Last November we mentioned Bentley's AECOsim Building Designer, in relation to the company's AECOsim Energy Simulator, where they were both used for assessing the sustainability of building models. The company has gone much further than that though, releasing a single application that provides comprehensive suites of design and analysis tools with AECOsim Building Designer for architects, and others.

This is in line with current trends, where practices are becoming increasingly multidiscipline, or at the very least are forming collaborations with other companies to provide total solutions to their clients. The growing acceptance of BIM as the driving force behind modern building design has also broadened the knowledge of interdependent construction technologies, and the need to share data and information with each of these more efficiently.

Hence the single application AECOsim Building Designer, that covers architectural, structural, mechanical and electrical systems, construction documentation and visualisation - plus a couple of other associated tools. It provides total interdisciplinary modelling environments, integrating design and documentation workflows, and cuts down the barriers between disciplines. It makes project information transparent, trusted and available to all participants, and enables innovative hypermodelling techniques to maximise information retrieval.

ONE STOP SHOP
It also provides access to the latest tools and technologies to provide lifelike rendering and animation, generative design, built-in clash detection, and the ability to integrate geometry and data from point clouds, other CAD and engineering applications, and in numerous formats including IFC and DWG - a veritable one stop shop for building design and construction.

It's an interesting step for Bentley to take. It reflects changing patterns in the way companies buy their software tools. Instead of picking out individual applications that matched your specific requirements from a lengthy list of core and technologically associated packages, like picking out Water Gems for water management then tacking on some more specific water management tools to complete a 'set' - each with their own specific licences' - Bentley has recognised the fact that this is a wasteful and expensive process, with some users having to purchase licenses for applications that are used on an infrequent basis and that others may wish to expand their capabilities beyond their traditional boundaries.

Hence the single application AECOsim Building Designer, that covers architectural, structural, mechanical and electrical engineers combines multidisciplinary technologies in single applications

Bentley's AECOsim Building Designer for architects, structural, mechanical and electrical engineers combines multidisciplinary technologies in single applications

LICENSING SCHEME
Even so, the vast amount of tools that Bentley has available makes it little impractical to ladle everything out onto the poor architect - all his Christmases come at once - so a degree of selection has been implemented, grouping applications together to reflect the main focus of different workgroups. Hence the divisions below.

AECOSIM BUILDING DESIGNER FOR ARCHITECTS
Centred round the Building Information Model, AECOsim provides architects with the key tools they need to improve building project quality, save money and reduce risk - most of which I hardly need to point out, as the BIM argument has been spelled out extensively over the last half decade, and can really be said to be won. A number of features have to be picked out, though, as they represent non-architectural features that have been integrated within the package to maintain its relative 'one stop shop' status. To clarify, it covers all of the features that an architect requires, but includes structural and terrain management features at a level that could be used by architects, but not in the depth that a civil engineer would require.

Consequently, beside the parametric and associative capabilities of the software, there are terrain modelling tools and support for international steel section tables, and the automatic generation of spaces, floors and ceiling slabs. The application also includes surface and solid modelling tools for the creation of complex, non-linear forms.

AECOsim for architects comes, as you would expect, with extensive documentation and drawing capabilities. It also includes high-end rendering, using radiosity and particle tracing, export facilities in STL format for rapid 3D model
The inclusion of AECOsim for the Electrical Engineer, therefore, epitomises the extent to which AECOsim is leading the development of design and building applications - through inclusion in the AECOsim philosophy and providing electrical engineers with the same interoperability, collaboration, and model-sharing capabilities as the rest of a project team. With the individual requirements and particularised software of the industry, and their plethora of standards, acronyms, components and elements, they were previously constrained from full involvement in the BIM process. They can sing from the same hymn sheet now.

AECOSIM BUILDING DESIGNER FOR MECHANICAL ENGINEERS

Mechanical Engineers have their own specific requirements too, covering the design and construction documentation of air handling and piping/plumbing systems, with tools to handle all types of components, ducts, pipes and their insulation, etc. Apart from the physical design and layout of HVAC, the software includes analysis, fabrication, construction and operating features, including route defining tools, the ability to check system integrity, apply air flows and trace system paths.

AECOsim for Structural Engineers integrates seamlessly with Bentley’s STAAD.Pro and RAM International products, and has direct integration with Oasys GSA. It can Export/import industry standard CIMSteel CIS/2 and SDNF files for analysis, steel detailing, and fabrication. It also provides Wizards for the creation of steel trusses, bar joists, handrails, columns with corbels, haunches, platforms, and other structural components. For other features, check out AECOsim for architects, above.

AECOSIM BUILDING DESIGNER FOR ELECTRICAL ENGINEERS

Like Mechanical Engineers, Electrical Engineers have their own requirements and jargon. When it comes to BIM their main focus is on power distribution, lighting, fire alarms, emergency lighting, telecommunications, IT, security, public address, lighting protection, video, EIB and other building service systems - a large, and growing, number of responsibilities. Each of the above relates to differing technologies and refinements, making the Electrical Engineer a critically important contributor to a building project. Not only do they have to design and analyse electrical systems, but put in place circuit management that caters for long term management and design refinement. Of all building design technologies, this is probably the one where the job doesn't finish with construction or implementation.

AECOsim for Structural Engineers

As such, engineers are now in partnership with interference detection across multiple files and disciplines, and the ability to simulate construction schedules in conjunction with project management applications, such as Microsoft Project or Primavera P3. Integration with Bentley’s Projectwise and associated applications is, of course, a sine qua non.

We covered the software’s environmental credentials last November, and they include gbXML export/import for the creation of analytical models for energy analysis via AECO Energy Simulator.

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