

Technical Memorandum

Date: 9/18/2015

To: Corwyn Martin, Traill County Highway Superintendent
Richard Sanders, Polk County Engineer

From: Dustin Kinnischtzke

RE: Nielsville Bridge Deck Inspection Findings



Introduction

The Nielsville Bridge is a double span thru truss bridge. It is located 8 miles east and 7 miles north of Hillsboro ND, or 2 miles west of Nielsville MN. This bridge is a ND/MN border crossing across the Red River that joins Traill County Highway 17 with Polk County Highway 1.

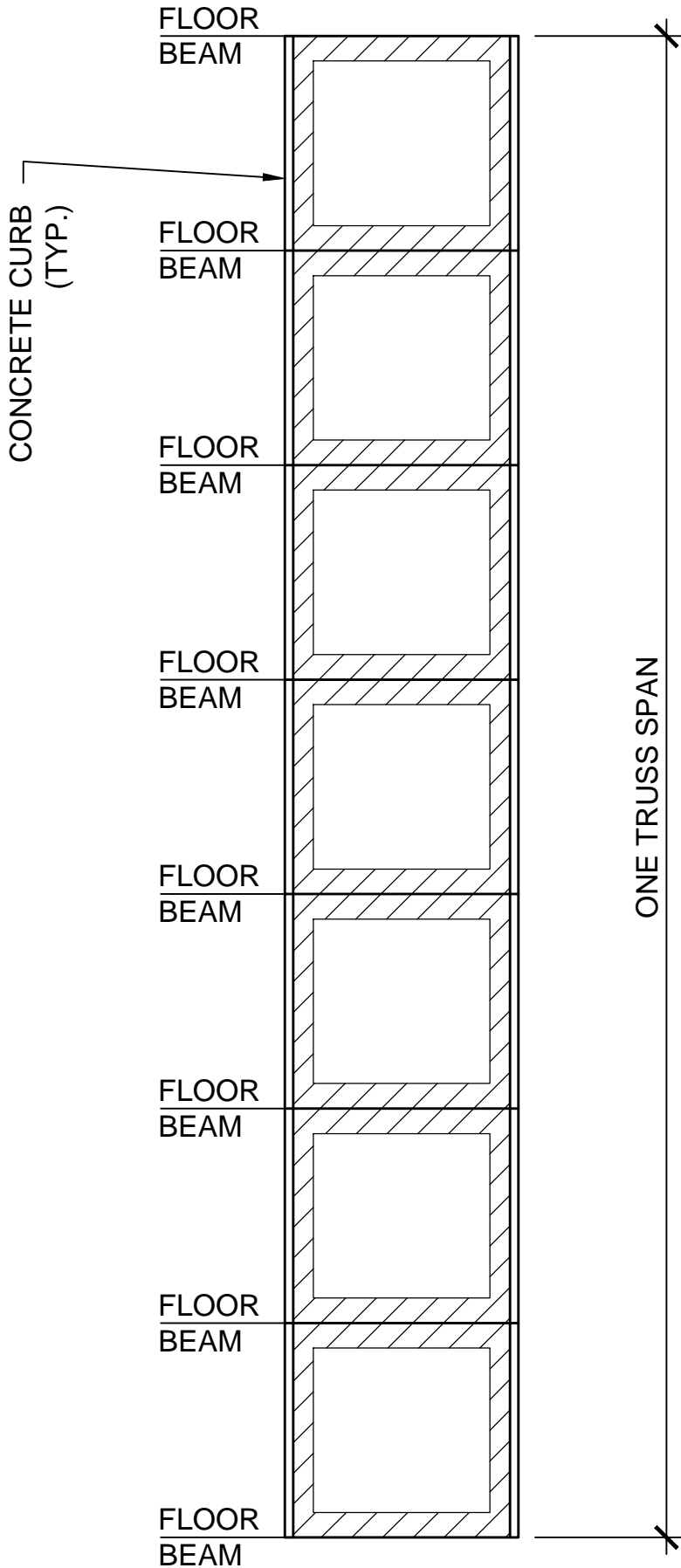
On 9/14/15, a hole was discovered in the concrete bridge deck. This hole is approximately 2' x 2' in area and located in the eastbound lane near the first floor beam east of the western abutment. In light of this discovery, the bridge was closed that same day. KLJ inspected the bridge deck on 9/17/15 to evaluate the extent of concrete deterioration. The purpose of this memorandum is to detail the findings of that inspection.

Inspection Findings

KLJ used chains to approximate where the areas of the concrete deck are unsound. Chaining is a technique that is commonly used to detect delaminations in concrete. The chain is dragged along the concrete surface and distinct hollow sounds can be heard when delaminations are encountered. It should be noted that the chain survey that was conducted only gives an approximate idea of where the unsound concrete areas can be found. In order to get a more precise idea of the unsound concrete areas, the areas would have to be marked and measured as they were chained.

Unsound concrete was detected around all of the asphalt-patched areas near floor beams and typically extended 3'-4' beyond the patching limits. The hole that has already developed was at one such patched area over a floor beam. Unsound concrete was also detected inside both curbs for the entire length of the bridge. These areas seemed to range from 2'-3' inside the curbs. The attached exhibit (Exhibit A) shows the approximate areas where unsound concrete was discovered. Based on this initial survey, the percentage of the concrete deck that may contain unsound concrete ranges between 40%-50%.

A chain survey will not reveal the depths of the unsound concrete. Based on the hole that that recently formed in the deck, it is likely that the deteriorated concrete extends nearly full depth in the areas over the floor beams. Depths of the unsound concrete would have to ultimately be verified with concrete coring. At this point, our recommendation is to further investigate the extent of deterioration of the concrete deck prior to initiating any repairs or reopening the bridge.



APPROXIMATE AREA
OF UNSOUND CONCRETE

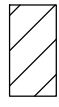


EXHIBIT A