



Presentation to  
Second National Covered Bridge Conference

# GOODPASTURE COVERED BRIDGE REHABILITATION

## Presenters:

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**OBEC Consulting  
Engineers  
Eugene, Oregon**

**165-foot-long  
heavy timber  
Howe truss  
main span**

**Bridge Location:  
Vida, Oregon**

**Bridge Owner:  
Lane County**

# BUILT 1938 BY LANE COUNTY



Under the supervision of veteran bridge builder Arthur C. Striker

# TO CARRY GOODPATURE ROAD ACROSS THE MCKENZIE RIVER FOR \$13,155

No. 16-28-29

Goodpasture Bridge over McKenzie River on Co. Road No. Sec. 27 T. 14 S. R. 2 E. W. M.

PIERS AND ABUTMENTS						
No. of Piers	Number	Type	Material	Year Built	Name of Builder	Cost
2	Dumbell	Ramp, Conc.		1937	Lane Co.	
1	Abutment					
4	Pedestals					

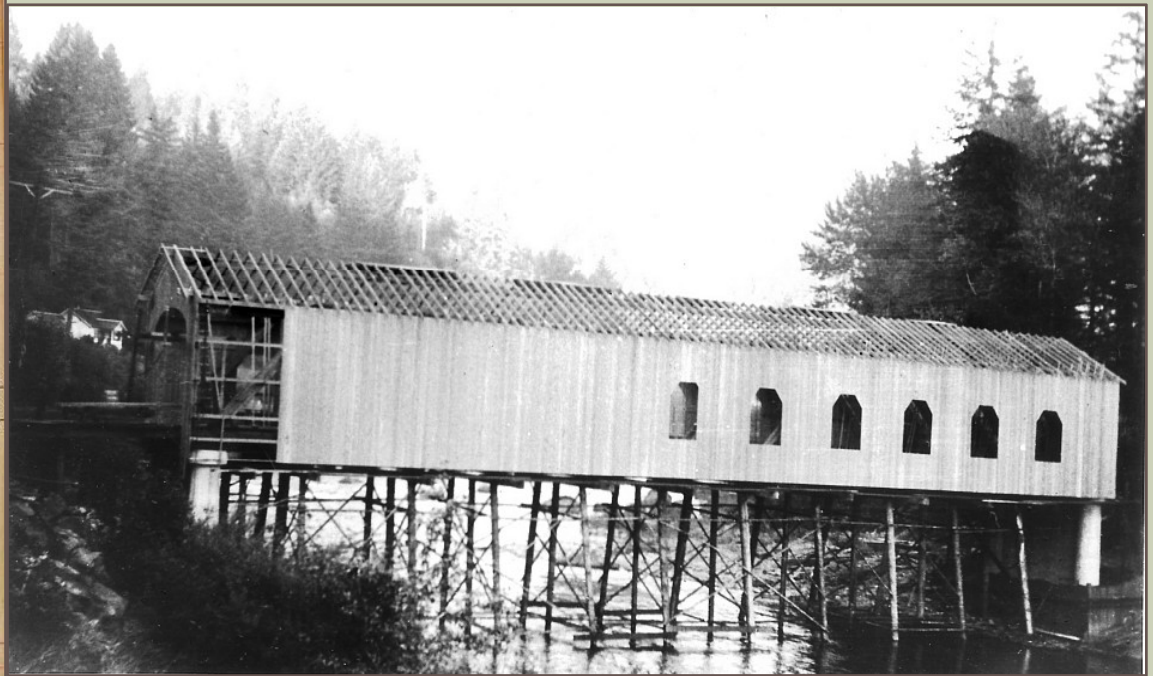
  

BRIDGE						
No. of Spans	Length of Span	Material	Type of Span	Year Built	Name of Builder	Cost
1	165'	Wood	Heavy Box	1937-38	Lane Co.	
2	19'	Wood	Frame			
3	23'	Wood	Frame			

SKETCH OF BRIDGE

Materials, Excavation, etc.	Quantity	Unit	Cost
Lumber	200,803		3,679.63
Labor			5,497.45
Falsework, Poles and Piling			35.10
Cement (113) sacks			745.44
Sand and Gravel 209 1/2 cu yds.			208.48
Hardware, Rods, bolts, spikes, iron, etc.			2,013.21
Labor - Hauling			121.73
Truck Rental			143.50
Shingles - 61 @ \$3.00			183.00
Labor, shingling @ 12¢			61.00
Engineering			109.36
Miscellaneous			124.07
Paint, Labor			174.65
Paint, incomplete			37.77
			<b>\$13,154.61</b>

19



Under Construction 1938

Original Construction Invoice

Goodpasture Covered Bridge



# Oregon State Highway Commission Standard Drawing 6566



# THE MIGHTY McKENZIE RIVER

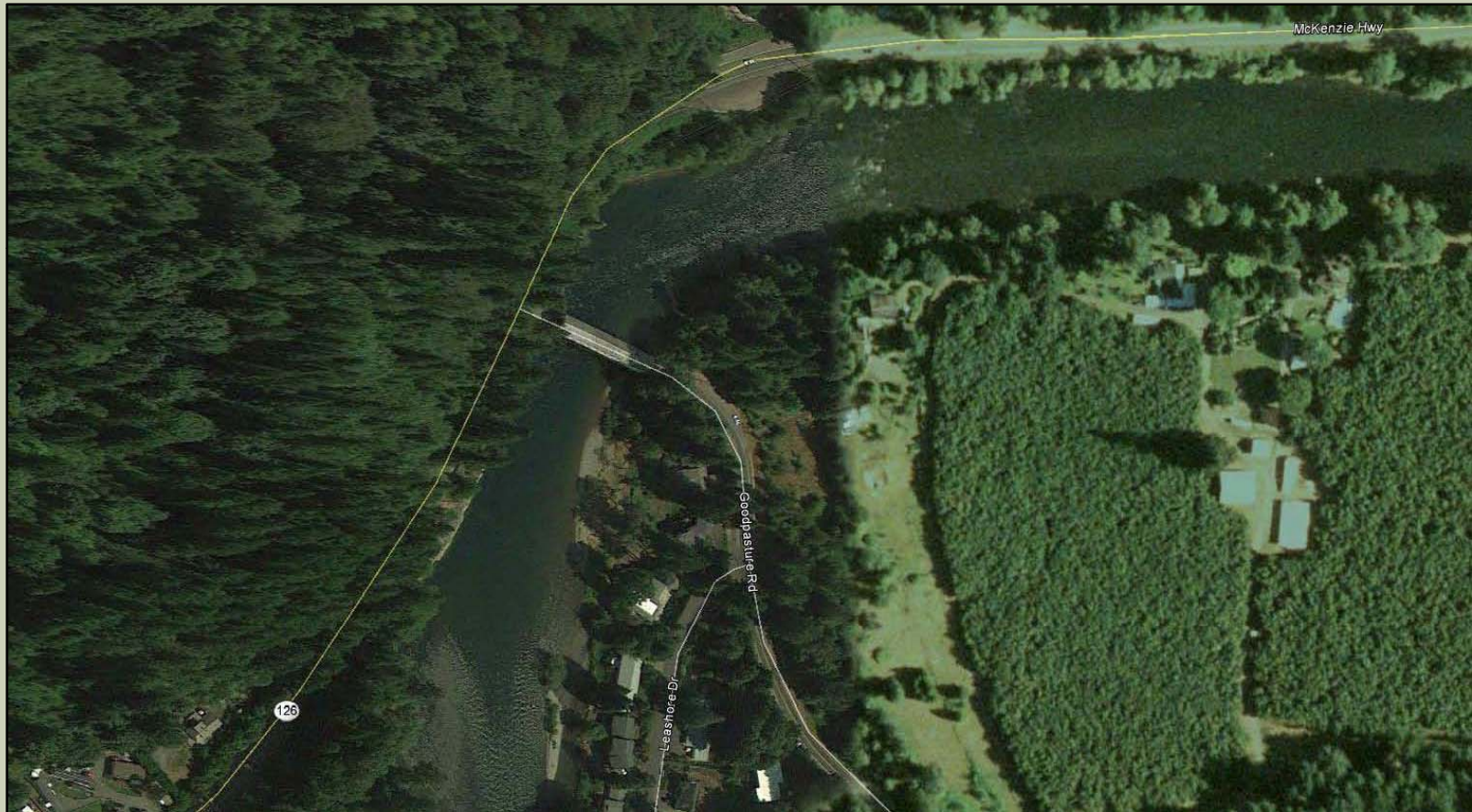


from Google Earth

Fast pristine water, good fishing, home to many listed species of aquatic life



# BRIDGE IS A LIFELINE TO COMMUNITY SOUTH OF RIVER



Aerial view – Google Earth

# THE NEW BRIDGE



Circa 1950 with H10 truck of the day





Typical modern Oregon log trucks



A hazard to covered bridges  
even when empty



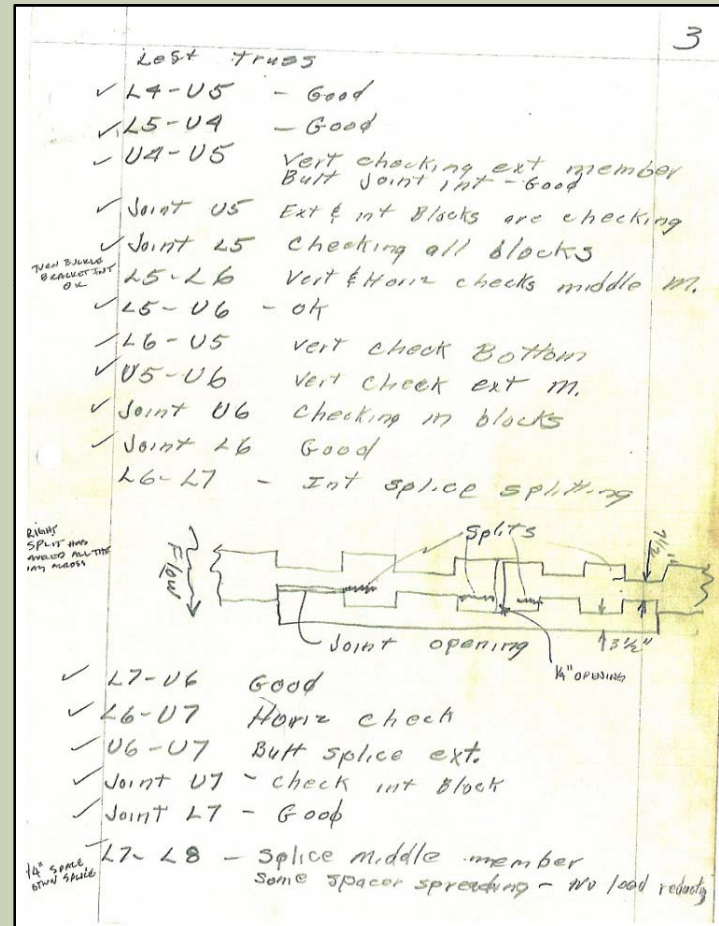
One-log loads,  
once common  
now rare

## TYPICAL OREGON LOG TRUCKS

Substantially  
heavier than  
design load

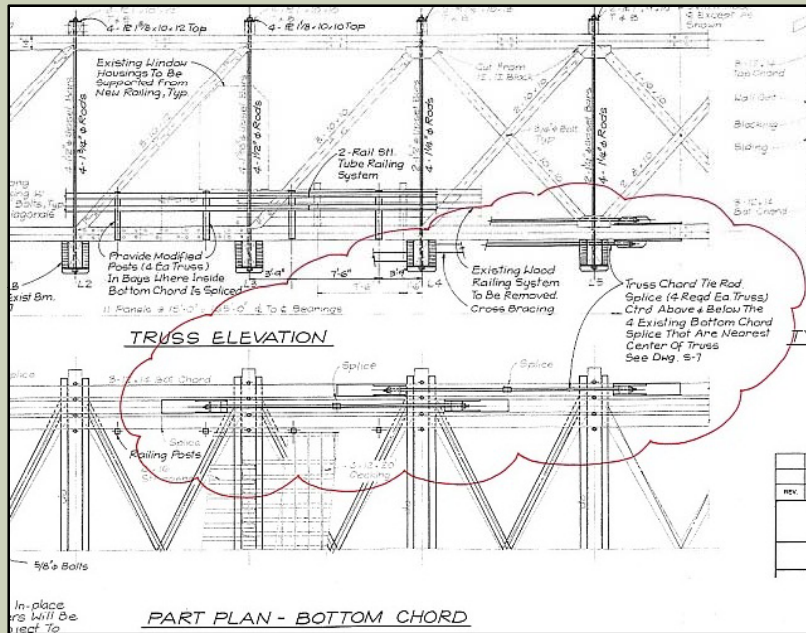


# 1972 STRUCTURAL DISTRESS

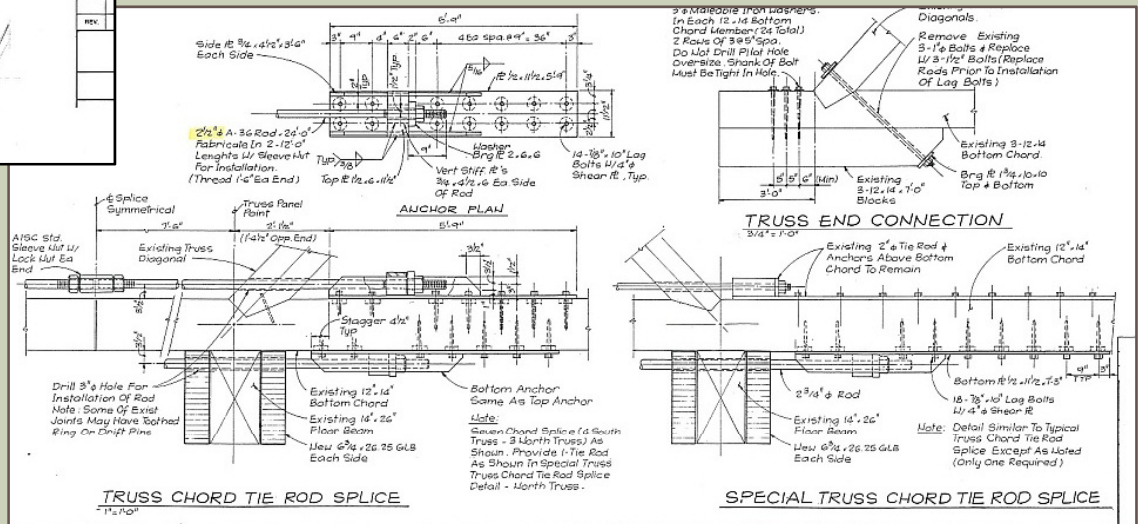


Inspector's notes documenting broken bottom chord splices

# 1986 CHORD SPLICE REINFORCEMENT DESIGN



**Welded steel plate anchors fastened to bottom chord segments with lag screws and 2½" diameter tie rods passing through timber truss diagonal members.**





# REPAIR ADDED >7 TONS OF DEAD LOAD BUT WAS ONLY MARGINALLY EFFECTIVE



Broken splices leaving gaps to  $\frac{1}{2}$ "



Some rods were never engaged

Gaps were not  
closed by the  
tie rods



Goodpasture Covered Bridge

# OVERLOADS

*ATTN Doug 541-682-8994*

OWNER: *Gresham Trailer*  
*Brook 1-888-444-7904*  
*Log Loader*

	MANUFACTURER	LICENSE	SERIAL NO
Trac.			
Jeep			
TrFr.			
Dist. Unit			

	8	8	8	10	9
ires/Axle					
le					
acing					
erall					
ngth					
le Width					
re Weight	12,000	44,000	41,000	40,000	40,000
sension					
pe					
re Size					
ating					
en Load					
ple Load					

NOTES:

Post-It* Fax Note	7671	Date 5-28	Page 1
To: Bill Hall		From: Doug McCart	
Co./Dept: DEC		Co: Log Co	
Phone #		Phone # 682-6928	
Fax #		Fax # 682-8994	

*6/1/98*  
*Told Doug OK w/*  
*- Drive down center*  
*- 5 mph*  
*- 43k max Tandem*

May-28-98 03:27P  
 541 682-8994  
 P.01

Approved overload request from 1998 GVW is 177,000 lbs.



# LIGHTER ROOF IN 2010



Very heavy cement/wood fiber composite roofing was leaking



Replaced with much lighter and historically more appropriate cedar shingles

# 4-INCH SAG AT MID-SPAN EVEN WITH LIGHTER ROOF



2012 photo



# TYPICAL RIVER LEVEL



Bridge soffit approximately 30 feet above hard rock stream bed, fast and deep water.  
In-water work period is only 6 weeks, July 15 to Sept. 1.

# HIGH WATER



Water level can rise several feet in a few days



# CONTAINMENT / WORK ACCESS



Containment



Suspended from truss bottom chords



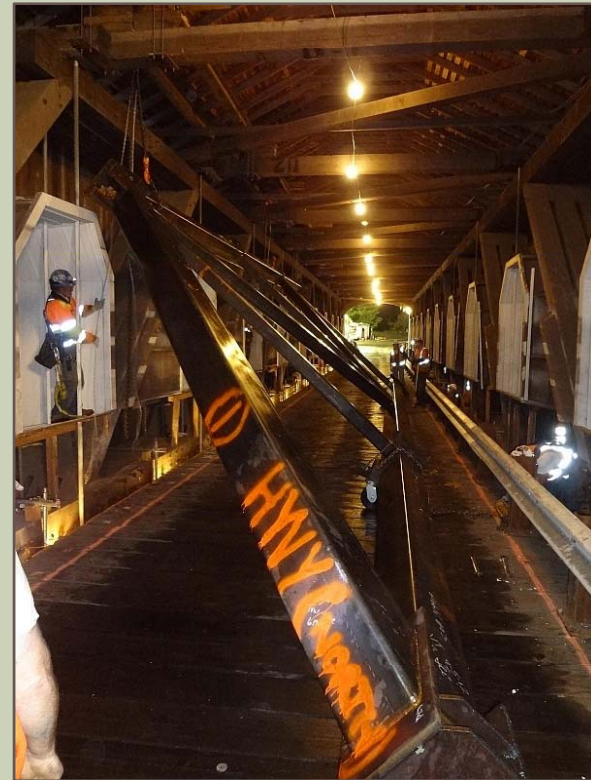
Work access



# CORRECTING THE GEOMETRY FROM ABOVE, STEP 1



Temporary rail installed  
and deck cut



Installing the first temporary steel  
truss during night-time closure

# FIRST TEMPORARY STEEL TRUSS IN PLACE



Standing vertical



Bearing on concrete pier



Temporary rail in place  
Ready for traffic



# LIFTING ASSEMBLY IN PLACE



Read to lift timber bridge

Goodpasture Covered Bridge



One of 20  
50-ton hydraulic jacks



# AVAILABLE CLEARANCES FOR POST-TENSIONING

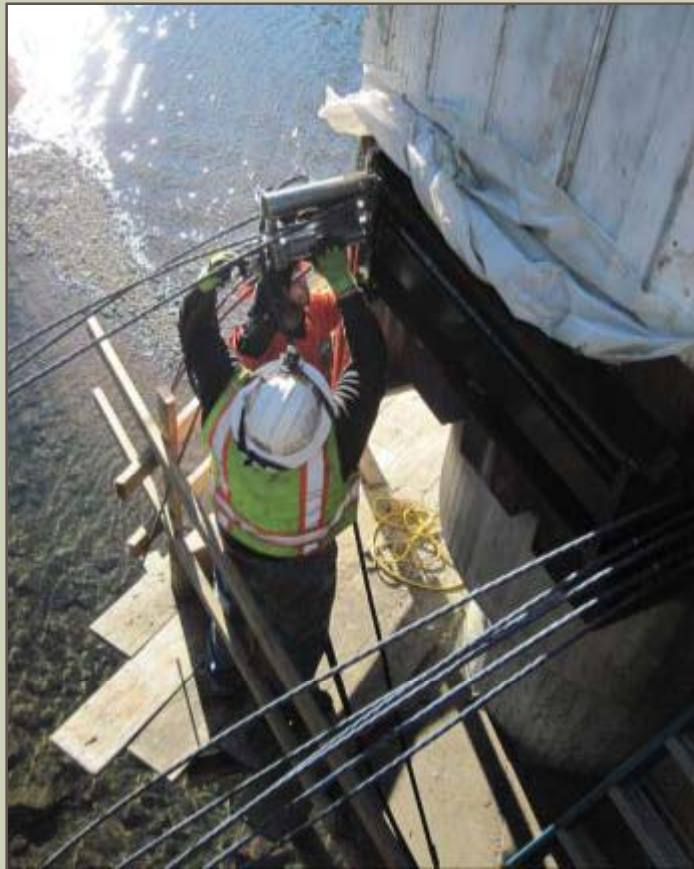


Between bottom chord and siding



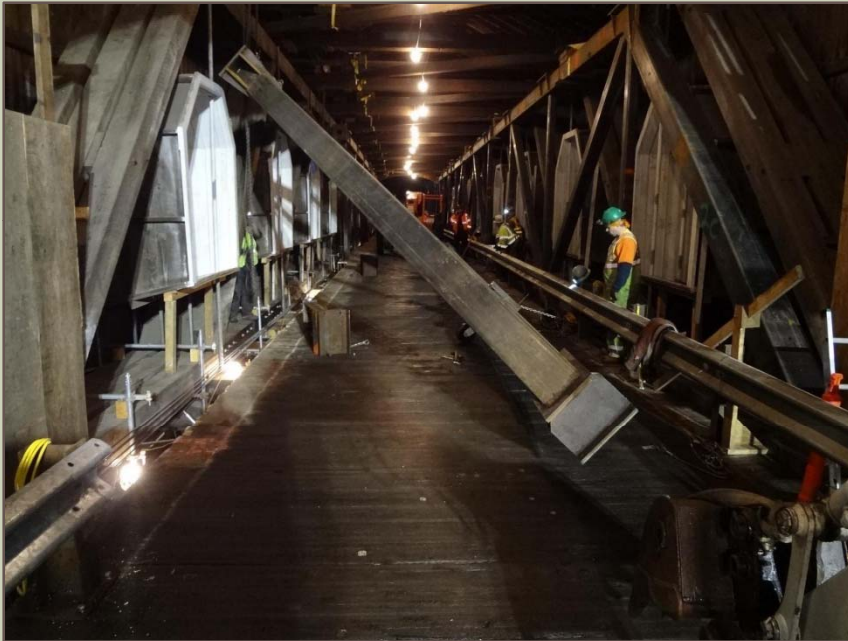
Between rail post and bottom chord

# JACKING THE STRAND



Six  $\frac{1}{2}$ " strands each side of each bottom chord  
Each pulled to 20,000 pounds

# REMOVING TEMPORARY STRUCTURE



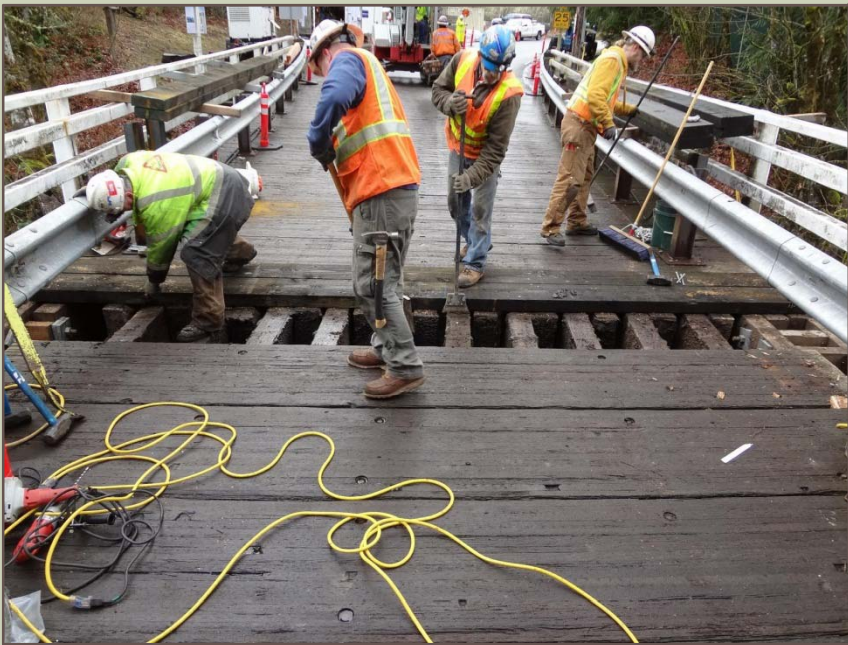
Removing temporary steel trusses



Reinstalling bridge rail



# REPLACING THE DECK



Spiking done during night closures

# PROJECT COMPLETE



Looking northwest March 11, 2013



# BLIND CURVE AND NO SHOULDER OR TURN LANE FOR WESTBOUND TRAFFIC



Looking east up highway



# LIGHTING FOR SAFETY

# INTERIOR NIGHT VIEW



Goodpasture Covered Bridge





Goodpasture Covered Bridge



Goodpasture Covered Bridge



# HOLIDAY LIGHTING



Prior to rehabilitation local residents strung lights with extension cords

Circuitry concealed behind wrap-around siding



Programmable LED lighting installed

# INTERPRETIVE DISPLAY



Informs visitors of the historical significance of the bridge



# PICTURESQUE SETTING



Fall 2012  
(prior to rehabilitation)





**GOODPASTURE COVERED BRIDGE  
2013**