

Mitigating the Impact of Natural Disasters on Government Buildings

Natural disasters are a significant and rising cost to the community. Irrespective of their geographic location, government buildings can be subject to a wide variety of extreme weather events which include cyclones, severe storms, floods, storm tide inundation, bushfires, landslide and earthquake. The risks and consequences from these hazards vary around the State depending on the location and the physical characteristics of the land. While the occurrence of these events cannot always be precisely predicted, their impacts are well understood and can be managed effectively through a comprehensive program of hazard mitigation planning.

The effects of any climate change in Queensland may include reductions in annual rainfall but increases in rainfall intensity, sea level and coastal erosion, bushfire risk, flood risk and damage to transport infrastructure and low-lying human settlements. These factors should also be considered when undertaking assessments or developing mitigation strategies.

Where buildings are leased, the process of determination of need, analysis of options, negotiation and lease management also need to address the risks associated with natural disasters.

In this guideline the term “agencies” is equivalent to and used interchangeably with “departments” (as defined in s8 of the [Financial Accountability Act 2009](#)).

This guideline will assist government departments to implement best practice processes and procedures to mitigate the risks associated with the impact of natural disasters on government buildings within their portfolio. Departments must comply with the relevant legislation, policies and codes¹ however, where practical they should seek to exceed these requirements, in particular for buildings critical to the delivery of services to the community or buildings intended to have a specific resilience² capacity. Resilient Government buildings will allow the continued delivery of government services irrespective of any natural disaster.

¹ The Capital Works Management Framework guideline [Building Regulatory Requirements](#) provides guidance to government departments regarding their approach to managing compliance of their building projects with the applicable building regulatory requirements.

² Building resilience is the capacity of a building to continue to function and operate during or after extreme conditions e.g. natural disasters.

Mitigating the Impact of Natural Disasters on Government Buildings

Departments should also be aware that eligibility to access [Natural Disaster Relief and Recovery Arrangements](#) (NDRRA) funding for natural disaster relief, capital works and transport infrastructure is directly linked to evidence of mitigation for likely or recurring natural disasters. The Queensland Reconstruction Authority (QldRA) coordinates the Commonwealth/State natural disaster relief and recovery arrangements, once a need has been established. QldRA takes a lead role in state-wide disaster resilience, mitigation and risk-based planning.

Benefits

Understanding the impacts of, and establishing best practices to address, natural disasters has the following benefits:

- helps preserve the safety of building occupants
- limits the effect of the buildings on the environment
- promotes long term planning to ensure the department has the capacity to continue to deliver its services irrespective of natural disasters
- informs decision-making – i.e. assists capital works improvement actions by using appropriate modelling assumptions associated with project proposals prior to proceeding with the necessary investment
- allows departments to move in the direction of continuous improvement to avoid costly repair and replacement costs associated with natural disasters.

Risks

Ineffective planning, scheduling, and prediction of natural disaster risks, as these relate to building management, can result in health, safety, financial and environmental implications including:

- disruption of delivery of government services
- loss of life
- contamination issues
- significant costs associated with reconstruction.

It is important to consider the potential adverse consequences of climate change on flooding in the local context and to remember that, in addition to possible impacts on rainfall and run-off, conditions such as sea level rise and an increase in the southern excursions of tropical cyclones may have significant implications for coastal floodplains.

1.0 Natural disasters and potential mitigation strategies

In this guideline a natural disaster refers to any one or a combination of the following: cyclone, storm, flood, bushfire, earthquake or landslides (**Attachment 1** provides an explanation of each of these terms).

A comprehensive approach to mitigation of the effects of natural disasters will include strategies related to:

- land use planning
- engineering (structural and civil)
- building services
- building codes and standards

Mitigating the Impact of Natural Disasters on Government Buildings

- increasing building resilience³.

Decisions about site selection, planning and design of government buildings (particularly in areas which are susceptible to natural disasters), should not increase the exposure of buildings to more risk during or after a natural disaster. This approach should be incorporated into the project planning, design and development at the earliest possible stage when the design and material decisions can achieve the greatest savings.

When planning new buildings departments should determine the degree of protection to be provided against specific hazards. The costs of protection should be commensurate with the probable losses from an incident.

According to the [Design Guidelines for Government Buildings](#) the following aspects should be addressed when designing new government buildings to increase their resilience to natural disasters:

- where appropriate, the proposed development and associated site works should be aligned to follow slope contours and be designed to minimise land excavation and filling. Where retaining walls are required, they should be designed as an integral element of the building form
- buildings should be designed for ease of maintenance. Provisions should be included for appropriate access to building elements and services to safely and efficiently assess the maintenance needs and deliver maintenance work
- the design of the proposed development should include appropriate consideration of the expected longevity (and continued operation) of the building before, during and after a disaster.

The building design should:

- address such factors as increased sea levels and extreme climatic risk events, including higher temperatures and greater wind loads in susceptible areas
- identify the acceptable and non-acceptable consequences for the building due to a risk event occurring and ensure that the consequences are minimised or avoided through an appropriate design response
- recognise the desired service delivery role of the building in and/or after the disaster may be quite different to its normal day-to-day service delivery role. In threat-prone areas, the building solution needs to be “multi-purpose” so that it is able to quickly respond to changing needs if required.

1.1 Cyclones

Cyclones are particularly damaging because they not only bring strong winds and heavy rain, but can also cause secondary hazards including a combination of flood, storm tide inundation and landslide.

Strategies which will improve the resilience of buildings to cyclones include:

- designing the structure to withstand the expected lateral and uplift forces
- strengthening the connection between the roof and walls to the ground

³ Building resilience is the capacity of a building to continue to function and operate during or after extreme conditions e.g. natural disasters.

Mitigating the Impact of Natural Disasters on Government Buildings

- ensuring roof tiles and anchorage systems are strong enough to resist extreme wind pressure⁴
- installing door and window hardware, fixings, hinges and locks that are suitable for the location. Large access doors such as roller doors or panel doors can be particularly vulnerable to severe wind events. Failure of doors during a severe wind event can result in internal pressurisation of the structure
- protecting and/or bracing doors and windows to reduce the impact of air-borne materials during a cyclone
- selecting appropriate weather treatments of eaves and building openings to protect from wind driven rain and mitigate the impact of any damage to building interiors
- minimising the extent of non-essential glazing on buildings particularly in exposed locations or those which are highly susceptible to extreme weather events
- protecting and securing equipment including air-conditioning plant, ventilators, antennas and solar panels installed on roofs to avoid loss of the services or secondary damage to the building envelope
- safely storing free standing furniture or other items (including bins, pot plants, etc.) in preparation for the arrival of a cyclone
- ensuring that the selection of species and the location of trees around buildings takes into consideration that heavy seasonal rainfall usually preceding a typical cyclone season can result in waterlogged ground which provides little support for large trees during a high velocity wind event.

When retrofitting existing buildings, departments should consider opportunities to upgrade the roof structure, improve the protection of windows to withstand high winds and prevent water entry.

The Department of Housing and Public Works, in collaboration with other agencies, has developed two guidelines: [Mitigating the Adverse Impacts of Cyclones: Evacuation and Shelter Guideline](#) and [Design Guidelines for Queensland Public Cyclone Shelters](#) to inform local government evacuation planning, site selection and design criteria for new public cyclone shelters.

1.2 Storms

Severe storms range from isolated thunderstorms to intense low pressure systems producing severe winds, heavy rain, lightning, flooding and storm tide.

Strategies which will improve the resilience of buildings to storms include:

- designing appropriate roofs to minimise the possibility of water ponding (which can cause deflection of structural members)
- protecting buildings against floods by preventing groundwater and rain water from penetrating into the interior of the building
- diverting surface water by grading the ground surface away from the walls
- maintaining the roofs to prevent blockages and premature corrosion in roof gutters.

⁴ Design wind pressures are derived from AS/NZS 1170.2 or AS 4055, as applicable. Design or construction details (including the timber size, bracing and fixing requirements) for residential timber-framed construction in cyclonic areas, are derived from the AS 1684.3-2010.

1.3 Floods

Strategies which will improve the resilience of buildings to floods include:

- preventative measures to safeguard or minimise the impact on the service delivery, including informed site and location selection (if possible away from coastal, estuarine and riverine floodplains)
- where buildings are required to be constructed in flood hazard areas⁵ for operational purposes, considering mitigating future flood damage through the use of elevated building pads, appropriate building design and/or selection of suitable construction materials (i.e. unlined core filled block work construction walls, free standing furniture, elevated power and data connections and carpet floor tiles, etc.)
- designing buildings so that habitable floor levels are at or above the flood level⁶ to increase protection of essential services and to limit the potential damage to the building and its contents if it is flooded
- dry flood-proofing, making the building watertight to prevent water entry, wet flood-proofing or making uninhabited or non-critical parts of the building resistant to water damage, where appropriate
- considering relocation of the building and the incorporation of levees and floodwalls into site design, where safety and other considerations can be properly addressed
- locating mechanical, electrical and electronic equipment above flood level (e.g. not in the basement) to prevent water damage to essential services for buildings
- providing auxiliary generators (appropriately located) to supply emergency power in the event that mains power is not available
- ensuring that the main switchboard has the capacity to connect to an emergency generating plant if the power supply to the main distribution board of the building is disrupted
- incorporating alternate means for on-site sewerage and water systems where protection may not be possible and disruptions may occur if the building is located in a flood hazard area
- considering installing pumps to remove water that may leak into the building
- providing protection against flowing flooding/surface water, commonly caused by a river overflowing its banks

⁵ A flood hazard area is an area subject to flooding as determined by the authority having jurisdiction, or where this information is not available, by the proponent in accordance with standards set, or referred to, by the authority having jurisdiction (i.e. local government). A local government may designate part of its area as a natural hazard management area (flood) and declare, for this area, the defined flood level, the floor level of habitable rooms, maximum flow velocity and the finished floor level required for class 1 buildings (houses). It may also declare a freeboard for building work carried out on an allotment located in a flood hazard area of a height of more than 300mm.

⁶ Enquiries about historical flood levels for the site should be made of the relevant authorities to ensure the land is suitable for its intended purpose. The information should be available to relevant officers for inclusion in subsequent project management processes (for example, in design development and compliance assessment).

Mitigating the Impact of Natural Disasters on Government Buildings

- ensuring that site selection decisions are supported by economic, social and environmental analysis and addressed during the preparation of the Business Case
- considering protection for buildings adjacent to large bodies of water which may be undermined due to erosion, the impact of storm driven waves or a tsunami.

The [Queensland Development Code Mandatory Part MP 3.5 - Construction of buildings in flood hazard areas](#) contains detailed requirements applicable to certain building work. Refer to resources on webpage [Construction in flood hazard areas](#) for further information.

1.4 Bushfires

Bushfires in Australia can occur all year-round, however the severity and the "bushfire season" varies by region. In the north of Australia, bushfires usually occur during the dry season (April to September) and fire severity tends to be more associated with seasonal weather patterns.

State and territory governments have a role in promoting better building design in bushfire-prone areas (as defined in AS 3959-2009). Local councils issue local laws and enforce building regulations that aim to reduce bushfire risk.

Strategies which will improve the resilience of buildings to bushfires include:

- appropriate siting of buildings including adequate separation of buildings from bushfire prone vegetation (firebreaks) – the use of cleared areas around a property is critical to reduce the level of radiant heat associated with bushfires and to provide a working space between property and bushfire prone vegetation for the fire brigade
- designing buildings to improve their resistance to burning embers, radiant heat, flame contact and/or a combination of these. If requirements for building design and location are considered early in the planning process, potential bushfire recovery costs can be minimised
- using suitable fire-resistant construction materials in roofs, awnings and exterior surfaces to assist in avoiding spontaneous combustion due to the radiant heat of bushfires. Fire-resistant construction materials may include timber if it has inherent 'bushfire-resisting' properties or it is chemically treated with fire-retardant substances
- planting fire retardant vegetation (most deciduous trees such as oaks and fruit trees are less flammable than pines and eucalypts)
- maintaining buildings and grounds to reduce bushfire risks.

If further information is required departments should refer to HB 330—2009 *Living in bushfire-prone areas, the companion to AS 3959-2009*, the [State Planning Policy](#) and relevant state interest guidelines for land use planning and development assessment.

1.5 Earthquakes

Building design should be influenced by the level of seismic resistance desired. Strategies which will improve the resilience of buildings to earthquakes include:

- specific structural components like shear walls, braced frames, moment resisting frames, and diaphragms

Mitigating the Impact of Natural Disasters on Government Buildings

- installing seismic dampers, such as diagonal braces or other energy dissipating devices and techniques
- bracing of non-structural components.

1.6 Ground subsidence, landslides and mudslides

Ground subsidence, landslides and mudslides are gravity-driven movements of earth which can result from water saturation, slope modifications and earthquakes.

In these unstable areas, the following measures should be considered:

- undertaking appropriate studies for the selection of a location and site and avoiding cut and fill building sites (where practicable)
- including preventative measures to safeguard or minimise the impact on the foundations of buildings
- when retrofitting structures to be more subsidence resistant, using shear walls, geo-fabrics and earth reinforcement techniques
- constructing channels, drainage systems, retention structures, and deflection walls
- planting groundcover.

2.0 Refurbishment and retrofitting of existing buildings

Key management decisions related to refurbishment and retrofitting (terms used here to also include extension and alteration) and building maintenance are opportunities for departments to include measures to mitigate risks from natural disasters (refer to section 1.1 to 1.6 for strategies for specific natural disasters).

Where refurbishing or retrofitting an existing building is proposed and the work requires *Building Act 1975* (Qld) assessment, all building regulations and standards also apply.

3.0 Building maintenance

Assessing buildings for maintenance requirements provides the opportunity to identify measures to mitigate risks from natural disasters. This assessment needs to be done in accordance with policy requirement 5 of the [Maintenance Management Framework](#) (MMF), which requires that, as a minimum, all Queensland Government buildings are assessed by site inspection at least every three years, depending on the nature of the facility.

The MMF also states that all buildings that have been adversely impacted by a natural disaster should be fully assessed as soon as practical after the event.

Some external works are considered part of building maintenance if they are necessary to prevent damage to buildings (refer to the [MMF policy advice note: Scope of Building Maintenance](#) for further guidance regarding the type of activities that should be considered as building maintenance).

MMF condition assessment

A condition assessment is a technical inspection by a competent assessor (as defined by the MMF) to evaluate the physical state of building elements and services and to assess the maintenance needs of the facility.

Mitigating the Impact of Natural Disasters on Government Buildings

It should:

- provide enough information on the condition of the building to support informed asset management decisions
- identify future remedial works in sufficient detail to enable their associated priorities and cost estimates to be developed
- include a review of disaster recovery plans, flood lines etc to determine the likely effect of a natural disaster on the building and its services
- assist departments to proactively identify opportunities for natural disaster mitigation including elements and services such as air conditioning, fire protection etc.

In accordance with the [MMF guideline: *Building Condition Assessment*](#) departments should manage the risks and determine the appropriate course of action to address critical maintenance items/issues brought to their attention by condition assessors and/or as a consequence of natural disasters, as soon as possible.

Departments should also consider:

- advice from maintenance service providers on workplace health and safety and risk issues which may be present and may require more frequent and thorough assessments
- actions to ensure damaged components are replaced with modern engineering equivalents where applicable
- providing feedback to building designers on using materials or items more resilient to natural disasters
- timely re-establishment of any soil eroded from the building footings/foundations after flooding.

For buildings located in bushfire-prone areas, departments should maintain the:

- grounds/landscape to ensure that any erosion does not affect the stability of the footings/foundations
- fire protection systems in accordance with the [Queensland Development Code Mandatory Part MP 6.1- Commissioning and maintenance of fire safety installations](#) (and [supporting guidance material](#)), which adopts the Australian Standard *AS1851 – 2012 Routine Service of Fire Protection Systems and Equipment*.

Attachment 1: Glossary of key terminology

Bushfire - an uncontrolled fire burning in forest, scrub or grassland vegetation. Bushfire may occur on most vegetation and topography types in Queensland where there is a fuel path of sufficient dryness to be flammable.

Bushfire Attack Level is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared, and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.

Earthquake is the result of a sudden release of energy in the earth's crust or upper mantle, usually caused by movement along a fault plane or by volcanic activity and resulting in the generation of seismic waves which can be destructive. Shaking and ground rupture are the main effects created by earthquakes, principally resulting in damage to buildings and other rigid structures. Earthquakes are mostly caused by rupture of geological faults, but also by volcanic activity and landslides.

Flood - temporary inundation of land by expanses of water that flow over the top of the natural or artificial banks of a watercourse i.e. a stream, creek, river, estuary, lake or dam. The behaviour of floodwaters varies across the floodplain and over the duration of a flood event, as well as between different flood events. Floodways provide the major flow paths for floodwaters and are typically aligned with obvious natural channels. Flood storage areas fill and then empty during the passage of the flood peak and are typically low velocity zones.

Related terms, such as defined flood level, maximum flow velocity of water and natural hazard management area (flood) are defined in the Building Regulation 2006.

Landslide - is movement of material downslope in a mass as a result of shear failure at the boundaries of the mass. There are several causes, including geological, morphological, physical and human. Geological causes include weak materials, weathered materials, jointed materials, adversely oriented structures and contrasts in permeability. Morphological causes include a steep slope, wave erosion or fluvial erosion. Physical causes are rainfall, rapid snowmelt and thawing. Humans can cause landslides by excavating, removing vegetation, irrigating and mining. Intense rainfall is by far the most common trigger of landslides in Australia.

Although no single set of characteristics can define the complex relationships between the physical environment and land instability, there are two basic principles that should be remembered. First, it is likely that landsliding will occur where it has occurred in the past. Secondly, landslides are likely to occur in similar geological, geomorphological and hydrological conditions as they have in the past.

The characteristics of a landslide-prone area may include a combination of some of the following:

- a) a history of landslide events in the region
- b) evidence of instability - any sign of irregularity may indicate a high risk of landslide including:
 - surface creep (e.g. trees tilted)
 - minor surface irregularity (e.g. areas of hummocks and depressions)

Mitigating the Impact of Natural Disasters on Government Buildings

- major surface irregularity (e.g. benches of abnormal or irregular flat areas in uniform sloping areas; scars; areas stripped of vegetation during slope movement and cracks; linear features showing lateral displacement of the ground surface and debris mounds, deposits of soil and rock on or at the base of slopes)
 - presence of scarps (i.e. linear features showing the location of vertical displacement of the ground surface)
 - evidence of rockfall or instability
 - evidence of disturbed infrastructure (e.g. tilted powerlines and fences, broken pipes and fractured drains, cracking or tilting of walls, cracking or slumping of embankment slopes, cracking and fall of material from excavated slopes).
- c) Recent or historical natural forest vegetation clearing or thinning significantly increases the risk of landslide
- d) Steeper slope angles are usually more at risk
- e) Slope shape – concave shapes are usually more at risk
- f) Site geology – weak materials are usually more at risk
- g) Colluvial thickness may increase the probability of landslides occurring
- h) Concentration of surface water – surface water on crests and upper slopes
- i) Concentration of groundwater
- j) Existing development modifications can significantly alter the risk of slope instability. For example, poor disposal of run-off water or sewage can significantly increase risk of landslide.

Mitigation - measures taken to reduce the severity of, or eliminate the risk from disasters.

Natural disaster - a natural hazard event that severely disrupts the fabric of a community and requires the intervention of the various levels of government to return the community to normality.

Storm - violent weather conditions which may include strong winds, rain, hail, thunder and lightning.

Storm surge is a raised dome of water typically between two and five metres higher than the normal tide level. If a storm surge occurs at the same time as a high tide then the potential risk of flooding will be even greater and the area inundated can be quite extensive, particularly along low-lying coastlines. The magnitude of the storm surge is dependent on the severity and duration of the event and the seabed topography at the site. In Queensland most large surges are caused by tropical cyclones.

Tropical cyclones are dangerous because they produce destructive winds, heavy rainfall with flooding and damaging storm surges that can cause inundation of low-lying coastal areas. The very destructive winds can cause extensive property damage and turn airborne debris into potentially lethal missiles. These winds can also produce phenomenal seas. Heavy rainfall associated with the passage of a tropical cyclone can produce extensive flooding which can cause further damage. This heavy rainfall can persist as the cyclone moves inland. Potentially the most destructive phenomena associated with tropical cyclones that reach land is the storm surge.

Attachment 2: List of policies and other relevant resources

AS/NZS 1768-2007 Lightning protection provides authoritative guidance on the principles and practices of lightning protection. In general, it is not economically possible to provide total protection against all the possible damaging effects of lightning, but the recommendations in this Standard will reduce the probability of damage to a calculated acceptable level, and will minimise any lightning damage that does occur.

AS/NZS ISO 31000-2009 Risk management - Principles and guidelines recommends that organisations should have a framework that integrates the process for managing risk into their overall governance, strategy and planning, management, reporting processes, policies, values and culture.

AS/NZS1170.2:2011 Structural design actions Part 2: Wind actions provides wind actions for use in the design of structures subject to wind action. It provides a detailed procedure for the determination of wind actions on structures, varying from those less sensitive to wind action to those for which dynamic response must be taken into consideration.

AS 1170.4-2007 Structural design actions Part 4: Earthquake actions in Australia provides designers of structures with earthquake actions and general detailing requirements for use in the design of structures subject to earthquakes.

The purpose of designing structures for earthquake loads is to:

- (a) minimise the risk of loss of life from structure collapse or damage in the event of an earthquake
- (b) improve the expected performance of structures
- (c) improve the capability of structures that are essential to post-earthquake recovery to function during and after an earthquake, and to minimise the risk of damage to hazardous facilities.

AS 1684.3—2010 Residential timber-framed construction Part 3: Cyclonic Areas provides provide the building industry with procedures that can be used to determine building practice, to design or check construction details, and to determine member sizes, and bracing and fixing requirements for timber-framed construction in cyclonic areas.

AS 1851-2012 Routine Service of Fire Protection Systems and Equipment sets out requirements for the routine servicing (inspection, testing, preventive maintenance and survey) of fire protection systems and equipment. This standard applies under the [Queensland Development Code Mandatory Part MP 6.1 – Commissioning and maintenance of fire safety installations](#).

AS 3959-2009 Construction of Buildings in Bushfire-prone Areas outlines a useful methodology for assessing the risk posed by bushfire for any given property and details construction standards considered appropriate to protect the property from a passing fire front. It specifies requirements for the construction of buildings in bushfire-prone areas in order to improve their resistance to burning embers, radiant heat, flame contact and/or a combination of these. *HB 330—2009 Living in bushfire-prone areas* is the companion to AS 3959-2009.

Building Code of Australia - National Construction Code Volumes One and Two (Australian Building Codes Board) provides a nationally uniform set of technical building standards for the design and construction of buildings in Australia.

Capital Works Management Framework guideline [Building Regulatory Requirements](#) (Department of Housing and Public Works) provides guidance to departments for managing

Mitigating the Impact of Natural Disasters on Government Buildings

the compliance of government building projects with the applicable building regulatory requirements.

[**Design Guidelines for Government Buildings**](#) (developed in 2010 by the then Office of the Queensland Government Architect) documents best practice in urban design outcomes that are adaptable to climate change, in particular that agencies should ensure that the design of the proposed development includes appropriate consideration of the expected longevity (and continued operation) of the building before, during and after a disaster including natural events such as a cyclone, flood, storm or fire.

[**Design Guidelines for Queensland Public Cyclone Shelters**](#) (Department of Housing and Public Works) describes the design requirements for public cyclone shelters in Queensland. It also provides detailed advice about site selection for the design of new buildings and for the assessment and upgrade of existing buildings, including management and operational aspects.

[**Disaster Management Act 2003**](#) establishes a framework for the effective management of disaster or emergency situations in Queensland. It includes provision for the preparation of disaster management plans and guidelines. Departments should be aware that these plans and guidelines may impact upon the design and construction of government buildings.

[**Maintenance Management Framework**](#) (MMF) (Department of Housing and Public Works) is the whole-of-Government policy for managing, planning and delivering building maintenance to ensure departments have a consistent approach. Maintenance is defined in the MMF as “work on existing buildings undertaken with the intention of (among other things) mitigation of the consequences of a natural disaster”.

[**Mitigating the Adverse Impacts of Cyclones: Evacuation and Shelter Guideline**](#) is the result of collaboration in 2008 between the then Department of Emergency Services and the Department of Public Works. The Guideline was prepared in accordance with the *Disaster Management Act 2003*. It defines a step-by-step process that local government can use to reduce community vulnerability to cyclones and inform functional operational and disaster mitigation planning. Local governments will be able to examine potential storm tide inundation, identify the structures that comply with cyclone building standards and put strategies in place to ensure that the community can evacuate and shelter safely. It provides a methodology for local governments to gather and analyse data necessary to effectively plan for the evacuation and shelter needs of existing and developing communities so as to reduce the risk to life from tropical cyclone and intense low pressure systems.

The [**Natural Disaster Relief and Recovery Arrangements**](#) (NDRRA) is a joint Queensland and Australian Government program that provides financial assistance following natural disaster events. Eligible disasters under NDRRA include: Cyclone, Flood, Landslide, Meteor Strike, Storm, Bushfire, Storm Surge, Terrorist Event, Tsunami, Tornado and Earthquake. The Restoration of Public Assets is a relief measure which financially assists eligible State and Local Governments in the restoration of essential public assets, following an eligible disaster event, to pre-disaster standard/level of service, or in accordance with current engineering standards/requirements and building codes/guidelines if required by legislation, while maintaining the same asset class and/or immunity level.

[**National Strategy for Disaster Resilience**](#) and its *Companion Booklet* (Council of Australian Governments) is the first step in a long-term process to move towards an approach that is focused on prevention, mitigation and resilience. It sets out concrete steps that governments at all levels can take to reduce risks posed by natural disasters and better support communities to recover from disasters. This includes consideration, in an integrated approach, of the predicted impact of climate change on sea levels and the

Mitigating the Impact of Natural Disasters on Government Buildings

frequency and intensity of extreme weather events in the planning and management-in-use phases of building assets.

[Queensland Development Code](#) (Department of Housing and Public Works) consolidates Queensland-specific building standards into a single document. The Code covers Queensland matters outside the scope of, and in addition to, the Building Code of Australia – National Construction Code Volumes One and Two.

[Queensland Strategy for Disaster Resilience](#) (Department of Local Government, Racing and Multicultural Affairs) sets out the Queensland Government’s vision for a disaster resilient future. The Strategy complements the State’s disaster management arrangements outlined in the *Disaster Management Act 2003*, the **[Queensland State Disaster Management Plan](#)**, and the **[Emergency Management Assurance Framework](#)**.

[State Planning Policy](#) (Department of State Development, Manufacturing, Infrastructure and Planning) provides a comprehensive set of principles which underpin Queensland’s planning system to guide local government and the state government in land use planning and development assessment. There are 17 state interests arranged under five themes:

- Liveable communities and housing
- Economic growth
- Environment and heritage
- Safety and resilience to hazards
- Infrastructure

To assist with the implementation of the SSP, a range of guidance material is available – such as, the SPP state interest guideline **[Natural hazards, risk and resilience](#)** and the **[Guidance for considering natural hazards, risk and resilience when designating land for community infrastructure](#)**.

The suite of guidelines which comprise the *Strategic Asset Management Framework* (available online at www.hpw.qld.gov.au) is organised under the following categories:

1. **Overview** - explains the principles and concepts of strategic asset management as they apply to buildings.
2. **Guidelines** - expand on key aspects of strategic asset management to inform decisions over the entire life-cycle of the asset.
3. **Decision-making methodologies and guidelines** - support agencies to implement best practice strategic management of buildings.

Mitigating the Impact of Natural Disasters on Government Buildings

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