Revival of Ukraine

Strategic transport infrastructure reconstruction projects

Pyrotechnic survey
3D as-built documentation
Static testing
Geotechnical survey
Project design in BIM

HRDLIČKA Holding

Valbek

Post-war reconstruction of Ukraine

The Russian military has destroyed and continues to destroy key transport infrastructure in Ukraine. Russian forces have already devastated 6,300 km of main railway lines in Ukraine and damaged over 24,000 km of roads, 289 road bridges and 41 railway bridges. Without these key roads and bridges, Ukraine will never be able to return to the level it was at before the war. Key infrastructure affects both life and business.

The HRDLIČKA Holding and VALBEK-EU, a.s. business group has come up with a comprehensive, modern and effective vision for the renewal of essential infrastructure. Both companies have long been operating in the Czech Republic and Ukraine and have production units in Kyiv. The reconstruction investment projects will serve as an example of Czech-Ukrainian cooperation.

We offer a comprehensive rejuvenation plan using modern methods:

1. Pyrotechnic survey

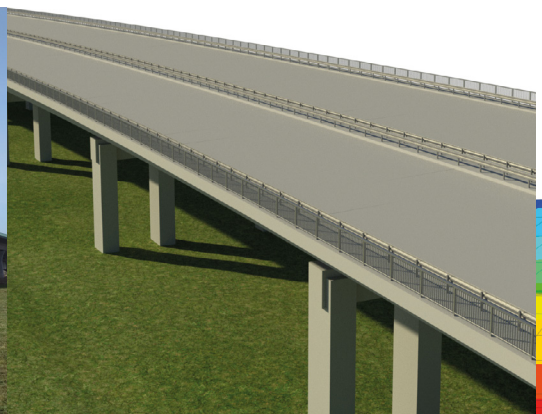
In war zones, it is essential that diagnostics and a quality pyrotechnical survey of any destroyed infrastructure are carried out. Without this, any movement during geotechnical work, static testing, and especially during reconstruction can be extremely dangerous, which can prolong the construction process.

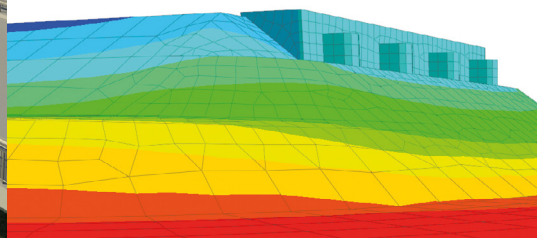
2. 3D as-built documentation

Modern aerial photogrammetry and laser scanning methods can be effectively used for highly accurate inspections, monitoring and data acquisition. The visualization, based on 3D technologies, allows the as-built condition to be periodically recorded and compared over time. These technologies are indispensable for facilities where access is restricted, difficult or dangerous. The data acquired can be used to create a detailed and accurate visualization that provides information about the condition of the building, a ‘digital twin’ of the building for detecting cracks, ruptures, concrete damage, deformation, displacement. The 3D visualization serves simultaneously as a basis for the creation of the project and the BIM model.

3. Static testing

Static on-site inspection of the infrastructure and decisions on the need for destructive and non-destructive tests of supporting structures. In some cases, the expert is able to decide how





to proceed directly on site. Whether it is worth keeping some parts, or if it is better to design a completely new structure. Close cooperation with geotechnical engineers is necessary.

4. Geotechnical survey

Geotechnical surveying work is needed to check the engineering and geological conditions at the foundations of bridge structures, especially when the ground plan layout of bridge structures has been disrupted. This work mainly involves drilled and bored probes, describing and taking samples of soils and rocks for laboratory tests to determine their mechanical properties. The outputs from the survey work are used to create precise geotechnical calculations, which serve to ensure the structure is based on reliable and adequate foundations.

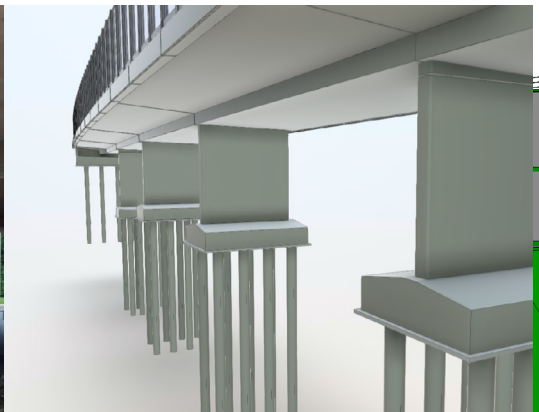
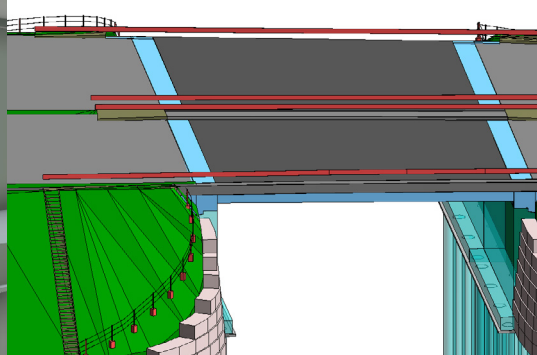
The geotechnical calculation is used to determine the deformation of the embankment subsoil, which affects the overall seating of the bridge and the long-term sustainability of the infrastructure as a whole. The work of a geotechnical engineer is an essential component in the design of bridge foundations.

5. Project design in BIM

In the case of damaged infrastructure, 3D projection has an undeniable advantage, as the original terrain around damaged bridges is significantly disrupted and the existing structure has shifted away from its original position. These facts cannot be taken into account faithfully enough in classic 2D design, which only shows sections and plan views. The 3D as-built documentation means that the necessary works can be taken into account in the plans, e.g. for the extent of demolition, landscaping (actual earthwork volumes), the construction of temporary structures, etc.

When using the BIM method, it is advantageous to make the most of the potential offered by the tools of this process (data sharing and communication via CDE, unification of element properties, quick creation of records of quantities, quick response to changes detected during the actual implementation process, which subsequently lead to changes in the documentation, etc.). The construction itself can also be accelerated by handing over the BIM models directly to the contractor, who can effectively plan the construction process and the financial schedule for the construction work and other activities.

The object-based and parametric style of work using the BIM method means that bridge structures can be unified and things such as bridge spans or widths can be changed more quickly, with changes automatically entered into the work list. This speeds up the entire preparation process. Once the construction is complete, the elements in the models can be supplemented with the attributes needed for subsequent management and maintenance.

What is BIM?

Building Information Modelling (BIM) means working with objects in a 3D environment, with information about the elements and the entire project management process. It is fast becoming the preferred design method, providing the following advantages:

– Increased productivity and work accuracy
– Faster project preparation
– Elimination of errors
– Control over the entire project
– Better quality of construction work
– Data can be used for infrastructure maintenance
– Extending the life of investments

Contact us

Let's help together where it is most needed

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