



Who Should Inspect Our Bridges?

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Since the tragic collapse of the I-35W Bridge in Minneapolis this past year, much attention has been focused on our nation's bridge inspection policies, intensities, and frequencies. With 25% of our 600,000 highway bridges structurally deficient or functionally obsolete, one area that should be discussed further is the qualifications of the Inspection Team Leader – the individual who is responsible for the day-to-day inspection and reporting of the condition of each of our nation's highway bridges.

The National Bridge Inspection Standards have five stated ways to be qualified to be a Team Leader. These range from a combination of registered professional engineer or ten years bridge inspection experience with a FHWA-approved comprehensive bridge inspection training course down to an Associates Degree in engineering or engineering technology with four years of bridge inspection experience and the FHWA course. Each state sets its own requirements based on these federal qualifications, and the results vary from a technician Team Leader to a Professional Engineer Team Leader inspecting bridges. The technician level may be sufficient for simple span highway overpasses, but additional qualifications are needed for bridges beyond the simple.

In my opinion, Inspection Team Leaders should ideally have all of the following educational requirements, experience, training, and licensure to perform bridge inspection:

- Bachelor's Degree in Civil and/or Structural Engineering
- Bridge design and rating experience
- Experience in bridge inspection and inspection equipment
- State- or federally-sponsored bridge inspection courses
- Professional Engineer license

The civil and/or structural engineering degree provides basic understanding of the principles of bridge structures, materials, and their properties; analysis of dead, live, and secondary loads; and the effects of these loads on the various types of bridge structures and their supports.

Bridge design experience takes the basics learned in college and expands them to the real world design, including factors such as sizing of bridge components, moving live loads and load paths, types of stresses and their locations, desirable and undesirable types of connections, failure mechanisms, and the differences between bridge types and materials. Bridge rating experience brings the inspector into the world of deterioration, distortion and buckling, and the effects these have on bridge capacity and stability. Bridge design and rating experience gives Team Leaders knowledge of the importance of what they are evaluating. Is the bridge deficiency critical? Should all traffic be stopped immediately? What emergency repairs or posting could be designed and where? These are some of the questions that

can be answered based on experience.

Interestingly, this is a two-way street, as beginning bridge designers should also have bridge inspection experience to give them an appreciation of types of bridges and structural materials, real component sizes, bridge access, and the peculiarities of bridge connections and details – or the “art” part of the art and science of engineering.

Experience in bridge inspection and inspection equipment can be obtained working under knowledgeable Team Leaders. An effective Team Leader should have hands-on field experience in determining what equipment to use to gain access to bridge components; what equipment is appropriate to measure, detect, and explore field conditions; how to report bridge conditions; what types of bridges are in service; and where to look for cracks, losses, and imperfections in the bridge.

State- or federally-sponsored comprehensive bridge inspection courses which offer both field and classroom time provide instruction to the Team Leader, but also measure his/her quality and effectiveness. Advanced courses can also offer updates on complex bridge structures and on special or new bridge inspection techniques as they become available.

Lastly, an Inspection Team Leader should be a Registered Professional Engineer. A Professional Engineer is an individual who, through education and training, practical experience, and rigorous examination has been granted the privilege to practice engineering by a specific jurisdiction in his or her field of expertise, and has the legal mandate and ethical obligation to protect the public's health and safety. Insuring that a bridge is in safe, serviceable condition falls under this legal mandate and ethical obligation.

With our aging infrastructure, the integrity of our bridges must be certified by the most qualified individuals who are licensed and trained to provide the quality inspection and reporting that the public expects and deserves. ■



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