FINAL DRAFT FOR EXHIBITION

Bankstown City Centre and Campsie Town Centre Sustainability Study Phase 3

9 March 2021

Prepared for:

CITY OF CANTERBURY BANKSTOWN

Prepared by:

GPO BOX 4637
Sydney NSW 2001
fluxco.co

Executive Summary

Draft site-specific controls have been developed to deliver the priorities and strategies identified in the Phase 2 report.

Each control is presented with Objectives and Controls together with suggested submission requirements. Additional notes are added to provide context and supporting information, such as the expected order of cost.

The proposed controls within this document focus solely on the delivery of the targeted sustainability outcomes. In some cases, such as waste management, the controls will need to be integrated with other non-sustainability related requirements.

Recommendation for amendments to the sustainability bonus scheme is made. The recommendations can be applied with explicit LEP provision similar to the current bonus scheme or integrated into a broader design excellence bonus scheme.

Finally, recommendations are made for the process of review and assessment to support the controls.

Table of Contents

Document Control

Project Name	Bankstown and Campsie Sustainability Study
Project Number	125
Document Title	Bankstown City Centre and Campsie Town Centre Sustainability Study Phase 3 report

Revision	Date	Prepared By	Approved By	Changes
Exhibition	9 March 2021	Ché Wall	Ché Wall	Issued for exhibition.

1. All new buildings to be all-electric

Moving immediately away from fossil fuel use within new buildings will ensure the buildings are positioned to achieve the LSPS priority to achieve net-zero emissions by 2050. It will also generate an immediate cost of living saving and improved amenity for residents.

1.1. Objective

A. To minimise the installation of plant and equipment in new buildings that rely upon on-site combustion of fossil fuels.

B. To ensure new buildings achieve the fullest benefit from the progressive greening of the grid-supplied electricity in NSW.

C. To prevent indoor pollutants associated with combustion.

1.2. Controls

A. All new developments are to use only electricity for all energy requirements associated with normal operations.

B. Where it is demonstrated that the intended use of the building requires a process or equipment that is not able to be served by electricity, fossil fuels may be provided to serve that service only. Evidence shall be provided with the application of market testing and equipment supplier advice to confirm that an electrically powered alternative is not technically possible.

1.3. Submission requirements / DA forms

A statement of compliance is required at DA stage, which is to confirm that no natural gas service is provided and that the application is designed as an all-electric building. Item to be an expressly scheduled condition of consent.

Review of BASIX certification for residential developments at DA to ensure the BASIX certification does not rely on gas for heating or hot water.

1.4. Notes

Normal operations refer to all building energy requirements other than the provision of standby power generations.

It is expected that all hot water heating and cooking must be electrical. Anticipated processes or equipment that might require gas include medical facilities or morgues (incineration), education (kilns, metal shops) and heavy industrial (kilns, etc.)

This initiative may generate a cost-saving for new residential development due to savings in the cost of reticulating gas and provision of meter to each apartment - circa $2,000 per apartment. Electric appliances are cost-neutral, but there may be some cost impact due to increased electrical maximum demand.

A minor cost increase is expected for commercial due to an increase in maximum demand unless the development has high costs to bring gas to the site.

2. Maximum use of rooftop solar energy

Rooftop solar energy is affordable and will generate significant ongoing savings for building owners. A requirement to maximise the potential of each new roof will ensure that the misalignment of financial benefit for developers is overcome.

2.1. Objective

A. To maximise the on-site collection of renewable energy

B. To reduce the cost to households and businesses to meet operational energy needs

2.2. Controls

A. The development will include the installation of a solar PV system of no less capacity than:

(i) A coverage area of solar panels of not less than 60% of the roof area not occupied by cooling towers or communal open space; or

(ii) Sized to provide no less than 45 w/m2 of total site area in year one AC maximum peak power delivery, after allowances for inverters and system losses.

(iii) Strata residential buildings of three storeys or less are to connect solar panels directly to the meters of individual units.

2.3. Submission requirements / DA forms

Roof plan showing the area(s) allocated to PVs and necessary access requirements for cleaning and routine maintenance.

2.4. Notes

At $1/watt of installed PV cost, this control's total cost is $45/m2 of site area.

This controls may not be suitable in some areas such as when in conflict with heritage requirements in a conservation area or where the visible impact will be detrimental to a heritage item.

For building above 3 stress, a single solar system under common ownership is most suitable.

Objectives do not cite greenhouse gas reduction as this would be a competing provision to the BASIX SEPP and be of no effect to the extent in residential development to which they aim to reduce emissions of greenhouse gases.

3. Electric Vehicle ready buildings

Providing essential infrastructure for vehicle charging will future proof the buildings and ensure residents can easily transition to electric vehicles. Without essential infrastructure, the future installation of charging facilities by an apartment owner can be much more expensive and in some cases technically impossible.

3.1. Objective

A. To recognise the positive benefits of increased electric vehicle adoption on emissions reduction and urban amenity.

B. To ensure new development provides the necessary infrastructure to support the charging of electric vehicles.

C. To minimise the impact that electric vehicle charging has on peak electricity demand requirements.

3.2. Controls

The following Electric Vehicle (EV) technical terms are used:

EV Ready Connection is the provision of a cable tray and a dedicated spare 32A circuit provided in an EV Distribution Board to enable easy future installation of cabling from an EV charger to the EV Distribution Board and a circuit breaker to feed the circuit.

Private EV Connection is the provision of a minimum 15A circuit and power point to enable easy future installation of an EV charger in the garage connected to the main switchboard.

Shared EV Connection is the provision of a minimum Level 2 40A fast charger and Power Supply to a car parking space connected to an EV Distribution Board.

EV Distribution Board is a distribution board dedicated to EV charging that is capable of supplying not less than 50% of EV connections at full power at any one time during off-peak periods to ensure impacts of maximum demand are minimised. To deliver this, the distribution board will be complete with an EV Load Management System and an active suitably sized connection to the main switchboard.

EV Load Management System is to be capable of:

- reading real-time current and energy from the electric vehicle chargers under management.
- determining, based on known installation parameters and real-time data, the appropriate behaviour of each EV charger to minimise building peak power demand whilst ensuring electric vehicles connected are fully recharged.
- scale to include additional EV chargers as they are added to the site over time.

A. All multi-unit residential car parking must:

(iv) Provide an EV Ready Connection to each and every space allocated to residents.

(v) Provide EV Distribution Board(s) in of sufficient size to allow connection of all EV Ready Connections and Shared EV connections.

(vi) Locate EV Distribution board(s) so that no future EV Ready Connection will require a cable of more than 50m from the parking bay to connect.

(vii) Provide adequate space for the installation of a meter (post construction) in or adjacent to the EV Distribution Board, to enable the body corporate to measure individual EV usage in the future.

(viii) Identify on the plans the future installation location of the cable trays intended to serve EV chargers, and to make spatial allowance for it when designing in other services.

(ix) All car share spaces and spaces allocated to visitors must have a Shared EV connection.

B. All commercial building car parking must

   (i) Provide 1 Shared EV connection for every 10 commercial car spaces distributed throughout the carpark to provide equitable access across floors and floor plates.

C. The bicycle storage facilities are to include 10A e-bike charging outlets to 10% of spaces with no space being more than 20m away from an outlet.

D. All garages in single dwellings are to be provided with a Private EV connection.

3.3. Submission requirements / DA forms

Location of EV Distribution Board(s) and cable trays is to be shown on DA plans.

Schedule to be provided indicating the number of parking spots allowed with EV provisions and the type of connection.

Statement of adequacy to be provided for parts A, B and C by an electrical engineer

3.4. Notes

The controls are based on the 2020 revised draft DCP controls exhibited by the City of Parramatta for Homebush Bay West.

The order of cost for the residential part of this control is around $1,000 per car parking space.

The provision of EV charging for buildings is scheduled to be included in the NCC 2022 BCA under the COAG Trajectory for Low Carbon Buildings.

4. Good access to natural ventilation in dwellings

Access to fresh air through well designed natural ventilation is important to reduce the reliance on air conditioning to provide comfort. More fresh air will also improve amenity for building occupants.

4.1. Objective

A. To improve the passive comfort of dwellings and reduce the reliance on mechanical systems for amenity.

B. To improve the passive resilience of buildings.

C. To ensure enclosed balconies do not adversely impact access to natural ventilation.

D. To compliment the relevant guidance of the Apartment Design Guide.

4.2. Controls

A. All multi-unit residential dwelling must meet the objectives and design guidance for Natural Ventilation contained in Part 4B of the Apartment Design Guide. The following additional guidance is to be applied.

(i) Unobstructed window openings are to be calculated following the ADG Glossary definition of Effective Open Area, including the necessary allowance for insect screens.

(ii) Apartments with natural cross ventilation are to have unobstructed window area of no less than 5% of the apartment floor area with no less than 2% of the apartment floor area in any individual facade providing dual aspects.

(iii) Aspects counted as dual aspects for natural cross ventilation are to be unsheltered from wind for at least 50% of the facade. Notches, building indentations, ventilated corridors and breezeways are generally not suitable for natural cross ventilation.

(iv) Aspects counted as dual aspect are to have a facade which is directly exposed to outside. The use of plenums that bridge other spaces to connect to outside is not suitable.

(v) Natural ventilation is not to be provided through any balcony that can be fully enclosed.

B. Any mechanical exhaust discharge points are to be located to provide minimum distance of separation from natural ventilation openings that meet or exceed the minimum requirements of AS1668.2

C. Any enclosed balconies or wintergardens must be designed and constructed as a private external balcony with drainage and finishes acceptable to an outdoor space and must not be treated as a conditioned or weatherproof space and have adequate natural ventilation provided by:

(vi) If fixed glazing is provided; permanent openings are required with an area not less than 15% of the greater of the enclosed wintergarden floor area or the external wintergarden facade area. 30-50% of the permanent opening is to be provided in a zone within 500mm of the floor with the remainder being provided within 500mm of the soffit, or;

(vii) Not less than 80% of the external wintergarden perimeter being fully operable glass louvres.

D. Glazing in the external façade of an enclosed balcony or wintergarden must have a solar absorption of less than 10%.

4.3. Submission requirements / DA forms

A window schedule is to be provided detailing window openings and effective open area of each window type.

A habitable room schedule is to be provided demonstrating 5% of floor area is provided in unobstructed opening.

Natural Cross Ventilation diagrams to be provided showing compliant apartments and balance of unobstructed openings between facades in each apartment.

The location of discharge locations for all exhausts of greater than 200l/s is to be shown on the plans.

4.4. Notes

Commercial buildings not included in this control.

The following highlights consistency with the ADG:

A (i) - consistent but clarified as often ignored or misapplied (ADG definitions)

A (ii) - additional detail added to clarify ADG requirement for balanced opening. (4B-3 diagram x)

A (iii) - new definitions to assist in assessing what can be considered a corned or cross ventilated apartment. (ADG definitions)

A (iv) - constant with ADG but worded to be explicit.

A (v) - consistent with ADG but often misinterpreted (4B-3)

B (i) - additional to ADG.

B (ii) - additional to ADG

C (I) - additional to ADG

The planned revision of the Apartment Design Guide by the NSW Government may necessitate amendment of these controls.

5. Natural ventilation in commercial buildings

Natural ventilation in commercial buildings can provide mixed-mode ventilation opportunities, where natural ventilation provides comfort depending on seasonal variations in the weather. Natural ventilation also offers improved resilience by providing access to ventilation and cooling in the event of mechanical plant failure.

5.1. Objective

A. To provide natural ventilation as a means of comfort cooling at suitable times of year.

B. To improve the passive resilience of commercial buildings.

C. To provide opportunities for occupants to enjoy a connection to outdoors.

5.2. Controls

A. Commercial buildings should provide natural ventilation through either;

(viii) Providing openable windows on each occupied floor on at least two facade orientations. The effective area of opening provided should be not less Thant 0.5m2 every 5 linear meters of facade, or;

(ix) The building is to be engineered to maximise mixed mode ventilation, which is to be interlinked to the air conditioning.

5.3. Submission requirements / DA forms

A window schedule is to be provided detailing window openings and effective open area of each window type and type of mechanism.

For part B, a report demonstrating the performance outcomes of the mixed-mode ventilation system is to be provided by a suitable qualified engineer.

5.4. Notes

Effective mixed mode ventilation needs to be carefully designed and therefore unable to be prescribed.

The prescriptive allowance will address Objective B, but will not necessary confirm a design that is able to provide energy savings.

6. Natural refrigerants in air conditioning

Moving to natural refrigerants in air conditioning will eliminate a significant source of greenhouse gas emissions. It will also provide ongoing saving to users through increased energy efficiency and a cost saving to Council by not having to pay for safe disposal of synthetic refrigerants.

6.1. Objective

A. To reduce the greenhouse gas emissions associated with the release to the atmosphere through leakage, or improper disposal, of synthetic refrigerant gases with high Global Warming Potential (GWP)

B. To future proof new air conditioning systems for the global phase-down of HFC under the Montreal Protocol.

6.2. Controls

A. All new air conditioning and refrigeration equipment are to:

(i) Use refrigerants with a GWP of less than 10 if the equipment can be supplied on similar terms to conventional systems and at a cost of not more than 10% higher than the market rate for conventional systems.

6.3. Submission requirements / DA forms

Confirmation that the proposed Air Conditioning system is able to use a low GWP refrigerant from a suitable qualified mechanical engineer.

This will need to be expressly provisioned for certification prior to CC.

6.4. Notes

There is a limited market capacity at present. Residential should be able to comply but not with multi-split type units. Need to confirm in the assessment process that scheme does not exclude the opportunity for natural refrigerants.

Control does not explicitly refer to natural refrigerants, so any future synthetic refrigerant with a GWP of less than 10 can also comply.

It is recommended that the Council consider a covenant requiring the future safe and climate-friendly disposal of all refrigerants, to be applied to any development that does not use natural refrigerants.

7. All new buildings to be water resilient

Requiring every building to be dual plumbed and suitable for connection to a future alternative recycled water supply will future proof the buildings for additional savings.

7.1. Objective

A. To increase resilience and water security by providing an alternative water supply to buildings.

B. To harvest rainwater and urban stormwater runoff for use.

C. To reduce the technical and financial barriers to upgrading buildings to connect to future non-drinking water supply infrastructure.

7.2. Controls

A. All new development is to provide rainwater collection and reuse. The rainwater storage will be sized to allow the capture and reuse of 90% of all water that falls on the roof in a typical year. The rainwater reuse will be connected to all non-drinking water uses via a dual reticulation system.

B. All development must install a dual reticulation system to support the immediate or future connection to a recycled water network. The design of the dual reticulation system is to be such that a future changeover to an alternative water supply can be achieved without significant civil or building work, disruption or cost. To facilitate this, the dual reticulation system is to have:

(i) One reticulation system servicing drinking water uses, connected to the drinking water supply, and.

(ii) One reticulation system servicing all non-drinking water uses, such as toilet flushing, irrigation and washing machines. The non-drinking water system is to be connected to the rainwater tank with drinking water supply backup until an alternative water supply connection is available.

(iii) Metering of water services is to be in accordance with the Sydney Water Multi-level individual metering guide Version 9 June 2020. Individual metering of the non-drinking water service is optional

7.3. Submission requirements / DA forms

Rainwater tank is to be located on DA drawing together with a confirmation of adequacy of capacity from a suitably qualified consultant.

Dual reticulation is difficult to demonstrate at DA so will need to be conditioned.

7.4. Notes

These controls are based on the 2020 revised draft DCP controls exhibited by the City of Parramatta for Homebush Bay West and conditions of consent for Development Applications of multiple buildings in the Parramatta CBD that have entered into Design Excellence Competition processes.

Costs vary depending between residential and commercial based on the number of fittings to be plumbed.

The order of incremental cost of dual piping for residential is $1,000-$2,000 per apartment.

Commercial office order of cost about $6-8/m2.

A qualified cost planner should confirm cost estimates.

Synergies with Water Efficiency controls.

8. Measures to reduce Urban Heat Island effect - limiting the heat reflected into the streets

A suite of strategies will help reduce the heating of the urban environment and its impacts on amenity and energy demands. Reducing the reflectivity for tall highly-glazed buildings will reduce the amount of heat that reaches the street.

8.1. Objective

A. To reduce the contribution of development to urban heat.

B. To improve user comfort in the local urban environment (private open space and the public domain)

C. To minimise the reflection of solar heat downward from the building façade into private open space or the public domain.

8.2. Controls

The following technical terms are used as part of controls in this section of the draft DCP:

Solar heat reflectance is the measure of a material's ability to reflect solar radiation. A 0% solar heat reflectance means no solar heat radiation is reflected and 100% solar heat reflectance means that all of the incident solar heat radiation is reflected. In general, lighter coloured surfaces and reflective surfaces such as metals will have typically higher solar heat reflectance, with dark coloured surfaces or dull surfaces will typically have lower solar heat reflectance. External solar heat reflectance measured at the surface normal (90 degrees) is used in these controls.

Solar transmittance is the percentage of solar radiation which can pass through a material. Opaque surfaces such as concrete will have 0% solar transmittance, dark or reflective glass may have less than 10%, whilst transparent surfaces such as clear glass may allow 80 to 90% solar transmittance.

Solar Reflectance Index (SRI) is a composite measure of a materials ability to reflect solar radiation (solar reflectance) and emit heat which has been absorbed by the material. For example, standard black paint has an SRI value of 5 and a standard white paint has an SRI value of 100. The lower the SRI value of a material, the more heat is absorbed and the hotter it will get.

Reflective Surface Ratio (RSR) is the ratio of reflective to non-reflective external surface on any given façade.

Reflective surfaces are those surfaces that directly reflect light and heat and for this DCP are defined as those surfaces that have a specular normal reflection of greater than 5% and includes glazing, glass-faced spandrel panel, some metal finishes and high gloss finishes.

Non-reflective surfaces are those surfaces that diffusely reflect light and heat and for this DCP are defined as those surfaces that have a specular normal reflection of less than 5%.

Maximum External Solar Reflectance is the maximum allowable percentage of solar reflectance for the external face of a Reflective Surface. The percentage of solar reflectance is to be measured at a normal angle of incidence

A. The extent of the vertical façade of street walls (or if no street wall, as measured from the first 12 metres from the ground plane) that comprise Reflective Surfaces must demonstrate a minimum percentage of shading as defined in Table 1 Part A as calculated at the relevant time of year in Table 2.

B. The extent of the vertical façade of the tower (above the street wall or if no street wall, as measured above the first 12 metres from the ground plane) that comprise Reflective Surfaces must demonstrate a minimum percentage of shading as defined in Table 1 Part B as calculated at the relevant time of year in Table 2.

Table 1 - Relevant time of year			
Part A - Street Wall			
Reflective Surface Ratio (RSR)	<30%	30%-70%	>=70%
Minimum percentage shading (%)	0	1.5*RSR-45	75
Part B - Tower			
Reflective Surface Ratio (RSR)	<30%	30%-70%	>=70%
Minimum percentage shading (%)	0	0.8*RSR-24	40

C. Compliance with A and B above is to de demonstrated on 21 December on the east-facing façade at 10 AM, northeast and southeast facing façade at 11.30 AM, north-facing façade at 1 PM, northwest and southwest facing façade at 2.30 PM and the west-facing façade at 4 PM as shown in Table 2.

Table 2 - Relevant time of year	
Façade Orientation	Sun Angles
East ± 22.5°	Reference Time: 10am AEDT (UTC/GMT+11) Sun Elevation: 51° Sun Azimuth: 86°
Northeast/Southeast ± 22.5°	Reference Time: 11.30am AEDT (UTC/GMT+11) Sun Elevation: 69° Sun Azimuth: 66°
North ± 22.5°	Reference Time: 1pm AEDT (UTC/GMT+11) Sun Elevation: 80° Sun Azimuth: 352°
Northwest/Southwest ± 22.5°	Reference Time: 2.30pm AEDT (UTC/GMT+11) Sun Elevation: 67° Sun Azimuth: 290°
West ± 22.5°	Reference Time: 4pm AEDT (UTC/GMT+11) Sun Elevation: 48° Sun Azimuth: 272°

D. Shading may be provided by:

(iv) External feature shading with non-reflective surfaces;

(v) Intrinsic features of the building form such as reveals and returns; and

(vi) Shading from vegetation such as green walls, where requirements for upkeep is covered by a positive covenant.

E. Where it is demonstrated that shading cannot be achieved in accordance with the above controls, a maximum external solar reflectance as defined in Table 3 is required for all Reflective surfaces.

Table 3 - Maximum External Surface Reflectance			
Reflective Surface Ratio (RSR)	<30%	30%-70%	>=70%
Maximum External Solar Reflectance (%)	No Max.	62.5-0.75*RSR	10

8.3. Submission requirements / DA forms

Shadow diagrams must be submitted with the development application quantifying the extent of shading at 10 AM, 11.30 AM, 1 PM, 2.30 PM and 4 PM on 21 December for each relevant façade. Shadows from existing buildings, structures and vegetation are not considered in the calculations. Refer to Table 2 for sun angles corresponding to shading reference times.

Calculation of RSR for each relevant façade must also be submitted with the development application.

8.4. Notes

The Urban Heat Island Effect controls are based on Parramatta Council's publicly exhibited Draft DCP for a site specific Planning Proposal at Wentworth Point, and conditions of consent for Development Applications of multiple buildings in the Parramatta CBD that have entered into Design Excellence Competition processes.

These controls aim to reduce the amount of heat reflected into the street. The control requires external shading elements to reduce reflected solar heat. The extent of shading needed is a product of the solar exposure relative to the facade's orientation and the proportion of glazing in the facade. Highly glazed buildings will need to provide the most external shading. In the instance where external solar shading cannot be complied with, the glazing's solar reflectivity is restricted.

The order of cost for the tower shading requirement varies from nil to <0.4% of the construction budget.

9. Measures to reduce Urban Heat Island effect - limiting the heat absorbed by rooftops

A suite of strategies will help reduce the heating of the urban environment and its impacts on amenity and energy demands. Reducing the heat absorbed by rooftops will assist in reducing heating of the urban canopy, particularly for lower-rise buildings.

9.1. Objective

A. To reduce the contribution of development to urban heat; and

B. To improve user comfort in the local urban environment (private open space and the public domain).

9.2. Controls

Low density development (FSR <= 1)

A. At least 75% of the site area must comprise of one or a combination of the following when assessed in plan view:

   (i) Vegetation,

   (ii) Green roofs,

   (iii) Roofing materials, including shade structures, have a minimum solar reflectivity index (SRI) of 82 if a horizontal surface or a minimum SRI of 39 for sloped surface greater than 15 degrees,

   (iv) Hardscaping elements shaded by overhanging vegetation or roof structures, including solar panels;

   (v) Water bodies and/or watercourses

Note: The area of Photovoltaic panels included on the site can be detected from the site area for the purposes of part A above. For example if 200m2 of solar panels are being provided on a site of 1,000m2, at least 75% of 800m2 must comprise of one of a combination of (i), (ii), (iii), (iv) and (v).

Medium and high density development (FSR > 1)

B. Where surfaces on rooftops or podiums are used for communal open space or other active purposes, the development must demonstrate at least 50% of the accessible roof area complies with one or a combination of the following:

   (i) Be shaded by a shade structure

   (ii) Be shaded by a solar panels;

   (iii) Be covered by vegetation consistent with the controls on Green Roofs or Walls;

   (iv) Provide shading through canopy tree planting, to be measured on the extent of the canopy cover 2 years after planting.

C. Where surfaces on rooftops or podiums are not used for private or public open space, for solar panels or heat rejection plant, the development must demonstrate the following:

   (i) Materials used have a minimum solar reflectivity index (SRI) of 82 if a horizontal surface or a minimum SRI of 39 for sloped surface greater than 15 degrees; or

   (ii) 75% of the total roof or podium surface be covered by vegetation; or

   (iii) A combination of (i) and (ii) for the total roof surface

D. At least 75% of the ground plane must comprise of one or a combination of the following when assessed in plan view:

(iv) Vegetation,

(v) Hardscaping elements shaded by overhanging vegetation or roof structures, including solar hot water panels and photovoltaic panels;

(vi) Water bodies and/or watercourses; or

(vii) Areas shaded by the proposed development for at least 50% of all daylight hours in summer.

9.3. Submission requirements / DA forms

Annotated Site Plans and Roof plans to demonstrate compliance.

9.4. Notes

The Urban Heat Island Effect controls are based on Parramatta Council's publicly exhibited Draft DCP for a site specific Planning Proposal at Wentworth Point, and conditions of consent for Development Applications of multiple buildings in the Parramatta CBD that have entered into Design Excellence Competition processes.

Permeable surface requirements could be added here but are best co-located with deep soil requirements and WSUD - refer to the Urban Tree Canopy and Landscape Control Reports.

10. Measures to reduce Urban Heat Island effect - heat rejection

A suite of strategies will help reduce the heating of the urban environment and its impacts on amenity and energy demands. Reducing the amount of anthropogenic heat within the urban canopy will assist in mitigating Urban Heat Island effect.

10.1. Objective

A. To reduce the impact of heat rejection from air conditioning and refrigeration from contributing to the urban heat island effect; and

B. To avoid or minimise the impact of heat rejection from air conditioning and refrigeration systems on user comfort in private open space and the public domain.

10.2. Controls

A. Residential apartments within a mixed-use development or residential flat building should incorporate efficient heating, ventilation and cooling systems which reject heat from a centralised source on the upper-most roof.

B. No heat rejection units shall be located on the street wall frontage on the primary street.

C. Heat rejection units are strongly discouraged from being located on building facades or private open space, such as balconies and courtyards. However, where it is demonstrated that heat rejection cannot be achieved per the controls A and B above and these units are installed, the HVAC system must demonstrate:

   (i) Heating, ventilation and cooling systems exceed current Minimum Energy Performance Standard requirements; and

   (ii) The heat rejection units are situated with unimpeded ventilation, avoiding screens and impermeable balcony walls; and

   (iii) The area required by the heat rejection units is additional to minimum area requirements for private open space.

D. Where a mixed-use development or residential flat building proposes wintergardens as the primary private open space, no heat rejection source from heating, ventilation and cooling systems are permitted to be located in the wintergarden.

10.3. Submission requirements / DA forms

Location of heat rejection is to be shown in the DA plan set.

10.4. Notes

The Urban Heat Island Effect controls are based on Parramatta Council's publicly exhibited Draft DCP for a site specific Planning Proposal at Wentworth Point, and conditions of consent for Development Applications of multiple buildings in the Parramatta CBD that have entered into Design Excellence Competition processes.

The requirement for the above minimum MEPS for HVAC should not conflict with BASIX.

Draft controls provide the necessary flexibility to support Natural Refrigerants.

Note reference to wintergarden.

11. Energy Efficiency

The planning controls that are applied to all new developments are to be upgraded to ensure they provide energy and water efficiency outcomes in new buildings that represent genuine best practice. Where possible these are to extend to the fitting out of commercial buildings too.

11.1. Objective

A. To promote sustainable development which uses energy efficiently and minimises non-renewable energy usage in the construction and use of buildings.

B. To ensure that development contributes positively to an overall reduction in energy consumption and greenhouse gas emissions.

C. To reduce energy bills and the whole of life cost of energy services.

11.2. Controls

A. For residential development subject to Building Sustainability Index (BASIX) an Energy score of +10 above the applicable regulated minimum requirements is required. All commitments listed on a BASIX certificate and required to meet NatHERS certificates must be clearly marked on all relevant plans and specifications and submitted with a development application.

B. All development not subject to BASIX will need to, as a minimum, comply with the Building Code of Australia energy efficiency provisions (Section J). A Section J report should be provided along with an annotated plan demonstrating compliance for fabric and services requirements.

C. In addition to the above requirements, the following development is required to achieve an energy efficiency rating equivalent to that currently being achieved by the 15th percentile of best performing buildings within the same building class:

(i) New development containing office premises with a net lettable area (NLA) of 1,000m2 or more.

(ii) New shopping centre/retail development with gross lettable area retail (GLAR) of 5,000m2 or more.

(iii) New hotels

(iv) New commercial office tenancies with a net lettable area (NLA) of 1,000m2 or more.

11.3. Submission requirements / DA forms

Documentation from a suitably experienced consultant is to be submitted with applications for development specified above demonstrating the measures that will be used to achieve the relevant energy efficiency scheme rating. Evidence of a formal commitment agreement or registration with the relevant scheme administrator may be required to be submitted prior to the issuing of a construction certificate.

11.4. Notes

These controls are based on the High Performance building requirements in the Planning Proposal for Parramatta CBD August 2020.

NABERS Energy targets are structured as dynamic so they keep pace with improving market practice and/or changed to the rating scheme. BASIX scores are also specified above the state minimum, which can only be affected by the LEP. This may be problematic when seeking gateway approval so a fall back will be to hardcode non-residential targets based on the 15% percentile in 2019 and default to regulated minimum BASIX.

The Department of Planning, Industry and Environment have data sourced from NABERS on energy efficient buildings which could be used as an industry standard to publish relevant targets for each building class annually. Council role would be limited to benchmarking. It is recommended Council to discuss with NABERS if they can publish suitable benchmark annually on behalf of Council.

12. Water Efficiency

The planning controls that are applied to all new developments are to be upgraded to ensure they provide energy and water efficiency outcomes in new buildings that represented genuine best practice. Where possible these are to extend to the fitting out of commercial buildings too.

12.1. Objective

A. To reduce the consumption of drinking water.

B. To reduce wastewater discharge.

12.2. Controls

A. For residential development subject to Building Sustainability Index (BASIX) a Water score of +5 above the applicable regulated minimum requirements is required. All commitments listed on a BASIX certificate must be clearly marked on all relevant plans and specifications and submitted with a development application.

B. All development not subject to BASIX will need to incorporate the following water-saving measures:

(v) Plumbing fixtures are to meet minimum Water Efficiency Labelling and Standards (WELS) Scheme Standards including 4 star rated showerheads, 4 star rated toilet cisterns, 5 star rated urinals and 6 star rated water tap outlets.

(vi) Appliances (dishwashers, clothes washers etc) are to be 5 stars (WELS Scheme) or better rated for water use efficiency.

C. Cooling towers are to be designed following best practice guidelines to reduce water consumption.

D. In addition to the above requirements, the following development is required to achieve a water efficiency rating equivalent to that currently being achieved by the 15th percentile of best performing buildings within the same building class:

(i) New development containing office premises with a net lettable area (NLA) of 1,000m2 or more.

(ii) New shopping centre/retail development with a GLAR of 5,000m2 or more.

(iii) New hotels.

12.3. Submission requirements / DA forms

Non-residential - Documentation from a suitably qualified consultant is to be submitted with applications for development specified above, demonstrating the measures that will be used to achieve the relevant water efficiency scheme rating. Evidence of a formal commitment agreement or registration with the relevant scheme administrator may be required to be submitted before a construction certificate is issued.

Residential - BASIX

12.4. Notes

These controls are based on the High Performance building requirements in the Planning Proposal for Parramatta CBD August 2020. Treatment of targets is the same as the energy controls. This may be problematic when seeking gateway approval so a fall back will be to hardcode non-residential targets based on the 15% percentile in 2019 and default to regulated minimum BASIX.

The Department of Planning, Industry and Environment have data sourced from NABERS on water efficient buildings which could be used as an industry standard to publish relevant targets for each building class annually. Council role would be limited to benchmarking. It is recommended Council to discuss with NABERS if they can publish suitable benchmark annually on behalf of Council.

13. Waste management infrastructure

Requiring every new apartment building to have dual waste chutes will promote better separation of waste and support a reduction of environmental impacts associated with landfill.

13.1. Objective

A. To improve the separation of waste streams.

B. To support better management and reduced environmental impact of waste disposal.

C. To improve the liveability of residents by integrating waste management infrastructure into the fabric of the building

13.2. Controls

A. All new residential development is to provide the following within each apartment:

(i) Space allocated to the storage of a minimum two days garbage and recycling

(ii) Space for organic collection/storage

B. All new residential development of four or more residential storeys is to also include:

(i) Dedicated waste chutes with openings to each floor for separated collection of general waste, recyclables.

(ii) A communal area for the separation and storage of bulky waste such as mattresses and e-waste.

(iii) A communal area for composting organic food waste separation/treatment

13.3. Submission requirements / DA forms

A waste management plan which show the integration of the separated waste requirements.

13.4. Notes

This control only addresses matters relevant to waste separation. These requirements will need to be integrated into other general waste management requirements.

The draft controls are recommended having reviewed the Waste Management Responses to Rapid Urban Densification Part 1: Summary Report 2018 prepared by Jacobs for City of Canterbury Bankstown.

The draft controls refer in part to Guide to Better Practice for Waste Management and Recycling in Multi-unit Developments by Sustainability Victoria.

Concern was raised in the review of draft controls that a second waste chute dedicated to recyclables may not be appropriate to high rise buildings due to the risk of breakages at the bottom of the chute. We investigated this concern and, of eight best practice waste guidelines reviewed, six favoured recycled waste chutes in tall residential buildings. Development Applications are also progressing in other local government areas with dual waste chutes serving 45 storeys. For these reasons, we consider the requirement for dual waste chutes remains appropriate to support the Objectives.

14. A redesigned sustainability bonus scheme

Providing an incentive for developers to innovate and materially exceed the minimum energy efficiency and water conservation requirements of the planning scheme will be valuable to maximise the potential of each site.

14.1. Objective

A. To promote design excellence in delivering higher-performance buildings

B. To improve sustainability outcomes in the areas of greenhouse gas emissions, water and health.

14.2. Controls

A. All development under the bonus scheme is required to:

(i) Not be connected to natural gas.

(ii) Install a solar PV system of no less capacity than:

a) A coverage area of solar panels of not less than 60% of the roof area not occupied by cooling towers or communal open space; or

b) Sized to provide no less than 45 w/m2 of total site area in year one AC maximum peak power delivery after allowances for inverters and system losses.

c) Strata residential buildings of three storeys or less are to connect solar panels directly to the meters of individual units.

B. All new residential development is also required to provide improved BASIX energy and water outcomes as follows:

(i) BASIX Energy score to be delivered at +20 above the applicable regulated minimum requirements, and

(ii) BASIX Water score to be delivered at +10 above the applicable regulated minimum requirements.

C. The following development is required to achieve a greenhouse gas and water efficiency rating that are at least 15% improved upon the performance currently being achieved by the 15th percentile of best performing buildings within the same building class.

(i) New development containing office premises with a net lettable area (NLA) of 1,000m2 or more.

(ii) New shopping centre/retail development with gross lettable area retail (GLAR) of 5,000m2 or more.

(iii) New hotels.

D. All other development is required to exceed the requirements of Section J of the NCC BCA, current at the time of application, by 15% to be demonstrated using the JV3 method for combined envelope and services.

E. Documentation from a suitably qualified consultant is to be submitted with applications for development specified above demonstrating the measures that will be used to achieve the requirements. Evidence of a formal commitment agreement or registration with the relevant scheme administrator may be required to be submitted before the issuing of a construction certificate. Any BASIX commitments relating to plant or equipment may be scheduled as discrete conditions of approval.

14.3. Submission requirements / DA forms

Submission requirements are noted in Condition E above.

14.4. Notes

The recommended targets above are based on the DCP controls being consistent with the draft controls in this report. Should any of the DCP controls not be adopted or materially changed, the targets tied to the sustainability bonus scheme will need to be revised.

15. Review and Assessment

Design review and Design Review Panels can be used to improve environmental outcomes and support the assessment process. It is recommended that any Design Review Panel appointed by the City to advise on design quality include a suitably qualified sustainability expert of a member.

It is recommended that the City builds capacity for the referral and review of the sustainability aspects of significant applications to cover any sustainability controls, SEPP 65 and BASIX certificates. Allowance should be made to undertake peer review of water and energy reports, particularly where bonus floor space is being applied for.

Review of sustainability aspects should consider the adequacy of the application and also appropriate conditions of consent to carry commitments through the Construction Certificate and Occupancy Certificate stages.

A set of standard consent conditions should be developed to support the controls adopted in the final DCP.