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Make Your Mark on Design with

MicroStation®

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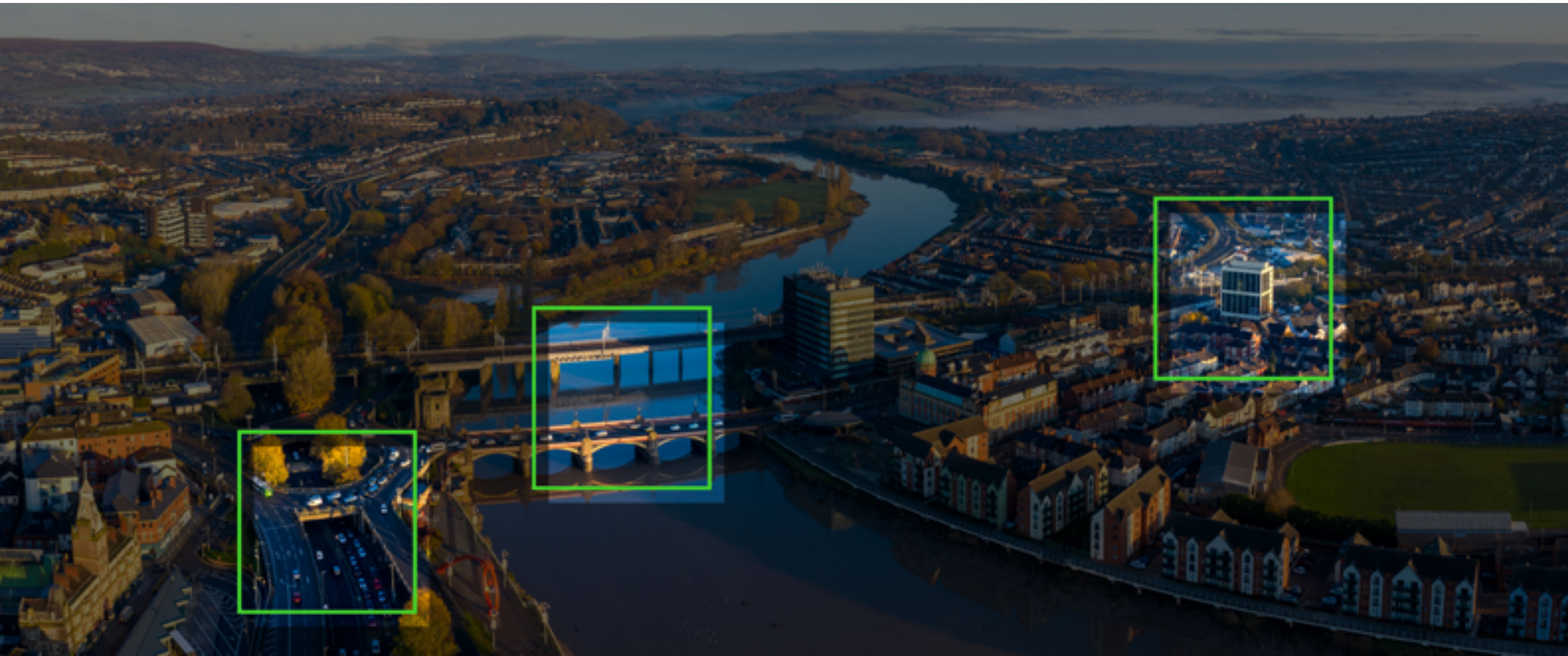
Introduction

The way that we design and deliver projects, the way that we plan our infrastructure, and the way that we build our communities are changing.

Design efficiency and productivity are crucial now that infrastructure design projects require increased costs, shorter duration requirements, updated standards, and new design techniques, all while facing limited engineering workforce capacity.

Now is the time for efficient and cost-effective technologies to plan, build, and repair infrastructure. And it all starts with CAD.

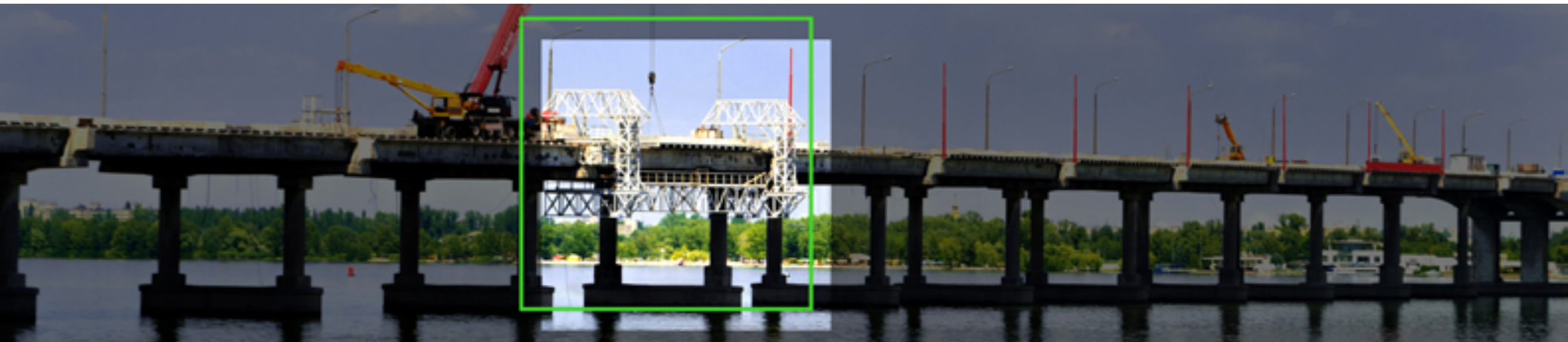


The Challenges Are Real

CAD designers, engineers, and architects—working on infrastructure projects from building design to bridge repair—are often presented with major design challenges, resulting in time delays, safety risks, and costly work.

Selecting a CAD platform is vital to the success of infrastructure projects to prevent the following:

- The inability to coordinate data in multiple formats results in errors, project delays, and a waste of time and money. With all the different applications used by the many different consultants that collaborate on design projects, a lack of interoperability among software products represents a huge risk.
- Delivering and using drawings and models that do not conform to standards introduces safety risks to field staff, causes errors, and leads to rework during construction. Using unstandardized drawings and models can result in losing future work and can damage the reputation of your organization.
- Software applications that cannot keep up with projects as they scale or support deliverable needs are a common struggle. Last-minute design changes and misunderstanding of design intent can cause costly delays and unexpected changes throughout the design process.



Meet MicroStation

MicroStation is the CAD solution professionals rely on to model, document, and manage infrastructure projects – better and faster. It is the solution that enables you to deliver innovative designs and creative visualizations and consolidates critical project elements in a single environment. With MicroStation, you have the power, control, efficiency, and security to reliably deliver the smallest to the largest and most demanding infrastructure projects.

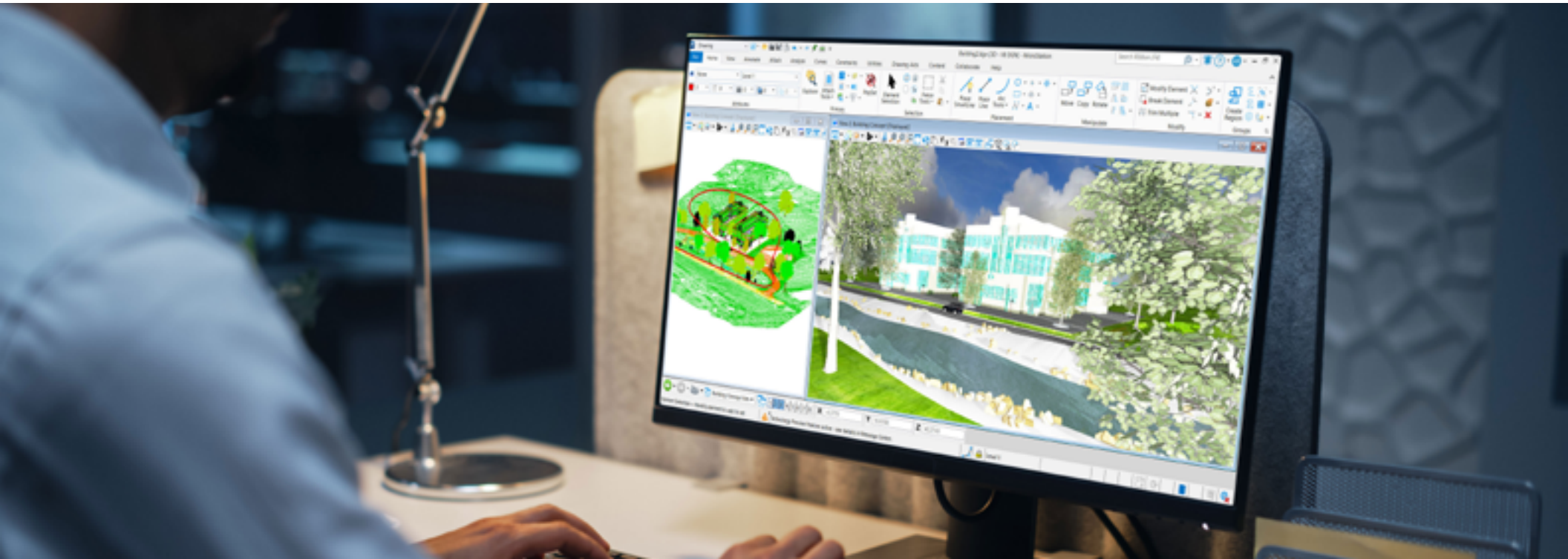
Explore MicroStation's features that users rely on around the world.

3D Modeling and Design

MicroStation provides a flexible 3D modeling approach to envision a design not constrained by 2D drawings.

MicroStation is not only a powerful 2D CAD application, but it also comes with a robust catalog of capabilities for 3D modeling. It offers the ability to create any type of 3D model, from buildings and structures to equipment or civil infrastructure, without the need for additional applications or a complex learning curve.

If a project requires more than simple drafting, MicroStation enables the ability to create highly complex geometry, large-scale, or extremely dense models on a tight timeline. MicroStation 3D modeling capabilities are reliable, fast, and include a wide range of mesh, solid, surface, and parametric modeling capabilities.



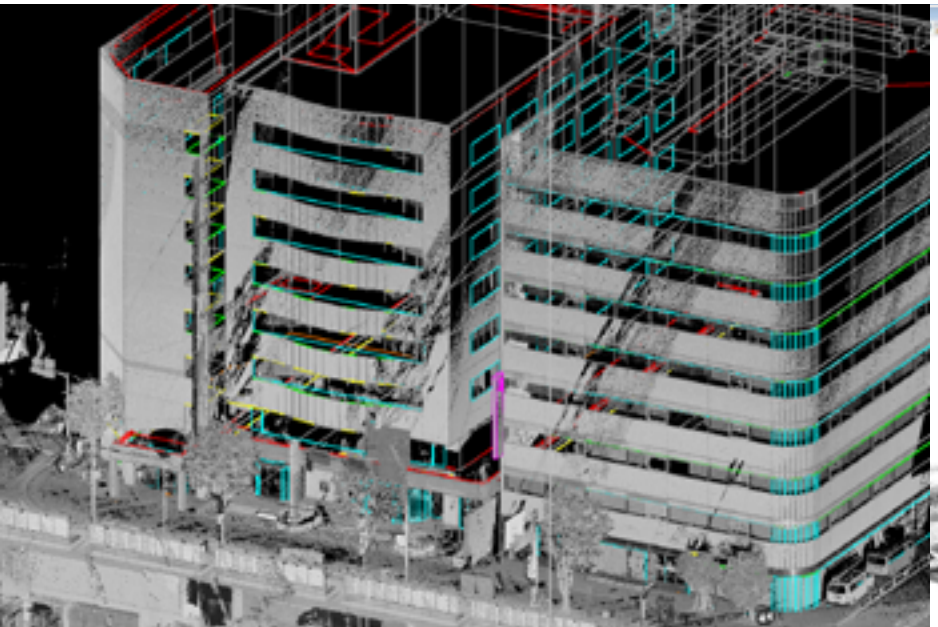
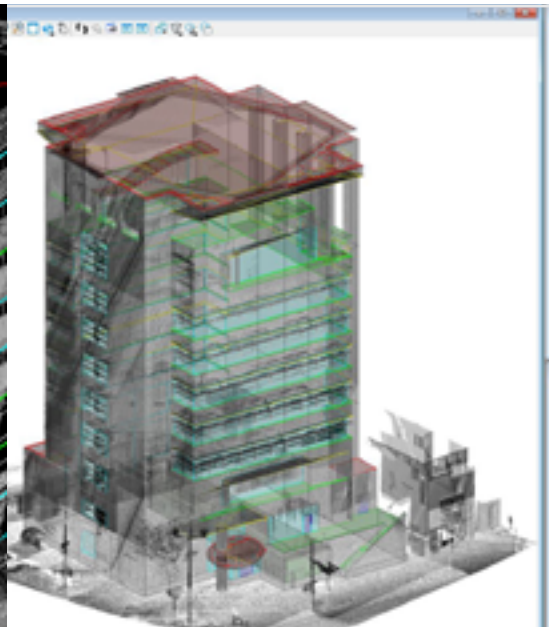
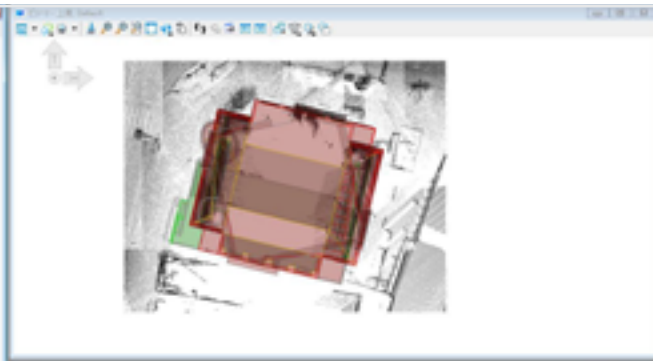
Project PLATEAU

Kokusai Kogyo Co., Ltd., Numazu, Shizuoka, and Kaga | *Ishikawa, Japan*

Project PLATEAU aims to develop Japan's largest-scale 3D city models for 56 cities and promote their use by releasing them as open platform data for urban activities and smart-city management. Kokusai Kogyo conducted 3D modeling for the project and implemented initiatives to achieve more detail. However, they faced challenges incorporating intricate spaces and complex features, such as underground passages and traffic infrastructure into their models.

Kokusai Kogyo selected MicroStation, enabling them to create 3D models with an unprecedented level of detail for 17 cities nationwide. Bentley's software improved workflow efficiencies, reducing resources hours by approximately 50%, and provided a platform to comfortably model the enormous point cloud data. The technology delivered highly detailed 3D models, achieving simulations that are closer to reality than previously possible, promoting smart city management throughout Japan.

Download Case Study


Geospatial Context

Geospatial context is where every design project starts. MicroStation brings geospatial data to the forefront of design projects, natively. The application enables multidiscipline teams to incorporate existing site conditions using reality as context for the design. Users can leverage geospatial information to design around existing infrastructure, analyze elevation challenges, or understand utility access.

MicroStation concentrates the full capabilities needed to create and access all types of contextual data in one place, as well as provides users with the ability to easily incorporate geospatial context—such as utilities, underground piping, types of soil, urban planning, or streets—directly into design files.

Digital City of Synergy

City of Helsinki | *Helsinki, Finland*

The Helsinki Digital Synergy project will integrate and utilize existing city models to add more value and support internal processes and public services. The project will also encourage engagement with the public, improve collaboration, and continue to support strategic goals for a sustainable, smart city. In addition to the existing city models, the project included the Helsinki City Environment Division, which is responsible for urban planning and development, a 3D team based in the mayor's office that creates 3D models of the city, and Forum Virium Helsinki, a company focused on smart city solutions. To work together and create a dynamic digital city, they realized that they needed an open digital city platform to overcome any technology and collaboration challenges.

The city of Helsinki uses MicroStation, ContextCapture™, and OpenCities® Map to generate and update a reality mesh and information model of the 500-square-mile city area for their digital twin, which includes CityGML. They established a connected data environment using ProjectWise® to ensure a single source of truth, with OpenCities Planner as the visualization and collaboration platform for all stakeholders, including the public. The open digital solution enables better decision making by connecting the right information to the right stakeholder and provides a reliable digitalized data infrastructure to support sustainable smart city initiatives. The city of Helsinki shares digital city data with the public to encourage dialogue and engagement.

Data Integration

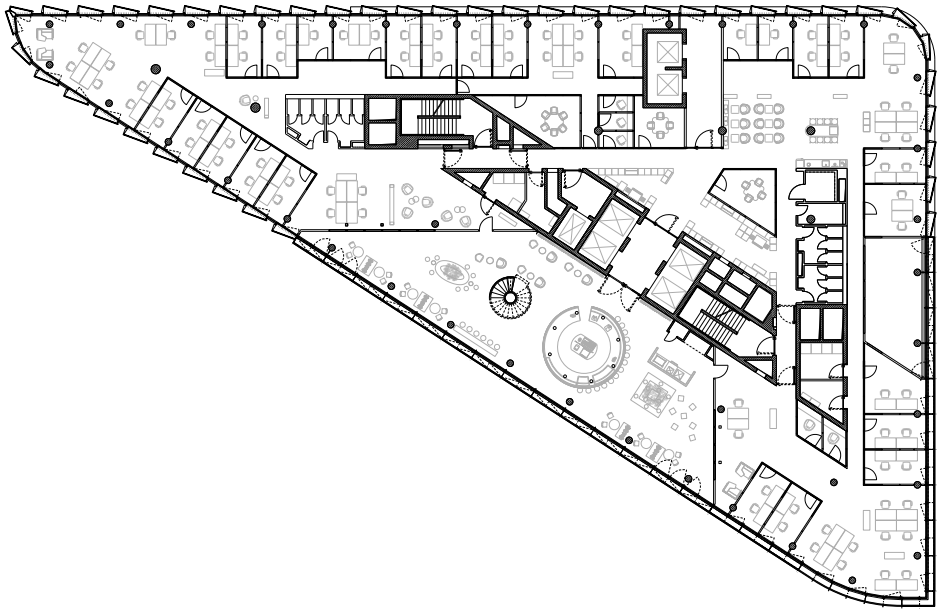
Infrastructure projects require enormous amounts of data generated throughout the lifecycle of a design project, which can be overwhelming or even unmanageable for many organizations. Storing and sharing this ever-increasing amount of information is a game changer for every step of the project lifecycle. MicroStation serves as a data integration application for all existing CAD and BIM environments, supporting more than 70 file formats without the need for translations. Therefore, it is the ideal application to share data from 2D drafting, to 3D modeling, to visualization. MicroStation creates a foundation for infrastructure projects and provides a single tool for a single source of truth.

Vertical Work Campus

Eclipse Düsseldorf, HPP Architekten GmbH | *Düsseldorf, North Rhine-Westphalia, Germany*

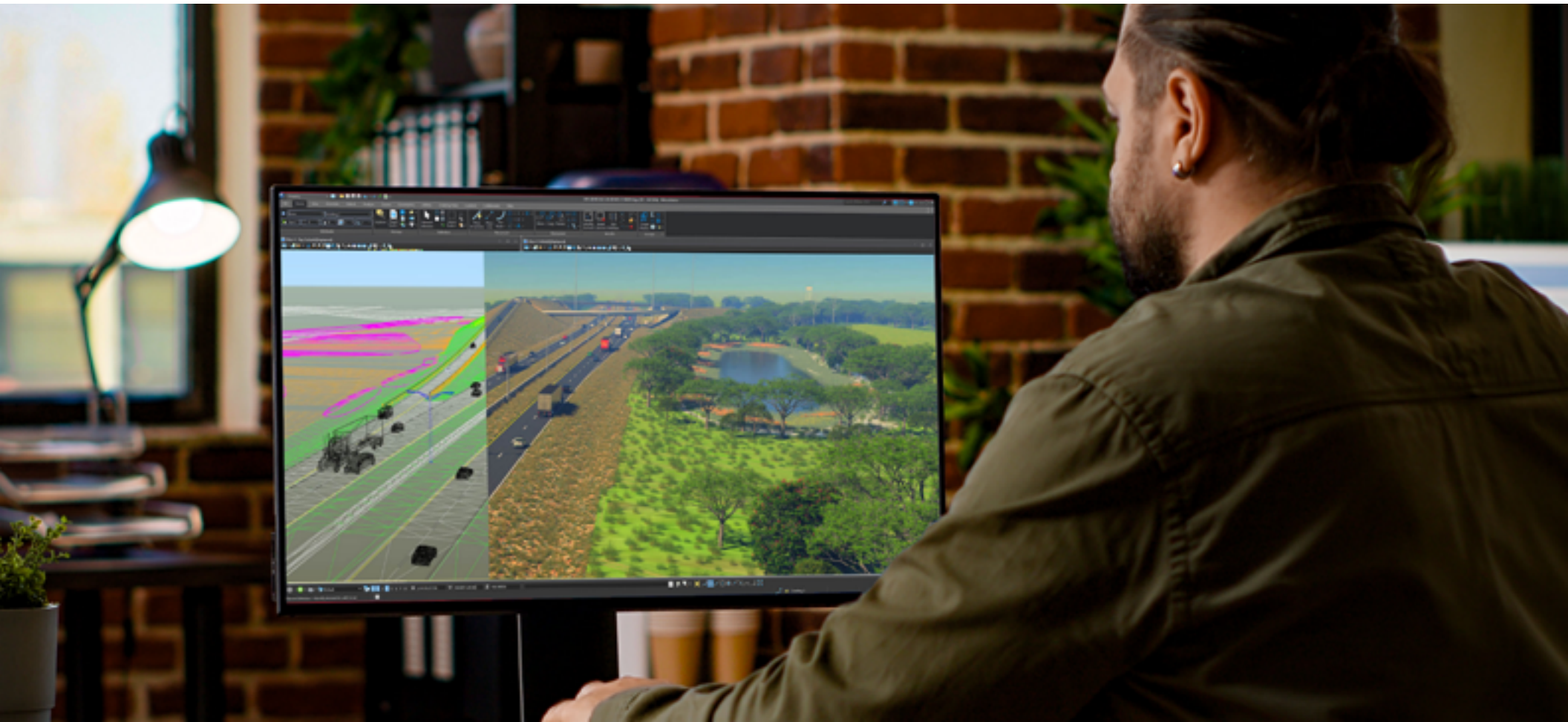
Forming the northern gateway to Düsseldorf, the 16-story Eclipse office tower is a modern, sustainable vertical campus based on the concept of being healthy, ecological, and future-oriented. HPP Architects is responsible for the project design and planning implementation. The team faced challenges maximizing outdoor recreation areas and managing a multidiscipline team that was using varying CAD-based platforms. They wanted to incorporate the recreation areas within the building's architectural concept and implement intelligent processes, requiring an innovative design and integrated digital approach.

To optimize space, ensure energy-saving and eco-friendly operations, and manage various disciplines and multiple CAD formats, they selected MicroStation to better automate and standardize workflows among the team and keep the project on schedule. The interoperability of Bentley's application with third-party technology enabled HPP to optimize technical operations and realize their smart, sustainable building concept, saving 200 tons of carbon dioxide annually, and allowing up to 15% of their rental space to be completely carbon neutral.



Scalability

MicroStation supports design projects large or small. Infrastructure projects tend to require CAD software that can handle the scale of an increasing data demand throughout a project lifecycle, which can be cumbersome, and over time, get larger and more complex. MicroStation can generate efficient 2D and 3D models for any size data set, without pesky crashes and loss of productivity due to unreliable systems.



Road Survey with LiDAR on Movable Support

ConsulCAD | *Perugia, Umbria, Italy*

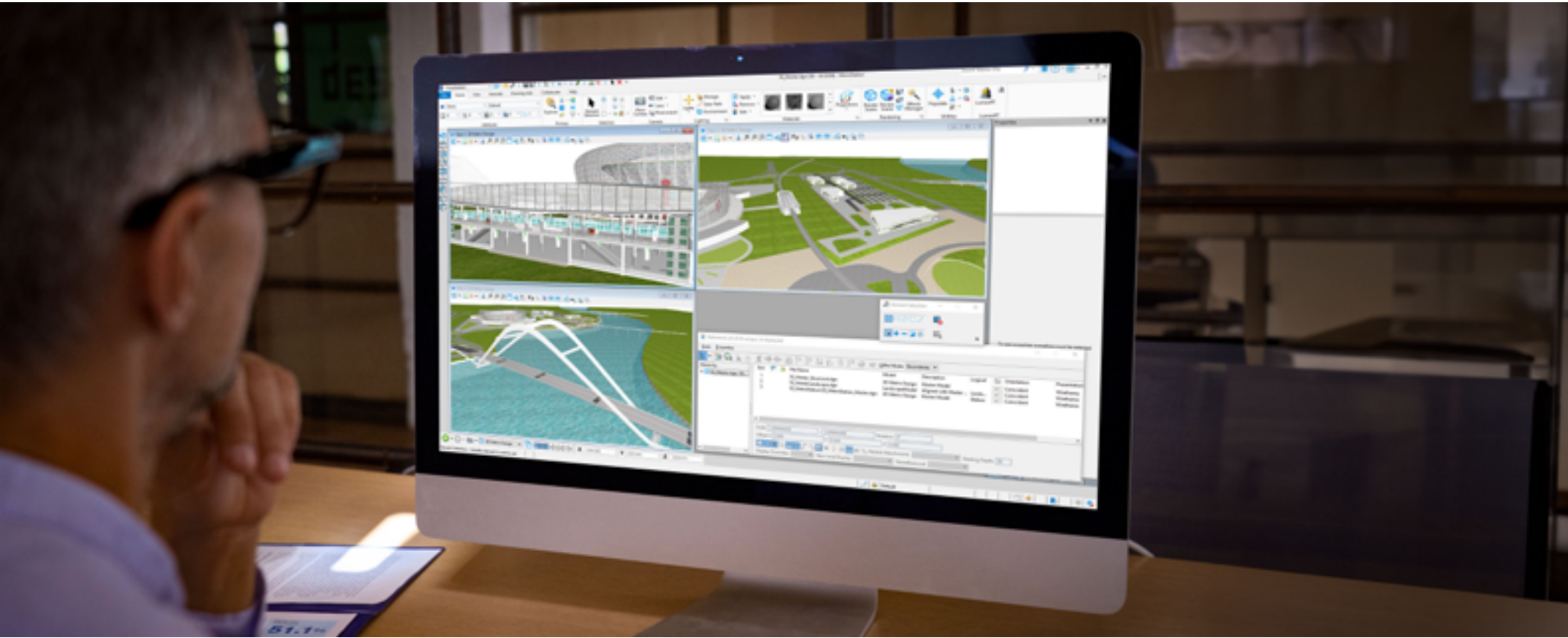
For this project, the client required a topographical survey along a 21-kilometer roadway, comprising 434 sections, to highlight the embankment size, slope geometry, and position of the road curb to replace and install barrier protectors. ConsulCAD was invited to submit a tender but faced survey challenges due to the dense vegetation at the roadside and near the underpass, compounded by a tight schedule. They needed an integrated solution to model a large volume of captured data quickly and accurately, then present it to the client.

After considering their options, ConsulCAD used MicroStation to process mobile, LiDAR-captured point clouds totaling 40 gigabytes, within a 3-centimeter accuracy. Using Bentley's 3D modeling application simplified and accelerated management of the voluminous point cloud data and 3D elements, saving time and delivery costs. MicroStation provided a viable digital solution that sets a benchmark for the continued future use of modeling technology.

Smart Deliverables

MicroStation is stocked with features to empower users to provide bring their vision to life accurately and error-free, every time. The application enables users to create live, intelligent views of a design that update automatically as the design evolves, all while tracking every design change along the way.

MicroStation's design intelligence makes teamwork easier while minimizing errors on project deliverables. In addition, users can generate consistent, high-quality paper and digital deliverables, such as paper plots, reports, 2D or 3D PDFs, and 3D physical models. With MicroStation, users can automate and speed up annotation, display styles, and reports by generating them directly from the embedded properties of objects.



Hafencity Dresden

Immograph, GmbH | *Saxony, Germany*

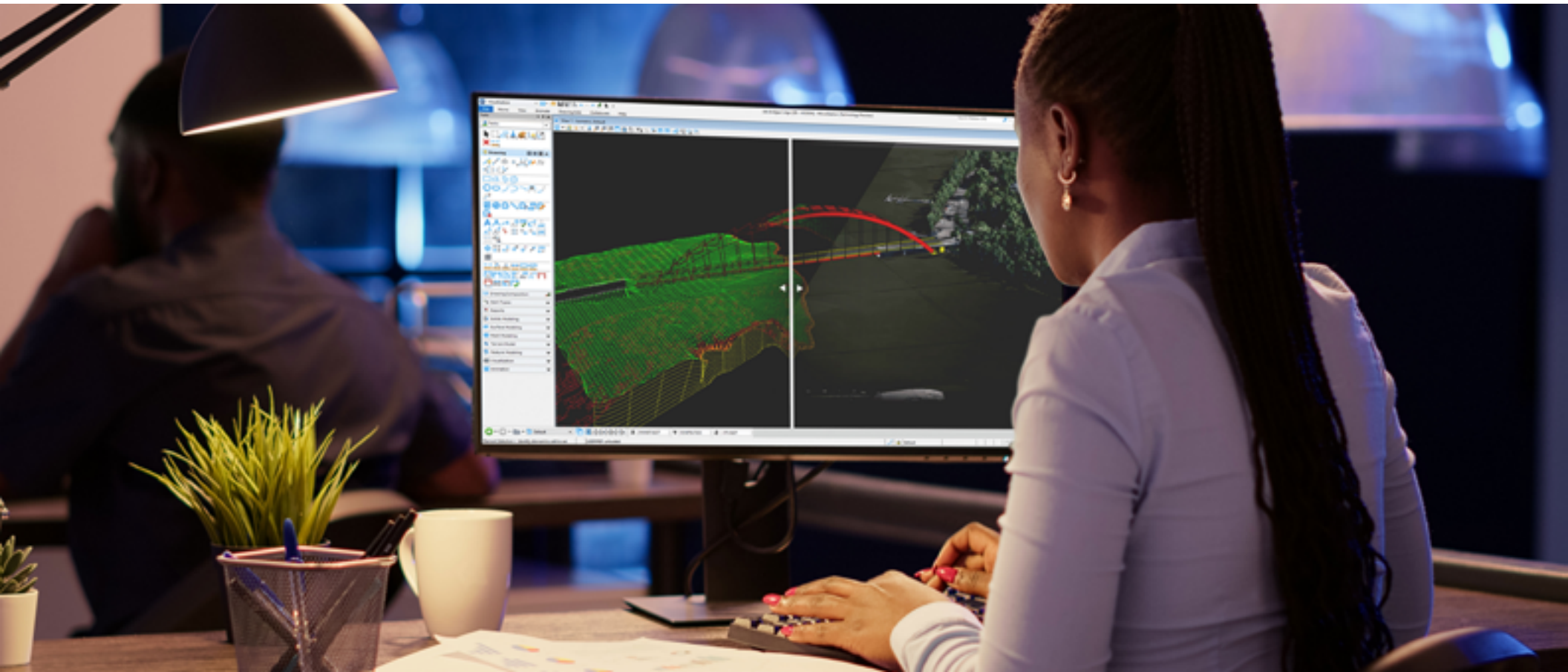
Hafencity Dresden is an urban transformation project to turn a dilapidated area into an attractive district that features a redesigned harbor, dining areas, a promenade, and a total of 18 new buildings for commercial and residential use. Given the large project scale and various software used by the planning and engineering teams, compounded by a tight schedule, Immograph needed interoperable construction visualization technology to integrate the multisourced, voluminous data and provide a high-quality 3D representation demonstrating the interaction among the various new infrastructure.

They selected MicroStation to process the immense amounts of data into accurate 3D models. The software's modular and hierarchal modeling structure allowed images and models to be conveniently linked and simplified change management, reducing the time it takes to make changes by 20%. Using the Bentley application significantly improved rendering and reduced file loading times by 40%. Through accurate visualization, they optimized planning and enhanced decision-making, shortening approval processes.

Timeless Design

MicroStation's native design file format—DGN, the file format for infrastructure design projects—provides timeless design. Infrastructure projects can take years to complete and need to be referenced for decades to come; MicroStation can do that. The DGN format provides greater flexibility to ensure access to models and drawings, both backward and future compatibility.

MicroStation, while native to DGN, also supports DWG files and provides DWG work mode to prevent the need for conversions or translated, if preferred.



S7 Road Project

Value Engineering | *Warsaw, Poland*

A new section of the S7 road in the Warsaw, Poland that will bring improved access and road network efficiency to Warsaw includes five road interchanges and two road tunnels. General Directorate for National Roads and Motorways, the administrative organization for roads in Poland, hired Value Engineering to design the project. Value Engineering needed to undertake traffic forecasts and geological studies, as well as develop road and tunnel concepts with detailed technical solutions to environmental conditions.

Using the project as a pilot to prepare the client for the challenges associated with the creation and implementation of a national BIM standard for infrastructure, designers needed to evaluate the creation of 2D drawings from 3D models, methods for preparing a model of the existing state of the site, and ways to streamline the visualization process.

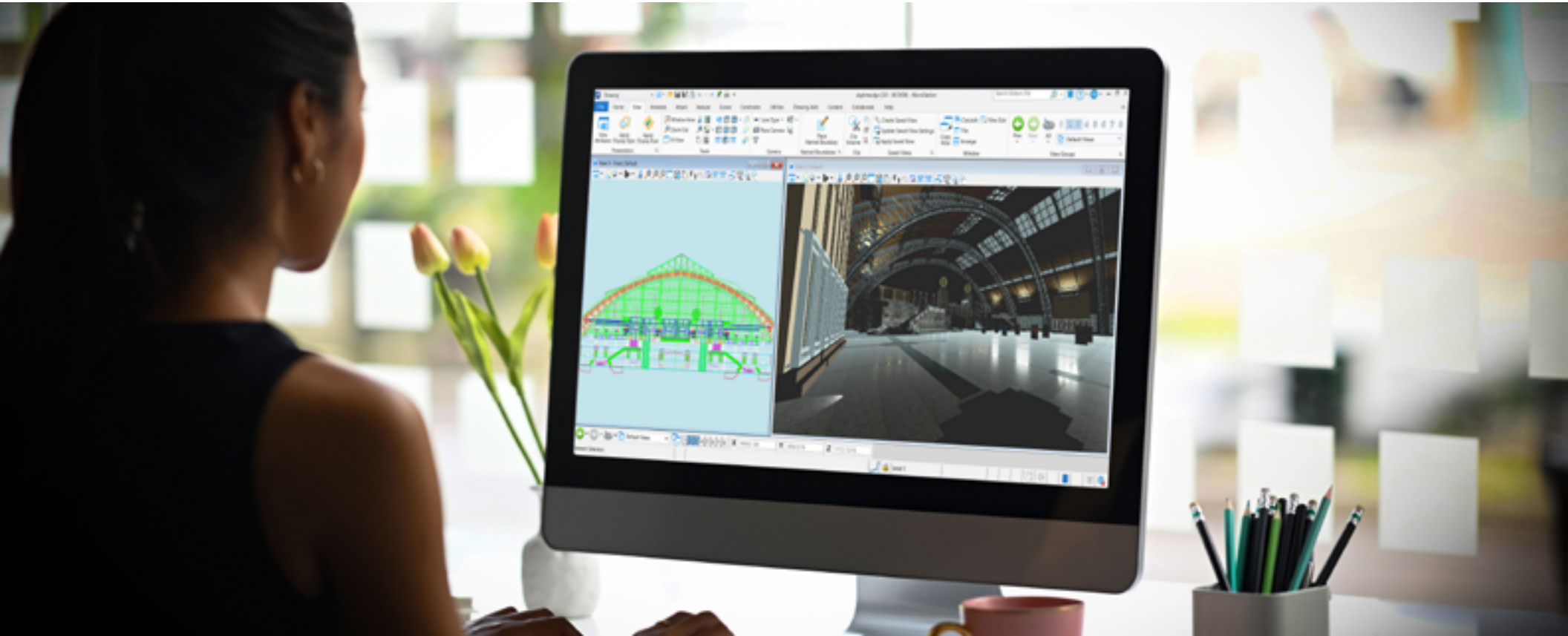
MicroStation enabled improved efficiency and time savings when analyzing design solutions, searching for project information, and generating documentation. The design team was able to detect collisions earlier, which would not have been possible with 2D documentation. Utilizing MicroStation, Value Engineering produced a higher-quality product that will reduce the number of changes in the next design phase.

Read the full case study

Visualization

MicroStation's enhanced visualization capabilities allow users to visually communicate designs to display design intent, avoid misinterpretations of a design, and help clients visualize a project and infrastructure change. MicroStation's 3D rendering capabilities create photorealistic visualizations at the push of a button.

MicroStation's visualization features create lifelike representations of designs through 3D models, photorealistic renderings, visualizations, and animations, all within real-world context.



Rostagno Funeral Home

Studio Architetto | *Porta, Cambiano, Turin, Italy*

Conceived when death rates rose during their early acute stages of the pandemic, the Rostagno Funeral Home project aimed to design a funeral home based on the concept of architecture for emotions. The scope of the project required the regeneration of a former 600-square-meter warehouse space. Transforming the industrial space into a multifunctional, scaled building, featuring public areas and private rooms with stringent hygienic regulations, presented technical challenges compounded by a tight schedule during the pandemic lockdown.

The architectural design team determined that MicroStation provided a collaborative 3D digital modeling environment capable of accommodating multiple design changes, eliminating scaling issues, and reducing errors. Bentley's platform provided the team with full control over the project, saving time and enabling timely completion. The MicroStation renderings were irreplaceable in helping the client fully understand the design proposals. The project has been nominated for the Architectture Rivelate 2020/2021 prize awarded by the Turin Association of Architects.

Integration with iTwin

MicroStation is a key part of the digital twin workflow, consolidating data from different sources, including 3D models, and feeding accurate, real-time CAD data to Bentley's iTwin Platform. With the ability to share data between the design desktop and the iTwin Platform, users can create effective collaboration of data and projects, including design review workflows and issue resolution within MicroStation.

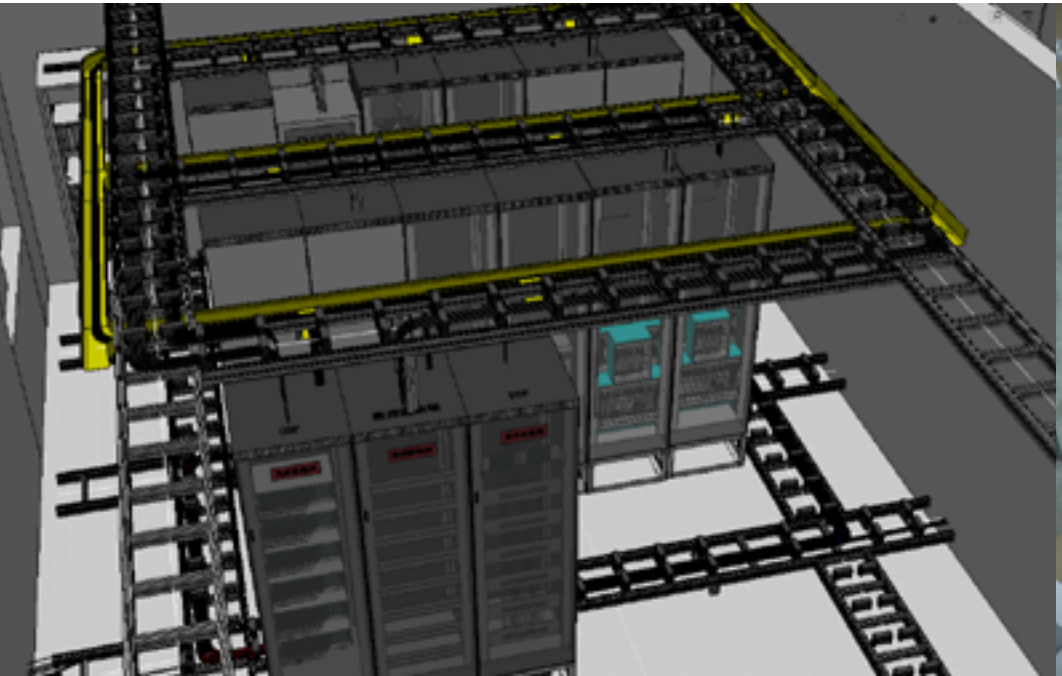
MicroStation integration with iTwin enables users to collaborate in real-time, evaluate the impact of changes more seamlessly, reduce rework, and expedite infrastructure intelligence.

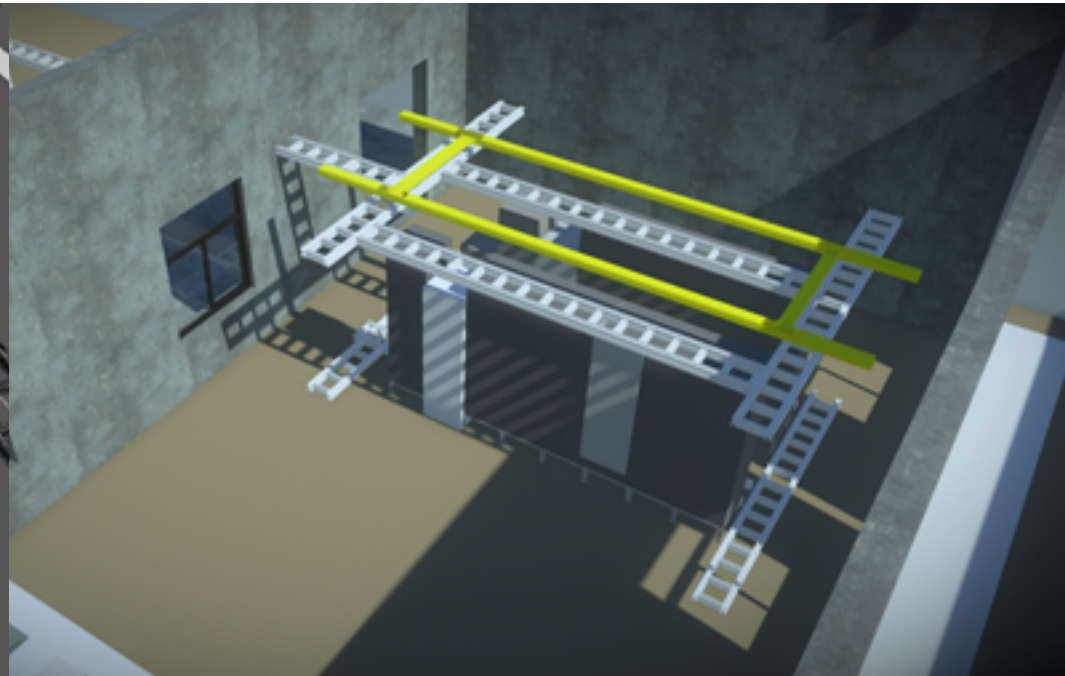
The Application of Railway Digital Engineering Certification in Jiuquan-Ejina Railway

China Railway First Survey and Design Institute | *China*

To upgrade a section of the Jiuquan-Ejina Railway, China Railway First Survey and Design Institute designed the reconstruction and creation of various new assets on the 243.7-kilometer rail section. They realized that traditional methods of laying out cables would lead to disorderly cable scheduling, low engineering quality, and high risk of error. For a project of this size and complexity, amid a short timeline, the team wanted to pilot railway digital engineering technology.

Having found Autodesk solutions insufficient for the enablement of accurate design, standardized construction, and intelligent operations and maintenance, the team chose Bentley software and achieved significant breakthrough results. Using MicroStation to create BIM models for communication, signal, electric power, and electrification engineering helped the team to improve cable layout accuracy by 96%. Using the iTwin Platform, they uniformly organized and managed data from all parties throughout the project lifecycle, increasing work efficiency by over three times and reducing material consumption by 70%.





MicroStation makes it easy to work the way you want, leaving you time to do what you do best.

Create Innovative Solutions to Meet Your Clients' Unique Challenges

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