GUIDELINES FOR SCHOOL SANITATION

Mankind owes to the child
the best it has to give.

Declaration of the Rights of the Child
(United Nations, 1959)

BUILDING AND MANAGING SCHOOL TOILETS THAT PROTECT LEARNERS' RIGHTS TO SAFETY, HEALTH AND DIGNITY

BOBBIE LOUTON AND DAVID STILL

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WATER RESEARCH COMMISSION

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FOREWORD

Taking a brave look at the failure of rural school sanitation

Many rural schools across South Africa have sanitation which fails – partially or totally – to fulfil its primary function: to allow learners to perform the most basic of bodily functions in privacy and dignity without danger to their safety, health or dignity. When these basic rights of learners are not protected, they are vulnerable to exposure to disease or bodily harm in their school toilets – something no child should ever face in their learning environment.

Failed sanitation can be defined as sanitation which undermines the safety, health or dignity of users.

Here is a composite description of some of the worst conditions seen during our research in rural school toilets. They serve to highlight the key issues with which we need to grapple:

> *The toilets are located far from the administration buildings and behind the classrooms: staff would not be able to hear if a learner called for help from the toilets.*
>
> *The toilets are dark. Many of the doors to cubicles are missing, affording no privacy. Many of the pedestals have no toilet seat. The rim of the pedestal is crusted with faeces and, as no toilet paper is supplied which could be used as a barrier between user and pedestal, learners have no options but to sit on excrement when they relieve themselves, or to squat above the toilet without making contact with the seat. Small learners have to place their hands on this filthy rim in order to lift themselves onto the toilet.*
>
> *Some of the pedestals are not securely fixed to the slab over the pit, which is starting to break. The opening through the pedestal is big enough that a small child could fall through into the pit. The pit is so full that the sludge is clearly visible and maggots, flies and cockroaches move around on the sludge as the user does her business. There are no bins for pads and no toilet paper to wrap them in, so these are either thrown into the pit or discarded on the floor.*
>
> *The smell is unbearable. The floor around the toilet has pools of urine and excrement and is littered with rubbish, which is sometimes used in place of toilet paper.*
>
> *Derogatory remarks about some of the learners are written on the doors. Some of the learners gather in the toilets to smoke and do drugs. No staff venture into the toilet blocks. Occasionally learners are sent into the toilets to clean them. They are provided with no protective equipment.*
>
> *Behind the toilets some of the pit access covers are missing. Some learners urinate and defecate behind the toilets because of the situation inside the toilets. Nearby are the remnants of even older toilets – now just pedestals and open pits with no structure remaining.*
>
> *The only handwashing facility on the school ground is a standpipe located some distance away from the toilets. This is shared by all learners for washing hands or drinking water. The tap handle has never been cleaned in the history of the school. The tap is surrounded by a pool of stagnant water and to use the tap a learner must balance on a number of uneven stones and bricks which have been placed in the muddy puddle.*
>
> *Near the office block are the teachers' flush toilets which are cleaned by the school cleaner and have toilet paper and soap. Because there are not enough toilets, learners queue for most of break time to use the toilet, and use class time frequently to use the toilet. Some learners go home to go to the toilet and don't come back and some girls don't come to school at all during their periods because it is too difficult to manage them in the school toilets. The*

school principal has not noted this pattern; he sees menstruation as an issue for female staff to address discretely.

While this description combines all the worst examples and therefore does not by any means fit all rural schools, the elements described here represent serious problems at many. In a situation like this, where children's rights are violated and their very learning environment poses a threat to their wellbeing, things can go horribly wrong. In one of the most tragic cases of failed school sanitation in South Africa, six year old Michael Komape drowned in a school toilet after falling into the pit in January 2014, during the first few days of his school career.

Michael's terrible death raises numerous questions about our schools and our society:

- Why did the staff entrusted – at school and department levels -- with *in loco parentis* responsibility for this little boy fail in their sacred duty to protect his well-being and guarantee his rights in the school environment?
- How do educators see the value of our children?
- What rights do our children have while they are at school?
- Do adults in the school environment have a higher claim to protection of their rights than the youngest and most vulnerable placed in their care?
- Whose job is it to ensure that toilets are safe?
- What should schools do when their toilets aren't safe and days pass without the department delivering new toilets?
- What can schools do to protect learners when toilets may pose a threat to them?

The schools where safety, health and dignity are at risk still typically reflect the demographic inequalities of apartheid. In its 2014 report, the South African Human Rights Commission stated that:

> "Those areas which lack water and sanitation mirror apartheid spatial geography. Former homelands, townships and informal settlements are the areas in which communities and schools, who are black and poor, predominantly do not enjoy these rights and many others. The lack of access to sanitation has an impact on other rights including rights to dignity, education, health, safety and the environment" (HRC, 2014).

Why do so many of our schools still have such appalling sanitation? A common explanation is that service delivery has still not caught up with apartheid era backlogs. It is true that backlogs still exist. Backlogs are determined by the Department of Basic Education (DBE) to be those schools which have no sanitation or inadequate sanitation. Unimproved pit latrines and chemical toilets are considered to be ''inadequate'' forms of sanitation, while VIP toilets, desiccating toilets (such as the Enviro Loo) and flush systems are considered ''adequate'' forms of sanitation. In 2015 the DBE reported that at its 25,720 education sites, 10,479 had unimproved pit latrines, 92 had chemical toilets and 128 had no sanitation at all. However, the adequacy of sanitation is clearly not ensured solely on the basis of the construction of a new toilet block. There are a host of other factors which render a potentially appropriate technology inappropriate in terms of the threat it represents to users' safety, health or dignity. These include:

- the use of inferior materials which break down (such as inadequately protected metal or timber slabs over pits which rot and rust in the constant presence of urine, creating a risk that they will collapse under the user)

- inferior construction (improperly constructed slabs, or holes in slabs which are too big for the pedestals mounted over them, resulting in the risk of the pedestal collapsing under the user into the pit)
- the design of the pedestal (designs which are degrading to human dignity have been used on occasion in toilets which otherwise could be considered acceptable)
- their current condition after having potentially been neglected since installation
- a multitude of factors beyond the type of technology used (e.g. can toilets which have no handwashing facilities, or are located several hundred meters from the classrooms, through long grass – be considered "adequate"?)

In addition, in our research the VIP toilet – the technology used overwhelmingly by the DBE for rural schools – is perceived by many learners and principals as posing a threat to the lives of learners. In our research, 54% of VIP users indicated that they had felt afraid of falling into their school toilet.

Clearly to focus solely on delivery of infrastructure as the route to ensure all schools have "adequate'' toilets would be a serious mistake. In fact, some infrastructure has reached a failed state only weeks or months after having been commissioned. The solution in such a case certainly cannot be to add the school to the list of those needing new toilets.

The visible failure of many of the toilets that *have* been delivered points to a range of issues both "hard" and "soft", both technical and human, including:

- INFRASTRUCTURE that does not support learners' rights due either to inappropriate design, improper construction or damaged/deteriorated condition
- MANAGEMENT that is unable or unwilling to ensure that dangerous toilets are not used, repairs are made, toilets are kept clean, toilets are protected and monitored from predators within or from off of the school grounds, and that toilets are equipped with the supplies needed for users to maintain an acceptable level of hygiene.

The fact is that while the delivery of sound infrastructure is absolutely fundamental, without equally sound management that infrastructure will deteriorate to an unsafe state within months. At that point, what the Department of Education has handed over as a completed project comes full circle: the school is once again in need of adequate sanitation.

Infrastructure not accompanied by an effective management system, therefore, can be expected to fail from the outset. The Department, the principal and the SGB must make a commitment not only to deliver sanitation but to *see sanitation through* over the long term, otherwise it can be assumed that the rights of learners will continue to be violated.

Effective management requires both CAPACITY and WILL on the part of managers. In South Africa, school principals often feel helpless in the face of conditions where their budgets seem inadequate for the needs of their schools. In many communities, there is no real possibility of raising funds from the community to pay for a school cleaner, for example. Destructive learner behaviour can also result in damage which then requires repairs. In addition, many rural school principals apparently don't have the time or organisational skills to develop the kind of management tools and systems

that are needed to keep school toilets safe and clean. In this context, it is not surprising that many principals simply ignore the toilets altogether. Intervention is needed from the department level – to support principals, equip them with skills and tools, and hold them accountable for their responsibility for protecting learners' rights.

Toilets: the most dangerous place in the school?

Toilets can easily be perceived as the least "important'' part of the school space. Learners' toilets may be both out of sight and out of mind to staff, who are not forced to enter them or think about them. The "hiddenness'' of the toilets is heightened by the fact that using a toilet is a private activity. And yet the toilets may very possibly be the part of the school environment where children's rights are most under threat. This is because:

- Structurally unsafe toilets **pose a threat to the lives of learners**
- Adult size pedestals and seats over pit latrines can **pose a threat to the lives of small learners**
- The **diseases in faeces can be spread between learners**. Faeces is easily transferred to learners' hands while wiping themselves and from there to flush handles, door handles and tap handles where diseases can be transferred to any other learner who touches these surfaces. Unless these surfaces are cleaned properly regularly throughout the school day, the school toilets will pose the greatest threat to learners' health at school.
- Toilets are often **the area of the school with the least supervision and monitoring** by staff. As a result, they are the area of the school environment where **learners are most vulnerable to threatening or abusive behaviour** by other learners.
- Toilets are often the **most unpleasant area** of the school environment. Unpleasant sights and smells and dark and filthy conditions may **leave a child feeling degraded, insecure and uncomfortable**.

For these reasons, toilets should have a central place in the focus of staff and should be vigilantly monitored and supervised.

How does failed sanitation impact learners' right to education?

School sanitation plays a central, but overlooked role, in learning. Central, because urinating and defecating is the most basic need which learners must be able to meet under conditions that are physically and emotionally safe at school in order to be ready to learn. Overlooked, because this need is taken care of in private, and the experiences and difficulties learners face while attending to this need will therefore be "invisible'' unless the school actively manages the conditions in the toilets and the experience of learners. Learners have no power to opt out of a school environment where toilets violate their rights to safety, health and dignity. When toilets routinely threaten or violate their rights to safety, health, and dignity their physical and psychological wellbeing is compromised and learning is undermined. Some learners will attempt to train themselves to not use the toilet for the duration of the school day, placing themselves at risk for developing lifelong health complications and undermining their ability to concentrate in the classroom. Others will simply leave school to go home and will not return, removing themselves from the learning environment altogether. Menstruating girls who do not feel they can attend to their periods with safety and

privacy at school may opt to stay home for the duration of their period every month. Others will go to the bush and return, missing valuable time in the classroom. Young children who are afraid of falling into the school toilet may feel they have no option but to defecate on the toilet floor or outside in the open, exposing themselves to humiliation and undermining their ability to thrive in the learning environment.

WAYS IN WHICH FAILED SANITATION COMPROMISES LEARNING

- Learners avoid going to the toilet, resulting in poor concentration in class and potentially in health problems
- Learners may contract illnesses from the toilets, resulting in time away from school
- Female learners stay home during their periods, missing learning
- Learners leave school to find a more acceptable toilet elsewhere, missing learning
- Learners feel less respected and happy, compromising their ability to thrive academically and socially

Below are some of the remarks made by principals about the impact of failed sanitation on learning during the course of our research.

COMMENTS BY PRINCIPALS ON THE IMPACT OF FAILED SANITATION ON LEARNING

"It will have a mental effect on them because they will go to the toilet and see the state of the toilet and will try to hold it in until they get home or something and now they won't be concentrating because they will be sitting in the classroom and thinking of what they have to do and not concentrating on their class work."

"The learner might not be able to relieve themselves due to the state of the toilet. You will find that the learner will opt to leave school."

"Some prefer not to use them and relieve themselves when they get home. This also affects their learning."

"Boys don't want to use the toilets and prefer to use the bush. It has some impact on learning as the bush is about 10 minutes away from the school."

"It has affected them greatly because you sometimes find someone saying "Sir I have a runny stomach -- may you please allow me to go home because the sanitation facilities are not good?" Our teaching and learning will definitely be affected because if you can't have a proper clean toilet then we have to allow the learners to go home and they miss the lessons being taught. "

"It affects the learning as they spend most of their time in the toilets to beat the queues. There is a serious shortage of toilets."

"Some learners have to rush home to relieve themselves especially when they have a running tummy."

"In order to get good results at school, you have to have good sanitation."

Background to this document

In 2014 a study was initiated by the South African Water Research Commission to evaluate school sanitation across three provinces: Limpopo, KwaZulu-Natal and Eastern Cape. The purpose was to attempt to compile a fair picture of the status of toilets and gain insights into key issues and needs which need to be understood and addressed in order for school sanitation not to fail. Following a review of guidance and other literature addressing school sanitation from around the world, 130 schools were visited. Principals and cleaners were interviewed and focus groups and surveys were

conducted with learners regarding practices, perceptions and attitudes around school sanitation. In addition, visual assessments of school sanitation facilities were conducted by the research teams. The insights yielded from this data set have been combined with best practices identified in the literature review to produce this guideline.

Using this document

This document addresses the rights and needs of users and the challenges faced by managers. It provides a guide for the *design* of toilets that meet the needs of users in the conditions of a rural school. It also provides a guide for the *management* of the toilets to ensure that the rights of users to health, safety and dignity are met at all times while they are in the school environment. Provincial education departments carry the first line of responsibility for providing adequate infrastructure and the resources, support and accountability to schools to ensure that toilets are maintained in a safe and healthy state; but there is much that principals, staff and School Governing Bodies can do to ensure that even with less than ideal sanitation infrastructure and limited resources they can keep the toilets clean and safe. This guideline addresses sanitation for staff only tangentially, because adult employees of schools have far more agency to protect their lives and their well-being than do children.

Bobbie Louton and David Still
August 2016

EXECUTIVE SUMMARY

The urgent need for functional school toilets

A prerequisite to learning is that learners' basic needs are met and their rights to health, safety and dignity are protected. One of learners' most fundamental needs which must be met at school is the need to urinate and defecate. Because learners relieve themselves in private, the problems they experience while using the school toilet can be "invisible'' to staff. Toilets that are not maintained in a safe condition pose a threat to the lives of learners. Filthy conditions undermine health, spreading infections which compromise cognitive development and result in absence from school. Degrading and frightening experiences in the toilet undermine learners' psychological wellbeing, compromising learning and their ability to thrive academically and socially. Learners who avoid using the toilets because of the conditions there may find themselves unable to concentrate in class, or may leave school to find a more acceptable toilet elsewhere. Girls who find it too difficult to manage their periods in the school toilets may routinely stay home when they are menstruating, compromising their education. With sanitation in a failed state at many of our rural schools, there is an urgent need to understand the issues contributing to failure and find a model that will ensure success.

Understanding the key issues

In 2014-2015 the South African Water Research Commission conducted a study to better understand the needs of learners with regard to school sanitation and the key issues that contribute to the failure of sanitation at schools[1]. The study began with a review of international literature addressing school sanitation, which was followed by visits to 130 to schools in KwaZulu-Natal, Limpopo and the Eastern Cape to collect data. Principals and cleaners were interviewed and focus groups and surveys were conducted with learners regarding practices, perceptions and attitudes around school sanitation. In addition, visual assessments of school sanitation facilities were conducted by the research teams.

Key issues identified in this study were:

- **Toilets which place the user over a deep pit, such as the VIP, create a risk of a user falling into the pit and dying.** This issue must be addressed from a design point of view: alternative designs should be sought; where VIPs are to be installed the design should be modified to reduce risk. This must also be addressed from a management point of view: toilets must be maintained in safe condition and children (particularly small children) who have to use toilets over a pit should be accompanied and assisted.
- **School infrastructure that is delivered without an effective management programme in place will fail.** Conditions of safety, health and dignity cannot be maintained without vigilant management which includes regular inspections, cleaning, maintenance, monitoring and reporting.
- **Schools typically lack the capacity to manage toilets on their own.** The department must provide clear standards for managing toilets, must provide the administrative tools for implementing these standards and must provide support, monitoring and enforcement to ensure that standards are upheld.

[1] The full report on this study is available from the Water Research Commission (WRC Report No 2381/P/15)

- **While all learners have a right to support and assistance in the toilets if needed, certain groups are in need of special assistance.** Schools must ensure that small children, menstruating girls, children with physical or other special needs or children who are the target of bullying or other abusive behaviour can meet their needs safely and with dignity in the toilets.

This guideline is informed by the insights gained from these school assessments as well as the best practices identified in the literature.

Guidance for successful school toilets

This guideline addresses the need for successful sanitation as follows:

- ***Chapter 1: Equipping ourselves to tackle the design and management challenges of sanitation*** The WRC study found that principals lacked a theoretical framework for understanding the role which sanitation plays in education and their role in ensuring that sanitation succeeds. This chapter provides a paradigm for addressing sanitation based on the legal rights of children – in particular the rights to safety, health, dignity and special care for special needs: with special attention to the issues faced by small children, children with physical or other challenges and menstruating girls. This is expressed in a proposed **Bill of Children's Rights in Sanitation.**
- ***Chapters 2-4 offer guidance on design choices for sanitation facilities, including design principles,*** location and layout of facilities, and selection and design of components, technologies, collection chambers, beneficial use of urine and faeces, treatment and disposal of sludge.
- ***Chapter 5 provides a model for managing school sanitation effectively.*** This chapter identifies obstacles and keys to successful management, addressing the values, knowledge and vision of managers, which together drive effective management. A team model in which the department, schools, SGBs and dedicated staff work together to achieve successful sanitation is discussed. A **Standard for the Management of School Sanitation** is provided, along with a detailed **Implementation Plan**.

The school sanitation management handbook, "Healthy Toilets are Possible!" has been published in conjunction with these guidelines.

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FIGURES

TABLES

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1. THE DESIGN AND MANAGEMENT CHALLENGES OF SCHOOL SANITATION

1.1 LOOKING THROUGH A CLEAN LENS: The rights of children at school

Confronted with the overwhelming challenges facing rural school sanitation it can sometimes seem as though very little real progress has been made, despite the considerable resources which have been allocated by government in the last ten years. For those who grew up using desperately horrible school toilets themselves, they may find themselves accepting, on some level, that the state of much of rural school sanitation is an unfortunate but unchangeable reality. Confronted with vandalism, theft and misuse of the toilets by learners for illicit activities and sometimes acts by which learners degrade their learning environment themselves – such as writing on the walls with faeces – it can almost seem that terrible toilets are a fit punishment for those who are co-creators of the disaster. We can forget that not every learner has treated the toilets badly, and that the majority should not be punished collectively for the misdemeanour of a few. We can forget that users of toilets are not just the big, unmanageable children who attract attention but are also small, weak and vulnerable children who need to be protected. We can forget that even the vandalizers, drug users and bullies are still children who must be protected and nurtured, and who have the same rights to safe, healthy toilets that uphold their dignity and meet their needs as any other child. The lens through which school sanitation is considered gets dirty. One can too easily forget that protecting the rights of children should be at the heart of everything one does.

1.1.1 Human rights and the special status of children

The South African Constitution[2] provides a strong foundation for the equality and dignity of every person in the Bill of Rights. It is important to remember that children share these rights equally and that some of these rights have particular significance in the context of school sanitation. The Bill of Rights states that:

Everyone has inherent dignity and the right to have their dignity respected and protected.
Everyone has the right to an environment that is not harmful to their health and well-being.
Everyone has the right to privacy.
Everyone has the right to bodily and psychological integrity.
Everyone has the right to not to be treated or punished in a degrading way.

In addition to sharing **equally i**n the rights enjoyed by all human beings, children have a ***special*** status. Colonial and cultural patterns of domination and oppression often result in the most vulnerable in society – women and children – having the lowest status. Many South Africans are accustomed to practices that are based on the idea that leaders are entitled to have more than those whom they lead, that adults deserve more respect than children, older children than younger children, and so on. While it is appropriate for children to honour the experience and wisdom of their elders, when our elders or leaders use their superior status to ensure their own comfort at the expense of the wellbeing of the young or vulnerable, this notion sours. Leaders who claim a right to higher status to justify their failure to attend to the needs of those in their care may appeal to traditions which afford them privilege, but they are on the wrong side of South African and international law.

[2] South Africa, 1996

> Every child has the right to be protected from maltreatment, neglect, abuse or degradation.
> *Bill of Rights, Constitution of South Africa*

The South African Bill of Rights states that government may not unfairly discriminate, directly or indirectly, against anyone on the basis of age. But even equal rights, while a good starting place, is not enough: children, with greater vulnerabilities to danger, disease and abuse than adults, are entitled to have their rights cared for first, not last, especially at schools – the institutions created expressly for their greater good. The International Declaration of the Rights of the Child[3], to which South Africa is a signatory, states that ***"the child, by reason of his physical and mental immaturity, needs special safeguards and care."*** In addition to the special rights of children, some children have additional vulnerabilities which entitle them to even more safeguarding and care by staff at school.

The legal framework for the rights of children and responsibilities of caregivers which have application to school sanitation is summarized in Table 1.

Table 1: Legal rights of children and obligations of educators

LEGAL RIGHTS OF CHILDREN AND OBLIGATIONS OF EDUCATORS THAT HAVE BEARING ON SANITATION
United Nations International Declaration of the Rights of the Child, 1959
○ Those responsible for the education of a child must **always act in the child's best interests**. ○ A child needs **special safeguards and care** because of his physical and mental immaturity, ○ A child needs **love and understanding** in order for his/her personality to develop fully in a balanced way. ○ A child has a right to **special protection**. ○ A child must be given the opportunities and **facilities** to develop in a **healthy** and normal manner and in conditions of freedom and **dignity**. ○ In all circumstances, **children must be among the first to receive protection and relief**. ○ A child must be **protected from all forms of neglect**, cruelty and exploitation. ○ A child who is physically, mentally or socially **handicapped** shall be given the special treatment, education and **care required** by his particular condition. ○ A child has a **right to grow and develop in health**; to ensure this, **special care and protection** must be provided to him/her. ○ A child **may not be required to do any activity which could negatively affect his/her health or education**.
United Nations International Convention on the Rights of the Child, 1989
○ All members of the human family have **inherent dignity** and have equal rights under all circumstances. ○ Governments are required to provide children with the **protection and care** necessary for their well-being. ○ **Children are entitled to special care and assistance**. ○ Governments must ensure that the institutions, **services and facilities** responsible for the care or protection of children conform with the standards established by competent authorities, particularly in the areas of **safety, health**, in the number and suitability of their staff, as well as **competent supervision**. ○ Public institutions must make the **best interests of the child a primary consideration**. ○ The government **may not unfairly discriminate** directly or indirectly against anyone **on the basis of age**.

[3] United Nations, 1959

South African Constitution, Bill of Rights (1996)

- Everyone has **inherent dignity** and the **right to have their dignity respected and protected**.
- Everyone has the **right to not be treated** or punished in a cruel, inhuman or **degrading way**.
- Everyone has the **right to bodily and psychological integrity**.
- Everyone has the **right to privacy**.
- Everyone has the **right to an environment that is not harmful to their health or wellbeing.**
- Every child has the **right to be protected from maltreatment, neglect, abuse or degradation**.
- Every child has the **right to not be required to perform work** or provide services that **place at risk the child's well-being, education, physical or mental health** or spiritual, moral or social development.
- A **child's best interests are of paramount importance** in every matter concerning the child.

South African Children's Act (No. 38 of 2005)

- Every child that is able to participate in any matter concerning him/herself **has the right to participate** in an appropriate way and **views expressed by the child must be given due consideration**.
- In any matter concerning a **child with a disability** due consideration must be given to making it possible for him/her to participate in educational activities, recognising the special needs he/she might have. He/she must be **provided with conditions that ensure dignity, promote self-reliance and facilitate active participation in the community**.
- In any matter concerning a **child with chronic illness** due consideration must be given to providing the child with **conditions that ensure dignity, promote self-reliance and facilitate active participation in the community**.

South African Council of Education: Code of Professional Ethics

An educator must:

- **respect the dignity**, beliefs and constitutional rights of learners and in particular children, which includes the right to **privacy and confidentiality**
- **avoid any form of humiliation** and refrain from any form of abuse, physical or psychological
- **exercise authority with compassion**
- acknowledge the uniqueness, individuality, and **specific needs** of each learner
- take reasonable steps to **ensure the safety of the learner**
- recognise, where appropriate, **learners as partners** in education

South African Schools Act (Government Notice No. 23315 of 2002)

- **Educators must protect, promote and fulfil the rights of learners**.
- **An educator has the same obligations as a parent to protect** a learner during the time she is at the school.
- Every learner has the right to freedom and security of his or her person, which includes the right to be free from all forms of violence or assault, and **not to be treated** or punished in a cruel, inhuman or **degrading way**.
- E**very child has the right to be protected from maltreatment, neglect, abuse or degradation.**
- All appropriate social and educational measures must be taken to **protect the child from** all forms of physical or mental violence, injury or abuse, **neglect or negligent treatment, maltreatment** or exploitation, including sexual abuse, while in the care of any person who acts in the place of the parent (*in loco parentis).*
- All parties have a responsibility to maintain a **safe environment that is conducive to education including well-cared for toilet facilities**.

The key rights addressed in this legal framework which apply to the context of school toilets are children's rights to safety, health, dignity and the accommodation of special needs. Taken together these provide us with an appropriate lens for engaging school sanitation, as shown in Figure 1.

Figure 1: A lens for engaging the challenges of school sanitation

1.1.2 Children's rights in the school toilets unpacked

When the ''lens" of children's rights ís focused on the context of school sanitation, it can be used to formulate a "Bill of Children's Rights for Sanitation" as shown in Table 2. This provides a framework for tackling the challenges of school sanitation.

Table 2: Bill of children's rights for sanitation

BILL OF CHILDREN'S RIGHTS FOR SANITATION
1. SAFETY: Children have a right to toilet facilities that are structurally safe and free from threats.
1.1. Children must be provided with infrastructure that is soundly constructed and maintained, with particular attention to the risk of a slab or pedestal collapsing into the pit. 1.2. Infrastructure for Grades R-3 should eliminate any risk of a child falling through the seat into the pit. 1.3. Children must be allowed to use staff toilets in a situation where these are the only safe toilets available. 1.4. Pit access hatches must be securely covered. Decommissioned pits must be filled with soil and covered. 1.5. Staff must be available to learners in the toilets at break to prevent abuse and intimidation**.**
2. HEALTH: Children have the right to toilet facilities which minimise the spread of disease.
2.1. Handwashing facilities, liquid soap, toilet paper and bins must be provided in all toilet blocks. 2.2. Toilet seats and all dermal contact points in the toilets must be disinfected at least twice a day. 2.3. Children must not be required to clean toilets. They may wash writing off of walls and clean windows. 2.4. Areas contaminated by overflowing toilets must be thoroughly disinfected before they are reopened. 2.5. Sludge collection chambers must be emptied before they exceed capacity. 2.6. Pits and vent pipes must be sealed or screened to prevent flies and other pests from spreading diseases.
3. Children have the right to toilet facilities which support their dignity, privacy, security and comfort.
3.1 Facilities must be maintained in a condition where privacy is protected. Broken doors must be replaced. 3.2 Staff must provide special support to children who are afraid or are vulnerable to bullying in the toilets. 3.3 The atmosphere in the toilets should be as pleasant as possible, with adequate light and ventilation. 3.4 The experience and opinions of learners should be considered in the design and management of toilets.
4. Children with special needs have a right to assistance from staff and accommodation from the school.
4.1 Staff should assist very young, physically or otherwise challenged learners who cannot use the toilet and handwashing facilities safely and independently. 4.2 A child with physical limitations must be provided with a toilet that accommodates his/her needs. 4.3 Girls must be provided with sanitary pads and bins. 4.4 A child who has a sanitation related accident should be assisted with caring and his/her dignity and privacy should be protected.

Below are some of the ways these rights are violated when schools fail to manage their toilets.

Table 3: Ways in which key rights are violated when toilets are not managed adequately

Right	Risk of violation
Safety	Learners may fall into a pit if a toilet breaks, if a pit access hatch is left uncovered, or if old toilets are left exposed or accessible. Learners may be threatened or abused by other learners or intruders. Learners may be threatened or harmed by animals. Learners may be vulnerable to danger if they leave the school premises alone during the day to look for a toilet or to defecate in the bush. Young learners may be in danger of falling through the pedestal into the pit.
Health	Learners may get diseases from surfaces in toilets that are not cleaned. Learners may get diseases because they cannot wash their hands properly. Learners may avoid using the toilets or avoid drinking so that they will not need the toilet, potentially resulting in health problems. Young learners may be unable to use the toilets because older learners prevent them or push to the front of the queue, compromising health. Pits that are not emptied when they begin to reach capacity may exceed capacity, with sludge reaching the level of the seat, creating a serious health threat. Blocked and overflowing flush toilets may contaminate the entire sanitation block. Pit toilets which do not have sealed pits and vent pipes that are intact and securely covered with mesh will allow flies that have visited the pit to exit, spreading contamination in the school environment.
Dignity and psychological wellbeing	Learners may feel devalued by the school, leaving them angry or undermining their self-esteem. Learners are exposed to very unpleasant smells and sights (e.g. maggots and cockroaches in a full pit) which make them feel degraded. Learners may be bullied, teased or humiliated in the toilets. Learners may not have adequate privacy in the toilets. Learners might feel afraid to use toilets that are dark, far from the classroom, or where other learners are smoking or doing drugs. A girl whose period has started unexpectedly or who has had an accident might find no one available to help in a private and caring way.
Assistance with special needs	Families of learners with physical disabilities may feel that it is impossible for their child to attend the school because the facilities are not accessible, are too difficult for their child to use or because the school will offer no assistance to their child. Small learners may struggle to manage toileting independently if toilets, taps or door locks are too high or are difficult to operate, or if buttons and zips on their uniforms are difficult to manage. Girls who are having their periods and find the toilets too dark or dirty to manage their periods, or that there are no pads, toilet paper, or bins provided, may feel they have no option but to stay home during their periods. A learner who has had an accident may find there is no one willing to help them.

1.1.3 Responsibilities of the Department of Education and of the school

For staff in the Department of Education and at individual schools problems such as the lack of adequate funds, the inefficiency of bureaucratic structures, the urgency of teaching and learning, inadequate management capacity and destructive learner behaviour can soon bury the issue of sanitation, relegating it to the bottom of a principal's or circuit manager's list of priorities. The toilets, which are often out of sight of the administration building, can become the forgotten and neglected "Cinderella'' of the school grounds, which staff would rather not visit or think about.

The ability to urinate and defecate without difficulty or danger is fundamental to a child's physical and psychological well-being. It follows therefore that meeting this need is a pre-requisite for a healthy learning environment. Sanitation facilities and hygiene behaviour need to become integrated into the teaching and learning environment as a healthy, supportive part of a child's school experience.

Many schools are unable to bring this about on their own. Principals may lack the vision, management skills, will, resources or accountability to do so. For isolated rural schools, this situation is even more acute. It is incumbent upon provincial Departments of Education to not only provide adequate infrastructure, but to champion a vision of healthy sanitation based on learners' rights and to equip schools to achieve this outcome.

Principals may lack the will to improve the management of sanitation at their schools because their own experience as a child was so poor that they accept the same experience in the school they lead. Perhaps they lack a full understanding of learners' rights or of the health and safety issues at stake, or perhaps their prior efforts have failed due to the destructive behaviour on the part of some learners and they have consequently become discouraged. It is crucial to remember that even in a situation where some learners vandalise or intentionally degrade the toilets (for example by smearing faeces on the walls) it is still the duty of the school to ensure that toilets are safe, clean and decent. Forms of collective punishment, such as locking the entire boys' toilet block because vandalism has occurred, are completely inappropriate. If behaviour issues are compromising the efforts of the school to maintain the facilities, the issue should be escalated to the SGB, with closer surveillance of the facilities, until the problem is solved. It is never appropriate for the school to take the attitude that if learners spoil the toilets then they deserve degrading toilets.

The responsibilities of the department to schools and of schools to learners are shown in Table 4.

Table 4: Responsibilities of schools and Education departments with regard to sanitation

RESPONSIBILITIES OF SCHOOLS
1. Safety
1.1. Toilets should be inspected weekly and maintained in a condition that is structurally sound.
1.2. Learners should be restricted from access to structurally unsafe toilets.
1.3. Small learners should be assisted if using adult sized pit toilets.
1.4. Pit access hatches should be kept securely covered.
1.5. Pits of decommissioned toilets should be filled and the toilets removed.
1.6. Maintenance issues should be addressed promptly and managed proactively.
1.7. Toilets should be monitored by staff during break to prevent abuse and respond to threats.
1.8. Learners should be allowed to use staff toilets if learners' toilets are unsafe.
1.9. Emergency safety protocols should be in place.
2. Health
2.1. Schools should provide liquid soap, toilet paper, bins and sanitary pads to learners.
2.2. A trained cleaner should disinfect dermal contact points and clean facilities at least twice a day.
2.3. Incidents of gross contamination should be dealt with before learners are given access to the facilities.
2.4. Pits should be desludged before they exceed capacity.
2.5. Pits covers should be sealed and vent pipes should be screened to prevent pests from spreading diseases**.**
3. Dignity and wellbeing
3.1. Staff should monitor user behaviour in the toilets to prevent abuse and intimidation.
3.2. Schools should ensure conditions in the toilets support dignity, privacy and comfort.
3.3. Staff should consider learners' experience, opinions and ideas in their management of toilets.
4. Assisting with special needs
Schools should provide assistance to learners who face challenges of any kind in the toilets, particularly young children, menstruating girls and children with physical challenges or who are vulnerable to abuse.
RESPONSIBILITIES OF THE DEPARTMENT
2 Infrastructure delivery
2.1 Slab designs which place a user over a deep pit should be approved by a structural engineer. Slabs should not be made of materials which degrade rapidly over time. The Department should explore alternative designs which do not place a user over a deep pit. For stability pits must be lined (note – not sealed, which would prevent drainage).
2.2 Smaller pedestals or designs that do not place the user over a pit should be provided for Grades R-3.
2.3 If possible, toilets should be built within 30 m and within visual contact of the administration block.
2.4 Infrastructure should minimise disease transmission through the choice of materials and design.
2.5 If a learner with a physical disability applies to the school, the department should make the necessary sanitation provisions to accommodate that learner.
2.6 No design should be used which could be considered degrading to users.
3 Capacity building and support
3.1 Personnel should be assigned specifically for supporting schools in sanitation management.
3.2 Learner's rights and their application to sanitation should be included in the training curriculum of educators and administrators.
3.3 School managers should be provided with explicit standards and protocols, as well as model management plans and the administrative tools to carry these out.
3.4 *No fees* schools should be provided with adequate funds to hire a cleaner for the toilets, to carry out repairs that the department cannot carry out itself promptly, and to provide the basic materials required for the health and dignity of learners including cleaning materials, toilet paper, soap and sanitary pads.
3.5 The capacity of SGBs to raise and manage funds for sanitation management should be developed.
3.6 Learners' experience, opinions and ideas should be considered in the design and management of toilets.
4 Maintenance
4.1 Unsafe infrastructure reported by the school should be addressed immediately. In the case of potential collapse of slabs or pedestals over pits, learners should be restricted from the affected toilets immediately and mobile toilets should be provided if a significant number of toilets are affected.
4.2 Clear communication channels should be created for schools to report and track maintenance needs.
5 Monitoring and enforcement
5.1 School toilets should be regularly inspected and management systems reviewed; issues arising should be timeously addressed.
5.2 Principals who are negligent in their management of school toilets should be disciplined.

1.2 GRAPPLING WITH THE KEY ISSUES

Before considering design and management issues, one must consider the key sanitation issues faced by learners and schools.

1.2.1 The dirt on school toilets: does it really make children sick?

While photos of appallingly filthy conditions in school toilets abound, educators, learners and cleaners are not always clear about what constitutes a threat to the health of users or what could be considered a hygienic toilet. For the principal who does care about clean toilets, muddy floors on a rainy day may seem to be a greater concern than the tap handles which show no visible dirt but have never once been cleaned. The unpleasant smell of pit latrines may be believed to transmit airborne diseases, while soap is considered a luxury which just can't be afforded. Without a sound understanding of how diseases may be transmitted in a toilet and how this can be prevented through good cleaning and hygiene practices, the toilets can pose a very real threat to the health of users even though they appear to be superficially clean.

The risk of disease from failed sanitation

Faecal sludge can contain a range of bacteria, viruses, protozoa and helminths depending on the health of the toilet users. In the South African context, where rates of infection with HIV and TB are high, the consequences of diarrhoeal diseases from bacteria or viruses or loss of nutrients to parasites can be serious.

Worldwide about 1.8 million people die every year from diarrhoeal diseases which are almost always transmitted as a result of improper sanitation and hygiene; 90% of these are children under 5, and most are in developing countries[4]. It is estimated that 88% of diarrhoeal deaths worldwide are attributable to contact with faecal matter as a result of inadequate sanitation, poor hygiene or drinking unsafe water[5]. Persistent diarrhoea is associated with an 11-fold increase in mortality for children with HIV compared to uninfected children[6].

Children are particularly vulnerable to the potential effects of helminth (worm) infections, such as nutritional deficiencies and impaired physical and mental development (WHO, 2005). Helminthic infections have been linked to a 23% drop in school attendance and 40% lower future earnings as adults[7]. Sub-Saharan Africa is the area of the world most affected by soil transmitted helminths.[8] A study conducted in 1998 with 1017 school children in northern KwaZulu-Natal found 90% of the pupils infected with either *Ascaris lumbricoides (roundworm)*, *Trichuris trichiura* (whipworm) or hookworm and 31% infected with all three[9]. Similarly, in studies conducted in the informal settlement of Khayalitsha in the Western Cape, helminthic infection rates at 12 schools were found

[4] World Bank Group, SHW Resource Guide, Sanitation and Hygiene: Why they matter, http://water.worldbank.org/node/83310, accessed 15 July 2014

[5] UNICEF/WHO, 2009 Diarrhoea: Why are children still dying and what can be done?

[6] UNICEF/WHO, 2009 Diarrhoea: Why are children still dying and what can be done?

[7] Children Without Worms (2011). www.childrenwithouthworms.org. Accessed 17 January, 2013

[8] GAHI (Global Atlas of Helminth Infections). www.thiswormyworld.org. Accessed 16 March 2016.

[9] Saathoff, E, Olsen, A, Kvalsvig, JD and Appleton, CC (2004). Patterns of geohelminth infection, impact of albendazole treatment and re-infection after treatment in schoolchildren from rural KwaZulu-Natal/South-Africa. *BMC Infectious Diseases* 4:27.

to be over 90%[10]. A study in 1984 found that 51% of the patients at Groote Schuur hospital with tapeworm cysts in their brains were children[11].

The role of toilets in preventing disease transmission

The purpose of a toilet is to create a barrier to prevent disease-laden faeces from making contact with surfaces in human environments and thus with humans. Once faecal material makes contact with a surface in the environment, however, it can easily be spread by dermal contact. As a result, providing 'hardware' alone (toilets and taps) will have limited impact on health if it is not accompanied by good cleaning and hygiene practices, particularly hand washing with soap, which can break the transmission of disease. The following are recommendations for sanitation that supports health:

Table 5: Recommendations for supporting health

RECOMMENDATIONS FOR SUPPORTING HEALTH	
Hardware	
Seats Flusher handles Door handles and locks Tap handle	Smooth, hard, scratch resistant so they will not harbour germs and can be easily cleaned. Avoid designs with crevices, lips and joints that are difficult to clean.
Tap handle	Self-closing so that contaminated surfaces do not have to be touched with clean hands in order to close. A design which eliminates finger contact, e.g. a lever that is pressed with an arm, knee or foot, further reduces the risk of hand to mouth disease transmission.
Soap dispensers	Liquid soap must be made available. Bar soap can harbour pathogens and pass them from one user to the next.
Cleaning regimen	
Frequency	Toilets should be cleaned after each break and at the end of school.
Target areas	Top priority should be given to cleaning surfaces touched by the hands: flush handles, door handles and locks, soap dispensers and tap handles, including the handles of taps elsewhere that learners use. Toilet seats, which are also dermal contact points, should also be given priority for cleaning. Any full or blocked toilet or an accident on the floor must be given priority and the area sanitized before users are allowed access to it again.
Protection of cleaner	The cleaner must work with appropriate protective equipment, especially intact gloves, at all times during cleaning to reduce exposure to diseases.
Hygiene practices	
Education	Educators, learners and the cleaner should be routinely taught how diseases are transmitted faecal-orally as well as disease prevention strategies, effective cleaning techniques and effective hygiene practices.
Modelling	Educators and the cleaner should model to learners, especially young learners, correct hygiene practices in the toilets.
Leaving the toilet clean	Users should be taught to use the toilet without soiling it, wipe the seat, flush, and alert the cleaner if there is a blockage or accident.
Using toilet paper	An adequate amount of toilet paper should be used to avoid faeces touching fingers.
Dispose of rubbish and sanitary pads in bins	Rubbish and sanitary pads must be deposited in bins, not in the toilet.
Washing hands	Hands should be washed after using the toilet, before eating, after playing in the sand. Lather the soap and scrub all surfaces of the hands. Don't fill the basin to wash hands.

[10] Mkhize-Kwitshana, Z. L., Taylor, M., Jooste, P., Mabaso, M.L.H and Walzl, G. (2011). The influence of different helminth infection phenotypes on immune responses against HIV in co-infected adults in South Africa. *BMC Infectious Diseases 11:273.*

[11] Mafojane, NA, Appleton, CC, Krecek, RC, Michael, LM, Willingham III, AL (2003) The current status of neurocysticercosis in Eastern and Southern Africa. *Acta Tropica* 87:25-33.

1.2.2 Safety: Being afraid at school

School toilets may be the most dangerous part of the school grounds, both in terms of unsafe infrastructure and in terms of threatening behaviour by learners. This can be exacerbated by the fact that school toilets are often far from the office block or playground and in many cases are completely unmonitored by staff. In the WRC research study nearly a third of learners (31%) surveyed described their school toilets as dangerous and almost half (45%) ranked safer toilets as their number one infrastructure priority in the toilets; 64% of principals and 44% of cleaners said the learners' toilets were not safe.

The danger of sitting over a pit

Users of both improved (VIP) and unimproved pit latrines reported the fear of falling into the pit while using the toilet. Learners and principals described two ways this could happen:

1) Smaller children (sometimes as old as Grade 8) may fall **through the pedestal** into the pit
2) A poorly made, or deteriorating, **slab or pedestal could collapse** into the pit while in use

This speaks to inherent problems with the pedestal-over-pit arrangement that can be exacerbated by inferior materials or workmanship or by poor management. While the South African government considers the VIP technology to be an acceptable technology, this should be reviewed in light of the very real danger of a user falling into a pit, which could be fatal. Any technology which offsets the user from the pit eliminates this danger. Section 3.1.2 discusses alternatives to the VIP and ideas for modifying the VIP design to be safer, while Section 5.3.1 provides guidance for keeping existing VIPs as safe as possible and ensuring user safety.

> *The younger learners use the pit toilet which has a big septic tank underneath. The pit is covered but the seat is movable. If a learner were to fall into that pit, that learner won't be able to be saved.*
>
> *It is a health hazard and risky. The wood inside there is decomposing. If a child can fall in there, the very department will come to me asking me why I let those learners use the toilet yet we have been reporting time and time again.*
>
> - **School principals**

Threatening behaviour

As there is typically less direct supervision of users by staff in the toilets than elsewhere in the school environment, there is greater potential for learners to intimidate, threaten, bully, harass or abuse other learners in the toilets. Threatening behaviour can target girls, younger children or children who are particularly vulnerable, different or unpopular, in particular. Many types of threatening behaviour were reported:

- Learners trying to force other learners to use drugs or to smoke, otherwise preventing them from entering the toilets.
- Older learners preventing younger learners from using the toilets
- Humiliating or insulting comments or graffiti targeting specific learners
- Violation of privacy by peering over or under doors or partitions or through collection chambers (in the case of some designs)
- Shaking mobile toilets while a user is inside.
- Sexual abuse of learners by learners – include

> *"We encountered a problem with going to the girl's toilet and were advised not to go alone because there is a group of guys from this school who might attack you. We were told to go in groups when going to the toilet to avoid being attacked because if we go alone we might be attacked."*
>
> - **Female focus group participant**

the rape of younger boys by older boys
- Threatening behaviour or attacks by intruders on the school grounds.

The risk of these dangers arising is increased by the positioning of the toilets far from the office block, out of visual contact with the office block, the failure of staff to actively monitor behaviour in the toilets during break, and the absence of a secure fence around the school property.

> *"The way they are so far poses a risk as someone might go in with the learner and rape them without anyone hearing them because they are too far."*
>
> - **School principal**

Other threats

Animals were also mentioned as a risk to safety. A number of respondents mentioned snakes having been seen in the pits or toilet blocks, presumably attracted to prey which visits the sludge. Without a secure fence around the perimeter of the school dogs and other animals could wander in and potentially pose a threat to learners visiting the toilets. Without a secure gate closing the toilet block after hours some schools found animals such as goats taking up residence in the toilet blocks.

> *"We feel scared; they are scary. It's like you could drown there, and something can come up and get you, and they are also very dark."*
>
> **-Male focus group participant**

Dark conditions in the toilets (which are required for optimal functioning of the VIP technology) contribute to toilets feeling unsafe.

1.2.3 How do toilets impact the dignity and psychological wellbeing of learners?

The dignity and psychological wellbeing of learners is intrinsically linked to the status of school sanitation. It is the area of their learning environment where learners are the most vulnerable and, as the toilets serve their most basic physical needs, they have no way to opt out if the toilets violate their rights to privacy, safety, health and dignity. In the WRC research, most learners experienced their toilets as smelly (71%) and dirty (63%); 58% said they felt afraid in the school toilets. For learners to feel degraded and that their safety and healthy are under threat in the school toilets compromises their dignity and wellbeing. This in turn compromises their ability to thrive and to apply themselves to learning in the classroom. The following are some of the issues which may affect learners' dignity and wellbeing in the toilets:

- Fear of falling into the pit
- Disgust and feeling degraded by having to use or touch toilet seats, floors, etc. which are soiled with faeces or urine
- Lack of privacy
- Dark, scary conditions
- Fear of being bullied, teased, humiliated, threatened, attacked or raped
- Fear of snakes, rats or other pests in the toilets
- Graffiti containing degrading or insulting remarks
- No facility to wash hands
- Lack of access to basic supplies for wiping, disposing of pads, washing hands

- Sight and smell of faeces in the pit and sight of maggots, cockroaches and other insects
- Lack of care by the principal or staff (as evidenced by lack of monitoring and neglect)
- Staff reserving best toilets for themselves
- No one to help them if they have a problem
- Being directed to urinate or defecate outside
- Having school toilets locked as a punishment
- Being forced to clean the toilets as a punishment or without protective equipment

For children who are the target of harassment the toilets may be the place where they feel the most vulnerable or are exposed to the greatest danger, because of the potential for bullies to threaten them without intervention from staff. If toilets are not closely monitored to ensure that they are safe spaces for vulnerable children, such children may feel too afraid to use the toilets. This may result in absenteeism, or in children trying to last the entire school day without relieving themselves. In addition, their sense of wellbeing may become compromised, affecting their ability to thrive and learn at school. Vigilance on the part of the school is needed to ensure that the dignity of such children is protected.

As the only "private'' space at school, toilets can also play an important role in meeting the psychological needs of users. Toilets are sometimes needed as a place of refuge for a child who is feeling in distress about circumstances at home or school. While children should not be encouraged to loiter in the toilets, staff should show understanding towards a learner occasionally needing a few minutes alone for reasons other than bodily functions. This is another reason why it is important that toilets are not smelly, filthy, scary and dangerous.

Creating toilets that are clean, light, safe and comfortable will affirm learners' dignity and wellbeing. Learners can be involved in designing artwork for the toilets, choosing paint colour or seeking sponsors for improvements in the toilets. In addition to raising morale, an increased sense of ownership of the toilets has also been linked to users taking better care of facilities.

One of the contributing factors to vandalism and antisocial behaviour in the toilets has been found to be anger and resentment on the part of users for feeling that staff do not care about their toilets. However limited a school's budget, the principal and his or her staff can send a powerful message of care and respect to learners by frequently visiting the toilets, personally attending to small maintenance issues, asking learners about the issues they face in the toilets and expressing concern about the problems learners experience.

1.2.4 Facing up to menstruation: freeing girls from a secret burden

Menstruation is possibly the biggest taboo in our culture. Girls are expected to handle a situation in which they are experiencing continuous and uncontrollable bleeding for several days in complete secrecy and silence while going about normal school activities. Dealing with the inconvenience of this bleeding from between their legs is not simple. It is logistically complicated: bleeding can start with no warning in the middle of class; blood leaking through underwear and staining the back of school uniforms can cause desperate embarrassment. If a girl experiences a problem during her period but has been taught that she must protect others from having to know about her periods, what can she do except pretend she is sick and ask to go home?

International studies have found that sanitation facilities can be a major factor in whether girls attend school during their periods or not. A study conducted in Ghana[12] found that 95% of girl participants in rural areas and 20% from peri-urban areas reported missing school during menstruation. A study at secondary schools in Malawi found that 95% of girls reported using reusable menstrual cloths made from old clothes; problems with cloths smelling or falling out at school were reported. Some (11%) reported leaving class to change their menstrual cloths and then going home rather than returning to class, while 7% said they didn't come to school at all during their periods.[13]

Menstruation can be psychologically distressing: girls sometimes start menstruating at a very young age and some have not been told about periods and that they are normal and a natural part of life. As a result, some girls experience terror when their period started for the first time, assuming that they are bleeding to death. When they discover that menstruation is a part of life but is also a serious taboo, they find they are not supposed to talk to their teachers or even their own relatives about their fears or how to cope with the challenges of menstruation. This is an enormous burden to place on young girls to manage in secrecy with no support throughout the demands of a school day. When boys discover the physical fact of menstruation it is typically shrouded in secrecy and they are expected not to ask questions. Without a good understanding of the physical and psychological aspects of this feature of girls' lives they may not understand the need – or know how – to behave empathetically and supportively toward their female classmates. Instead, they may tease girls, violate their privacy in the toilets, or otherwise humiliate them during their periods.

Dealing with menstruation is expensive: many girls' families cannot afford pads or tampons. Girls in this situation have to try to cope by putting cloths in their underwear. At home this might be manageable but at school, where almost all South African girls wear dresses as part of their school uniform, cloths can fall out. And girls may feel uncomfortable being seen going into the toilets carrying something which reveals to others that they are menstruating. In the WRC research learners reported that some girls place a wad of newspaper in their underwear to absorb blood because they can't afford pads but that this is not effective and the blood often soaks through their clothes. Wearing dresses, particularly if they are light in colour, makes blood stains even more obvious and embarrassing. Girls may find this an unbearable situation. How can a girl avoid this humiliating possibility other than staying home during her period?

> *"Boys watch girls when they change their pad and they tease them."*
>
> **-Focus group participant**

> *"You ask for them from the principal himself. Some learners are scared to ask from the principal because he is a male. They would rather ask to go home than to go to the office and ask for a pad. I would rather they place a cardboard in the toilet with 10 or 5 pads."*
>
> **-Female focus group participant**

If pads are provided at school, these might not be provided in a way that girls feel comfortable accessing them.

[12] Scott, L, Dopson, S, Montgomery, P, Dolan, C and Ryus, C (2009); *Impact of providing sanitary pads to poor girls in Africa*, University of Oxford Study.

[13] Pillitteri, S. 2011. *School menstrual hygiene management.* Malawi. Available from: http://r4d.dfid.gov.uk/PDF/Output/sanitation/MenstrualHygieneManagement-Malawi.pdf [accessed: 14/04/2014]

If school toilets are crowded, dirty or dark or lack privacy, girls may feel they cannot manage their periods in the toilets and may feel they have no option but to stay home during their periods, compromising their education.

Guidance for supporting girls during menstruation is provided in Section 5.3.4.

1.2.5 The special needs of small learners

Small children can face a number of particular problems when using the toilets. These include:

- The danger of falling through the toilet seat into the pit
- Lack of knowledge of how to use the toilets properly or of effective hygiene behaviour
- Difficulty using pedestals, basins, door handles and door locks which are too big or high for them.
- Inadequate fine motor control to manage zips and buttons on clothes independently
- Tap handles, door locks or flush handles that require greater strength than some small children have to operate
- Bullying, intimidation or abuse by older children
- Accidentally urinating/defecating in their clothes

> *"Their teachers must teach them how to use the toilet because at home they don't use them: they poo outside."*
>
> *The young children mess on the toilet seats. This is because the people who accompany them just wait outside the toilets until the child comes out not knowing what is happening inside. The teachers should monitor the children. Blocks should be made so that teachers are able to enter the toilets and see what their learners are doing."*
>
> *"I would say that we should be separated from the young children, because in the toilets that we use the seats are too big for them because they are short. The problem is that they end up doing what they intended on doing in the toilet on the floor. We find that they poo and pee on the floor."*
>
> *"When we were in grade R there were boys who'd stay at the toilets and when we went in they'd make us take out our money."*
>
> **-Focus group participants**

Children who do not have flush toilets, toilet paper, running water or soap at home may not know how to use these appropriately. At some homes with VIP toilets children are required to defecate outside because parents feel the toilet is not safe; these children may have no experience of toilet use when they arrive at school. Children from homes where water is collected from a river may not understand the importance of closing taps after use.

Pedestals that are too big result in learners being unable to get up onto the toilet seat, or having to place their hands on a soiled toilet seat to pull themselves up. Full sized pedestals over pits also generate fear in both learners and teachers that the child could fall through the hole into the pit and drown. At one school, the Junior Primary learners were not allowed to use the toilets at all for this reason and were instructed to urinate and defecate outside. The principal reported that *"The grade R's feel bad and they sometimes want to use the toilets but we are afraid that they might fall inside."* Some learners described young learners never being given a chance to use the toilet when older learners push past them in crowded toilets as well as young learners being bullied in other ways in the toilets. Guidance on building facilities to accommodate small learners is provided in Section 2.5.1 and guidance on management to support young learners is provided in Section 5.3.4 .

1.2.6 Accommodating special needs

The abilities of learners range widely from one individual to another and across the years that a child is in school. In addition to the normal wide range of abilities, some children face specific physical challenges which can range enormously as well – from visual limitations to mobility issues to incontinence. In addition to these special requirements are those resulting from illness or injury – the children temporarily incapacitated who are not accustomed to the challenges of their physical limitations.

"Disability'' has been defined and measured by many different standards and criteria, resulting in different estimates of how many children have special access needs. By some estimates, 20% of the world's poorest people have some kind of disability which presents a barrier to accessing education, sanitation and other services[14].

The fact that many South African schools have not made any adaptations to accommodate learners with disabilities to access facilities has contributed to children with disabilities being excluded from the schools in the communities in which they live. While there are over 359 special needs schools operating across the country[15], these are often a long distance from rural areas. Attending a special needs school may mean that a rural child has to spend a large part of the day traveling to and from school or can no longer live at home at all. This impacts the child's quality of life and connection with her community, depriving her of the experience of being part of her local school community, as well. While special needs schools play a crucial role meeting the needs of some children, it is incumbent upon each public school to make every effort to accommodate the needs of the children in its community so that those children can exercise their right to attend their local school if they choose to.

In the WRC research, 42% of the principals that were interviewed said that there were children in their school community with physical challenges but only 21% reported that the school had ***ever*** had a learner with a disability. Special access sanitation facilities were observed at only 15% of the schools which were visited. This raises several very important questions:

- To what extent are families self-excluding themselves from the local community school because the school cannot accommodate their child's needs, to the detriment of that child?
- To what extent are principals unaware of the range and limitations of abilities of children enrolled at their school who have not been given a specific diagnosis, with the result that some of their learners experience challenges accessing the toilets but receive no support or intervention from the school?
- To what extent do children experiencing challenges accessing the toilets at school avoid drinking fluids and avoid relieving themselves for the entire school day, with potentially serious consequences to their health?

[14] Zomerplaag, J and Mooijman, A (2005) Child-Friendly Hygiene and Sanitation Facilities in Schools: Indispensable to effective hygiene education [Online] IRC International Water and Sanitation Centre, Delft, The Netherlands, available from http://www.dwaf.gov.za/dir_ws/tkc/vdFileLoad/file.asp?ID=275

[15] Department of Basic Education. 2011. Report on the National School Monitoring Survey (DBE013).

It is important that instead of understanding children as able or disabled we begin to see that children have a range of abilities and experience a range of challenges, all of which are entitled to accommodation and support in the school environment. South African law now requires that all school buildings comply with the principles of Universal Design. While these are described in detail in Section 2.6, the central idea behind Universal Design is that ***everything*** should accommodate ***everyone*** – rather than having facilities designed for the majority and then a separate facility designed for those with special needs. The design of new infrastructure must be based on this approach, while schools living with existing infrastructure that does not meet the criteria of Universal Design must make every effort to accommodate the specific needs of learners in their community. Should a school community have a child with specific challenges which the school cannot allow for by making simple, low-cost accommodations, the school should approach the Department to request urgent provision of a Universal Access toilet for that learner.

> "The truth is that there is no clearly defined separation between the well and the infirm and that many of those considered well will suffer some infirmity. The old idea that barrier-free architecture is catering to a minority is no longer valid."
> ***James F. Hillary, American Institute of Architects (DWAF, no date)***

> "All latrines should be able to accommodate the 'un-average' person."
> ***(DWAF, no date)***

1.2.7 Overcrowding: what are the consequences when there aren't enough toilets?

Overcrowding is a problem at many schools. When there aren't enough toilets a number of problems can arise, including:

- Learners spend all of their break time queueing
- Learners use class time to go to the toilet
- Facilities are shared by boys and girls
- Facilities are shared by staff and learners
- Learners defecate or urinate on the floor
- Learners leave school to look for a toilet
- Boys urinate at the back of the toilet block
- Facilities become dirty more quickly after cleaning
- Pits fill more quickly
- Learners make use of old infrastructure which is not safe to use

1.2.8 What happens when children feel they can't use the school toilets?

In the WRC research, 17% of learners reported that they did not use the school toilets. Most of these (55%) waited the entire school day to use the toilet at home, a coping strategy which can lead to lifelong health problems as well as compromising concentration in the classroom. Others defecated on the ground (21%), a behaviour which undermines privacy and dignity and results in contamination of the environment and a higher risk of disease. Others left the school

> *"Some learners scare us and say there is 'Pinky Pinky' a living creature with huge nails so I don't use the school toilet;* ***I hold it until I go home****."*
>
> **- Focus group participant**

grounds and went home to use the toilet (16%).

> *"I don't use them during my periods because the seat are always wet with urine so it's not comfortable to sit on people's dirt; no doors for privacy; no toilet paper and bins; and soap is not there to wash my hands."*
>
> **Female focus group participant**

The most common reason given by learners for why they don't use the school toilets is that they are too dirty (39%), followed by the fear that they could get diseases from the toilets (32%). Others were afraid the toilet could break and they could fall in (19%) or were afraid there could be animals (dogs, snakes, or insects) that they were afraid of in the toilets (19%). Some were unwilling to use the toilet because of the behaviour of other learners in the toilets (smoking, using drugs, bullying) (19%) or were uncomfortable defecating or urinating in the presence of others (9%) – a problem exacerbated by overcrowding or broken or missing doors. Some learners also said they couldn't use the school toilets because they were full (14%).

It should be remembered that the toilets are a necessary space not only for urinating and defecating, but also for girls to change their pads during their periods. If they find the toilets are too scary, unpleasant or lacking in privacy to do this, they may stay home from school during their periods, as discussed in the next section.

2. DESIGNING A SCHOOL SANITATION SYSTEM

2.1 A conceptual framework for design

The design of school toilets as an integral part of the learning environment, which has a direct and powerful impact on learners' needs and rights, needs to be undertaken within the context of a carefully considered conceptual framework. This framework should include the following elements:

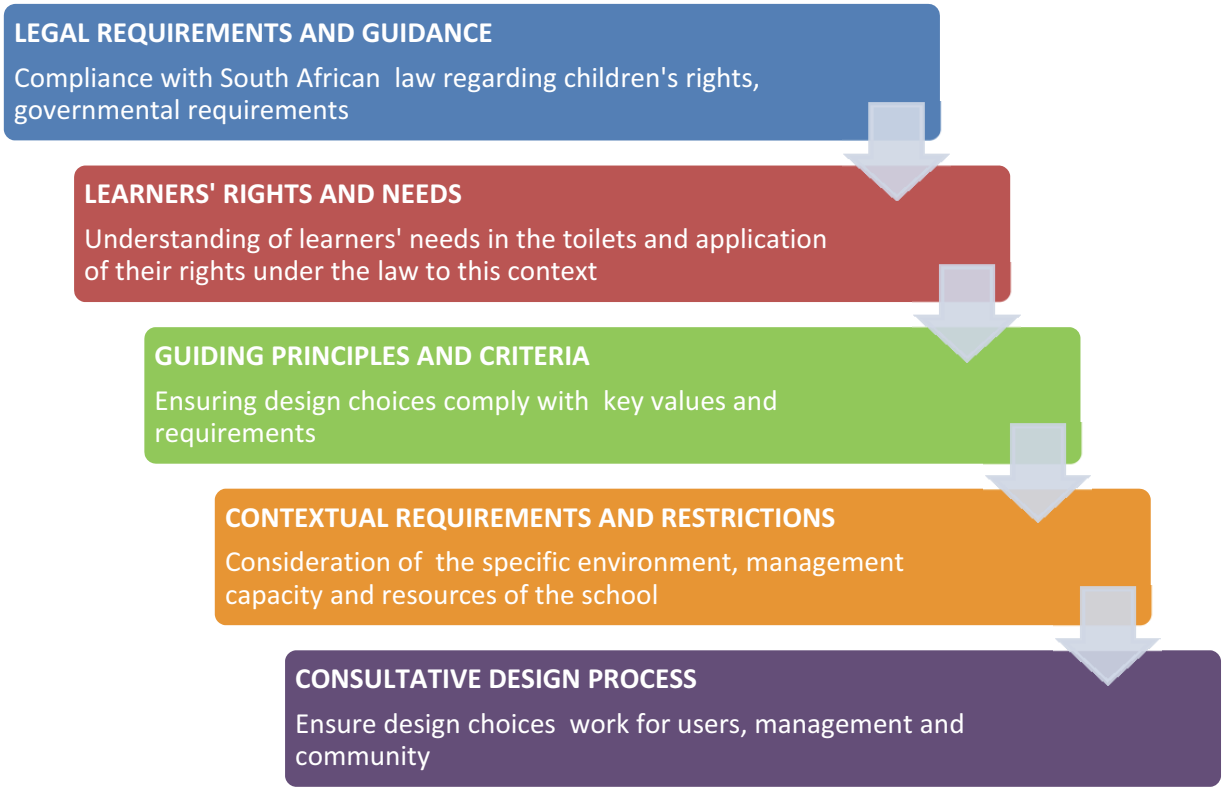


Figure 2: A conceptual framework for design of school toilets

While legal requirements must be satisfied in the design of sanitation facilities, they should be understood as *minimum* criteria to be satisfied. Beyond this, the needs of learners in the toilets should be understood and the application of their rights with regard to their needs in the toilets should be explored. From this understanding principles and criteria can be identified to guide the design process. A sound understanding of environmental constraints, including the capacity and resources of schools, should further focus design parameters, within which decisions can be made through a consultative process with schools, users and the community.

2.1.1 Legal framework

Section 1.1.1 provides an overview of the rights of children under the law which should inform the design of school sanitation. In addition, regulations and guidance published by the South African government should be considered.

The Strategic Framework for Water Services (DWAF, 2003) defines a ***basic sanitation facility*** as the infrastructure necessary to provide a sanitation facility which is safe, reliable, private and protected from the weather. It should be ventilated, keep smells to the minimum, be easy to keep clean, and minimise the risk of the spread of disease related to poor sanitation.

The *Regulations relating to minimum uniform norms and standards for public school infrastructure*[16], published in 2013under the South African Schools Act, are presented below in Table 1.

Table 6: Norms and standards for school sanitation infrastructure (regulations under the SA Schools Act)

NORMS AND STANDARDS FOR SCHOOL SANITATION INFRASTRUCTURE		
	Requirement	**Acceptable options**
Water supply	Schools must have sufficient water of good quality which complies with drinking water standards for drinking, personal hygiene and food preparation. Water must be available at all times with convenient access	Municipal reticulation network Rainwater harvesting Mobile tankers Boreholes Local reservoirs and dams
Sanitation facility	All school must have sufficient number of sanitation facilities. They must be: Easily accessible Provide privacy and security Promote health and hygiene Comply with all relevant laws Be maintained in good working order Provide separate facilities for teachers, girls and boys	Water borne sanitation Small bore sewer reticulation Septic or conservancy tank systems Ventilated Improved Pit latrines (VIPs) Composting toilets ***NB: Unimproved pit latrines and bucket latrines are not acceptable***

The choice of an appropriate sanitation technology is to be determined through an assessment of the particular school. The number of toilets, urinals and wash basins are determined on the basis of the size of the school and whether it is a primary or secondary school.

The National Building Regulations and Building Standards Act (1977) states that any building must ensure that: ***"Persons with disabilities shall be able to safely enter the building [and] use all the facilities."*** But how can a school cater to such a range of potential requirements, not all of which can be foreseen during the design of the school? The norms and standards for school infrastructure put in place by the DBE in 2013 address this by specifying that ***"all schools must adhere to the requirements and principles of Universal Design"*** (South Africa, 2013). The principles of Universal Design are discussed in the next section.

[16] South African School Act 84 of 1996 Notice 932 of 2013

2.1.2 Learners' rights and needs

The *Bill of Children's Sanitation Rights* proposed in Section 0 applies the rights of children under the law to the context of school sanitation. While Section 1.2 discusses many of the key issues which learners face while using school toilets, needs specific to learners at target schools should be identified through surveys or workshops with learners.

2.1.3 Guiding principles and criteria for design

Principles of Universal Design

The South African Norms and Standards for public school infrastructure specify that the principles of Universal Design be followed in the design of school facilities[17]. The principles of Universal Design were developed by a group of architects, product designers, engineers and environmental designers based at North Carolina State University in the USA in 1997. The philosophy of Universal Design continues to evolve and is described by the Institute for Human Centred Design as ***"a framework for the design of places, things, information, communication and policy to be usable by the widest range of people operating in the widest range of situations without special or separate design. Most simply, Universal Design is human-centered design of everything with everyone in mind."***[18]

The central principle of Universal Design is that ***everything*** should accommodate ***everyone*** – rather than having facilities designed for the majority and then a separate facility designed for those with special needs. The seven principles of Universal Design are as follows:

1. **Equitable Use**: The design must be able to be used by people with diverse abilities.
2. **Flexibility in Use:** The design must accommodate a wide range of individual preferences and abilities.
3. **Simple and Intuitive Use:** It must be easy to understand how to use the design regardless of a user's experience, knowledge, language skills, or ability to concentrate.
4. **Perceptible Information:** The design must communicate necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
5. **Tolerance for Error:** The design must minimize hazards and the adverse consequences of accidental or unintended actions.
6. **Low Physical Effort:** The design must be able to be used efficiently and comfortably with minimum fatigue.
7. **Size and Space for Approach and Use:** Appropriate sizes and adequate space must be allowed for users to approach, reach, manipulate, and use the facility regardless of their body size, posture, or mobility.

The IDeA Center at Miami Dade College in the USA has developed eight Goals of Universal Design, each of which corresponds to a measurable outcome and a knowledge base from research:

1. **Body fit:** The design must accommodate a wide range of body sizes and abilities
2. **Comfort:** The design must not push the limits of users' body function and perception
3. **Awareness:** The design must ensure that the important information for correct use is easily grasped —insuring that critical information for use is easily perceived;

[17] *Regulations relating to minimum uniform norms and standards for public school infrastructure* (South African School Act 84 of 1996 Notice 932 of 2013)

[18] http://www.universaldesign.com/universal-design/1761-the-seven-principles-of-universal-design.html

4. **Understanding:** The methods for operating technologies must be clear and intuitive
5. **Wellness:** The design must contributing to health promotion, avoidance of disease, and prevention of injury
6. **Social integration:** The design must treat all groups with dignity and respect
7. **Personalisation:** The design must incorporate opportunities for choice and the expression of individual preferences
8. **Appropriateness:** The design must respect and reinforce cultural values and the social and environmental context of the facility

2.1.4 Criteria for designing school facilities

Criteria for designing school facilities should be based on learners' rights and needs, environmental considerations and the capacity of the school. Table 7 provides a list of some of the criteria which should be considered.

Table 7: Criteria for consideration in the design of school toilets

CRITERIA FOR CONSIDERATION IN THE DESIGN OF SCHOOL TOILETS
Protect learners' safety, health and dignity
Designs should not pose a threat to the safety of users (e.g. possibility of learner falling into pit)
Designs should not be used which are considered humiliating by users
Materials should not be used that will become unsafe, unhygienic, smelly or disgusting as they age
Designs should promote good hygiene (e.g. no-contact or low contact taps, liquid soap fixtures)
Facilities should be easy to clean (e.g. avoid unnecessary walls, materials which harbour germs)
Designs should provide adequate privacy
An adequate number of toilets should be provided to minimize queueing
Toilets should not be far from classrooms
Toilets should not be out of sight of adult supervision
Pit access should not be located in the area most frequented by learners
Local cultural and religious practices which have bearing on behaviour in the toilet should be considered
Girls' practices with regard to menstruation and associated needs should be considered (e.g. mirror, shower)
Facilities should have adequate lighting and ventilation for comfort and safety
Designs should be aesthetically pleasing (e.g. choice of paint, tiles, light)
Accommodate special needs of learners
Comply with principles of Universal Design to provide access to learners of all physical abilities
Accommodate individual learners with specific physical needs at individual schools
Facilities and components should be properly sized and mounted for learners of different sizes
Use of space, lighting and orientation of facilities should minimise potential for bullying or abuse
Work with environmental conditions
Consider soil texture, stability, permeability
Consider groundwater level and possibility of flooding in design of collection chambers
Consider water sources in placement of collection chambers
Consider availability of water in choice of technologies
Be robust for user behaviour
Fittings should be selected which cannot easily be broken or stolen
Fittings should be chosen which are not a target for theft
Designs should places mountings or vulnerable parts of systems out of reach of users
Technologies should not be selected which may become unusable as a result of user behaviour
Work with school capacity
Technologies should not be selected which require expertise the school does not have (e.g. high tech systems)
Technologies should not be selected which will incur costs the school cannot afford (e.g. electricity, expensive parts)
Designs should not be selected which rely on functional management for the safety of users

Appropriate design for different age groups

The IRC's[19] manual on child friendly design of sanitation facilities provides guidelines for ensuring that sanitation is appropriately designed for each age group in terms of the knowledge and attitudes that are prevalent in the age group, the level of participation learners can have in the process and the implications of these for design. A sample of these guidelines for the age group 5-7 (early primary) is provided in Table 8 below.

Table 8: Sample guideline for design of appropriate sanitation for age group 5-7 (Zomerplaag and Mooijman, 2005)

Knowledge & Attitude	Implications for the design of hygiene and sanitation facilities	Children's participation
Children in this age group experience the positive effects of personal care on their appearance (washing themselves, combing their hair and brushing their teeth). They tend to value things in a simple way: looking and smelling good means feeling good	Facilities should reflect the sensation of being clean: light colours, sufficient natural light and ventilation. Themes used in hygiene promotion materials can be used for decoration to strengthen the link between education and practice. Facilities should be designed in such a way that a teacher or older student can stand next to the child to teach him or her how to use the toilet properly. However, most children can complete simple actions or tasks on their own or with minor assistance. There is no direct need for privacy; children like to observe others and imitate their behaviours.	In this age group children could become actively involved in design, planning, maintenance and operation of facilities. However, they cannot be held fully responsible and require close guidance of adults or older children.

2.1.5 Consultative design process

> "Active involvement of the users is essential in all phases of the design process. In general, when properly coached and guided, potential users are perfectly able to assess their existing practices and find solutions for their own needs." IRC, 2005.

While it can be tempting for the provincial department to roll out a standardized design with little consideration for the specific school because this is cheaper and helps with quality control, it is vital that the implementer develop the design in a consultative process with school management, who in turn should use a consultative process with learners and parents. Knowledge of local conditions (prevailing winds, seasonal flooding, presence of free ranging animals, local cultural or religious practices, etc.) as well as specific needs, behavioural issues and preferences should be considered to ensure that the infrastructure is appropriate for the context and the users. In addition, if management and users are not actively involved in decisions there is a risk that the infrastructure will be rejected. It is also important to remember that learners are experts on the topics of their own needs and behaviour issues, and it is vital that they are consulted to identify issues and participate in problem solving. Needs and behaviours related to the toilet can be highly personal and discussions should be held with sensitivity, separating boys from girls, and younger children from older children. Consultation can be done class by class, or representatives could be selected to form a consultative committee. Competitions could also be run to generate creative solutions to design problems.

[19] (Zomerplaag and Mooijman, 2005)

Involving users in the design will also help to cultivate a sense of ownership of the facilities, which may reduce vandalism, theft, misuse of the facilities and other behaviour which will degrade the facilities more quickly over time. Having users participate in decision making will help them buy in to decisions even if their first choice options weren't met. Users may also have creative ideas for how to make the toilets appealing and comfortable which may not be expensive.

2.2 Location and layout

The location of the toilets should be chosen after careful consideration of the following factors:

- User needs (safety, privacy, convenience)
- Physical conditions of the site
- Requirements for effective management (monitoring, supervision, cleaning and maintenance)

Balancing the elements discussed below can be complex, and it is recommended that maps be drawn for each alternative design, ensuring that no condition has been left out, until an optimal design is reached.

2.2.1 Meeting user needs

Safety and privacy often have to be weighed against each other when considering design. Young learners need more safety and monitoring and less privacy, while older children need more privacy. Bullying and abuse are very serious concerns in the school environment. Infrastructure location and layout must support the school's management plan to eliminate the risk of a learner being attacked, raped, coerced, humiliated or denied access to the toilet by others when entering the school toilet. One way to address this is to split the number of toilets needed per sex into multiple blocks and provide some in closer proximity to the administration building and playground and with design aspects that allow better supervision but less privacy (e.g. toilets opening directly on playground, with no interior circulation area) and design the other blocks with more privacy. Learners can then be assigned blocks based on their age or self-select blocks based on whether their primary concern is safety or privacy.

In addition to basins in the toilet facilities, handwashing facilities can be placed in locations that can be shared by both sexes, such as near the playground or attached to the administration building, to enable teachers to instruct learners to wash their hands as they line up, encourage and model good hygiene behaviours and help to integrate hygiene awareness into the learning experience.

Distance from classrooms

Some users and principals would like onsite systems to be located far from the classrooms and administration block to minimise the unpleasant smell of the toilets disturbing learning. The drawbacks of placing the toilets far from the classrooms, however, outweigh this. These include:

- Difficulty monitoring unauthorised use of toilets by learners during class time, or by people or animals who should not be on the property and could pose a threat to learners
- Difficulty monitoring user behaviour in the toilets (vandalism, theft, drug use, bullying, abuse)

- Difficulty monitoring user needs and safety in the toilets (e.g. a call for help from a learner who has fallen into the toilet).
- Difficulty maintaining the environment: the condition of the path to the toilets may deteriorate and if long grass grows beside this path it will further compromise the safety of learners.
- Difficulty for learners with limited mobility or other challenges.
- Difficulty for young learners, who need support and assistance.
- More time used by learners (both class time and break time) to use the toilets.

For these reasons, toilets should be sited not more than 30 meters from classrooms. The following guidelines should be applied:

- Toilets should be located within visual contact and hearing range of the administration block, so that administrators can monitor usage of the toilets and be alerted if a child needs help.
- Facilities should be located near classrooms so that learners who need to relieve themselves during class or those with mobility issues or special needs can do so quickly.
- Toilets must be sited where they can be reached in all weather conditions, ensuring that learners will not have to cross flooded areas during heavy rains.
- Toilets must not be built where learners will have to walk through long grass or bushes where snakes, dogs, or other threats could be lurking.
- Facilities should not be located on the fringes of the property alongside rubbish dumps, where unpleasant sights, smells, insects or pests may compromise the dignity of learners.

> "Even a well-designed facility faces the risk of not being used if it has a poorly considered location."
> - IRC, 2005

- If Universal Access toilets are built separately from the main blocks (see Section 2.6) they should be located in a position that is easily accessible to visitors to the school.
- It is not recommended that nearby households be given access to the school toilets after hours because of the possibility of vandalism, theft or toilets being left in poor condition, but if this is planned the location of the toilets should be chosen with this in mind.

Layout

Layout should again balance safety against privacy, with the following considerations:

- The layout inside toilet blocks should avoid hidden corners or spaces that cannot be easily monitored by staff.
- Toilets should be positioned so that the communal area can be seen from outside without jeopardising privacy, with cubicle doors at 90 degrees from the circulation route. A screen should be provided for urinals.
- Mirrors should be positioned so that they don't enable people to see urinals or see into cubicles from the outer door.
- People at washbasins should not be facing those at urinals, or facing a mirror which shows urinals.
- All windows should have frosted glass. If windows need to be opened, they should not be placed in view of urinals or the inside of a cubicle.
- If it is possible to build separate facilities for pre-primary learners, an open plan arrangement with low or no walls between cubicles will allow the teacher to supervise and train the children together.

2.2.2 Facilitating effective management

When deciding on the location of school toilets, management needs should be considered. Key considerations are:

- Ensure there is visual contact between the toilet entrances and office block so that administrative staff can maintain passive surveillance of the toilets. As it is important for learners to be able to use the toilet during class when needed, this will enable staff to monitor loitering after learners have used the toilet.
- Visual contact between the playground and toilets will facilitate monitoring of activity around the toilets by the educator on duty on the playground during break.
- The location of the toilets should enable a security person to monitor the facilities to prevent unauthorised use or vandalism outside of school hours.
- While considering the need for privacy, boys' and girls' toilets should be in close enough proximity that a Health and Safety Officer can be available to both boys and girls during break. The Officer should be able to move between all facilities for monitoring purposes and should be available to learners of either sex should they need assistance or hygiene supplies.
- As mentioned earlier, placing additional handwashing facilities near the playground or line up area or outside of classrooms can facilitate handwashing after playing with soil and facilitate modelling and teaching of effective hygiene practices to learners.
- Facilities should not be located on the edge of the property where learners may find it easy to leave school on the pretext of going to the toilet.
- Pits must be accessible to pit emptying vehicles entering the property. As contamination of the immediate area around the pits is likely during pit emptying, pits should not be placed in a circulation area where learners may come into contact with contamination.

2.2.3 Working with environmental conditions

When selecting the location of toilets, conditions of the environment such as soil, groundwater, slope and wind should be considered as follows:

- Plans for expansion of other school facilities, development of play or sport areas or addition of future sanitation should be considered.
- On-site sanitation should be located at least 30 m from wells, boreholes or springs and should be on the downslope side of such water sources.
- Toilets should not be built in depressions that can be flooded, or where there is a risk that a high water table will flood the pit
- Areas where pit excavation will be difficult should be avoided; this can be tested by drilling holes with an auger or digging a trial pit.
- The bottom of pits should be above the groundwater table.
- If sludge is to be buried on-site, this site should be designated as well.
- Toilets with doors leading directly outside should be orientated with consideration for the direction of the prevailing winds to prevent damage to the doors from winds. The doors of VIPs should face the prevailing wind direction and not into the sun to aid ventilation and should not be built upwind of the classrooms.

2.3 Capacity

Internationally, recommendations for the number of toilets per children served typically range from 1:20 to 1:50. The World Health Organisation[20] provides ratios of 1:25 toilets for girls and 1 toilet plus 1 urinal (or 50cm of urinal wall) to 50 boys, with a minimum of one toilet for female staff and one for male.

In South Africa, the norms and standards for public school infrastructure introduced in 2013[21] require that toilets, urinals and hand washing facilities be provided as follows:

Table 9: South African standards for number of toilets and basins per users for primary schools

Enrolment	Enrolment per gender	Girls toilets	Girls basins	Boys toilets	Boy's urinals	Boy's basins	Unisex* grade R toilets	Grade R basins	Unisex disabled toilets & basins	Female staff toilets	Female staff basins	Male staff toilets	Male staff urinals	Male staff basins	Total toilets
0-25	0-13	2	1	1	1	1	0	0	1	0	0	1	0	0	6
26-65	13-33	2	1	1	1	1	0	0	1	0	0	1	0	0	6
66-134	33-67	3	2	1	2	1	2	1	1	1	1	1	0	1	11
135-310	68-155	6	4	2	4	2	3	2	1	2	1	1	1	1	20
311-620	156-310	8	6	4	4	2	4	3	1	2	1	1	1	1	25
621-930	311-465	10	6	4	6	3	5	3	2	3	2	1	2	2	33
931-1240	466-620	12	8	6	6	4	5	3	2	3	2	1	2	2	37

NB: for Grade R enrolment is assumed to be $\frac{1}{8}^{th}$ of total enrolment

Table 10: South African standards for number of toilets and basins per users for high schools

Enrolment	enrolment per gender	girls toilets	girls basins	boys toilets	boy's urinals	Boy's basins	unisex disabled toilets & basins	female staff toilets	female staff basins	male staff toilets	male staff urinals	male staff basins	total toilets
0-100	0-50	2	1	1	1	1	1	0	0	1	0	0	6
101-200	51-100	4	2	2	2	2	1	1	1	1	0	1	11
201-400	101-200	6	4	2	4	2	1	2	1	1	1	1	17
401-600	201-300	8	6	4	4	3	1	2	1	1	1	1	21
601-800	301-400	10	6	4	6	3	1	2	1	1	1	1	25
800-1000	401-500	12	8	4	6	3	2	3	2	1	2	2	30
1001-1200	501-600	14	8	6	6	4	2	3	2	1	2	2	34

[20] WHO (2009). *Water, Sanitation and hygiene standards for schools in low-cost settings.* Geneva
[21] South African School Act 84 0f 1996 Notice 932 of 2013

A primary school with 500 learners would require a total number of 25 toilets as follows:

- For 219 girls: 8 toilets (1:28) and 6 basins (1:37)
- For 219 boys: 4 toilets (1:55), 4 urinals (1:55) and 2 basins (1:110)
- For disabled users: 1 toilet and 1 basin
- For 62 Grade R users: 4 toilets (1:16) and 3 basins (1:21)
- For female staff: 2 toilets and 1 basin
- For male staff: 1 toilet, 1 urinal and 1 basin

A high school with 500 learners, on the other hand, would require a total number of 21 toilets as follows:

- For 250 girls: 8 toilets (1:31) and 6 basins (1:37)
- For 250 boys: 4 toilets (1:63), 4 urinals (1:63) and 3 basins (1:83)
- For disabled users: 1 toilet and 1 basin
- For female staff: 2 toilets and 1 basin
- For male staff: 1 toilet, 1 urinal and 1 basin

As most visits to the toilet are to urinate, rather than defecate, urinals can be used in place of some seats. This is an option which is increasingly being used for girls elsewhere, and could be explored in South Africa. Urinals are discussed in more detail in Section 2.5.4.

If a school has an inadequate number of toilets the situation can be mitigated by staggering break times or having teachers (especially of younger grades) take their class to the toilet before break and before the end of school. Alternatively, introducing an extra break time would allow more opportunities to use the toilet, placing lower demand on the toilets at any given time.

Toilets should never be assigned jointly to both sexes except for Grade R or other pre-primary Grades. Handwashing facilities, however, can be placed in locations that can be shared by both sexes, such as near the playground or attached to the administration building.

2.4 Water supply

The amount of water required for sanitation will depend on the number of learners and the type of toilet technology. The following guideline can be used:

- 6 litres per use for standard flush
- 2.5 litres per use for pour flush or low flush
- 2 litres per use for handwashing

Rainwater can be harvested by directing guttering from roofs into storage tanks. The amount of water that can be collected this way depends on the roof area it is collected from and the amount of rainfall. In most parts of South Africa rainfall is seasonal and therefore rainwater harvesting will only serve to supplement another source of water.

There are many ways in which water usage can be reduced to make water resources last:

- Use self-closing taps (see Section 2.5.5)
- Use pour flush or low flush toilets instead of full flush toilets (see Section 3.3.3)

- Use waterless urinals or use water collected after handwashing to rinse urinals.
- Use water collected after handwashing to flush toilets.
- Fix leaks or running flush toilets immediately – repairing a dripping tap could save thousands of litres over the course of a year.
- Teach users to flush only after defecation, not after urination, and allow the cleaner to flush all toilets needing flushing after break [one preschool taught users: ***If it's brown flush it down, if its yellow let it mellow].*** If the volume of toilet paper deposited in the toilets after urination is too great, however, this could result in blockages.

2.5 Components

In a context like South Africa where resources to meet desperate needs are stretched to the limit, it is tempting to opt for the cheapest materials and components that will do the job. While trying to select sanitation components, however, it should be ensured that they will meet the following criteria:

- **Durable:** All materials and components selected should be strong enough to last through many years of cleaning and rough handling by children. Selecting plastic fittings will discourage theft, but this choice should be balanced against the durability of the fittings.
- **Non-porous, smooth and scratch resistant:** Surfaces that will come into contact with faeces or urine must be impermeable and easy to wipe. Plastic tap handles become scratched quickly, creating many crevices which are hard to clean and may harbour diseases.
- **Minimal joins and difficult-to-reach corners:** Fixtures with ridges and joins will accumulate dirt quickly and could harbour diseases. Fixtures should be as smooth and simple as possible. Rounded joints between walls and floors will prevent dirt from accumulating in corners.

2.5.1 Sizing and mounting components correctly for Foundation Phase Learners

Younger children require components to be scaled differently and fixtures to be mounted at a different height. The paramount concern for young learners is their safety, and so the utmost care must be taken to ensure that there is no risk of them falling into pits through a pedestal.

If it is possible, separate facilities should be provided for learners Grades R to Grade 2 (and any older learners who are particularly small) to allow the entire facility to be designed to a smaller scale. If this is not possible, 2-3 toilets and 2-3 basins in each main toilet block can be scaled for smaller users. If at all possible, VIP toilets and other pedestal-over pit arrangements should not be used for small children (see Section 3.1.2) because of the risk to their safety, but rather a toilet design with a shallow compartment under the pedestal, such as a desiccating toilet, or a design which offsets the pit behind, rather than under, the pedestal, such as a pour flush, low flush or standard flush toilet. If there is no option but to use a VIP toilet, lower pedestals with smaller holes with smaller, securely mounted seats must be provided to minimise the risk of a small learner falling into the pit. In addition, the height of the following should be considered:

- Pedestals
- Locks and handles on doors
- Toilet roll dispensers

- Wall-mounted urinals
- Taps and basins
- Soap dispensers
- Steps
- Handrails

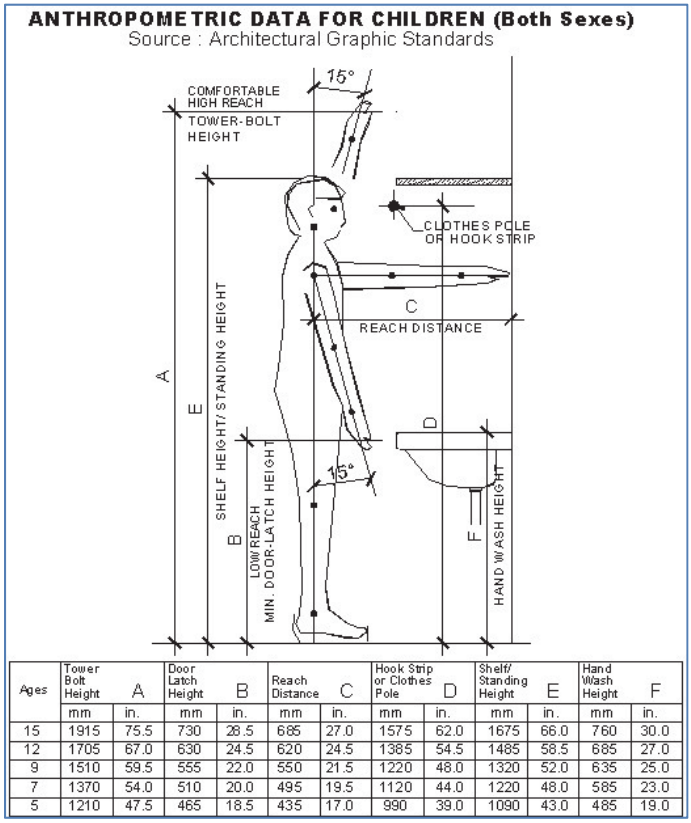
In addition, younger children may lack the physical strength and motor skills required for operating some tap handles, door locks or flush mechanisms, and this should be considered when they are selected. The weight of doors, toilet seats and buckets of flush water (in the case of pour flush toilets) should be considered to ensure that they are within the abilities of the smallest children at the school.

Children vary greatly in size from one place in the world to another. In addition, in poor communities inadequate nutrition, diarrhoeal diseases and worm infections can be responsible for stunting, resulting in children being smaller than their counterparts in communities within the same country which enjoy better nutrition and better hygiene. As a result, it cannot be assumed that dimensions calculated for one context will be appropriate for another, and measurements should be taken and averaged for each grade across the communities where toilets are planned to be built. Figures 3 and 4 below show heights calculated for learners' toilets in the UK[22] and India[23] based on average heights of children there.

It is important to remember that not only physical safety, but also psychological safety, must be considered in the design of sanitation infrastructure. For Grade R children, it is preferable that toilets are combined for both sexes and that cubicles don't have locks and only low partitions are used, in order to facilitate staff monitoring, assisting and training these young learners.

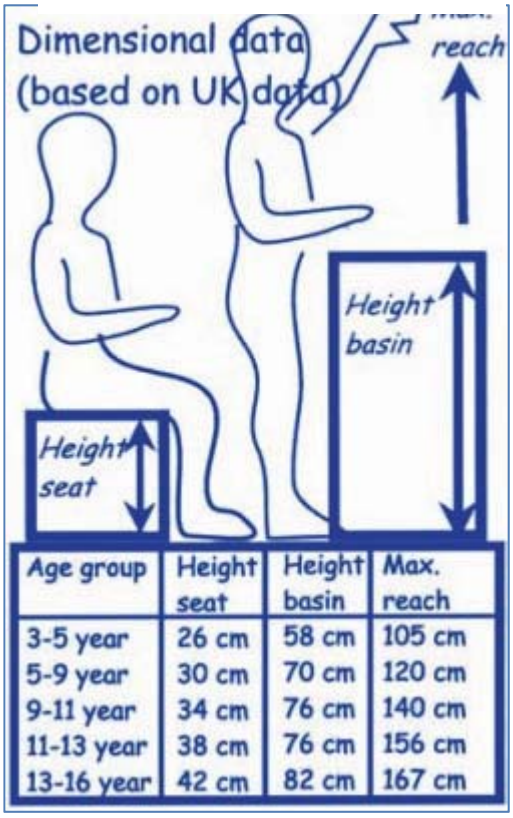
[22] Zomerplaag, J and Mooijman, A (2005) Child-Friendly Hygiene and Sanitation Facilities in Schools: Indispensable to effective hygiene education [Online] IRC International Water and Sanitation Centre, Delft, The Netherlands, available from http://www.dwaf.gov.za/dir_ws/tkc/vdFileLoad/file.asp?ID=275

[23] India (ND) National School Sanitation Manual [Online] Government of India Ministries of Urban Development & Human Resource Development, available from <http://schoolsanitation.com/pdfdocument/1309769575PDF00000002NSSI_ManualBook.pdf>



Ages	Tower Bolt Height A		Door Latch Height B		Reach Distance C		Hook Strip or Clothes Pole D		Shelf/ Standing Height E		Hand Wash Height F	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
15	1915	75.5	730	28.5	685	27.0	1575	62.0	1675	66.0	760	30.0
12	1705	67.0	630	24.5	620	24.5	1385	54.5	1485	58.5	685	27.0
9	1510	59.5	555	22.0	550	21.5	1220	48.0	1320	52.0	635	25.0
7	1370	54.0	510	20.0	495	19.5	1120	44.0	1220	48.0	585	23.0
5	1210	47.5	465	18.5	435	17.0	990	39.0	1090	43.0	485	19.0

Figure 3: Anthropometric data obtained for children in India



Age group	Height seat	Height basin	Max. reach
3-5 year	26 cm	58 cm	105 cm
5-9 year	30 cm	70 cm	120 cm
9-11 year	34 cm	76 cm	140 cm
11-13 year	38 cm	76 cm	156 cm
13-16 year	42 cm	82 cm	167 cm

Figure 4: Dimensions based on data collected in the UK

2.5.2 Fixtures

As with all components, fixtures should be durable, as smooth and easy to clean as possible, and mounted securely to prevent vandalism. A few recommendations can be made regarding the selection and mounting of fixtures:

- Attach back to back or with through fixing for strength.
- Avoid screw fixtures because of the possibility of vandalism.
- Toilet paper holders should be fixed so that rolls cannot be removed; this will prevent rolls from being thrown into the toilet or the rod falling into the toilet.
- Jointing strips, extrusions and visible fixings should be avoided as they provide places for dirt and germs to accumulate and hinder cleaning.
- Locks for doors should be simple and easy to operate to avoid the possibility that a learner with poor fine motor skill locks the door and is unable to open it again. Locks should not be easy to open from the outside, however.
- Locks should also be designed so that they are the weaker element and if force is applied the lock, rather than the door or frame, will break (as a lock is cheaper to replace than a door or frame).

2.5.3 Pedestals

The design of the pedestal may be dictated to some degree by the technology that has been selected. However with a design such as a VIP, a wide range of pedestal designs have been used.

Designing for safety

The first consideration in terms of pedestal design is safety. The pedestal should not be made from materials which will deteriorate over time such as untreated timber or steel which is inadequately protected against corrosion. The pedestal design should moreover minimize the risk of a user falling through the pedestal into the pit; i.e. holes should either be circular with a diameter of 220-250 mm, or an oval shape 220 by 270 mm. Smaller pedestals with smaller holes must be provided for Grade R to Grade 3 learners.

Untreated wood or inadequately protected steel should NOT be used in the construction of slabs, benches or seats as they will quickly rot or rust and become unsafe. As discussed in Section 2.5.1 the appropriate height should be determined on the basis of the size of learners. The distance from the front of the bench to the front of the hole should be no more than 75 mm or the hole will be set too far back for user comfort and soiling of the bench may increase.

Effective cleaning

One of the challenges with pedestals is keeping them and the surrounding area clean. Smooth surfaces and junctions between the toilet and the floor and different components of the pedestal will reduce problem areas where dirt can build up. With flush toilets, one way to make mopping easier is to mount toilets on the wall, getting them off the floor completely. This is a more expensive option however. A bench design can be easier to clean (and more robust) than moulded pedestals, and the 90 degree join between bench and floor can be rounded to facilitate cleaning. However user acceptance is likely to be higher with a design that looks as close to a standard flush toilet as possible.

Whatever materials are used, the pedestal surface must be easy to clean. Concrete, plastered masonry or timber which is not sealed and painted with several coats of high quality washable paint will be impossible to clean effectively and will therefore quickly become unsanitary and unpleasant to use.

Seats and lids

Seats and lids and their hinges represent a significant amount of surface area that requires cleaning. In addition, they can crack and break or be stolen. If they become loose they can slip underneath a user, potentially increasing the risk of a user falling into the hole. However a toilet in which the seat has been eliminated from the design may be perceived as degrading by users. If an alternative design is developed it should take into consideration aesthetics, human anatomy and comfort.

With a bench design, the toilet seat can be cemented into place to ensure that it is securely attached. If the joins with the bench are made cleanly, this will also reduce the build-up of dirt and facilitate cleaning.

A seat flap or lid is not essential to good sanitation and is more a matter of aesthetics and user preference. A flap is certainly a good idea in pit toilets which are not adequately ventilated as it will to some extent reduce odours in the cubicle and will limit the access of flies. In toilets which do not

have water seals, such as the VIP, a seat flap (assuming it is in place) must not fit flush on the seat but should be spaced off the seat by at least 5 mm to aid ventilation.

Flush handles

The flush handle poses the same problem. In South Africa, users and cleaning staff may have little consciousness of the fact that flush handles and door handles quickly becomes contaminated by a user who has not yet washed his/her hands and contamination can then be passed to the next user. In the United States, where consciousness of contamination may be relatively higher, the Bradley Corporation in their 2015 survey[24] found that 57% of respondents reported that they used their foot to flush the toilet to avoid touching the flusher with their hand. School children who feel the flush handle is too dirty to flush may simply not flush at all. For flush toilets, a footflushing mechanism would increase hygiene (and possibly require less strength from young or disabled users) but make cleaning more difficult. Toilets with foot flushing mechanisms are available in some parts of the world, for example Sloan Valve in the United States manufactures a foot flush pedal[25] and Thetford in the UK manufactures a pedestal with a footflush incorporated into the front [26]. If this specification became standard in South Africa for public toilet and institutional toilets local suppliers and manufacturers would quickly find ways to meet the need.

Figure 5: Foot flush pedals made by Sloan Value (left) and Thetford (right) in the USA

2.5.4 Urinals

The availability of urinals for boys, and also possibly for girls, has a number of advantages:

- **Safety:** If the school has pit toilets and there is some risk to learners of falling into the pit, the availability of urinals reduces their exposure to this risk to just those occasions when they need to defecate.

[24] https://www.bradleycorp.com/handwashing/2015handwashingsurvey Accessed 16 March 2016
[25] http://www.sloanvalve.com/Specifications/Royal_310.pdf Accessed 3 July 2014
[26] http://www.thetford.com/HOME/Products/PermanentToilets/AquaMagicVFootPedalFlushwandwoWaterSa/tabid/106/Default.aspx Accessed 3 July 2014

- **Reduces burden on toilets:** If toilets are reserved for defecation, the demand for them decreases dramatically. This can ease the situation at schools where the number of toilets is inadequate, and reduces the number of toilets needed in the design of new toilet blocks (see Section 2.3). Where school facilities are inadequate it may be possible to add urinal blocks more cheaply and quickly while resources are collected for improving toilets.
- **Reduces exposure to disease:** Using a urinal rather than a toilet eliminates contact with a toilet seat and flush handle, and possibly with a door handle as well – key disease transmission points in the toilets. Small children using toilets that are too big for them may have to use their hands to lift themselves onto a soiled toilet seat, which represents an unacceptable level of potential exposure to disease.
- **Overcomes difference in user size:** A trough urinal can serve users of any size, overcoming difficulties for young learners who have to climb onto toilet seats if they are too high for them.
- **Reduces odour:** The unpleasant smell of pit latrines is largely due to the presence of ammonia emanating from fresh urine. Separate disposal of urine eliminates it from the pit, reducing the offensive smell. In addition, urine around toilets is often a big contributor to the unpleasantness of school toilets. By reducing the extent to which toilets are used for urination, the environment will be cleaner, drier and less smelly.
- **Can be located close to the classrooms:** While many schools prefer to locate pit toilets some distance from the admin block and classrooms to prevent the unpleasant smell of the toilets from reaching these buildings, this is at the cost of safety and convenience. A small block of urinals, however, can be located closer to the classrooms or playground, making it easier for staff to monitor their use and reducing the amount of time learners spend during break or class using the toilet.
- **Reduces toilet use time**: A urinal is quicker to use than a toilet, reducing waiting times and congestion in the toilets.
- **Possible use of urine in agriculture:** Urine is an excellent fertiliser and on its own does not contain the pathogens that may be present in faeces. If the school has established vegetable gardens, urine from urinals can be collected in a tank and used for this purpose. Urine should be diluted to 1 part urine: 10 parts water and poured onto the soil, avoiding the leaves of plants.
- **Reduces water usage for flush toilets:** Where flush toilets are in use, many flushes can be needlessly used after a user has only urinated. By eliminating these wasted flushes through the use of waterless urinals, water will be conserved.

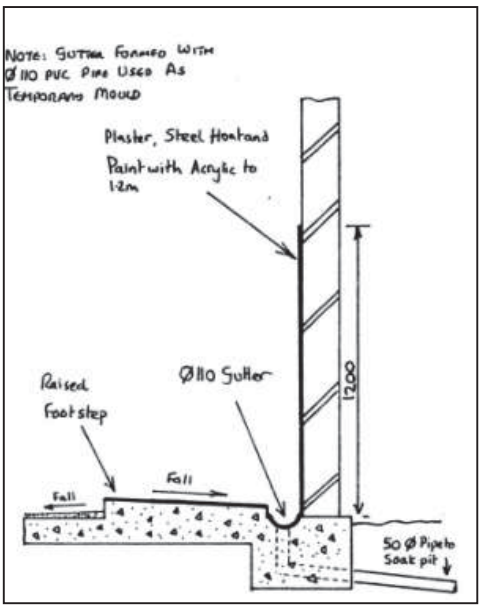


Figure 6: Urinal design

Urinals for girls

Urinals for girls and women are increasingly being used with success in other countries. Trough urinals for boys can be adapted for girls with minimal modification by simply adding non-sloping standing blocks on either side of the sloping floor, so that urine can fall directly down onto the slope and run into the collection channel without wetting the user's feet.

Because girls use toilet paper for wiping, bins must be provided for collecting toilet paper if urinals are used. Unenclosed urinals can be provided for girls Grades R-3 if they have a separate toilet block. For older girls, if urinals are enclosed in a stall and a water source is provided they can provide a means for cleaning and washing during menstruation. If urine from urinals is collected for food gardens, however, the greywater from urinals used by girls Grades 3 and older should be diverted elsewhere to avoid the presence of blood in the urine supply.

Designing urinals

A simple urinal design[27] is shown in Figure 6. Urine runs into a 110 mm floor-level channel which is separated from the screeded concrete floor by a raised foot kerb. The urinal leads to a drain pipe that empties into a soak pit. The walls of the urinal compartment should be plastered and steel floated up to 1.2 m above the floor and painted with a washable epoxy or acrylic paint. A robust trap in the drain is important to prevent debris from blocking the pipes. Dividers can be placed between the urinal spaces – 600 mm should be allocated for each person. As urinals in toilet blocks can be smelly, some schools have constructed them separately from the toilets and left them unroofed, allowing them to be dried by the sun or rinsed by rain.

Figure 7: Girls' urinal at a school in Uganda

A number of designs for school urinals for girls which have proven successful are shown below.

The design used at Mirembe Infant Primary School in Uganda[28], shown in Figure 7, has a slope of approximately 45 degrees to ensure that urine splashes away from the user (angle of incidence is equal to angle of reflection/deflection of the urine) and to facilitate drainage. Staff reported improved class attendance and reduced open urination after these urinals were installed.

[27] Deverill, P and Still, D (1998) Building School VIPs: Guidelines for the design and construction of Ventilated Improved Pit toilets and associated facilities for schools [Online] IRC publication available from < http://www.ircwash.org/sites/default/files/321.4-98BU-15447.pdf>

[28] Uganda (2009). *Urinals for the girl child.*

These urinals at a Peepoople project[29] at a school in Kenya were found to be clean and odour free.

UNICEF reports high acceptance of school urinals for girls in its Water, Environment and Sanitation project in Malawi.[30]

Figure 8: Girls' urinal in a Peepoople project at a school in Kibera, Nairobi, Kenya (Photo by Elisabeth Meunch)

Figure 9: A female urinal design used in schools in Malawi[31]

[29] http://forum.susana.org/forum/categories/52-mobile-or-portable-solutions-public-toilets/6318-peepoo-bags-at-schools-in-low-income-areas-in-kenya, Accessed 18 June 2014.

[30] http://www.unicef.org/Malawi_wes.pdf accessed 26 August 2014.

[31] http://www.soafrica.com/Client/AfricaSan/S2/3%20Marieke%20Heijnen%20-%20Wash%20in%20primary%20Schools%20in%20Malawi%20.pdf#page=15&zoom=auto,-40,330 accessed 26 August 2014.

Figure 10 shows a design for urinals for boys and girls, with raised footsteps provided for girls, recommended by the Government of India. [32]

Figure 10: Designs for girls and boys urinals recommended by the Government of India

In South Africa, while no trials of urinals for girls or women in schools or public restrooms are known, the concept of a urinal for women has entered the sports arena with portable models such as the *Go Girl* urinal funnel, which markets itself as "the way to stand up to crowded, disgusting, distant or non-existent bathrooms ."[33]

Waterless urinals

While traditionally urinals have been flushed with water, waterless urinals are becoming increasingly popular. They conserve water and so can be used in contexts where there is a limited or unreliable supply of water. In addition, they reduce the problems of scale, odour, blockage and subsequent flooding associated with flush urinals. In addition, aerosols are created during flushing which can carry bacterial through the air; this is avoided with dry urinals.

The EcoSmellStop (ESS) manufactured by Addicom[34] in South Africa allows the urine to flow through silicon curtains/flaps that stick together when wet, preventing odours from traveling back up the pipe. WECF fitted condoms with a small hole cut into the tip over the outflow pipe to convert standard flush urinals to dry urinals. Some problems were experienced in warm climates with the latex sticking together if the urinal was not used frequently. [35]

[32] Government of India (2004) School and Anganwadi toilet designs: Norms and Options http://www.mdws.gov.in/sites/default/files/SchToiletDesign_1.pdf Accessed 16 March 2016
[33] www.go-girl.com, Accessed 16 March 2016.
[34] http://www.addicom.co.za/waterless-urinals.html Accessed 16 March 2016
[35] http://forum.susana.org/forum/categories/34-urine-diversion-systems-includes-uddt-and-ud-flush-toilet/6679-simple-urine-valves-to-control-odour-on-waterless-urinals-or-on-urine-diversion-toilets

Figure 11: EcoSmellStop (ESS) from Addicom (left); a condom adapted as a water seal (right)

For controlling odour, charcoal can be placed in a mesh bag in the urinal to absorb odours. The charcoal will need to be replaced regularly as its adsorptive capacity will eventually be exhausted.

2.5.5 Hand washing facilities

To limit the spread of contagious disease, it is very important that children remove any germs that have gotten onto their hands while using the toilets. Washing with water and soap while scrubbing all surfaces of one's hands vigorously is effective in removing germs. Rubbing with water loosens and rinses off the germs, while soap loosens germs even more effectively and helps to kill them. Drying one's hands after washing them also helps because any germs remaining on one's hands may quickly begin to multiply on warm, damp skin. In most South African schools water, soap and hand towels or driers are not available, compromising learner's ability to protect their health. The cost of supplying disposable paper towels is high but cloth towels reused by many learners are more likely to spread diseases than reduce them. The easiest intervention is soap, but many schools report that soap is stolen or soap dispensers are abused if they are provided. Bar soap may also spread diseases as faecal matter may be left on the bar by one user and then get on the hand of the next user; germs may also breed in the wet environment of soap that is not strongly antibacterial. Liquid soap should therefore be used, where the soap is not handled over and over by users. All fixings should be concealed to avoid pupils vandalising dispensers and dirt and germs building up.

Basins

A trough basin rather than individual basins may be preferable for the following reasons:

- They are quicker and easier to clean
- The drains of individual basins can be blocked by learners, causing flooding or unhygienic conditions with standing water.
- Learners may fill individual basins with water to wash their hands, which is less hygienic than using running water.
- Individual basins are more vulnerable to vandalism.

If possible, basins should be mounted on the wall rather than the floor to prevent the build-up of dirt around supports which interfere with mopping. Basins should be mounted strongly enough, however, so that a learner sitting or standing on the basin will not break it off the wall. If possible fasteners should be recessed into the wall and covered to prevent vandalism.

Taps

Ideally, hands-free, self-closing taps should be used for school taps for two important reasons:

- The purpose of washing hands is to remove germs from hands. When learners open the tap they may leave germs on the tap. When they then close the tap again afterwards, their hands may pick up germs that others have left on the tap.
- Taps that do not self-close can be left open by users, wasting water and potentially causing flooding.

A self-closing tap design should be chosen carefully. Some designs require more strength to operate, which could be a problem for young learners or those with a physical disability. Others are even easier to operate than standard taps, potentially solving issues for young learners or those with physical disabilities. The tap should stay on long enough for pupils to wash their hands properly.

A-Aqua, a Norwegian manufacturer, supplies a low cost self-closing tap valve that provides a higher flow late at lower water pressures.[36] The valve is operated with a button, which means that it can be operated with less dermal contact than a tap that needs to be turned. It may also be appropriate for the strength level of young users. The tap attachment should be modified so that it cannot easily be unscrewed by learners, leaving the water to flow continuously.

Figure 12: A-Aqua self-closing tap valve

[36] http://www.scan-water.com/products.php?vareid=93

A-Aqua also manufactures a handwashing station with 6 taps[37] which could be used for schools with no handwashing facilities.

Even better would be a design that requires no contact with the user's hand at all. One option is a lever which can be pushed with an arm or sleeve. Other designs use a lever operated by the knee or foot or a button which is stepped on while the user is washing. Galvin Engineering in Australia has developed a knee operated tap device as well as two self-closing foot pedal operated devices.[38]

Figure 13: A-Aqua water station with 6 taps

Figure 14: Foot operated (left and centre) and knee operated (right) self-closing taps manufactured by Galvin Engineering

MTE Valves in Thailand also makes a foot operated self-closing valve.[39]

[37] http://www.a-aqua.no/Automasjon/Omr%C3%A5der/Water-Tap-Station-61, Accessed 14 March 2016
[38] http://www.galvinengineering.com.au
[39] http://www.valvemte.com/Foot%20Tap%20Valves%20MCM.html

Figure 15: Foot operated self-closing valve manufactured by MTE Valves

The tippy tap concept[40] is a hands free, foot operated design which learners could make themselves and which is highly adaptable to different environments. A jug of water is suspended from a rod and is tipped forward by placing one's foot on a stick or other lever hung from the tap with one end suspended slightly off of the ground. Tippytap.org reports that hands can be washed using only 40 millilitres of water by this method. Figure 16 shows Tippy taps in use at a preschool toilet facility in KwaZulu-Natal. The facility was designed by Lima in collaboration with Save the Children.

Figure 16: The tippy tap concept explained (left) and in use at a preschool toilet facility designed by Lima/Save the Children in KwaZulu-Natal (right)

These options could also be considered for users with physical limitations.

Schools in South Africa have experienced problems with steel fittings being stolen from toilets. Tap handles made from plastic, however, can quickly become scratched and then harbour germs.

[40] www.tippytap.org

Drains

All taps – including outside standpipes – should be provided with drains leading to a soakpit, or else the area will becoming muddy and unhygienic. Handwashing water can also be channelled to greywater recycling catch pits if such a system is in use.

2.5.6 Cubicles

Cubicle walls and doors should be robust enough to withstand wear and tear in the school environment, especially at the point where door frames meet the walls (often a weak point, especially where cheap door frames are used).

Walls and doors that extend all the way to the floor can be hard to clean as it is difficult to reach into corners. Wherever there are corners, the joint can be rounded to facilitate cleaning. Leaving some open space above and below doors and walls makes it easier and faster to clean the floors. It also means that a child who needs help while using the toilet will be able to be heard if she calls for help. Leaving such a space, however, means that other children will be able to look under the door or wall and harass the person in the cubicle. Sometimes children stand on the toilets and look over the walls at children in other cubicles, violating their privacy. For these reasons, it is recommended that partitions are raised less than 100 mm off the floor and end 100 mm or less below the ceiling.

2.5.7 Doors and gates

In toilet blocks at senior primary schools and high schools all cubicles should have doors, however a privacy screen may be preferable for preschool and junior primary to avoid the difficulties of using door locks. If toilets are built with cubicle doors facing directly onto the school yard, a privacy wall should be built in front of the block to protect against a loss of privacy should doors swing open or be stolen.

For doors which open directly to the outdoors it is recommended that doors open inward to prevent damage from the wind.

The locking or bolting of toilet doors should only be possible from the inside of the cubicle. Placing a catch on the outside of the door to secure it introduces the danger of someone securing the catch while a learner is inside, trapping them.

If timber doors are used it is important that they are constructed well to prevent sagging or warping. A suitable design is to use 22 mm treated softwood which is tongued and grooved and battened with 22 mm x 110 mm softwood, taking into account which way the door is to be hung. Doors should be between 650 and 850 mm wide, depending on the size of blocks used in the superstructure. It is also important that timber planks be completely dry before the construction of doors as otherwise the planks will shrink away from each other, leaving gaps which then compromise privacy.

Some provision must be made for a user to be able to exit a cubicle if the door will not open (e.g. the lock jams or the child cannot operate the lock). This could be achieved by either raising the door 200 mm from the floor to allow a person to crawl under it or by designing the door to lift off of its hinges. The first option raises the same possibilities of other users violating the privacy of the user in the cubicle. Designing doors to be able to be lifted off their hinges, however, increases the possibility of vandalism by larger learners and many learners may not be able to lift the door off should they need

to get out. Another option is simply to ensure that the door locking mechanism can be easily forced by a person of normal adult strength from the outside.

A lockable door or gate should be fitted to the entrance of every toilet block. This should be closed outside of school hours to prevent unauthorised access and vandalism as well as to prevent the entry of snakes or other animals. A gate may allow greater ventilation but may also allow dust to be blown into the block and may not prevent the entry of snakes and rodents.

2.5.8 Flooring

Flooring can be made of a variety of materials, however the following considerations should be kept in mind:

- The flooring should be impervious to water
- Smoothness for ease of cleaning should be balanced against slip resistance, which should be built into the full depth of the material if possible, so that the slip resistance doesn't wear out before the floor itself wears out.
- A finish should be chosen which will bond well with the surface and not peel off prematurely.
- If it is possible to raise funds for more expensive materials, such as tiling, this may have benefits in terms of users viewing their facilities with greater respect and consequently treating them with greater care.
- To aid cleaning, the floor should be designed to slope gently towards a 40 mm drain hole. The floor can also incorporate integral gullies to allow for the entire toilet area to be sluiced regularly. Where integral gullies are included they need to be effectively sealed to the floor finish.

The floor should have an integral 100 mm high coved skirting in matching material and finish to create a sealed membrane so that the floor can be washed without risk of damage to the wall finish. Gaps between the skirting and walls should be filled with a suitable filler such as cement mortar, acrylic sealant or tile grout and corners should be finished with a slight radius to aid cleaning.

2.5.9 Walls

Walls inside the building should be plastered and painted with a washable acrylic paint that is light in colour but not white, which will show the most soiling. The joint between the wall finish and the integral coved skirting should be sealed against water and dirt.

If a privacy wall is provided to screen the entrance to the toilets, it must be built on prepared foundations and tied in to the structure or buttressed every 3 metres or less to ensure stability.

2.5.10 Roof

Rafters are not required for the small spans over individual toilets. Timber purlins should be built directly into the front and back of the side walls and tied down securely with wire of at least 3 mm diameter. Roof sheets can be made of corrugated iron, IBR or fibre cement and should be nailed to the purlins. If a privacy wall is provided, the roof can be extended over the privacy wall to provide a sheltered space and protect the doors.

2.5.11 Ventilation and lighting

Adequate ventilation is important in order to reduce odours in the toilet and prevent damp conditions in which pathogens may multiply. Adequate lighting is important not only for practical reasons, such as girls being able to see what they are doing when they are changing their pads, but also for psychological reasons: a dark toilet is scary and unpleasant. Dark conditions also may encourage pests as well as encourage anti-social behaviour. This is a drawback of the VIP design, which requires a dimly lit toilet interior in order to better attract flies to the light at the top of the vent pipe. It is essential for learners' wellbeing that toilets are as light, clean and pleasant as possible. Windows provide the most light but should not compromise privacy and if they are broken may let in draughts, dust, rain, pests and vandals. In school toilets built by eThekwini Municipality in 2013, clear fibreglass panels were used for some of the roofing, allowing sunlight to enter the building and creating a pleasant atmosphere. Cream walls and sky blue floors added to the light, pleasant atmosphere. In 2015 the Pietermaritzburg-based Lima Rural Development Foundation constructed the pour flush toilet facilities shown in Figure 17 for a preschool in partnership with Save the Children. Lima designed the facilities through a consultative process with stakeholders.

Figure 17: Pour flush sanitation facilities built by LIMA and Save the Children for a crèche

2.6 Universal access facilities

South African law requires that all facilities are built in compliance with the principles of Universal Access. Universal Access, which is discussed in Section 2.1.3, requires that all facilities are designed for use by all users, rather than some facilities for "able'' users and others for ''disabled'' users.

DWAF[41] identifies the key design requirements for toilets for people with disabilities as:

- accessibility
- ability to use without additional help
- preservation of dignity

Due to the conditions in rural South African schools, where pit (VIP) toilets are frequently located some distance from the classrooms, it may be in learners' best interests to have a Universal Access toilet located closer to the classrooms to accommodate limited mobility. It may also afford the user greater safety and independence, rather than negotiating crowded conditions in the main toilet blocks and the possibility of threats from other users.

In the case of existing facilities which are in adequate condition but do not meet the criteria of Universal Access, a separate Universal Access toilet can be built at the school according to these guidelines in order to bring the school into compliance with the requirement to provide access to all learners in the community served by the school, regardless of their temporary or permanent limitations.

Where separate Universal Access facilities are built, it is important that access to these is not restricted only to learners using wheelchairs. Any child who struggles to use the main toilet facilities -- because of size or ability or because he or she feels afraid or has been the target of bullying -- should be allowed to use these facilities. If the school only has VIP or unimproved pit toilets, Foundation Phase learners should also be given access to Universal Access toilets if they have to go to the toilet alone (for example, during class time) to protect them from the danger of falling into the pit.

The Centre for Excellence in Universal Design established by the National Disability Authority in Ireland provides detailed guidance on building sanitary facilities in the manual *Building for Everyone: A Universal Design Approach (Volume 5: Sanitary Facilities)*[42]. This manual provides numerous plans for different arrangements (single sex, unisex and enlarged) that satisfy the requirements of Universal Design. Guidance below is taken from this manual as well as guidance from the *Guidelines for the design and construction of Ventilated Improved Pit toilets and associated facilities for schools* (Deverill and Still, 1998).[43]

Access to toilet facility. As wheelchair access requires a gentle gradient, the topography of the school grounds should be considered carefully to determine optimal sites for the Universal Access toilets. Toilets should be as close to classrooms and the playground as possible (not exceeding 25 m). A smooth, wide path, ideally surfaced with brick or concrete, should be constructed from the classroom to the toilet. This pathway should be at least 0.9 m wide to accommodate wheelchairs and users on crutches. The path should have a maximum slope of 1:20, with the exception of short sections of less than 2 m which may have a gradient of 1:10. A guide rope should also be attached to

[41] (no date)
[42] http://universaldesign.ie/Built-Environment/Building-for-Everyone Accessed 15 March 2016.
[43] Deverill, P and Still, D (1998) Building School VIPs: Guidelines for the design and construction of Ventilated Improved Pit toilets and associated facilities for schools [Online] IRC publication available from < http://www.ircwash.org/sites/default/files/321.4-98BU-15447.pdf>

poles along the edge of the pathway for blind or partially sighted persons. If a school has multiple storeys, a unisex accessible toilet should be provided at each floor level and should be clearly identified.

Entry to the toilets. A low threshold (<2cm) should be bevelled with a slope of no greater than 1:2. If a ramp is needed, it should be built with a slope of 1:12 or less. Facilities should not have entry doors that have to be opened in order to enter the facility. A main door or gate that is locked after hours can be opened and securely fastened during the day (the lock should be kept with a caretaker to prevent a learner from locking other learners into the facilities). Privacy screens or walls can be used to prevent a direct line of vision into the toilets, however it must be ensured that these do no block access by a wheelchair.

Floor. There should be no step from the main circulation area into the cubicle. The floor should be constructed of a durable slip resistant material such as a grano-screed with suitable stone chip base, which can easily be cleaned. The fall on the floor should be limited to 1:75 and should drain from one or more even falls without channels.

Cubicle doors. Unless the interior of the toilet is very spacious, the toilet door should open outwards to allow the user enough space to enter through the doorway and close the door behind her. The door should be at least 0.8 m wide. The door should open outward at least 90 degrees against an adjacent wall to minimise the risk of another user colliding with the door. A full width grab rail should be attached to the inside of the door so that it can be easily closed. If the toilet door opens to the outdoors, a suitable stop should be installed to prevent the door opening wider than approximately 120 degrees and being damaged by strong winds. If inward opening doors must be used, they should be fitted with lift-off hinges so that the door can be removed if a person falls against the door inside the cubicle. A level or other door handle design should be used which can be easily grabbed by a person who does not have the full use of their hands.

Floor space inside the cubicle should be adequate to allow a wheelchair to manoeuvre alongside the pedestal and allow space for an assistant to come alongside the user. Cubicles should be 900 to 920 mm wide and provide a 900 mm x 900 mm circulation space clear of the pedestal and the path of the door (if inward opening). To modify an existing toilet block, a wall can be removed between two cubicles to create adequate space, or an inward opening door can be changed to an outward opening door or a sliding door.

Pedestal. The pedestal and seat should be robust in design and securely fixed to the floor slab with masonry anchors to ensure there is no movement during use or transfers which could result in an injury. The height of the seat should be level with the seat of a wheelchair, or 500 mm above the finished floor level. The front of the pedestal should be positioned 750 mm from the rear wall to allow a wheelchair to be positioned alongside, and level with the pedestal so that a user can move sideways from one to the other. The pan should be able to accommodate an extension piece to raise the height and be wide enough to allow a user to wipe himself while seated. A smaller pedestal and seat should be used for learners Grade R-3 to ensure that they do not fall through the seat. The shape of the pan should allow toe space under the bowl to aid with a frontal transfer and to accommodate boys wishing to stand while they urinate.

Fixtures. Door handles and locks should be chosen which allow a user to open with a downward motion to accommodate users with limited hand function. Provision should be made to enable the

door to be opened from outside in the case of an emergency; for example a rope attached to the mechanism and passed through a slot in the door.

Horizontal grab rails should be mounted on the door and across the back wall behind the pedestal. Angled grab rails should be installed on either side of the pedestal extending 40 to 50cm past the front of the seat. They should be mounted a height of 60 to 70cm (or appropriate to the size of specific users) at the rear and 1.6 m at the front. Grab rails can be manufactured from robust plastic pipes (e.g. 50 mm PVC class 16) or 50 mm galvanised piping and should be 3.8 cm to 4.5 cm in diameter with the ends bent to be raised 4 to 5cm off the wall. These should be fixed to the wall with masonry anchors or bolted in the case of timber construction. Block work cavities should be filled wherever grab rails and other fittings are to be secured. In the case of timber structures, reinforcing panels should be provided to carry these fittings. A stainless steel sheet metal kick plate 300 mm high should be fitted to both sides of the door to protect the door from damage generated by the footrests of the wheelchairs.

Basins. The height of the washbasin should suit people using it in both a seated and standing position, with the rim 720 mm to 740 mm above floor level and a clear knee space, free of pipes, of at least 0.7 m beneath to facilitate a user seated in a wheelchair. The tap should be fitted with a lever handle.

Urinals. At least one urinal should be fitted with grab rails on each side, and in the front, of the urinal. In a row of urinals, at least one in six should be positioned at a lower height, with the rim 380 mm above floor level instead of the standard 500 mm. A clear space 900 mm wide x 1400 mm deep should be provided in front of the lower height urinal to suit the approach by a person using a wheelchair.

Lighting and colours. Painting surfaces white, with fixtures and junctions between surfaces painted with contrasting colours can aid visibility for sight impaired users.

Unisex facility. A dedicated, unisex special access facility should be clearly marked so that visitors to the school can easily identify it. The room should be at least 1800 mm wide x 2600 m long. The basin, soap and towel should be within reach of a person seated on the toilet. A mirror may be provided and should be tilted or placed at a suitable height for wheelchair users.

Figure 18 provides a plan for a unisex accessible toilet published by the Centre for Excellence in Universal Design.

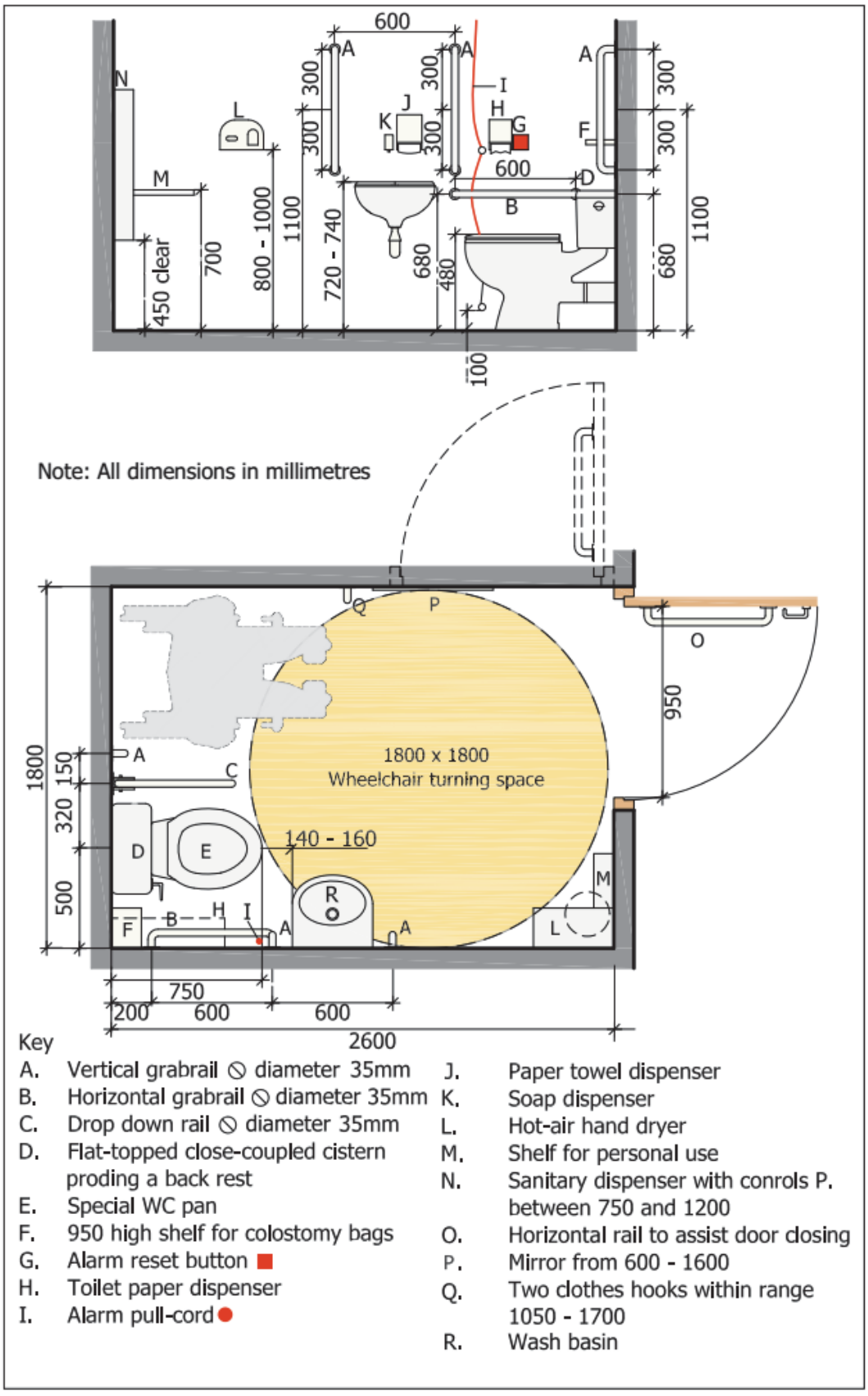


Figure 18: Unisex accessible toilet – right hand transfer (Centre for Excellence in Universal Design, no date)

In addition to the specific adaptions described above, there could be other special needs which require adaptations, such as problems with continence which could require private and appropriate disposal facilities. Adaptations for specific children with special needs should be designed in consultation with the child's family. A shower facility, perhaps located in one special access toilet in the school, may also be required to deal with incidents of diarrhoea, vomiting etc. The former Department of Water Affairs and Forestry, in its guideline for sanitation facilities for people with disabilities,[44] provides specifications for toilets to address the needs for particular disabilities.

2.7 Cosmetic aspects

While budgets for cosmetic aspects of school sanitation may seem like a luxury that is out of reach for poor schools in the developing world, even small efforts to beautify the toilets can increase the level of comfort enjoyed by users as well as ownership of the facilities with potentially positive spin offs in terms of reduced vandalism, theft and abuse of facilities. Trevor Mulaudzi, founder of the South African Water and Sanitation Academy (SAWASA) has enjoyed success with a model of raising funds from businesses to renovate school toilets to a high standard. He found that a dramatic visual improvement has been found in some cases to have a powerful the impact on user behaviour.[45] If a small amount of funds can be raised some key improvements could be made which could boost morale. For example:

- Paint doors a bright colour. Learners could vote to choose the colour.
- Buy a mirror for each toilet block. A full length mirror would allow girls to be able to check their dresses.
- Incorporate learners' creative work into the toilets. For example:
  - ✓ Run a competition in the school for the design of a mural, a catchy or funny slogan, or an inspiring quote to be painted in each toilet.
  - ✓ Have learners paint a mural in the toilets or paint decorative designs on the stall doors.

Figure 19: Artwork in school toilets (sources unknown)

[44] Department of Water Affairs and Forestry (DWAF), South Africa (no date). *Guidelines for sanitation facilities for people with disabilities.*

[45] Trevor Mulaudzi, pers. comm.

3. CHOOSING THE RIGHT TECHNOLOGY

Each technology comes with its pros and cons and associated requirements. There is no silver bullet and no one-size-fits-all technology. How then, should a technology be selected? This section discusses some of the issues to be considered, presents criteria that should be used in selecting a technology and reviews the technology options that have been tested in schools to date.

A number of factors should be borne in mind when selecting a technology.

1) Pedestal-over-pit technologies pose a danger of a user falling into the pit and drowning. Offsetting the pedestal from the pit eliminates this danger.
2) Where pedestal-over-pit designs are used it is vital that smaller holes and seats be provided for young learners and that slabs are well designed and preferably made from reinforced concrete, not poorly protected metal or untreated wood which will deteriorate over time. It is imperative that a pedestal-over-pit design be accompanied by a stringent management and monitoring regimen to ensure that the safety of toilets does not deteriorate; rural schools frequently lack the capacity (skills) and commitment (will) to provide this.
3) Users hate filthy conditions and unpleasant smells and these undermine dignity and the learning environment: a dry technology that is well-managed may be preferred over a flush technology that is not.
4) Flush technologies are overwhelmingly preferred by learners and staff; as a technology they are perceived to better support health, safety and dignity because the smell, sight and danger of a dark pit full of smelly sludge is eliminated.
5) Any design which does not utilise an open pit requires a commitment to providing toilet paper and bins in order to prevent frequent blockages by foreign materials.
6) Adequate ventilation and lighting is vital to provide an environment in which users feel safe and comfortable. VIP designs which require a dim, windowless stall are inappropriate for schools.
7) The fact that many schools have not secured reliable water access from their municipality is a barrier to wet technology options which might otherwise be viable for schools. This is a matter where stronger advocacy and leadership from the DoE could empower schools.
8) Basins and taps should be seen as integral to a technology option: the purpose of sanitation is undermined when toilets are provided with no means for users to wash their hands.
9) Components – toilets, urinals or taps – with metal or removable parts are vulnerable to theft or breakage. Plastic parts are less vulnerable to breakage but may more quickly break or scratch, and begin to harbour pathogens.
10) **Technologies which are implemented without an effective management plan can be expected to fail.**

3.1 Design considerations

This section explores the advantages and challenges associated with onsite technologies, safety concerns with pedestal-over-pit designs, dry, wet and urine-diverting options and design for optimal ecological sustainability.

3.1.1 Onsite versus sewered technologies

While learners and staff alike typically express a desire for waterborne sanitation, which allows the user and the school to "flush and forget", there are a number of reasons why a sewered system might not be possible or desirable for rural schools.

- The distance to schools may make the costs of sewering prohibitive.
- Sewers that are not properly maintained can leak in poorly monitored areas resulting in a health risk and environmental contamination.
- The concept of standard flush technology, in which drinking water is used to transport disease-bearing excreta for long distances, is becoming increasingly unsustainable as the burden on water resources becomes greater.

Comprehensive monitoring of *E. coli* by water authorities in the Pietermaritzburg/Durban area over 20 years has shown conclusively that the greatest environmental threat to the area's rivers is created by dysfunctional sewage systems rather than on-site sanitation. Our rivers are far more polluted below sewered areas than they are below unsewered areas with on-site sanitation.

On-site toilets therefore limit the extent of contamination should it occur. They also open up the possibility of using the nutrients in urine or faeces to increase the fertility of soil. With malnutrition of children and the food security of families a serious concern in many rural communities, the ability of the school to generate food is important. Balanced against this, however, is the capacity of the school to safely and consistently manage excreta used as fertiliser and sustain food gardens.

While on-site sanitation may be the only option for many rural schools, it has its own set of disadvantages which must be managed. It can be difficult to control the unpleasant smells in on-site systems. This, along with the unpleasant experience of having to see others' excreta in dry systems, can make toilets feel perpetually dirty and disgusting to users, undermining their dignity and perceived safety from disease. In addition, however, as unpleasant smells can be a disturbance in the learning environment, principals can be inclined to locate the toilets far from the classrooms, introducing a range of new problems in terms of convenience, monitoring and safety, particularly for vulnerable children. It should be noted, however, that onsite toilets which are well managed need not be filthy or particularly unpleasant in any way.

In addition, on-site sanitation systems operate on a cycle of filling and emptying as follows:

1 	Urine, faeces and wiping material are deposited through some sort of ''user interface'' (toilet pedestal or urinal).
2 	It is then collected in some kind of collection chamber, vault or tank. In that container it might receive some kind of treatment to reduce volume or pathogen load or to aid decomposition.
3 	It is then removed, and in some cases it is then treated or processed further to make it safe for use as a fertilizer, or it is disposed of, usually through burial or by removal to municipal waste water treatment works.
1 	The empty chamber is now ready for the cycle to begin again.

It is important that every stage of the cycle is carefully considered in the selection of a sanitation technology. Pits should be sized, designed and placed with the pit emptying cycle in mind. Emptying the full pit can involve a host of challenges. Some schools have reported full pits to the department but received no intervention until pits are overflowing and unusable, creating an unacceptable threat to learners' health and resulting in a situation where learners have no access to sanitation. When pits are emptied, emptying teams typically do not properly protect the environment around the pits, which results in faecal contamination of the school environment, putting learners at risk for diseases. For this reason, as well as because of the risk of learners falling into pits that aren't safely sealed, learners should be restricted from access to the pit area behind on-site toilets.

Table 11 summarises the advantages and disadvantages of on-site sanitation for schools.

Table 11: Advantages and disadvantages of on-site sanitation for schools

Advantages	Disadvantages
• Eliminates the risk of sewer leaks and spills causing major contamination in public areas. • Allows for dry technologies that reduce the burden on water resources and can accommodate inadequate or unreliable water supply. • Enables sanitation in rural areas where sewer connections are not possible. • Allows for the possibility of schools to use urine or composted faeces as fertilizer for growing food.	• The on-site design most commonly used in South African schools, the VIP, places the user over the pit, introducing a potential threat to life into the school environment. • It is difficult to eliminate the offensive smell of excreta in dry on-site systems. • If municipalities or the department are unwilling to assist when pits become full, or do not respond in a timely fashion, a degrading and unhealthy situation may result. • Sludge removal and burial may result in contamination of the school environment. • Users may perceive a system in which they have a greater role in management of excreta as a "second-class" technology.

As these guidelines address schools in rural areas of South Africa where standard sewered sanitation is generally may an option, only on-site alternatives are discussed here.

3.1.2 Safety concerns with pedestal-over-pit designs

Dry technologies typically place the user directly over a collection vault of some kind, as it is difficult to move excreta from under a user without water. The vault generally needs to be deep so that it won't fill up too quickly, although desiccating toilets allow for a shallower vault. A deep pit under the user carries the serious risk of a user falling into the pit and dying, either by falling through the hole in the pedestal into the pit, or by the slab suspended over the pit collapsing, or the pedestal collapsing into the hole.

The danger of a learner falling into the pit while using the toilet and potentially dying is a critical infrastructure and management issue.

In the WRC research, 57% of VIP users and 72% of unimproved pit latrine users indicated that they had felt afraid of falling into the toilet at school at some point. This danger inherent in the pedestal-over-pit arrangement of VIPs and unimproved pit latrines was reiterated over and over throughout the data in many different contexts by different respondents. It is imperative both that the design and construction of infrastructure overcome this threat to the greatest extent possible and also that schools and the department protect against the possibility of tragic death in the toilet through

stringent management systems. Guidance for designing pits to minimise the risk of a child drowning in the pit is provided in Section 4.1.1.

"What is very, very, very sad is that the toilets in other schools, learners fall down the toilets. You know, the bigger learners fall down the pit system. Also, another structure collapsed with the learners. It was the pit system. Then now, we are afraid of the learners to go there, because the pit system is not safe as this type of toilet that using water. That is why we decided to take the foundation phase to use these [pour flush] toilets."

-Eastern Cape principal, 2015 pour flush pilot study

3.1.3 Dry, wet or separate?

Flush or no flush

While "flush and forget" technology is standard across the developed world, it has serious drawbacks. In one year roughly 500 litres of urine and 50 kilogrammes of faeces are flushed away with 15,000 litres of pure water by each user of a standard flush toilet[46]. The global demand for fresh water tripled over the second half of the 20th century and it has been projected that by 2030 more than half the world's population will face a shortage of water[47]. Because of this, new sanitation technologies which use little or no water but are not inherently dangerous, degrading or disgusting (in terms of unpleasant sights and smells) are urgently needed. Many alternative designs have been developed and many others are still in the testing phase. Some new sanitation concepts require expensive, difficult-to-source parts or complicated management and maintenance and would therefore be inappropriate in the rural school environment, where toilets typically experience harsh use and very limited attention from school management. Any new concept should be tested on a small scale for several years in a realistic context before being delivered as a technology solution to rural schools.

"… civilized people ought to know how to dispose of the sewage in some other way than putting it into the drinking water"

U.S. President Teddy Roosevelt (George, 2009).

While many users and principals would like to see their pit latrines replaced by flush toilets, a reliable and adequate water supply is a significant barrier. In the WRC research, water supply was found to be an issue at many schools, with principals reporting water supply as inadequate at 43% of schools and unreliable at 51% of schools. Rainwater was reported to be harvested at 59% of schools.

Low flush or pour flush systems can bridge the gap between the sustainability of dry systems and the convenience of flush systems by significantly reducing the amount of water required to flush and by using grey water rather than potable water to flush, while still affording the user the preferred experience of flushing. Rainwater harvesting can also augment the available water supply.

[46] Stockholm Environment Institute (SEI) (2004). *Ecological Sanitation*. SEI: Stockholm.
[47] Ibid.

Separation of liquids and solids

Separating urine (and flush water, in a wet system) from dry material (faeces and toilet paper) can offer a number of benefits:

- The absence of urine (and flush water) results in a drier sludge; if further aided by composting or desiccation this reduces the pathogen load in the sludge, making it less hazardous to handle during removal.
- It allows urine (and greywater, in a wet system) to be collected and used for agriculture without further treatment.
- If urine and faeces are separated at source then the formation of ammonia – the main contributor to the noxious smell associated with pit toilets – will be limited.

Separation of liquids and solids can be done in the pan, with urine flowing into a forward compartment and faeces falling into a compartment at the back (See Section 3.3.2). Urinals can also be used to separate urine. The Blue Diversion Toilet developed by EAWAG/EOOS uses surface tension to separate the urine[48]. Source separation of urine allows the urine to remain relatively pathogen free and ready for use without further treatment. Another design option is to allow urine, flush water and faeces to mingle and then to separate them later. The liquid collected this way must be assumed to be contaminated with pathogens, however, and must be treated before it is used.

3.1.4 Ecologically sustainable systems (EcoSan)

An increasing number of technologies are being developed which aim to prevent environmental pollution as well as capture and use the nutrients in urine and faeces to grow food and thereby increase food security.

Typically, urine is diverted and faeces is stored in a vault where it decomposes, or is dehydrated or composted. Using alternating vaults allows faeces to dehydrate or decompose in the vault that is not currently in use without being mixed with fresh faeces, helping to reduce the pathogen load before handling.

Human waste contains valuable nutrients which can be used to increase food security and alleviate undernutrition[49]. The NPK in urine is readily available to plants and vegetable and fruit crops grown using urine fertilization have been found to produce 2 to 10 times the amount of crop by weight as those grown in unfertilized, poor soil[50]. In addition, as urine contributes the largest share of nutrients to household wastewater, removing urine from the waste water stream reduces the concentration of nutrients in wastewater.

While the urine of a healthy person is sterile, in a school environment urine collected from urinals or urine diversion toilets can be assumed to have some contamination from urinary tract infections, cross-contamination with faeces and menstrual blood. Storing undiluted urine for a month allows die off of pathogens which may have entered the urine supply[51]. Urine should be stored in a covered container to prevent the loss of nitrogen to the air.

[48] http://www.bluediversiontoilet.com, Accessed 16 March 2016.
[49] Stockholm Environment Institute (SEI) (2004). *Ecological Sanitation*. SEI: Stockholm. EI, 2004
[50] ibid
[51] ibid

If urine is separated, the resulting sludge will contain fewer nutrients but will still, after treatment, have value as a soil conditioner which can increase the organic matter content of the soil, improve its water-holding capacity and increase the availability of nutrients. If urine is not separated from faeces, the resulting sludge will have value as a fertilizer. As untreated sludge can be expected to contain high levels of pathogens so should not be used to grow vegetables. It can, however, be buried in holes or trenches and have fruit trees planted over it without risk to the public.

EcoSan systems are a positive development in the field of sanitation and these technologies should be seriously explored as alternatives, not only for poor or rural users but for all users. However, as mentioned earlier, any technology which has not been rigorously tested in the school environment for several years should be considered with caution.

3.2 Criteria for selecting a sanitation technology

For a suitable sanitation technology to be chosen for a specific school, a number of technical, environmental, social and management requirements must be met. A summary of the technical aspects of a technology which must be considered is provided in Table 12.

Table 12: Assessing the technical aspects of a sanitation technology

ASSESSING THE ELEMENTS OF A SANITATION TECHNOLOGY	
User interface (toilet or urinal)	• Is the design safe for the target learners to use? • Is the design easy for learners to use? • Will the design be robust enough to withstand rough use and attempts at vandalism and theft? • Can replacement parts be sourced at a reasonable cost and is the expertise available to install them? • Is it easy to keep clean over time? • Do users find the design acceptable? Does it uphold dignity? • Will it work for users with special needs? • Does the design require any additional investment or management commitment (e.g. the provision of bins to prevent disposal of rubbish in the toilet)? Does the school have the management capacity to carry this out consistently over the long term?
Collection chamber / slab	• What is potential of the learner falling into the pit, either through over large openings or through the deterioration of materials over time? How could this danger be overcome? • How should collection chambers be oriented to: minimise smells carried by the wind; limit impact on groundwater; allow access to tankers; and be out of the way of learners? • Should excreta be treated in any way during storage to reduce pathogens, smell or moisture? • Does the school have the capacity (will, skill and resources) to carry out the treatment processes safely and consistently over time?
Sludge removal	• How often will sludge have to be removed from pits? How old and how dry will it be at that point? How will it be removed? • What is the potential that the school environment will become contaminated during emptying and how could adaptations to the design minimise this?
Use of excreta	• Will urine or faeces be used as fertiliser, to generate biogas, or for other purposes? How will it be safely collected and stored? Does the school have the capacity to sustain this? Does the school have a strong commitment to sustain this?
Disposal of excreta	• Will sludge be buried on site? Where? • How will the area be protected from disturbance? • Will sludge be transported off site for use or disposal? • Will disposal be safe for the environment? • How much will it cost?

Each technology will provide a different set of advantages and disadvantages when measured against these requirements, and a selection of the optimal technology should be made carefully. Technologies which have been identified as potentially suitable should also meet the following prerequisites:

Table 13: Prerequisites for a suitable technology

	PREREQUISITES FOR A SUITABLE TECHNOLOGY
Tested in similar conditions	A technology should not be specified for a school until it has been adequately tested for a significant period in a similar environment.
Meets users' needs and protects users' rights	The design of the toilet must be safe for all users in the target group (i.e. might require smaller scaling for smaller users). The toilet design must facilitate cleaning and the prevention of disease transmission over the long term; e.g. surfaces must not be rough or porous (which could harbour pathogens), complicated joints and surfaces should be avoided where dirt will build up, splash back of contaminated liquids should be prevented. The design of the toilet must support users' dignity and security by not looking degrading or dirty, not allowing a strong smell of excreta to permeate the facility even when it is clean, and being reasonably comfortable and appealing.
Commitment by school	Principals, staff and learners should demonstrate a desire for this technology and a strong willingness to manage the technology.
Acceptable to users and families	Selection of a technology should be done in a consultative process with users. It should not look offensive or degrading and should be consistent with families' cultural and social values.
Robust for use	The design should be simple and hardy, with components designed for the heavy use that occurs at schools. If vandalism and theft are major concerns, parts should not be used which are not likely to be targeted for theft (e.g. metal fixtures) or vulnerable to vandalism. There should not be access to parts of the system which can easily be abused (e.g. the cistern).
Robust for management	It must not require frequent maintenance, which many schools do not have the capacity to do. Maintenance and management requirements must be within the school's technical capacity. Parts must be easy to source and reliably supplied. It must not require resources that the school might not be able to provide on a sustained basis: e.g. excessive amounts of water, electricity, fuel, additives.
Protect the environment	Ensure that the technology is appropriate for soil conditions, water table and water availability. Servicing must be possible with minimal environmental contamination and risk to workers.

3.3 Review of technologies

The sanitation landscape in South Africa is dominated by two technologies on opposite ends of the spectrum, with only small numbers of alternatives in operation: on the one hand is standard waterborne technology, connected either to a municipal sewer or to a septic tank; on the other hand is the pit latrine. "Unimproved" pit latrines, which follow no standard design, are considered, as a category, to be structurally unsafe (often having a slab of questionable stability over an unlined pit also of questionable stability) and a threat to health (in terms of the spread of diseases by flies visiting the pit) and they fall below the minimum standard for basic sanitation used by the government for service delivery and for school sanitation (South Africa, 2013). The Ventilated Improved Pit latrine (VIP), which is reviewed in Section 4.5.1 is the on-site technology that has been used most widely in rural South African schools. VIPs are unpopular among users primarily because of the risk that a user could fall into the pit and drown, and also for the unpleasantness of smelling and seeing the excreta in the pit. For this reason flush toilets are often strongly preferred by users. However, many rural schools do not have reliable access to enough water to operate flush toilets,

and many of those that do have a reliable water supply do not manage their flush toilets well. A poorly managed flush toilet typically poses a much greater health risk than even an indifferently managed pit toilet, so the choice to opt for flush toilets should not be made lightly. Both standard flush toilets and VIPs have limitations in terms of meeting the various sanitation, environmental, political and psychological needs of users. Neither system by design makes beneficial use of the products of the sanitation system (faeces and urine).

There is an urgent need for new designs which overcome the drawbacks of the VIP and the standard flush toilet. Desiccating toilets (manufactured for example by Enviro Loo) have been widely used in Limpopo as an alternative to the VIP. Pour flush toilets have been tested by the WRC in 13 schools (as well as 2 pre-schools) and low flush toilets in two. Dry urine diversion toilets have been tested in schools elsewhere in Southern Africa. These alternative technologies overcome the dangers of deep pits without the resource demands of standard flush toilets.

Due to the harsh conditions in rural schools, where toilets may be expected to be abused and vandalised and management capacity is minimal, it is advisable that any new technology is tested in a similar context for several years before going to scale. For this reason, only tried and tested technologies are reviewed in depth in this section. Experimental technologies are discussed briefly in Section 3.3.7.

3.3.1 VIP

In South Africa the Ventilated Improved Pit latrine is the government's minimum standard sanitation technology and is widely used.[52]

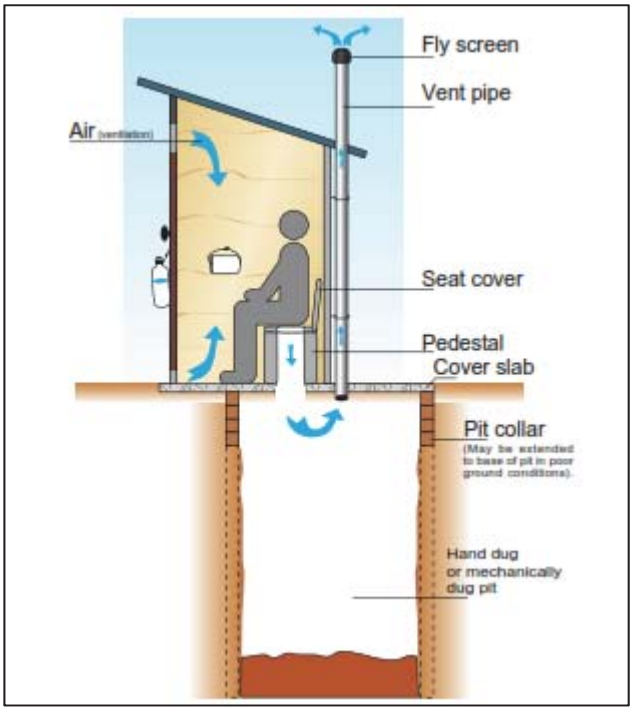


Figure 20: The essential elements of the VIP design, DWAF 2002

Design

The main design objectives of the VIP are to reduce the unpleasant smell associated with unimproved pit latrines, reduce disease transmission from flies visiting the sludge heap, and ensure the safety and stability of the latrine structure. Because the pedestal is situated directly over the pit the strength and stability of the slab are critical for safety.

Wind passing over the vent pipe sucks air from the pit which pulls air into the cubicle and down the pedestal. This effect is enhanced if any ventilation gaps in the superstructure face the prevailing wind. While flies are attracted by the smell of the air leaving the vent pipe, 1 mm mesh covering the exit of the vent pipe prevents

[52] In India, however, VIPs are considered below the minimum standard. India (ND) National School Sanitation Manual [Online] Government of India Ministries of Urban Development & Human Resource Development, available from <http://schoolsanitation.com/pdfdocument/1309769575PDF00000002NSSI_ManualBook.pdf>

them from entering the pipe. Flies which enter the pit through the pedestal are attracted to the light at the top of the vent pipe where they are trapped by the fly screen and eventually die before they can exit the structure (to aid this effect the cubicle should not be brightly lit).

Advantages

The VIP toilet is straightforward to build, inexpensive and requires no specialised parts which may be difficult to source. It requires no water, and uses no moving parts.

Disadvantages

Because the user sits above a deep pit which may be full of sludge, there is a risk of a small user falling through the hole or of the pedestal or slab collapsing into the pit, potentially resulting in the death of the user. This potential threat to life is a concern which must be taken seriously when considering the design[53]. Users frequently express their dislike for VIP toilets because of their foul smell and the fact that excreta and often maggots and other insects are visible through the pedestal, resulting in the toilets seeming filthy regardless of how much they are cleaned. The smell of toilets can lead to principals wanting to site VIPs far from the classrooms, which further undermines safety, convenience and comfort for users. While keeping the facility dimly lit is a condition for the successful functioning of VIPs, a dark environment in the toilets is not conducive to maintaining a safe and pleasant atmosphere for users or to cleaning. The emptying of VIP toilets can be difficult if the vault is located directly under the building. Because users can throw rubbish directly into the pit through the pedestal, school VIP pits often contain significant amounts of rubbish, increasing the speed at which pits fill, particularly if bins are not provided for the users.

Table 14: Advantages and disadvantages of VIP toilets

Advantages	Disadvantages
• Simple to construct • No specialised parts and few parts which can be broken or stolen • No water is required • No moving parts	• There is a risk of small children falling through the toilet seat into the pit. • There is a risk of the slab collapsing and a user falling into the pit if the slab is not properly designed or constructed. • Unpleasant smells prevents toilets from being located immediately next to classrooms. • The excreta pile and insects are visible below the user. • The facility must be kept dim, which creates an insecure and unpleasant environment for children. • Users can throw rubbish into the pit through the pedestal, resulting in a faster filling rate and creating a sludge that can be difficult to remove with a vacuum tanker. • Sludge can prove difficult to remove if the chamber is directly under the pedestals.

Suggested adaptations for making VIPs safer

If VIPs continue to be built, their design should be modified to reduce the risk of users drowning in the pit. The following ideas have not been tested, but could be incorporated into VIPs that are built in the future or used as food for thought for new ideas:

[53] The risks inherent in the VIP design can be eliminated by sound structural design, use of materials which do not lose their strength over time, and by the specification of seat and chute dimensions and/or barriers which will not permit a user to fall into the pit.

Table 15: Adaptations to increase the safety of VIPs

ADAPTATIONS TO INCREASE THE SAFETY OF VIPS
Add barriers inside the pit
Offset pit with safety handrails
Add handles on either side of the toilet seat

Add barriers inside the pit

By installing two say 8 mm galvanised steel reinforcing bars 200 mm apart across the squat hole, the safety of a VIP could be increased. If a child fell through the pedestal, the bars would catch the child before it could fall any further. By placing the bars from front to back across the pit most faeces and urine would still fall between the bars. Faeces that did land on the rods would slide off without accumulating significantly.

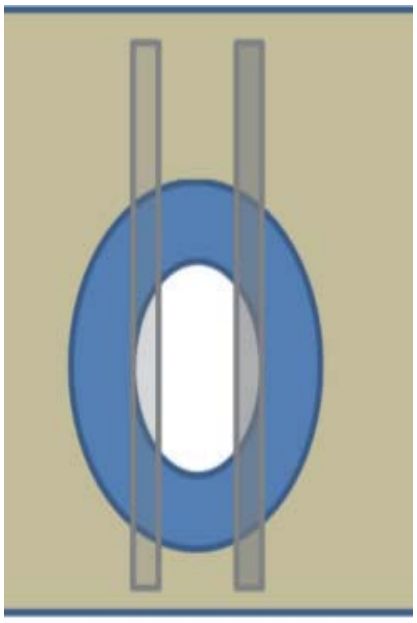


Figure 21: Barriers placed across the slab opening would catch a child falling through the toilet seat

Add handles to either side of the seat

Adding handles to the bench on either side of the toilet seat – or onto the walls on both sides of the cubicle – could increase the safety of small users at risk of falling through the seat into the pit.

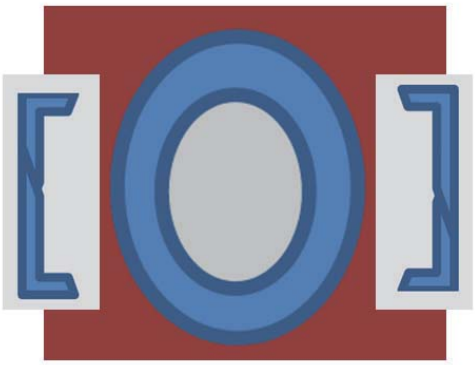


Figure 22: Handles added to either side of the seat for young users to grip

3.3.2 Urine diversion

Urine diversion toilets separate liquids from faeces and toilet paper. Typically the pan is divided into two sections – the front section for catching urine and the back section where faeces pass through into a collection chamber. It is important that the two sections of the toilet are well separated to ensure that a) faeces do not fall into and clog the urine collection area in the front, and that b) urine does not splash down into the dry area of the toilet. When the toilet is cleaned with water, care should be taken to ensure that the faeces are not mixed with water. Other designs use surface tension to allow urine to travel down the wall of the pedestal into a collection trough around the base of the pedestal instead of splitting the pan into two sections[54].

Sludge removed from urine diversion toilets cannot be considered to be pathogen free and should not be used as a fertiliser for vegetables without further treatment. It can however, be buried in trenches and holes with fruit trees planted on top, with a 300 mm covering of soil over the sludge.

Figure 23: Typical urine diversion type pan arrangement with urine collection bowl in front[55]

Other alternatives to diverting urine at source is liquid separation from combined excreta (and flushwater, if used). For example the Aquatron, a composting urine diversion toilet developed in Sweden, is a device with no moving parts which uses the velocity of the flush (either standard flush or low flush) to force the liquid into the inner wall of a circular collector while the solids fall through an opening in the middle into a collection chamber[56].

Another way of separating liquids is to allow them to drain through a net or perforated floor in the bottom of the collection chamber, as shown in Figure 25. It must be kept in mind that, in contrast to

[54] http://www.bluediversiontoilet.com, Accessed 16 March 2016.
[55] Rich Earth Institute, http://richearthinstitute.org/our-work/urine-diversion/, Accessed 16 September 2016
[56] http://www.aquatron.se/index-2.php, Accessed 5 September 2014

urine diversion where liquids do not come into contact with faeces, in liquid separation the liquids that are collected are contaminated and must be treated before they can be used.

Figure 24: The Aquatron separator which uses a cyclone principle to separate solid and liquid waste

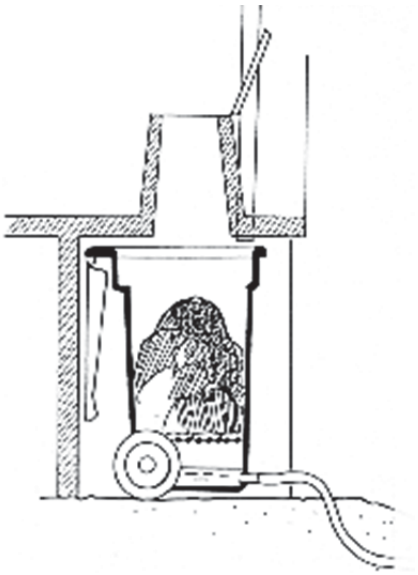


Figure 25: A composting toilet with liquid separation through a perforated floor

Urine diversion could be used with a number of different kinds of systems (VIP, pour flush, etc.) in order to collect urine for use or to reduce liquids in the collection chamber for the purpose of composting, dehydration, incineration or easier manual emptying. Depending on the treatment and use that will follow, drying material such as lime, ash or earth should be added into the collection chamber after defecating.

Table 16: Pros and cons of a dry urine diversion system

Advantages	Disadvantages
Less smell than VIP A shallow vault presents less risk to users in the event of a child falling in or a pedestal collapse. Urine can be easily collected for use as a fertilizer Sludge is drier, resulting in reduced volume and easier removal	The excreta pile and insects are visible below the user Sludge can prove difficult to remove because the chamber is directly under the pedestal Cannot be located indoors User interface can feel awkward to users Some users may be unable to separate urine and faeces streams Separate urinal is also required, otherwise male users have to sit while urinating Faeces can be accidentally deposited in the urine collection area, causing blockages Urine pipe can become clogged or come loose, resulting in urine leaking around base of pedestal.

3.3.3 Pour flush and low flush technology

Pour flush technology is used extensively across Asia but with a squat plate rather than a pedestal. In 2009 the Water Research Commission began the development and testing of a design with a pedestal that could be used in the South African context. With a toilet pan that is more funnel shaped than a conventional toilet and a P-trap with a more gradual bend, it was found that toilet paper and even newspaper could be flushed using between one and three litres of. After several years of successful tests had been run in domestic applications the technology is now being used in several parts of South Africa, with over 1 000 units installed to date.

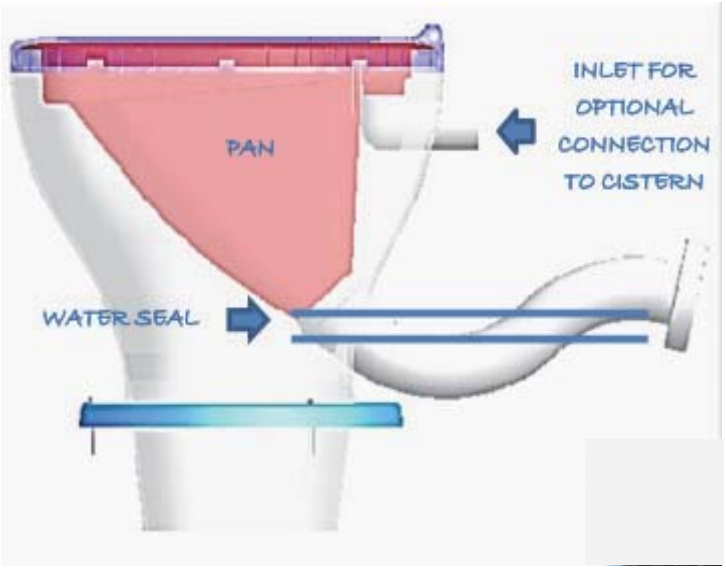


Figure 26: Design of pour flush/low flush pedestal

In terms of institutional use, 74 units have been installed in schools in Limpopo and the Eastern Cape and 5 in preschools in KwaZulu-Natal.

In 2013 the prototype was modified to accommodate a cistern and a flush; this "low flush'' version is operated like a full flush toilet rather than pouring water into the pan. Six of these low flush units were installed in schools in eThekwini municipality in 2014. The low flush units were intermingled with full flush units to test user acceptance. When interviewed learners did not identify the low flush toilets as being different from the full flush toilets and the principals at both schools have reported they have experienced no problems with the low flush toilets other than those experienced across the toilet blocks as a result of user behaviour.

Figure 27: Low flush toilet tested in schools in KwaZulu-Natal

Design

Pour flush / low flush technology uses a pedestal which looks similar to that of a standard flush toilet, but requires far less water. To flush the pour flush toilet, the user pours 1-2 litres of water into the pan, while with the low flush version a standard flush mechanism is used to dispense approximately 2.5 litres of water into the pan. The water and excreta exits the pedestal via the sewer pipe into a simple soak away, similar to a VIP pit but positioned behind, rather than under, the pedestal. As with a standard flush toilet, the exit pipe contains a P-trap which forms a water seal preventing odours and insects from traveling up the pipe from the pit into the pan.

For pour flush units, flush water can be provided in buckets in each cubicle; however these would have to be monitored by the cleaner in order to ensure that they remain full. In the 11 schools at which pour flush toilets have been installed to date, cisterns were mounted behind the pedestal which were supplied with a constant level of water and were not covered. Users then dipped water from the cistern with a jug. Grey water can be used for flushing and potentially handwashing water could be piped back into the cisterns of units for flushing. The model that is currently manufactured by Envirosan[57] is designed with an optional cistern connection, so that a user can "upgrade" from pour flush to low flush should a reliable water connection become available.

Advantages

By eliminating the pedestal-over-pit arrangement, pour flush technology overcomes the threat to safety represented by a pedestal-over-pit design. By flushing excreta out of sight the toilet has the clean look and feel of a flush toilet which many users desire, eliminating the sight and smell of other's faeces as well as the unpleasant sight of maggots and other insects on the pit contents. In addition, the much lower water requirement compared to standard flush toilets may make this technology viable for schools where the water supply is not adequate or reliable enough for standard flush toilets[58]. A storage tank filled by the municipality or from a borehole or by rainwater harvesting could supplement an unreliable water supply when necessary. Pits may not fill up as quickly because they do not contain non-degradable rubbish, reducing the frequency with which emptying is required. In addition, emptying is easier than with VIPs as the pit is offset from the building, allowing easier access.

Figure 28: Eaziflush pour flush / low flush pedestal manufactured by Envirosan

[57] http://envirosan.co.za/products/, Accessed 16 March 2016.

[58] Note that a single leaking cistern can easily waste over 5 000 litres of water in a day. This is a problem that cannot happen if there are no cisterns, which is why pour flush is recommended for any school where the convenience of waterborne sanitation is a priority, but where the water supply is limited or unreliable.

Disadvantages

Any flush toilet – be it full flush, low flush or pour flush – will block up if it is used when there is no water at all, or if it is generally abused (for example by throwing trash down the toilet). A blocked toilet which is then still used until it is virtually overflowing, or overflowing, is worse than no toilet at all. Dry pit toilets, on the other hand, remain functional under almost any circumstances. As with standard flush toilets, the components in a pour flush or low flush system (i.e. flushing jugs, cisterns and flush handles) can be damaged, vandalised or stolen in the harsh environment of a school. Since learners with pit toilets and no bins typically become accustomed to disposing of rubbish and sanitary pads in the pit, it is vital that any flush technology that is introduced be accompanied by a commitment by the school to provide and maintain bins in all cubicles and provide toilet paper as well as to educate and monitor users to ensure that toilets are used properly.

All this means that a water based sanitation system, however simple, should not be specified for a school which does not have the will, the resources and the capacity to manage it successfully.

Table 17: Advantages and disadvantages of pour flush and low flush technologies

Advantages	Disadvantages
• Child cannot fall through pedestal into pit • No risk of slab collapsing as pit is offset from pedestal • Water trap eliminates smells and insects from pedestal • No smell so can be installed in or near classroom or admin blocks • Satisfies user desire for flush technology while not requiring full flush water supply or sewer connection • Meets psychological needs for "cleanness" as user does not have to see the excreta of previous users • Eliminates the use of the pit for rubbish, slowing the rate that the pit fills • Can use a simple soakaway instead of a septic tank • Pour flush provides flush experience with no risk of leaky pipes or cisterns • Grey water can be used for flushing • Costs significantly less than a full flush toilet (only 10% to 20% more than a VIP) • Off-set pit allows easier access during emptying	• Requires access to water, though tolerates unreliable water supply better than full flush toilets. • Requires a commitment by management to supply toilet paper reliably and to see that bins are present in all cubicles (especially in girls block) and that cubicles are regularly emptied. • Possibility of blockages from newspaper, menstrual rags, etc. if improperly used. **If a cistern is used (i.e. low flush, not pour flush), then** • Low flush has the same risks of leaky pipes and cisterns as full flush • Low flush uses parts which can be broken, vandalised or stolen by users

"The biggest strength is the water saving system that is used. The low-flush toilets are small but effective. You use a limited amount of water to flush the toilet and that way we save on our water bill. We haven't encountered any serious disadvantages. It's just that some people are rough when they handle things and it has nothing to do with the system itself. So what was installed seems to be working well."

-Principal discussing low flush toilets installed for testing

3.3.4 Desiccating Toilet, e.g. the Enviro Loo

The Enviro Loo is a dry sanitation system developed and manufactured in South Africa which has been implemented in significant numbers in rural schools. As of May 2015 the DBE had documented Enviro Loos at 1,704 schools in South Africa[59], the bulk of which (1,236) were in Limpopo, where the Enviro Loo has become the technology of choice of the Department of Education. As of March 2016, Enviro Loo reported that it had installed 45,000 units at schools[60].

The system uses a custom-designed ceramic bowl over a sealed container. Solids are caught on a sloped, perforated drying plate and over time slide down the slope of the plate. Liquids drain through the plate and collect in the bottom of the container. Air is drawn into the container through inlet vent pipes and the toilet bowl and is drawn across both liquids and solids within the collection chamber, aiding drying and evaporation before being extracted by a wind driven "whirly bird" extractor on the outlet pipe (see Figure 29). The negative pressure within the container helps to prevent odours from escaping up into the cubicle through the bowl or air inlet pipes. The collection chamber is covered by a black cover which absorbs sunlight and increases temperatures inside the collection chamber, further aiding dehydration and decomposition.

Figure 29: Enviro Loo toilet block (left) showing vent pipe with Whirly Bird extractor on top of pipe and black collection chamber covers and pedestal (right)

Enviro Loo states that while maintenance can be easily performed by owners of systems, all of its distributors provide regular-on site preventative maintenance, followed by a detailed service report, on a contractual basis to ensure the sustainable operation of the system. Instructions for periodic maintenance given on Enviro Loo's website are as follows[61]:

1. Open the rear external inspection cover.
2. Check that the liquid level is below the drying plate and that the system is in an aerobic

[59] (DBE, 2015. NIEMS standard report. http://www.education.gov.za/LinkClick.aspx?fileticket=X36y4Qhe5E0%3d&tabid=358&mid=1994
[60] http://www.enviro-loo.com/how.html Accessed 15 March 2016.
[61] http://www.enviro-loo.com/how.html Accessed 15 March 2016.

state of operation, i.e. liquids and solid waste are separated by the drying plate. If necessary pump out and remove all liquid from the liquid holding area. This is accomplished by inserting the pump's pipe through the service hole located in the drying plate.
3. If necessary place the already dried waste situated at the rear drying area into the hanging drying bag. If the drying bag is already filled with waste from a previous service, remove from the unit and safely dispose of the dried waste from site. Refill the drying bag with new dried waste from the rear section of the unit.
4. Rake solid waste from under the pan section towards the now open rear end section of the drying plate.
5. Remove any foreign waste from the unit and safely dispose from site, i.e. bottles, cans, plastic, etc.
6. Lightly cover the raked waste with normal garden compost and introduce 80 g packet of fresh enzymes.
7. Add approximately three handfuls of new compost and another 80 g packet of enzymes to the front section of the unit via the ceramic toilet pan.
8. If excessive mosquitoes are experienced a cup of chlorine can be added to the liquid holding area below the drying plate. This must be poured into the unit via the service / pump hole situated at the rear section of the drying plate below the open inspection cover.
9. Other alternative materials that can be introduced into an Enviro Loo as a substitute for compost are; agricultural lime, ash, wood chips and any other organic material.
10. Always check and ensure free operation of the wind turbine on top of the external vent pipe.
11. Check and ensure that the entire exterior section of the Enviro Loo and apertures of the two air inlets, are free of debris and vegetation growth.

Although the Enviro Loo is designed to evaporate the urine and to desiccate the faeces, it only works effectively if the system is not over-used. The sealed vault is not large relative to a normal pit and this means that with high usage frequent maintenance is required, along the lines of the instructions above. If this maintenance is not carried out timeously, then the system will become overfull. In particular care must be taken to ensure that pit access covers are replaced and secured after maintenance.

An unintended consequence of the Enviro Loo design is that the environment around the toilet is noticeably more smelly in a school environment than is the case with other dry sanitation designs. This is because the urine is not allowed to seep away and the ammonia coming from the urine is vented out.

The Enviro Loo is particularly appropriate in a situation where pit latrines are not suitable due to for example a high water table or very shallow soil depth over hard rock.

Table 18: Advantages and disadvantages of the Enviro Loo technology

Advantages	Disadvantages
• **Collection chamber is sealed, so a high water table or an impermeable soil is not a problem** • While a small child could fall through the pedestal if an adult size seat is used (which should not be the case for at least Grade R to Grade 2 children) the child will not fall far and its life will not be at risk. • Easier to empty than a VIP	• The environment outside the toilet is more smelly than is the case for other forms of dry sanitation. This is due to the urine not being allowed to seep into the surrounding soil. • The sealed collection chamber means more frequent maintenance is required than is the case for a large pit. • The collection plate is not far below the pedestal. Fresh waste is always clearly visible, unless covered after use with sand, ash or compost.

3.3.5 Squat toilets

While toilets that are designed for a user to squat over a hole rather than sit on a pedestal are commonplace in many parts of the world, they are not widely used in South Africa. They are preferred by some families of Asian descent and are found in some South African schools serving these families.

Introducing a squat toilet would therefore represent a significant behaviour change, and while the technology is well established internationally it should be treated with the same caution as a new or experimental technology in South Africa purely from a user acceptance point of view. This design does, however, offer some advantages in the school environment over pedestal designs:

- The difficulties small users face when using standard sized pedestals are overcome, as the user simply squats over the hole. This includes a child having to place her hands on the contaminated toilet seat in order to hoist herself, as well as the greater risk of falling into the hole when she is unable to place her feet on the ground while using the toilet.
- Contact with a contaminated toilet seat can be eliminated completely by standing and squatting over the hole
- If a self-closing handheld shower is mounted on the wall in the cubicle, this can be used by menstruating girls or children who have had an accident to rinse themselves, and the rinse water can be washed away via the squat hole.

3.3.6 Mobile toilets

Some schools by default have begun to use lightweight temporary toilets for extended or indefinite periods of time, although these are never intended as a permanent solution. Some of the reasons for this are as follows:

- The number of toilets at the school is inadequate and the school is waiting for more toilets to be built; the temporary toilets in the meantime supplement the number of permanent toilets.
- the school building itself is temporary and the school is waiting for new premises / infrastructure.
- pits have become full and no plan has been made to empty them.
- pits began to collapse when an attempt was made to empty them and so while no new sanitation infrastructure was planned for the school, the existing infrastructure has become unusable.

In the WRC study, mobile toilets in KwaZulu-Natal were hired out and serviced by the company which owned them. Schools accordingly felt they had little or nothing to do with the management

"The mobile toilets are being emptied by the honey sucker. The period of emptying is long. There has been a service provider that would come and load the chemicals into toilets. They are very disruptive because they are noisy and it smells." **– Male learner**

"We have...plastic toilets which people come and clean but we do not use those toilets, reason being that whilst you use those toilets, other learners come and shake those toilets while you are using the toilet and you do not feel safe using them." – **Female focus group participant**

"Strong wind can easily blow away the mobile toilet; other learners shake it while there is one using it." **– School principal**

and maintenance of these toilets. In addition, the weekly servicing of toilets was sometimes reported to be disruptive to the school day and produce unpleasant odours. Some had handwashing facilities within their mobile structures and others did not, compromising users' ability to protect themselves from diseases. Some users reported that because the toilets were not fixed to the ground they were vulnerable to other learners shaking or tipping them while someone was in the toilet, or being able to look through a service hatch at the back to see the user. Strong winds were also reported to sometimes tip over the toilets. As a result, one teacher reported that learners could only use the toilets with adult supervision, which resulted in valuable class time being used to take the class to the toilets.

Mobile toilets are not an appropriate solution for school sanitation and should only be used for the shortest period of time possible if their use is unavoidable.

3.3.7 Experimental technologies

There is recognition across the global sanitation community of the need for more options along the continuum of sanitation technologies. A wide range of new sanitation technologies have been and are being developed in recent years, many based on the EcoSan principles of using minimal or no fresh water and capturing and safely using the nutrients in excreta. In 2014 the Department of Water and Sanitation (DWS) announced the Sanitation Innovation Challenge to mobilise innovative sanitation technologies and solutions towards providing more appropriate solutions to South Africa's sanitation challenge. The DWS defines sanitation innovations as *"those systems or solutions which are alternative to conventional waterborne sewerage and onsite ventilated improved pit latrines"* and specifies that *"technologies should provide sustainable sanitation services to urban, peri-urban and rural areas and take into account effectiveness, social preferences, water resource availability, affordability, possible beneficiation of waste products, economic development and cost reduction in the sanitation delivery chain"*.[62]

Once these technologies have been adequately tested, some of them may be found to be appropriate for wider application in the rural school context. Departments, or schools, considering implementing a relatively new technology should consider the following:

- Has it been tested in a context similar to the target school in terms of culture, resources and environmental characteristics? What challenges were encountered and how will the target school address these?
- What measures will be taken to educate learners and staff about the technology?
- Does the technology require electricity, fuel, additives, or involve other running costs to operate? If so, can this be accommodated with the school's budget?
- Does the technology require specialised maintenance? Does the school possess the capacity to gain and keep this expertise?
- Are there any groups of users which will not be able to use this technology?

[62] DWS, pers. comm. 3 Sept 2014.

3.3.8 Summary of technologies

The advantages and disadvantages of the technologies described in this section are summarised in Table 19.

Table 19: Advantages and disadvantages of different sanitation technologies

TECHNOLOGY	ADVANTAGES	DISADVANTAGES
VIP	• Requires no water • Can accept rubbish • Can handle other wiping materials • Robust; no moving parts	• Small child could fall through the pedestal into the pit and die if suitable precautions are not taken • Pedestal could fall into the pit and user could die if the slab is poorly designed. • Sight of pit contents is unpleasant • Malfunctioning VIPs encourage breeding of flies • Poorly designed or maintained VIPs are smelly • Difficult to empty • Rubbish reduces lifespan • Design requires dimly lit interior • Located far from classes due to smell
Desiccating toilet	• No water required • Collection chamber is sealed, so a high water table or an impermeable soil is not a problem • While if an adult size seat is used a small child could fall through the pedestal the child will not fall far and its life will not be at risk. • Easier to empty than a VIP	• The environment outside the toilet is more smelly than is the case for other forms of dry sanitation, such as the VIP. This is due to the urine not being allowed to seep into the surrounding soil. • The sealed collection chamber means more frequent maintenance is required than is the case for a large pit. • The collection plate is not far below the pedestal. Fresh waste is always clearly visible, unless a covering medium is used.
Septic tank/full flush	• Child cannot fall through pedestal into pit • No risk of slab collapsing as pit is offset from pedestal • Water trap eliminates smells and insects from pedestal • User not exposed to contents of pit • Slower filling than VIP – no rubbish in pit	• Requires adequate, reliable water supply • Poor management can result in massive water loss through leaks that are not fixed • Possibility of blockages from newspaper, menstrual rags, etc. • Blocked toilets are a health hazard • Blocked toilets are unusable which can result in open defecation • Needs toilet paper and bins to be provided reliably • Moving parts can break • Requires education for users who are new to flush
Low flush/ pour flush	• Child cannot fall through pedestal into pit • No risk of slab collapsing as pit is offset from pedestal • Water trap eliminates smells and insects from pedestal • No smell so can be installed in or near classroom or admin blocks • Satisfies user desire for flush technology while not requiring full flush water supply or sewer connection • Meets psychological needs for "cleanness" as user is not exposed to pit contents • Eliminates the use of the pit for rubbish disposal, slowing the rate at which the pit fills • Can use a simple soakpit instead of a septic tank plus soakpit • Pour flush provides flush experience with no risk of leaky pipes or cisterns • Grey water can be used for flushing • Costs significantly less than a full flush toilet (only 10% to 20% more than a VIP) • Off-set pit allows easier access during emptying	• Requires access to water, though tolerates unreliable water supply better than full flush toilets. • Requires a commitment by management to supply toilet paper reliably and to see that bins are present in all cubicles (especially in girls block) and that cubicles are regularly emptied. • Possibility of blockages from newspaper, menstrual rags, etc. if improperly used. **If a cistern is used (i.e. low flush, not pour flush), then** • Low flush has the same risks of leaky pipes and cisterns as full flush • Low flush uses parts which can be broken, vandalised or stolen by users
Mobile toilets	• Quick relief under emergency conditions	• No hand washing facilities • Expensive • No ownership by school • Need for frequent servicing is disruptive • Toilet can be blown over or tipped over

4. SLUDGE COLLECTION AND MANAGEMENT

The requirements for collection chambers such as pits, vaults or soakaways for faeces, urine and greywater will depend on the technology selected. The primary consideration should be the safety of users. The capacity and lifespan of the collection chamber should be considered in the design phase in order to ensure that it is compatible with emptying or beneficial use cycles. The use of pits for disposal of rubbish by users can dramatically increase filling rates and reduce lifespan. This factor is reduced for flush toilets. However it should be kept in mind that users require receptacles for rubbish and sanitary products and if schools do not provide these, the pit at least provides users with an option for disposal. The introduction of flush toilets, therefore, should only be considered if there is a strong commitment (and budget allocation) on the part of the school to provide and empty bins.

4.1 Designing a collection chamber

4.1.1 Designing for safety and health

Preventing accidents

One of the most serious issues with dry sanitation is the potential that a learner could fall into the pit and drown. This could happen by the pit itself collapsing, the slab collapsing into the pit, the pedestal falling through the slab into the pit, or the user falling through the hole in the pedestal into the pit. In addition, if the access hatch to the pit behind the facility is not properly covered with a cover that remains strong and secure over time, a person or an animal could potentially fall into the pit from behind the facility.

Table 20: Guidance for addressing the dangers inherent in pedestal-over-pit designs

GUIDANCE FOR ADDRESSING THE DANGERS INHERENT IN PEDESTAL-OVER-PIT DESIGNS
DESIGN AND CONSTRUCTION INTERVENTIONS

• Seriously consider technology alternatives which do not place the user above a deep pit
• Explore modifications to the pit design with could increase safety, such as:
  o Include parallel bars 20cm apart across the pit over the hole in the slab
  o Offset the pit behind the pedestal
  o Attach grab rails to the side of the cubicle
• Ensure the pit is reinforced and cannot collapse
• Ensure the slab over the pit is designed so that it will not deteriorate over time. Do not use poorly protected metal or untreated wood in slab construction.
• Do not make the hole in the slab bigger than necessary. Ensure that there is no possibility that the pedestal could fall through the hole.
• Do not choose a pedestal, or design a bench, with a hole (base and seat) that is bigger than necessary.
• Ensure that the toilet seat is securely attached to the pedestal/bench, so that there is no possibility of it becoming unstable over time.
• Provide lower toilets with smaller holes and seats for smaller children. These should be provided to all Grade R-3 learners but also made available to any other smaller children who are at risk using standard sized toilets.

Preventing the spread of disease

Flies are attracted to the sludge in pits and can then carry diseases with them to the school or the neighbourhood. Cockroaches and other insects are also attracted to the sludge and carry pathogens with them when they leave. To prevent this, pit access hatches should be tightly sealed with no gaps that insects could enter from the outside. Vent pipes covered with fine mesh are intended to draw a flow of air into the pedestal and out the pipe, drawing odours up through the pipe and reducing unpleasant odours emanating from the pedestal, which can also attract flies. Flies which find their way into the pit through the pedestal are attracted to the light at the top of the vent pipe but because it is covered with fine mesh they will be unable to exit and will eventually die. It is important that the condition of vent pipes and mesh is monitored to ensure that holes and tears don't compromise the effectiveness of this system.

Protecting drinking water

A further safety concern is the potential that pathogens or nutrients in sludge could leach from the pit into the surrounding soil and make their way into the groundwater, potentially contaminating drinking water sources. Studies have found however that nutrients and pathogens do not migrate far through most soils[63], and siting pits at least 30 metres from springs and boreholes, downslope, is generally more than adequate to mitigate any risk, unless the soil is very coarse or fractured and unless the groundwater flow is particularly high. The following measures can mitigate this risk where there is concern:

- As urine is more nutrient-rich than faeces and its presence in a dry sanitation pit creates wetter conditions, extending the zone of saturation around the pit, a sanitation system can be chosen which diverts urine, eliminating it from the pit.
- A sand filter can be provided around the pit.

In extreme conditions where flooding may be expected sealed pits can be used . However, these will fill up much faster (within months rather than years) and will therefore need to be emptied more frequently. Their filling rate can be reduced by diverting urine to a tank for dehydration or beneficial use, and by eliminating rubbish from the pit by providing bins and enforcing their use. Pits can also be built above ground, however this requires an elevated structure accessed by stairs, which may present an access problem to some users.

Pit emptying presents a risk of contamination of the surrounding area through spillage and careless use of tools by workers. For this reason the pit area should be out of the way of users.

Table 21 provides basic guidelines for pit design in order to minimize health and safety risks.

[63] Lorentz S, Wickham B, Still D. Investigation into pollution from on-site dry sanitation systems. WRC Report N0. 2115/1/15. ISBN No. 978-1-4312-0671-1. May 2015

Table 21: Guideline for the design and construction of sludge collection chambers

GUIDELINE FOR THE DESIGN AND CONSTRUCTION OF SLUDGE COLLECTION CHAMBERS	
Site pits 30 m and downslope from water sources	If this is not possible use sealed pits and a dry system with desiccation or an alternative such as an earth auger toilet.
Pits must be reinforced	Pits must be lined with courses of concrete blocks to ensure there is no possibility that they will collapse.
Modify pedestal-over-pit designs for safety	Explore modifications such as off-setting the pit, adding parallel bars under the seat which would prevent a user from falling into the pit, or adding grab rails to the walls of the cubicle.
Holes in slabs over pits must not be too big	Ensure that if the pedestal becomes loose over time it cannot slip into the pit.
Slabs over pits must be well built	Poorly protected metal or untreated wood must never be used to cover a pit as such materials will deteriorate over time.
Access hatches to pits must be securely covered	Pit covers should be made of a material that will not deteriorate over time. The joint between pit covers and pits should be closed in such a way that pests are prevented from entering.
Pit access area should be out of the way of learners	Use fencing or the facility orientation to restrict learners from entering the area behind the toilet facility, where they could tamper with pit covers or pits. In addition, this area may become contaminated during pit emptying. Ensure that pit emptying vehicles will be able to access this area, however.
Ensure that vent pipe and mesh are intact	No holes or gaps must be left that could allow pests to access the pit.

4.1.2 Designing for emptying cycle

In the WRC research, the median filling rate for VIP pits at schools was 8.6 litres per person per year. If the pit dimensions and year of construction of existing toilets in the area are known, the sludge accumulation rates can be calculated as follows to predict filling rates for new facilities:

Table 22: Calculating the rate at which pits have filled

CALCULATING THE RATE AT WHICH PITS HAVE FILLED
1. **Determine the length and width of each pit** (using original drawings, if possible) 2. **Measure the depth of the sludge in each pit:** use a long stick marked in centimetres; measure in each corner and the centre if possible and average the 5 measurements. Wrap the stick well in plastic before disposal) 3. **Calculate the volume of sludge in each pit:** length x width x depth = x cm^3 4. **Convert the volume to litres:** x cm^3 *0.001 = x litres 5. **Calculate the total volume for all pits for each gender** (i.e. total for boys and total for girls) 6. **Calculate the filling rate per year:** Divide the number of litres (per gender) by the number of years that the pit has been filling (since the last desludging) 7. **Calculate the filling rate per person per year:** Divide the filling rate per year by the average number of users (of that gender) over the years the pit has been filling.

Filling rates will depend primarily on the number of users, on how well the pit drains into the surrounding soil and on whether the pit is used for the disposal of rubbish.

If household sludge accumulation data is available for the type of system that is being designed the following assumptions can help to inform predictions of sludge filling rates:

- Schools are typically open only 200 days or approximately 55% of the year (unless used by outsiders)
- The solids accumulation rate is less for children than it is for adults. In high schools, it can be reduced by 25% (i.e. multiply by 0.75), in primary schools, 50% (i.e. multiply by 0.50) and in nursery schools by 75% (i.e. multiply by 0.25).
- The accumulation rate must be reduced by a further 50% (i.e. multiply by 0.50) to allow for the use of toilets at home outside of school hours.
- Rubbish will contribute substantially to the volume of the pit contents unless bins are provided and users are actively encouraged to use them.

The assumptions above give very similar results to those observed in the WRC research, i.e. sludge accumulation rates for schools can on average be expected to be less than 10 litres per learner per year.

4.1.3 Single or double pits

If a double pit arrangement is used then the pits can be shallower. Shallow double pits provide the following benefits:

- Shallow pits are needed where the water table is high or the soil depth is shallow.
- Allowing a full pit to rest for several years results in a drier sludge which is less offensive to handle, has a reduced level of pathogens and can be removed with shovels if access by honeysucker is impossible
- Allowing a full pit to rest results in a signicantly reduced volume and weight of the sludge (less than half, typically)
- If a toilet user should fall through into a shallow pit, it is unlikely to result in a fatality.

A double pit arrangement is easily achieved with a system that uses water to carry excreta from the pedestal to the pit (i.e. standard flush, pour flush and low flush). At a point in the sewer line the line is bifurcated to the two pits. One branch is closed off with a stop end and a 22 degree or 45 degree bend is used in the active line. When the first pit eventually fills up the bend must be reoriented to direct the sewage to the second pit, an operation that can be achieved in a matter of hours (bearing in mind that the sewer leading to a soakpit should always be laid as shallow as possible, so deep excavation is not required). The location of the bend must however be marked otherwise a lot of effort might be required to find it.

For a dry system, in which excreta must be collected directly below the user, each toilet cubicle will have two holes in the slab, one of which is in use and one of which is plugged. The cubicles will not be aligned directly above the pits, but rather offset to the side by the width of one half pit (Figure 30). That way each cubicle will be able to use one of the pits beneath it at any time. One pit is used by two cubicles simultaneously while the alternating pits are not used. When the pits in use become full, their contents may be left to decompose for several years, and the pedestals are shifted to the holes over the alternative pits. As this option will require larger cubicles and additional block work, it will be approximately 20% more expensive to build.

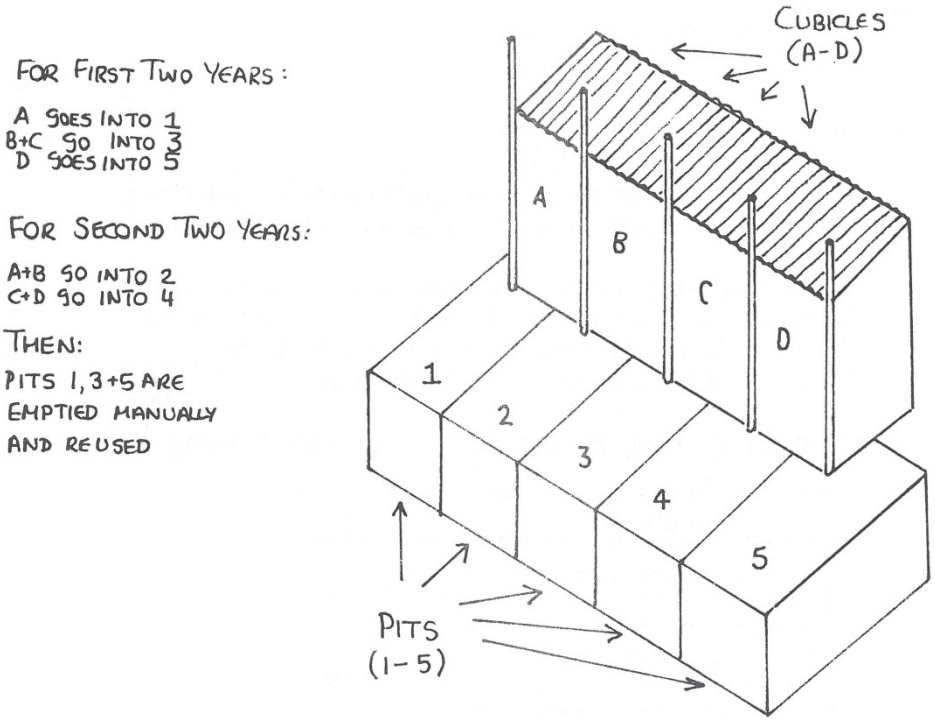


Figure 30: Ventilated improved double pit arrangement

4.1.4 Types of collection chambers for solids and liquids

On-site standard flush systems require a traditional septic tank and soakaway arrangement. Pour flush and low flush systems use a reduced volume of water, however, and can be connected to a simple soakaway, essentially the same as a VIP pit but off-set behind the pedestal.

Figure 31: Soak pits used with pour flush and low flush systems. In this case the blocks have been turned on their sides to aid percolation of liquid from the pit. If the blocks are laid conventionally then the vertical joints must be left open (i.e. not mortared). The gap between the pit walls and the in-situ soil should be filled with river sand, which helps with percolation and will also act as a barrier against migration of most pathogens.

Soak pits should be provided for waste water from hand washing stands and urinals (if urine is not collected for use as fertilizer). The sizing of soak pits should be determined based on the volume of liquid they are expected to receive and the permeability of the soil. A pit 6 m long, 1.25 m deep and 0.5 m wide should be adequate for 10 urinal spaces (500 learners) or a hand washing stand. The pit should be filled with stone or rubble, covered with polythene or a similar barrier and the top 500 mm backfilled with the excavated soil.

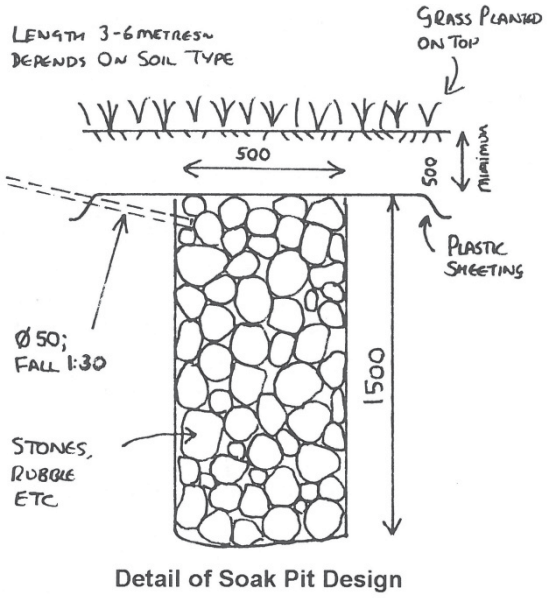


Figure 32: Soakpit for liquids (Deverill and Still, 1998)

To test the drainage capacity of the ground a small pit can be dug to the required depth and filled repeatedly with water to a mark until the ground around the pit is fairly saturated. The volume of water needed to maintain this level is then measured over a number of hours. If the daily volume of urine and waste water is known or can be reasonably estimated, the results of this test can be used to size the soak pit.

Where urine is diverted and sludge is expected to be dry, an above the ground vault can be used which allows for easier emptying.

4.2 On-site treatment of sludge

4.2.1 Pathogen reduction

A number of systems are marketed as producing a pathogen-free sludge which can be used as a form of soil conditioner or compost for agriculture. Such a claim should be treated with extreme caution when the system is considered for use in rural schools. Some pathogens are extremely hardy. The eggs of intestinal worms have been found to remain viable in VIP pits for many years, and some studies have found the incidence of infection with intestinal worms among children to be as high as 90% in some parts of South Africa (see Section 1.2.1). Drying sludge may reduce the pathogen load to some extent and may have other benefits but cannot be relied upon as a method to make sludge safe enough for use. If sludge is maintained at a high temperature for a long enough period of time, pathogens will be destroyed. However, this requires careful management which may be beyond the capacity of many rural schools. Processes such as high temperature composting or increasing pH through the addition of urea or lime will reduce the pathogen load but cannot be relied upon to ensure total deactivation of helminth eggs. Incineration can be used if a completely sterile product is required, but again this will require technical knowledge and diligent maintenance.

4.2.2 Dehydration

Allowing the sludge to dry as much as possible in the pit will reduce its volume and weight. Diverting urine and if applicable, flush water is obviously the first step to reducing the moisture content of

sludge. Another method is to allow liquids to drain through a perforated bottom of pit to be collected elsewhere, however liquids that have been in contact with faeces must be considered pathogenic[64]. The addition of dry material to lower the moisture content of sludge will increase the volume of sludge. Extraction fans can aid evaporation but can also draw foul odours out of the pit into the school environment. Fitting the pit with a black cover can aid evaporation rates.

4.2.3 Biogas / biodigestion

When sludge is collected in a tank and additional organic material is added, methane gas will be produced which can be safely used for cooking or producing electricity. Biodigesters require skilled design and construction to ensure the tight seal of the system to prevent gas leakage and ensure that the flammable gases are managed safely. The equipment also needs regular cleaning to prevent corrosion[65]. To establish the system active sludge is needed to seed the system. Once established the system is self-mixing, however stirring once a week is recommended to keep reactions even.

The biodigestor needs to be supplied with additional organic material which is not always available on a school property, and many schools don't have the capacity to manage this additional responsibility.

The slurry that remains is odourless but will still need secondary treatment in order to be pathogen free. The slurry will need to be removed every 6 months to 10 years depending on the capacity of the digester relative to its usage.

For a biogas system treating human waste to produce enough gas to make the capital cost worthwhile it is generally advisable to supplement the digestor with additional organic waste matter. This could be agricultural waste (clippings, cuttings, husks, etc.) or food waste. Food waste in particular is a useful additive to a biogas digestor as it will produce more than three times as much gas per kilogramme than faeces.

[64] Note that excess liquid will drain away from any pit that is located in a soil that allows liquid to percolate away from the pit, where the pit lining is constructed with plentiful openings for drainage and is not sealed. The remaining sludge will typically have a moisture content of 50% to 70%, whereas sludge in poorly drained pits tends to have a moisture content of 80% to 95%. If the surrounding soil has a high clay content or is partly in rock then the pit will not drain well and the sludge will remain fairly wet. Whether the pit is wet or dry, the surrounding soil will in almost all cases act as a very effective filter medium to prevent the migration of pathogens and nutrients into the ground water. The removal of pathogens and nutrients from pit seepage is effected by both physical and biological processes. Pit latrines can impact groundwater quality, but except in rare cases with specific conditions (very permeable soil and very high groundwater flow) this effect tends to be limited to within just 3 or 4 metres from the pit. The effect of pit latrines on groundwater tends to be greatly exaggerated as a marketing strategy by promoters of proprietary sanitation systems, but in truth there is very little real scientific evidence to substantiate the claims that are typically made in this regard. If an offset distance of 30 metres is maintained between a pit latrine and a water source (i.e. a borehole or a spring) and if the pit latrine is located downslope of the water source, then the pit latrine is highly unlikely to affect that water source. However, any water source should be periodically checked for signs of pollution and a school should check the quality of its water supply if it is not supplied from outside by a reputable water service provider.

[65] Apart from methane, biogas contains hydrogen sulphide which can form sulphuric acid, which is highly corrosive. It is advisable to include a "scrubber" in the gas supply from a biogas system which removes the hydrogen sulphide from the gas.

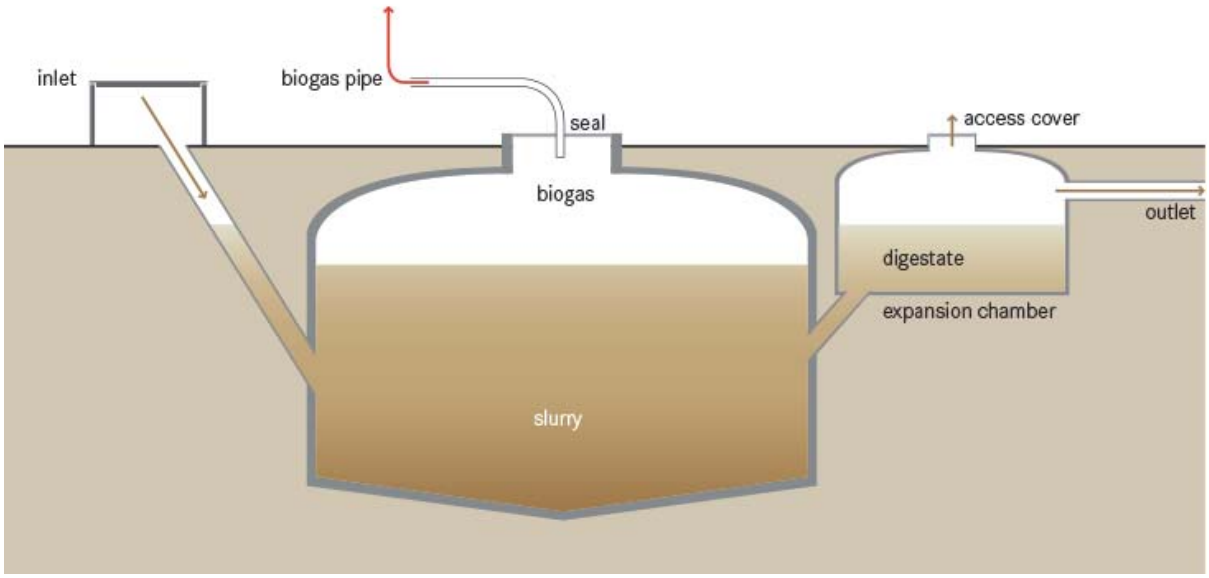


Figure 33: Biogas digestor (Tilley et al, 2008)

Table 23: Advantages and disadvantages of biogas systems

ADVANTAGES	DISADVANTAGES
• Generates energy • Low operation costs • Long life span – if maintained well • Can be built and maintained with locally available resources • No electricity required to operate • Small land area required	• Skilled design and construction needed • Careful management required to ensure safety • Cannot produce gas at temperatures below 15^{o}C • Like any septic tank the digestor still requires periodic desludging (depends on design, but probably about once every 5 years) • Unlikely to produce enough gas to be really useful unless supplementary organic waste is added, so this must be available and there must be the commitment to add the extra waste.

4.2.4 Incineration

Systems designed to incinerate human waste should produce a pathogen-free product, eliminating the danger of contaminating the school environment during desludging. However these systems have more complicated management and maintenance requirements than standard pits and septic tanks. Given that many rural schools do not yet have the capacity to manage basic aspects of sanitation, it is not recommended that incinerating toilets be installed at such schools until they have become mainstream in use as public toilets or at urban schools and their requirements are better understood.

Table 24: Advantages and disadvantages of incineration

ADVANTAGES	DISADVANTAGES
• No handling of pathogenic sludge • Greatest reduction of volume of sludge • Easy disposal of waste • Waste product is useful as a soil conditioner	• Requires electricity or fuel to start up • More specialised maintenance issues • Possible odours during burning • Harmful gases released during burning

4.2.5 Composting

Composting allows sludge and plant materials to decompose together into a material which can be used to improve soil and fertilise plants. Sludge from schools can be expected to have a high pathogen load, however, and ensuring that compost is pathogen-free requires that the entire heap, from exterior to centre, reaches temperatures over 60ºC. The pile also needs to be turned regularly, which presents health risks to management staff as the compost will not yet be pathogen free. A number of variables need to be carefully controlled for successful composting, such as carbon:nitrogen ratio, pH-value, biological activity and temperature. While composting is an important alternative for the beneficial use of sludge which can be explored by municipalities and other bodies with the capacity to manage the process carefully, many schools still lack the capacity to manage basic aspects of sanitation successfully. It is therefore not advised that rural schools attempt to compost sludge.

4.3 No treatment option: On-site burial

The simplest method for managing sludge from on-site systems is to transfer the untreated sludge from the vaults to pits to trenches or holes that have been prepared on-site[66]. The sludge is then buried with a substantial cover of soil and trees are planted on the sludge. This method safely contains pathogens and eliminates the costs of transporting sludge to a disposal or treatment site. Trees use a portion of the nutrients and produce a yield of fruit, building material or fuel.

The following factors should be considered in siting burial locations for sludge on site:

- If groundwater is present in the VIP pit, a sludge disposal site should be found where the groundwater is deeper.
- On-site burial should not be used in gravelly soils because of the potential of groundwater contamination.
- Burial holes should not be located on eroded banks or cutaways where later activity could erode the vertical face into the sludge itself, exposing pathogens.
- Burial holes should not be located within 15 m of a stream.
- Burial should not be in areas used by learners, because of the possibility of contamination of the area during entrenching.

Holes or trenches should be prepared with adequate proportions to contain the sludge while also allowing for 300 mm of soil backfill on top of the sludge surface to prevent sludge from becoming exposed over time.

[66] There is a widespread belief that the presence of sludge in soil contaminates the groundwater. While fresh sludge may indeed have a small and very localised effect on groundwater (except under very specific and most unusual conditions such as very high groundwater flow), sludge which has been sitting in a pit vault for years has lost most of its potential to affect the groundwater. If a site was suitable for pit latrines in the first place, then it is no less suitable for the on-site disposal of sludge removed from those pit latrines. The buried sludge breaks down in soil and within a matter of years will be almost impossible to distinguish from soil. The belief that sludge contaminates soil is widely promoted by those who wish to sell proprietary sanitation systems which are often both complex and expensive. See Still D; Lorentz S; Adhanom G, *Entrenchment of pit latrine and wastewater sludges*; Water Research Commission Research Report No. 2097/1/14

4.4 Keeping the school safe during sludge handling

Care should be taken while transferring sludge to protect workers and the school environment from pathogens in the sludge through the use of barriers.

Principals should monitor emptying teams working at the school and ensure the following:

- Pit emptying workers must remain in the area directly behind the toilets and not walk onto any other part of the school property in contaminated work clothes, including the inside of toilet blocks.
- For their own safety, pit emptiers should not be allowed to climb into the pits (also because their boots will then become contaminated, posing a threat to the school environment).
- Protective sheets must be placed on the ground and lip of the pit to prevent sludge from being spilled on the ground.
- Tools used in pit emptying must not be laid on the bare ground.
- Hoses from honeysuckers must not be allowed to touch the ground.
- Under no circumstances may tools belonging to the school be used by the pit team in contact with sludge.
- The principal must inspect the empty pits before they are closed to ensure they are stable after emptying.
- Pit covers must be securely fastened after pit emptying.

Because of the risk of the school environment being contaminated during pit emptying, it is advisable to plan pit emptying if possible immediately after the end of fourth term or second term, so that learners are not on the premises and as much time as possible is allowed for pathogens to die off. It should be kept in mind, however, that some pathogens can survive for years in the environment and this measure will only reduce, not eliminate, the risk of learners coming into contact with infectious organisms from the sludge.

5. MANAGEMENT: THE KEY TO SUCCESS WITH SCHOOL SANITATION

Even the best infrastructure will fail if it is not managed effectively. In many rural schools, a combination of factors have resulted in ineffective, or non-existent, management. As a result, learners' safety – and even their lives – are put at risk. They are exposed to diseases, abuse and other threats in the toilets and their dignity and well-being is compromised.

The primary obstacles to effective management are a lack of **"will"** (the vision which in turn produces drive and commitment), a lack of **"skill''** (the knowledge and expertise to be able to assess, plan, implement, monitor and evaluate independently) and a lack of funds to pay the **"bills"** incurred in running toilets well.

To overcome these obstacles, managers at both school and department levels need to be trained and developed to generate the "will'' that provides the drive for good management. While the capacity of schools needs to be developed to manage sanitation well, this transfer of "skill'' needs to be done over a longer period with significant partnership and support from the Department of Education (the DoE). Training in administrative skills needs to be accompanied by the provision of administrative tools – standards, criteria, protocols, procedures as well as monitoring checklists, reporting forms and training materials. Schools with adequate capacity can adapt these and improve upon them, but schools without must at least have a minimum framework provided to work within. The department needs to support the school with adequate funds and financial tools to pay the "bills" for good management.

The following sections look at some of the obstacles to good sanitation management and then present the key components to meet the "will, skill and bill" requirements for a successful sanitation programme as follows:

Table 25: Keys to effective sanitation management

	KEYS TO EFFECTIVE SANITATION MANAGEMENT
VISION	**Section 7.2: Why** should managers prioritise sanitation when there are so many other urgent concerns?
STANDARDS	**Section 7.3: What** needs to be done to ensure decent toilets?
TEAM	**Section 7.4: Who** is responsible for ensuring toilets meet standards?
PLAN & TOOLS	**Section 7.5: How** can toilets be kept in good condition?
FUNDS	**Section 7.6: Where** will the resources come from to make this happen?

5.1 Obstacles to effective management of school sanitation

A number of obstacles can stand in the way of good management of sanitation. These are summarised in Table 26 and are discussed in the following section.

Table 26: Typical obstacles to effective management of toilets

	OBSTACLES TO EFFECTIVE MANAGEMENT OF TOILETS
Values	Staff **lack the key values** of service, i.e. placing the needs of learners first. They see the unpleasant smells, sights and problems associated with failed sanitation as below them and place their status and comfort above the health and safety of learners.
Knowledge	Schools: A **lack of understanding** of the importance of sanitation in ensuring learners' wellbeing and its role in learning, they are also unaware of learners' rights and their own obligations and lack an understanding of principles of structural safety and of disease transmission. Department: A **lack of training** for school managers.
Vision	Schools and department: Vision results from core values engaging knowledge to produce a desire for a better reality and the positive energy to work for that. Staff who lack the values of service and meeting learners' needs and do not have a clear understanding of learners' rights, their responsibilities and a minimum standard for sanitation may **lack vision** to change the situation.
Capacity	Schools: A **lack of capacity** to assess sanitation needs, develop a successful management plan, create implementation tools, and carry it out consistently. Department: A **lack of support** in terms of providing clear standards and tools.
Follow through	Schools: A **lack of concern** for the plight of learners and a **lack vision** for sanitation. Department: A **lack of accountability,** in terms of monitoring and enforcement.
Resources	Schools: A **lack of resources** to pay for maintenance, cleaning and hygiene materials. Department: A **lack of responsiveness** to maintenance needs and funding challenges.

Lack of key values

In the WRC research, principals ranked themselves as performing the best of all stakeholders in fulfilling their role in school sanitation. Yet less than half (46%) said that the rights of learners are protected while 61% said that the rights of staff are protected at their school. When explored further only 41% said that the health and safety of learners at their school is protected and only 36% said that learners' toilets at their school are safe.

School staff may feel that as adults and professionals their rights, needs or comfort are more important than those of learners and subsequently reserve the best toilets for themselves or their staff, leaving the most degrading or dangerous toilets to learners. This is the situation described by Michael Komape's parents at the school where he died. Some principals may feel that because of their status they should not have to deal with unpleasant things like the school toilets personally. Their views of status and hierarchy may also lead them to believe that is acceptable to give older learners better services than younger learners, rather than ensuring that the rights of the youngest and most vulnerable are the most carefully protected. Where they do have these values in place in the classroom, they may not have extended these in their thinking to include the private but important aspect of a child's life that happens in the toilets. They may feel that their status places them above a position of service, with the result that they are not comfortable or willing to model an attitude of service and humility to learners or their staff.

Lack of knowledge

The WRC research found extremely variable views among staff about what learners are entitled to, what their own responsibilities are and what the basic requirements are for acceptable school sanitation. Principals, cleaners and learners demonstrated a lack of knowledge of disease prevention and corresponding hygiene practices. They may fail to understand their *in loco parentis* role – that

they assume responsibility on behalf of each child's parents during the school day to protect, nurture and develop learners physically, intellectually and emotionally. Because at a provincial or national level the Department of Education has not set out clear standards for the management of toilets or trained principals in the management of toilets, principals have no clear or shared idea of what is expected. Beginning just with the concepts of ''clean'' and ''safe'', expectations and standards vary dramatically from one school to another. While one principal believes that an adequate cleaning programme requires toilets to be cleaned three times a day by a cleaner, another principal is satisfied to occasionally have learners clean the toilets for punishment, with no other cleaning regimen in place. In terms of safety, one principal might focus on the fear of snakes in the toilets and completely ignore the fact that the slabs under pit toilets have deteriorated and there is a danger that a learner could fall into the pit and drown at any time; another principal is so concerned about the safety of small learners using pit latrines that she requires them to defecate outside in the open with no privacy in order to protect their lives. In terms of monitoring and maintenance, one principal may inspect the toilets personally every day, while another never checks them personally and only has a maintenance person check them once a year.

Lack of vision

In our research few principals were able to articulate a vision for an effective sanitation programme. Many of our managers and leaders grew up attending schools with failed sanitation. For some, the appalling state of many school toilets today may seem unfortunate but unavoidable. They may feel that this is just the way things are in the rural areas and there is not too much that can be done to change it. As a result, they lack the vision needed to try to change things and accept things as they are. It is incumbent upon the Department to impart to educators and administrators a vision, based on clear standards, for a learning environment that supports learners' rights and wellbeing in every way.

Lack of capacity

Rural schools are often challenged by inadequate capacity in many ways. While the Department has placed the burden of managing school toilets on the schools themselves, providing little support, many schools simply lack the capacity to address their sanitation management needs. Principals may not have the skills to assess issues effectively or the skills to develop the management systems and tools that are required for successful management. They may feel they are doing their best, and they may truly be doing their best, but this still might not be adequate. What was striking when principals were asked about their management programmes was the complete lack of a common sense of what management entailed – the nature and scope of responses varied massively. While some principals never set foot in the toilets others monitored them personally on a daily basis – and measured their performance against any clearly defined criteria defined by the Department.

Follow through: lack of support and accountability

In the WRC research, many principals indicated that they felt helpless to manage the toilets adequately because they receive inadequate support from the DBE; however their concept of what the role of the Department was varied widely. While many said they simply do not have the funds to manage the toilets, many expressed a need for more direct intervention and support – even in the form of inspections – by the circuit or DBE and 82% said that the department does not fulfil its role with regard to school sanitation. It appears that to a large extent the management of school toilets

is completely under the radar of the Department and it is entirely up to each principal whether any kind of management will be attempted or whether they will be completely neglected, as in many cases no routine inspections are conducted by the circuit or DBE and principals are not held to account for the safety and health status of their toilets. There are neither positive nor negative incentives to motivate circuit managers or principals to ensure that sanitation is kept to an adequate standard.

Lack of resources

In the WRC research, many principals said that the Department simply doesn't provide them with enough funds to do any better and they are unable to raise funds within their communities, where in some cases very few houses have an income. While the Department expects general infrastructure funds to be used to cover sanitation, principals may feel other needs take priority and they cannot justify dedicating funds to paying a cleaner, buying hygiene materials and other sanitation needs.

Addressing each of these obstacles, important keys to the effective management of sanitation are summarized in Table 26. These keys are discussed in detail in the following sections in this guideline.

Table 27: Keys to the effective management of toilets

	KEYS TO THE EFFECTIVE MANAGEMENT OF TOILETS
Values, knowledge, vision	Staff in schools and in administrative positions within the department need to receive **explicit training on the rights of learners, the responsibilities of staff, and the application of professional ethics** to the context of school sanitation. In addition, staff need explicit training in **disease transmission and prevention and structural safety issues** as applicable to the context of school sanitation. Building on a foundation of ethics and knowledge, the department needs to provide staff with a **vision of successful sanitation which supports learners' rights and wellbeing and learning**. This includes providing clear standards. Staff should be engaged in developing a vision for school sanitation in their province/circuit/school.
Capacity	The department needs to capacitate principals to manage sanitation by providing clear **standards** and protocols, providing models and support to develop a comprehensive **management plan**, and providing **administrative tools** and training materials to carry this out. Training and ongoing support is needed.
Follow through	**Management plans should include checks and balances** within the school to ensure that the plan is carried out consistently. In addition, the department should **monitor schools regularly** to ensure that toilets are maintained at an acceptable standard. Principals who fail to meet standards should be **disciplined**. A **reward system** for schools with exemplary sanitation management would provide a positive motivation.
Resources	The department should **ensure that no-fees schools have adequate funds** to implement a basic sanitation management plan. SGBs could be required to **ring fence infrastructure funds** for sanitation. The department could provide support and training to schools in seeking sponsors for additional resources.

5.2 KNOWLEDGE, VALUES AND VISION: The driving force for effective management

While capacity and resources are necessary for toilets to be managed well, even with these in place sanitation will fail if managers do not have the necessary will. While some motivated and committed principals will follow through with good management even when no one is looking, others will do nothing unless someone mandated by the Department regularly inspect the toilets (in the words of the old management adage, people do not do what you expect, they do what you inspect). It is

important for the Department to monitor schools and discipline principals who neglect their toilets, . Similarly, the departmental staff responsible for monitoring schools will follow through with care and commitment if they are personally convinced of the importance of good sanitation.

Where does this motivation come from? For many schools, under resourced and under capacitated, placing the core business of teaching and learning on a solid footing is still a battle to be won. How then can it be justified to divert precious time and resources to the most humble, and often invisible, aspect of the learning environment – the toilets? And WHY should toilets be given more time and attention – isn't it just a reality that toilets are unpleasant and shouldn't learners just face up to it and do their business as quickly as possible there?

To understand why sanitation deserves to be a high priority despite competing demands, managers need a **sound understanding** of the needs and rights of learners and how sanitation can either support or undermine that. The logistical and psychological aspects of safety, health, dignity and assistance with special needs need to be thoroughly explored – for all facets of the school environment but with special attention to the toilets, where these rights can potentially be most under threat. Secondly, managers need to have the **values** in place that will drive a personal concern for ensuring the needs of learners are met. This requires examining existing values and actively inducting staff into a professional code of ethics. Thirdly, managers need to apply their code of ethics to the rights of learners and the challenges of sanitation to arrive at a **vision** of transformed sanitation that meets all of the needs and satisfies the rights of learners.

It is incumbent upon the Department to ensure that prospective teachers, principals and departmental personnel involved with oversight of school management are trained and developed in these three areas. The following sections discuss the key aspects of each of these areas that need to be addressed.

5.2.1 Knowledge: Understanding why sanitation is so important

Staff working within the school or department environment, with its history and hierarchical structures and institutional culture, can easily forget that the single and only reason the school – and the Department itself – exist, and that they are there, is to serve the needs and fulfil the rights of children. It can be even harder to see that the toilets – an often unpleasant place which many would prefer not to think about – are centrally important to their core business of teaching and learning. The role of the toilets in education is described below.

IMPORTANCE OF SCHOOL SANITATION

Schools exist for no other reason than to meet the needs of children; specifically, to satisfy their right to learn. The basis for everything that is done in the school environment is the needs and rights of learners.

Urination and defecation are among the most basic physical needs of a child.

These acts should not, be avoided or needlessly delayed during the school day due to inadequate sanitation.

Because of the private nature of these acts, a child is psychologically vulnerable when using the toilet.

Keeping a child physically and psychologically safe while using the school toilets is therefore one of the most basic requirements for a learning environment and a core management responsibility.

Toilets that are structurally unsafe, dirty, scary, not private, or allow learners to feel threatened violate children's rights and undermine learning.

Because of the private nature of using the toilet, the issues that learners face there and violations of their rights that they experience can be "invisible" to management.

Staff cannot be expected to ensure that the rights of learners are protected when they use the toilet, if they do not have a clear understanding of what the rights of children are how these rights relate to sanitation. The rights of learners and the laws that support them were presented in detail in Chapter 1. There it was shown that the key rights that are impacted by sanitation are the rights to safety, health, dignity and psychological wellbeing, and the right to have help with special needs. These rights applied to the context of sanitation lead to a set of specified conditions to which learners are entitled. These are articulated as a proposed "Bill of Rights'' for learners specifically addressing the context of sanitation (Table 28).

Table 28: A proposed "Bill of Children's Rights for Sanitation".

BILL OF CHILDREN'S RIGHTS FOR SANITATION
1. SAFETY: Children have a right to toilet facilities that are structurally safe and free from threats.
1.1. Children must be provided with infrastructure that is soundly constructed and maintained, with particular attention to the risk of a slab or pedestal collapsing into the pit. 1.2. Infrastructure for Grades R-3 should eliminate any risk of a child falling through the seat into the pit. 1.3. Children must be allowed to use staff toilets in a situation where these are the only safe toilets available. 1.4. Pit access hatches must be securely covered. Decommissioned pits must be backfilled and covered. 1.5. Staff must be available to learners in the toilets at break to prevent abuse and intimidation**.**
2. HEALTH: Children have the right to toilet facilities which minimise the spread of disease.
2.1. Handwashing facilities, liquid soap, toilet paper and bins must be provided in all toilet blocks. 2.2. Toilet seats and all dermal contact points in the toilets must be disinfected at least twice a day. 2.3. Children must not be required to clean toilets. They may wash writing off the walls and clean windows. 2.4. Areas contaminated by overflowing toilets must be cordoned off and thoroughly disinfected before they are reopened. 2.5. Sludge collection chambers must be emptied before they exceed capacity. 2.6. Pits and vent pipes must be sealed or screened to prevent flies and other pests from spreading diseases.
3. Children have the right to toilet facilities which support their dignity, privacy, security and comfort.
3.5 Facilities must be maintained in a condition where privacy is protected. Broken doors must be replaced. 3.6 Staff must provide special support to children who are vulnerable to bullying in the toilets. 3.7 The atmosphere in the toilets should be as pleasant as possible, with adequate light and ventilation. 3.8 The experience and opinions of learners should be considered in the design and management of toilets.
4. Children with special needs have a right to assistance from staff and accommodation from the school.
4.5 Staff should assist very young, physically or otherwise challenged learners who cannot use the toilets and handwashing facilities safely and independently. 4.6 A child with physical limitations must be provided with a toilet that accommodates his/her needs. 4.7 Girls must be provided with sanitary pads and bins. 4.8 A child who has a sanitation related accident should be assisted with caring and his/her dignity and privacy should be protected.

In order to understand how these rights might be compromised in the toilets and what is required to protect these rights, staff need to be empowered with specific information. This includes:

Table 29: Knowledge required for effective management of sanitation

KNOWLEDGE REQUIRED FOR EFFECTIVE MANAGEMENT OF SANITATION	
Safety	Principles of structural safety (particularly with regard to VIP toilets where there is a risk of a pedestal or slab collapsing into a pit with a user, but also addressing toilet block design) How to assess safety and conduct inspections How to respond to emergencies (what to do if a child falls in the pit, attempts suicide, etc.) How to conduct maintenance How to manage aggressive behaviour How to manage threats (access to trespassers, snakes)
Health	Disease transmission: particularly through dermal contact with surfaces in the toilets Identifying contamination ''hot spots'' where disease may be transmitted in the toilets Principles for breaking routes of disease transmission: Physical removal of pathogens from surfaces, deactivating pathogens on surfaces, importance of frequent cleaning Effective cleaning practices, model protocols Health problems related to avoiding urination/defecation Menstrual cycle and girls' needs during periods Principles of good hygiene and effective hygiene practices
Dignity and psychological well-being	Dealing with bullying, verbal, physical or sexual abuse. Infrastructure requirements for privacy. Strategies for creating a pleasant environment with a limited budget. Providing support and care (*in loco parentis*)
Assistance with special needs	Types of physical and other limitations and possible adaptations Assessing the needs of small children Providing support while encouraging independence Supporting menstruating girls and tracking absences
Planning and administration	Management models for monitoring, cleaning, inspections, maintenance, health and hygiene education and pit emptying. Calculating pit filling rates and quantities for cleaning and hygiene materials. Working with the SGB and Department to address needs.

5.2.2 Values: Professional ethics applied to sanitation

As discussed in Section 5.1 , the values that teachers, principals and departmental personnel hold affect how they see sanitation and also affect their will and commitment to improve sanitation. Each prospective teacher or employee will bring with him or her a set of values reflecting many different influences. Hierarchical social structures in our various ethnic and tribal cultures as well as past colonial and apartheid hierarchical structures may have a bearing on how a person in authority sees the rights of a child and the responsibilities of a teacher in the context of a school. Our understanding of what it means to be a good leader and how power should be used will be influenced by the model set by our political, religious and other leaders, some of whom will use their power to privilege themselves over those they lead. In many of these models, status trumps service and there is a clear ranking with privilege, and sometimes rights, diminishing from top to bottom. Left unchallenged, teachers ensure their needs are met but neglect the needs of learners – especially in hidden or ''invisible'' zones such as the toilets. It was in such a situation that Michael Komape lost his life in his school toilets while his teachers kept the only safe school toilets for themselves.

Given the wide range of inputs into each person's value system, it is imperative that the Department actively and explicitly engages the values of students and new employees by facilitating a process whereby existing paradigms are identified and examined, the ethos of the department is clearly

articulated and explored, and newcomers are inducted into a professional culture which is committed to this ethos. While teachers, principals and departmental staff may receive some training in professional ethics, their application to sanitation must be made explicitly.

The following values should be emphasized in the discussion of professional ethics:

Table 30: Professional values that are key to transforming sanitation

PROFESSIONAL VALUES THAT ARE KEY TO TRANSFORMING SANITATION
Employees of the department have an *in loco parentis* role – they assume responsibility on behalf of each child's parents during the school day to protect, nurture and develop learners physically, intellectually and emotionally. This applies to all aspects of the learning environment, including the toilets. Staff must care for children's toileting needs with compassion and thoroughness.
Learners' rights and needs must be satisfied before those of staff. The school exists only to serve learners and meet their needs. It is unacceptable for staff to place their own needs and comfort ahead of those of learners. If the only safe and decent toilets at the school are the staff toilets, the learners must be given access to them.
The youngest and most vulnerable must be given the most care and support. It is unacceptable for older children to be given safer or better toilets while younger children are made to use inferior toilets. Menstruating girls and learners with specific vulnerabilities must be given consideration and additional support.
Leaders are expected to demonstrate servant leadership. This means that the greater the authority and status of a person, the greater her responsibility to serve those under her by ensuring their needs are met with dignity. Principals and circuit managers must be willing to go into the learner toilets and demonstrate how to use them appropriately and clean and care for them.
The school exists to serve all children of school age in the community. The school must actively support the right of learners with physical or other challenges in the community to attend the school and demonstrate its willingness to make the necessary accommodations to meet their needs and protect their rights.

5.2.3 Vision

A manager who has herself grown up with failed school sanitation and who manages an under-capacitated school may struggle to imagine the situation improving apart from the Department building new toilets. In the WRC research, principals had extremely varying ideas of what school toilets should be like. Many idealised flush toilets as a solution to their problems; others had extremely low expectations. A manager equipped with the knowledge and values described above, however, is in a position to forge a vision for the management of sanitation at her school or in her district which fully satisfies the needs and rights of her learners. This should be facilitated as part of training, with managers sharing their vision statements with each other in order to build a shared and complete sense of vision.

A vision should address all of the items in the Bill of Children's Rights and comply with the standards provided by the Department, appropriate to each level of management. Below are two examples that could be discussed and developed. As a vision for the toilets should overlap significantly with the vision for the rest of the school, this could be expanded to be a vision for the school, if the school does not have a vision statement, or key elements highlighting sanitation could be incorporated into an existing vision statement.

Vision statement for school sanitation at X Primary School

Our school exists for one reason: to empower the children in our community to develop to their full potential.
We as staff ensure that our learners' needs are met before our own and we treat our learners with the same care that we do our own children.
We educate our learners in a happy, healthy, safe and nurturing environment.
Our school toilets are a high priority because they are the place where our learners take care of their most private needs.
We ensure that our learners enjoy toilets that are safe and healthy and where they feel respected, so that they are able to learn and thrive.
We educate our learners about how to respect their bodies and how to keep their bodies healthy and safe, including providing information about good hygiene practices and about menstruation.
Our toilets are cleaned several times each day. Our trained cleaner ensures that "hot spots" where disease could be spread are given particular attention. Our learners always have access to toilet paper, liquid soap, bins and pads.
There is always someone available to support a learner who needs assistance in the toilets.
Our toilets are strictly monitored so that no one is teased, bullied or threatened.
Young children, children with special challenges and children who are especially vulnerable to bullying are given special support.
We address maintenance issues promptly and ensure that no child is allowed to use a toilet that threatens his safety, health or dignity.
We listen to the needs and ideas of our learners and respond to these to make the toilets the best that we can.

Vision statement for school sanitation District or Circuit

Our schools exist for one reason: to empower the children in our district to develop to their full potential.
We ensure that learners are educated in a happy, healthy, safe and nurturing environment. School toilets are a high priority because they are the place where our learners take care of their most private needs. We therefore strive to give children the best that we can in terms of sanitation.
We ensure that our learners enjoy toilets that are safe and healthy and where they feel respected, so that they are able to learn and thrive.
We make decisions regarding new infrastructure in careful consultation with schools and with every effort to ensure the safety, health and dignity of learners.
We ensure that learners with physical challenges are given the opportunity to go to school and that appropriate toilets are provided for every learner, whatever his or her needs may be.
We develop the capacity of our schools to manage sanitation by equipping our principals with models, tools and training for managing sanitation effectively.
We assist schools in securing funds for managing sanitation and develop the capacity of SGBs to secure sponsorship and develop networks in the school community to increase the resources available.
We inspect school toilets regularly to ensure that schools are managing them effectively, especially with respect to keeping the toilets clean throughout the day, inspecting them regularly and following up promptly on maintenance issues.
We address management problems and discipline any principal found to be negligent in the management of school sanitation.
We work closely with our school to ensure maintenance issues, particularly those compromising health or safety, are addressed promptly.
We provide support to schools dealing with vandalism or behavioural issues.
We provide educational materials to our schools dealing with good hygiene practices as well as menstrual management.

5.3 WHAT NEEDS TO BE DONE? A standard for effective management

The purpose of toilets is to enable learners to meet their basic needs safely and comfortably without compromising their health or dignity. The Bill of Children's Rights in Sanitation presented in Section 5.2.1 provides the basis for a standard for school sanitation as follows:

STANDARD FOR THE MANAGEMENT OF SCHOOL SANITATION	
1.	**SAFETY: The safety of all learners must be ensured**
1.1	Toilet design and construction should guard against any risk of a user falling into a pit.
1.2	Toilet blocks, pedestals and pits should be inspected weekly for structural safety.
1.3	Pit access hatches should be kept securely covered.
1.4	Pits of decommissioned toilets should be filled and toilets removed.
1.5	Learners should be restricted from access to structurally unsafe toilets.
1.6	Maintenance issues should be addressed promptly and managed proactively.
1.7	Toilets should be monitored by staff during break to prevent abuse and respond to threats.
1.8	Small learners should be assisted if using adult sized pit toilets.
1.9	Emergency safety protocols must be in place.
2.	**HEALTH: Toilets must be kept clean and provision made for learners to practice good hygiene**
2.1	Facility design should minimise points of disease transmission and support hygiene.
2.2	A trained cleaner should disinfect dermal contact points and clean facilities at least twice a day.
2.3	Incidents of gross contamination should be dealt with before learners are given access to the facilities.
2.4	Pits should be desludged before they exceed capacity.
2.5	The integrity of infrastructure should be maintained to prevent pests from spreading diseases.
2.6	Learners should be educated in sound hygiene practices.
2.7	Schools should provide liquid soap, toilet paper, bins and sanitary pads to learners.
3.	**DIGNITY AND WELLBEING: An environment of dignity, respect and comfort must be promoted.**
3.1	Infrastructure must not be allowed to deteriorate to a degrading state; unpleasant sights and smells should be minimised.
3.2	Staff should monitor user behaviour in the toilets to prevent abuse and intimidation.
3.3	Schools should ensure conditions in the toilets support dignity, privacy and security.
3.4	Learners experience, opinions and ideas should be considered in the design and management of toilets.
4.	**Assisting with special needs:**
4.1	Schools should provide assistance to learners who face challenges of any kind in the toilets, particularly young children, menstruating girls and children with physical challenges or who are vulnerable to abuse.

5.3.1 SAFETY: The safety of all learners must be ensured

Toilet facilities may present a number of dangers to users. A management plan must ensure that all of these risks are addressed. The principal must take responsibility to see that the management plan is implemented, but may delegate the day to day management to a member of staff, who is thus designated the sanitation manager. If the principal does not delegate this authority, then the principal is de facto the sanitation manager.

- **Toilet blocks, pedestals and pits should be inspected weekly for structural safety**

The most serious physical danger learners are exposed to at school could be the risk of falling into the pit of a VIP or unimproved pit latrine. A school with toilets that places the user above a pit must monitor the structural integrity of these toilets constantly as follows:

  - Both the cleaner and the sanitation manager should be trained to recognise whether slabs or pedestals are deteriorating and are at risk of collapsing.

- The cleaner should take note of any structural issues during daily cleaning and should report anything of concern to the school's sanitation manager. The manager should inspect the toilets weekly.
- In addition to the toilets themselves, the sanitation as a block must be checked for structural soundness. This includes roofs, walls, floors and steps.

- **Pit access hatches should be kept securely covered.**

Ensure that each pit is covered with a strong and secure cover that will not break if stood on, cannot be removed by curious learners and has no gaps allowing access to flies or other pests.

- **Pits of decommissioned toilets should be filled and toilets removed.**

As learners may be tempted to use old toilets, or play behind them, a toilet block that is no longer carefully monitored can be a safety threat. Access should be restricted by locking or sealing entrances and the pits of decommissioned toilets should be backfilled and the area restricted until the full pit becomes stable.

- **Learners should be restricted from access to structurally unsafe toilets**

A condition noted by the cleaner or manager which constitutes an immediate danger should be reported immediately and no further access should be allowed to the toilet until the problem is addressed. This can be done by locking the toilet, encasing the pedestal with a black rubbish bag, or placing tape across the entrance. A bold notice could be placed on the door indicating that the toilet is not safe and shouldn't be used. Learners can also be alerted to the danger posed by the toilet by their teachers.

In the event that a significant number of toilets become unsafe, the following measures can be taken to ensure that learners have access to safe toilets:

- Mobile toilets can be rented as a temporary measure. These should have handwashing facilities, or else access should still be allowed to handwashing facilities in the affected blocks, if this can be done safely.
- A schedule can be made for sharing safe toilets. For example, if the boys' block is affected, the girls' block can be shared by allowing girls access during the first half of break and boys during the second half. If facilities are shared, they should be monitored vigilantly to ensure that boys and girls do not use the same facilities at the same time (for example, during class time). If some, but not all, toilets in both boys' and girls' toilets are affected, break times could be extended to allow time for all learners to use the toilet. Alternatively, the teachers of younger learners could bring them to the toilets before break to reduce the volume in the toilets during break.
- ***If there is no other option, staff toilets must be opened for learners to use.***

- **Maintenance issues should be addressed promptly and managed proactively**

The department should prioritise maintenance in cases where the safety of learners is at risk.

- Loose slabs or pedestals must be serviced without delay.
- Materials (particularly covering the pit) that are cracked, rusted or rotten to the extent that children's safety is in danger must be replaced without delay.
- Cyclical servicing tasks such as pit emptying should be scheduled proactively.

- **Small learners should be assisted if using adult sized pit toilets**

A small learner using an adult sized pedestal over a pit toilet faces the risk of falling into the pit through the hole. A school in this situation should have smaller pedestals or flush toilets built for Grade R-3 learners. Until appropriate infrastructure can be provided, the following measures can be taken:

- Small-child friendly seats should be fitted where needed.[67]
- A raised concrete step and a handrail (attached to the wall) can be added to a few of the stalls in each block so that a small learner can hold securely to the rail and place his feet securely on the step while using the toilet. Handles fixed on either side of the toilet seat or a knotted rope hanging from the ceiling can also provide additional stability and safety to young learners.
- If the pedestals can be safely removed and reattached without compromising their integrity, they could be removed and two steel rods fixed securely across the hole in the slab from front to back, 10cm to the left and right of the centre of the hole. Most faeces and urine will pass directly between the two rods and if some should fall on the rods it will slide off easily enough. If a child falls through the pedestal she will be caught by the rods and will be able to call for help or climb back out.
- Teachers of Grades R-3 can take their class to the toilet before each break and before the end of the day. The teacher and the cleaner can then assist learners in both boys' and girls' blocks to ensure their safety. This involves holding the hands of any child who is afraid to provide stability, and ensuring that all children are safely out of the block before leaving.
- Teachers can take their Grade R-3 learners to the staff toilets, if these are flush toilets.
- If a Grade R-3 learner needs the toilet during class, she should either be sent to the teachers' toilets or sent to the cleaner who will assist her.

- **Emergency safety protocols must be in place.**

Protocols should be developed in consultation with experts for dealing with emergencies that could occur in the toilets. These include:

- a child falling into the pit and being submerged in sludge
- a health emergency resulting from substance abuse
- rape or other physical attack
- attempted suicide
- snakebite or a bite by a dog, rat, etc.

Protocols should specify who should be notified (a staff member trained in CPR) and an alternative, what equipment must be kept on hand and how it should be used, whether the child should be taken to a clinic, how the victim should be counselled, how the victim's privacy should be protected, and how other learners should be informed, warned or counselled.

Below is a draft protocol for assisting a child who has fallen into a pit.

[67] As just two examples, small-child friendly seats are manufactured by Envirosan (http://envirosan.co.za/products) and Amalooloo (http://www.amalooloo.co.za/products/pedestal-design)

PROTOCOL FOR ASSISTING A CHILD WHO HAS FALLEN INTO A PIT

If a child falls into a pit staff are expected to do everything within their power to rescue the child, even if this places their own health or safety at risk. If the child is not submerged, a ladder can be lowered into the pit (either through the pedestal or through the pit access hatch) to the child. All learners should be trained in the protocol they should follow in the event of a health or safety emergency. They should notify the cleaner to bring rescue equipment and adult assistance and then look for a staff member who is trained in CPR. If the hole is too small, a knotted rope or pole can be lowered down to give the child something to hold on to until access to the pit can be achieved, even if this means knocking a hole in the side of the pit. If the rescued child is conscious, staff should flush his or her mouth, nose, eyes and ears well with water, then prepare warm water and soap and bathe the child well. Once the child is clothed in warm, dry clothes, she should be taken to the clinic. If the child is not conscious, a staff member should clear the sludge from her mouth and nose with his fingers and a trained staff member should begin CPR immediately.

5.3.2 HEALTH: Toilets must be kept clean and provision must be made for learners to practice good hygiene.

Toilets can represent the biggest health threat in the school environment. After learners defecate and wipe themselves they may have small amounts of faeces, too small to be seen, on their hands. This faeces can contain a wide range of diseases, and as learners touch surfaces after using the toilet – the flush handle, door handle, door lock and tap handle – these diseases can be transferred to other surfaces and then to the hands of other learners who touch these surfaces. Diseases on hands can easily end up entering the mouth and potentially causing illness. A clean and hygienic environment and access to the materials for practicing good hygiene are essential at schools.

A trained cleaner should disinfect dermal contact points and clean facilities after breaks and after school

Because of the heavy and sometimes careless use which school toilets experience, diseases may spread quickly between learners while using toilet facilities. It is essential, therefore, that learners' toilets are cleaned after every break and after school. It is important to remember that the primary purpose of cleaning is to remove and destroy germs which could cause diseases from surfaces which are "hot spots'' for disease transmission. These germs are too small to see and so these surfaces may appear clean to the eye but still be heavily contaminated. It is therefore of utmost importance that "hot spots'' are cleaned according to a schedule and protocol and not only when they appear dirty to the cleaner. ***Important hot spots are toilet seats, flush handles, door handles, door locks and tap handles – including outside taps around the school grounds.*** Surfaces which may appear dirtier but are not important routes of disease transmission – such as muddy floors – should also be cleaned but these are a secondary goal of cleaning.

A cleaner who has not been trained in modes of disease transmission and prevention may inadvertently spread disease through incorrect cleaning practices. In addition, a cleaner must be provided with protective equipment to minimise his or her risk of exposure to disease during cleaning.

Effective cleaning requires an agent which helps to physically remove germs and grime from surfaces as well as an agent which kills germs. Any soapy cleaner can be used to physically remove grime but may not be effective in killing germs. Bleach (a product which contain sodium hypochlorite, such as

Jik) is an effective disinfectant but used alone may not remove grime. Some cleaners, such as Domestos, include both kinds of agents in one product.

In the WRC research Jeyes Fluid was found to be the most popular cleaner used. This product, however, comes with serious warnings if it is used in an area without adequate ventilation (as many school toilets are) and may cause drowsiness or dizziness. It should not be handled by pregnant or breastfeeding women. Goggles and rubber gloves should be worn by anyone handling the product as it can cause serious damage to the eyes.[68] Other cleaning products may also contain hazardous components. Products that contain sodium hypochlorite, such as bleach or Jik, can create a poisonous gas if mixed with urine or some other cleaning products[69]. High levels of exposure can cause severe breathing problems, damage the lungs and even cause death. Because of these potential dangers the following guidance should be followed when using cleaning products:

- Flush or rinse toilets before adding Jik/bleach products to the toilet bowl.
- Flush or rinse the toilet after adding Jik/bleach.
- Large volumes of undiluted cleaning products should never be poured into toilet pits, either in an attempt to reduce the odour or for disposal, as their agents could react with the urine in the pit, creating poisonous gases. In addition, these agents will kill the microorganisms which break down sludge in the pit, which can result in pits filling faster.
- The cleaner must always use protective equipment while handling cleaning products.
- Containers with cleaning products must never left in the toilets where learners could access them and potentially harm themselves.

Table 31 gives an example of a cleaning protocol which should be followed every day after each break and after school. Two separate cleaners are used for example and the brand name Jik is used to represent a sodium hypochlorite disinfectant.

Many people do not understand disease transmission and do not practice effective cleaning practices at home. A person who is hired as a cleaner cannot be expected to know and use effective practices without proper training. Training materials for a cleaner are provided in the management handbook “Healthy Toilets are Possible!”, which is a companion to this publication. It is important that the cleaner always uses protective equipment (clothes, boots, gloves and a mask) when cleaning. Cloths, mops, brushes or buckets that are used in the toilets must never be used in any other part of the school.

Incidents of gross contamination should be dealt with before learners are given access to the facilities.

If an area of the toilet block becomes contaminated with faecal material through, for example, a toilet overflowing or someone defecating on the floor, learners should be prevented from entering the area until the problem has been addressed, the contamination removed, and the area disinfected carefully with a disinfectant solution.

[68] http://www.e-hygienesystems.com/coshh/sheets/Jeyes%20Fluid.pdf, accessed 12 April 2016
[69] http://www.doh.wa.gov/YouandYourFamily/HealthyHome/Contaminants/BleachMixingDangers, accessed 12 April 2016

Table 31: Cleaning protocol for school toilets

CLEANING PROTOCOL FOR SCHOOL TOILETS	
CLEANING ROUTINE TO BE FOLLOWED AFTER BREAKS	
Prep	Put on protective equipment. Prepare a bucket of Jik solution by adding 100 ml of Jik to 10 litres of water.
Hot spots	Wipe with a cloth soaked in Jik solution: • Outside taps (e.g. on playground) • Inside taps and basins • Door handles • Door locks or bolts • Flush handles
Toilet seat and rims	Wipe with a cloth soaked in Jik solution AFTER ALL OTHER SURFACES IN ALL BLOCKS HAVE BEEN CLEANED.
Inside pedestal	Scrub inside pedestal or bowl with soapy cleaner and brush.
Floors	Pick up rubbish and put in bins. Sweep with broom. Mop with soapy cleaner.
Finish up	Rinse toilet brushes in the bucket of soapy cleaner. Rinse the cleaning cloth, mop and bucket at a drain and dry in the sun.
CLEANING ROUTINE TO BE FOLLOWED AFTER SCHOOL	
Prep	Put on protective equipment. Prepare a bucket of Jik solution by adding 100 ml of Jik to 10 litres of water.
Grimy areas	Scrub with a scrubbing brush and soapy cleaner then wipe with a cloth: Taps, basins, soap dispensers, toilet seats, pedestal rims, and other areas with grime.
Hot spots and seats	Wipe with Jik solution as after breaks.
Inside pedestal	Flush toilets: Scrub with soapy cleaner and toilet brush and flush. Add 1 cap Jik to the bowl and leave overnight. Dry toilets (if there is a washable pedestal liner): Scrub liner with soapy cleaner and toilet brush. Squirt Jik from a bottle around rim of liner and scrub with toilet brush.
Floors	Pick up rubbish and put in bins. Empty bins. Sweep with broom. Mop using bucket of Jik solution (after hot spots and seats are wiped).
Supplies	Restock soap and toilet paper dispensers.
Finish up	Rinse toilet brushes in the bucket of Jik solution. Make a fresh bucket of Jik solution and leave the mop and cloth to soak overnight. Hang up to dry in the morning.
ADDITIONAL CLEANING TO BE DONE ONCE A WEEK	
Walls	Scrub with cleaning brush and soapy solution wherever they are visibly dirty.
Windows	Wash the windows and sills with a wet cloth at least bi-weekly
Rubbish bins	Scrub bins with Jik solution.

Pits should be desludged before they exceed capacity.

As pits become full the sludge may be piled higher under the pedestals, making the experience of using the toilet increasingly unpleasant, degrading and unhealthy for users. Eventually the toilets will become unusable and learners will have no access to sanitation at school at all. In addition, if rain water stands in the full pit there could be a risk of the pit overflowing, causing long-lasting contamination of the environment around the pits. The sludge level should be monitored through the pedestals and pit desludging should be scheduled in a timely manner.

The integrity of infrastructure should be maintained to prevent pests from spreading diseases.
Sludge attracts flies, cockroaches and even rats. When these pests leave the pit they can carry diseases with them and spread them around the school environment or the surrounding neighbourhood. In addition, snakes can then be attracted to the animals visiting the sludge pile, introducing a safety threat. Access to the sludge by pests can be prevented as follows:

- Keep pits securely covered, with no gaps that could allow pests to enter
- Repair cracks in vent pipes
- Ensure that vent pipes are adequately screened

Learners should be educated in sound hygiene practices.
Without proper education, learners will not understand how diseases are transmitted or how they can protect themselves from diseases. Education should cover:

- How diseases are transmitted
- Disease "hot spots'' in the toilets
- How to use toilet paper correctly and reduce the risk of faeces getting on hands
- Effective handwashing techniques
- Proper use of toilets
- Managing menstruation hygienically
- Safe and effective cleaning of toilets (for use in their homes, not at school)

Schools should provide liquid soap, toilet paper, bins and sanitary pads to learners.
It is essential that learners are able to practice good hygiene practices while at school. While the absence of toilet paper in toilets is a violation of dignity, it can also lead to the spread of disease. When learners do not have access to toilet paper at school some will carry it with them from home while others will wipe themselves with anything that comes to hand, such as pages from their exercise books or chip packets, or they do not wipe themselves at all. The materials used for wiping are thrown into the pit, and if these are non-biodegradeable such as plastic packets they increase the rate at which pits fill and hamper emptying. Toilet paper must therefore be provided to learners, however how and where to provide the toilet paper is a question which the school must work out. The ideal is for the toilet paper to be available in the stalls, dispensed by a multi-roll dispenser which will not run out during the day. However in some schools children will take advantage and hoard the toilet paper or take it home so that the supply is quickly exhausted. If this problem cannot be overcome by educating the children, then alternative options are for toilet paper to be dispensed by the cleaner at the toilets or by a staff member elsewhere.

Effective handwashing is achieved by washing all surfaces of the hands with an anti-bacterial liquid soap that foams well using warm water and drying hands afterwards with a clean cloth. Warm water and paper towels may be far beyond the means of many rural schools, however, and a good handwashing technique aided by soap is adequate. Bar soap shared between users quickly becomes contaminated and can become a source of diseases itself. It is important that schools make liquid soap available to learners.

Towels that are reused can be expected to transfer disease more than prevent them and this should not be practiced. Schools can request learners to bring a small towel from home for drying hands which they hang on a hook with their schoolbag however this should be taken home frequently for washing. It is most likely learners will dry their hands on their uniforms.

It is also important that pads are made available to menstruating girls as some families are unable to afford these and girls may stay home from school during their periods if they do not have access to pads, compromising their education.

5.3.3 DIGNITY AND WELL-BEING: An environment of dignity, respect and comfort must be promoted.

Staff should monitor user behaviour in the toilets to prevent abuse and intimidation

The toilets are often the part of the school grounds that have the least staff supervision. As a result, learners may find they can get away with a wide range of destructive, threatening or careless behaviours that can make other learners afraid to use the toilets or place them in danger if they do. Learners may be afraid to report on others' behaviour.

It is essential that learners of all ages and both boys and girls are able to use the toilets without fear or anxiety. Aggressive behaviour by boys towards other boys should not be ignored as this creates space where some boys may be abused. In fact threatening or intimidating behaviour of any kind is completely unacceptable and it is the responsibility of the school to ensure that it is eliminated. Some of the threatening behaviours that learners experience from others in the toilets include:

- Being prevented from using the toilets.
- Being pressured to smoke or use drugs.
- Being physically threatened or abused.
- Being raped or sexually harassed (including boys being raped by boys, and learners being raped by intruders who have entered the school property).
- Being verbally threatened, insulted or teased.
- Learners violating others' privacy by trying to look over, under or through stall doors or walls (or peer through the collection hatch behind the toilet, in the case of some mobile toilets)
- In the case of mobile toilets, learners may shake or tip the toilet to frighten the user inside.

Vandalism and theft are also serious problems at many schools.

Incorporating the following practices into the management plan for toilets can help to eliminate or reduce these problems.

Monitoring

A greater presence of adults in the toilets can help to reduce threatening behaviour by learners, particularly if they cannot predict when staff will enter the toilets. The Health and Safety Officer should be on duty at the toilet blocks throughout each break time, moving between the blocks to assist learners. In addition, the principal should make it a habit to visit the toilets at break time regularly. Members of the SGB should also check on the toilets. Staff should give special attention to learners who have been causing problems as well as to supporting and protecting learners who have been the target of aggressive or unkind behaviour.

Passive surveillance

Ideally, toilets should be built within sight of the administration block to allow some monitoring of the toilet blocks, and also close enough that a cry for help could be heard by teachers. If this is not the case at a school, every effort should be made to make the toilet area as open and easy

to monitor as possible. The area around the toilets should be open and clear, not providing places where an attacker could hide. The teacher on duty on the playground should be alert when a problematic child or a vulnerable child visit the toilets and investigate if the child does not return to the playground in a reasonable time.

Reporting

The Health and Safety Officer on duty in the toilets during break times must have a clear method for reporting behaviour issues. Issues can be noted on the reporting form and discussed with the Health and Safety Manager on a daily basis who can then report them to the principal.

In addition, there must be a simple and anonymous procedure for learners to report threatening behaviour they have experienced or witnessed. A reporting slip can be made available in classrooms and at the administration block with a box where they can be deposited. Learners must be encouraged frequently to report issues and issues that have been reported should be mentioned at assembly if appropriate, so that learners can see that the school has responded.

Consequences

A learner who has been found to threaten or harm others in the toilets should be disciplined. However -

- Learners must not be required to clean toilets for punishment. A learner who has written on a wall in the toilets may be required to clean the wall, but must not be required to clean toilets and basins as without individual protective gear and proper training their health may be put at risk.
- A learner or group of learners may not be punished by being denied access to the toilet facilities.
- A group of learners may not be punished for an act committed by only some of the group.

Schools should ensure conditions in the toilets support dignity, privacy and comfort.

The psychological needs of learners must be considered in the toilets. Apart from the violations of health and safety that occur when sanitation fails, broken, filthy and smelly toilets are degrading to learners and are an affront to their dignity. This can compromise learners' sense of well-being at school. If learners dread using the toilets they will feel anxious which will impact their ability to concentrate, or they may avoid using the toilets completely. Feeling that their bodies are not treated with dignity when they use the toilet may impact self-esteem. Degrading conditions can lead to degrading behavior, where learners urinate or defecate on the floor or behave in a disrespectful way to each other. Destructive, threatening or careless behaviour may be motivated in part by learners feeling disrespected by degrading conditions in the toilets. Some behaviour may be an expression of anger towards the school.

Doors must be kept in working order along with their handles and locks to ensure adequate privacy.

Ensuring that there is adequate ventilation in terms of windows and functional vent pipes and whirly birds will help to reduce unpleasant smells, as will regular and effective cleaning.

Broken toilet seats and taps must be promptly replaced. If there are issues with theft and vandalism, these must be managed rather than leaving infrastructure unrepaired.

The school should make every effort to make the conditions in the toilets as comfortable as possible. While most schools will not have the budget to make major alterations to improve the atmosphere in the toilets, a new coat of paint on the walls, doors or floor could boost learners' sense that the school cares for their needs and could help them to feel comfortable and respected in the toilets. Or learners could be asked to create designs to paint on the walls or doors. This would also help to build a sense of ownership, which should pay off in terms of learners taking better care of the toilets, reducing the cleaning burden and the costs of maintenance.

Staff should consider learners' experience, opinions and ideas in their management of toilets.
While using the toilet is an important part of each learner's school day, it is also the only activity which is not actively observed by staff. Staff should not assume, therefore, that they know what goes on in this "hidden'' part of school life, that they understand learners' needs in the toilets, or that because learners do not articulate needs that all is well in the toilets. The private nature of using the toilet, which can be compounded by cultural taboos, as well as social and power dynamics may make it extremely difficult for learners to tell their teachers about the problems they experience in the toilets. It is vital, therefore, that staff actively solicit learners' views and opinions about the toilets and create a safe environment for them to express problems, needs or ideas. Learners, as the "experts'' on their own experiences and needs, should be consulted regarding sanitation problem solving and design; they may be best positioned to come up with ideas and solutions that could be acceptable to learners and best meet their needs.

5.3.4 ASSISTING LEARNERS WITH SPECIAL NEEDS

Young learners and learners with special needs or with characteristics that may make them the target of teasing, harassment or humiliation, are particularly vulnerable when using the toilets and may try to avoid using the toilets if they find the experience distressing. In addition, some of the conditions in the toilets may pose a risk to some learners.

Young children must be protected, coached and helped as needed.
Difficulties young learners may face include:

- The toilet seat is too big and they are in danger of falling through and into the pit.
- The toilet is too high and they can't get onto it by themselves.
- The learner is not able to manage toileting independently (e.g. cannot do up the fly and button by himself)
- Basins are too high.
- Door locks are difficult to operate.
- Older learners threaten them in the toilets.
- Learners are afraid of dark conditions, insects or other pests.
- Older learners push ahead and don't give younger learners the opportunity to use the toilets.

The following kinds of support could be provided:

i) Class teachers can take the entire class to the toilet ten minutes before break or before the end of school. Teachers can assist learners in using toilets that are too big for them, by lifting them on to the seat, placing a step for them, or holding their hand.
ii) Teachers can teach learners good hygiene practices and model these in the toilets.

iii) Small learners can be accompanied by the Health and Hygiene Officer when going to the toilet during class time.
iv) Learners must be protected from bullying by older learners.
v) Vulnerable learners must be given extra support to ensure their safety and psychological wellbeing in the toilets and to ensure that they don't avoid using the toilets.

Girls must be given the support they need for their dignity, privacy and health to be protected during their periods.

Treating menstruation as a taboo subject places an enormous burden on girls. They are expected to manage a part of their life, which may be confusing and difficult, in complete secrecy while trying to go about their school day. It is vital that principals and staff handle menstruation with an open, accepting and respectful attitude, communicating to girls and boys alike that it is a normal and natural part of school life and that girls are free to discuss their needs and are entitled to support from everyone.

Apart from the cramps and psychological discomfort which go along with menstruation, girls can face a number of problems around menstruation at school. These include:

- Having not been told about menstruation by the time their period begins and believing they are seriously ill or dying when their period starts.
- Periods starting unexpectedly during the school day, resulting in blood showing on their uniform.
- Needing to change their pad during class and being refused to "go to the toilet" by the teacher.
- Teasing or gossiping by other learners.
- Not having access to pads at home and being afraid rags will fall out of their underwear while at school or that they will bleed through onto their school dress.
- There being no toilet paper to wrap used pads or bins in which to dispose of them.
- Falling behind with school because of missing school due to the above reasons.

Girls can be supported in the following ways:

Education. Schools should handle education about menstruation in an open and respectful way with both boys and girls, giving them accurate information about this important aspect of girls' experience and allowing them to ask questions in a confidential environment. Learners should be taught how to support girls who are menstruating, both in terms of respecting their privacy and of offering support. Education for girls should include the safe use and disposal of pads, tampons and menstrual cups, and signs of infection they should watch for. They should understand that cramps are a normal part of menstruation and they do not need to go to the clinic unless they have unusual symptoms.

Support. Any girl who asks to use the toilet during class should be allowed to do so. If a learner appears to be excusing herself frequently or for long periods of time the teacher should investigate and may also tell the girl to report to the Health and Safety Officer who will accompany her to the toilet during class. Girls experiencing cramps can be offered paracetamol and the opportunity to lie down in the sickroom until the medicine has taken effect. The health and safety manager should

communicate with the parents of any child who seems to be experiencing unusual difficulty around menstruation.

School attendance. If a child reports that paracetamol has not alleviated her cramps, she can be allowed to go home from school. Teachers should be instructed to be observant about patterns in learner absence, and if a teacher suspects that a learner is missing school regularly due to her periods, the teacher or the Health and Safety Manager should speak to the child privately to find out what the problem is. The school should make every effort to resolve the problem in order to enable the child to attend school.

Provision of pads. Girls' families may not be able to afford pads. If they use folded up cloths these may not be effective and blood may leak through, the cloth could also fall out of their underwear, particularly if their school uniform is a dress, causing them enormous embarrassment. For this reason, it is essential that schools provide pads to girls. This needs to be done discretely. Pads could be kept by the Health and Safety Officer and given on request to girls. Some schools have embarked on programmes where girls sew their own reusable pads at school[70]. It is important that girls also have access to toilet paper to wrap the pads and bins for disposal. Providing a long mirror in the girls' toilet will also allow girls to check their uniform, alleviating anxiety about spotting.

Uniforms. Girls may be very anxious about the possibility of blood spotting on their uniform. This can be intensified if the uniform is light in colour. It would be very helpful if the dress code for all schools allowed girls the option of wearing pants as part of their school uniform if they feel more comfortable. If dark coloured pants were allowed as an alternative part of the uniform it may alleviate girls' anxiety tremendously. Alternatively and as an interim measure, the dress code could be expanded to allow girls to wear uniform tracksuit pants under their dresses. This can benefit girls in other ways, for example giving them greater freedom to play and climb on the jungle gym without concern for their modesty. This should be at girls' discretion so that it does not become an obvious sign that a girl is menstruating. Schools should consider this aspect of girls' wellbeing when selecting a school uniform. The school should keep some uniforms of different sizes (for example from the lost and found property) as well as some clean underwear available so that girls can discretely ask the Health and Safety Officer for a change of clothes. Girls should have an option to wash their uniform and underwear discretely at a utility sink if possible and be allowed to hang it to dry, possibly in the cleaner's storeroom.

In summary the following is recommended:

Table 32: Guideline for supporting girls during menstruation

GUIDELINE FOR SUPPORTING GIRLS DURING MENSTRUATION
Establish a culture of openness and support at the school around menstruation.
Provide accurate education to boys and girls and give them opportunities to ask questions.
Provide pads discretely to girls as well as toilet paper and bins.
Keep extra uniforms and clean underwear available in case a girl spots on her underwear.
Expand the dress code to allow girls to wear dark pants or tracksuit pants when or if they choose to.
Provide a long mirror in the girls' toilet so that girls can check their uniforms.
Provide paracetamol to girls experiencing cramps and allow them to lie down.
Provide a private space for girls to wash should they feel the need to.
Monitor absences and investigate absences that appear to be linked to periods.

[70] UNICEF: Menstrual hygiene management in Malawian schools. http://www.unicef.org/wash/schools/files/Malawi_MHM_Conf.pdf Accessed 15 March 2016.

Children with disabilities must be supported to use the toilet as independently as possible but with any assistance that is needed.

Children with physical disabilities can be found in most communities. They have a right to attend the public school in their community, but frequently they are bussed to special schools instead. Attending a special school may provide a child with more individual attention which can be beneficial, but it can also result in them spending long amounts of time being transported every day and losing out on the experience of being among their peers from their neighbourhood at school. Traditionally, public schools were not always equipped to enable learners with some physical disabilities to access all of the areas of the school easily. Toilets were a particular problem. While the law now requires all new school toilets to be built with handicapped-accessible toilets, many older schools still do not have these facilities. And those who do, as described in Section 1.2.6, usually don't have a learner with a disability to use them. In addition, the range of potential physical disabilities is so great that no one design can foresee all possible needs. In addition as discussed in Section 2.1, physical limitations can be experienced by almost everyone at various times in their lives. Small children may lack the strength to open taps. A child with a broken leg may need special assistance during recovery. All of these children have a right to continue going to school with the school providing the additional support that they need. In order to accommodate the range of abilities and limitations found among children in the school community, the following is recommended:

- The school should be proactive in sending the message to the community that learners with particular challenges have a right to attend the school and that every effort will be made to meet their needs.
- A learner's needs in terms of sanitation should be assessed with the assistance of his or her family, to determine what infrastructure adaptations and support will enable his or her to use the toilet with the greatest possible degree of safety and independence. Adaptations could range from a ramp if steps are too difficult, a guide rail, support bars for sitting down on to the toilet and standing up, a guide rope to the toilet for a visually impaired child, or foot, knee or elbow attachments for operating taps.
- To finance these adaptations, the school should liaise with the Department. The school may also have success in requesting a private business to sponsor the necessary adaptations for the child.
- If is not possible to adapt the toilet block to the learners' needs, and the Department is not able to build a universal access toilet soon enough, the learner should be allowed to use the staff toilets, if these can accommodate her.
- Any child with a special need is also entitled to assistance from staff as needed. The class teacher, Health and Safety Manager and Health and Safety Officer could rotate assisting the child to use the toilet.

Children who are vulnerable to abuse must be protected and supported.

Learners must be made aware that the Health and Safety Officer is on duty and is available to help them or be present in the toilets when they use them. The Health and Safety Officer should also look out for children who are vulnerable and look for ways to support them that will not draw additional teasing or bullying.

5.4 ESTABLISHING A SANITATION TEAM

The Department of Education, the school principal and the School Governing Body share responsibility to ensure that school toilets are managed effectively. When principals are expected to manage sanitation on their own it frequently fails and learners' rights are violated.

Structures need to be set up within the DBE and DoES at all levels – national, provincial, district and circuit -- to ensure that the health, safety and dignity of learners are protected while they are at school – and particularly in the toilets, where learners are most vulnerable and their rights can be most under threat. These departmental personnel should be tasked with developing standards, protocols, management tools, reporting systems and hygiene educational materials for schools, as well as for training managers, addressing major maintenance issues, inspecting toilets and enforcing standards.

Under the Occupational Health and Safety Act 85 of 1993 the health and safety of teachers (as employees) and learners (as individuals present in a workplace) must be protected. A Health and Safety Officer is required to be appointed in every work place. It is the responsibility of the Department of Education to ensure that each school has a designated Health and Safety Officer (the most logical person for this role would be the school cleaner, as no other staff member would be able to focus as much time and attention on these priorities)[71]. A Health and Safety Manager role and responsibility is also defined in the OSHA Act. This role is needed both in a daily supervisory function at the school – a function which could be assigned to an educator – and in an oversight role at the circuit level, where a dedicated position should be created with responsibility for training, supervision, monitoring and reporting for a cluster of schools. These posts could be funded jointly by the Department of Basic Education, the Department of Health and the Department of Water and Sanitation.

The School Governing Body must play an active role in supporting the sanitation team. In addition, the role of learners in sanitation must be clear. It is a violation of learners' rights to place their health in jeopardy by requiring them to clean the toilets. Their participation in caring for their toilets when they use them and giving staff feedback about needs and issues is important, however.

In addition, the National Sanitation Task Team should bring together government and civil society to provide input from experts in relevant disciplines.

Table 33 identifies key players and their roles.

[71] The school's cleaner is typically the staff member with the lowest income and the lowest status. Some schools do not have a cleaner at all, and many do not have a full time cleaner. Some school cleaners only clean the classrooms and offices and never set foot in the learners' toilets. However, given the critical importance of health and hygiene in the school environment, particularly in the learners' toilets, a full time cleaner should be seen as a priority for any school. While most schools' finances are inadequate to cover all their needs, if health, safety and hygiene were more highly valued in the school environment then this need would enjoy a higher priority in school budgets. It would be a great help to the poorest schools if the position of school cleaner could be included in a national job creation programme such as the Expanded Public Works Programme. Apart from the remuneration and affordability question, the status of cleaners would be enhanced if they were to be officially designated the schools' Health and Safety Officers.

Table 33: Members of the sanitation team and their roles

MEMBERS OF THE SANITATION TEAM AND ROLES	
Department/circuit Health and Safety Manager	Trains administrators and educators in learner rights and the importance of sanitation in meeting these rights. Provides administrative tools to Health and Safety Officers and Managers Monitors school management of toilets and infrastructure conditions. Responds to infrastructure needs; respond immediately to safety threats. Disciplines staff in the case of negligence.
Principal	Promotes health and hygiene at the school Addresses threatening or destructive behaviour in the toilets Reports routinely to SGB and Dept. Ensures learners are restricted from using infrastructure which poses a safety or health threat (e.g. collapsing slabs or overflowed toilet) and that threats are resolved without delay
SGB	Takes care of minor repairs Holds principal and Health and Safety Officer accountable Reports to and liaises with Department re: infrastructure needs and major repairs Liaises with local government and private sector for resources and services.
School Health and Safety Manager (staff member)	Trains and supervises Health and Safety Officer Reports monthly to principal Reports repair needs weekly to SGB rep Liaises with the department for management tools Promotes health and hygiene education in the school With principal and SGB, develops new interventions to respond to learner needs that arise Ensures cleaning supplies, hygiene supplies and protective equipment for cleaner are stocked.
Health and Safety Officer	Monitors and supports learners in toilets during breaks. Assists learners with special needs in using toilets and basins. Cleans learner toilets after each break and after school with attention to dermal contact points. Cleans staff toilets daily. Reports learner behaviour and infrastructure needs to Health and Safety Manager.
Learners	Report sanitation concerns Participate in design and problem solving Participate in care, beautification of toilets Participate in health and hygiene education Participate in building networks for more resources

These roles are discussed in greater detail below.

Department

Within the department, staff on the national, provincial, district and circuit levels should be tasked specifically with supporting schools in the management of sanitation. These departmental players are needed to provide training and administrative tools to schools, to provide clear communication channels between schools and the department for addressing issues, to monitor that schools are successfully managing sanitation and to take action if schools are not. At the circuit level, Health and Hygiene Managers should work directly with school-level Health and Safety Managers at clusters of schools.

Principal

At the school level, the principal is ultimately responsible for ensuring that sanitation is managed effectively. While day to day management should be delegated to others, the principal should play a vital role in raising the status of the toilets at the school, dealing with threats and crises, promoting

the status of the Health and Safety Officer, reinforcing health and hygiene information, and addressing behaviour issues and needs.

School Governing Body

The SGB monitors that the sanitation programme is running effectively and intervenes if any other member of the team is not playing its role effectively. It handles maintenance needs reported by the Health and Safety Manager, approves the budget for the programme and also works to increase the resource base of the school for sanitation. It liaises with the department and with local government for services.

School level Health and Safety Manager

A staff member at the school should be appointed as Health and Safety Manager to drive the management of the toilets. This person is responsible for training and supervising the Health and Safety Officer who implements the programme on a day by day basis and ensures that cleaning and hygiene materials are stocked. He or she inspects cleaning daily and liaises with the Health and Safety Officer. She does a careful inspection of the infrastructure once a week and promptly addresses maintenance issues with the SGB. If there is a safety issue she ensures that no user uses the part of the toilets that is unsafe until it is repaired. She promotes health and hygiene education in the school and works with learners to address their needs and build their ownership of the toilets. She liaises with the circuit level Health and Safety Manager for health and hygiene educational materials and administrative tools, and reviews the programme monthly with the principal.

Health and Safety Officer

The Health and Safety Officer is responsible for monitoring and assisting learners in the toilets during break, cleaning the toilets, reporting health, safety and behavioural issues and needs, and modelling and teaching good practices to learners. The Health and Safety Officer is especially trained to ensure "hot spots" where disease could be spread are carefully sanitised during cleaning. She also makes sure that there is always toilet paper and liquid soap available and that girls have access to pads. She checks to make sure the toilets are safe and addresses any behaviour problems. She is always available to help anyone who needs help using the toilet, has had an accident or has any other problem. She monitors user behaviour and reports threatening or destructive behaviour. She teaches the learners how to take care of their bodies and keep themselves safe from diseases. She encourages learners to share their ideas or problems with her and addresses these with the Health and Safety Manager to try to make the toilets better[72].

Learners

The learners themselves, as the "clients'' of the school sanitation programme, should be considered an integral part of the team. Learners should be included in a consultative process if new facilities are being designed and to problem-solve issues that arise with sanitation. They can also be involved by integrating sanitation into content areas of their work. This will help to restore sanitation to a central place, to reinforce hygiene knowledge and to build ownership. For example: learners could be involved in writing letters to businesses seeking sponsorship for renovations or for hygiene supplies; learners could assist with the beautification of the toilets through painting or murals; and learners could develop drama pieces dealing with health and hygiene issues. Running a competition

[72] The Health and Safety Officer would typically be the school's cleaner and may have other duties in addition to those set out here.

annually could also promote the status of sanitation. Learners should not be given duties with regard to the toilets that could compromise their health or their time in the classroom. It is a violation of their rights to require them to clean contaminated areas of the toilets, as this can only be done safely with proper equipment and training, but they can be involved with tasks such as cleaning windows, walls and painting.

The relationship between the different players on the sanitation team can be modelled as follows:

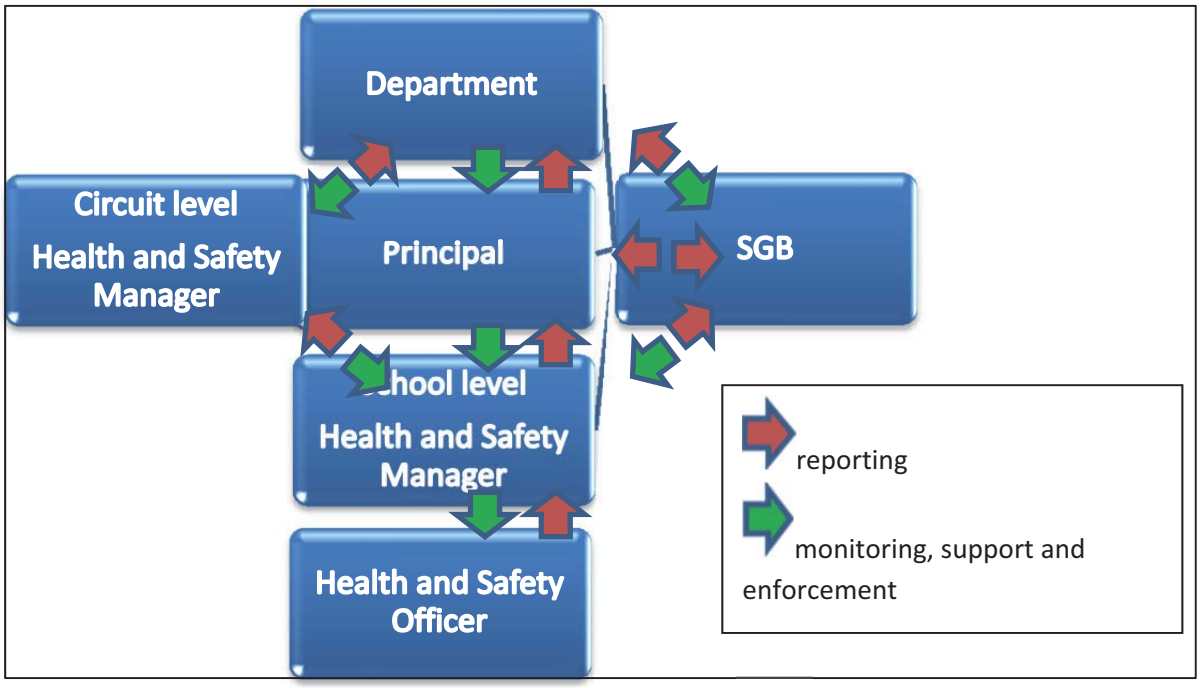


Figure 34: Model of relationships within sanitation management team

5.5 ACTION PLAN AND TOOLS

Having identified the key business of a sanitation programme and the team members who will manage it, it is important to develop a detailed plan for carrying it out.

The standard provided in Section 5.3 can be implemented through 5 key activities, as shown in Figure 35.

Figure 35: The key elements in an action plan for managing school toilets

5.5.1 Activities and responsibilities

These activities are detailed in Table 34 with the responsible team member and frequency indicated.

Table 34: Activities and responsibilities for management of toilets

SANITATION MANAGEMENT ACTIVITIES AND RESPONSIBILITIES		
Keep infrastructure safe and in good repair	**By who?**	**How often?**
Provide safety standards and inspection checklists	Department	Annually
Inspect infrastructure; address management challenges and negligence	Department	Quarterly
Watch out for problems during cleaning, report safety issues immediately	H&S Officer	Daily
Inspect infrastructure	H&S Manager	Weekly
Report maintenance issues to principal and **SGB**	H&S Manager	Weekly
Restrict access to unsafe infrastructure	H&S Manager	As needed
Report significant maintenance needs to Department; report safety issues immediately	Principal SGB	As needed As needed
Carry out small repairs	Principal, SGB	Quarterly
Inspect infrastructure; address poor management, report issues to SGB		
Clean facilities and promote hygiene		
Provide cleaning protocols and checklists and health and hygiene materials	Department	Annually
Inspect cleaning; address management challenges and negligence	Department	Quarterly
Clean facilities and disinfect "hot spots" after each break and after school	H&S Officer	3x daily
Provide hygiene supplies to learners and staff	H&S Manager	Ongoing
Teach learners effective hygiene practices	H&S Officer	As needed
Report incidents of gross contamination to Health and Safety Manager; disinfect	H&S Officer	As needed
Restrict access to contaminated areas until disinfected	H&S Officer	Quarterly
Monitor cleaning	H&S Manager	Daily
Manage stock for hygiene supplies, cleaning supplies and protective equipment	H&S Manager	Ongoing
Promote hygiene and care of toilets	Principal	Quarterly
Inspect cleaning practices; address poor management	Principal	Monthly
Prevent threatening and destructive behaviour		
Give clear direction to learners re vandalism, theft, bullying and abuse	Principal	Ongoing
Discipline learners participating in vandalism, theft, bullying or abuse	Principal	Ongoing
Maximise safety of school grounds (no access to trespassers, no long grass)	H&S Manager	Ongoing
Be present in toilets during break, address behaviour issues and report to HSM	H&S Officer	Daily
Support and assist vulnerable learners		
Assist and support vulnerable learners when using the toilet	H&S Officer	Daily
Accompany Grades R-3 to the toilet if toilets are not safe for them	Teachers	Daily
Ensure adaptations are in place as needed for learners with physical challenges	HSM/SGB	As needed
Modify stalls for young learners if necessary	HSM/SGB	As needed
Promote dignity, respect and comfort		
Ensure facilities provide privacy (doors are present and can be bolted from the inside**, no cracks or holes)**	HSM/SGB	Weekly
Reduce sight and smell of sludge by timely desludging, adequate ventilation	HSM/SGB	Ongoing
Invest in small interventions and engage learners to beautify toilets	Staff	Annually
Staff inspect **learner facilities occasionally**	Staff	Ad-hoc
Engage learners re needs and ideas re toilets	Staff	Ongoing

5.5.2 An implementation plan

Table 34 can be rearranged according to the frequency of the action required.

Table 35: Implementation plan for sanitation management

SANITATION MANAGEMENT IMPLEMENTATION PLAN	
Launch / annual	**By who?**
Provide tools and training for standards, inspections, reporting and education.	Department
Ensure adaptations are in place as needed for learners with physical challenges	H&S Manager, SGB, Dept.
Modify stalls for young learners if necessary	H&S Manager, SGB, Dept.
Explain management program, correct use of toilets, rights and responsibilities, safety issues and behaviour expectation to learners and staff	H&S Manager
Present Health and Safety Officer as authority figure to learners	Principal
Demonstrate correct use of toilets and effective hygiene practices to learners	Health and Safety Officer
Daily cleaning and support	
Clean facilities and disinfect "hot spots" after each break and after school	H&S Officer
Keep watch for safety issues and report immediately if observed	H&S Officer
Provide hygiene supplies to learners and staff	H&S Manager, H&S Officer
Be present in toilets during break: address behaviour issues and report to HSM, teach learners effective hygiene practices, assist and support vulnerable learners when using the toilet	H&S Officer
Accompany Grades R-3 to the toilet if toilets are not safe for them	Staff
Monitor cleaning	H&S Manager
Weekly	
Inspect infrastructure and report maintenance issues to Principal and SGB	H&S Manager
Report significant maintenance needs to Dept.; report safety issues immediately	Principal and SGB
Carry out small repairs	SGB
Communicate with Principal and SGB re needs and maintenance	Department
Monthly	
Manage stock for hygiene supplies, cleaning supplies and protective equipment	H&S Manager
Report to principal on status and issues with regard to school sanitation	H&S Manager
Inspect infrastructure and cleaning; address management challenges and negligence	Principal
Promote hygiene and care of toilets. Inspect infrastructure and cleaning	Principal
Quarterly	
Inspect infrastructure; address management challenges and negligence	SGB and Department
Ongoing	
Give clear direction to learners re vandalism, theft, bullying and abuse	Principal/HSM/HSO
Discipline learners participating in vandalism, theft, bullying or abuse	Principal
Maximise safety of school grounds (no access to trespassers, no long grass)	H&S Manager / SGB
Invest in small interventions and engage learners to beautify toilets	H&S Manager / SGB
Staff inspect learner facilities occasionally	H&S Manager / Staff
Engage learners re needs and ideas re toilets	Principal / staff
Advocate to local government for needs (e.g. water)	SGB
Build relationships with businesses and the community for sponsorship of renovations and supplies	SGB
As needed	
Report incidents of gross contamination to Health and Safety Manager; disinfect	H&S Officer
Restrict access to unsafe or contaminated areas until disinfected	H&S Manager
Reduce sight and smell of sludge by timely desludging, adequate ventilation	H&S Manager / SGB

5.5.3 Administrative tools

In order to manage toilets effectively, schools will need a package of administrative tools and resources. To ensure consistency, and given that rural schools often have limited capacity and principals may not have the expertise to develop these tools, the Department should provide tools that are ready to use but can be customised to the circumstances of each individual school and developed further by schools with the capacity to do so. The tools and resources that are needed are as follows:

Table 36: Administrative tools and resources needed for managing sanitation

ADMINISTRATIVE TOOLS AND RESOURCES NEEDED FOR MANAGING SANITATION
Roles of management team and rights and responsibilities of each member
Management plan (tasks to be done at what intervals and by whom)
Budget model and worksheet
Training materials for Health and Safety Manager
Cleaning protocol
Cleaning checklist
Inspection checklist
Reporting forms (Sanitation manager to SGB, SGB to DoE, learner to school) and procedures
Learner rights poster for toilets
Health and hygiene educational materials

Templates for some of these tools to be used internally at the school are provided in the companion WRC publication, the management handbook “Healthy Toilets are Possible!”.

5.6 FUNDING SANITATION MANAGEMENT

When the Department builds toilets and then expects schools that do not have adequate capacity to manage them successfully, sanitation often fails. The Department should ensure that each school has the means to adequately manage sanitation. This involves not only training but also ensuring that schools have adequate funds to provide ongoing sanitation. Funds are needed to carry out the minor repairs that are not handled by the Department, to hire a Health and Safety Officer and to provide health and safety equipment, cleaning materials and hygiene materials. Some principals report that the department does not provide them with adequate funds to hire a cleaner or buy health and hygiene materials. The Department, in turn, states that principals and SGBs are expected to allocate a portion of the funds which they receive from the department each year towards sanitation management. However without proper training and clear directives regarding the importance of sanitation, many principals feel they cannot justify allocating school funds for sanitation when there are other urgent needs to be met.

Funding a Health and Safety Officer post at each school – a requirement of the Occupational Health and Safety Act – could possibly be done through the Community Public Works programme as a job creation initiative, or through joint funding by the Department of Basic Education, the Department of Health and the Department of Water and Sanitation. Ideally funds should be ring-fenced for the officer’s salary, cleaning and hygiene materials, and minor repairs.

Other initiatives could be spearheaded by the School Governing Body to increase the funds and resources available for sanitation. Some schools have successfully engaged local businesses to fund specific projects, cleaning supplies or hygiene materials as part of their social responsibility commitment. Members of the SGB or parent body could be tasked with this liaison; learners could also participate in initiatives by writing letters to local businesses. In addition, a list of parents with relevant skills could be drawn up who could be asked assist with repairs and maintenance at a reduced cost from time to time.

A model budget and worksheet are provided in the companion publication to these guidelines, the management handbook "Healthy Toilets are Possible!" A costing sheet for the cleaning programme expenses is also provided which can be fed into the budget model. It is important that long term and cyclical costs, such as pit management, are budgeted for proactively.

5.7 MAKING A FRESH START

When toilets have been in a failed state at a school for some time, it can be difficult to get things moving in the right direction again. Efforts on the part of staff can be met with indifference by learners who continue to disrespect the toilets or may steal materials that have now begun to be provided – such as toilet paper – or vandalise new fixtures. This section contains guidance on helping everyone at the school – staff, learners, parents and the SGB – to make a paradigm shift to positive and successful sanitation.

5.7.1 Restoring the dignity of learners

Using the toilet is a necessary and private activity that places one in a vulnerable and exposed position. When children are forced to do this in an environment that is dangerous, filthy, dark, frightening and smelly, where they do not have access to the basic materials needed to take care of their body cleanly and possibly where they are threatened, ridiculed or denied privacy by other learners, their right to dignity is violated. This can contribute to mistreatment of the toilets by children, disrespectful behaviour to others, and can impact the academic or social life of children negatively.

It is vital that the school send a strong message to learners about what their rights are and that the school is making every effort to respect their rights. This can be done by:

- Teaching learners what the law says about their rights, in assembly or in the classroom, and showing them how this applies to sanitation.
- Teaching learners that their bodies deserve to be treated with respect and that the school will support them in taking care of their bodies' needs in a clean, safe and comfortable environment. In this context education about disease transmission, prevention and good hygiene practices, as well as proper use of the toilets, can be given. In this context it is important for the school to model a respectful and supportive attitude towards menstruation by discussing it frankly with both boys and girls as a normal and healthy part of school life and letting learners know that they are free to express their needs in this area.

- Explaining the new programme to learners in detail and how each aspect is designed to uphold their rights. Learners should know that they have a right to decent sanitation and that if something goes amiss with the programme they are entitled and expected to let staff know that there is a problem.
- Engaging learners about how they feel their dignity is supported or violated in the school environment, and genuinely seeking to understand their experience and learn from them. Letting them know they are partners in the programme will boost a sense of ownership which will help to curb destructive or careless behaviour.

5.7.2 Giving sanitation status

In many rural schools sanitation is the "Cinderella'' of infrastructure – the part of the school that is often hidden away and which staff would be all too happy to never have to see or think about. Learners, who are forced to use forgotten and degraded toilets, see this attitude taken by staff towards their facilities day after day. Toilets in well-resourced schools, however, are often conveniently located in the same block as the classrooms. They have status as an important and integral part of school infrastructure. If sanitation has been placed far from the rest of the school infrastructure, staff will have to make a greater effort to make it "visible'' as a respected part of the school environment.

Staff can raise the status of the toilets in the following ways:

- Make learners aware that the Health and Safety Officer is more than a cleaner; she has a position of authority as she is responsible for teaching and modelling correct use of the toilets and good hygiene practices, monitoring infrastructure and addressing behaviour in the toilets. The Health and Safety Officer can be empowered in this role by regularly being given a platform at school assemblies to addressing problems identified in the toilets, praising learners for improved behaviour in the toilets or providing education on effective hygiene practices at assemblies.
- The principal too should make a habit of mentioning the toilets in assembly, in terms both of issues that need to be addressed and also praising learners for a week of clean toilets or a month with no vandalism. This lets learners know that the toilets are visible to staff and that they consider them an important part of school infrastructure. The principal should be seen visiting the toilets often so learners know that they are important to him or her.
- Some schools have found a business partner willing to donate materials to do a makeover of a dilapidated toilet block. Tiling the floors, painting, or adding mirrors to the toilets demonstrates to learners that the toilets are important infrastructure which should be cared for. This approach has been reported to be instrumental in turning around destructive behaviour in the toilets in some schools.
- Integrate sanitation and hygiene into the school curriculum. Art classes could paint a mural on the toilet wall, a drama class could create a performance piece about good hygiene or respecting the toilets to be performed in assembly. Classes could put together a report and proposal for a local business for sponsorship of something they need in the toilets.

5.7.3 Demonstrate servant leadership

A key problem undermining successful sanitation is the view held by some principals and staff that their position is above having to manage toilets or deal with learners' sanitation needs. In some schools they have been reported to keep the best toilets for themselves while vulnerable young learners are forced to put their lives in danger using dangerous toilets. Learners who have been degraded in this way need a strong message that the school exists for them and the role of the staff is to protect, nurture and develop them.

Educators need to understand that legally they have the responsibility of parents towards the children in their care during the school day. This means that they are required to care for learners' physical and psychological wellbeing around using the toilet with a willing and compassionate attitude and should give higher priority to meeting the sanitation needs of learners than to meeting their own. Some of the ways educators should demonstrate this:

- Educators should facilitate discussions and role plays with learners about taking a supportive role with a vulnerable learner; this could include a small child, a learner with a physical challenge, a learner who has had an accident and a girl who is having her period. Allow learners to articulate what they think the needs and feelings of that person would be and what support would be needed.
- In some schools, educators come to the toilets with their class and are the last one to use the toilets. This demonstrates their commitment to knowing what their learners experience and addressing the issues they face.
- Principals should visit and be seen to visit the toilets frequently to check the condition, ask learners if they are experiencing any problems, and model good handwashing techniques.
- If learners' toilets become temporarily unusable (for example pits are full, slabs are at risk of collapsing, or toilets have overflowed and floors are contaminated) they should allow learners to use the staff toilets.
- If young children are required to use adult size pit toilets and there is a risk that they could fall in, teachers of younger grades should accompany their class to the toilets and assist learners to ensure their safety, or else let them use staff flush toilets, if they are available, until toilets appropriate for their size can be provided.

5.7.4 Launch the new management programme with a celebration

The companion publication to these guidelines, the management handbook "Healthy Toilets are Possible!", provides ideas for activities around launching a new management programme in order to help everyone at the school make a fresh start with the toilets and cultivate a sense of ownership. These include:

- Staff and learners working together to clean and renovate the toilets.
- Beautifying the toilets.
- Involving the learners in equipping the toilets with supplies.
- Having learners and staff take a pledge to care for the toilets.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