

BIM and Gaming Engines: How We Present 4D Models Using Our Design Suite and Gaming Engine

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AB5801 In this class, you will learn how to use your Autodesk® Building Design Suite to produce accurate renders and animations in Autodesk 3ds Max® that show the 4D building construction information you produce in Autodesk Navisworks®. We will cover how to link your 4D building construction sequence into Showcase® to present and show your client each stage of your building process. We will discuss how to improve client and consultant understanding and confidence in a project by showing how the building is built using Showcase. You will learn how to set up and use storyboards and alternatives, import your materials and cameras from 3ds Max and the construction sequence from Navisworks. We will cover how you can extend, improve, and maximize your workflow process. Learn how we have extended our workflow using the .NET API and gaming engines, and see the latest gaming technology used to deliver an interactive model to the client. We will show you how we let them explore the 4D construction sequence and BIM information for themselves, which in turn improves the client's and everyone else's understanding and confidence.

Learning Objectives

At the end of this class, you will be able to:

- Import Revit and consultant models into Navisworks and add 4D building sequencing information
- Link your Navisworks 4D information into 3ds Max to produce animations showing each step in the building construction sequence
- Present your 3ds Max model and Navisworks 4D info in Showcase, set up views and storyboards, and link 3ds Max materials and cameras
- Explain how the .NET API and gaming engines can be used to improve workflow and present complex 4D models and information

About the Speaker

Nicholas is currently working for the COX Architecture, producing accurate 4D building construction sequencing, and renders and animations showing the building in each stage of construction. Nicholas also develops new ways gaming engine technology can be used. Nicholas has a passion for Revit® and BIM. After converting the first architectural office he worked in over to Revit, he established himself as a Revit and BIM expert and started doing Revit training and implementation, becoming a BIM coordinator for a large Melbourne architectural firm. A passion for problem solving and creating intelligent solutions to complicated problems still drives Nicholas. He describes BIM as only in its infancy, and sees big room for development and workflow improvements. He enjoys teaching at RMIT University. After attending AU in 2009, he presented a successful talk at AU in 2010 on the Power of Showcase and Gaming Engines and has also spoken at Revit Technology Conference.

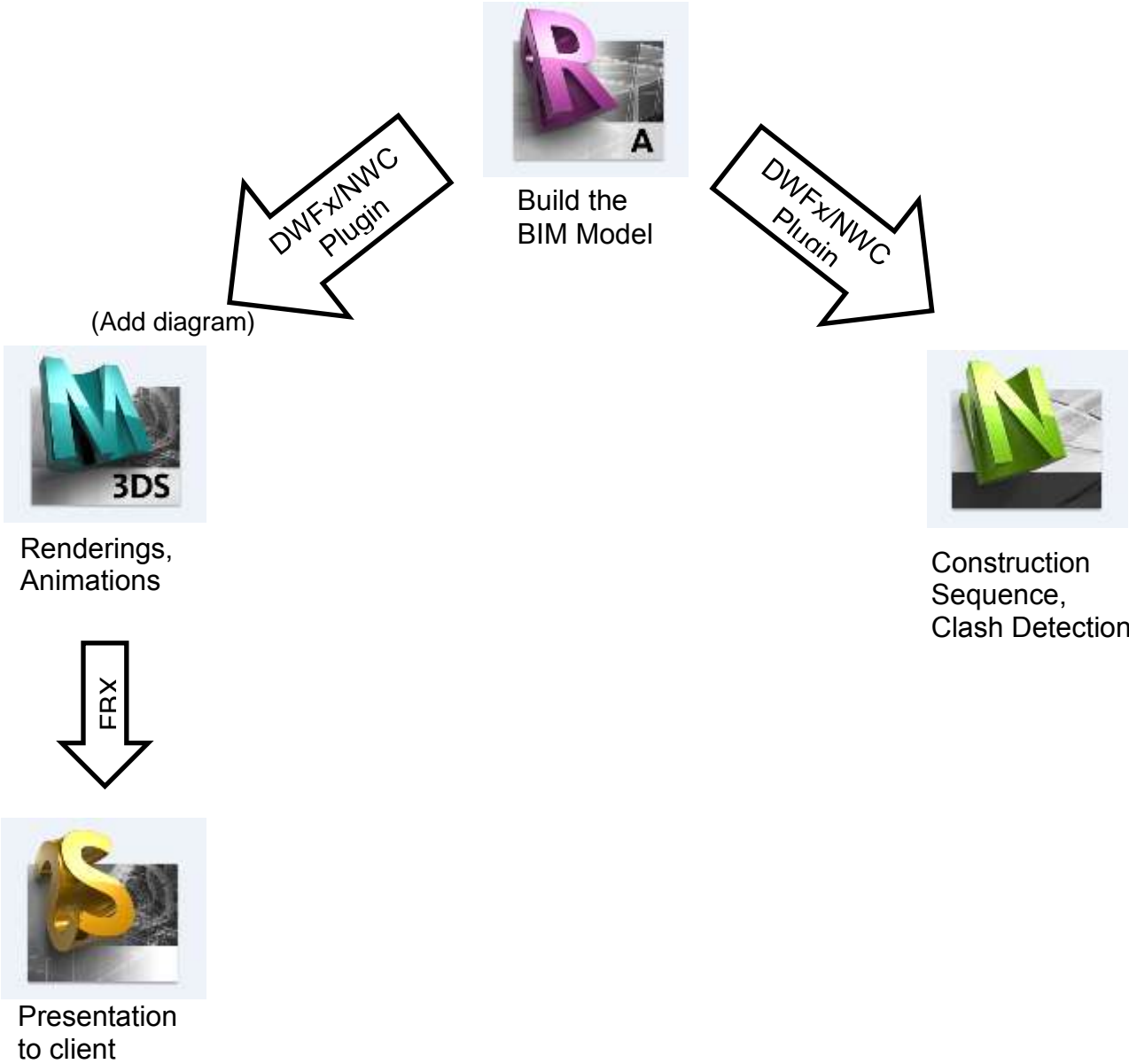
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Introduction

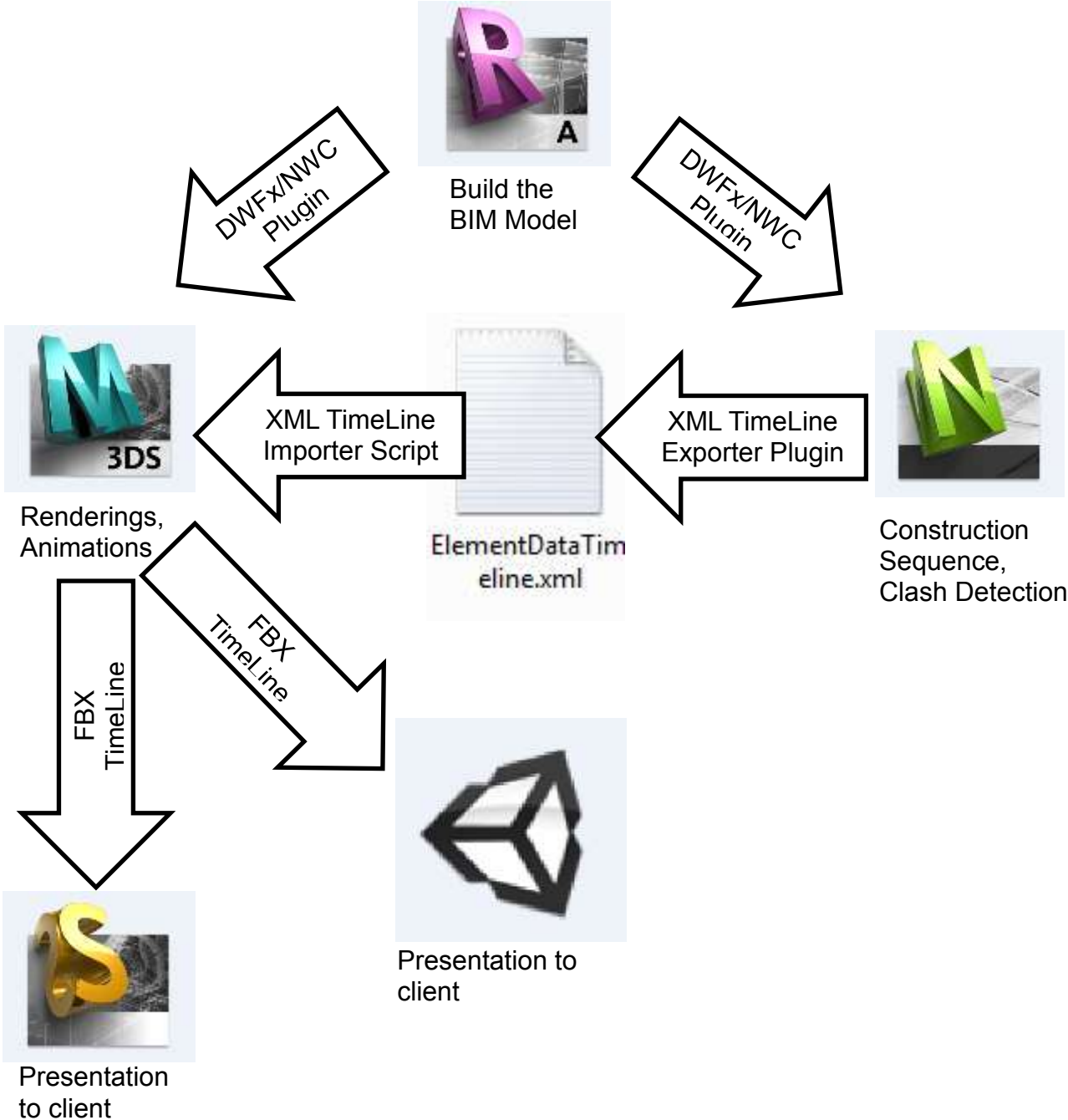
The Autodesk Building Design Suite

The Design Suite Delivers a lot of software and power into the hands of users, using just one of these pieces of software can be challenging at the best of time. The demands of ever tighter deadlines and a slow economy mean we need to work more efficiently than ever, our workflow must be seamless. The Design Suite provides the right tool for the job but Linking the work into that Software can be a challenge.

The Typical Design Suite Workflow

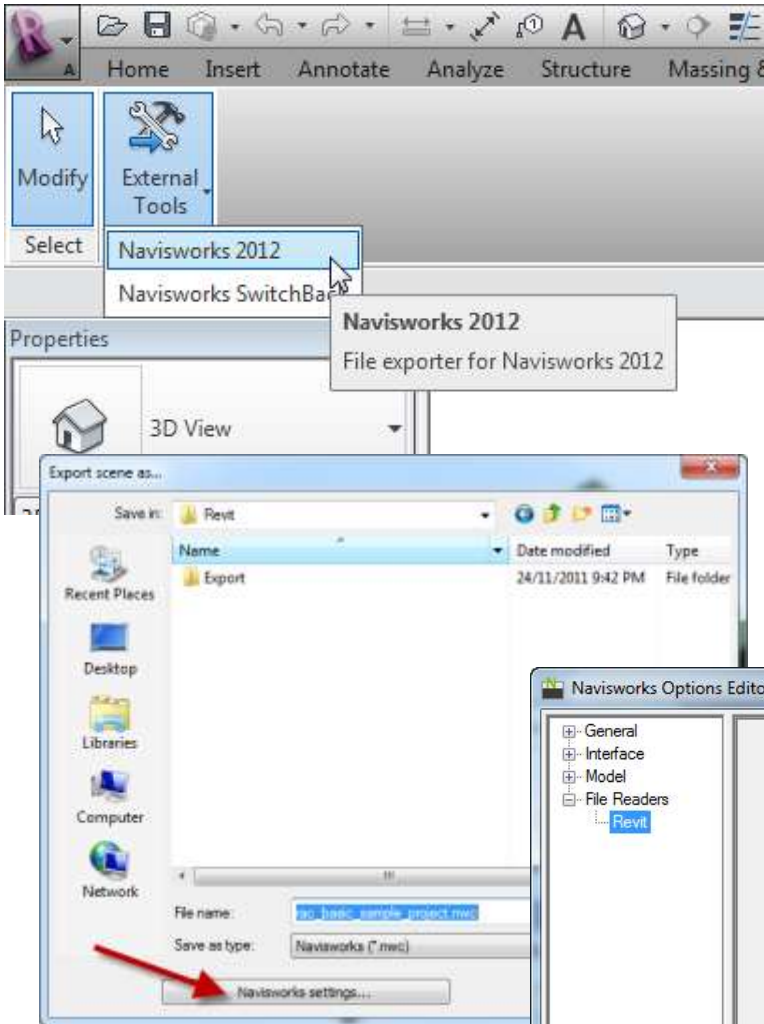


Workflow Achievable using Navisworks XML TimeLine Exporter to 3DsMAX and Unity Gaming Engine



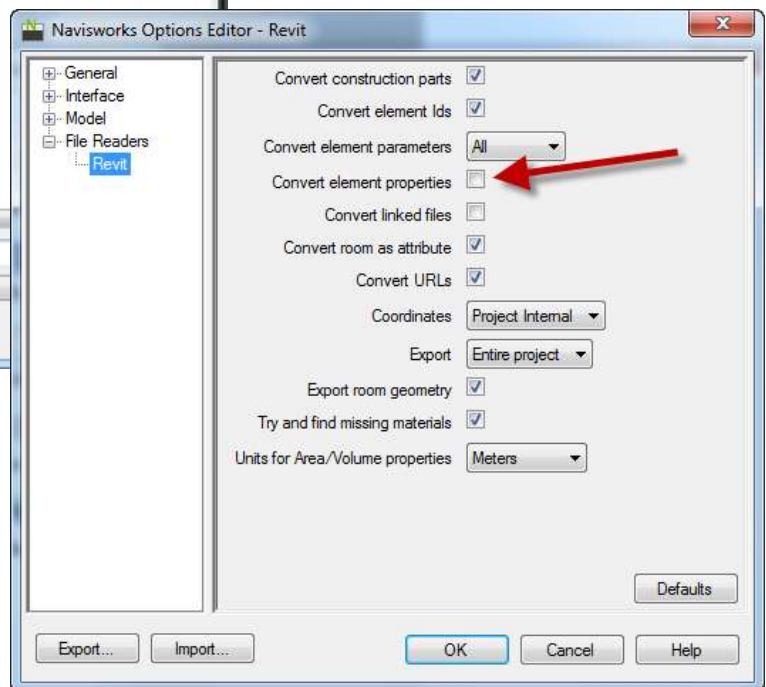
Importing DWFx or NWC files from Revit into Navisworks

1. In Revit Open a 3d View showing all the Model items you would like to Export to DWFx or NWC, exporting to DWFx or NWC is something you will need to explore. Typically NWC will export more parameter than DWFx but this makes the File much bigger and this can make the file difficult to work on and time consuming to send to consultants. I find that DWFx export all the information I need and item in the Project are listed in the Selection Tree by Category making items very easy to find and isolate for clashing.
2. To Export NWC click the “Add-ins” tab, “External tools” and click “Navisworks 2012”



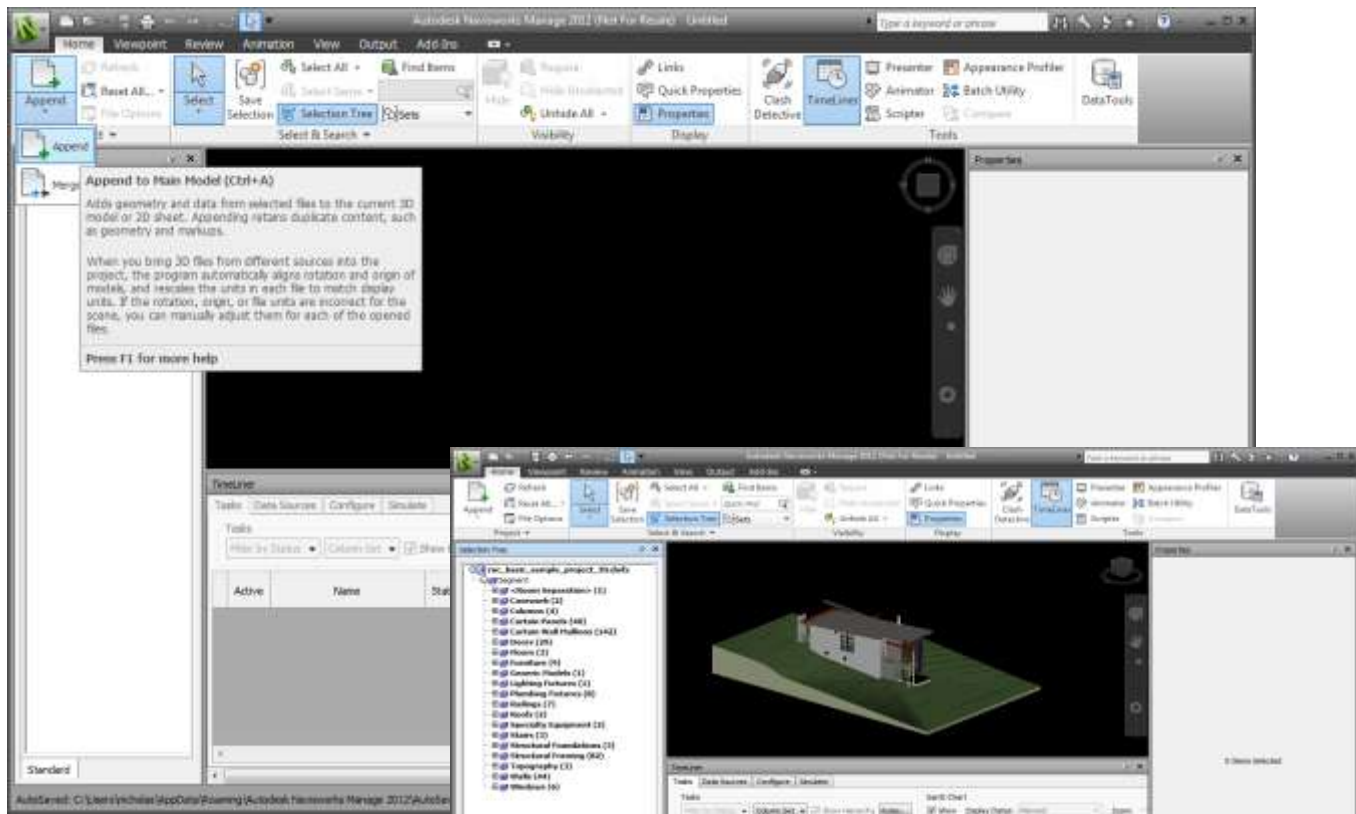
3. From the Window that opens name the file and select a save location,

4. The NWC setting can be accessed by clicking “Navisworks Settings”, the most important setting is “Convert element Properties” this will toggle exporting every elements individual Element Properties adding Lots more Data into the Navisworks File but increases the file Size and Export Time dramatically

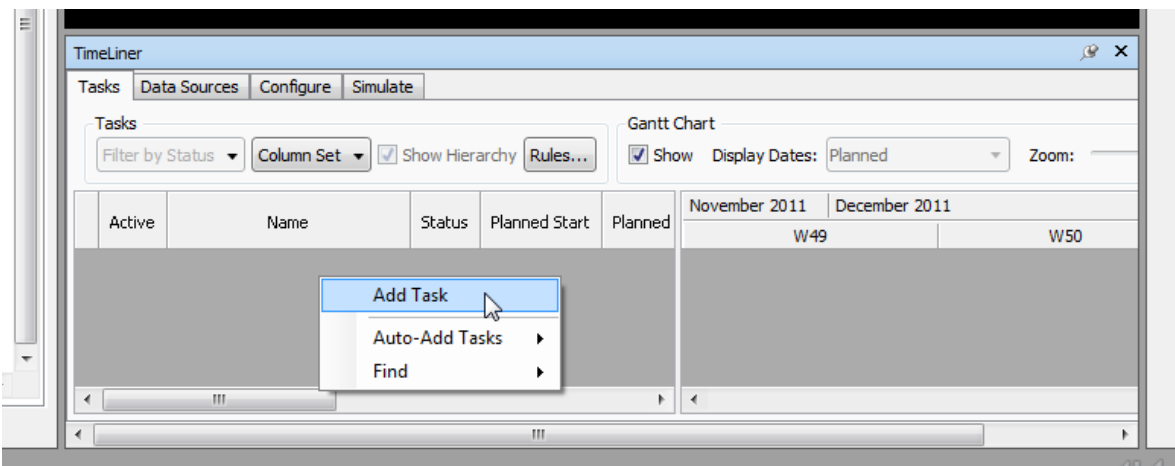


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- 5. Open Navisworks, click new and click "Append" from the "Home" tab, select the Exported file

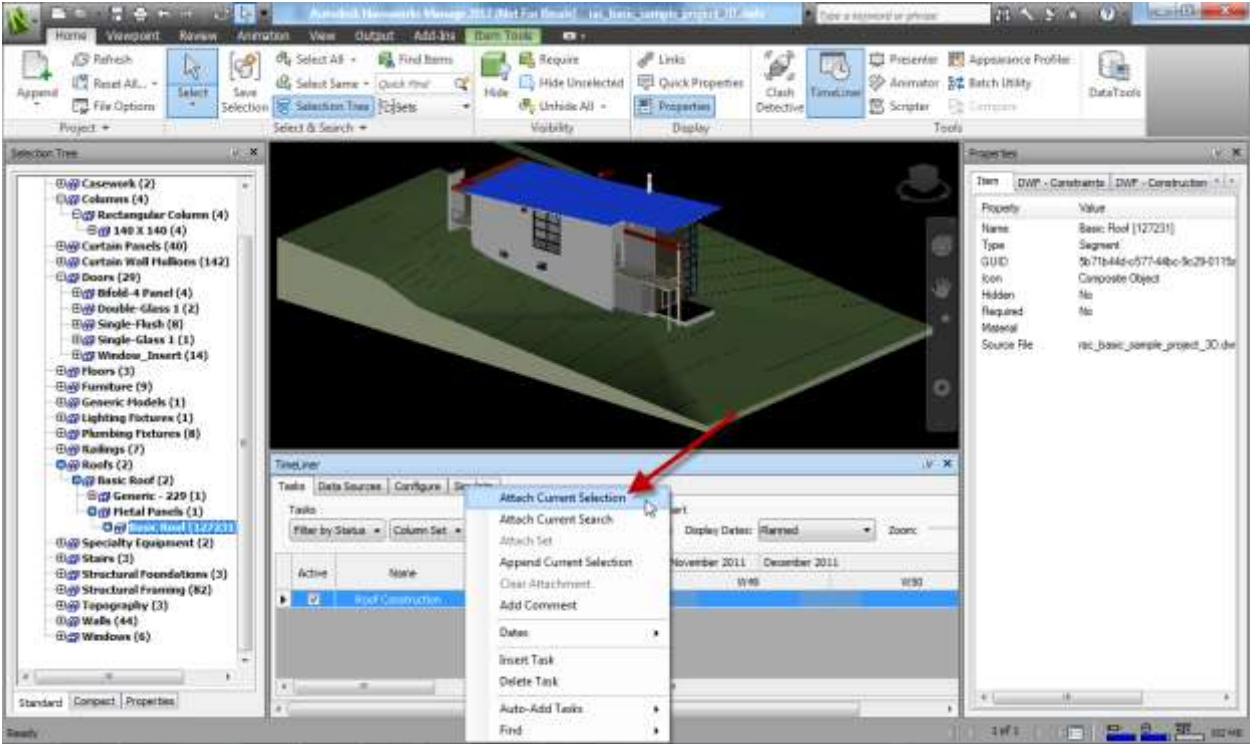


- 6. Open the "TimeLiner" from the "Home" Tab, Right click in the Time liner tasks grey area and click "Add task", select the created Task and press "F2" to rename the Task e.g. "Roof Construction", "Wall Construction".



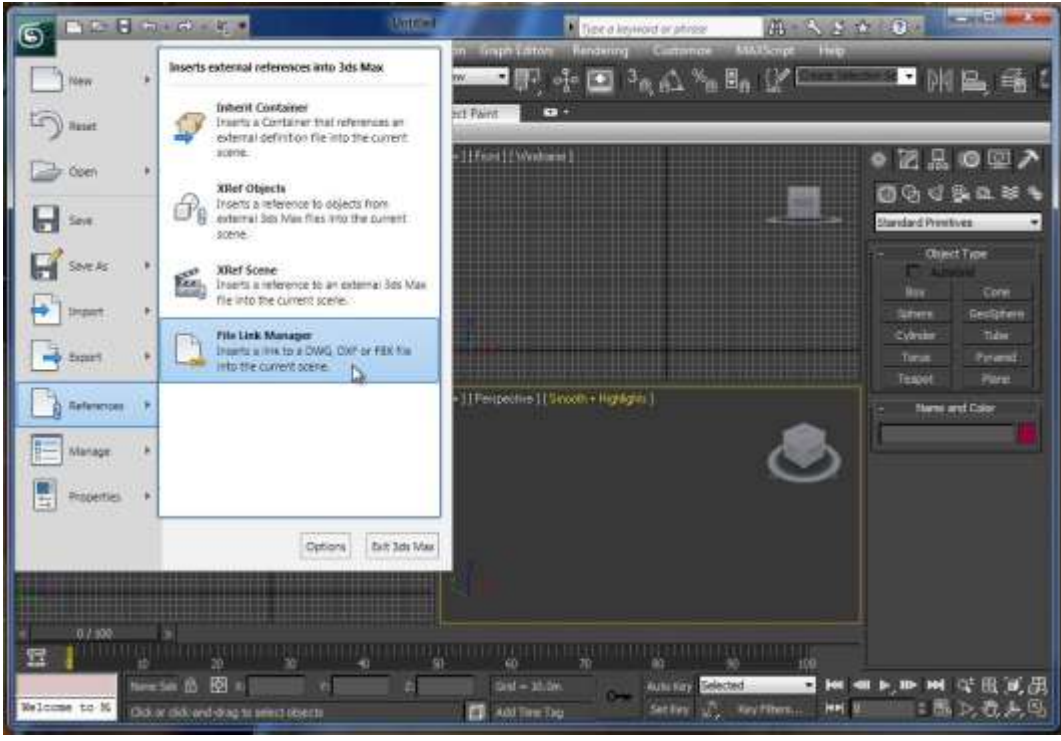
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- 7. Now to add items to the task, select an item from the scene, right click the task and select "Attach Current Selection"

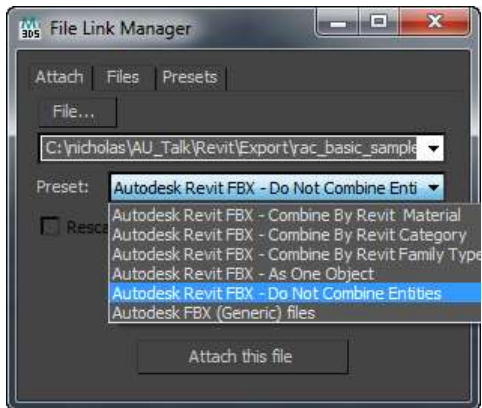


Importing FBX files from Revit into 3ds Max

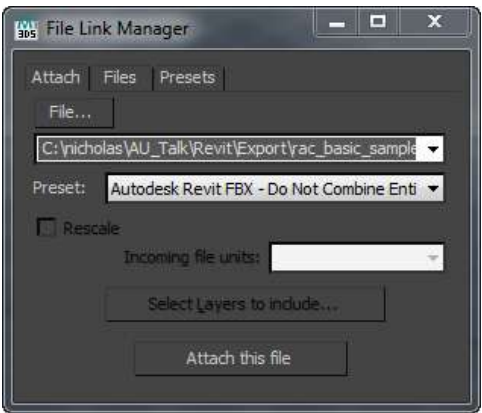
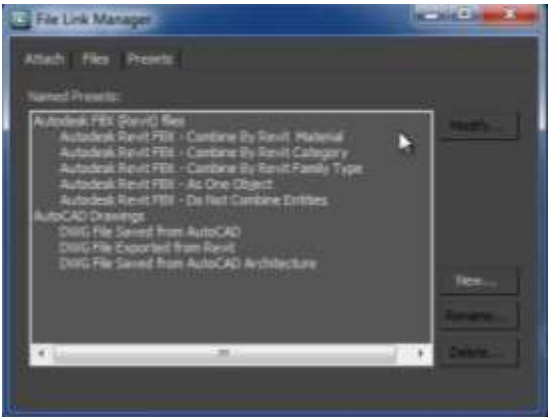
1. Open a new Max scene
2. Click the Application Menu, References, File Link Manager



3. Click the Attach tab if tab is not currently active, Click file and select the Revit FBX exported previously
4. Under presets select “Autodesk Revit FBX – Do Not Combine Entities”. There are many presets to choose from each with their own work flow benefits see the 3Ds Max help file for details on each of the presets. NOTE: We will use “Do not Combine entities” preset later so that we can add detailed animation to the scene and import that animation into Showcase”

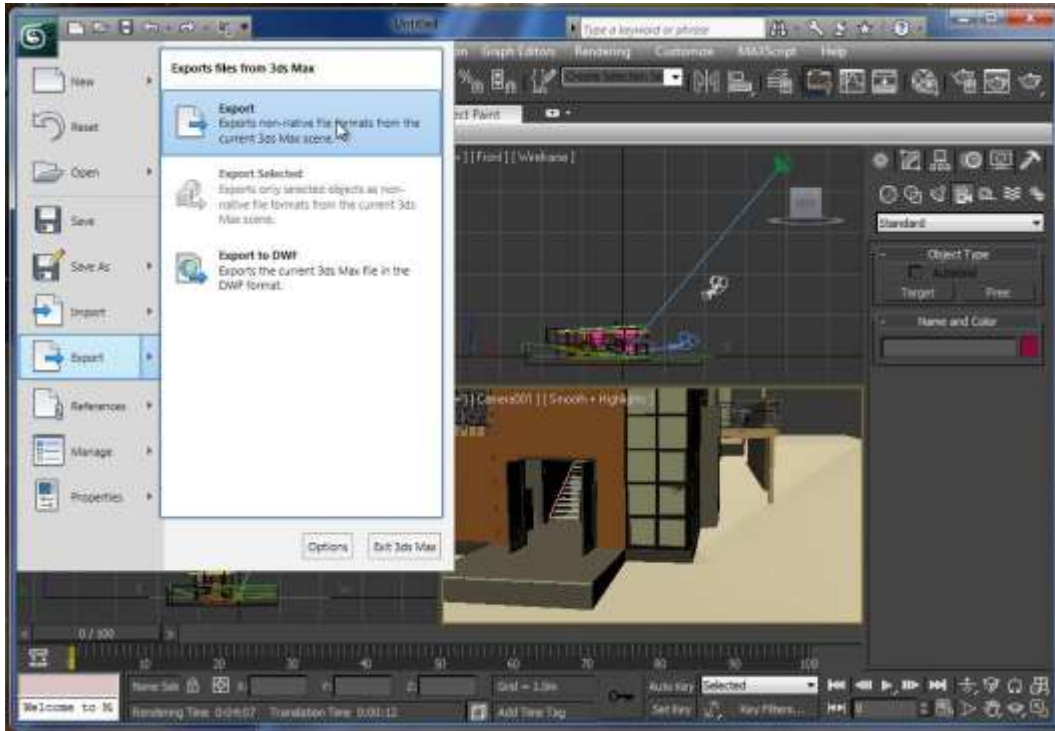


5. Click Attach File
6. Save the scene

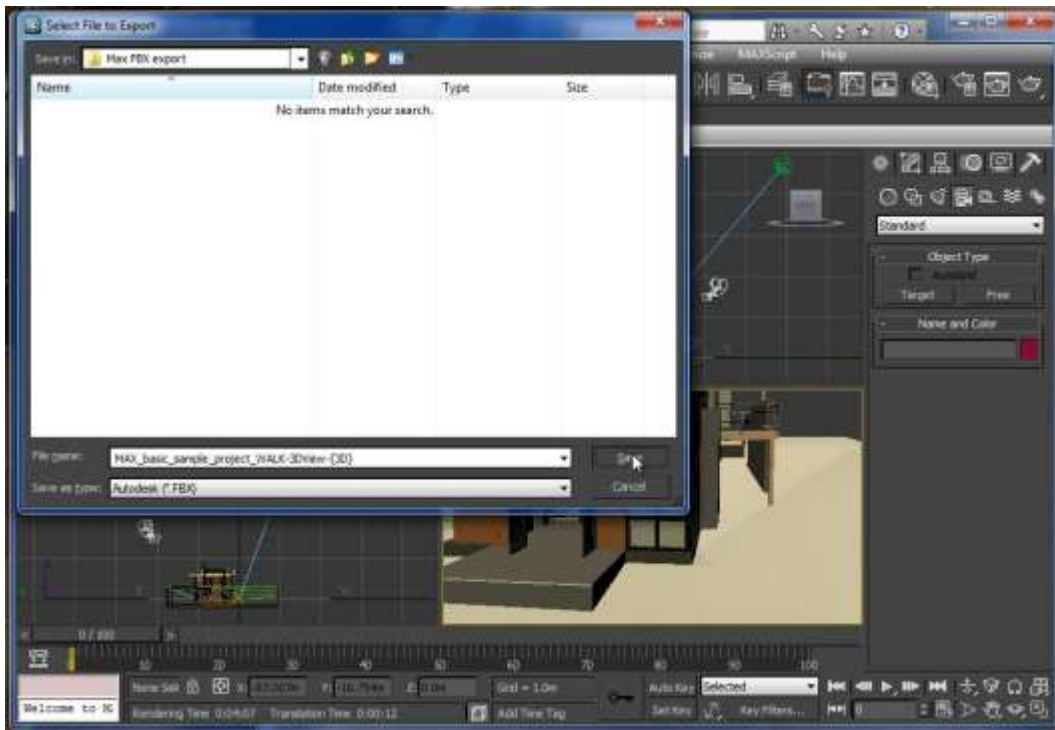


Exporting FBX files out of 3Ds Max for use in Showcase

1. With the imported FBX model from Revit open in Max (Save your work before running the export, I have had multiple crashes while exporting to FBX)
2. Click the Application Menu, Export, Export

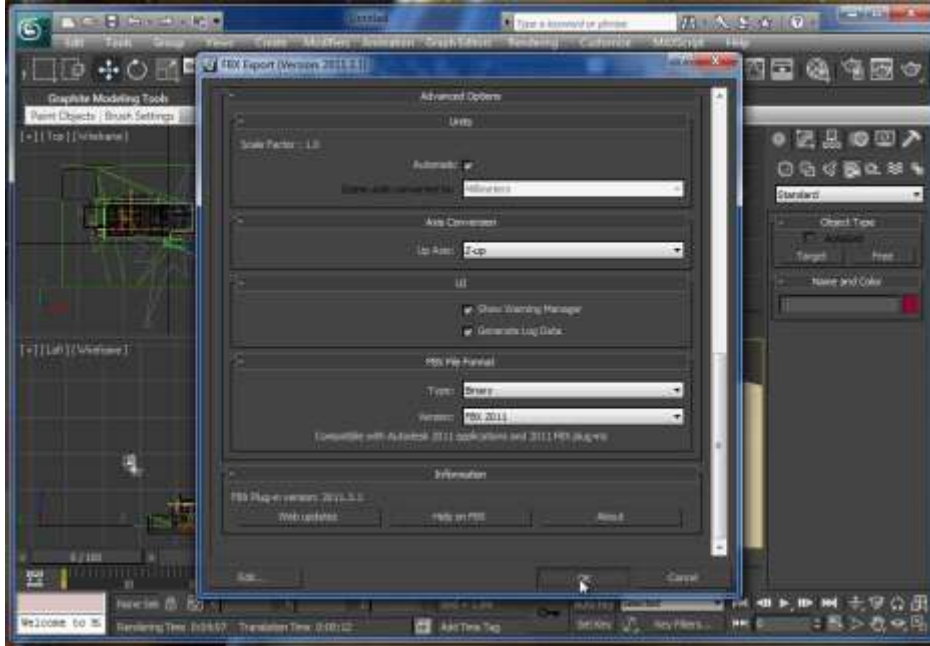


3. Select FBX from the save type drop down and Give the FBX file a name and click Save



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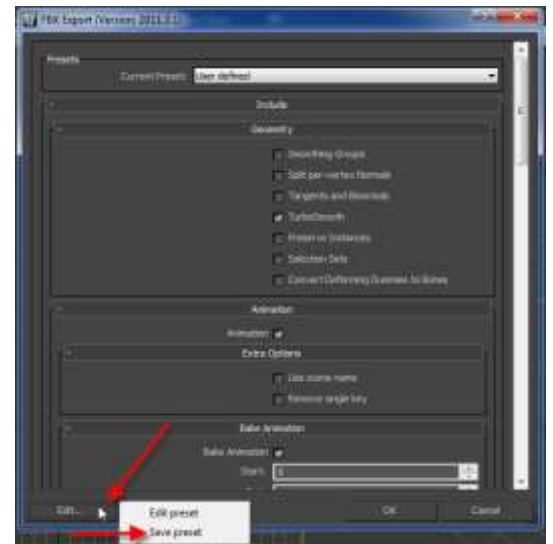
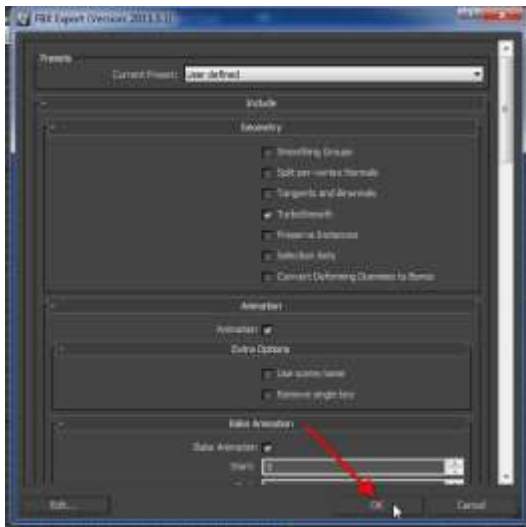
4. The FBX Exporter Presets window will open, Select the “Autodesk Media & Entertainment” from the current Preset drop down, this is a good Preset to start with



5. Ensure the settings match the ones show below

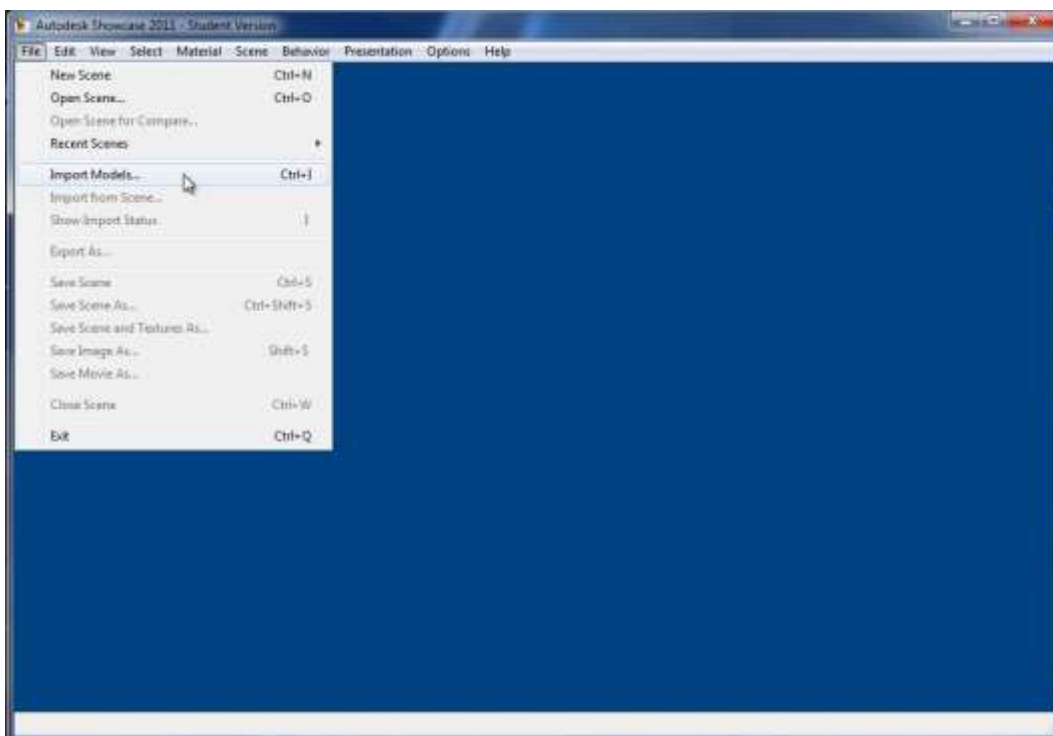


6. When the Presets are set, Click edit in the lower left corner, type a name and save the presets for later use
7. Click ok, in the lower right corner and 3ds Max will process the Export, this can take some time. The screen will return to the default Modeling screen when the export is complete



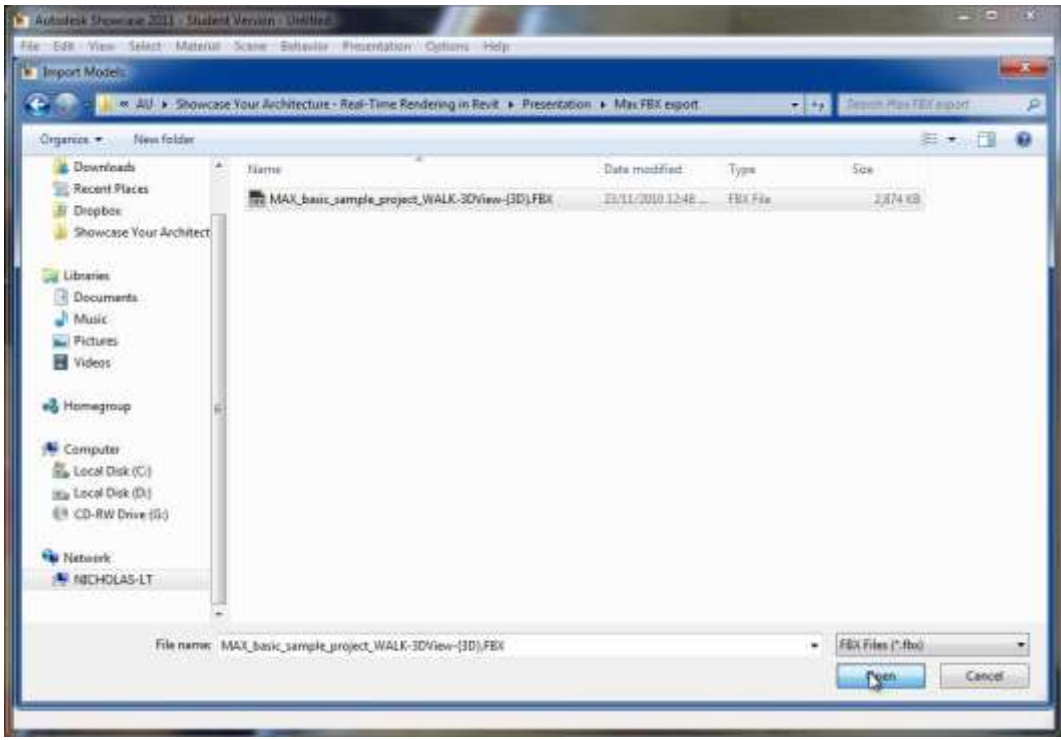
Import Revit files from 3Ds max into Autodesk Showcase

1. Open showcase and start a new scene
2. Select file, "Import Models"

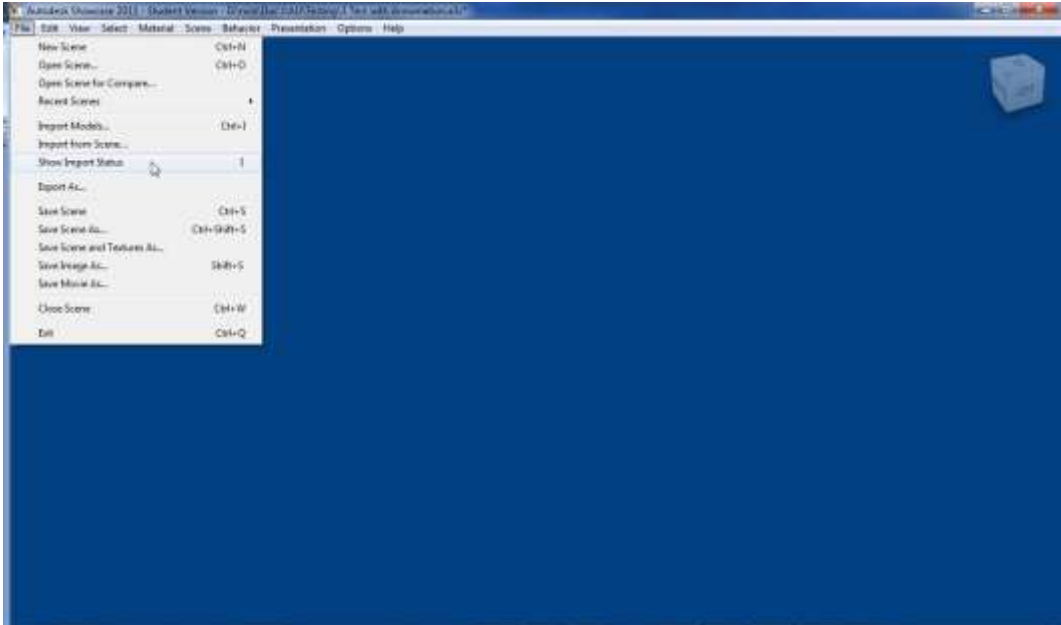


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- 3. The “Import Models window” will appears (will take a few seconds to load the first time)
- 4. Brows to the FBX file you exported from 3d max (See “Exporting FBX files out of 3Ds Max for use in Showcase” section for details) select the FBX file and click Open



- 5. The importing process can take some time (depending on the complexity of the models), the status of the current import can be seen by opening the “import Status” from the File menu. (FBX files do not require you to set a LOD (Levels of Detail) as “.dwg” or “.dxf” files require you to



- 6. Once the model has been imported, it will appear on screen.

7. Ctrl F is “fit to view” this will maximize the view if the model is not visible on screen after import is complete (see “import Status” from the File menu, for file import Status)

Import Revit files from 3Ds max into Unity Gaming Engine

Unity is a breakthrough in Game Development, they have unlocked Game development for the masses by making a Game Development Utility that is both Powerful and Easy to use.

Unity is also free, the Pro Version is a very affordable \$1500USD.

Unity can also build games for a very wide range of Platforms PC, Mac, Web, iOS, Android. An easy to use, easy to learn, power full, deliverable gaming engine and all for free!

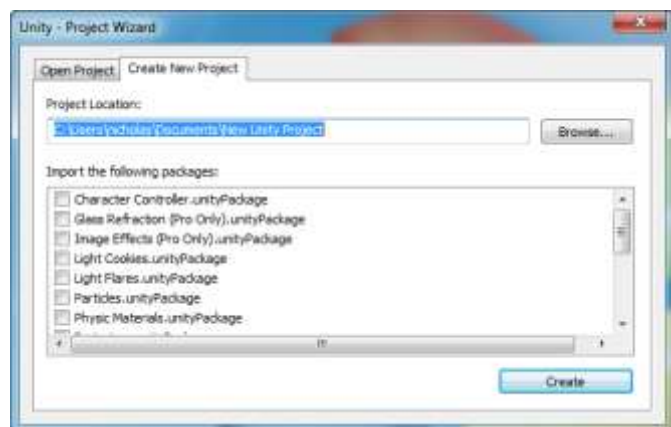
1. Download Unity from <http://unity3d.com/unity/download/>

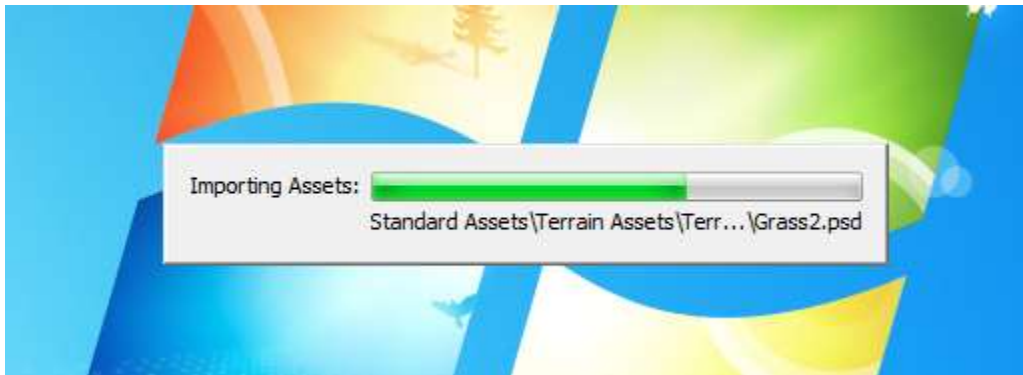


Download



2. Install the Software
3. When finished installing click the unity icon on your Desktop to open Unity
4. The “Unity- Project Wizard” will open, select the Create New Project, Click “Browse” to select a folder for you Project to be created in

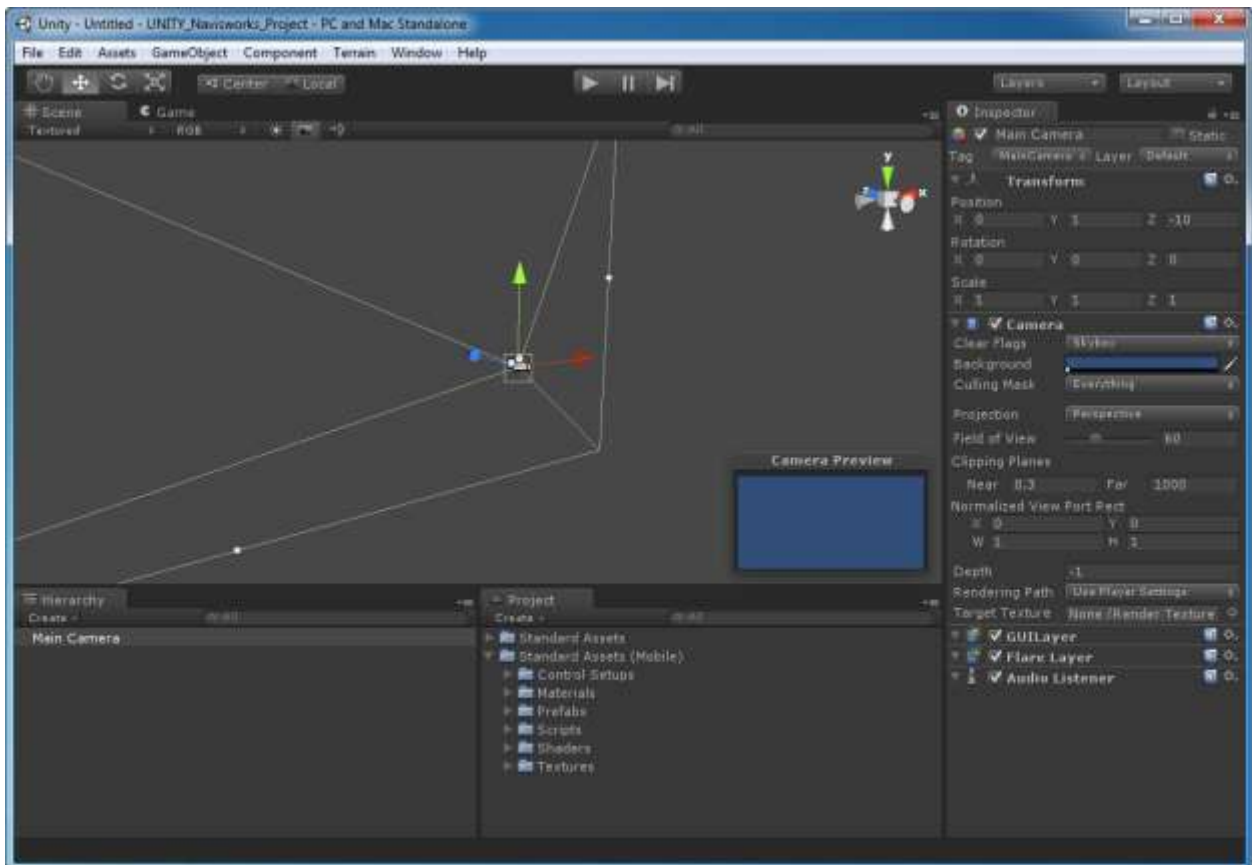




5. Unity Will Create the Job folder and open the Unity Editor

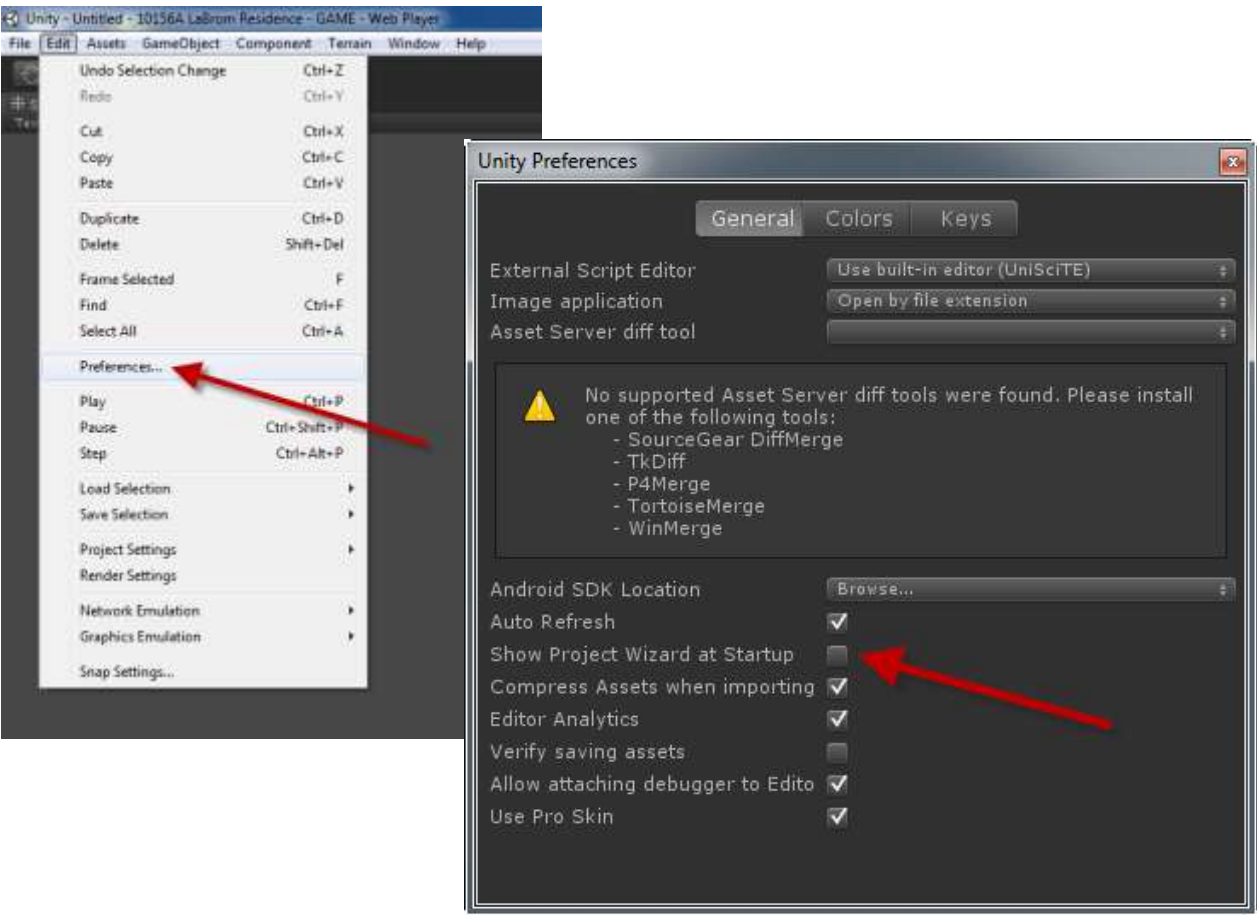
Quick Overview of the UI:

- Inspector Tab shows the Properties of any selected item
- Project Tab show all files in the Project Folder on your computer
- The Hierarchy Tab shows all objects in the Game Scene
- Scene Tab is the Working View for creating, building and selecting objects
- The Game tab is the View through the main Game Camera
- The Play button will Start the game, it with quickly build the game and let you preview the game



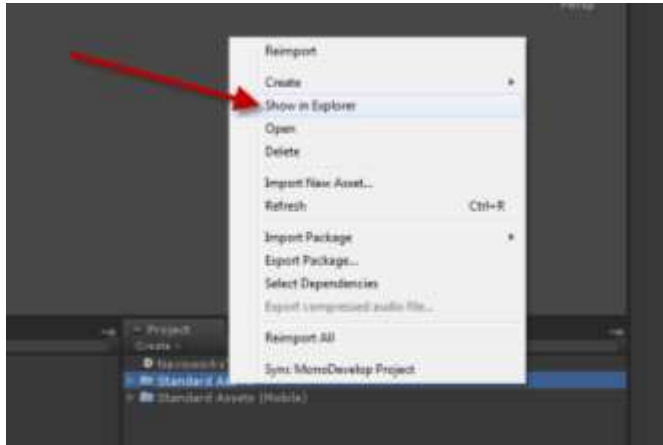
6. Setting up Unity, when you open unity it will open the last project you were working on, this not great when you projects become very big and you don't want to work on the last one you work on, so to disable this and get unity open the Project Wizard and let you select a project to open.

From the "Edit" menu select Preferences and Select "Show Project Wizard at Startup"



7. To import an FBX from Revit or 3dsMax

Right click a folder in the Project Tab, select Show in Explorer from the menu that opens, in the Explorer Window that opens create a folder for all the FBX imports and copy and paste your FBX File into it.



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8. Switch back to Unity, Unity will import the File, it will appear in the Project Tab, click the imported file in the Project Tab the Inspector tab will show the “(FBX importer)” properties change the “Scale Factor” to 1, You should always export from 3ds Max in Meters, with these setting any material texturing you have done in 3ds Max will import scaled correctly, select the imported FBX file from the Project Tab drag and drop it into the Hierarchy tab, the FBX is now in you game.

