# HOW TO MASTER REVIT® FASTER THE EASY WAY TO TRANSITION FROM 2D CAD TO 3D BIM

FOR ARCHITECTS AND DESIGNERS



QARC Systems 59 Chermside Street Grange QLD 4051 Ph: 07 3356 9051 www.qarcsystems.com.au



#### INTRODUCTION

- In this book you will learn how to transition from **2D CAD** to **3D BIM** as quickly as possible. Essentially this is a biography of the journey written by someone who wants to help others and make their journey easier. More information about the author can be found at the end of this E-book.
- This E-book is organized following my chronological transition from when I started work until current day.
- The first section talks about the joys of **hand drawing**. For those of you who are afraid technology will kill your creativity all is not lost.
- Then we discuss the first transition from manual drafting to **2D Computer Aided Drafting**.
- The next transition is from **2D CAD to 3D CAD** which was essentially the precursor to Building Information Modelling.
- Naturally this leads into a discussion on what **BIM** really is?
- We then postulate why true **3D computer modelling** is still relatively **uncommon**.
- We discuss where manufacturers fit into this puzzle and the value of **manufacturer supplied 3D content**.
- <sup>"</sup> This leads us to some **tips for getting started** when it comes to 3D BIM.
- <sup>"</sup> The importance of **the taxonomy of drawings** is investigated next before informing you about **QARC content libraries**.
- After extolling the virtues of QARC4REVIT the complete 3D design and documentation system, we discuss how you can use 3D to increase your income by leveraging 3D to deliver and earn more.
- We summarize how **QARC delivers the complete 3D solution** to **Master REVIT ® Faster**.

# **Hand Drawing**



- Are you old enough to recall **standing up** at a **drawing board**? Some of you may remember tracing paper that stretched 10mm by the end of the day in a non airconditioned building. That translates to 1 metre on site. Who can remember scratching through the tracing paper with razor blades? What about hand hatching - how tedious and mind numbing was that?
- Not surprisingly when CAD technology arrived many of us were more than ready to embrace it. Little did we know it was going to be such a long ride and bumpy.
- I transitioned by putting my 13inch screen on my drawing board.
- <sup>1</sup> It must have been Movember?





# <sup>77</sup> Transition ONE - 2D CAD

- The first transition is often from manual drafting to 2D CAD. If you were lucky you might have virtually gone straight to 3D CAD with software which was essentially a 3D add on to Autocad.
- Back then 3D was basically 2D plan *lines* extruded to the third dimension and *not true 3D*. Even today some software is not true live 3D software and requires *manual* conversion to 2D CAD for the elevations and working drawings after *every* change.
- This type of semi 3D platform is definitely not the way to go. You want real 3D.
- So perhaps the best thing about 2D CAD was we finally got to sit down at a chair instead of standing up at the drawing board all day. Well that is until your back goes out - 15 hours a day slumping in a seat is no good for anyone!
- I cant believe we thought the first computers and screens were fantastic. At least I found a use for my drawing board.







#### Transition TWO - 2D CAD to 3D CAD

- <sup>7</sup> There are many software providers claiming they have the best software to design and document in 3D.
- You might find it surprising that some are not much better than what was available nearly 20 years ago. You see there are many varied ways for designers to produce 3D CAD drawings.
- Some choose to use low tech software to model ideas then some outsource (overseas) to do the pretty pictures. There is no argument this can sometimes be quite cost effective. In most cases it is simply wasteful. In most instances the building must be recreated in another software again. Often this is only in 2D and/or also outsourced.
- Invariably this means every time something changes you start the process all over again.
- What you really want is true 3D software that really *updates* all 3D and (apparent) 2D views *instantaneously* and accurately. Accuracy is the key replication can only lead to errors.
- There are many software options each with their own pro's and con's. You need to research what best suits your needs. It might be something as simple as selecting the one that provides the best native presentations - or drawings for that matter.
- Remember the learning curve is going to be steep and long. The last thing you want is for the software to sit in the original box for 1 or 2 years making it a *real* collector's edition.
- Despite the range of software available you may not have made the transition from drawing board to 2D or 3D yet. You may be afraid of the learning curve and how the transition will cost you in time or money. It is rare for smaller practices to be in a position where they can afford to run 2 systems in parallel. Similarly, you can't afford to commit to totally changing over to a completely new system. You need to segue to BIM.





#### What is BIM?

- <sup>7</sup> BIM is more than the process of designing and constructing or operating a building. BIM should be the complete concept to construction electronic object-oriented information management tool for a building. g. BIM should use tags and schedules and reports containing all the information about the 3D object- based products in the Model.
- Governments around the world are mandating BIM and all customers will eventually require it. Why would they? Probably for operational management and to incorporate all the disciplines for now and for the future.



- <sup>7</sup> Some think BIM is simply about identifying the mechanical or electrical clashes. It is not. The real power of BIM is its virtual reality. Real 3D uses actual *extruded components* not just extruded *lines*. BIM is a design and production tool. Modelling assists with visualization which I found even more useful as I got older and could not visualize as well as you used to be able to. Some may recall when you used to flip the butter paper to get a different idea? Using 3D modelling BIM it is now possible to play with different roof pitches and curves.
- BIM is also a great design and documentation tool. You know for sure if something will fit if you use the actual 3D object. BIM also allows you to schedule, legend, import and export data, attach images and work in conjunction with consultants.



#### Why Is 3D still so uncommon?

- Possibly one reason 3D design and documentation remains so uncommon in smaller practices is because of the lack of good quality 3D content.
- 3D content is called families in Revit<sup>®</sup>. It is usually the first thing we are taught and because we are Architects our egos take over. We think we can reinvent a better family. Then we share our families on line. Perhaps that is why the internet is full of 3D rubbish.
- If we are smart we soon realize our limitations. Insufficient parameters inhibit easy changes or instances of the same family so you end up with too many families. Often no materials are assigned for rendering purposes. So invariably we trawl the net for better stuff. There are a lot of 3D components available - perhaps too much? Finding the good stuff is like trying to find a needle in a haystack.





#### Manufacturer supplied 3D content!

- What about manufacturer's content?
- We constantly receive new content from manufacturers.
- Generally in order to access it you firstly must register and assign a password. Then you try to retrieve the family from the web site. If you are lucky you will understand the importance of a good hierarchical taxonomy - which is discussed later in this E-book. Without a logical folder structure you may find it difficult to find what you are looking for again. You can bet if you use a temporary name or place marker you will end up with a huge folder with too many oddly named "temporary" files.
  - If you already have a good document management system in place it will be easy to find the downloaded file, open it (wait for it to update) and import it. Only then will you find the family does not look right because the material textures were not already in the root directory of your computer. Then you will have to get all those texture files and put them in the right place for Revit to find them. Some manufacturers do not realize many users would not know where to put these texture files. If you use realistic views you need this information to be mapped.





- Further, a cladding material often comes as a single skin product not attached to a wall. Cladding by itself is of no use. So that means you will have to attach the cladding onto a wall frame to be of any use. You would have to do this for every different colour or texture of the cladding. All of this wastes your time. If the manufacturer saves you time you are more likely to use their product.
  - Poor Families also rarely have any parameters or they are not editable. Too many parameters can be just as bad taking lots of trial and error to eventually (not) get what you are looking for.
- In the meantime you have a problem. If you are learning you are not earning. There are times when you simply must get the job out the door. This means projects end up with lots of "that will do for now" families which get passed on from project to project - because we always run out of time to make better ones. Even worse some details get imported from old 2D libraries or drawn in 2D.
- Slowly but surely these legacy families get incorporated into the project template until the project template is bloated and all project files start too large.





# Tips for getting started

- Before you change software you need to know how to make the transition painless. Most 3D software these days is essentially the same. They generally require a template and large libraries of 3D elements and families.
- If you do not have these libraries and do not have the time to learn how to create them then you need an expert to assist you. Don't be surprised if everyone wants to charge you the earth to set you up. You would think if you are not trying to reinvent the wheel you just could simply adopt an established system.
  - Unfortunately you will find no one will want to share their systems because they have invested so much time and are still looking for a pay back. It is almost like it is considered a Revit rite of passage (RevITE) so you should have to do the same?





# The Construction of a Good Template

- Eventually you will work out you need a drawing sheet set up template
- the template should include documentation support like:
  - . views on sheets
  - . schedules
  - . annotations
  - . shadow times
  - . legends
  - . 🧹 area plans etc
  - . a simple consistent drawing numbering system
  - . an easily accessible family and elements library
  - . an easy to understand process + manual
  - to deliver good design and documents
  - to make some money

You may also work out what you do not want:

- . to understand how Revit works in the background
- to know exactly how to build complex parametric families
- . to spend time setting up new drawing sheets for each project
- You are not alone on this journey. There are many others who have had the same struggle. QARC Systems was created by a handful of skilled and experienced designers and Revit experts who felt it was about time there was collaboration in the industry. This group of designers and software gurus decided they could assist in helping the design profession earn a living. So QARC Systems was created specifically QARC4Revit<sup>®</sup>.
- By saving designers from having to reinvent the wheel QARC can shave 2-4 years off your Revit<sup>®</sup> learning curve so you can master Revit faster.

1015P - Site Plan 1-50 102SP1 - Site Plan 1-200 103Sp1 - Site Plan 1-200 Ground Level 105CP - Concept Site Plan 110FP - Level O Floor Plan 111FP1 - Level 1 Floor Plan Floor Plan: proposed FloorRoof lines Floor Plan: proposed L1 floor plan E Legend: Icons Floor Plan Proposed Legend: KEYNOTES LEGEND Schedule: Area Schedule (New) Schedule: Area Schedule (Proposed Schedule: Renovations List Schedule: Sheet Notes - 111FP 112FP1 - Level 2 Floor Plan 131RP1 - Roof Plan 132RP - Roof Drainage Diagrams 141EP - Site Electrical Plan 150EP - Level O Electrical Plan E 151EP - Level 1 Electrical Plan 9 - 152EP - Level 2 Electrical Plan 160RC - Level 0 RCP 161RC - Level 1 RCP

QARC Plan 100 Bracing QARC Plan 100 DemoFloor QARC Plan 100 DemoRoof QARC Plan 100 DraftingLines+Text QARC Plan 100 Floor QARC Plan 100 Floor Finishes QARC Plan 100 FloorRoofOverDotted QARC Plan 100 FramingOutlines QARC Plan 100 FramingStructure QARC Plan 100 FramingWalls QARC Plan 100 Measure QARC Plan 100 Pressure QARC Plan 100 Power QARC Plan 100 Roof QARC Plan 100 Roof QARC Plan 100 RoofLinesOverExist OARC Plan 100 Setout OARC Plan 100 WallsUnderDotted QARC Plan 100 WallsUnderRoof QARC Plan 100 WorkingFloor QARC Plan 100 WorkingFloorExist QARC Plan 100 WorkingRoof QARC Plan 200 DemoSite QARC Plan 200 Power QARC Plan 200 Power QARC Plan 200 Roof CatchmentDrainage QARC Plan 500 Joinery QARC PlanArea 100 QARC PlanArea 100 QARC PlanArea 100 Existing QARC PlanArea 200 QARC PlanArea 200 Existing QARC Site 200 Standard QARC Site 200 WallsDotted QARC Site 200 Working



#### The taxonomy of drawings

- The partners at QARC have over 100 years of experience between them and have asked the hard questions. When creating QARC Systems they approached it like a first-time user often asking stupid questions like "why can't we do this...?".
- The numbering system was one of these developments. Who really understands some of the standard numbering systems - what does A201 mean? Consecutive sheet numbering often means sheet renumbering when more sheets are added – and that just leads to mistakes.
- Each of the QARC partners
  used their extensive
  experience to come up with an alphanumeric numbering
  system that made sense. Now
  you never have to alter sheet
  numbers ever again! The
  numbers are the same on
  every job only the project
  number changes.
- For quality documentation a highly developed template is crucial. The template should be already set up with working views for modelling, and presentation views on sheets. Many people draw (or build the 3D model) in "sheets" – don't do that it is an old 2D habit.



- Model everything in 3D using good families and their assets and materials i.e. BIM.
- In the QARC template working axonometrics are set up with roof taken off each level so it is possible to see and understand what you are doing. These 3D views are also useful as some manufacturers families only install in 3D and not in the plan view.



- All the sheets should be set up to populate automatically. It is crucial to set up every sheet in template with lots of overlays applying view templates. Use overrides in overlays with layers turned on or off or shaded or light or dashed so the drawing displays and prints correctly.
- You will still have to open the sheets to add labels (tags) but again if the family is set up correctly it tags automatically at the click of a mouse. You also require:
  - a cover
  - drawing lists
  - support plans
  - set out view
  - view templates
  - legend/schedules
  - phasing
  - default levels set up
  - standard general notes
  - sustainability notes
  - standard details
  - general checklist
  - title blocks
  - scale bars
  - rotational north points
- Minimum
   11 Accurate Output

   SWMIN
   This Wind Rating is an overall Project Parameter, and in the Titleblock with a visibility switch. Already switched on, for this sheet.
   Sheet Shee
- Most importantly all the required views need to be set up on the sheets in advance. This means it is easy to print a batch of sheets. You can see some samples on the QARC web site.
- The added bonus to all these additional sheets is they make your fees look reasonable for the quantity and quality of the documentation. You may use more paper and ink but clients now understand their project more and show their friends.







#### **QARC** content libraries

QARC4Revit contains a great library of system families and families that actually work – this is paramount. Just like everyone else the creators of QARC found their families were also usually created for a specific project - just to get the job out the door. Creating QARC forced them to rebuild their entire library which contains thousands of families.

Even better the QARC library of system families and families are parametric as needed which means there can be less of them. QARC also provides you with an easy to follow 'how to" companion rather than a massive manual.





# QARC4Revit the complete 3D system

The QARC4Revit plug in integrates the BIM content with Revit<sup>®</sup> projects directly from an extensive cloud-based library - growing every day. Better still they can be previewed and simply dragged and dropped directly from the cloud into your 3D model - instantly. This ability to drag and drop includes system families which is something no other system worldwide (that I know of) can do this at this point in time.

The families automatically bring and assign texture materials.

- In addition to the families the QARC4Revit plug-in includes:
  - A project template with views and sheets set out with a comprehensive drawing numbering system ready for quality documentation
  - Working views and view templates
  - automatic notes and scheduling tags
  - a manual and support something or someone to turn to
  - a tree provided on cloud so you have less need for library system yourself
  - content with a search function
  - 2017 2018 and 2019 versions of the software
  - families that report directly to schedules
  - the QARC archetype template which is designed for use on any project
  - each sheet with a "how to" guide
  - an on-line link to the user's manual
  - check sheets ensure for junior staff everything required on sheets
  - Australian (Brisbane) based team of Designers and Architects and Coders





### Use 3D to increase income

- Learning to design and document in 3D requires a significant investment in money and time. You need to get a pay back.
- Once you have good families and a good template you need to leverage 3D to increase your income. A 3D model is useless unless you can share and print it and get paid for it!
- <sup>"</sup> Here is how you can leverage 3D.
- Undertake your space planning (Pre-Design) in 3D with:
  - . no textures
  - . using "working views" that
  - automatically populate the specific PD sheets
  - . with basic (apparent) 2D + 3D views
  - with generic nominal 250 thickness walls
  - . with added windows and doors
- Then print the 20+ sheets including axonometric views.
- <sup>"</sup> Then send a Pre-Design account.
- For Sketch Design switch to colour views still with:
  - . generic walls
  - . more views
  - . site cover
  - . GFA
  - . shadow views
  - . perspectives
- Then print the 20+ coloured sheets and send a SD account.
- It is not as much work as it may appear to the client.



- For **Developed Design** or **Town Planning** Stage change to:
  - . real wall types
  - with required textures
  - and colours often presented in "realistic" mode
  - . with standard sheets including sun diagrams
  - . site cover
  - . axonometric views
  - . perspectives



- Native Revit is so good most of the time renders are not required. You can elect to do them if you are paid extra.
- Again a good family library will make the realistic views look better and make rendering much easier.
- For the documentation or **Working Drawing Stage** switch back to:
  - . black and white lines all still 3D
  - . add schedules
  - . 3D axonometrics in colour
  - . And all details in 3D not 2D





#### Leveraging 3D to deliver and earn more

- This is the ultimate power of 3D the ability to leverage it to earn more. In 2D one little change used to mean lots of work.
- In 3D one little or big change to the 3D model automatically changes every sheet. Change levels easy. Move the entire building easy.
- You can finally get paid for all the work you do.
- By changing the model you can change 50 sheets automatically so you no longer have to lose money on every change. In fact the changes may now be so easy you might even resist them a little less.
- You might even decide to charge less once you have repaid for:
  - time invested in learning the software
  - time invested in making families
  - money invested in software
  - time and money invested in software training
  - money invested in new hardware
  - money invested in plug ins and subscriptions etc.





#### QARC delivers the complete 3D solution

- One of the problems with current BIM application s is that noone shares good content.
- Why? Because we all are perceived as competitors.

QARC Systems was created to help designers earn a living and create quality documentation – so the design industry could deliver more to our customers.

- If only there was a way to access over 20+ years of experience for a fraction of the normal investment in time and money? Even better what if you could:
  - access manufacturer's content without having to log in
  - with a preview of the product
  - and the ability to direct drag and drop live into the model
  - with a plug-in app for Revit
  - with an Australian content library
  - that is constantly growing
  - that has been tried and tested for several years
  - with optional upgrades to better templates and families
  - that can allow you to render instantly
- Would that be good?
- A complete system like QARC will jump you from Revit Zero to Revit Hero in a fraction of the time it would normally take.
- With 251 working days a year if a system like QARC only saved you 1 hour per day (at a nominal charge out rate of \$100 per hour) that represents a saving of \$25,100 per year.
- At the cost of a good cup of coffee a day QARC Systems is the solution.





- If you are as excited about this world leading product please like and share our web page link (or this e-book) and email QARC Systems with an expression of interest. Register to become a world first adopter of new technology and download the free version of the plug in with free access to manufacturers content and the basic version of the QARC Template.
- For more information on the upgrade optional subscription **Professional** or **Premium** versions of **QARC4Revit** go to <u>www.qarcsystems.com.au</u>
- Don't have Revit yet? Contact CADGROUP for all your BIM solutions and services and get the ultimate bundle Revit and QARC4Revit go to <u>www.cadgroup.com.au</u>
- Once you have the ultimate 3D production tool **QARC4Revit** you will:
  - never have to learn another program ever again
  - never have to trawl web sites for bad families
  - rarely have to pay for staff training
  - maybe just maybe make some money
  - and finally enjoy design again

With QARC4REVIT you will Master REVIT Faster.



FIRST TO MARKET No comparable product exists

TIME SAVER Guaranteed to save time in day-to-day use

Manufacturers employing QARC will enjoy superior standards

#### RESOURCES

The QARC system provides drag and drop access to BIM content that works

#### TRAINING

The QARC plug-in can be used as a training methodology

VALUE Take full advantage of the power of your REVIT content



# Exactly what you get with QARC4REVIT from QARC Systems

QARC Plug-in	Value	Basic	Professional	Premiun
Coversheet	\$195	YES	YES	YESI
with drawing schedule	\$295		YES	YES!
plus Consultants List and sheet numbering facility	\$95			YES!
Survey sheets	\$95		YES	YES!
with Locality Plan + Code Data sheets	\$95			YES!
Site Plan	\$95	YES	YES	YES!
with Services Legend + Site Data group + Site Cover schedule	\$195		YES	YES!
plus topography schedule + optional wall line underlays	\$95	***		YES!
<ul> <li>Floor plans for two levels for 2 levels with optional roof line underlays, Keynote Legend,</li> </ul>	\$295	YES	YES	YES!
Renovations and Floor plan schedules. for <b>3</b> levels with optional roof line underlays, Keynote Legend,	\$195		YES	YESI
Renovations and Floor plan schedules.	\$195			YES!
Roof plans	\$295	YES	YES	YES!
with optional wall line underlay	\$195		YES	YES!
plus Roof schedules + rainwater catchment schedules	\$195			YES!
Electrical and Lighting plans with symbols and legend provided	\$295		YES	YES!
Reflected Ceiling plans	\$195	***	YES	YES!
<ul> <li>Area plans including site cover, new and proposed areas</li> </ul>	\$195		YES	YES!
plus GFA, POS, COS and landscaping	\$295			YES!
<ul> <li>Shadow studies in plan and 3D</li> </ul>	\$295	442		YES!
Elevations and Sections	\$295		YES	YES!
Perspectives	\$195	1123	YES	YES!
plus axonometrics and axonometric cut-aways	\$295			YES!
<ul> <li>Setout for floor plans</li> </ul>	\$195		YES	YES!
plus Set out for site, grids, floor plans and slab layouts	\$295			YES!
<ul> <li>Framing plans for floors and roof</li> </ul>	\$195	***	YES	YES!
<ul> <li>Bracing plans and elevations</li> </ul>				
including keyplan and schedule of wind load calculations	\$295			YES!
Standard details sourced from reputable sources				
including stairs, waterproofing, bracing and tie-down	\$195		YES	YES!
Window and door schedules	\$195	YES	YES	YES!
with legend	\$195		YES	YES!
plus associated keyplans	\$195	2.65		YES!
<ul> <li>Additional sheets for renders, streetscape, 3D building envelope</li> </ul>				
including structural details and joinery / finishes details	\$295		1110	YES!
<ul> <li>Demolition sheets for floor levels, roof, elevations and 3D</li> </ul>	\$195	****	YES	YES!
<ul> <li>Concept sheets for site, plans, elevations and 3D</li> </ul>	\$195	*** :		YES!
<ul> <li>Keynote your drawings easily with provided keynote data</li> </ul>	\$395	+++	YES	YES!
Extensive annotations	\$295	***		YESI
View templates	\$495		YES	YES!
Guidance notes on sheets	\$995		YES	YESI
<ul> <li>QARC premium content library with over 4000 items</li> </ul>			f.	
via the QARC drag and drop Browser	\$3,995		YES	YES!
<ul> <li>Free generic and manufacturers content library</li> </ul>				
via the QARC drag and drop Browser	\$995	YES	YES	YES!
<ul> <li>Revit metric library via the QARC drag and drop Browser</li> </ul>	\$195	YES	YES	YES!
QARC Companion and tutorials	\$495		YES	YES!
<ul> <li>QARC checklists to assist in preparing complete drawings</li> </ul>	\$695		YES	YES!
Drafting options including text styles, line styles, hatches, dimensions	\$195		YES	YES!
Industry standard titleblocks	\$295	YES	YES	YES!
A choice of titleblock layouts tailored to your practice	\$495		YE\$	YES!
<ul> <li>Individually customised Titleblocks for your practice</li> </ul>	\$995			YES!

MY TOTAL VALUE \$17,570	\$1,565	\$7,970	\$11,405
YEARLY INVESTMENT	\$0	\$920	\$1.540
My Total SAVING	\$1,565	\$7,050	\$9,865

# About the Author

- My name is Mark Wilson. I have had my own Architectural practice since 1985. I used the drawing board for over 15 years. Back then I had a massive 13-inch VDU screen and a massive 4MB of ram. This meant (even with a massive 4 MB ram) I often had 2 computers going while drafting on the drawing board between commands while waiting for the processor to catch up.
- <sup>7</sup> I purchased Autocad and a 3D add on from a builder who just did not have the time to make it into a **production tool**. Does that sound familiar?
  - In those early days it was not unusual to spend 14 hours a day in front of the computer. Transition number one meant long days no breaks except for my back. I have been a user of Autocad for over 20 years and I have been using 3D 3<sup>rd</sup> party add-ons for 20 years.
  - I "transitioned" to different 3D software two more times. Each software was compatible with the Autocad® OEM. At times I even Beta tested software and it slowly improved - with or without any help. The add-ons (to Autodesk) software all got harder and harder to use with Autocad® OEM as Autocad® developed their own Architectural desktop 3D program.
- Eventually the Brisbane written software was bought out by Americans and the whole thing became Americanised. What's a foot I had to ask? Eventually frustration meant the search was on again. I wanted this to be the last time I had to learn new software. Along the way I recorded every problem and solution documenting the journey in the hope I could pave the way and make the destination easier for others to reach. This probably meant my transition took longer than it should have. But that was the price I was happy to pay for the benefit of the Architectural profession.
- <sup>"</sup> That is how QARC was born.
- Interestingly I am back standing at the drawing board with my computer screens and keyboard and space mouse.

