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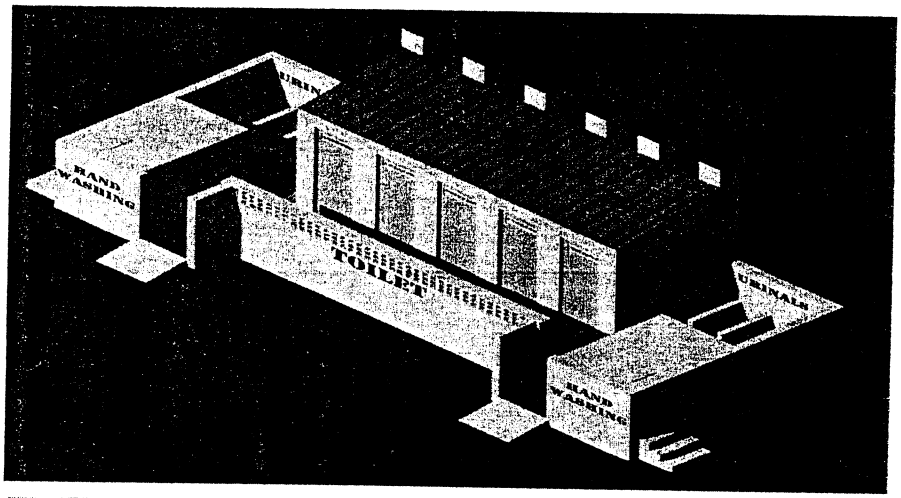
TECHNICAL GUIDE FOR CONSTRUCTION OF SCHOOL SANITATION FACILITIES IN NIGERIA



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ACRONYMS

A-VIP	-	Alternating – Ventilated Improved Pit
BOQ	-	Bill of Quantity
CASSAD	-	Centre for African Settlement Studies and Development
CBO	-	Community Based Organization
CIS	-	Corrugated Iron Sheet
CSO	-	Civil Society Organization
CtC	-	Child to Child
DFID	-	Department for International Development
EHC	-	Environmental Health Club
EHO	-	Environmental Health Officer
ETF	-	Education Trust Fund
EU	-	European Union
FCR	-	Fibre Concrete Roof
FGN	-	Federal Government of Nigeria
FME	-	Federal Ministry of Education
FRESH	-	Focusing Resources on Effective School Health
GIT	-	Gastro-Intestinal Tract
GPS	-	Global Positioning System
HIV/AIDS	-	Human Immuno-Deficiency Virus
IDPs	-	International Development Partners
IMR	-	Infant Mortality Rate
LG	-	Local Government
LGA	-	Local Government Authority
LGEA	-	Local Government Education Authority
MDG	-	Millennium Development Goal
MOU	-	Memorandum of Understanding
NEEDS	-	National Economic Empowerment and Development Strategy
NGO	-	Non-Governmental Organization
O&M	-	Operation and Maintenance
PRCS	-	Precast Reinforced Concrete Slabs
PTA	-	Parents Teachers Association
PVC	-	Poly Vinyl Chloride
RUWASSA	-	Rural Water Supply and Sanitation Agency
RUWESA	-	Rural Water Environmental Sanitation Agency
SBMC	-	School Based Management Committee
SSHE	-	School Sanitation and Hygiene Education
SUBEB	-	State Universal Basic Education Board
ToT	-	Training of Trainers
TPL	-	Traditional Pit Latrine
UBEC	-	Universal Basic Education Commission
UNESCO	-	United Nations Educational Scientific and Cultural Organization
UNICEF	-	United Nations Children's Fund
VIP	-	Ventilated Improved Pit
WASH	-	Water, Sanitation and Hygiene
WATSAN	-	Water and Sanitation
WES	-	Water and Environmental Sanitation
WHO	-	World Health Organization

FOREWORD

Nigeria is still way behind in the journey to achieve the Millennium Development Goals (MDGs) target, set for 2015 by the world body, the United Nations. This is particularly so of water, sanitation and health, on which the others hang, and more so of schools, most of which lack basic sanitation facilities. The scourge of water and sanitation related diseases, high mortality and morbidity has, therefore, and understandably so, remained unabated, indeed worsening, in parts of the country, both urban and rural.

The need for serious intervention can therefore not be underestimated, more so when several have been undertaken in the past with minimum impact, largely owing to lack of properly conceived integrated approach. The various interventions, especially in the area of school sanitation, have been largely sectoral, resulting in the proliferation of different designs and structures, going under the names of the various promoters of the interventions, including SUBEB, UNICEF, LGEA, etc. Many of these facilities are so substandard as to be non-functional, even at the point of commissioning.

The above situation, among others, dictated the reasons for the Development of Technical Guide for Construction of School Sanitation Facilities in Nigeria. This Technical Guide was developed by The Centre for African Settlement Studies and Development (CASSAD) with inputs from the Federal Government of Nigeria and its agencies; State Governments and their agencies, the Local Government Education Department and related units; UNICEF; School authorities; PTAs, SBMCs, School Environmental Health Clubs and other members of schools' communities. The idea is to come up with standard (model) guides for the design, construction, operation and maintenance of the facilities. This will assist the process of giving schools standard functional sanitation facilities (latrines/toilets, urinals and hand washing facilities) that are capable, with the health education curriculum, of not only inculcating healthy living habits, but also improving the health of the pupils and through them, the local communities. The expectation is that the pupils will be in the best position to positively influence the sanitation and hygiene habits of their community members and so raise the health status of the people as a whole. Ultimately, the prospects of attaining the MDG target in Nigeria would be enhanced.

The development of this Technical Guide which was sponsored by UNICEF will support the present government's efforts of ensuring provision of adequate sanitation facilities in all primary and secondary schools in the country towards providing enabling and conducive environment for effective learning.

Signed
Honourable Minister of Education.

PREFACE

The Basic and Secondary Education Statistics in Nigeria reported that about 25% of the schools have access to water from pipe connections and boreholes while about 42% have improved sanitation facilities. An Impact Study commissioned by UNICEF in 2003 in four selected States confirmed impact of Water, Environmental Sanitation and Hygiene on health and education of Girls. The stud reported a high incidence of dysentery (41%), diarrhea (36%), cholera (20%), typhoid (32%), and guinea worm (21%). The prevalence of these water and sanitation related diseases caused 46% of lateness to schools, 45% absenteeism, 42% poor performance and 44% low academic achievements. The pupil to toilet ratio was estimated at 1:600 for primary schools while the toilet to student ratio in secondary schools is 1:172.

It is in recognition of the important roles provision of water, sanitation and hygiene facilities could play in ensuring child friendly school environment that prompted the intervention of Water, Sanitation and Hygiene (WASH) programme in primary schools. The WASH In School project is presently being implemented as part of the overall Federal Government of Nigeria/UNICEF WASH programme implementation in the country.

Concerned efforts have been made in the past in the design and implementation of School WASH project including building capacity of partners to ensure effective service delivery. Several schools have benefited from the project and the interventions are contributing to more child friendly school environments. Based on reports from field visits, there are various latrine designs in schools and most of these designs do not comply with the standard specifications. The quality of construction of most of the latrines is also not satisfactory.

Giving the precarious situation of the sanitation facilities in schools throughout the country, especially the lack of standard, whether in terms of design, of construction or of operation and maintenance, it was felt necessary that any effort to standardize the procedures of all these would be well worthwhile, especially in the case of latrines, urinals and hand washing facilities in schools. It is also in recognition of the important roles that the provision of standard and safe sanitation facilities could play in ensuring child friendly environments that prompted UNICEF to sponsor the development of this technical guide.

The Technical Guide provides information on various types of standard latrine/toilet, urinal and hand washing facilities with clearly spelt out guides as to the design, siting, construction, operation and maintenance of the facilities as well as Bill of Quantities. The idea is to ease the process of the provision of sanitation facilities for schools throughout the federation but with provision made for regional/cultural differences. The expectation is that this technical guide will support the present effort of standardizing and ensuring quality provision of sanitation facilities in schools in rural, peri-urban and urban communities which inevitably will contribute to achieving increase in school enrolments and attendance especially for girls who are often most affected with lack of sanitation facilities in schools.

Dr. Suomi Sakai
UNICEF Representative

ACKNOWLEDGMENTS

Many people and institutions contributed to the successful development of this Technical Guide. The financial and technical supports from Water, Sanitation and Hygiene (WASH) and Basic Education Sections of UNICEF are highly appreciated as without these supports the development of this technical guide would not have been possible at this time.

The contribution of The Centre for African Settlement Studies and Development (CASSAD) in coordinating the development of this technical guide is acknowledged. The NGO has demonstrated high sense of professionalism in facilitating the processes that eventually led to this final document.

The efforts and assistance of the various Officers in all the State visited in the course of documenting the existing designs and drawings are also acknowledged. These include the directors of school services in the States' Ministries of Education, States' Universal Basic Education Boards (SUBEBs), UNICEF Desk Officers and other Agencies such as RUWASSA/RUWESA/WATSAN in the various States. Also worthy of mentions are the contributions of the teams from The Federal Ministry of Education, Federal Ministry of Environment, Housing and Urban Development, Universal Basic Education Commission; and Federal Ministry of Agriculture and Water Resources who participated in field works, stakeholders' workshop and editing of this document.

Finally, the contributions of all other institutions and individuals who have contributed to the development of this technical guide are well acknowledged and appreciated.

Director,
Basic and Secondary Education,
Federal Ministry of Education

EXECUTIVE SUMMARY

The technical guide for the construction of school sanitation facilities (latrines/toilets, urinals, hand washing facilities) in Nigeria was prepared to address the issues of divergent latrine designs and constructions in schools; non compliance of the various designs with the standard specifications in both UNICEF focus and non focus primary schools and the un-satisfactory poor quality of construction materials and workmanship of most of the latrines in Nigeria.

The tasks connected with this assignment included:

- Consultations and meetings with Federal and States Ministries, Departments and Agencies (MDAs); International Development Partners; Local Governments and members of National Sanitation Task Group on appropriate designs for school sanitation facilities including latrine/toilet, urinal and hand washing.
- Field visits to 15 States to identify successes as well as lapses in school latrine construction and develop action plans for rectifying the lapses and improving on the so-called "success stories"
- Desks review of all existing school sanitation documents and drawings.
- Preparation of a draft technical guide for the construction of school sanitation facilities.
- Field testing of the technical guide in 4 States (i.e. 1 State per UNICEF field office)
- Critique of the draft technical guide at a national stakeholder workshop
- Demonstrative construction of integrated school sanitation facilities and training of trainers (ToT) for Sanitation Officers, Technical Officers, Engineers, Builders, Contractors and Artisans, using the technical guide.
- Finalization of the technical guide incorporating comments from the stakeholders and construction workshops.

In order to make the facilities child-friendly, the expected users (boys and girls, male and female staff) were consulted during the course of developing this technical guide. Thus, the designs were developed by asking the expected users about their needs and ideas on how the sanitation facilities should be designed, constructed, operated and maintained.

On the basis of the consultations, the various designs were developed and the detailed designs of each of the options provided alongside their bill of quantities. Costs were left out in view of inflation factor. Two types of alternating ventilated pit (A-VIP) latrine and pour flush toilet of six, five, four, three and two compartment units are recommended, viz: the stand alone type and the combined type, to satisfy the varying conditions of the schools in the country.

Also described are the procedures for the selection of the facility type/model/system by each school, calculation of school sanitation facility, location for the selected facilities, and composition of the project teams at school level and the supervision/certification/management committees at school level. The supervision/management procedures/guidelines necessary for the effective use and longevity of the facilities are described, as well in the guide.

While the problem of poor/inadequate school sanitation facilities is generic, the specific approaches and designs differ between the six geo-political zones, States or even local governments. The designs recommended in the technical guide have therefore been developed to be relevant to local practices as well as optimizing use of local materials and construction approaches.

Above all, the need for school and community sanitation and hygiene education; the roles of various stakeholders and the health implications of properly managed school sanitation and hygiene facilities are stressed, with a view to achieve maximum benefit from the provided facilities.

CHAPTER ONE

OVERVIEW OF SCHOOL SANITATION AND HYGIENE FACILITIES IN NIGERIA

... Girls who have to spend time gathering water for the family tend not to be in school. And where schools have sanitation, attendance is higher, especially for girls. Water is connected to health, since millions of children get sick and die every year from water-borne diseases and for lack of basic sanitation and hygiene.

- Former United Nations Secretary General, Kofi Annan's remarks to the United Nations Commission on Sustainable Development, New York, 28 April 2004.

1.1 INTRODUCTION

It is estimated that about 60% of primary school age children aged 6-11 years (64% of males and 57% of females) in Nigeria attend primary schools. There are wide regional and gender disparities in school attendance: in urban areas, about 70% of school age children attend school compared with 56% in rural areas. Also, school attendance varies from 42% in the North Western part to 83% in the South Western part of the country. Similarly, more girls than boys do not attend schools with the worst gender disparity occurring in the North Western part of the country (CASSAD, 2003a).

Several factors are responsible for this low level of school attendance, notable among which are: cost of schooling which includes the household's need for the children's labour and the monetary cost of schooling; the unfriendly school environment, characterized by inadequate classroom blocks; poorly motivated teachers and lack of access to safe water supply, and sanitation facilities. Over half of the schools in Nigeria are without safe sanitary excreta disposal, hand washing and water supply facilities. In few cases where these facilities are available, they are grossly inadequate and unsafe to maintain good hygiene, especially for girls.

A study commissioned by UNICEF and conducted by CASSAD (2003b) confirmed the significance of water, environmental sanitation and hygiene (WASH) for the health and education of pupils, especially girls. The study reported a high incidence of dysentery (41%), diarrhea (36%), cholera (20%), typhoid (32%) and guinea worm (21%), all of which combined to cause 46% of lateness to school, 45% absenteeism, 42% poor performance and 44% low academic achievement. Similarly, another study conducted by CASSAD (2003c) put the toilet to pupil ratio at 1: 600 for primary schools, while the toilet to student ratio in secondary schools was 1:172.

It is in recognition of the important roles provision of water, safe sanitation (comprising VIP latrine, urinal and hand washing facilities) could play in ensuring child friendly school environment that prompted the intervention of Water, Sanitation and Hygiene (WASH) programme in primary schools, under the current Federal Government of Nigeria/UNICEF WASH programme in the country. Prior to the programme and as part of this drive, the Federal Government developed the Water and Sanitation Policy in 2000, while the Small Towns Water and Sanitation Programme reviewed in 2004 was geared towards ensuring that programme modalities are consistent with overall policy direction of the Government.

However, the reviews did not take note of the need for a well focused and sustained sanitation and hygiene education with a view to improving the health status of the people.

1.2 OBJECTIVES AND IMPORTANCE OF SCHOOL SANITATION AND HYGIENE EDUCATION (SSHE)

1.2.1 Objectives of SSHE

Nigeria as at today is far from the track to reaching the sanitation millennium development goal (MDG) of 70 per cent coverage by the year 2015. This is partly because the country seems to have stuck to using wrong strategies, based on hackneyed attitudes and behaviours, occasioning low level of political will and commitment. At the current pace it will take the country almost a century to reach the MDG target for rural sanitation alone. Yet, without adequate sanitation, hygiene and water supply, Nigeria will not be able to achieve other MDGs, especially those of reducing child mortality, improving literacy levels, fighting HIV/AIDS, etc. Consequently, the SSHE approach has been adopted as a catalyst for enhancing sanitation and hygiene in Nigeria, with the following specific goals or objectives:

- Increasing investment in water, sanitation and hygiene education in schools.
- Developing key elements in effective national programming for school water, sanitation and hygiene education, based on good practices and lessons from field experiences.
- Developing broad-based partnerships among key stakeholders with a consensus on guiding principles, operational framework and resource requirements.
- Identifying and agreeing on key follow-up actions and partnership activities in support of school water, sanitation and hygiene education at the global, regional and country levels.

1.2.2 Importance of SSHE

School sanitation and hygiene education refers to the combination of hardware and software facilities that are necessary to produce a healthy school environment as well as develop and support safe hygiene behaviors at personal, school and community levels. The hardware components include: safe water supply options such as hand/motor pumps installation; tap connection and rain water harvesting; while sanitation facilities include latrines, urinals, hand-washing and solid waste management facilities. Software components include capacity building programme for teachers; establishment of school health clubs and school based management committees; hygiene education for behavioral change and monitoring/support mechanisms.

Following the realization of the importance of school sanitation and hygiene and the key roles school children can play in promoting them in both the school and its community, the need to scale it up has recently been identified as a priority by both the Federal Government of Nigeria and its international development partners, among others. This attention is further buttressed by the fact that safe sanitation and hygienic practices are paramount to enhancing public health and indispensable to optimal outputs in education and economic productivity. One key method of achieving improved sanitation and hygiene is through improvement in school sanitation, because of the central role children play as change agents, not only in the school, but also at the community level and, ultimately, the country at large.

At present in Nigeria, SSHE is characterized by the following inadequacies:

- Lack of active participation by teachers, children and school community members

- Lack of or limited support by government
- No discernable operation and maintenance (O&M) system
- Poor level of integration of the system exemplified by poor understanding of the link between water, sanitation and hygiene, on one hand, and disease on the other.
- Lack of proper health education
- Poor level of technical know-how
- Limited level of application of improved and acceptable technology

On the other hand, the following are the advantages to be derived from a well-structured and properly implemented SSHE project:

- *Effective learning:* Children perform better in a hygienic and clean environment.
- *Consistent enrolment of girls:* Provision of clean toilets for girls will encourage parents in many settings to send their children (girls) to school as well as keep them in school.
- *Child rights:* Healthy and happy life is assured as child right; good health and sanitation being a key to happy childhood.
- *Reduced diseases and worm infestations:* Clean, well-used toilets and good hygiene practices will prevent infections and infestation.
- *Reaching the home and community*: Children and their schools are able to introduce and reinforce hygienic behaviours in the home and community.
- *Environmental cleanliness:* Properly used hygiene facilities will prevent pollution of the environment and limit health hazards for the community at large.

1.3 POLICY ISSUES IN SCHOOL SANITATION

Availability of safe drinking water, sanitation and good hygiene influences learning in schools, while its lack has contributed significantly to low enrolment, attendance and retention in schools in Nigeria, especially among girls. Promotion of hygiene and sanitation in schools is also essential because schools offer an important point of entry for raising the profile of hygiene and sanitation, as well as improving the environmental health conditions in the communities, since schools are integral parts of their communities. Children have indeed proved to be effective change agents for hygienic practices, such as washing of hands, using latrines and maintaining hygienic environments generally. Moreover, children who adopt good hygiene practices at young age not only work as peer advocates but are also likely to grow-up to be health conscious adults, while transferring the knowledge, skills and practices to the rest of their families (CASSAD, 2005; UNICEF, 2007).

All these are pertinent to the declared goal of the National Environmental Sanitation Policy (FGN, 2005a), which is to ensure a clean and healthy environment by adopting efficient, sustainable and cost-effective strategies to safeguard public health and wellbeing, in line with national development objectives. The policy also aims to ensure sustainable environment and poverty reduction, setting as one of its specific targets the development of school sanitation programmes in 50% of schools by 2006 and 100% by 2010.

The policy goals of the National School Health Policy (FGN, 2006) are more focused, namely, ***to enhance the quality of health in the school community*** and ***create an enabling environment for inter-sectoral partnership in the promotion of child friendly school environment, for teaching and learning and health development***. The policy also aims to promote the health of learners to achieve the goals of Education For All (EFA). Similarly, the Policy Guidelines on Excreta and Sewage Management (FGN 2005b), aims to ***ensure***

countrywide access to efficient and sustainable excreta and sewage management methods and obviate associated public health hazards, while the Policy Guidelines on School Sanitation (FGN, 2005c) aims ***to provide an optimal sanitary environment which is safe and conducive for physical, mental and emotional health of the school community in order for the child to achieve maximum benefits from educational development***. All these are geared towards correcting the sorry state of the school health system in the country, which showed that only 25% of schools in Nigeria had ventilated improved pit (VIP) latrine, 46% had pipe borne water or borehole, while 67% were reported to be clean (FGN 2006).

1.4 PURPOSE OF THE TECHNICAL GUIDE

In Nigeria, there are various latrine designs in schools and most of these designs do not comply with the standard specifications. The quality of construction of most of the latrines is also not satisfactory. In addition, experience has shown that there are divergent designs of VIP latrines, urinals and hand-washing facilities in both UNICEF focus and non-focus primary schools.

The need, therefore, arises for quality control vis-à-vis designs and construction procedures, as well as strict adherence to specifications by the appropriate implementation agencies and contractors. It is against this background that this technical guide has been prepared. Thus, UNICEF is supporting quality assurance of school sanitation projects through the development of this technical guide for the construction of standard school latrines, urinal and hand washing facilities.

The technical guide document covers all the stages of school sanitation facilities, including: design, site selection, construction, operation and maintenance. It stresses the importance of active involvement of pupils (girls and boys), teachers, parents and the community in the entire process so that they can by themselves find solutions to problems that may arise during operation and maintenance: in short, it enables them own the projects and manage them for posterity.

The scope of the guide covers the different technical options for the school sanitation facilities, namely: latrines, urinals and hand washing. The guide describes in detail the practical designs and construction of each facility, while also providing easily accessible guidance to policy makers, designers and implementers. Moreover, the designs are meant to be used by Planners, Engineers, Sanitation Officers, Contractors, Builders, Educators, among others, as basis for possible adaptation to particular school environments. The annexes to the guide show the various detailed designs of the recommended facilities, namely: alternating-ventilated improved pit latrines (VIP), pour flush toilets, urinals and hand washing facilities.

CHAPTER TWO

PREPARATION FOR SCHOOL SANITATION PROJECT

2.1 CRITERIA FOR PROVISION OF SCHOOL SANITATION FACILITIES

The following criteria are essential for the selection of beneficiary school and subsequent successful implementation of an acceptable school sanitation project and so must be ensured *ab-initio*, or otherwise incorporated into the planning and design of the projects.

- A water point within the school premises or in the community. Ideally, the water point *should not be more than 100m away from the school.*
- Democratically elected, gender balanced and functioning/active parents-teachers association (PTA) and school based management committee (SBMC).
- Willingness to contribute financially for the maintenance, in addition to participating actively in the planning, implementation, construction, operation, management and monitoring of the project.
- Agreement by at least three teachers (including at least one female teacher) to take on responsibilities for planning, monitoring, construction and maintenance activities as well as for hygiene education in the school.
- Willingness of school, community and pupils to be part of implementation and maintenance of the facilities.

2.2 PROCEDURE FOR THE INSTALLATION OF SCHOOL SANITATION FACILITIES

2.2.1 Introduction

The Child to Child (CtC) approach, offers tremendous opportunities for the satisfaction of the above criteria and so; it has also been tested and verified worldwide for this purpose. It is a systematic process of facilitating (not dictating) children (indeed all stakeholders) to understand, plan, undertake and monitor actions to bring about sustainable attitudinal and behavioural change at individual, school, family/household and community levels.

This is more so because the provision of these sanitation facilities requires careful planning and involvement of all key stakeholders if the desired goals are to be achieved. Careful planning is also required because resources for putting the facilities in place are scarce, while managing and sustaining the facilities require an enduring mechanism so that the life span of the facilities are prolonged. This is because providing a school with facilities it is unable to maintain is a waste of resources.

Practically, not all schools can participate or be involved in school sanitation projects at the same time. While all schools may be sensitized, the selection process should not only identify schools that have applied for participation in the project, but also schools that have demonstrated convincing ability to participate in the planning, construction and management of the facilities as well as in the education of the pupils in the proper use of the facilities. Such schools should stand better chance of being selected for participation in the project.

The recommended CtC steps for a successful school sanitation project are illustrated graphically in Fig. 2.1, starting from choosing the theme and understanding it well (step 1) to doing it better next time and sustaining the action (step 6).

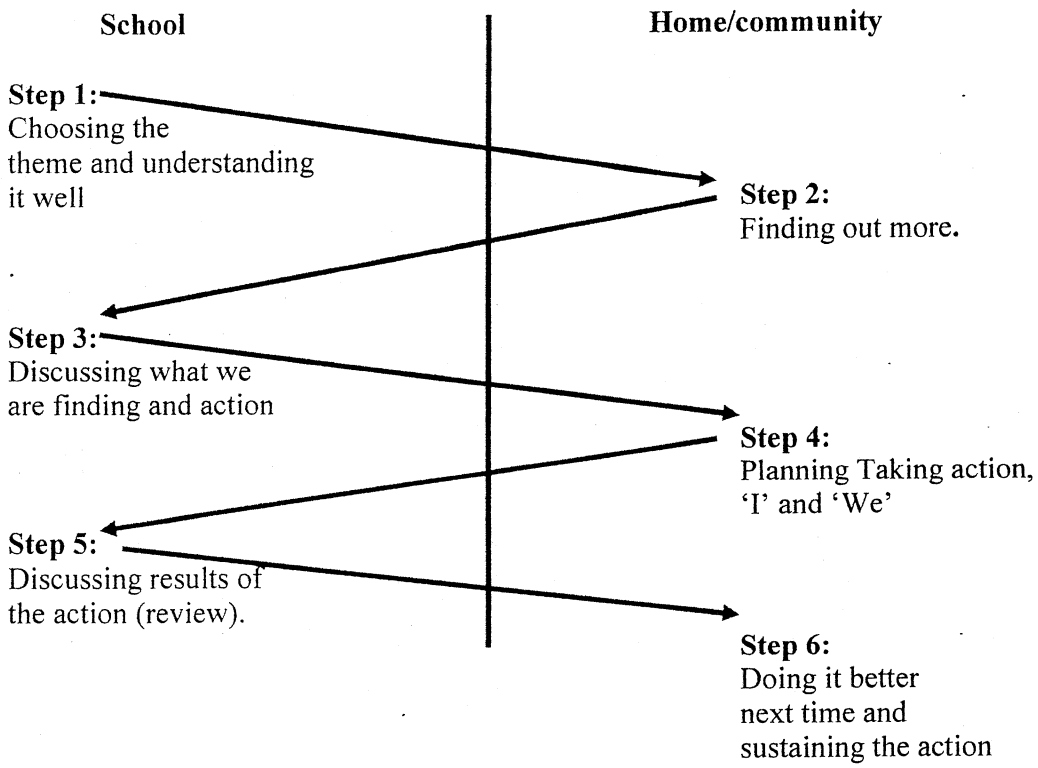


Fig. 2.1: Working of CtC approach

Source: Adopted from UNICEF (2006a)

2.2.2 Advocacy, sensitization and mobilization

All key stakeholders in school sanitation should be involved in advocacy, sensitization and mobilization. If an NGO/CBO is facilitating the process, the NGO/CBO should pay advocacy visit(s) to the relevant government agencies at both the State and the LG levels. At the State level, the Ministry of Education; the State Universal Based Education Board (SUBEB) and WATSAN/RUWESA/RUWATSAN/RUWASSA are key stakeholders. They must be made to understand why the project is necessary in schools and their cooperation in playing their roles must be secured *ab initio*. They must also be made to understand the criteria for selection of facilities and why such criteria are necessary; otherwise, political considerations may be introduced such that those schools that qualify for intervention are not selected. At the LG level, the Chairman, LGEA and the Supervisory Councilor for Education must be carried along in the process.

A recommended strategy to adopt at this stage is to organize a stakeholders' sensitization workshop at the LG level, with representatives of the State agencies in attendance, and lasting for 1-2 days. The objective of this workshop will be to sensitize participants on the school sanitation intervention, the processes involved and expected roles and responsibilities of the stakeholders involved in the project. Private sector participants may also be involved in this workshop as they may be expected to work with the schools and the communities in construction of the facilities. This will afford them the opportunity to understand the background and fundamentals of the project, as well as what is required of them. At the workshop, the facilitating NGO/CBO or government authority should share the school selection criteria with participants with a view to improving on them.

At the end of the workshop, interested schools are given application forms (sample attached as Annex 1). The date for submission of the application form(s) should be agreed at the workshop, while possible dates of inspection of schools should also be agreed upon. This idea is to give all interested schools adequate time and enablement to make appropriate preparation.

In the application, schools should endeavour to justify why they should be considered for intervention, with emphasis on what they have already achieved in this regard: what they are doing as at the time of completing the forms; what they can contribute in terms of financial and material resources; teachers' availability and willingness to supervise proper maintenance of facilities and the status of sanitation and hygiene education in the schools. The schools should also outline plans on how they will operate and otherwise maintain the facilities. This should be done in conjunction with the school based management committee, PTA and the community.

2.2.3 Verification of claims

Before intervention can commence in any school, it is necessary that assessment of resources and verification of claims by schools be carried out. This is to ensure that schools selected have the required resources and capacities or have plans for investment on school sanitation projects. This exercise will lead to final selection of beneficiary schools. Schools which failed to meet the criteria (as listed in section 2.1) at one stage should be advised on how they can improve before re-applying.

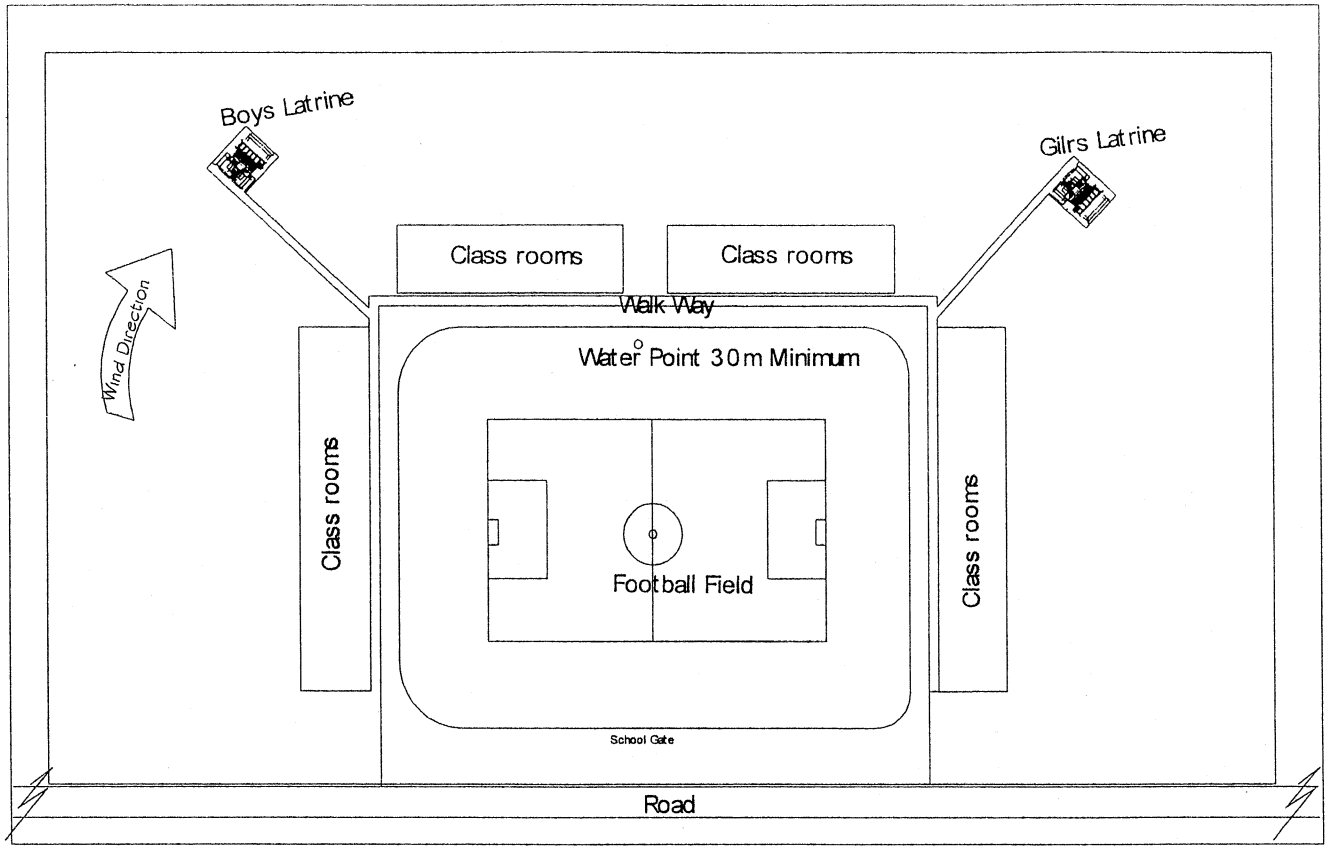
2.2.4 Establishing contact with the school and school based management committee

Once a school has been selected for support in the provision of sanitation and hygiene facilities, the school based management committee and the community where the school is located need further mobilization through a demand driven, rights based approach, to ensure the success of the exercise. Conditions and mutual obligations of the schools, community and the LGA need to be carefully explained and understood. These conditions and obligations should form the basis of the contract between the school, the community, the LG, the state and the donor.

2.2.5 Site selection

Selection of the right site for the sanitation facilities is very important and should be done alongside the decision on the type and number of facilities. The planning exercise should be carried out by the school committee, the PTA, the community representatives and the selected builder (contractor). The local government education authority (LGEA), WASH unit/department and community development department should also participate in this exercise. It is equally important that boys, girls and teachers have significant input at this stage as they are the ultimate users of the facilities. The following points should be considered in selecting the sites and the layout of the facilities:

- *Privacy and discretion:* Boys, girls and teachers have different requirements. However, the facilities, while being located in an open place for safety reasons, should not be close to roads and other major public places to guarantee adequate privacy. Fig. 2.2 shows the recommended layout or site plan of a typical school in relation to the sitting of the VIP latrines or pour flush toilets.



NB: The direction of the prevailing wind should be considered in the location of school latrine/toilet

Fig. 2.2: Layout of a typical school and the sitting of latrines/toilets

- *Water source*: Water should be easily accessible in the school to fill hand washing tanks and for cleaning latrines and urinals. On the other hand, the latrine should not be a source of contamination for the water and should be positioned downhill and at least 30m away from the water source (Fig. 2.2).
- *Access:* The facilities must be accessible at all times. Hand washing facilities should be as near as possible to the latrines and urinals to encourage hand washing.
- *Security of the facilities*: This should also be considered to avoid vandalism or putting girls at risk or fear of harassment by people or attacks by animals such as snakes. The host community should be involved in security matters.
- *Use by the community and vandalism*: The community should be involved in the planning for the facilities to guide against or properly supervise usage outside school hours and during the holidays by neighboring households.
- *Environmental squalor*: The facilities should not be located close to waste dumps and flood prone areas in order not to discourage pupils from using them.
- *Drainage:* This should be considered so that natural slopes are taken advantage of in order to facilitate proper drainage of waste water from the hand washing facilities and urinals. Moreover, there must be at least 2 metres of soil depth between the pit floor and the water table or rock surface.
- *Space:* Schools with land and space can take advantage of the urinal and hand-washing facilities to grow tree crops such as bananas and vegetables. The proceeds from the sales can be used to maintain the facilities.
- *Socio-cultural aspects*: The final selection should look at different prevailing, social and cultural aspects of the locality for it to mitigate against the risk of not being used if it has a poorly considered location. As much as possible, the boys and girls facilities should be located in opposite direction.
- *Wind direction:* The latrine/toilet should face wind direction for proper ventilation. Moreover, it should be at least 2 metres away from anything (e.g. branches of trees) that may impede the action of the wind across the vent pipe, thus not interfering with ventilation in the pipes
- *Participation:* Finally, decision on the final sites for location of the facilities should be made in a participatory way involving the expected users (pupils and teachers), school based management committee, parents teachers association, members of the neighboring communities, local and state governments officials and NGOs/CBOs.

2.2.6 Selecting the type and number of required facilities

One of the lessons learnt from school sanitation and hygiene promotion is that most times, latrines are provided short of requirements. Also, it should be noted that most children do not defecate at school and that the provision of urinals reduces the pressure on latrines. For this reason, the population of the school should be considered alongside that of the ratio of boys to girls. Teachers and other non-teaching staff of the school should also be provided with latrines, separately for males and females.

2.2.7 Participation by and role of stakeholders

2.2.7.1 Introduction

A school is a place where all the stakeholders are expected to participate and contribute towards the development of the teaching and learning process. The participation level varies depending on the ability and capacity of the person or the stakeholders' group. For instance, the school teacher is more involved in maintaining the quality of education in the school than

the Parents-Teachers Association, which in turn should be more involved in the welfare of both the pupils and staff alike.

Stakeholders are those groups of individuals or organizations who have an interest in the outcome of a particular process. Relevant stakeholders are those who should be involved in a particular process, as well as those who are mainly affected by it. A detailed stakeholder analysis should be carried out at the start of a school sanitation project.

2.2.7.2 Essential stakeholders
The essential stakeholders in the SSHE project consist of primary and secondary stakeholders.

The primary stakeholders include:
- Pupils and staff who are the expected users of sanitation facilities.
- The village education committee or village health committee, if in existence.
- The PTA and the school-based management committee
- CBOs and other self-help groups (including communities where the school is located)

The secondary stakeholders include:
- Local Government and its agencies, including LGEA, LGA WASH Unit/Dept, and the LG Council
- State agencies (SUBEB, WATSAN/RUWESA/RUWATSAN/RUWASSA, Ministry of Education)
- Service providers/developers and investors
- Private sector participants

2.2.7.3 Obligations of key stakeholders in SSHE project
The obligations of various stakeholders at various levels of planning and implementation of the sanitation facilities, which should be discussed and agreed upon at the early stages of contacts, also vary according to whether they are primary or secondary stakeholders.

❖ *Primary stakeholders*
- Participate actively and provide leadership at all stages of the intervention, including planning, implementation, monitoring and certification of completion of the contract.
- Assume ownership and full responsibility for operation, management and maintenance of all facilities and the school environment.
- Participate in community mobilization for the implementation of the school sanitation and hygiene project activities, including the monitoring of the construction of the facilities, without expecting any payment or allowances.
- Provide labour for specified activities when required.
- Participate in improving the health status of the pupils by learning about relevant disease transmission routes and how to prevent diseases in the schools.
- Participate in community awareness on the importance of hygiene and sanitation at school and form the link between the school and the communities surrounding the school.
- Provide security during construction and thereafter.

❖ *Secondary stakeholders*

- Oversee site selection and selection of the required facilities – type and number
- Supervise and monitor the construction of the facilities and verification of materials on site and claims by the contractor
- Provide training for school based management committee members on the planning, monitoring/supervision and maintenance of facilities.
- Provide training to teachers on proper use and maintenance of facilities and on hygiene and sanitation education, which training will be passed down to pupils.
- Provide technical advice to the school in order to properly monitor the construction operation and maintenance activities.

2.2.8 Selecting the right technological option

Once the various construction designs and technological options have been developed (see chapter 3), they should be shared with the primary stakeholders, i.e. the pupils, school based management committee, PTA and CBOs, so that they can make informed decision from the various options available. The various designs should be those that are feasible to put up in the locality. The designs should include BOQs with costs and the advantages/disadvantages of each option should be stated clearly for the locals to understand. This, if properly done, will guide them in their selection of options, after they must have weighed the implications of each option. However, the host school should not be rushed to make a choice of technological options, since they will be responsible for the decision they made. A reasonable length of time should be given them to make the decision.

Two points need to be made at this stage. First, while thinking and planning to embark on new projects, existing facilities can be improved at little cost. This is a worthwhile exercise as it may take long time before the new facilities are ready for use. The second is that the school should note that the focus should be on how to use and manage the facilities well and not the facilities themselves.

2.3 Award of Contract

2.3.1 Introduction

This is another stage where careful planning and consultation with key stakeholders is required. It has been observed that contractors take on jobs such as this, with a view to maximize their profits at the expense of the project. There is therefore the need to identify those contractors that have proven integrity in service delivery. The following stages/processes are very necessary in awarding the contract:

2.3.2 Pre-qualification of contractors

The first stage is for the state agencies (e.g. SUBEB, WATSAN/RUWESA/RUWATSAN /RUWASSA and Ministry of Education), in collaboration with NGOs and other development partners in the area, to carry out a pre-qualification exercise, with a view to identifying contractors that have demonstrated capacity and ability to undertake school sanitation facility projects. This will involve calling for company profiles and assembling as many as possible, followed by verification of the claims of the bidders. The assessors may or may not give prior notice to the companies. A checklist of what to look for in the companies' profiles could be developed before embarking on the exercise. This, however, should be a continuous exercise

as new contractors may continue to emerge, while those earlier selected may for one reason or the other fail to meet expectations.

2.3.3 Sensitization workshop for pre-qualified contractors

Having succeeded in pre-qualifying a reasonable number of contractors, a one-day orientation/sensitization workshop should be organized for them. The objective of this workshop is to properly orientate the contractors on the proposed projects/facilities for school sanitation. The workshop is also a forum to explain the processes to the contractors, and agree on their expected obligations and mode of payment. The pupils, teachers, school based management committee, community representatives and the LGEA should also be invited to this workshop, as a way of enhancing good working relationship. At the end of the workshop, bid forms are distributed to the contractors giving them reasonable time to complete the forms. Relevant BOQs and designs are also distributed along with the bid forms.

2.3.4 Analyzing bid forms

At the expiration of time for submission of bids to the appropriate agency, a bid evaluation committee is formed, comprising representatives of both the secondary and primary level stakeholders. The committee meets at a designated venue to evaluate the bids one after the other and recommends the most reasonable bids in terms of cost, quality of materials, and timeliness for each of the designed options. The committee then submits a report to the larger stakeholder group comprising the school based management committee, the PTA, the community, the LGEA and NGO/CBOs/WASHCOMs. At the end of the meeting, a contractor to work with the school is finally selected, based on the report and the recommendation of the evaluation committee. The contractor has to sign a memorandum of understanding (MOU) before the commencement of work.

2.3.5 Contact with school/community

At this stage, the LGEA facilitates a meeting between the contractors, the school based management committee, the PTA and community leadership. The objective of the meeting is to formally introduce the contractor to the primary stakeholders, with a view to commencing discussion on the project. The selected contractor will necessarily be a part of the site selection process as well as participate in all meetings that directly relate to the project.

2.4 Supervision of Construction and Commissioning

2.4.1 Introduction

This is another crucial stage of the project. The project needs to be adequately supervised, both technically and timeliness to ensure that the desired target is met at the right time, based on the contract agreements signed by the contractor.

2.4.2 Supervision and Certification Committee

The contract awarded, the school, in collaboration with the PTA, SBMC and community, will set up a monitoring committee with the primary aim of monitoring the construction work and reporting to the appropriate committee or agencies. Members of this committee must be trusted members of the PTA, SBMC and community with proven integrity. Some if not all the members of the committee should have some basic knowledge and skill about construction, so that they can be in a position to check the contractor's excesses when such occur. Although, all shades of interests should be represented on this committee, making it too large may slow down the pace of work. Hence, a membership of not more than seven (7) is recommended, with adequate women representation. Where no member of the proposed committee has the technical skills or knowledge required for the supervision, a technical

person from the LGA, such as WASH Unit or Works Department, should be included in the committee

The committee is to give a stage by stage report to the sponsors of the project, namely, WATSAN, SUBEB, LGEA and the LGA Engineer, to ensure that standards are complied with. The committee is also to work in harmonious relationship with the school to ensure that construction materials are not lacking at the construction site. The security outfit of the community should be made to cooperate with the committee to see that adequate security is provided for construction materials and personnel on site.

It is also the responsibility of the supervising committee to call meetings as may be necessary. Such meetings may be for revision or revocation of contract award, if the contractor is found wanting or for adjustment in design or plan in order to overcome any hurdle in the course of construction and budget/financial matters, among others, as they relate to the project. The committee should also undertake certification of completion of contract before final payment.

2.4.3 Commissioning Committee

This is a committee specifically established to plan and implement the project commissioning ceremony. As such, it shall be responsible for the planning, invitation of dignitaries to the occasion, entertainment and all other logistics that will facilitate a successful programme. The recommended membership of this committee is 10-12. It is also recommended that respectable women in the community should be members, with one of them chairing the committee.

The expected dignitaries at the occasion should include the State Commissioner for Education; Chairman/Executive Secretary of SUBEB; LGA Council Chairman, the Director of Personnel Management (DPM) the LGEA Secretary; Political office holders in the State and LGAs; representatives of local NGOs/CSOs; the media; and international development/bilateral/multilateral agencies that promote school sanitation, such as UNICEF, EU, DFID, etc.

CHAPTER THREE

DESIGNS OF SCHOOL SANITATION FACILITIES

3.1 Sanitation Facilities in Schools

In many countries, as observed in Chapter One above, there exists a high prevalence of water and sanitation related diseases, causing many people, children in particular, to fall ill or even die (CASSAD, 2006). Improved hygiene practices are therefore essential if transmission routes of these diseases are to be reduced. Whereas appropriate hygiene education can bring about the intention to change hygiene behaviour, for most hygiene behaviours appropriate water and sanitation facilities are needed to allow people to transform intention into real change.

After the family, the school is another very important place of learning for children and so has a central place in the society. The school provides a stimulating learning environment for children, including stimulation and initiation of positive change. If sanitary facilities are, therefore, available in schools, they can be made to function as ***role models*** for their communities. Schools can more easily influence communities through outreach activities by their pupils who are mostly in touch with a large proportion of the households in a community.

Although the importance of water and sanitary facilities for schools is acknowledged, in practice and as remarked above, the sanitary situation in many schools in developing countries is deplorable. Most of the schools are faced with the following sanitation problems, among others:

- Water supply is either non-existent or inadequate for the number of school children
- Toilets and latrines, where available, do not function properly due, for example, to lack of water for flushing
- Latrines are padlocked because children are not trusted to use them properly
- Children, especially girls, do not attend school because appropriate sanitation facilities are lacking.

3.2 Optimal Standards for Sanitation Facilities in Schools

3.2.1 Introduction

The policy guidelines on school sanitation (2005) and the implementation guidelines on national school health programme (2006) prescribed at least a toilet for every 30 pupils, with separate ones for boys and girls, male and female staff.

Experience has shown that the prescription may not be attainable, thus, for the purpose of this technical guide, ratio 1:40 (1 latrine/toilet cubicle/compartment for 40 pupils) and 2-user urinals per 1 latrine/toilet compartments have been adopted. Moreover, a School should have at least 2 units (1 for boys and 1 for girls).

The example of how to calculate the number of latrine/toilet compartments, urinals and hand washing facilities is given in figure 3.1. Thus, a school with a population of 800 pupils (480 girls and 320 boys), with two break periods would need 7 and 5 toilets for the girls and boys, respectively (Figure 3.1)

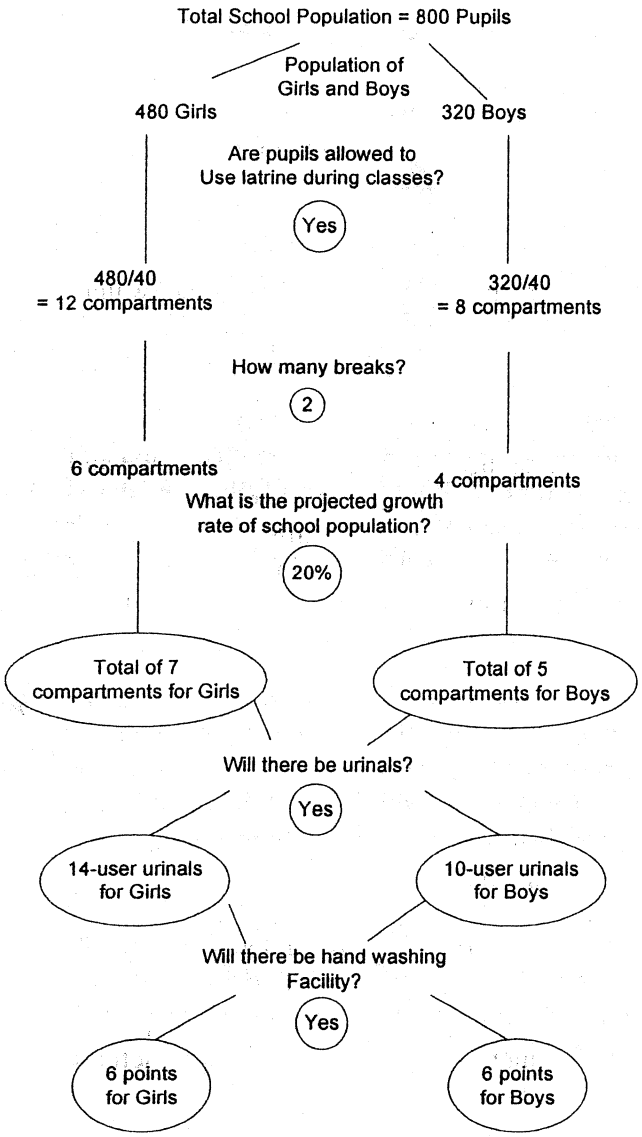


Fig. 3.1: Calculating School Sanitation Capacity

Source: Adapted from World Bank, 2005

3.3 Excreta Disposal Facilities

3.3.1 Introduction

Two types of excreta disposal systems are recommended for schools in rural, peri-urban and urban areas:

- Multi-compartment ventilated improved pit (VIP) latrine for rural and peri-urban schools
- pour-flush latrines for urban schools

For schools in rural and peri-urban areas and where no water or insufficient water for flushing is available close to the latrine or where leaves, stones or sticks are used for anal cleansing, the VIP latrine is the most suitable option. In the urban and peri-urban areas, where adequate supply of water is available close to the latrine and the facilities can be well maintained; pour-flush latrine may be considered. Regular cleaning of pour-flush latrines is particularly essential; otherwise they will become dysfunctional and un-useable within a short time. Although, there are many more types of excreta disposal facilities, the needs of the users and the resources available should be carefully considered to ensure that the most appropriate type of facility is selected, following the process described in Chapter Two above. The types of latrines now in use and from where the above choices have been made are described briefly in what follows.

3.3.2 Pit latrines (PL)

The PL is one of the most widely used latrines in the tropics (Rybczynski *et al,* 1982). It consists of three parts: superstructure, reinforced concrete floor with squatting holes and pit. Excreta deposited in the pit are decomposed to gases, liquid and solid. Gases escape into the atmosphere, liquid soaks into the soil, while the solid, which remains, become harmless after a year and can be dug from the pit and used as manure.

The pit latrine is the most common means of excreta disposal in many rural areas of developing countries. However, they have three major disadvantages:

- Unpleasant odour, and vector breeding (flies and mosquitoes)
- Poor construction, which sometimes leads to structural failure (collapse), thus, endangering the lives of users.
- Heat

However, well maintained pit latrines have advantages such as low cost and little need for water to operate.

3.3.3 VIP latrine

This is the improved type of pit latrine that removes odour and prevents flies from breeding. It consists basically of a pit, a cover slab with a squat hole and a vent pipe cast through the slab. A superstructure is built, which must be kept semi-dark, and the vent pipe is raised to at least 0.5 metres above the top of the roof. A durable fly screen is placed on the top of the vent pipe (Morgan, 1990). It is important that the latrine is far from high buildings or trees to avoid shading the ventilation pipe. The VIP latrine offers a simple, safe and reliable method of excreta disposal where there is inadequate water supply, as we have in many Nigerian primary schools.

3.3.4 Multi-compartment VIP latrine

There are two basic types of VIP latrines, the single pit (single compartment) described above and the alternating (multiple compartments) type. For schools, the multiple

compartment ones are more economical because they last for quite long, if properly maintained; indeed, they can be permanent features of the school.

The typical VIP latrine consists of two separate pits, each with its own squat hole and vent pipe but only one superstructure. The squat holes not in use are usually sealed. The pit is usually designed for a life span of two or more years, with emptiable sanitation facility. It is suitable for use in rural, peri-urban and even urban areas where there is inadequate water supply. One pit is used at a time and when full (usually 1-3 years), the second pit is put to use. When the second pit is almost full (about 2 years), the first pit is emptied and put back to use. This allows the two pits to be used virtually indefinitely as stated above.

VIP systems are essential and desirable if:

- The pits are to be emptied manually
- Off-site treatment or hygienic disposal of the emptied pit contents is impracticable
- Excreta re-use is to be practised.
- Very shallow pits are required to avoid groundwater pollution
- There is solid rock at shallow depth and raised pits are not feasible.

Some of the advantages of VIP latrine include:

- Suitable for water scarce areas.
- Suitable for communities using dry cleansing materials.
- Limited water required for occasional cleaning of squat plate.
- Can be built with local material.
- Relatively low construction cost.
- Simple to construct and maintain.
- Excreta biodegraded into essentially pathogen-free product that can be handled without risk to public health; hence, manual emptying is permissible
- Shallow pit can be used to avoid groundwater contamination
- Alternating cycle permits the restoration of the infiltrative capacity of the pit-soil interface
- Greater flexibility in the precise time when the pit is emptied
- Long lasting
- The digested sludge (excavated excreta) can be used in the school farms as soil conditioner.
- Suitable for areas where free space is not available for relocating latrine when full.

However, user education is necessary to ensure that both pits are not used at the same time. More importantly, the squat hole not in use must be properly sealed.

3.3.5 Pour-flush toilets

Pour flush toilet refers to the single pit or twin-pit pour flush system, which consists of a pan and trap (the bowl), with a single pit or twin-pit either just below the bowl (on-set type), or slightly away from the bowl (off-set type). It is a specially designed water-seal latrine which requires only 2-3 litres of water for each manual flushing. The water-seal eliminates odour, and prevents rodents from entering the latrine room from the pit

Advantages:

- Odour free.
- Provides privacy.
- Little chance for transmission of excreta-related disease.

- Can support good health and hygiene practices.
- Appropriate where water is available.
- Water requirement for flushing is low (2-3 liters).
- Hygienic for the users since they have to wet the squatting slab before defecation and flush immediately after use
- The U-trap overcomes problem of flies, mosquitoes, and odour by serving as a water seal
- Construction and maintenance are cheap and easy.
- Suitable for less populated areas where space is available for relocating the pit once filled-up for single pit type, but for twin-pit it can also be suitable for densely populated areas because of the way it works.

Disadvantages:

- Water is necessary for flushing.
- In high ground water table, there is a risk of groundwater pollution.
- Not appropriate where communities use dry cleansing materials.
- Needs training for the initial users on how to use and maintain the latrine pans.
- The U-bend can easily become blocked, thereby preventing excreta from flowing easily into the septic tank
- Bulky material used for anal cleaning can't be flushed through the U-trap.
- The U-trap needs to be checked monthly for blockages.
- If excreta are not properly flushed, the latrine can get choked and become a health hazard.

3.4 Basic features of VIP latrines

3.4.1 Odour control

The mechanism by which odour is controlled in VIP latrines is through the action of wind blowing across the top of the vent pipes. Foul air produced from decomposition of faecal material in the pit rises to the top of the pipe when it is heated by direct sunlight. Thereafter, fresh air entering the superstructure passes through the squat hole to continue the cycle (Fig. 3.2). The result is an odour-free latrine.

3.4.2 Fly control

The vent pipe controls flies in two ways:

- Flies approaching the latrine from outside are strongly attracted to the head of the pipe because of the faecal odour emanating from it, but they are prevented from entering the pit latrine by the fly-screen.
- Some flies entering the superstructure and squat-hole lay their eggs in the pit. Adult flies emerging from those eggs are attracted toward the brightest source of light from the vent pipe (provided the superstructure is well shaded and fitted with a roof. The flies fly up the vent pipe, where they get trapped, while the fly-screen prevents them from escaping. Subsequently, they die and fall back into the pit (Fig. 3.2).

3.4.3 Mosquito control

The *Anopheline* group of mosquito, which transmit *malaria* breed in clean water but *Culicine* mosquitoes, which transmit *Bancroftian filariasis* breed in polluted areas especially wet pit latrines, that is, pits which extend below the groundwater table. Many of the newly emergent mosquitoes will leave via the squat hole rather than being attracted to

the vent pipe like the flies. Mosquitoes breeding in the pit of VIP latrines can be controlled in many ways:

- By adding substances which will kill the mosquito larvae to the pit e.g. bio-insecticide, kerosene, used engine oil.
- Covering the squat hole with a mosquito trap.
- Polystyrene balls (half a kilogram) poured into the pit, float and prevent the mosquitoes from getting in contact with water, thus making breeding impossible.

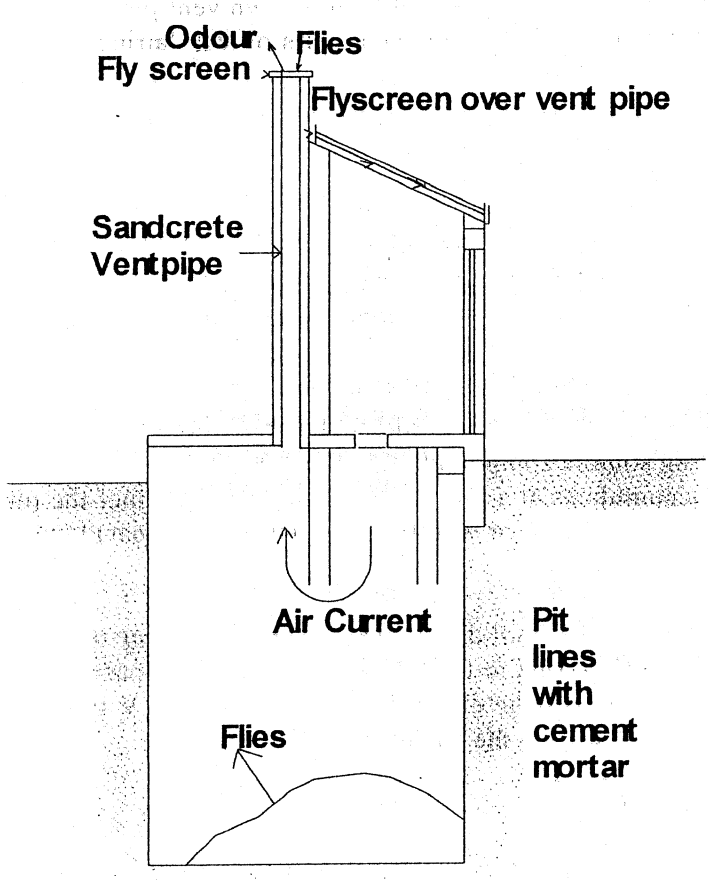


Fig. 3.2: Schematic diagram of a ventilated improved pit latrine

3.5 Components of VIP Latrine

3.5.1 Introduction

The VIP latrine consists of a substructure and a superstructure. The substructure consists of the pit (lined) and the cover slabs; while the superstructure consists of the wall, door, roof, and vent pipe. VIP latrine has two separate pits, each with its own vent pipe. The cover slab has two squat holes, one over each pit. The component parts of VIP latrine and the design requirements are described below.

3.5.2 Substructure

❖ **The pit**

The pit serves two essential functions (Mara, 1984):

- The liquid fraction of the excreta (urine) with small amount of water used for anal cleansing and cleaning of the cover slab infiltrates into the surrounding soil.
- The faecal matter deposited in the pit is digested anaerobically by bacterial activity into:
  - gases (e.g. methane, hydrogen sulphide, and carbon dioxide),
  - liquid containing soluble compounds which infiltrate into the soil
  - solids which accumulates at a rate which depends on whether the pit is a dry (0.03 – 0.06m^3/person/year) or wet (0.02 – 0.040/person/year) type.

❖ **Effective pit volume**

The effective pit volume depends on the solid accumulation rate, number of users and the pit design life. The pit must not be allowed to fill up completely; a free space of about 0.5m must be left at the top of the pit. Hence, the effective pit volume space V (m^3) of pits less than 4 meters deep may be calculated from the equation:

V (m^3) = CPN where,

C = solids accumulation rate

P = no. of people using toilet

N = no. of years the pit is to be used

4m³

Solid accumulation rate for:

dry pit = 0.04 -0.05m^3/person/year

wet pit = 0.02 – 0.03m^3/person/year

A factor of 1.25 is introduced if bulky anal cleaning material is used and it is assumed that the pit will be emptied when it is three quarters full.

❖ **Pit lining**

The foundation of the pit lining should be made of 225mm x 750mm with concrete mixture of 1:3:6 aggregate (cement: sand: gravel). Thereafter, the pit is fully lined by holding the blocks (225mm x 225mm x 450mm) together with 1:4 cement mortar from the foundation to one course above ground level.

The partition walls between the pits should be built up to the same height. The back wall should have weep holes of 25mm, while the other parts of the wall should be properly bonded such that it will not allow cross-flow of air between pits, which could interfere with the ventilation and might cause odour to enter the superstructure.

❖ **Slabs**

The reinforced concrete slabs (75mm thick) could be cast in-situ or pre-cast. It should be made with clean and well graded aggregates (1:2:4) and should be used to cover the pits.

o **Double squat hole cover slab**

Where the pre-cast reinforced concrete slabs (1,150mm x 600mm) are used, clean sheet of cement paper or a thin sheet of plastic sheet should be spread on the platform before arranging the formworks for casting concrete. After casting, the slab should be allowed to cure for at least 7 days in the shade before positioning. The design detail is shown in Fig. 3.3.

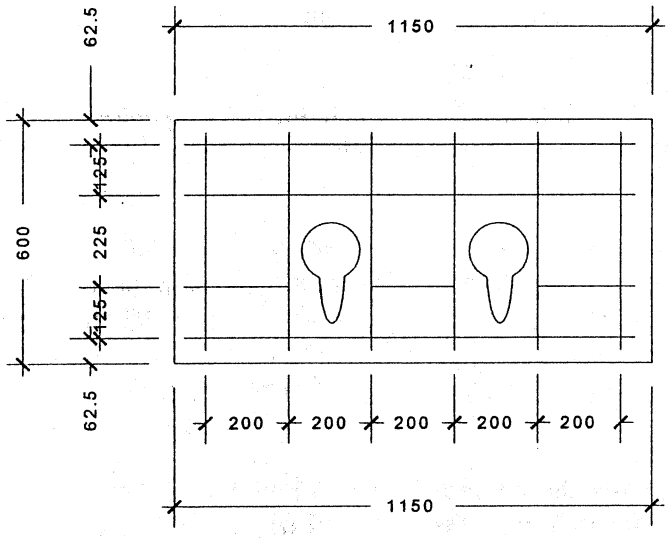


Fig. 3.3: Details of Double squat hole cover slab

Two keyhole squat holes (350mmx150mmx100mm each) are made into the squat slab. A gentle slope should me made towards the squat hole to prevent excreta from falling unto the squatting slab and to ease cleaning.

o **Vent and evacuation cover slabs**

Fig. 3.4 shows the removable cover slab of 1,150mm x 300mm, made of reinforced concrete to allow access for evacuation, while figure 3.5 shows the vent slab of 1,150mm x 600mm. The edge details of the cover slab sections should not have any gap between the central and outer section to allow escape of flies and odours. Cement mortar should be used to bed the removable slab sections to the central section and to the collar to make them airtight.

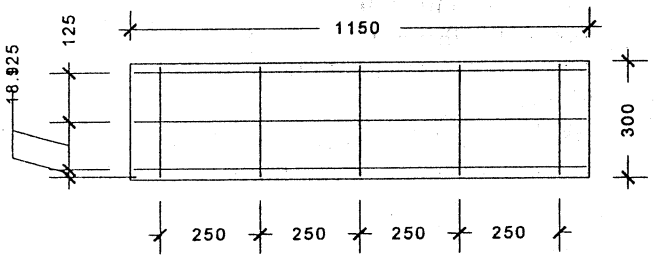


Fig. 3.4: Details of Cover Slab

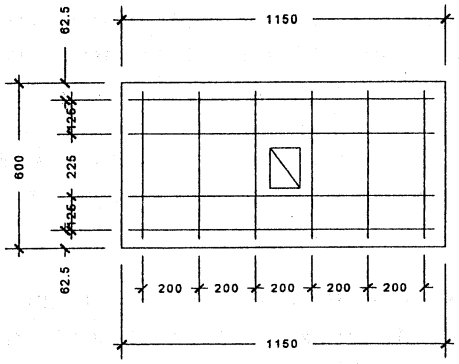


Fig. 3.5: Details of Vent Slab

3.5.3 Superstructure

The superstructure is the part of the VIP latrine above the ground level which provides privacy, comfort and protection for the users and protects the toilet from weather. It also serves to provide sufficient shade over the squat hole so that light rays come in only through the vent pipe. The superstructure consists of wall, door, roof and vent pipe. It can be built using a wide variety of materials. In urban areas, materials such as brick, block-work or ferrocement are often used; the roof can be tiled or made from a thin concrete slab, corrugated iron steel or fibre concrete roofing tiles/sheets.

The design adopted in any one locality depends largely on socio-cultural preference and the availability and affordability of materials; in general, the superstructure form should be architecturally similar to the local houses and school buildings, and this principle normally determines what materials are used. In this way are local sensibilities taken into account and so not offended.

The VIP latrine superstructure should be fairly dark to discourage flies (carrying disease-causing organisms) that enter the pit from leaving it through the squat hole. This works on the principle that flies are attracted to light. To a fly in the pit, the squat hole will not be brightly illuminated so it will try to leave by going up the vent towards the sunlight shining down into the pit. The fly-screen will stop it escaping and it will eventually die.

❖ **The wall**

The wall of the superstructure should be built with 150mm x 225mm x 450mm blocks fixed together with cement mortar following the specified dimensions. Each of the compartments should have its own entrance with door and key to ensure safety of the pupils especially the girls.

The superstructure should be off-set from the pit and only part of it should be over the cover slab. The rest of the superstructure is supported on a single course of blocks laid in cement mortar at right angles to the superstructure. The superstructure should be plastered inside and outside with cement mortar to give smooth finish. There should be a ramp (with a fall of 1:10) at the entry for easier entry.

The internal space for each of the compartments should be at least 950mm wide and 1,500mm long, with each having two squat holes; or 1,500mm wide and 1,500mm long for the compartment for the physically challenged pupils (to provide enough room for movement within the compartment when using the latrine). Moreover, guardrails should be provided on the side-walls (horizontally between 500mm and 700mm above the latrine slab) or any other type of rails that may provide support for those who may have difficulty in squatting and standing up. A sitting structure of 225 mm height should be provided.

Short screening (dwarf) walls should be constructed in front of the latrine units to provide full visual protection for the user from someone more than 3 metres away from the latrines. The dwarf walls can be used to:

- Indicate male and female toilet
- Advertise health and hygiene messages, e.g. need to carry water to the latrine and need for hand-washing with water and soap after using the toilet.

❖ **Door/Latrine entrance**

Traditionally the latrine is entered through a doorway, with the door providing the user with privacy. It is very important that the door remains closed while the latrine is not in use; if it is left open, flies in the pit will be presented with an alternative source of bright light and to escape the latrine via the squat-hole and superstructure. Fly control, which is one of the principal advantages of VIP latrines, therefore becomes ineffective. Self-closing doors can be used (a counterweight attached to the top of the door via a rope and pulley is sufficient for this purpose). Also, the latrine should be locked on the outside; this is often done by the users in order to prevent casual use of the latrine by unauthorized people such as passers-by or members of neighbouring communities without latrines.

To provide the space required for effective functioning of the vent pipe, 225mm x 225mm maximum space (air gap) should be provided on the top and bottom of the door respectively, to maintain ventilation. The space should be covered by fly-screen.

❖ **Vent pipe**

This is the most important component of a VIP latrine. It is a major factor in the control of odour and insects in the latrine. Although it could be made of brick, block, PVC or any locally available material, sanderete block is recommended with external measurement, 225mm x 225mm and the internal wall should be smoothly connected to the pit. The top of the pipe should be covered with fly-screen to stop flies using the vent to enter or leave the pit. To prevent the fly-screen deteriorating due to the sunlight or corrosive gases from the latrine it should be of glass fibre or stainless steel and not plastic or normal steel mesh. Wind blowing across the top of the vent pipe sucks air out of the pit while fresh air flows into the pit through the squat hole. This flow of air is helped if the door faces the direction from which the wind normally blows.

The block vent pipe is advantageous in that it forms part of the superstructure. Unlike the PVC which can either crack under the effect of the sunlight; or get damaged by pupils, the block vent pipe may last for as long as the structure stands. The vent pipe should be at least 500mm above the roof level (Plate 3.1; Fig. 3.6).

❖ **Fly-screen specification**

The purpose of the fly-screen is to prevent the passage of flies and mosquitoes; therefore the mesh aperture must not be larger than 1.2 mm x 1.5 mm (smaller apertures are not recommended as they will result in decreased ventilation rates, due to increased frictional losses). The fly-screen must be made of corrosion-resistant material that is able to withstand intense rainfall, high temperatures and strong sunlight. It is preferable to use stainless steel screens, which last indefinitely. The fly-screen should be mounted on a wooden frame (454mm x 254mm x 10mm) made from hardwood (Fig. 3.6).

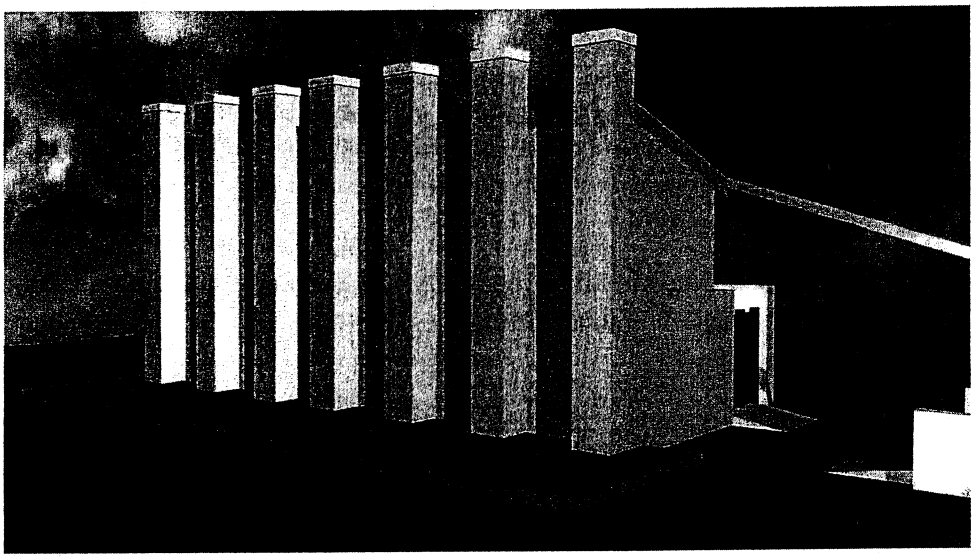


Plate 3.1: Back elevation of the VIP latrine superstructure showing the block work vent pipe

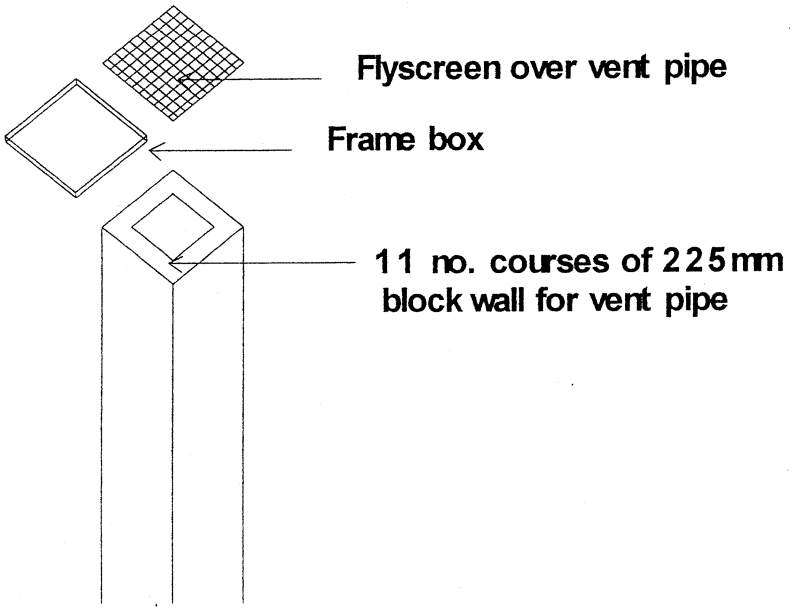


Fig. 3.6: Details for fixing fly-screen to vent pipe (block work)

❖ **Roof**

The roof could be made of aluminum or corrugated iron sheets (CIS) or fibre concrete roofing tiles/sheets supported by timber members: rafters (75mm x 50mm), purlins (50mm x 50mm) and wall plate (75mm x 50mm). Fascia boards (150mm x 25mm) should be provided to conceal the internal roofing timber. These should be well treated to avoid attack by termites. The roof should slope away from the vent pipe (Fig. 3.7).

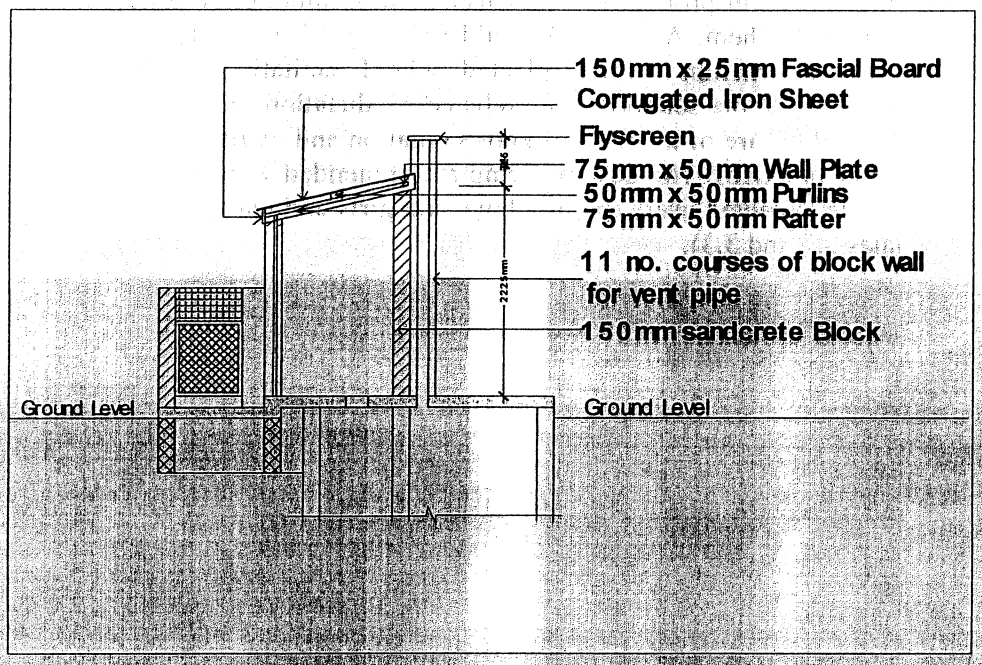


Fig. 3.7: Cross Section of the VIP latrine showing details of the roof structure

3.6 Urinals

The urinal is usually an elongated structure designed in such a way that the walls are finished with smooth and very hard mortar. Urine is led through a channel either directly into the pit through a hole in the base slab or, in case of a separate urinal, through a pipe leading to a soak pit.

Separate urinals from toilets should be provided in schools because people urinate more often than they defaecate; urine also accounts for most of the smells from latrines. There is, therefore, need to drain the urine into a separate soak-away pit.

3.7 Hand washing facilities

Regular washing of hands is one of the most effective means of preventing most gastro-intestinal tract (GIT) diseases; others include safe stool disposal and adequate household water supply (CASSAD 2006). It is particularly important that children wash their hands after defecation, urinating, cleaning of the latrines, especially before eating or drinking from a tap or a hand pump. It is difficult for most pupils to wash hands at school, where there is no facility, or where facilities are not functioning properly, for a variety of reasons, including poor design and/or construction, missing or broken taps, inaccessibility to water, and so on.

3.8 Designs of Sanitation Facilities for Schools

3.8.1 Involvement of Schools

Schools should be involved in promoting and selecting from among the different types of latrines/toilets available to them. Also, they should be involved in the design, supervision and certification of construction of the selected school sanitation facilities. Hygiene education should be part of the school's comprehensive education programme in order to ensure that all pupils are aware of the risks of poor sanitation and hygiene, and to help them develop good hygiene practices. The designs being recommended were arrived at sequel to the involvement of the expected users (pupils- boys and girls and teachers) of the facilities in the designs (Plates 3.2 and 3.3).

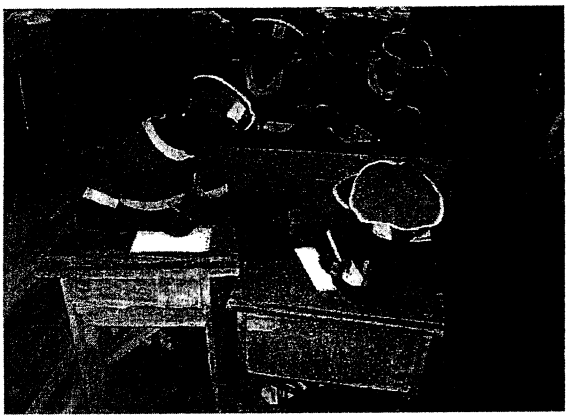


Plate 3.2: Some pupils (girls) participating in the drawing of their preferred type of school sanitation facilities

Plate 3.3: A girl-pupil drawing her preferred type of latrine/toilet

Stemming from consultations with the pupils and teachers of selected schools during the field work for this exercise; review of a catalogue of design options; pilot testing of the various designs; and bearing in mind the key design criteria of affordability, reliability and usability by the pupils, especially the girl-child, it is recommended that there should be separate sanitation facilities for boys and girls and for male and female teachers and non-teaching staff. Also recommended are variants of the school sanitation facilities of latrines/toilets, urinals and hand-washing.

The recommended sanitation facilities are simple, affordable, appropriate to local conditions and easy to maintain. The designs are attractive to the users based on local preference and acceptability. Selection of technology and building materials recommended in this guide were, in particular, made in close consultation with pupils, teachers and parents; thus, the designs and construction are sustainable, affordable and replicable.

Alternative designs are presented that include hand washing facility inside latrine buildings, which is especially suitable for girls. Each latrine compartment includes a door that extends to the floor, with space provided at the bottom and top for effective ventilation. The door should always be closed, to provide privacy and security for the users, especially girls. There will be high quality polished concrete slabs in the latrines to ease cleaning by the children.

The options for urinal construction have taken account of the needs of different age groups as well as the importance of smell minimization and adequate disposal of urine from the facility. The urinal designs will make use of run-off from hand-washing taps to help keep the urine channels clean. It will also make adequate drainage for the removal of rainwater or water used for cleaning.

Hand washing facility is a priority for encouraging behavioural change in schools. Designs and location will be such that will encourage effective usage by both male and female pupils.

3.8.2 Child-Friendly Designs

User (child/girl/physically challenged) – friendly considerations were also given prominence in the designs. Thus, the designs satisfied the special requirements of children in general and girls in particular. The needs of older girls who require more privacy have been taken into account in the designs. Various alternative designs are presented that include stand alone VIP latrine, pour flush toilets, urinals, and hand washing facilities. There are also designs that combined all the facilities (VIP latrine, urinals and hand washing), which is especially imperative for menstruating girls. Urinals have partitioning of dwarf walls on individual compartments.

Provisions have also been made in the designs for physically challenged users, since one in five of the world's poorest are disabled and for them access to basic services (such as sanitation and safe water) is a daily problem and may lead to reduced opportunities, isolation, poor health and poverty (Zomwelaag *et al*, 2005). Efforts have been made to incorporate facilities for the following categories of disabled children:

- **Blind or poorly sighted children:** special grips and guiding systems (Fig. 3.8).
- **Children in wheelchairs or with crutches**: ramp, wider doors, special grips, block filled with concrete seats or foldable seats (Fig. 3.8; Plates 3.4 and 3.5)
- **Children with missing arm(s) or paralyzed arms**: taps and knobs that can be opened with one hand, are not heavy or can be opened with the feet.

When incorporated in the original design, the above adaptations can be made using locally available materials while making a big difference in a disabled child's life and access to education. Thus, the facilities will enable, motivate and promote appropriate hygiene practices among children, thereby creating enabling learning environment in schools.

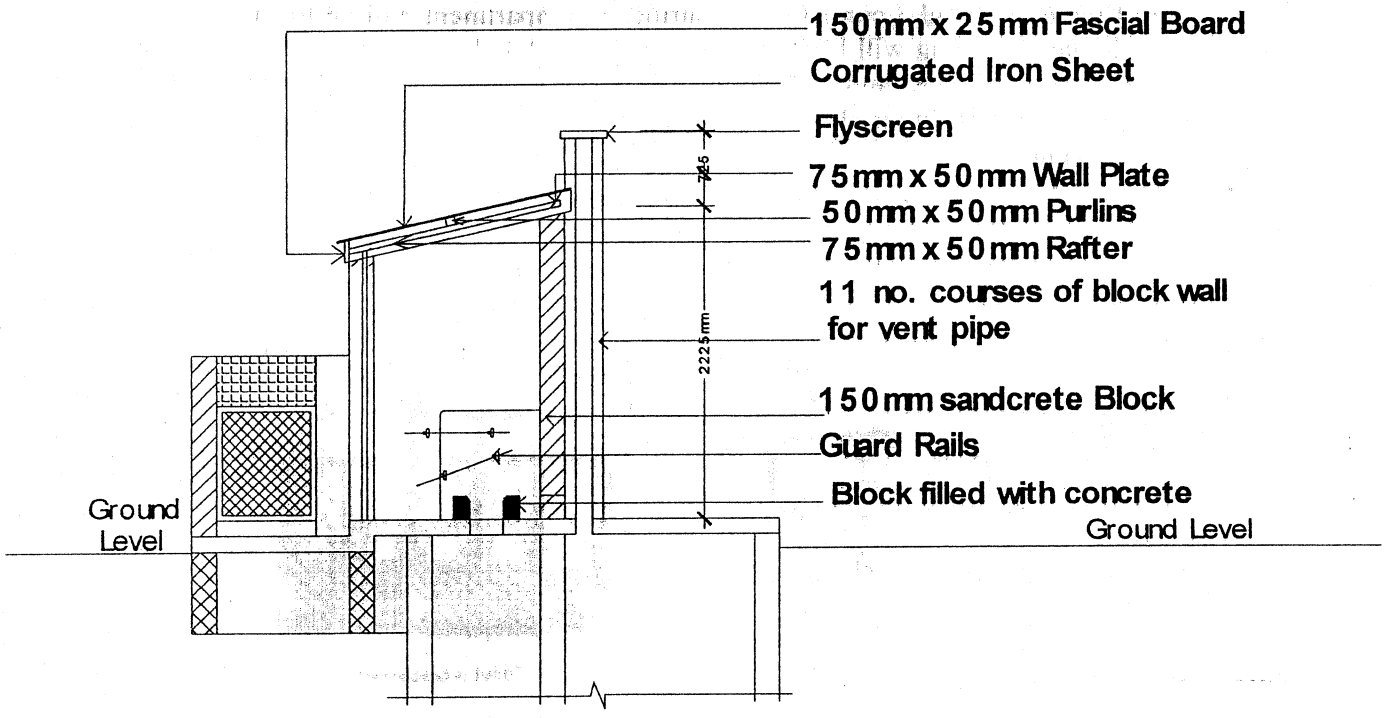


Fig. 3.8: Guardrails and seats for Children with Disability

3.8.3 Design Options

3.8.3.1 Introduction

Among the range of design options available to meet the latrine/toilet needs of schools, two types of multi-variants facility are being proposed in this technical guide, namely:

- Stand alone facility
  - Multi-compartment VIP latrines
  - Pour flush toilets
- Combined facility
  - Multi-compartment VIP latrines
  - Pour flush toilets

From technical and health points of view, multi-compartment VIP latrines are better options because they can last for a long time; space is economised and good quality manure can be produced. Although, lined pits that are not raised above ground are proposed, however, in difficult soil conditions or high water table, the raised option should be used.

3.8.3.2 Stand Alone Facility

In this design, provisions have been made for 2 separate units of: empty-able, lined multi-compartment ventilated improved pit (VIP) latrine/pour flush toilet; urinal and hand washing, one unit each for males and females. Depending upon the population and other criteria, there may be 6, 5, 4, 3 or 2 compartments of the VIP latrine or 4, 3, or 2 pour flush toilets per unit. For urinals, provisions have been made for 10, 8, 6, or 4 users. However, in the case of hand washing facility, the design is constant, although each school can duplicate as required.

In the case of the 6, 5, 4 and 3 compartment latrine, 1 compartment will be for the female teachers, while the remaining will be for girls (female pupils). The same system applies to the other units for males. The hand washing facility is positioned, as stated above in such a way that water from the facility is channeled through the urinals into either soak pit or school garden (Fig. 3.9; Plate 3.4).

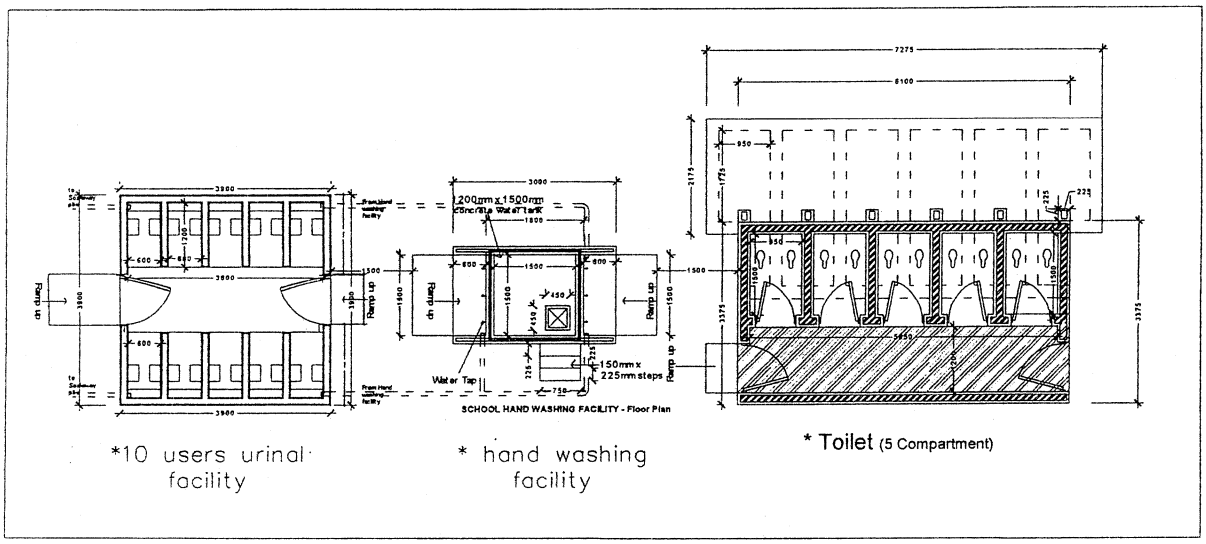


Fig. 3.9: 5 compartment **VIP** *latrine, urinals (10 users) and hand washing (Stand Alone Facility)*

Plate 3.4: Perspective view of the 5 compartment VIP latrine, urinals and hand washing facility (Stand Alone Facility)

3.8.3.3 Combined Facility

The design of the combined facility consists of the same set of components. The only difference is that all the three facilities of multi-compartment VIP latrine or pour flush toilets, urinals and hand washing are within the same block. There are two variants of this design (Figs. 3.9 and 3.10). In the first case, there are twin urinals and hand washing facilities, with each beside the 6 compartment latrine, while in the other case, the two facilities are directly in front of the 5 compartment latrine. Moreover, all the facilities are roofed in the second variant. In the two, the urinals and the hand washing facilities are located in the traffic pattern of the building so that users could access them easily. Moreover, whosoever wants to use either the urinal or the hand washing facility alone could access them without necessary entering the inner part of the building where the latrines are located (Figs. 3.10-3.15; Plates 3.5 and 3.6).

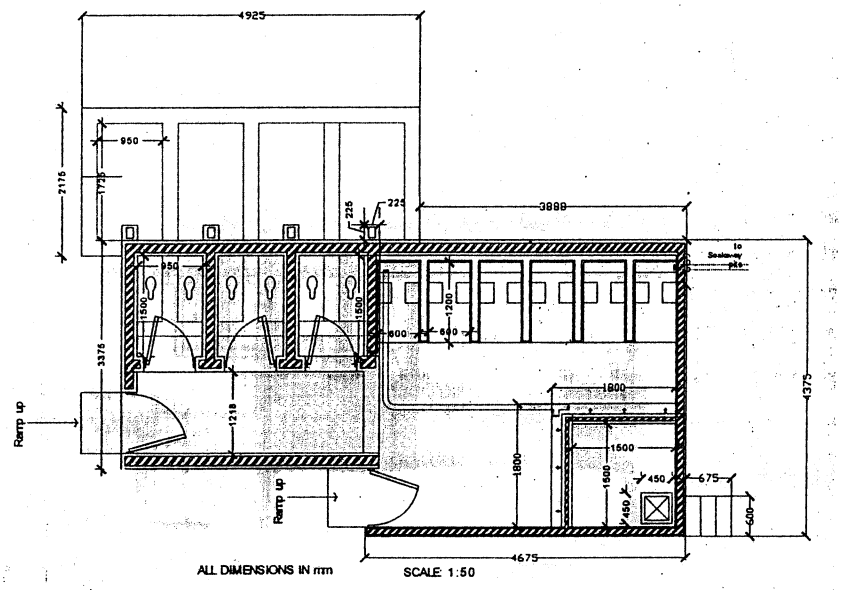


Fig. 3.10: 3 compartment **VIP** *latrine, urinals and hand washing facilities (Combined Facility)*

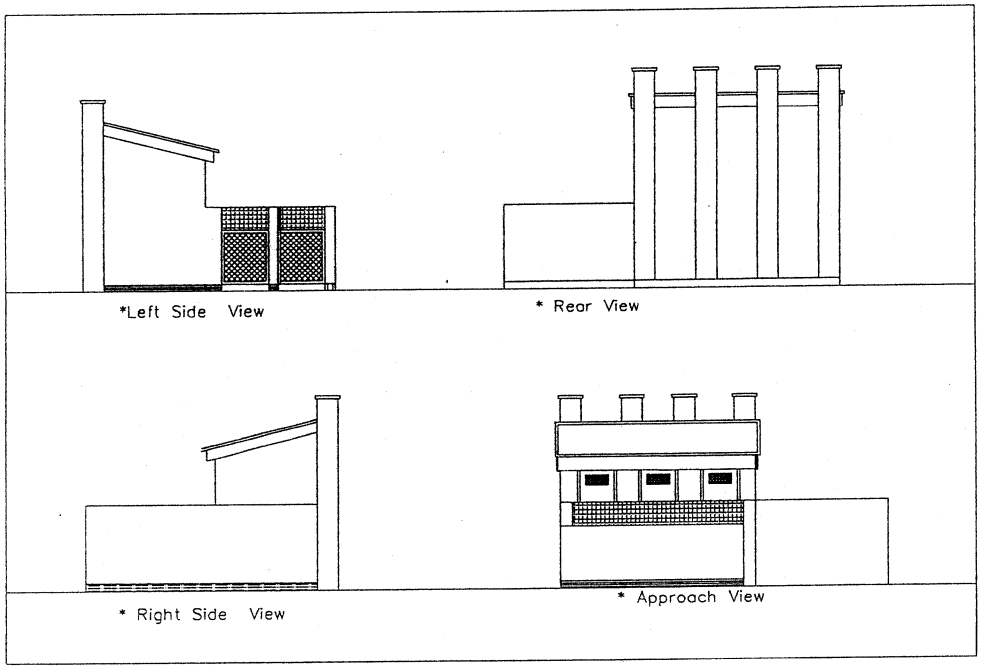


Fig. 3.11: Elevations of the 3 compartment **VIP** *latrine, urinals and hand washing facilities (Combined Facility)*

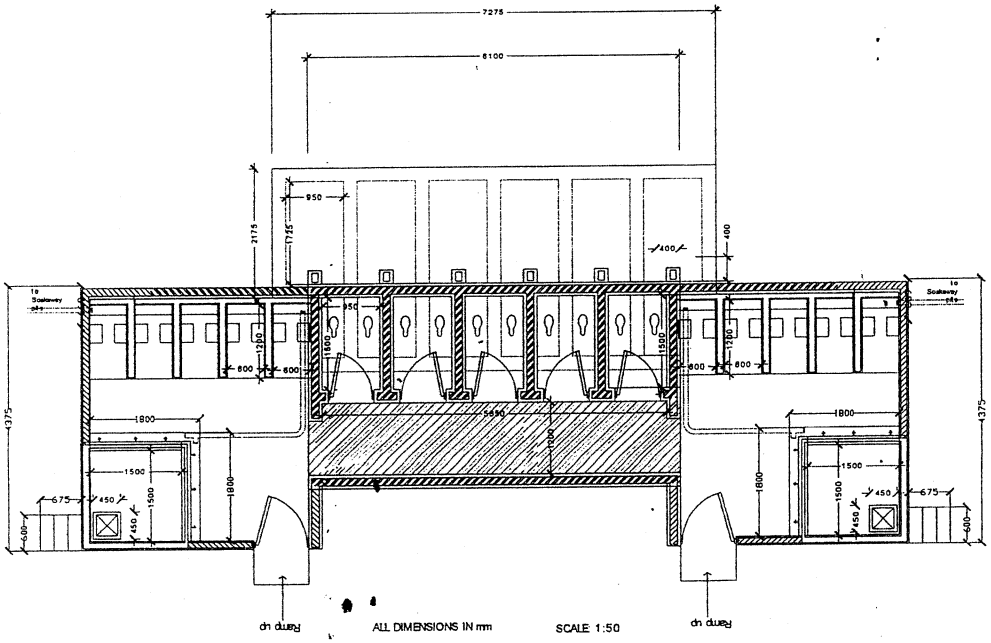


Fig. 3.12: 5 compartment **VIP** *latrine, urinals and hand washing facilities (Combined Facility)*

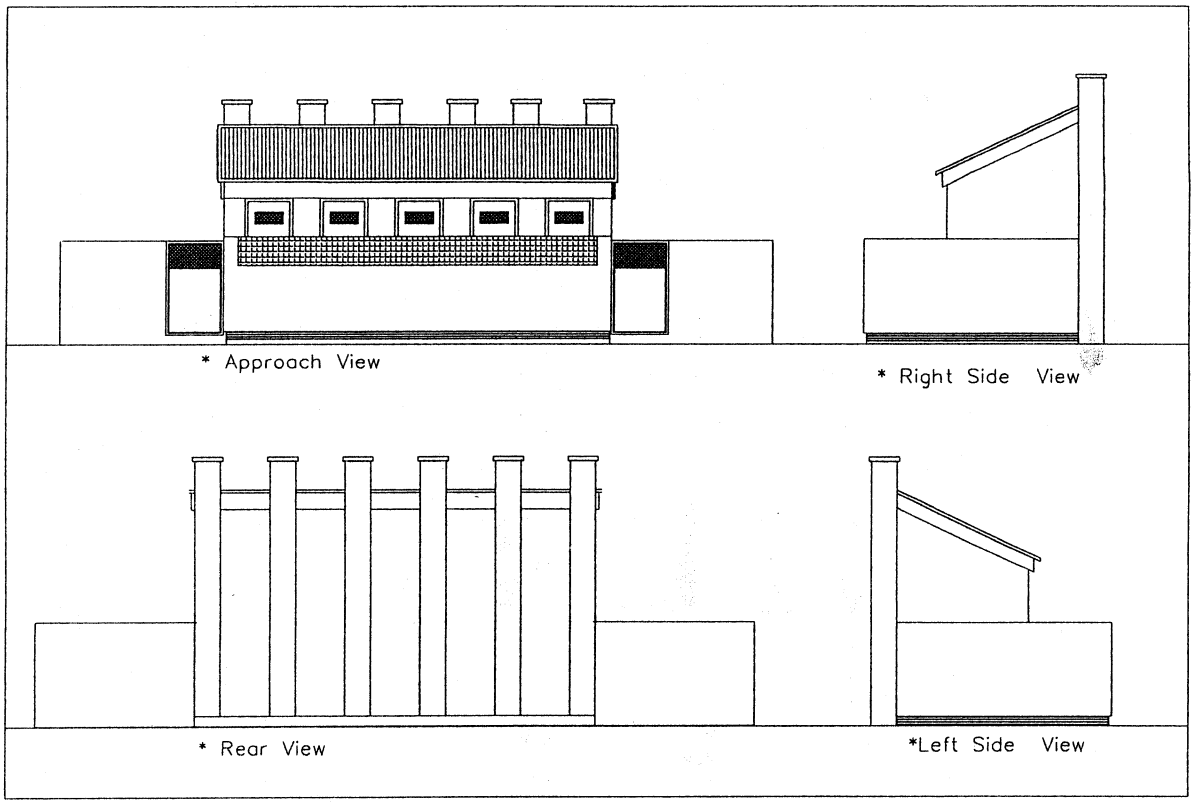


Fig. 3.13: Elevations of the 5 compartment **VIP** *latrine, urinals and hand washing facilities (Combined Facility)*

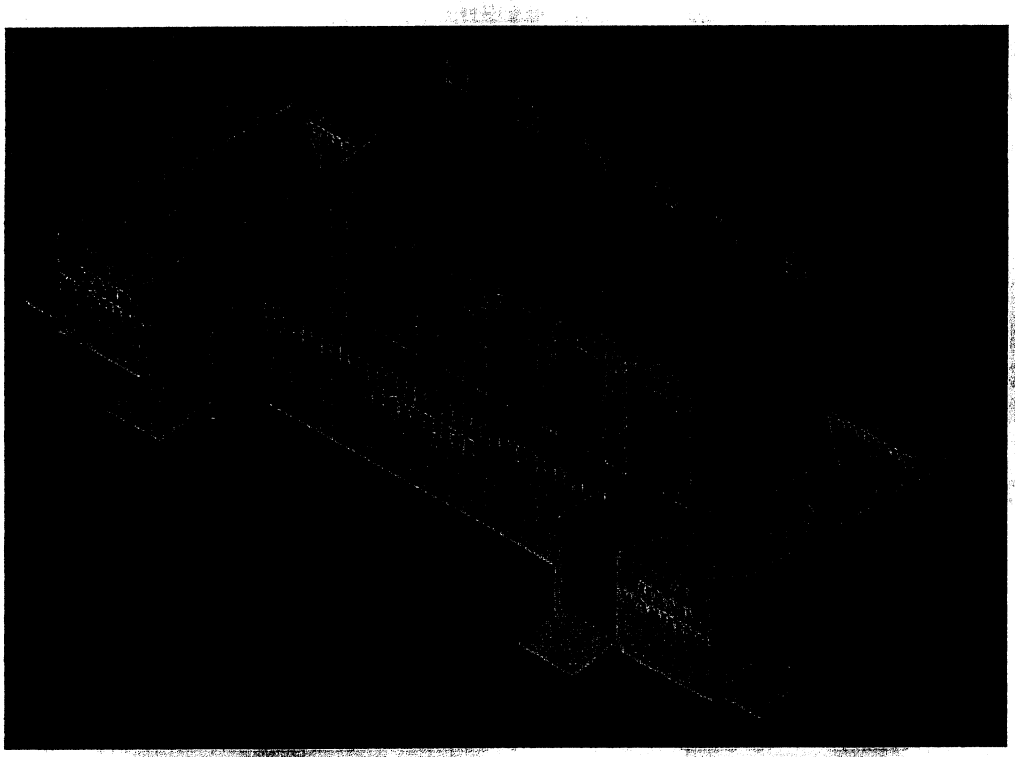


Plate 3.5: Perspective view of the 5 compartment VIP latrine, urinals and hand washing facilities (Combined Facility)

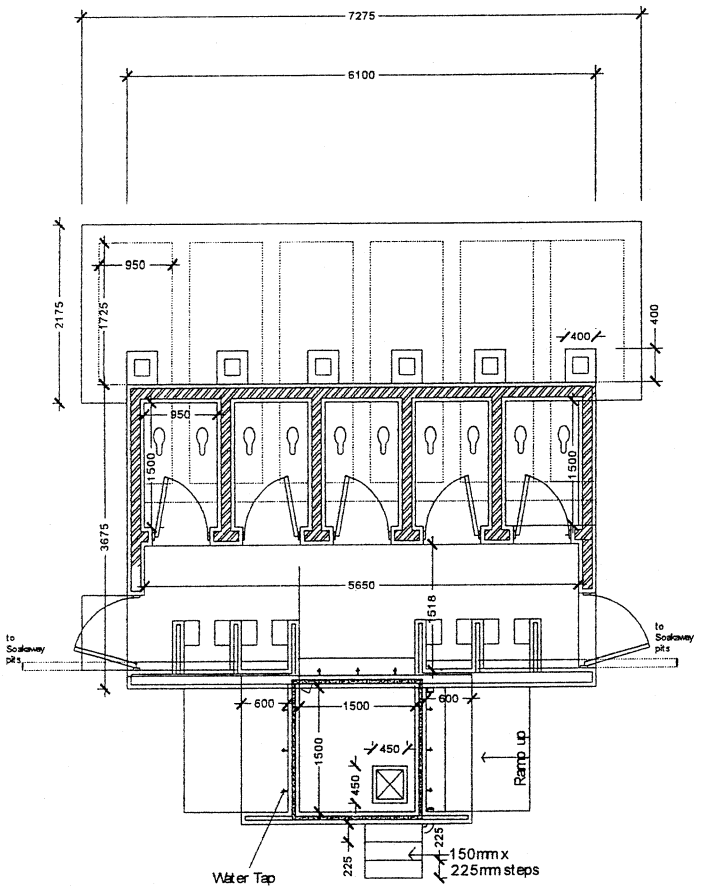


Fig. 3.14: Another 5 compartment **VIP** *latrine, urinals and hand washing option (Combined Facility)*

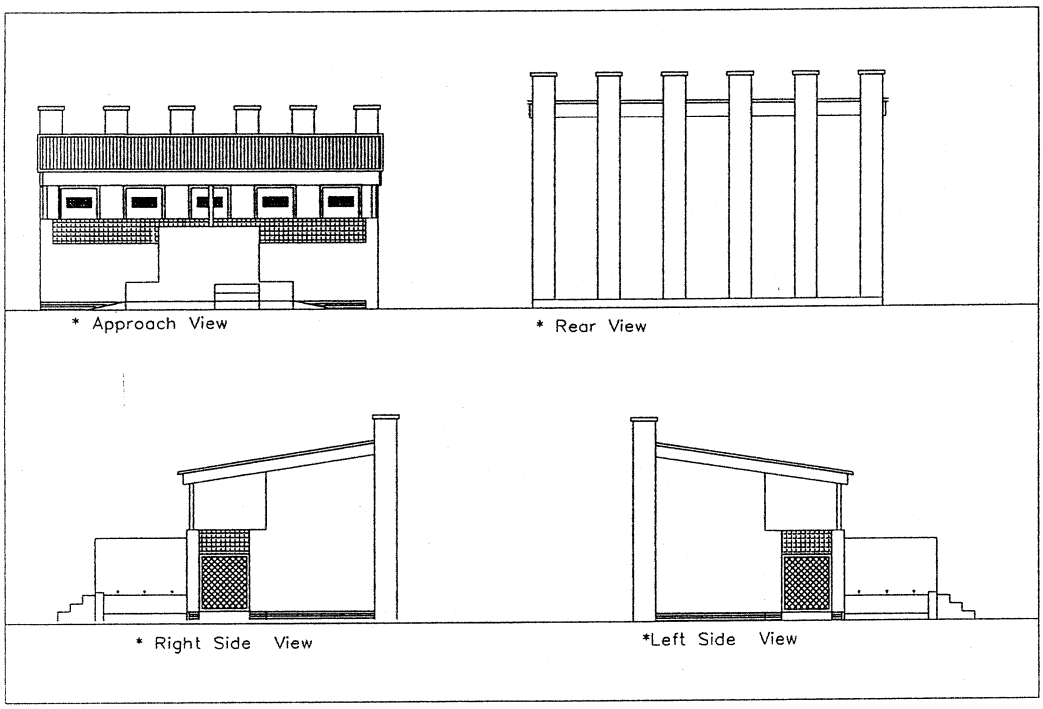


Fig. 3.15: The Elevations of the 5 compartment **VIP** *latrine, urinals and hand washing (Combined Facility)*

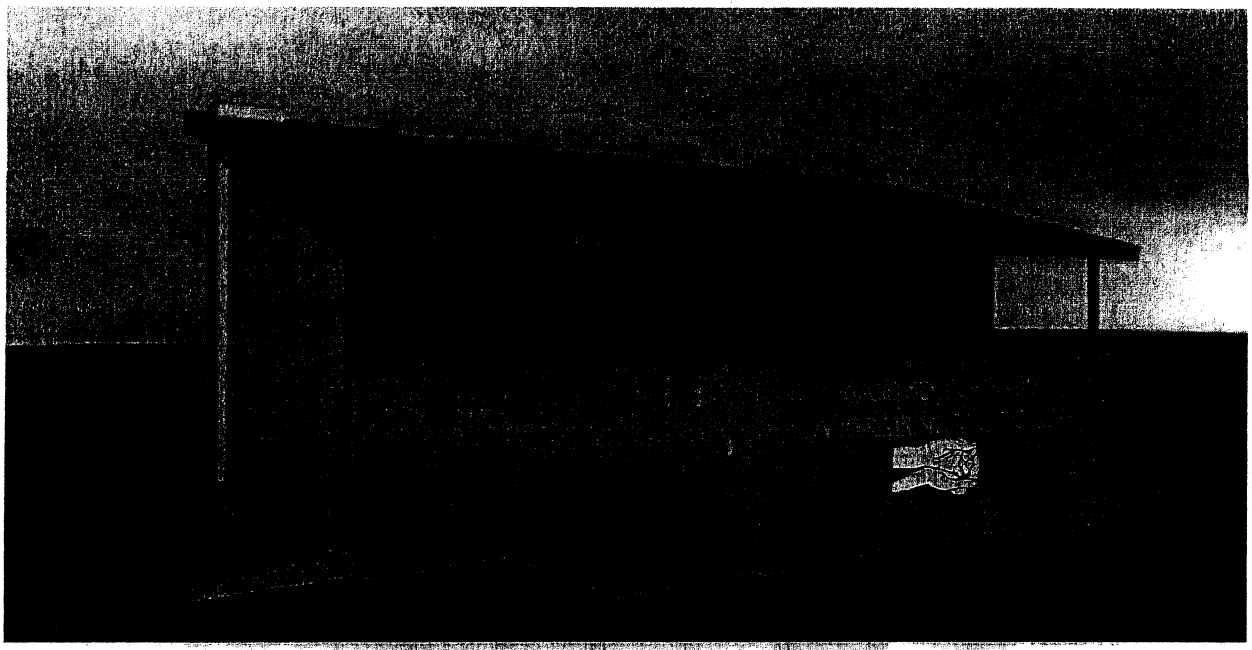


Plate 3.6: Perspective view of the 5 compartment VIP latrine, urinals and hand washing facilities (Combined Facility)

3.8.4 The Designs

3.8.4.1 Multi-compartment VIP Latrines

The multi-compartment VIP latrine is designed in such a way that the size varies from 2 to 6 compartments, according to the needs of the school.

❖ ***Design Details***

The pit is rectangular in shape and extends to the rear of the superstructure to make evacuation easy. The design details are the same for the 2, 3, 4, 5 and 6-compartment VIP latrines. The dimensions of the pit and the other various components of each type of VIP are as shown in table 3.1. The plans and elevations are presented in figures 3.16 – 3.25.

Table 3.1: Dimensions of the various compartments

Components		Compartments				
		2	**3**	**4**	**5**	**6**
Cover slab		15	20	25	30	35
Vent		3	4	5	6	7
Double Squat		2	3	4	5	6
Pit	Number	3	4	5	6	7
	Length (mm)	3750	4925	6100	7275	8450
	Breadth (mm)	3575	3575	3575	3575	3575
	Depth (mm)	1650	1650	1650	1650	1650
Wall (mm)	Length (mm)	2575	3750	4925	6100	7275
	Breadth (mm)	3375	3375	3375	3375	3375

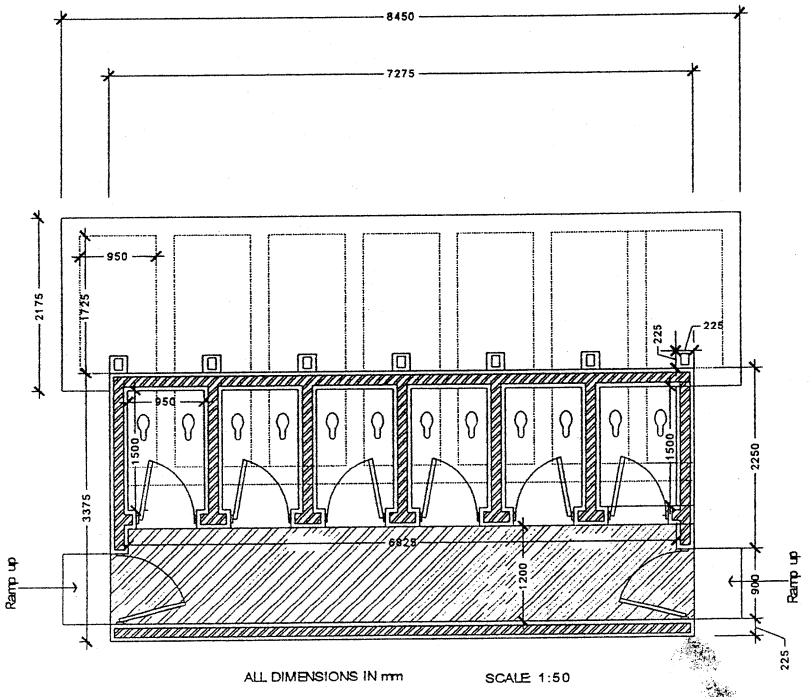


Fig. 3.16: Floor Plan of the 6-compartment VIP Latrine

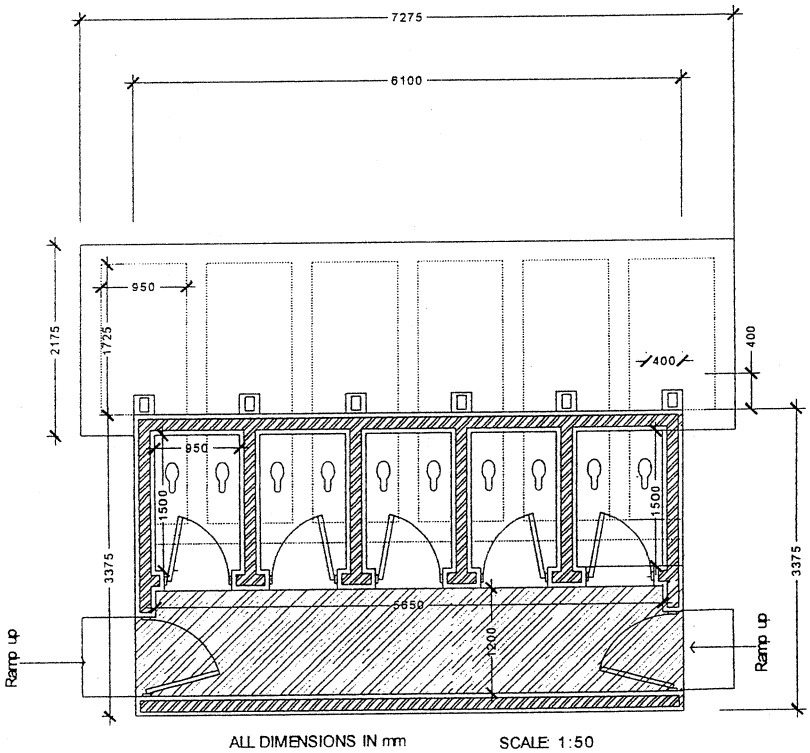


Fig. 3.17: Floor Plan of the 5-compartment VIP Latrine

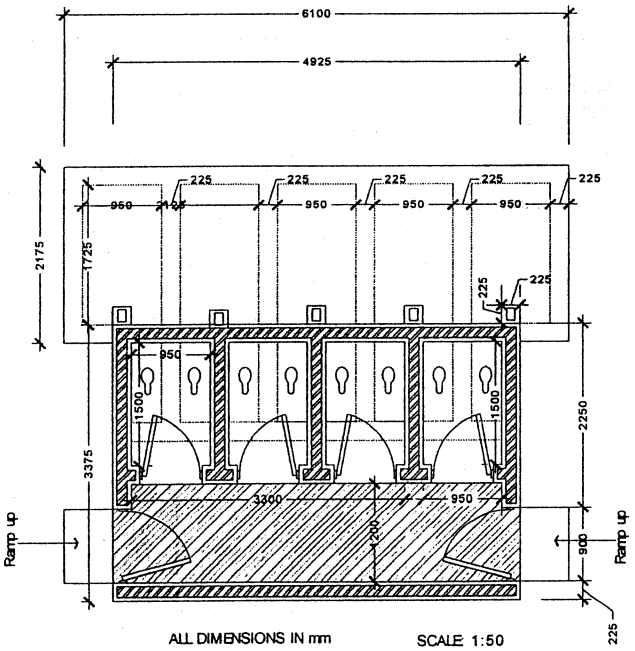


Fig. 3.18: Floor Plan of the 4-compartment VIP Latrine

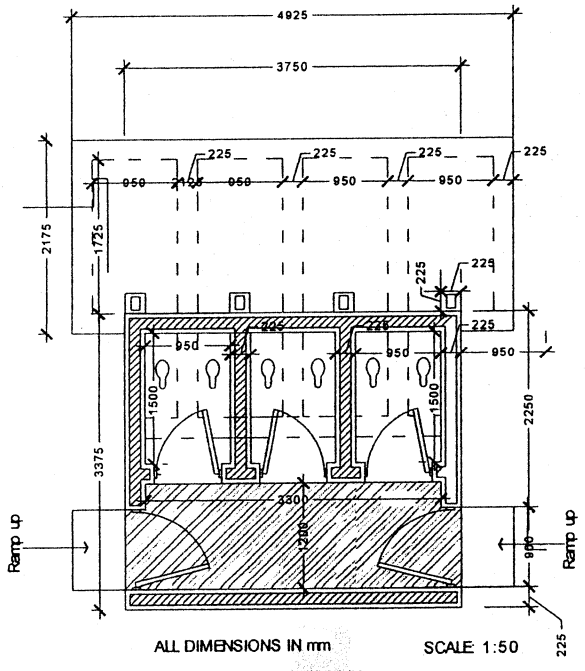


Fig. 3.19: Floor Plan of the 3-compartment VIP Latrine

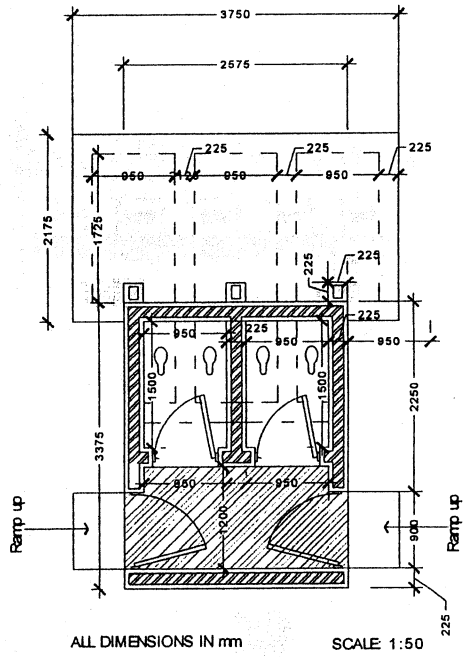


Fig. 3.20: Floor Plan of the 2-compartment VIP Latrine

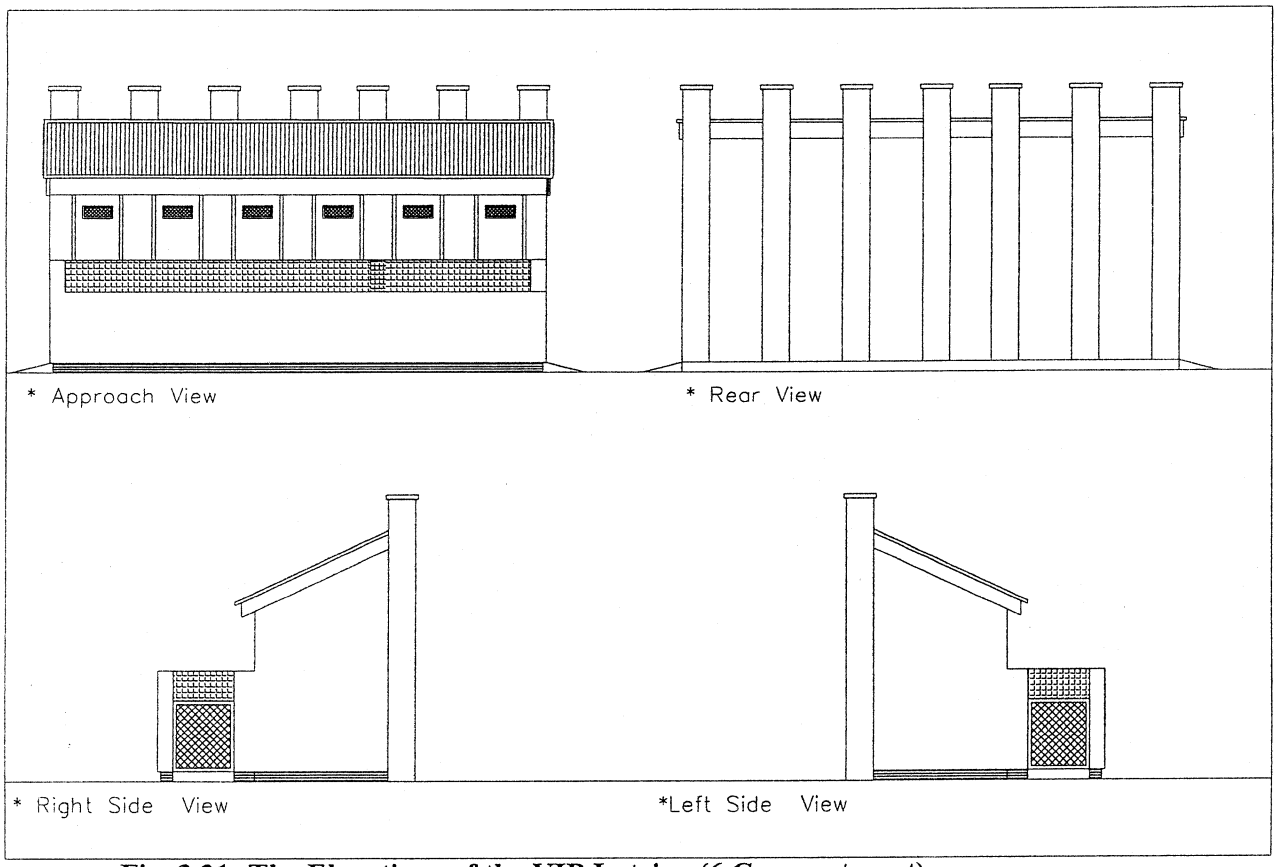


Fig. 3.21: The Elevations of the VIP Latrine (6 Compartment)

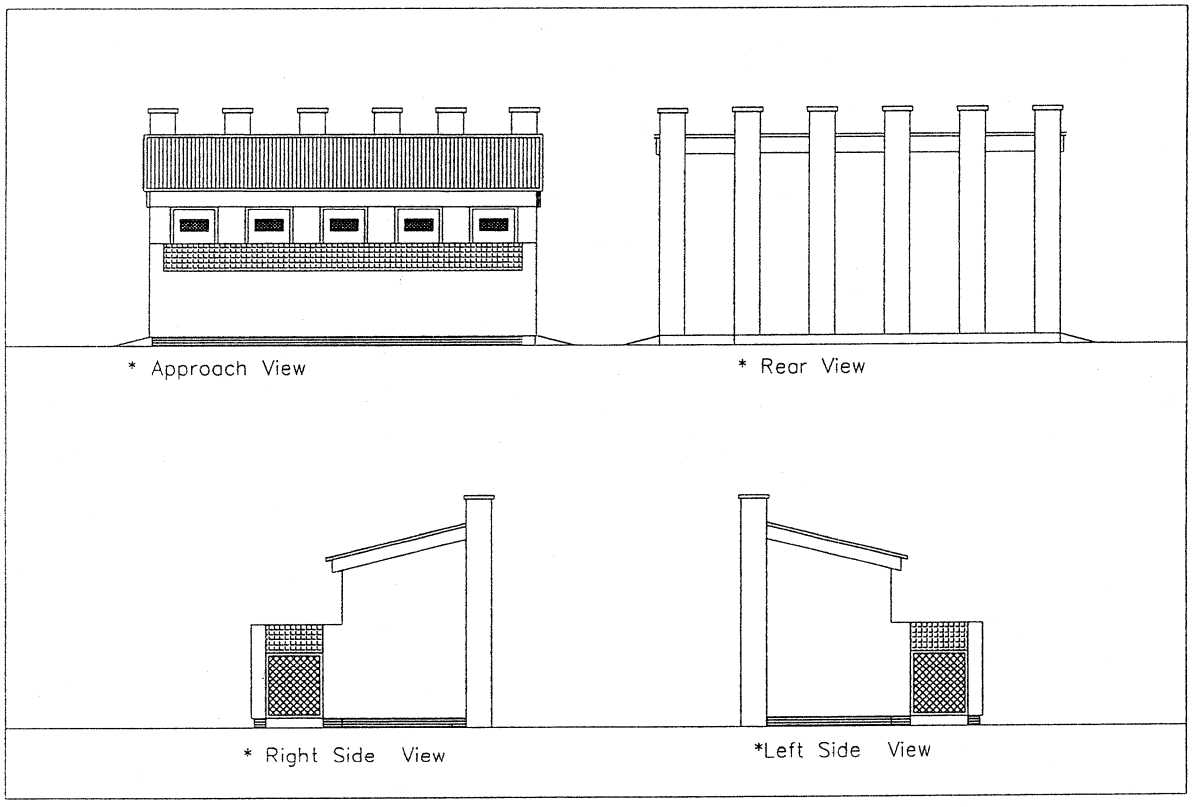


Fig. 3.22: The Elevations of the VIP Latrine (5 Compartment)

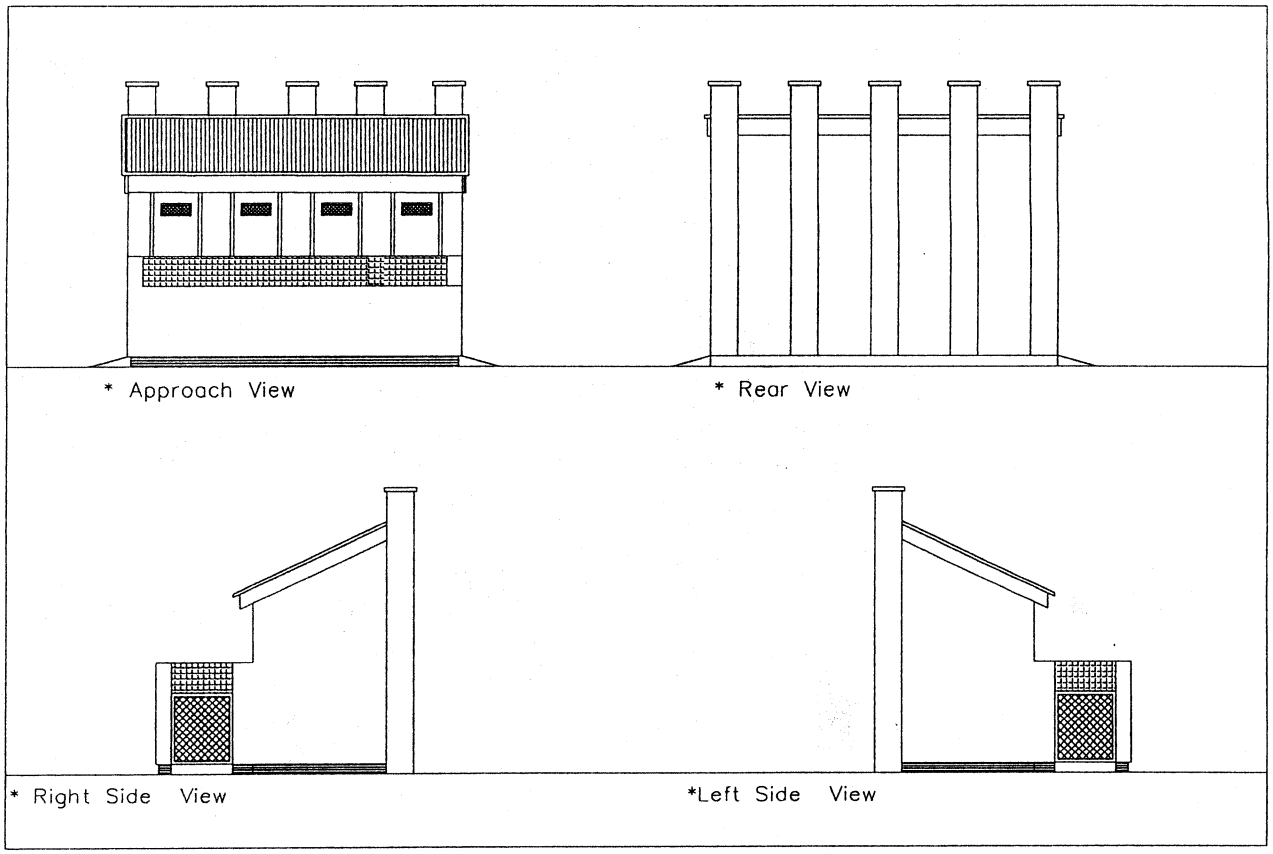


Fig. 3.23: The Elevations of the VIP Latrine (4 Compartment)

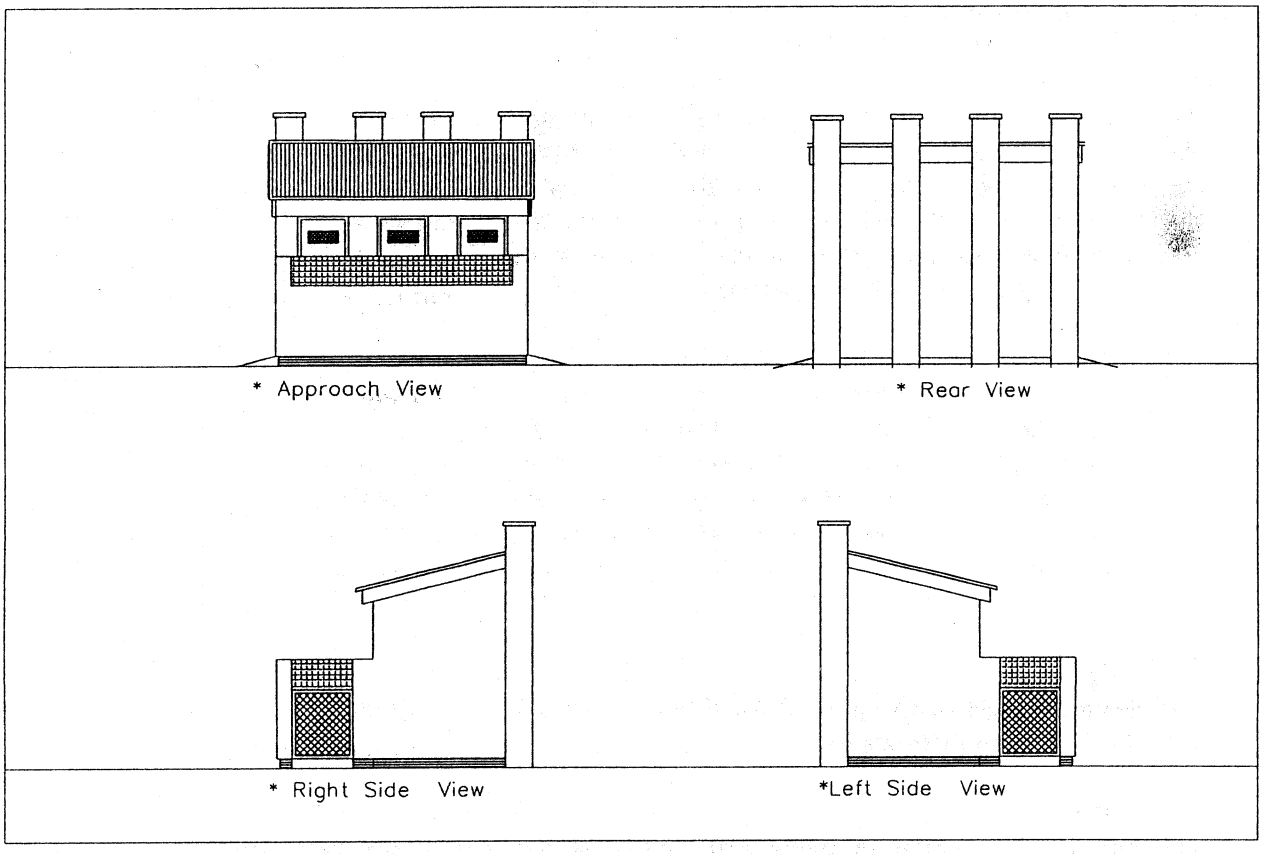


Fig. 3.24: The Elevations of the VIP Latrine (3 Compartment)

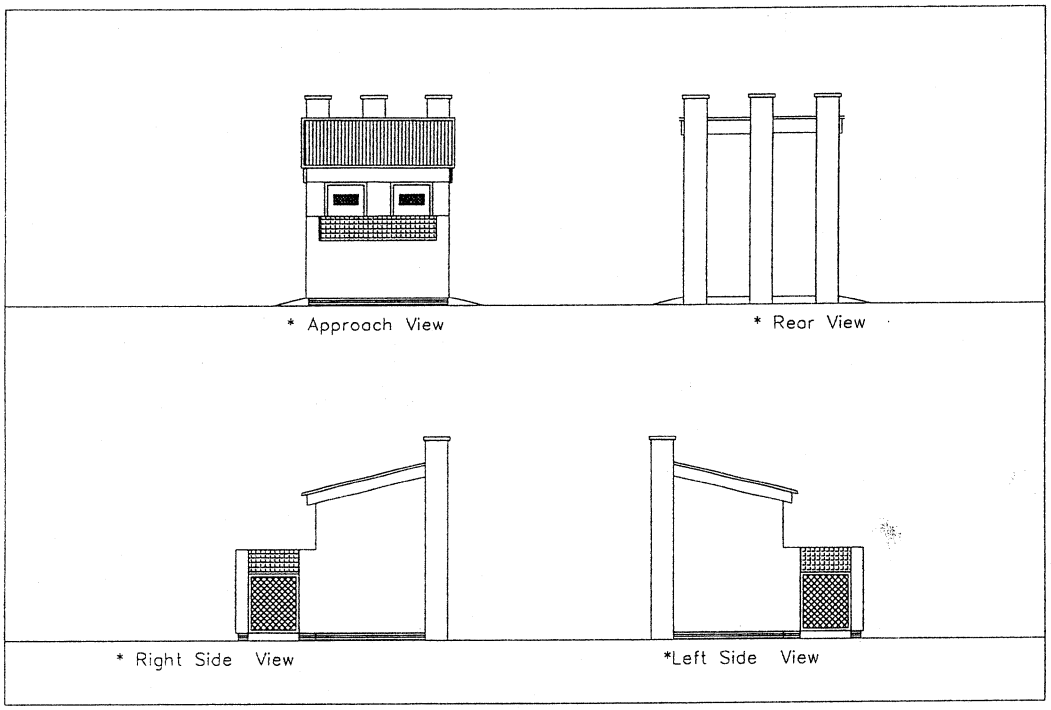


Fig. 3.25: The Elevations of the VIP Latrine (2 Compartment)

3.8.4.2 Pour Flush Toilet

❖ ***Introduction***

Pour flush toilet is designed with a U-shaped squatting pans partly filled with water under the slab. It uses water to flush excreta into the pit. After use, excreta is manually flushed by pouring water into the pan with a scoop. An average of 2.5 litres water is required for each flush, though the amount of water required depends mainly on the design of the toilet and U-trap. The pour flush pan can be made from plastic and ceramic, or from galvanized sheet metal. It can either be made in squatting or seating type.

Pour flush toilets can only be properly used in regions where water is available for flushing. This may require the construction of a (septic) tank/biogas digester/pit. Also, pour flush toilets are appropriate, especially in densely populated schools where dry handling of excreta is socio-culturally inappropriate. Moreover, pour flush slabs are suitable where people use water for anal cleaning and either seat or squat to defecate. No material that could obstruct the U-trap, which serve as a water seal, should be thrown in the toilet. Unlike the multi-compartment VIP latrine, the pour flush toilets vent pipe should be made of PVC pipe, which is connected from the junction box to the pit with another PVC pipe.

❖ ***Design Details***

The design details of the pour flush toilet are similar to multi-compartment VIP latrine, with the following differences:

- **Pit**

The pits are rectangular in shape and located at the rear of the superstructure to make evacuation easy. The dimensions for each type of pour flush toilets are as shown in table 3.2. Figures 3.26 – 3.28 show the floor plans of 4, 3 and 2 compartment pour flush, respectively.

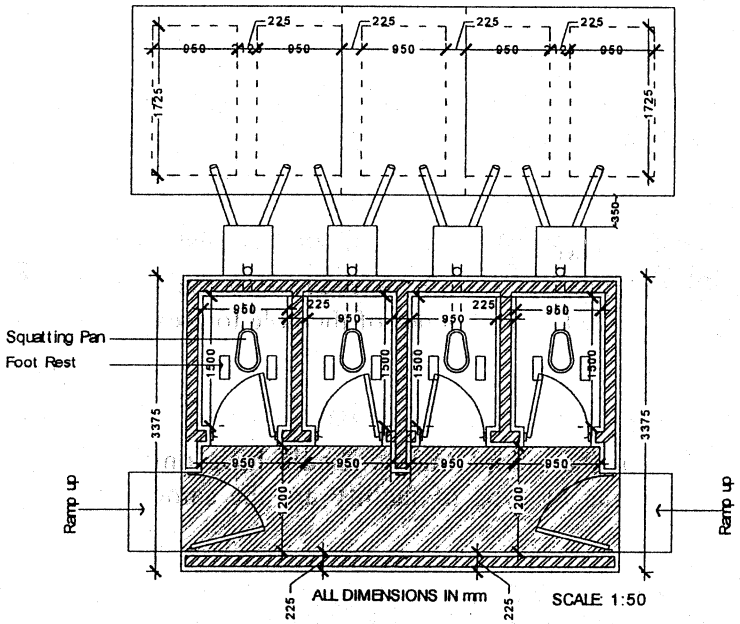


Fig. 3.26: Floor Plan of the 4-compartment Pour Flush Toilet

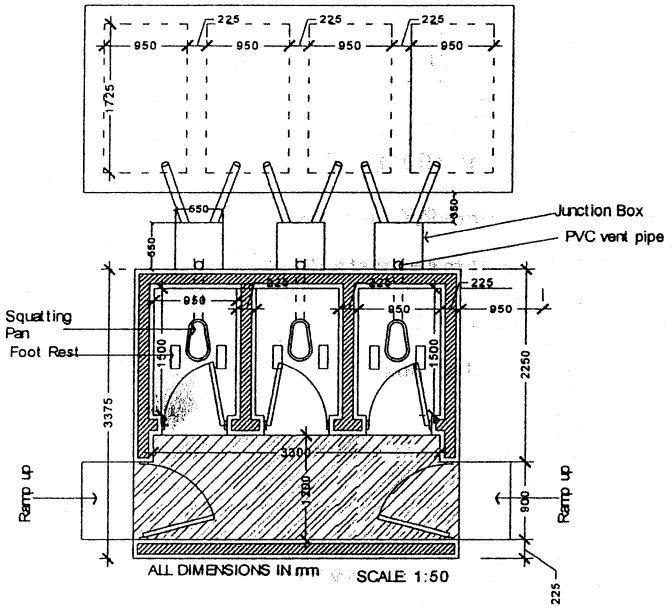


Fig. 3.27: Floor Plan of the 3-compartment Pour Flush Toilet

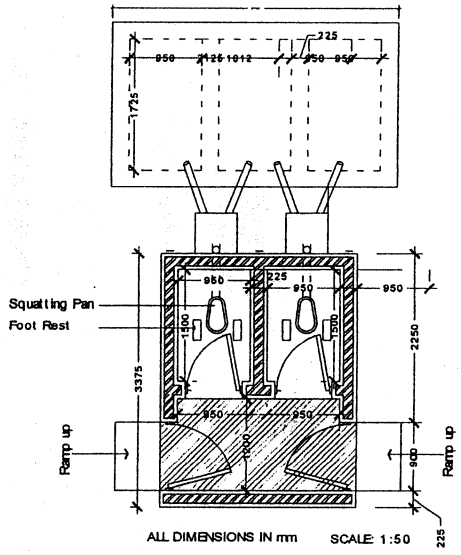


Fig. 3.28: Floor Plan of the 2-compartment Pour Flush Toilet

- **Pit lining**

The entire pit is recommended to be lined, while the lower part of the lining should have weep holes (25mm) so that liquid can seep through the holes and out of the pit.

- **Single squat hole cover slab**

A single squat hole, 500mmx220mmx310mm, is made into the squat slab. Foot rest of 275mm x 100 mm should be added on both sides of the hole to prevent excreta from falling unto the squatting slab.

- **The wall**

The internal space for each of the compartments should have only one squat holes. The dimensions of the compartments by type of facility are the same as for the VIP latrine (Table 3.2).

- **Vent pipe**

Although it is not compulsory for pour flush toilet to have a vent pipe, for the purpose of this guide a vertical pipe made of block work with internal measurement, 225cm x 225cm and the internal wall should be smoothly connected to the inspection chamber. However, PVC pipe could also be used. While figure 3.29 shows the cross section of typical pour flush toilet, figure 3.30 shows details of the pan and trap.

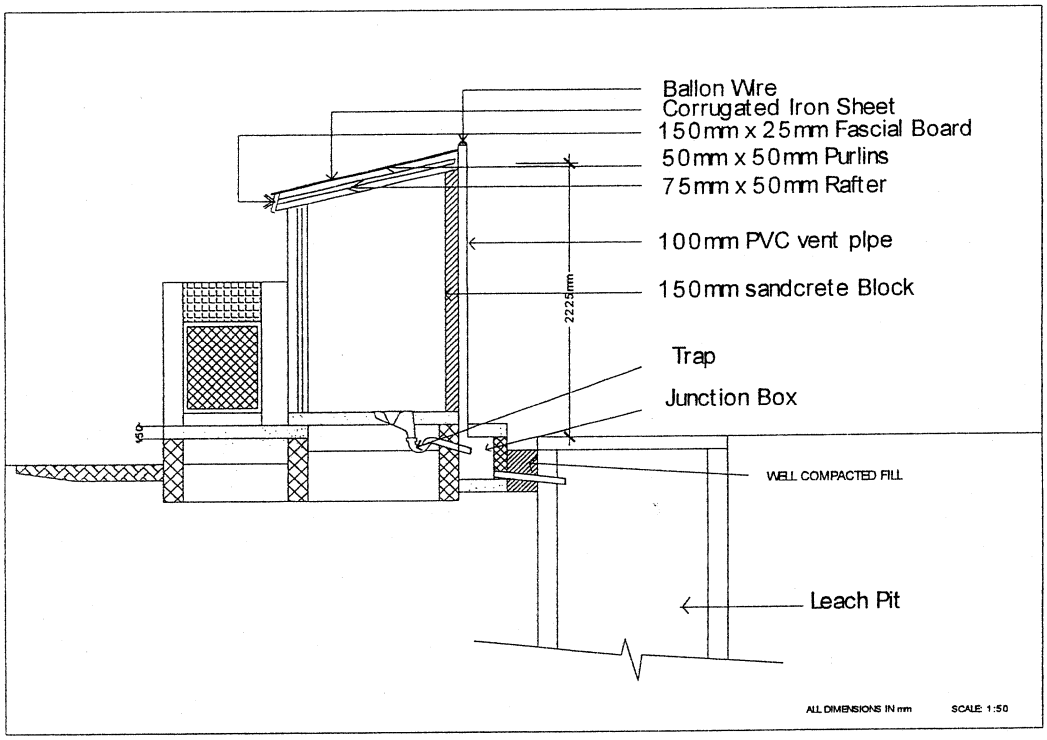


Fig. 3.29: Cross Section of the Pour Flush toilet showing details of the pan, trap, junction box and pit

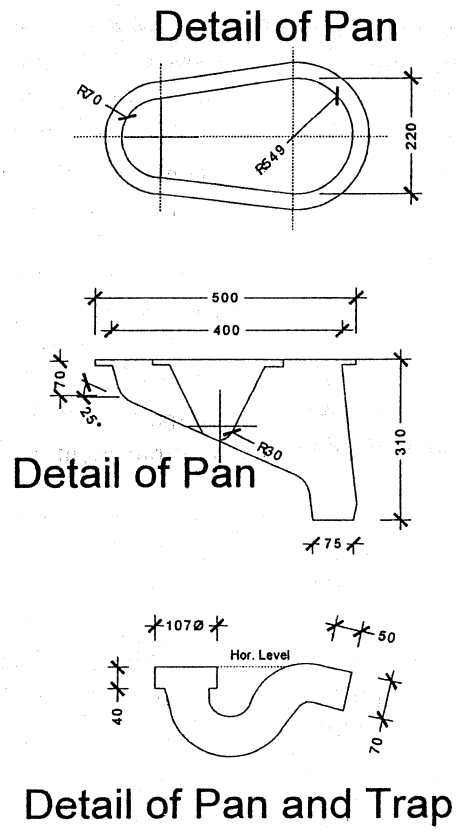


Fig. 3.30: Details of the pour flush pan and trap

3.8.4.3 Urinal

❖ ***Introduction***

A urinal is any specially designed sanitation facility or container for urinating by people. It could be built as part of the multi-compartment unit or built as a separate (stand alone) unit. The waste (urine) will however, drain into a separate soak-pit, in which case the connection is underground through thick walled PVC piping or of block work.

The recommended urinals are designed with partitions or dividers to provide some privacy for the users, especially the girls. The design also incorporates two methods of flushing system: hand washing dependant and manual, to rinse urine from the collector and prevent foul odor. The hand washing dependant system operates automatically whenever the hand washing facility is used. This system does not require any action from the urinal's users, but from the users of the hand washing facility. The manual on the other hand, involves deliberate flushing of the urinal after use. The drain floor is sloped to aid effective removal and ease cleaning. The drain is designed to have a plastic mesh guard to prevent solid objects from causing plumbing stoppage or blockage.

Unlike the latrine, the walls of the urinals are dwarf so that the users are always in plain sight to everyone within and outside the facility. However, small partitions or dividers and doors

have been introduced for privacy or hiding of the exposed private area of the users, while the rest of the body ill be in plain view. The doors are self-closing and the urinals spaced far apart to create an air of comfort. Overall, the urinals are designed in such a way that the users do not need to hover awkwardly or to bring his/her genitals into close contact with the facility. Even, girls and female adults could use them without touching the facility.

❖ ***Design options***

Four main designs of the two recommended types (stand alone or combined facility) are proposed for schools, viz:

- 10-users:
  - 10-users stand alone urinal for 5-compartment VIP latrine (Fig. 3.31)
  - 10-users urinal combined with 5-compartment VIP latrine and hand washing facility in the same building
- 8-users:
  - 8-users stand alone urinal for 4-compartment VIP latrine (Fig. 3.32)
  - 8-users urinal combined with 4-compartment VIP latrine and hand washing facility in the same building
- 6-users:
  - 6-users stand alone urinal for 3-compartment VIP latrine (Fig. 3.33)
  - 6-users urinal combined with 3-compartment VIP latrine and hand washing facility in the same building
- 4-users:
  - 4-users urinal combined with 5-compartment VIP latrine and hand washing facility in the same building (Fig. 3.14)
  - 4-users stand alone urinal for 2-compartment VIP latrine

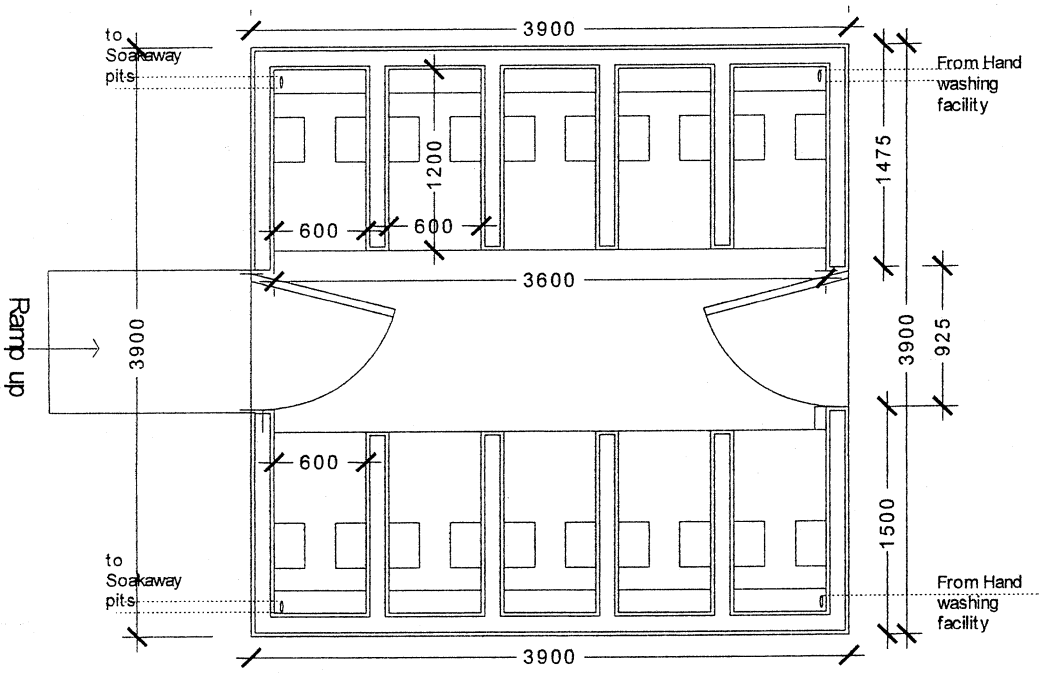


Fig. 3.31: The Floor Plan of the 10-Users Stand Alone Urinal

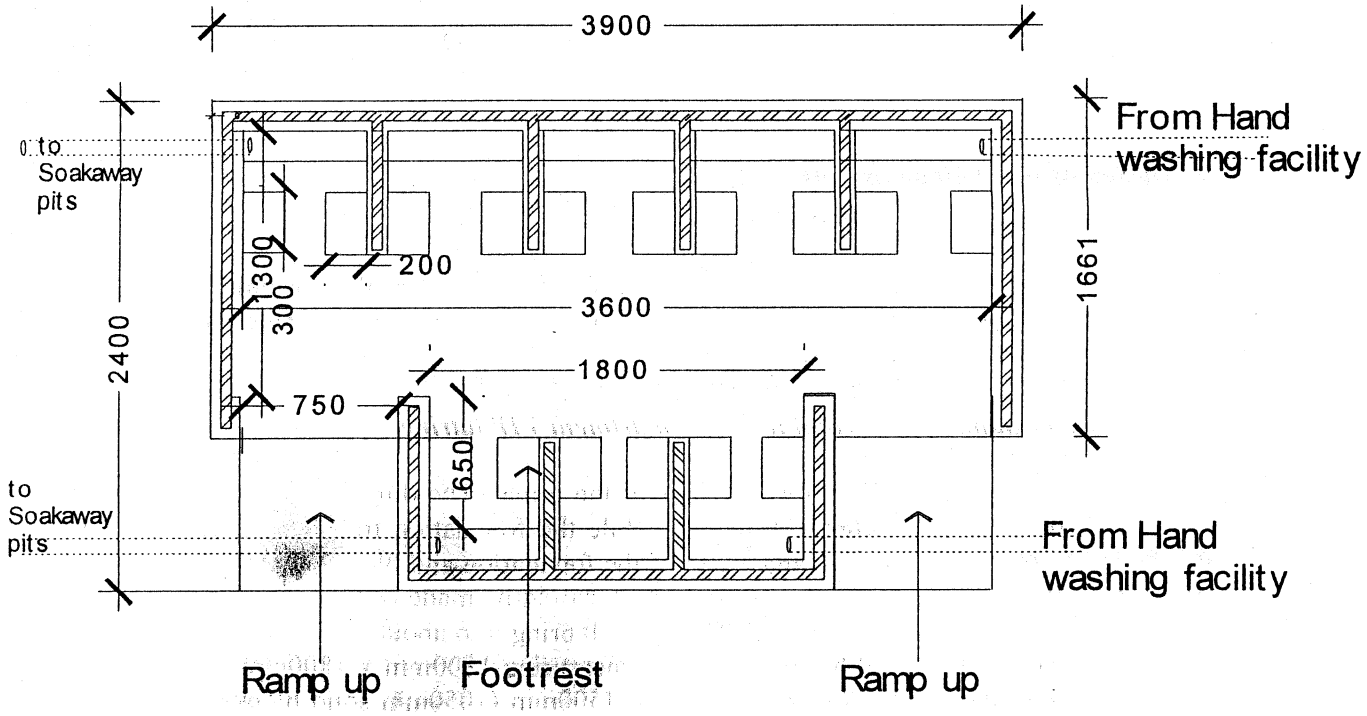


Fig. 3.32: The Floor Plan of the 8-Users Stand Alone Urinal

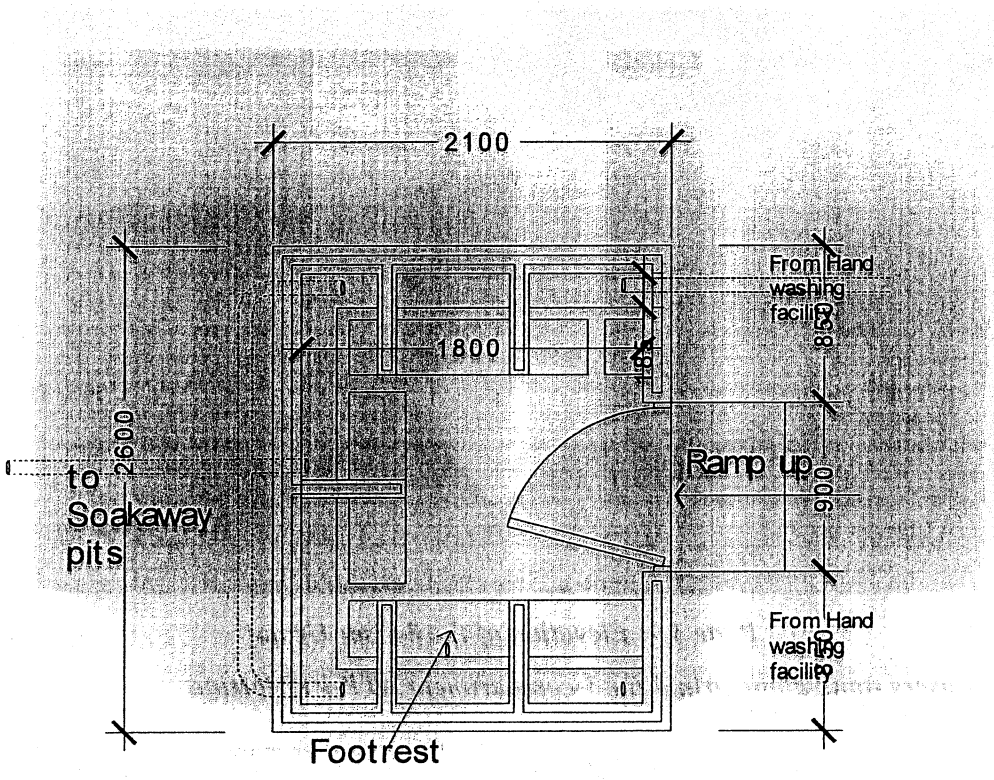


Fig. 3.33: The Floor Plan of the 6-Users Stand Alone Urinal

❖ *Design of stand alone urinals*

In this design, separate units are to be provided for males and females for units of any VIP latrine. The designs will include a foundation, base slab, floor, drainage pipe, plaster work, finishing and landscaping. Some of these are described below.

- *8-users stand alone urinal for 4-compartment VIP latrine*

A block foundation is provided for the walls of the urinal. The dimension of the foundation should be 3900mm x 2400mm x 1500mm, while the foundation trench should be 300mm wide and 150mm deep. The size and shape of the foundation and block walls of the structure are shown in the Fig. 3.32. The foundation itself should be made of blocks, laid side by side in mortar, 225mm wide and 250mm deep. This will bring it to about one course above ground level. The front of the urinal has a dwarf wall measuring 1800mm x 1800mm which should be built up from the foundations to a height of 1500mm (1050mm solid blocks and 450mm perforated blocks at the top-optional). The facility has two entrances (900mm wide) with iron doors for security. Ramps are provided at the entrances for physically challenged pupils (Plate 3.7).

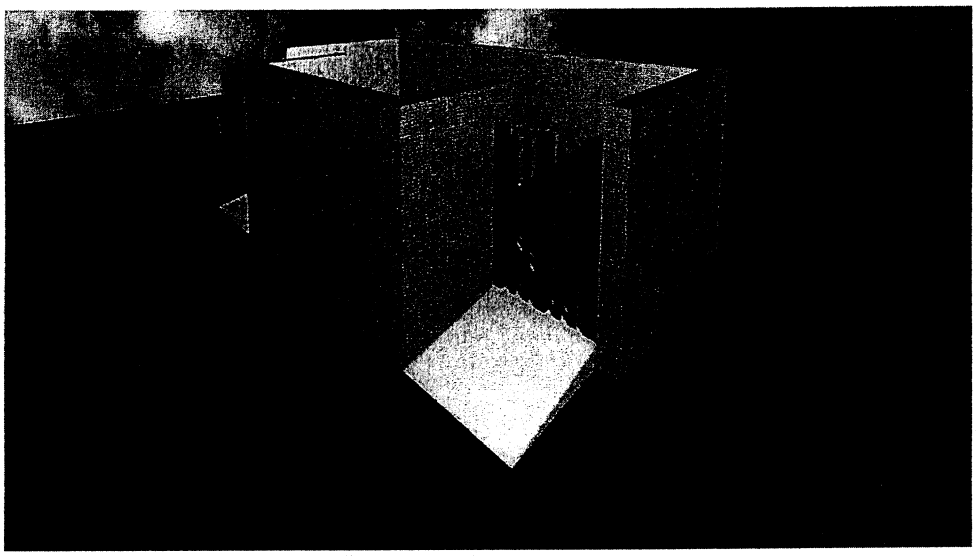


Plate 3.7: Elevation of the 8-User Urinal

- *6-users stand alone urinal for 3-compartment ATP-VIP latrine*

The design details are almost the same as for the 10 or 8-users stand alone facility except for the following:

- The dimension of the foundation should be 2600mm x 2100mm x 1500mm
- The facility has 6 pairs of foot rest, implying usage by 6 people at a time
- The facility has one entrance with iron door and ramp
- Wastewater from the hand washing facility enters the urinal through the 2 sides to flush the urine out and converges at the back before being led into the soak away pit through a channel. Details are shown in Fig 3.33.

- ***4-users urinal with multi-compartment VIP (combined facility).***

The front section of the 5 compartment alternating latrine building is converted into a urinal. The urinal is built over a foundation, which does not cover a pit. As for the stand alone urinal, the wastewater from the hand washing facility is channeled to flush down urine from the slab into a soak away pit.

The design details are almost the same as for the 10, 8 or 6-users stand alone facility except for the following

- The dimension of the foundation should be 1650mm x 825 in two places
- The facility has 4 pairs of foot rest, implying usage by 4 people at a time
- The facility has two entrances with iron doors and ramps
- Wastewater from the hand washing facility flushes the urine before being led into the soak away pit through a channel. Details are shown in Figs. 3.14 and 3.15.

3.8.4.4 Hand washing facility

As in the other cases described above, two options are proposed for the school hand washing facility: the stand alone and the combined facility. The hand washing facility has been designed to reflect the importance of washing hands in schools, in such a way that it may not easily get dirty or spoilt. Moreover, pupils of all ages can easily reach and operate the taps. Also, the designs have been done to achieve the maximum impact, by locating it in such a way that it works as hygiene barriers between the dirty and clean hand areas and by ensuring that the water source is not contaminated by contact with dirty hands. The design provides for rainwater harvesting to solve the problem of water scarcity. Wastewater from the hand washing facility will be channeled to flush urinals in order to help conserve water and promote hygiene.

❖ **Stand alone facility**

The foundation of the facility is 3000mm x 1800mm with ramp on the two sides to enable the physically challenged have access to the facility. The facility consists of a storage tank in which water is stored. The dimensions are 1800mm x 1800mm (wall to wall), and 1500mm x 1500mm for the inner wall. The mix for all the concrete work should be 1:2:4 (cement : sand : gravel). The concrete and block work should be plastered with 1:3 cement mortar internally and externally to prevent leakages. The tank has a manhole 450mm x 450mm for pouring water. Two sides of the facility have 3 taps for washing hands. 3 150mm X 225mm steps are attached to the storage tank to enable pupils fetch water from any available source and pour it into the tank through the man hole (Figs 3.34 and 3.35). To reduce cost, wire mesh can be used in constructing the floor of the concrete storage tank. The hand washing facility is positioned in such a way that water from it is channeled through the urinals into either soak pit (Fig. 3.36) or school garden. The facility can be used to propagate hygiene education messages which can be inscribed on the wall of the tank in written and pictorial forms (Plate 3.8).

❖ **Combined facility**

The combined facility involves the construction of either 1 or 2 hand washing facilities, on a side or both sides of the VIP latrine and 5 or 6-user urinal enclosed by a wall. The other option is 1 hand washing facility in front of the 5 compartment VIP latrine and 4-user urinal. The design detail is the same as for the stand alone facility except for the fact that the storage tank that goes along with the second option is smaller, 1200mm x 900mm. Details are shown in Figures 3.10 - 3.15.

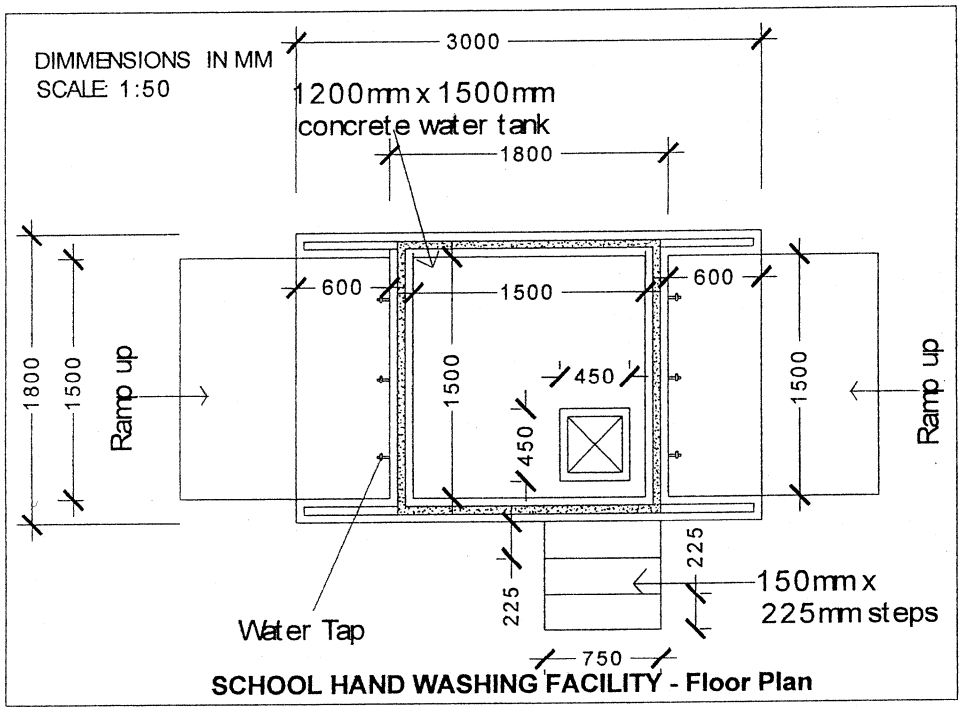


Fig. 3.34: Floor plan of the hand washing facility

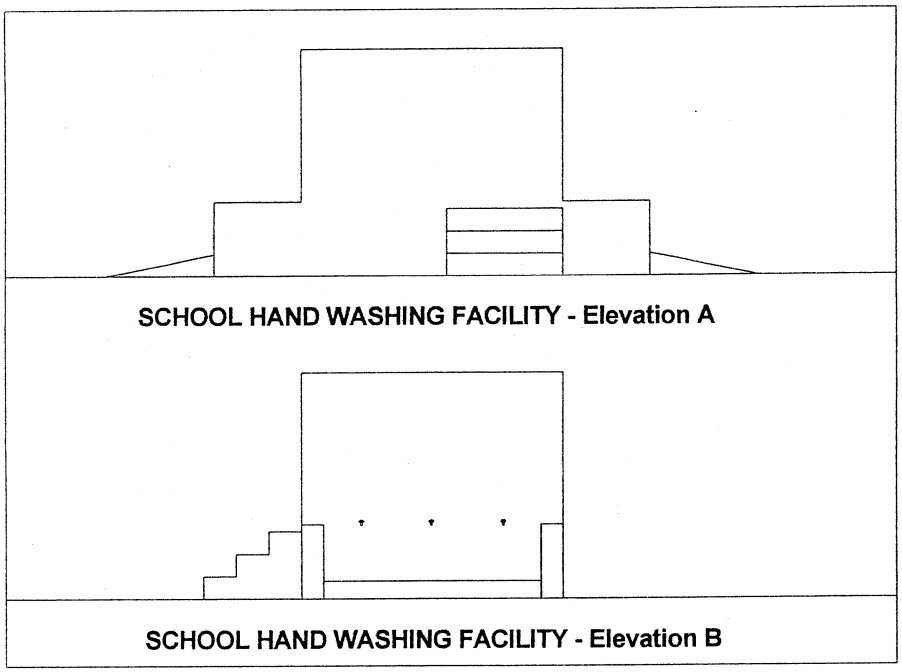


Fig. 3.35: Elevation plans of the hand washing facility

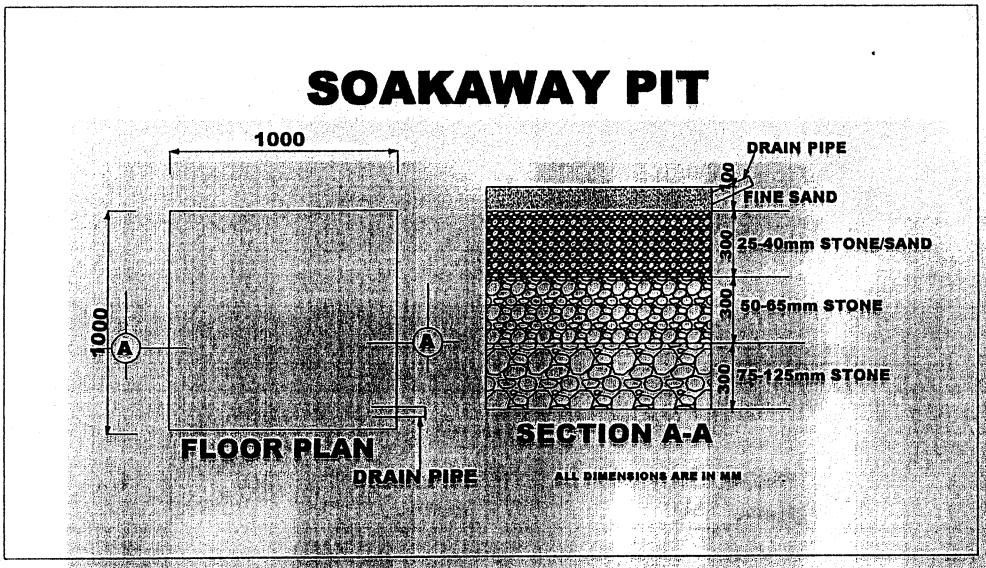


Fig. 3.36: Floor Plan and Cross Section of the Soak away Pit

3.8.4.5 Water Supply for School Sanitation

Adequate supply of water is required to ensure effective usage of virtually all the sanitation facilities but particularly for the hand washing facility and the pour flush toilet. Hence, adequate water supply is very essential. Water supply may be through:

- provision of borehole with motorized pump and pipes to fill the tank automatically
- provision of borehole/deep well with handpump
- installation of rainwater harvester.

In situations where the water is supplied by handpump, pupils may need to collect water with buckets to fill the storage tank. In such a situation, the tank is provided with steps to enable pupils reach the tank cover (Plate 3.9).

Rainwater harvester gathers rainwater from the roof of multi-compartment VIP latrine building. It has gutters and down pipes (made from wood, bamboo, galvanized iron sheet or PVC) that go to the storage container (cement block tank). A pour flush device or detachable down pipe is provided to collect the first 20 litres of the runoff during a rainstorm that may be contaminated with dust, leaves, insects etc. Filters are provided at both ends of the pipe. Padlocks are also sometimes needed to prevent misuse and ensure proper control of the facility.

Just before the start of the rainy season, the system should be checked for leakages and broken or otherwise affected parts for repair. During the rainy season the system has to be checked regularly and cleaned when dirty or every other month and sand-washed at least every six months. Chlorination of the water may be necessary at intervals.

Rooftop harvesting systems at schools can lose water from taps, if left dripping. Rainwater harvesting will provide additional supply of water for the hand-washing storage tank during the rainy season. Plate 3.9 shows the school sanitation facility and the rain harvester.

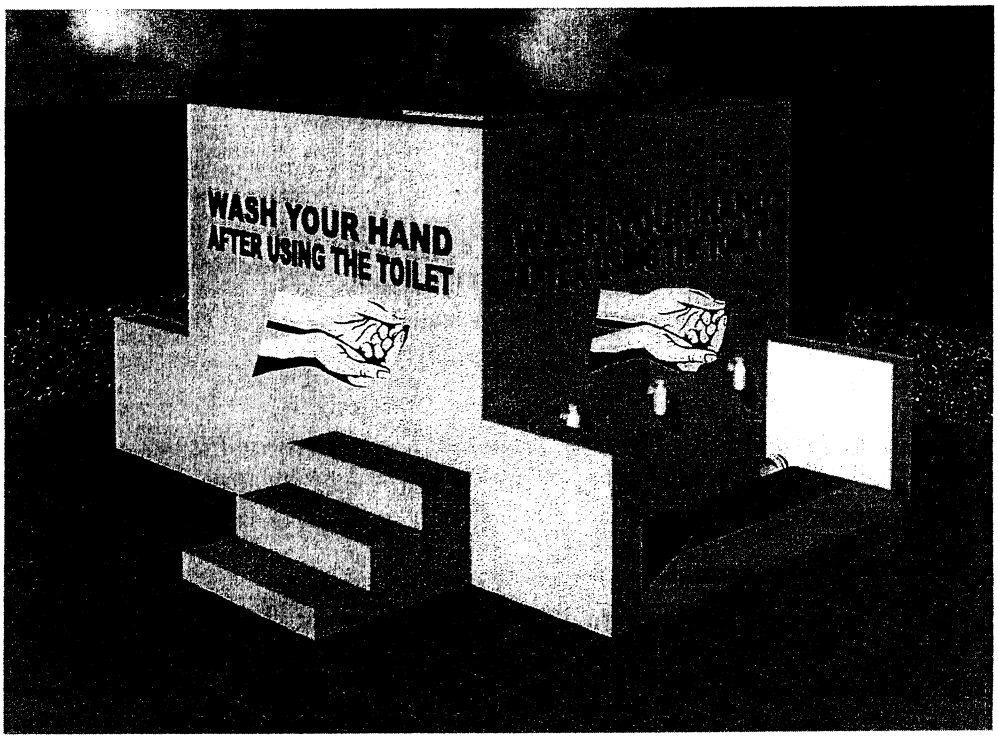


Plate 3.8: Elevation of the stand alone hand washing facility

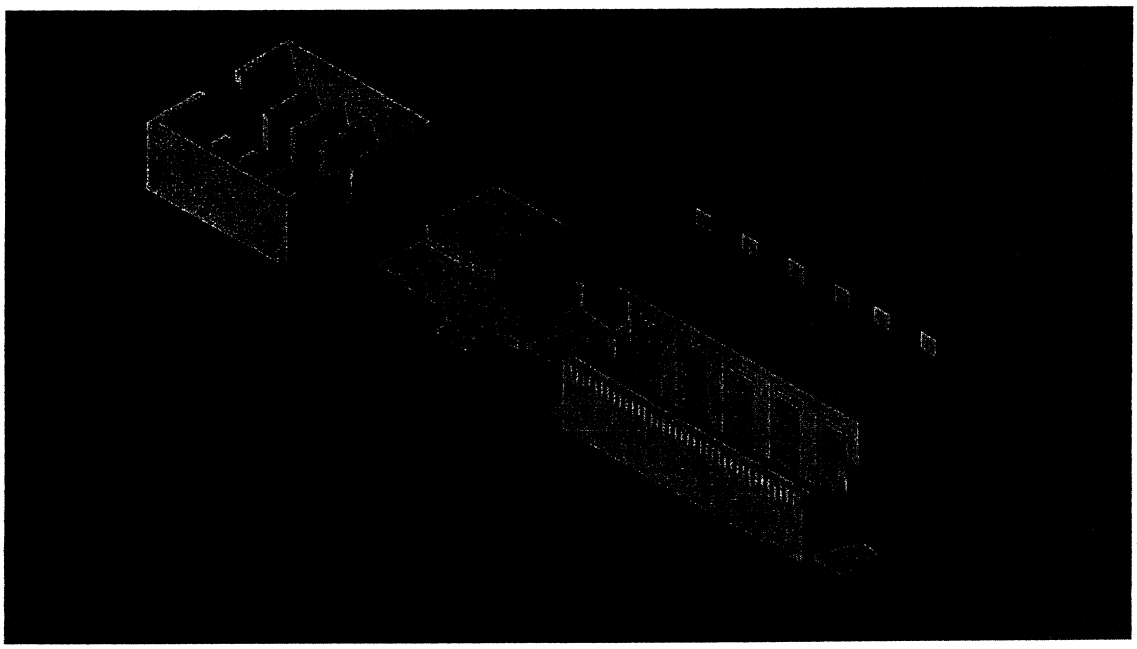


Plate 3.9: Elevation of the school sanitation facility showing the rain harvester

CHAPTER FOUR

BASIC REQUIREMENTS AND LABOUR INPUTS FOR CONSTRUCTION OF SCHOOL SANITATION FACILITIES

The basic requirements and labour inputs for construction of some of the school sanitation facilities are described in this chapter, from which others can take a cue.

4.1. Basic requirements and labour inputs for construction of Multi-compartment VIP latrines

The prices are not quoted because they are subject to inflation and other prevailing economic and local conditions. Similarly, the basic material requirements should be taken as indicatives and as guide in the preparation of realistic quantities and prices before construction.

4.1.1 6 Compartment VIP Latrine

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount (₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	5		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	2		
5.	225 x 225 x 450mm blocks	No.	800		
6.	150 x 225 x 450mm blocks	No.	700		
7.	Cement	Bags	70		
8.	10mm Iron Rod	No.	24		
9.	Binding wire (5kg roll)	Bundle	3		
10.	75mm x 50mm Hard wood for rafters	No	12		
11.	75mm x 50mm Hard wood for wall plate	No	8		
12.	50mm x 50mm Hard wood purlin	No	14		
13.	150mm x 25mm Facial Board	No	9		
14.	Netted metal doors	No	6		
15.	Roofing sheets	No	17		
16.	Assorted nails (2", 3", 4" etc) 5 Ib. wt each	Ib. wt	15		
17.	75mm x 50mm plank (soft wood) for formwork	No.	20		
18.	300mm x 25 mm plank (soft wood) for formwork	No.	20		
19.	Roofing nails	Ib. wt	10		
20.	Roofing belt	Pieces	12		
21.	Fly-screen	Yd	2		
22.	Keys/Padlocks	No	8		
23.	Hinges etc.	No (Pair)	8		
24.	Emulsion paint	Gallons	10		
25.	Gloss paint	Gallons	3		
26.	Water for construction	Lump sum	-		
27.	Clearing and Finishing	Lump sum			
28.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	14		
2	Bricklayer	5	8		
3	Labour	5	10		
4	Carpenter	2	3		
5	Iron bender	2	2		
6	Digger (Excavation)	3	4		
7	Painter	2	2		
8	Artist	1	1		
				TOTAL	

4.1.2 5 Compartment VIP Latrine

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount (₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	5		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	2		
5.	225 x 225 x 450mm blocks	No.	750		
6.	150 x 225 x 450mm blocks	No.	600		
7.	Cement	Bags	60		
8.	10mm Iron Rod	No.	23		
9.	Binding wire (5kg roll)	Bundle	2.5		
10.	75mm x 50mm Hard wood for rafters	No	10		
11.	75mm x 50mm Hard wood for wall plate	No	7		
12.	50mm x 50mm Hard wood purlin	No	10		
13.	150mm x 25mm Facial Board	No	7		
14.	Netted metal doors	No	5		
15.	Roofing sheets	No	13		
16.	Assorted nails (2", 3", 4" etc) 5 Ib. wt each	Ib. wt	15		
17.	75mm x 50mm plank (soft wood) for formwork	No.	15		
18.	300mm x 25 mm plank (soft wood) for formwork	No.	10		
19.	Roofing nails	Ib. wt	7		
20.	Roofing belt	Pieces	10		
21.	Fly-screen	Yd	2		
22.	Keys/Padlocks	No	7		
23.	Hinges.	No (Pair)	7		
24.	Emulsion paint	Gallons	8		
25.	Gloss paint	Gallons	2		
26.	Water for construction	Lump sum	-		
27.	Clearing and Finishing	Lump sum			
28.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	14		
2	Bricklayer	4	7		
3	Labour	4	10		
4	Carpenter	2	3		
5	Iron bender	2	2		
6	Digger (Excavation)	3	3		
7	Painter	1	2		
8	Artist	1	1		
				TOTAL	

4.1.3 4 Compartment VIP Latrine

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount(₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	3		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	2		
5.	225 x 225 x 450mm blocks	No.	600		
6.	150 x 225 x 450mm blocks	No.	480		
7.	Cement	Bags	50		
8.	10mm Iron Rod	No.	20		
9.	Binding wire (5kg roll)	Bundle	2		
10.	75mm x 50mm Hard wood for rafters	No	9		
11.	75mm x 50mm Hard wood for wall plate	No	7		
12.	50mm x 50mm Hard wood purlin	No	8		
13.	150mm x 25mm Facial Board	No	6		
14.	75mm x 50mm plank (soft wood) for formwork	No	10		
15.	300mm x 25 mm plank (soft wood) for formwork	No	10		
16.	Netted metal doors	No	4		
17.	Roofing sheets	No	12		
18.	Assorted nails (2", 3", 4" etc) 5 Ib. wt each	Ib. wt	15		
19.	Roofing nails	Ib. wt	6		
20.	Roofing belt	Pieces	8		
21.	Fly-screen	Yd	2		
22.	Keys/Padlocks	No	6		
23.	Hinges etc.	No (pair)	6		
24.	Emulsion paint	Gallons	6		
25.	Gloss paint	Gallons	2		
26.	Water for construction	Lump sum			
27.	Clearing and Finishing	Lump sum			
28.	Logistics	Lump sum			
	TOTAL				

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount
1.	Supervisor	1	14		
2	Bricklayer	3	7		
3	Labour	3	10		
4	Carpenter	2	2		
5	Iron bender	1	2		
6	Digger (Excavation)	3	3		
7	Painter	1	2		
8	Artist	1	1		
				TOTAL	

4.1.4 3 Compartment VIP Latrine

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount(₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	2		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	1		
5.	225x225x450mm blocks	No.	450		
6.	150x225x450mm blocks	No.	350		
7.	Cement	Bags	40		
8.	10mm Iron Rod	No.	18		
9.	Binding wire (5kg roll)	No	2		
10.	75mm x 50mm Hard wood for rafters	No	7		
11.	75mm x 50mm Hard wood for wall plate	No	6		
12.	50mm x 50mm Hard wood purlin	No	8		
13.	150mm x 25mm Facial Board	No	6		
14.	75mm x 50mm plank (soft wood) for formwork	No	12		
15.	300mm x 25 mm plank (soft wood) for formwork	No	15		
16.	Netted doors	No	3		
17.	Roofing sheets (zinc)	No	10		
18.	Assorted nails (2", 3", 4" etc) 3 Ib. wt each	Ib. wt	9		
19.	Roofing nails	Ib. wt	5		
20.	Roofing belt	Pieces	6		
21.	Fly-screen	Yd	1		
22.	Keys/Padlocks	No	5		
23.	Hinges	No (Pair)	5		
24.	Emulsion paint	Gallons	3		
25.	Gloss paint	Gallons	1		
26.	Water for construction	Lump sum			
27.	Clearing and Finishing	Lump sum			
28.	Logistics	Lump sum			
	TOTAL				

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount
1.	Supervisor	1	14		
2	Bricklayer	3	7		
3	Labour	3	8		
4	Carpenter	2	2		
5	Iron bender	1	2		
6	Digger (Excavation)	3	3		
7	Painter	1	1		
8	Artist	1	1		
				TOTAL	

4.1.5 2 Compartment VIP Latrine

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	*Amount (₦)*
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	1		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	1		
5.	225x225x450mm blocks	No.	300		
6.	150x225x450mm blocks	No.	240		
7.	Cement	Bags	28		
8.	10mm Iron Rod	No.	16		
9.	Binding wire (5kg roll)	Bundle	1		
10.	75mm x 50mm Hard wood for rafters	No	4		
11.	75mm x 50mm Hard wood for wall plate	No	3		
12.	50mm x 50mm Hard wood purlin	No	4		
13.	150mm x 25mm Facial Board	No	4		
14.	Netted metal doors	No	3		
15.	Roofing sheets (zinc)	No	8		
16.	Assorted nails (2", 3".5" etc)	Ib. wt	8		
17.	75mm x 50mm plank (soft wood) for formwork	No.	6		
18.	300mm x 25 mm plank (soft wood) for formwork	No.	6		
19.	Roofing nails	Ib. wt	4		
20.	Roofing belt	Pieces	6		
21.	Fly-screen	Yd	1		
22.	Keys/Padlocks	No	4		
23.	Hinges	No (Pair)	4		
24.	Emulsion paint	Gallons	3		
25.	Gloss paint	Gallons	1		
26.	Water for construction	Lump sum	-		
27.	Clearing and Finishing	Lump sum			
28.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	14		
2	Bricklayer	2	5		
3	Labour	2	8		
4	Carpenter	2	2		
5	Iron bender	1	2		
6	Digger (Excavation)	2	2		
7	Painter	1	2		
8	Artist	1	1		
				TOTAL	

4.2 Basic requirements and labour inputs for construction of urinals

4.2.1 Stand-alone Urinal (6 points)

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount (₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu M)	2		
3.	Sand (smooth)	Load(5Cu M)	1		
4.	Gravel (washed)	Load(5Cu M)	1		
5.	150x225x450mm blocks	No.	200		
6.	Cement	Bags	12		
7.	Metal Door	No	1		
8.	150mm PVC drain pipe	M	10		
9.	Emulsion paint	Gallons	3		
10.	Gloss paint	Gallons	2		
11.	Water for construction	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	7		
2.	Bricklayer	1	4		
3.	Labour	2	5		
4.	Digger (Excavation)	1	2		
5.	Plumber	1	1		
6.	Painter	1	1		
7.	Artist	1	1		
		TOTAL			

4.2.2 Stand-alone Urinal (8 points)

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount(₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu M)	3		
3.	Sand (smooth)	Load(5Cu M)	2		
4.	Gravel (washed)	Load(5Cu M)	2		
5.	150x225x450mm blocks	No.	330		
6.	Cement	Bags	21		
7.	Metal Door	No	2		
8.	150mm PVC drain pipe	M	14		
9.	Emulsion paint	Gallons	4		
10.	Gloss paint	Gallons	2		
11.	Water for construction	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	11		
2	Bricklayer	2	6		
3	Labour	2	6		
4	Digger (Excavation)	1	4		
5	Painter	1	1		
6	Artist	1	1		
		TOTAL			

4.2.3 Stand-alone Urinal (10 points)

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount(₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu M)	3		
3.	Sand (smooth)	Load(5Cu M)	2		
4.	Gravel (washed)	Load(5Cu M)	2		
5.	150x225x450mm blocks	No.	380		
6.	Cement	Bags	23		
7.	Metal Door	No	2		
8.	150mm PVC drain pipe	M	16		
9.	Emulsion paint	Gallons	6		
10.	Gloss paint	Gallons	2		
11.	Water for construction	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	11		
2	Bricklayer	2	6		
3	Labour	2	6		
4	Digger (Excavation)	1	4		
5	Painter	1	1		
6	Artist	1	1		
	TOTAL				

4.3 Basic requirements and labour inputs for construction of hand-washing facility

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount (₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu M)	1		
3.	Sand (soft)	Load(5Cu M)	1		
4.	Gravel (washed -12mm diam)	Load(5Cu M)	1		
5.	225 x 225 x 450mm blocks	No.	32		
6.	150 x 225 x 450mm blocks	No.	12		
7.	Cement	Bags	20		
8.	12mm reinforcement high yield steel (1 length=10m)	Length	21		
9.	10mm reinforcement high yield steel (1 length=10m)	Length	10		
10.	5mm thick steel manhole cover (450mm x 450mm)	No	1		
11.	BRC on top of the filling	Roll	1		
12.	Binding wire (5 Kg)	Bundle	4		
13.	75mm x 50mm plank (soft wood) for formwork	No	8		
14.	300mm x 25 mm plank (soft wood) for formwork	No	20		
15.	Nails (2" and 3") 5 Ib. wt	No (lb.wt)	6		
16.	50mm PVC pipe	No	10		
17.	50mm PVC elbow	No	10		
18.	12mm UPVC pipe	No	1		
19.	Funnel	No	1		
20.	100mm PVC pipe	No	2		
21.	Roofing belt	No	2		
22.	Yarn rope	No	1		
23.	Taps with padlocks and other accessories (cork, washers, etc)	No.	6		
24.	Emulsion paint	Gallons	1		
25.	Gloss paint	Gallons	2		
26.	Water for construction	Lump sum			
27.	Clearing and Finishing	Lump sum			
28.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	7		
2.	Bricklayer	2	4		
3.	Carpenter	1	4		
4.	Iron Bender	1	3		
5.	Labour	2	5		
6.	Digger (Excavation)	1	2		
7.	Painter	1	1		
8.	Artist	1	1		
				TOTAL	

4.4 Combined Facility (Multi-compartment VIP Latrines, Urinal and Hand washing facility)

4.4.1 5 Compartment VIP Latrines, Urinal and hand washing facility in front

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount (₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	7		
3.	Sand (smooth)	Load(5Cu Yd)	2		
4.	Gravel (washed)	Load(5Cu Yd)	2		
5.	225 x 225 x 450mm blocks	No.	800		
6.	150 x 225 x 450mm blocks	No.	650		
7.	Cement	Bags	80		
8.	10mm Iron rod	No.	31		
9.	12mm Iron rod		23		
10.	75mm steel pole (2.5m long)	No	3		
11.	BRC on top for the filling	Roll	1		
12.	Binding wire (5kg roll)	Bundle	5		
13.	75mm x 50mm Hard wood for rafters	No	10		
14.	75mm x 50mm Hard wood for wall plate	No	7		
15.	50mm x 50mm Hard wood purlin	No	10		
16.	150mm x 25mm Facial Board	No	7		
17.	Netted metal doors	No	5		
18.	Roofing sheets	No	28		
19.	Assorted nails (2", 3", 4" etc) 5 lb. wt each	lb. wt	30		
20.	75mm x 50mm plank (soft wood) for formwork	No.	22		
21.	300mm x 25 mm plank (soft wood) for formwork	No.	30		
22.	150mm PVC drain pipe	M	10		
23.	50mm PVC pipe	No	10		
24.	50mm PVC elbow	No	10		
25.	12mm UPVC pipe	No	1		
26.	Funnel	No	1		
27.	100mm PVC pipe	No	2		
28.	Roofing belt	No	2		
29.	Yarn rope	No	1		
30.	Taps with padlocks and other accessories (cork, washers, etc)	No	9		
31.	Roofing nails	lb. wt	15		
32.	Roofing belt	Pieces	15		
33.	Fly-screen	Yd	2		
34.	Keys/Padlocks	No	7		
35.	Hinges.	No (Pair)	7		
36.	Emulsion paint	Gallons	8		
37.	Gloss paint	Gallons	2		
38.	Water for construction	Lump sum	-		
39.	Clearing and Finishing	Lump sum			
40.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount
1.	Supervisor	1	14		
2	Bricklayer	6	8		
3	Labour	6	10		
4	Carpenter	2	3		
5	Iron bender	2	3		
6	Digger (Excavation)	2	2		
7	Painter	1	2		
8	Artist	1	1		
				TOTAL	

4.4.2 3 Compartment Combined VIP Latrines (Urinal and hand washing facility at one side)

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount (₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	5		
3.	Sand (smooth)	Load(5Cu Yd)	2		
4.	Gravel (washed)	Load(5Cu Yd)	2		
5.	225 x 225 x 450mm blocks	No.	550		
6.	150 x 225 x 450mm blocks	No.	530		
7.	Cement	Bags	70		
8.	10mm Iron rod	No.	26		
9.	12mm Iron rod		23		
10.	75mm steel pole (2.5m long)	No	2		
11.	BRC on top for the filling	Roll	1		
12.	Binding wire (5kg roll)	Bundle	3		
13.	75mm x 50mm Hard wood for rafters	No	7		
14.	75mm x 50mm Hard wood for wall plate	No	6		
15.	50mm x 50mm Hard wood purlin	No	8		
16.	150mm x 25mm Facial Board	No	6		
17.	Netted metal doors	No	3		
18.	Roofing sheets	No	17		
19.	Assorted nails (2", 3", 4" etc) 5 Ib. wt each	Ib. wt	15		
20.	75mm x 50mm plank (soft wood) for formwork	No.	16		
21.	300mm x 25 mm plank (soft wood) for formwork	No.	20		
22.	150mm PVC drain pipe	M	10		
23.	50mm PVC pipe	No	10		
24.	50mm PVC elbow	No	10		
25.	12mm UPVC pipe	No	1		
26.	Funnel	No	1		
27.	100mm PVC pipe	No	2		
28.	Yarn rope	No	1		
29.	Taps with padlocks and other accessories (cork, washers, etc)	No	6		
30.	Roofing nails	Ib. wt	10		
31.	Roofing belt	Pieces	10		
32.	Fly-screen	Yd	1		
33.	Keys/Padlocks	No	5		
34.	Hinges.	No (Pair)	5		
35.	Emulsion paint	Gallons	7		
36.	Gloss paint	Gallons	2		
37.	Water for construction	Lump sum	-		
38.	Clearing and Finishing	Lump sum			
39.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount
1.	Supervisor	1	14		
2	Bricklayer	2	8		
3	Labour	2	10		
4	Carpenter	1	3		
5	Iron bender	2	2		
6	Digger (Excavation)	2	2		
7	Painter	1	2		
8	Artist	1	1		
				TOTAL	

4.4.3 5 Compartment VIP Latrines, Urinal and hand washing facility at both sides

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount (₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	10		
3.	Sand (smooth)	Load(5Cu Yd)	5		
4.	Gravel (washed)	Load(5Cu Yd)	5		
5.	225 x 225 x 450mm blocks	No.	812		
6.	150 x 225 x 450mm blocks	No.	1,000		
7.	Cement	Bags	124		
8.	10mm Iron Rod	No.	43		
9.	12mm Iron Rod	No.	42		
10.	5mm thick steel manhole cover (450mm x 450mm)	No	2		
11.	Binding wire (5kg roll)	Bundle	7		
12.	BRC on top of the filling	Roll	1		
13.	75mm x 50mm Hard wood for rafters	No	10		
14.	75mm x 50mm Hard wood for wall plate	No	7		
15.	50mm x 50mm Hard wood purlin	No	10		
16.	150mm x 25mm Facial Board	No	7		
17.	Netted metal doors	No	5		
18.	Roofing sheets	No	13		
19.	Assorted nails (2", 3", 4" etc) 5 Ib. wt each	Ib. wt	25		
20.	75mm x 50mm plank (soft wood) for formwork	No.	31		
21.	300mm x 25 mm plank (soft wood) for formwork	No.	30		
22.	Roofing nails	Ib. wt	7		
23.	Roofing belt	Pieces	10		
24.	50mm PVC pipe	No	20		
25.	50mm PVC elbow	No	20		
26.	12mm UPVC pipe	No	2		
27.	Funnel	No	2		
28.	100mm PVC pipe	No	4		
29.	Roofing belt	No	4		
30.	Yarn rope	No	2		
31.	Taps with padlocks and other accessories (cork, washers, etc)	No	12		
32.	Fly-screen	Yd	2		
33.	Keys/Padlocks	No	7		
34.	Hinges.	No (Pair)	7		
35.	Emulsion paint	Gallons	12		
36.	Gloss paint	Gallons	3		
37.	Water for construction	Lump sum	-		
38.	Clearing and Finishing	Lump sum			
39.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	14		
2	Bricklayer	4	10		
3	Labour	4	12		
4	Carpenter	2	4		
5	Iron bender	2	4		
6	Digger (Excavation)	3	3		
7	Painter	1	2		
8	Artist	1	1		
				TOTAL	

4.5 Basic requirements and labour inputs for construction of pour flush toilets

4.5.1 2 Compartment pour flush toilet

(A) Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	*Amount (₦)*
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	1		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	1		
5.	225x225x450mm blocks	No.	300		
6.	150x225x450mm blocks	No.	240		
7.	Cement	Bags	28		
8.	10mm Iron Rod	No.	16		
9.	Binding wire (5kg roll)	Bundle	1		
10.	75mm x 50mm Hard wood for rafters	No	4		
11.	75mm x 50mm Hard wood for wall plate	No	3		
12.	50mm x 50mm Hard wood purlin	No	4		
13.	150mm x 25mm Facial Board	No	4		
14.	Netted metal doors	No	3		
15.	Roofing sheets (zinc)	No	8		
16.	Assorted nails (2", 3".5" etc)	Ib. wt	8		
17.	75mm x 50mm plank (soft wood) for formwork	No.	6		
18.	300mm x 25 mm plank (soft wood) for formwork	No.	6		
19.	Roofing nails	Ib. wt	4		
20.	Roofing belt	Pieces	6		
21.	Fly-screen	Yd	1		
22.	Keys/Padlocks	No	4		
23.	Hinges	No (Pair)	4		
24.	Low level closet with trap (squat-pan)	No	2		
25.	100mm PVC pipe (long)	No	2		
26.	Balloon wire	No	2		
27.	100mm clips	No	4		
28.	Emulsion paint	Gallons	3		
29.	Gloss paint	Gallons	1		
30.	Water for construction	Lump sum	-		
31.	Clearing and Finishing	Lump sum			
32.	Logistics	Lump sum			
				TOTAL	

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount (₦)
1.	Supervisor	1	14		
2.	Bricklayer	2	5		
3.	Labour	2	8		
4.	Carpenter	2	2		
5.	Plumber	1	1		
6.	Iron bender	1	2		
7.	Digger (Excavation)	2	2		
8.	Painter	1	2		
9.	Artist	1	1		
				TOTAL	

4.5.2 3 Compartment Pour Flush Toilet

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount(₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	2		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	1		
5.	225x225x450mm blocks	No.	450		
6.	150x225x450mm blocks	No.	350		
7.	Cement	Bags	40		
8.	10mm Iron Rod	No.	18		
9.	Binding wire (5kg roll)	No	2		
10.	75mm x 50mm Hard wood for rafters	No	7		
11.	75mm x 50mm Hard wood for wall plate	No	6		
12.	50mm x 50mm Hard wood purlin	No	8		
13.	150mm x 25mm Facial Board	No	6		
14.	75mm x 50mm plank (soft wood) for formwork	No	12		
15.	300mm x 25 mm plank (soft wood) for formwork	No	15		
16.	Netted doors	No	3		
17.	Roofing sheets (zinc)	No	10		
18.	Assorted nails (2", 3", 4" etc) 3 Ib. wt each	Ib. wt	9		
19.	Roofing nails	Ib. wt	5		
20.	Roofing belt	Pieces	6		
21.	Fly-screen	Yd	1		
22.	Keys/Padlocks	No	5		
23.	Hinges	No (Pair)	5		
24.	Low level closet with trap (squat-pan)	No	3		
25.	100mm PVC pipe (long)	No	3		
26.	Balloon wire	No	3		
27.	100mm clips	No	6		
28.	Emulsion paint	Gallons	3		
29.	Gloss paint	Gallons	1		
30.	Water for construction	Lump sum			
31.	Clearing and Finishing	Lump sum			
32.	Logistics	Lump sum			
	TOTAL				

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount
1.	Supervisor	1	14		
2.	Bricklayer	3	7		
3.	Labour	3	8		
4.	Carpenter	2	2		
5.	Plumber	1	1		
6.	Iron bender	1	2		
7.	Digger (Excavation)	2	2		
8.	Painter	1	1		
9.	Artist	1	1		
				TOTAL	

4.5.3 4 Compartment Pour Flush Toilet

A. Basic Material Requirements

No	Description	Unit	Quantity	Rate (₦)	Amount(₦)
1.	Excavation	Lump sum			
2.	Sand (sharp)	Load(5Cu Yd)	3		
3.	Sand (smooth)	Load(5Cu Yd)	1		
4.	Gravel (washed)	Load(5Cu Yd)	2		
5.	225 x 225 x 450mm blocks	No.	600		
6.	150 x 225 x 450mm blocks	No.	480		
7.	Cement	Bags	50		
8.	10mm Iron Rod	No.	20		
9.	Binding wire (5kg roll)	Bundle	2		
10.	75mm x 50mm Hard wood for rafters	No	9		
11.	75mm x 50mm Hard wood for wall plate	No	7		
12.	50mm x 50mm Hard wood purlin	No	8		
13.	150mm x 25mm Facial Board	No	6		
14.	75mm x 50mm plank (soft wood) for formwork	No	10		
15.	300mm x 25 mm plank (soft wood) for formwork	No	10		
16.	Netted metal doors	No	4		
17.	Roofing sheets	No	12		
18.	Assorted nails (2", 3", 4" etc) 5 Ib. wt each	Ib. wt	15		
19.	Roofing nails	Ib. wt	6		
20.	Roofing belt	Pieces	8		
21.	Fly-screen	Yd	2		
22.	Keys/Padlocks	No	6		
23.	Hinges etc.	No (pair)	6		
24.	Low level closet with trap (squat-pan)	No	4		
25.	100mm PVC pipe (long)	No	4		
26.	Balloon wire	No	4		
27.	100mm clips	No	8		
28.	100mm PVC elbow	No	1		
29.	Emulsion paint	Gallons	6		
30.	Gloss paint	Gallons	2		
31.	Water for construction	Lump sum			
32.	Clearing and Finishing	Lump sum			
33.	Logistics	Lump sum			
	TOTAL				

B. Labour Requirement

No	Description	Quantity	No. of days	Rate/day	Amount
1.	Supervisor	1	14		
2.	Bricklayer	3	7		
3.	Labour	3	10		
4.	Carpenter	2	2		
5.	Plumber	1	1		
6.	Iron bender	1	2		
7.	Digger (Excavation)	2	2		
8.	Painter	1	2		
9.	Artist	1	1		
				TOTAL	

CHAPTER FIVE

GUIDELINES FOR THE SUPERVISION OF THE CONSTRUCTION AND OPERATION AND MAINTENANCE OF SCHOOL SANITATION FACILITIES

5.1 Introduction

Supervising the construction, operation and maintenance of WASH facilities in schools should adopt an integrated and overlapping approach. All stakeholders should be involved, including representatives of RUWESA/RUWASSA/RUWATSAN, LGA WASH Unit/Department, SBMC, PTA, communities, contractors, Due Process office (where available) and WASH consultants. The LGA WASH unit/Department and or other appropriate MDAs should take the lead and ensure quality assurance of the materials and processes used during construction of school sanitation facilities. It is particularly important to involve representatives of the communities, so that they can replicate the good designs and construction of such facilities in their various communities. However, the responsibility of day to day supervision of the construction should be the responsibility of the Agency that awarded the contract, with support from PTA/SBMC/Communities representatives of the various schools, where the construction work would be implemented.

In this regard, it is required that Officers of line agencies at State and local government levels should be trained, in the first instance, on the protocol of constructing the VIP latrine, hand washing facilities and urinals, from site selection to formwork development, appropriate mixes of sand: gravel: cement, for foundation, reinforced concrete slabs, sub-surface pit lining construction, superstructure, plastering and other finishing activities.

In addition, the officers so trained should be competent and know the technical details of the construction from inception to completion. This would equip them with requisite skills needed to effectively supervise the construction (operation and maintenance) of VIP latrines, urinals and hand washing facilities for the desired results/outputs. The supervising and monitoring responsibilities; the power to sign off the contract and the issuance of contract completion certificates should mostly be based on the report of the supervising officers, since they are to be with the contractors throughout the construction period.

Other stakeholders, such as State governments, through the Due Process office, State WASH consultant, RUWASSA and other interested partners should play a supportive role to the leading Agencies. However, the leading Agency supervising the construction of WASH facilities should do it with active participation of sanitation officers of the LGA WASH Units/Departments where the school is located.

Apart from the above mentioned arrangement, it is also necessary for the coordinating Ministries at the Federal level, such as Federal Ministry of Education and Federal Ministry of Agriculture and Water Resources, and donors to play a supportive role to ensure quality and effective supervision during the construction exercises.

5.2 Guidelines for the construction of WASH facilities

5.2.1 Latrine Construction

The following procedure is essential to be observed for a successful construction of VIP latrines in schools:

- **General**: The bidder(s) visit(s) and examine(s) the site(s) to obtain necessary information for the bidding exercise. The cost of such visit(s) is to be borne by the bidder(s).

- **Work schedule:** The successful bidder(s) on acceptance of the contract(s) submit(s) comprehensive work schedule(s) which should fall within the agreed/prescribed contract execution period. This will be done prior to the mobilization of men, materials and equipment to the site(s).

- **Personnel:** The contractor(s) shall use competent personnel, including qualified and experienced builders, professionals and artisans.

- **Mobilization:** The contractor(s) arrange(s) for the storage and security of materials and equipment in such a way and manner as not to constitute any nuisance to the environment and the job(s). It will be essential for the contractor(s) and the client(s) to visit the school(s) and meet with the beneficiaries, as stated in Section 2 above.

- **Concrete Work(s)**:
  - Good quality Precast Reinforce Concrete Slabs (PRCS) should be used for the pit.
  - It is particularly important to ensure that the sand, cement, gravel, water and reinforcements meet the prescribed quality standards. It is the duty of the supervising body to ensure this as well as other quality standards
  - The recommended concrete for the slab shall be 1:2:4, while that of the pit walling and binding concrete shall be 1:3:6.
  - The reinforced concrete slab shall be left to cure (air dry) for at least 7 days before installation.
  - All concrete for slab after placing in framework shall be thoroughly compacted to ensure smooth and good surfaces free from cavities
  - The upper surface of the concrete shall be finished with 1:1 cement and sand mixture.
  - Prior to arranging the formworks for casting concrete, thin plastic sheet (e.g. cement bag) should be spread on the platform. Casting of reinforced concrete on bare floor not acceptable.
  - All reinforced concrete slabs shall be 75mm thick.

- **Cement:** Ordinary Portland Cement shall be used for the construction

- **Aggregates** (Washed gravel and granite):
  - The coarse aggregates to be used should be clean and free from clay.
  - The size of the coarse aggregates shall be 10-20mm diameter
  - Both smooth and sharp sand would be required (free from clay).

- **Steel Reinforcement:**
  - All steel reinforcement for the casting of slab shall be hot rolled mild steel bars, 10mm diameter in size
  - The steel shall be kept clean and free from rust, oil, grease, oily paint or any material which may impair the bond between the concrete and the reinforcement or which may cause corrosion or deterioration of the concrete.
  - 10mm diameter high yield steel bars may also be used where the mild steel bars are not available (The BOQ is based on mild steel).

- **Block work:**
  - 225x225x450mm (9"x9"x18") blocks shall be used for pit lining
  - 150x225x450mm (6"x9"x18") blocks and construction of superstructure.

- **Artwork:**
  - Simple hygiene education messages are to be inscribed on the walls of the latrines, e.g.
    - Keep our toilet clean always
    - Prevent diseases, use sanitary latrines
    - Wash your hands with soap after using latrine
      (To be translated to local languages)
  - Latrines should be labelled: Teachers (Male, Female); Pupils (Boys, Girls) (using local languages, cultures, figurines, etc.)
  - The artwork could also be pictorial

- **Site Completion/Security**
  - Site should be restored as far as possible to the condition found on arrival, by proper landscaping and removal of all left over materials, equipment, etc.
  - Doors should be properly locked before handing over to the client.

- **Report:**
  - The contractor should produce a report, containing:
    - Name(s) of school(s)
    - Type(s) of latrine
    - Number of blocks/compartments per block
    - Total and disaggregate of school enrolment, including teachers and other staff
    - GPS coordinates of the school and the facilities

- **Mode of Payment**
  - Pay according to BOQ, following issue of authentic certificate by the client
  - The tranches should be determined by the Agency awarding the contract and based on the signed MOU
  - There could be a retention fee of between 5-10% to be paid 3-6 months after successful completion of the contract and any remedy effected.

5.2.2 Urinal Construction

- ***Foundation and wall***

The foundation should be made of blocks, laid side by side in mortar, 225mm wide and 250mm deep. This will bring it to about one course above ground level. The front of the

urinal should have a dwarf wall, which should be built up from the foundations to a height of 1500mm (1050mm solid blocks and 450mm perforated blocks at the top-optional).

- ***Urinal base slab***

The base slab of the urinal is laid down within the foundation, which will be made with concrete (4 parts gravel, 2 parts river sand to 1 part cement) of 75mm thick. It is to be flattened with a wooden float and allowed to cure for one day.

- ***Urinal floor***

This is laid on the urinal base slab, with a slight to slope running into a channel. The channel is formed at the base of the wall and at the lower end of the sloping floor by laying down a series of blocks at the base of the wall. This floor is then built up against the blocks. When the urinal floor has set, the blocks can be removed to leave a channel. The urinal floor is provided with pairs of foot rest each measuring 300mm x 200mm

- ***Fitting the drainage pipe***

Before the final plaster work is laid over the working surfaces of the urinal, the drainage pipe is laid between the urinal channel and the soak pit. PVC pipe can be used for this purpose and PVC bend will also be required. The length of the pipe will depend on the distance between the urinal and the soak-away pit.

A section of the block foundation is evacuated so that the 5cm PVC bend attached to the length of 5cm PVC pipe can be introduced through a gap left in the foundation. The bend should be positioned so that it can drain all urine into the pipe that runs through an evacuated trench to the soak pit. The evacuated section of the foundation is built up again in concrete around the bend and drainage pipe.

Alternatively, the drainage channel can be constructed with blocks to reduce cost and increase the life span of the structure. Another advantage of this is that the PVC pipes may be vandalized by pupils and sometimes they crack due to prolonged exposure to the sun.

The used water from the hand washing facility is diverted to the urinal. The waste water enters through the urinal from the two sides to flush the urine away from the channels to the soak away pit.

The soak pit is made by digging a pit 1500mm across and 2000mm deep and lining it with blocks, which should be spaced apart at the bottom of the pit. The pit should be filled with stones of different sizes - 75-125mm, 50-65mm, 25-40mm in different layers of 300mm depth and fine sand. The top of the pit is covered with a concrete cover slab. The urinal drainage pipe should be led into this pit. If drainage conditions are poor, the soak pit may require enlarging. The waste water from the hand washing facility is channeled into the urinal.

- ***Plaster work***

The urinal wall, the urinal channel and the urinal floor should be plastered with cement mortar. For boys the splash wall should be made of hard, shiny plaster (sand/cement mix of 3:1) and should be 1000mm high. The girls' urinal should have foot rest (250mm apart) constructed with bricks/blocks and plastered with hard, shiny cement. Alternatively, the foot rest may be made using sanplat foot rest mould, but ensuring proper spacing and angle.

- ***Roof***

A roof is not essential for a urinal, but it is useful during the rains and aids the appearance of the structure. Corrugated iron sheets, ferro-cement slabs, fibre concrete roofing tiles/sheets can be used.

- ***Finishing and Landscaping***

The area around the urinal can be built up with soil, and the trench leveled. The finished structure can be plastered and painted. It is advisable to place a stainless steel sieve over the channel drainage hole to avoid blockage.

5.2.3 Hand Washing Facility Construction

- Should be connected to urinal for flushing
- The soak pit should be located in such a way as not to cause injury to the pupils
- The soak pit should be filled with stones or broken blocks and topped with sand
- The mix for all the concrete works shall be 1:2:4
- The concrete and the block work should be plastered with cement mortar both internally and externally. The mix for the mortal should be 1:3
- Provision should be made for simple artwork and messages, as for the toilet.

5.3 Guidelines for routine operation and maintenance

5.3.1 Introduction

A well organized system of cleaning and maintenance of the school sanitation facilities is of utmost importance. Badly maintained sanitation facilities often cause an even bigger health risk. Stagnant water around tap stands and in blocked drainage channels attracts rodents and forms breeding place for mosquitoes. Thus it is important that proper arrangement is made for maintenance of the facilities. A good cleaning and maintenance system requires fund, spare parts, people and equipment, and a clear definition of roles and responsibilities among the actors involved.

The plan for the maintenance and upkeep of school sanitation facilities should be produced before the facility is constructed. Details of the maintenance are provided in this section.

5.3.2 Operation and maintenance plans

The overall situation in the school and the condition of its hygiene and sanitation facilities is closely linked and should be developed by inclusive participation of all stakeholders, before the facilities are completed. When students, teachers, parents and the community are involved, apart from representatives of other stakeholders, the plan has a better chance of being implemented through the commitments of community and PTA/SBMC/WASJCOM/ EHC level stakeholders.

An operation and maintenance plan should have the following attributes:

❖ **Developed and agreed upon before the facilities are completed**

It is important to start thinking about operation and maintenance at an early stage. School management, teachers, parents and students should be made aware of the maintenance implications during the design phase, such as the availability and affordability of spare parts and cleaning supplies needed for the chosen solution and how their regular supply can be arranged.

❖ **Defined responsibilities and monitoring**

The division of responsibilities among the different stakeholders should be clear and complete, covering all the necessary activities from filling up water containers for hand washing and keeping the surroundings tidy, to purchasing spare parts and supplies and supervising maintenance activities. Allocation of one toilet for each class or a few classes helps to improve the use, cleanliness and maintenance because the responsibility is with a small clearly defined group. If the teacher has to use the same toilet as well, she or he will have an additional motivation to keep it clean (although this might not be appropriate if the toilet is designed at child-size). A, preferably already existing, committee representing students, teachers, parents and the community can be responsible for the final coordination. The plan also defines monitoring and actions in the event of non-compliance.

❖ **Non-discrimination towards sex, age, caste, nationality, religion, ethnic group and social class**

All responsibilities should be shared and not determined by any of the factors mentioned. In many schools girls are responsible for cleaning the toilets, while boys have other or no tasks. The school is a place for children to learn about teamwork and cooperation between all in a non-discriminatory way.

❖ **Linked to other school improvement efforts**

A child-friendly, health-promoting and truly community-based school requires more than clean and well-maintained hygiene and sanitation facilities. The operation and maintenance plan for the hygiene and sanitation facilities can be part of an overall plan to improve the entire school.

❖ **Open and continuous dialogue among stakeholders ensured**

Problems related to operation and maintenance can be discovered before they can negatively affect the sanitation and hygiene situation at the school. The operation and maintenance plan should allow for easy diagnosis and reporting of problems. In addition, it should be reviewed periodically as deemed appropriate.

5.3.3 General Guidelines

❖ **Routine preventive maintenance and upkeep**

This entails daily activities carried out by pupils, with supervision by health teachers and environmental health club members. Daily, the toilets should be washed, with application of disinfectants, surroundings swept and remnants of faeces dislodged and washed into the pit, cutting bushes around the facility. This will make the facility sanitary and child friendly to use.

❖ **Corrective maintenance and upkeep**

This may take place in several ways such as

- Inspecting the facility for minor damages and fixing them
- Ensuring that the surrounding of the facilities are not littered with refuse and faeces
- Ensuring regular inspection of the facility for anomalies and misuse by pupils
- Dislodging cob webs on the vent structure netting through pouring water into to dislodge them, once a month

❖ **Rehabilitation**

Rehabilitation entails making major repairs to the existing facility. This includes:

- Fixing broken vent structures and weak nettings
- Fixing collapsing facilities
- Mending cracks around the slab and superstructure of the toilet

5.3.4 Specific Guidelines

5.3.4.1 Latrines/Toilets

The routine maintenance protocol for multi-compartment VIP latrines and pour flush toilets includes the following:

- Wash compartments (floor) with water, soap and disinfectants, everyday
- Sweep surroundings daily to make it neat, attractive to users and child friendly
- Sweep the slab and drop holes areas daily
- Keep the toilets under lock and key, especially after school hours, to prevent abuse by nearby residents

5.3.4.2 Urinals

The basic maintenance regimen for the urinal:

- It should be washed daily to reduce odour and encourage pupils to use it.
- Once a week, the facility should be disinfected, and this would be complemented by channelling waste water from the hand washing facility to the urinal before flowing to the soak pit through gravity
- Bushes surrounding the urinals should be cut
- The footpath leading to the urinal should be well maintained always, devoid of bushes

5.3.4.3 Hand washing facility

The hand washing facility should be maintained as follows:

- Constantly have water for use by pupils
- Soap pan must always have soap to enable pupils practice hand washing effectively
- The tap should constantly be inspected to avoid water waste through leaking taps
- The hand washing facility should be desludged, at least, once in three month to avoid sediments coming out, instead of water when the water level is low, especially during the dry season
- The path of the waste water from the hand washing facility to the urinals should be cleaned to prevent stagnation and blockage of the pipes by sediments

5.3.5 The school and maintenance of sanitation facilities

The organization of cleaning and maintenance of school sanitation facilities is of the utmost importance. Badly maintained sanitation facilities often cause an even bigger health risk than scattered defecation. Stagnant water around tap stands and in blocked drainage channels attracts rodents and forms a breeding place for mosquitoes. It is not so important who cleans and maintains facilities, but that arrangements for it are made, and that this is done before construction starts. A good cleaning and maintenance system requires funds, spare parts, people and equipment, and a clear division of roles and responsibilities among the actors involved. A number of organizational options for maintenance exist:

- through a cleaning committee
- by classes on a rotation basis, with or without a rewarding mechanism
- external cleaning personnel
- by individual students

Pupils (especially the matured ones) could also be involved and trained to operate and maintain the facilities. *Responsibility* for cleaning and maintenance and *involvement* in it are often seen as being synonymous. Often teachers refer to students, who have been given the task to clean latrines, as being finally responsible for the latrines' upkeep, whereas the final responsibility, involving supervision and corrective action if needed, should remain with the school management. The establishment of school environmental club under the supervision of an active sanitation officer will go a long way in exposing students to:

- Knowledge on the importance of proper sanitation and hygiene at critical times.
- A good understanding of the link between faeces and diarrhoea, and of the importance of barriers.
- A good knowledge of the importance of using clean or running water, and using soap to get rid of germs.
- Ability to distinguish the signs and symptoms of diarrhoea, cholera and dysentery

The sanitation teachers and clubs become a kind of SSHE Evangelists and may be involved in a wide range of activities, including hygiene promotion to fellow students and parents.

In order to become effective promoters and implementers of school sanitation facilities, teachers require a certain level of hygiene awareness and commitment. This includes:

- A working knowledge of the relation between water, sanitation, hygiene behaviour and health
- Awareness about their importance as a role model, resulting in proper hygiene behaviour
- Skills to work with students in a participatory way
- Commitment to bring about improvement themselves or to get third parties involved if necessary.

Training of teachers, who, if motivated and enthusiastic, are a key element for effective hygiene education, should also include effective teaching methodologies, e.g. the use of participatory techniques. For bringing about or facilitating improvements in the water and sanitation situation, teachers will need to know how and where to apply for assistance, how to mobilize community members, etc. Construction of a latrine at the teacher's premises will help enhance the teacher's appreciation of sanitary facilities and at the same time be a motivating factor. Selection of teachers for training should be done carefully. Selection criteria include:

- The teacher can act as a role model and have good contacts in the community,
- The teacher has a genuine interest in SSHE
- The teacher can be allocated some time for taking SSHE activities in the school a bit further.

Care should also be taken that male as well as female teachers get involved in SSHE.

However, as we have seen earlier, teachers may not be able to put their knowledge and commitment to effective use if the curriculum does not allow for hygiene education, or if agencies do not respond to requests for assistance in the provision of water and sanitation facilities. Training of teachers should therefore never be carried out in isolation, which also calls for interagency cooperation. The basic professional training of school teachers should include education related to sanitation and hygiene and to a participatory way of working. Teachers already in service have to get the opportunity to upgrade their knowledge and skills in this respect. Regular interdisciplinary workshops involving school teachers, health

workers, planners, etc., can contribute significantly to the necessary cooperation and coordination of activities.

5.4 Attitudinal Change

Schools are often more than just places for learning and behaviour change. If school sanitation and hygiene facilities are absent, or are badly maintained and used, schools become risky places where diseases are transmitted. Schools can also pollute the natural environment in such a way that it causes health hazards for the community at large. It is therefore important that schools have proper facilities. However, improved facilities in themselves are not sufficient. If we want to reduce the incidence of sanitation and hygiene-related diseases, and to protect the natural environment, behavioural changes are also needed, leading to proper use of the facilities. Three factors have to be addressed if lasting changes in hygiene behaviour are to occur. These are:

- predisposing factors - knowledge, attitude and belief;
- enabling factors - availability of resources like latrine facilities and safe water supply, enabling students to transform newly acquired knowledge, attitudes and beliefs into desirable behaviours;
- reinforcing factors - factors affecting the students' ability to sustain certain behaviour, like support and cooperation received from parents, guardians and peer groups.

Increasing students' knowledge about health and disease prevention should therefore only be part of the story. When knowledge is supported by enabling and reinforcing factors, desirable changes may occur in the school setting and in the community. This stresses the importance of combining hygiene education with the construction of water and environmental sanitation facilities and involving the community and health institutions in SSHE.

5.5 Conclusion

The overall objective of the provision of child-friendly hygiene and sanitation facilities is the improvement of hygiene conditions and related life skills, healthy and safe schools and communities. Operationalizing effective school sanitation facilities should therefore go hand-in-hand with operation and maintenance, to ensure that the overall objective of school WASH project is met.

In addition, the selection, construction and monitoring of WASH facilities should be done by a combined team made up of representatives of LGEA, SUBEB, State RUWATSA, LGs WASH Units/Departments, PTAs/SBMCs, Community, WASH Consultants and Due Process office.

Post construction monitoring should be mainstreamed into the work of the WASH Units/Departments, with constant dialogue with the head teachers, SBMCs/PTAs and Communities. The Sanitation Officers at the LGA, with support of the Community Mobilization and Hygiene Promotion officers should work with the schools Environmental Health Club to ensure post construction monitoring of the use, maintenance and upkeep of the WASH facilities.

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Annex 1

Sample of Application form for selection of schools facilities

1. Name of School: .....
2. Location (Town, LG and State): .....
3. Total Population of pupils.....
   - Boys .....
   - Girls .....
   - Total .....
4. Population of Teaching Staff /Non Teaching:
   - Male ....
   - Female ....
   - Total ....
5. Number of total Classrooms .....
6. Number of total class .....
7. Number of arms per class .....
8. Availability of school sanitation facility(ies): (Y...) (N...)
9. If available, which ones (List):
   - Latrine ( )
   - Urinals ( )
   - Hand washing ( )
   - Water facility ( )
10. Number of Sanitation Facilities:
    - Toilets (Number of blocks, Compartments)
    - Hand-washing facility
    - Urinals
11. Provider of facility(ies)
12. Availability of School sanitation/environmental health club (Yes...), (No....)
13. If yes, name of officers (EC members) .....
    (General meeting) .....
14. If available, how often do they meet? .....
15. How effective is the club? (Very effective....) (Effective....)
    (Not effective....) (Not sure....)
16. Availability of School Based Management Committee/ Parents Teachers Association
    .....
17. How effective is the SBMC/PTA in the management of the school?
    (Very effective....) (Effective....)
    (Not effective....) (Not sure....)