



US Army Corps of Engineers
St. Paul District

Dam Bridge & Gate Painting: USAF thru LD10

Location/Description

The St. Paul District operates and maintains 13 Locks and Dams (LD) beginning at Upper St. Anthony Falls (USAF) in downtown Minneapolis and ending at LD10 in Guttenberg, Iowa. Each of the 13 LD's represents a critical step in the "stairway of water" that makes navigation possible between Minneapolis and St. Louis. These facilities are aging structures, with LD2 through LD10 originally constructed in the 1930's, LD1 in the 1910's and 1920's, Lower St. Anthony Falls in the 1950's, and USAF in the late 1950's/early 1960's. All sites have a dam bridge and dam gates, with the exception of USAF and LD1, which have pedestrian bridges only. The dam gates are one of the most critical components at the sites, as they are manipulated on a daily basis in order to maintain proper pool elevation for navigation, environmental, water supply, and flood control purposes. The dam bridges support the machinery and chains that make the operation of the gates possible.

Status

When originally constructed, the steel dam bridges and gates were coated with "lead-based" paint to protect the individual steel components of these structures from corrosion due to the severe environment to which they are exposed; the majority of the time the gates are submerged or partially submerged in flowing water and subsequently subjected to abrasion from sediment and debris load carried by the river, as well as impact loads from large floating trees and ice. The paint systems are also exposed to significant temperature extremes ranging from sub-zero degree temperatures during the winter to over 100°F plus temperatures in the summer. All of these factors, including the UV effects of the sun, work together in degrading the paint system on the dam bridges and gates.

In addition to the degradation of the paint systems described above, the elimination of the lead-based paint on the original structures is being performed to protect the environment and personnel from the potentially harmful effects of the lead. To date, all the dam gates have had their lead-based paint removed, but only four of the dam bridges have been sandblasted and painted; the remainder have never been painted since their original construction in the 1930's.

The life expectancy based on current paint system technology ranges from 15 years to 25 years depending on the elements to which the paint system is subjected.

Fiscal

The average cost of sandblasting and painting (in today's dollars) is estimated at approximately \$1.6 million per bridge structure, and \$2.5 million for dam gates per site. Protection of the substantial investment that has been made in this critical component of the Nation's inland waterways infrastructure through proactive preventive maintenance is sound, justifiable, and prudent, especially when compared with the replacement cost of a lock and dam structure, which is routinely estimated in today's dollars to be in the billions.



Lock & Dam 2 in Hastings, MN during high flows in April 2001 (view from upstream side of dam of floating debris and trees impacting the dam bridge and gates)