Northern Territory Government

ENVIRONMENTAL HEALTH STANDARDS

for Remote Communities
in the Northern Territory

Prepared by Territory Health Services on behalf of the NTG Environmental Health Task Group:

Territory Housing
Department of Local Government
Office of Aboriginal Development
Power and Water Authority
Territory Health Services
ACKNOWLEDGMENTS

The responsibility for the development and content of this document rests with the Northern Territory Government Environmental Health Task Group.

These Environmental Health Standards, and the level of intersectoral collaboration involved in their development, could not have occurred without the ongoing support of the CEO/Secretaries of Territory Housing, Department of Local Government, Office of Aboriginal Development, Power and Water Authority, and Territory Health Services. In addition, the field staff of these agencies has provided extensive support and contribution.

The Environmental Health Task Group also gratefully acknowledges the assistance of those who have provided support, advice, and comment. In addition to the organisations below, there were many individuals, too numerous to mention individually, who provided valuable contribution to the development of these Standards. The ongoing assistance from these people is greatly appreciated in the review of this document.

- The Architects Studio (NT)
- ATSIC Regional Councils (NT)
- Healthabitat
- Indigenous Housing Authority of the Northern Territory
- Julalikari Aboriginal Corporation
- Nganampa Health
- Northern Territory Architects and Building Consultants
- Department of Local Government
- Department Lands, Planning and Environment
- Department of Transport and Works
- Office of Aboriginal Development
- Power and Water Authority
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<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<td>ANZFA</td>
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<td>APAS</td>
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<td>ARI</td>
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<td>ATSIC</td>
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<tr>
<td>BCA</td>
<td>Building Code of Australia</td>
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<td>CDEP</td>
<td>Community Development Employment Program</td>
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<td>CIAS</td>
<td>Community Information Access System</td>
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<td>DLG</td>
<td>Department of Local Government</td>
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<td>DLPE</td>
<td>Department of Lands, Planning and Environment</td>
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<td>DN</td>
<td>Nominal Size</td>
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<tr>
<td>DR</td>
<td>Dezincification Resistant</td>
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<td>IHANT</td>
<td>Indigenous Housing Authority of the Northern Territory</td>
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<td>MDF</td>
<td>Medium Density Fibreboard</td>
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<td>NAHS</td>
<td>National Aboriginal Health Strategy</td>
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<td>NT</td>
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<td>Ultra Violet</td>
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AS3660 Protection of buildings from subterranean termites – prevention, detection and treatment of infestation
AS3660-1 New buildings
AS/NZS 2312 Guide to the protection of iron and steel against external atmospheric corrosion
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AS 1170-2 Wind loads
AS3500 National Plumbing and Drainage Code
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INTRODUCTION

Background

Despite progress in recent years towards the improvement of Aboriginal living conditions and health status, it is evident from reports such as the National Aboriginal Health Strategy, the Royal Commission into Aboriginal Deaths in Custody, the Northern Territory Aboriginal Health Policy 1996, and the Australian Bureau of Statistics report ‘The Health and Welfare of Australia’s Aboriginal and Torres Strait Islander Peoples’, that much more needs to be done.

‘Indigenous Australians suffer a higher burden of illness and die at a younger age than non-Indigenous Australians, and this is true for almost every type of disease or condition for which information is available. In 1992-94, the life expectancy of Indigenous people in Western Australia, South Australia and the Northern Territory was about 15 - 20 years lower than for their non-Indigenous counterparts.’ (ABS 1997)

‘The Evaluation of Environmental Health Survey Data – Indigenous Housing, confirms the low standard of functionality of the environmental health infrastructure in the Northern Territory. Many houses lacked functional facilities for standard living practices. This poses risks to the health and safety of house occupants’ (Runcie & Bailie 2000).

‘It is universally accepted that the attainment of a satisfactory standard of health in any community depends on the provision of certain basic amenities including water supply, sanitation and sewerage facilities, housing and electricity. The high incidence and recurrence of many infectious diseases amongst Aboriginals...result largely from their unsatisfactory environmental conditions.’ (HRSCAA 1979 quoted in Reid & Trompf 1991)

The Northern Territory Government (NTG) together with the Indigenous Housing Authority of the Northern Territory (IHANT), initiated the development of Environmental Health Standards for Remote Communities in the Northern Territory.

The majority of environmentally transmitted diseases currently prevalent in sections of the Aboriginal population are no different to the diseases that existed in the wider Australian community prior to the introduction and systematic enforcement of Public Health and Building legislation. While standards and legislation exist in the wider Australian community, such standards and legislation are not always available or may be inappropriate for the unique geographical, climatic and social conditions in the remote areas of the Northern Territory.
For example, at present the Building Code of Australia (BCA) only applies to gazetted building areas, which exclude the majority of remote communities (refer Appendix A for a map of the gazetted building areas in the Northern Territory). The resulting lack of standards and/or inappropriate standards, contributes to the difficulties encountered when addressing environmental health problems in remote communities in the Northern Territory.

The development of this document and the methods of achieving the desired outcomes outlined in the following sections, acknowledges that access to core essential services and a healthy living environment are basic human rights. The mechanisms by which these rights are to be met must be clear to all those involved. This includes the acknowledgment that if, in some areas, local communities are unable to provide these core essential services, the NTG must intervene to ensure environmental health problems are avoided. A process reconciling the aims of self-determination whilst acknowledging NTG responsibility, is outlined in the Environmental Health Infrastructure Maintenance System (refer Part B.11).

People may make an informed choice to live outside the areas that can be provided with the level of service and standards described in this document. This document does not intend to prevent people from living in isolated areas, however, in some instances these areas cannot be expected to receive the same level of service as more populated areas.

**Intersectoral Collaboration**

The goal of improving the health status of Indigenous people in remote communities may seem to be an issue that rightfully belongs within the health sector. However there are many factors influencing peoples’ health for which the prime responsibility lies outside of the health sector. This is particularly relevant for the environmental conditions in which people live. The health sector is neither resourced nor responsible for providing services such as water supplies, housing, waste disposal services, etc. The health sector may be able to influence outcomes via approval functions.

Figure 1 illustrates this more clearly, by listing the components of a healthy community in order of the importance of the role of the health sector.
<table>
<thead>
<tr>
<th>Components of a Healthy Community</th>
<th>Examples</th>
<th>Relative Role of Health and Other Sectors</th>
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| Good health status of community residents. |  » High levels of immunisation  
» Low incidence of preventable diseases such as diabetes  
» Mortality and morbidity statistics to match or better the national average |  |
| Residents with the skills and knowledge to improve and maintain their health. |  » Increased levels of exercise  
» Reduced consumption of alcohol and other drugs  
» Improved nutritional food choices |  |
| Community organisations support healthy behaviour of residents. |  » Shaded areas at schools and public areas  
» Nutritious food and personal hygiene items available at the store |  |
| Safe and sustainable natural environment. |  » Adequate water supply  
» Good air quality and reduction of dust  
» Safe disposal of waste |  |
| Safe and sustainable man made environments. |  » Safe and adequate housing  
» Safe power supply  
» Safe waste collection services |  |
| Supportive social and economic environment. |  » Adequate levels of income and employment opportunity  
» Participation by residents in decision making  
» High degree of control of social and economic factors |  |

Figure 1: Components of a healthy environment and relative importance of the Health Sector

The shaded areas show the aspects encompassed within these standards, and that several agencies have responsibility for these issues. Reflecting this shared responsibility, this document has been developed with the participation and cooperation of several agencies; namely Territory Housing (TH), Department of Local Government (DLG), Office of Aboriginal Development (OAD), Power and Water Authority (PAWA), Territory Health Services (THS), Department of Transport and Works (T&W) and Department of Lands, Planning and Environment (DLPE).
However, these agencies have not only participated just because they have the responsibility for environmental health related services and functions. More importantly, there is recognition that the ability of each agency to achieve its core responsibilities is increased by working in cooperation with other agencies who have interrelated functions.

Using housing as an example, the following diagram illustrates that each agency has at least one core function that is impacted upon by the activities of the other agencies.

![Diagram showing interrelated core functions of NTG Agencies](image)

Figure 2: Interrelated core functions of NTG Agencies
* Most agencies have more than one core function

Working towards good quality, functioning houses is an activity that assists each agency achieve their core function/s.

**Status of document**

This document is not set in a legislative framework, as it currently operates as a set of guidelines. However, some of the requirements encompassed in the document are covered by Northern Territory legislation and are therefore enforceable. These sections are clearly noted in the text with reference to the current relevant legislation. In addition, these standards form part of the Conditions of Grant for projects funded by the Indigenous Housing Authority of the Northern Territory.
SECTION A

General Provisions
A.1 SCOPE OF DOCUMENT

As the purpose of this document is about setting environmental health standards for remote communities in the Northern Territory, we need to define both ‘environmental health’ and ‘remote communities’.

Environmental health

Environmental health is defined as:

> Environmental health comprises those aspects of human health, including quality of life, that are determined wholly or partially by factors in the social and physical environment. It also refers to the theory and practice of assessing, correcting, controlling or preventing those factors in the environment that can potentially affect adversely the health and quality of life of present and future generations. (UK Commission on Environment and Health 1996)

More specifically, the issues to be covered by these standards include housing, (inclusive of outdoor living spaces) public buildings, community food stores, power and water supply, rubbish and sewage disposal, pest and animal control, and civil works.

Education, transport and communications are often included in the broad definition of environmental health, but are not addressed within this document.

Remote communities

For the purposes of this document remote communities are defined as:

- those areas not gazetted as building areas under the Building Act (refer Appendix A); and
- Indigenous housing located in gazetted building areas under the Building Act.

The level of service provided to many smaller communities and outstations may be determined by the population of the community. In some circumstances it may not be possible to achieve the standards specified in this document. An explanation relating to these exceptions is provided in the text.
This document incorporates performance based standards and intends to avoid over
prescription where possible. The standards define expected achievements and/or provision
of infrastructure and services.

The document is designed to closely reflect the presentation of the Building Code of
Australia (BCA). Many of the standards in this document adopt the BCA as a basis and
make additional requirements or exemptions where appropriate.

Similarly to the BCA, this document specifies the objectives and performance requirements,
but the manner in which they are achieved tends not to be dictated. Acceptable
construction is achieved by either of two processes:

- **Deemed-to-Satisfy Provisions**: includes specifications, that if complied with, are
  proof that the Performance Provisions have been satisfied; or

- **Alternative Solutions**: proposals that differ in whole or part from the Deemed-to-
  Satisfy Provisions, but can be demonstrated to either comply with the relevant
  Performance Provisions or at least perform in an equivalent manner to the Deemed-to-
  Satisfy Provisions.

The one aspect of the environment that has the greatest impact on people’s health is their
immediate living area, that is, their ‘house’. A large proportion of this document deals with
housing or domestic building standards. As such, the closer this document is to the BCA in
format and usage, the easier it will be for people to use the two documents together.

Australian/New Zealand Standards referenced in this document are deemed to be the
current versions. The Standards Australia website (http://www.standards.com.au) can be
used to check for current versions.
A.3 REVIEW PROCESS

Overview of process

Standards that are performance based in preference to being prescriptive are developed to ensure that new or more appropriate options are not excluded. Advances in technology, and lessons learned from past and current practices, can be incorporated into building standards.

In order to do this, this document will be regularly reviewed, with particular attention given to Part B.1 Housing.

While this document is a joint initiative between Northern Territory Government agencies, Territory Health Services is the agency with primary responsibility for ongoing management of the document. In conjunction with relevant agencies, THS will set the timeframe and process for review. Each agency has responsibility for the review of certain sections of the document, as shown in the following table. THS will coordinate with relevant agencies to ensure that each section has been reviewed in time.

<table>
<thead>
<tr>
<th>Agency with Primary Responsibility of Review</th>
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<td>Territory Health Services</td>
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<td>Department of Lands, Planning and Environment</td>
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<td>‣ Sewage disposal systems</td>
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Table 1: Responsibilities for review of Environmental Health Standards for Remote Communities in the Northern Territory

Should you have any issues that you wish to discuss or place on the agenda for review, please contact the agency with primary responsibility for review of that section of the document. For general enquiries please contact Territory Health Services.
Environmental Health Standards for Remote Communities in the Northern Territory - June 2001

**Updating of Environmental Health Standards document**

As this document is to be regularly reviewed it is important to ensure that you have an up-to-date copy. The document will not normally be re-printed in full and re-distributed. Only those sections that contain amendments will be re-printed. Registered holders of the current document will be notified when amendments are available and where they can be obtained.

Each up-date will have a cover page similar to the following:

---

**Environmental Health Standards for Remote Communities in the Northern Territory**

*Update for .....................*

**Contents:**

1. Amendments to:
   - [list of sections and part numbers amended]

2. Updated list of amendments:
   - Example
     - Section / Part | Date of Amendment
     - B.1
     - B.2
     - etc.

---

Each page of the document has a date at the top, which identifies when it was written.

It is your responsibility to make sure that you have, and are complying with an updated copy of this document at all times.
There is much variability with respect to the delivery of health-related infrastructure and services to remote communities. The Northern Territory covers 1.35 million km² ranging from arid desert to tropical regions. In addition, the size, historical background and social make-up of communities varies considerably.

However there are some overarching principles and objectives that remain constant. A set goal that is applicable across the whole of the Northern Territory is:

To improve the environmental health conditions in which Indigenous people live in remote areas of the Northern Territory.

Adoption of the principles underpinning the application of these standards will help ensure a more holistic approach is taken to achieving an improvement in Indigenous health in remote communities, and provide a framework for the objectives outlined in the Performance Provisions (refer Section B) of this document. The principles that underpin the application of environmental health standards are detailed overleaf.
**Principles**

**Equity:** Indigenous people living in remote communities in the Northern Territory are entitled to the provision of services and infrastructure that provide an environment facilitating a healthy lifestyle. This includes the requirement that any work undertaken and materials used must comply with relevant Australian/New Zealand Standards.

**Participation:** Indigenous people living in remote communities in the Northern Territory must become involved in the design, building and maintenance of infrastructure, and delivery of services to their community. While it is the responsibility of the Northern Territory Government to ensure core essential services are provided, involvement by Indigenous people in the delivery of these services will help to ensure that lifestyle and cultural requirements are considered.

**Communication:** Exchange of information must be open and honest between all stakeholders, government agencies, private industry and community, to enable informed decision making and shared understanding.

**Collaboration:** Collaboration and cooperation between all levels of government, Indigenous organisations and Indigenous communities is necessary to establish priority needs and maximise use of resources.

**Holistic approach:** While the key goal is to improve health status, health cannot be achieved in isolation from educational achievement, economic status and social and cultural health. Wherever possible activities and strategies must encompass and support these aspects.

**Flexibility:** The application of these standards must include a level of flexibility such that unique and evolving situations can be accommodated. This may include situations where people make an informed decision to occupy locations at which the environmental health standards described in this document cannot be provided, for example water quality. However, each situation will be considered in relation to its particular set of circumstances and in accordance with the relevant approval processes described in this document.
A.5 CONSULTATION PROCESSES

Consultation and appropriate design of infrastructure and services are essential components to ensure/encourage appropriate use and maintenance of infrastructure. Community involvement in the design and construction of infrastructure promotes ownership of that infrastructure and ensures the design meets the particular needs of the recipients. Morel and Ross (1993) strongly argue for consultation. Consultation is particularly important in remote communities given the lack of market forces providing impetus for innovative and more acceptable housing, and the lack of any alternative housing options for community residents.

Consultation is considerably more than a meeting between the building consultants and the community council members, as this does not always ensure all members and family groups in the community are consulted. Sufficient time must be allowed for people to talk together to determine what they want, and this must be accompanied by discussion and explanation of all the available options, including the advantages and disadvantages of various choices in housing design.

In addition to asking people what they want, consultation requires explanation of constraints such as compliance with standards and legislative requirements.

WHO?
The people included in consultation depends to some degree on the topic. For larger proposals, all identifiable community groups and individuals need to be consulted. That is, not only the council, but also women’s groups, men’s groups, all different family groups, community elders and traditional owners, and/or community nominated representatives of these groups.

For smaller components of an overall project, say an individual house, the proposed occupants, including men, women and older people, should be consulted to ensure that the house meets any gender, age or disability specific requirements.

WHEN?
Consultation must occur before the inception of every new development or project. Requirements differ from community to community, between different groups in a community and can change over time.

During a development or project, consultation should occur as often as possible throughout the entire process, but at least several times before any plans are finalised. This allows time to talk to all necessary people and to allow them time to talk together and to determine what exactly they need. Traditional methods of communication and decision making processes within the community must be respected.
WHERE?
Consultation should occur in appropriate locations in the community as determined by the group being consulted. It may not be appropriate to use certain buildings or locations for some groups.

WHAT?
Consultation must be undertaken for all aspects of the development or project. This includes:

- the location of infrastructure within the community in relation to neighbouring infrastructure and the most appropriate position for infrastructure with regard to climatic conditions;
- the design and features of the house and the living areas, including such things as number of bedrooms, type of kitchen, type of cooking facilities, location of toilets and bathrooms, etc; and
- repair, maintenance and management arrangements. Maintenance and conditions and the responsibilities of the occupants are examples of issues to be discussed and agreed upon.

HOW?
Morel and Ross (1993) outline a number of methods that may be used for community consultation and since there are both benefits and problems with each, a mixture of the methods should be used. Methods include:

- placing pegs to show where houses will be built and their proximity to each other;
- using cut-out shapes of rooms to plan the layout of a house;
- walking through existing houses together and discussing them;
- photographs;
- house plans;
- video;
- models; and
- sketch plans by householders.

The use of interpreters and translators must occur wherever possible.
A.6 SUMMARY

The following summary is drawn from Morel and Ross (1993):

- Do not try to save costs on consultation;
- Allow enough time for delays in consultation;
- Consult about all aspects of the housing process, including community layout, organisation and management aspects, house designs and choice of contractors;
- Make sure all appropriate individuals and groups are included in consultation, depending on the issue under discussion. Provide information and several options so that people can think carefully about their needs. Conduct consultation over several sessions, to allow people time to think and discuss matters among themselves;
- Use a mixture of techniques to assist consultation. Do not rely on one alone; and
- Consultation must include an explanation of constraints and possibilities so that clients can make an informed choice.
A.7 APPROVAL PROCESSES

Some works/projects covered by these standards require approval from Northern Territory Government agencies. Other works/projects may be covered by a variant set of approval processes endorsed by the Northern Territory Government. An example being the Conditions of Grant associated with projects funded by the Indigenous Housing Authority of the Northern Territory.

It is important that the proper approvals are sought at the beginning as this can save a lot of time and effort, and cost, for all the parties concerned - private industry, government agencies and communities.
SECTION B

Performance Provisions
Deemed-to-Satisfy Provisions
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B.1 HOUSING

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B.1 HOUSING

B.1.1 Performance Provisions

**Explanatory Information**

The Performance Provisions in the Building Code of Australia remain largely unchanged, except for the addition of the following.

**Objective**

The objective is to protect people from adverse climatic conditions, and external dangers, and provide access to health hardware necessary for healthy living.

**Functional Statement**

A house must provide safe shelter, security, and adequate facilities for safe personal and domestic hygiene practices, and food storage and preparation.

**Performance Requirement**

(a) All houses must comply with the Performance Provisions set out in the BCA, and must also consider the special conditions associated with the provision of housing for Indigenous people in the Northern Territory, particularly in remote areas;

(b) Design solutions are to:
   (i) be culturally appropriate;
   (ii) be climatically appropriate;
   (iii) address environmental health and safety concerns; and
   (iv) incorporate robust, durable and low maintenance materials, services, fixtures and fittings suitable for remote areas.

(c) Houses must be able to accommodate high and fluctuating occupancies;

(d) External living areas must be designed and constructed to accommodate the external living practices of the occupants of the dwelling; and

(e) Rooms must have sufficient space to accommodate the anticipated number of occupants, as well as provide for adequate storage space, as appropriate to the use and function of each room.
B.1.2 Deemed-to-Satisfy Provisions

B.1.2.1 Construction

Construction in accordance with the BCA, as modified by the following requirements, is a Deemed-to-Satisfy solution.

The following parts are numbered as they appear in the BCA to allow for ease of cross-referencing.
PART 3.1.2 DRAINAGE

Explanatory Information

Height of slab-on-ground construction: It is emphasised that the following Clause refers to minimum heights that may not be sufficient in all cases. Minimum floor level heights need to be worked out between the builder and the plumber to ensure proper installation of Overflow Relief Gullies (ORG).

There may also be other design features such as external drains that will be required to divert surface water. Issues, which need to be considered in this context, are included in the BCA.

The definition of surface water includes water flowing onto the site from elsewhere, e.g. floodwater. Where statistical information is not available, local knowledge may need to be utilised.

Variation to the BCA

Clause 3.1.2.3 (b) Surface water drainage is to be replaced by the following:

(b) The following minimum heights apply to slab-on-ground construction:

(i) the finished floor level of the house shall be a minimum of 300 mm above the finished ground level;

(ii) the finished floor level of any verandah (measured at the edge) shall be a minimum of 100 mm above finished ground level;

(iii) the finished floor level of the house shall be a minimum of 150 mm (measured at the edge adjacent to the floor slab) above any adjacent verandah or paved area; and

(iv) the verandah shall have a minimum fall of 1:80 away from the house.
PART 3.1.3 TERMITE RISK MANAGEMENT

Explanatory Information

Termites: Where the primary building elements of a building are considered to be susceptible to termite attack, the BCA requires protection against termites according to AS 3660.1.

The BCA allows for certain types of construction to be excluded from the requirement for treatment against termites, and this approach has been approved in practice in the Northern Territory. ‘Primary structural elements’ (defined in the BCA) must be made from certain materials that are not susceptible to attack by termites; for example, steel, concrete, masonry and treated timber.

The approach of not providing a chemical termite protection system through the use of termite resistant structural materials should be seriously considered for remote communities. There does however need to be an awareness that this approach may leave other non-structural parts of the building vulnerable to attack, and it may still be appropriate for houses to incorporate non-chemical systems, which discourage termites or expose their activities to inspection.

Chemical termite protection systems must comply with guidelines set by the Director of Building Control, Department of Lands, Planning & Environment.

Concrete mowing strips 300 mm wide and 50 mm minimum thickness should be provided where there is known termite activity. The top of any mowing strip shall be a minimum of 150 mm below the finished floor slab level.
PART 3.2.3 CONCRETE AND REINFORCING

Explanatory Information

Designers should note that using aggregates sourced from remote community localities often results in concrete with compressive strength of less than 20 MPa.

The compressive strength of concrete that can be achieved in remote communities using locally available aggregates is variable because of the grading, particle strength and plasticity limitations of the natural aggregates. Locally available aggregates are usually sourced from naturally occurring lateritic ridge gravel deposits. These generally lack a coarse sand component, have an armchair grading with an excess of fines, can contain clay that disrupts the aggregate cement bond, plus the natural gravel particles often have only medium strength (they cannot be broken by hand but are easily broken with a hammer). These factors (singularly or in combination) prohibit the production of high strength concrete and in some cases, satisfactory concrete cannot be economically achieved.

Good quality crushed rock must be used (imported if necessary) for structural purposes, i.e. reinforced concrete footings, beams, columns and slabs.

Additional Clause to the BCA

Clause 3.2.3.1 (e) Aggregates from remote communities

Unless certified by a practicing structural/civil engineer, aggregates sourced from remote community localities are not permitted for use in the manufacture of concrete used for structural purposes.
PART 3.4.2 STEEL FRAMING

Explanatory Information

Steel framing: For the purposes of this Part, ‘steel framing’ means floor framing, wall framing, roof/ceiling framing and associated fasteners.

Steel framing has many advantages but can be subject to corrosion. A description of why corrosion occurs in remote areas plus some special requirements have been included (in addition to those outlined in the BCA).

Factors causing corrosion of steel framing in remote areas

Corrosion of steel framing is generally caused by three factors:

1. Time of wetness (moisture) – The amount of time the atmosphere (in contact with the steel) has a relative humidity of 80% or greater. This includes the case where the steel is covered by a thin film of water.

2. Coastal salts – Airborne salts can greatly increase the rate of corrosion, in particular where deposited salt is unable to be washed off by rain. The deposition of airborne salt is mainly dependent on the prevailing sea breezes (and surf) and is seen to decrease exponentially as distance from the coast increases.

3. Corrosive agents – Laundry washing powders and bleaches and other such cleaning agents can greatly increase the rate of corrosion.

AS/NZS 2312 includes details to minimise the risk of water being trapped in sections and recommends thickening up steel sections in corrosive areas to give greater factors of safety.

Design of steel framing and associated protective coatings

Protective coatings should be regarded as slowing the corrosion process down not preventing it. The approach to designing and protecting steel structures in Northern Territory remote coastal areas should be to protect the steel from moisture, coastal salts, corrosive agents, and provide a greater steel thickness.

A greater steel thickness in corrosive environments can sometimes be economically achieved by resizing large thin walled sections to smaller thicker sections. The increase in cost associated with using less efficient structural members (more steel required) can be offset by an increased member life in a corrosive environment.
Regular maintenance on protective coatings can greatly extend the life of steel framing. However, as regular maintenance can not be guaranteed on remote communities, a protective coating (which could include additional sacrificial steel), needs to be substantial enough to achieve the desired design life.

**Steel floor framing and floor support columns**
Steel floor framing forms part of the foundation of an elevated house and needs to remain structurally sound. It would be expected that the foundation for permanent housing should last at least 30 years.

Excessive moisture (from leaking plumbing) is recognised as posing the greatest risk to steel floor framing. This moisture combined with salt or laundry powders provides an extremely corrosive environment, which can dramatically shorten the life of a structural member. Reinforced concrete is recommended for use, instead of steel floor framing in the high corrosion risk areas.

Detailing of steelwork in accordance with AS/NZS 2312 is important to limit the amount of time moisture remains in contact with the steel. The use of sections that readily shed water such as rectangular hollow sections (RHS) or tapered flange sections is encouraged for steel floor framing. Water should not be allowed to pond next to floor support columns.

**Steel framing and fasteners**
Fasteners are critical items in steel framing and must be adequately protected from corrosion. Zinc coated fasteners need to be used in conjunction with zinc coated steel framing and comply with AS/NZS 4680.

**Corrosion of bottom plates**
Bottom plate corrosion by moisture has been a major problem on many remote communities. They have to be kept dry to minimise corrosion.

**Recommended protection treatments for bathroom floors, Laundry floors, and floor framing**
The BCA outlines protective coatings for steelwork in different environments (refer BCA Clause 3.4.4.4 and Table 3.4.4.2) and mentions that framing over kitchens and bathrooms (wet areas) may need increased protection because of moisture.
Specific treatments for flooring in different environments are outlined below:

- Bathrooms and laundries are seen to be very high-risk corrosion areas. Concrete should be used wherever possible for bathroom and laundry flooring, and concrete hobs provided to avoid water contact with steel framing. Laundries are best placed adjacent to the house so as to avoid the need for steel framing.

- Exposed steel floor framing within 3 km of the coast – the thinner a steel member, the faster it will lose its structural properties (through loss of steel) in a corrosive environment. Therefore, minimum steel thicknesses are specified.

- Exposed steel floor framing within 1 km of the coast – Two proven (zinc based) protective treatments are being specified in this environment to simplify choices for the industry.

Variation to the BCA

Clause 3.4.4.4  Corrosion protection

The following requirements are additional to BCA Clause 3.4.4.4 and Table 3.4.4.2. These additions are made in relation to steel floor framing.

Special requirements for steel floor framing

General – Steel floor framing shall be detailed in accordance with AS/NZS 2312 to minimise the likelihood of moisture staying in contact with steel framing.

Steel floor columns/footings shall be detailed to prevent water or soil contact with the column base over this period.

Hot dip zinc galvanizing, where specified, shall be carried out in accordance with AS/NZS 4680. All paints shall comply with the Australian Paint Approval Scheme (APAS).

Steel floor framing near the coast (high tide mark)

Within 3 km* of the high tide mark – All exposed floor joists shall have a minimum steel thickness of 1.9mm.

All exposed bearers and columns shall have a minimum flange thickness of 4mm. If hollow sections are to be used for exposed bearers or columns they shall have a minimum wall thickness of 4mm and be permanently closed at the ends.

As far as possible all protective coatings shall be applied before transporting into this area.
Within 1 km* of the high tide mark - Corrosion protection to exposed steel floor framing shall be either by:

- Hot dip galvanized zinc to a minimum coating thickness of 42 microns (equivalent to Z600 or 300 grams per m²); or
- Inorganic zinc silicate to a dry film thickness of 75 microns.

Within 125 m* of the high tide mark – All exposed floor joists shall be steel hollow sections with a minimum wall thickness of 3mm, and be permanently closed at the ends. All exposed bearers and columns shall have a minimum flange thickness of 5mm. If hollow sections are to be used for exposed bearers or columns they shall have a minimum wall thickness of 5mm and be permanently closed at the ends.

*Distance is taken to be the plan distance plus elevation from the high tide mark shown on the community SLAP map.

**Bottom plates** Flashing must be provided to bottom plates in wet areas to prevent water coming in contact with the steel.
PART 3.5.2 GUTTERS AND DOWNPIPES

Explanatory Information

Gutters, downpipes, rainwater tanks: The BCA does not require the installation of gutters, downpipes, or associated drainage, and nor does this document.

Gutters and downpipes entail additional expense and require ongoing maintenance problems and may be omitted on these grounds.

However, consideration shall be given to the installation of rainwater tanks in certain circumstances, which may have one or more of the following benefits:

- providing an alternative water supply in the event of the failure of the main system.
- providing water for watering gardens.

The ‘first wash diversion’ facility referred to is a facility whereby a given amount of water from the first rain of the season is diverted away from the tank, along with accumulated dust, etc. Such systems are commercially available.

Reference should also be made to the National Environmental Health Forum Monograph, Water Series No. 3: Guidance on the Use of Rainwater Tanks (Cunliffe, 1998).

Additional Clause to the BCA

3.5.2.20 Rainwater tanks

If rainwater tanks for the collection and storage of rainwater are installed, such a system must be sealed, must include a ‘first wash diversion’ facility, and must otherwise be designed to minimise potential health risks, such as access by animals, insects or people. Materials used must be resistant to corrosion.
PART 3.5.3 WALL CLADDING

Explanatory Information

Wall cladding: Design solutions for wall cladding are expected to comply with the performance requirements of this document. As a result, it is likely that design solutions will be required which will be more robust and water resistant than those that are Deemed-to-Satisfy in the BCA.

This should be reflected in selection of materials, thickness of materials, spacing of framing members, etc.

However, there is a diverse range of conditions and requirements encompassed by Indigenous housing projects. In particular, the lower wall sections and skirting boards should be made from water-resistant materials.

Plasterboard and 4.5 mm fibre-cement sheeting would not be Deemed-to-Satisfy except in exceptional circumstances.
PART 3.6 GLAZING

Explanatory Information

Glazing: The use of normal float glass may well not be appropriate on Indigenous housing projects, and consideration should be given to using laminated or toughened safety glass.

The use of materials other than glass may also be advisable in some Indigenous housing projects. For example, plastics such as polycarbonate or acrylic are commonly used instead of glass because of their resistance to breakage. ‘Solid’ louvres such as steel are also common because they are durable and provide privacy.

The following requirement clarifies the use of materials other than glass.

Additional Part to the BCA

3.6.20 Materials other than glass

Design solutions incorporating glazing materials other than glass must:

(a) be covered by a glazing certificate, with design based on AS 1170.2 and which states that the installation meets all requirements of the BCA with the exception of water penetration; and

(b) ensure adequate natural lighting and ventilation according to the BCA.
PART 3.7.2 SMOKE ALARMS

Explanatory Information

Smoke alarms: Proper maintenance of smoke alarms is vital, but is outside the scope of this document. However, the following variation intends to minimise problems due to back-up batteries discharging quickly and not being replaced. Circumstances where mains power is not available are also addressed.

Smoke alarms fitted with rechargeable back-up batteries are the preferred type where mains power is available.

Smoke alarms fitted with long-life (e.g. lithium) batteries must be installed where mains power is not available. Long-life batteries may last three times longer than standard alkaline batteries.

Variation to the BCA

Clause 3.7.2.2 (c) Requirements for smoke alarms is to be replaced by the following:

Smoke alarms must be connected to the consumer mains power where consumer power is supplied to the building. These alarms must be interlinked so that when one is activated, every alarm sounds.

If there is no consumer power, then battery-operated smoke alarms with long-life batteries must be installed.
PART 3.8.1 WET AREAS

Explanatory Information

Wet areas: The definition of ‘wet areas’ in the BCA is quite limited and basically only includes shower floors, walls adjacent to showers, walls immediately adjacent to wet area fixtures, and certain junctions.

Acceptable construction practice results in wet areas that are robust, easy to clean, and minimise potential health problems. To achieve this aim the following variations broaden the definition of ‘wet areas’.

Concrete has generally been found to be the most cost effective construction material for ease of grading and durability in wet areas.

Variations to the BCA

Clause 3.8.1.2 (a) is to be amended as follows:

Wet areas
In addition to the shower floor area, the whole of the floor area of bathrooms, showers, laundries, toilets and kitchens are to be protected from the effects of water and are therefore defined as ‘wet areas’ for the purposes of this document.

Clause 3.8.1.2 (b) (iii) is to be replaced with the following:

(iii) immediately behind or adjacent to a wet area fixture, to a minimum height of 300 mm, and adjacent to any bench top or horizontal surface in any wet area, to a minimum height of 150 mm.

Clause 3.8.1.2 (c) is to be replaced with the following:

(c) Floor, wall and bench junctions

(i) The junction between the floor and wall of all wet areas.

(ii) The junction between the wall and any bench top or horizontal surface in any wet area.
**Explanatory Information**

**Wet areas:** The following variation contains additional requirements for wet area floors. Only 100 mm (minimum) diameter floor wastes are acceptable. This will minimise blockages and make clearage easier if blockages do occur.

Alternatives to floor wastes are acceptable in certain circumstances. One such design solution involves grading wet area floors in one direction towards a continuous grated floor waste. Grated floor wastes offer some benefits over the 100 mm diameter floor waste, however they must be self cleaning. AS 3500 has certain restrictions on the use of grated floor wastes which include:

- floor grates are only to be used to collect shower and floor waste and other bathroom wastes are not to be discharged over the grates; and
- shower floor grates are limited to 1200 mm in length (from the waste outlet), where used in single shower applications.

Other design solutions are possible but all design solutions must be in accordance with AS 3500.

In the light of the requirements of the following Clause, and other Clauses of this document, serious consideration should be given to the separation of wet areas from the other areas of the house, while still providing convenient all-weather access.

**Variation to the BCA**

Clause 3.8.1.4 *Protection of shower floors in wet areas is to be replaced with the following:*

**Protection of floors in wet areas**

(a) The shower floor area as defined in 3.8.1.2 (a) must be waterproof and protected by one of the following systems:

(i) a shower tray with sides which are the greater of:

- 100 mm above the finished floor surface; or
- 75 mm above the adjoining structural floor level; or
- 25 mm above the maximum possible water level of the shower compartment; or
(ii) a waterproof membrane extending 100 mm up the adjoining shower or bathroom area walls and turned down into a drainage flange; or

(iii) a purpose-designed prefabricated shower base.

(b) Floor finishes which will be Deemed-to-Satisfy for showers are:

(i) grouted, non-slip, glazed ceramic floor tiles; or

(ii) purpose-designed prefabricated shower bases.

(c) Floor finishes which will be Deemed-to-Satisfy for bathrooms, laundries, kitchens, and toilets are:

(i) grouted, non-slip, glazed ceramic floor tiles, including a ‘skirting’ tile extending a minimum of 150 mm upwards at the junction of vertical surfaces; or

(ii) weld-jointed sheet vinyl with a minimum wear layer thickness of 1 mm, coved and extending a minimum of 150 mm upward at the junction of vertical surfaces.

(d) Floors and floor wastes

(i) The shower floor must have a minimum grade of 1:60 to the shower trap or drain;

(ii) Floor wastes if used are to be a minimum of 100 mm in diameter connected to a 100 mm waste pipe;

(iii) Floors fitted with a floor waste or drain must be evenly graded across the entire floor area towards the floor waste or drain at a minimum grade of 1:60;

(iv) Bathrooms, shower rooms, laundries and toilets shall be designed so that it is not possible for wastewater to overflow into any habitable area, including the kitchen, even if the main floor waste/drain backflows or becomes blocked; and

(v) Kitchens are not required to have floor wastes.
PART 3.8.3 FACILITIES

Explanatory Information

Facilities: The BCA has minimal requirements in terms of facilities. The following variations require the provision of certain facilities considered essential to health and amenity. A range of other facilities may also be required, however consideration must be given in each case.

Facilities should be made available to people staying outside the house with all facilities intended for the exclusive use of the occupants and their visitors, not for members of other households. ‘High’ means a minimum of 1500 mm above floor level.

Variation to the BCA

Clause 3.8.3.2 Required facilities is to be replaced with the following:

The minimum facilities for all Indigenous housing are:

(a) **Kitchen:** A kitchen shall include:

   (i) a stainless steel kitchen sink unit, including a drainage section on at least one side. If there is a drainage section on one side only, then there shall be sufficient bench space on the other side to enable stacking of dirty dishes;

   (ii) adequate dry food storage areas, designed to prevent access to pests, vermin and animals, and part of which must be at a high level;

   (iii) adequate facilities for the preparation and cooking of food, including a stove top;

   (iv) adequate dry food storage areas, designed to prevent access to pests, vermin and animals, and part of which must be at a high level;

   (v) adequate dry food storage areas, designed to prevent access to pests, vermin and animals, and part of which must be at a high level;

Explanatory Information

Ovens: Where it is proposed that ovens are not to be provided, extensive consultation with the community must occur. Due to the high maintenance costs of stove tops and ovens, durable and robust units must be used (preferably commercial units).

   (iii) adequate facilities for the preparation and cooking of food, including a stove top;
Variation cont...

(iv) adequate storage for utensils used for preparing and eating food; and
(v) an area for the placement of a refrigerator.

(b) **Shower:** A shower shall include a soap holder, towel rail(s), storage area for personal cleaning items, and the facility to hang or store clothes while people are bathing. People using the shower must be afforded reasonable privacy.

Four bedroom houses must have two facilities for washing adults, i.e. two showers, or a shower and a separate bath, each of which, must include the requirements described above.

(c) **Child washing facilities:** A facility for washing children shall be provided. The laundry tub may double as a facility for washing children, but if so must have a bench space or drainer adjacent and the hot water must be tempered.

(d) **Clothes washing facilities:** Clothes washing facilities shall comprise a stainless steel laundry tub and an adjacent space for a washing machine. The tub must be a minimum of 70 litres in capacity, include a washing machine bypass assembly and an overflow assembly. A soap holder shall be provided and high storage shall be provided above.

(e) **Clothes line:** An external, robust purpose-built clothes line shall be provided.

(f) **Water supply:** Hot and cold water shall be provided to the kitchen sink(s), shower(s), bath, laundry tub(s), and washbasin(s). Hot water may be supplied to the washing machine. Water supply to kitchen sinks must be potable.

(g) **External hosecocks:** Two external hosecock locations shall be provided. Standpipes are to be protected from the likelihood of damage and must comply with Clause 3.8.17.1 (d) and (e) of this document. External hosecocks must be designed so that water does not pool beneath them.

(h) **Storage for cleaning items:** Adequate storage shall be provided for cleaning items such as mops, buckets, brooms, etc.

(i) **Outdoor cooking facilities:** The provision of facilities for outdoor cooking is not mandatory, but where provided should include the following:

   (i) a preparation bench of robust construction, finished with a material that is impervious, free of cracks and crevices, waterproof, highly durable, resistant to chemicals, and capable of withstanding heavy chopping from cutting up food. Deemed-to-Satisfy surface finishes would be stainless steel, galvanised steel, or solid concrete with an appropriate surface treatment;

   (ii) access to a sink; and

   (iii) an area for the placement of a fireplace.
Explanatory Information

It is not uncommon for the 'real' population of individual Indigenous houses to exceed 20 people at various times throughout the year. (Ceremonies, sporting events, overcrowding due to lack of sufficient housing, other community houses vacated due to the death of an occupant, visitors, seasonal changes, etc).

Overcrowding in Indigenous houses is linked to key health issues and has been shown to be a major factor in the prevalence of respiratory infection/pneumonia in Indigenous people. Overcrowding will affect access to washing and toilet facilities. Improvements in washing and waste disposal by the provision of additional toilet and washbasin facilities will help to counteract the effect of overcrowding on the health status of individual households. The toilet area should also allow enough area to accommodate a medium to large washbasin and enable an adult to assist a child when using the toilet or washbasin.

Design of toilet areas should facilitate cleaning. Inadequate floor drainage for cleaning the toilet area is common and the installation of a 100 mm diameter water-charged floor waste with good falls to the waste point will assist cleaning.

Poorly detailed fittings such as toilet roll holders, privacy locks and lack of high shelving for toilet roll storage often make using and maintaining a functional toilet difficult. In the absence of dry, easy to access toilet paper, rags or paper will be used thus dramatically increasing toilet blockages.

(i) **Toilet:** At least one inside toilet shall be provided to houses with a maximum of two bedrooms. Two inside toilets shall be provided to houses that have three or more bedrooms.

Each toilet must have a dedicated medium to large washbasin and a 100 mm floor waste. The toilet floor area shall be of sufficient size to allow for a toilet pan and washbasin.

In unsewered areas, the community may decide to substitute one of the internal toilets for a pit toilet (see Clause 3.8.3.4 of this document).

All toilet areas shall be provided with a good quality toilet roll holder and high shelf for toilet roll storage.
Additional Clause to the BCA

Explanatory Information

Pit Toilets: Where two toilets are provided, strong arguments must exist for one of the two toilets being non-water-dependant (e.g. pit toilet or similar). A pit toilet can act as a reliable back-up should a septic system fail and provides a means of disposing of items such as disposable nappies that cannot be disposed in a flushing toilet.

A pit toilet is not permitted in a sewered area. A pit toilet should be considered in remote areas where sewage/effluent disposal is on-site, as there may be a greater chance of the disposal system failing.

PAWA should be consulted if it is proposed to use pit toilets in an unsewered community with a PAWA water supply (refer Part B.5.2.2 of this document). Excessive use of pit toilets may impact on the quality of water supply.

3.8.3.20 Pit toilets

If a pit toilet is provided, the following requirements apply:

(a) The pit toilet must comply with the Code of Practice for Small On-Site Sewerage and Sullage Treatment Systems and the Disposal or Reuse of Sewerage Effluent.

(b) Sufficient artificial lighting shall be provided to allow safe access to and from the pit toilet at night.

(c) Artificial lighting is not required internally.
PART 3.8.4 LIGHT

Explanatory Information

Natural Light: The house should be constructed and orientated to make best use of natural light.

The BCA requires natural lighting to all habitable rooms. This excludes bathrooms, laundries and toilets.

Variation to the BCA

Clause 3.8.4.2 Natural lighting

For the purpose of this Clause, habitable rooms shall also include bathrooms, toilets and laundries.
PART 3.8.5 VENTILATION

Explanatory Information

Ventilation: Adequate ventilation for housing is required on health grounds.

The BCA requires openings with an openable size of at least 5% of the floor area of the room. In many cases, a much greater openable area will be required to satisfy the requirements of this document with regard to appropriate design for climate.

The area required for ventilation only has to be ‘openable’. If all windows, etc. are closed, (perhaps for cultural reasons) it is possible that no ventilation is being provided. This may be a problem in the laundry, bathroom, walk-in pantries and toilet areas when dealing with objectionable odours and harmful contaminants.

Additional Clause to the BCA

3.8.5.20 Permanent ventilation

Permanent ventilation must be provided to the laundry, bathroom, walk-in pantry and toilet areas. This excludes windows, doors or other devices that can be closed.
PART 3.8.17  DETAILED PLUMBING AND DRAINAGE REQUIREMENTS (Additional Part to the BCA)

To be read in conjunction with BCA Part 3.8.1 Wet Areas.

3.8.17.1 Plumbing

Explanatory Information

**Plumbing:** Special plumbing requirements are necessary because fixtures and fittings need to be robust and low-maintenance, and also because of the highly corrosive water in the Northern Territory. Highly corrosive water can rapidly corrode copper piping and standard fittings and fixtures. The failure of plumbing pipework, fixtures and fittings has serious implications for health and amenity. Water leaking into wall cavities can cause structural failure.

All areas within 100 km of the Northern Territory coast are deemed to have highly corrosive underground water sources. The presence of significant quantities of carbon dioxide gas is a main cause of underground water sources in the Northern Territory coastal region being highly corrosive (acidic). This gas is produced from the rapid decay of organic matter being dissolved and pushed into the underground water sources by the heavy rainfall.

Naturally corrosive rainwater (slightly acidic) also contributes to corrosive underground water sources. The soils in the Northern Territory coastal region tend not to neutralise the rainwater acidity as they do in other Northern Territory regions.

Figure 3 shows areas deemed to have highly corrosive water. Where applicable in this Part the Deemed-to-Satisfy requirements must be met within all areas with highly corrosive water.

Alternatives to the Deemed-to-Satisfy requirements may be allowed outside of areas with highly corrosive water, but evidence as to water quality must be provided to justify the use of such alternatives.

All plumbing and drainage shall comply with AS 3500 and the performance requirements set out in this document, except for the following variations:

(a) A property’s water service from the water reticulation main to the point where PAWA’s service obligation terminates shall be constructed in accordance with PAWA’s standard drawings (standard drawings are available from PAWA’s Drawing Services Group).

(b) The underground water service to the house (other than that described in 3.8.17.1(a)) shall be constructed in UPVC or polyethylene and shall have a minimum depth cover of 450mm.
All areas within 100 km of the NT coast are considered to have highly corrosive underground water unless proven otherwise. Areas outside this zone may also have highly corrosive water but require investigation on an individual basis.
(c) All concealed, internal pipework (hot and cold water) shall be an approved non-
corrosive material such as polybutylene.

(d) In areas with highly corrosive water (refer Figure 3), unprotected pipework accessible
from ground level shall be grade 316 stainless steel.

(e) In areas without highly corrosive water, unprotected pipework accessible from
ground level shall be grade 316 stainless steel or alternative products such as copper
and galvanised steel.

(f) Pipework and fittings subject to UV degradation, such as polybutylene, shall be
protected from direct sunlight.

(f) All tapware including spouts, handles, flanges, and showerheads shall be vandal-
resistant, easy-to-clean of solid dezincification resistant (DR) brass construction, with
stainless steel seats.

3.8.17.2 Breeching pieces

**Explanatory Information**

**Breeching pieces, etc:** Stainless steel breeching pieces and backing plates may be
more expensive than standard items. However, standard items corrode rapidly in
areas with highly corrosive water, and replacement can be difficult and expensive.
There is no doubt the cost of stainless steel breeching pieces and backing plates can
be justified in terms of life-cycle costing in areas with highly corrosive water.

Most underground water sources in the Northern Territory are corrosive to some
degree and the use of stainless steel breeching pieces is strongly recommended for
most remote communities.

The shower is the only fixture that requires a breeching piece. Elsewhere, ‘mixers’
(and therefore breeching pieces) are not essential. In fact, if ‘pillar cocks’ are
installed, ease of replacement of taps is improved.

(h) In areas with highly corrosive water, breeching pieces and backing plates to taps and
showers built into a wall or otherwise not easily replaceable shall be 316 stainless
steel.

(i) In areas without highly corrosive water, where breeching pieces and backing plates
to taps and showers are built into the wall or are not easily replaced, chrome-plated
DR brass may be an alternative to 316 stainless steel.
3.8.17.3 Showers

**Explanatory Information**

**Showers:** There should be a sufficient quantity of water delivered from a shower rose to make showering an effective washing process.

It is recommended that fixed, low pressure shower head roses be used.

(j) The shower rose shall deliver a minimum of 10 litres, (one standard bucket) in two minutes, using the hot water tap only.

(k) Hot water supply pipework to the shower shall be 22 mm diameter.

3.8.17.4 Hot water systems

**Explanatory Information**

**Hot water systems:** The provision of hot water is important for health reasons. Hot water systems tend to have a very high failure rate in remote communities, due to a range of factors including poor water quality, lack of maintenance, and vandalism.

Corrosive water is a significant problem. For example, solar hot water systems are common, but standard models used widely in urban areas fail in the presence of corrosive water, and almost certainly will not be acceptable. Design consultants should look to models that are low maintenance and specifically designed to cope with corrosive water.

There are some steps that can be taken to extend the life of hot water systems and facilitate maintenance and these are addressed in the following requirements (l) to (n).

(l) All hot water systems shall be low-maintenance, take into account the corrosive nature of the water and be of sufficient capacity for the number of occupants.

(m) The outlet from hot water systems shall be designed so that the first metre (minimum) is easily accessible, so that calcified pipework may be replaced.

(n) The collector plates of solar hot water systems must be protected from damage, whilst allowing for effective operation and cleaning.
3.8.17.5 Toilet cisterns

Explanatory Information

**Toilet cisterns:** Toilet cisterns are a source of maintenance problems. The internal workings of all cisterns are similar. The robustness of the ‘container’, and limiting access to the internal workings are the main issues. Possible solutions include ‘in wall’ or stainless steel cisterns. Standard plastic cisterns will not be sufficiently robust in many situations.

Discouraging access to the internal workings of the toilet cistern is important. For plastic cisterns this may be achieved (for example) by screwing the lid down with stainless steel screws. Metal covers are effective in areas where cisterns have been frequently damaged.

(o) All toilet cisterns must be designed to discourage access to the internal workings.

3.8.17.6 Inspection shafts

Explanatory Information

**Inspection shafts:** The most common form of blockage in sanitary drains is from matter disposed of through the toilet. It is realised that on remote communities there is often no ready access to skilled plumbers and location plans for sanitary drains. To overcome this situation a durable, easy to find, inspection shaft needs to be installed adjacent to each toilet.

(p) The sanitary drain from each toilet shall have an inspection shaft complying with the PAWA standard drawings for miscellaneous sanitary drain inspection shafts (refer Appendix B).
3.8.17.7 Septic tanks and effluent disposal

Explanatory Information

**Septic tanks and effluent disposal:** There is a range of problems relating to sewage and sullage disposal that are particular to remote communities, including high daily flow rates. These problems may cause system failure and consequently major health problems.

The Code of Practice for Small On-site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent has particular requirements with regard to on-site sewage and sullage disposal for Indigenous housing in remote communities including:

- separate tanks for sewage and sullage;
- daily flow allowances are higher than normally required; and
- special consideration must be given to the protection of the septic tanks and trenches from damage, particularly from vehicles.

There are different processes for septic tank installations outside building areas and inside building areas.

The following requirements are designed to minimise such problems.

(a) **Outside building areas:** Most remote communities are located outside building areas and therefore on-site sewage and sullage disposal shall be in accordance with:

(i) the *Public Health Act and Regulations*;

(ii) the Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent and associated Territory Health Services Administrative Procedures; and

(b) **Inside building areas:** On-site sewage and sullage disposal in remote communities located inside building areas shall be in accordance with:

(i) the *Building Act*;

(ii) the Code of Practice for Small On-site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent; and

(iii) the Department of Lands, Planning and Environment’s administrative processes.
PART 3.8.18 DESIGN FOR CLIMATE  
(Additional Part to the BCA)

Explanatory Information

General
The design of houses should aim to provide the greatest thermal comfort possible while reducing the need for energy consumption. Sustaining electrical energy supplies for remote community housing, in particular outstation housing, is very expensive compared to urban housing.

Different design strategies are necessary for hot humid and hot arid regions. These regions are defined on a map, refer Figure 4.

Orientation and shading: Where possible the longest walls should be orientated east to west, as eastern and western wall areas are difficult to shade from the sun by using simple eave overhangs. Information on northern and southern eave angles is included in Figures 5 and 6.

Natural ventilation: Ventilation can significantly increase evaporation rates to improve a person’s comfort in hot climates. Hot humid regions have very low evaporation rates (in still air) and any increase in ventilation, particularly natural ventilation (breezes), should be promoted.

Coloured surfaces: Dark coloured surfaces are hotter in the sun than light coloured surfaces. Light coloured surfaces can be produced by using tinted coatings (any colour de-saturated with white) or zincalume, galvanised steel coatings.

It should be noted that aesthetics is an integral part of design and light coloured surfaces need only be considered for surfaces exposed to significant amounts of direct sun.

ROOF DESIGN
Heat gain from the sun: Roof insulation is important because a large proportion of heat gain and heat loss (relevant to arid regions) occurs through the roof.
Roof ventilation: Research is being undertaken regarding different roof constructions for humid regions. The use of ceiling insulation is the best option where artificial heating or cooling of houses is to be used or where there are cold winters, such as in the arid regions.

Problems have been experienced with rotary ventilators becoming noisy and being made inoperable by building occupants. Water ingress through rotary ventilators can also be a problem. Designers should consider the use of either fixed roof ventilation features or high quality rotary ventilators where roof ventilation strategies are adopted.

Verandah roofs: There can be significant heat build up under uninsulated verandah roofs, especially in hot arid regions during summer (Oct to April). Providing some form of roof insulation can make verandah areas much more attractive for daytime use and consequently provide an extra daytime living area.

WALL DESIGN
Heat gain from sun: The amount of heat gain from low morning and afternoon sun striking eastern and western walls, and especially living area/bedrooms windows, should be minimised. This can be achieved by using measures such as: reducing exposed wall area; avoiding windows on these facades; vertical shading devices; verandahs; and vegetation.

Blockwork walls: Shading is an extremely important consideration where concrete block walls are used as it is relatively costly to add an insulating layer. Concrete blockwork (hollow and solid) absorbs and stores heat from direct sun and releases it into dwellings over time. It also has very poor insulating properties (see below). Direct sun on concrete blockwork should be avoided at all times except in hot arid regions in winter where this may be an effective passive heating strategy.

Insulation values: The “R-Value” is a scientific unit, which indicates how well a building element insulates against the transfer of heat into or out of a house. For example, a wall with an R-Value of 2 stops twice as much heat from entering or exiting through the wall as a wall with an R-Value of 1.

Some indicative wall R-Values:
Steel clad, steel frame walls,
- R 0.32 – No Sisalation and internal plasterboard
- R 0.70 – Sisalation and internal plasterboard
- R 1.3 - Bulk R 1.5 insulation and internal plasterboard

Blockwork walls
- R 0.35 - Hollow concrete blockwork wall, 190 mm thick.
Note that the insulating value of sisalation is only achieved if the reflective side is facing an air gap greater than 25 mm wide.

**FLOOR DESIGN**
Concrete floors reduce internal temperatures during days and increase internal temperatures during nights compared to elevated timber/light weight floors.

In effect concrete floors have a much greater capacity (called thermal mass) to store and release heat than timber/lightweight floors. This can be used to advantage in areas where there are extremes in temperature, such as the desert regions.

### 3.8.18.1 Design for climate in hot humid regions

**Explanatory Information**

**General**
House orientation and installation of shading devices should aim to protect walls (especially concrete blockwork walls), concrete floors, and especially living areas/bedroom windows from direct sun at all times of the day and year.

Light coloured finishes should be considered for roof and wall surfaces which are likely to be exposed to more than 4 hours of direct sun per day during October to April (wet season).

Consideration shall be given to maximising natural ventilation, by orientating (if no problem with solar control) houses to catch prevailing breezes, careful selection and placement of external and internal openings for cross flow ventilation and adopting narrow floor plans.

Houses in hot humid regions (refer Figure 4) shall comply with the minimum requirements:

**Roof design**

**(a) 100% naturally ventilated dwellings**
Three deemed-to-satisfy options for roofs over enclosed areas are:

(i) *Under-roof sisalation (reflective side facing down) and weathertight, vermin-proof roof space ventilation designed to provide a high level of air flow through eaves and gable and/or ridge ventilation, or

(ii) Under-roof sisalation (reflective side facing down) and R2.5 ceiling insulation, or

(iii) R2.5 foil backed insulating blanket directly under roof.

*Note: Full roof ventilation is not recommended for steel framed roofs within a kilometre of the coast because of increased corrosion risks.*
(b) Air conditioned dwellings (either part or fully air conditioned)

Under-roof sisalation (reflective side facing down) and R2.5 ceiling insulation shall be provided for roofs over enclosed areas.

Wall design

Light weight framed walls

(i) 100% naturally ventilated dwellings - sisalation (reflective side facing the air gap) shall be installed in all external walls as a minimum insulating requirement.

(ii) Air conditioned dwellings (either part or fully air conditioned) - insulation with a minimum R-value of 1.5 shall be installed in all external walls as a minimum insulating requirement.

3.8.18.2 Design for climate in hot arid regions

Explanatory Information

General

Housing orientation and installation of shading devices should aim to protect walls (especially concrete blockwork walls during October to April), concrete floors and especially living area/bedroom windows from direct sun during September to April but possibly allow some low angle winter sun to strike northern walls and especially windows and concrete floors during May to August.

Light coloured finishes should be considered for roof and wall surfaces which are likely to be exposed to more than 4 hours of direct sun per day from October to April.

Consideration should be given to insulating and lining verandah roofs to provide comfortable daytime living areas in summer.

Houses in hot arid regions (refer Figure 4) shall comply with the minimum requirements:

Roof design

All roofs over enclosed areas shall have under-roof sisalation (reflective side facing down) and R2.5 ceiling insulation provided.
Wall design

Light weight framed walls

(i) 100% naturally ventilated dwellings - sisalation (reflective side facing the air gap) shall be installed in all external walls as a minimum insulating requirement.

(ii) Air conditioned or heated dwellings - insulation with minimum R-value of 1.5 shall be installed in all external walls as a minimum insulating requirement.
Figure 4: Hot humid and hot arid climatic zones in the Northern Territory

3.8.18.3 Eave angles

**Explanatory Information**

**Hot humid regions**

Eaves (and verandahs) designed using suggested minimum angles shown in Figure 5 shade walls and windows from northern and southern direct sun all year:

![Figure 5: Recommended Darwin and Katherine Minimum Eave Angles](image)

Minimum Northern Eave Angle = (Latitude + 23) degrees
Minimum Southern Eave Angle = 18-19 degrees

**Hot arid regions**

**Northern eaves** – Consider designing eaves to shade northern windows between August and April whilst letting the winter sun shine in (refer Figure 6). Concrete floors, and other exposed internal heavy mass materials, store heat from the winter sun penetration and release this heat during the cooler nights.

![Figure 6: Recommended Alice Springs Northern Eave Angle](image)

Eave angles that let northern sun strike Alice Springs and Tennant Creek walls and windows from 22 March – 22 September. However, as summers are long and hot and winters are relatively short, it is more important that good shade is provided throughout the year than passive solar heating is achieved in winter.

For other hot arid regions:
Northern eave angle to shade windows from August-April = (Latitude + 11) degrees
**Southern eaves** – During summer the sun is in the southern half of the sky. Avoid heat gain in summer by: maximising southern eave and verandah widths; limiting southern window areas; ensuring window sill heights are as high as possible to maximise shading by eaves; using wall materials with good insulating properties; and using vertical wing walls to shade windows and walls from low west-southwest and east-southeast sun.
PART 3.8.20 MISCELLANEOUS (Additional Part to the BCA)

Explanatory Information

This Part sets out miscellaneous requirements, which broadly fall into the definition of ‘Health and Amenity’.

3.8.20.1 Food preparation

(a) Facilities must be provided as described in Part 3.8.3 of this document for the preparation and storage of food.

(b) All surfaces used for preparation and storage of food must be impervious, free of cracks and crevices, and resistant to moisture. Bench tops used for preparation must be of robust construction, with a surface that is highly durable and resistant to scratching and chemicals.

Deemed-to-Satisfy materials for bench top surfaces are stainless steel; laminated 32 mm moisture-resistant MDF, with the front edge either solid timber or post-formed; and 18 mm compressed fibre-cement with an epoxy finish. Stainless steel is the preferred material in heavy-use areas.

(c) Walls behind fixtures and benchtops must be protected from the effects of water according to Clause 3.8.1.2 (b) (iii) of this document, with Deemed-to-Satisfy materials and construction as set out in Clauses 3.8.1.5 and 3.8.1.6 of the BCA.

Such walls will also be Deemed-to-Satisfy if they are constructed from the same material as the bench top surface.

(d) Walls behind stove tops and/or ovens must be protected from the floor to a height of 600 mm above the cooking surface, and 150 mm to each side of the stove, with Deemed-to-Satisfy materials and construction as set out in Clauses 3.8.1.5 and 3.8.1.6 of the BCA.

(e) Stove tops and/or ovens should be designed to be easily cleaned. They must either be set flush into the benchtop or, if freestanding, must be a minimum of 75 mm away from adjacent benches or fixtures to allow access for cleaning.
3.8.20.2 Pest control

(a) Construction generally must discourage access by pests and vermin such as rats and mice.

(b) All cabinetwork must be designed so as to discourage pests and vermin (including cockroaches) from harbouring and breeding.

(c) All cabinetwork shall sit free of the floor by a minimum of 300 mm, with the floor finish continuous under the cabinet work.

3.8.20.3 Insect screening

Explanatory Information

Insect screening: Consideration should be given to using materials more robust than conventional screening. There are several steel and aluminium meshes available that may be appropriate.

(a) Insect screening must be provided to all openable windows and external doors.

3.8.20.4 Cultural issues

(a) As described in the Performance Requirements in Part B1.1 of this document, designs must address cultural considerations including high and fluctuating occupancy levels.

(b) Bedrooms shall have a reasonable degree of privacy without necessarily requiring curtains or the like over windows, e.g. by the use of opaque or obscure glazing materials.

(c) The location and design of the bathroom and toilet(s) shall take into account the following:

   (i) the facility for discreet entry to these areas, i.e. bathrooms and toilets are not to be located immediately off the living areas or kitchen, and access to either must generally be screened; and

   (ii) the desirability of accessing these areas separately from the outside, so that visitors ‘camping’ on verandahs or near the house may access facilities without going through the house.
(d) The existence of avoidance relationships must be considered, in the following ways:

(i) there should be good views from the main areas of the house towards where visitors are likely to arrive, and

(ii) consideration shall be given to more than one entry/exit from the main living area of the house.

Explanatory Information

Verandahs: For verandah areas intended for sleeping purposes a minimum verandah width has been given. This is to ensure there is enough room to walk around the end of a bed. Also the verandah roof needs to be wide enough to provide adequate shelter from the rain. A minimum 4 m wide verandah roof should be considered for verandah sleeping areas.

(e) High and fluctuating occupancy levels must be accommodated by meeting the requirements of Clause 3.8.20.5 of this document with regard to floor area, and by consideration of the following:

(i) provision of ‘overflow’ sleeping areas adjacent to or near the house, such as verandahs, which must be dry and designed for a reasonable level of privacy;

(ii) where verandahs are provided as overflow sleeping areas, they shall have a minimum width of 3 m as measured from the outside wall; and

(iii) provision of adequate food preparation, bathroom, laundry and toilet facilities, sewage disposal capacity, and hot water capacity. Visitors should be allowed access to all facilities.

3.8.20.5 Required floor area

Explanatory Information

Room sizes: Overcrowding is a significant issue in Indigenous housing and the BCA does not have any requirements for room size.

Statistics show an average population of 9 people per Indigenous household in the Northern Territory (CIAS, 2001). If this is combined with the high mobility due to seasonal and cultural factors, then it can be argued that houses should be designed to accommodate at least 9 people, and ideally be able to cope with fluctuating numbers from 0 to 20+ people.

Floor areas may include storage. That is, they are not intended to indicate ‘clear’ floor area.
(a) The amount of floor area provided must meet the Performance Requirements set out in Part B.1.1 of this document.

(b) Any room intended for sleeping in must have a minimum floor area of 12 m².

3.8.20.6 Security

Security issues must be considered in the following ways:

(a) Day-to-day security of the house needs to be assessed and appropriate measures provided, which may include security bars or grilles, security doors, etc.

(b) Consideration shall be given to the likelihood of some or all of the occupants of the house being away for extended periods. This may require lock-up facilities within the house for individual belongings, and/or the facility to secure the entire house for extended periods.

3.8.20.7 Fire safety

Explanatory Information

Fire safety: There is no evidence of a higher incidence of fires in Indigenous housing than in other housing in the Northern Territory. However, it is noteworthy that there are very few requirements in relation to fire safety in residential buildings in general in the Northern Territory, and it is possible to design houses that, while in accordance with all legal requirements, are quite unsatisfactory from the point of view of fire safety.

The intention of this Clause is to draw attention to the factors involved in fire safety so that they may be given consideration in the design.

External locks such as padbolts are deemed to create a fire safety risk and do not comply with 3.8.20.7(a).

With regard to fire safety, consideration must be given to the following:

(a) Appropriate door hardware, which is openable at all times from the inside without the use of a key;

(b) Alternative exits in the case of a fire;

(c) Distance to exit(s);

(d) Avoiding a situation where escape from bedrooms is past the kitchen (the most likely source of a fire); and

(e) Use of materials with low fire hazard indices.
3.8.20.8 Electrical requirements

(a) All electrical installations shall comply with AS/NZS 3000, and with the requirements of PAWA. In addition:

(i) all underground wiring is to be at a minimum depth of 600 mm;

(ii) consideration must be given to impact-resistant switches and general power outlets, and to the mounting height of switches and general power outlets; and

(iii) electrical boosters for solar hot water systems (if installed) shall have a ‘one-hit’ switch so water is boosted to maximum temperature only once.

(b) The minimum number of general power outlets provided shall be:

(i) Each bedroom: 1 x double

(ii) Kitchen: 2 x doubles above benches, plus 1 x single for fridge. A flush mounted 32 amp outlet may be provided for the stove top and/or oven. The outlet configuration is to be similar to the Clipsal Brand type – 2031 VCS,WE and plug and lead to Clipsal Brand type – 800 CL.

(iii) Living: 3 x doubles

(iv) Laundry: 1 x double adjacent to the washing machine

(v) Bathroom: 1 x single

(vi) Externally: 1 x double

(c) Power outlets for stove tops and/or ovens not hardwired shall be located at a safe height not readily accessible to children.
3.8.20.9 Doors and hardware

**Explanatory Information**

Doors and hardware: It is advisable that multiple copies of house keys be retained by council or the housing office.

The following requirements must be met:

(a) Doors and door hardware must be robust and low maintenance;

(b) External doors shall be solid-core;

(c) All solid-core doors must have three hinges;

(d) All door hinges shall be 100 mm;

(e) All locksets must have removable cylinders;

(f) Hinges to cabinetwork must be robust and low maintenance;

(g) Privacy latches to all bathrooms and sanitary compartments; and

(h) If provided with locksets, bedroom doors shall be openable from the bedroom side at all times by turning the handle.
### 3.8.20.10 Outdoor living/landscaping

<table>
<thead>
<tr>
<th>Explanatory Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outdoor living/landscaping</strong>: The development of the area around the house should be given high priority due to the potential to reduce overcrowding, and to provide positive environmental health and amenity outcomes.</td>
</tr>
<tr>
<td>The following areas should be given due consideration.</td>
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<tr>
<td>(a) Dust minimisation (via restriction of vehicle movement and suitable planting);</td>
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<tr>
<td>(b) Facilities for outdoor living, sleeping, cooking, recreation, and other activities, taking into account the likelihood of high numbers of visitors;</td>
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<td>(c) Shade;</td>
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<tr>
<td>(d) ‘Bush tucker’; and</td>
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<tr>
<td>(e) Fencing.</td>
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B.1.3 Approval Processes

IHANT projects

For Indigenous housing works constructed under community housing grants funded by the Indigenous Housing Authority of the Northern Territory (IHANT), the approval process entails self-certification by a consultant appointed by the community. The process is described in the Manual for the Administration of Projects Funded by the Indigenous Housing Authority of the Northern Territory.

Other housing projects

The decision to construct Indigenous housing in accordance with this document is strongly recommended but ultimately rests with the funding agency.
B.2 COMMUNITY FOOD STORES

B.2.1 Performance Provisions

Objective
The objective is to-
(a) ensure a safe and adequate food supply;
(b) prevent the transmission of food borne disease; and
(c) assist in the achievement of personal and domestic hygiene practices.

Functional Statement
The community food store must be built and operated to ensure a safe and nutritious food supply and access to basic personal and domestic hygiene items.

Performance Requirement
Community food stores must:
(a) have enough space for their equipment and the work that they do;
(b) be protected from pests and other contaminants such as dirt and fumes;
(c) be easy to clean and keep clean;
(d) have enough water available at the right temperature for the work to be done;
(e) have a disposal system for garbage, sewage and wastewater;
(f) have sufficient lighting and ventilation;
(g) where the community food store is the only store in the community, stock basic personal and domestic hygiene items; and
(h) be constructed and operated in accordance with any Work Health Authority requirements for workplaces.

Fixtures, fittings and equipment must be:
(i) appropriate for the work of the business;
(j) suitable for the jobs they are used for;
(k) easy to clean and, if necessary, sanitised; and
(l) be made of material that does not contaminate food.
**B.2.2 Deemed-to-Satisfy Provisions**

**Explanatory Information**

There are four national food safety standards that reflect international best practice. The Australian New Zealand Food Authority (ANZFA) developed these standards in consultation with State and Territory health authorities, the food industry and other interested organisations and individuals.

The food safety standards are:

3.1.1 Interpretation and application

3.2.1 Food Safety Programs (Food Safety Programs are not yet required in the NT);

3.2.2 Food Safety Practices and General Requirements; and

3.2.3 Food Premises and Equipment.

Please contact your local Environmental Health Officer for more information about the food safety standards.

Darwin Urban ☎ (08) 8922 7377
Darwin Rural ☎ (08) 8922 8988 / (08) 8922 8349
East Arnhem ☎ (08) 8987 0440 / (08) 8987 0441
Katherine ☎ (08) 8973 8411
Barkly ☎ (08) 8962 4302
Alice Springs Town Council ☎ (08) 8950 0500
Alice Springs Rural ☎ (08) 8951 6920

Australian New Zealand Food Authority
PO Box 7186
Canberra MC ACT 22610
☎ 1300 652 166
http://www.anzfa.gov.au

Construction in accordance with the following is a Deemed-to-Satisfy solution:

**Standard 3.2.3 Food Premises and Equipment**

This Standard sets out the requirements for food premises, fixtures, fittings, equipment and food transport vehicles, to minimise the risk of food contamination.
B.2.3 Approval Processes

Plans and specification for new community food stores, or alterations to existing community food stores, shall be submitted for comment to the Environmental Health Officer for the locality in which the works are to be carried out.

Plans and specifications for new community food stores, or alterations to existing community food stores, shall also be submitted for comment to the Power and Water Authority regional office for the locality in which the works are to be carried out.

Outside building areas it is desirable that structural works, including alterations or additions, be certified by a registered building practitioner in accordance with the Building Act.
B.3  PUBLIC BUILDINGS

B.3.1  Performance Provisions

Objective

The objective is to provide a safe venue for the conduct of public activities.

Functional Statement

Public buildings must be able to safely accommodate the intended use.

Performance Requirement

(a) All public buildings must comply with the Performance Provisions set out in the Building Code of Australia; and

(b) Public buildings must also have sanitary and ablution facilities that accommodate privacy requirements.
B.3.2 Deemed-to-Satisfy Provisions

Construction in accordance with the following requirements is a Deemed-to-Satisfy solution:

B.3.2.1 Public buildings - construction

(a) Compliance with the Building Code of Australia Volume 2, Class 2-9 Buildings.

(b) Separate sanitary facilities must be provided for both men and women. (i.e. unisex facilities are not permitted).

(c) Entry to sanitary facilities must be designed and constructed to allow discrete access to these facilities.

B.3.2.2 Public buildings - management and operation

Explanatory Information

Public buildings must be kept clean and functional in order to safely accommodate the intended use. The responsible person or community organisation must ensure that all sanitary, ablution and/or cooking facilities are kept clean and functional.
B.3.3 Approval Processes

Plans and specification for new public buildings, or alterations to existing public buildings should be submitted for comment to the Environmental Health Officer for the locality in which the works are to be undertaken.

Plans and specification for new public buildings, or alterations to existing public buildings, shall also be submitted for comment to the Power and Water Authority regional office for the locality in which the works are to be carried out.

Outside building areas it is desirable that structural works, including alterations or additions, be certified by a registered building practitioner in accordance with the Building Act.
B.4 PUBLIC SANITATION AND ABLUTION FACILITIES

B.4.1 Performance Provisions

Objective

The objective is to reduce the transmission of infectious diseases by facilitating personal hygiene practices.

Functional Statement

Public sanitation and ablution facilities must provide toilet, hand washing, bathing and laundry facilities for those people who do not have access to these facilities elsewhere in the community.

Performance Requirement

(a) Toilet facilities must ensure human waste is disposed of in a manner that minimises the risk of contact between people and pathogenic organisms;
(b) Bathing facilities must be provided for adults and children and must provide adequate privacy for occupants, and facilities for the temporary placement of personal clothing and items;
(c) Laundry facilities must allow for the washing of clothing and bedding;
(d) Public sanitation and ablution facilities must be able to dispose of all wastewater generated, in a manner that minimises the risk of contact between people and pathogenic organisms; and
(e) Public sanitation and ablution facilities must be maintained in a clean and functional condition.
B.4.2  Deemed-to-Satisfy Provisions

Construction and operation in accordance with the following is a Deemed-to-Satisfy solution:

B.4.2.1  Public sanitation and ablutions facilities – location

Public sanitation and ablution facilities are to be located within, attached or adjacent to a public building.

Explanatory Information

This will assist in identifying the person or organisation responsible for ensuring that cleaning and maintenance of the facilities is undertaken on a regular basis.

B.4.2.2  Public sanitation and ablutions facilities - toilets

All community facilities and public access buildings must be provided with public toilets in accordance with the Building Code of Australia, except that unisex facilities are not acceptable.

B.4.2.3  Public sanitation and ablutions facilities - showers

(a)  All plumbing must be in accordance with AS 3500.

(b)  Public shower facilities must be provided in at least two locations in the community. Facilities must be located at or within community buildings such as the women’s centre, council offices, resource centres, CDEP offices, etc. (health centre facilities are not to be counted as public facilities).

(c)  Separate shower facilities must be provided for men and women, with a minimum of two shower cubicles for each gender at each location.

(d)  Showers must comply with requirements set out in Part B.1.2 of this document.
B.4.2.4 Public sanitation and ablutions facilities - laundries

(a) All plumbing must be in accordance with AS 3500.

(b) Commercial grade washing machines must be made available for community use in at least two locations in the community. Facilities must be located at or within community buildings such as the women’s centre, council offices, resource centres, CDEP offices, etc.

(c) A high shelf constructed of smooth impervious material must be provided for each washing machine.

(d) Each location must also have stainless steel laundry troughs, complete with an integral drainage board, or dedicated bench space, on at least one side.

(e) The troughs must be a minimum of 70 litres capacity, have a washing machine bypass assembly, and an overflow assembly.

(f) Washing machines and troughs must be provided in the ratio of one for every 50 people, or part thereof.

(g) A prominent notice should be provided specifying appropriate quantities and use of detergent. On-site sewage and sullage disposal systems must be of sufficient capacity to dispose of maximum hydraulic loads.

B.4.2.5 Public sanitation and ablutions facilities - drainage

(a) All wet areas - such as laundry and shower facilities, must be graded and drained to floor waste.

(b) All wet areas must be made waterproof in accordance with the requirements of the BCA and Part 3.8.1 of this document.

(c) All wet areas must be designed and located to ensure any flooding that may occur does not flow into the attached building.

B.4.2.6 Public sanitation and ablutions facilities - management and operation

Explanatory Information

Public sanitation and ablution facilities must be kept clean and functional in order to provide the intended service. The person or organisation responsible for the public building in which the facilities are located must ensure that the facilities are maintained in a clean and functional condition.
B.4.3 Approval Processes

Plans and specification for public sanitation and ablution facilities shall be submitted for comment to the Environmental Health Officer for the locality in which the works are to be undertaken. Approval for the sewage disposal system shall also be sought in accordance with Part B.7.2 of this document.

Outside building areas it is desirable that structural works, including alterations or additions, be certified by a registered building practitioner in accordance with the Building Act.
B.5 WATER SUPPLY

B.5.1 Performance Provisions

Objective
The objective is to:

(a) provide a safe supply of drinking water;
(b) provide a sustainable water supply for domestic needs; and
(c) prevent the transmission of infectious disease via contaminated water or by the inability to wash due to an inadequate water supply.

Functional Statement
The water supply must be of a quality safe for consumption and an adequate quantity to provide for drinking, cooking, washing, and cleaning.

Performance Requirement
(a) The water supply will be protected from contamination;
(b) A continuous supply of water will be available to facilities on all serviced allotments; and
(c) The water supply will be monitored on a regular and ongoing basis to ensure suitable quality and quantity.

Explanatory Information
The above applies to communities serviced by the Power and Water Authority (PAWA).

PAWA is not responsible for water supplies to outstations. ATSIC is currently responsible for services to outstations. (This is a situation where people may choose to live in areas where it is not possible to provide the same level of service as are available in more highly populated, or less remote areas).

This establishment of outstations, including service delivery, is being examined by ATSIC and to some extent IHANT. It is envisaged that at some stage in the future, charges may be levied for water consumption.
B.5.2 Deemed-to-Satisfy Provisions

Contents for water supply

B.5.2.1 Guidelines for setting out and recording works

B.5.2.2 Water supply to remote communities (communities serviced by PAWA)

B.5.2.3 Water supply to outstations (communities not serviced by PAWA)

Construction and operation in accordance with the following is a Deemed-to-Satisfy solution.

B.5.2.1 Guidelines for setting out and recording works on remote communities in the Northern Territory

**Explanatory Information**

Poor location records can lead to water mains being broken during construction works and possible contamination of a community’s water system. Contamination (health) risks are increased where non-chlorinated water supplies are used and where on-site disposal of sewage is employed.

Land tenure

There are very few cadastral boundaries that exist within remote communities in the Northern Territory. Lot fence posts are installed to help determine the location of housing and related infrastructure, not to signify legal property (cadastral type) boundaries.

Control

Control points are being established on remote communities to allow the accurate recording of underground service location information on NTG maps.

Power poles are the permanent control points for survey work and are used to set out and record all land servicing work on communities. The power pole locations (control points) are shown on the present topographic map compiled and managed by the Department of Lands, Planning and Environment (DLPE). Their location on the ground is expected to be within 0.5 m of the recorded photogrammetric position.
DLPE are currently in the process of mapping control points. Other well defined features on aerial photography may need to be used in the interim (refer to SLAP maps produced by DLPE). Well-defined features normally include old power poles and fencing corner posts. Mapping accuracy is summarised below:

<table>
<thead>
<tr>
<th>SLAP mapping</th>
<th>Proposed control points</th>
<th>Well defined features</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDA 94</td>
<td>100% within 0.5 m</td>
<td>generally 90% within 0.5 m</td>
</tr>
<tr>
<td>pre GDA 94</td>
<td>not available</td>
<td>generally 90% within 1.25 m.</td>
</tr>
</tbody>
</table>

Confidence levels for old mapping without control points vary considerably, and due care should be taken when referencing work to well-defined features.

**Set out of works**

Design intent shall be the governing factor in setting out the works. Works shall be referenced to control points identified by DLPE if available, otherwise to features that would be well-defined on aerial photography.

Lot fence posts and services may be shifted up to 1 m to help with setting out, any adjustments over 1 m in setting out shall require the approval of Territory Housing.

**Recording of works on plans**

Only underground services and features not visible on aerial photography are to be recorded. Lot boundaries need not be recorded. Underground services locations shall be recorded within an accuracy of 0.5 m from control points identified by DLPE or if not available from well defined features on aerial photography.

**Recording of works in the field**

As constructed information shall be delivered in accordance with PAWA requirements. Special field markers for allotments and underground services are detailed on PAWA standard drawings included in Appendix B.

Water reticulation field markers shall be installed to record the location of fire hydrant stubs for future hydrant connection.

**Reference points for setting out and recording of works**

Minor underground service extensions shall be referenced to at least 2 control points and major underground extensions (subdivisional work) to at least 4 control points. If using well-defined features then more reference points should be used.
B.5.2.1 (a) Requirements for producing a SLAP map amendment drawing using design information

Design information is used for adding and amending information held in the SLAP Map Information System files. A SLAP map amendment drawing based on project design information is required to help with the updating process.

General specifications

SLAP map amendment drawings are to be supplied to Territory Housing – Land Use Planning Branch (ph 8999 8467) in the following formats:

(a) Microstation or Autocad format with the same global origin, working units (metres, centimetres) and coordinate system as the SLAP Map Information System files.

(b) A3 hard copy of the digital SLAP map amendment drawing with lettering not less than 2 mm high. Refer to Figure 7 for a typical layout.

An A3 hard copy is required at the 90% design stage and the digital information is to be supplied with the tender drawings.

Data required for the SLAP map amendment drawing

For assistance in the preparation of a SLAP map amendment drawing, contact the Department of Lands, Planning & Environment, Nichols Place, Darwin - ph 8999 7031 or fax 8999 7750.

Only underground services, power poles (if independent survey control used) and lot boundaries, refer Figure 7, are to be featured on the SLAP map amendment drawing. The half tone symbology represents the existing SLAP map services that are not being amended.

The SLAP map amendment drawing shall be referenced to at least 4 power pole locations shown on the SLAP maps. SLAP control points - specially mapped power pole locations shall be used in preference to standard mapped power pole locations. Mapping accuracy is summarised below:

<table>
<thead>
<tr>
<th>Mapping</th>
<th>SLAP control points</th>
<th>Standard mapped power pole locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDA 94 pre GDA 94</td>
<td>100% within 0.5 m</td>
<td>generally 90% within 0.5 m</td>
</tr>
<tr>
<td></td>
<td>not available</td>
<td>generally 90% within 1.25 m</td>
</tr>
</tbody>
</table>
Figure 7: SLAP map amendment drawing

<table>
<thead>
<tr>
<th>CONTROL PP</th>
<th>VARIATION BETWEEN SLAP TO SURVEY PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP1</td>
<td>0.08</td>
</tr>
<tr>
<td>PP2</td>
<td>0.18</td>
</tr>
<tr>
<td>PP3</td>
<td>0.26</td>
</tr>
<tr>
<td>PP4</td>
<td>0.37</td>
</tr>
<tr>
<td>PP5</td>
<td>0.18</td>
</tr>
<tr>
<td>PP6</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Legend:
- SEWER
  - Septic Tank
  - 3/6 Manhole and Cover No.
  - PS 2 Pump Station and No.
  - Sewer Rising
  - Main Marker or Valve Marker

- WATER
  - Water Marker or Fire Hydrant
  - Service Valve
  - Reducer

- CONTROL POINTS
  - Power Pole
    - (Approx. 0.5m to 1.25m Accuracy)
  - Power Pole SLAP Map Control Points
    - (Better than 0.5m Accuracy)
  - Power Poles Picked Up When Ground Survey Used.

Ground Surveyed Power Poles Are To Be Referenced To SLAP Map Control - See Table (example only)

Drawn: ..............
Date: ..............

SLAP Map Amendment Drawing for "community".
B.5.2.2 Water supply for remote communities (serviced by PAWA)

Explanatory Information

The following requirements only apply to communities serviced by PAWA.

As noted in Part B.5.1 of this document, PAWA is not responsible for water supplies to outstations. However, in less populated and remote areas, quality, quantity, and safe storage of water must be considered minimum requirements for health.

In exceptional circumstances some communities or outstations will be established in areas where the water supply does not meet minimum quality or quantity guidelines. Such decisions are made by funding bodies such as the Indigenous Housing Authority of the Northern Territory (IHANT), and are based on the understanding that the people living in that location are aware of the problems with the water supply, but maintain that the benefits of living there outweigh the possible risk to health from the available water supply.

This is not a recommended practice for areas where the water quality may have detrimental effects on human health.

Quality

(a) Microbiological quality of the water supply shall be in accordance with the 1987 National Health and Medical Research Council (NH&MRC) guidelines. Chemical quality of the water supply should be in accordance with the 1996 NH&MRC guidelines.

(b) For PAWA serviced communities, testing and monitoring of the quality of the water supply shall be in accordance with the 1987 NH&MRC guidelines.

(c) If required, disinfection facilities for PAWA serviced communities shall be in accordance with PAWA standards.

B.5.2.2 (a) Water collection and storage

(a) Collection and storage facilities for PAWA serviced communities shall be in accordance with PAWA standards.

(b) Collection and storage facilities for PAWA serviced communities will be protected from access by unauthorised people, in accordance with PAWA standards and Work Health Authority requirements.

(c) Water storage tanks will be sealed and covered to prevent access to contaminants, animals, unauthorised people, and to inhibit breeding of mosquitoes.
B.5.2.3 Water supply to outstations (not serviced by PAWA)

B.5.2.3 (a) Guidelines for minimum water supply service levels

**Explanatory Information**

This Part recommends the basic quantity and pressure of water that should be delivered to housing on outstations to maintain healthy living practices.

The guidelines relate to the delivery of water for drinking, cooking, personal washing and laundry purposes. The issue of water quality (bacteriological and chemical), is yet to be addressed.

The following intends to assist funding organisations and developers in selecting appropriate and affordable service levels for the delivery of water to outstation housing. It is not practical to set one water supply service level to cover all outstations because of the greatly differing water supply costs in different regions of the Northern Territory.

B.5.2.3 (b) Water source management, storage and mains

**Water source management**

The quality and rate of supply from the water source and associated headworks are to be the subject of a water management plan. This plan is to be developed in consultation with the Department of Lands, Planning and the Environment - Natural Resources Branch and other relevant organisations. Water supply infrastructure development proposals should target compliance with health related water criteria.

Water sources of less than 0.5 litres per second sustainable yield are generally not considered viable for outstation development.

**Water storage**

The water tank size for reticulated outstation water supplies should be not less than 20,000 litres and should store enough water for 2 days average water demand. Where the pumping equipment is a windmill only, the basic storage should allow for 5 days average demand.

**Water mains**

Both rising mains and reticulation pipework should be of DN50 or larger with a minimum pressure rating of class B (rural). Rising mains should generally be less than 3000 m long. All plumbing and pipework shall comply with the provisions of this document.
B.5.2.3 (c) Water supply levels

**Explanatory Information**

Many outstations have limited water supplies to housing because of the high cost of pumping water. Water quality can also greatly affect water supply costs and prohibit the development of a water source, however this examination is beyond the scope of this document. The following recommendations are made in recognition of generally high costs of pumping that occur on outstations:

**Level 1:** Should only be considered where there are very high recurrent costs such as:
- water has to be transported because there are no suitable local water sources;
- local water sources need treatment because of poor quality; or
- very deep water tables (e.g. Barkly region), incur high pumping costs.

Infrastructure should still be constructed to Level 2 to allow for future upgrading.

**Level 2:** Should be considered where there are high pumping costs due to expensive energy sources such as:
- solar cells (solar energy source), which are expensive to purchase;
- fuel (chemical energy source), which is expensive to transport to remote areas; or
- windmills (wind energy source), which are expensive to set up and maintain.

(Most outstations will probably be covered by Level 2 because of their remoteness.)

**Level 3:** Should be considered where there are moderate pumping costs due to relatively cheap energy sources such as:
- fuel which can be economically transported to the outstation for most of the year;
- mains power which provides relatively cheap electrical energy; or
- high water tables that help reduce energy demands on solar pumping systems.
The recommended minimum supply figure for outstation houses is 250 litres per person per day. Water supply levels that fall below 100 litres per person per day are unlikely to provide a satisfactory and healthy service for house residents. New house construction should not occur if the water supply level is likely to fall below 100 litres per person per day.

The Australian Water Resources Council recognises three levels of water supply. These three levels, with minor adjustments for outstation conditions are:

**Level 1: Minimum housing supply level**

100 litres per person per day. All available water conservation measures are to be adopted. These include adopting waterless toilets, showers only - (no baths), manual washing of clothes - (no automatic washing machines), no gardening and ensuring all plumbing is kept in good condition to minimise water leakage.

**Level 2: Basic housing supply level**

250 litres per person per day. Less stringent water conservation measures need to be adopted. These include adopting very restricted gardening practices - (hand watering only), low volume dual flush toilets and ensuring all plumbing is kept in good condition to minimise water losses. If automatic washing machines are to be used an extra 30 litres per person per day should be added to the above figure.

**Level 3: Desirable housing supply level**

400 litres per person per day. All plumbing needs to be kept in good condition to minimise water losses.

In comparison - the desirable water supply level (on average) for a major remote community is around 600 litres per person per day.
B.5.2.3 (d) Water pressure levels

The average operating water pressure levels supplied to outstation houses should be as follows:

**Ground level housing**
- **cold water only** \(4.5 \text{ m supply head}\)
- **hot and cold water** \(6 \text{ m supply head}\)
- **washing machine use** \(10 \text{ m supply head}\)

**Elevated housing**
- **cold water only** \(6 \text{ m supply head}\)
- **hot and cold water** \(10 \text{ m supply head}\)
- **washing machine use** \(10 \text{ m supply head}\)

The supply head is measured from ground level at the housing site. Floor levels for ground level housing are assumed to be less than 1 m from ground level and elevated house floor levels less than 3 m from ground level.

Automatic washing machines generally require 14 m supply head to operate satisfactorily. Those operating on less than a 10 m supply head may need modification, or be equipped with a pressure pump to allow them to operate satisfactorily. Very limited power supplies, such as small solar systems, are unlikely to provide enough power to operate automatic washing machines or electric hot water systems.

The minimum average water pressures required for normal operating conditions are:
- \(1.5 \text{ m supply head to a shower nozzle}\);
- \(3 \text{ m supply head to a solar hot water system}\);
- \(10 \text{ m supply head to an electric hot water system}\); and
- \(10 \text{ m supply head to an automatic washing machine}\).

*The recommended minimum supply head for elevated houses on outstations is 10 m. For ground level houses the recommended minimum operating supply is 6 m. Emerging communities should be considering an average operating supply head of at least 10 m and preferably 14 m.*
B.5.3 Approval Processes

Requirements for connection, or any new or upgraded use of existing connections, shall be submitted for comment to the Power and Water Authority regional office for the locality in which the works are to be undertaken. In some instances fees will be applicable.
B.6 POWER SUPPLY


Objective

The objective is to-

(a) provide a safe power supply;

(b) assist in undertaking safe food storage and preparation practices; and

(c) assist in undertaking healthy personal and domestic hygiene practices.

Functional Statement

A safe power supply be available to all serviced allotments on application to the Power and Water Authority (PAWA).

Performance Requirement

The power supply will be in accordance with PAWA’s requirements.

Explanatory Information

The above applies to communities serviced by the PAWA. Power supplies are subject to a fee for service charge.

PAWA is not responsible for power supplies to outstations. At this stage ATSIC is responsible for services to outstations. (This is a situation where people may choose to live in areas where it is not possible to provide the same level of service as are available in more highly populated, or less remote areas.)

Issues regarding the establishment of outstations, including service delivery, are being examined by ATSIC and to some extent IHANT.
B.6.2 Deemed-to-Satisfy Provisions

Construction and operation in accordance with the following is a Deemed-to-Satisfy solution.

B.6.2.1 Guidelines for setting out and recording works

Please refer to Part B.5.2.1 of this document.

PAWA serviced communities infrastructure

(a) Any power supply must comply with Power and Water Authority (PAWA) requirements.

(b) Power supply facilities and equipment beyond PAWA responsibility, (i.e. the mains connection box), must comply with AS/NZS 3000 and other associated standards.

Explanatory Information

For outstations that are not serviced by a PAWA power supply, the power supply is usually provided privately.

For private power supplies it is essential that they meet AS/NZS 3000, and other associated standards which cover generation and distribution systems.

Northern Territory Legislation applicable to this Part:

<table>
<thead>
<tr>
<th>Applicable Legislation</th>
<th>Enforcement Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power and Water Authority Act</td>
<td>Power and Water Authority</td>
</tr>
</tbody>
</table>
B.6.3 Approval Processes

Requirements for connection, or any new or upgraded use of existing connections, shall be submitted for comment to the Power and Water Authority regional office for the locality in which the works are to be undertaken. Fees may apply.
B.7 SEWAGE DISPOSAL SYSTEMS

B.7.1 Performance Provisions

Objective

The objective is to prevent the transmission of infectious disease by direct contact with disease organisms or by contamination of food or water supplies.

Functional Statement

Sewage and wastewater must be disposed of in a manner that prevents direct and indirect contact between people and infectious organisms.

Sewage and wastewater must be stored and disposed of in a manner that prevents the breeding of mosquitoes.

Performance Requirement

(a) Adequate toilet facilities that safely dispose of human waste must be provided;

(b) All buildings and structures supplied with water must have adequate drainage systems to ensure the safe removal of wastewater;

(c) Sewage disposal systems must be constructed, located, maintained and operated so as to minimise the risk of contact between people and infectious organisms; and

(d) Sewage disposal systems must be constructed, located, maintained and operated so as to minimise the risk of contamination of drinking water supplies, food crops or other supplies, and to prevent the breeding of mosquitoes.
B.7.2 Deemed-to-Satisfy Provisions

Construction and operation in accordance with the following is a Deemed-to-Satisfy solution.

B.7.2.1 Guidelines for setting out and recording works

Please see Part B.5.2.1 of this document.

B.7.2.2 Septic tank systems and on-site effluent disposal systems

(a) Must comply with the Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent (refer Clause 3.8.17.7 of this document).

B.7.2.3 Sewage disposal systems involving effluent disposal off-site (common effluent disposal systems/sewage treatment lagoons, etc) which are operated and maintained by PAWA:

(a) The effluent disposal system must be designed and constructed to comply with the requirements of PAWA and be operated/ maintained in accordance with all contractual obligations between PAWA and the community council.

(b) Reuse of wastewater must be in accordance with the requirements of the Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent.

(c) For any sewage treatment plant which discharges effluent to a natural water body a discharge licence may be required under the Water Act - contact the Natural Resources Division at the Department of Lands, Planning and Environment.

Note: Each application for reuse of effluent and wastewater must be negotiated with Territory Health Services and the Power and Water Authority and will be considered on its individual merits.
B.7.2.4 Sewage disposal systems involving effluent disposal off-site (common effluent disposal systems/sewage treatment lagoons, etc.) which are to be privately maintained:

(a) Must comply with the Policy for the Design of Off-Site Sewerage Ponds and the Disposal or Reuse of Sewerage Pond Effluent (THS, PAWA, & DLPE 1997).

(b) For any sewage treatment plant which discharges effluent to a natural water body a discharge licence may be required under the Water Act - contact the Natural Resources Division at the Department of Lands, Planning and Environment.

Note: Each application for reuse of effluent and wastewater must be negotiated with Territory Health Services and the Power and Water Authority and will be considered on its individual merits.

**Explanatory Information**

Sewage storage, treatment, and disposal systems must adequately treat and dispose of sewage and wastewater to minimise/prevent contact with people, food or water sources. These systems must be constructed and maintained to prevent the breeding of disease vector insects such as mosquitoes.

**Northern Territory Legislation applicable to this Section:**

<table>
<thead>
<tr>
<th>Applicable Legislation</th>
<th>Enforcement Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health (General Sanitation, Mosquito Prevention, Rat Exclusion &amp; Prevention) Regulations</td>
<td>Territory Health Services</td>
</tr>
<tr>
<td>Water Act</td>
<td>Department Lands, Planning &amp; Environment</td>
</tr>
<tr>
<td>Water Supply and Sewerage Services Act</td>
<td>Power and Water Authority</td>
</tr>
</tbody>
</table>
B.8 RUBBISH COLLECTION AND DISPOSAL

B.8.1 Performance Provisions

Objective

The objective is to-

(a) prevent the transmission of infectious disease by reducing the number of disease vectors, pests and other vermin; and

(b) reduce the risk of injury and trauma.

Functional Statement

Rubbish must be collected, transported and disposed of in a manner that reduces the spread of disease, breeding and harbourage of insects and vermin and removes potential injury sources.

Performance Requirement

(a) Rubbish must be collected and disposed of on a regular basis;

(b) Rubbish must be disposed of in a manner that minimises contamination of the environment; and

(c) Rubbish must be stored and disposed of in a manner that prevents pest and vermin breeding, feeding and harbourage.
B.8.2 Deemed-to-Satisfy Provisions

Construction and operation in accordance with the following, is a Deemed-to-Satisfy solution.

B.8.2.1 Rubbish collection service

(a) Rubbish must be collected and disposed of at an approved tip site at least twice a week.

(b) Rubbish must be disposed of in accordance with the Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory (DLPE and THS 1995).

(c) Medical waste must be collected and disposed of in accordance with the Interim Policy for the Disposal of Departmental Clinical and Medical Waste (Territory Health Services 1995).

B.8.2.2 Rubbish bins - location

(a) All community facilities must be provided with an adequate number of rubbish bins. Community facilities include, but are not limited to: store, Council offices, women’s centre, clinic, sports oval or other sports facilities.

(b) Rubbish bins should also be located at strategic points along frequently used pedestrian pathways, e.g. between the store and council office, etc. (Strategic location will need to take into account vehicle access for collection, and need to avoid areas of general vehicle access which would result in damage to the rubbish bin.)

(c) Each house and living area must be provided with a rubbish bin for the deposit of household rubbish.

B.8.2.3 Rubbish bins - construction and design

(a) Rubbish bins must be capable of being secured in a manner that prevents dogs or other animals tipping them over.

(b) Rubbish bins must be constructed of materials that are smooth, impervious, durable, and easily cleaned.

(c) Rubbish bins must be easily emptied into collection vehicle.
(d) Rubbish bins should be fitted with lids that are attached to the bin itself.

(e) Rubbish bins must be of a volume, or number, to contain the expected amount of rubbish deposited between collection services.

**B.8.2.4 Rubbish collection vehicle**

(a) Vehicle must be constructed of materials that allow easy cleaning.

(b) Vehicle must be constructed so that collected rubbish cannot ‘fall’ or be blown out during transportation.

(c) Vehicle must be designed to allow for easy loading and unloading of rubbish, and cleaning.

**B.8.2.5 Rubbish tip site**

(a) The rubbish tip site must be constructed and operated in accordance with Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory (DLPE and THS 1995).

**Explanatory Information**

The *Waste Management and Pollution Control Act* received assent on 28 September 1998. This Legislation requires the approval of construction of landfills and the licensing of their operations.

**Northern Territory Legislation applicable to this Section:**

<table>
<thead>
<tr>
<th>Applicable Legislation</th>
<th>Enforcement Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Public Health (Nightsoil, Garbage, Cesspits, Wells &amp; Water)</em> Regulations</td>
<td>Territory Health Services</td>
</tr>
<tr>
<td><em>Waste Management and Pollution Control Act</em></td>
<td>Department of Lands, Planning and Environment</td>
</tr>
</tbody>
</table>
B.8.3 Approval Processes

Plans and specification for construction of a rubbish disposal site shall be submitted for approval to the Environment and Heritage Division of the DLPE.

See Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory (THS and DLPE 1995) for assistance in preparing the management plan.
B.9 PEST AND ANIMAL CONTROL

B.9.1 Performance Provisions

Objective
The objective is to prevent the transmission of infectious diseases by insects and other vermin.

Functional Statement
The incidence of insect and other vermin must be controlled to reduce the risk of disease transmission.

Animals must be controlled and treated when necessary, to prevent transmission of disease causing organisms.

Performance Requirement
(a) All buildings, including rainwater tanks and septic tanks, must be constructed so as to minimise the likelihood of insect and vermin entry and harbourage;
(b) All potential food sources for insect and vermin pests must be stored or disposed of in a manner that minimises access;
(c) Mosquito breeding areas must be eliminated if possible, or monitored and treated when there is evidence of mosquito breeding; and
(d) Animals that are capable of transmitting disease to humans should be kept separate from people or otherwise treated so as to minimise the risk of disease transmission to people.
B.9.2 Deemed-to-Satisfy Provisions

Explanatory Information

Insects and animals are an integral part of the environment and usually pose little threat to human health. However, some diseases are transmitted to humans via insects and animals.

Many aspects of disease prevention in this area rely on human behaviour. People can reduce the incidence of insect and animal borne disease by implementing personal protection against biting insects, avoiding close contact with animals and removing food waste and breeding sites around the home.

In some cases chemical methods, such as repellents, fly sprays and cockroach baits may be used. Whenever any chemicals are used, it is imperative that they are used in accordance with the safety directions on the packaging. Further advice can be sought from Environmental Health Officers or local Environmental Health Workers.

Animal control issues such as number of dogs, pigs and other animals is a community issue and many local councils have the authority to establish their own local by-laws to address animal problems within the community. Local Government Community Development Officers can offer further advice in this regard.

Should the prevalence of insects and pests provide a particularly significant risk at any time, for example high numbers of mosquitoes, Environmental Health Officers or local Environmental Health Workers may advise or direct that breeding sites are removed or treated to reduce numbers of the pest.
B.9.3 Approval Processes

Where scheduled poisons are being used, approval must be sought from Territory Health Services Chief Poisons Inspector, who may authorise their use under the *Poisons and Dangerous Drugs Act*.

**Pesticides:** Persons wishing to apply pesticides to control pests such as cockroaches, ants, rats or termites in the house, should refer to the Chief Poisons Inspector. In some cases it may be necessary for the person to obtain a licence to be a pest control operator.

**Animal medicines:** Persons wishing to administer Schedule 4 contraceptive and worming drugs to dogs, as part of a dog health program, must apply to the Chief Poisons Inspector for authorisation.
B.10 CIVIL WORKS

B.10.1 Performance Provisions

Objective
The objective is to control dust and storm water in the community environment.

Functional Statement
The community environment must be designed and maintained so as to reduce environmental health risks.

Performance Requirement
The community environment should be designed and maintained to reduce dust, wet season erosion and the pooling of storm water.
B.10.2 Deemed-to-Satisfy Provisions

B.10.2.1 Community roadworks

**Explanatory Information**

The following design guidelines set out dust control in communities with very low traffic volumes. These guidelines are to be used in conjunction with other recognised industry guidelines such as AUSTROADS publications.

**Road and drainage reserve widths within communities**

Where table drains are used for road drainage, “through” roads shall have a minimum road reserve width of 20 m, “no through” road 15 m and shared access to lots 10 m.

Drainage not included in road reserves shall have an identified reserve. The minimum reserve width for an open unlined drain shall be 10 m and lined drain 5 m.

**Sealed road design**

Pavement design shall be based on sub-grade assessments as well as traffic volumes likely to be experienced over the next 20 years. Compaction requirements shall be not less than 93% maximum modified dry density for sub-grade and 98% for base course. Stabilisation of pavements is required where prolonged inundation is expected.

Pavement widths for roads without kerb and gutter - main through roads shall have a minimum pavement width of 8 m (6 m seal), minor through roads and no through roads 6 m (4 m seal) and shared accesses to lots 4 m (4 m seal).

Gradeline design and construction is not required unless specifically needed for drainage reasons or significant vertical realignments. The preferred method is to not use grade lines for roadworks in order to simplify construction and reduce costs.

Sealing shall be single coat 10mm seal with a double coat 10/7 mm seal on floodways and inverts. For roads without kerbing the minimum seal width for two lanes shall be 6 m and for single lane 4 m. The inside road shoulder quadrant on ‘T’ intersections shall be sealed. Dust suppression measures other than bitumen sealing may be used provided it can be demonstrated to be cost effective in the long term.

**Typical cross sections (without kerb and gutter)**

Roads constructed next to community lots shall have either of the following cross sections to facilitate access:

- a semi boxed-in section with finished shoulder level 50 to 100 mm above natural surface; or
- a fully boxed-in section to allow water to sheet across the road.
Batters in V shaped table drains shall be not steeper than 1 in 8 where they are to be trafficable. Sealed pavement cross-fall shall be not less than 1%.

**Traffic control**

Traffic control devices such as kerbing and barriers shall be installed to encourage vehicles to stay on sealed roads and to provide safer intersections.

**B.10.2.2 Community drainage works**

**Explanatory Information**

The following drainage design guidelines set out drainage requirements in communities with very low traffic volumes.

Drainage is described by “major” and “minor” flow systems. The purpose of the “major” flow systems or Major Drainage Network, is to control stormwater runoff from roads, road reserves, allotments, open space and other community development areas during a major storm event. The “minor” flow system, or Minor Drainage Network, is a part of the Major Drainage Network but focuses on reducing nuisance flows, ponding and erosion from minor storm events.

Surface drainage, as opposed to underground drainage systems, has been the preferred means of handling stormwater on remote communities. This is because surface drainage systems are largely self-cleaning and cheaper to build and maintain.

**General**

Permanent low maintenance cost solutions shall be sought for drainage works on remote communities with very low traffic volumes. Drainage shall be achieved through surface drainage methods unless underground drainage becomes necessary for safety or cost reasons. The basis of design is the:

- latest edition of Australian Rainfall and Runoff, recognised by the Institute of Engineers, Australia.
- rainfall intensity for a storm event, derived for the area in which the design is proposed.
**Major Drainage Network (for major storm events)**
The Major Drainage Network shall be designed to prevent the flooding of habitable dwellings, health clinics, power stations and sewage pump stations, for a storm event with an Average Recurrence Interval (ARI) of 100 years. It shall also be designed to limit damage to the built and natural environment from major storm events.

Major open drains shall have a trapezoidal shape. Where possible the bottom width shall be 10 to 15 times the depth of flow experienced in a 1 year ARI storm to minimise future maintenance requirements.

**Minor Drainage Network (for minor storm events)**
To limit ponding times, drain slopes shall not be less than:
- 0.5% for minor open unlined drains (includes tabledrains)
- 0.4% for major open unlined drains
- 0.3% for lined drains

A sealed road and gutter is considered to be a lined drain and its full width is permitted for short term flooding.

Drainage shall be designed to a gradeline unless it is obvious from the topography that this is not required. An approved drainage plan shall form part of the contract drawings.

Sealed floodways and inverts (at T intersections) are to be used wherever economical. Floodway depth in communities shall be limited by safety criteria for small children. This criteria is defined as depth of flow x velocity of flow not exceeding 0.4. Longitudinal sections shall be designed on comfort criteria in accordance with AUSTROADS guidelines and contain runoff from the 2 year ARI storm.

Underground stormwater pipes and culverts shall have a minimum least dimension of 450mm and be self-cleaning. Inlet structures to stormwater systems shall limit the potential danger to small children while as far as possible be self-cleaning.

Where culverts are used in conjunction with floodways they shall be sized to prevent prolonged inundation of the roadway. In absence of a detailed analysis a minimum flow figure relating to 10% of a 2 year ARI storm runoff may be used.

**Protection works**
These works shall consist of dumped rock unless found to be unsuitable. All sealed inverts and floodways shall have at a minimum, a downstream concrete margin, with additional protection works as indicated by velocity of stormwater and scour potential of the natural soil.
B.11 REPAIR AND MAINTENANCE OF ENVIRONMENTAL HEALTH INFRASTRUCTURE

B.11.1 Performance Provisions

Objective

The objective is to ensure that environmental health related infrastructure is maintained in a functional condition.

Functional Statement

All environmental health related infrastructure should operate in a safe manner so as to provide the service or function for which it is designed and constructed.

Performance Requirement

(a) Housing must be maintained to provide safe, secure accommodation, and access to functioning health hardware; and

(b) Community infrastructure and services must be maintained to provide the level of functionality or service as described in this document.
B.11.2 Deemed-to-Satisfy Provisions

The existence and operation of a repair and maintenance program in accordance with the following is a Deemed-to-Satisfy solution.

B.11.2.1 General

 IDENTIFICATION OF A PROBLEM

1 By an occupier

2 By a community official

3 By a NT official

4 Report to responsible Community organisation

5 Investigation. Decision to plan to address or do nothing

Problem requires action

COMMUNITY ACTION

6 Plan developed for resolution by occupier/community or refer NT agency

7 Plan succeeds / fails in addressing problem

SUCCESS

Fails

NTG AGENCY ACTION

8 Investigation/assessment of problem by agency

Either

OR

9 Plan developed for resolution involving occupier, community organisation and/or government

10 Direct action taken by agency to address problem

11 Plan succeeds / fails in addressing problem

12 Monitor to ensure achievement of desired outcomes

SUCCESS

Failure

Feedback to responsible community organisation

Feedback

No Action Required

Figure 8: Environmental Health Infrastructure Maintenance System
Explanatory Information

While it is important to support self-determination and deliver services through a community development model, it is also necessary to recognise that there is a point where the NTG will intervene to ensure that appropriate environmental health standards are being maintained.

Figure 8 illustrates how these two seemingly incompatible approaches can be accommodated, and provides a ‘Minimum Standard Procedure’ to be followed in addressing environmental health problems.

All infrastructure requires both regular maintenance and repair of worn or damaged components. Housing is of particular importance given its immediate impact on occupants. For houses to maintain the performance requirements detailed in Part B.1.1 of this document, they must be subject to a routine repair and maintenance program.

The community organisation responsible for housing should:

- have a reporting mechanism in place, accessible to all community members, that records all items requiring repair.
- have a cyclical repair and maintenance program established for each of the dwellings it manages, including an identified budget to allow for this.
- submit a summary of repair and maintenance to its ATSIC regional council on an annual basis.

*Note: IHANT may place conditions relating to repair and maintenance on organisations receiving IHANT grants. Where this is the case the IHANT conditions take precedence.*
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SECTION C
GLOSSARY

**Cultural requirements**
Behaviours and practices that are an integral and necessary part of the beliefs and values of a group of people.

**Deemed-to-Satisfy**
Meets the requirements of, or that is accepted as appropriate for achieving the desired outcome.

**Domestic hygiene**
Cleaning the immediate living environment, including house and living area to reduce the risk of disease transmission. Washing dishes, clothing, walls, floors etc. Cleaning health hardware, disposing of rubbish, etc.

**Environmental health**
Environmental health comprises those aspects of human health, including quality of life, that are determined wholly or partially by factors in the social and physical environment. It also refers to the theory and practice of assessing, correcting, controlling or preventing those factors in the environment that can potentially affect adversely the health and quality of life of present and future generations. (UK Commission on Environment and Health 1996)

**Environmental health infrastructure**
Any infrastructure including services that can have an impact on health. That is, housing, water supply, power supply, food supply, waste disposal, etc. (See also Health - Related Infrastructure.)

**Environmental health standards**
Standards for the provision of infrastructure and services that impact on or are part of the environmental health of the community. Covers such aspects as housing, community food stores, water, power supply, rubbish disposal, and sewage disposal.

**Environmentally transmitted disease**
Any disease or illness that has environmental factors as part of its mode of transmission. Includes diseases transmitted via food or water, poor personal hygiene, overcrowding/close person-to-person contact, vector-borne illness.
**Essential services**

Refers to any actions or activities that support the delivery and use of infrastructure and the achievement of good environmental health conditions and practices. Includes rubbish collection services, maintenance and repair, provision of water, food and power, disposal of human waste.

**Health hardware**

Any infrastructure that is required for the maintenance of personal and domestic hygiene practices. Includes showers, baths, basins, sinks, taps, toilets, troughs, drains, washing machines etc.

**Health-related infrastructure**

Any infrastructure, including services, that can have an impact on health. That is, housing, water supply, power supply, community food stores, waste disposal, etc. (see also Environmental Health Infrastructure).

**Housing**

Includes, in addition to the building, the surrounding living area that is identified as part of that family’s ‘home’.

**Infrastructure**

Any physical item, fixture or fitting or system: includes, but is not limited to, buildings, landscaping, bores, tanks, reticulation systems, generators, power supply equipment, septic tanks, health hardware, etc.

**Living area**

The outdoor area around a house used for domestic purposes such as sleeping, cooking and eating, storage of household and personal effects, and family congregation.

**Personal hygiene**

Any personal actions and behaviours that clean the human body, or parts thereof, in order to reduce the transmission of disease. For example, bathing, showering, washing hands, etc.

**Potentially hazardous foods**

Refers to foods that include meat, seafood, dairy products and cooked cereals, and includes such foods as custards, quiches, soft cheeses, dips, mayonnaise, salads, rice dishes, meat dishes, sandwiches, etc.
Public health

1. Public health is primarily concerned with the prevention of disease and injury in whole communities as distinct from the role of clinical practice, which is primarily concerned with the treatment of individuals (Lawson 1991:1).

2. Public health is the organised response by society to protect and promote health, and to prevent illness, injury and disability. The starting point for identifying public health issues, problems and priorities, and for designing and implementing interventions, is the population as a whole, or population sub-groups.


The scope of public health activities and processes can be grouped into three key areas:

- **Public health intelligence** is involved with gathering and analysing information about the determinants of health, the causes of ill health and the patterns and trends of health and ill health in the populations.

- **Public health intervention** refers to developing policy, setting priorities for action, developing plans, coordinating services, strategies and interventions aimed at prevention, protection and promotion of the health of the community, where promotion is the action taken to solve public health problems.

- **Public health infrastructure** refers to the administrative, legislative and information systems developed for making priorities, for developing policy, for funding, for monitoring and surveillance, for research and evaluation, for program delivery, and includes the workforce required to accomplish these tasks (National Public Health Partnership 1997).

3. A distinction has been made in the health promotion literature between public health and a new public health for the purposes of emphasising significantly different approaches to the description and analysis of the determinants of health, and the methods of solving public health problems. This new public health is distinguished by its basis in a comprehensive understanding of the ways in which lifestyles and living conditions determine health status, and a recognition of the need to mobilise resources and make sound investments in policies, programmes and services which create, maintain and protect health by supporting healthy lifestyles and creating supportive environments for health. Such a distinction between ‘old’ and ‘new’ may not be necessary in the future as the mainstream concept of public health develops and expands (WHO 1998).

Public Health Bush Book (1999)
Standards

‘Anything taken by general consent as a basis of comparison’ (Macquarie Concise Dictionary 1982). The level of service that must be achieved, or model or class or quality of infrastructure to be provided. A benchmark, a measuring point.
REFERENCES

Guidelines, Codes, Policies, etc.

Australian Building Codes Board (1996)
  Building Code of Australia 1996; Australian Building Codes Board; Canberra

Australian Institute of Environmental Health (1993)
  National Code for the Construction and Fitout of Food Premises; AIEH; Canberra

Department of Lands, Planning & Environment, and Territory Health Services (1995)
  Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in
  the Northern Territory; Environmental Health Program; Darwin

National Health and Medical Research Council (1987)
  Guidelines for Drinking Water Quality in Australia; Australian Government Publishing
  Service; Canberra

Power and Water Authority, Territory Health Services, & Lands, Planning & Environment
  (1997)
  Policy for the Design of Off-Site Sewerage Ponds and the Disposal or Reuse of
  Sewerage Pond Effluent; Unpublished report; Territory Health Services; Darwin

Territory Health Services (1996)
  Aboriginal Health Policy 1996; Territory Health Services; Darwin

Territory Health Services (1996)
  Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the
  Disposal or Reuse of Sewage Effluent; Environmental Health Branch; Darwin

Territory Health Services (1999)
  The Public Health Bush Book; Public Health Strategy Unit; Darwin

Territory Health Services (1995)
  Interim Policy for the Disposal of Departmental Clinical and Medical Waste; Territory
  Health Services; Darwin

Territory Housing (1999)
  Technical Standards – Land Servicing Works; published in NT Local Government’s
  ‘Manual for administration of projects funded by IHANT’

The Urban Water Research Association of Australia (UWRAA) and the Agriculture and
  Affordable Water Supply and Sewerage for Small Communities – Investigation,
  Design and Management Handbook
General

Australian Bureau Statistics (1997)
  *Health and Welfare, Aboriginal and Torres Strait Islander Peoples;* Australian Government Publishing Service; Canberra

Australian Construction Services (1992)
  *1992 National Housing and Community Infrastructure Needs Survey;* Aboriginal and Torres Strait Islanders Commission; Canberra

Australian New Zealand Food Authority (1996)
  *Proposal to Develop a National Food Hygiene Standard;* Information paper; ANZFA; Canberra

Benenson, A. (1990)
  *Control of Communicable Disease in Man;* 15th Edition; American Public Health Association; Washington

  *Environmental Health Engineering in the Tropics;* John Wiley & Sons; Chichester

  *Guidance on use of Rainwater Tanks;* National Environmental Health Forum; Adelaide

  *Review of Aboriginal Health Policy in Western Australia;* Community Health Research and Training Unit; University of WA

Harris, E. & Wills, J. (1997)
  *Australian and New Zealand Journal of Public Health*

Health Habitat (1994)
  *Housing for Health;* Health Habitat; Australia

Lloyd, Dr. C.R. (1997)
  *Washing Machine Use in Remote Aboriginal Communities;* NTRC Report Cat 97/3; Centre for Appropriate Technology Inc

Morel and Ross (1993)
  *Housing Design and Assessment for Bush Communities;* Tangentyere Council; Alice Springs
    *A National Aboriginal Health Strategy*; NAHSWP; Canberra

Nganampa Health Council Inc (1987)
    *Uwankara Palyanyku Kanyintjaku An Environmental and Public Health Review within the Anangu Pitjantjatjara Lands*; South Australian Health Commission; Adelaide

Peddle Thorp NT Architects (1997)
    *ATSIC NAHS Environmental Health Program - Housing Design Guidelines*; Unpublished report; Peddle Thorpe NT Architects; Darwin

    *Northern Territory Health Outcomes, Morbidity and Mortality 1979-1991*; Northern Territory Department of Health and Community Services; Darwin

    *The Health of Aboriginal Australia*; Harcourt Brace Jovanovich; Sydney

    *Dog Health in Indigenous communities*; Qld Department of Primary Industries; Cairns

UK Commission on Environment and Health (18 March 1996)
    Quoted in *Environmental Health News*, vol 11 (12), 22 March 1996
APPENDIX A

Map of Building Areas in the Northern Territory
Explanatory Information

Building areas: Building areas in the Northern Territory are those areas declared under the Building Act by the Minister for Lands, Planning and Environment.

Whilst some aspects of the Building Act apply to all of the Northern Territory, building control is only affect in gazetted building areas.

The extent of the gazetted building areas is detailed in the map of the building areas in the Northern Territory (overleaf).

The current building areas include:

(a) Adelaide River
   Alice Springs
   Batchelor
   Borroloola
   Brewer Estate
   Darwin
   Elliott
   Jabiru
   Katherine
   Katherine Gorge National Park

(b) Land within 500 m of each side of the road reserve of the highways and roads detailed on the map of the building areas in the Northern Territory.

NOTE: Detailed maps of these areas can be obtained from the Building Branch at Department of Lands, Planning and Environment.

NOTE: Where there are no road reserves then the distance is measured from the centre line.
APPENDIX B

Power and Water Authority
Sewerage and Water
Standard Drawings
1. The terminology used on this drawing is consistent with that defined in the National Plumbing and Drainage Code AS/NZS 3500. Glossary of Terms:
   A) Inspection Shaft - A vertical shaft to surface level for the purpose of locating, inspecting, accessing and clearing the pipe over which the inspection shaft is placed.
   B) Inspection Opening - An access opening capped off below surface level in a pipe or pipe fitting arranged to facilitate inspection, testing or the clearing of obstructions, and fitted with a threaded cap or plug.
2. Std Drg Nos. W1/2-04 and W1/2-05, which are cross-referenced by this drawing, use the term inspection opening to mean an inspection shaft with an access cover at surface level.
3. Inspection shafts are required:
   A) As close as practical outside the building within the mowing strip (where specified) on each branch connecting one or more water closets or slop hoppers.
   B) On the sewer connection.
4. Inspection openings are required in accordance with AS/NZS 3500.2.2.
5. Concrete shall be Class N28 Mix (20 MPa; 20 mm MAX aggregate).
NOTES:

1. THE TERMINOLOGY USED ON THIS DRAWING IS CONSISTENT WITH THAT DEFINED IN THE NATIONAL PLUMBING AND DRAINAGE CODE AS/NZS 3500.0 GLOSSARY OF TERMS.

A) INSPECTION SHAFT - A VERTICAL SHAFT TO SURFACE LEVEL FOR THE PURPOSE OF LOCATING, INSPECTING, ACCESSING AND CLEANING THE PIPE OVER WHICH THE INSPECTION SHAFT IS PLACED.

B) INSPECTION OPENING - AN ACCESS OPENING CAPPED OFF BELOW SURFACE LEVEL IN A PIPE OR PIPE TYPING, ARRANGED TO FACILITATE INSPECTION, TESTING OR THE CLEANSING OF OBSTRUCTIONS, AND FITTED WITH A THREADED CAP OR PLUG.

2. INSPECTION SHAFTS ARE REQUIRED:

A) AS CLOSE AS PRACTICAL OUTSIDE THE BUILDING WITHIN THE MOVING STRIP (WHERE SPECIFIED) ON EACH BRANCH CONNECTING ONE OR MORE WATER CLOSETS OR SLOP HOPPERS.

B) AT THE START OR END OF THE EFFLUENT DISPOSAL AREA.

C) CONCRETE SEPTIC TANKS SHALL HAVE AN INSPECTION SHAFT AT THE INLET.

3. INSPECTION OPENINGS ARE REQUIRED IN ACCORDANCE WITH AS/NZS 3500.2.2.

4. CONCRETE SHALL BE CLASS N20 MN (20 MPa, 20mm NAP AGGREGATE).

5. REFERENCE SHALL BE MADE TO THE CODE OF PRACTICE FOR SMALL ON-SITE SEWAGE AND SULLAGE TREATMENT SYSTEMS AND THE DISPOSAL OR REUSE OF SEWAGE EFFLUENT.

PLAN
LOCATION OF INSPECTION SHAFTS ON SANITARY DRAINAGE SYSTEMS

ELEVATION
DETAIL A - HEAVY DUTY INSPECTION SHAFT AND CONCRETE BASE
CONCRETE MARKER WITH FRI STEEL WEA CENTRALLY PLACED (REFER NOTE 3)

ELEVATION

DIRECTION OF SEWER RISING MAIN

PLAN
CONCRETE MARKER
FOR ABORIGINAL COMMUNITIES

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

2. ENGRAVE OR SCORE MARKING ON SURFACE OF CONCRETE MARKER TO INDICATE DIRECTION AND NOMINAL DIAMETER OF SEWER RISING MAIN. DIAMETER MARKING TO BE 100 MM LONG X 5 MM WIDE X 5 MM DEEP. NOMINALS TO BE 100 MM HIGH X 80 MM WIDE X 10 MM DEEP. SPACE # 0.50 MM X 5 MM DEEP.

3. USE CONCRETE OF GRADE NO. WIN 120 MPa. 20 MM MAX SIZE AGGREGATE COMPLIANT WITH AS 1379.

4. USE ONLY THOSE MANUFACTURERS' PRODUCTS SHOWN APPROVED IN THE WATER AND SEWER INFRASTRUCTURE PRODUCTS MANUAL.

SEWERAGE STANDARD DRAWING

MAINLAYING SEWER RISING MAINS LOCATION MARKING

DES: P.S./P.K.
DRN: A.GRAY
C.KO: J.PIGHT
APPROD: ASHLEY
SCALE: 1:50
ISSUED: MAY 2007

A3 DRAWING NUMBER MZ-2-09

AMENDMENTS

A5 297 X 420

CAD PRODUCT - DO NOT AMEND MANUALLY
MARKER POST LOCATED AT INTERSECTION OF PROPERTY BOUNDARIES

BOUNDARY

ENGRAVED NUMBERS TO FACE TOWARDS ALLOTMENT

ALLOTMENT NUMBER 123

ENGRAVED NUMBERS TO FACE TOWARDS ALLOTMENT

ALLOTMENT NUMBER 124

PLAN

ALLOTMENT MARKER POST LOCATION

DN 50 GST POST CAP

ENGRAVE ALLOTMENT NUMBERS 1 TO HIGH

WITHIN HATCHED AREA

150

ENGRAVED NUMBERS TO BE MIN TO HIGH

POSITION NUMBERS VERTICALLY (EQ: 1

2

3)

DN 50 GST POST (REFER NOTE 1)

1300 OR TO SUIT COUNCIL

FENCING REQUIREMENTS

CONCRETE SURROUND TO SUPPORT POST

(REFER NOTE 2)

ELEVATION

ALLOTMENT MARKER POST

NOTES:

1. GALVANISED STEEL TUBE SHALL BE MEDIUM

WALL THICKNESS COMPLYING WITH AS 1074.

2. CONCRETE SHALL BE CLASS N20 M2

120 MPa, 20 mm MAX SIZE AGGREGATE.
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. FOR ABORIGINAL COMMUNITIES ONLY USE THE CONCRETE MARKER.
3. USE MARKER POSTS FOR LOCATING STOP VALVES ONLY WHERE THERE IS NO KERB FOR MARKING OR WHERE DIRECTED WHEN THE VALVE IS NOT EASILY LOCATED FROM THE KERB MARKING.
4. PLACE THE MARKER POST LABEL TOWARDS THE STOP VALVE.
5. CURE CONCRETE KERBING AND SURROUNDING FOR AT LEAST NINE WEEKS BEFORE APPLYING PAINT.
6. APPLY AT LEAST THREE COAT OF PAINT IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. DO NOT PAINT THE SURFACE BOX CONCRETE SURROUND IN INTERNAL WITH A CONCRETE FOOTPATH.
7. LOCATION OF STOP VALVES IN ROADWAYS IS ONLY PERMITTED WITH EXPRESS APPROVAL OF PWD.
8. USE CONCRETE OF SCAE NO. 100/60 20 MM AGRAGATED COMPLYING WITH AS 1379.
9. ENGRAVE ON EACH MARKING TO SURFACE OF CONCRETE MARKER TO INDICATE DIRECTION AND NOMINAL DIAMETER OF WATER MAIN,なんだ. TO BE 100 MM MARKED A 150 MM MARKED A 100 TO 150MM STRIKE. WIDTH 8.9MM DEEP.
10. DEPTH OF STOP VALVE CONCRETE MARKER SHALL NOT EXCEED 300MM FROM SURFACE BOX BUT SHALL BE NO LESS THAN 150MM.
11. USE ONLY THOSE MANUFACTURERS' PRODUCTS SHOWN APPRoved IN THE WATER AND SEWAGE INFRASTRUCTURE PRODUCTS MANUAL.