Dwg. of

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

STANDARD PLANS
FOR

SINGLE LOG STRINGER TRAIL BRIDGE
[PROJECT NAME & BRIDGE NUMBER]

PROJECT DESIGN CRITERIA:

THIS BRIDGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
OPTIONS TO BE SELECTED ARE BRACKETED [ ].

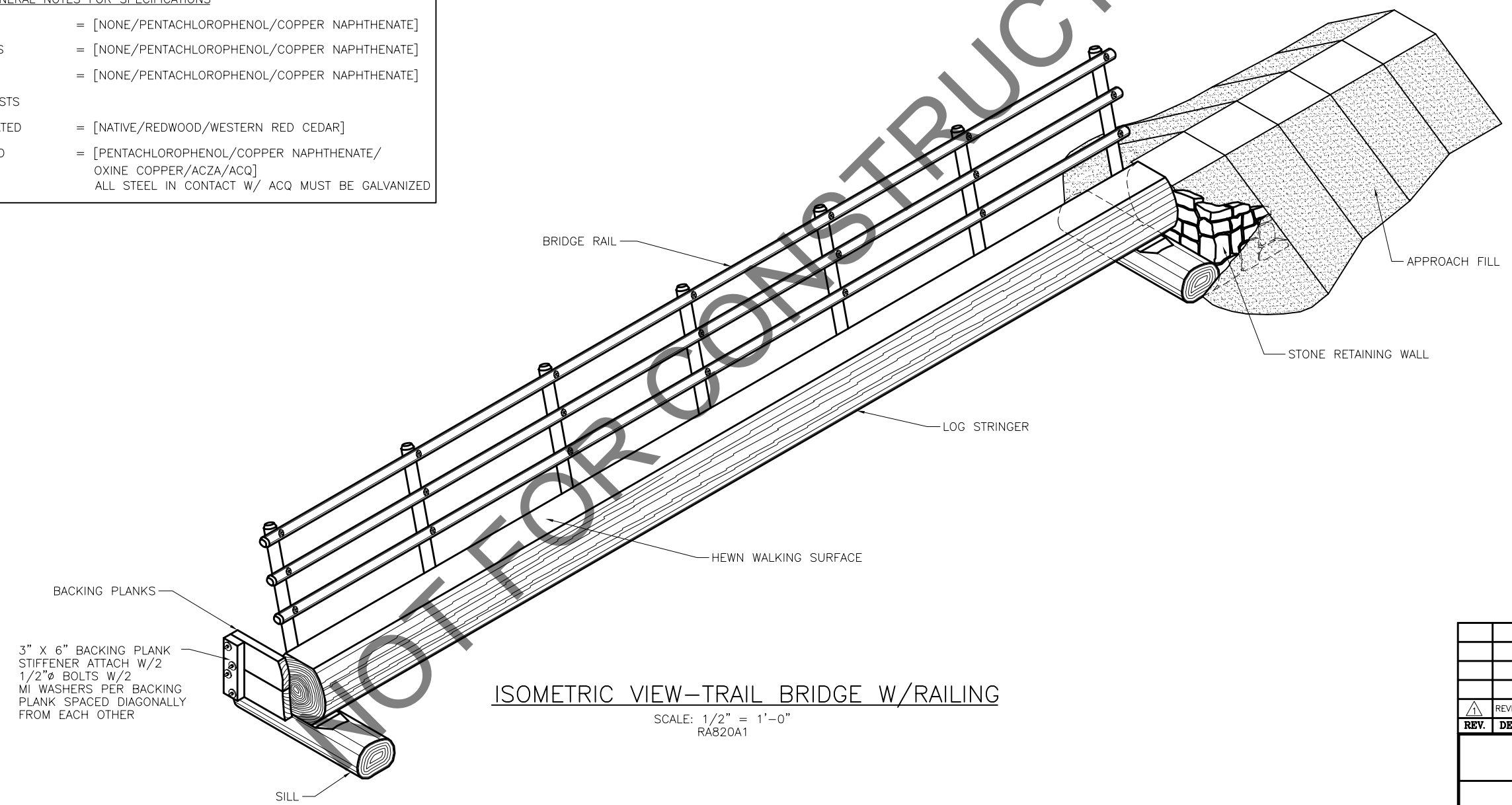
PEDESTRIAN LIVE LOAD	= _____ PSF
GROUND SNOW LOAD	= _____ PSF (WITH NO MODIFICATION FACTORS)
SPAN LENGTH	= __'-__" (℄ BEARING-TO- ℄ BEARING)
TREAD WIDTH	= __'-__" (SEE TYPICAL SECTION)
PEELED LOG DIAMETER *	= __" MID SPAN DIAMETER

*REFER TO TABLE 2 AND COMPARE STRINGER SIZE REQUIREMENTS FOR BOTH PEDESTRIAN AND SNOW LOADING. IN THE SPACE ABOVE, ENTER THE LARGER STRINGER DIAMETER THAT SATISFIES THE TWO LOAD CASES.

BRIDGE RAIL	= [NATIVE POLES/SAWN TIMBER/NONE]
STEEL HARDWARE	= [UNCOATED/GALVANIZED/WEATHERING STEEL]

TREATMENT – SEE GENERAL NOTES FOR SPECIFICATIONS

STRINGER	= [NONE/PENTACHLOROPHENOL/COPPER NAPHTHENATE]
SILLS & DECK PLANKS	= [NONE/PENTACHLOROPHENOL/COPPER NAPHTHENATE]
BACKING PLANKS	= [NONE/PENTACHLOROPHENOL/COPPER NAPHTHENATE]
BRIDGE RAILING & POSTS	
UNTREATED	= [NATIVE/REDWOOD/WESTERN RED CEDAR]
TREATED	= [PENTACHLOROPHENOL/COPPER NAPHTHENATE/ OXINE COPPER/ACZA/ACQ] ALL STEEL IN CONTACT W/ ACQ MUST BE GALVANIZED



ISOMETRIC VIEW–TRAIL BRIDGE W/RAILING

SCALE: 1/2" = 1'-0"
RA820A1

–REDUCED–
DO NOT SCALE DRAWING

REV.	DESCRIPTION	APPROVED	DATE
1	REVISED TO R-6 STRUCTURES CAD STANDARDS	MOE	3/24/05

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
THE PACIFIC NORTHWEST REGION (R-6)

SINGLE LOG STRINGER
10 FT – 45 FT LONG
TRAIL BRIDGE

Forest: **Loading:**
Bridge No.: **Length:**
Location: **Width:**

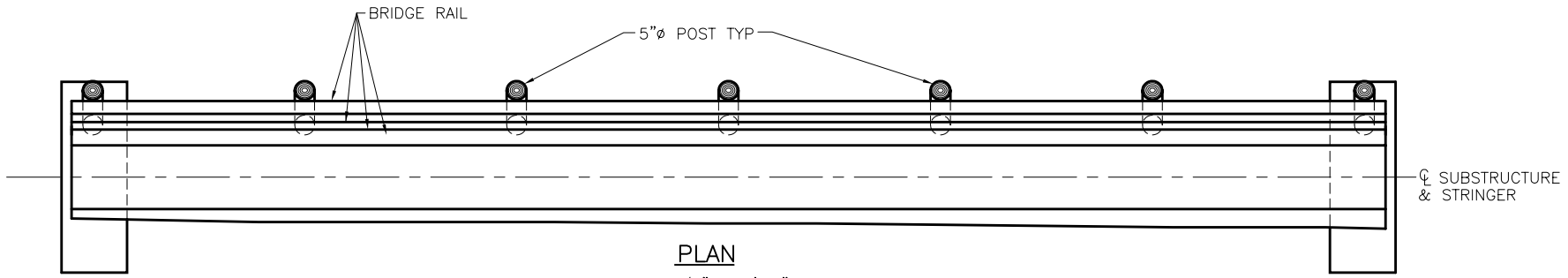
APPROVED:

_____ DATE _____

FOREST ENGINEER

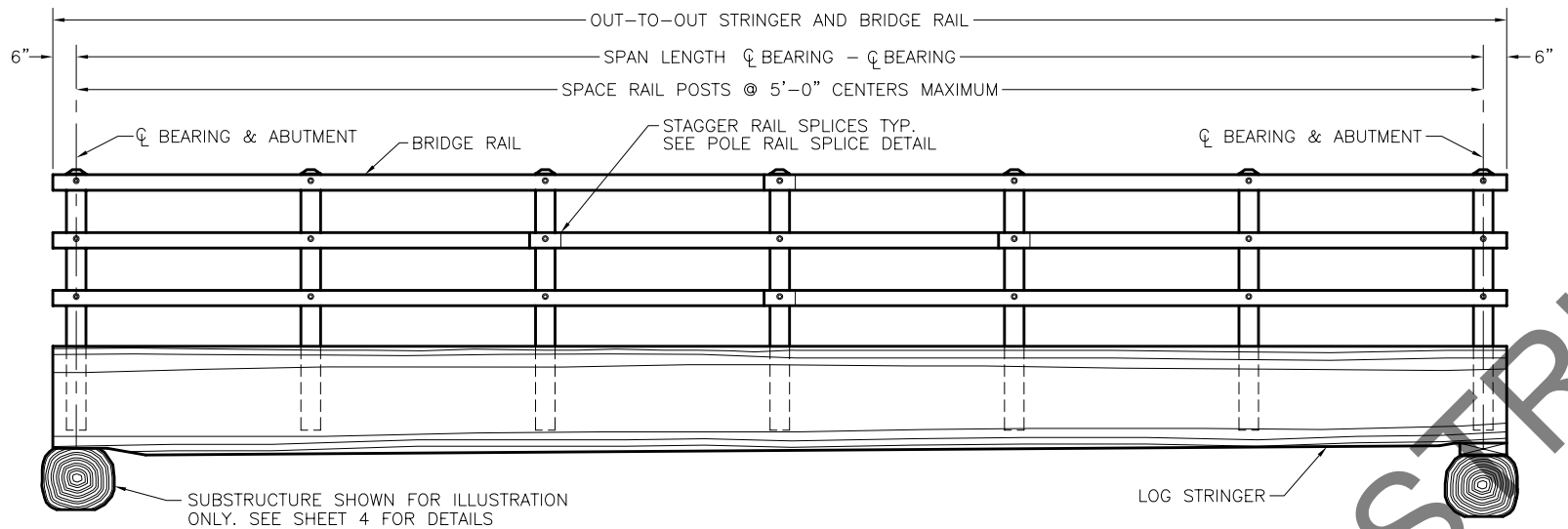
DWG NO.

SHEET 1 of 4 **DESIGN AID RA820**



PLAN

SCALE: 1/2" = 1'–0"



ELEVATION–INTERIOR FACE OF RAIL

SUPERSTUCTURE

RA820A2
SCALE: 1/2" = 1'–0"

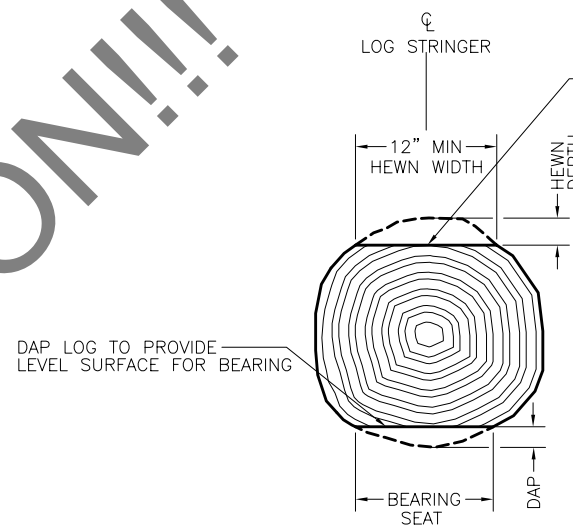


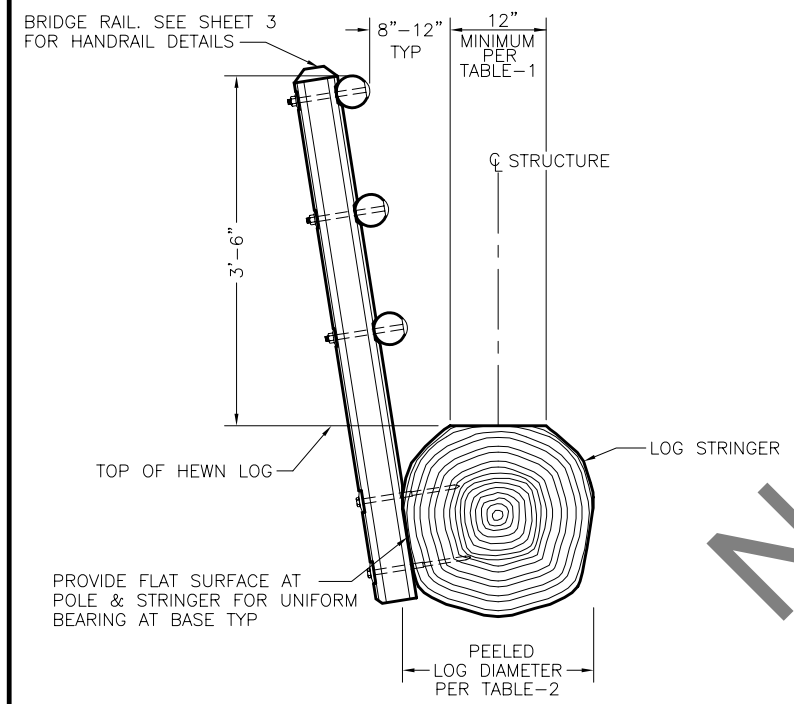
TABLE: 1

PEELED DIAMETER	HEWN DIMENSION DEPTH *	WIDTH
16"	3"	12"
17"	3"	13"
18"	3 1/2"	14"
19"	4"	15"
20"	4"	16"
21"	4 1/2"	17"
22"	5"	18"
23"	5"	19"
24"	5"	20"

* DO NOT EXCEED HEWN DEPTH SHOWN FOR STRINGER DIAMETER.

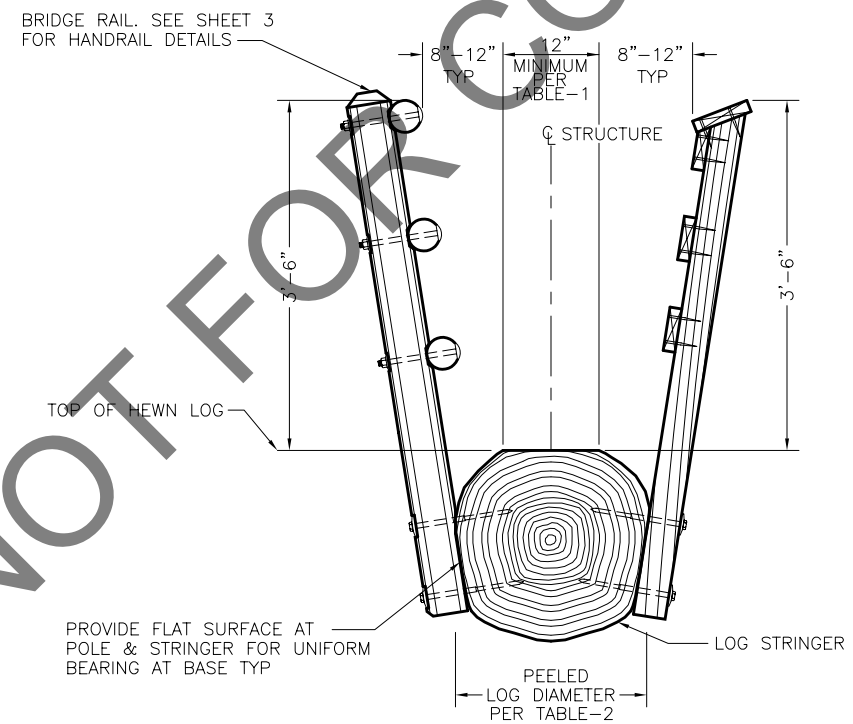
LOG STRINGER DAPPING

RS820C2
SCALE: 1" = 1'–0"
MAXIMUM DEPTH OF DAP AT BEARING SHALL NOT EXCEED 10% OF LOG DIAMETER OR 2"



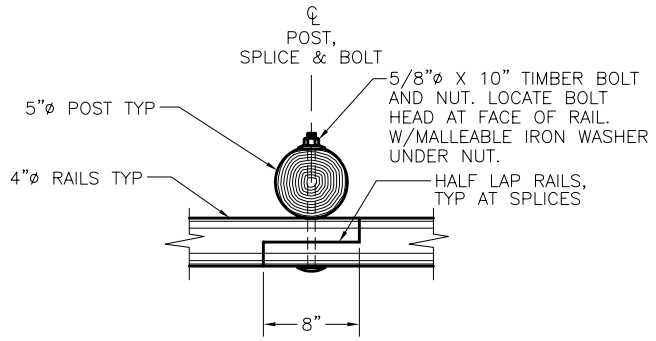
DECK SECTION W/POLE HANDRAIL ONE SIDE

RA820E2
SCALE: 1" = 1'–0"



DECK SECTION W/HANDRAILS EACH SIDE

RA820D2
SCALE: 1" = 1'–0"



PLAN–POLE RAIL SPLICE DETAIL

RA820B2
SCALE: 1–1/2" = 1'–0"
NOTE: SPLICE RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO POST SPACES. ALTERNATE RAIL SPLICES AT POSTS.

APPROVED:

_____ DATE _____

FOREST ENGINEER

DWG NO.

–REDUCED–
DO NOT SCALE DRAWING

REV.	DESCRIPTION	APPROVED	DATE
1	REVISED TO R–6 STRUCTURES CAD STANDARDS	MOE	3/24/05

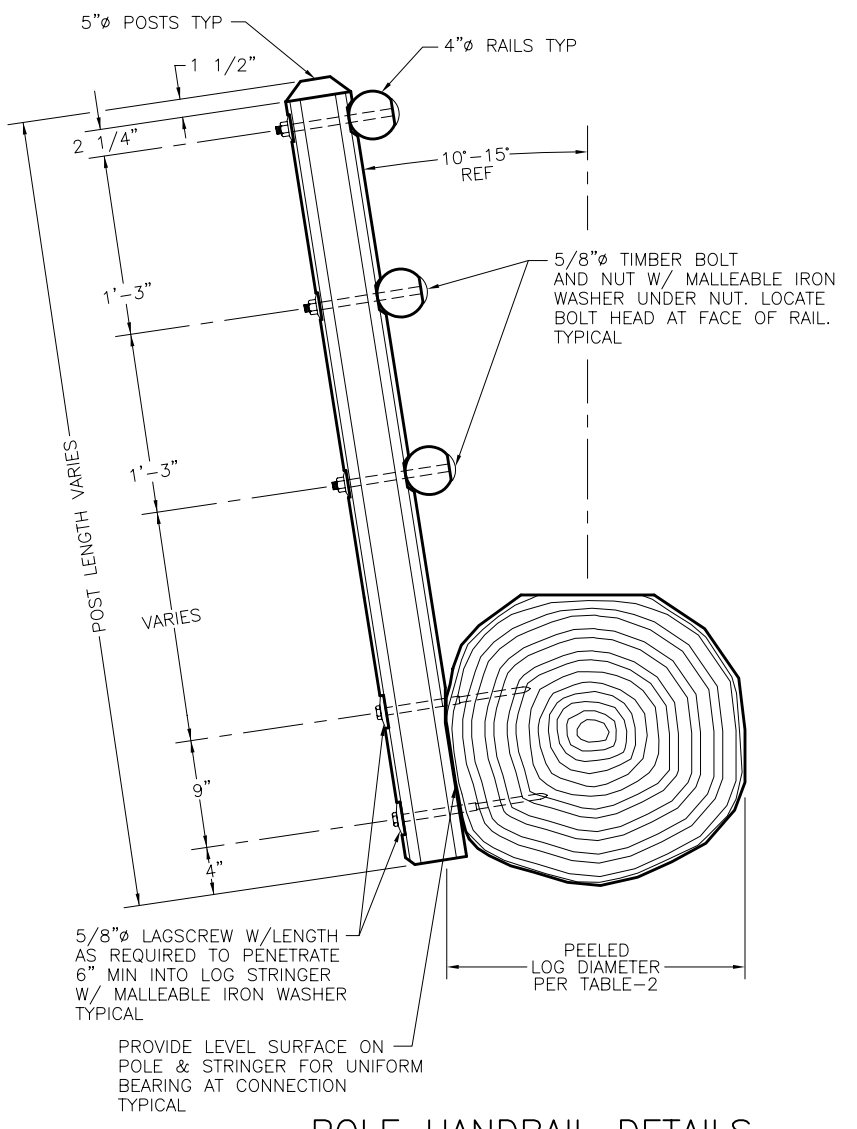
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
THE PACIFIC NORTHWEST REGION (R–6)

SINGLE LOG STRINGER 10 FT – 45 FT LONG TRAIL BRIDGE

Forest: **Loading:**
Bridge No.: **Length:**
Location: **Width:**

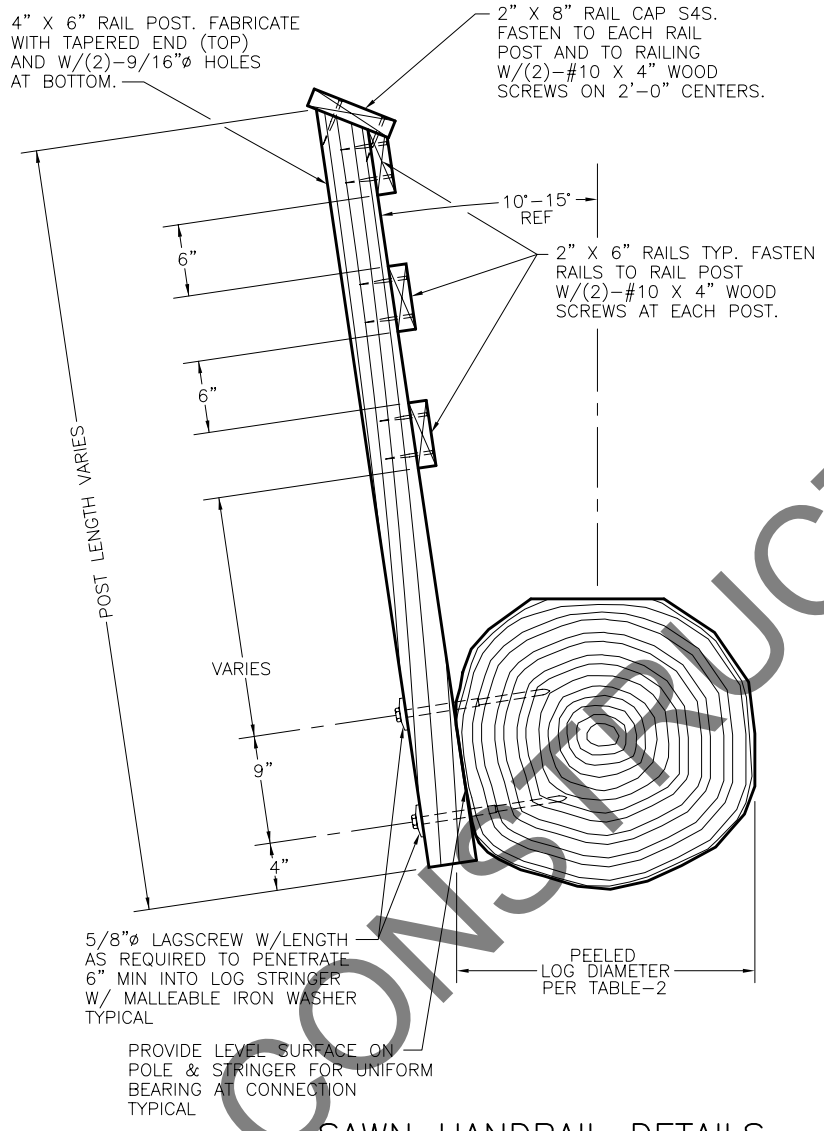
Designed: **Drawn:** **Checked:**

Approved: /S/ MERVIN O. ERIKSSON **Date:** 03/01/2004
REGIONAL BRIDGE ENGINEER



POLE HANDRAIL DETAILS

RA820A3
SCALE: 1 1/2" = 1'–0"



SAWN HANDRAIL DETAILS

RA820B3
SCALE: 1 1/2" = 1'–0"

TABLE–2: SINGLE ROUND LOG STRINGER PEELED MID SPAN DIAMETER REQUIREMENTS

STRINGER SPAN (FEET)	TIMBER SPECIES – DOUGLAS FIR (COASTAL OR INTERIOR NORTH) AND WESTERN LARCH				
	DESIGN LOADING IN POUNDS PER SQUARE FOOT				
	PEDESTRIAN LOAD		GROUND SNOW LOAD		
	65	85	120	150	200
10	16"	16"	16"	16"	16"
15	16"	16"	16"	16"	16"
20	16"	16"	16"	16"	16"
25	16"	16"	16"	16"	17"
30	16"	17"	16"	17"	18"
35	18"	19"	17"	18"	20"
40	20"	21"	19"	20"	23"
45	21"	23"	21"	22"	24"

RA820D3

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GENERAL NOTES:

SPECIFICATIONS: MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE CURRENT ADOPTED USDA FOREST SERVICE SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES, AS MODIFIED FOR THIS CONTRACT.

LOG MEMBERS: LOGS USED FOR STRINGERS SHALL BE ONE OF THE SPICES LISTED IN TABLE 1.1 WITH MINIMUM, PEELED, MID–SPAN LOG DIAMETERS AS NOTED FOR THE VARIOUS SPANS AND DESIGN LOADING. NATIVE TREES TO BE USED FOR BRIDGE STRINGERS SHALL BE STRAIGHT, SOUND, AND FREE OF DEFECTS AND ROT. STRINGERS SHALL BE CHOSEN FROM TREES WITH RELATIVELY FEW LIMBS, AND HAVE NO KNOT GREATER THAN 3" IN DIAMETER. LOGS SHALL BE DAPPED AT ENDS TO CREATE A LEVEL BEARING SURFACE AT SUPPORTS TAKING CARE TO AVOID OVERCUTTING. DAP UPPER SURFACE OF LOGS TO PROVIDE A LEVEL BEARING SURFACE FOR DECK PLANKS. REFER TO PLANS FOR DAPPING 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 ROUGH SAWN No.1 GRADE, GRADING RULES AGENCY – WWPA, WCLIB
BRIDGE RAILS & POSTS (SEE PROJECT CRITERIA)	
SAWN – UNTREATED	– REDWOOD, S4S, No.1 GRADE GRADING RULES AGENCY – RIS
	– WESTERN RED CEDAR, S4S, SELECT STRUCTURAL GRADE GRADING RULES AGENCY – WWPA, WCLIB
SAWN – TREATED	– HEM–FIR/DOUGLAS FIR, S4S, No.1 GRADE GRADING RULES AGENCY – WWPA, WCLIB
POLES	– LODGE POLE PINE, PEELED AND DRIED. GRADING RULES AGENCY – NLGA

TREATMENT: SEE PROJECT CRITERIA FOR MEMBERS IDENTIFIED TO BE TREATED AND FOR TREATMENT TYPE. PRESERVATIVE TREATMENT SHALL BE IN ACCORDANCE WITH THE CURRENT AWPA SPECIFICATIONS USING THE TREATMENT MATERIALS LISTED BELOW. TREATMENT WILL COMPLY WITH THE REQUIREMENTS OF THE CURRENT EDITION OF WWPI'S "BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS".

LOG STRINGERS, POSTS AND POLES	– AWPA C4 – PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT) – COPPER NAPHTHENATE IN HEAVY OIL (TYPE A SOLVENT)
SOLID SAWN LUMBER	– AWPA C2 (ABOVE GROUND USE) – PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT) – COPPER NAPHTHENATE IN HEAVY OIL (TYPE A SOLVENT)
SOLID SAWN LUMBER AND POLES USED FOR BRIDGE RAILS AND POSTS	– AWPA C2 (ABOVE GROUND USE) – PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT) – COPPER NAPHTHENATE IN HEAVY OIL (TYPE A SOLVENT) – OXINE COPPER IN LIGHT OIL (TYPE C SOLVENT) – ACZA, ACQ

FIELD TREATMENT: COPPER NAPHTHENATE (2% SOLUTION) SHALL BE FURNISHED FOR FIELD TREATING OF WOOD. ALL ABRASIONS AND FIELD CUTS –APPROVED BY THE C.O.R.– 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 POURED FULL OF 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 FINISH. GALVANIZED OR UNFINISHED HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 36, WITH NUTS AND BOLTS CONFORMING TO ASTM A307, GRADE A. WEATHERING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 50W, WITH BOLTS AND NUTS CONFORMING TO ASTM A325, TYPE 3. USE MALLEABLE IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.

RA820C3

–REDUCED–
DO NOT SCALE DRAWING

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1	REVISED TO R–6 STRUCTURES CAD STANDARDS	MOE	3/24/05

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
THE PACIFIC NORTHWEST REGION (R–6)

SINGLE LOG STRINGER
10 FT – 45 FT LONG
TRAIL BRIDGE

Forest: **Loading:**
Bridge No.: **Length:**
Location: **Width:**

Designed: **Drawn:** **Checked:**

Approved: /S/ MERVIN O. ERIKSSON **Date:** 03/01/2004
REGIONAL BRIDGE ENGINEER

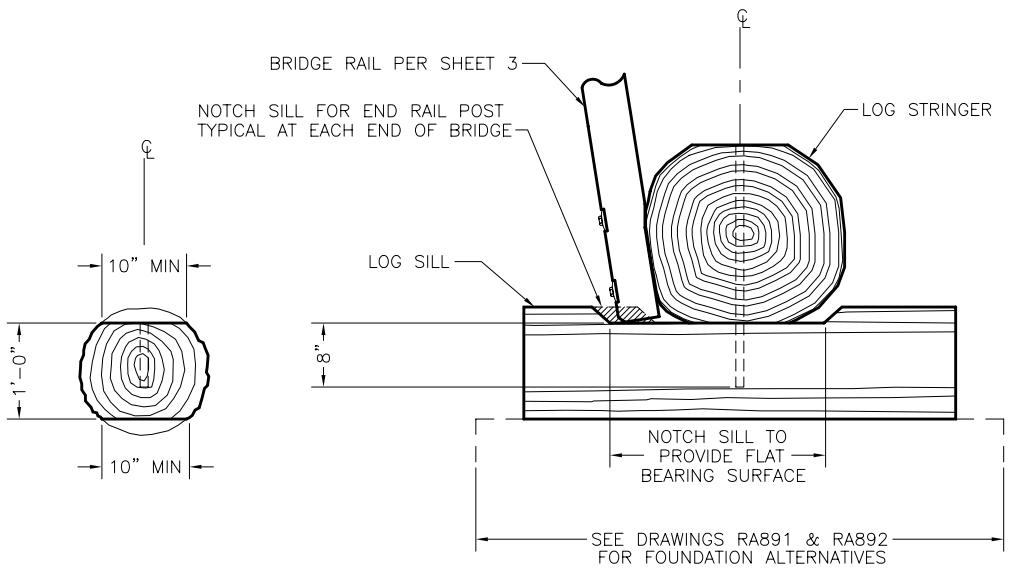
APPROVED:

_____ DATE _____

FOREST ENGINEER

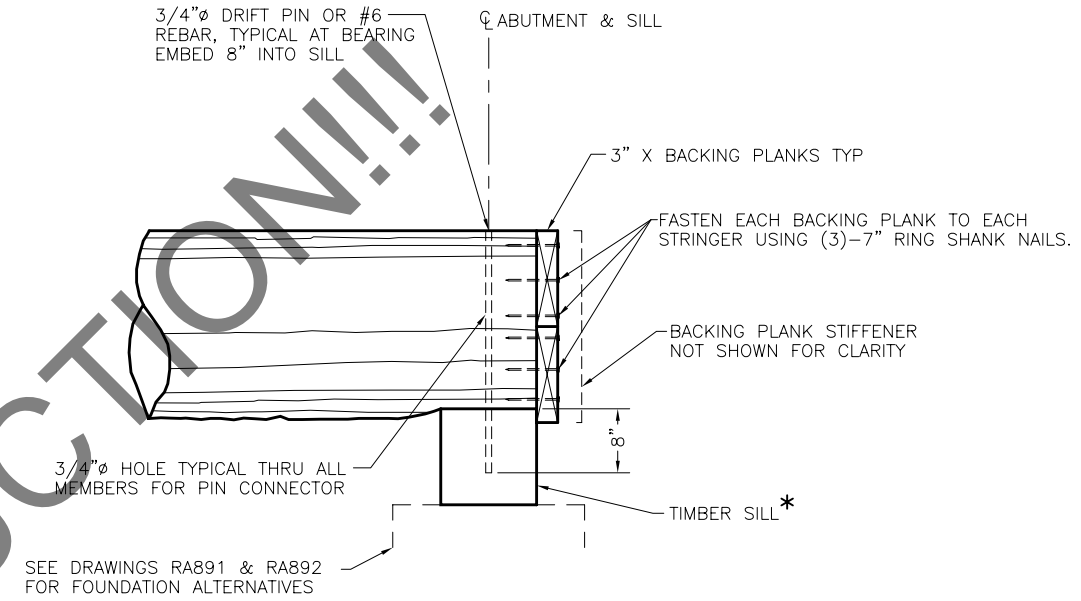
DWG NO.

SHEET 3 of 4 **DESIGN AID RA820**



LOG SILL NOTCHING DETAIL

SCALE: 1" = 1'-0"
RA820A4



* 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, OR LOG SILL. SEE LOG SILL NOTCHING DETAIL

ABUTMENT CONNECTION DETAIL

SCALE: 1" = 1'-0"
RA820B4

NOTES:

SPECIFICATIONS: MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE CURRENT ADOPTED USDA FOREST SERVICE SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES, AS MODIFIED FOR THIS CONTRACT.

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 BOLT INSTALLATION: PREBORE LAG BOLT 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 70% OF THE BOLT DIAMETER AS SHOWN ON THE PLANS AND IS TO BE BORED AT LEAST TO THE LENGTH OF THE THREADS. DO NOT DRIVE LAG BOLTS WITH A HAMMER.

-REDUCED-
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U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
THE PACIFIC NORTHWEST REGION (R-6)

SINGLE LOG STRINGER
10 FT - 45 FT LONG
TRAIL BRIDGE

Forest: **Loading:**
Bridge No.: **Length:**
Location: **Width:**

Designed: **Drawn:** **Checked:**

Approved: /S/ MERVIN O. ERIKSSON **Date:** 03/01/2004
REGIONAL BRIDGE ENGINEER

APPROVED:

_____ DATE _____
FOREST ENGINEER

DWG NO.

SHEET 4 of 4 | **DESIGN AID RA820**