GOODPASTURE COVERED BRIDGE REHABILITATION

Bridge Location: Vida, Oregon

Bridge Owner: Lane County

165-foot-long heavy timber Howe truss main span

Presentation to Second National Covered Bridge Conference

Presenters:
Greg Ausland, PE, Project Manager, gausland@obec.com
Tony LaMorticella, PE, SE, Sr. Project Engineer, TLaMorticella@obec.com
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

Goodpasture Covered Bridge

Under Construction 1938

Original Construction Invoice
THE MIGHTY McKENZIE RIVER

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

Substantially heavier than design load

A hazard to covered bridges even when empty

One-log loads, once common now rare

Goodpasture Covered Bridge
1972 STRUCTURAL DISTRESS

Inspector’s notes documenting broken bottom chord splices
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 ½"

Gaps were not closed by the tie rods

Some rods were never engaged

Goodpasture Covered Bridge
OVERLOADS

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

Goodpasture Covered Bridge
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
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

Goodpasture Covered Bridge

Containment

Work access

Suspended from truss bottom chords
CORRECTING THE GEOMETRY FROM ABOVE, STEP 1

Temporary rail installed and deck cut

Installing the first temporary steel truss during night-time closure

Goodpasture Covered Bridge
FIRST TEMPORARY STEEL TRUSS IN PLACE

Standing vertical

Bearing on concrete pier

Temporary rail in place
Ready for traffic

Goodpasture Covered Bridge
LIFTING ASSEMBLY IN PLACE

Read to lift timber bridge

One of 20
50-ton hydraulic jacks
AVAILABLE CLEARANCES FOR POST-TENSIONING

- Between bottom chord and siding
- Between rail post and bottom chord

Goodpasture Covered Bridge
JACKING THE STRAND

Six ½" 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

Goodpasture Covered Bridge
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
HOLIDAY LIGHTING

Circuitry concealed behind wrap-around siding

Prior to rehabilitation local residents strung lights with extension cords

Programmable LED lighting installed
Goodpasture Covered Bridge

Informs visitors of the historical significance of the bridge