



# datum

04/09  
April 09

## Editor's Note Gerry McLoughlin DATUM Editor

*This edition of Datum concentrates on updating members on the upcoming AWARDS 2009 – Please consider lodging an application for a project you are proud of . Secondly we have an article by Antony McPhee that shares his considerable journey in assessing the respective merits of thermal ratings systems. Also there is an article on the current developments on the ARBV introducing continuing PD requirements following Min Madden's request for a review of registration requirements.*

## Thermal Simulation Which Software ?

by Antony McPhee ,

Architeam Member and Principal of Antony McPhee Archtect Practice

Shares his research into a software package that is a good practical choice for his practice

The thermal performance of buildings has returned as an important issue in the design of buildings. Before the advent of cheap and abundant energy during the 2<sup>nd</sup> half of the twentieth century it was a necessity, air conditioners were not an option. In an effort to reduce energy use Architects are now, once again, required to ensure their buildings have good thermal performance.

Now if your design style is "sustainability" this is not such a problem. The crude rules of thumb for good thermal performance are your palette, so it is highly likely the end result will perform well thermally. But what if you want to investigate other ideas in architecture? What do you do if you want to integrate thermal performance into your design rather than make it a driver of your design?

You could present your fully developed design to an accredited assessor. After all, won't they just require a few tweaks to insulation and change some windows to double glazing? But what if it takes more than that? By the time the assessor sees it the design is fully resolved, sold to the client and meets budget. Double glazing is not cheap, doubling wall thickness may not be possible.

You are also relying on the assessor to make suggestions on how to improve thermal performance, who is not only unlikely to share your architectural vision, but may be pushing their own.

With this in mind I began a search to find a way to interrogate my designs, a way to understand their real likely performance. Rules of thumb are not enough; I want to be able to push my designs to the edge. Being the 21<sup>st</sup> Century the obvious place to look is in computer simulation.

My search criteria were simple (I didn't want to spend too much time searching): be able to produce a result that could be compared to the BCA star system; flexible enough to be able to drill down and identify problem areas; and be easy and efficient to use.

I use *Revit*. *Revit* is a BIM software so it produces files that contain all the information you need to do an energy analysis. So I first started looking at plug-ins for *Revit*.

I tried a free plug-in from IES called *VE-Ware*, available from their web site. It is pretty easy to use, but has some short comings. The range of available wall, window etc. types is limited, and many unfamiliar (no doubt because IES is a Scottish company). But the biggest problem was it was unclear what the result meant.

I suppose you get what you pay for. So I looked at the fuller versions. IES have a "Sustainability Toolkit" called *VE-Toolkits* (\$1,500), and a larger package called *Architectural Suites* (\$4,750-\$6,000). But they do a lot more than I require, and therefore more complicated to use. I looked at other *Revit* plug-ins. AutoDesk, maker of *Revit*, have recently purchased *Ecotect* (*Eco Architect* – get it?).

This provides a whole lot of functionality beyond mere thermal performance. You can calculate the percentage of floor that has a view out of windows for example. It looks like a great program, but way more than I need, and still a little pricey (\$3,700).

It was looking like the only realistic solution was to use an Australian program designed to provide a BCA compliant star rating. There are only three available, *FirstRate5*, *AccuRate* and *BERS Pro*. All can be downloaded as demos.

### Common Features (or Lack of Features)

All the Australian rating programs use the same analysis software engine developed by the CSIRO, so the differences between them are only in how information is put in, and reporting of results (Figure 1).

Results from the analysis engine are in MJ/sqM, that is energy use per square metre. Because of this the building being analysed doesn't need to be entered into the software with absolute accuracy.

A building of the same construction and slightly different in size would produce the same energy use per square metre. The star rating is obtained by matching number of stars to a specified range of MJ/sqM. There is also a discount if the building's area is below a certain value (to encourage smaller buildings), which slightly increases the star value.

*Continued...*

## AccuRate

The underlying CSIRO analysis software engine is called AccuRate, so the AccuRate product is really just a basic front end. Input is via figures only, no graphical interface (Figure 2).

AccuRate provides greater access to the underlying analysis engine. But at a cost. I gave up after an hour of typing in zone, floor, wall, window, door, roof dimensions, areas and volumes. My biggest concern was accuracy.

I glaze over putting in lists of numbers and always make mistakes. So I always have to go back and double check all the figures. With a graphic interface you can see if you put a stupidly large or small figure in because the object in question looks out of place. It also doesn't cross reference, or calculate, related elements. Make a zone 2.7 high, and you have to manually change all walls to that height. Areas of floors have to be entered manually rather than calculated from surrounding walls, as are volumes for zones, which could be calculated from floors and walls.

There is a command called *Check Data*. But I don't know how reliable it is. When I changed the volume of a zone and the length of a wall to ridiculous figures it didn't report any errors (Figure 3).

You do, however, have more control over the type of construction. You can make your own wall, floor, ceiling, roof systems, as well as there being comprehensive libraries available. There is no way to globally change settings to see what happens, although you can select multiple elements (like external walls) and change all their settings at once. You can also set up Design Options where each option has different settings.

The only analysis tool is a temperature chart which shows temperatures on a per room basis over specific periods like "Hot week in summer" etc. You can use this tool to compare different simulation runs.

A comprehensive Building Report is produced listing construction used on per element and per room basis. The energy report lists energy used for heating and cooling, as calculated and as adjusted for small area. It gives a star rating value and a table of area adjusted star values.

## FirstRate5

FirstRate was originally designed for use in Victoria, although FirstRate5 (the current version) can be used elsewhere in Australia. It is put out by Sustainability Victoria. Its purpose is to rate simple buildings to see if they achieve BCA requirements. It is the cheapest of the software.

FirstRate requires you to redraw your building into the program, and then assign values to various building elements (Figure 4). Make sure you set a scale before you start drawing, and ensure it is correct by looking at wall lengths of the first zone you draw. If you change the scale after doing substantial drawing it messes up your drawing. You rely on counting grids to dimension so it is quite tedious and easy to make a mistake.

I couldn't find where you could change default settings, so you have to change values for every wall, window etc. as you put them in. There doesn't appear to be an undo function, so if you draw a zone line wrong you have to start again. There is a huge range of proprietary windows to select from, but a limited range of wall, floor and roof types.

FirstRate has what it calls an *Optimizer* that allows you to change certain settings, like wall insulation, to see what star rating this change achieves (Figure 5). Changes are to all walls in the building so once again it doesn't inform which part of the building specific improvements could be made.

First Rate provides a simple result. After hitting the Calculate button a star rating and single figure for MJ/sqM is shown. The result report has more information, including separate heating and cooling energy use, and area corrected star value. FirstRate provides no information on how different parts of the building perform (Figure 6). It produces a "Feature" Report which lists different construction types used in the building, but doesn't break it down into rooms.

## BERS Pro

This program is the only private sector product. Developed by Holgar Willrath in Brisbane, it is mainly graphically based. You can trace a plan on screen, rather than draw it from scratch like FirstRate, which saves an enormous amount of time (Figure 7). You can set defaults for all elements, and even change those defaults and reapply them. BERS Pro is a bit quirky. It certainly doesn't follow the Microsoft standard.

That said its interface has been carefully considered. The tools you need are there, and it has obviously been constructed by someone who uses the product. For example to trace a plan you can't import a CAD file, or even a PDF. You bring in an image file (.BMP), typically one produced by capturing an image on your computer screen. Then you reduce or enlarge it to match a known dimension. At first I thought this was a negative. But what it actually means is any drawing that can be displayed on a computer screen can be imported and traced in BERS Pro. Not only does that mean any computer program, but also scanned hand drawings.

Zones are colour coded, and doors & window settings shown graphically along with a diagram showing the door or window in the wall. Which means checking everything is correct is much easier (Figure 8).

BERS Pro doesn't have an optimisation tool as such. It keeps track of previous calculation runs so you can compare against previous configurations. But to test alternatives you have to change the construction settings of elements. You can create copies of BERS Pro files (i.e. with alternative constructions), but it will only save to its own folder and file name so if you want to resurrect an old copy you need to rename the file and re-open it.



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Results show total energy use, and for cooling & heating, including graphs showing heating and cooling use for each month (Figure 9). Star value and area adjusted star value are included.

You can also see all this information for each individual zone, informing you which spaces are holding performance back (Figure 10). BERS Pro also displays temperatures for each zone in the same manner as AccuRate (Figure 11). A certificate can be printed, presumably to give to the building surveyor.

A Summary report can be generated showing dimensions, construction, etc of all spaces. This report can be filtered to just show external walls, floors etc, which is very useful for checking.

Unfortunately none of the reports print very well. The certificate has no margins, and the summary is not very well tabulated.



**Atlantis Hotel Complex**  
Jumeirah Palm Island  
Courtesy Von Affleck

### Summary

AccuRate is for the hard-core, and those with an engineering bent. The amount of time it would take to enter and check all the information it requires is hard for an architect to justify.

FirstRate provides adequate BCA star information, but is poor at providing detail information about your building. It might be fine for simple buildings, but it would be at best tedious, and perhaps not even possible, to put all information in required for more complicated buildings.

BERS Pro provides a quick(ish) way to input information, and shows it in a way that is easier to check for correctness. Reporting is good, showing how each space performs. It is a bit eccentric, but once you get over that you can produce results pretty quickly.

I believe the ideal solution is a plug-in for BIM software like Revit that feeds information to the Accurate engine. But with the Australian market being so small, I'm not holding my breath for this to happen.

I ended up buying BERS Pro. I think it provides the best mixture of efficiently entering information accurately and producing useful results. But give it a try yourself. Download the demo version.

### It's only a Simulation

Using thermal performance simulation software will not absolve you of having to understand what you are doing. You can set the R-Value of insulation, but it won't tell you how thick that insulation will be. You'll need to look that up. You can add reflective insulation, but you have to ensure you allow an air gap on reflective sides or it won't work in the real world.

You also need to keep in mind that computer simulation is just that, simulation. Assumptions and short cuts are by necessity built in. Although you may find quirks in the software that produce excellent results, that doesn't mean your building will match that in the real world. One of the current limitations is simulating thermal mass.

The underlying engine uses the insulation value of dense materials like bricks, but doesn't calculate the contribution of its mass to providing warmth and "coolth".

For more information on this limitation check out the article by Ross Maher on the bpn web site (link is below under *Article on Thermal Mass*).

This means your analysis will always show heavily insulated lightweight construction performs better than masonry construction. Which may not necessarily be the case, demonstrated to me when I attended a BDAV seminar. The presenter proudly showed the highly rated house he built for himself in country Victoria.

He explained its heavily insulated lightweight construction ensured the inside temperature "only" got to 30 degrees on Black Saturday in February, when the outside temperature was 46 degrees.

That day I was also recording temperatures. In my 137 year old brick terrace house it peaked at 26 degrees. But it is an unfair comparison; my house was built before air conditioners were available.

## the training

## Training

The thermal simulation programs reviewed are tools, they don't provide design solutions. As such it is important you have a full understanding of how the tool works.

One of the problems I had analysing all three programs is the lack of information available. None of them have very good help files or background information (FirstRate doesn't have a help file at all).

They all rely on users attending training sessions. These training sessions are usually held along with training to become accredited BCA assessor. Although it costs more than the software it is probably a good idea. There is no reason you can't officially rate your own projects, and if you are hard up you can rate other's work for money.

Training is sporadic and not well advertised. It is not uncommon for advertised sessions to be cancelled due to lack of registrations. Always check web sites for latest information.

The ABSA (Association of Building Sustainability Assessors) holds courses for AccuRate and FirstRate. Courses are over 4 full days and cost around \$1,500. Some TAFEs also hold courses, which may be useful if you live in regional Victoria.

BERS Pro training is by the software provider, the next in Melbourne is over 4 days, 11 to 14<sup>th</sup> May. Cost \$1,500. Two day software only training costs \$800.

## the software

## The software

IES VE-Ware Revit Plug-in  
<http://www.iesve.com/Revit/VE-Ware>

AutoDesk Ecotect:  
<http://ecotect.com/>

AccuRate:  
<http://www.hearne.com.au/products/accurate/>  
Cost: \$795 (\$845 by mail) + \$295/year for support.  
AccuRate courses are scheduled for October and December in Melbourne.

FirstRate:  
<http://www.sustainability.vic.gov.au/www/html/1491-energy-rating-with-firstrate.asp>  
Cost: \$550 no support, free updates.  
FirstRate courses are scheduled for June, August, October and December in Melbourne.

BERS Pro:  
<http://www.solarlogic.com.au/>  
Cost: \$726 + \$330/year for support & updates (there are discounts – check their web site).  
BERS Pro training will occur in Melbourne 11 to 14<sup>th</sup> May and 29 June to 2<sup>nd</sup> July.

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**ARCHITEAM STUDIO end of the week drinks somewhere near you**

**To kick off this new initiative Renuka Rodriguez, RMR Architects in the Ivanhoe area will be holding the first Studio drinks after work on the first Friday of the month of 1 May 2009 at 6.00pm ADDRESS 12 /40 Springthorpe Boulevard McLeod**

This is an initiative by Architeam to **encourage members to meet and network in your area for mutual professional benefit . Members are welcome and drinks are on Architeam.**

**STUDIO DRINKS will be held every first Friday of the month. TO HOST A SESSION PLS LET THE OFFICE KNOW**

*Please drop an email to Architeam Office if you are interested in attending for catering purposes*

## ARCHITEAM AWARDS 2009

**Architeam** is a co operative body that represents small to medium sized architectural firms, offering an alternative to the Royal Australian Institute of Architects (RAIA).

We provide Professional Development, a monthly emagazine, a website, access to resources and information, a shared Professional Indemnity Insurance policy for a membership of over 300.

We also run an awards program on a bi annual basis. This year's event is the third awards program for Architeam and the theme for the 2009 Awards programme is

**Responsible Architecture  
in the face of  
Climate Change and Global Economic meltdown**

What does design have to contribute to the big debates around responsible responses to place making and buildings into the future. Are we past hero architecture - is now the time of recycle, reclaim, and sustainable affordable solutions.

The Awards event is scheduled for the first two weeks of September 2009 at **Obscura Gallery Beller House Suite 11, 285 Carlisle Street East St Kilda** a very fine Photographic Gallery <http://www.obscuragallery.com/>

An Awards book will be published of the works submitted for the Awards .

Two principal events:

- 1st - **Opening Night - Awards presentation**
- 2nd - **Closing event - Panel Discussion** of invited high profile figures around the themes of the Awards Program.

Please consider lodging an entry  
Categories include: small, medium and large buget projects, student / non built category

*Non members are welcome to lodge an entry at a extra lodgement fee  
Students attract no fee*

### AWARDS 2009

**Architeam's Awards program 2009 is locked in for the first two weeks of September 2009**

**Entries open 1 July and Close 30 July 2009**

*Please think about projects you wish to submit*  
**ENTRY PACKS WILL BE AVAILABLE 1<sup>st</sup> June 2009**

### INFORMATION

Please be aware of the **Building Commission** sponsored seminars currently being rolled out across the state in relation to the changes to the **AS 3959 Design and Construction of buildings in Bushfire prone areas** and the 2009 BCA and Amdt VC53 of the Victorian Planning Scheme

View the Building Commission Website for date and venues  
[www.buildingcommision.com.au](http://www.buildingcommision.com.au)

Bushfire Building Advice Line  
Ph 1300 360 320 Building Commission  
9am - 5pm M - F



*Photo taken from the roof of Doncaster Shopping Center  
Black Saturday 7 February 2009*

## ARBV April 09 meeting - Continuing Professional Development

### Compulsory Continuing Professional Development for Registration as an Architect.

This process is new to architects but not to many other professions which includes lawyers.

Minister Justin Madden has asked the ARBV to review the parameters requiring architects to do Continuing Professional Development as a pre requisite for registration.

This comes about six years after the Victorian Government's requirement for all registered Architects to have compulsory Professional Indemnity Insurance.

All currently registered architects were invited to attend any one of three venues (one in Melbourne, one in Warragul and the other in Ballarat) where members of the ARBV Board would present their outcomes from a working party that has been looking into the arguments for compulsory CPD's introduction in the year commencing 2009-10.

That means that it is proposed to introduce the requirement for architects to do 20 hours of continuing professional development in this coming financial year to be able to be eligible for registration in 2010-2011.

The 20 hours will be divided into two components. The first is 10 hours will be of structured cpd such as seminars run by Architeam and the other 10 hours can be by informal means, such as teaching, delivering talks, research and other categories of this nature.

The ARBV will define these categories as they develop their website to include information on this proposed requirement. The idea is to have the system as a self-regulatory process, where each architect will set up a log on their site with the ARBV and keep it up to date throughout each year.

The ARBV then checks your log at each renewal year. The ARBV working party arrived at its proposed model after exhaustive research into other models.

These were the one currently operating in NSW and the ones proposed for South Australia and Western Australia. They also looked at the ones operating in the UK and New Zealand. The idea is to have consistency in the models in Australia so that registration for architects in other states will be made simple.

The presentation was professionally done with a DVD and the chairman of the ARBV Board Andrew Hutson explaining that the main focus was to protect the profession's reputation in the public domain and to continue to build confidence in the public about the good stature of architects. As we are aware, Architeam has been providing a CPD service and doing this for a number of years.

Our CPD sessions have given Architeam members the basis for keeping them informed of changes and developments in our industry and we will continue developing our programme in conjunction/discussions with the ARBV's mandate.

John Henry  
Director  
ARCHITEAM

## RULES REVIEW COMMITTEE – *HAVE YOUR SAY!*

At present the Rules Review Committee consists of Bernard Hennessy, Helen Berthelsen, Peter Hogg and Fred Tonelli. This Committee is about to convene with the purpose of reviewing and commenting on the adequacy of Architeam's "Rules" in today's environment.

Since Architeam's inception a number of developments have occurred like; electronic banking, recognition of Registered Building Practitioners, almost universal reliance on electronic communication, changes to statutory regulations to name a few. Consequently in 2008, the Board felt that time had come for a review of the Rules to take place.

It is therefore intended to prepare any recommendations for changes to the Rules for approval at the 2009 Annual General Meeting.

**The Committee invites all members to acquaint themselves with the Rule, available on the web page, and offer any constructive comments and advice. Any member wishing to contribute or discuss any matter associated with this are welcomed to contact Kerry or Fred Tonelli via Architeam office.**

We look forward to your involvement.

Fred Tonelli  
Director  
ARCHITEAM

## ArchiTeaM Professional Development for 2009

### REVIEW *How to Survive the down turn !*

**April PD Session: April 09**

The recession is upon us, and it looks like it might be a long and deep one. Recessions are the winnow of capitalism. Under performing business go to the wall, clearing the decks form the next round of growth.

Panelists **Tony Styant-Browne, Greg Strickland** and **Andrew Begg** discussed why **Architeam** was founded, their experiences in the last big recession in the late 1980s and earl 1990s. Many good tips where given about how to survive in harsh economic times, how to take advantage of every marketing opportunity and how desperate unemployed and underemployed architects banded together 20 years ago to found **Architeam** to network, pool resources and make a go of it.

- Manage your own morale
- Try markets that wouldn't normally consider using an architect
- Subsidise your practice with work that you wouldn't normally consider ie teaching/tutoring, building audits, emergency services audits, design advice to local governments etc
- Consider this may be the time to do that extra study / professional development

There was some lively and informative discussion from the floor and the panel and hopefully a few valuable lessons were learnt.

*Around 30 people attended this session  
Our last session in excess of 80 attended*

### Next PD Session: May 14

May 14 Michael Lennon, CEO of Housing Choices Australia, The housing commission tower block is now a thing of the past and new and innovative models of affordable housing are helping to avoid many of the problems associated with social housing in the past. With the federal government pumping money into the economy in an effort to curtail the recession there is a boom in much needed public housing.

CEO of Housing Choices Australia, Michael Lennon, will talk about recent developments in affordable housing both in Australia and around the world at our May PD session. Come along and hear about recent developments in this important sector.

June 11, Architeam director Gerry McLoughlin and co-presenters will discuss CADs, Transit Cities and the Transport Plan (The Eddington Report) Transportation has been a hot topic of late, especially when the tracks buckle and we are all left on the platform cursing. Where is this taking us all. Tram No. 88 to the door, all aboard, remember to validate.

July 9 the heads of Melbourne 4 main architecture schools assemble to discuss the philosophy, aims and goals of their respective schools. Thinking of returning to study, taking up teaching, or just interested in what the students are up to? Come along and hear the story from those who know.

August 13 directors Fred Tonelli and John Henry will present the new agreement and run through its salient features.

#### A must!

The old RAlA short form agreement has had its day, so Architeam has commissioned a new, up to date client architect agreement.

September is AWARDS time, stay tuned for what is going to be an action packed month. Get those entries ready!

Opening Night 3<sup>rd</sup> September 2009  
Closing Night 17<sup>th</sup> September 2009

OBSCURA GALLERY Beller House Suite 11, 285 Carlisle St East St Kilda

Finally October 8<sup>th</sup> sees the return of Dr. Esther Charlesworth to talk about issues surrounding aboriginal housing, a hot topic right now with the "intervention" entering its 3<sup>rd</sup> year. Check it out!

Attendance at PD is not compulsory (at least not yet) but we hope that there will be something in the year ahead that will appeal to all members. Come along and check it out and be part of an active and happening co-op....and if you can't make it along to a session log on and check it out on line.

#### BOOKINGS:

Members are encouraged to book ahead with the office to ensure PD sessions are not sold out. Payment can either be made on line or on the night. At \$20 for members, \$30 for non-members, and \$10 for students it beats the other PD programmes hands down.

**Peter Hogg**  
Director Member Services