR 2-INCHES

4 INCHES DIAMETER IS TO BE EIGHT 12-INCH LONG TIMBER SHANKS AS REQUIRED AT LOG TIPS

**FLOORING STANDARD DRAWINGS 965-10, 965-20, 965-30, & 965-40 FOR FOUNDATION ALTERNATIVES
<table>
<thead>
<tr>
<th>Structure Number</th>
<th>Species</th>
<th>Type</th>
<th>Height</th>
<th>Material Type</th>
<th>Treatment</th>
<th>Species</th>
<th>Size</th>
<th>Type</th>
<th>Treatment</th>
<th>Length Near End</th>
<th>Material Type</th>
<th>Material Depth</th>
<th>Geo-Synthetic Type</th>
<th>Coatings</th>
<th>Comments</th>
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<tr>
<td>962 - SAWN TIMBER TRAIL BRIDGE</td>
<td>STS</td>
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</tbody>
</table>

**NOT APPLICABLE**

**Abutment Material Type**
- SS = Solid Sawn
- GLU = Glulam
- CONC = Concrete

**Hardware Coating Type**
- GAL = Galvanized
- UNC = Uncoated
- WEA = Weathering Steel

**Diagram**
- Trail Bridge W/Railing System
- Sawn Timber Stringer Trail Bridge
- Sheet 1 of 4

**Scale**
- Not to Scale

**U.S. Department of Agriculture**
- Forest Service

**Standard Trail Plan**
**TABLE 1: SOLID SAWN STRINGER SIZE REQUIREMENTS - LRFD**

<table>
<thead>
<tr>
<th>STRINGER SPAN (FEET)</th>
<th>TIMBER SPECIES - DOUGLAS FIR - LARCH</th>
<th>PEDESTRIAN LIVE LOAD</th>
<th>GROUND SNOW LOAD</th>
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<tr>
<td></td>
<td>GRADE - NO.1</td>
<td>90</td>
<td>120</td>
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<tr>
<td></td>
<td><strong>PEDESTRIAN LIVE LOAD</strong></td>
<td><strong>GROUND SNOW LOAD</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>3 x 8&quot;</td>
<td>3 x 10&quot;</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>4 x 10&quot;</td>
<td>4 x 12&quot;</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>4 x 14&quot;</td>
<td>6 x 12&quot;</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>6 x 12&quot;</td>
<td>6 x 14&quot;</td>
</tr>
<tr>
<td></td>
<td><strong>INSTALL BRACING WITHIN A DISTANCE OF THE DEPTH OF THE BEAM FROM THE CENTERLINE OF BEARING</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>STRINGER SIZE SHALL BE THE LARGER OF THE PEDESTRIAN OR GROUND SNOW LOAD SIZE</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>REQUIRED FOR THE SITE CONDITIONS</strong></td>
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<tr>
<td></td>
<td><strong>STRINGER LENGTH EQUAL TO STRINGER SPAN PLUS ONE FOOT</strong></td>
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<td><strong>REQUIRED REGIONAL BRIDGE ENGINEER APPROVAL</strong></td>
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**NOTES:**

1. All dimensions in Table 1 are nominal (rough sawn).
2. The minimum stringer depth for bridges with a pedestrian railing system is 15 inches. Braced with stringer depths less than 15 inches shall have curbs only. The minimum number of stringers is three.
3. Fasten deck planks to stringers with two rows of 1/2-inch diameter x 2-inch ring shank nails per plank at each stringer. 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.
6. Bracing required at the ends of each member. The bracing shall be three-quarters to full depth and placed 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.
7. Wood blocking shall be bolted to stringers with steel angles or suspended in steel hangers that are nailed to blocking and stringer sides.
GENERAL NOTES:

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

TIMBER & LUMBER: SOLID SAWN TIMBER MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF THE GRADING RULES AGENCY FOR THE SPECIES, TYPE, AND GRADE SPECIFIED BELOW.

DECK PLANKS, CURBS, SILLS, & BACKING PLANKS:
- COASTAL REGION: DOUGLAS FIR-THICK RIBBED SAWN NO. 1 GRADE, GRADING RULES AGENCY = WPCA, WHEL
- RUNNING PLANKS:
  - COASTAL REGION: DOUGLAS FIR-THICK RIBBED SAWN NO. 2 GRADE, GRADING RULES AGENCY = WPCA, WHEL

RAILS & POSTS (SEE PROJECT CRITERIA):
- UNTREATED:
  - REDWOOD, S4S, NO. 1 GRADE GRADING RULES AGENCY = RS
  - WESTERN RED CEDAR, S4S, SELECT STRUCTURAL GRADE GRADING RULES AGENCY = WPCA, WHEL
- TREATED:
  - HEM-FIR/DOUGLAS FIR, S4S, NO. 1 GRADE GRADING RULES AGENCY = WPCA, WHEL


STRINGS, DECKED, RUNNING PLANKS, & RAILING SYSTEM, IF TREATED:
- APA-URSUS CATEGORY SYSTEM (U1) FOR USE CATEGORY 99 ABOVE GROUND-EXPOSED (G3)
- FENTON-CHROMOFLUX IN LIGHT OIL (TYPE 0 SOLVENT)
- COPPER NAPHTHALENE (Cu) IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHALENE (Cu) IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHALENE IN HEAVY OIL (TYPE A SOLVENT)

FIELD TREATMENT: COPPER NAPHTHALENE (Cu) SOLUTION SHALL BE FURNISHED FOR FIELD TREATMENT PRIOR TO INSTALLATION OF ALL ABRASIONS AND FIELD CUTS. THE COPPER NAPHTHALENE SOLUTION SHALL BE CAREFULLY THRESHED AND GIVEN TWO COAT OF THE FIELD TREATMENT SOLUTION. IF APPROVED FIELD TREATMENT OF SILL OR NAIL HOLE IS REQUIRED, THE HOLE SHALL BE FILLED WITH PREDERATIVE PRIOR TO INSERTING THE FASTENER.

HARDWARE AND STRUCTURAL STEEL: SEE PROJECT DESIGN CRITERIA FOR STEEL HARDWARE. FURNISHED UNPREDERATIVE HARDWARE SHALL MEET THE REQUIREMENTS OF ASME M260, GRADE 50, WITH NUTS AND BOLTS CONFORMING TO ASTM A327, GRADE 5 WEATHERING STEEL HARDWARE SHALL MEET THE REQUIREMENTS OF ASME M270, GRADE 50, WITH NUTS AND BOLTS CONFORMING TO ASTM A327. THE USE OF MALLEABLE IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.

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

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

DRILL 11/16" HOLE IN PANELS AND POSTS FOR CONNECTION BOLTS (TYP). FIELD TREAT PER GENERAL NOTES.

GENERAL NOTES:

**SEE TABLE 1.1 ON SHEET 4 FOR NAIL-LAMINATED TIMBER DECK PANEL DEPTH REQUIREMENT BASED ON SPAN AND LOADING.**

**INSIDE FACE TO INSIDE FACE OF RAILING SYSTEM, NUMBER OF DECK PANELS MINUS 3 INCHES.**

**SEE SHEET 3 FOR DETAILS ON LAMINATE LAYOUT (TYP).**

LAMINATIONS, RUNNING PLANKS & RAILING SYSTEM, IF TREATED:
- APA USE CATEGORY SYSTEM (UI) FOR USE CATEGORY 38 ABOVE GROUND-EXPOSED (UC38)
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHALENE (CuA) IN LIGHT OIL (TYPE C SOLVENT)

SEAILS (BACKING PLANKS, CRUSH, TIMBER WALLS, IF TREATED):
- APA USE CATEGORY SYSTEM (UI) FOR USE CATEGORY 40 GROUND CONTACT-HEAVY DUTY (UC40)
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHALENE (CuA) IN LIGHT OIL (TYPE C SOLVENT)

FIELD TREATMENT:
- COPPER NAPHTHALENE (CuA) SOLUTION SHALL BE FURNISHED FOR FIELD TREATMENT OF WOOD. ALL ABRASIONS AND FIELD CUTS APPROVED BY THE C.O. SHALL BE CAREFULLY TRIMMED AND GIVEN THREE BRUSH COATS OF THE FIELD TREATMENT SOLUTION. WHERE APPROVED FIELD DRILLING OF BOLT OR NAIL HOLES IS REQUIRED, THE HOLES SHALL BE PULLED WITH PRESERVATIVE SPOONS INTO THE TAPED HOLES.

HARDWARE AND STRUCTURAL STEEL: SEE PROJECT SPECIFICATION FOR STEEL HARDWARE FINISH. GALVANIZED OR UNFINISHED HARDWARE SHALL MEET THE REQUIREMENTS OF ASME M270, GRADE 36, WITH NUTS AND BOLTS CONFORMING TO ASTM A572, GRADE 50, WITH BOLTS AND NUTS CONFORMING TO ASTM A527, TYPE 3. USE UNWELLEABLE IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.

WHEN STRUCTURAL STEEL IS TO BE HEATED, THE HEATING PROCEDURE SHALL BE IN ACCORDANCE WITH ANSI D1.1 AND SHALL BE SUBMITTED FOR THE GRASE OF STEEL AND EXTENDED USE OR SERVICE.

FAEILLURATION: SUBMIT SHOP DRAWINGS FOR ALL BRIDGE COMPONENTS. SHOW ALL DIMENSIONS AND FABRICATION DETAILS FOR ALL CUT OR BORED TIMBERS. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THE DRAWINGS.

TE ROD TENSIONING: THE ROODS SHALL BE TORQUED TO 200 FT-LBS UPON INITIAL INSTALLATION OF THE DECK PANEL. THE ROODS SHALL BE CHECKED FOR PROPER TENSION EACH YEAR FOR THE FOLLOWING 4 YEARS AFTER INSTALLATION. SUBSEQUENT TENSION CHECKS SHALL OCCUR DURING ROUTINE INSPECTIONS UNLESS OTHERWISE NOTED IN THE INSPECTION REPORT.
RAILING SYSTEM

LONGITUDINAL NAIL-LAMINATED TIMBER DECK PANELS

NAILING PATTERN FOR NAIL-LAMINATES

The following nailing patterns should be followed:
- Indicates nails in first lamination
- Indicates nails in second lamination
- Indicates nails in third lamination

(1) - 12" DECK PANEL

SILL

LAYOUT OF DECK PANEL LAMINATIONS

Layout shown for 16-foot longitudinal nail-laminated timber trail bridge deck panels.
Butt joints not allowed
LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE

NAILING PATTERN FOR NAIL-LAMINATES

THE FOLLOWING NAILING PATTERNS SHOULD BE FOLLOWED:
• INDICATES NAILS IN FIRST LAMINATION
• INDICATES NAILS IN SECOND LAMINATION
• INDICATES NAILS IN THIRD LAMINATION

LAYOUT OF DECK PANEL LAMINATIONS

LAYOUT SHOWN FOR 20-FOOT LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE DECK PANELS.
BUTT JOINTS NOT ALLOWED.

ONE DECK PANEL COMPLETED = 12'
LAYOUT PATTERN FOR 12' DIMENSIONAL LAMINATIONS

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE
962 - SAWN TIMBER TRAIL BRIDGE

NOT TO SCALE
NOTES:

1. SPIKE RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO POST SPACES. ALTERNATE RAIL SPACES AT POSTS. FASTEN RUNNING PLANKS TO DECK PANELS WITH 30D (4 1/2-INCH RING SHANK) NAILS AT 24-INCH SPACING. ALTERNATE SIDEWITS TWO AT EACH END.

2. ALL DECKS SHOWN IN TABLE 1.1 ARE NOMINAL. NAIL-LAMINATED DECK PANELS SHALL BE CONSTRUCTED USING 52S LAMBERS.

*TABLE 1.1: LAMINATION DEPTH REQUIREMENTS – LRFD*

<table>
<thead>
<tr>
<th><strong>DECK PANEL LENGTH (FEET)</strong></th>
<th>PEDESTRIAN LOAD</th>
<th>GROUND SNOW LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>150</td>
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<tr>
<td>6&quot;</td>
<td>6&quot;</td>
<td>6&quot;</td>
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<tr>
<td>16</td>
<td>6&quot;</td>
<td>6&quot;</td>
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<tr>
<td>20</td>
<td>8&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

- DECK PANEL SIZE SHALL BE THE LARGER OF THE PEDESTRIAN OR GROUND SNOW LOAD SIZE REQUIRED FOR THE SITE CONDITIONS.
- DECK PANEL LENGTH EQUAL TO DECK PANEL SPAN PLUS ONE FOOT.
- REQUIRES REGIONAL BRIDGE ENGINEER APPROVAL.
NOTES:
1. Splice rails at posts. Rails shall be contiguous for a minimum of two post spaces. Alternate rail splices at posts. Fasten running planks to deck panels with 30d (4 1/2-inch ring Shank) nails at 24-inch spacing. Alternate sides with two at each end.
2. All depths shown in Table 1.1 are nominal. Nail-laminated deck panels shall be constructed using S2S lumber.

---

**Table 1.1: Lamination Depth Requirements – LRFD**

<table>
<thead>
<tr>
<th><strong>Deck Panel Length (Feet)</strong></th>
<th><strong>Timber Species – Southern Pine</strong></th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>Grade – No. 1</strong></td>
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<tr>
<td></td>
<td><strong>Pedestrian Load</strong></td>
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<tr>
<td></td>
<td><strong>Ground Snow Load</strong></td>
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<tr>
<td>6</td>
<td>65</td>
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<tr>
<td>12</td>
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<td>20</td>
<td>150</td>
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<td>200</td>
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</tbody>
</table>

*Deck panel size shall be the larger of the pedestrian or ground snow load size required for the site conditions.

**Deck panel length equal to deck panel span plus one foot.

***Requires regional bridge engineer approval.

---

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE

SECTION
962 - SAWN TIMBER TRAIL BRIDGE

 Draughting Name & Location:

Drawing Title:

Redaction Date:

Drawing No.
STD_962-20-04b

Sheet 4 of 5

NOT TO SCALE
GLULAM STRINGER TRAIL BRIDGE

**STRINGER SPAN (FEET)**

<table>
<thead>
<tr>
<th>PEDESTRIAN LIVE LOAD</th>
<th>GROUND SNOW LOAD</th>
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</thead>
<tbody>
<tr>
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**STANDARD TRAIL PLAN**

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

**SECTION**

963 - GLULAM TRAIL BRIDGE

**DRAWING NO.**

STD_963-10-02a

**NOT TO SCALE**
LONGITUDINAL GLULAM DECK PANEL LENGTH OUT-TO-OUT AND RAILING SYSTEM

DECK PANEL SPAN & BEARING TO BE BEARING

POSTS @ 5'-0" MAXIMUM SPACING

RAIL CAP ABOVE (SHOWN AS DASHED)

4#4 RING SHANK NAILS SEE NOTES FOR SPACING

TIE RODS @ 5'-0" MAXIMUM SPACING

SPAN MATCHES THAT FOR POSTS

PLAN

TIE ROD

ELEVATION

GRADE SHOWN = 0.0%

NOTES:
1. DECK PANEL LONGITUDINAL DECK PANELS SHALL BE FABRICATED WITH A MINIMUM OF 8 LAMINATIONS PER DECK PANEL
2. FASTEN RUNNING PLANKS TO DECK PANELS WITH 40# 4" RING SHANK NAILS AT 24-INCH SPACING. ALTERNATE SIDES WITH TWO AT EACH END.
3. SPACED RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO POST SPACES. ALTERNATE RAIL STUDS AT POSTS.

GLULAM DECK PANEL (PER TABLE-1)

4" X 6" POST (TYPE) POSTS SHALL BE VERTICAL

SUBSTRUCTURE SHOW FOR ILLUSTRATION ONLY. SEE SHEET 4 FOR DETAILS

LONGITUDINAL GLULAM DECK PANEL DEPTH REQUIREMENTS—LRFD

**DECK PANEL**

**TIMBER SPECIES** — SP. ID. NO. 50

DESIGN LOADING IN POUNDS PER SQUARE FOOT

<table>
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<tr>
<th>SPAN (FEET)</th>
<th>PEDESTRIAN LIVE LOAD</th>
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<td>10 1/2&quot;</td>
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**DECK PANEL WIDTH SHALL BE THE NARROWER OF THE PEDESTRIAN OR GROUND SNOW LOAD SIZE REQUIRED FOR THE SITE CONDITIONS.**

**DECK PANEL LENGTH EQUAL TO DECK PANEL SPAN PLUS ONE FOOT**

**REQUIRES REGIONAL BRIDGE ENGINEER APPROVAL.**

TYPICAL DECK PANEL SECTION W/RAILING SYSTEM

**SEE TABLE-1 FOR DETAILS ON GLULAM DECK PANEL WIDTH REQUIREMENTS BASED ON SPAN AND LOADING.**

**INSIDE FACE TO INSIDE FACE OF RAILING SYSTEM.**

5/8" ROD (LENGTH DEPENDS ON BRIDGE WIDTH) W/PLATE WASHER 1/2" X 8" X 6" (STEEL AISI 6) & HEAVY HEX NUTS. THREAD 8" AT EACH END OF ROD.

POST CONNECTION SEE SHEET 3 FOR DETAILS

2" X 6" MINIMUM RUNNING PLANKS 2" X 12" SHOWN

2" X 8" MINIMUM HOLES THRU DECK PANEL @ 9'-0" CENTERS MAXIMUM

MATCH DRILL 11/16" HOLES THRU DECK PANELS @ 9'-0" CENTERS MAXIMUM

**CLEAR WIDTH**

3" DIAMETRAL BACKING PLANKS (TRIP) FASTEN TO DECK PANEL W/4/4 RING SHANK NAILS AT 12" CENTERS ALONG TOP & BOTTOM EDGES

2 X 6 X 4-6 VERTICAL END SUPPORT FOR RAILS (TRIP) (2)-16# NAILS INTO EACH RAIL W/2)-3/8" X 3 1/2" LAG SCREWS AT BASE

*NOTE: PLANT LONGITUDINAL DECK PANELS SHALL BE FABRICATED WITH A MINIMUM OF 8 LAMINATIONS PER DECK PANEL.

4" X 6" POST (TYPE) POSTS SHALL BE VERTICAL

SUBSTRUCTURE SHOW FOR ILLUSTRATION ONLY. SEE SHEET 4 FOR DETAILS

LONGITUDINAL GLULAM DECK PANEL DEPTH REQUIREMENTS—LRFD

**DECK PANEL**

**TIMBER SPECIES** — SP. ID. NO. 50

DESIGN LOADING IN POUNDS PER SQUARE FOOT

<table>
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<th>SPAN (FEET)</th>
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</table>

**DECK PANEL WIDTH SHALL BE THE NARROWER OF THE PEDESTRIAN OR GROUND SNOW LOAD SIZE REQUIRED FOR THE SITE CONDITIONS.**

**DECK PANEL LENGTH EQUAL TO DECK PANEL SPAN PLUS ONE FOOT**

**REQUIRES REGIONAL BRIDGE ENGINEER APPROVAL.**
LONGITUDINAL GLULAM DECK PANEL TRAIL BRIDGE
963 - GLULAM TRAIL BRIDGE  TYPE: LGD

ELEVATION

TYPICAL SECTION

ABUTMENT CONNECTION DETAILS

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

** SEE STANDARD DRAWINGS 963-10, 963-20, 963-30, & 963-40 FOR FOUNDATION
ALTERNATIVES

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 (FT-03) AND STANDARD SPECIFICATIONS FOR
CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS,
HARDWARE AND STRUCTURAL STEEL: SEE SUPERSTRUCTURE DRAWINGS FOR PROJECT
DESIGN CRITERIA AND GENERAL NOTES.

TREATED TIMBER & LUMBERS: REFER TO THE GENERAL NOTES ON THE SUBSTRUCTURE
DRAWINGS FOR TREATED TIMBER & LUMBER SPECIFICATIONS AND FIELD TREATING OF WOOD.

LAG SCREW INSTALLATION: PRE-BORE LAG SCREW HOLES USING TWO DIAMETERS, ONE FOR
THE SHAFT AND ONE FOR THE THREADS. THE LEAD HOLE FOR THE SHAFT IS TO BE
1/16-INCH LARGER THAN THE SHAFT DIAMETER AND IS TO BE BORED TO THE DEPTH OF
PENETRATION OF THE SHAFT. THE LEAD HOLE FOR THE THREADED PORTION IS TO BE 70
PERCENT OF THE SCREW DIAMETER AS SHOWN ON THE PLANS AND IS TO BE BORED AT
LEAST TO THE LENGTH OF THE THREADS. DO NOT DRIVE LAG SCREWS WITH A HAMMER.

OUT-TO-OUT DECK DECK PANELS

FILL COUNTERSUNK HOLE WITH SILICONE SEALANT (TYP)

3/4" X (LENGTH VARIES)
W/DECK PANEL DEPTH). LAG SCREW: SEE LAG SCREW NOTES
BELOW, COUNTERSINK AS SHOWN

TOP OF LONGITUDINAL DECK PANELS SEE
SUPERSTRUCTURE PLANS FOR
DEPTH REQUIREMENTS

6" PENETRATION OF LAG SCREW INTO SILL (TYP)

TIMBER SILL

3/4" X (LENGTH VARIES)
W/DECK PANEL DEPTH). LAG SCREW: SEE LAG SCREW NOTES
BELOW, COUNTERSINK AS SHOWN

TOP OF LONGITUDINAL DECK PANELS SEE
SUPERSTRUCTURE PLANS FOR
DEPTH REQUIREMENTS

40D RING SHANK NAILS

TIMBER SILL

**FOUNDATION ALTERNATIVES
### Prefabricated Steel Trail Bridge

#### Table

<table>
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<tr>
<th>Structure Number</th>
<th>Trail No.</th>
<th>Bridge Location</th>
<th>Bridge Length</th>
<th>Bridge Span</th>
<th>Pedestrian Load</th>
<th>Ground Snow Load</th>
<th>Handrail</th>
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**Deck Type:**
- ST = Steel Through Truss
- FRP = Fiber Reinforced Polymer Through Truss
- CONC = Concrete Voids Slab

#### Running Plank

| Structure Number | Species | Size | Width | Treatment Type | Type | Size | Width | Height | Treatment | Length Near Far | Material Type | Material Depth | Geo-Synthetic Type | Comments |
|------------------|---------|------|-------|----------------|------|------|-------|--------|-----------|----------------|-----------------|---------------|-----------------|------------------|----------|
|                  |         |      |       |                |      |      |       |        |           |                |                |               |                  |        |
|                  |         |      |       |                |      |      |       |        |           |                |                |               |                  |        |
|                  |         |      |       |                |      |      |       |        |           |                |                |               |                  |        |
|                  |         |      |       |                |      |      |       |        |           |                |                |               |                  |        |

**Runway Material Type:**
- SS = Solid Sawn
- GLU = Glulam
- CONC = Concrete

### Elevation

- Maximum Grade: 10%
- Bearing to Bearing = 5'
- Running Planks and Deck Planks Not Shown for Clarity

---

**H-5 Vehicle Loading Diagram**

- Design High Water
- Clearance

---

**Inside Face of Curb or Rub Rail**

- 2000 LBS
- 8' 8" x 5'
- 5' 1" x 1' 1" x 1'
- 3" x 4" x 4" x 4"

---

**Substructure Shown for Illustration Only. See Adjustment Details**

**Repair Armor (Typ.) At Adjustments Where Required. See Sheet 2 for Details**

---

**Safety Railings as Required. See Project Design Criteria**
ELEVATION - GRADE BEAM

* 12" CAST-IN-PLACE ANCHOR OR 7" EPOXY ANCHOR WHEN APPROVED BY CO.

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 (FH-03) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.

CONCRETE: USE CLASS A244 FOR CONCRETE, Fc = 4000 PSI AT 28 DAYS WITH AN ENTERED AIR CONTENT OF 5% ± 1%.

PROVIDE ALL CONCRETE IN ACCORDANCE WITH AN APPROVED MIX DESIGN. CHAMFER ALL EXPOSED EDGES OF CONCRETE 3/4"-NON.

REINFORCING STEEL: USE REINFORCING STEEL OF THE DEEMED TYPE CONFORMING TO ASHTO M31 (ASTM A615), GRADE 60.

CONCRETE COVER SHALL BE AS SHOWN, WHERE NOT SHOWN, IT SHALL CONFORM TO ASHTO, OUT AND END STEEL IN ACCORDANCE WITH A315.

CONCRETE GRADE BEAM DETAILS SHOWN ON THIS SHEET PROVIDE MINIMUM SIZES AND REQUIREMENTS. THE CONTRACTOR SHALL PREPARE AND SUBMIT COMPLETE GRADE BEAM DETAILS WITH THE PROPOSED SUPERSTRUCTURE DESIGN AND SHOP DRAWINGS.
ELEVATION – GEOCELL FOUNDATION

*SILL MATERIAL AND DIMENSIONS WILL VARY, REFER TO SUPERSTRUCTURE SHEETS FOR ACTUAL SILL DIMENSIONS AND ADJUST GEOCELL AS NEEDED.

SECTION A-A

1 1/4" X 1/4" METAL STRAP

ELEVATION – ANCHOR BOLT DETAIL

HEAVY HEX NUT

MALLEABLE IRON WASHER

METAL STRAP

13/16" HOLE

TACK

HEAVY HEX NUT

FOUNDATION 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.

HARDWARE AND STRUCTURAL STEEL: SEE SUPERSTRUCTURE DRAWINGS FOR PROJECT DESIGN CRITERIA AND GENERAL NOTES.

GEOCELL ABUTMENT STABILIZATION: REFER TO THE SPECIAL PROJECT SPECIFICATIONS FOR A DESCRIPTION OF THE WORK, MATERIALS, AND INSTALLATION PROCEDURES.
TIMBER CRIBBING W/ GEOCELL FOUNDATION

**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", & 5" X 12" TREATED MEMBERS, OR LOG SILL. SEE LOG SILL NOTCHING DETAIL.**

Construct cribbing with 6" X 6" rough sawn treated timbers. Field drilled hole shall be treated per general notes (see superstructure sheets).

**" 2"-6" MINIMUM TO 4"=0" MAXIMUM**

GENERAL NOTES:
- Construct cribbing with 6'' X 6'' wood treated in accordance with AASHTO M-18.
- All cribbing shall be treated with a preservative that is approved by the project engineer.
- All cribbing shall be installed in accordance with the project specifications.
- All cribbing shall be installed in a manner that ensures stability and safety.
- All cribbing shall be inspected and approved by the project engineer prior to use.

HARMONIZATION AND STRUCTURAL STEEL: See superstructure drawings for project design criteria and general notes.

GEOCELL ARMSMENT STABILIZATION: Refer to the special project specifications for a description of the work, materials, and installation procedures.

TREATED TIMBER & LUMBER: Refer to the general notes on the superstructure drawings for treated timber & lumber specifications and field treating of wood.
CONCRETE LEVELING PAD ON BEDROCK FOUNDATION

FOUNDATION 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 (FM-03) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.

HARDWARE AND STRUCTURAL STEEL: SEE SUPERSTRUCTURE DRAWINGS FOR PROJECT DESIGN CRITERIA AND GENERAL NOTES.

GENERAL ABUTMENT STABILIZATION: REFER TO THE SPECIAL PROJECT SPECIFICATIONS FOR A DESCRIPTION OF THE WORK, MATERIALS, AND INSTALLATION PROCEDURES.

TREATED TIMBERS & LUMBER: REFER TO THE GENERAL NOTES ON THE SUPERSTRUCTURE DRAWINGS FOR TREATED TIMBER & LUMBER SPECIFICATIONS AND FIELD TREATMENT OF WOOD.