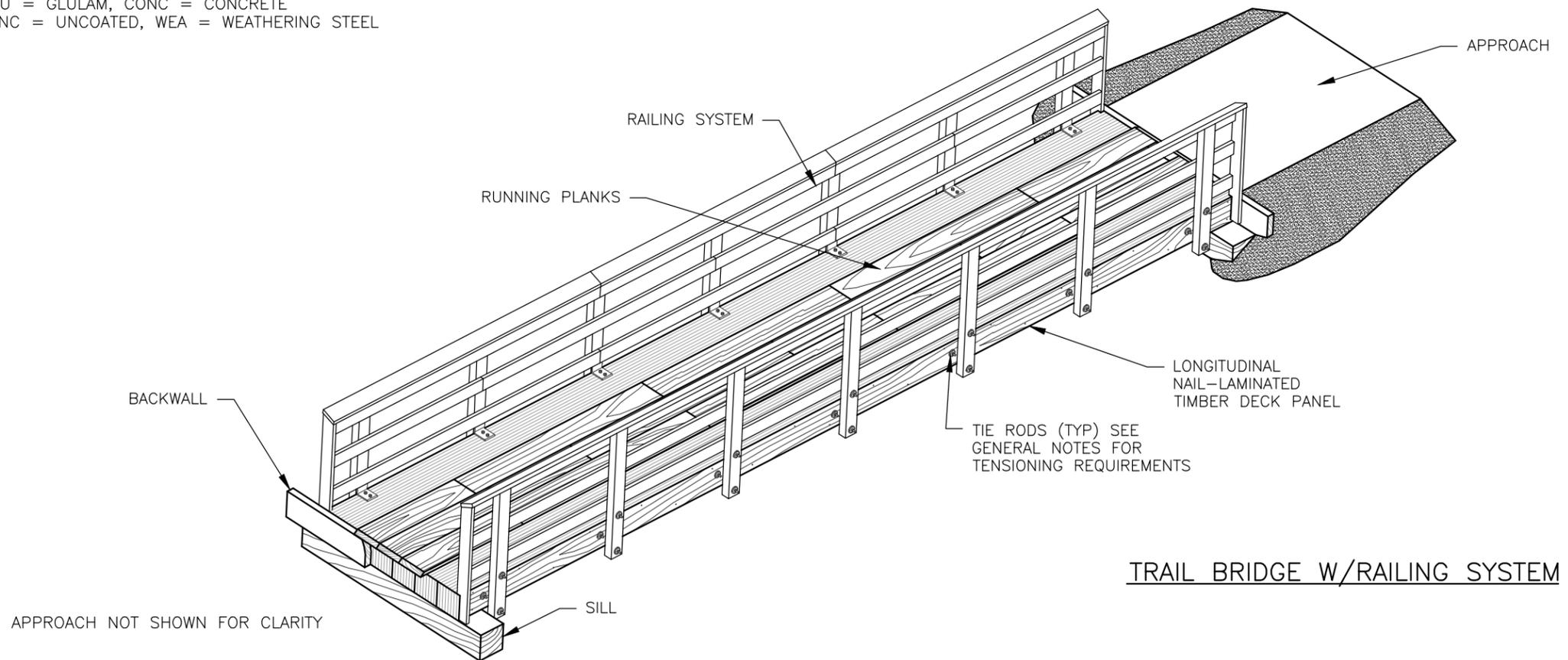


STRUCTURE NUMBER	TRAIL NO.	BRIDGE LOCATION	BRIDGE LENGTH OUT-TO-OUT	DECK PANEL SPAN C-C BRNG	BRIDGE CLEAR WIDTH	PEDESTRIAN LOAD	GROUND SNOW LOAD	DECK PANNELS				BACKWALL					COMMENTS	
								SPECIES	NUMBER	MATERIAL SIZE	TREATMENT	TYPE	SPECIES	SIZE	WIDTH	HEIGHT		TREATMENT

NA = NOT APPLICABLE

STRUCTURE NUMBER	RAILING SYSTEM/CURB						RUNNING PLANK					SILL			APPROACHES					HARDWARE		
	SPECIES	TYPE	HEIGHT	MATERIAL TYPE	TREATMENT		SPECIES	SIZE	WIDTH	TREATMENT		TYPE	SIZE	TREATMENT	LENGTH		WIDTH	MATERIAL TYPE	MATERIAL DEPTH	GEO- SYNTHETIC TYPE	COATINGS	
					YES	NO				YES	NO				NEAR	FAR						

ABUTMENT MATERIAL TYPE: SS = SOLID SAWN, GLU = GLULAM, CONC = CONCRETE
HARDWARE COATING TYPE: GALV = GALVANIZED, UNC = UNCOATED, WEA = WEATHERING STEEL



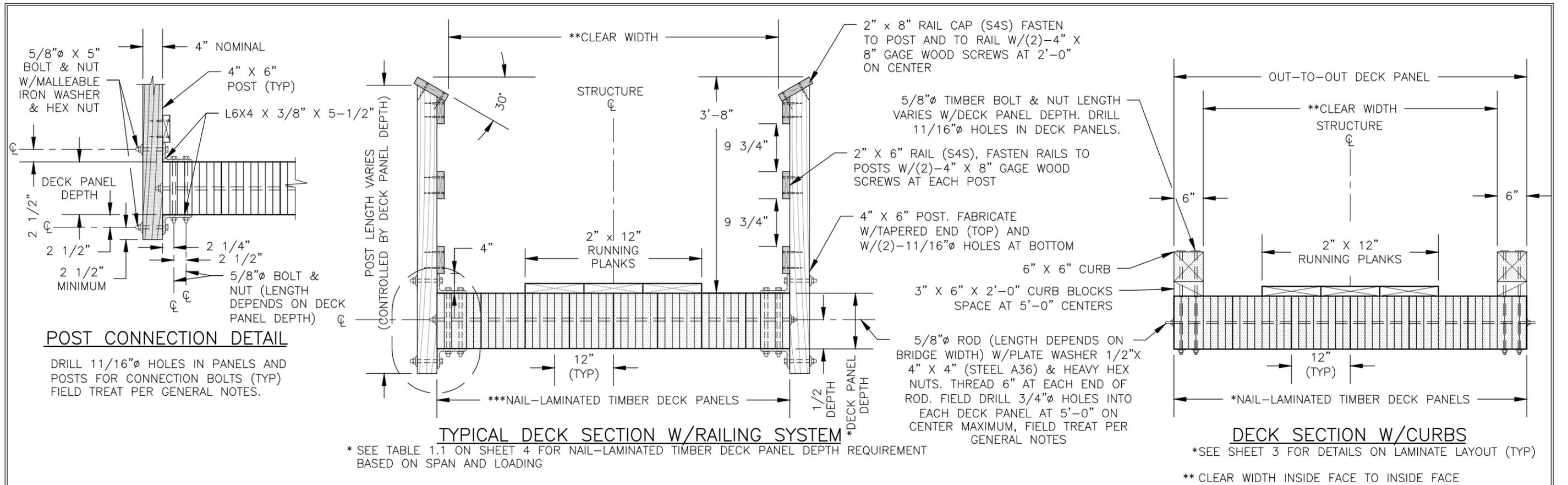
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE**
SECTION **962 - SAWN TIMBER TRAIL BRIDGE** TYPICAL ID **LNL**

REVISION DATE
NOT TO SCALE

DRAWING NO. **STD_962-20-01**
SHEET OF



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 (FP-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.

LAMINATIONS

- COASTAL REGION DOUGLAS FIR - LARCH OR HEM - FIR SURFACED S4S, NO. 1 GRADE GRADING RULES AGENCY - WWPA, WCLIB

CURB MEMBERS, SILLS, AND BACKING PLANKS RUNNING PLANKS

- COASTAL REGION DOUGLAS FIR-LARCH ROUGH SAWN NO.1 GRADE, GRADING RULES AGENCY - WWPA, WCLIB
- COASTAL REGION DOUGLAS FIR-LARCH ROUGH SAWN NO.2 GRADE, GRADING RULES AGENCY - WWPA, WCLIB

RAILS & POSTS (SEE PROJECT CRITERIA)

UNTREATED

- REDWOOD, S4S, NO.1 GRADE GRADING RULES AGENCY - RIS
- WESTERN RED CEDAR, S4S, SELECT STRUCTURAL GRADE GRADING RULES AGENCY - WWPA, WCLIB

TREATED

- HEM-FIR/DOUGLAS FIR, S4S, NO.1 GRADE GRADING RULES AGENCY - WWPA, WCLIB

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".

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

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

LAMINATIONS, RUNNING PLANKS, & RAILING SYSTEM, IF TREATED

- AWPA USE CATEGORY SYSTEM (U1) FOR USE CATEGORY 3B ABOVE GROUND-EXPOSED (UC3B)
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHENATE (CuN) IN LIGHT OIL (TYPE C SOLVENT)

SILLS, BACKING PLANKS, CRIBS, TIMBER WALLS, IF TREATED

- AWPA USE CATEGORY SYSTEM (U1) FOR USE CATEGORY 4B GROUND CONTACT-HEAVY DUTY (UC4B)
- PENTACHLOROPHENOL IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHENATE (CuN) IN HEAVY OIL (TYPE A SOLVENT)

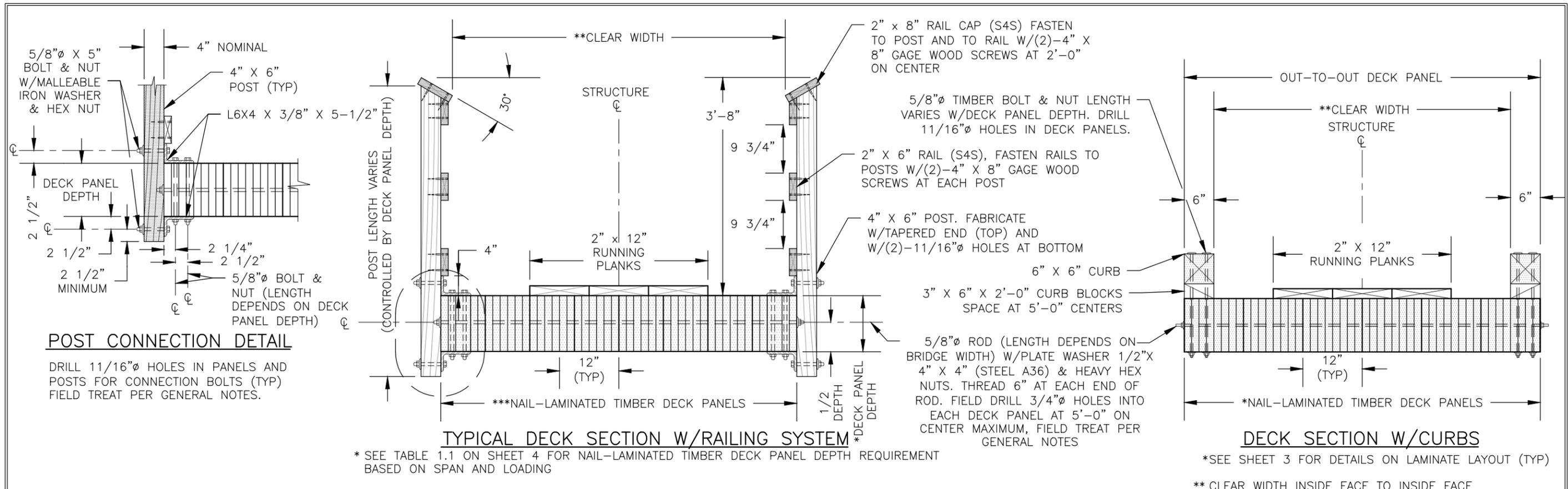
FIELD TREATMENT: COPPER NAPHTHENATE (2% SOLUTION) SHALL BE FURNISHED FOR FIELD TREATING OF WOOD. ALL ABRASIONS AND FIELD CUTS -APPROVED BY THE C.O.- SHALL BE CAREFULLY TRIMMED AND GIVEN THREE BRUSH COATS OF THE FIELD TREATMENT SOLUTION. WHERE APPROVED FIELD DRILLING OF BOLT OR NAIL HOLES IS REQUIRED, THE HOLES SHALL BE FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.

HARDWARE AND STRUCTURAL STEEL: SEE PROJECT 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.

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 BORED TIMBER. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THESE PLANS.

TIE ROD TENSIONING: TIE RODS SHALL BE TORQUED TO 200 FT-LBS UPON INITIAL INSTALLATION OF THE DECK PANELS. TIE RODS 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.



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 (FP-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.

LAMINATIONS

- SOUTHERN PINE, SURFACED S4S, NO.1 GRADE GRADING RULES AGENCY - SPIB

CURB MEMBERS, SILLS, AND BACKING PLANKS RUNNING PLANKS

- SOUTHERN PINE ROUGH SAWN NO.2 GRADE, GRADING RULES AGENCY - SPIB

RAILS & POSTS (SEE PROJECT CRITERIA)

UNTREATED

- BALDCYPRESS, S4S, NO.1 GRADE GRADING RULES AGENCY - SPIB
 - WHITE OAK, S4S, SELECT STRUCTURAL GRADE GRADING RULES AGENCY - NELMA

TREATED

- SOUTHERN PINE, S4S, NO.1 GRADE GRADING RULES AGENCY - SPIB

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".

LAMINATIONS, RUNNING PLANKS, & RAILING SYSTEM, IF TREATED

- AWPA USE CATEGORY SYSTEM (U1) FOR USE CATEGORY 3B ABOVE GROUND-EXPOSED (UC3B)
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)
- COPPER NAPHTHENATE (CuN) IN LIGHT OIL (TYPE C SOLVENT)

SILLS, BACKING PLANKS, CRIBS, TIMBER WALLS, IF TREATED

- AWPA USE CATEGORY SYSTEM (U1) FOR USE CATEGORY 4B GROUND CONTACT-HEAVY DUTY (UC4B)
- PENTACHLOROPHENOL IN HEAVY OIL (TYPE A SOLVENT)
- COPPER NAPHTHENATE (CuN) IN HEAVY OIL (TYPE A SOLVENT)

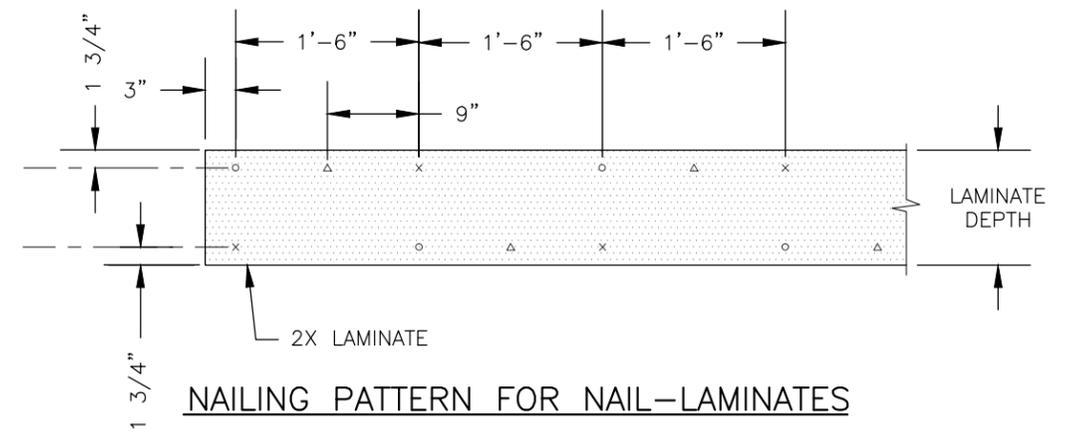
FIELD TREATMENT: COPPER NAPHTHENATE (2% SOLUTION) SHALL BE FURNISHED FOR FIELD TREATING OF WOOD. ALL ABRASIONS AND FIELD CUTS -APPROVED BY THE C.O.- SHALL BE CAREFULLY TRIMMED AND GIVEN THREE BRUSH COATS OF THE FIELD TREATMENT SOLUTION. WHERE APPROVED FIELD DRILLING OF BOLT OR NAIL HOLES IS REQUIRED, THE HOLES SHALL BE FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.

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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.

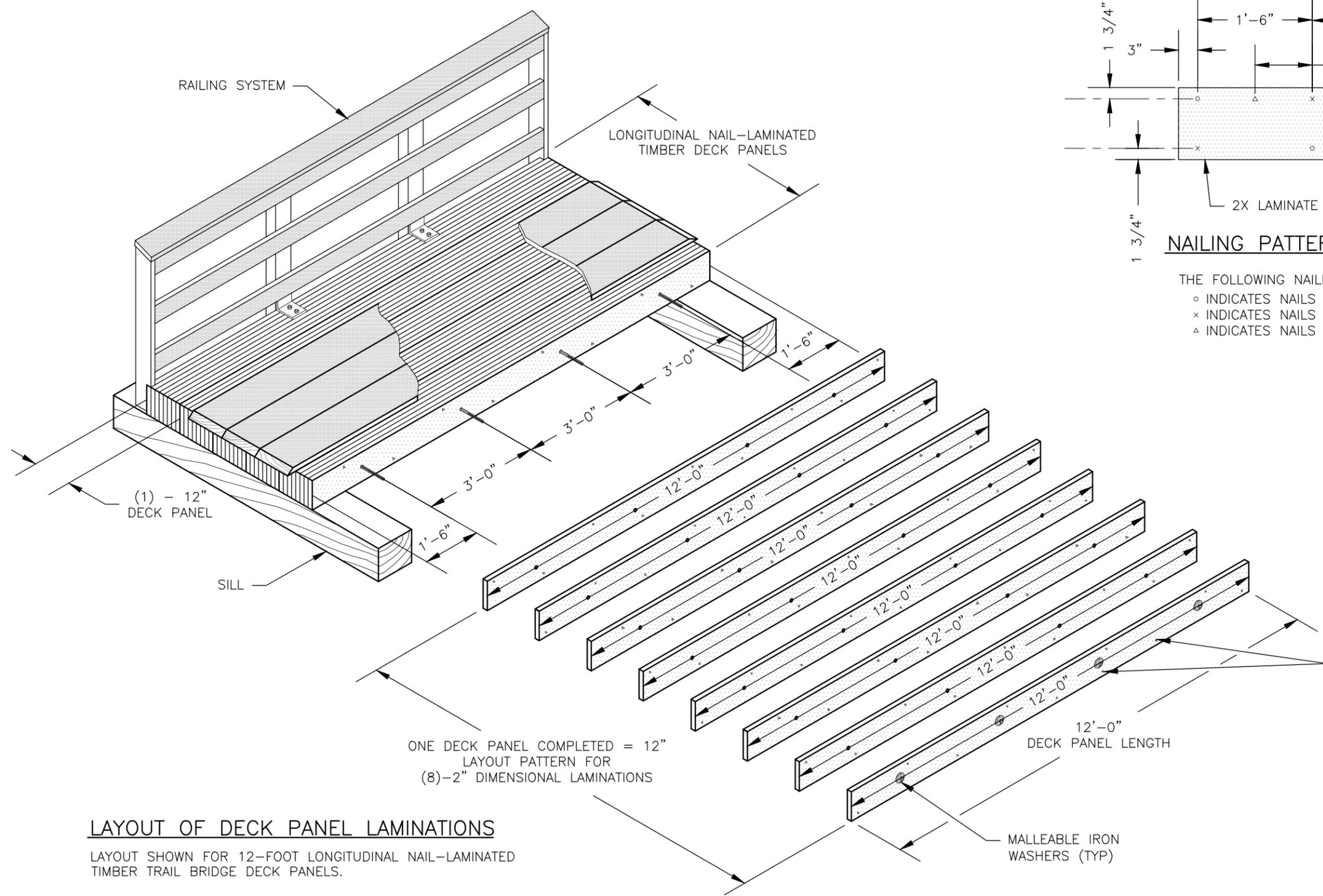
FABRICATION: SUBMIT SHOP DRAWINGS FOR ALL BRIDGE COMPONENTS (EXCEPT TIMBER RUNNING PLANKS). SHOW ALL DIMENSIONS AND FABRICATION DETAILS FOR ALL CUT OR BORED TIMBER. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THESE PLANS.

TIE ROD TENSIONING: TIE RODS SHALL BE TORQUED TO 200 FT-LBS UPON INITIAL INSTALLATION OF THE DECK PANELS. TIE RODS 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.



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 12-FOOT LONGITUDINAL NAIL-LAMINATED
 TIMBER TRAIL BRIDGE DECK PANELS.
 BUTT JOINTS NOT ALLOWED

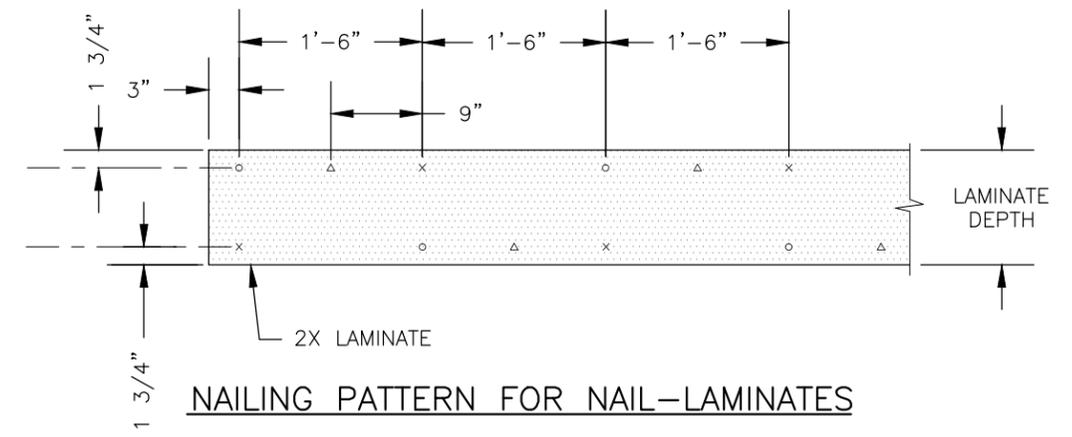
U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE**
 SECTION **962 - SAWN TIMBER TRAIL BRIDGE** TYPICAL ID **LNL**

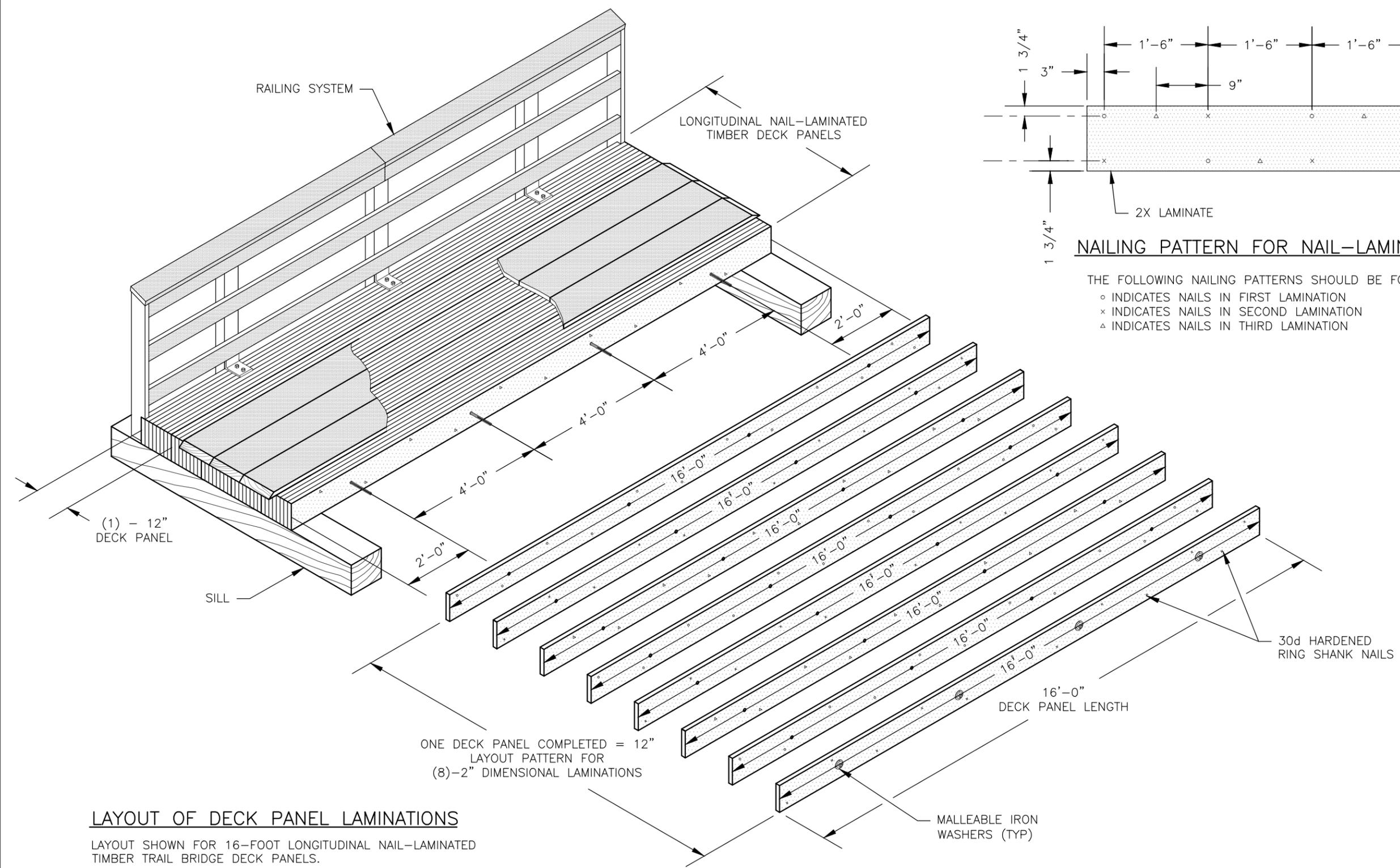
REVISION DATE
NOT TO SCALE

DRAWING NO. **STD_962-20-03a**
 SHEET OF



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

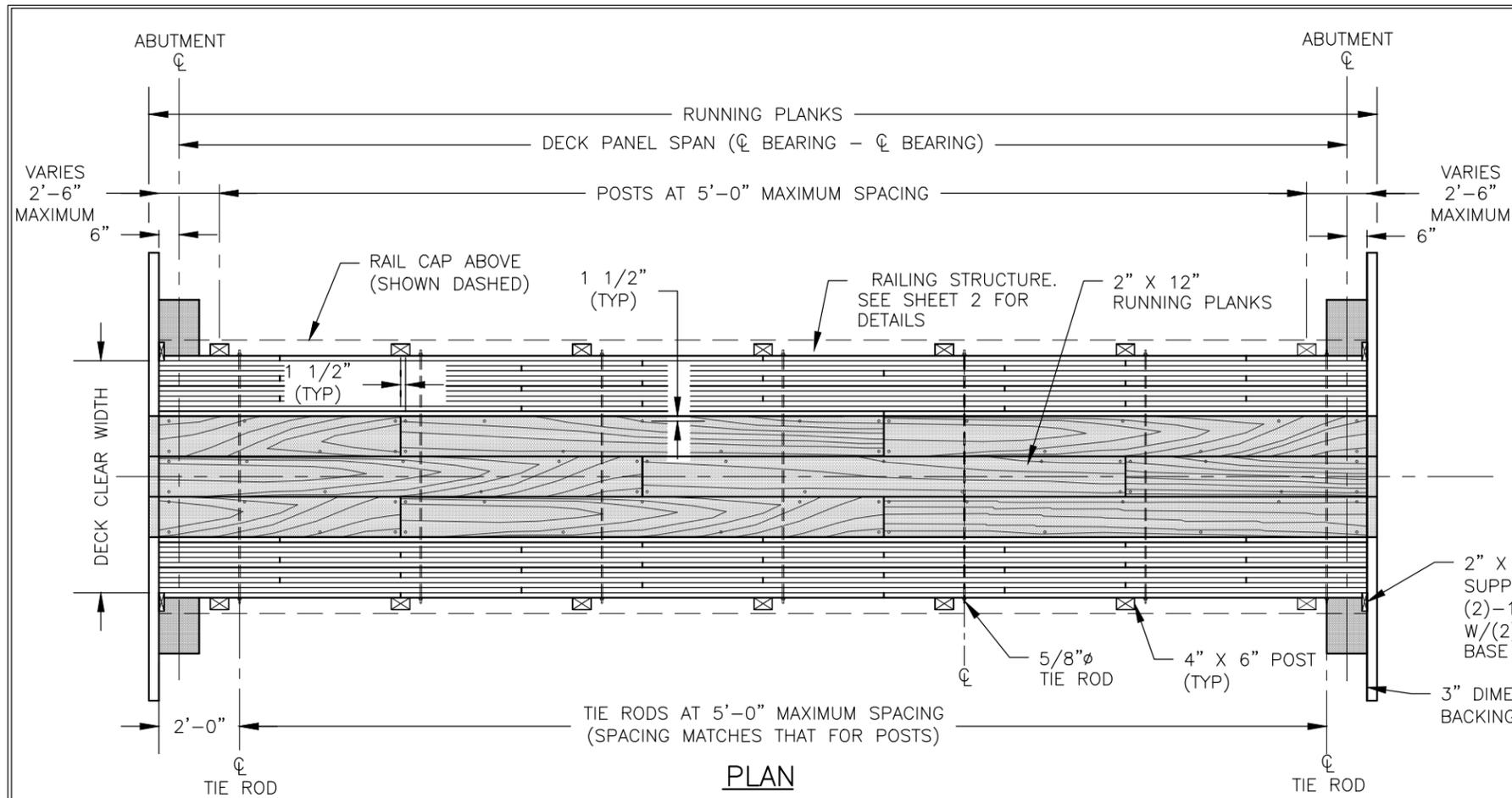
U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL NAIL-LAMINATED TIMBER TRAIL BRIDGE**
 SECTION **962 - SAWN TIMBER TRAIL BRIDGE**
 TYPICAL ID **LNL**

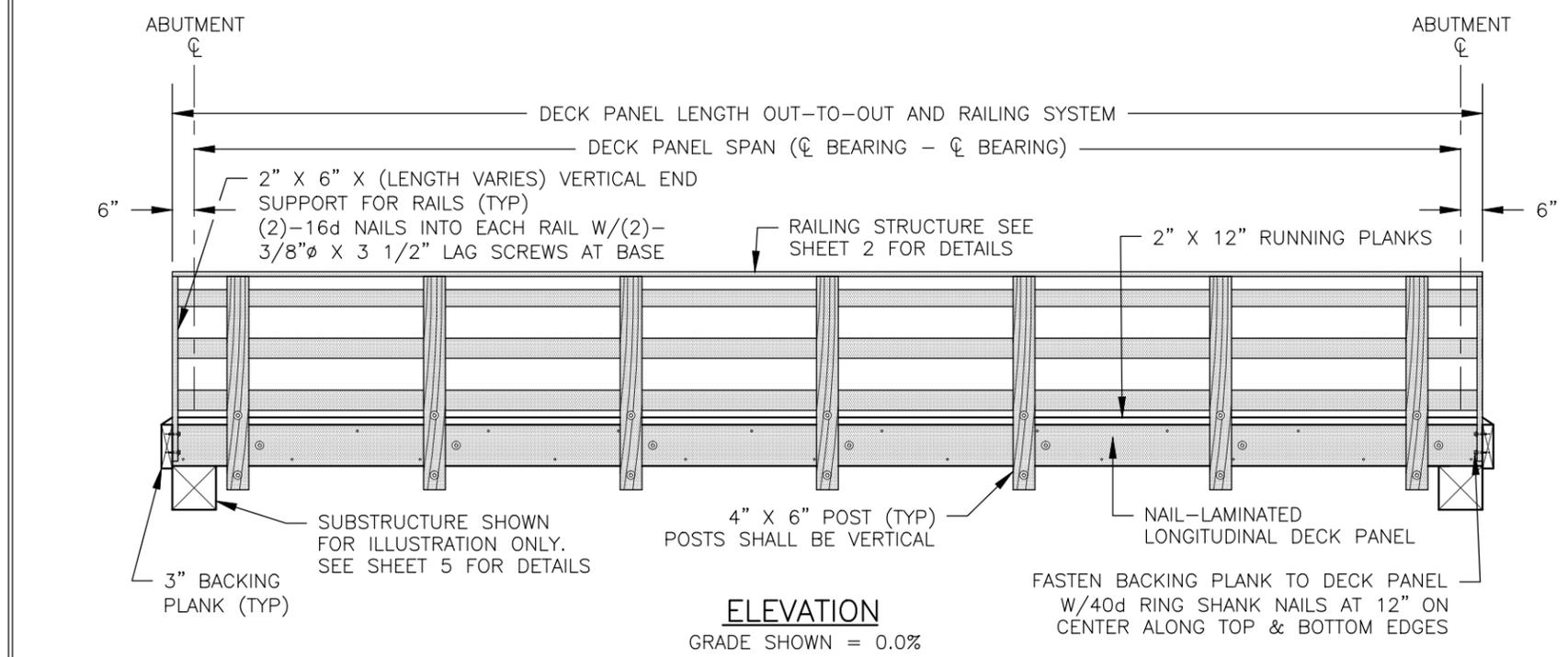
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DRAWING NO. **STD_962-20-03b**
 SHEET OF



NOTES:

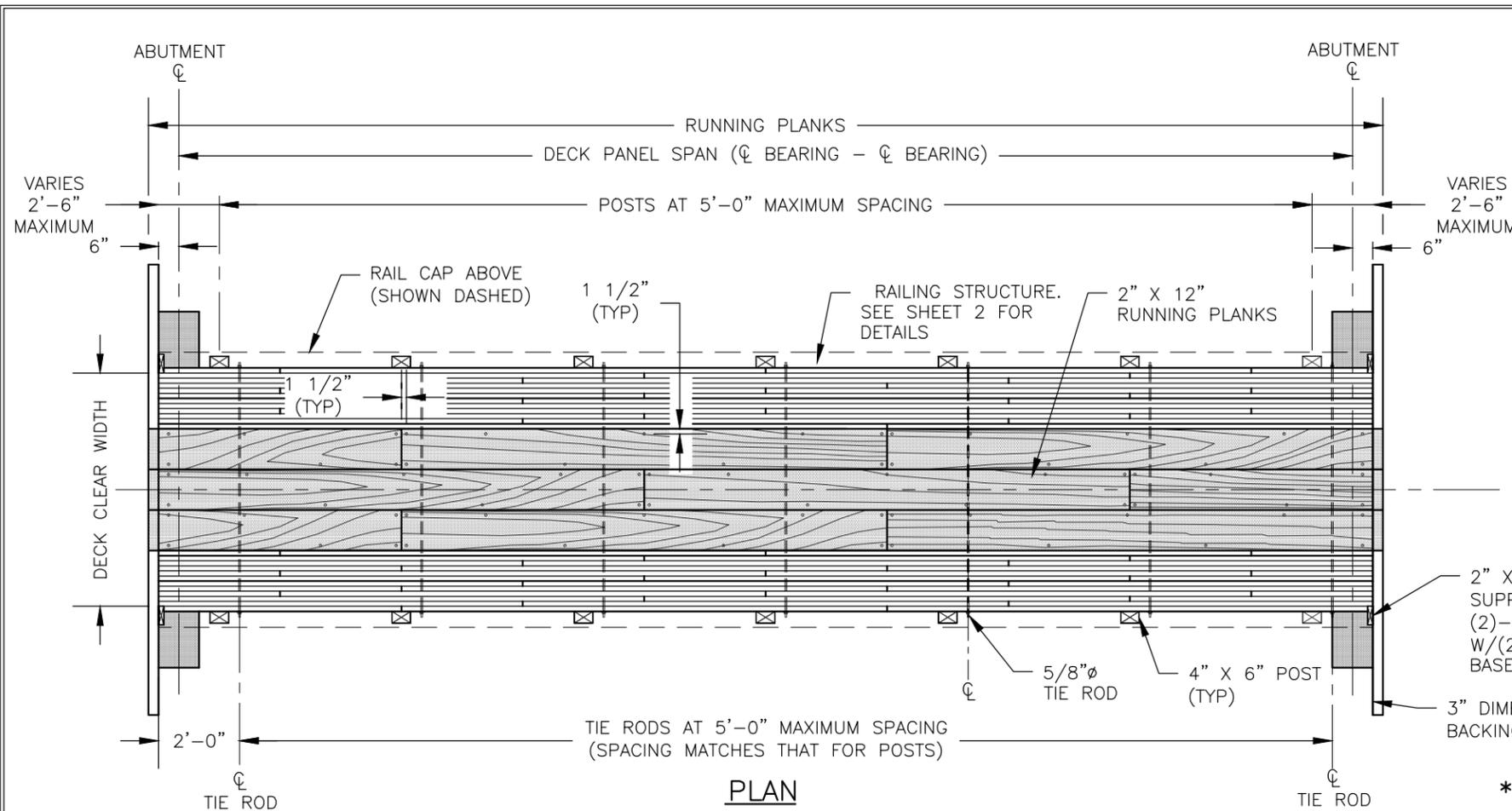
1. SPLICE RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO POST SPACES. ALTERNATE RAIL SPLICES AT POSTS. FASTEN RUNNING PLANKS TO DECK PANELS WITH 30d (4 1/2-INCH RING SHANK) NAILS AT 24-INCH SPACING. ALTERNATE SIDES WITH TWO AT EACH END.
2. ALL DEPTHS SHOWN IN TABLE-1.1 ARE NOMINAL. NAIL-LAMINATED DECK PANELS SHALL BE CONSTRUCTED USING S2S LUMBER.



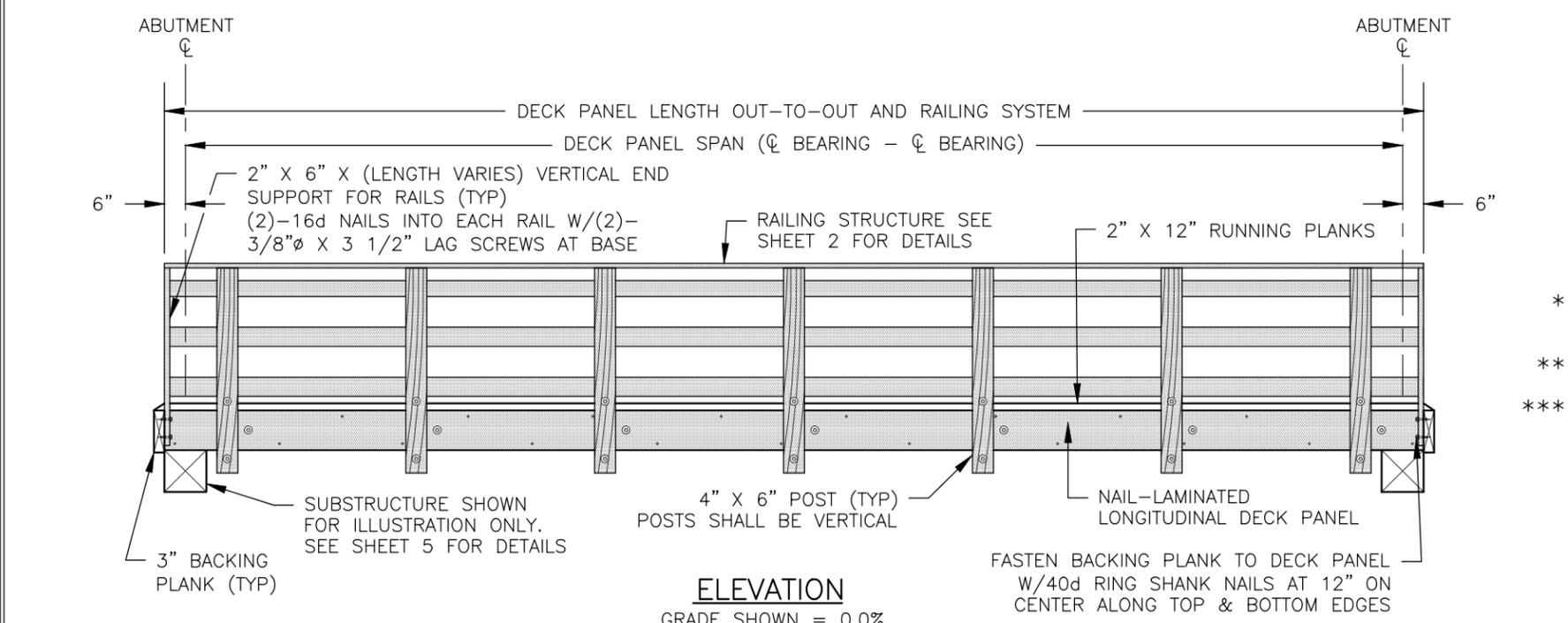
***TABLE-1.1: LAMINATION DEPTH REQUIREMENTS - LRFD**

**DECK PANEL LENGTH (FEET)	TIMBER SPECIES - DOUGLAS FIR/HEM-FIR GRADE - NO. 1				
	DESIGN LOADING IN POUNDS PER SQUARE FOOT				
	PEDESTRIAN LOAD ***65	90	120	150	200
12	6"	6"	6"	6"	6"
16	6"	6"	6"	6"	8"
20	8"	8"	8"	8"	10"

- *DECK PANEL SIZE 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



PLAN



ELEVATION

GRADE SHOWN = 0.0%

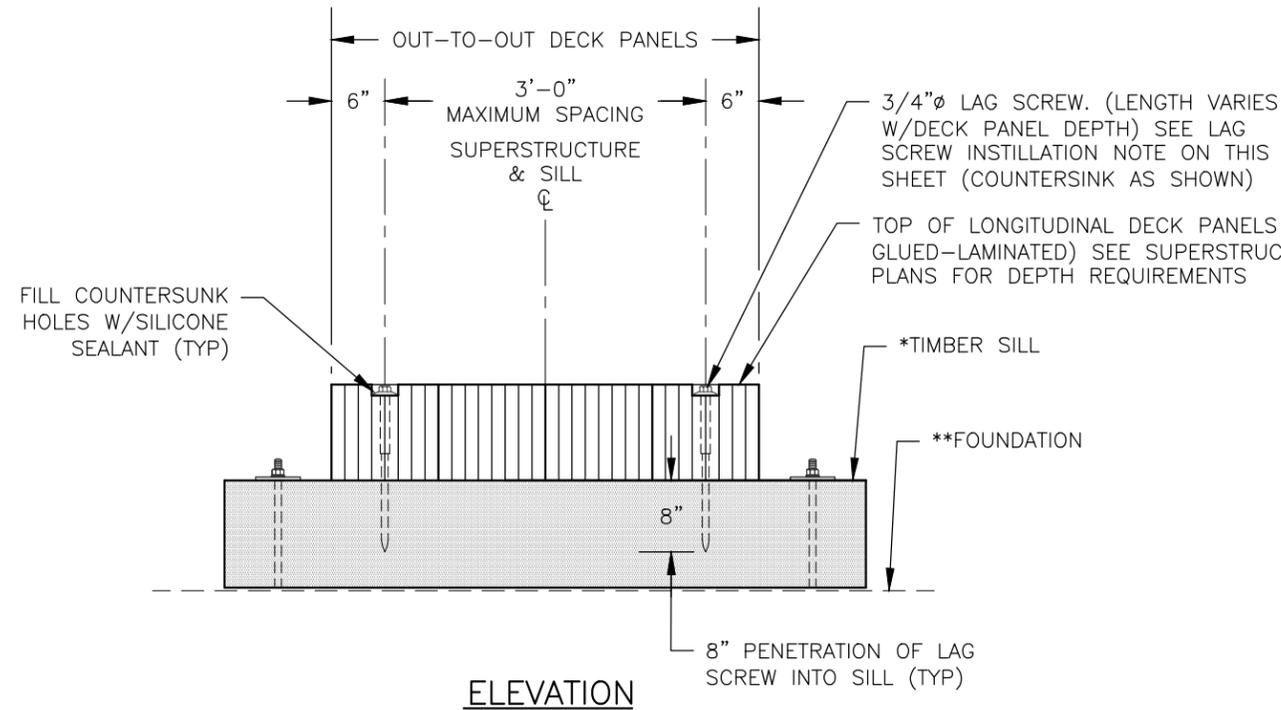
NOTES:

1. SPLICE RAILS AT POSTS. RAILS SHALL BE CONTINUOUS 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.
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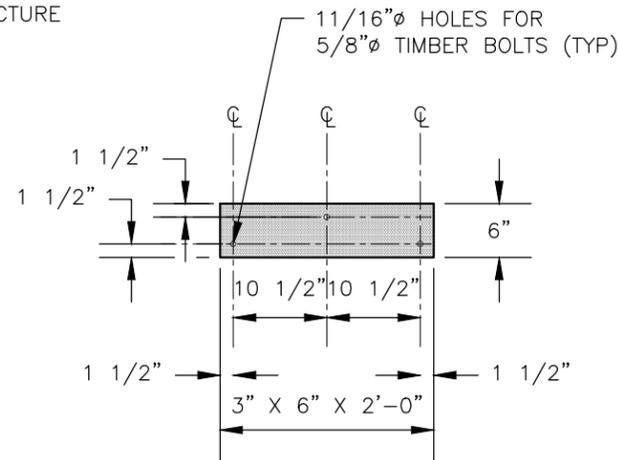
***TABLE-1.1: LAMINATION DEPTH REQUIREMENTS - LRFD**

**DECK PANEL LENGTH (FEET)	TIMBER SPECIES - SOUTHERN PINE GRADE - NO. 1				
	DESIGN LOADING IN POUNDS PER SQUARE FOOT				
	PEDESTRIAN LOAD ***65	90	120	150	200
12	6"	6"	6"	6"	6"
16	6"	6"	6"	6"	8"
20	8"	8"	8"	8"	10"

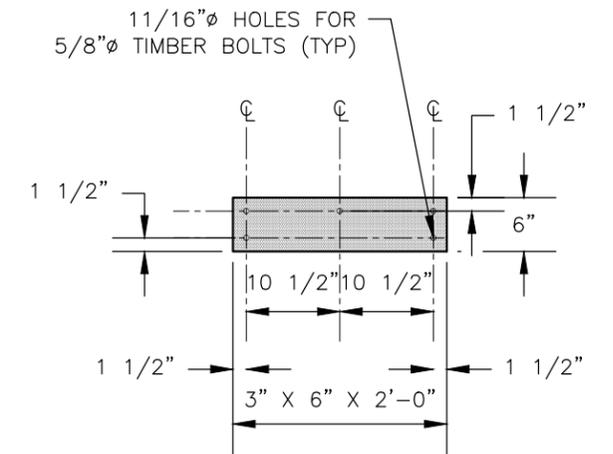
- *DECK PANEL SIZE SHALL BE THE LARGER OF THE PEDESTRIAN OR GROUND SHOW LOAD SIZE REQUIRED FOR THE SITE CONDITIONS
- **DECK PANEL LENGTH EQUAL TO DECK PANEL SPAN PLUS ONE FOOT
- ***REQUIRES REGIONAL BRIDGE ENGINEER APPROVAL



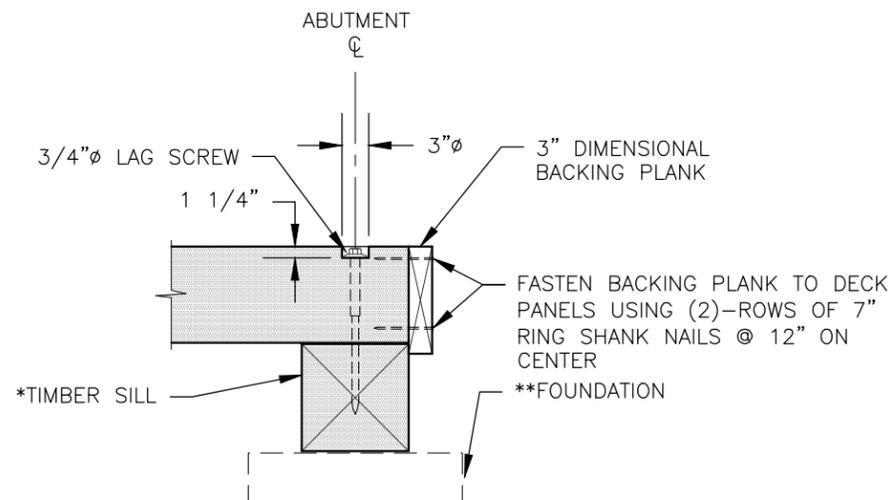
ELEVATION



PLAN-CURB BLOCK



PLAN-CURB BLOCK AT SPLICE



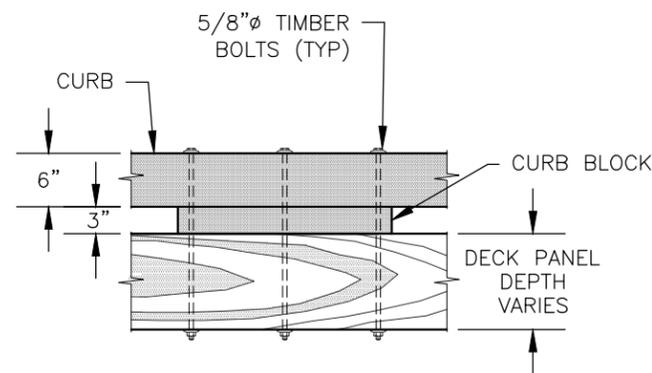
TYPICAL SECTION

ABUTMENT CONNECTION DETAILS

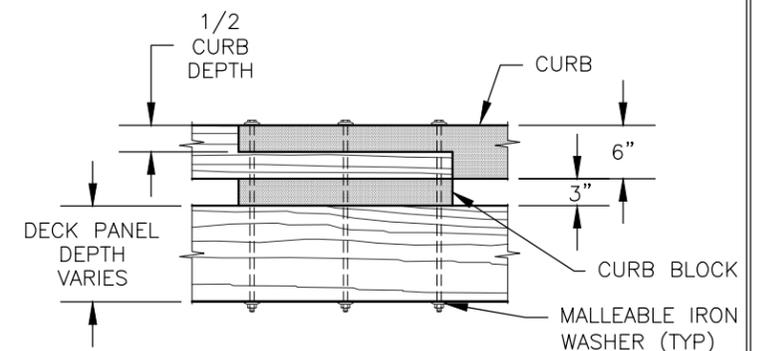
BACKING PLANKS NOT SHOWN FOR CLARITY

* 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



ELEVATION TYPICAL CONNECTION



ELEVATION CONNECTION AT SPLICE

SOLID SAWN CURB CONNECTION DETAILS