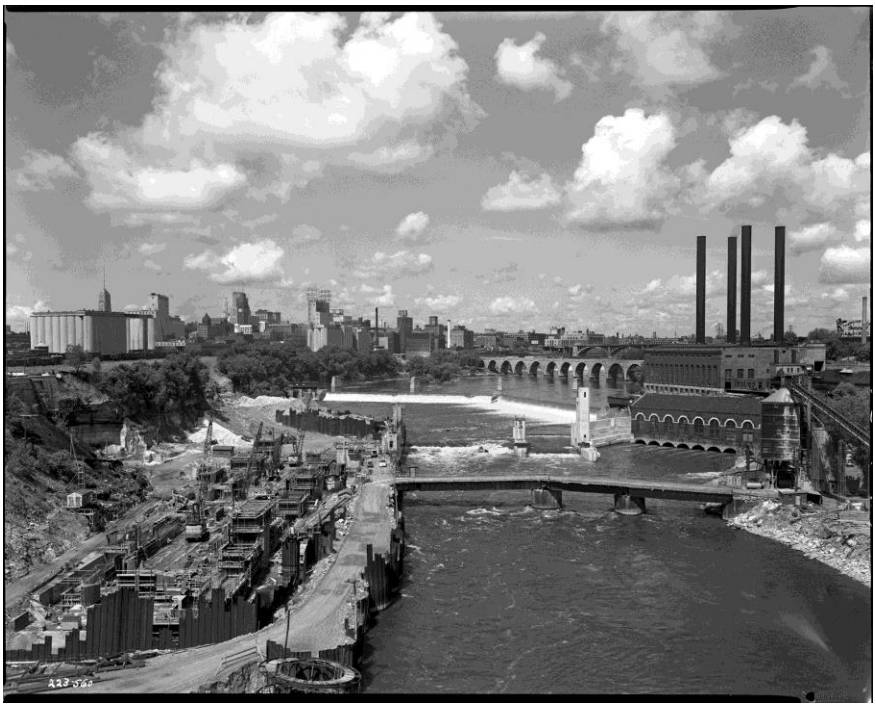
Civil Engineers: Designers and Builders of the Quality of Life

The Upper Harbor Project

Reprint of past article by Paul D. Schimnowski, M.ASCE

As early as the 1850s, settlers in the Minneapolis area considered the idea of extending navigation above St. Anthony Falls. The idea continued to be debated for the next 80 years until Congress finally approved the Upper Minneapolis Harbor Development Project in 1937, fulfilling a long-awaited vision to expand river navigation above Minneapolis.

As early as 1832, the Corp of Engineers had been working to better the navigation of the Mississippi River. Construction wing dams constricted the river, and side channels were closed off. These measures forced the river down a narrower passage, allowing it to cut through sand and debris in the main channel. Beginning with a 4 ½ foot deep channel, then a 6-foot channel in 1907, Congress authorized the Corp of Engineers to increase the channel depth to 9 feet through the construction of locks and dams on the Mississippi River. However, the presence of St. Anthony Falls created a difficult barrier for navigation north of Minneapolis.



Skyline view of Minneapolis showing upper harbor construction below St. Anthony Falls.
MN Historical Society Photo

Before the construction of the Upper Harbor Project, the 9 foot channel extended to the Northern Pacific Railway Bridge upstream of Washington Avenue. This project would extend the 9 foot channel in the Mississippi River by an additional four and a half miles. But because of World War II, numerous economic problems, and lengthy

engineering studies, construction of the Minneapolis Upper Harbor Project was delayed until 1948. The Upper Harbor Project included the construction of the Upper Lock and the Lower Lock and Dam, along with dredging a channel 9 feet deep and 150 feet wide.

The fragile geology of the St. Anthony Falls area and the highly congested nearby development called for a different approach from conventional design and construction practices for the project. In 1939, the Corps built a 1:50 scale model of the project site at the St. Anthony Falls Hydraulic Laboratory at the University of Minnesota.

Making matters more complicated, three railroad bridges ran through the project area. Without discontinuing rail service, the Corps replaced parts of the original bridges with steel trusses to allow the passage of river vessels. Modifying the Great Northern Railway's Stone Arch Bridge presented the most complex engineering problem. Because it was not practical to reroute the large number of trains that used the bridge, the Corps had to remove one pier and two spans of the structure without disrupting train traffic. To erect the truss and remove two arch spans under these conditions, the railroad grade was raised five feet and the trains were limited to a single track.

The completion of the Upper and Lower St. Anthony Falls locks made navigation possible for numerous vessels over the Mississippi River's only waterfall. This allowed the region to compete economically due to the ease of navigation. The project dramatically changed the St. Anthony Falls area and fulfilled a century-old dream to extend river navigation above Minneapolis thanks to civil engineers working to better the infrastructure around us.