2.2.4 Basic Design Drawing

(1) Types of Water Supply Facilities

(2) Well Structure

(3) Hand Pump Installation

(4) Platform of Hand Pump

(5) Intake Pit for Spring Water

(6) Water Reservoir Tank (20m3)

(7) Water Reservoir Tank (30m3)

(8) Water Reservoir Tank (40m3)

(9) Water Reservoir Tank (50m3)

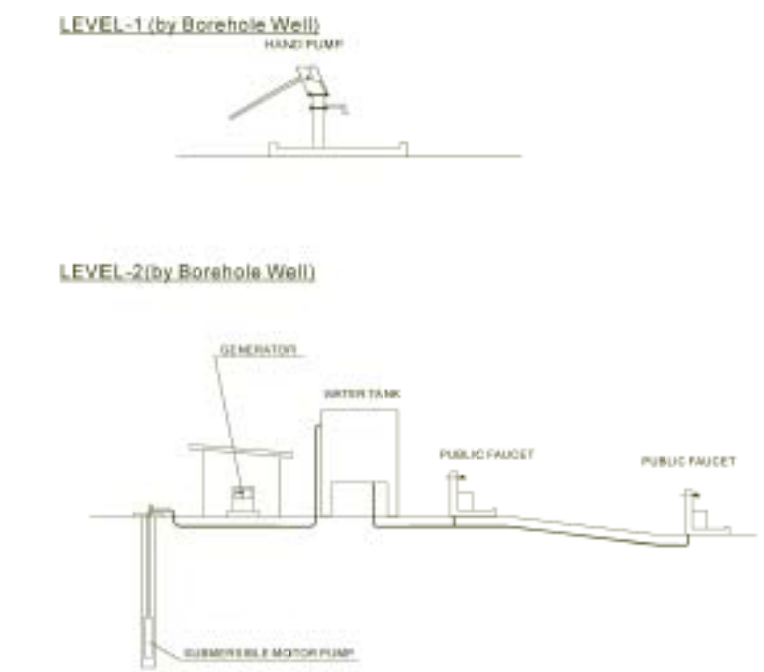
(10) Generator House-A

(11) Generator House-B

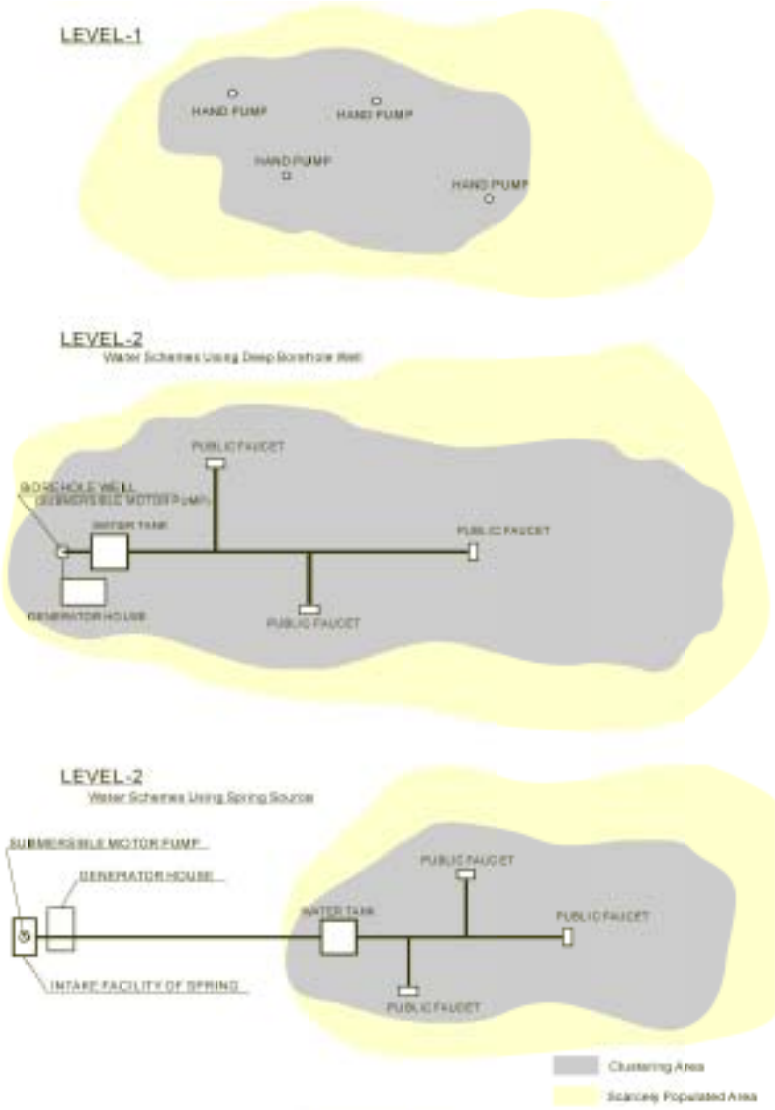
(12) Pipeline for Borehole well

(13) Pipeline for Spring

(14) Public faucet



Types of Water Supply Facilities



FACILITY PLAN

RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-1	DESIGNED BY :	DATE :
DRAWING TITLE : Type of Water Supply Facilities		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	

JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KOKUSAI KOGYO CO.,LTD.

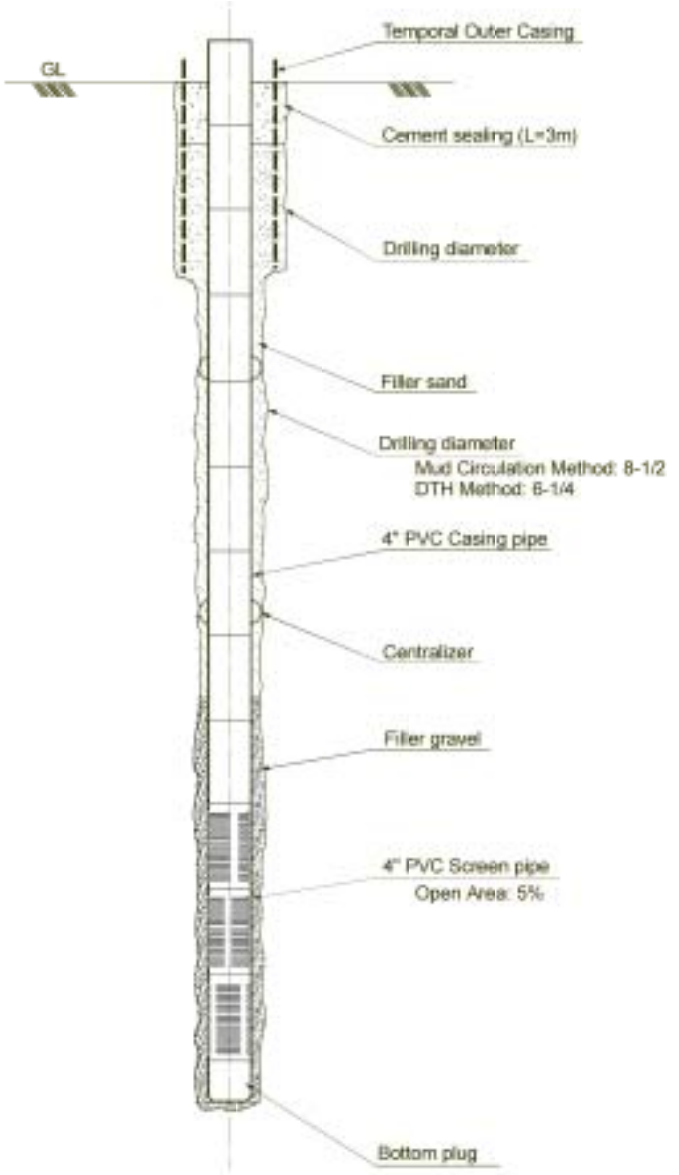
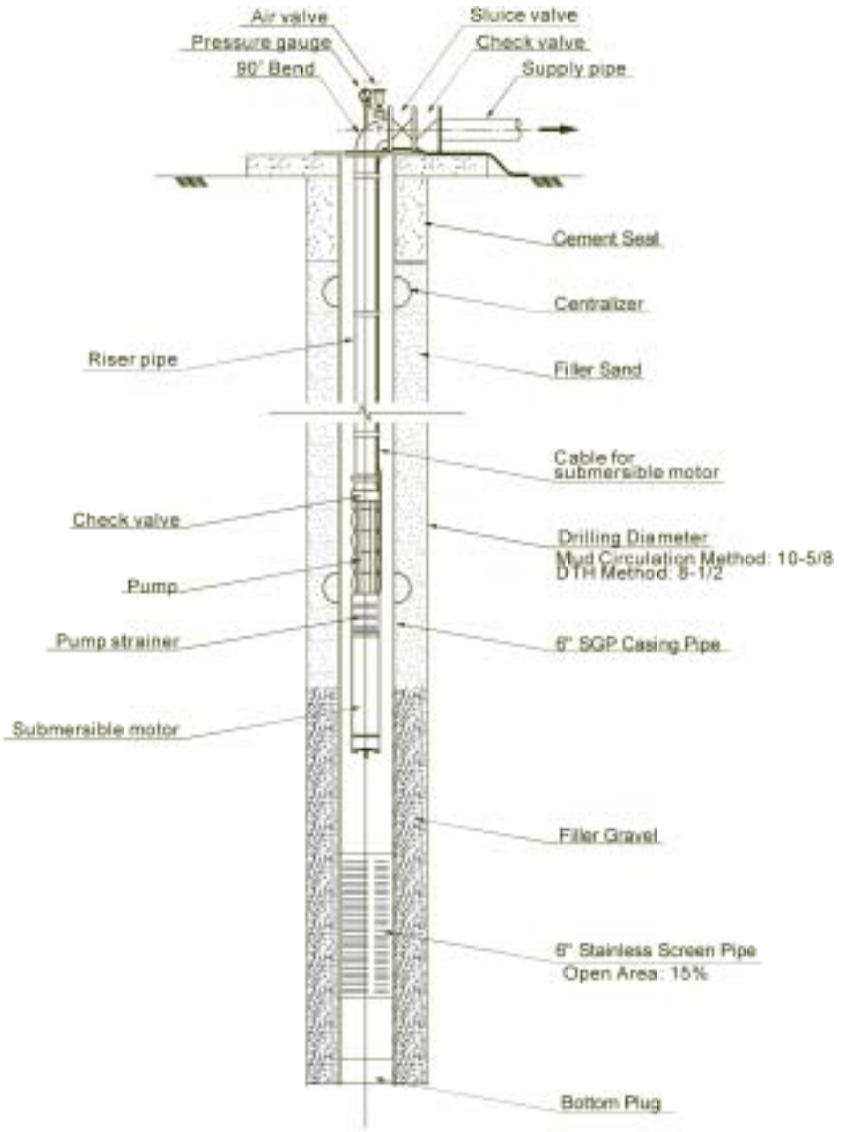
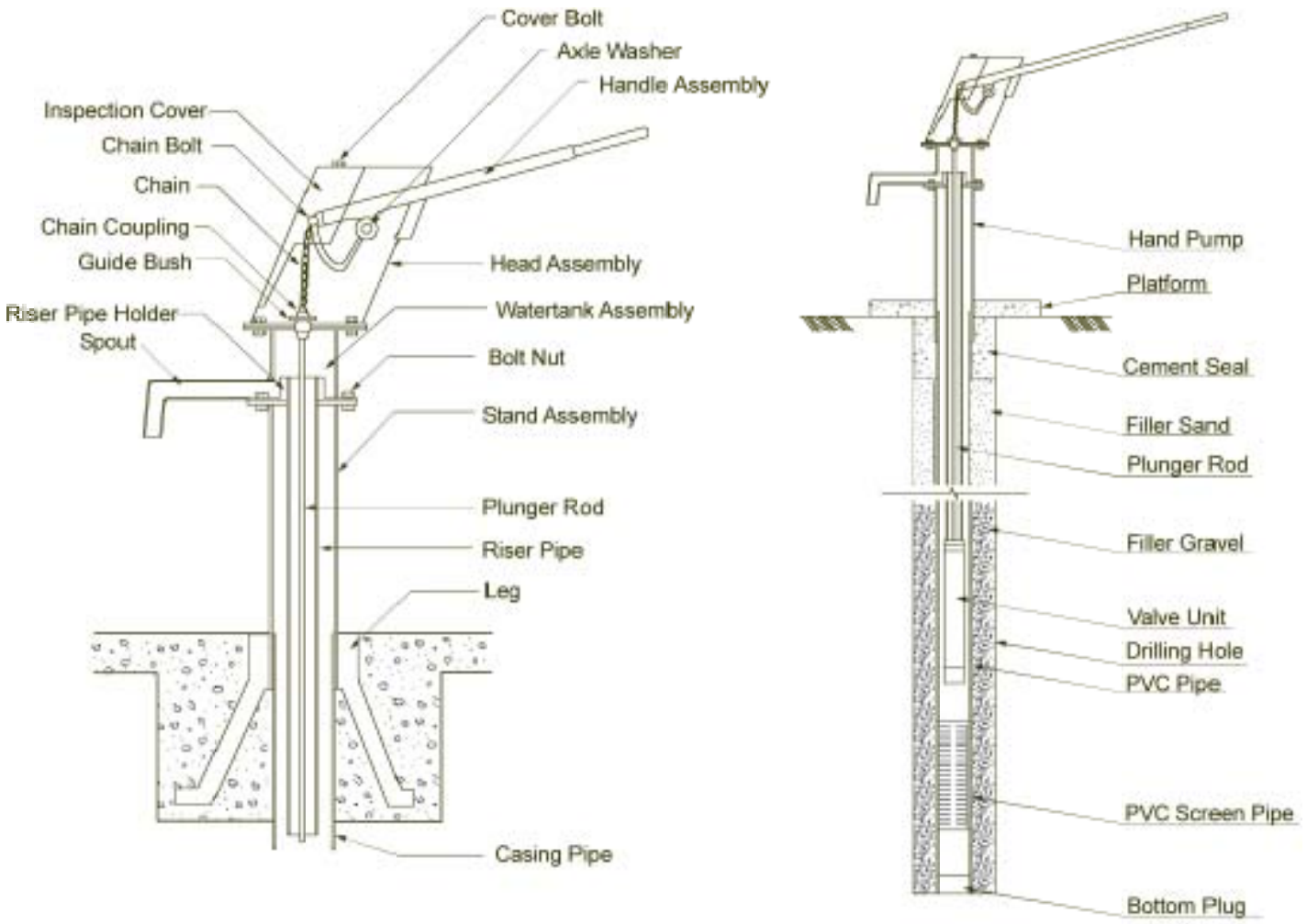


Figure 4 Well Structure for Hand Pump



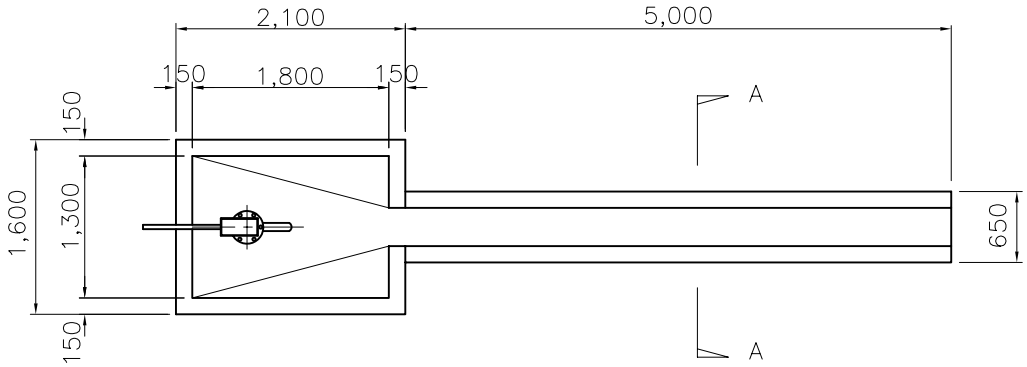
Well Structure for Submersible Pump

RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-2	DESIGNED BY :	DATE :
DRAWING TITLE : Well Structure		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			



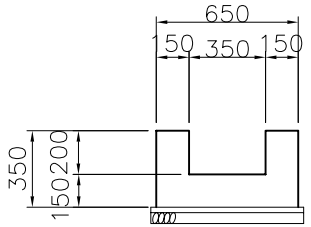
Detail of Hand Pump Installation

RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-3	DESIGNED BY :	DATE :
DRAWING TITLE : Hand pump installation		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			



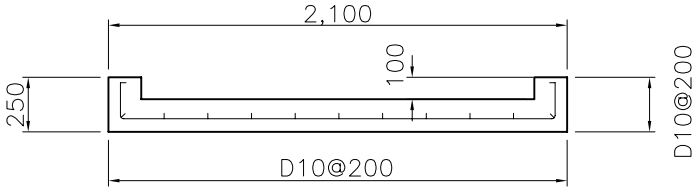
PLAN

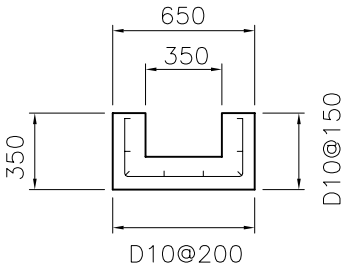
S=1:50



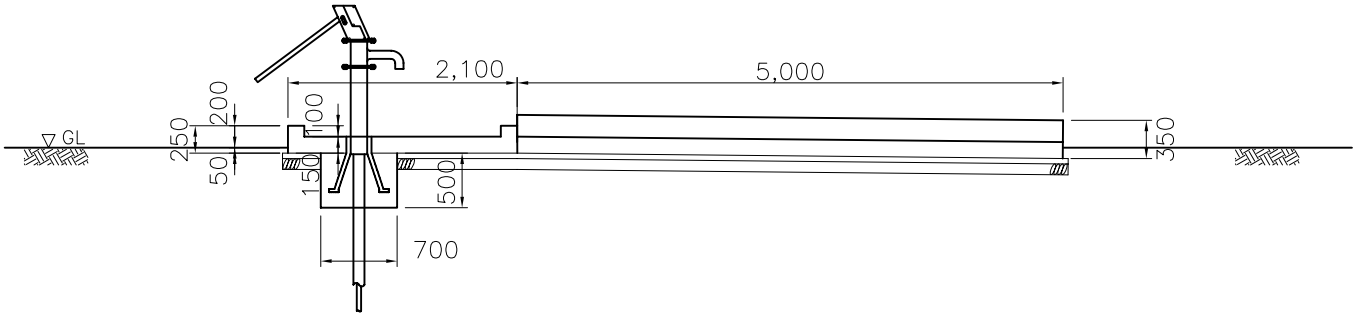
SECTION A—A

S=1:25





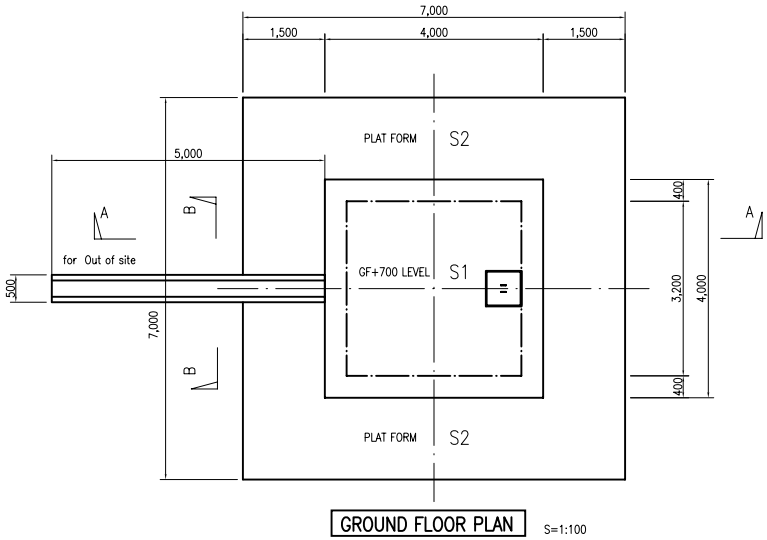
BAR ARRENGEMENT



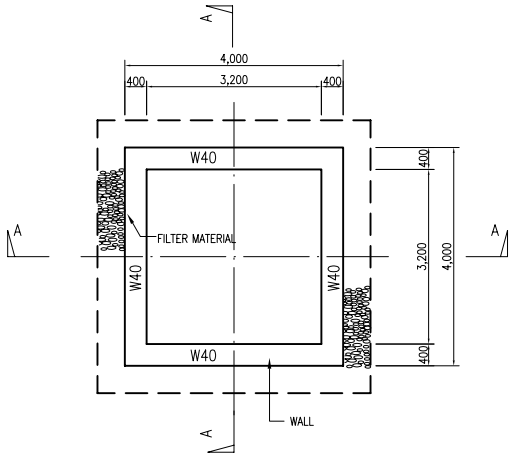
SECTION

S=1:50

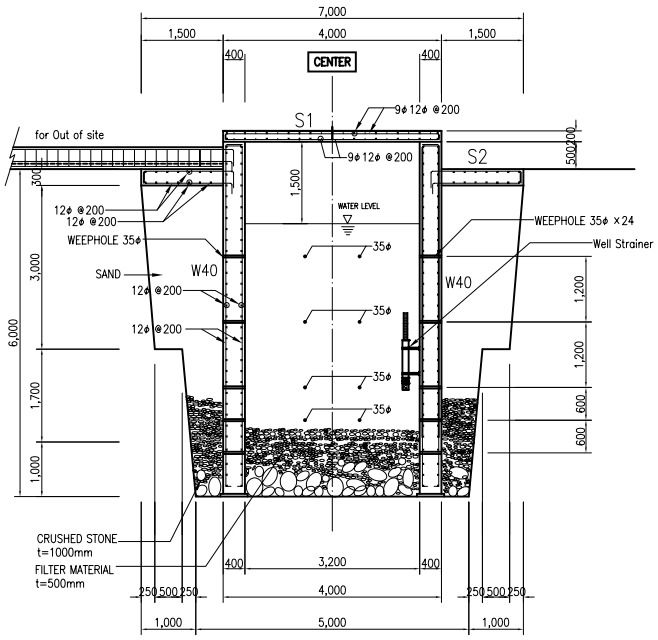
RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-4	DESIGNED BY :	DATE :
DRAWING TITLE : Platform of hand pump		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			



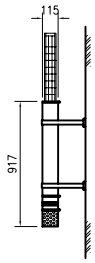
GROUND FLOOR PLAN S=1:100



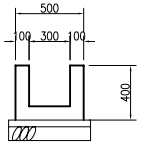
G.F.−5000 LEVEL PLAN S=1:100



SECTION A — A S=1:100



Detail of Strainer S=1:40

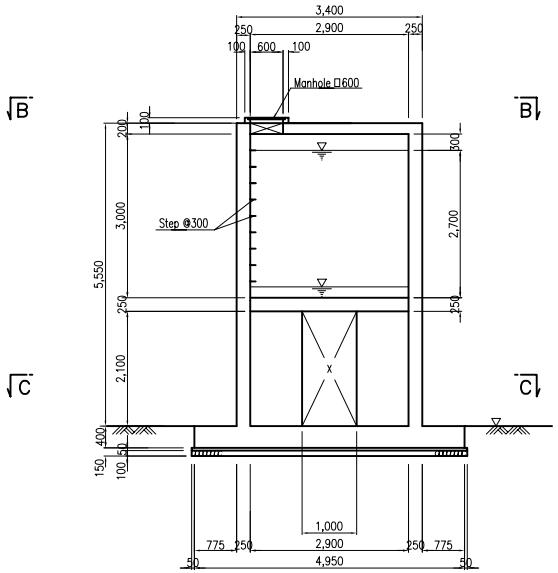


SECTION B — B S=1:40

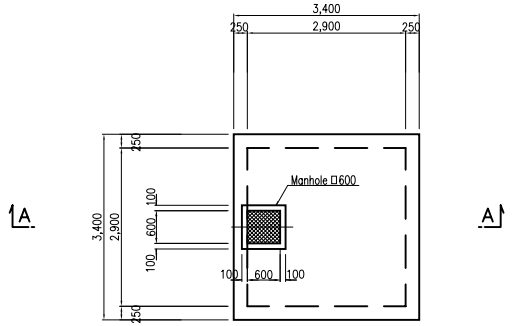
RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-5	DESIGNED BY :	DATE :
DRAWING TITLE : Intake Pit for Spring Water		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			

Water Reservoir Tank 20m3

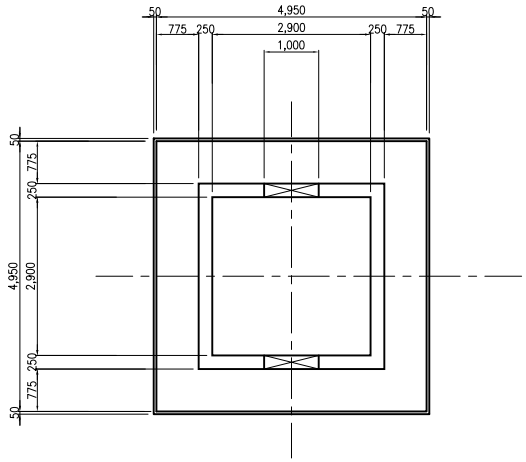
A – A



B – B



C – C

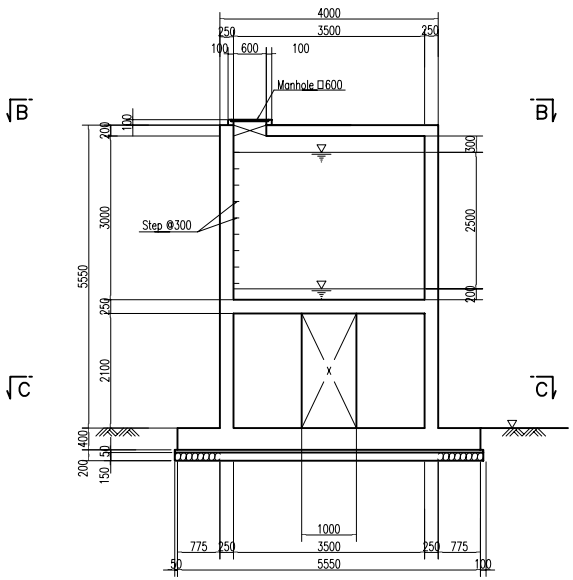


RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-6	DESIGNED BY :	DATE :
DRAWING TITLE : Water Reservoir tank (20m3)		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	

JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KOKUSAI KOGYO CO.,LTD.

Water Reservoir Tank 30m3

A – A



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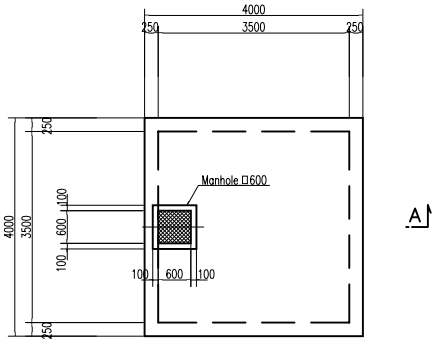

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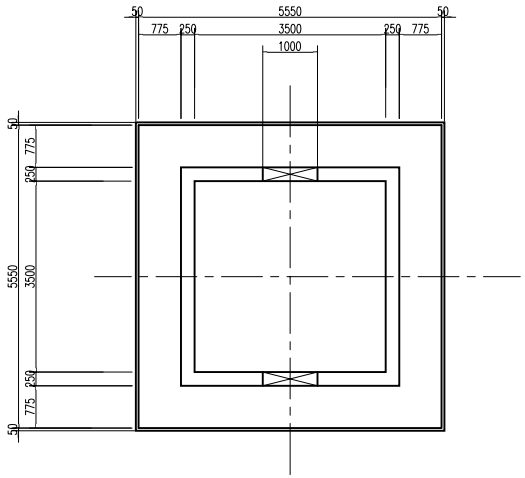
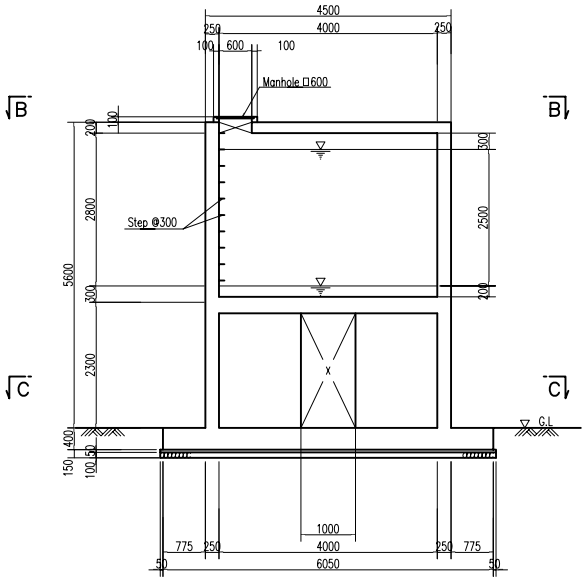


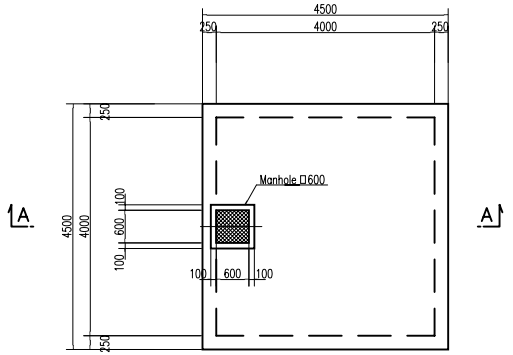
RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-7	DESIGNED BY :	DATE :
DRAWING TITLE : Water Reservoir tank (30m3)		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			

Water Reservoir Tank 40m3

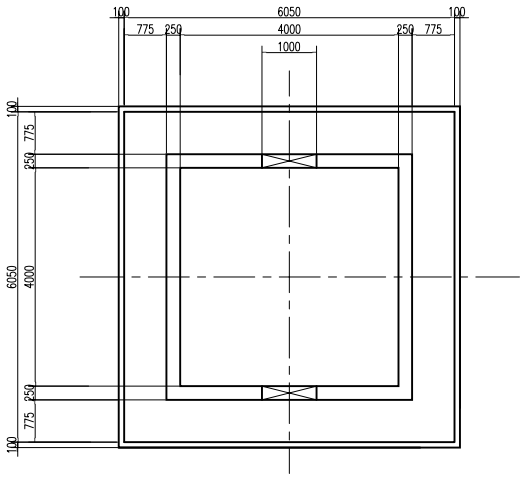
A – A



B – B



C – C

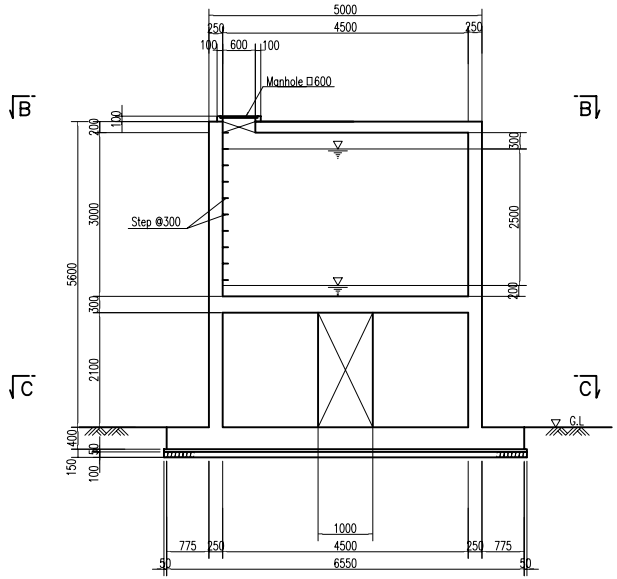


RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-8	DESIGNED BY :	DATE :
DRAWING TITLE : Water Reservoir tank (40m3)		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	

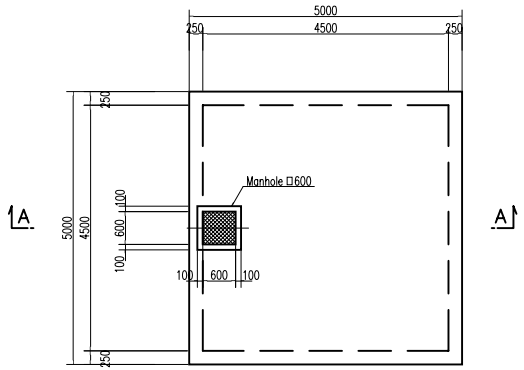
JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KOKUSAI KOGYO CO.,LTD.

Water Reservoir Tank 50m3

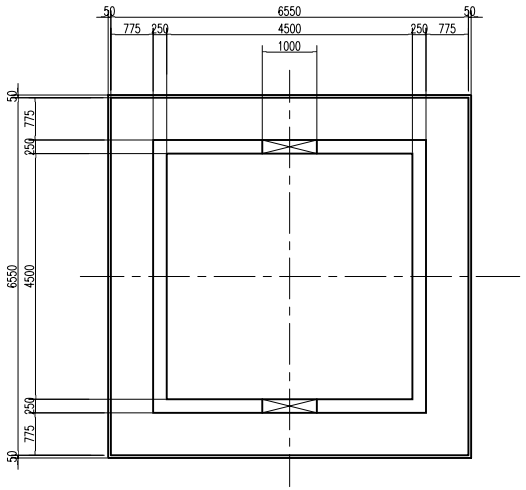
A – A



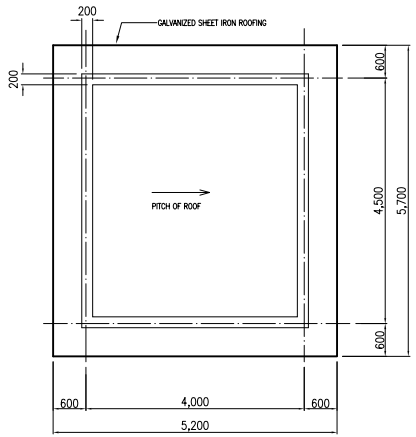
B – B



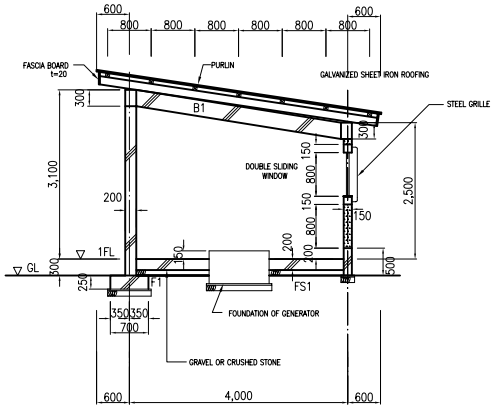
C – C



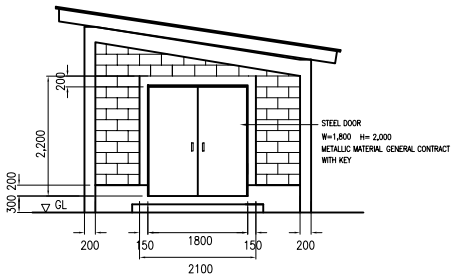
RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-9	DESIGNED BY :	DATE :
DRAWING TITLE : Water Reservoir tank (50m3)		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			



ROOF PLAN S=1:100

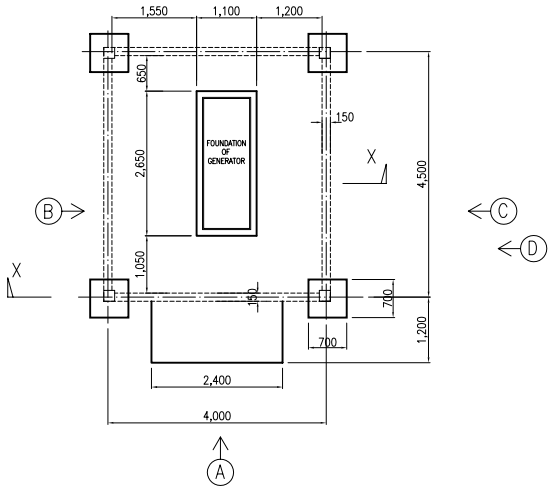


SECTION X—X S=1:100

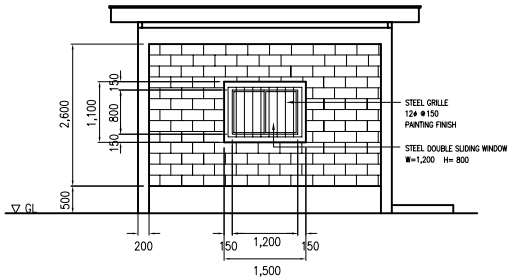


Ⓐ SIDE ELEVATION S=1:100

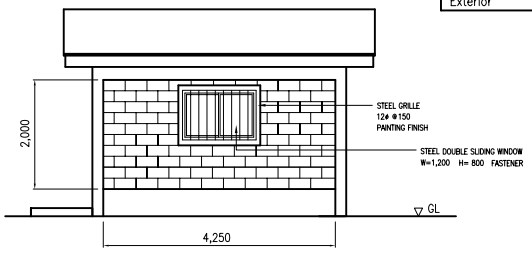
Finishing Schedule	
Interior	Emulsion Paint
Exterior	Emulsion Paint



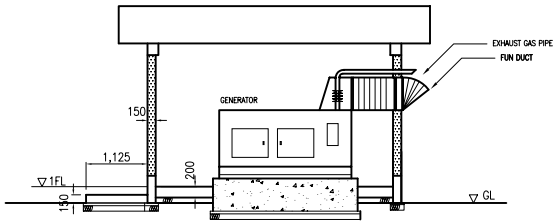
1ST.FLOOR PLAN S=1:100



Ⓑ SIDE ELEVATION S=1:100

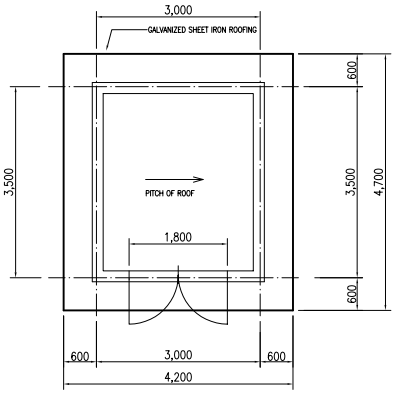


Ⓒ SIDE ELEVATION S=1:100

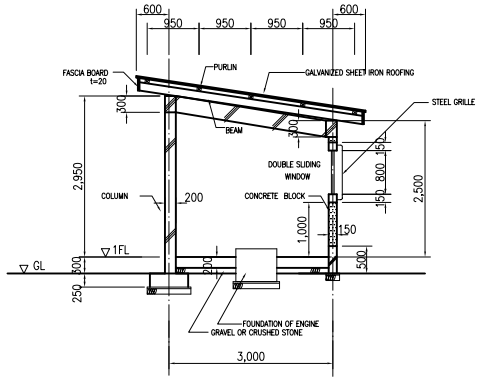


Ⓓ SIDE ELEVATION S=1:100

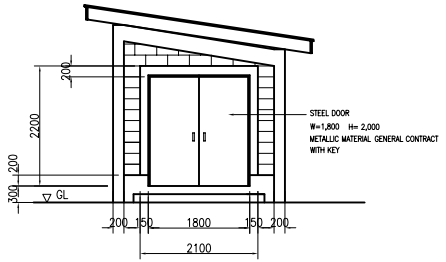
RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-10	DESIGNED BY :	DATE :
DRAWING TITLE : Generator House A-1		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			



ROOF PLAN S=1:100

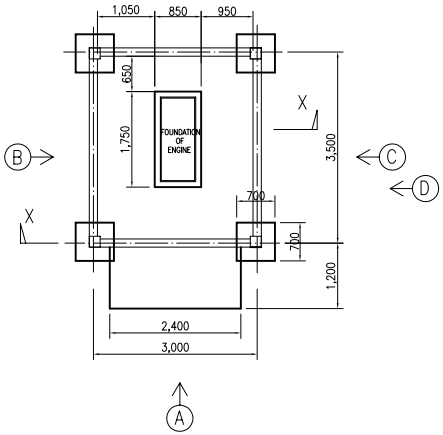


SECTION X—X S=1:100

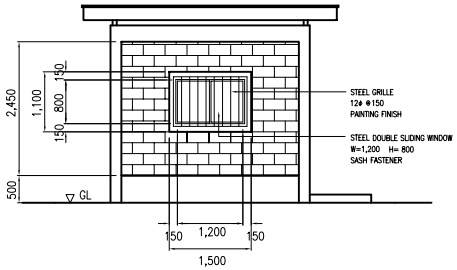


Ⓐ SIDE ELEVATION S=1:100

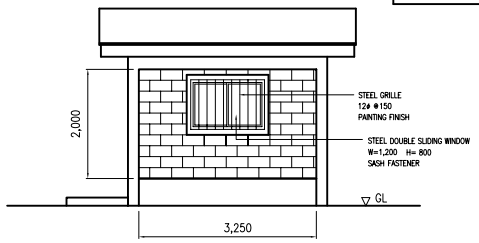
Finishing Schedule	
Interior	Emulsion Paint
Exterior	Emulsion Paint
Window	



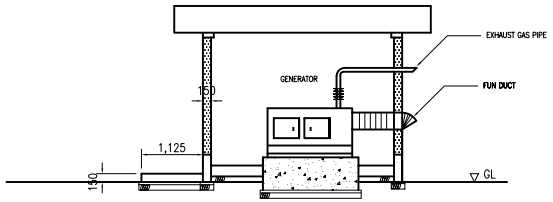
1ST.FLOOR PLAN S=1:100



Ⓑ SIDE ELEVATION S=1:100



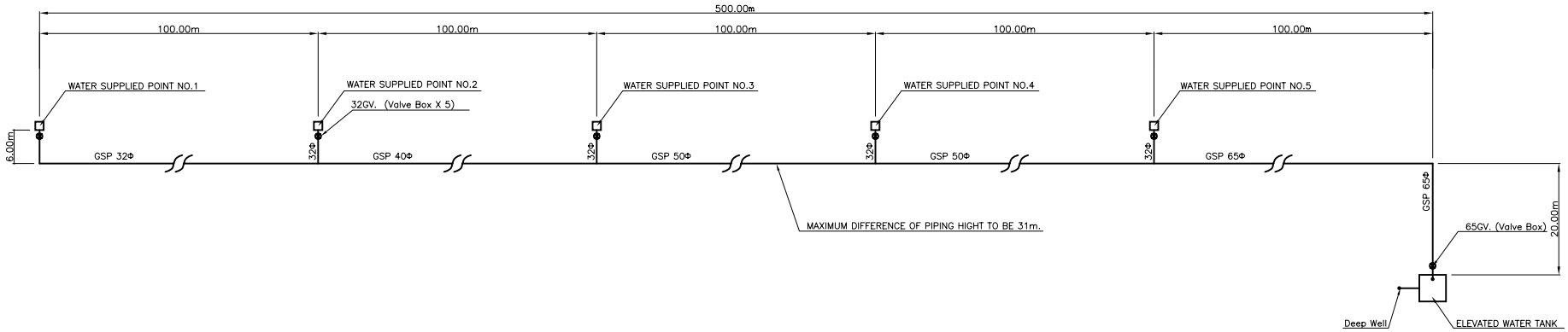
Ⓒ SIDE ELEVATION S=1:100

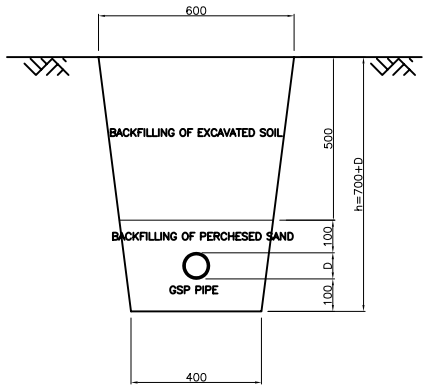


Ⓓ SIDE ELEVATION S=1:100

RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-11	DESIGNED BY :	DATE :
DRAWING TITLE : Generator House B-1		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	

JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KOKUSAI KOGYO CO.,LTD.





SECTION OF EXCAVATED TRENCH

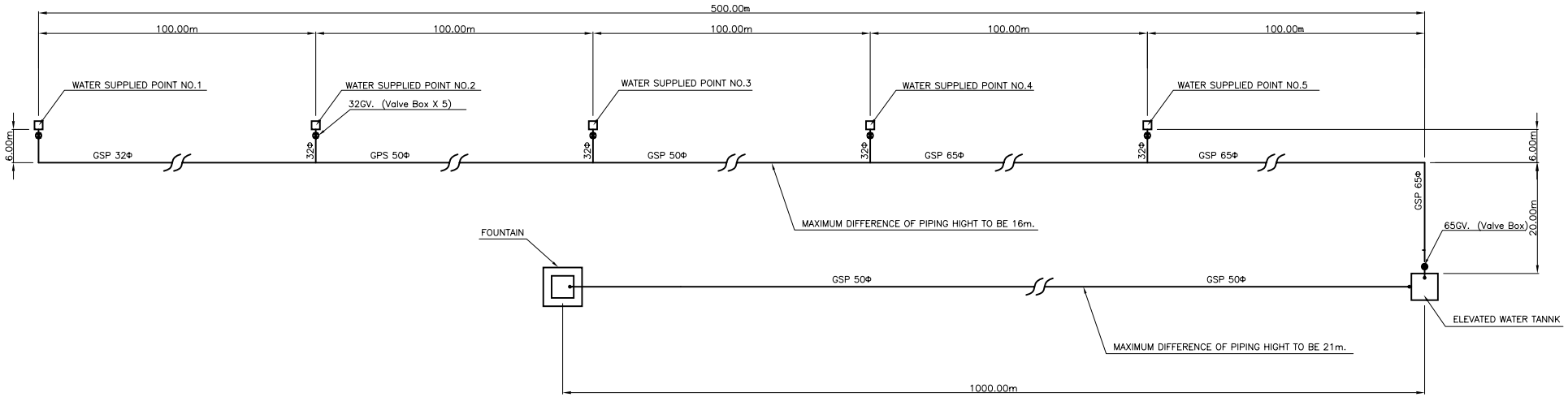
(mm)

GSP Pipe	Diameter (Exterior)	Depth of Excavation (h)
ϕ 32	ϕ 43	743
ϕ 40	ϕ 49	749
ϕ 50	ϕ 61	761
ϕ 65	ϕ 76	776

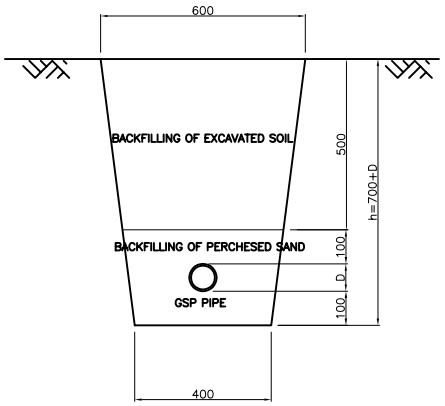
RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA

SEQ NO. :	SHEET NO. : Figure 2-12	DESIGNED BY :	DATE :
DRAWING TITLE : Pipeline for Borehole well (Pipeline distance 500m)		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	

JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KOKUSAI KOGYO CO.,LTD.



PLAN FOR WATER SUPPLY SYSTEM WITH FOUNTAIN



SECTION OF EXCAVATED TRENCH

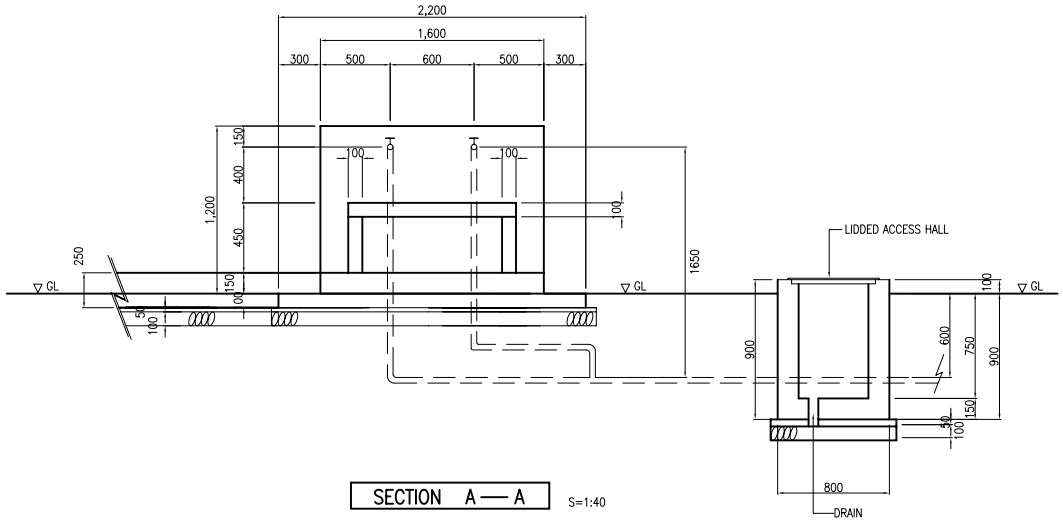
(mm)

GSP Pipe	Diameter (Exterior)	Depth of Excavation (h)
ϕ 32	ϕ 43	743
ϕ 40	ϕ 49	749
ϕ 50	ϕ 61	761
ϕ 65	ϕ 76	776

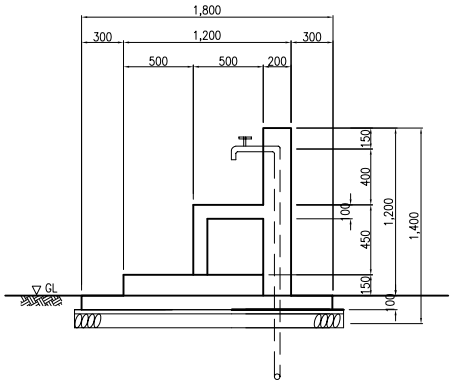
RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA

SEQ NO. :	SHEET NO. : Figure 2-13	DESIGNED BY :	DATE :
DRAWING TITLE : Pipeline for Spring		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	

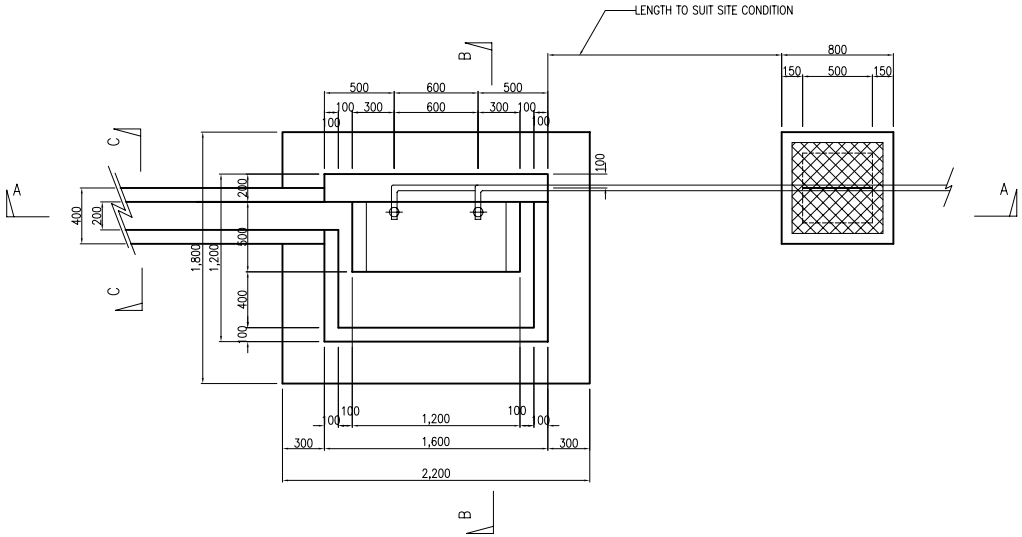
JICA JAPAN INTERNATIONAL COOPERATION AGENCY
KOKUSAI KOGYO CO.,LTD.



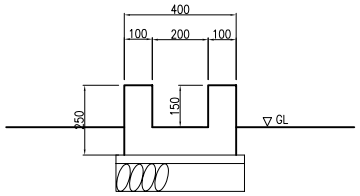
SECTION A — A S=1:40



SECTION B — B S=1:40



PLAN S=1:40



SECTION C — C S=1:20

RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS IN THE UNITED REPUBLIC OF TANZANIA			
SEQ NO. :	SHEET NO. : Figure 2-14	DESIGNED BY :	DATE :
DRAWING TITLE : Public Faucet		DRAWNED BY :	SCALE :
		CHECKED BY :	REVISION NO. :
		APPROVED BY :	
JICA JAPAN INTERNATIONAL COOPERATION AGENCY KOKUSAI KOGYO CO.,LTD.			

2.2.5 Implementation Plan

2.2.5.1 Implementation Policy

After conclusion of the Exchange of Notes (E/N) between Japan and Tanzania, the Tanzanian government shall enter into a contract with a Japanese consultant company on the detail design (D/D) and the supervision of the procurement of equipment and facility construction. Based on the contract, the consultant company shall commence the D/D in Tanzania. After completion of the D/D, a Japanese contractor shall be selected by tendering in the presence of Tanzanian government officials.

Facility construction and the procurement of equipment will be performed as follows.

1) The project requires 35 months from conclusion of the contract to completion of the work because it includes the procurement of drilling equipment. Therefore, the project duration is divided into three phases.

2) The drilling equipment must be procured prior to facility construction. Therefore, equipment shall be procured in Phase I.

3) Facility construction in the two regions is performed concurrently in Phase II and III.

4) The target villages are scattered throughout an area of about 300 km^2 and road conditions are bad. Therefore, a project office shall be established during each phase.

5) The Tanzanian side shall secure the sites and the inventory location of the equipment and materials before commencement of construction work.

2.2.5.2 Implementation Conditions

(1) Accessibility to the site

There is no problem with accessibility to the site in the dry season. However, road conditions worsen in the rainy season and access to the target villages becomes difficult in some places. The construction schedule must be planned considering accessibility to every village.

(2) Temporary yard for construction

It is necessary to prepare a temporary yard to stock equipment and materials.

(3) Quality control

It is necessary to prepare a concrete testing laboratory in the temporary yard, as it is difficult to find a place to install such a laboratory in the project area. There is a laboratory for water quality analysis at RWE in Mtwara.

(4) Electricity

Electric power is supplied by TANESCO, although the serviced area is limited to the district capital and the large villages located along the main road. Blackouts frequently occur due to the chronic shortage of electricity. Therefore, it cannot be utilized for construction work.

(5) Waterworks

Water is supplied in the capitals of the regions and districts by public waterworks. It is difficult to use water for construction in other areas. It is necessary to secure a means of water supply for construction work.

(6) Communication

Telephone lines only connect the capital towns of the regions and districts. In order to establish a communication system for the project, wireless communication is indispensable. In addition, satellite telephones must be furnished for communication in emergency situations.

(7) Accommodation

There are several guesthouses in the district capitals. However, they are not suitable for the prolonged stay of Japanese counterparts. It is necessary to construct accommodation for them in the temporary yard or rent a house in Mtwara and Lindi towns.

(8) Port of Import/Export

Mtwara port is an international port in the project area. However, regular liners for import/export do not exist. The port is mainly utilized for cashew transportation only in the farming season. Therefore, equipment shall be imported via Dar es Salaam Port.

(9) Inland transportation

The project area is about 500km away from Dar es Salaam Port and the road is severed in the rainy season. A reliable means of transporting the equipment from Dar es Salaam to Mtwara and Lindi Port is by domestic vessel.

2.2.5.3 Scope of Works

In the event that the project is executed by Japan's grant aid, demarcation of responsibility and obligation for the Japanese side and the Tanzanian side is shown in the following table.

Table 2-8 Demarcation of Responsibility and Obligation

Item	Contents	Japanese Side Obligation	Tanzanian side Obligation
Construction of Water Supply Facility	Deep well equipped with hand pump	• Construction of facility	• Land acquisition for construction • Provision of land for temporal yard • Preparation of access for construction • Embankment of hand pump facility • Organization of O&M
	Deep well equipped with motorized pump	Same as the above	Same as the above
	Spring water supply system	Same as the above	Same as the above
Procurement of Equipment	Well drilling equipment	• Procurement of equipment	• Acceptance and securement of organization and staff for OJT
	Equipment for O&M	Same as the above	• Acceptance and securement of organization and staff
	Equipment for survey	Same as the above	Same as the above
Soft Component	Guidance and training for O&M (software)	• Guidance for O&M and Hygiene education for villagers.	• Securement of organization and staff
	Guidance and training for O&M (hardware)	• Guidance for operation, maintenance and repair of the water supply facility.	Same as the above
	Guidance and training for survey and supervision of construction work	• Guidance for the survey	Same as the above

The main implementing body of the project is the Ministry of Water and Livestock Development (MoWLD). The MoWLD acts as the chief executive of the project. If the project is executed by Japan's grant aid, it must financially follow the budgetary system of the Japanese government. In order to implement the project smoothly, the matters required at each step must be carried out promptly. The scope of the responsibility is as follows.

1) The contract agreement between the Japanese consultant company based on the E/N

2) The contract agreement between the Japanese contractor based on the E/N

3) In order to pay contract deposit for the above-mentioned contract, Authorization to Pay (A/P) shall be inaugurated at a registered Japanese foreign currency trading bank immediately after conclusion of the contract.

4) Following the bank arrangement, the commission charge must be paid immediately after the issuance of the A/P.

5) Opening of a project office necessary for supervisory work and assignment of staff

6) Issuance of visas to the Japanese consultant and contractor staff for their entry into Tanzania and their stay therein for work, immediately upon their request.

7) Registration of the Japanese consultant and contractor and their staff and payment of the registration fee (when necessary)

8) Acquisition of land lots necessary for construction (Immediately after conclusion of the contract)

9) Arrangement of access road for mobilization and demobilization of the construction equipment and materials.

10) Exemption of tax and duties on facility construction and the procurement of equipment

11) Prompt unloading and clearance of customs of the equipment and materials imported from Japan and/or a third country, and payment of duties, internal taxes and other fiscal levies imposed by Tanzania.

12) Upon request by the consultant, inspection of constructed facilities and equipment delivered at each stage shall be conducted.

13) Issuance of certificates for payment to the consultant and contractor.

14) Technical guidance on O&M, hygiene education and necessary support for the villages after completion and hand-over of the facilities.

2.2.5.4 Consultant Supervision

The work plan is divided into two stages, i.e. detail design and supervision.

During the detail design stage, the consultant services to be rendered are as follows:

1) Provision of detailed drawings
2) Provision of technical specifications for facility construction and the procurement of equipment.
3) Provision of tender documents
4) Estimation of the project price
5) Execution of tender(s)

The field survey in the detail design stage is as follows:

1) Hydrogeological survey
2) Detailed land survey for Level 2 system (deep well)
3) Detailed land survey for Level 2 system (spring)
4) Confirmation of equipment plan
5) Confirmation of construction and procurement plan

6) Market survey for cost estimate

7) Confirmation of unconfirmed matters in the basic design study

During the supervision stage, the services to be rendered are as follows:

1) Examination and approval of construction plan, drawings, equipment and materials.

2) Confirmation of the Tanzanian side's obligation

3) Monitoring of the progress of construction

4) Supervision of construction work

5) Reporting the progress of the project both for Japanese and Tanzanian government organizations concerned.

6) Examination of the procured equipment and materials before shipping

7) Confirmation of shipping for the procured equipment and materials

8) Monitoring the progress of transportation and delivery of equipment and materials

9) Inspection of the equipment and materials procured before consignation.

10) Inspection of the completion

11) Assistant services such as issuing the certificate of payment to the contractor.

The consulting experts required for the above services are as follows:

A. Detail design stage

Chief engineer	1	Overall management
Facility engineer	1	Design of water supply facility
Hydrogeologist	1	Deep well site determination and well design
Equipment engineer	1	Design of equipment procured
Construction and Procurement Plan	1	Planning and cost estimate
Tender document experts	1	Preparation of tender and contract document

B. Supervision Stage

Chief engineer	1	At fixed times (the start, intermediate, completion)
Facility engineer	1	At fixed times (the start, intermediate, completion)
Hydrogeologist	1	At the start of drilling
Equipment engineer	1	For the delivery of equipment
Resident engineer	1	During the construction

C. Soft component stage

O&M planner	1	Organization of O&M / Hygiene education

2.2.5.5 Procurement Plan

Steel and PVC casings are difficult to procure in the local market. They shall be procured in Japan or a third country. Stainless or PVC screen shall also be procured in a third country or Japan.

There are several sales agencies of hand pumps in Tanzania and some parts are made locally. Considering the procurement of spare parts in the future, hand pumps are to be procured in Tanzania.

Motor pumps and generators are to be procured in Japan considering the time of supply. Equipment is to be installed after the pumping test of the well so that the time for procurement and delivery is limited. Spare parts and after-purchase servicing are also needed in the future. Therefore, the equipment shall be selected from the manufacturer that has sales agency in Tanzania.

Cement, aggregate, reinforcing bar, etc shall be procured in Tanzania or a nearby country for cost cutting.

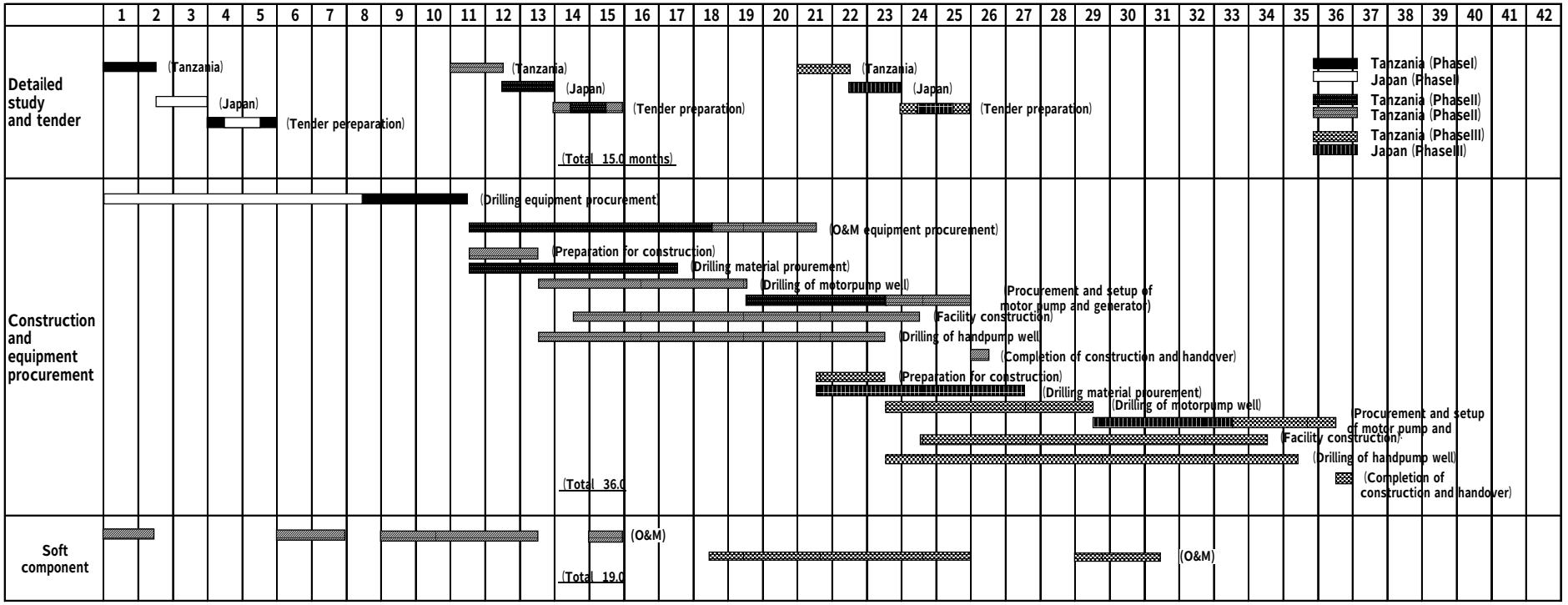
There are a wide variety of manufacturers of existing drilling rigs in DDCA in the USA, Japan and European countries. Therefore, manufacturers in Japan and third countries shall compared in terms of cost and easiness of maintenance.

Other equipment shall be procured in Japan, in principle.

2.2.5.6 Implementation Schedule

The implementation schedule based on the above plan is given below.

Figure 2-15 Implementation schedule



2.3 Obligation of Recipient Country

The obligation of the recipient country is shown below.

Table 2-9 Obligation of recipient country

Components	Items	Obligation	Cost
Facility Construction	Construction of Level 1 Well	Acquirement of building lot	–
		Offer of temporary office/ dwelling lot for construction	–
		Improvement of access road to the sites	500mx4mx26= 52,000m2x400Tsh= 20,800,000 Tsh
		Embankment for hand pump facility	2.1mx1.6mx50cmx26= 44m3x5,000Tsh= 220,000 Tsh
		Formation of O&M organization	–
	Construction of Level 2 well	Acquirement of building lot	–
		Offer of temporary office/dwelling lot for construction	–
		Improvement of access road to the sites	500mx4mx38= 76,000m2x400Tsh= 30,400,000 Tsh
		Embankment for hand pump facility	–
	Construction of spring water supply facility	-ditto-	–
	Registration of Japanese company	Registration of Japanese consultant	10,000 US$
		Registration of Japanese contractor(s)	10,000 US$
Equipment Procurement	Drilling equipment	To ensure a site for storage and organizations/personnel to be trained.	–
	O&M equipment	To ensure a site for storage and organizations/personnel concerned.	–
	Survey equipment	-ditto-	–
Soft Component	Operation and maintenance	To ensure organizations and personnel to be trained.	–
Total			71,333,000 Tsh

VAT on the equipment procured in Tanzania will be exempted, which amounts to approximately 70.6 million Tsh.

2.4 Operation Plan

2.4.1 Organization

(1) RWE

RWE is responsible for water supply and sanitation in the province and its main function is coordination. RWE also provides technical support for the district council's activities on water supply and sanitation. RWE's roles in the project are management of the construction schedule and support for O&M activities in the districts.

(2) DWE

DWE is responsible for planning, development and O&M of the water supply and sanitation in the district. DWE provides water supply to urban area and does O&M of the water supply systems. In rural areas, DWE supports the construction of facilities in villages technically and financially. DWE also conducts dissemination activities to establish resident's organization for O&M in accordance with the national policy. In the project, DWE shall give guidance and support to VWCs on O&M .

(3) VWC

VWCs are organized under the committees of the village government. In principle, VWCs are composed of six members, three men and three women, respectively. Almost all villages in the project area have already established a VWC, however, they are not actually functioning because of lack of water supply. In the project, the organization shall be regrouped and promote O&M of the water supply system through resident participation.

2.4.2 O&M System

A Water Point Committee shall be organized at each hand pump of the Level 1 system and each public faucet of the Level 2 system. A caretaker and a fee collector shall be elected and put in charge of daily maintenance of the facility such as operation, maintenance, repair and fee collection. The VWC shall manage the WPC and make requests to DWE and RWE for spare parts, etc as a representative of the residents. DWE and RWE shall repair major damage to the facility, which the residents cannot repair. DWE shall conduct routine checks of the facility and support hygiene education.

2.4.3 O&M Cost

O&M cost consists of the following items of expense.

(1) Hand pump water supply system

① Personnel cost for hand pump caretaker

② Buying expenses of spare parts

③ Well cleaning expenses

④ Reserve fund for repair

⑤ Allowance for routine checks

(2) Motorized pump water supply system

① Personnel cost for operator

② Fuel expenses

③ Well cleaning expenses

④ Reserve fund for repair of generator and pump

⑤ Reserve fund for repair of pipe, valves and faucets

⑥ Allowance for routine checks

The results of the O&M cost estimation for the Level 1 and Level 2 systems are shown below.

Table 2-10 OM Cost for Level 1 System

(Annual cost per facility Unit:Tsh)

Item	Unit Cost	Quantity	Amount	Remarks
1. Personnel cost	35,000	12months/person	420,000	Basic wage
2. Spare parts	213,500	5%	10,700	Cost estimate
3. Well cleaning	563,000	20%	112,600	do
4. Reserve fund for repair	213,500	5%	10,700	do
5. Allowance for routine checks				
Transportation	20,000	2 persons/day	40,000	card rate
	21,000	2 times	42,000	30 liters of gasoline
Total			636,000	

Table 2-11 OM Cost for Level 2 System

(Annual cost per facility Unit:Tsh)

Item	Unit Cost	Quantity	Amount	Remarks
1. Personnel cost				
Operator	35,000	12months/person	420,000	Basic wage
Fee collector	35,000	12months/5persons	2,100,000	do
2. Fuel cost (average)	36,330	12 months	436,000	10 hours operation
3. Well cleaning	563,000	20%	112,600	cost estimated
4. Reserve fund for repair of pump and generator	37,167,000	5%	1,858,000	do
5. Reserve fund for repair of pipe, valve and faucets etc	1,051,000	2.5%	26,300	do
6. Allowance for routine checks	20,000	2 persons/day	40,000	card rate
Transportation	21,000	2 times	42,000	30 liters of gasoline
Total			5,034,900	

2.5 Other relevant Issues

2.5.1 Soft Component Plan

(1) Policies for Soft Component

The facilities constructed in the past years in the two regions have not been necessarily maintained in proper ways. The Tanzanian government declared that the beneficiaries should participate in the O&M of water facilities in the national water policy published in 1991. The government emphasized that communities should have responsibility for the O&M of water facilities in terms of finance in the national water policy revised in 2002. The policy has six objectives including the integration of water supply, public health, and hygiene education in order to improve the health conditions of residents. However, RWE and DWE do not have a concrete concept or an approach for the implementation of participatory O&M and do not have any personnel or sections in charge of health education. Furthermore, the community side does not understand the ownership of water facilities and the principle of beneficiary-payment. The Tanzanian government requested support for the capacity building at the regional, district, and village levels in terms of O&M. Based on this situation, it has been decided to conduct the technical assistance mentioned below for the sustainable management of the facilities constructed by the project. RWE and DWE will develop their capacity through activities such as the establishment of community organizations and making a community based O&M plan, which are to be conducted following the workshop and training on community participation. Each village will also develop its capacity through experience in establishing O&M organizations and making a plan with the initiatives of RWE and DWE.

The soft component activities will be effective if they are implemented at specific construction stages. Therefore, the schedule shall be decided according to the construction schedule.

(2) Contents of the Plan

① Community Participation

Residents have generally donated their effort in the construction of water supply systems in the past. In addition to this, cost sharing has recently been introduced to implant a sense of ownership of the water supply facility. However, the contribution of labor and partial provision of the fund are not enough for sustainable O&M. The residents need to have responsibility for the planning and utilization of the water supply facility. Accordingly, dissemination activities shall be conducted in order to make both the government side and the resident side understand the importance of community participation in O&M.

② Support for O&M Plan

The residents themselves must prepare a feasible O&M plan. They have no experience in planning. DWE does not have enough experience, either. Therefore, the project will hold workshops in each village to make an O&M plan including rules of use. At the same time, the workshops will provide opportunities of OJT as facilitators to DWE staff.

③ Support for establishment of O&M system

The Village Water Committee (VWC) is not functioning in almost all villages in the project area. There is much room to improve in VWC. This program supports to establish suitable O&M system for each village involving the VWC, village and district governments, DWE and RWE.

④ Technical training of O&M

Technical training for members of the VWC and DWE staff on the maintenance and repair of the water supply facility shall be conducted. In addition, information related to maintenance and repair such as the procurement of spare parts will be provided in the training. Training on administration will also be provided to members of the VWC to ensure the proper collection and management of fees. In conjunction with the maintenance of the facility and the account, training in how to take records on the working situations of the facilities and collecting money will also be provided.

⑤ Support for monitoring and evaluation

O&M activities should be monitored and evaluated by the residents themselves. According to the evaluation, the residents will be able to solve problems and take countermeasures. The project will support the communities in each village in making a monitoring and evaluation plan that includes the persons in charge, the timing and frequency of monitoring and evaluation, and so on. The project shall transfer the skills for monitoring and evaluation to DWE by OJT, so that DWE will be able to help communities conduct monitoring and evaluation.

⑥ Hygiene education

This project aims at improving the health and sanitary environment of the villages through the supply of clean and safe water. As a part of the soft component, hygiene education shall be conducted during the project period. The proper use of water facilities in terms of hygiene as well as the supply of clean water will also contribute to the improvement of the health of residents. For example, residents should understand the importance of keeping the facility clean and using a clean bucket to store water. Although the Water Policy revised in 2002 emphasizes hygiene education, there are no sections or personnel in MoWLD, RWE, and DWE for implementing such a progam. Hence, the project will conduct hygiene education in collaboration with local government or NGOs in the field of health and hygiene.

Table 2-12 Soft Component Activity Plan

Activities	Target/day	Remark
1.1 Introductory workshop	2regions×1day	Workshop will be held to introduce a concept of participation to RWE and DWE.
1.2 Training on community participation	9districts×1day	Training on participation will be held for DWE and VWC.
1.3 Village meeting	64villages×1day	Village meeting will be held to make residents understand the project.
1.4 Workshop for the establishment of community organizations	64villages×5days	Community organization will be established through the revision of current VWC. Activity 2.1 will be conducted at the same time.
1.5 Hygiene education	64villages×1day	Precaution of diseases driven from polluted water will mainly be taught to give residents motivation to receive water facilities.
2.1 Workshop for making a O&M plan	(64villages×5days)	Each village will make an O&M plan including rules for users and measures of repair. Activity 4.1 will be conducted at the same time.
2.2 Training on maintenance 1 (DWE)	9districts×2days	A contractor will provide the training.
2.3 Training on maintenance 2 (VWC)	9districts×1day	DWE will conduct training for the maintenance staff of VWC at each district.
2.4 Training on administration	9districts×2days	DWE will conduct training on administrative skills such as collecting and managing fee for administration staff and leaders of VWC at each district.
3.1 Steering committee	64villages×1day	
3.2 Visit & Training on O&M	64villages×1/2day	
3.3 Monitoring	64villages×1day	
3.4 Visit & Training on hygine	64villages×1day	It is planned to request NGO to conduct the activity. The activity will be continued during the project period.

3 Project Evaluation and Recommendations

3.1 Project Effect

3.1.1 Provision of Safe and Clean Water

This project aims to improve the sanitary environment by securing a safe and clean drinking water supply in 64 villages where water facility construction lags in the two southern regions of Tanzania, mainly by deep wells. This will directly satisfy the BHN of the 201,967 beneficiaries (the estimated population for 2005). It is also expected to ease women and children's work load regarding water fetching, and the newly created work force shall be shifted to agriculture and various regional activities.

3.1.2 Promotion of National Water Policy

This project shall be implemented in accordance with the "National Water Policy" being pushed forward by Tanzania. The policy is based on the principle that each village shall organize a Village Water Committee (VWC) and carry out operation and maintenance of the water supply facilities independently. Through this project, the implementing agencies, the MoWLD, RWE, and DWE, shall assist in setting up the VWCs, give operational guidance and technical support, conduct training in operation and maintenance, and hold awareness raising activities. This project can therefore serve as a model for rural water supply schemes within the scope of the country's "National Water Policy", which is expected to have a great impact on the promotion of rural water supply projects in the future.

3.1.3 Improvement of the Sanitary Environment

As for the current situation of the target villages, there are either no water supply facilities or the facilities constructed in the past have deteriorated due to lack of maintenance, many of which are no longer functioning. The local residents are therefore using water from hand-dug wells, ponds and springs that are at risk of being contaminated. As a result, water-borne diseases such as diarrhea, parasites, and skin and eye afflictions are widespread, and there is an urgent need for a sanitary and safe water supply. Implementation of this project is expected to improve the sanitary environment of the villages and reduce the rate of incidence of such water-borne diseases in the long-term.

3.1.4 Training in operation and maintenance, awareness-raising activities and regional development

The implementing agency shall conduct training in operation and maintenance as well as awareness-raising activities through the capacity building carried out as the project's soft component. As a result, the villagers shall be more conscious of self-management and acquire the skills required for operating and maintaining the water supply facilities independently. This process will promote a sense of community in the villages, which is expected to help boost production activities in the region and lead to development towards the formation of a dynamic rural society.

3.2 Recommendations

Based on the issues mentioned above, smoother and more effective implementation of the project can be ensured by the following.

1. The operation and maintenance of the water supply facilities shall fundamentally be carried out by the local residents themselves (the beneficiaries), which is the basic principal of the "National Water Policy". The implementing agency must ensure that the residents are fully aware of this principal and provide technical assistance on items that exceed the ability of the VWCs. Therefore, when implementing the project, the responsibilities and roles of both the implementing agency and VWCs need to be thoroughly discussed and by-laws for VWCs that can be self-enforced need to be formulated.

2. At each stage of the project (i.e. planning, construction, and operation and maintenance), the DWE shall provide guidance, educational activities and awareness-raising activities to the local residents on facility operation under instruction from the consultant. They shall also conduct training on facility maintenance and repair with the aim of establishing a permanent system of management by the VWCs. In the process, the DWE shall receive support for capacity building from the consultant.

3. After completion of the facilities, the RWE and DWE should effectively use the equipment provided for operation and maintenance by conducting routine facility checks, education activities, and training. It is also necessary to implement awareness-raising activities on community development and public hygiene in cooperation with government related organizations.

4. The various spare parts necessary for facility repair need to be stored at the RWE and DWE. Spare parts for minor repairs shall be kept at the RWE and provided to the VWC at a cost upon request. The equipment and spare parts for serious repairs shall be kept and used at the DWE. In order to support smooth operation and maintenance, it is essential to improve the technical level of the engineers on the side of implementing agency. Therefore, it is advised that the MoWLD plan and implement regular workshops and on-the-job training on skills for operation and maintenance on a nationwide scale.