

## Meadow Way Bridge Repairs Project Description

Meadow Way Bridge is a wooden trestle-type bridge constructed in early 1950s over San Anselmo Creek in the town of Fairfax. Meadow Way begins at Cascade Drive, crosses the creek a block further, comes to a T-intersection, runs in both directions and dead ends after a short distance of a block or two each way. This bridge is the single access structure across the creek to and from approximately 30 homes on the other side. Its safe, uninterrupted service and operation is extremely important for this reason.

The primarily 4-span wooden bridge deck is carried by longitudinal timber and steel beams. The beams frame into transverse wooden beams supported on five sets of three driven timber pile extensions. The supports are labeled Abutment 1, Piers 2 through 4 and Abutment 5. At the deepest part of the creek, the deck is approximately 20 feet above the creek. It appears that the piles and most of the wood beams and stringers are soaked with creosote from the time of the original construction. There are no bridge record drawings or reports available on file from the original design and construction. However, an inventory of the bridge's super- and substructure members and dimensions has been performed and an "as-built" Bridge General Plan has been prepared and included.

The bridge was inspected by Caltrans in 2014 as part of the State's Biennial Bridge Inspection Program and a Bridge Inspection Report (BIR) was issued. The bridge has a low Sufficiency Rating according to the Caltrans BIR and is Functionally Obsolete (FO) because of its narrow width. The bridge is currently programmed for replacement construction starting in 2018 because of its generally poor condition and going through design and environmental studies.

Caltrans returned to the site in July 2015 to re-inspect the bridge as part of the State's quality control program and because of the bridge's condition, age and its timber materials. The 2015 inspection revealed two critical deficiencies that need immediate repairs. First, the wooden 12" x 12" transverse cap beam on top of the piles at Abutment 5, supporting stringers that carry the bridge deck, is dry-rotted. Secondly, one pile head at Pier 3, supporting a similar wooden cap beam, has split. Caltrans has stated the current conditions cannot wait to be addressed when the bridge is replaced several years from now. Caltrans has directed the Town to make these repairs within six months of notification in August 2015, or the



Meadow Way Bridge - Pier 4 (foreground) & Abutment 5 (back)

bridge will have to be closed. The dry season runs through October 15 and construction in the Creek will not be allowed until April 15, 2016, which will be too late. For this reason, the Town has decided to make the repairs immediately and finish them in September 2015 and, certainly, before October 15.

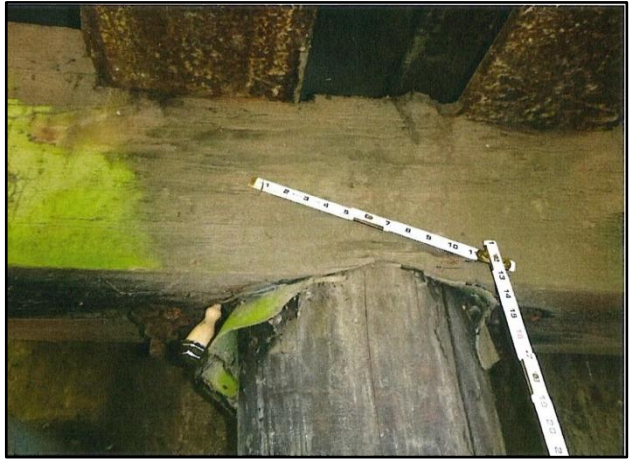
The Fairfax Town Council adopted an emergency resolution for the repairs on September 2, 2015. The Town will hire a licensed contractor to make the repairs and pay for them from its own reserves. The repair work will be done from down below and through access gained to the upper portion of the bridge supports from the creek bed. Access to the bridge's underside will be on foot and mainly from the creek bank on the northwest corner of the structure, down a short and windy earthen path. The small equipment and tools needed for the work, as well as the construction materials will be hand carried down this path. As of this permit application, the creek bed is completely dry.

The repair work will be simple and mostly manual. The equipment used will be a generator, an electric

concrete drill, electric saws, ladders and an assortment of other small power and hand tools. A pickup truck or two will be used to transport materials and personnel. Limited parking is available off road on top. No flow or flow diversion is expected in the creek during the operations. There will be no excavation or fill taking place anywhere on the job site. Beside small amounts of wood cuttings and concrete dust from drilling six holes, no appreciable debris will be generated. Such refuse will be collected and hauled away. If any creosote-laden wood is removed from the existing bridge, it will be contained and disposed of properly in a specially designated landfill site. The steel beams are not painted and no lead paint chips will be present. All equipment and materials not used for construction will be collected and taken away. Foot and vehicular traffic will continue on the bridge during the operations. Engineering staff will be observing the contractor's work and ensure any permit conditions are complied with. The entire work is expected to take no longer than one week.

The following narrative describes the specific repair work at each of the two bridge locations:

**Cap Beam at Abutment 5** – At this location, the bridge deck and stringers are supported on a 12" x 12" by 14-foot long wooden beam that sits atop three vertical 12" diameter wooden piles. The above-ground lengths of three piles have been encased in a thick concrete platform to within four feet of the bottom of the longitudinal stringers that carry the deck. Access to the abutment concrete platform will be achieved by using ladders placed on the dry creek bed.



Crushed cap Beam at Abutment 5

The repairs will start with standing three pieces of 12' x 12" x 2'-9" long wooden blocks on top of the platform, one next to each existing pile. Each wooden block will be fastened to the platform using two prefabricated galvanized steel brackets that bolt to the block and the platform. To fasten each bracket to the concrete platform a six-inch long hole will be drilled into the concrete (total of six). The holes will be filled with special epoxy cement, an all-thread rod will be placed in each hole and the epoxy is allowed to set up. The three wooden blocks will also be strapped to the existing pile heads above the concrete platform. Next, a new 12" x 12" beam will be placed on top of the wood blocks and attached to them using two L-shaped galvanized brackets at each location (total of six). The new transverse beam will reach the bottom of the steel stringers and any gap remaining between the wood stringers and the beam will be filled with short lengths of wood and wedges until all stringers bear on the beam completely. The dry-rotted beam and the existing pile heads will remain in place and, as the old beam slowly disintegrates, the deck loading transfers to the new auxiliary beam and blocks.

**Pile Head at Pier 3** – The top of the leftmost pile at this location will be banded to contain the pile head and stop the splitting. Each band will consist of one-inch wide, 3/32-inch thick steel bars formed into two semi-circular fasteners clamped around the top of the split pile head with two sets of bolts, nuts and washers. Three sets of such bands will be used next to each other at the top. The location of the repair is approximately 18 feet above the creek bed and will be accessed using ladders.



Split Pile Head at Pier 3