GOODPASTURE COVERED BRIDGE REHABILITATION

165-foot-long heavy timber Howe truss main span

Bridge Location:
Vida, Oregon

Bridge Owner:
Lane County

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

OBEC Consulting Engineers
BUILT IN 1938 BY LANE COUNTY

Under the supervision of veteran bridge builder Arthur C. Striker
TO CARRY GOODPASTURE ROAD ACROSS THE MCKENZIE RIVER FOR $13,155

Under construction 1938

Original construction invoice
STATE STANDARD DRAWING FOR H10 LOADING
THE MIGHTY MCKENZIE RIVER

Fast pristine water, good fishing, home to many listed species of aquatic life
BRIDGE IS LIFELINE TO COMMUNITY
SOUTH OF RIVER

Aerial view – Google Earth
BLIND CURVE AND NO SHOULDER OR TURN LANE FOR WESTBOUND TRAFFIC

Looking east up highway
BRIDGE CIRCA 1950

With H10 truck of the day
Substantially heavier than design load

Hazard to covered bridges even when empty

One-log loads, once common, now rare
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 ½"

Gaps not closed by tie rods

Some rods were never engaged
Approved overload request from 1998 GVW is 177,000 lbs.
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 September 1.
HIGH WATER

Water level can rise several feet in a few days
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

Ready to lift timber bridge

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

Between bottom chord and siding

Between rail post and bottom chord
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
PROJECT COMPLETE

Looking northwest, March 11, 2013
LIGHTING FOR SAFETY
INTERIOR NIGHT VIEW
Goodpasture Covered Bridge

Prior to rehabilitation local residents strung lights with extension cords

Programmable LED lighting installed

Circuitry concealed behind wrap-around siding
PICTURESQUE SETTING

Fall 2012
(prior to rehabilitation)