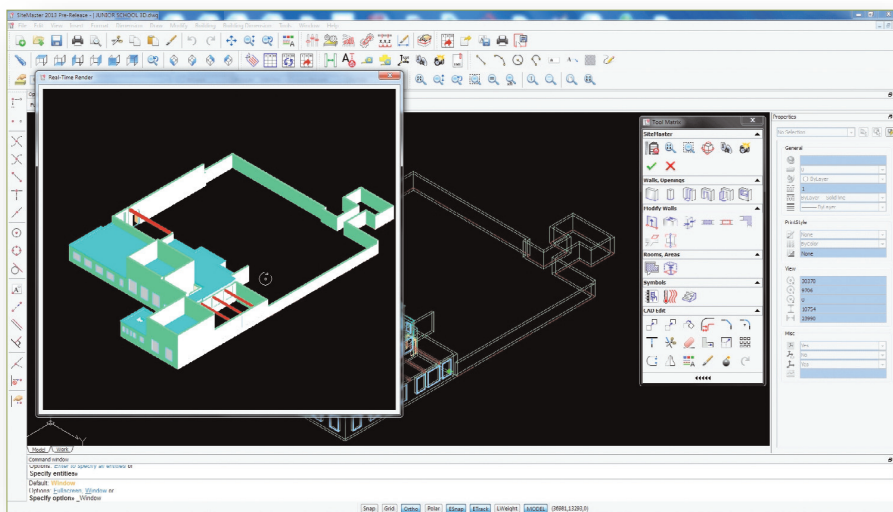


Building Surveying with BIM

SiteMaster BIM 2013 makes the creation of 3D building models from surveys incredibly simple, even to the point of the Disto usurping the role of the mouse



As we draw near to the Government's strategy to require BIM across all public sector construction projects by 2016, architects and surveyors might like to know that BIM implementation on a site development project can even start before the design stage, using an efficient and cost effective 3D surveying solution - i.e. BIM on existing buildings and not just new build. SiteMaster BIM 2013 from Graebert iSurvey provides users with the ability to create fully object orientated 3D models using only a handheld laser distance meter.

Furthermore, the 3D models and 2D representations can be exported either in IFC, .dwg and other formats to architects and engineers who, in the course of developing the 3D models further, can add materials, objects and other component information.

SiteMaster BIM 2013 is the latest version of the SiteMaster surveying product family that is developed from Graebert's ARES CAD engine. The same engine utilised in the very popular CAD software, DraftSight from Dassault Systèmes, which has been downloaded over 4.2 million times so far.

SiteMaster 2013 is a 2D surveying tool with 3D viewing, and SiteMaster BIM 2013 has additional 3D capabilities and features with an IFC export.

SiteMaster 2013 & SiteMaster BIM 2013 run on Windows 7 and 8 devices, which connect via Bluetooth with a laser distance meter that can very accurately record all distances, angles, elevations within a building. The whole system is designed to be used by surveyors of varying capabilities, but who may lack architectural skills - i.e., not so much concerned about why a window is offset within a wall, and the direction in which it opens, but in recording the exact measurements of the object itself.

As ARES is a fully featured CAD application, providing all of the functions that you would find in AutoCAD, including the ability to use PDF and DGN underlays as templates for surveys, it could be used to develop the building through to completion. Here it provides the drawing and modelling functions that back up the laser distance meter. It comes with a couple of other surveying refinements, as well - specifically designed to both simplify

and speed up the process, completing the drawing of walls and other regular features when a surveyor exits a room before inputting all information. Catering for surveyors with varying levels of CAD skills - or none at all - SiteMaster BIM 2013 has been made as simple to use as possible, with a minimum number of clicks to perform most functions and even allowing the handheld laser to be used to both take measurements and take over the drawing function on the tablet/laptop.

POINT CLOUDS OR DISTO

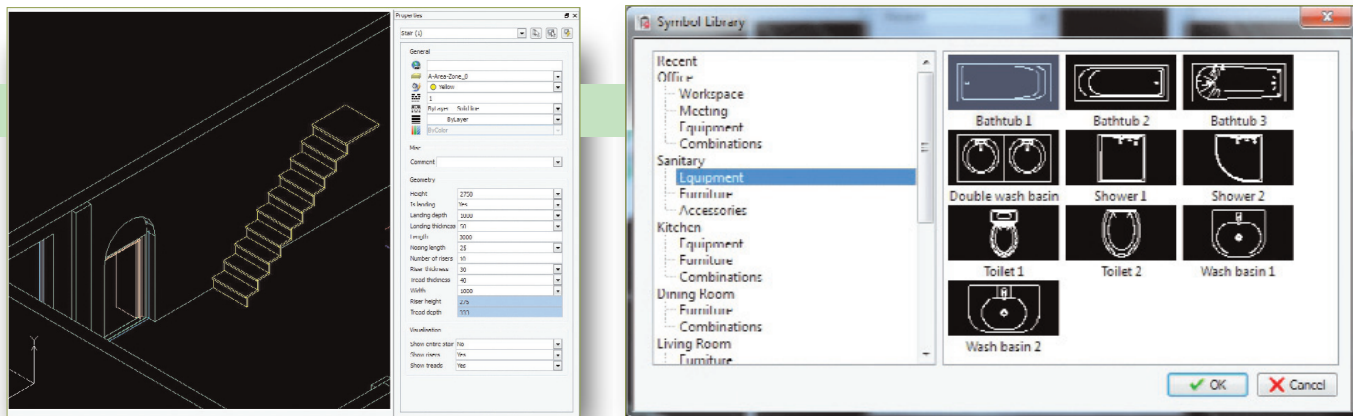
Before we look at how easy SiteMaster BIM 2013 is to operate, though, a couple of points about 3D surveying. Many building projects concern the modernisation or development of existing structures, and require accurate representations of what already exists. There are basically two ways of doing this; 3D laser surveying using laser scanners, used by specialist companies, create huge point clouds of data, require significant processing capability and are, therefore, expensive.

Handheld laser measuring tools can be used by anyone, provide accurate data with an accuracy of 2mm in 200 metres, can feed those measurements directly into a laptop or Windows tablet on site, and, as in the case of SiteMaster BIM 2013 using Bluetooth technology to do it wirelessly.

If you are not surveying the Parthenon, but want a quick and inexpensive survey without the frills - salient measurements without the entirely extraneous statues of saints in ornate niches - you can get exactly what you need by talking to your friendly local surveyor.

SITEMASTER BIM 2013

SiteMaster BIM 2013, therefore, provides the optimum solution for BIM exponents, allowing surveyors to select just the right level of survey data to satisfy an architect's



brief. It is flexible enough to be configured the way that individual surveyors prefer to work, and provides a survey oriented user interface that allows surveyors to select the features they are working on - selecting a wall, for instance, brings up different types of wall features - rectangular, arched, inclined walls, gabled, etc. Similar variations are also available for doors, windows, roofs and stairs. SiteMaster BIM 2013 can be used to create additional categories if they are a recurring feature within a building.

Because such features are object oriented they come with a range of attributes, which can be edited or added to in a separate window. This information is used to annotate 2D drawings, or for creating schedules of component features. One of the first steps to be taken on surveying a room is to establish its height.

The surveyor is not just creating a 2D floor plan, but a 3D model of the internal structure of the building. Even SiteMaster 2013 which works in 2D has an integral 3D viewer, which shows a 3D model of the building being surveyed in isometric view in wireframe or rendered mode - a handy reference for checking gross surveying errors.

The software comes with sufficient intelligence for it to allow the Disto to take over the control of the drawing on the laptop using duplicate keys on the Disto. This allows the surveyor to survey, room by room, resting the tablet device and entering survey data using the up, down, keys on the laser distance measurer, 'minimising the number of clicks'. A key feature of the software utilises a layer to record each

measurement carried out even down to the direction from a starting point - a very useful QA layer for final drawing inspection.

WINDOWS, DOORS, STAIRS AND ROOFS

Each structural feature has its own surveying requirements - e.g., windows have sill and opening heights. Windows, after type selection, are typically entered using an offset measurement from a room corner, with the surveyor recording sill depths and window positioning and openings. Doors come with flush or protruding frames, may have limited opening capabilities, and are hung in a particular direction.

Such information is critical to the architect who may want to incorporate them or replace them in his design. But, as objects, they can be modified or resized in situ, replaced, and labelled to facilitate their identification on any subsequent document, schedule or representation.

Staircases are surveyed using dialogue boxes to establish the number of risers, width, landings and the bottom and top locations of the stairs. Beam types are included in the feature categories, and roofs are created by outlining the roof boundary, including overhang and selecting a roof type from the roof category.

The new SiteMaster products will be updated regularly with small and major enhancements throughout its contracted life - this will ensure that the product is always optimised and up to date.

SiteMaster BIM 2013 also includes a number of other symbols of building features, e.g. plumbing components. A

sink, from a number of types, can be accessed and dragged anywhere within a room, using the SiteMaster software to accurately locate and orientate the object against a wall. Movable objects, such as chairs, can be precisely located in rooms using triangulation.

There is a floor management system that allows floors to be added, but surveyors have to calculating the slab thickness as an extrapolation from adjacent measurements - in exactly the same way that a surveyor would handle it using more primitive systems. Cut planes can be defined at any height, as well, overriding the default plane for measurements, which is between waist and shoulder height. Changing the cut plane height can be quite revealing, especially when it passes through the plane of a window at different heights.

INSTALLATION AND TRAINING

SiteMaster BIM 2013 is supplied on a licensed only basis - enabling Graebert iSurvey to keep the levels of software used by all of its customers as up to date as possible. Because the company wants its customers to maximise their use of the product, considerable attention is given to training users before they go out into the field, undertaken by Graebert iSurvey agents country wide, who will go out on-site with their customers for their first surveys using SiteMaster BIM 2013.

Graebert iSurvey will be holding a number of workshop events around the country, allowing existing and potential clients alike to see the new software in action - visit the website below for the latest updates.

www.graebert-isurvey.com