



Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**
Resources Safety

Village: Infrastructure audit – guide

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Table of contents

- Introduction 2
- 1 Mobile buildings 5
- 2 Permanent buildings and/or structures 9
- 3 Other infrastructure 11

Introduction

The scope of the 'Village' audit documents are designed to include operating standards associated with the management of villages, camps and accommodation facilities (mining infrastructure) in mine operations.

These audits were developed in 2016 and they are currently being trialled and assessed by the Department. They have also been made available to industry. The content will continue to be reviewed, and where appropriate updated, over the coming months.

The four 'Village' audit documents cover:

- Village: Occupational health and safety (OHS)

This broadly covers the safety standards associated with the management of occupational health and safety (OHS) matters (including aspects associated with administration, management, training, dangerous goods, traffic management, storage, food preparation, safety and health representatives, personal protective equipment and general aspects) at a village on a mine.

- Village: Infrastructure

This broadly covers the safety standards associated with the management of infrastructure matters (including aspects associated with mobile, prefabricated and permanent buildings and/or structures) at a village on a mine.

- Village: Electrical

This broadly covers the safety standards associated with the management of electrical matters (including management and technical aspects) at a village on a mine.

- Village: Mechanical

This broadly covers the safety standards associated with the management of mechanical matters (including aspects associated with workshops and other areas) at a village on a mine.

These audits have been developed to assist duty holders in their compliance with legal requirements under the mines safety legislation and other relevant legislation (e.g. Building Code of Australia), and to achieve good practice in village accommodation in the Western Australian mining industry. Though every effort has been made, the content is not exhaustive and duty holders should ensure they conduct a specific review of the mines safety legislation, and other state and national legislation (as applicable) to ensure compliance.

Where, in the intent, the word "verify" is used, this means that it is a regulatory requirement, which is mandatory and has to be complied with. Where, in the intent, the word "ensure" is used, it is not a mandatory requirement, but it does set out a recommended safe method which, if followed, should minimise the potential for an adverse incident to take place.

Accommodation situations cover the spectrum from long-term village accommodation to more transient camp arrangements (e.g. exploration camps). These audits have primarily been designed to address the fundamental aspects associated with village accommodation. However duty holders for more transient arrangements may find parts of the content applicable. Every effort should be made to risk assess and manage change as accommodation evolves.

Audits should be carried out by competent persons, properly authorised and appointed by the registered manager of the mine site.

While the occupational health and safety (OHS) audit is expected to take around 4 to 6 hours to complete, each of the other audits is expected to take less than 4 hours to complete, provided all necessary documentation is readily available and there is free access to all areas to inspect.

List of abbreviations

AS	Australian Standard
BCA	Building Code of Australia – is a requirement of the Western Australian Building Act and Building Regulations 2012
ELR	Electricity (Licensing) Regulations 1991
GP	Good practice – villages would be expected to adopt and achieve industry standards
ISO	International Standards Organisation
LR	Legal requirement – villages are expected to have addressed these items
MSIA	<i>Mines Safety and Inspection Act 1994</i>
MSIR	Mines Safety and Inspection Regulations 1995
NCC	National Construction Code series – is a requirement of the <i>Western Australian Building Act 2011</i> and Building Regulations 2012
NZS	New Zealand Standard
SRS	The Department of Mines and Petroleum's online Safety Regulation System
r.	Regulation (of the MSIR)
rr.	Regulations (of the MSIR)
s.	Section (of the MSIA)
ss.	Sections (of the MSIA)

Supporting documentation

Documentation referred to in the village audits can be found via the links below:

- State Law Publisher, www.slp.wa.gov.au
 - *Mines Safety and Inspection Act 1994*
 - Mines Safety and Inspection Regulations 1995
 - Electricity (Licensing) Regulations 1991
- Department of Mines and Petroleum (DMP), mining safety publications, www.dmp.wa.gov.au/Safety/Mining-Safety-publications-16162.aspx
 - *Accident and incident reporting – guideline*
 - *Management of noise in Western Australian mining operations – guideline*
 - *Prevention and management of violence, aggression and bullying at work – code of practice*
 - *Safe design of buildings and structures – code of practice*
 - *Prevention and control of Legionnaires' disease – code of practice*
- Department of Mines and Petroleum (DMP), General exemption: Approval for fit person to inspect classified plant, www.dmp.wa.gov.au/Safety/What-are-the-requirements-for-7947.aspx
 - *General exemption from Mine Safety and Inspection Regulation 6.40(1) and 6.40(3) (dated 5/12/2003)*
- Safe Work Australia, Publications and resources, www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/publication
 - *Hazardous Manual Tasks Model Code of Practice*
 - *National Standard for the Storage and Handling of Workplace Dangerous Goods [NOHSC:1015(2001)]*
 - Industrial lift trucks guidance material
- Department of Commerce, WorkSafe, High risk work licensing, www.commerce.wa.gov.au/worksafe/high-risk-work-licence
- National Transport Commission, Australian Dangerous Goods Code (Edition 7.4), www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/
- Department of Health (WA), Australian drinking water guidelines, www.public.health.wa.gov.au/3/657/2/australian_drinking_water_guidelines.pm
- Australian Environmental Pest Managers Association, Industry codes of practice www.aepma.com.au/Codes-of-Practice
 - *Code of practice for Pest Management in the Food Industry in Australia and New Zealand*
- Food standards Australia New Zealand, Australia New Zealand Food Standards Code, www.foodstandards.gov.au/code/Pages/default.aspx
 - Standard 3.2.2 *Food Safety Practices and General Requirements* (Australia only)
- Australian Building Codes Board

- National Construction Code Suite
- Australian and other standards, SAI Global, <http://infostore.saiglobal.com/store/>
 - AS 1170 *Structural design actions – General principles*
 - AS 1319 *Safety signs for the occupational environment*
 - AS 1657 *Fixed platforms, walkways, stairways and ladders – Design, construction and installation*
 - AS 1940 *The storage and handling of flammable and combustible liquids*
 - AS 2359.1 *Powered industrial trucks – Powered industrial trucks*
 - AS 2444 *Portable fire extinguishers and fire blankets – Selection and location*
 - AS 3780 *The storage and handling of corrosive substances*
 - AS 4084 *Steel storage racking*
 - AS 4282 *Control of the obtrusive effects of outdoor lighting*
 - AS 4332 *The storage and handling of gases in cylinders*
 - AS 4452 *The storage and handling of toxic substances*
 - AS 4801 *Occupational health and safety management systems – Specification with guidance for use*
 - AS 5104 *General principles on reliability for structures*
 - AS ISO 13822 *Basis for design of structures – Assessment of existing structures*
 - AS/NZS 1680 *Interior lighting – Safe movement*
 - AS/NZS 1891 *Industrial fall-arrest systems and devices*
 - AS/NZS 3000 *Electrical installations (known as the Australian/New Zealand Wiring Rules)*
 - AS/NZS 4600 *Cold-formed steel structures*
 - AS/NZS ISO 9000 *Quality management systems – Fundamentals and vocabulary*
 - AS/NZS ISO 31000 *Risk management – Principles and guidelines*

1 Mobile buildings

Includes prefabricated units used as dongas and offices.

Point	Standard	Guideline
1.1	<p>Mobile buildings were designed and constructed to an adequate level of structural reliability, assured by the manufacturer or importer, and approved for occupancy by a competent person.</p>	<p>Intent:</p> <p>To ensure that mobile buildings were designed and constructed to an adequate level of structural reliability, assured by the manufacturer or importer, and approved for occupancy by a competent person, by:</p> <ul style="list-style-type: none"> • providing certification documentation and specifications of use to this effect <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>View supporting documentation. Documentation should ideally state compliance with AS 5104 or BCA requirements, with wording about quality control systems used (e.g. AS/NZS ISO 9000 or similar). Building reliability is effectively its strength and robustness to withstand statutory loading. It is the basis of all Australian and international structural safety.</p> <p>A competent person is usually a building structural design and construction quality control specialist, or professional engineer competent in this area.</p> <p>Refer to MSIA s. 9(1) , s 13, s 14 NCC (BCA) AS 5104</p>

1.2	Documentation required has been reviewed by management who have compared it to the village hazard register (or similar) and found fit-for-purpose to satisfy the specific site conditions.	<p>Intent:</p> <p>To ensure that documentation required has been reviewed by management who have compared it to the village hazard register (or similar) and found fit-for-purpose to satisfy the specific site conditions, including, but not limited to, the following:</p> <ul style="list-style-type: none"> • wind loading • earthquake loading • thermal loads • imposed loads • any other site-specific conditions • occupancy rating <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>View the major hazard register which should include the loadings which all structures are subjected to. If a structure is not suitable for site conditions (as identified by the hazard register) it requires:</p> <ul style="list-style-type: none"> • written confirmation, by the original designer; and • amended certification of use documentation, including occupancy certification; or • assessment by an authorised competent person. <p>Refer to MSIA s. 9(1), s 13, s 14 NCC (BCA) AS1170, AS 5104</p>
1.3	Mobile building construction and the associated pathways for emergency egress were surveyed by competent persons (in respect of fire risks after installation) to ensure design intent has been met	<p>Intent:</p> <p>To ensure that mobile building construction and the associated pathways for emergency egress were surveyed by competent persons (in respect of fire risks after installation) to ensure design intent has been met.</p> <p>Personnel:</p> <p>As required.</p> <p>Method:</p> <p>Observe the spacing and grouping of mobile buildings. Mobile buildings should be located in such a way as to prevent exposure to, and spread of, fire either by following the NCC and BCA or through rational design. Fire modelling and prototype testing is also permissible.</p> <p>A competent person is usually a fire specialist or professional engineer competent in this area.</p> <p>Refer to MSIA s. 9(1) , s 13, s 14 NCC (BCA)</p>

1.4	<p>Mobile buildings were surveyed by competent persons after placement, and regularly thereafter, to ensure the design intent of foundations and anchorage are met and maintained</p>	<p>Intent:</p> <p>To ensure that the strength and stability of the building are not compromised by inadequate foundations or anchorages to foundations.</p> <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>Observe the founding and anchorages (including tie-downs) as required to meet statutory wind and other loading to not overturn, slide or collapse. A competent person is specialist at building foundation design and integrity assessment, or professional engineer competent in this area.</p> <p>Refer to MSIA s. 9(1), s 13, s 14 NCC (BCA) AS 5104</p>
1.5	<p>Mobile buildings are surveyed by competent persons after significant events, including severe weather (e.g. fire, storms, high rainfall, strong wind, very high or low temperatures), to check for:</p> <ul style="list-style-type: none"> • washaway of foundations • instability • structural damage • water ingress damage • services damage (e.g. cracking, leaks) • or any other damage 	<p>Intent:</p> <p>To ensure that the physical conditions of the building and its surrounding area have, as a result of the event as itemised, not changed such that they increase the risk of exposure to harm.</p> <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>Interview personal and view supporting documentation to check that personnel understand that some storm events may result in loading and conditions which may exceed those of the designer. The building can experience partial or full failure, significant changes to the stability requirements, or other defects which render them unsafe for occupation A competent person is usually a specialist at building and foundation design and integrity assessment or professional engineer competent in these areas</p> <p>Refer to MSIA s. 9(1), s 13, s 14 AS 5104</p>

1.6

Mobile buildings are inspected and maintained regularly to ensure compliance for:

- structural integrity (e.g. corrosion, impact damage, unauthorised modifications, water damage, including condensation or leaks from condensers)
- ventilation effectiveness
- lighting
- cooling and heating
- noise resistance (e.g. walls), and connection to external areas for propagation (e.g. common platforms and walkways)

Intent:

To ensure that the physical condition of any part has not changed such that it increases the risk of exposure to harm.

Personnel:

As required

Method:

Interview personnel and view supporting documentation to check that

- Inspections include checking for corrosion damage, impact damage, unauthorised modifications, or other effect on the structural integrity of either the frame or its cladding components
- Extraction ventilators and provisions for fresh air intake are present to prevent mould and ensure air changes are being met
- Water supply and sewer lines are not leaking and are effective (no repeated blockages, ventilation to stand pipes correct, no odours, distance to conservancy or tanks sufficient)
- Heating and cooling devices do not affect structural integrity e.g. no leaks and minimise exposure to temperature ranges
- Adequate ventilation is present so as not to adversely impact the living environment, e.g. absence of mould

A competent person is usually a specialist at building and foundation design and integrity assessment or professional engineer competent in these areas.

Refer to MSIA s. 9(1), s 13, s 14
AS 5104, AS ISO 13822

2 Permanent buildings and/or structures

Buildings and structures constructed on site

Point	Standard	Guideline
2.1	<p>Documentation issued by the designer of the building or structure, lists the limitations</p> <ul style="list-style-type: none"> • If compliance is not to the BCA and relevant standards, those used are expected to be equivalent to or exceed, the requirements of the BCA • If not, the documents are inspected by a competent person to compare against the requirements of the BCA 	<p>Intent:</p> <p>To ensure that the design of the building meets or exceeds the required structural reliability, robustness and functionality. This also means the building and all its parts will reasonably resist all expected Australian loading conditions within its design life.</p> <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>Check that consideration has been given to</p> <ul style="list-style-type: none"> • the exposure to, and spread-ability, of fire; • strength of the building and/or structure; • serviceability of the building and/or structure; and • suitability for occupancy class <p>as required by the NCC (BCA) and/or associated Australian Standards.</p> <p>Refer to MSIA s. 9(1), s 13,s 14 NCC (BCA) AS 5104, AS ISO 13822</p>
2.2	<p>Permanent buildings and structures were surveyed during and after completion, and deemed fit for occupation by competent persons</p> <p>The survey report has been reviewed by management. These include:</p> <ul style="list-style-type: none"> • records of quality control by the designer (or their approved representatives) or other competent persons, during construction and on completion • records of final inspection and approval for use, including an occupancy certificate. 	<p>Intent:</p> <p>To ensure that the construction including final commissioning of the building meets or exceeds the required structural reliability and robustness.</p> <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>Check that there are processes in place to address quality control at defined stages of the construction. This is an important link to ensure adequate structural integrity and reliability.</p> <p>A competent person is usually a building structural design and construction quality control specialist, or professional engineer competent in this area.</p> <p>Refer to MSIA s. 9(1), s 13, s 14 AS 5104, AS ISO 13822</p>

2.3

All permanent buildings and structures in the village and their surrounding areas are surveyed regularly by competent persons to ensure design conditions are met and maintained.

Check there are no unauthorised modifications (e.g. design checking and change management systems), or unacceptable levels of:

- corrosion
- impact damage by vehicles
- overloading
- foundation movement
- cracking
- failing parts (e.g. loose sheeting)

Intent:

To ensure that the strength, stability and serviceability of the building are not compromised by changes due to abuse, use or other incidental activity.

Personnel:

As required

Method:

Interview personnel and view supporting documentation to confirm that the site conducts regular surveys to identify structural integrity issues.

Check that all buildings and structures are covered in the structural integrity survey, including but not limited to the following:

- bridges
- canteens
- carports
- architectural features, including signage
- gyms
- halls
- offices
- switch rooms
- workshops
- storage tanks, vessels and their supports

These check points are some indicators which lead to reduced structural capacity, and unless assessed by competent person(s) (e.g. structural engineer), may result in structural collapse and potential harm.

Refer to MSIA s. 9(1), s 13, s 14
AS 5104, AS ISO 13822

3 Other infrastructure

Other infrastructure

Point	Standard	Guideline
3.1	Onsite wastewater treatment systems (e.g. treatment, holding tank) are adequately constructed to appropriate standards (e.g. distance away from dwellings, suitable ventilation systems installed). The performance of the system is assessed by a competent person.	<p>Intent: To ensure that hazards associated with wastewater treatment are mitigated.</p> <p>Personnel: As required</p> <p>Method: Interview personnel and view supporting documentation associated with the wastewater treatment systems and their assessment of performance. A competent person is usually a plumbing specialist, or professional engineer competent in this area.</p> <p>Refer to MSIA s. 9(1), s 13 NCC(BCA) v. III – Plumbing Code of Australia</p>
3.2	Sanitary plumbing and drainage system are designed, constructed and maintained to ensure it safeguards people from illness or loss of amenity.	<p>Intent: To ensure that sewer water, gasses and associated hazards are managed to an acceptable standard.</p> <p>Personnel: As required</p> <p>Method: Interview personnel and view supporting documentation associated with the sanitary plumbing and drainage systems. Confirm that consideration is given to</p> <ul style="list-style-type: none"> • avoiding uncontrolled discharge • leaks resulting in biohazards • adequate ventilation • blockage resulting in loss of service <p>Refer to MSIA s. 9(1), s 13 NCC (BCA) v. III – Plumbing Code of Australia</p>

3.3	All water is checked for quality and disease (e.g. Legionella), including supply, stagnant water, condensed or recycled systems	<p>Intent: To ensure that monitoring for water borne disease is carried out in all areas and at adequate intervals that allow action to be taken to avoid spread of disease.</p> <p>Personnel: As required</p> <p>Method: Interview personnel and view supporting documentation. Sight water quality testing results.</p> <p>Refer to MSIA s. 9(1), s 13</p>
3.4	<p>Stormwater management systems are checked for:</p> <ul style="list-style-type: none"> • debris and damage before expected seasonal rainfall • damage and function after severe events (e.g. temperature, weather, overloading) 	<p>Intent: To ensure that damage to stormwater infrastructure and consequential damage to buildings and other structures does not lead to their failure or collapse.</p> <p>Personnel: As required</p> <p>Method: Interview personnel and view supporting documentation associated with the stormwater management system.</p> <p>Refer to MSIA s. 9(1), s 13</p>
3.5	Emergency illuminated signage is fitted to all exits and lighting is provided to emergency pathways	<p>Intent: To ensure that all emergency exits are fitted with illuminated emergency signage and emergency pathways are fitted with sufficient emergency lighting to direct personnel to emergency exits and to maintain visibility in the case of an emergency or power outage.</p> <p>Personnel: As required</p> <p>Method: Inspect the workplace to confirm emergency exit signs and emergency lighting is installed where required. Confirm that emergency lighting will illuminate following a loss of power. Confirm that what is in place is as stated in the emergency management plan.</p> <p>Refer to MSIR r. 4.31 NCC (BCA)</p>

3.6	Lighting to work areas is adequate	<p>Intent:</p> <p>To ensure that the lighting provided gives the correct level of illumination for the tasks being undertaken in the work area and does not introduce hazards (e.g. flickering lights).</p> <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>Interview personnel and view supporting documentation to confirm that lighting requirements have been assessed during the design stage. Confirm that lighting requirements have been reassessed following modification to the building or occupancy changes.</p> <p>Refer to MSIA s. 9(1), NCC (BCA)</p>
3.7	Nuisance noise is reportable and investigated (e.g. rattling air conditioning, creaking flooring , walls too thin to damp noise)	<p>Intent:</p> <p>To ensure that occupiers of buildings are not subject to noise which will be harmful.</p> <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>Interview personnel and view supporting documentation to confirm that noise levels have been considered in the building design (e.g. the correct sound damping of walls), and purchase, construction and maintenance of building and access way parts. Confirm that the noise levels building occupants are exposed to have been assessed. Confirm that there is a procedure in place that if noise levels are too high they should be reported and acted on by management.</p> <p>Refer to MSIA s. 9(1), NCC (BCA)</p>
3.8	Roadways and pathways are of suitable construction and are adequately maintained for intended purpose as assessed by a suitable competent person	<p>Intent:</p> <p>To ensure that the roadways and pathways are fit for purpose.</p> <p>Personnel:</p> <p>As required</p> <p>Method:</p> <p>Inspect the workplace (e.g. roadways and pathways) to identify the presence of potholes, uneven steps, broken surfaces and other defects which introduce risks to occupants. Confirm that a procedure is in place to address and rectify these hazards when identified.</p> <p>Refer to MSIA s. 9(1), s 14</p>

3.9

Pool area maintained at the village.

Intent:

To ensure that the signage and physical condition of the area does not place users at risk of harm.

Personnel:

As required

Method:

Interview personnel and view supporting documentation associated with the maintenance of the pool area. Inspect the pool area of the village checking the following

- signage of depth
 - signage of slip hazards
 - signage regarding supervision
 - signage regarding emergencies including resuscitation information
 - presence of fence and gates with child locks
 - surfaces free from undue slip and trip hazards

Refer to MSIA s. 9(1), MSIR r. 4.10