

3-D Visualization for Inspection and Management of Complex Bridges

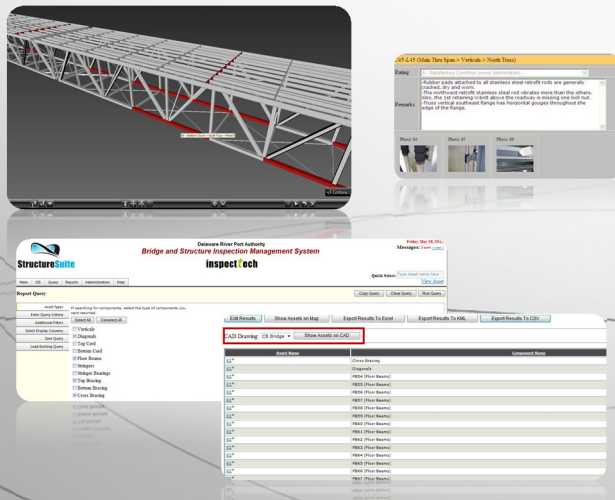


Background

InspectTech software has incorporated a 3-D Visualization tool to help improve the management of complex bridges and extend the manager's visibility to the most meticulous level of detail. The software enables agencies to hierarchically bridge into thousands of sub-components, allowing information to be collected and entered for any specific component of the bridge, within an inspection report. Communication between InspectTech and various entities helped identify and define this need for large and complex transportation infrastructure. Today, this tool is being used on several complex and critical bridges such as the Commodore Barry Bridge, the longest Cantilever Thru Truss Bridge in the U.S. and the West Gate Bridge in Port Melbourne, Australia. Inspection and maintenance data can be captured and organized, allowing users the ability to query any information and return the results within the 3-D module for easy identification and viewing. This customizable tool has the potential to incorporate various other critical infrastructure owned and operated by asset owners all around the world.

Inspection and Management

The 3-D model provides inspection and management information with a click of a button. Users can select a specific component within the model and the software will generate all information in a separate window. This is proving to be one of the most useful features of the 3-D model. History, ratings, calculations, notes, sketches, pictures, and other files all associated with the component are generated and displayed directly on the screen. Users can update information, add new files, supply notes, and even change ratings as needed. This reduces the need for inspectors and managers alike to open and review inspection reports to find information. Instead, users can now click on the component to get all information within seconds.



Full Searching and 3-D Visualization

Managers are able to search across any field or combination of fields within the Manager component. Searches can be constructed on all condition ratings, inventory data, maintenance information, and other important fields. For example, if a manager needs to quickly identify all steel fracture critical components with ratings of 6 or less, he or she can complete that query and retrieve results in just a couple of seconds. Queries ranging from very simple to extremely complex can be created and saved for ongoing usage. Results are displayed in grid form and enable users to export the returned results to a number of GIS and 3-D tools without the need to install additional, costly software.



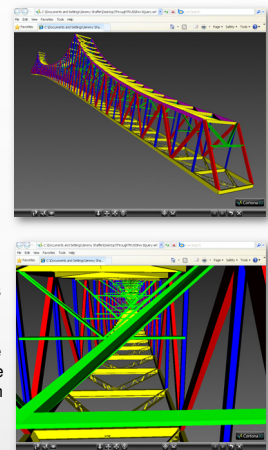
The 3-D module dramatically enhances the presentation of a wide variety of data for the complex bridge, and more clearly shows the relationship of bridge components. As you can see in the example directly above, the 3-D model highlights the components returned during a query for the Commodore Barry Bridge. The results from the query are highlighted red and are clearly identifiable in the model. This allows users to have a better understanding of the results in terms of the bridge as a single unit without diving into numbers and various reports.

Queried Results

Queries help drive the 3-D tool. Users will begin by choosing which bridge components to include within the query and add specific characteristics to limit results to exactly what is needed. Colors shown within the 3-D module demonstrate component type (top chord, diagonals, verticals, etc.) This approach saves significant time locating the exact components, as well as provides information at the manager's fingertips for decision making. For example, users are able to interactively click any identified component within the module and instantly retrieve its summary information, historical data, condition ratings, pictures, manuals, sketches, and associated maintenance needs. All of this information comes into play when making critical investment or repair decisions concerning the bridge. The query results can also be displayed in other formats such as a map, excel file, KML, and/or CSV. The initial query screen and a sample of the generated results are shown directly to the left.

Simple Navigation Tools

Using the 3-D Visualization model, users can interactively "fly-through" and zoom in and out of the structure. This can be utilized by inspectors and data entry personnel as well to enter data by clicking on an individual item. A variety of views are available which provide multiple angles and viewpoints of the bridge, and the module has simple user controls to navigate the screen. By scrolling the mouse over an individual component, users can view that component's name and location in a pop-up format. If a particular component requires further review, users can click on that component, and a separate window will appear to display its information. The software enables a "drill-down" feature which involves clicking on a picture to see enlarged views of defects with additional detail. This tool can be applied to the most detailed component level(s) desired by the agency. Finally, the module allows users to turn on/off layers of the bridge to see certain components by themselves, without the cluster of the various other bridge components in the way. This provides extended user control and facilitates fast and efficient location of components.



The model provides a detailed navigation menu which enables users to view the model in various ways.

Conclusion

Any organization can benefit from a 3-D model of their large and/or complex infrastructure. InspectTech developers have the ability to provide an exact replication of the bridge or other large asset and can help agencies better understand the health and condition of their complex assets by highlighting/summarizing each element and providing a clear representation of all relevant information associated with making informative decisions.

