TWEED SHIRE COUNCIL

Protocol

Sustainable Design Guidelines for Council Buildings and Infrastructure

Version 2.0

Adopted by Executive Leadership Team at its meeting on 24 October 2018

Division:	Engineering
Section:	Design
File Reference:	N/A
Historical Reference:	Version 1.0 adopted 2 July 2008 Environmental Design Guidelines for Council Buildings

THIS PAGE IS BLANK

TABLE OF CONTENTS

INTRODUCTION		**5**
1.	**ENERGY**	**7**
2.	**WATER**	**11**
3.	**STORMWATER**	**11**
4.	**SELECTION OF MATERIALS**	**12**
5.	**WASTE**	**13**
6.	**LANDSCAPING AND ECOLOGICAL IMPACT**	**13**
7.	**ACTIVE TRANSPORT**	**14**
8.	**BUILDING UTILITY AREAS**	**14**
9.	**FAIL-SAFE SYSTEMS**	**14**
10.	**USE AND MAINTENANCE OF SUSTAINABLE BUILDING DESIGN FEATURES**	**15**
11.	**SUSTAINABLE DESIGN CHECKLIST**	**15**
12.	**ACCESS AND INCLUSION**	**15**
13.	**ACKNOWLEDGEMENTS**	**16**
14.	**OTHER REFERENCE MATERIAL**	**16**
APPENDIX 1 - COUNCIL BUILDINGS SUSTAINABLE DESIGN CHECKLISTS		**18**

THIS PAGE IS BLANK

Introduction

This Protocol has been developed for asset owners, project managers and designers' consideration to ensure the best environmental performance possible is achieved for Council Buildings. The Protocol applies to design, construction and refurbishment /renovation of all habitable council buildings. This protocol should be implemented in conjunction with "Universal Design Principles" which includes the current "Disability (Access to Premises – Buildings) Standards" and is over and above all National Construction Code (NCC) and Construction Certificate requirements.

This guideline requires the designer to consider the design implications in regard to sustainability, operations, maintenance and whole of life costs.

Policy background

The Protocol reflects Council's commitment to environmental sustainability as presented in the Tweed Shire Council Environmental Sustainability Prioritization Strategy 2015-2020, and relate directly to the following principles from the Strategy:

Council leadership

- Council operations model good environmental sustainability practices and incorporate opportunities for environmental education and continuous improvement.

Exemplar infrastructure and facilities

- New infrastructure and facilities are designed to minimise greenhouse gas emissions, energy and water use, reduce waste and facilitate active transport.
- Existing infrastructure and facilities are progressively retrofitted to reduce emissions and minimise energy and water use as part of asset maintenance and renewal.
- Must be functional for purpose

Sustainable development

- Development incorporates design considerations which promote climate sensitive buildings and subdivisions.

The Protocol also assists Council staff comply with sustainability objectives in Council's Procurement Policy and supports operational requirements reflected in Council's asset management plans.

Universal Design

These guidelines should be implemented in conjunction with Universal Design principles which includes the current "Disability (Access to Premises- Buildings) Standards" and the associated "Australian Standards for Access and Mobility" contained within the National Construction Code.

The protocol is consistent with the elements of the Renewable Energy Action Plan (REAP), in regards to energy efficiency design and equipment and self-generating renewable energy at Council facilities.

Responsibilities
Project clients, project managers, designers, construction contractors, developers and asset owners all have a responsibility to apply these guidelines in the design for all phases of building, construction, refurbishment and asset management-related project management.

The Designers and Project Managers will have the greatest opportunity to achieve the aims of the Guidelines and affect change through the Planning and Design Phase of a building construction or refurbishment projects.

Monitoring, evaluating, documenting and articulating the environmental and sustainability initiatives of Council projects is also the responsibility of project clients, project managers, designers, constructors and asset owners, with support from Council's Management, and Sustainability Program .

Implementation and Compliance

Design checklists in Appendix 1 are to be completed by the designer in consultation with the project manager. If the design is by contract, the requirement to complete the checklist shall be included in the contract documents. Where the designer (council, consultant/ contractor/ or developer) is of the opinion that compliance with this Protocol is not appropriate for a project, (due to project contraints) this is to be clearly stated and justified in the notes section of the checklist in Appendix 1.

Building Functional Requirements- Functional Specification
In order for effective design to be undertaken the parameters for the building function and purpose must be clearly defined by the building stakeholders and championed by the proposed asset owner who shall be responsible for the safe and cost effective management of the facility into the future. These parameters need to also reflect the requirements of Council's Building Asset Management Plan (BAMP) and its objectives.

Appendix 1 provides a proforma document to be completed by the proposed asset owner/stakeholder user group that will provide the designer with the functional parameters for the proposed new building or refurbishment.
These building function parameters include:

1. *Building Classification (according to BAMP)*
   The Building Asset Management Plan defines four (4) building categories
   i. Premium e.g. Tweed Regional Gallery or Front of house at Murwillumbah Civic Centre
   ii. Level 1 e.g. Civic Centre offices, Banora Community Centre, Sports Centre
   iii. Level 2 e.g. Generally sports building club houses, halls, high use public toilet
   iv. Level 3 e.g. Generally public toilets, storage sheds

2. *Building Function*
   The proposed function of the building must be detailed by the project initiator and agreed to by the future asset owner of the facility.
   This will assist to determine what parts of the NCC (National Construction Code of Australia) are applicable and to what extent Part J (sustainability requirements) of the NCC is applicable to the building project.

Mixed use issues must be accounted for in the design as well as occupancy levels that will determine the minimum floor areas. Access requirements ,including the Disability Discrimination Act (DDA) and fire provisions in the NCC will be drawn into the design through clear understanding of the proposed building usage.

Climate Change

Council buildings and infrastructure projects incorporate resilience to regional predictions of future events, such as storms, flooding, droughts, fires, changing temperature and precipitation patterns, and associated coastal inundation from sea level rise. These matters must be addressed in the design considerations below.

Environmental Design Considerations

Council requirement for building design to achieve sustainable outcomes that are in and above the requirements of the NCC are detailed below.

1. Energy

Goals:

- *To ensure that the building is designed to minimise the consumption of power.*
- *Comply with current building standard (National Construction Code) as a minimum.*
- *Utilise renewable energy generation systems to provide power to the building where practical and in accordance with Council's Renewable Energy Action Plan-REAP Visit http://www.tweed.nsw.gov.au/SustainableOperations.*
- *Consider site layout and building orientation to maximise natural energy efficiency.*
- *Maximise passive energy design concepts.*

1.1 Solar Design

The building design should:

1.1.1 Maximise heat gain from the sun in winter and minimise heat gain from the sun in summer through appropriate orientation and the use of shading (eg. roof eaves, landscaping).

1.1.2 Consider thermal mass such as 'slab-on-ground', combined with suitable ventilation, roof and wall insulation as specified in section 1.2.2.

1.1.3 Consider window design in a building:

a) Window orientation considerations

- North facing windows - ideally most windows in the building should face north. North facing windows should be horizontally shaded to allow low winter sun into the window whilst providing shade from high summer sun. (Eg. eaves, awnings). East and west facing windows - east and west facing windows receive little autumn, winter or spring sunlight, but excessive summer sunlight. This means that they can be serious sources of heat loss in winter and overheating during summer. If included they should be relatively small in size and well shaded with vertical shading devices such as vertical blinds, blade walls and appropriate "building appropriate" vegetation.
- South facing windows - south facing windows receives no direct sunlight in winter and only receives early morning and late afternoon sunlight in summer. As such, minimal shading devices are required. South facing windows are good for cross-

ventilation, however, their size should be optimised to reduce heat loss (south west facing windows should be shaded in summer).

b) Window Treatments

Consider specialised glazing and/or window treatments on all windows to control heat loss and heat gain. Consider:

- Toned glass - has a tint applied to the glass during manufacture.
- Reflective coatings - Reflective coatings are thin films of metal or metal oxide that are applied to standard glass. They stop greater amounts of heat gain than some toned glasses, but can cause glare problems.
- Double glazing - consists of two panels of glass separated by a layer of dry air which provides a barrier to conducted heat flow. It is more effective than toned and reflective coatings. Alternative gases for filling double glazed units to improve performance are also available, with the most common being argon. Double glazing does not reduce the amount of solar radiation entering so appropriate shading is still required.
- Advanced glazing technologies - glass can be treated to reduce solar energy transmission; particularly suitable for west facing windows.
- Other methods of reducing heat flow through windows - metal window frames should be light colours are preferred as they reflect most radiant heat and this can considerably reduce heat flow and frames have “thermal breaks”.

1.1.4 Consider outdoor patios and decks with wind protection, winter solar access and summer shade.

1.1.5 Provide ventilation to the roof space as close to the highest point as possible. Ventilation installed should be able to be opened and closed by users via appropriately-positioned controls to enable ventilation to be closed in winter months to trap heat. Must be vermin protected and if appropriate bushfire suitable.

1.1.6 Energy generation: opportunities to maximise renewable energy generation must be considered in the Design Phase, to provide for the buildings power demands to the greatest extent possible. Roof specifications should allow for installation of a photovoltaic array, inclusion of relevant conduit and wiring, and structural capacity of roof to bear the load of any proposed or future installation such as the use of photovoltaic cells with safe access for maintenance.

1.2 Insulation

1.2.1 Specify roof and ceiling insulation with a minimum “R” rating appropriate for the Tweed based on the current version of the National Construction Code.

1.2.2 Specify wall insulation with a minimum “R” rating appropriate for the Tweed based on the current version of the NCC.

1.2.3 Provide floor insulation for suspended floors (not concrete slab).

1.3 Hot Water

1.3.1 Where hot water is required, provide hot water systems having a minimum 4-star energy rating and incorporating solar heating or heat pump technology where

practical. Instantaneous Gas systems shall be considered where high volume, intermittent use is required e.g. change rooms.

1.3.2 Locate hot water storage systems as close as possible to 'wet areas' (i.e. bathrooms, kitchens, laundries).

1.3.3 Cluster wet areas to minimise pipe runs. Where this is not possible, consider the use of a device that re-circulates the initial cool water back to the cold water inlet of the hot water system.

1.3.4 Insulate hot water tanks and pipes in accordance with AS3500.

1.3.5 Ensure timer switches are installed on hot water urns so they do not operate outside of normal building operating hours or equivalent systems for energy management

1.4 Lighting

1.4.1 Ensure building orientation in conjunction with 1.1.3 for building envelope and floor plans to maximise natural light access without creating major heat gain or heat loss pathways. Consider the use of:

- Skylights (skylights shall block a minimum of 95% of the UV spectrum)

1.4.2 Design lighting fixtures to suit the purpose of specific areas (e.g. bright lighting may be required in kitchens or work stations, while task or effect lighting may be appropriate for leisure areas).

1.4.3 Provide separate switches for special-purpose lights and signpost these switches so they are not turned on unless required.

1.4.4 Include 'lighting zones' of no more than100m^2 allowing for zones not required to be lit to be turned off, and clearly label light switches accordingly.

1.4.5 Incorporate energy-efficient light emitting diodes (LED) lamps and fittings with a minimum of 3 years comprehensive warranty. All fixtures must be IPART approved.

1.4.6 Locate switches at exits to rooms/lobbies etc. to encourage switching off.

1.4.7 Incorporate auto sensing switches where appropriate. Use DALI type drivers where dimmable settings are required.

1.4.8 Consider solar power for external lighting, particularly landscape and pathway lighting.

1.4.9 Security lighting shall be:

- Controlled by a timer and PE cell and be activated by motion sensor
- Must be vandal and theft resistant

1.5 Ventilation Systems

Where air conditioning is not proposed, consider the use of natural ventilation systems:

1.5.1 Locate external openings for intake and exhaust to maximise use of breezes (avoid uptake of noxious gases and odours).

1.5.2 Align windows, doors and vents in straight lines to maximise air flow.

1.5.3 Use windows which are lockable in a partly open position.

1.5.4 Minimise internal obstructions to cross ventilation.

1.5.5 Use convection air flows to remove hot air by including vents or windows as high as possible, incorporating controls so they can be easily opened or closed by building users.

Where mechanical air conditioning is proposed, consider a layout that incorporates air-lock and air exchange barriers:

1.5.6 a) Calculate the cooling and heating loads for the layout

b) A minimum 5-star rating is required (Energy Efficiency Rating, EER 4.0) for heating.

c) A minimum 5-star rating is required (EER >4.0 for 3-phase) for cooling.

d) Inverter technology shall be used for systems up to 18kWr (Kilowatt refrigeration).

Within coastal areas, the inverter shall be protected from corrosion (e.g. use of Clear Guard Aerosol of equivalent)

e) Consider the use of solar powered climate control technology to improve the efficiency of mechanical air conditioning systems.

f) Chilled water systems shall be designed by appropriately qualified mechanical systems specialist to provide optimum design outcomes for energy and function with consideration of the rapidly changing technology in this area.

g) Ensure design incorporates zoning (or the ability to close off certain areas) so that only those areas which need to be are heated or cooled.

h) Ensure there is no likelihood of airborne odour or pollutants being transmitted between specific work or recreation areas.

i) Allow duct access for maintenance.

j) UV or biological control of duct environment is desired.

1.6 Building Management Systems

1.6.1 Consider the use of a Building Management System to control, monitor and manage all or part of the equipment installed in the building to suit the building operational functionality.

1.6.2 Consider future proofing building systems to permit upgrade or installation for remote monitoring and management systems.

1.7 Electrical and Appliances

1.7.1 Distribution Boards shall be constructed from suitable materials to suit the locale (e.g. Coastal external – Stainless Steel, Inland external - Galvanised , Inside a building- Plastic). Position boards 500mm above 1 in 100 year flood levels.

1.7.2 All switchgear to TSC electrical standards. Install“Rapid Test” equipment for RCD testing.

1.7.3 Distribution boards shall have a minimum 50% oversize for future proofing potential upgrades/extensions.

1.7.4 Power points should be placed in easily accessible locations so they can be switched off. The number of power points must be carefully determined to avoid the need for the use of power boards when the building is in operation.

1.7.5 Ensure automatic timer switches are installed on all appropriate equipment (e.g. hot water urns, air conditioning, and chilled water units).

1.7.6 Specify a 4-star minimum energy rating for fridges, freezers and other relevant electrical appliances.

2. Water

Goal: To ensure that the development maximises water conservation.

2.1 Provide an appropriately-sized rain water tank to harvest roof runoff for re-use where feasible and the tank and pump facilities can be adequately protected and serviced. The tank must be fitted with a first flush diversion device and overflow connected to the stormwater system. Consider using tank water for irrigation, toilet flushing and washing machines. Incorporate a mains top-up facility where appropriate. Refer to Tweed Shire Council Rainwater Tank Policy for backflow prevention requirements where the tank incorporates a mains top-up facility.

2.2 Specify shower fittings with at least a 3-star rated Water Efficiency Labelling Scheme (WELS).

2.3 Specify a minimum 4-star WELS rating and a 4-star energy rating for any washing machines or dishwashers.

2.4 Specify 5-star WELS rated dual-flush toilets to all water closets.

2.5 Specify 5-star WELS rated urinals . Waterless sanitary fixtures are not acceptable.

2.6 Consider the reuse of sewage or grey water in accordance with New South Wales guidelines. On Council permanently staffed sites only (to minimise business risk)

Visit http://www.metrowater.nsw.gov.au/planning-sydney/recycling/greywater

for more information about water reuse in NSW.

2.7 Unless specified otherwise, pipework for sanitary plumbing and drainage applications shall be PVC or HDPE (or approved equivalent) to prevent pipe corrosion.

3. Stormwater

Goal: To minimise the effect of stormwater from the site on external systems in terms of quantity and quality

3.1 Topography and vegetation - avoid changes to topography and vegetation wherever possible on the site to preserve the site's infiltration capacity.

3.2 Impervious areas - minimise impervious areas by reducing sealed surfaces to the minimum necessary to meet accessibility and functional requirements.

3.3 Incorporate Water Sensitive Urban Design (WSUD) features, where feasible such as:

- swale drains around sealed areas
- infiltration trenches; excluding locales with plastic (clay) soils
- bio-retention systems; and
- rain gardens away from buildings.

Note: All water features must be suitably isolated from building footings and walls to ensure ground moisture stability and long term integrity of structures.

3.4 Green roofs and green walls - consider for landscaping walls only.

4. Selection of Materials

Goal:

- *To ensure the development promotes the sustainable and efficient use of resources. Construction materials should be selected to increase the energy efficiency of the building.*
- *To minimise damage to the environment, to contribute to healthy indoor environments and to have low life cycle impacts due to production techniques and maintenance requirements.*
- *Designer to consider whole of design life costs, including repeated replacement, due to flooding, fire, theft and vandalism.*

4.1 Building materials should be vandal resistant and low-maintenance - where possible, select the building materials that will require the least maintenance (painting, retreatment, waterproofing etc.), or whose maintenance will have minimal environmental effects. See Design Specification - Public and Sport Ground Amenities (TSC).

4.2 Investigate local opportunities to recover and recycle waste products. Recycled materials are to be considered for projects subject to feasibility.

4.3 Design and specify recyclable materials where practical - for ease of deconstruction, reuse and recycling, either upon major refit or demolition.

4.4 Consider Low embodied energy materials - specify materials and finishes with a low environmental impact during manufacture, application and use. Locally manufactured and sourced are preferred

4.5 Sustainable timber - all timber used during construction and fitout should be either recycled or from plantation or sustainably managed re-growth forests.

4.6 Paint - both water and oil based paints emit vapours that are toxic to humans. Zero-solvent and low-solvent paints are readily available for all decorative and almost all industrial applications and should be specified wherever practicable.

4.7 PVC - is used in such products as pipelines, wiring, siding, flooring and wallpaper. It is possible to reduce the use of PVC by replacement with other materials. Polyethylene pipes can be used instead of PVC pipes (except for drainage refer 2.7) and linoleum floor covers can be used instead of vinyl. A comprehensive database listing alternatives to PVC can be found on the Greenpeace PVC database website http://web.archive.org/web/20121015062909/http://archive.greenpeace.org/toxics/pvcdatabase/productalt.html.

4.8 Flooring - vinyl flooring is a significant source of volatile organic compounds (VOCs). A more sustainable alternative is linoleum. Carpets, carpet underlays and carpet adhesives also emit VOCs. Recycled rag carpet underlays are preferred. New carpets with styrene-butadiene latex emit particularly odorous VOCs. Tung oil finishes for wood floors are preferred to polyurethane. Sustainable alternative floorings to consider include wood, cork, bamboo, linoleum and 100% wool carpets and wool carpet tiles.

4.9 Non-chemical-based termite treatments are preferred - must be incorporated into all new building designs where practical. Australian Standard AS 3660.1 - 1995 Protection of buildings from subterranean termites: Part 1 – new buildings specifies procedures for implementing physical barrier systems. Where practical design shall incorporate termite resistant structural components.

4.10 Formaldehyde emissions - the most common source in buildings is from pressed wood products made with urea-formaldehyde (UF). Designs are to specify E0 or E1 which are no- or low-formaldehyde products wherever feasible.

5. Waste

Goals:

- *Ensure that the development's design includes appropriate waste management facilities.*
- *Maximise recycling and reuse of construction and demolition waste.*
- *Minimise waste generation.*

5.1 Ensure that waste is minimised and managed in accordance with Council's DCP sectionA15-Visit http://www.tweed.nsw.gov.au/Controls/Planning/Documents/PlanningDocs/A15%20%20PDF%20VERSION.pdf. Methodologies to minimise waste include areas for source separation , and avoid over ordering,

5.2 Ensure building design includes adequate storage areas for paper/cardboard recycling bulk bin, bottles/cans recycling mobile garbage bin(s), green waste recycling (where applicable) and putrescible waste mobile garbage bins.

5.3 If waste storage areas cannot be placed within a secure storage area, locate these areas away from structures to minimise risk of fire, vermin and vandalism. Ensure accessible access to waste bins including disposal cigarette butts and recycling.

5.4 Where demolition of existing structures is required, ensure a materials salvage process is implemented that includes source separation of recyclables including metals, glass, plasterboard and concrete. Local recyclers should be engaged to remove recyclables.

5.5 Minimise waste during construction, including reduce over-ordering, areas for source separation, record data on waste material recovery.

6. Landscaping and Ecological Impact

Goals:

- *Landscaping should stabilise ground moisture and enhance building footing performance and solar heat gain performance.*
- *Landscaping shall enhance the use and operation of the building.*
- *Plant local native species that contribute to local ecology, improve habitat connectivity where possible, and promote biodiversity (outside the building affected zone).*

6.1 Minimise ecological impact. Locate construction clear of existing native trees

6.2 Where possible, topsoil removed during construction should be reused on-site. Consider contamination issues with any reuse or disposal option.

6.3 Plant local native species with similar water requirements shall be grouped together, (hydro zoning) and should be positioned clear of buildings in accordance with CSIRO guide BTF 18 Foundation maintenance and footing performance

6.4 Minimise impervious surfaces by selecting porous paving materials and minimising the extent of paved areas, (except perimeter buildings/ footings which require impervious paths). High use pedestrian areas, and universal access require hard, non-slip surfaces and should be flush jointed concrete)

6.5 Impervious areas should be graded towards porous areas &/or separated with turf, *gravel or vegetation to increase infiltration:*

6.6 Use of cost effective landscaping construction materials that contain recycled content (e.g. bollards).

6.7 Design landscaping to shade western facing walls (mature tree height limited to 0.75 x distance from foundations). All garden mulch to be clear of building walls, damp-proof course and weepholes. Prevention of moisture ingress, and pests.

6.8 Design landscaping to enhance thermal performance by channelling breezes, facing walls and not overshadowing solar panels or other windows.

7. Active Transport

Goal: To reduce reliance on motor vehicles through the provision of infrastructure that facilitates active transport.

7.1 Provide bike parking infrastructure in accordance with the Tweed Development Control Plan Section A2 Access and Parking Code.

7.2 Provide safe, pleasant and convenient pedestrian access that is compliant with relevant accessibility standards for “Universal Design” and the DDA.

8. Building Utility Areas

Goal: To enable safe effective utility areas.

8.1 Ensure facilities have safe access to adequate utility area.

8.2 Provide suitable sized cleaning and storage facilities**.**

8.3 Provide suitable delivery receivable and inventory management facilities**.**

9. Fail-safe Systems

Goal:

- To allow for future upgrades, change of use, or retrofits
- Provide a back-up to the passive design.
- Allow for changing electrical technology

9.1 The installation of fails-safe systems as a backup to the passive design, or to allow for the future fitting of a system into existing building. “A fail-safe is a device or practice that in the event of a specific failure responds in a way that will cause or minimize harm to personel or devices. The system design mitigates the unsafe consequences of the system failure.

9.2 Provide for future upgrade of electrical technology systems and the easy of implementing electrical connections throughout the building.

9.3 Consider future re-purposing of the structure, and the retrofit required. Provide wider corridor and doorways (or large doorway lintels for future widening of doorways). Retrofit may include upgrade of under-slab services and possible power-points in each room.

Examples such as converting a larger store room into a universally accessible change room or accessible toilet and shower.

10. Use and Maintenance of Sustainable Building Design Features

Goal: To ensure that services continue to operate at the most effective level throughout the life of the facility and includes:

- *Compliance to Work Health Safety (WHS) requirments applicable in NSW*
- *Minimises on-going operational costs*
- *Building layout shall comply with standards for operational needs.*

10.1 Ensure that adequate and safe access to the building's equipment/plant will allow the required maintenance to be conducted in accordance with WHS regulations.

10.2 Provide design documentation as part of the building handover process setting out equipment selection, building maintenance requirements and the standard to which services/equipment needs to be maintained.

10.3 Provide warranty conditions of design equipment

10.4 Provide design certification and calculation as required for specialist components of the design (eg Fire systems, Lifts, Air conditioning performance etc)

10.5 Include provision of a 'Building User Guide' in the construction specification for the Building Owner to place at the entrance to any building with new Environmentally Sustainable Design (ESD) features incorporated, setting out their optimal usage methods.

10.6 Sites with large trees require special consideration. Desiger should consider, gutter guards, root barriers, non slip footpaths, mould cleaning from roof and walls. Consider costs associated with risk assessment, pest access to roof, path damage and maintenance.

10.7 Council does not permit box gutters and minimum roof slopes below five (5) degrees due to maintenance and damage considerations.

10.8 Severe marine environments associated with coastal areas, require roofs from colourbond ultra cladding, door frames from hardwood, stainless steel fixings fittings and hardware. Corrosion resistant composite will be considered.

11. Sustainable Design Checklist

Goal:

- To document design decisions to allow for asset owner and project manager to review these decisions.

11.1 All applicable sections of the attached appendix 1 'Design Checklist' are to be completed by the designer in consultation with the project manager.

11.2 The designer shall make themselves aware of all other TSC protocols and specifications that are relevant to their design and apply them accordingly.

11.3 If the design is by contract, the requirement to complete the checklist shall be included in the contract documents.

12. Access and Inclusion

Goal:

- To ensure that “universal design” is undertaken to ensure effective level access to all facilities throughout the life of the building
- Inclusion is considered for staff, contract workers, volunteers, and the public

12.1 All Ensure adequate site signage for accessible parking and entry. Consider undercover parking for unloading.

12.2 Provision of disabled parking bay (off road preferred) as close as practical to building.

12.3 Provide level, step free pathways to front entry doors with clear wayfinding signage or colours, zero thresholds etc.

12.4 Provide automatic front entry doors (or light weight wide entry doors).

12.5 Entry, reception, corridors, doorways to include accessible circulation clearances and suitable signage.

12.6 Access to accessible toilet facilities. Building to include strengthened walls for future grabrails in sanitary compartments.

12.7 Features to include low sections of front counters, adjustable workstations heights, suitable lunch tables, benches, sink heights, stage access or lift if provided, and hearing loops to ensure full inclusion.

12.8 Emergency exit suitable with suitable circulation or push bar doors, zero thresholds, visual and audible alarms. Concrete path surface to assembly area.

13. Acknowledgements

This document has been produced with the assistance of:

- City of Bendigo Sustainable Building Design Guidelines
- Cairns Regional Council Sustainable Tropical Building Design - Guidelines for commercial buildings
- Shoalhaven City Council - Sustainable Building Design Policy.
- Shellharbour Council - Sustainable Building Design for Council Buildings

14. Other Reference Material

- Design specification - Public and Sport Ground Amenities (TSC)

  http://www.tweed.nsw.gov.au/controls/Planning/Documents/PlanningDocuments/appendix%20J%20-%20Sportsfield%20construction%20guidelines.pdf
- Growing Green Guide: A guide to green roofs, walls and facades in Melbourne and Victoria, Australia - State of Victoria through the Department of Environment and Primary Industries 2014
- Urban Green Cover In NSW Technical Guidelines - 2015 State of NSW and Office of Environment and Heritage
- ESD Design Guide - Office And Public Buildings - Commonwealth of Australia 2007 Department of the Environment and Water Resources

- Green Star – Interiors The Green Star rating tool for interior fit out projects - The Green Building Council of Australia www.gbca.org.au
- Sustainability Guidelines For Decision Makers - Southern Sydney Regional Organisation of Councils
- Australian Green Infrastructure Council: Guideline for Climate Change Adaptation. http://www.isca.org.au/images/pdf/cca_guideline_v2.1.pdf
- http://acereport-archives.org/pvc3.html
- http://www.tweed.nsw.gov.au/Documents/Environment/Flora%20and%20Fauna/TSC01958_Native_Species_Planting_Guide_Users_Guide.pdf
- Centre for Excellence in Universal Design (Ireland Government Authority) http://universaldesign.ie/
- NATSPEC Construction Information Techreport TR01 Specifying ESD.

  http://wwwnatspec.com.au/login

Appendix 1 - Council Buildings Sustainable Design Checklists

This guideline requires the designer to consider good environmental practices in the design implications in regard to construction, sustainability, operations, maintenance, renovations, refurbishments and whole of life costs (including repairs).

Sustainable infrastructure and facilities must be functional and promote climate sensitive buildings designed to minimise greenhouse gas emissions, energy and water use, reduce waste and facilitate active transport. The facilities should be adaptable to future use, with changing tenants and varied operational needs.

Checklist Goals:

Owner defined parameters

Building Asset Management Plan - Ensuring that the natural environment, economic development, and community well-being, are all considered. Level of service provided is determined.

Building Classification (according to BAMP)

The Building Asset Management Plan defines four (4) building categories

i. Premium e.g. Tweed Regional Gallery or Front of house at Murwillumbah Civic Centre
ii. Level 1 e.g. Civic Centre offices, Banora Community Centre, Sports Centre
iii. Level 2 e.g. Generally sports building club houses, halls, high use public toilet
iv. Level 3 e.g. Generally public toilets, storage sheds

The building catergory needs to be identified and requires that the design accommodates the following budget constraints for each category to facilitate sustainable outcomes:

i. Premium - built cost is less than $\$7,000/m^2$ under the roof line
ii. Level 1 - built cost is less than $\$5,500/m^2$ under the roof line
iii. Level 2 - built cost is less than $\$4,500/m^2$ under the roof line
iv. Level 3 - built cost is less than $\$2,000/m^2$ under the roof line

Additional allowances

- Wet Areas - $\$1,500/m^2$ be added to the above values for areas that are “wet areas” such as toilets and amenities
- Catering and kitchen facilities - $\$1,500/m^2$ be added to the above values for areas that are used for catering or kitchens
- Bush Fire Provision - $\$1,000/m^2$ be added to the above values for buildings that are required to meet bush fire construction requirments.

- All rates shall be indexed annually by a minimum of the CPI and shall be comprehensively reviewed at least every five years against Quantity Surveying publications such as “Cordell’s Building Cost Book & Estimating Guide”.

Date of last cost review – March 2018 for rates above.Check for current rates .

Asset Owner Constraints:
Stakeholders, number of users or groups using facilities:……..
……
Post disaster function applicable:…….
Choose building importance, wind exceedance probability:…….
Habitable each working day, with, staff, workers,or volunteers: …….
Part J requirements if air conditioned. Yes/No……

Other critical functions……....
Critical functionality - functional and operational requirements:……..
Eg. canteen facing the field
Function of the building (reason)……
Possible alternative future use identified? ……

Social and Environmental factors :-
1) Disability Discrimination Act (DDA), equitable universal access and inclusion
2) Crime Prevention Through Environmental Design, eg neighbours / vandalism / theft
3) CC/DA,
4) Bushfire,
5) Flooding, climate change effect,
6) National Construction Code
7) Site risk assessment - Erosion, and slope stability, wind probability of exceedance, building importance, site shielding, and topograpy.
8) Geotechnical Investigation- Acid Sulphate Soil, previous soil contamination (termite chemical barriers), site classification (plasticity of clays and reactivity of site)
9) Heritage considations- (including cultural heritage)
10) Assessment of hazardous materials in existing structure – Asbestos, arsenic, organochlorides etc, perform underslab soil testing, sampling of ac cement board.

Project ID……Project Address……..……..DATE ……

Design Checklist

Drawings: Plan, Sections, Elevations and Standard Drawings – Buildings

Space for comment or key consideration provided adjacent to tick box selection

1.0 ENERGY

Goals:

- To ensure that the building is designed to minimise the consumption of power.
- Comply with current building standard (National Construction Code) as a minimum.
- Utilise renewable energy generation systems to provide power to the building where practicable.
- Consider site layout and building orientation to maximise natural energy efficiency.
- Maximise passive energy design concepts.

	1.1 Solar Design	**YES**	**NO**	**N/A**
1. 1.1	Maximise heat gain from the sun in winter and minimise heat gain from the sun in summer through appropriate orientation;……	☐	☐	☐
1.1.2	Consider 'slab on ground' and solid masonry walls to achieve thermal mass;…….	☐	☐	☐
1.1.3	Consider in the positioning of windows in a building most windows should face north;……	☐	☐	☐
1.1.4	Consider outdoor patios and decks with wind protection, winter solar access and summer shade;……...	☐	☐	☐
1.1.5	Provide ventilation to the roof space as close to the highest point as possible;……	☐	☐	☐
1.1.6	Use of photovoltaic cells to supplement the buildings power demands wherever possible (Where high usage- air conditioned and staff occupied) or other energy generation options that are feasible) ……	☐	☐	☐
	1.2 Insulation			
1.2.1	Minimum roof and ceiling insulation with a minimum "R" rating of R2.5. Provide wall insulation with a minimum "R" rating of R1.5 studs. Consider cavity wall in masonry;……..	☐	☐	☐
1.2.2	Provide specialised glazing and/or window treatments on all windows not in permanent shade to control heat loss and heat gain - solar film or coating considered.…….	☐	☐	☐

1.2.3	Provide floor insulation for suspended floors (not concrete slab)……	☐	☐	☐
1.3	**Hot Water**	**YES**	**NO**	**N/A**
1.3.1	Provide hot water systems having a minimum 4-star energy rating and incorporating solar heating or heat pump technology where practical in habitable buildings, eg office, lunchroom, etc (not hall)	☐	☐	☐
1.3.2	For kitchens instant hot water and urns in accordance with AS3500 (minimalise tanks), consider timers	☐	☐	☐
1.3.3	For supply to showers and basins - Avoid mass storage unless using solar or heat pump hot water systems. Consider the use of instantaneous gas hot water systems or switch operated hot water systems where hot water use is infrequent and high demand…….	☐	☐	☐
1.3.4	Position HWS close to clustered wet areas, insulate all hot water pipes to AS3500…….	☐	☐	☐
1.4	**Lighting**			
1.4.1	Ensure building orientation, building envelope, skylights and floor plans maximise natural light access …….	☐	☐	☐
1.4.2	Design lighting fixtures to suit the purpose of specific areas, eg stadium ……	☐	☐	☐
1.4.3	Provide separate switches for special-purpose lights and label these switches ……...	☐	☐	☐
1.4.4	Include 'lighting zones', switch, specific, of no more than100m^2 and clearly label light switches accordingly ……	☐	☐	☐
1.4.5	Incorporate energy-efficient lamps and fittings (LED), fixtures to be IPART approved;……	☐	☐	☐
1.4.6	Locate light switches at exits. Power points easily accessible for safety and security……	☐	☐	☐
1.4.7	Incorporate auto sensing light switches;……	☐	☐	☐
1.4.8	Consider solar power for external and security lighting, vandalism, patronage, particularly landscape and pathway lighting ;……	☐	☐	☐
1.4.9	Security lighting shall be vandal and theft resistant. Motion sensor security lighting controlled by timer clock and PE sensor……..…	☐	☐	☐

1.5	Ventilation Systems	YES	NO	N/A
1.5.1	Locate external openings (doors and windows) for intake and exhaust to maximise use of breezes (mechanical system);……..	☐	☐	☐
1.5.2	Align windows, doors and vents in straight lines to maximise air flow;…….	☐	☐	☐
1.5.3	Use of windows which are lockable in a partly open position; ……..	☐	☐	☐
1.5.4	Minimise of internal obstructions - must be security screened; ……	☐	☐	☐
1.5.5	Use convection air flows to remove hot air. Easily opened vent controls. …….	☐	☐	☐
1.5.6	Mechanical air conditioning, consider air exchange barrier (or air lock) at entry. Apply Section 1.5.6 in protocol (see page 10) -Inverter Systems Five (5) Star up to 18 KWr …….	☐	☐	☐

1.6	Building Management Systems	YES	NO	N/A
1.6.1	Where feasible provide systems to control / monitor all or part of the equipment installed in building; ……..	☐	☐	☐
1.6.2	Provide switchboard or sub board space and conduits for future remote or wireless antannae or controls;……	☐	☐	☐

1.7	Electrical and Appliances	YES	NO	N/A
1.7.1	Distribution boards, positioned above flood and constructed of suitable materials for location , stainless steel -coastal external, galvanised - inland external, plastic- indoors, ……..……..	☐	☐	☐
1.7.2	All electrical switchgear conforms to TSC standards. Install 'Rapid test" equipment for RCD testing ……..	☐	☐	☐
1.7.3	Distribution boards 50% over-size for future …..	☐	☐	☐
1.7.4	Power points in accessible locations ……	☐	☐	☐
1.7.5	Ensure automatic timer switches on all appropriate equipment where practical in habitable buildings, eg office (not halls)…… …..	☐	☐	☐
1.7.6	Specify Four (4) Star energy rating for fridges and freezers and electrical appliances……..	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 1

2.0 WATER

Goals:

- To maximise water conservation and efficiency Ensure that the building is designed to minimise the consumption of water.
- To harvest roof water in a tank (with a first flush system) where feasible.
- To utilize water reuse to gardens (or toilets of PERMANENTLY staff occupied building)

		YES	NO	N/A
2.1	Provide shower fittings with at least a 3-star rated Water Efficiency Labelling Scheme (WELS).;…….	☐	☐	☐
2.2	Specify a 4-star WELS rating and a 4-star energy rating for any washing machines or dishwashers;……	☐	☐	☐
2.3	Provide at least 5-star WELS rated dual-flush toilets to water closets.....	☐	☐	☐
2.4	Provide aerators to basins with universal handles, and accessible clearances;……..…….	☐	☐	☐
2.5	Provide Five (5) Star urinals (Not waterless) …….	☐	☐	☐
2.6	Consider appropriate sized tank to harvest roof runoff and water re-use for permanently staffed buildings;……..…….	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 2

3.0 STORMWATER

Goal:

- To minimise the effect of stormwater from the site on external systems in terms of quantity and quality
- To stabilise soil moisture content around building in accordance with CSIRO Guide BTF 18

		YES	NO	N/A
3.1	Incorporate where possible WSUD features such as: • Swale drains around sealed areas • Infiltration trenches (in sandy soils ONLY) • Bio-retention systems (in sandy soils ONLY) • Rain gardens (away from building, in permeable soils) with mature tree height limited to 0.75 x distance from foundation. Minimise sealed areas (except around foundations) Stabilise foundations with perimeter concrete paths	☐	☐	☐
3.2	Consider green roofs and green walls to reduce stormwater runoff and the urban heat island effect as well as improving the building insulation	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 3

4.0 SELECTION OF MATERIALS

Goal:

- To ensure the development promotes the sustainable and efficient use of resources. Construction materials should be selected to increase the energy efficiency of the building,
- To minimise damage to the environment, to contribute to healthy indoor environments and to have low life cycle impacts due to production techniques and maintenance requirements.
- Designer to consider whole of design life costs, including repeated replacement, due to flooding, fire, severe storms damage, stormwater runoff, theft, and vandalism.

		YES	NO	N/A
4.1	Select building materials that will require little maintenance (painting, retreatment, waterproofing etc.) and are fire and vandal resistant	☐	☐	☐
4.2	Recycled materials are to be considered for projects (subject to feasibility) ……..	☐	☐	☐
4.3	Design and specify recycled materials where practical - for ease of deconstruction, reuse and recycling, either upon major refit or demolition.	☐	☐	☐
4.4	Low embodied energy - select materials and finishes with a low environmental impact during manufacture, application and use.. Locally manufactured and sourced are preferred……..	☐	☐	☐
4.5	All timber used during construction and fit out should be from plantation or sustainably managed re-growth forests;……	☐	☐	☐
4.6	Select zero-solvent and low-solvent paints……...	☐	☐	☐
4.7	Minimise use of PVC see link for possible alternatives http://web.archive.org/web/20121015062909/http://archive.greenpeace.org/toxics/pvcdatabase/productalt.html	☐	☐	☐
4.8	Floor Coverings - see Guidelines for details on VOC reductions;…….	☐	☐	☐
4.9	Non-chemical based termite treatments - must be incorporated in the building design. Australian Standards AS 36601.1 - 1995 Protection of Buildings from Subterranean Termites: Part 1 – New Buildings applies; included pipe penetrations and slab perimeters;……	☐	☐	☐
4.10	Formaldehyde emissions - designs should specify E0 or E1 (no- or low-formaldehyde products);……	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 4

5.0 WASTE

Goals:

- Ensure that the development's design includes appropriate waste management facilities.
- Maximise recycling and reuse of construction and demolition waste.
- Minimise waste generation.

		YES	NO	N/A
5.1	Ensure that the waste storage area is constructed in accordance with Council's Guide for Storage & Disposal of Garbage & Other Solid Wastes……..	☐	☐	☐
5.2	Ensure building design includes adequate fire resistant storage areas for paper/cardboard recycling bulk bin, bottles/cans recycling mobile garbage bin(s), green waste recycling (where applicable) and putrescible waste mobile garbage bins ……	☐	☐	☐
5.3	If waste storage areas cannot be placed within a secure storage area, locate these areas away from structures to minimise risk of fire, vermin and vandalism. Ensure accessible access to waste bins including cigarette butts and recycling. ……..	☐	☐	☐
5.4	Ensure construction waste is source separated, recyclables salvaged sortedransported to approved facility and sorted for re-use and salvage.;……	☐	☐	☐
5.5	Minimise waste with methodologies, including reduced over-ordering, source separation, record data on waste ……	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 5

6.0 LANDSCAPING and ECOLOGICAL IMPACT

	Goals:	YES	NO	N/A
	• Landscaping should stabilise ground moisture and enhance building footing performance and solar heat gain performance. • Plant local native species that contribute to local ecology and improve habitat and promote biodiversity. • Landscape immediately adjacent to building shall enhance the use and operation of the building .			
6.1	Locate building to avoid existing native trees where possible;……	☐	☐	☐
6.2	Topsoil re-use - where possible, topsoil removed during construction (if free from contamination) should be reused on site……	☐	☐	☐
6.3	Local native plant species with similar water requirements should be grouped together (hydro zoning) (low water requirement species close to buildings ONLY. See CSIRO BTF18 guide……	☐	☐	☐
6.4	Minimise impervious surfaces by selecting porous paving materials and minimising the extent of paved areas, (except the perimeter of buildings / footings which require impervious paths). High pedestrian traffic areas and universal access require hard non-slip surfaces and should be flush jointed concrete ……..	☐	☐	☐
6.5	Impervious areas should be graded towards porous areas &/or separated with turf, gravel or vegetation to increase infiltration……	☐	☐	☐
6.6	Use cost effective landscaping materials that contain recycled content (e.g. bollards) …….	☐	☐	☐
6.7	Design landscaping to enhance shading western facing walls (mature tree height limited to 0.75 x distance from foundations). All garden mulch to be clear of building walls and weepholes. Prevention of moisture ingress, and pests ……...	☐	☐	☐
6.8	Use of external vegetation and landscaping features to cool incoming air (where it does not impact upon asset protection zones) or shade solar panels. ……..	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 6

7.0 ACTIVE TRANSPORT

Goal:

- To reduce reliance on motor vehicles through the provision of infrastructure that facilitates active transport Provide accessible parking close to building entrance and constructed at building heights

		YES	NO	N/A
7.1	Provide located bike parking infrastructure in accordance with the Tweed Development Control Plan Section A2 Access and Parking Code;……	☐	☐	☐
7.2	Provide safe, step-free, and convenient pedestrian access, includes accessible access from designated parking to entrance and all facilities; ……	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 7

8.0 BUILDING UTILITY AREAS

Goal:

- To enable safe effective utility areas

		YES	NO	N/A
8.1	Ensure facilities have safe access to adequate utilities areas ……..	☐	☐	☐
8.2	Provide suitable sized cleaning and storage facilities……	☐	☐	☐
8.3	Provide suitable delivery recieval and inventory management facilities…… ……..…	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 8

9.0 FAILSAFE SYSTEMS

Goal:

- To allow for future upgrades, change of use, or retrofits
- Provide a back-up to the passive design.
- Allow for changing electrical technology

		YES	NO	N/A
9.1	Consider the installation of fail-safe systems and manually operated alternatives within the building; ……	☐	☐	☐
9.2	Allow 50% upgrade of switch board or sub-board and future conduits to roof space and slab exterior ground pits……..	☐	☐	☐
9.3	Consider future change of use and associated retrofit by providing wider doorways and corridors ……	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 9

10.0 USE AND MAINTENANCE OF SUSTAINABLE BUILDING DESIGN FEATURES

		YES	NO	N/A
	Goal: to ensure that services continue to operate at the most effective level thoughout the life of the facility • Compliance with Work Health and Safety (WHS) in NSW. • Minimise on-going operational costs. • Building layout will comply with standards for operational needs			
10.1	Ensure that adequate and safe access to the buildings equipment /plant will allow the required maintenance to be conducted to WHS regulations (position plant rooms at ground level) ……..	☐	☐	☐
10.2	Construction contract includes requirement to produce'Design Documentation' and 'Building User Equipment Operation & Maintenance Guide' in the handover process……	☐	☐	☐
10.3	Provide warranty conditions of all equipment ……	☐	☐	☐
10.4	Provide Design Certification and calculation as required on specialist components of the facility (e.g. Fire systems, Lifts, Air-conditioning performance etc)	☐	☐	☐
10.5	Include provision of a 'Building User Guide' in the construction specification for the Building Owner to place at the entrance to any building with new Environmentally Sustainable Design (ESD) features incorporated, setting out their optimal usage methods…….	☐	☐	☐
10.6	Sites with large trees consider , gutter leaf guard, root barriers, slip resistance paths, mould on roof and walls. Costs include regular inspection, risk assessment, trimming, path damage and replacement, maintenance costs, pest access to building roof……	☐	☐	☐
10.7	No box gutters within building line. Roof slopes above 5 degrees…….	☐	☐	☐
10.8	Coastal areas, Colourbond ultra cladding, hardwood door frames, s/steel fixings and hardware, composites considered	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 10

11.0 CONTRACT SPECIFICATIONS

	Goal:	YES	NO	N/A
	• To ensure intent of environmental sustainable design (ESD) operates at the most effective level throughout the life of the facility. • To ensure the whole of life costs are considered for each building feature			
11.1	Building construction specifications to include ESD requirements in the specification that reflect the design intent.;……	☐	☐	☐
11.2	Achieve legislative and Strategic requirements (including NCC, AS1428 compliance), equipment certificates and warrantees to be supplied with Building Users Guide.;	☐	☐	☐

12.0 ACCESS AND INCLUSION

	Goal:	YES	NO	N/A
	• To ensure that "universal design" is undertaken to ensure effective level access to all facilities throughout the life of the building. • Inclusion is considered for staff, contract workers, volunteers, and the public			
12.1	Ensure adequate site signage for accessible parking and entry. Consider undercover parking for unloading. ……..	☐	☐	☐
12.2	Provision of disabled parking bay (off road preferred) as close as practical to building……	☐	☐	☐
12.3	Provide level, step free pathways to front entry doors with clear wayfinding signage or colours, zero thresholds etc……	☐	☐	☐
12.4	Provide automatic front entry doors (or light weight wide entry doors) ……..	☐	☐	☐
12.5	Entry, reception, corridors, doorways to include accessible circulation clearances and suitable signage ……..	☐	☐	☐
12.6	Access to accessible toilet facilities. Building to include strengthened walls for future grabrails in sanitary compartments. ……	☐	☐	☐
12.7	Features to include low sections of front counters, adjustable workstations heights, suitable lunch tables, benches, sink heights, stage access or lift if provideded, and hearing loops to ensure full inclusion ……	☐	☐	☐
12.8	Emergency exit suitable withsuitable circulation or push bar doors, zero thresholds, visual and audible alarms.	☐	☐	☐

DEPARTURES FROM COUNCIL PROTOCOL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED FOR SECTION 11 and 12

Designed by	Initials	Date	Checked by	Initials	Date
…….……	……	..../…./….	……..	……	..../..../….

Asset Owner	Initials	Date
…….……	……	..../…./….

Version Control:

Version History		
Version #	**Summary of changes made**	**Date changes made**
1	First version	2 July 2008
2	Final	17 August 2018