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HVAC Industry response to AIRAH Survey on BCA Section J compliance

An industry - government initiative



Prepared by:
**The Australian Institute of
Refrigeration Air Conditioning
and Heating**
in conjunction with
**The Australian Building Codes
Board**

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About AIRAH

AIRAH is the recognised voice of the Australian air conditioning, refrigeration and heating industry. We aim to minimise the environmental footprint of our vital sector through communication, education and encouraging best practice.

Industry support

This report has been developed in conjunction with the following industry associations and bodies:

- Australian Institute of Refrigeration Air conditioning and Heating (AIRAH)
- Air Conditioning and Mechanical Contractors Association (AMCA)
- Air Conditioning and Refrigeration Equipment Manufacturers Association of Australia (AREMA)
- Engineers Australia (IEAust)
- Fan Manufacturers Association of Australia and New Zealand (FMAANZ)
- Chartered Institute of Building Services Engineers (CIBSE)
- Master Plumbers and Mechanical Services Association of Australia (MPMSAA)

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Section 1 - Survey summary

1.1. Survey Background

AIRAH in conjunction with associated industry bodies is working to facilitate feedback to the Australian Building Codes Board (ABCB) on specific issues the HVAC&R industry is having with BCA Section J.

In order to identify and understand what specific issues industry is encountering with the BCA 2010 Section J requirements a membership survey was conducted. Industry bodies participating in the survey and feedback process include Institutions and associations such as:

- Australian Institute of Refrigeration Air conditioning and Heating (AIRAH)
- Air Conditioning and Mechanical Contractors Association (AMCA)
- Air Conditioning and Refrigeration Equipment Manufacturers Association of Australia (AREMA)
- Engineers Australia (IEAust)
- Fan Manufacturers Association of Australia and New Zealand (FMAANZ)
- Chartered Institute of Building Services Engineers (CIBSE)
- Master Plumbers and Mechanical Services Association of Australia (MPMSAA)

The member base of these organisations represents a broad cross section of the HVAC and associated industries in all states and territories in Australia.

The survey asked the following questions:

- Do you have any issues complying with BCA Section J?
- Which (BCA) climate zone does your issue relate to?
- Which clause of BCA Section J does your issue relate to?
- Please outline the technical issues with this clause.
- Please outline how you believe these issues could be resolved or improved?

Survey respondents were given the opportunity to bring up multiple issues. Respondents were further asked:

- Are there other ways AIRAH or ABCB can facilitate better understanding of the BCA?
- What other training or awareness material would assist?
- What format/s would you prefer?

The views contained in this report are the views put forward by the survey respondents and do not necessarily represent the views of AIRAH or the other industry bodies associated with the BCA Section J Survey. AIRAH strongly supports further dialogue and review on these issues.

1.2. Who responded, two perspectives

Although respondents come from across a range of building disciplines the responses could be very generally categorised into two perspectives or groups:

- One view, typical of approximately 50% of survey respondents, is that any BCA requirement can be complied with, it's simply a matter of cost. Although no compliance issues were highlighted by this group many questioned the effectiveness and energy/cost modelling of the requirements for Material R values. Concerns regarding deliberate and indeliberate non-compliance were strong with this group. If industry do not agree or fully understand the BCA Section J requirements compliance is more difficult and less likely.
- The second view, again about 50% of respondents and typical of a contractors or manufacturer perspective, are generally about the practicality of the requirements for R values and fan and pump power ratios which are generally seen as driving pipe and duct sizes up compounding the already difficult onsite coordination and installation of a buildings mechanical services, particularly for large systems/buildings. Manufacturers and contractors are also concerned about retooling and retraining costs.

Survey respondent generally fell into the following four categories;

- Design engineers/Consultants Approximately 55%
- Mechanical services contractors Approximately 25%
- Equipment manufacturers/suppliers Approximately 15%
- Others (Industry associations/advisors) Approximately 5%

1.3. Major technical Issues

Insulation R values

By far the most common issue highlighted by respondents relates to the new increased insulation requirements for mechanical services, pipes and ducts and particularly Deemed To Satisfy (DTS) specifications J5.2 on ductwork insulation and sealing and J5.4 on insulation of piping, vessels, heat exchangers and tanks.

The significant increase in the R values specified for DTS specifications coupled with the move from Total R value to Material R value, resulting in a derating of most current product, is seen as a double barrier to compliance by the industry.

There is considerable industry concern regarding the energy modelling, cost impact, practical implications and energy outcomes of these new insulation R value requirements.

Many respondents doubted the energy efficiency outcomes of the requirements and questioned whether the embodied energy of the extra materials and the additional transport, manufacturing and installation energy requirements had been taken into account during the modelling. Had the additional costs of implementing these requirements been included in models? Had large building and systems been considered?

With the increasing R values comes either a larger product profile or a requirement for new manufacturing materials and systems. Either way there will be cost implications for the duct and insulation manufacturers. Have the retooling and retraining costs to duct manufacturers and insulation suppliers been taken into consideration?

Assuming existing insulation materials such as fibre glass blanket, styrene and expanded foam plastics continue to be used then the physical size/space of installed piping and ducting systems will rise considerably. Can these new sizes be accommodated within allowed service zones, will buildings need to be larger to accommodate these new requirements and have these overall project cost increases been considered? Can these larger sizes be used in retrofits and refurbishments?

Larger insulation product means increased;

- Materials for manufacture, e.g. internally lined galvanised ductwork.
- Energy for manufacture and transport or larger product.
- Space for manufacture and storage
- Costs for installation including labour and fixing systems.

There was also considerable confusion regarding the requirements for insulating condenser water systems, heat recovery systems and small bore pipes in all systems. Mechanical contractors, ductwork manufacturers and pipework installers expressed the most concern regarding the specified DTS insulation levels.

Fan and pump power

Many respondents felt that the current specified fan and pump powers are set too high for practical application. If retained, the likely outcome is oversized pipe and ducts leading to escalating materials and installation costs, reduced service space, increased on-site coordination conflicts, increased rather than reduced life cycle energy costs and increasing incidences of non-compliance.

Fan manufacturer and supplier groups have proposed that that maximum fan power should be regulated by specifying the required Fan Minimum Efficiency Grade (FMEG), determined in accordance with the ISO 12759 test standard, rather than setting arbitrary and in some cases impractical fan power limits.

Mechanical contractors similarly believe that maximum pump power should be regulated by specifying the required minimum efficiency of the pump rather than setting arbitrary and in some cases impractical pump power limits.

Electric duct mounted heaters

Several respondents from Zone 2 regions objected strongly to the removal of electric heating options entirely from the BCA. The removal of an electric heater option from Clause J5.4 is seen as having the potential to create a lot of needless capital expenditure for possibly negative energy efficiency outcomes.

Heating is still required in Zone 2 areas but often only for early morning start up in winter and the system usage rarely justifies the cost of a full boiler plant or local reverse cycle plant. Many buildings in these zones have central chilled water but with distributed reheat or trim heat usually achieved by electric duct or terminal mounted heaters. Central heating systems are seen as an unnecessary and significant additional capital cost as they operate so infrequently. System preheat and system distribution losses may well lead to a higher energy penalty for central heating systems. Gas is often not available to buildings in this zone.

Although this issue is partly addressed in the draft BCA 2011 proposals, compliance with BCA 2010 provisions is seen as a major issue and risk.

Other technical issues

Many other issues were highlighted in the survey responses and a summary of all issues addressed by respondents is listed by BCA Clause number in section 2.

Section 2 - Summary of specific issues identified

The following specific technical issues are listed in order of BCA clause number

Clause	2.1. Specification JV Table 2h
Issue	Table 2h concerning equipment load is only an input criterion for energy model. There are no mandatory requirements at present.
Suggestions	The 5 W/m ² equipment load in Table 2h should be made mandatory or DTS like lighting.
Notes	Discuss in guide

Clause	2.2. Part J1 Building fabric insulation - fire safety
Issue	Houses on fire with medium R value can reach flashover in 30 minutes, but houses to BCA2010 are so super insulated, that in a fire they can reach flashover in 3 to 6 minutes. The principle also applies to commercial buildings; these increased R values have fire safety implications.
Suggestions	Ease BCA2010 R-values back to BCA2009 values for fire safety reasons.
Notes	Discuss in guide

Clause	2.3. Part J1 Building fabric insulation - R values
Issue	BCA2010 now mandates such high R values that low k materials are now demanded (to fit within thin walls), which means use of high embodied energy insulation materials like polystyrene, polyurethane and PIR.
Suggestions	Compliance should be by life-cycle energy auditing, not just on operating energy. This would probably mean that lower embodied energy insulations are optimum, and lower target Total R values should be specified in BCA. In any case, as energy prices escalate, so insulation prices escalate too, so lifecycle costing would not dictate insulation levels much higher than BCA2009.
Notes	Discuss in guide

Clause	2.4. Table J1.3b Adjusting ceiling R values
Issue	Practical compliance Table J1.3b has a range of 0-5.0% and R2.5-R5.5. We believe that a lot of buildings have an uninsulated ceiling area greater than 5% due to lighting, diffusers, grilles, roof lights, EWIS etc. If a ceiling only requires R2.0 or less on the ceiling to comply with Table J1.3a, how do you comply with Table J1.3b?
Suggestions	BCA should provide the Table J1.3b with a greater range, extrapolated down to R0.5 & up to 9% uninsulated ceiling area.
Notes	Discuss in guide

Clause	2.5. J1.5 High mass construction
Issue	Earth buildings (high mass wall constructions e.g. 300mm rammed earth) so significantly moderates internal temperature variations that most occupants are comfortable without heating or cooling, but BCA2010 mandates added insulation which is difficult and unnecessary in this form of construction.
Suggestions	Compliance should include an option of meeting the intent of the energy efficiency requirements, simply by proving/demonstrating actual low energy consumption. e.g. If first year of occupancy has low power consumption, fine, if otherwise, then add

	insulation.
Notes	Zones 1,2,3,4,5,6 Any high mass construction method? Discuss in guide

Clause	2.6. J1.5 Walls
Issue	It is very difficult to find a practical solution for tilt panel construction. Provision of plasterboard walls and foam insulation are not suitable in an environment with forklifts.
Suggestions	BCA or guide should provide practical compliance advice on these type of issues
Notes	Discuss in guide

Clause	2.7. J3.1 and Section F Ventilation
Issue	The issue of high humidity in apartments due to air tightness is growing rapidly here in Canberra with almost daily accounts of apartments severely affected. We note that Section J 2010 now clearly states that in climatic regions 4, 6, 7 & 8, (J3.1) that conditioned spaces are to be sealed. Traditionally we have always treated dwellings as being naturally ventilated but the requirements of Section J3 means that over the last three years we have been creating virtually air tight compartments when doors and windows are closed. It is our opinion that the ABCB should clearly state that the designers should treat a dwelling in our region as not been naturally ventilated but capable of natural ventilation when ambient conditions are suitable. This would alert the designers to the need to incorporate a controlled ventilation system in their designs. Wet area exhausts cannot move air under such circumstances and the apartment air becomes incredibly humid laying the foundation for mould and fungal growth.
Suggestions	Ensure that make-up air to required exhaust systems is always available and does not solely rely on manually openable/closable openings.
Notes	Discuss in guide

Clause	2.8. Clause J3.4 (2011 draft) concerning entry of the building
Issue	Councils always want shopping centre to open up and activate the streets. But this clause prohibits the intention.
Suggestions	Retain BCA 2009 requirement of self closing 2nd door and the 3m non air conditioned area.
Notes	BCA 2011

Clause	2.9. J5.2 (a) (IV) and Specification J5.2 Ductwork/Fittings insulation Table 3
Issue	Disagreement with Specified R Values (see summary) <ul style="list-style-type: none"> • Many R values and insulation thicknesses doubled (depending on climate and service location) • Material R value not Total R value now specified • Duct manufacturer retooling and retraining costs • Increased manufacture, storage, transport and installation costs • Increased space required for services, reduces usable area of buildings • Increase weight of services requiring new support systems • Mechanical contractor retooling and retraining costs

	<ul style="list-style-type: none"> • New insulation materials (to retain traditional thicknesses) are more expensive and have a higher embodied energy • Maintenance more difficult due to less space
Suggestions	<ul style="list-style-type: none"> • Reduce R values to practical levels. Use energy and cost impact modelling that includes embodied energy, life cycle energy and all additional implementation costs associated with R value increases including transport, installation, training, and costs associated with increased services spatial requirement. • R values to be heat loss per metre instead of a just location.
Notes	Disagreement not lack of clarity Requirements need to be validated

Clause	2.10. Specification J5.2 Clause3 (a) Table 3 Fittings
Issue	The term “Fittings” is open to interpretation and needs to be better defined.
Suggestions	Define term explicitly (e.g. dampers, fittings or components?)
Notes	Exclude fittings that cannot be practically insulated to Table 3 levels Discuss in guide

Clause	2.11. Specification J5.2 Clause3 (a) Table 3 Shafts/Plenums
Issue	Where plenums and shafts are used as part of the ductwork system should the Table 3 insulation levels be applied?
Suggestions	Exclude shafts and plenums from the Table 3 requirements?
Notes	Clarify in guide

Clause	2.12. Specification J5.2 Clause 3(a) (ii) Flexible ductwork
Issue	Confusion as to the requirements for flexible duct over 3m
Suggestions	Clarify that flex duct over 3m must comply with Table 3
Notes	Clarify in guide

Clause	2.13. J5.2 (a) (ix) and Table J5.2 Air conditioning fan power
Issue	Confusion as to the application of this requirement. Is it to apply to air conditioning supply, return and outdoor air fans only or to all fans associated with ventilation systems?
Suggestions	Clause should explicitly exclude exhaust fans, carpark ventilation fans, specialised exhaust (fume cupboards, clean rooms etc). See J5.2(b) (iii)
Note	J5.5 on miscellaneous exhaust systems is also relevant. Miscellaneous exhaust systems should be better defined. Clarify in guide, confusion as to what requirement applies to what fan.

Clause	2.14. Table J5.2 Maximum fan power
Issue	In Table J5.2 the maximum fan power in W/m^2 is a function of the air conditioning sensible load which is undefined. At least four problems are identified not including difficulties in incorporating this requirement into building energy programs: <ul style="list-style-type: none"> • One, is this the room sensible load or total sensible load including outside air. • Two, is this the design load or the peak load. • Three, does this include any safety factor that may be applied. • Four, in an existing building being re-furbished this means the load for each AHU

	has to be re-calculated. Why has this been made so complicated? It would be much simpler to base the W/m^2 on the installed cooling coil capacity instead.
Suggestions	Replace the air-conditioning sensible heat load with installed cooling coil capacity.
Notes	Or explain/define in guide

Clause	2.15. Table J5.2 fan Minimum Efficiency Grade
Issue	Fan manufacturers and suppliers believe that Maximum fan power should be regulated by specifying the required Fan Minimum Efficiency Grade (FMEG), determined in accordance with the ISO 12759 test standard rather than setting arbitrary and in some cases impractical fan power limits.
Suggestions	Specify the required Fan Minimum Efficiency Grade (FMEG), determined in accordance with the ISO 12759 in Table J5.2.
Notes	Fan Manufacturers Association - Australia and New Zealand (FMA ANZ) have offered to assist ABCB implement regulatory strategies based on FMEG.

Clause	2.16. J5.2 (a) (ix) (A) Outdoor air energy
Issue	Confusion as to how the “power for an energy reclaiming system” is demonstrated or calculated, are theoretical energy calculations required, and how can this power be excluded from Table J5.2 requirements?
Suggestions	Exclude fans in systems that include energy reclaiming to precondition the outdoor air from the requirements of J5.2 (a) (ix).
Notes	Or explain/define in guide

Clause	2.17. J5.2 (a) (ix) (B) HEPA filter energy
Issue	Confusion as to how the “power for process related components” is demonstrated, are theoretical energy calculations required, and how can this power be excluded from Table J5.2 requirements?
Suggestions	Exclude fans in systems that include “process related components” from the requirements of J5.2 (a) (ix). (Probably need definition of process related components).
Notes	Or explain/define in guide

Clause	2.18. J5.2 (b) (ii) (A) 20% Outdoor air upper limit
Issue	It is not clear that the 20% limit relates to outdoor air flow rates
Suggestions	Add text “...in excess of the minimum outdoor air quantity required by...”
Notes	For clarity

Clause	2.19. J5.2 (b) (ii) (A) Green Star Ventilation
Issue	20% limit is in conflict with green star
Suggestions	Guide should address different focus or explain non-alignment
Notes	Explain non-alignment

Clause	2.20. J5.2 (b) (iii) (A) Fan power/Fan efficiency
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Issue	Fan manufacturers and suppliers believe that using specific power limits to regulate for power usage in ventilation systems is unworkable. Analysis of these requirements and available product has shown that these power to area/load ratios restrict system design total pressures to 350-400Pa. This severely limits the designers' ability to design air distribution systems and the components that can be included in such systems.
Suggestions	Fan power should be regulated by specifying the required Fan Minimum Efficiency Grade (FMEG), determined in accordance with the ISO 12759 test standard.
Notes	Fan Manufacturers Association - Australia and New Zealand (FMA ANZ) have offered to assist ABCB develop and implement FMEG regulatory strategies.

Clause	2.21. J5.2 (b) (iii) (A) and Table J5.2 Large ventilation systems
Issue	Mechanical services contractors believe that complying with Table J5.2 is not possible for many large ventilation systems such as carpark ventilation systems.
Suggestions	Revert to BCA 2009 Specify required Fan Minimum Efficiency Grade (FMEG), ISO 12759
Notes	Carpark ventilation systems energy is also addressed in J5.2(b)(iii) (CO monitoring)

Clause	2.22. J5.2 (b) (iii) (B) (bb) Occupancy
Issue	BCA sets requirement based on "Carpark not occupied for a period of two hours". Confusion expressed over how to implement this requirement. Practical difficulties with motion sensing in carparks leading to potentially expensive yet unreliable solutions.
Suggestions	Explain the requirement and methods of compliance, are there alternatives to motion detection, administrative measures, scheduling?
Notes	Explain rationale and compliance in guide

Clause	2.23. J5.2 (b) (iii) (B) (bb) Minimum air change rate
Issue	Maintaining an average minimum air-change rate of 0.5 air changes per hour. What is the intent of this requirement? It is not consistent with AS 1668.2-1991 or AS 1668.2-2002. This would likely require a separate standalone ventilation system to comply as large carpark ventilation systems would not operate effectively at these low flow rates, air distribution patterns would be poor, uneven and ineffective. The words "average minimum air change" rate seems to rule out a "pulse" control strategy. If this is intended to address off gassing from the building and materials (in the unoccupied carpark) then the requirement should be consistent with AS 1668.2-2002, i.e. 0.5 air changes in any 24 hour period.
Suggestions	Delete (bb) or require a minimum of 0.5 air changes in any 24 hour period.
Notes	The intent of this clause (the reason for the requirement) should be made clear.

Clause	2.24. J5.3 Time Switch
Issue	J5.3 Time Switch references J6. J6 3. Time switch has been rewritten by the electrical engineers for their equipment and is no longer clearly applicable for Airconditioning and mechanical services. A 365 day time clock has been required since at least since BCA2006. Strictly read BCA2010 is a step backwards to a 7 day time switch. Is that really what was intended?

Suggestions	J5.3 Time Switch should be standalone and should include a clear statement "provide a 365 day programmable time switch with auto daylight savings adjustment".
Notes	Or explain/define in guide

Clause	2.25. J5.4 (a) (i) and Specification J5.4 Table 2a System capacity
Issue	Confusion whether the system capacity refers to the total system size or the system served by that pipework. It is expected that the intention of the system size differentiation was to ensure that the extent of insulation remained an order of relevance to the pipework, i.e. small bore pipework to a small fan coil unit does not merit the same insulation R Value as the main pipework (e.g. 20mm pipework insulated with 50mm insulation making an OD of 120mm).
Suggestions	Define system capacity as the system served by that pipework (not the total system).
Notes	Or explain/define in guide

Clause	2.26. J5.4 (a) (i) and Specification J5.4 Table 2a Pipework insulation
Issues	Disagreement with Specified R Values (see summary) <ul style="list-style-type: none"> • Many R values and insulation thicknesses doubled (depending on climate and service location) • Material R value not Total R value now specified • Duct manufacturer retooling and retraining costs • Increased manufacture, storage, transport and installation costs • Increased space required for services, reduces usable area of buildings • Increase weight of services requiring new support systems • Mechanical contractor retooling and retraining costs • New insulation materials (to retain traditional thicknesses) are more expensive and have a higher embodied energy • Maintenance more difficult due to less space
Suggestions	Reduce R values back to practical levels One insulation thickness per kW rating would assist
Note	Disagreement not lack of clarity

Clause	2.27. Spec J5.4 2(a) (i) Heat recovery piping
Issue	Confusion whether this table is required for pipework associated with heat recovery systems.
Suggestions	Exclude heat recovery systems from the J5.4 requirements
Notes	Clarify in guide

Clause	2.28. J5.4 (a) (i) and Specification J5.4 Table 2a Fittings
Issue	Concerns whether the system fittings could be practically insulated to all Table 2a levels.
Suggestions	Define what/how system fittings such as valves and actuators are insulated.
Notes	Explain/define in guide

Clause	2.29. J5.4 (a) (i) and Specification J5.4 Table 2a Small bore pipes
Issue	Insulation R levels for small bore pipes are too high. Small bore pipes lose less heat due to less surface area

Suggestions	Table 2a and Table 2b should allow for derating for small bore pipework.
Notes	Disagreement not lack of clarity

Clause	2.30. J5.4 (a) (i) and Specification J5.4 Table 2b Refrigeration pipes
Issue	Insulation R levels for small bore refrigeration pipes are too high. Small bore pipes loose less heat due to less surface area. 15mm pipe requires 80mm with "Armaflex" insulation?
Suggestions	Table 2a and Table 2b should allow for derating for small bore pipework.
Notes	Disagreement not lack of clarity

Clause	2.31. J5.4 (a) (ii) Pump power
Issue	Confusion as to what "pump power to the pump" actually means
Suggestions	Define pump power as input shaft power.
Notes	Or explain/define in guide

Clause	2.32. Table J5.4a Cooling/heating loads
Issue	In Table J5.4a the maximum pump power in W/m ² is a function of the cooling or heating load. At least four problems have been identified: <ul style="list-style-type: none"> • One, is this the design load or the peak load. • Two, does this include the piping and pump losses or is it just the sum of the AHU loads • Three, in an existing building being re-furbished this means the load for the chiller has to be re-calculated. • Four, if a chiller or boiler is sized to allow for a future extension is the load the current load or the future anticipated load. <p>Why has this been made so complicated? Wouldn't it be much simpler to base the W/m² on the chiller/boiler installed capacity?</p>
Suggestions	Replace the cooling or heating load with installed cooling or heating capacity.
Notes	Or explain/define in guide

Clause	2.33. Table J5.4a Large pumping systems
Issue	Many respondents believe that the pump power limits for chilled water and condenser water systems are not achievable in large buildings/systems.
Suggestions	Revert to 2009
Notes	Disagreement not clarity

Clause	2.34. Table J5.4a Pump efficiency
Issue	Mechanical contractors believe that pump power should be regulated by specifying the required Minimum Efficiency of the pump. Where pump pressure limits are set too low pipe sizes will rise leading to increased size and space, materials, insulation, weight, transport, installation etc
Suggestions	List minimum % pump efficiencies in Table J5.4a
Notes	Disagreement not clarity

Clause	2.35. Spec J5.4 2(a) (iii) (A) Cooling water piping
Issue	Confusion whether this table is required for condenser water systems (operating range 25 to 40°C) and high temperature chilled water systems serving chilled beams etc (typical operating range 14 to 17°C)
Suggestions	Rename cooling water piping as Chilled water piping and specify the operating range (typical operating range 2 – 13°C)
Notes	Explain rationale in guide

Clause	2.36. J5.4 (b) (ii) Electric heating
Issue	<p>The current requirements basically ban the use of electric duct heaters. Options listed in J5.4 (ii) are in reality unworkable and would generally produce a worst carbon result that electric heaters. There seems to be no overall statement that allows engineers to produce a designed solution. What do we do? We have an unworkable situation in Qld and the North, I think it will also have a devastating impact upon the lower end of the market in all other states as well. Reverse cycle can't be used everywhere and it's ridiculous to think of building a boiler plant for a small commercial development.</p> <p>Electric space heating is now not allowed. A centralised system now has to be provided. With Brisbane requiring minimal heating the provision of a centralised heating system results in a larger capital cost. It can also result in higher energy consumption because of the preheating of the centralised system despite there being a low heating demand.</p> <p>Here in South-East Qld it is generally widely accepted that hydronic heating infrastructure is overcapitalisation for the relatively fewer operation hours that "winter" heating demands. Traditionally, the use of electric elements as trim heaters is a fairly low capital expense that accommodates heating for relatively low on-going operation cost (maintenance and service also considered) in the SE Qld region.</p>
Suggestions	Electric heating be allowed in the warmer climate zones with a capped capacity per square metre.
Notes	<ul style="list-style-type: none"> • Zone 2 • Addressed BCA 2011? • Disagreement not lack of clarity • Clarification is requested, as Page 152 of the BCA Handbook (published 27 May 2010) states "electricity can be used only for reheat in a ducted system and, even then, Clause J5.2(a) places limits on the amount of reheat allowed"

Clause	2.37. Table J5.4c MEER
Issue	Why do units less than 65 kW _r not have a Minimum Energy Efficiency Rating?
Suggestions	Explain in guide
Notes	Under 65 kW _r covered by MEPS program.

Section 3 - Compliance, training and other issues

3.1. Industry Compliance issues

Industry compliance with the specific DTS requirements of BCA Section J5 was seen as a significant issue by all stakeholders including a view expressed by many that some of the requirements are so severe they “cannot be complied with”. The rate and frequency of change of the BCA is also perceived as creating a barrier to code compliance. Designers, installers, certifiers, manufacturers and related design professionals were all concerned about the level of industry knowledge regarding the BCA in general and the current requirements of BCA Section J specifically J5 on airconditioning and ventilation systems in particular.

“We have observed that certification of Section J is typically by the designer of the system, i.e. there is no third party review. Building certifiers do not understand the technical aspects of Section J and are approving non-compliant designs on the word of the designers. This is observed prevalently in our sector. We recommend an independent review of designs be enforced to ensure Section J compliance.”

“Lack of industry awareness of BCA section J implications. Scope confirmation of who does the BCA compliance check for architectural aspects. Architects often not aware of how to do it, engineers exclude it to be competitive.”

“I don’t believe that compliance with the BCA Section J is an issue. There are ways to comply with all that is in the BCA including the BCA2010 changes. It is a matter of how much it will cost you to comply and further to that, what energy savings you get for the cost of complying. Many areas including insulation have reached a definite point of diminishing returns.”

3.2. Training issues

The following suggestions were made in response to the question what training areas would assist industry?

- Possible Forums with Q&A on points of the Code that can need clarification and/or further discussion with regard practicality etc.
- Access to Frequently Asked Questions relative to section J
- Conducting seminars in more regional locations would be helpful and more likely to improve understanding across the industry.
- Provide detailed information in respect to compliance issues. Make AIRAH the accreditation authority for Part J assessors?
- Legal implications from relevant State and Territory Jurisdictions as per the legal requirements to comply with the BCA Part J. The increasing importance of compliance of the as-built solution in the light of increasing Commonwealth Govt. focus on Energy Performance of buildings gains momentum. Education of customer and client base to ensure compliant solutions are quoted and installed in accordance with BCA requirements.

“Involve design engineers from not just consulting, but from the contracting side of the construction industry for running the technical training. In this way, a more balanced perspective can be reached from engineers who have to install and commission what they design, not just put together

deliverables which 'the contractor will take care of'. I say this because I come from both the consulting & contracting sides of the playing field and I have noticed the differences in perspectives."

"Training regarding the Regulatory Authority processes that are associated with the Codes and Regulations that Regulate AS1668 Air-Handling Systems and Prescribed Fire Safety Air-Handling Systems in Queensland."

3.3. The Style of the BCA

Several comments were submitted on the narrative style and content of the BCA itself. Most felt that the BCA could be rewritten in a less formal and easier to read style.

3.4. The BCA Guide

Several comments were also submitted on the content and purpose of the accompanying BCA Guide. Most felt that the BCA Guide or a similar document could be significantly expanded to better address industry issues.

"I think that there needs to be a greater awareness of the intent of the BCA and what they are trying to achieve and how difficult the process of change for the ABCB is. It would greatly help lots of people if the ABCB explained their interpretation and intent for many of the clauses in the BCA Section J. I understand however they may not do this as the BCA is to be self regulated."

The following suggestions were made in respect to possible content for the BCA Guide:

- Include guides to achieving compliance E.g. industry information regarding construction of high R values roofs. Educate architects Provide some simple specific examples, e.g. R3.2 ceiling sandwich = metal deck + 100mm typical insulation
- Include Part J assessment procedures
- Utilising the guide to expand further on some areas would make the thinking behind some of the calculations or rules. More precise definitions would also clear up certain issues like what exactly is an "air conditioning system". Does this include the chiller/condenser or only the fan coil units etc?

3.5. Regulatory issues

Several comments were made in relation to the regulatory or administrative issues within their state.

"Owners cannot clarify who is/are the Regulatory Authority(s) in Queensland that Regulate J5.5 for AS1668 Air-Handling Systems. The Administrators of the legislation should provide a service to clarify the intent of the legislation. Owners cannot identify who is/are the Regulatory Authority(s) who regulate AS1668 Air-Handling Systems here in Queensland. The Administrators of the legislation should offer a service to clarify who is/are the Regulatory Authority(s) who regulate AS1668 Air-Handling Systems here in Queensland"

Provide a service to clarify the intent of legislation in Queensland that relates to AS1668 Air-Handling Systems and Prescribed Fire Safety Air-Handling System Installations in Queensland."

3.6. General comments

The following general comments or suggestions were also received:

- Resolving this issue (increased R values) would be to allow sufficient time for the industry to catch up and make alternative products commercially available. Improved is to ask industry relevant bodies to comment on changes they see prevalent in improving the energy reduction rather than driven from desktop audits.
- ABCB should use buildings of different classes and a larger size to model future requirements.
- More visibility when BCA section J is going to change and what is the process the BCA goes through when making changes. Higher efficiency targets are good for all, but we need time to develop the equipment.
- More publicity to educate the general public on the need for more energy efficient housing. The BCA should adopt similar standards as western Europe and encourage buildings to become carbon neutral
- Web publish a free energy rating software, even if it just assesses basics, to give users an initial assessment (to aid design) before they contract the expense of a registered assessor.
- Recommending LED downlights to avoid the energy waste and insulation loss from using DQI downlights.



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