SUSTAINABILITY IN DESIGN REVIEW - TEMPLATE

Australian Pacific Airports Corporation (APAC) which includes both Melbourne Airport and Launceston Airport both have the vision to build airports to be proud of. This includes the commitment to undertake our business operations in an ethical, environmentally friendly, and socially responsible manner.

We have six priorities which address the issues of highest importance to our organisation, our stakeholders and our community, in relation to Environment, Sustainable and Governance matters:

1. *Carbon emissions: Achieving net-zero for emissions within our control and working with our partners to support aviation industry decarbonisation*
2. *Waste: Substantially reducing our waste to landfill and improving resource recovery opportunities*
3. *PFAS and Water Quality: Minimising our impact on local waterways and effectively managing PFAS*
4. *Diversity and Inclusion: Embedding D&I principles and increasing representation of female leadership within our business*
5. *First Nations: Proactively managing cultural heritage on our airport sites and celebrating First Nations heritage in our terminals*
6. *Sustainable Procurement: Promoting local employment and embedding sustainable design principles into how we design, build and operate our airports*

MELBOURNE AIRPORT

In order to ensure our projects are considering APAC's ESG targets and relevant Environment Strategies, the following indicators and sub-indicators must be considered for your project:

Project Name:
CP Number:

Note: *Where 'X' is present in the tables below, it indicates the corresponding sub-indicator is applicable for the type of project referenced and a response MUST be provided*

Energy & Carbon

In this section, the term 'energy efficiency' applies to any Sustainability In Design initiative that will allow Melbourne Airport to provide the same level of service while using less energy and carbon; either through reduced demand, reduced consumption or more efficient supply.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Commissioning	Undertake fundamental building and utility systems commissioning to a recognised standard ***1**	Yes	X	X		X			
	Engage an Independent Commissioning Agent (ICA) to oversee the design and commissioning process. **Note:** on projects of higher complexity (engineering services heavy) and large footprint/cost an ICA is considered mandatory	No	X	X		X			
Building Envelope	Exceed the requirements of BCA Section J2 for glazing and shading by at least 5% ***GUIDANCE NOTE*** *We should be achieving at least 5% and aiming for a higher reduction target; QS to carry out whole of life cost benefit analysis between BCA section J2 and the higher target solution*	No	X	X		X			
	Use cool roof paint or other surface finish to reduce heat absorption ***GUIDANCE NOTE*** *We should be doing this; QS to carry out whole of life cost benefit analysis between base case and a higher target solution*	No	X	X		X			
	Exceed the insulation requirements of BCA Section J1 by 5% ***GUIDANCE NOTE*** *Aspirationally we should be doing this and aiming for a higher reduction target; QS to carry out whole of life cost benefit analysis between BCA section J1 and the higher target solution*	No	X	X		X			
	Undertake building pressure test to identify / address air leakage paths in building construction on projects of higher complexity (engineering services heavy) and large footprint/cost	Yes	X	X		X			

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Lighting Efficiency	Zone lights by functional areas which can be switched off or dimmed when not in use. Utilise daylighting driven design (maximising opportunities for natural lighting) as first principle	Yes	X	X					
	Achieve a light power density that is at least 10% below the maximum set by BCA Section J6. ***2** ***GUIDANCE NOTE*** *Aspirationally we should be doing this; QS to carry out whole of life cost benefit analysis between base case and a higher target solution*	No	X	X					
	Give preference to highly efficient fittings	Yes	X	X					
	For intermittently used spaces, automatically dim or turn off lighting when the space is not in use (using motion sensors, timers etc.) ***3**	Yes	X	X					
	Install daylight dimming to lights in the perimeter zones of a space	No	X	X					
	Lighting Control System - Ensure lighting design has been integrated into the Airport's lighting control system ***GUIDANCE NOTE*** *Subject to location i.e. if for a Terminal than yes, otherwise no*	No	X	X					
External Lighting Efficiency	Provide high-efficiency external lighting and lower power density in areas with lower/no use, and/or motion sensors ***GUIDANCE NOTE*** *Consider Smart poles / solar powered external lighting*	Yes			X		X	X	

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
HVAC Efficiency	Zone HVAC by functional areas and ensure that intermittently used areas are automatically switched off or set-back (widen the temperature band) when not in use; Design for adaptive thermal comfort which considers varying levels of HVAC control	Yes	X	X		X			
	Provide natural ventilation where appropriate ***4**; Design for operability and passive natural ventilation during appropriate climatic conditions	Yes	X	X		X			
	Provide energy recovery ***5** on major exhaust air systems to pre-condition in-coming outside air	Yes	X	X		X			
	Provide energy efficient elevator, escalator and travelator systems and controls. Design for universal accessibility and active design by promoting use of ramps and stairs where possible; explore regenerative drive technology / provide energy efficient systems where practicable	Yes	X	X	X				
	Provide mechanical occupant movement systems with sleep or set-back modes to save energy when note in use	Yes	X	X	X				
	HVAC Design - Demonstrate application of low energy HVAC solutions such as displacement, low temp VAV and passive ventilation	Yes	X	X					
	Heating (new) – Consider use of electric space heating as opposed to gas space heating (we are trying to remove airport's reliance on gas as a fuel source for heating) ***GUIDANCE NOTE*** *All electric should be fundamental to new builds as gas supply will become a future retrofit issue. Eg. do not design in soon to be redundant technologies*	Yes	X	X					
	BMS Controls - Confirm BMS controls strategy has been documented and is consistent with Melbourne Airport's BMS technical standard to allow for ongoing data capture and performance efficiency optimisation	Yes	X	X					
	Building Tuning - Confirm 1-YR quarterly HVAC building tuning post completion has been specified	Yes	X	X					

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Heat Island (HI)	Demonstrate reduced heat island effect from paved surface or other surfaces that absorb and retain heat	No			X		X		
Hot Water	Provide regulated temperature water for wash basins / showers / etc of temp between 43-48 degrees. For disabled / parents room bathrooms set temp between 40-45 degrees	Yes	X	X					
	Make use of solar heating or heat pump technology (where available) ***GUIDANCE NOTE*** *Do a cost benefit analysis*	No	X	X					
	If hot water is electric, ensure a highly energy efficient system of minimum 5 Minimum Energy Performance (MEPs) star rating is selected	Yes	X	X					
Appliances	Select appliances which are of minimum 5 MEPs or the best available at the time	Yes	X						
Energy Metering	Energy Metering of Major Energy Uses - Confirm energy metering that enables ongoing monitoring and reports for major energy uses e.g. HVAC, Lighting, People Movement, Baggage Handling etc.	Yes	X	X	X	X	X	X	

Notes	
*1	For example: AIRAH, CIBSE or ASHRAE
*2	This should be demonstrated post-construction by providing a copy of the building report
*3	This indicator may only be applied where there is no conflict with safety and security considerations
*4	Issues regarding noise and air quality must be taken into account when considering natural ventilation
*5	Sensible / latent heat exchange using thermal wheel, plate heat exchanger

Water and Water Sensitive Urban Design

Water Sensitive Urban Design, or WSUD, describes the way in which land planning and engineering design can integrate urban water cycle considerations into urban design strategies to minimise environmental impacts and improve positive outcomes for receiving environments. Hydraulic design should also meet all relevant Australian and local design Standards.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Irrigation	Use sub-soil or sub-mulch drip irrigation where irrigation is needed	Yes		X	X	X		X	
	Use non-potable water for any required irrigation where available	Yes		X	X	X	X	X	
Water Capture and Re-Use	Capture and re-use rain water for toilet flushing and/or landscape irrigation ***GUIDANCE NOTE*** *Do a cost benefit analysis subject to location*	Yes	X	X		X			
	Provide grey / black water treatment systems to supply water for non-potable end uses, such as toilet flushing and landscaping ***GUIDANCE NOTE*** *Do a cost benefit analysis subject to location*	No	X	X		X			
	Capture and re-use fire system test water ***GUIDANCE NOTE*** *Do a cost benefit analysis subject to location*	No	X	X		X			
Metering	Provide water meters for all major water end uses within a facility and provide connection to the BMS	Yes	X	X		X		X	
	Provide an automated leak detection system	No	X	X		X			
Flood Risk Management	Design with both current and future rainfall intensities in mind for gutters and other stormwater systems to avoid unacceptable local flooding risk ***6**	Yes		X	X	X	X	X	[*specific climate change scenario to be included - TBA*]?
Stormwater Design and Management	Where space is available, favour passive and natural methods for stormwater management, including permeable surfaces, swales and vegetation ***7**	Yes		X	X	X	X	X	
	Achieve best practice stormwater quality levels as per current CSIRO guidelines ***8**	Yes		X	X	X	X	X	
	Develop a WSUD management plan, including ongoing inspection and maintenance and this should be part of the data pack to Krisian ***9**	Yes		X	X	X	X	X	

Notes	
*6	Refer to: Bureau of Meteorology rainfall intensity data
*7	All planting must be undertaken in accordance with the Melbourne Airport Planting Guidelines
*8	Refer to most recent version of: Urban Stormwater Best-Practice Environmental Management Guidelines, CSIRO publishing
*9	This may fit within the management plan required in the Environmental Management section

Indoor Environmental Quality (IEQ)

The design of indoor environments is crucial for many Melbourne Airport developments and often provides an important interface for staff, passengers and other customers.

Indoor Environmental Quality or IEQ refers to the quality of a building's internal environment with regards to the wellbeing of its occupants. IEQ can be implemented throughout design, construction and fit out stages of development.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Indoor Air Quality	Provide outside air ventilation rates 50% above those required by BCA Section F4 subject to design assessment	No	X	X					
	Use demand controlled ventilation (e.g. CO2 sensors) to control outside air flow rates for spaces with dense and / or variable occupancy	Yes	X	X					
	Select low emitting materials including low VOC paints, sealants and adhesives, and flooring, and low formaldehyde composite wood products	Yes	X	X					
	Ensure air quality design considers aviation and traffic emissions with respect to indoor air quality e.g. provision of carbon filters where appropriate	Yes	X	X					
	Confirm indoor air quality sensors have been specified for ongoing monitoring of IAQ	Yes	X	X					
Visual Comfort	Design facades and skylights to optimise the appropriate use of natural light, and, consider heat ingress and necessary shading devices as required	Yes	X	X					
	Manage glare through the use of external shading, blinds and material selection (non-reflective vs reflective surfaces) as appropriate for the functional use of the space ***GUIDANCE NOTE*** *Aspirationally we should be doing this; QS to carry out whole of life cost benefit analysis between base case and a higher target solution*	No	X	X					
	For artificial lighting, use high-frequency ballasts or lights that do not require ballasts	Yes	X	X					

Air Quality

Air quality is an important consideration for many activities at Melbourne Airport. Minimisation of pollution to air and other receiving environments can be considered throughout the design, construction and fit out of buildings and infrastructure.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Air Emissions	Avoid combustion processes where possible, otherwise control the discharge of any combustion processes (e.g. boilers, cogeneration, gas-fired heaters) to achieve appropriate air quality in the vicinity of the point of discharge and for any likely receivers	Yes	X			X	X	X	
	Provide a leak detection system and gas recovery system on any plant that uses ozone depleting gases and / or gases with high global warming potentials	Yes	X			X	X	X	
Light Pollution Reduction	Avoid glare and light pollution, particularly from external and internal artificial lighting sources in compliance with CASA Aviation Safety Requirements	Yes	X	X	X	X	X	X	
Public realm greening / Internal Planting	Provide increase in tree canopy coverage to improve air quality in public realm; explore integration of interior planting	Yes	X	X	X	X	X	X	

Environmental Management

Environmental management is a focus area for Melbourne Airport in all its operations. Sustainability In Design initiatives in this area describe those that assist in reducing impacts on receiving environments and helping the Airport to maintain environmental management Standards.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Contaminated Land	If triggered by the Contaminated Land Site Register, develop a Contamination Management Plan ***10** ***GUIDANCE NOTE*** *Ensure Preliminary Environmental Assessment is completed by Environmental and Sustainability Team to address this indicator*	Yes		X	X	X	X	X	
Landscape Design	Implement landscaping and exterior design techniques to reduce heat islands, including use of surfaces & finishes with low solar heat gain potential (e.g. high reflectivity concrete pad) ***11**	Yes		X	X	X	X	X	
Climate Change	Consider undertaking a climate change risk assessment to identify high and catastrophic risks under future climate scenarios and appropriate design responses to minimise risk. **Note:** mandatory on significant projects	No		X	X	X	X	X	
Habitat Restoration and Biodiversity Management	Avoid, minimise or offset impacts on existing ecological values and native species. ***GUIDANCE NOTE*** *Ensure Preliminary Environmental Assessment is completed by Environmental and Sustainability Team to address this indicator*	Yes		X	X	X	X	X	
	Maximise use of native species for onsite planting to enhance ecological values and drought resilience ***12**	Yes		X	X	X	X	X	
	Investigate options to avoid removal of trees. If avoidance is not possible, follow the Melbourne Airport tree removal process	Yes		X	X	X	X	X	
	Minimise hard stand and design permeable surfaces, treat all surface level water run off	Yes		X	X	X	X	X	
First Nations and Historical Cultural Heritage	If a Cultural Heritage Assessment has been undertaken for the area, implement the recommendations of the Cultural Heritage Management Plan ***13** ***GUIDANCE NOTE*** *Ensure Preliminary Environmental Assessment is completed by Environmental and Sustainability Team to address this indicator*	Yes		X	X	X	X	X	
	Specify use of indigenous plants in landscaping, courtyards, green roofs and walling	Yes		X	X	X	X	X	
Refrigerant Selection	Low GWP - Confirm low global warming potential refrigerants have been specified for all HVAC applications	Yes		X	X	X	X	X	

Notes	
*10	This process must be undertaken by a suitably qualified consultant
*11	Refer to the Melbourne Airport Planting Guidelines to identify suitable species
*12	Refer to the Melbourne Airport Planting Guidelines to identify suitable species
*13	Recommendations may include (but are not limited to) archaeological salvage of the First Nation artefacts, undertaking cultural heritage awareness training conducted by the Registered First Nation Party, and completing a monthly compliance checklist during construction works

Sustainable Transport & Design

Transport planning is an increasingly important consideration for Melbourne Airport, as the number of passengers, staff and visitor trips are forecast to grow significantly over the coming decades.

Sustainability In Design considerations can be implemented into transport planning to help improve community and environmental outcomes associated with vehicle travel, public transport and active transport at the Airport.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Pedestrian, Cycling and Public Transportation	Enhance access to public transport, pedestrian and cycling infrastructure; Pedestrian and active transport prioritised over private vehicles	No		X	X				
	Provide bicycle access and storage (particularly for business park developments) and e-charging for e-mobility where it makes practical sense to do so	No		X	X				
	Provide access to change rooms including showers	No		X	X				
	Provide preferred access / parking to carpool vehicles and vans	No		X	X				
Clean Fuel Vehicles	Provide fuel points / infrastructure for alternatively fuelled vehicles (both landside and airside) **Note:** must be consistent with APAM strategy	No			X				
Sustainable Traffic Infrastructure	Minimise roadway congestion	Yes			X				
	Design roads for increased durability	Yes			X				

Waste & Resource Recovery

Melbourne Airport aims to reduce the amount of waste disposed to landfill per passenger in APAM managed terminals and associated facilities

Implementing best practice sustainability standards through the design, construction and re-fit of buildings will assist Melbourne Airport in achieving its goals for waste minimisation and resource efficiency.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Waste Management / Construction	Achieve 80% resource recovery from construction waste; Design for disassembly / repurposing / repatriation to nature	Yes	X	X	X			X	
Terminal Waste	Ensure all appropriate waste streams are in place to maximise resource recovery i.e. commingled recycling, organics, general waste, reverse vending machines, etc.	Yes	X	X	X			X	

Sustainable Procurement and Materials

Sustainable Procurement describes purchasing decisions that are ethically sound, reduce environmental impact through the supply chain, and are socially & ethically responsible.

Because the design and construction of buildings and infrastructure requires large scale procurement of materials and resources, this section is an important consideration for all developments.

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Re-use of Materials	Re-use existing building & infrastructure materials where appropriate (including steel and aggregate).	Yes	X	X	X	X	X	X	
	Design for disassembly ***14**	Yes	X	X	X	X	X	X	
	Salvage / re-use equipment and materials where appropriate	Yes	X	X	X	X	X	X	
Material Volumes	Use prefabrication	Yes	X	X		X		X	
	Use low finish interiors	Yes	X	X		X		X	
	Use shell structure roofs	Yes	X	X		X		X	
	Optimise structural member spacing	Yes	X	X		X		X	
Sustainable Materials	Where appropriate, Incorporate lifecycle costing into product selection decisions, including consideration of material lifespan and durability	No	X	X	X	X	X	X	
	Prioritise use of sustainable materials, including: - Materials with recycled content (e.g. reclaimed asphalt pavement) - Local/regional materials - Materials with low embodied energy (carbon footprint) - Certified Timber - Asphalt: warm mix asphalt oppose to hot mix - Concrete: use of recycled concrete - Fill - maximise on site fill / balance cut and fill - Structure, finishes, glass, etc. - Reuse existing pavement material as lower layers as drainage blanket/select fill/improved subgrade layer during rehabilitation or reconstruction - . Use civil construction materials such as drainage pipe, pit covers, steel sheets that are a fraction of its content manufactured with recycled/recoverable material ***GUIDANCE NOTE*** *Where practicable implement these materials*	Yes	X	X	X	X	X	X	
Production & Construction Methodology	Quantify the energy generated as part of the production process	Yes			X		X		
	Use insitu pavement recycling and stabilisation	No			X		X		
Transportation Mode	Consider use of alternative clean energy i.e. bio diesel, hydrogen, EV/hybrid vehicles, solar, etc.	No			X		X		

Notes	
*14	For further information refer to: Design for Deconstruction, SEDA Design Guides for Scotland: No. 1, SEDA 2005

Community Wellbeing and Safety

Melbourne Airport is dedicated to demonstrating a strong commitment to wellbeing and safety for all of its staff, passengers and stakeholders.

A number of Sustainability In Design considerations can contribute to the wellbeing and safety of buildings and infrastructure by improving environmental quality

Indicators	Sub-Indicators	Mandatory Requirement?	Fit-Out	New Build / Extension	Road / Civil Infrastructure	Utility Infrastructure	Airfield Infrastructure	Other Infrastructure	Response
Community Involvement and Ownership	Provide opportunities for enhanced community awareness of First Nations and European cultural heritage values	Yes	X	X	X				
Safety and Comfort	Incorporate Crime Prevention through Environmental Design (CPTED) principles for safety ***15**	Yes	X	X	X	X	X	X	
	Enhance ease of access to basic needs (water, toilets, seating, shade and shelter)	Yes	X	X	X	X	X	X	

Notes

*15	For examples see www.urbandesign.gov.au/protocolframework/principles/safe.aspx

As part of the MAPP (Melbourne Airport Project Process) Gate 4: Detailed Design, please capture the 'Sustainability in Design' benefits associated with the specific project in the table below. Note for Design & Construct (D&C), benefits should be captured in Gate 3: Schematic Design

Sustainability in Design Benefits

For each of the key categories, provide a qualitative and quantitative response to describe the estimated benefit achieved through the implementation of the Sustainability in Design process.

APAC ESG Indicator	Sustainability In-Design Indicator	Quantitative Achievement	Qualitative Achievement
Carbon Emissions	Energy & Carbon	*e.g. % Reduction in Carbon / Energy Consumption*	
Waste	Waste & Resource Recovery	*e.g. % Reduction in Waste to Landfill % of recycled materials incorporated*	
PFAS and Water Quality	Water and Water Sensitive Urban Design		
Diversity and Inclusion	Community Wellbeing and Safety		
First Nations	Environmental Management	*e.g. % of indigenous materials incorporated through Supply chain. CHMP findings*	
Sustainable procurement	Sustainable Transport & Design		
	Sustainable Procurement and Materials	*e.g. % locally sourced materials*	
Other	Indoor Environmental Quality (IEQ)		
	Air Quality		