BCA – NCC VOLUME ONE ENERGY EFFICIENCY PROVISIONS

INTRODUCTION

This TECHnote includes information useful in satisfying the BCA energy efficiency provisions for Class 2-9 buildings. The BCA objective is to reduce greenhouse gas emissions – this does not necessarily improve energy efficiency. The operational energy is currently the focus of the BCA, embodied energy will be considered in the future for sustainability controls.

PERFORMANCE REQUIREMENTS

JP1: Provision of building features to facilitate the efficient use of energy as appropriate to a number of considerations including building use and location.
JP2: Provision of features that facilitate maintenance of building systems.
JP3: Using renewable, reclaimed or low greenhouse gas intensity energy for heating.

DEEMED-TO-SATISFY PROVISIONS

The *deemed-to-satisfy* provisions vary depending on the *Climate zone* of the building. They relate to the following:

Part I2 - Energy efficiency installations
Provisions require that the services equipment installed are maintained so they continue to comply with Section J and to operate in an effective and efficient manner.

Part J0 – Energy efficiency
Provisions clarify the application of Section J for the various classes of buildings. Class 2 and 4 need to collectively achieve a minimum energy rating of 6 stars and individually achieve a minimum rating of 5 stars calculated using software that complies with the ABCB protocols for energy rating software. The minimum requirements for ceiling fans are also set.

Part J1 - Building fabric
Provisions contain a great range of compliance options covering the use of both bulk and reflective insulation, light coloured and ventilated roofs, rooflights, blockwork, concrete and high mass walls, shaded walls and all forms of suspended and on-ground floors.

Part J2 - Glazing
Glazing calculators are available on the ABCB website to aid users. Glazing is treated as complete glass and frame systems. The U-value and Solar Heat Gain Coefficient (SHGC) of the window is determined by Australian Fenestration Rating Council (AFRC) procedures.

Part J3 - Building sealing
Provisions relate to the control of unwanted air movement through the building envelope. It addresses the elements of the building like chimneys and flues, roof lights, external windows and doors, exhaust fans, construction of roofs, walls and floors and evaporative coolers. The building sealing requirements vary depending on the climate zone and location.

Part J5 – Airconditioning and ventilation systems
Provisions include:

- The ability to only operate the airconditioning, ventilation or exhaust systems of a building or part of a building when needed.
- Outside air to a car park to be varied depending upon the contaminant level.
- Limiting the power used by the fans of airconditioning and ventilation systems and heat rejection plant.
- Limiting the power used by the pumps of heating, cooling and heat rejection plant.
- Insulation on heating and cooling ductwork and piping.
- Setting minimum energy performance for boilers, chillers and package airconditioning plant, not covered by a Minimum Energy Performance Standard (MEPS).

Part J6 – Artificial lighting and power
Provisions include:

- Manual and automatic control of internal and external lighting.
- Maximum lighting power loads based on different room functions, and with concessions allowed where rooms are small or where there are lighting control devices.
- Time clock control of boiling water and chilled water storage units.

Part J7- Hot water supply and swimming pool and spa pool plant
Provisions relate to the control of loss of heat from hot water systems and storage water heaters that heat and supply water including for swimming pools and spas. In general, hot water supply pipes are required to be insulated except for solar water heaters in *Climate zones* 1, 2 and 3.

Part J8 - Access for maintenance and facilities for monitoring
Provisions require that plant and equipment are readily accessible so that they can be easily maintained. Buildings must have facilities to monitor its energy usage.

VERIFICATION METHODS

JV3 Verification using a reference building: This is currently the only method of verification. It compares the annual energy consumption of a proposed building against a reference building that complies with the *Deemed-to-satisfy* provisions. Characteristics of both buildings (such as occupancy profiles, internal heat gains, etc), for the purposes of calculating their thermal performance, are specified in Specification JV.

Definitions

ABCB: Australian Building Code Board.

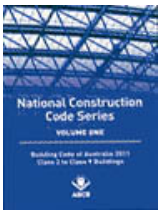
Annual energy consumption: The theoretical amount of energy used annually by the building services, excluding kitchen exhaust and the like.

Energy efficiency: A measure of the reduced energy consumption resulting from design improvements in comparison to the amount of energy that would otherwise have been consumed. It improves the performance of services systems that directly consume energy and the ways that heat flows into and out of the building through its enclosing fabric.

Services: Mechanical, hydraulic and electrical systems that use energy to provide air conditioning, ventilation, hot water supply, artificial lighting etc. For the purposes of the BCA, services do not include systems used solely for emergency purposes, cooking facilities and portable appliances.

NATSPEC

NATSPEC uses the *deemed-to-satisfy* provisions where possible but most factors involve design decisions. The entire services packages are heavily oriented towards energy efficiency. The SELECTIONS clauses provide for the nomination of energy related values.



Relevant websites

BCA
www.abcb.gov.au

BCA Climate zone map
www.abcb.gov.au

BCA Glazing calculator
www.abcb.gov.au

AFRC technical documents
www.afrc.org.au

Relevant documents

BCA
BCA Energy efficiency provisions information handbook
NATSPEC TECHnote GEN 011 *Specifying BCA requirements.*
NATSPEC TECHnote DES 013 *BCA Energy efficiency protocol and software for housing.*
NATSPEC TECHnote DES 014 *Voluntary environmental rating schemes for buildings.*

Relevant worksections

042 *Roofing worksections*
043 *Cladding worksections*
0451 *Windows and glazed doors*
0453 *Doors and access panels*
0461 *Glazing*
0471 *Insulation and sarking membranes*
07 *Mechanical worksections*
08 *Hydraulic worksections*
09 *Electrical worksections*