

*Design Profile*  
*U.S. Department of Navy*  
*D Street Bridge*  
 GREAT LAKES NAVAL STATION, ILLINOIS  
 Issue #07 - 2010



Architecture  
 Interiors  
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 Construction

Creative Solutions for a Sustainable Future

## U.S. Department of Navy D Street Bridge

GREAT LAKES NAVAL STATION, ILLINOIS



Epstein provided civil, mechanical, electrical and structural engineering services for the design/build replacement of a 300-foot Span of D Street across a 30-foot ravine and Pettibone Creek at the Great Lakes Naval Station. The existing 50-year old two-lane bridge consisted of three spans of reinforced concrete beams monolithic with the deck. Existing water, gas, steam, condensate, electrical and communication utilities were suspended from the deck for the full length of the bridge. The replaced bridge is a two-lane, three-span, precast, post-tensioned Bulb-T beam superstructure with a cast-in-place deck. The D Street Bridge substructure was replaced down to footings and the existing footings were extended and reused.

The project also involved sanitary sewer relocation from a nearby existing trestle to the new bridge; water main replacement; steam and condensate replacement as well as gas, electrical and communications replacements. NAVFAC required a 6' pedestrian bridge to allow uninterrupted access for the pedestrians across the ravine during construction.

One of the challenges of the project was to remove and replace the bridge without interruption to the many utilities attached

to the bridge. The solution was to install temporary utilities both under the ravine via directional bore and over the ravine via a 10' prefabricated Warren truss steel bridge with a secure barrier between the pedestrians and the utilities. This was wide enough to allow room for utility installation and the required 6' walkway. The temporary utilities were supported by the concrete deck and attached to the truss. This solution proved to be the least expensive and quickest installation.

For the installation of the permanent utilities, Epstein worked closely with the subcontractors to design a utility routing that worked for each subcontractor and also worked as a whole unit.

In the end, all but one of the bays have multiple utilities hanging from steel channels welded to plates embedded in the precast Bulb-T beams. Heavy coordination was required throughout construction with the beam fabricator, subcontractors and the fluctuating utility layouts in order to ensure no re-work or time delays.



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A: Utility Line Subsurface Access Platform  
 C: D-Street Bridge (Campus View)

B: Utility Line Detail  
 D: D-Street Bridge View (Entrance View)



E: D-Street Elevation (Campus View)  
F: Railing Detail  
G: D-Street Elevation from Ravine  
H: Subsurface View of Utility Lines

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## About the *Design Profile*



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Epstein's *Design Profile* is a brief in-house publication addressing our recent design and construction projects and discussing today's industry challenges.

Since 1958, the *Design Profile* has covered our project history, from warehouse and distribution facilities to award-winning architecture and interior design projects.

Now in our fifth decade of publishing the *Design Profile* has now transformed into a completely electronic publication. In an effort to be as sustainable an organization as possible we no longer print and distribute the *Design Profile* via traditional mail. Each issue is now "published" to our readers through an e-mail message that is linked to our website. We hope that this little step in sustainability inspires you to find opportunities to become "green" with your publications/communications.