

Using BIM Technology to Evaluate Contractor Proposals on Complex Projects

What the innovation is and why it is innovative

The US Department of State's Bureau of Overseas Buildings Operations (OBO) recently pioneered the use of macro BIM technology to evaluate contractor proposals on a complex, large scale, multi-phase embassy compound project. In evaluating the proposers' project plans, OBO used scenario-based planning systems and modeling tools to rapidly and accurately examine all options, selecting the best proposal based on capability and cost-effectiveness.

Where and when it originated, has been used, and is expected to be used in the future

As one of the largest and most complex embassy projects in the world, with construction executed on an operating compound, OBO recognized that the project required a detailed Critical Path Schedule (CPM) that captured not only the project phasing, but all of the detailed project activities like moving out of certain buildings, relocating those operations within the compound, and complete demolition of the classified spaces, as well as existing non-classified spaces.

First, the OBO team constructed a macro level volumetric model, using BIM software, of the entire 1.8 million SF, six-year project. The project team then used the model to test the underlying assumptions of the project and perform a 'clash detection' analysis of the phasing plan. The result was a detailed time and cost loaded 3D model of the project, all created in 24 hours.

OBO uploaded each contractor's schedule information into the macro BIM project model and tested it against the government baseline analysis. This approach let OBO graphically illustrate the execution of the each identified element of the project, in a 3D format. The team examined the planned expenditure of project costs forecast by the government baseline and showed where the contractor was likely to encounter execution problems. This exercise also showed where overlapping work activities would impact post operations.

Practicing "clash detection" on the bidders' master construction plan uncovered phasing conflicts from the low bid contractor that would have ratcheted the project's cost through change orders and shut down the embassy. It also identified errors in another contractor's proposed plan. OBO decision makers used these insights to select the contractor, incorporate that contractor's phasing innovation, *compress the schedule by six months and negotiate a lower price*.

What it changed or replaced

The OBO team used data and advanced technology to create an advantage over the traditional proposal evaluation process. Creating a detailed time and cost-loaded 3D model of the project allowed the OBO team to 'test drive' each contractor's project plan and see the construction in 3D, all in less than 24 hours. Traditional proposal evaluation methods would have taken weeks and would have been unlikely to discover the phasing conflicts, or other inconsistencies uncovered in using a 3D model to replicate construction on a timeline.

An OBO representative presented this innovation at a recent User's Conference. The video excerpt of the presentation, **OBO Leverages Macro BIM to Evaluate Contractor Proposals**, is available on the home page of Beck Technology's website: <http://beck-technology.com>.

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Macro BIM Models



The US Department of State's Bureau of Overseas Buildings Operations (OBO) pioneered the use of macro BIM technology to evaluate contractor proposals on a complex, large scale, multi-phase embassy compound project.

OBO constructed a volumetric model of 1.8 million SF, six-year project.

The time and cost-loaded 3D model of the project was created in 24 hours.

Practicing 'clash detection' on the bidders' master construction plans uncovered phasing conflicts in the low bid contractor's plan, as well as an error in the 2nd contractor's proposal. OBO used these insights to select the contractor, incorporate an innovative phasing plan, compress the schedule by six months and negotiate a lower price.

Time and Cost-Loaded 3D Models Bring Proposed Critical Path Schedule Construction Plans to Life

