**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 (FH-03) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGE PROJECTS.**

**LOG MEMBERS:** LOGS USED FOR STRINGERS SHALL BE DOUBLE FIRED OR WESTERN LARCH WITH MINIMUM PEELED MID-SPAN LOG DIAMETER AS NOTED IN THE VARIOUS SPANS AND DESIGN LOADING NATIVE TREES TO BE USED FOR BRIDGE STRINGERS SHALL BE STRAIGHT, SOUND, AND FREE OF DEFECTS AND NOT STRINGERS SHALL BE CHOSEN FROM TREES WITH RELATIVELY FEW BARKS AND HAVE NO KNOTS GREATER THAN 3-INCH IN DIAMETER. LOGS SHALL BE BATTED AT ENDS TO CREATE A LEVEL BEARING SURFACE TO SUPPORT TAILING TO AVOID CUTTING. HEMI UPPER SURFACE OF LOGS TO PROVIDE A LEVEL BEARING SURFACE TO REPORT TO PLANS FOR HEAVY DETAILS.

**TIMBER & TIMBER:** CUT OR TIMBER MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF THE GRADE STRINGER AND FOR THE SPECIES, TYPE, AND GRADE SPECIFIED BELOW:

**SAWN RAILING SYSTEM DETAILS**

**DECK PLANKS, SILLS, AND BACKING PLANKS**
- SOUTHERN PIN, ROUGH SAWN NO.1 GRADE, GRADE PLANS ARE GIVEN (PSB TREATMENT, TYPE C SOLVENT)
- WHITE OAK, SAWN, SELECT STRUCTURAL GRADE, GRADE PLANS ARE GIVEN (NSA TREATED, TYPE C SOLVENT)
- SOUTHERN PINE, SAWN, NO.2 GRADE, GRADE PLANS ARE GIVEN (PSB TREATED, TYPE C SOLVENT)

**STRINGERS & RAILING SYSTEM, IF TREATED:**
- APA USE CATEGORY SYSTEM (US) FOR USE CATEGORY 31, ABOVE GROUND-EXPOSEO (UC3B), TREATMENT TYPE (TCHLORO-HYDROXYL NITRATE IN LIGHT OIL, TYPE C SOLVENT)
- COPPER NAPHTHALENE (CNA) IN LIGHT OIL, TYPE C SOLVENT
- BRADFORD, BRADWELL, OIL, TYPE C SOLVENT
- COPPER NAPHTHALENE (CNA) IN HEAVY OIL, TYPE A SOLVENT

**FIELD TREATMENT:** COPPER NAPHTHALENE (2% SOLUTION) SHALL BE FURNISHED FOR FIELD TREATING OF WOOD, ALL ABRASIONS AND FIELD CUTS - APPROVED BY THE C.O.R. - SHALL BE GATHERED AND DISPOSED OF. TREATMENT SHALL BE TREATED TO THE FIELD TREATMENT SOLUTION, WHERE APPROVED. FIELD DRILLING OF BOLT, SCREW OR NAIL HOLES IS RECOMMENDED. HOLES SHALL BE FILLED WITH PREPARATORY TO INSPECTING THE TERNS.

**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 STRINGER PLANS:**

**FIELD TREATMENT CRITERIA:** FIELD TREATMENT CRITERIA FOR STEEL HARDWARE FINISH, GALVANIZED OR UNFINISHED HARDWARE SHALL MEET THE REQUIREMENTS OF ASTM A325, GRADE 50, WITH NUTS, BOLTS, AND NUTS CONFORMING TO ASTM A574, GRADE 5, WITH NUTS AND BOLTS CONFORMING TO ASTM A325, TYPE 5 USE WALLEABLE IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTIFIED.

**FOR LOG HOLES DRILL HOLES 1/16-INCH LARGER THAN LOG HOLES DIAMETER FOR WOOD KNOTION.**

---

**TABLE 2 - SINGLE ROUND LOG STRINGER PEEL ay M ID SPAN DIAMETER REQUIREMENTS - LRAFD**

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

**STRINGER LENGTH EQUAL TO STRINGER SPAN PLUS ONE FOOT**

**REQUIRED REGIONAL ENGINEER APPROVAL**

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**POLE RAILING SYSTEM DETAILS**

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**SAWN RAILING SYSTEM DETAILS**

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

---

**SINGLE LOG STRINGER TRAIL BRIDGE**
**SECTION 961 - LOG STRINGER TRAIL BRIDGE**
**PLAN**
**SLS**
**NOT TO SCALE**

---

**DRAWING NO. STD_961-10-03b**
**NOT TO SCALE**

---

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

---

**SINGLE LOG STRINGER TRAIL BRIDGE**
**SECTION 961 - LOG STRINGER TRAIL BRIDGE**
**PLAN**
**SLS**
**NOT TO SCALE**

---

**DRAWING NO. STD_961-10-03b**
**NOT TO SCALE**
ABUTMENT CONNECTION DETAIL

BACKING PLANK STIFFENER NOT SHOWN FOR CLARITY

*TIMBER SILL CAN BE EITHER 1 1/2" X 1 1/2" SOLID SAWN, 10 3/4" X 1 1/2" OAK (LAMINATED), BUILT-UP 3" X 1 1/2", 4" X 1 1/2", 6" X 1 1/2" TREATED WOOD, 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 THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (F-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" LARGER THAN THE SHANK DIAMETER AND IS TO BE BORED TO THE DEPTH OF PENETRATION OF THE SHANK. THE LEAD HOLE FOR THE THREADED PORTION IS TO BE 20% OF THE SHANK DIAMETER AS SHOWN IN 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 FOR END POST AT EACH END OF BRIDGE (TOP)

LOG STRINGER

LOG SILL

NOTCH SILL TO PROVIDE FLAT BEARING SURFACE

**FOUNDATION

LOG SILL NOTCHING DETAIL

24" MINIMUM

1" MINIMUM
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NA = NOT APPLICABLE, BACKWALL TYPE: ST = STONE, W = WOOD

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<tr>
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<th>RUNNING PLANK</th>
<th>STILL</th>
<th>APPROACHES</th>
<th>HARDWARE</th>
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RAILING SYSTEM/CURB MATERIAL TYPE: R = ROUND LOG, D = DIMENSIONAL LUMBER
APRONET MATERIAL TYPE: SS = SOLID SAWN, GLU = GLUED, CONG = CONCRETE
HARDWARE COATING TYPE: GALV = GALVANIZED, UNCO = UNCOATED, HEA = HEATING STEEL

TRAIL BRIDGE W/RAILING SYSTEM

2" x 8" CONTINUOUS PLATE

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 (PH-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 TEELED, 8'-6"-SPAN LOG DIAMETER AS NOTED FOR THE VARIOUS SPANS AND DESIGN LOADING. NATIVE TREES TO BE USED FOR BRIDGE STRINGERS SHALL BE STRONG, SOUND, AND FREE OF DEFECTS AND ROT. STRINGERS SHALL BE CHOSEN FROM TREES WITH RELATIVELY FEW LINES, AND HAVE NO KNOT GREATER THAN 3-INCH IN DIAMETER. LOGS SHALL BE DAPPED AT ENDS TO CREATE A LEVEL SEATING SURFACE AT SUPPORTS TAKING CARE TO AVOID OVER CUTTING. HEWN UPPER SURFACE OF LOG TO PROVIDE A LEVEL SEATING SURFACE REFER TO PLANS FOR HEWN DETAILS.

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, SILLS, AND BACKING PLANKS

- COASTAL REGION DOUGLAS FIR - LARCH RUGH SAWN NO. 1 GRADE GRADING RULES AGENCY = WAPA. WCLB.

RUNNING PLANKS

- COASTAL REGION DOUGLAS FIR - LARCH RUGH SAWN NO. 2 GRADE GRADING RULES AGENCY = WAPA. WCLB.

RAILS & POSTS (SEE PROJECT CRITERIA)

- SAWN - TREATED
  - REDWOOD, SIK, NO. 1 GRADE GRADING RULES AGENCY = RAP.
  - WAPA. WCLB
- SAWN - TREATED
  - HEU - FR/DOUGLAS FIR, SIK, NO. 1 GRADE GRADING RULES AGENCY = WAPA. WCLB.

POLES

- LODGE POLE PINE, SAWN AND DRIED. GRADING RULES AGENCY = WAPA.

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 (WAPA) SPECIFICATIONS USING THE TREATMENT MATERIALS LISTED BELOW. TREATMENT WILL COMPLY WITH THE "REQUIREMENTS OF THE CURRENT EDITION OF WESTERN WOOD PRESERVERS INSTITUTE (WPI) TREATMENT MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS."

STRINGERS, DECKING, RUNNING PLANKS, & RAILING SYSTEM, F TREATED

- WAPA USE CATEGORY SYSTEM (US) FOR USE CATEGORY 2B ABOVE GROUND-EXPOSED (UC2B)
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHALENE (CNA) IN LIGHT OIL (TYPE C SOLVENT)
- SILLS, BACKING PLANKS, CRIBS, & TIMBER WALLS, F TREATED
- WAPA USE CATEGORY SYSTEM (US) FOR USE CATEGORY 4B GROUND CONTACT-HIGH DUTY (UC4B)
- PENTACHLOROPHENOL IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHALENE (CNA) IN HEAVY OIL (TYPE A SOLVENT)

FIELD TREATMENT: COPPER NAPHTHALENE (2% SOLUTION) SHALL BE FURNISHED FOR FIELD TREATED TIMBER. ALL DECKING AND FIELD TREATED - APPROVED BY THE IG-03 - 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 DESIGN CRITERIA FOR STEEL HARDWARE, GALVANIZED OR UNFINISHED HARDWARE SHALL MEET THE REQUIREMENTS OF ASME M270, GRADE 50, WITH NUTS AND BOLTS CONFORMING TO ASME A325, GRADE A. HEATING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF ASME M270, GRADE 50, WITH BOLTS AND NUTS CONFORMING TO ASME 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 TIMBERS, RUNNING PLANKS). SHOW ALL DIMENSIONS AND FABRICATION DETAILS FOR ALL CUT OR BORED TIMERS. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THE PLANS.

TREES 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 THE STRUCTURE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-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 FEEDED, MID-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 NOT STRINGERS SHALL BE CHosen FROM TREES WITH RELATIVELY FEW LINERS, AND HAVE NO Knot 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 HEAVY UPPER SURFACE OF LOGS TO PROVIDE A LEVEL SEAT SURFACE REFERS TO PLANS FOR HEAVY DETAILS.

TAMPER & LINERS: LOG AND TIMBER MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF THE PLACING RULES AGENCY FOR THE SPECIES, TYPE, AND GRADE SPECIFIED BELOW.

DECK PLANKS, SILLS, AND BACKING PLANKS
- SOUTHERN PINE NO.2 GRADE, GRADE PLACING AGENCY - SPF
- RUNNING PLANKS
- SOUTHERN PINE NO.2 GRADE PLACING AGENCY - SPF
- RAILS & POSTS (SEE PROJECT CRITERIA)
- SAWN - UNTREATED
- SAWN - IMMERSIBLE, S4S, NO.1 GRADE PLACING AGENCY - SPF
- SAWN - WHITE OAK, S4S, SELECT STRUCTURAL GRADE PLACING AGENCY - SPF
- SAWN - TREATED
- SOUTHERN PINE, S4S, NO.2 GRADE PLACING AGENCY - SPF
- POLES
- SOUTHERN PINE, FEEDED AND DRIED, GRADE PLACING AGENCY - SPF

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 (WWPI) "BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS".

STRINGERS, DECKING, RUNNING PLANKS & RAILING SYSTEM, IF TREATED
- AWPA USE CATEGORY SYSTEM (U.S.) FOR USE CATEGORY 3B ABOVE GROUND - EXPOSED (LC3B)
- PENTACHLOROPHENOIL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHATE (CN) IN LIGHT OIL (TYPE C SOLVENT)
- SILLS, BACKING PLANKS, OREBS, & TIMBER WALLS, IF TREATED
- AWPA USE CATEGORY SYSTEM (U.S.) FOR USE CATEGORY 4B GROUND CONTACT - HEAVY DUTY (LC4B)
- PENTACHLOROPHENOIL IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHATE (CN) IN HEAVY OIL (TYPE A SOLVENT)

FIELD TREATMENT: COPPER NAPHTHATE (CN) SOLUTION SHALL BE FURNISHED FOR FIELD TREATMENT OF WOOD. ALL APPLICATIONS AND FIELD CUTS - APPROVED BY THE C.D.R. - SHALL BE CAREFULLY TRIMMED AND GIVEN 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. FINISHED, GALVANIZED OR UNFINISHED HARDWARE SHALL MEET THE REQUIREMENTS OF AASHO M70, GRADE 50, WITH NUTS AND BOLTS CONFORMING TO ASTM A321, GRADE 8. WEATHERING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF AASHO M70, GRADE 50, WITH BOLTS AND NUTS CONFORMING TO ASTM A321, 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 BORED TIMBER. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THE PLANS.

TREES TO BE USED FOR STRINGERS SHALL BE FEEDED AND THEN HAVE AN ADDITIONAL 1/2-INCH OF THE OUTER SAPWOOD REMOVED PRIOR TO BEING USED FOR STRINGERS.
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ABUTMENT MATERIAL TYPE: **SS** = SOLID SAWN, **GLU** = GLULAM, **CONC** = CONCRETE

HARDWARE COATING TYPE: **GALV** = GALVANIZED, **UNC** = UNCOATED, **REA** = WEATHERING STEEL

**Sawn Timber Stringer Trail Bridge**

**Rail Bridge W/Railing System**

**Approach Not Shown for Clarity**

**Bearings Shown See Sheet 4 for Details**

**Approach**

**Railing System**

**Backwall**

**Sill**

**Deck Planks**

**Sawn Sawn Timber Stringer**

**Deck**

**Backwall**

**Stringer**

**Decks**

**Hardware**

**Notes**

**Sheet 1 of 4**
<table>
<thead>
<tr>
<th>STRUCTURE NUMBER</th>
<th>TRAIL NO.</th>
<th>BRIDGE LOCATION</th>
<th>BRIDGE LENGTH OUT-TO-OUT</th>
<th>DECK PANEL TYPE</th>
<th>SPECIES NUMBER</th>
<th>MATERIAL SIZE</th>
<th>TREATMENT</th>
<th>TYPE</th>
<th>SPECIES</th>
<th>SIZE</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TREATMENT</th>
<th>COMMENTS</th>
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NA = NOT APPLICABLE

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<thead>
<tr>
<th>RAILING SYSTEM/CURB</th>
<th>RUNNING PLANK</th>
<th>SILL</th>
<th>APPROACHES</th>
<th>HARDWARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRUCTURE NUMBER</td>
<td>SPECIES</td>
<td>TYPE</td>
<td>HEIGHT</td>
<td>MATERIAL TYPE</td>
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ABUTMENT MATERIAL TYPE: SS = SOLID SAWN, GLU = GLUED, CONC = CONCRETE
HARDWARE COATING TYPE: GALV = GALVANIZED, UNCO = UNCOATED, WEA = WEATHERING STEEL

TRAIL BRIDGE W/RAILING SYSTEM

APPROACH NOT SHOWN FOR CLARITY

LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE

PROJECT NAME: STANDARD TRAIL PLAN

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

SHEET 1 OF 5
LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE

LAYOUT OF DECK PANEL LAMINATIONS
Layout shown for 12-foot longitudinal nail-laminated timber trail bridge deck panels.
Butt joints not allowed.
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

LAYOUT OF DECK PANEL LAMINATIONS

LAYOUT SHOWN FOR 16-FOOT LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE DECK PANELS.

BUTT JOINTS NOT ALLOWED

ONE DECK PANEL COMPLETED = 12" DECK PANEL LENGTH

LAYOUT PATTERN FOR (8)-2" DIMENSIONAL LAMINATIONS

30D HARDENDED RING SHANK NAILS

MALLEABLE IRON WASHERS (TYP)
NAILING PATTERN FOR NAIL-LAMINATES

THE FOLLOWING NAILING PATTERN 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.
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 SIDES WITH TWO AT EACH END.
2. ALL DECKS SHOWN IN TABLE-1.1 ARE NOMINAL. NAIL-LAMINATED DECK PANELS SHALL BE CONSTRUCTED USING 52S LAMINAR.

*TABLE-1.1: LAMINATION DEPTH REQUIREMENTS - LRFD

<table>
<thead>
<tr>
<th>PEDESTRIAN LOAD</th>
<th>GROUND SNOW LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESIGN LOADING IN POUNDS PER SQUARE FOOT</td>
<td>120</td>
</tr>
<tr>
<td>6&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>8&quot;</td>
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</tbody>
</table>

**DECK PANEL LENGTH (FEET)**

<table>
<thead>
<tr>
<th>TIMBER SPECIES - DOUGLAS FIR/HEM-FIR GRADE - NO.</th>
<th><strong>DECK PANEL LENGTH OUT-TO-OUT AND RAILING SYSTEM</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>2&quot; X 6&quot; X (LENGTH VARIES) VERTICAL END</td>
</tr>
<tr>
<td>6&quot;</td>
<td>(2)-16d NAILS INTO EACH RAIL</td>
</tr>
<tr>
<td>6&quot;</td>
<td>RAILING STRUCTURE SEE SHEET 2 FOR DETAILS</td>
</tr>
</tbody>
</table>

**ELEVATION**

GRADE SHOWN = 0.0%

SUBSTRUCTURE SHOWN FOR ILLUSTRATION ONLY. SEE SHEET 5 FOR DETAILS

NAIL-LAMINATED LONGITUDINAL DECK PANEL

FASTEN BACKING PLANK TO DECK PANEL W/4D8 RING SHANK NAILS AT 12" ON CENTER ALONG TOP & BOTTOM EDGE

3" RACKING PLANK (TYP)

NOTE: DECK PANEL LENGTH SHALL BE THE LARGER OF THE PEDESTRIAN OR GROUND SHOW 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
962 - SAWN TIMBER TRAIL BRIDGE

NOT TO SCALE
NOTES:

1. SPACED RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO POST SPACES. ALTERNATE RAIL SPIKES AT POSTS. FASTEN RUNNING PLANKS TO DECK PANELS WITH 304 (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 525 LUMBER.

*TABLE-1.1: LAMINATION DEPTH REQUIREMENTS - LRFD

<table>
<thead>
<tr>
<th>DECK PANEL LENGTH (FEET)</th>
<th>TIMBER SPECIES - SOUTHERN PINE</th>
<th>PEDESTRIAN LOAD</th>
<th>GROUND SNOW LOAD</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>DECK PANEL SIZE SHALL BE THE LARGER OF THE PEDESTRIAN OR GROUND SNOW LOAD SIZE REQUIRED FOR THE SITE CONDITIONS</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>*<strong>DECK PANEL LENGTH EQUAL TO DECK PANEL SPAN PLUS ONE FOOT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>****REQUIRES REGIONAL BRIDGE ENGINEER APPROVAL</td>
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</tr>
<tr>
<td>12</td>
<td>6&quot;</td>
<td>6&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>16</td>
<td>6&quot;</td>
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963 - GLULAM TRAIL BRIDGE

<table>
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<tr>
<th>STRUCTURE NUMBER</th>
<th>TRAIL NO.</th>
<th>BRIDGE LOCATION</th>
<th>BRIDGE LENGTH GLOBE-TO-GLOBE</th>
<th>STRINGER SPAN LENGTH</th>
<th>STRINGER SPAN CLEAR WIDTH</th>
<th>PEDESTRIAN LOAD</th>
<th>GROUND LOAD</th>
<th>COMBINATION SYMBOL</th>
<th>SPECIES</th>
<th>MATERIAL SIZE</th>
<th>TREATMENT</th>
<th>SPECIES</th>
<th>SIDE</th>
<th>TREATMENT</th>
<th>TYPE</th>
<th>SPECIES</th>
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NA = NOT APPLICABLE

RAILING SYSTEM/CURB | RUNNING PLANK | SILL | APPROACHES | HARDWARE
<table>
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<tbody>
<tr>
<td>STRUCTURE NUMBER</td>
<td>SPECIES</td>
<td>TYPE</td>
<td>HEIGHT</td>
<td>TREATMENT</td>
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<tr>
<td></td>
<td>YES NO</td>
<td>SPECIES</td>
<td>SIZE</td>
<td>WIDTH</td>
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ARBITRARY MATERIAL TYPE: SS = SOLID SAWN, GLU = GLULAM, CONC = CONCRETE
HARDWARE COATING TYPE: GALV = GALVANIZED, UNC = UNCOATED, WEA = WEATHERING STEEL

TRAIL BRIDGE W/RAILING SYSTEM

APPROACH FILL

RAILING SYSTEM

GLULAM STRINGER

DECK PLANKS

BEARING SHOE SEE SHEET 3 FOR DETAILS

SILL
### Table 1C: Glulam Stringer Size Requirements - LRFD

<table>
<thead>
<tr>
<th>Species</th>
<th>SP/SP, Combination Symbol 24F - V3</th>
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</thead>
<tbody>
<tr>
<td><strong>Design Loading in Pounds per Foot</strong></td>
<td><strong>PEDESTRIAN LIVE LOAD</strong></td>
</tr>
<tr>
<td></td>
<td>90</td>
</tr>
<tr>
<td>25</td>
<td>5 1/8&quot; x 15 1/6&quot;</td>
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<tr>
<td>30</td>
<td>5 1/8&quot; x 13 7/12&quot;</td>
</tr>
<tr>
<td>35</td>
<td>5 1/8&quot; x 11 5/6&quot;</td>
</tr>
<tr>
<td>40</td>
<td>5 1/8&quot; x 9 5/12&quot;</td>
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<tr>
<td>45</td>
<td>5 1/8&quot; x 7 1/2&quot;</td>
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<tr>
<td>50</td>
<td>5 1/8&quot; x 5 3/8&quot;</td>
</tr>
<tr>
<td>55</td>
<td>5 1/8&quot; x 3 1/2&quot;</td>
</tr>
</tbody>
</table>

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

**Stringer Length Equal to Stringer Span Plus One Foot**

***Requires Regional Bridge Engineer Approval***

---

**Notes:**

1. Fasten deck planks to stringers with two rows 60d (6-inch) ring Shank nails per plank at each stringer, alternate centers.
2. Fasten running planks to deck with 45d (5-inch ring Shank) nails at 24-inches spacing, alternate centers with two at each end.
3. Space nails at posts. Nails shall be continuous for two post spaces. Do not locate more than one nail on any post.
4. The minimum stringer depth for bridges with pedestrian rails is 15-inches.
5. Bridges with stringer depths less than 15-inches shall have curbs only.
TIMBER SILL CONNECTION DETAIL

* Timmer Sill can be either 12" x 12" Solid Sawn 10 3/4" x 12" glued-laminated, bolted or built-up 3" x 12", 4" x 12", & 6" x 12" treated members.


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 (FH-93) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.

CONCRETE: USE STRUCTURAL CONCRETE WITH 3/4" MINIMUM MIX APPROVED BY THE C.O. OR CONCRETE SHALL MEET THE TYPICAL SURFACE FINISH CONCRETE SHALL HAVE 45-65% ENTRAINED 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 (AASHTO M49-68) GRADES 40 OR 60. PROVIDE 2-INCH CLEAR CONCRETE COVER FOR ALL REBAR UNLESS NOTED OTHERWISE ON THE PLANS.

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

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

LAG SCREW INSTALLATION: PRE-DRILL LAG SCREW HOLES USING TWO DIAMETERS, ONE FOR THE SHANK AND ONE FOR THE THREADS. THE DEEPER HOLES FOR THE SHANK IS TO BE 1/16" LONGER THAN THE SHANK DIAMETER AND IS TO BE BORED TO THE DEPTH OF PENETRATION OF THE SHANK. THE DEEPER HOLES FOR THE HOLE FOR THE HOLE AT THE LENGTH OF THE THREADS IS TO BE BORED AT LEAST TO THE LENGTH OF THE THREADS. DO NOT DRIVE LAG SCREWS WITH A HAMMER.
<table>
<thead>
<tr>
<th>STRUCTURE NUMBER</th>
<th>TRAIL NO.</th>
<th>BRIDGE LOCATION</th>
<th>PANELS</th>
<th>BACKWALL</th>
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NA = NOT APPLICABLE

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<tr>
<th>RAILING SYSTEM/CURB</th>
<th>RUNNING PLANK</th>
<th>SILL</th>
<th>APPROACHES</th>
<th>HARDWARE</th>
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<tbody>
<tr>
<td>STRUCTURE NUMBER</td>
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<td>TYPE</td>
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ARMSHITE MATERIAL TYPE: SS = SAWN, GLU = GLULAM, CONC = CONCRETE
HARDWARE COATING TYPE: GALV = GALVANIZED, UNCO = UNCOATED, WEA = WEATHERING STEEL

TRAIL BRIDGE W/RAILING SYSTEM

APPROACH NOT SHOWN FOR CLARITY

GENERAL NOTES FOR TENSIONING REQUIREMENTS

APPROACH NOT SHOWN FOR CLARITY
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 (FG-01) 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 SUBSTRUCTURE DRAWINGS FOR TREATED TIMBER & LUMBER SPECIFICATIONS AND FIELD TREATING OF WOOD.

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 BORED TO THE DEPTH OF PENETRATION OF THE SHANK. THE LEAD HOLE FOR THE THREADED PORTION IS TO BE 70 PERCENT OF THE SHANK 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.

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 965-10, 965-20, 965-30, & 965-40 FOR FOUNDATION ALTERNATIVES
<table>
<thead>
<tr>
<th>Structure Number</th>
<th>Trail No.</th>
<th>Bridge Location</th>
<th>Bridge Length</th>
<th>Bridge Span</th>
<th>Bridge Clear</th>
<th>Pedestrian Load</th>
<th>Ground Snow Load</th>
<th>AOA Required</th>
<th>Height</th>
<th>Rub Rail Species</th>
<th>Rub Rail Size</th>
<th>Treatment</th>
<th>Vertical</th>
<th>Diagonal</th>
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<th>Size</th>
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**Deck Type:**
- ST = Steel Through Truss
- FRP = Fiber Reinforced Polymer Through Truss
- CONC = Concrete Voids Slab

**Approaches:**
- Running plank
- Abutment
- Backwall

**Running Plank**
- Species
- Size
- Width
- Treatment Type
- Type
- Size
- Treatment Yes/No

**Abutment**
- Species
- Size
- Width
- Height
- Treatment
- Length Near Far
- Width
- Material Type
- Material Depth
- Geo-Synthetics Type

**Backwall**
- Species
- Size
- Width
- Height
- Treatment

**Safety Railings:**
- As required

**Design High Water:**
- Clearance

**Elevation:**
- Maximum grade @ bearing to @ bearing = 5%
- Running planks and deck planks not shown for clarity

**Substructure:**
- Shown for illustration only
- See abutment details

**Armor:**
- Required at abutments where required
- See sheet 2 for details

**H-5 Vehicle Loading Diagram**
- 2000 LBS
- 8000 LBS

---

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

**Drawing Title:**
- Prefabricated Steel Trail Bridge

**Project Name & Location:**
- Blank

**Drawing Number:**
- STD_964-10-01

**Not to Scale:**
- Sheet 1 of 3

---
GENERAL NOTES:

NOTE FACE TO INSIDE FACE (RUN RAILS AND RAIL)

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

DECK PLANKS AND BACKING PLANKS:
- DECK PLANKS: USE Category 3B,ABA or Category 3, ABA, or Category 4, ABA, or Category 5, ABA for bridge construction.
- BACKING PLANKS: USE Category 3, ABA, or Category 4, ABA, or Category 5, ABA for bridge construction.

DESIGN: The design of all prefabricated steel bridge superstructure elements shall comply with the American Institute of Steel Construction (AISC) specifications for design of steel bridges. Current edition and AISC-L101 design specifications, revised and issued in 2010, shall be used.

MATERIALS: USE steel shapes, plates, and bars of steel conforming to AASHTO A36, grade 50 (A500 or A500B), or grade 70 (A441 or A611). USE steel bars for reinforcement in concrete-conforming to AASHTO A611 or A612. USE steel bars for reinforcement in concrete-conforming to AASHTO A611 or A612.

FIELD TREATMENT: USE Parker's (12% solution) for field treatment of wood. All timbers and field cuts are approved by the park rangers. All timbers will be carefully trimmed and given three coats of the field treatment solution, where approved field drilling of bolts or nail holes is required. The holes shall be filled with preservative prior to inserting the fasteners.

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

REVISION DATE

DRAWING NO.

SHEET 2 OF 3

964 - PREFABRICATED TRAIL BRIDGE

NOTE FACE TO INSIDE FACE (RUN RAILS AND RAIL)
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 SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FHWA) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS. CONCRETE: USE CLASS A4F FOR CONCRETE, f_c = 4000 PSI AT 28 DAYS WITH AN ENTRAINED AIR CONTENT OF 5% ± 2%. 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 DEFORMED TYPE CONFORMING TO ASTM A615 (ASTM A615), GRADE 60. CONCRETE COVER SHALL BE AS SHOWN, WHERE NOT SHOWN, IT SHALL CONFORM TO ASHTO C650 OUT AND END STEEL IN ACCORDANCE WITH ACO S15.

CONCRETE GRADE BEAM DETAILS SHOWN ON THIS SHEET PROVIDE MINIMUM SIZES AND REQUIREMENTS. 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.

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

MATERIALS 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.

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

HEAVY HEX NUT

MALLEABLE IRON WASHER

METAL STRAP

13/16" HOE

HEAVY HEX NUT

ELEVATION–ANCHOR BOLT DETAIL

11-0" SILL
ELEVATION - GABION FOUNDATION

OUT-TO-OUT WIDTH OF STRINGERS/SLABS (EXTERNAL FACE TO EXTERNAL FACE)

SILL MATERIAL AND DIMENSIONS WILL VARY. REFER TO SUPERSTRUCTURE SHEETS FOR ACTUAL SILL DIMENSIONS AND Adjust GABION AS NEEDED.

SECTION B-B

TABLE 1: STANDARD GABION BASKET SIZES

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>SIZE</th>
<th>HEIGHT</th>
<th>NO. OF DIAPHRAGMS</th>
<th>CAPACITY CUBIC YARDS</th>
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</thead>
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<td>3 ft</td>
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</tr>
<tr>
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<td>3 ft</td>
<td>3 ft</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
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<td>3 ft</td>
<td>3 ft</td>
<td>3</td>
<td>4</td>
</tr>
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<td>1.5 ft</td>
<td>1</td>
<td>1</td>
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<td>1.5</td>
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<td>1 ft</td>
<td>3</td>
<td>1.33</td>
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FOUNDATION 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 (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.

GABION ARMS/TERTIARY STABILIZATION: REFER TO THE SPECIAL PROJECT SPECIFICATIONS FOR A DESCRIPTION OF THE HARDWARE AND INSTALLATION PROCEDURES.

GABION FOUNDATIONS: REFER TO GABION FOUNDATION NOTES.

GABION FOUNDATION NOTES:

1. GABION BASKETS SHALL BE CONSTRUCTED USING WIRE MESH (U.S. STANDARD GAGE 6). BASKETS CONSTRUCTED USING TWISTED WIRE MESH WILL NOT BE ALLOWED. WOVEN WIRE MESH SHALL BE POLYVINYL CHLORIDE COATED (PVC) WHERE BASKETS ARE EXPOSED TO CORROSIVE SOILS.

2. MATERIAL USED TO FILL THE GABION SHALL BE 4-INCH TO 8-INCH HARD, DURABLE, ANGULAR ROCK.

3. ROCK MAY BE PLACED MECHANICALLY PROVIDED CARE IS TAKEN TO ENSURE THAT IT IS TIDILY PACKED WITH A MINIMUM OF WASTE, FOR EXPOSED ROCKS, HARD LABOR SHALL BE USED TO KEEP THE MESH VERTICAL, PREVENT ROLLING, AND TO PRODUCE AN ATTRACTIVE APPEARANCE.

4. ALL GABIONS SHALL BE PLACED ON UNDISTURBED SOIL OR A FOUNDATION OF DURABLE MATERIAL REMOVE AND REPLACE UNSATISFACTORY SOILS WITH A MINIMUM OF 12-INCHES OF COARSE CRANLAP BACKFILL. COMPACT BACKFILL MATERIAL AT AN OPTIMUM MOISTURE CONTENT WITH A VIBRATING COMPACTOR. OPERATE COMPACTING EQUIPMENT OVER THE FULL WIDTH OF THE FOUNDATION AREA UNTIL VEIN RECONSTRUCTION OF THE BACKFILL CEASES.

5. BACKFILL WILL BE PLACED IN FILLING OPERATION BACKFILL CLEARING GABIONS WITH A COARSE CRANLAP MATERIAL COMPACT BACKFILL MATERIAL AT AN OPTIMUM MOISTURE CONTENT WITH A VIBRATING COMPACTOR. OPERATE COMPACTING EQUIPMENT OVER THE FULL WIDTH OF THE IN-FILL AREA UNTIL VEIN RECONSTRUCTION OF THE BACKFILL CEASES.
**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 (FF-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.

**Treated Timber & Lumber:** Refer to the general notes on the superstructure drawings for treated timber & lumber specifications and field treating of wood.

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**Timber Sill on Timber Cribbing**

*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" timber members, or log sill. See log sill notching detail.

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

**2" - 6" minimum to 4" - 0" maximum***
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 (FH-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.

SPECIAL 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.