RM Bridge Has Established A Reputation In The Industry And Can Meet The Requirements Of The Most Demanding Projects

I think RM Bridge's widespread recognition comes from its use on some of the most complex and high-profile landmark bridge projects in the world. These are mainly cable-supported bridges - cable-stayed and suspension bridges - and arch structures, where cables are used during the erection procedure. RM Bridge also is the first application developed to solve for bridge engineers the very demanding and expensive problem of deriving an optimal sequence for the tensioning of the cable stays in a very short time, saving time and money. Over the past 15 years, the software has been enhanced, becoming easy to use on all types of bridges, including short span bridges requiring only static analysis. Users have provided us with valuable feedback on the enhancements they require, and our development team has paid attention and come up with innovations that directly address these technical requests. Says Ms. Vanja Samec, PhD—Global Director - RM Bridge, Bentley Systems, in an interaction with CE&CR on Bentley RM Bridge software.

CE&CR: **What advantages does RM Bridge provide to bridge engineers?**

_V.S._: RM Bridge has been used by bridge engineers for more than 30 years, and I think this long track record of successful implementations is its first advantage. In addition, RM Bridge was developed by bridge engineers for bridge engineers, which is in keeping with Bentley's commitment to working smarter, together with our users to develop innovations that meet their needs, while providing them industry-leading, continuous support to further ensure the success of their projects.

RM Bridge is a proven technology that our users rely on for all types of bridge projects including the most demanding and complex bridge structures. The software is part of a unique solution for linear, non-linear, static and dynamic problems for concrete, steel, cable supported (cable-stayed, arch, suspension) bridges that can be built in different erection procedures: incremental launching, cantilever, stage per stage, pre-cast segmental, and more. Being able to use one tool for any bridge problem and project is a great advantage for bridge engineers—eliminating the need to master multiple software products, reducing software costs, increasing productivity, and more. Better still, the application is not only technically advanced but also simple to use - with many built-in wizards, templates, etc.

Another significant advantage of RM Bridge is its support of international standards, not only for analysis but also for design. This is crucially important given that today's bridge engineers work on projects around the globe. Moreover, decades of experience on worldwide reference projects and design code checks have been incorporated in the capabilities of RM Bridge.

Bentley further brings to bridge engineers the complete solutions that are required to satisfy the very tight deadlines of international projects. The software's interoperability within the BrIM (bridge information modeling) framework of Bentley applications - starting with road/rail software followed by planning/analysis/design by RM Bridge in 4D space -delivers with one click all the rebar, pre-stressing tendons, and full 3D geometry.
information to steel detailing software. This, in our view, represents huge time savings.

Bentley's innovative BrIM solution is a revolutionary approach to the bridge market. Bridge engineers can use the same data over the bridge life cycle, which eliminates human errors and saves time. This results in significant returns on investment for bridge modification projects, which are part of every major bridge's life cycle. The information model includes interaction of the bridge object with other associated infrastructure objects, such as roads and interchanges; this allows engineers to work in a single environment, without needing to export and import data, thereby eliminating most of the errors that result from integrating multiple systems.

**CE&CR: In which countries has RM Bridge been used for bridge design and engineering?**

**V.S.:** Bentley and its RM Bridge software is well-known in all the major countries around the world where bridge infrastructure plays an important role, as well as by the world’s top bridge consultants, who regularly rely on Bentley not only for its bridge software, but also its technical know-how in bridge design and construction. Thousands of bridge projects of varying degrees of complexity have been successfully completed with the use of RM Bridge. But its use is highlighted by the design of cable-supported and suspension bridges as well as several high-speed rail projects with train speeds over 350 km per hour. It is also highly sought after for application environments that demand a highly reliable, high-tech bridge application, such as to design bridge structures being constructed in stormy, windy, or high-seismic areas with very dynamic security demands.

RM Bridge has established a reputation in the industry and can meet the requirements of the most demanding projects. Users have provided us with valuable feedback on the enhancements they require, and our development team has paid attention and come up with innovations that directly address these technical requests.

**CE&CR: What makes RM Bridge so popular?**

**V.S.:** I think RM Bridge’s widespread recognition comes from its use on some of the most complex and high-profile landmark bridge projects in the world. These are mainly cable-supported bridges – cable-stayed and suspension bridges - and arch structures, where cables are used during the erection procedure. RM Bridge also is the first application developed to solve for bridge engineers the very demanding and expensive problem of deriving an optimal sequence for the tensioning of the cable stays in a very short time, saving time and money. This advantage was a key factor in the initial popularity RM Bridge gained among leading bridge experts some 20 years. Cable-supported bridges are, indeed, complex and incorporate a lot of problems that can be solved within RM Bridge. Over the past 15 years, the software has been enhanced, becoming easy to use on all types of bridges, including short span bridges requiring only static analysis.

RM Bridge has established a reputation in the industry and can meet the requirements of the most demanding projects. Users have provided us with valuable feedback on the enhancements they require, and our development team has paid attention and come up with innovations that directly address these technical requests.
pinnacle of structural engineering—encompassing not only bridge structures but also ground/soil conditions, roads, rail, and much more. Similar products on the market were developed as an all-in-one solution for buildings first and added bridges as an extension. But it’s obvious that the slender, long structures that comprise bridges behave very differently than buildings. At Bentley, we believe in serving our clients with our know-how, with professional support, and with the implementation of their technical requirements.

**CE&CR: What do you think are the additional challenges today from the technology standpoint?**

**V.S.:** The productivity tools available today on the desktop are extremely powerful. But in order to address the increasing mobility
of engineers, Bentley is developing i-models and mobile apps that allow our users to perform important design, analysis, and review tasks in the field on mobile devices, such as the iPad. This doesn't mean that a complete bridge project can be calculated on an iPhone, but by employing i-models, which are containers for open information exchange, engineers can take important project information with them to the construction site and do, for example, project reviews in a secure environment – knowing that the data they are referencing is the right version. For example, Bentley just recently announced the availability of InspectTech Collector Mobile for use initially on the iPad. Used with Bentley’s InspectTech software-as-a-service offering, the new app empowers inspectors of transportation and infrastructure assets from bridges and culverts to signs, light poles, antenna towers, storm water networks, and more to quickly and effectively collect a range of inspection information, including photos and audio, in the field on their iPads. By expediting these inspections, InspectTech Collector Mobile enhances inspector productivity and saves owner-operators time and money. These types of new developments will benefit RM Bridge users to address needs across the entire bridge life cycle, enabling information reuse across multiple disciplines as well between the design, engineering, construction, and operation phases.

**CE&CR: What is Bentley Systems plan for the Indian market?**

**V.S.:** The bridge construction industry in India is rapidly developing and civil engineers and designers are eager to learn about the newest technology innovations and best practices. RM Bridge can ensure knowledge transfer to all bridge engineers, but this powerful, modularized solution will be of most interest to engineers dealing with more stage bridges, mid- and longer-span, and, of course, cable-supported and arch bridges. We have an excellent solution for an incremental launching methodology, for pre-cast segmental bridges (construction engineers), and cantilever structures can be calculated as well with the highest accuracy.

Our product is ready for the Indian market due to its integration of Indian standards, and we are proud that our solution is being used by very prominent Indian contractors, bridge designers, and consultants. We will continue to listen to our Indian bridge users and to incorporate their requirements, as necessary, into our software. We are committed to investing in our products and services and strongly encourage user feedback. This allows us to build a strong solution for the region.