



July 20, 2020

Indian Hills Subdivision
Cove 9 Bridge
Flood Damage Inspection
Cochran Project SC20-1110

INTRODUCTION

At the request of Mary Beth Huffman, the POA president, I inspected the Cove 9 Bridge on the afternoon of July 14, 2020. Mary Beth said that the bridge had been underwater during a flood event on July 3, 2020, and had previously provided some pictures of that event. After that event some additional damage to and deterioration of the bridge had been observed. The purpose of my inspection was to determine if the flood damage had made the bridge unsafe or affected the load capacity of the bridge structure.

OBSERVATIONS

We went underneath the bridge (in a boat) to observe the current condition. The east end of the beam on the south side of the bridge has been shifted slightly to the north. It is also noticeably separated from the slab. This is the upstream side of the bridge and could be explained due to water pressure and being impacted by drift and or debris carried by the flood.

A hole has also appeared in the web of this beam where there was previously heavy scale. This too, could be explained by impact from drift. It also indicates that the webs of the beams, at least this one, are severely deteriorated.

Mary Beth had previously provided me with pictures of being able to penetrate the timber pile with a screw driver. The cracks in the timber pile are not new, but the saturation and drying cycle may have caused them to expand. This reduces the load capacity of the pile.

There was what appeared to be a small rotten spot on the boards of the back wall on the west end bent. We investigated further by pushing an oar into the hole and discovered a large cavity behind the end bent wall. It was impossible to determine the vertical dimensions of the cavity, but the oar went in over 3' before hitting anything. It was determined that the cavity extended below the water line, but the depth could not be determined.

Severe deterioration of some of the pile on the east end bent was also noted. This damage had been noted on previous inspections and the condition is continuing to deteriorate.

The oar was used to try to find the depth of scour at the southeast corner of the bridge. The oar was not long enough to find the bottom, so it is known to be more than 6' below the water surface. The actual depth is unknown, as is the integrity of the base and whether or not the backfill is being washed from behind this abutment also.

DISCUSSION

The damage caused by the flood continues to emphasize the poor condition of the bridge. The shifting and puncture of the south beam emphasize the severe deterioration of the steel members and their connection to the slab.

The cavity behind the west end bent is also of concern and needs to be monitored very closely. That size of cavity could allow a collapse of the roadway to occur quickly and without warning.

CONCLUSION

The ongoing deterioration of the bridge deck, beams and substructure indicate the need to control the weight of traffic on the bridge. Additionally, the cavity behind the west end bent could allow the roadway to collapse at any time. It is our recommendation that a Load Limit of 12 Tons be placed on the bridge to prevent large trucks such as trash trucks and dump trucks from using the bridge and accelerating the deterioration.

The cavity behind the west end bent is of concern. If that were to collapse during the night a traveling vehicle might not be able to stop in time. The roadway should be closely monitored morning and evening to detect early signs of roadway collapse. We would suggest to be on the safe side and go ahead and excavate the cavity and backfill with rock or concrete.

If work needs to be done on the dam spillway to allow large vehicles to use that route, this repair could possibly wait until that is done. We do not recommend waiting until the new bridge construction unless the construction schedule is advanced.

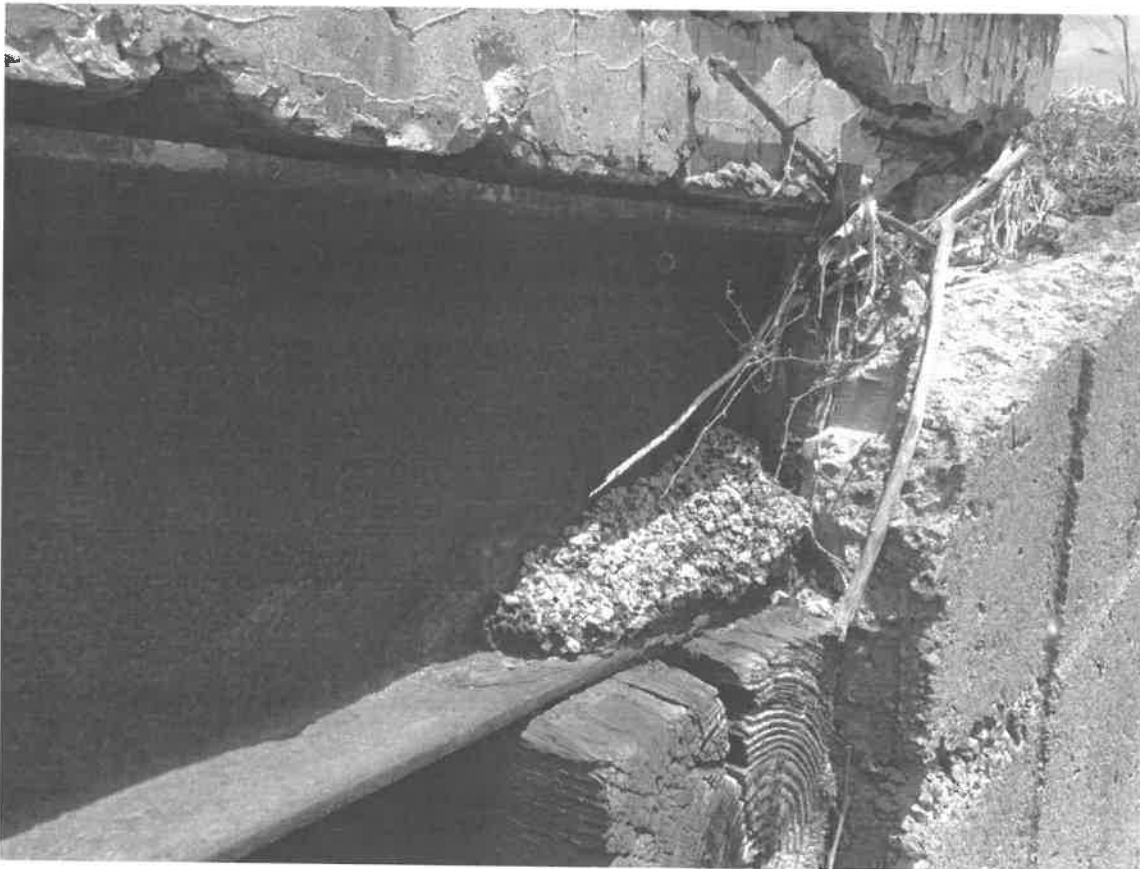
B. Bradford Dunagan, P.E.

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Pictures included:



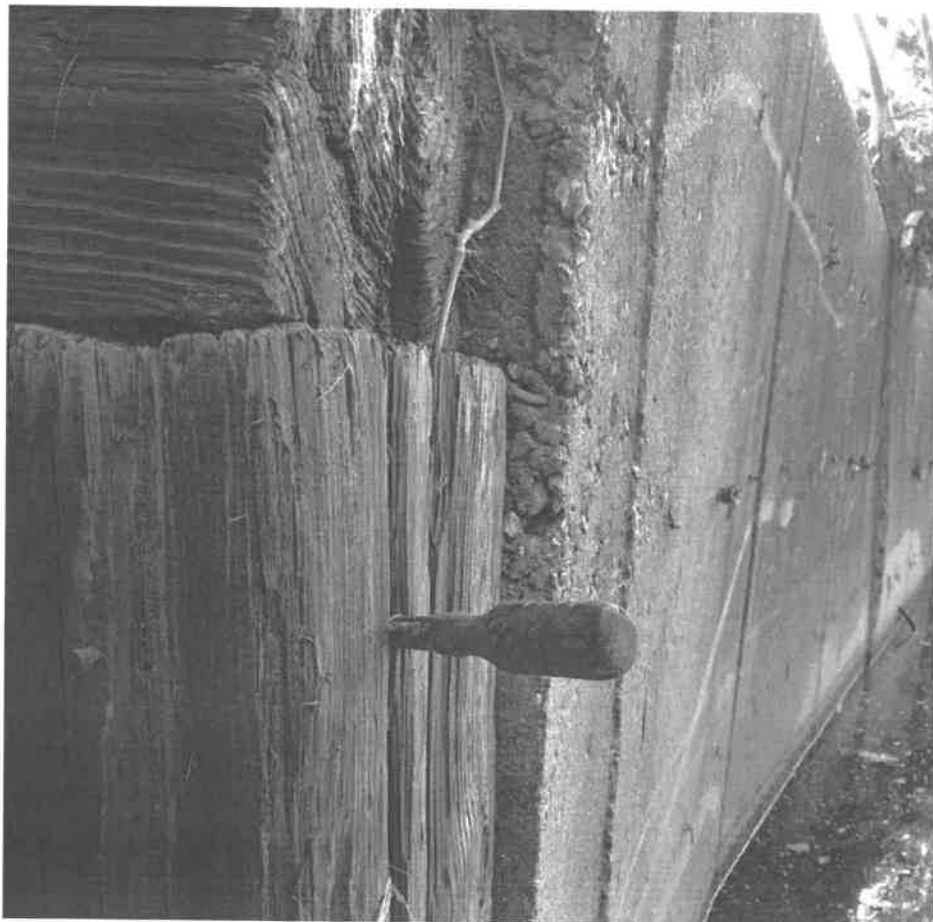
This picture shows the south beam at the time of the curb inspection.



IMG_2106 This picture, taken after the flood, shows that the beam has shifted.



The hole is now completely open through the web.





IMG_2110 The oar went over 3' into the cavity at the west end bent.





IMG_2108 Showing deterioration of timber pile.



IMG_2122 Showing deterioration of concrete deck and steel beams.