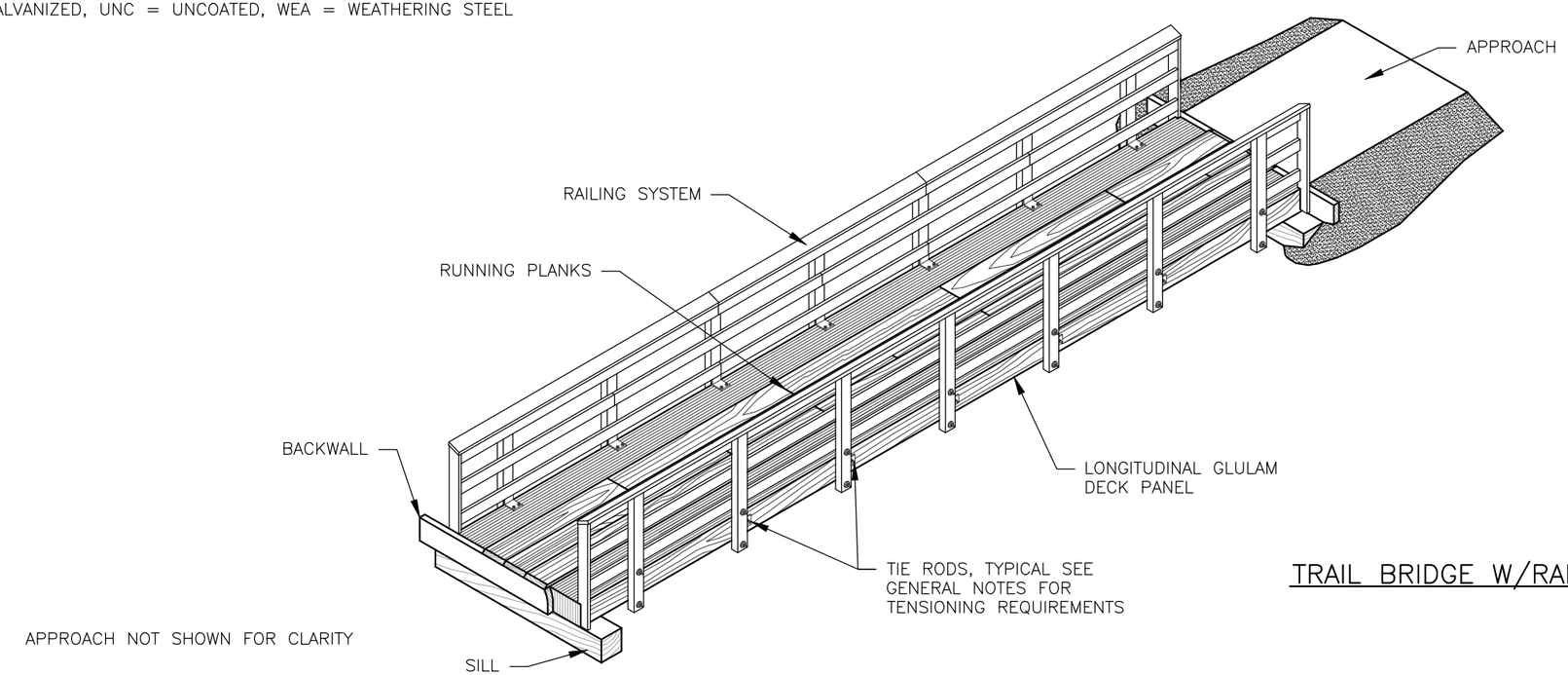
STRUCTURE NUMBER	TRAIL NO.	BRIDGE LOCATION	BRIDGE LENGTH OUT–TO–OUT	DECK PANEL SPAN ℄–℄ BRNG	BRIDGE CLEAR WIDTH	PEDESTRIAN LOAD	GROUND SNOW LOAD	PANELS				BACKWALL					
								IDENTIFICATION NUMBER	SPECIES	MATERIAL SIZE	TREATMENT	TYPE	SPECIES	SIZE	WIDTH	DEPTH	TREATMENT

NA = NOT APPLICABLE

STRUCTURE NUMBER	RAILING SYSTEM/CURB					RUNNING PLANK					SILL			APPROACHES						HARDWARE	
	SPECIES	TYPE	HEIGHT	TREATMENT		SPECIES	SIZE	WIDTH	TREATMENT		TYPE	SIZE	TREATMENT	LENGTH		WIDTH	MATERIAL TYPE	MATERIAL DEPTH	GEO–SYNTHETIC TYPE	COATING	COMMENTS
				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



TRAIL BRIDGE W/RAILING SYSTEM

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

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL GLULAM DECK PANEL TRAIL BRIDGE**

SECTION **963 - GLULAM TRAIL BRIDGE**

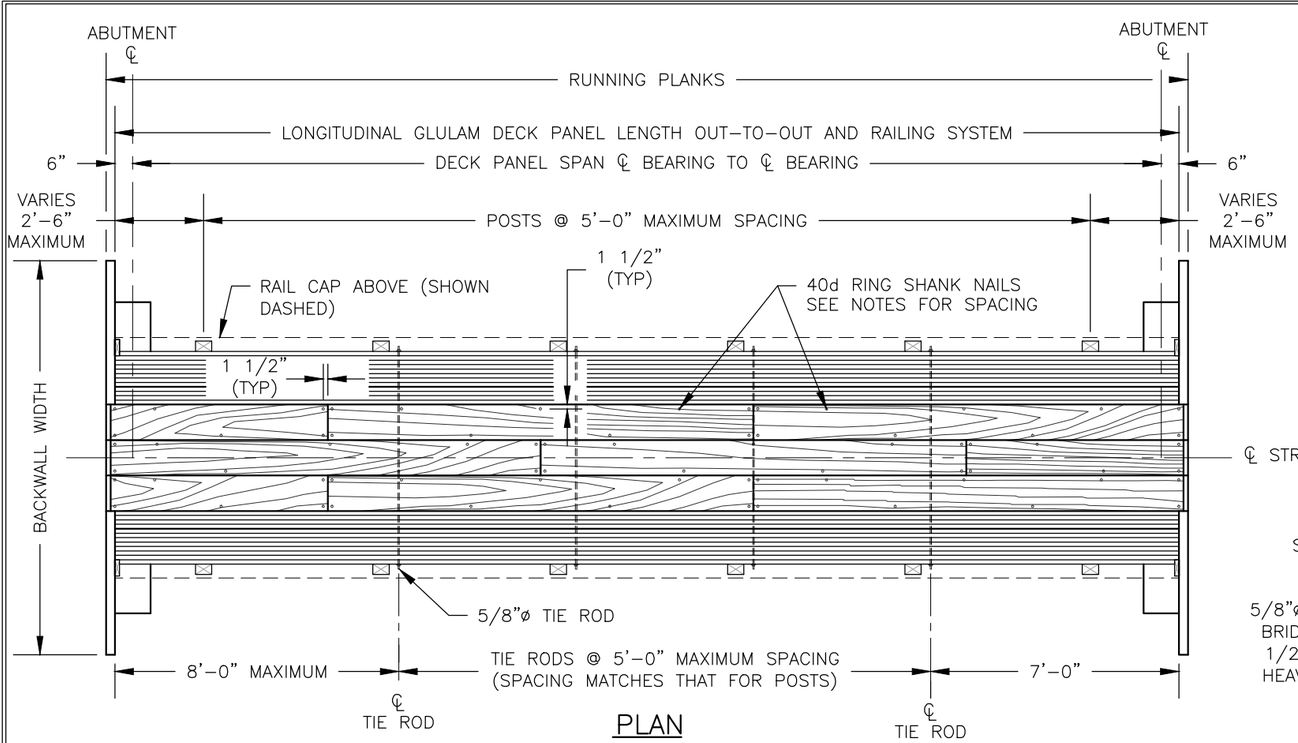
TYPICAL ID **LGD**

REVISION DATE

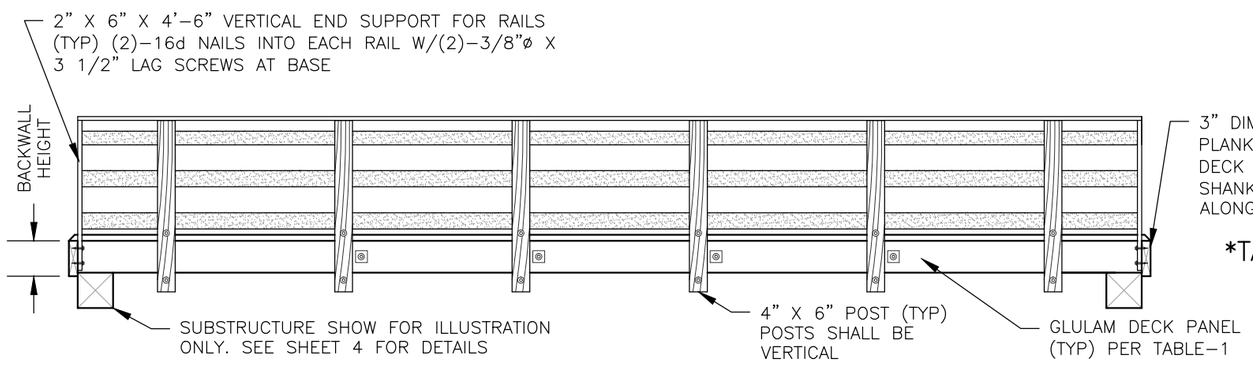
NOT TO SCALE

DRAWING NO. **STD_963-20-01**

SHEET OF

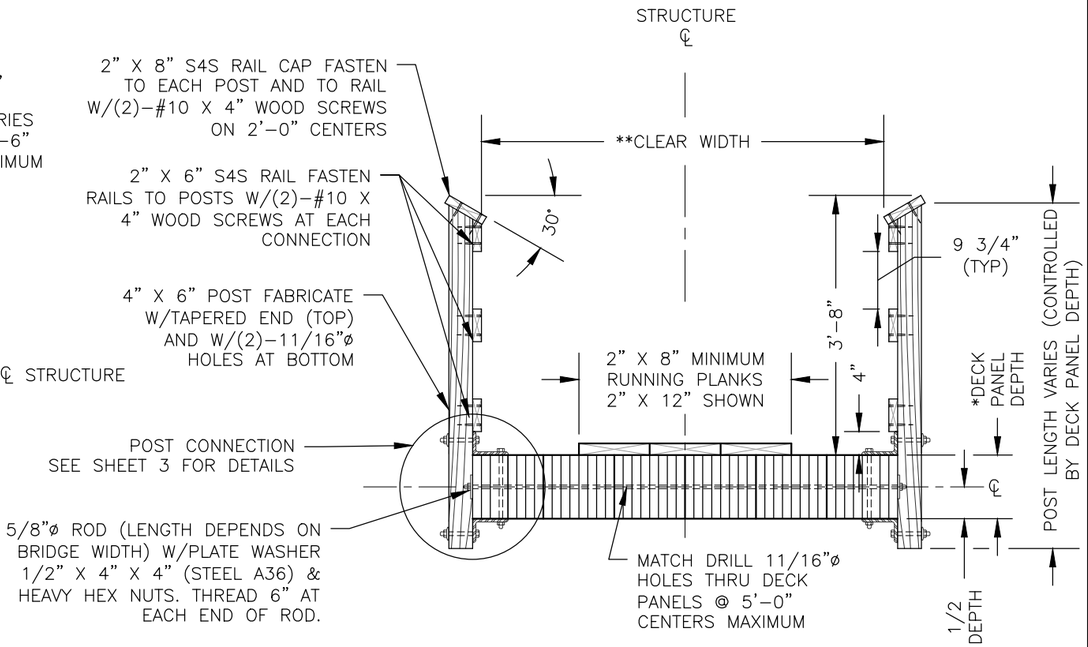


PLAN



ELEVATION

GRADE SHOWN = 0.0%



TYPICAL DECK PANEL SECTION W/RAILING SYSTEM

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

** INSIDE FACE TO INSIDE FACE OF RAILING SYSTEM

*TABLE–1: LONGITUDINAL GLULAM DECK PANEL DEPTH REQUIREMENTS – LRFD

**DECK PANEL SPAN (FEET)	TIMBER SPECIES – DF, ID. NO. 5				
	DESIGN LOADING IN POUNDS PER SQUARE FOOT				
	PEDESTRIAN LIVE LOAD		GROUND SNOW LOAD		
	***65	90	120	150	200
10	5 1/8"	5 1/8"	5 1/8"	5 1/8"	5 1/8"
15	5 1/8"	5 1/8"	5 1/8"	6 3/4"	6 3/4"
20	6 3/4"	6 3/4"	6 3/4"	8 3/4"	8 3/4"
25	8 3/4"	8 3/4"	8 3/4"	8 3/4"	10 3/4"
30	10 3/4"	10 3/4"	10 3/4"	10 3/4"	12 1/4"

* 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

NOTES:

1. GLULAM LONGITUDINAL DECK PANELS SHALL BE FABRICATED WITH A MINIMUM OF 8 LAMINATIONS PER DECK PANEL.
2. FASTEN RUNNING PLANKS TO DECK PANELS WITH 40d (5–INCH RING SHANK NAILS) AT 24–INCH SPACING. ALTERNATE SIDES WITH TWO AT EACH END.
3. SPLICE RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO POST SPACES. ALTERNATE RAIL SPLICES AT POSTS.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL GLULAM DECK PANEL TRAIL BRIDGE**

SECTION **963 - GLULAM TRAIL BRIDGE**

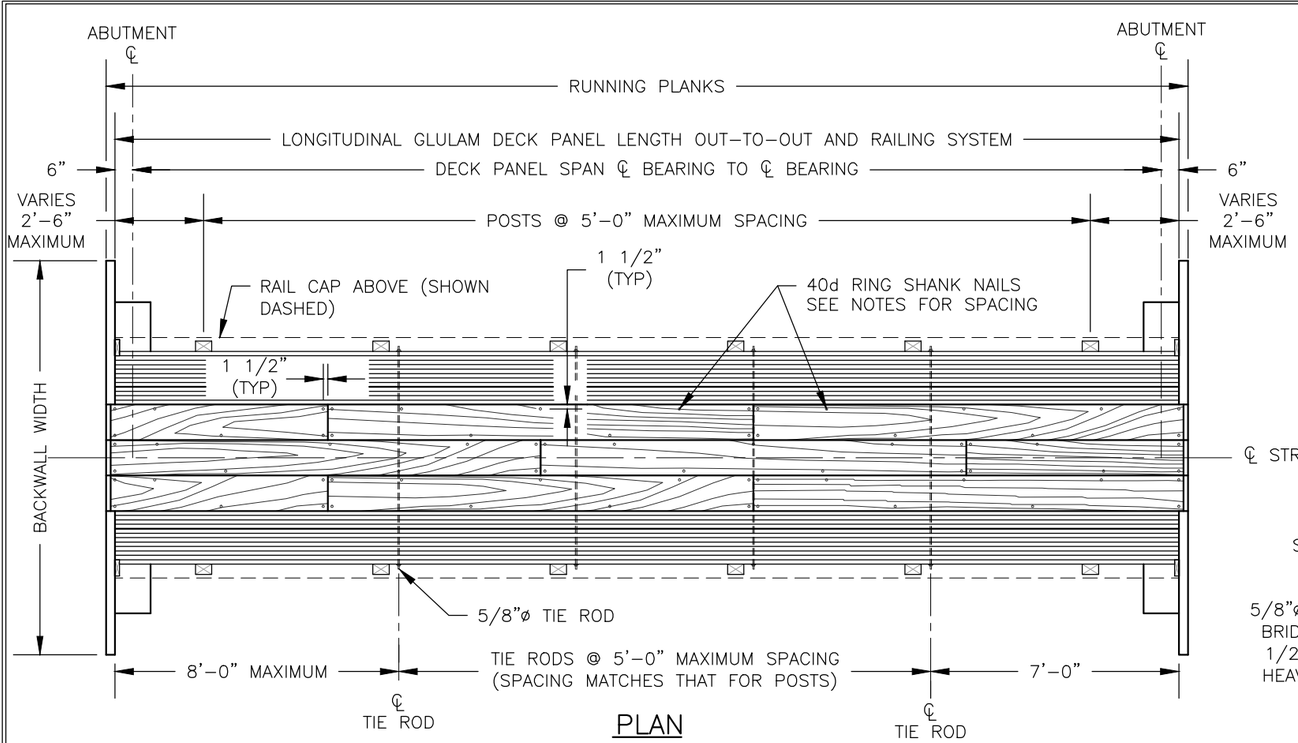
TYPICAL ID **LGD**

REVISION DATE

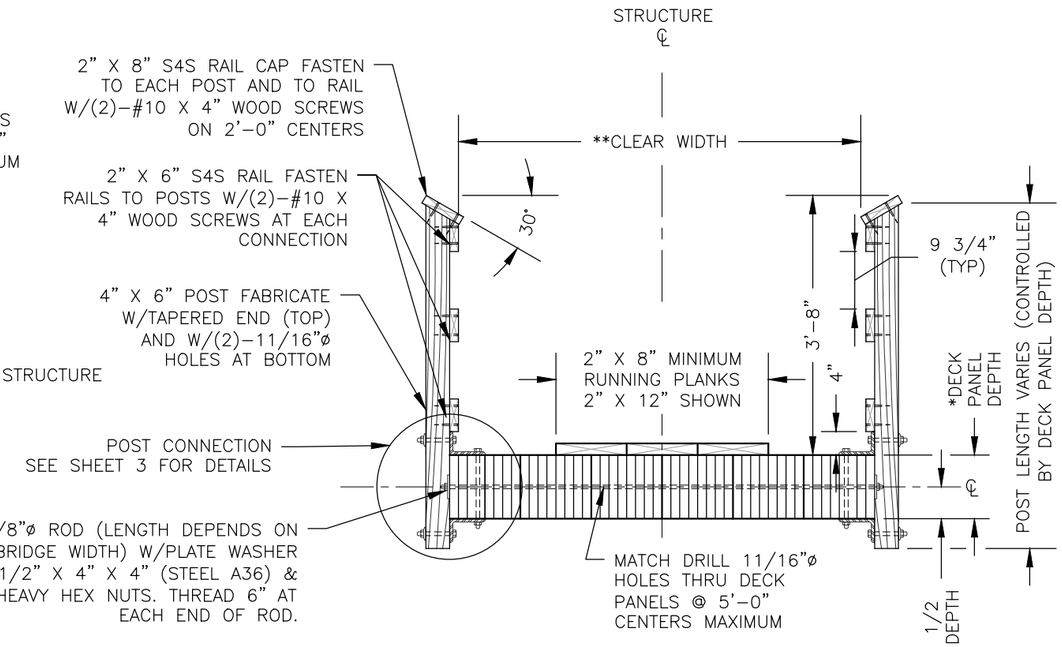
NOT TO SCALE

DRAWING NO. **STD_963-20-02a**

SHEET OF



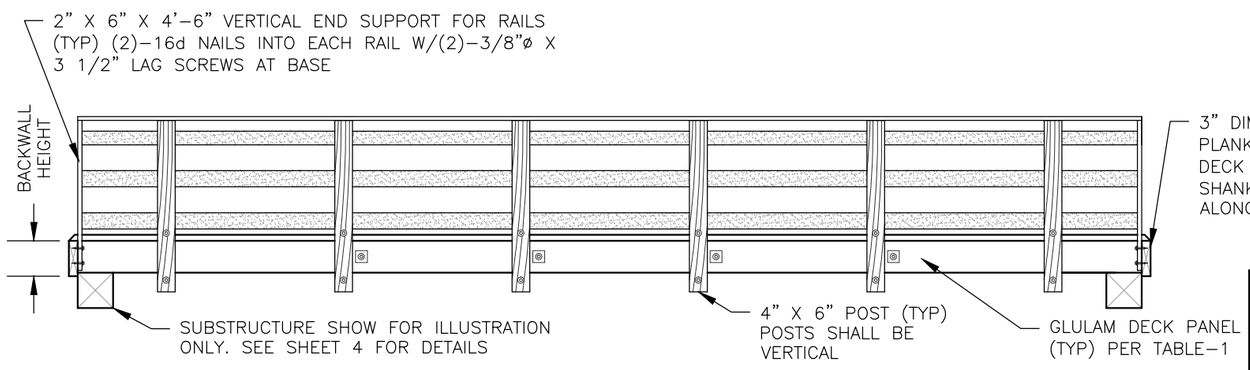
PLAN



TYPICAL DECK PANEL SECTION W/RAILING SYSTEM

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

** INSIDE FACE TO INSIDE FACE OF RAILING SYSTEM



ELEVATION

GRADE SHOWN = 0.0%

*TABLE–1: LONGITUDINAL GLULAM DECK PANEL DEPTH REQUIREMENTS–LRFD

**DECK PANEL SPAN (FEET)	TIMBER SPECIES – SP, ID. NO. 50				
	DESIGN LOADING IN POUNDS PER SQUARE FOOT				
	PEDESTRIAN LIVE LOAD		GROUND SNOW LOAD		
	***65	90	120	150	200
10	5 1/8"	5 1/8"	5 1/8"	5 1/8"	5 1/8"
15	5 1/8"	5 1/8"	5 1/8"	6 3/4"	6 3/4"
20	6 3/4"	6 3/4"	6 3/4"	8 1/2"	8 1/2"
25	8 1/2"	8 1/2"	8 1/2"	10 1/2"	10 1/2"
30	10 1/2"	10 1/2"	10 1/2"	12"	12"

* 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

NOTES:

1. GLULAM LONGITUDINAL DECK PANELS SHALL BE FABRICATED WITH A MINIMUM OF 8 LAMINATIONS PER DECK PANEL.
2. FASTEN RUNNING PLANKS TO DECK PANELS WITH 40d (5–INCH RING SHANK NAILS) AT 24–INCH SPACING. ALTERNATE SIDES WITH TWO AT EACH END.
3. SPLICE RAILS AT POSTS. RAILS SHALL BE CONTINUOUS FOR A MINIMUM OF TWO POST SPACES. ALTERNATE RAIL SPLICES AT POSTS.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL GLULAM DECK PANEL TRAIL BRIDGE**

SECTION **963 - GLULAM TRAIL BRIDGE**

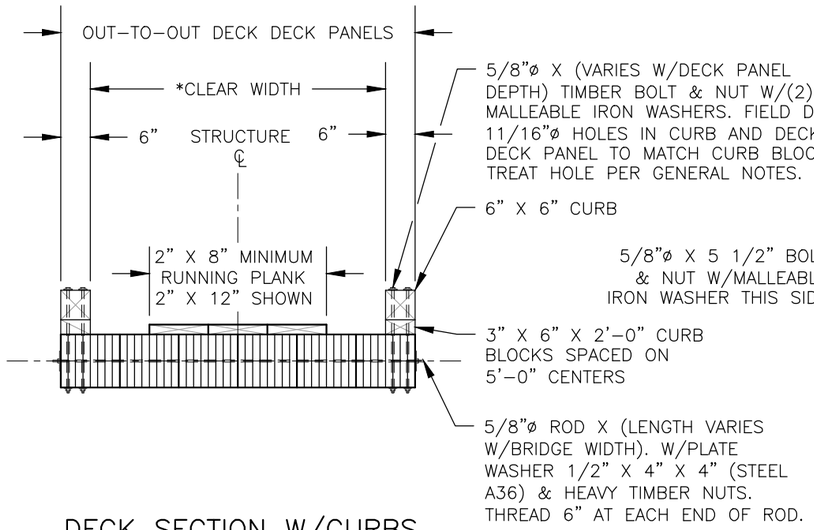
TYPICAL ID **LGD**

REVISION DATE

NOT TO SCALE

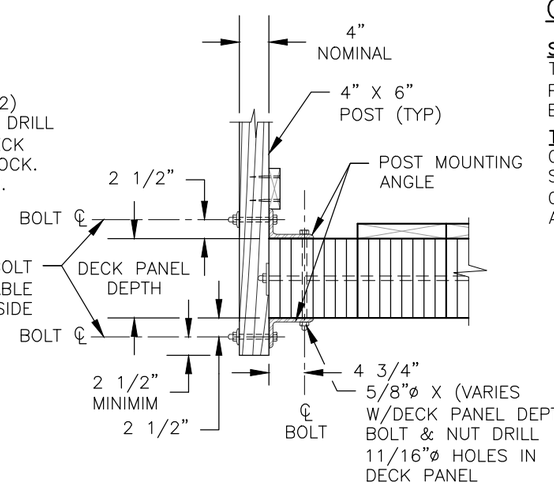
DRAWING NO. **STD_963-20-02b**

SHEET OF

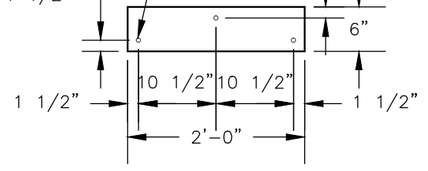


DECK SECTION W/CURBS

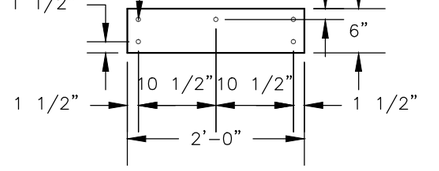
*INSIDE FACE TO INSIDE FACE OF CURB STRUCTURE



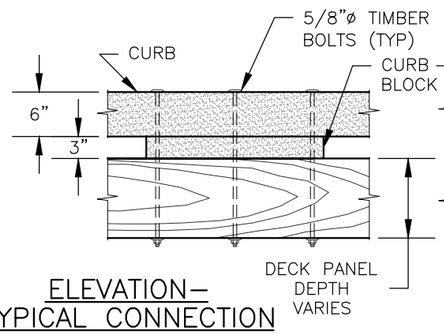
POST CONNECTION DETAIL



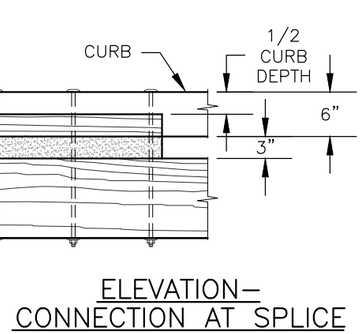
PLAN–CURB BLOCK



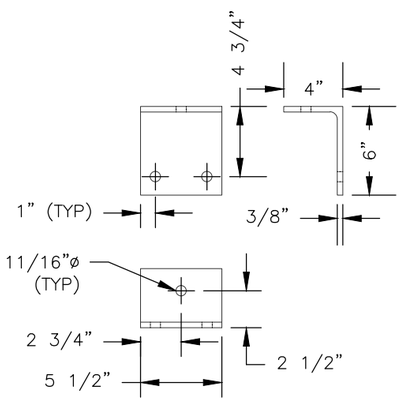
PLAN–CURB BLOCK AT SPLICE



ELEVATION– TYPICAL CONNECTION



ELEVATION– CONNECTION AT SPLICE



POST MOUNTING ANGLE

MATERIAL = STEEL ANGLE 6" X 4" X 3/8" A36
QUANTITY REQUIRED = (2)–MOUNTING ANGLES PER POST PER SIDE

SOLID SAWN CURB CONNECTION DETAILS

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. GLULAM MEMBERS SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD, STANDARD SPECIFICATIONS FOR STRUCTURAL GLUED LAMINATED TIMBER OF SOFTWOOD SPECIES (ANSI 117) FOR THE COMBINATION, SPECIES, USE, AND APPEARANCE SPECIFIED BELOW.

GLULAM DECK PANELS
- IDENTIFICATION NUMBER 5, SPECIES – DF WET CONDITION USE AND INDUSTRIAL APPEARANCE

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".

GLULAM DECK PANELS
- 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)

DECKING, 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 OD 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 FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.

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.

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 THE PLANS.

TIE ROD TENSIONING: TIE RODS SHALL BE TORQUED TO 100 FT/LBS UPON INITIAL INSTALLATION OF THE DECK PANEL 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.

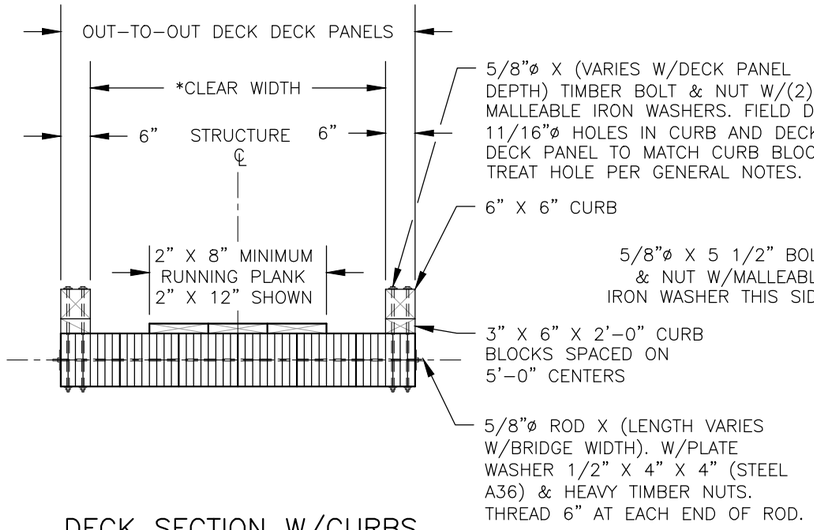
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL GLULAM DECK PANEL TRAIL BRIDGE**
SECTION **963 - GLULAM TRAIL BRIDGE**
TYPICAL ID **LGD**

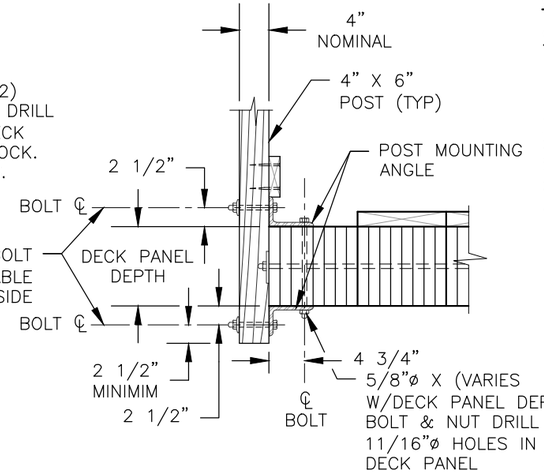
REVISION DATE
NOT TO SCALE

DRAWING NO. **STD_963-20-03a**
SHEET OF

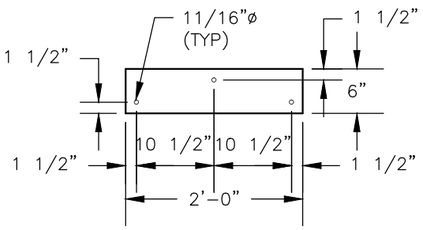


DECK SECTION W/CURBS

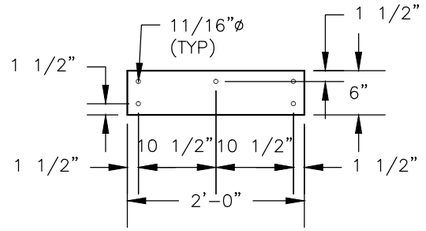
*INSIDE FACE TO INSIDE FACE OF CURB STRUCTURE



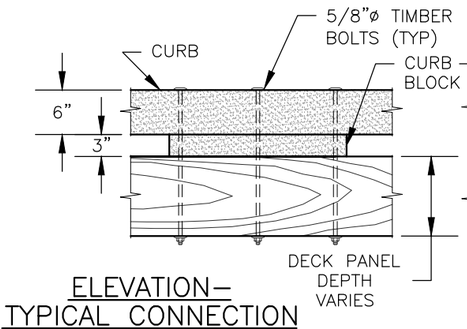
POST CONNECTION DETAIL



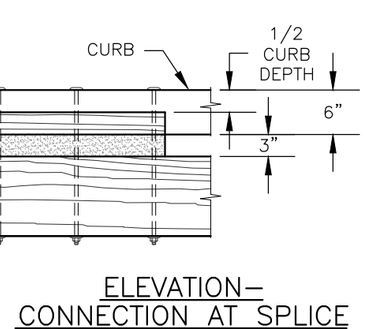
PLAN–CURB BLOCK



PLAN–CURB BLOCK AT SPLICE

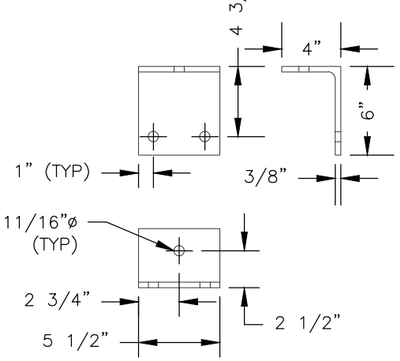


ELEVATION– TYPICAL CONNECTION



ELEVATION– CONNECTION AT SPLICE

SOLID SAWN CURB CONNECTION DETAILS



POST MOUNTING ANGLE

MATERIAL = STEEL ANGLE 6" X 4" X 3/8" A36
QUANTITY REQUIRED = (2)–MOUNTING ANGLES PER POST PER SIDE

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. GLULAM MEMBERS SHALL CONFORM TO THE AMERICAN NATIONAL STANDARD, STANDARD SPECIFICATIONS FOR STRUCTURAL GLUED LAMINATED TIMBER OF SOFTWOOD SPECIES (ANSI 117) FOR THE COMBINATION, SPECIES, USE, AND APPEARANCE SPECIFIED BELOW.

GLULAM DECK PANELS
- IDENTIFICATION NUMBER 50, SPECIES – SP WET CONDITION USE AND INDUSTRIAL APPEARANCE

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.2 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".

GLULAM DECK PANELS
- 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)

DECKING, 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 OD 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 FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.

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.

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 THE PLANS.

TIE ROD TENSIONING: TIE RODS SHALL BE TORQUED TO 100 FT/LBS UPON INITIAL INSTALLATION OF THE DECK PANEL 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.

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

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL GLULAM DECK PANEL TRAIL BRIDGE**

SECTION **963 - GLULAM TRAIL BRIDGE**

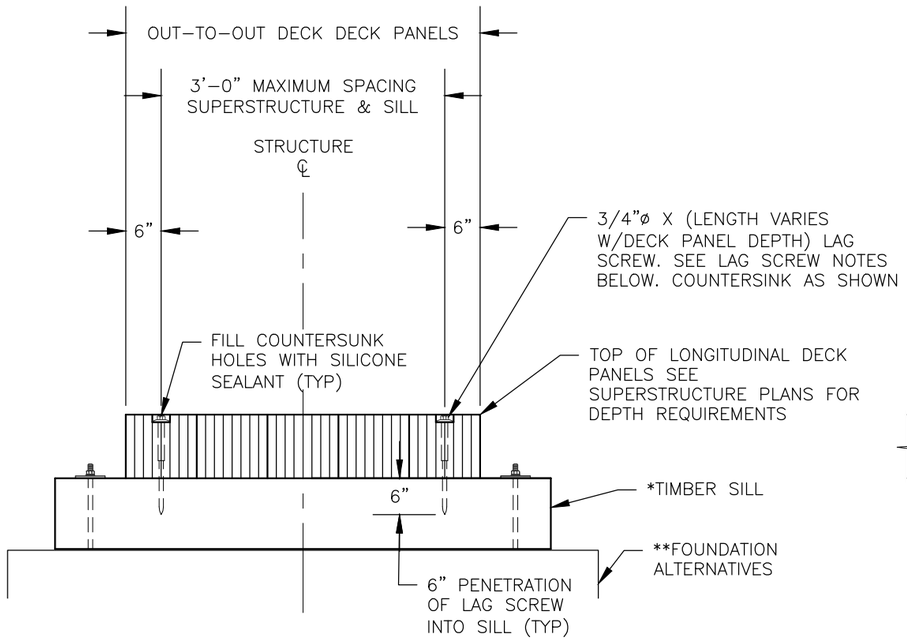
TYPICAL ID **LGD**

REVISION DATE

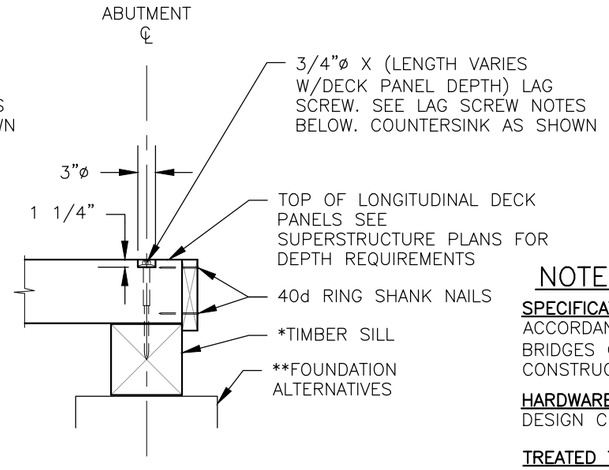
NOT TO SCALE

DRAWING NO. **STD_963-20-03b**

SHEET OF



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 965–10, 965–20, 965–30, & 965–40 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 (FP–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 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 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 BOLT 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.**

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

PROJECT NAME & LOCATION

DRAWING NAME **LONGITUDINAL GLULAM DECK PANEL TRAIL BRIDGE**

SECTION **963 - GLULAM TRAIL BRIDGE**

TYPICAL ID **LGD**

REVISION DATE

NOT TO SCALE

DRAWING NO. **STD_963-20-04**

SHEET OF