GRAPHISOFT Virtual Building Explorer User Guide

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Introduction

GRAPHISOFT Virtual Building Explorer (VBE) allows architects to create photorealistic walk-through models from their ArchiCAD projects. With this innovative presentation tool, navigable 3D models can be saved as self-running executable files containing also predefined fly-through animations and images of the building.

Product Details

The VBE package contains two components:

1) The **Virtual Building Export Add-on for ArchiCAD 14** allows the seamless export of ArchiCAD models directly into Virtual Building Explorer.

2) The **Virtual Building Explorer** is a standalone application to make live presentation environments of the imported ArchiCAD models and to save them as self-running executable files.

Workflow

The standard workflow between ArchiCAD and VBE is the following:

- The Virtual Building model is created in ArchiCAD with the appropriate surface textures and materials applied on the building elements.

- Using the VBE export add-on for ArchiCAD, the 3D model is sent to the GRAPHISOFT Virtual Building Explorer for further processing.

- The walk-through model is opened in VBE and visualized with shaded OpenGL or global illumination engines. Preferred fly-through paths can also be defined and saved with the model.

- The VBE model is saved into a self-running application file, which can be sent to the owners, builders and others parties for easy exploration of the project.

Exporting ArchiCAD Models for VBE

Once the Virtual Building model is created in ArchiCAD 14 and the proper surface textures are applied, the model is ready for export into VBE:

1) Open the project in AC14 and check the consistency of the model and the surface textures before starting the export process.

   Note that you can't modify the 3D model and the surface materials in VBE.

2) Open the 3D window (perspective or axonometric views).

3) Launch the **File/ Export for Virtual Building Explorer** command.

4) The **Export for Virtual Building Explorer** status window opens.

5) Once the export process is finished, click on the **Launch** button.

6) The VBE application starts automatically and the exported model is loaded into the program's memory.

Saving VBE Projects

Once the AC model is exported into VBE, you can save the project in the native VBE self-running application file format:

1) Press the **ESCAPE** key on your keyboard to access the VBE menus.

2) Click on the **File** menu.

3) Choose the operating system (Windows/Mac OS X) on which you want to open the self-running project file.

4) Select the preferred project file location and enter the name of the VBE file.

5) The VBE project is saved as a self-running application file.

Opening a VBE Project for Editing

1) Start your VBE application. You need a full VBE license to edit a project.

2) Open the **File** menu and click on the **Load** command.

3) Select the preferred VBE project file to open it.

4) Now you can start to edit the VBE project.

Note that double-clicking on a VBE application file opens the project in non-editable, navigation mode.

Exploring a VBE Executable File

Click on the executable/application file to explore the VBE model. This will install the VBE viewer application automatically. You don't need a commercial license of VBE to open these projects.

Interface

The VBE interface consists of the navigation window and the VBE menu. You can toggle between them with the ESCAPE key.

Menus

The following menus are available in Virtual Building Explorer:

- FILE
- SETTINGS
- GLOBAL ILLUMINATION
- LAYERS
- GALLERY
- CONTROLS
- INFO
- QUIT

FILE Menu

The file menu includes the standard I/O functions of the program. The **LOAD** command opens a VBE project for editing. The **Save for Windows** and **Save for Mac OS X** commands will store your project in the standard VBE self-running executable/application file formats.

Note that self-running VBE project files can only be played and edited in their native platform.

SETTINGS Menu

The Settings dialog stores all the parameters that are related to the VBE model display and navigation control.

View Style

The VBE model can be displayed in the following view styles:

- Unlit
- Gouraud
- Headlight
- Metal
- Hidden Line
- Global Illumination

The **Global Illumination** method give you the most realistic view of the model.

> **Note** that you have to render the model with the Global Illumination engine before you can activate this view style.

> **Note** that Global Illumination and Headlight view styles are using more resources of the OpenGL Video Cards than the other methods. In case you work with a very large model or if your computer has a slow video card we recommend to use the Gouraud, Metal or Hidden Line render modes.

Background

VBE offers the following background options:

- SKY (default VBE Sky image)
- WHITE
- GREY
- BLACK
- GRADIENT

In case you'd like to use custom skybox images, you have to replace the six .bmp files included in the **VirtualBuildingExplorer/Skybox** folder.

Stereo View

VBE can display the model in stereo view modes. The following methods are available:

- Left/Right
- RED/ CYAN
- OFF

    Note that you need special stereo view glasses to enjoy this VBE feature.

Transparency

Value range: 20-80

The transparency of all translucent surfaces in the model is controlled by this parameter. Higher values result in less transparent surfaces.

View Cone

Value range: 10-120

Speed

Value range: 10-1000

This parameter defines the default speed of navigation. Higher numbers result in faster movement.

    Note that you can temporary increase the navigation speed by holding down the 'SHIFT' button.

Mouse Sensitivity

Value range: 10-50

Mouse Invert

This option inverts the mouse navigation directions.

Additional Settings Menu commands

The following parameters are self-explanatory. The parameter value limits are shown in brackets.

Sun Altitude (10-80)

Sun Azimuth (0-360)

Sun Brightness (-100 - +100)

Sun Overbright (-100 - +100)

Camera Height (600-2000)

Camera Radius (150-400)

Units

The measured distances can be displayed in Metric or Imperial units

Sunflare

This option displays the sun flare if the camera looks towards the sun.

Help Popups

If this option is activated, a help popup window will appear over some of the Settings menu's commands.

It also controls if the introduction help-popup is displayed at the center of the screen when opening a VBE model.

GLOBAL ILLUMINATION Menu

In order to be able to view the model in Global Illumination mode, you have to render the model first. Choose **INITIALIZE** to prepare the model for Global Illumination view.

> **Note** that this can be a lengthy process depending on the size of the model (number of triangles), the computer hardware (RAM, Video RAM, processor, Video Card type) and the Global Illumination options you choose. Initialization may fail if the model is too big since any single point on the model needs to be handled separately in the computer memory. The more graphics memory you have the larger model you can initialize.

Cancel the process by pressing ESCAPE. You can resume the process later. Completely lit surfaces are saved into project files and .exe files. When resuming the process, the starting point may roll back a few percent from where you cancelled.

Computing Light

This option affects the length of the Global Illumination calculation process.

- LIGHT VIEW: Lights surfaces visible from the current camera viewpoint only.
- LIGHT ALL: Lights all surfaces.

Sample Falloff

This option affects the length of the rendering process and the quality of the resulting images.

If your sample rate is lower than 1000-2000, try setting this to option to **LOW**. This will make shadow gradients less smooth and more pixelized, but will result in faster rendering.

> **Note:** Changing sample falloff will invalidate any previously computed light.

Lightmap quality

This parameter has three values:

- Ultra
- Default
- Low

"Ultra" will provide more realistic lights and shadows in the final rendered model, however the rendering process can be significantly slower in case of large models.

CONTROLS Menu

The CONTROLS menu displays the list of the basic navigation commands and their shortcuts for the international keyboard. Most of these functions are self-explanatory and commonly used in first-person shooter computer games (FPS).

Functions	Keyboard Shortcut
Menu	ESCAPE
Movement	W, S, A, D and the Arrow keys
Move Fast	SHIFT
Move Slow	CMD or CTRL
Crouch	ALT
Jump	SPACE BAR
Lift	PAGE UP
Lower	PAGE DOWN
Fly Mode	F
Info Tool	I
Measure Tool	M
Outlines	O
Sun Shadows	F3
Screenshot	F5
Parallel View	F8
Map Mode	BACKSPACE

Info Tool

Pressing "**I**" during navigation activates the **Info Tool**. In this mode the cursor's shape changes to a cross and the bounding box of the currently selected model element is highlighted. One click with the mouse opens the Info palette, which shows basic information about the selected model element. The following information is displayed in the **Info Tool**:

- **Type –** Element Type (wall, slab etc.)
- **Layer –** Element Layer
- **Size –** Size of the element's bounding box
- **Volume –** Volume of the element
- **Floor Ind –** Index of the story in which the element is placed

Fly Mode vs. Walk Mode

The 'F' key toggles between Fly Mode and Walk Mode. The Walk Mode provides you with a more realistic viewing experience including the following features:

- **Opening recognition** to distinguish the solid building structures such as walls, columns and roofs from doors and windows during navigation.
- **Gravity** to keep the camera height stable over slabs, ramps or stairs.

Map Mode

This useful feature helps you to find your current position in the building during navigation. Press "**BACKSPACE**" during navigation to project the corresponding section of the floor plan over the current 3D view. Your current position and viewing direction is marked with a red arrow. Use the mouse wheel to zoom the map.

Measure Tool

Press '**M**' to enable the measure tool. The three-dimensional distance from the camera to the world point at the center is computed and displayed as '**View Distance***'. To measure the distance between two three-dimensional points, click the left mouse button and pick two points. The resulting distance is computed and displayed as 'Measured Distance'.

Screenshot

Press '**F5**' to print the current view to a 24-bit .bmp file. The image will have the same resolution as your current viewport (your desktop resolution). The .bmp file will be saved with a unique name into the '**VirtualBuildingExplorer\Screenshot**' folder. When screenshots are printed from a stand-alone .exe file, the images will be saved into the same directory as the .exe file.

Parallel View

Press '**F8**' to enable the orthographic view. Use the mouse to rotate the model and the mouse wheel to zoom in/out. Hold down the right mouse button and move the mouse to pan over the model.

> **Note** that Stereoscopic rendering is currently not supported in orthographic view.

INFO Menu

The Info Menu shows basic information about the active project and your VBE license:

- **Version:** The version and build number of your VBE application.
- **License Type:** Type of your VBE license (full, trial, educational). It also displays whether you are using the global illumination version of VBE.
- **Triangle Count:** The models in VBE are made of 3D triangles. The speed of the 3D navigation and the memory usage by the VBE application are strongly affected by the number of triangles in the 3D model.
- **Video RAM Usage:** Displays the size of the Video RAM used by the project
- **RAM Usage:** Displays the size of the RAM used by the project

LAYERS Menu

The VBE project preserves the layers of the original ArchiCAD model. You can control the visibility of the model layers in the **Layers** dialog.

> **Note** that layers are not available in global illumination mode.

GALLERY Menu

The Gallery menu accommodates the commands with which you can add pre-recorded walk-through clips and camera positions to your project.

Adding Camera Angles (positions) to your Project

To add camera angles press '**F4**'

Recording Walk-through Clips

- To enter clip record mode: Press '**SHIFT+R**'.
- To start/stop recording: Click left mouse button.
- To exit clip record mode: Press '**SHIFT+R**'.

You must be in pause mode when exiting clip mode or you will lose that clip.

Both perspective mode and orthographic mode (F8) can be recorded.

Editing the Gallery

To change the order of the clips in the Gallery, press "**MOVE LEFT / MOVE RIGHT**".

Using the gallery

- Clips will playback in sequence if '**SEQUENCER**' is enabled, otherwise only the current clip will be played.
- Click the image to jump into that position or to play that clip.
- Press '**P**' to playback the current clip.
- Press '**Shift+P**' to playback the sequence of clips from the top.
- '**PLAY ON START**' will playback the sequence of clips as the .exe starts.
- '**PLAY ON IDLE**' will make playback start or continue screensaver-style.

Technical Notes

Texture Formats

VBE supports the following surface texture formats: jpg, bmp, tif, tga, png, gif.

If a texture would fail to load for any reason, the object that uses it will be drawn with the material color instead.

Alpha Channel Texture Effects

VBE supports alpha channel texture effects with 32-bit tif, tga and bmp images. For the alpha channel effects to be detected inside VBE, you must enable transparency in the ArchiCAD material/texture properties.

Shadows

Shadows in VBE are rendered using the OpenGL ARB_shadow extension. It works by rendering the scene, from the sun's point of view, into a texture map. This texture map is then projected onto the scene and OpenGL will determine whether a pixel is in shadow or not. Larger texture maps will produce higher quality shadows. The maximum size is determined by your graphics card (the graphics memory available and the maximum texture size allowed). Some graphics cards may have 256 MB on-board memory, but only allow a maximum texture size of 4096 x 4096. A shadow texture is typically 24-bit.

8192x8192 shadow texture will consume 200 MB of video memory.

4096x4096 shadow texture will consume 50 MB of video memory.

2048x2048 shadow texture will consume 12.5 MB of video memory.

VBE will automatically try to generate the largest possible shadow texture, starting with 8192x8192. Next, if this fails, it will try half that size, and so on.

The shadow's altitude, azimuth (heading) and brightness are controlled via the settings interface.

To turn off the sun shadows, set sun shadow brightness to a value near zero.

Sun Shadow Artifacts

Depending on the amount of available video card memory and the (physical) size of your model, the sun shadows may display artifacts. This is due to the fact that VBE cannot fit the whole model into the shadow map with good quality. Smaller models and more video graphics memory will improve the result.

Special Keyboard Shortcuts

- Holding down **Z** then pressing **ESCAPE** will quit.
- Holding down **SHIFT** and **CONTROL** at the same time will activate the light speed navigation, which is ten times faster than running.
- Holding down the right mouse button while flying will make you stay on a fixed altitude. This is useful when recording a fly-over above a building, for example.
- Holding down the right mouse button while walking will lock the view horizontally for a perfectly straight perspective.

System Requirements

Operating System

The Operating System requirements correspond to those of the ArchiCAD 14 version. For more details, see "Getting Started with ArchiCAD 14" available from the ArchiCAD Help menu.

Software

ArchiCAD® 14 version is needed to run the VB Export Add-On.

Java 6 or later is required to run the installer.

CPU

Windows: Intel® Pentium 4 or higher

Mac: Macintosh with any Intel processor

Multicore processor is recommended to exploit ArchiCAD 14 performance capabilities.

RAM

2 GB of RAM is required.

4 GB or more is recommended for complex models.

Hard Drive

Minimum of 1 GB free hard disk space is required for a full installation of ArchiCAD 14 and VBE.

Additional 2-3 GB is required for work with complex projects and 3D visualization.

Display

Resolution of 1280*1024 or higher to work with ArchiCAD. VBE supports 1024*768 or higher resolutions.

Video card

Open GL 1.4 and DirectX 9 compatible graphics card with 256 MB or more on-board video memory is recommended to fully exploit hardware acceleration capabilities.

To find compatibility data for video cards, please visit the following website: *http://archicadwiki.com/Video_Cards*

Installing the Virtual Building Explorer Package

Important: When installing VBE, you must be logged on as a member of the Administrator Group.

Installing from CD:

Windows: After inserting the VBE Installation CD into your CD-ROM drive, the "Virtual Building Explorer Installation" screen will appear. Choose "Virtual Building Explorer" to start the installation Wizard. If the installer does not start automatically, double-click on the "Setup" application in the CD root directory.

Mac OSX: Insert the VBE CD into your CD-ROM drive and double-click on the "VBE Installer" application in the CD root directory.

Installing from web download package:

Windows: Double-click the downloaded executable file, which will open the unpacker application. Specify a temporary location for the installer files, then click "Extract". After files are extracted, the installer wizard will automatically start.

Note: Java 6 is required to run the VBE Installer. If you do not have Java 6 installed on your system, it will be automatically installed when you begin installing ArchiCAD.

Mac OSX: Double-click on the downloaded image file to be automatically mounted by the system. Then double-click on the "VBE Installer" application in the mounted volume's root directory.

Uninstalling the Virtual Building Explorer Package

Windows: To uninstall the entire Virtual Building Explorer package, go to the Windows "Control Panel" and select "Programs and Features" (Vista and Windows 7) or "Add or Remove Programs" (XP). Find Virtual Building Explorer in the list of programs, and click the "Uninstall/ Change" (Vista and Windows 7) or "Change/Remove" (XP) button. This will start the uninstaller, which will remove all program components from your computer, including the Virtual Building Export Add-on for ArchiCAD 14 and the Virtual Building Explorer application.

> **Important:** Do not remove the Java Runtime Environment before uninstalling VBE.

Mac OSX: Run "uninstaller" in the **Uninstall.VBE** subfolder of your Virtual Building Explorer application folder. This will start the uninstaller, which will remove all VBE components from your computer.

License Management

Virtual Building Explorer for ArchiCAD 14 is protected with the WIBU protection technology. To run VBE with your commercially licensed copy of ArchiCAD 14, you need a separate license for VBE in the ArchiCAD 14 WIBU or CodeMeter keyplug. If you do not have such a license please consult your ArchiCAD distributor.

> **Important**: After installing VBE do not forget to restart your computer; otherwise the hardware protection key will not work properly. Plug in the protection key only after you have rebooted your system. (No restart is required if you already had a WIBU protection key driver installed on your computer, and no driver was installed by the VBE installer.)