

SANITATION AT THE WORKPLACE – EVALUATING EXISTING SANITATION INFRASTRUCTURE AT PUBLIC, COMMERCIAL, MINING AND INDUSTRIAL WORKPLACES

BEST PRACTICE GUIDELINE FOR WORKPLACE SANITATION

D Naidoo & J Davis



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Sanitation at the Workplace – Evaluating Existing Sanitation Infrastructure at Public, Commercial, Mining and Industrial Workplaces

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Report to the
WATER RESEARCH COMMISSION

by

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LIST OF ABBREVIATIONS

DCT	Dry Compost Toilets
DWS	Department of Water and Sanitation (previously DWA)
ETS	Eco-Toilet System
FGD	Focus Group Discussions
GBAC	Global Biorisk Advisory Council
HCS	Hazardous Chemical Substances
KII	Key Informant Interview
LEED	Leadership in Energy and Environmental Design
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, and others
MHSA	Mine Health and Safety Act
OHSA	Occupational Health and Safety Act
SABS	South African Bureau of Standards
SANS	South African National Standards
VIP	Ventilated Improved Pit
WELL	WELL Building Standard
WRC	Water Research Commission
WSA	Water Services Act

1 WHAT IS THE PURPOSE OF THIS GUIDELINE?

This Best Practice Guideline forms part of a research project to evaluate Existing Sanitation Infrastructure at Public, Commercial, Mining and Industrial Workplaces on behalf of the Water Research Commission. The project aimed to evaluate existing sanitation infrastructure at public, commercial, mining and industrial workplaces and provides a preliminary exploration of sanitation infrastructure in public, commercial, mining and industrial workplaces in relation to Occupational Health and Safety Act (Act No 85 of 1993) (OHSA) with the following study aims:

1. Provide an inventory of sanitation facilities, number of users and its condition at the targeted public areas, and mining and commercial industries.
2. Provide a comparison of survey results with the OHSA and Regulations, and in relation to the National Building Regulations.
3. Develop a Guideline that highlights best practices at workplace and provides a design component for the industries that includes technology choice and their benefits / limitations, design features and maintenance requirements to keep facilities in hygienic state.

This guideline addresses study aim 3 above and constitutes the sanitation in the workplace best practice guideline.

For the purposes of this guideline, public workplaces include institutions that fall under the control of local, provincial and national government while commercial workplaces include profit-oriented private organisations. Mining workplaces include organisations involved in the extraction of valuable minerals or other geological materials from the earth and industrial workplaces include organisations involved in collecting raw materials and making them into products.

The definition of 'sanitation infrastructure' is taken from The National Norms and Standards for Domestic Water and Sanitation Services (2017), which states that the terms '*sanitation infrastructure*' and '*sanitation facility*' can be used interchangeably to mean "*the structures and technology system(s) that create effective barriers between human excreta and human contact from collection, transport, storage, treatment, reuse, to disposal.*" This definition can be further expanded to include sanitation and ablution facilities and associated infrastructure, fixtures, and fittings; for example, change rooms, showers, wash basins, railings, lighting, mirrors, storage compartments, and waste receptacles.

The guideline focus is on the sanitation facilities requirements for employees in the workplace, however, where facilities requirements for the general public have relevance to the workplace, or where legislative overlap was found, these have been included within reason.

2 WHO SHOULD USE THIS GUIDELINE?

This Guideline provides best practice for sanitation in the workplace and applies to the following sectors:

- Public (local, provincial and national government-controlled facilities);
- Commercial;
- Mining; and
- Industrial.

It provides practical guidance for persons and organisations managing, operating, maintaining, renovating, and/or constructing facilities within the aforementioned sectors on how to provide and maintain safe and healthy workplace sanitation facilities. In meeting the legislative requirements, best practices and employee needs, employers, developers and facility managers can ensure a physical work environment that is not only without risks to health and safety, but inclusive and in line with environmental considerations.

In the guideline, “must” indicates a mandatory requirement, while “should” indicates that which is recommended on the strength of authoritative sources but may not necessarily be interpreted as mandatory.

3 AIM OF THE GUIDELINE

This Workplace Sanitation Best Practice Guideline is designed as a centralised resource for the requirements, norms and standards for sanitation in the workplace.

This Guideline includes:

- Best practices in workplace sanitation based on relevant legislation, regulations, norms and standards within the South African perspective.
- Sanitation technology choices available in literature available at the time of drafting the guideline.

Generally, there is a paucity of literature specific to workplace sanitation. This guideline aims to consolidate applicable technologies from literature resources both locally and internationally in order to inform the planning and design phases of workplace sanitation facility development, or subsequent renovation of existing facilities to meet required norms and standards.

The guideline will assist in the sustainable provision of workplace sanitation infrastructure for all employees irrespective of gender, race, cultural beliefs and sexual orientation.

4 WHAT LEGISLATIVE REQUIREMENTS MUST BE CONSIDERED

Generally South Africa has a very firm and comprehensive legislative foundation. It is therefore not surprising that there are several key Acts, Regulations and Norms and Standards that have prescriptive requirements regarding the type and number of sanitation facilities that must be provided in the sectors contemplated in this guideline, which are outlined below.

All new buildings and major renovations must comply with the National Building Regulations and Building Standards Act, (Act 103 of 1977), as amended, which specifies certain requirements in terms of sanitation facilities. Furthermore, when adding new facilities or renovating existing sanitation facilities in an older building, there are some important regulatory requirements that must guide both existing and planned workplace sanitation facilities.

The Occupational Health & Safety Act (85 of 1993) (OHSA) was enacted to provide for the health and safety of persons at work and the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work. The OHSA and its various Regulations address diverse aspects that relate to safety at workplaces and is managed and enforced by the Department of Labour. Under the OHSA, the Facilities Regulations (GNR.924 of 3 August 2004) was established to address employee welfare needs which include sanitary facilities, toilets, bathrooms, showers, dining facilities, drinking water, as well as the conditions of these facilities that forms part of the work environment. A number of OHSA Regulations that are applicable to workplace sanitation are listed below:

- OHSA: Facilities Regulations, 2004 (as amended).
- OHSA: Hazardous Chemical Substances Regulations, 1995 (as amended).
- OHSA: Regulations for Hazardous Biological Agents, 2001.
- OHSA: Construction Regulations, 2014.
- OHSA: Asbestos Regulations, 2002.

The Mine Health and Safety Act, (Act No 29 of 1996) (MHSA) was enacted to provide for protection of the health and safety of employees and other persons at mines. The MHSA is enforced by the Department of Mineral Resources: Mine Health and Safety Inspectorate with the aim of eliminating or reducing worker exposure to the different occupational health hazards within the South African mining industry. Section 9.2 of the MHSA has provisions for workplace sanitation.

South African National Standards 10400 was developed and published by the South African Bureau of Standards (SABS). These standards are vital to the success of any building project as they stipulate the requirements to be adhered to when building new structures or making any alterations. The South African National Standards are enforced by the Local authorities.

The National Norms and Standards Relating to Environmental Health in Terms of the National Health Act 2003, (Act no 61 of 2003) are a compilation based on existing South African policy and legislation and international best practise by the National Department of Health aimed at strengthening the provision of environmental health services in South Africa. The standards address various issues such as food safety, water quality monitoring, waste management with sanitation being one of them and the Environmental Health Practitioners at provincial and municipal levels are responsible for enforcement. The Department of Health, Norms and standards for environmental health in South Africa (2013), stipulate various requirements for different building uses. In addition, the National Environmental Health Norms and Standards for Premises and Acceptable Monitoring Standards for Environmental Health Practitioners. Annexure A: Norms and standards for premises covers some requirements for toilet and ablution facilities.

Extracts of the above regulations, norms and standards have been used to inform this guideline; however, it is advised that in planning or upgrading any workspace sanitation facilities the above listed legislation, regulations, and documents be studied independently as is relevant to each sector.

5 HOW TO FACTOR INTERNATIONAL BEST PRACTICES INTO YOUR DESIGN

It is important to incorporate new ideas and practices, some of which may be sourced from international communities in order to ensure the continued progress of technology and its application for solutions to challenges faced locally. However, the use of international best practices should be properly considered before being adopted directly to the South African context. When considering their designs for workplace sanitation facilities, architects and engineers should tailor their designs to suit the specific requirements of the sector for which they are designing and, in addition, ensure that the choice of technology is appropriate and does not conflict heavily with the cultural preferences or practices of the employees who will use the facilities.

With Climate Change creating environmental crises such as water shortages, the need to explore and incorporate technology that address these challenges is ever more necessary. The previous Minister of Water and Sanitation, Ms. Nomvula Mokonyane at the National

Sanitation Indaba 2015 suggested that property developers must be challenged through regulation and licencing on developing less water reliant buildings (DWS, 2015). Planners should incorporate green building design elements that rely less on conventional waterborne sanitation systems and linear resource-to-disposal paradigms, but rather push the envelope to create low water use systems and sanitation systems that recycle grey water or possibly reclaim energy from sewerage waste.

In the backdrop of the Covid-19 pandemic, focus on health and hygiene has been paramount and a number of new health and safety standards, accreditations and initiatives have been developed within the global community, for example WELL Certified, GBAC STAR, and LEED. Given that Covid-19 is predicted to be a factor in our communities for the foreseeable future, it would be pertinent to consider design elements in workplace bathrooms that would inherently reduce the risk of disease spread between co-workers beyond conventional hygiene practices, such as adequate fresh air circulation; reducing crowding; increasing the physical barriers between restroom users; and reducing touchpoints and shared surfaces.

Access to bathrooms based on gender identity continues to be controversial but gaining ground in the global movement of inclusivity. Developers, planners and employers should as far as possible factor inclusive design options into workplace sanitation facilities. Designing for inclusivity should ideally be incorporated into initial designs for new facilities but can be incorporated into existing buildings in a manner that reinforces tolerance and organisational values. The design and implementation of inclusive sanitation facilities must be undertaken in a manner that takes cognisance of all employees' needs, especially the vulnerable (for example disabled persons, and women) by ensuring that facilities remain safe environments that the most vulnerable employees feel secure in using. While unisex facilities may be welcomed by some, others may feel threatened or uncomfortable sharing facilities with other genders, especially in the context of a country struggling with gender-based violence. This again highlights the need for careful deliberation when considering the selection or implementation of global best practice to ensure that it fits with the local South African context.

6 WHAT PRINCIPLES NEED TO BE CONSIDERED WHEN PLANNING SANITATION INTERVENTIONS?

When implementing sanitation facilities there are many principles and factors to consider, these include social impacts, environmental considerations, legislative and policy framework, governance, design and architecture and financial considerations.

The dominant social consideration is centred around who the main users of the sanitary facilities are. It is found largely through various case studies that women, children, the elderly

and people with disabilities were largely disregarded when sanitary facilities are implemented (Peprah, Baker and Moe *et al.*, 2015). Women's groups and organisations representing disabled workers should have a seat at the decision-making table especially through the planning and implementation processes. Infrastructure such as hand-rails, lower toilets and secure toilet seats should be put in place to ensure that the disabled do not struggle to use the sanitary facilities.

Any workplace sanitation infrastructure that is considered should be environmentally friendly and progressive. Systems should be put in place to ensure that as little waste as possible is produced and the waste that is produced is properly treated and/or discarded in an environmentally safe manner. As an example, the Eco-Toilet System (ETS) of the Philippines proves to be very eco-conscious with little to no-water use and the conversion of human waste into a fertilizer suitable for produce production (Malenab *et al.*, 2018). Where systems that need little or no disposal of waste can be used, such as the Dry Compost Toilets (DCTs), or where limited water is used should be considered in new workplace infrastructure.

The legislative framework surrounding sanitary facilities should take into account the needs of the users of the facility and how best to protect their dignity and offer a safe space. Rules should be enforced and upheld, and increased regulation of current and future legislation on sanitary facility requirements should be instituted. Perhaps specific provisions concerning women and people with disabilities should be considered. The United States can be seen to be making progressive legislative steps to ensure vulnerable groups and their needs are considered, for example the American Disabilities Act has specific provisions concerning disability-friendly sanitary facilities (American Disabilities Act, 1990). Where possible all role players should contribute to the drafting of the rules. Safety mechanisms should be put in place to ensure that users especially those that are vulnerable are protected and regulations governing these mechanisms should be enforced. Procedures concerning the upkeep and maintenance of facilities should also be drafted to ensure that these facilities are hygienic and safe for use.

Where infrastructure is needed, efforts should be put in place to achieve it, however this infrastructure should take into consideration the other principles stipulated above. Where it is possible and necessary, provisions should be made for people with disabilities and women. Sanitary facilities, when divided by gender, should be assigned in proportion to the male-female ratio of the people who will be using the facilities. The structure of the sanitary facility should ensure that users are safely separated from excreta, their dignity is upheld in keeping with their privacy and the facilities that are provided are culturally sensitive (Ndungu, 2018). Mechanisms such as individual direct entry stalls, doors designed to ensure privacy as well

as well-lit facilities can be put in place to ensure the safety of users. As stated by Winter, Dreibelbis and Barchi (2018), women are vulnerable and can be subjected to sexual harassment, disease and minimal privacy if mechanisms surrounding sanitary facilities are not in place to protect them. Measures should be put in place to ensure that these sanitary facilities are attractive, easy to use and easy to maintain and clean – these measures can include tiled floors and bathroom surfaces that can be easily cleaned. The sanitation option must be technically feasible in the physical environment in which it is installed and be compatible with local cultural practices and preferences.

Depending on the system used the financial impact of a new and/or improved sanitary facility could be minimal to the user. The maintenance of these facilities seems to be where the bulk of finances should be focused as the intention is to keep these facilities operational for as long as possible. As can be seen in Kenya, when facilities are ill-maintained and inconvenient to the user, they become dilapidated and un-used. The obvious deduction to make is that the cost of having to renovate or even demolish and rebuild these facilities will out-weight the cost of fitting suitable facilities in the first place. The budget must include Information, Education and Communication that is needed to accompany the sanitary system must be put in place. Mara, *et al* (2007) provides a useful algorithm that can be used when trying to choose the most suitable sanitary arrangement. The algorithm takes into account the cost and affordability, socio-cultural acceptability, technical feasibility and environmental impact and reuse potential.

7 FACTORS TO CONSIDER WHEN SELECTING AN APPROPRIATE TECHNOLOGY OPTION

Several different sanitation technologies are available, with new innovations added in response to challenges experienced linked to climate change, financial considerations, and a paucity of service provision in largely rural and low-income areas. Various resources exist, such as the Department of Human Settlements Planning and Design Guidelines or ‘Red Book’; SANS 10400; and the National Building Regulations that can be consulted to further explore the available technologies and engineering requirements. Several factors need to be taken into consideration when selecting an appropriate technology option for workplace sanitation, which are discussed below.

Technology choices are likely to be driven by the following main factors:

1. The regulatory environment.

The regulatory environment should speak to the various legislation frameworks, regulations, norms and standards that must inform the decision of what sanitary

requirements are needed. The guideline presented in the next chapter is based on South African legislation, regulations and norms and standards. Whichever technology choice is made, it must, as a minimum, meet the requirements set out in the regulatory framework of South Africa.

2. The implementation context.

The implementation context should cover the planning considerations associated with the characteristics of the workplace, such as the type of sector, type of workplace hazards and risks, number and demographic of employees expected to use the facilities. For example, the inclusion of squatting type toilets would cater for various culturally diverse workplaces. In addition, it should also include the situational environment or setting of the workplace sanitation facility, such as whether it is located in a rural, urban, peri-urban, or formal area; and any specific or associated environmental sensitivities or impacts. Technology types which would be appropriate to the context of workplace and associated environment, or setting should be investigated and selected.

3. Approaches and considerations (available technologies, vulnerable people considerations). Together with the above should be a consideration of approaches and concepts with emphasis on considerations for vulnerable people (e.g. women, members of the LGBTQ+ community and disabled persons) and innovative technologies that are environmentally conscious, including water sensitive design, allowing for use of treated water or recycled water to minimise wastewater, reducing the demand on potable water supplies, and preventing pollution.

A strong drive exists to incorporate innovative technologies, for example, handwashing facilities that consider affordability, accessibility, ease of use, and water conservation. For example, handwashing facilities in workplace sanitation facilities can be designed to reuse the water for toilet flushing. It is important that such technologies be investigated as part of project planning and incorporated as far as reasonably possible.

Taking the three technology drivers into consideration, especially the implementation context, will assist to determine whether, for example, a non-sewered or sewerred systems can be used based on the availability of adequate service provision in the area and whether the work will be temporary or more permanent in nature. A construction site that will be in operation for a few months and an industry or business that will be in operation for a number of years or decades will have different sanitation technological needs to suit the nature and setting of the work environment. Likewise, workplaces in the same sector, but with different health and safety risks, such as industries where employees are exposed to hazardous chemical substances (HCS) compared to industries where no HCS exposure exists, may have different

workplace sanitation requirements. Furthermore, a single workplace may require the need for several different sanitation technologies based on the nature of the working environments. For example, a mine may have more permanent sanitation facilities located above ground which may or may not be sewer systems, but temporary non-sewered sanitation facilities below ground. Therefore, the choice of technology cannot be prescriptive but rather adaptive based on workplace type, risks, and environment, and should be founded firmly on legislative framework and best practice in its implementation.

Not only is the choice of technology important but the way the technology will be implemented and managed is also essential in ensuring health and hygiene standards. Containment facilities associated with non-sewered systems for example, should be designed and constructed in ways that do not pose any hygienic or mechanical risk to users, sanitation workers, water resources, and the environment, and which are resilient to climate change impacts. The design and construction of containment facilities should consider the implementation context, including the soil type and seasonal variations of climate, number of users, and type of input (e.g. faeces, urine, greywater, flushing water, etc.) and suitable mechanisms should be in place to guarantee safe operation and maintenance.

Another factor to consider in choosing applicable technology is that sanitation facilities should be designed to minimise hand contact as far as possible for hygienic reasons, especially in the context of disease prevention. Electronic products for toilets such as flush valves and taps require minimum maintenance but offer enhanced operations that promote sanitation and perceived cleanliness because of hands-free operation. Various sensors can be incorporated into sanitation design including smart lighting sensors that register movement to address energy saving, smart amenity sensors for hand soap and towel dispensers.

Other factors to consider for design include that the sanitation facility renovation cycle or lifespan should first be determined before deciding on the type of materials or fixtures used. For example, a facility to be renovated or with a lifespan of five years should have materials which are durable to last for at least 5 years. Materials used should be durable, easy to maintain and resistant to vandalism and neglect. Following this approach would minimise intermediate maintenance and situations of facilities falling into disrepair which could impact on the health and safety of employees.

During the planning phase it would be advised that a risk assessment be undertaken which would inform developers and employers of the type and level of sanitation facilities needed in line with regulations, implementation context, and to ensure the health and safety of employees.

8 BEST PRACTICE GUIDELINE FOR WORKPLACE SANITATION

As part of the planning, design, construction or renovation of workplace sanitation facilities, the following should be taken into account in line with the legislation, regulations and norms and standards.

8.1 What Toilet and Washing Facilities Should be Provided?

- In terms of the Mine Health and Safety Act, the employer must provide readily available latrine facilities, within a reasonable distance from each working place and in refuge bays in the case of underground mines. The facilities must also enable employees who perform work involving hazardous substances to wash their hands and faces before eating any meals at work.
- Adequate sanitation and hand washing facilities should be available on the premises for use by employees and visitors, in accordance with Part F, P and Q of the SANS 10400; including those for people with disabilities.
- Sanitary facilities must be freely and readily accessible to employees.
- Toilet paper must be made available.
- Sanitary facilities must be provided with a water closet pan seat, toilet paper, hot and cold water, drying towels and handwashing soap.
- Floors of the toilet must be constructed of an easily cleanable surface.
- Privacy must be ensured through the provision of screen walls, partitions or doors
- Signage indicating gender and adequate ventilation in accordance with Part O of National Building Regulations must also be provided.
- Suitable, effective and approved drainage and sewage disposal system must be in place on the premises, for urban, rural and temporary workplaces.
- Toilet facilities should be adequately ventilated and illuminated in accordance with the provision of Part O of the National Building Regulations.
- Where paper towels are present many will use a piece of towel to grip the handle. Some littering of the restroom floors can be reduced by recognizing this smart practice and providing trash receptacles close to the exit. Alternatively providing for main facility doors that do not require hand touching to open or close would be a more hygienic solution.
- Urinal privacy screens should be sufficiently high to prevent adjacent urinal person to person eye-contact is an impediment to nefarious activities.
- Single facility entrance/exit plans work well provided the path of the users do not cross each other and the main entrance is wide enough and sufficient screening is provided to maintain privacy. Dispensing with the main entrance door to the public toilet not only helps to improve the ventilation within the toilet but also minimises hand contact for hygiene reasons.

- Location of accessible toilets should not be too remote from the main traffic area to avoid long travel distance. It should be easily accessible for those with urgency for the users.
- Developers and operators should design and plan for the provision of toilets such that sufficient facilities are provided based on the highest expected toilet use. In large facilities, toilets should be provided at every floor and uniformly distributed.

8.2 How Many Facilities Need to be Provided?

- Under the Occupational Health & Safety Act every employer must provide sanitary facilities at the workplace in accordance with the provisions of the National Building Regulations, i.e. 1 toilet for every 20 employees.
- Separate showers and change-rooms should be provided for males and females.
- The Department of Health, Norms and Standards for Environmental Health in South Africa require separate toilets and hand wash facilities must be provided for School staff members on the premises, with one toilet and one hand wash basin provided for every twelve staff members on the premises.
- Separate toilet and wash up facilities must be provided for male and female staff members.
- For industries, at least one toilet facility and one hand wash basin must be provided for every 20 employees on the premises.
- Separate change rooms must be provided for both males and females on the premises.
- For employees working in public gathering places, at least one toilet and one hand wash basin must be provided for every 20 employees on the premises.
- Requirements for office buildings include adequate sanitation and hand washing facilities must be available on the premises for use by employees with at least one toilet facility and one hand wash basin must be provided for every 50 employees on the premises, and one urinal must be provided for every 50 employees on the premises.
- One shower shall be provided for each 10 employees of each gender, or numerical fraction thereof, who are required to shower during the same shift.
- The SANS 10400 specifies the number of sanitary facilities required in various buildings based on the purpose and population for which such building is designed.
- In addition to quantities, SANS 10400 Regulation S2 requires that workplaces be provided with adequate and accessible facilities for use by disabled persons.

Table 1: Number of Toilets required for Residential Accommodation, Hotels, Dormitories, Domestic residences, Prisons and Hospitals (Source SANS 10400)

1	2	3	4	5	6	7	8
For a population of up to —	Number of sanitary fixtures to be installed relative to the population given in Column 1						
	Males				Females		
	WC pans	Urinals	Washbasins	Baths	WC pans	Washbasins	Baths
8	1	1	1	1	2	1	1
20	1	2	2	2	3	2	2
40	2	3	3	3	4	3	3
60	3	4	4	4	6	4	4
80	4	6	5	5	9	5	5
100	4	8	6	6	12	6	6
120	5	9	6	6	14	7	7
140	5	10	7	7	15	8	8
180	5	11	8	8	16	8	8
	For a population in excess of 180 add 1 WC pan for every 50 persons	For a population in excess of 180 add 1 urinal for every 40 persons	For a population in excess of 180 add 1 washbasin and 1 bath for every 50 persons		For a population in excess of 180 add 1 WC pan, 1 washbasin and 1 bath for every 60 persons		

Table 2: Number of Toilets Required for Personnel, Schools, Commercial sites, Industries, Churches, Museums, Storage and Entertainment centres (Source SANS 10400)

1	2	3	4	5	6
For a population of up to —	Number of sanitary fixtures to be installed relative to the population given in Column 1				
	Males			Females	
	WC pans	Urinals	Washbasins	WC pans	Washbasins
15	1	1	1	2	1
30	1	2	2	3	2
60	2	3	3	5	3
90	3	5	4	7	4
120	3	6	5	9	5
	For a population in excess of 120 add 1 WC pan, 1 urinal and 1 washbasin for every 100 persons			For a population in excess of 120 add 1 WC pan for every 50 persons	For a population in excess of 120 add a washbasin for every 100 persons

The ratios provided above should be used as minimum requirement. Where possible, additional sanitary fixtures should be provided to limit queuing and potential overuse which could impact not only on the health and wellbeing of users, but on overall maintenance costs.

8.3 What if Staff Work in Remote or Rural Locations or Temporary Workplaces without Waterborne Sanitation?

Compliance with the requirements of the Department of Health Norms and Standards, South African National Standards, and the Occupational Health & Safety Act Facilities Regulations and the Mine Health and Safety Act is needed to ensure the safe and healthy provision of sanitation facilities for employees working in challenging environments. Additional considerations include:

- In terms of the Mine Health and Safety Act, the employer must provide readily available latrine facilities, within a reasonable distance from each working place and in refuge bays in the case of underground mines. The facilities must also enable employees who perform work involving hazardous substances to wash their hands and faces before eating any meals at work, and to shower and change clothes at the end of each shift.
- Sanitary facilities must be freely and readily accessible to employees.
- Every water closet pan that is designed to have a seat must be supplied with a seat.
- Toilet paper must be made available.
- Privacy must be ensured through the provision of screen walls, partitions or doors.
- Signage indicating gender and adequate ventilation in accordance with Part O of National Building Regulations must also be provided.
- Suitable, effective and approved drainage and sewage disposal system must be in place on the premises for temporary workplaces.
- See 7.2 in terms of the number of facilities required.
- Separate facilities must be provided based on gender.
- Hand washing facilities must be provided with clean water and soap.
- Receptacles specially designed for collection of sanitary wear, or other suitable receptacle, shall be provided and used for the disposal of sanitary products. Each toilet unit must have one such receptacle which must be serviced regularly so as not to result in overfilling, offensive odours, or a health hazard.
- Mobile or temporary sanitation facilities (both water closets and showers) must not result in environmental pollution and should be designed, installed, serviced and managed in such a manner as to prevent environmental pollution while maintaining a healthy work environment for employees.

8.4 What Facilities Need to be Provided for Change Rooms and Showers?

- The Mine Health and Safety Act states that the employer must provide and maintain suitable and adequate change houses to enable employees who perform work involving hazardous substances to change into working clothes at the start of their shift and to wash themselves and change their clothes at the end of their shift.
- Shower walls must be smooth and impermeable and the floors slip-free and sloped for effective drainage.

- Walls and floors of showers must be constructed of a smooth and easily cleanable material and the walls must be painted with a light-coloured washable paint.
- Separate showers and change-rooms should be provided for males and females and these rooms must be provided with adequate seating in the form of chairs or benches.
- Employees who use showers shall be provided with individual clean towels.
- Body soap or other appropriate cleansing agents convenient to the showers shall be provided.
- Change rooms must not be used as a storage area.
- Adequate privacy must be afforded.
- Signage indicating gender must be present.
- Whenever employees are required by a particular standard to wear protective clothing because of the possibility of contamination with toxic or hazardous chemical materials, change rooms equipped with storage facilities for street clothes and separate storage facilities for the protective clothing shall be provided.
- Where working clothes are provided by the employer and become wet or are washed between shifts, provision shall be made to insure that such clothing is dry before reuse.
- Facilities must be adequately ventilated by natural or artificial ventilation.
- There should be no direct communication between the change-room and toilet facilities.
- The change rooms must not be located near any room where there is possible exposure to a hazardous chemical substance or a hazardous biological agent.
- Change rooms must be equipped with separate lockers for storage of each employee's personal belongings.

8.5 What Facilities can be Provided to Combat Gender-Based Violence and Provide for Female Employee Requirements?

As stated by Winter, Dreibelbis and Barchi (2018) women are vulnerable and can be subjected to sexual harassment, disease and minimal privacy if mechanisms surrounding sanitary facilities are not in place to protect them. Compared to their male counterparts, women have unique health and safety needs due to their anatomical makeup. In addition, where female workers are not provided with facilities that meet their needs this may result in unequal employment opportunities.

The following factors can assist in providing women with sanitation facilities that support women's safety, privacy, and hygiene needs:

- Locks should be installed on bathroom stall doors.
- There should be no outside latches that could be used to lock a person in a stall.
- The employer shall ensure that each work area and walkway is adequately lighted whenever an employee is present.

- Thoughtfully placed mirrors can increase security, especially in Women's Restrooms, by allowing a line of sight from the entrance to the back of the restroom without compromising privacy.
- Individual hand towels or sections thereof, of cloth or paper, air blowers or clean individual sections of continuous cloth towelling, convenient to the lavatories, shall be provided.
- Hand washing facilities must be provided with clean water and soap to support and promote women's reproductive and general health.
- Toilet paper must always be available.
- Handbag hooks should be placed behind stall doors at an appropriate height.
- Receptacles specially designed for collection of sanitary wear, or other suitable receptacle, shall be provided and used for the disposal of sanitary products. Each toilet unit must have one such receptacle which must be serviced regularly so as not to result in overfilling, offensive odours, or a health hazard.
- Within the mining sector and construction work environments especially, demarcating female sanitary facilities for reasons of privacy, protection and dignity is essential.
- Employees who may still be nursing a child should be provided with a place other than a bathroom, that is shielded from view and free from intrusion from co-workers and the public, which may be used by an employee to express breast milk in a dignified and private manner.

8.6 How can Sanitation Facilities be Inclusive?

Members of the LGBTQ+ community can feel discriminated against in the workplace by being instructed to use a particular gender specific sanitation facility or not being afforded adequate privacy. A growing movement is the provision of inclusive sanitation facilities. To ensure the comfort of all employees, the introduction of inclusive facilities should be accompanied by information and organisational support. Furthermore, a workplace can be made more inclusive by considering other cultural practices in sanitation. Ways in which inclusive workplace facilities can be incorporated are outlined below.

- Design for inclusivity from the beginning as far as possible rather than waiting for issues to arise within the organisation.
- Where space and financial provision allow, a unisex inclusive bathroom in addition to the classic male and female only bathrooms, to better accommodate LGBTQ+ employees. Should this not be possible, hybrid solutions or multi-stall solutions that combine private and communal spaces for all users can be adopted if the overall safety and security of facility users is not compromised.
- Adoption of a policy that allows employees, such as those who are transgender, to use the facility consistent with their gender identity will assist in creating an inclusive working environment.

- Select appropriate language, such as 'gender inclusive' or 'all gender' over 'gender neutral' in order to be more considerate.
- Follow the requirements of the Department of Health Norms and Standards, South African National Standards, and the Occupational Health & Safety Act Facilities Regulations regarding the facility provisions, number, and specification.
- Consider the installation of different types of toilets, for example sitting and squatting options, and bidets, to accommodate employees with different cultural preferences.

8.7 What Facilities are Needed to Accommodate Disabled Employees?

The following standard should be consulted and followed to align workplace sanitation facilities with requirements needed to accommodate disabled employees – SANS 10400-S:2011 Edition 3: The application of the National Building Regulations Part S: Facilities for persons with disabilities.

Some extracted standards are listed below:

- Wheelchair accessible toilet, meaning a toilet designed to include use by wheelchair users.
- Facilities both on-site and within permanent buildings should be:
 - in accordance with the requirements given in this part of SANS 10400;
 - the subject of a rational design or rational assessment undertaken by a competent person.
- Any entrance or route used to reach sanitation facilities must also be accessible to persons with disabilities.
- Facilities that are included in a building specifically for use by persons with disabilities, such as wheelchair-accessible toilets, shall be indicated by the international symbol for access and shall comply with 4.2.1 of the Standard.
- A handle fitted to a door leaf of a door in an emergency route or in a feeder route or in any compartment containing toilet facilities for use by persons with disabilities, shall be of the lever type, with a lever at least 150 mm long, and shall be installed at a height that does not exceed 1.0 m above floor level.
- Specifically, Section 4.12 and Annex D of the standard outline requirements for toilet facilities for persons with disabilities including typical layouts for design considerations.

8.8 What is Required for Operation and Maintenance of Sanitation Facilities?

- The maintenance shall be such that the mechanical strength of the building or structure is not reduced. Technical devices and installations shall be maintained in such a way that they function as intended and with safety unimpaired
- For temporary, mobile, VIP type toilets in remote areas or areas without waterborne sanitation connection, overuse can result in toilet failure, an unhygienic environment in

which to use the toilet and an increased risk of contact with human waste. It is thus important to ensure adequate provision of toilets per number of employees, or where overuse is noted during operation, additional facilities should be catered for. Maintenance of the toilets provided is of importance to ensure that the waste is adequately removed and the risk of contact with human waste is reduced. This is generally done through weekly or fortnightly servicing to remove the waste and to reset the system.

- In terms of the Mine Health and Safety Act, sanitary facilities must be inspected during or at the end of each shift to ensure they remain in a satisfactory condition as indicated in MHSA Regulations 2.15.6.
- The sanitary facilities should be maintained in a clean, hygienic, safe, whole and leak-free condition, and good state of repair.
- Toilet facilities must be kept clean at all times, with general cleaning conducted daily, and facilities should be provided with an adequate supply of toilet paper, soap and drying towels.
- The timing and frequency of deep cleaning should be determined by the crowd flow. Thorough cleaning of toilets should be carried out during off-peak hours when toilet usage is low. Touch up cleaning should be done more often during peak hours
- Toilet facilities must also be maintained in good working order and in good repair at all times and must be adequately ventilated and illuminated.
- Faulty or broken components must be repaired within reasonable time so as not to infringe on the health and safety of employees.
- All toilets that are not connected to sewers shall be linked to a containment facility that either allows for faecal sludge to be safely treated onsite or transported to offsite treatment facilities.
- All toilets that are not connected to sewers and where excreta cannot be treated onsite shall have access for safe emptying.
- Sanitary receptacles must be serviced regularly so as not to result in overfilling, offensive odours, or a health hazard, and shall be maintained in a clean and sanitary condition.
- Preventative servicing should be undertaken regularly to ensure that sanitary fixtures, sensors, and mechanical parts are maintained in working order.

8.9 Which Factors Should be Considered for Decommissioning of Sanitation Facilities?

Decommissioning of sanitation facilities is most likely to occur during renovation projects or when remote or temporary sanitation facilities are no longer required.

- Waste other than sewerage waste should be managed in line with the hierarchy of waste with emphasis on the reuse, recycling, and recovery of waste before considering disposal as an option.

- Sewerage waste must be removed by an authorised service provider for disposal at a licenced wastewater treatment plant.
- Appropriate steps should be taken to minimise spillages during removal and transport and remediated should they take place should any spillages occur.
- Temporary sanitation facilities should be decommissioned in such a way that all signs of the facilities are removed and left in a clean and sanitary condition.

9 TOWARDS BETTER WORKPLACE SANITATION

When implementing sanitation facilities there are many principles and factors to consider. Vulnerable groups that have been marginalised for a vast period should have provisions and mechanisms put in place directed specifically at them. A solid legislative framework is also important surrounding sanitary facilities. Legislation should be clear and direct. It should be easily enforced and should be upheld by the relative authorities. A good legislative drafting means little, however, when it is not enforced, and poor enforcement often results in a poor sanitation environment. It is important for sanitation facilities to include special provisions surrounding environmental considerations and impact, and the vulnerable or special groups of people mention before. Where it is possible, the most environmental conscious designs and infrastructure should be used. The main focus concerning the environmental impact of these sanitation facilities is for little waste and water to be used. The design and infrastructure of these facilities should take into account operating hours and day-to-day maintenance. Materials that are easily cleaned and eco-conscious should be used, such as tiled floor and easily cleansed surface finishing, and the facilities should be available to the public when needed.

Safe and equitable sanitation depends on effective regulation of the sector and in providing clear guidelines for those working within it. For regulation to be effective, it must be adapted to and cognisant of the local institutional and political context, or it may not lead to service improvements. When considering workplace sanitation facility design, it would be advised that a risk assessment be undertaken which would inform developers and employers of the type and level of sanitation facilities needed in line with regulations, implementation context, and the employees' needs.

Workplace sanitation facilities in South Africa should meet the legislative requirements as a minimum, but readily incorporate new technologies that are eco-friendly and befitting local culture and context to create facilities that uphold and support the health and safety of employees.

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