Beanfields Railroad Bridge

On May 17 2012, Greg Porter, Iran Martinez, and Brent Pence inspected the old concrete bridge at the north end of the old railroad grade that runs along the west edge of the Beanfields area near Irvine PA.

This bridge was constructed to serve the railroad, and it is evident from the width and configuration of old ties that there were 2 tracks crossing the bridge. The bridge is approx. 28' wide between curbs, with a clear span of 24'. The deck is approx. 2'8" thick concrete (see attached drawing). The stream or drainage that the bridge crosses apparently only flows after heavy rains, receiving runoff from along SR2033 and the village of Irvine. There was no flow on this day, and the hydraulic opening is large enough that flood flows are not a concern.

The bridge is constructed of concrete reinforced with twisted square steel reinforcing bars. There are old cast iron posts that once supported steel pipe guardrails bolted to the raised curbs of the bridge. The concrete curbs retain a layer of soil and old railroad ballast. I dug a small hole to determine the depth of material over the concrete deck. The ballast is slag aggregate, approx. 1" to 3" diameter in a layer about 6" deep. This is covered by 4 to 8 inches of duff, organic soil, old ties, and growing vegetation including small trees. The condition of the concrete deck under the ballast in the small area exposed was sound and solid.

The concrete contains rounded river gravel and is crumbing, spalling, and delaminating in numerous locations. There were some areas of exposed rusted rebar on the underside of the bridge superstructure – most of this rebar has only limited section loss. There was no evidence of the bridge sagging and there were no transverse cracks in the underside that would indicate movement, structural distress, or failure. Areas of spalling and delamination on the underside constituted about 15% of the area, with more extensive spalling on the outer edges. Depth of spalling averaged 1 to 2 inches, deeper – up to 4" at the longitudinal construction joints where water appears to be seeping through.

The abutments are concrete, about 5 feet high from streambed to underside of bridge. The abutments were more crumbling and spalling that the superstructure, with about 75% of the south abutment and 25% of the north abutment spalled up to 4" deep and up to 6"-8" at the bottom near the waterline. The southeast wingwall is separated from the abutment, allowing the road surface to erode into the gap, causing a hole in the road at this corner about 3' around and 4' deep. The superstructure has about a 12" wide bearing surface on the abutments, which looks competent.

Although exposed areas of concrete are crumbling, the structure itself appears to be sound enough for use. As it was originally designed for railroad traffic, it should be capable of safely carrying the trail and any construction equipment including loaded tri-axle trucks for limited gravel haul. This bridge should be inspected during/after any heavy loads (20 tons+) are transported over it, and on a regular schedule in the future.

Greg Porter 5/18/2012

Exposed Rebar under deck

Cast Guardrail Post

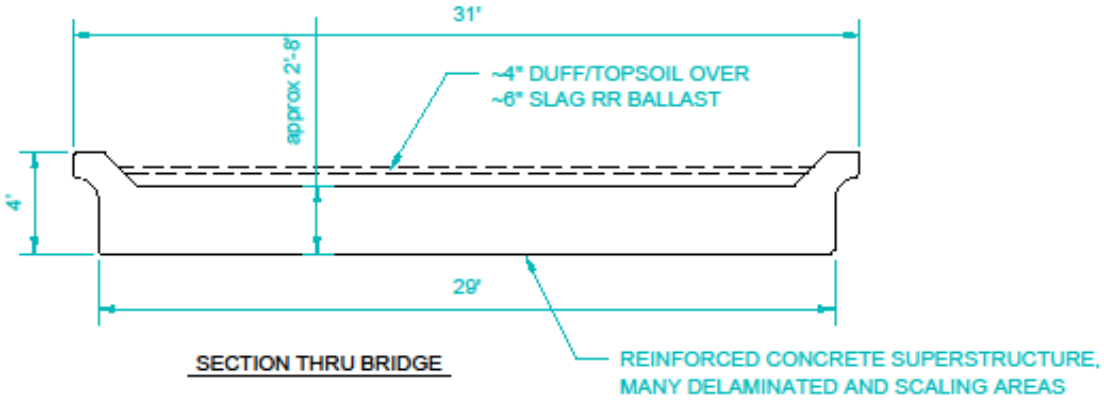
South Abutment

North Abutment

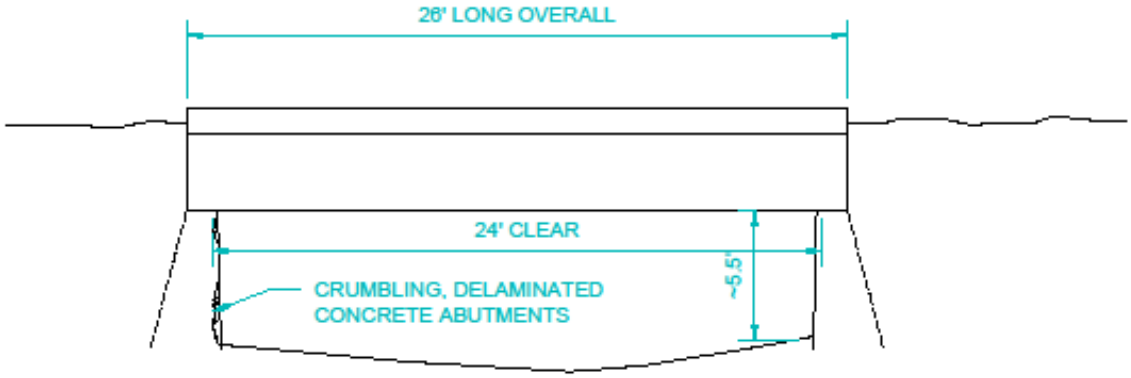
Erosion at Southeast Corner

Downstream Edge

Spalling at construction joint



SECTION THRU BRIDGE



BRIDGE ELEVATION VIEW

BEANFIELD RAILROAD BRIDGE

G.PORTER 5/17/2012