

# Additional information

Glossary

Bibliography

Appendix 1: Energy Efficiency Design Guidelines

Appendix 2: Social impact assessment checklist

Appendix 3: Lodging a Development Application

Index

**Access lane** a rear or side lane providing access to parking on lot/s with street frontage and/or short connections between access places or access streets principally to facilitate movement of service and emergency vehicles.

**Amenity** the enjoyment of the environment, whether by the community or by an individual, arising from the use of property, dwellings or publicly accessible land, community facilities or open space and includes, but is not limited to the enjoyment of sunlight, privacy, views, and residential and community life free from nuisance.

**AMCORD** prepared by the Federal Department of Housing and Regional Development, is the Australian Model Code for Residential Development, A National Resource Document for Residential Development 1995.

**Attic** the top storey of a building, formed by the roof space or under the beams of the roof, where there are two or more storeys. For the purpose of the definition of the building height:

- Attics can be built if the roof angle or pitch is not greater than 36 degrees.
- For an attic to constitute a room in the roof (and not an additional storey) the roof must pitch from the ceiling level of the upper most floor.

**Balcony** an upper storey platform projecting from the wall of a building supported by posts or brackets, and enclosed by a balustrade.

**BCA** the Building Code of Australia.

**Building envelope** defined by the height and scale, the setback and the floor space ratio controls, which set the limits of development. (Refer to Part E Building envelope).

**Communal car-park** a group of car spaces under the control of the body corporate of a multi-unit development.

**Communal street** the carriageway and verge, if any, providing access to a multi-unit development and which is under control of a body corporate.

**Communal open space** useable community open space for recreation and relaxation of residents and which is under the control of a body corporate.

**Conceptual boundaries (Edges)** a clearly defined visual or physical zone which is shared between districts or precincts, such as Oxford Street or King Street, railway tracks and elevated motorways.

**Conservation area** a precinct in which the architectural character or streetscape is considered worthy of conservation. It includes all areas defined in South Sydney Local Environmental Plan 1995 and areas of merit identified by the National Trust of Australia and referred to as such in this DCP.

**Contributory buildings** buildings with some trait or feature existing in significant numbers to influence the overall character of an area. They usually share common architectural features, materials or decorative details. Contributory buildings are important to define a regional or local character which can be used as a guide for further development.

**Controls provisions** (often numerical) which are accepted without any further evidence being required as one option for meeting the elements objections.

**dB(a)** a measure of sound levels in decibels.

**Development control plan** a plan made by this Council under Section 72 of the Environmental Planning and Assessment Act, 1979.

**Development contribution** a fee or contribution charged under section 94 of the EPA Act, 1979 for the provision of infrastructure.

**Dwelling** a room or suite of rooms occupied or used or capable of being occupied or used as a self-contained housing unit.

**Ecologically Sustainable Development (ESD)** is a conceptual framework for development concerned with dealing with the decreasing ability of the earth to continue to support humanity. It "...aims to improve the quality of life now, and in the future, equitably, in a way that maintains the ecological processes in which life depends....It implies an integration of environmental and economic considerations in decision making, an appropriate valuation of environmental assets, dealing cautiously with risk

and irreversibility and recognizing the global implications of our actions.” (Strategy for a Sustainable Sydney, Greenpeace, 1993).

**Ecological sustainability** in an urban environment context, is a characteristic that is based on the philosophy of conserving and recycling resources to contribute to the restoration of underlying ecological processes on which all life depends. It involves the integration of ecological processes such as on-site stormwater absorption, soil conservation, grey water recycling, renewable energy harvesting, natural habitat and air quality, with the social, cultural and economic dimensions of human activities to achieve high levels of overall performance.

**Environmental Planning and Assessment Act 1979** an act gazetted on 4th July 1980 instituting a system of environmental planning and assessment for the State NSW.

**Facade** the face or front of the building identified on a plan as an elevation.

**Figural character** the overall shape and appearance of the streetscape.

**Floor space ratio** means the ratio of the gross floor area of the building to the area of the site on which the building is, or is to be, erected.

**Frontage** the area of land between the building and the street .

**Grey water** water that has been used for residential purposes such as kitchen sink, bathwater and washing machine waste water, but not toilet flushings. Grey water may be used for residential garden irrigation, toilet flushing, firefighting, car washing and similar outdoor uses (e.g. washing paths).

**Gross floor area** the sum of the areas of each floor of a building where the area of each floor is taken to be the area within the outer face of the external enclosing walls as measured at a height of 1.4 metres above each floor excluding:

- columns, fin walls, sun control devices and any elements, projections or works outside the general lines of the outer face of the external walls
- lift towers, cooling towers, machinery and plant rooms and ancillary storage space and vertical air conditioning ducts.
- car-parking and associated access needed to meet the requirements of the Council.
- space for the loading and unloading of goods.

**Habitable room** a room used for normal domestic activities such as ,bedroom, living room, lounge room, kitchen, dining room, study, play room and sun room.

**Height** in relation to a building, means the vertical distance expressed in metres between a point on

the ceiling of the topmost habitable floor and the natural ground level immediately below that point but does not include an attic elsewhere defined.

**Interim Conservation Order (ICO)** an order under the *Heritage Act 1977* placed on an item of environmental heritage or a precinct to ensure its temporary conservation whilst its heritage significance is being investigated. An ICO is in place from its gazettal date.

**Item of environmental Heritage (IEH)** a building, work, relic or place of historic, scientific, cultural social, architectural, archaeological, natural or aesthetic significance that is identified as an item of environmental heritage on a the heritage and conservation map in South Sydney LEP 1995.

**Heritage significance** means historic, scientific, technological, cultural, social, archaeological, architectural, townscape, natural or aesthetic significance.

**Horizontal control lines** prominent horizontal elements on a building facade such as string courses, cornices, balcony balustrades, roofs, eaves, door/window heads, etc.

**In-fill development** a general term used for new housing in existing residential areas and usually involving the use of a vacant site or the removal of an existing dwelling to enable construction of a larger number of dwellings.

**Intrusive buildings** or elements in the urban environment include anything which is considered unsympathetic to the character of the district as a whole. Such visual intrusions may be new buildings, which by their scale and mass, or architectural treatment, are out of character with the buildings around them.

**Landmarks** are prominent visual features or objects of the City. They act as points of reference which people experience from outside. Some landmarks are very important elements of urban form. Landmarks enhance definition and identification of the urban environment.

**Landscape plan** a plan or document outlining the extent, type and location of landscaping proposed for a development.

**Large development sites** are sites over 5,000 sq. metres and require a Masterplan

**Local area traffic management (LATM)** a scheme for planning and controlling the usage of streets within a local residential area to achieve goals, determined by affected parties, for the improvement of the residential environment.

**Local environmental plan (LEP)** a plan made by the minister under section 70 of the Environmental Planning and Assessment Act, 1979.

**Lot** an area of topographical space shown on an approved plan of subdivision and on which it is

intended to erect a building.

**Maximum Building Height** means the maximum vertical height of a building permitted expressed in metres, measured from the natural ground level to the uppermost point of any permanent fixture/structure of the building (including plant, lift towers and the like) and only applies to the William Street Precinct, as defined in “Part G: Section 6” of this Plan.

**Natural ground level** in relation to a site means the level determined by the Council to be the natural level of the site.

**Nodes** centers of activity of focal places such as junctions or paths; examples extend from roundabouts to market squares. Nodes usually are perceived as total entities which can be ‘entered’.

**Non-habitable room** a bathroom, laundry, water closet, food storage pantry, walk-in wardrobe, corridor hallway, lobby, clothes drying room, and other spaces of a specialized nature occupied neither frequently nor for extended periods.

**Objectives** define the intention of each element and indicate the desired outcomes to be achieved in the completed development.

**Open Space** that area within a particular site upon which no building or work has been erected.

**Parapet** a low wall or barrier, placed at the edge of a platform, balcony, roof etc.

**Performance criteria** the requirements of the design elements in this DCP that provide a basis for judging whether the objectives have been met.

**Permanent Conservation Order (PCO)** an order made by the Minister under the *Heritage Act 1977* with respect to an item of environmental heritage or a precinct to ensure the permanent conservation of the item or precinct.

**Private Open Space** an open area of land or building attached to a dwelling intended for the exclusive use of the occupants of the dwelling for private outdoor living activities.

**Public Domain** is defined in Part C – Public Domain.

**Public Domain Improvement Plan** the plan under South Sydney DCP 1995 that identifies opportunities to improve the Public Domain.

**Regional Environmental Plan (REP)** a plan made by the Minister under section 51 of the Environmental Planning and Assessment Act 1979.

**Residential flat building** a building containing two or more dwellings. This does not include a row of two or more dwellings attached to each other, commonly known as semi-detached houses or terrace buildings.

**s94 contribution** a contribution made under section 94 of the EPA Act 1979 and set out in Council’s

s94 Contributions Plan for the provision of infrastructure or community facilities or amenities. It may be in the form of a monetary contribution, land dedication and/or the provision of material public benefit.

**Setback** the distance of the wall of a building from the site boundary, sometimes referred to as the alignment of a building.

**Settings** refer to the formal structure, the mass or external shape of the City. Significant elements include ridge lines, valleys, hilltops, key built up areas, view corridors, vantage points and landmarks.

**South Sydney Local Environmental Plan 1996** is part of the South Sydney Plan and establishes statutory planning controls for the development of land in South Sydney.

**State Environmental Planning Policy (SEPP)** is a policy made by the Governor under section 39 of the EPA Act 1979.

**Strategy for a Sustainable City of South Sydney 1995** is part of the South Sydney Plan and forms the blueprint for future development in South Sydney and the basis for both South Sydney LEP and DCP 1995.

**Streetscape** is the combination of elements within a street which create the urban form of that street. It includes elements such as building forms and styles, landscaping, street furniture, pavements, etc.

**String course** is a distinctive horizontal course carried around a building.

**Sustainable** able to be carried out without damaging the long-term health and integrity of natural and cultural environments.

**Terrace housing** is a dwelling designed so as to form, or be capable of forming a row of attached houses.

**Urban precincts** Precincts of special character which contain buildings and streetscapes of local significance. Demolition of any buildings constructed before a selected period requires a Heritage Assessment.

**Urban village** is a compact, well defined community, featuring higher intensity development, a strongly pedestrianised environment, a clear and interactive community focus (usually transit/civic and commercially based), housing and land use mix, generous public spaces and high quality urban design.

**Verandah** is a roofed terrace along the side of a dwelling.

**Vertical control lines** are prominent vertical elements on a building facade such as blade/party walls, nib walls, exposed down pipes, attached piers, changes in facade planes, etc.

## BIBLIOGRAPHY

- Australian Model Code For Residential Development (AMCORD) 95 *A National Resource Document for Residential Development - Draft 1* Canberra 1995
- Australian Model Code for Residential Development: Urban Guidelines for Urban Housing - Edition 1 (AMCORD URBAN) - Canberra 1992
- Baulkham Hills Council *Kellyville/Rouse Hill Residential Development Control Plan 1994*
- Department of Planning NSW, *Urban Development Plan for Ultimo - Pyrmont Precinct 1995*
- Department of Transport and Communications, Federal Office of Road Safety, *Environmental Adaptation of the Main Street in Rural Towns: Towards Guidelines 1992*
- Heritage Council of New South Wales, Royal Australian Institute of Architects (NSW) *In-fill: Guidelines for the Design of In-fill Buildings*
- Hurstville City Council *Draft Residential Development Control Plan 1993*
- Keys Young Eveleigh Precinct *Draft Public Domain Strategy 1994*
- Ku-ring-gai Municipal Council *Draft Energy Efficient Housing Policy 1995*
- Leichhardt Council *Draft Energy Efficient Controls and Guidelines for Commercial and Industrial Buildings - November 1995*
- Leichhardt Council *Draft Leichhardt TownPlan 1995*
- Leichhardt Council *Interim Development Control Plan No. 17 - Energy Efficient Housing 1994*
- Newcastle City Council *Building Better Cities - Newcastle Housing Design Manual 1995*
- South Sydney City Council *Development Control Plan No.1*
- South Sydney City Council *Strategy for a Sustainable City Of South Sydney 1994*
- Sydney City Council *Draft Central Sydney Development Control Plan 1995 Parts 1 & 2 - April 1995*
- Department of Planning and Development of Victoria *The Good Design Guide for Medium-Density Housing Victoria 1995*
- Victorian Department of Planning and Development *Victorian Code for Residential Development- Multi Dwellings 1993*
- Walker M, Marquis P Australia ICOMOS *The Illustrated Charter for the Conservation of Cultural Significance - Sydney 1992*

## Appendix 1

# ENERGY EFFICIENCY DESIGN GUIDELINES

*This Appendix complements PART E – Energy Efficiency. It gives additional information on the rationale, guidelines and requirements for energy efficient design.*

## Broad principles

This section expands on the broad principles of energy efficient design that apply to most building forms.

Energy efficient design can be achieved in three key areas:

1. In the **design** and siting of buildings using passive solar design strategies.
2. In **operating energy** by choosing supplementary systems or active solar design strategies to either eliminate or limit the use of non-renewable energy resources.
3. In **construction energy** by choosing materials and construction techniques with low energy inputs in their production.

## Passive solar design

Passive solar design uses the building structure as a collector, storage and transfer mechanism with a minimum of mechanical support. Passive solar design results in the internal conditions of a building being modified as a result of the building's siting and layout and the behaviour of a building's form and fabric. There are appropriate passive solar design strategies for both heating and cooling. With careful design, buildings can perform well in both winter and summer.

### *Layout*

The location of the living, sleeping and service areas of a domestic dwelling is of great importance in the use of solar energy and should be located to maximise energy gain in winter and minimise energy gain in summer.

### *Solar access and overshadowing*

The siting and orientation of a building will impact on the solar access to that building and surrounding buildings. The ideal siting and orientation of a building is one that maximises winter sunshine to the northern wall whilst taking advantage of prevailing summer breezes.

The sun will warm the dwelling during the winter months and cooling summer breezes, if directed through the building, will help keep it cool during summer.

There are varying degrees of solar access. Although total solar access is desirable, it is often unachievable in developed urban environments. It is therefore important to consider the relationships between achieving desired densities whilst maintaining satisfactory levels of solar access.

It is considered that a minimum of two hours sunlight between 9:00am and 3:00pm in winter should be ensured for the windows of all habitable rooms and private open space as a result of the erection of any new building or structure.

## Windows

Windows serve four functions simultaneously: they admit light, heat, air and provide for views. The design of windows and the degree of control occupants have in opening or closing windows can have a considerable impact on the energy efficiency of a building. Glass lets heat escape from a building more than ten times faster than an insulated wall and three times faster than an uninsulated wall. Heavy, close-fitting curtains with insulated linings should be drawn across window openings after sunset in winter, to create an insulated pocket of air.

In general windows should be exposed to the sun's path in winter but not in summer. North facing windows should be shaded from the summer sun. East and west facing windows should be more extensively shaded from morning and afternoon sun in summer. South facing windows should only be provided for views and cross ventilation and should be kept to a minimum size.

## Shading

The correct use of shading devices will permit the penetration of sunshine in winter and provide shading in summer. Shading devices should control or eliminate the penetration of solar radiation in summer which may result in an increase in temperature above the accepted comfort level. Shading devices should allow air-flow and maintain views and adequate daylight. Shading devices may include overhangs, projecting blade walls, louvres, screens, heat absorbing and reflective glass, or curtains and blinds.

External shading devices are more effective than internal devices as they prevent the sun from penetrating the windows.

## Insulation

Thermal insulation is essential to any energy efficiency design strategy to control the heat flow through the external fabric of a building including the roof, the walls and floors. Without thermal insulation, all the heat gained during the day in winter will be lost before any benefit is felt by the occupant at night. In summer, the heat gained during the day may cause overheating at night.

The choice of material should be based on individual requirements, availability and price.

## Building materials and thermal mass

The use of appropriate thermal mass reduces temperature fluctuations and thereby reduces energy consumption. Thermal energy storage can be achieved in the walls and/or floors of a building. The ideal arrangement is for the thermal mass to be inside a protective envelope of insulation, such as a reverse brick veneer wall or cavity brick wall, or to allow the ground under the building to act as the energy store complete with a concrete floor slab. For any room receiving direct sunlight, the surface area of the thermal mass should be as large as possible.

Examples of common thermal storage materials include:

water, concrete, brick and stone are high-density materials with good storage capacity. Plasterboard, timber, AAC and glass fibre are low-density and have minimal thermal storage capacity.

### Ventilation and draught control

The flow of air into or out of a building should be under the control of the occupants. Ventilation refers to desirable controlled air movements, whilst infiltration or draught is unwanted air movement and accounts for a large proportion of heat gain and loss in buildings.

Unwanted air-flow may be controlled by one or more of the following:

- Isolating major entrances and commonly used doorways through the use of lobbies and vestibules.
- Exhaust fans should be fitted with positive action shutters to close when off.
- Seal openings and gaps in a building structure.

Varying degrees of cooling can be achieved using natural sources. Ventilation will occur if a pressure differential exists across a building. When the shape, orientation and openings are designed to take advantage of prevailing wind direction, the pressure differential will be enhanced.

In Sydney, in summer, prevailing north-easterly winds and cooling evening southerlies should be allowed to enter the building with north window placement forming "breeze ways" through the house. In winter all windows and doors should be adequately sealed to minimise draught.

### Landscaping

Appropriate landscape measures can have a significant impact on the thermal comfort and energy efficiency of a development.

Landscape features such as trees and plants can be sited for maximum environmental control, to provide shade on eastern and western elevations and to reduce glare on large hard paved areas.

Vegetation can also be used to gain the benefits of transpiration cooling of the air by plants. This is particularly significant in commercial buildings with large atriums.

Built elements such as pergolas and screens can be used in combination with trees and vine planting. Deciduous vines should be used to cover walls for control of heat absorption in summer.

Paved surfaces should be minimised to allow for reduced reflection and maximum water penetration and to reduce water run-off or evaporation.

Use mulch materials instead of grass to minimise the use of power maintenance equipment and to cool soil temperatures in summer.

The use of landscape features on balconies, in internal courtyards, atriums, rooftops, and parking lots need to be considered.

A compact built form which allows for more landscaping should be promoted.

### Operating energy

"Operating energy" is the amount of energy required to operate appliances. Elements of passive solar design will impact on the operating energy of building.

Active design systems are usually visible with roof-mounted collectors, pumps, plumbing, control systems and storage tanks. (*Energy Efficient Australian Housing 1992*)

Natural ventilation and heating are the most desirable options in terms of energy efficiency however in the case of large commercial and retail buildings these strategies are not always practical.

HVAC (Heating, Ventilation and Air Conditioning) Systems are the major energy consumers in large commercial buildings. The HVAC system should be selected to minimise energy use. Through the use of appropriate guidelines in the selection and operation of HVAC systems there is considerable scope to minimise energy consumption.

The following points relate to operating energy.

### Hot water heating

Water heating is the largest single user of energy in the residential sector. About 80% of NSW homes use electricity, 12% use gas and 3% use solar energy for water heating. A reduction in energy use for water heating is desirable. Solar, heat exchange or gas hot water heating systems consume less fossil based energy than electric systems.

The use of efficient fittings such as controlled flow shower roses, tap aerators or flow control valves will significantly reduce water consumption therefore saving energy and money.

### Lighting

The use of natural light is preferred, although this is not always possible. Energy efficient light fittings such as compact fluorescent light fittings will reduce energy consumption and save money.

It is important that illuminance is appropriate for the use and switching arrangements limit unnecessary illumination.

### Solar thermal collectors

Another significant active solar design strategy involves the use of solar thermal collectors for swimming pool heating, hot water heating, air heating and air conditioning. A solar thermal collector is a device that transfers solar radiation directly into heat energy.

Solar thermal collectors are available in a variety of forms including flat plate collectors (which are the most commonly used) evacuated tubular collectors and concentrating collectors.

### Ventilation

Ceiling fans provide cooling air movement in summer and in winter may also be used to move warm air near the ceiling back down to the occupants.

### Automatic curtains

Automatic curtains may be used on north facing living

areas for effective solar gain during a winters day or insulation on a winters evening. Curtains are operated by temperature controls.

## Construction energy

Choice of materials

Ecologically sound materials may have many of the following qualities:

- Renewable
- Abundant
- Non-polluting
- Energy efficient (low contained energy)
- Durable
- Recyclable
- Ability to reduce fossil based energy consumption

The following tables gives some estimates of the energy expended per unit mass during manufacture.

Material	Energy/unit mass
Steel	37
Aluminium	241
Lead	50
Brick	4.7
Glass	22
Rockwool	14
Porcelain	22
Concrete	0.7
Lightweight concrete	8
Cement	8
Sand/Gravel	0.04
Plasterboard	3.5
Plastics	34
Wood	0.4

In the choice of materials an important factor to consider in determining contained energy and material selection is the total quantity of each type of material used. A typical house may contain only a few kilograms of aluminium in its roof sarking. Although aluminium is undesirable from the contained energy point of view it is very cost efficient in its performance.

Although timber will require more maintenance than aluminium it is usually more appropriate for windows and doors as it has minimal contained energy and is a renewable resource. Concrete slabs on ground exposed to the sun will absorb solar energy and dissipate it during cold winter nights far more effectively than timber floors.

In the average brick veneer dwelling the greatest amount of contained energy (by quantity) is in the clay bricks used for cladding. Other materials that should be considered are timber framing, timber cladding, cement bricks and concrete pavers.

## Rainforest timber

There is increasing worldwide concern surrounding the use of timber derived from tropical rainforests. The rapid depletion of the rainforests has a significant affect on the worlds climate and the balance of gases such as carbon and oxygen in the atmosphere.

Timbers that **should not** be used are:

Kapur, Meranti, Ramin, Bangkirai, Baru, Jelutong, Keruing, Mengkulang, Nyaton, Merbau, Phillipine Mahogany, Calantas, Narra, and Teak.

Timbers that **should be** used are:

1. Framing and General Construction
  - Radiata Pine
  - Plantation – grown oregon
  - Cypress Pine
  - Composite Products (e.g. glue laminated beams)
  - Recycled timber
  - Scrimber
  - Australian regrowth forest hardwoods (e.g. Blackbutt Red Ironbark).
2. Concrete Formwork
  - Use only plantation pine such as radiate, slash and hoop pine.
  - Reuse formerly where possible.
3. Flooring
  - Plantation Pine
  - Eucalypt hardwoods, especially for decorative flooring
  - Plywood
  - Particle board
  - Recycled hardwoods
  - Cypress Pine
4. Panelling and Lining
  - Plantation Pines
  - Cypress Pines
  - Eucalypt hardwoods of all densities
  - Plywood (non-rainforest)
  - Veneered (non rainforest) particle board and fiberboard
  - Hoop Pine
  - Popular
  - Hardboard (masonite)
  - Pine Veneer Plywood
5. Furniture, joinery, shelving bench-tops
 

This section provides energy efficiency guidelines and standards for residential buildings only.

  - Plantation pines
  - Eucalypt hardwoods (lower densities)
  - Plywood (non rainforest) Particle board and fiberboard
  - Popular
  - Plantation Oregon
  - Camphor Laurel
  - Particle Board
6. Doors and frames
  - Plantation Oregon
  - Hoop Pine
  - Radiata Pine
  - Recycled Doors and Timber
7. Cladding
  - Treated Plantation Pine
  - Australian Regrowth Forest Hardwoods
  - Durable Recycled timber
  - Treated Exterior Grade Plywood
8. Fencing exposed decking and stairs
  - Durable recycled timber
  - Australian regrowth forest hardwoods
9. Internal Stairs
  - Recycled timber

- Plantation pines (not for treads)
- Australian regrowth forest hardwoods.

#### 10. Decorative Veneer

- Plantation pines
- Camphor laurel
- Australian regrowth forest hardwoods.

### Construction efficiency

Manufacture and assembly off-site may minimise waste and maximise control over inventory and mass production.

Off-cuts from products used in the construction process can be used on site for example crushed brick or concrete can be used as fill for drainage trenches. Materials not used should be stored in recycling bins and returned to manufacturers.

Whenever possible soils and vegetation removed should be relocated and re-used on development sites.

### Energy target

*An energy target has been incorporated as a guideline to provide a basis for the assessment of buildings which will be required to submit an Energy Performance Report.*

In line with current practice, the energy target of 450 Mega Joules/annum/metre square (MJ/am<sup>2</sup>) for the commercial sector has been selected as it is considered a reasonable and achievable figure. The target for the retail sector is 900MJ/m<sup>2</sup>.

It is intended the energy target be reviewed annually to ensure its application is successful.

Energy targets have not been selected as the sole method of control for buildings for the following reasons:

- The energy target is an estimation of the energy consumption of a building. Actual consumption will not be known until a building is occupied and operational.
- Energy targets may be used to provide a guide to the energy consumption of a building, from which conclusions 'may be drawn to improve the efficiency of the building (it is a good base figure to rate a building).
- The energy target calculation process using a simulated computer program is not 100% accurate. It would be unreasonable to expect all buildings to meet a specified target and to refuse an application for not meeting this target.
- An energy target figure would need to be reviewed as technology changes. It may be possible that an unachievable target today may be easily achieved in the near future.

The energy target or estimated energy consumption of a building using a simulated computer program is a useful tool in assessing the anticipated energy consumption of a building. This figure may be used to compare and possibly rate buildings against each other and to compare different designs.

The calculations of the energy target using a computer program is useful to identify areas within a building

where efficiency may be improved. Following the identification of inefficient components of a building, steps may be taken to improve the efficiency of the building. The energy target forms one component of the *Energy Performance Report*.

### Energy Performance Reports

An energy performance report must be submitted for all development proposals where the total cost is greater than \$500,000 (for requirements pertaining to residential development please refer to Part E, Section 5.4 Energy Star Ratings). The energy performance report must be prepared by an accredited energy consultant and must contain the following information:

- a) Details of the total anticipated energy consumption of the proposal in Mega Joules per annum per square metre (MJ/am<sup>2</sup>) estimated using a computer program. Appropriate computer programs are BunYIP (SCIRO) or its recognised equivalent for commercial buildings; and NatHERS (SCIRO) or its recognised equivalent for residential buildings. The anticipated energy consumption should not be greater than 450 MJ/am<sup>2</sup> for commercial proposals; 900MJ/a/m<sup>2</sup> for retail proposals.
- b) Details of all passive and active energy efficient design measures that have been incorporated into the proposal.
- c) Details of how the energy efficiency of the building may be improved, the cost of such changes and their anticipated cost savings.
- d) Energy consumption details of:
  - Plant and equipment;
  - Fixed appliances, and
  - Lighting.
- e) Details of the effect the proposal may have on any solar thermal collectors in the immediate vicinity of the proposal.
- f) Details of renewable energy sources in the proposal

This *Energy Performance Report* is to be submitted with the DA (to ensure energy efficiency has been given consideration during the design of the proposal).

### Energy consumption

#### The residential sector

The residential sector consumes about 12 percent of total energy use and about 30 percent of total electricity use in NSW. The increased use of energy efficient appliances has improved the energy efficiency of residential buildings. However there is still potential for improvement in both the design and operation of residential buildings. The controls contained in the DCP address building design only. The energy efficiency of any building is determined not only by the design but also by the energy consumption requirements and practices of the occupants.

#### The commercial sector

In Australia in 1986/87 the commercial sector consumed 5.3% of delivered energy and produced 9.8% of CO<sub>2</sub> emissions. A reduction in the consumption of non-renewable energy in the commercial sector through building design and operation will result in a reduction in greenhouse gas emissions, in particular CO<sub>2</sub> emissions.

Heating and cooling, hot water, plus tenants' lighting,



account for a major component of a building's energy consumption. The energy efficient design and operation of a commercial building will result in a reduction in energy consumption in all energy consuming areas of the building, especially heating/cooling and lighting and may also result in substantial cost savings.

The term "commercial sector" covers a wide range of built forms ranging from small scale ancillary offices such as that found in conjunction with industrial development to large scale commercial developments found in central business districts and large commercial centres.

The energy consumption of a commercial building will vary as the occupants change. Council may not control the energy consumption of the occupants of a building but can ensure that a building is designed and constructed as an energy efficient building.

### The retail sector

The retail sector includes a variety of built forms ranging from individual retail outlets to a conglomeration of retail outlets such as those found in large shopping complexes.

Large retail shopping complexes create an enclosed air conditioned shopping environment which has the potential to consume large amounts of energy. Energy efficiency needs to be considered during the design stages of large shopping complexes.

In general, shops have minimal windows, therefore require large amounts of artificial lighting, especially in large retail shopping complexes. This means that there will be minimal heat loss and gain through windows, however there will be additional heat gain through lighting and occupation by people.

This additional lighting places extra demands on the mechanical heating and cooling system. The use of energy efficient lighting and an energy efficient air conditioning system in a shopping complex should result in increased energy efficiency.

Another area of importance is roofing material and insulation. The use of transparent roofing materials have become increasingly common in shopping complexes to increase natural lighting. As a result, heat may be transferred through such roofing materials placing additional demands on the mechanical heating and cooling system.

### The industrial sector

The energy consumption in the industrial sector accounted for more than one third of the total final energy use in the economy and more than a third of CO<sub>2</sub> emissions in 1990-91.

Manufacturing (including construction) for 1990-91 had an Energy Consumption of 924.2 (PJ), being 34.5% of the share of total energy use in the industrial and commercial sector. Manufacturing also produced 36.2 % of CO<sub>2</sub> emissions for the sector.

(*National Energy Management, December 1992, Federal Government*)

Guidelines, Minimum Criteria and Energy Performance Reports are the main methods of control for energy

efficiency in the industrial sector.

Energy Targets for the industrial sector have not yet been developed to a stage where Council may implement them, however the commercial/office component of industrial buildings are to be assessed under the commercial controls contained in this DCP.

In light industrial practices there are a number of ways savings can be made through energy efficiency practices. They include carrying out an energy audit to monitor annual energy use, the use of energy efficient appliances and alternative fuel sources.

For heavy industrial practices, areas where energy efficiency savings could be made include:

*Smelting:* smelting of metallic ores to metal – intelligent controllers, heat recovery, increased scrap use, direct reduction processes.

*Metal Process:* metal forming and forging – improved heater design, combustion control, heat recovery.

*Furnaces:* cement, brick, glass – combustion efficiency and control, heat recovery.

*Steam:* pipe insulation, optimised distribution systems. Combustion efficiency is incorporated within cogeneration.

*Drying:* combustion efficiency, intelligent controllers, heat transfer optimisation.

*Fluid Heat:* combustion efficiency, insulation, optimisation of use, improved heat exchanges.

*Mechanical Devices:* efficient electric motors, variable speed drives, optimisation of end-use energy use, optimal sizing, in-house wiring optimisation.

*Aluminum:* electrode tuning, increased recycling.

### Further information

This Development Control Plan has been prepared with reference to the following existing publications and information on energy-efficient development:

Australian Institute Of Building Surveyors, NSW Chapter, Energy Efficiency Training Seminar Papers, (1991).

Ballinger, J.A., Passive Solar Construction, University of NSW.

Ballinger, J.A., Prasad, D.K., & Rudder, D., Energy Efficient Australian Housing, (1992).

Bartels, Dr. Robert, Household Energy Consumption – An analysis of the 1984 A.B.S. N.S.W. Energy Survey. Prepared for the Electricity Commission of NSW and the NSW Department of Energy.

BOMA, Budget Levels for Office Buildings.

BOMA, Energy Guidelines for Building Owners and Managers (1986).

Botany Council, Draft Greenhouse Effect, Ozone Depletion and Atmospheric Pollution Policy, (1992).

Brown, M.R., A Review of Energy Management in New and Existing Buildings. Australian Refrigeration, Air Conditioning and Heating, June 1989 pp. 20-31.

Brunswick Council, Residential planning Code for Brunswick (December 1991).

Brunswick Electricity Supply Department, Home Energy

- Hints...how to be more comfortable and save energy...
- Commonwealth of Australia, National Greenhouse Response Strategy (December 1992).
- Commonwealth of Australia, National Strategy for Ecologically Sustainable Development (December 1992).
- Department of Arts, Sport, the Environment, Tourism and Territories, Harnessing the Sun and Wind: Reducing Australia's Greenhouse Gas Emissions with the Generation of Electricity from the Sun and Wind: A Summary, (June 1991).
- Department of Arts, Sport, the Environment, Tourism and Territories, Sustainable Energy in a Greenhouse Age – A summary taken from A Greenhouse Energy Strategy: Sustainable Energy Development for Australia.
- Department of Energy, Helen Wellings' Home Energy Guide, (June 1988).
- Department of Energy and Minerals, Victoria, Development of a Commercial Building Energy Code: Victorian Impact Study, Volume 1: Main Report, (December 1992).
- Department of Energy and Minerals, Victoria, Development of a Commercial Building Energy Code: Victorian Impact Study, Volume 2: Appendices, (December 1992).
- Department of Energy and Minerals, Victoria, Commercial Building Energy Code Project, Report to National Roundtable Meeting, Canberra, (24 November 1992).
- Department of Manufacturing and Industry Development, Victorian Government Renewable Energy and Energy Efficiency Activities, Annual Inventory 1992-1993.
- Department of Manufacturing and Industry Development, Victoria's Energy Efficiency Strategy Part I, (June 1991).
- Department of Manufacturing and Industry Development, Victoria's Energy Efficiency Strategy Part II, (June 1991).
- Department of Manufacturing and Industry Development, Residential Building Performance Standards Options Paper – A Consultation Resource, (September 1991).
- Department of Planning, Solar Access Technical Report, (1982).
- Department of Primary Industries and Energy, Saving Energy in Commercial Buildings, Advisory Booklet 16, (1985).
- Department of Primary Industries and Energy, The Energy Audit, Advisory Booklet 3, (1983).
- Department of Primary Industries and Energy, Saving Energy Through Lighting Management, Advisory Booklet 6, (1986).
- Department of Primary Industries and Energy, Energy Efficient Australian Housing, Edition 2, (1992).
- Earth Exchange, Energy Conservation in Lighting.
- Earth Exchange, How to get into Hot Water.
- Earth Exchange, The Thermal Value of Insulation.
- Earth Exchange, Controlled Flow Shower Roses and Valves.
- Earth Exchange, Energy Conservation with Trees.
- Earth Exchange, Design for Sun and Climate.
- Earth Exchange, External Shading Devices and the Design of Pergolas.
- Earth Exchange, Comparative Hot Water Costs.
- Earth Exchange, Energy Labelling of Domestic Appliances.
- EMET Consultants, Bradford Insulation paper: Evaluation of Cost Benefits and performance of Insulation Levels in Commercial Buildings, (November 1992).
- Energy management Advisory Services, How to Conduct a Building Energy Study, (November 1983).
- ENERSONICS, North Sydney Council Commercial Building Energy Regulations, prepared for North Sydney Council, (September 1991).
- Hession, Alan, Energy Efficient Medium Density Housing – Energy Efficiency in Buildings Conference 1993.
- Leichhardt Council, Energy Efficient Housing Development Control Plan No.17, December 1993.
- Local Government and Shires Associations, Local Government and Energy Efficiency, (1993).
- Macsporrán, C., & Tucker, S.N., Target Budget levels for Building Operating Costs.
- Office of the Environment, Victoria, Greenhouse Unit, Work Greenhouse Saver.
- Oppenheim, David, Energy Efficient Commercial Buildings, A paper prepared for the Energy in Buildings Conference 1993.
- Pupilli, Stephen, Director of EMET Consultants Pty. Ltd., Computerised Methods for the Analysis of Energy Efficiency of Commercial Buildings.
- Pupilli, S., Designing Buildings for Energy Efficiency. Australian Refrigeration, Air Conditioning and Heating, (February 1989).
- Senate Standing Committee on Industry Science and Technology, Reserve the Future: Reducing the Impact of the Greenhouse Effect, (1991).
- SOLARCH, Energy Efficiency and Conservation in Residential Buildings of North Sydney, prepared for North Sydney Council, (September 1991).
- Sproats, Kevin, Local Government Energy Efficiency Guidelines, Presented at National Energy Efficiency Building and Planning Seminar 1 July 1992.
- SSROC, A Greenhouse Strategy for the Southern Sydney Region, (April 1992).
- State Projects, Building Energy Manual, (1993).
- Tucker, A.J., & Miller, A.J., & Macsporrán, C., Budget Levels for Non-residential Buildings in Australia, Final Report, (June 1990).

Appendix 2

**SOCIAL IMPACT ASSESSMENT CHECKLIST**

Impact	Likely to result from development (Y) (N)	Comments
<p><b>Childcare Issues</b> Access to childcare Affordability of childcare Facilities</p>		
<p><b>Children’s Needs</b> Family support services Open space Security Schools Playgrounds</p>		
<p><b>Community Cohesion</b> Demographics Community consultation Communities of interest Community morale</p>		
<p><b>Community Identity</b> Demographics Cultural issues Changing community needs and expectations</p>		
<p><b>Community or Neighbourhood Character</b> Heritage Cultural issues Community politics Community cohesion Neighbourhood safety</p>		
<p><b>Cultural and Heritage Issues</b> Heritage significance Specific communities Areas of cultural significance</p>		
<p><b>Cumulative Impacts</b> Significant population and other demographic changes Cultural issues Availability of relevant infrastructure Access to services and facilities Overall land-use patterns</p>		
<p><b>Health impacts</b> Access to health services Community health and safety Traffic Toxic waste and hazardous chemicals Air and water quality</p>		

<p><b>Housing for older people</b>          Availability of support services          Access to transport          Traffic          Pedestrian access          Community safety          Affordability          Management options          Supply          Identified needs</p>		
<p><b>Housing for people with a disability</b>          Community tolerance          Safety          Community safety          Access to support services          Affordability          Management options          Supply          Identified needs</p>		
<p><b>Housing for special needs groups</b>          Identified needs          Supply          Access to support services</p>		
<p><b>Local Employment</b>          Local employment opportunities          Unemployment rates          Business development</p>		
<p><b>Low income and affordable housing</b>          Affordable housing opportunities          Housing prices          Housing choice          Supply of affordable housing</p>		
<p><b>Access to education, job training and retraining</b>          Local employment and training initiatives          Demographics          Unemployment rates</p>		
<p><b>Need for community facilities and services</b>          Redundant facilities and possible reuse          Availability of services and facilities          Access to services and facilities (including affordability, ownership and management)          Recreation needs</p>		

## Appendix 3

# LODGING A DEVELOPMENT APPLICATION

All development requires a development application (DA).

Development in relation to land is defined in the EPA Act 1979 as:

- the erection of a building on that land;
- the carrying out of work in, on, over or under that land;
- the use of land or of a building or work on that land; and
- the subdivision of that land.

It does not include development prescribed in the regulations to the act and State Environmental Planning Policy No. 4.

A development application *must include*:

1. Three completed development application forms and the applicable fee. The form must be signed by the owner/s of the land. If company owned, the company seal or stamp must be affixed.
2. Three sets of plans to scale incorporating.

The plans must incorporate the following:

### A. Site analysis drawing

The drawing must contain the following information (Refer to PART E1.1):

- **North point:** The orientation of true north.
- **Topography:** Any fall of the land, using relative levels or contours at 0.5m intervals, related to a nearby benchmark; and drainage lines across the site.
- **Trees:** The location, size and type of trees on or affecting the site.
- **Microclimate:** Sun and shade characteristics, and prevailing winds.
- **Site Location:** Height, footprint, status and uses of adjacent buildings or structures affecting the site. Window openings which face the boundary. Adjacent or nearby heritage buildings.
- **Shadow Diagrams:** Shadow of existing buildings. Use the winter solstice (21 June) to assess solar access for 9.00am, 12.00 noon and 3.00pm and March/September and 21 December, or more detail, at the discretion of Council.
- **Public Domain:** Elements that make up public spaces surrounding the site (e.g. trees, streets, buildings) and opportunities for enhancement.

For small infill sites and alterations to existing dwellings, a scaled drawing, showing key characteristics and relationships to adjacent buildings and streets is only necessary. Minimum information to be shown in the drawing includes:

- footprint of adjacent buildings;
- front and rear elevations showing adjoining buildings;
- position of windows;
- trees affecting the development;
- boundaries of allotment;
- street verge including footpath.

A site analysis may not be required for minor work that requires a development application such as minor alterations and additions to a dwelling or change of use.

### B. Site Plan, Floor Plans, Elevations and Sections

The plans must clearly document the propose buildings or works and show:

- **Property Dimensions:** The size of the land is to be indicated. The length of all boundaries is to be indicated, and the area of the site shown in square metres. The scale shall also be clearly indicated upon the site plan.  
The scale for floor plans, elevations, and sections is 1:100. The scale for the site plan is 1:200. Photocopy reductions of plans will not be accepted. A north point shall be provided on the site plan.
- **Easements and Right of Ways:** It is the applicant's responsibility to check the property title deeds to ascertain whether it is benefited or burdened by easements or right-of-ways. The site plan shall indicate the exact location of any existing easement or right-of-way in relation to the boundaries of the land. The width, length, and type (e.g. water, sewer, power, access) shall also be indicated. If the land is not subject to easements or right-of-ways, a notation of such should be made on the proposed plan or in a written statement.
- **Existing Buildings/Works:** All existing buildings, works and improvements are to be shown on the plan except where there is a total redevelopment of the block. It is essential that offset dimensions of all external walls are shown on the plans. The basic internal layout of the building shall be indicated. The existing use of the buildings adjacent to the development site shall also be indicated.
- **Existing Trees:** The location of all existing vegetation in excess of 3 metres in height shall be shown on the site plan. The site plan shall indicate those trees which are to be removed, or otherwise influenced as a consequence of the development.
- **Contour Levels to Australian Height Datum:** All levels are to be tied to the Australian Height Datum; and not assumed reduced levels. Contours should extend for a minimum of 5 metres into adjoining lands to identify natural flow paths. Floor and ridge levels shall also be shown (to A.H.D.) on the elevations and sections. Levels are not required for internal alterations and minor alterations to existing buildings.
- **Existing Storm Water Drainage:** Existing storm water drainage is to be shown on the site plan, including the nearest available Storm Water pit. Proposed Storm Water Drainage is to be indicated on the site plan to show how proposed drainage from the site will be achieved. Details to be provided include all levels, discharge rates, pipe sizes, and grades. Waterways and watercourses are also to be shown on the site plan. Any existing drainage problems shall also be indicated.

- **New Building/Works:** The proposed new structure shall be indicated upon the site plan, together with setbacks from all affected properties (minimum of two setbacks) and proximity to any easements, mains, and the like.
- **Extent of Cut and Fill:** Areas subject to cut and/or fill shall be indicated on the site plan. The depth (to A.H.D.), and method of retention of and/or fill shall also be indicated on site plans.
- **Floor Area:** See the appropriate Local Environmental Plan (or other appropriate planning instrument) for a definition. A floor plan of each level of the building, showing uses of each room is to be provided. Any partition, window and door locations are to be indicated and dimensioned. The unit area, (the gross floor area of the individual unit within a residential flat building, dual occupancy, factory unit etc.) is to be shown. Floor space calculations must be included on the plan. (FSR is the ratio of gross floor area of the building (as defined) to area of the site).
- **Parking and Loading Areas:** The location of these areas is to be indicated. It is required that the applicant address the requirements of Council's Transport Guidelines Code (DCP No. 11). The plans must also indicate access, egress, and manoeuvring areas. Any existing driveways are to be indicated upon the site plan.
- **Garbage Storage Plan:** Individual or industrial storage bins areas are to be indicated on the site plan. The area shall be designed such that suitable space exists for the storage, manoeuvring of bins, and access to the enclosure by the collector (where appropriate).
- **Allotment Dimensions and Allotment Size:** All allotment dimensions are to be indicated using an appropriate scale. All lengths and areas are to be shown in metric.
- **Road Widths/Laneways/Existing Kerb/Gutter:** The width of all roads and laneways adjacent to the development site are to be indicated. The location of kerb and gutter is also to be shown on the site plan.
- **Storage Areas:** Storage areas whether covered or open are to be indicated on plans.
- **Hours of Operation:** Details are to be provided indicating the hours, and days when the development is operating. This includes when staff are working within the premises, and when the premises is open for business.
- **Graphic Illustration:** For development in excess of 0.5 million dollars, Council requires a coloured perspective, and one 35mm projection slide of each plan accompanying the submission. These slides shall include the perspective, and a photograph showing the site from as near as possible to the perspective, showing the relationship to other buildings in the vicinity. Development in excess of 0.5 million dollars shall also be accompanied by a floppy disc copy of the development platted on the Model View three dimensional graphics package. Where demolition or alterations to a building is involved, Council requires the application to be accompanied by 35mm negatives and postcard sized prints of each elevation, or part of the building to be altered. The provision of a model (scale 1:500) only applies

to development in excess of 5 million dollars. The model of the proposed development should include all buildings proposed, and all other buildings affected due to their proximity.

- **Existing Water and Sewer Mains:** Site plans shall indicate the location of water and sewer mains. If the mains do not burden the property, please indicate their location and intended connection points.
- **Land Subdivision:** Details of clearance from the relevant statutory authorities (e.g. Sydney Electricity, Sydney Water) are to be provided with the subdivision application verifying the possibility of amplifying services to the proposed allotments.

### C. Landscape plan

The Plan for the site will indicate the areas to be landscaped. This Plan shall include existing vegetation, planting, paving, fencing, mounding, lawns, play areas, and the like. In relation to the plants to be used, the information should include the size, spread, mature height and species of plants used.

### D. Statement of environmental effects

Every application is to be accompanied by a statement outlining any impact the development may have on the environment. The statement must:

- Demonstrate that consideration has been given to the environmental effects of the development. The application should address issues such as noise, traffic, parking, privacy, overshadowing, streetscape and heritage.
- Where shadow diagrams are submitted the use the winter solstice (21 June) to assess solar access for 9.00am, 12.00 noon, and 3.00pm and March/September and 21 December, or more detail, at the discretion of Council.
- Set out the measures taken to mitigate any likely adverse environmental impact.
- Demonstrate how the proposed development relates to the controls that apply to the site.
- Include any other materials that are required including plans of management to address the Safer Design Policy.
- Detailed requirements are set out in the heads of consideration in the Environmental Planning and Assessment Act.

### E. Plans of management to address safer design

Plans of Management are required for the following developments:

- Amusement centres
- Backpackers hostels
- Boarding houses
- Brothels
- Child-care centres, youth centres, aged housing and aged-care facilities
- Educational establishments
- Hotels and other licenced premises
- Needle exchange centres and clinics relating to drug dependency
- Places of public entertainment.

Plans of Management must set out the following details:

- Proposed hours of operation and justification for these proposed hours
- Measures to ensure that internal amenity is such as

- to maximise safety to users of the proposed facility
- Measures to minimise noise impacts to neighbours
- Design measures to maximise security within and beyond the premises
- Staffing details including qualifications of and requirements of staff.

Plans of Management should be integrated into a Statement of Environmental Effects.

### Additional information

For large sites you may have to submit a Masterplan and Social Impact Assessment (refer to Parts D and E).

For certain development proposals an Energy Performance Report must be submitted. (Refer to Part E: Energy Star Ratings for Residential Development and Appendix 1: Energy Efficiency Design Guidelines).

For development involving **existing use rights**, you will need to provide details of the existing use, and any changes proposed to the nature or extent of that use. This will require development consent in almost all cases.

Where a development application is required for the **demolition of a building of heritage significance**, details of the age and condition of the buildings will need to be submitted.

An **Environmental Impact Statement** (E.I.S.) shall accompany any application where the proposal is for designated development within the meaning given under the Environmental Planning Act 1979.

It may also be appropriate to support your application with additional graphic information (e.g. photographs, slides, models).

It should be noted that the above requirements are minimum requirements. Additional supporting information may be submitted if you consider it necessary and Council may also require additional information.

Additional information can be obtained from the City Environment Department.

Telephone: 9288 5000

Fax: 9288 5999

### The DA process

All development applications go through the following steps before determination:

- **Preliminary Check**

A preliminary check is made to ensure that the DA form is completed correctly and the required information is submitted. If there is insufficient or incorrect information the applicant will be asked within 14 days of lodgment to supply additional information. This may delay processing of the application.

- **Notification**

Before assessing a development application Council may advise in writing adjoining property owners and occupiers and those who the Council considers may be affected by the proposed development. Some DAs may also be notified in local news papers to allow the views of the general public to be obtained. All DAs that are advertised can be examined at the Planning and Building Department for at least 14 days. Larger DAs may be put on exhibition at local libraries, or other appropriate locations. Any submission must be made within the submission period.

- **Referrals**

DAs are referred to other Council sections and departments and from some major DAs to State Government Departments. Where referrals to outside organisation occur DA processing may take longer.

- **Assessment**

A planner will prepare a detailed assessment of the DA in accordance with LEP No. 1998, this DCP and the EPA Act Section 79, matters for consideration. Submissions will be addressed in this report. A planning report will be prepared recommending approval or refusal.

- **Determination**

The DA will either be determined under delegation if there are no valid objections, or at a Planning and Building Committee meeting, followed a week later at a full Council meeting. The applicant and those who made submissions, and so requested, will be advised which Planning and Building Committee meeting the report will be going to and will have the opportunity to speak at that meeting. Once a decision has been made, the applicant and any objectors will be advised by mail.