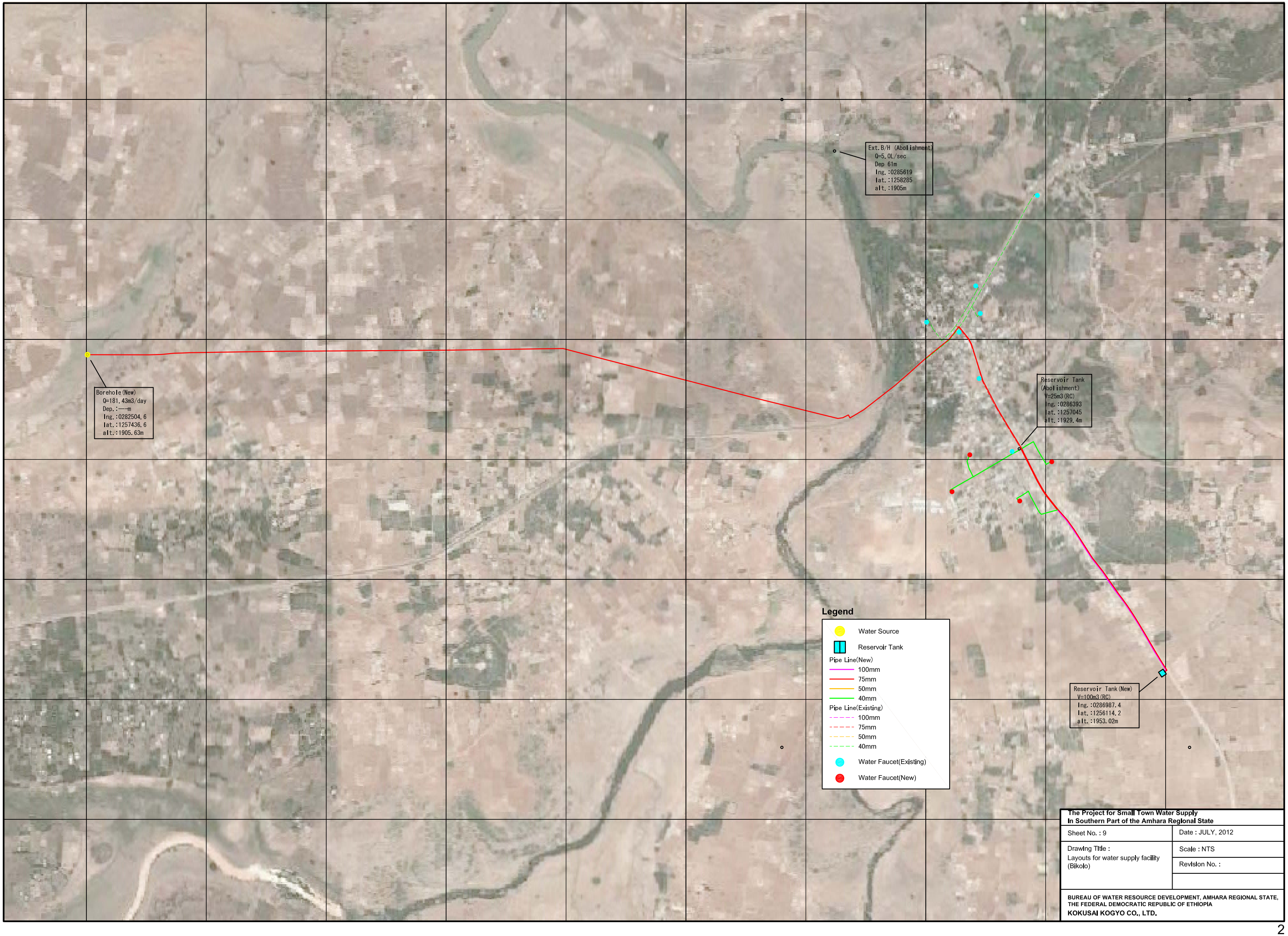


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State

Sheet No. : 9	Date : JULY, 2012
Drawing Title : Layouts for water supply facility (Bikolo)	Scale : NTS
	Revision No. :

BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

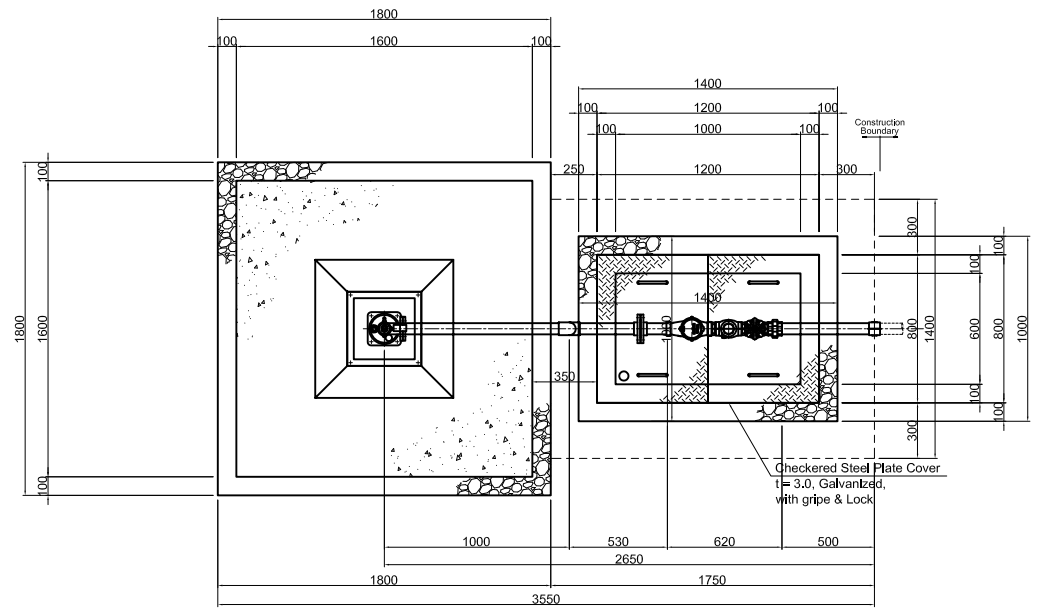
KOKUSAI KOGYO CO., LTD.

2-3-2 Basic Design Drawing

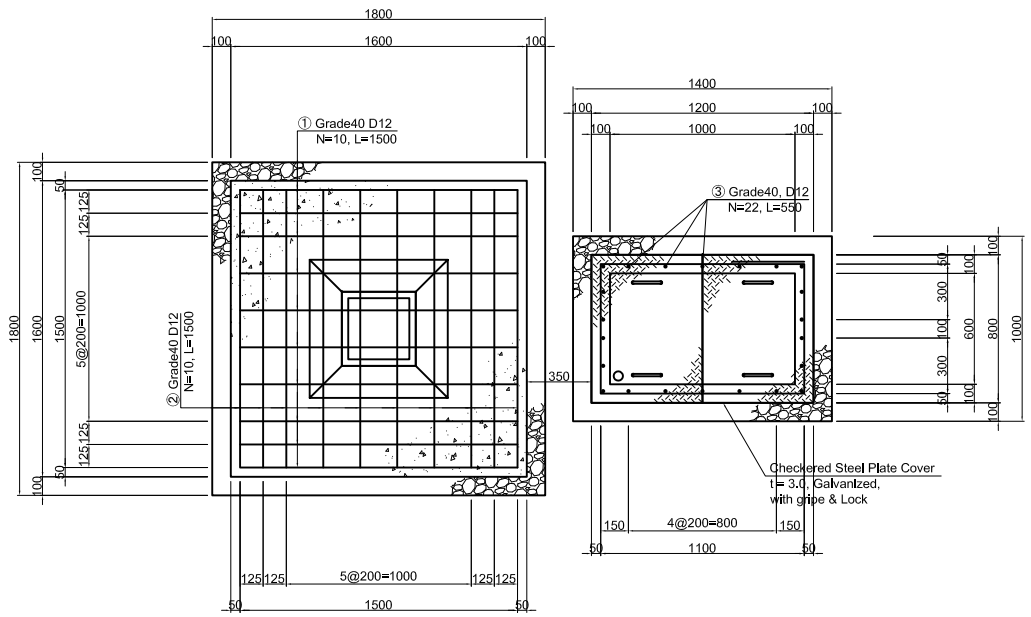
Basic design drawings for this Project are as shown below.

Platform and Borehole Equipment for Submersible Pump
(Type 1)

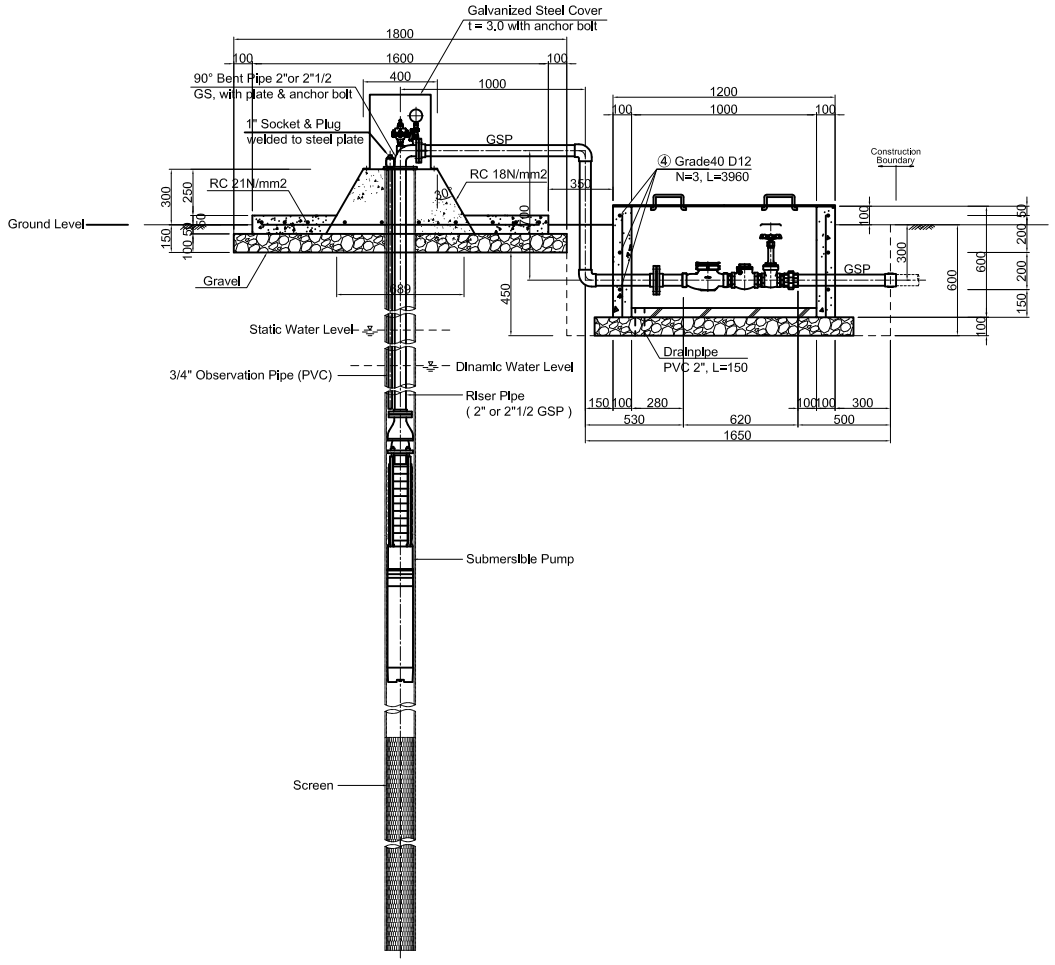
Plan View



Bar arrangement drawing (Plan View)



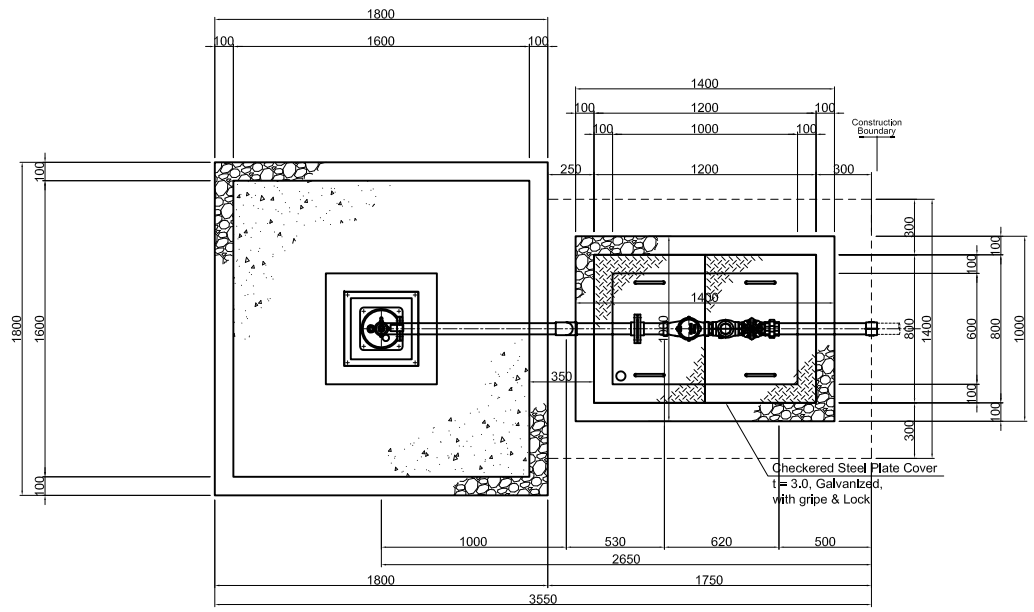
Side View



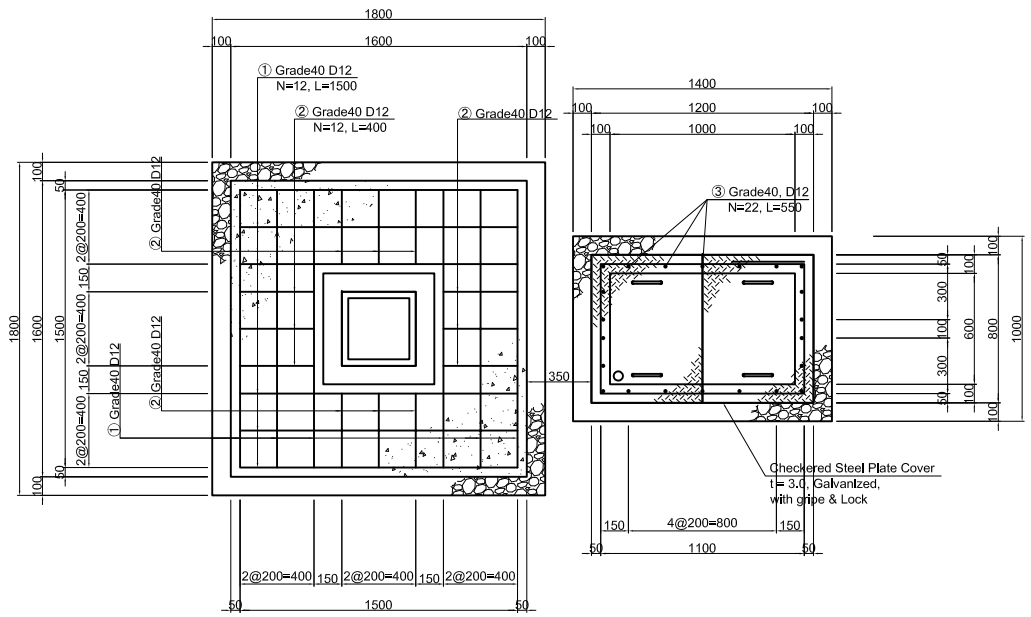
The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 10	Date : JULY, 2012
Drawing Title : Basic design drawing (Motorized pump setting #1)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA **KOKUSAI KOGYO CO., LTD.**	

Platform and Borehole Equipment for Submersible Pump
(Type 2)

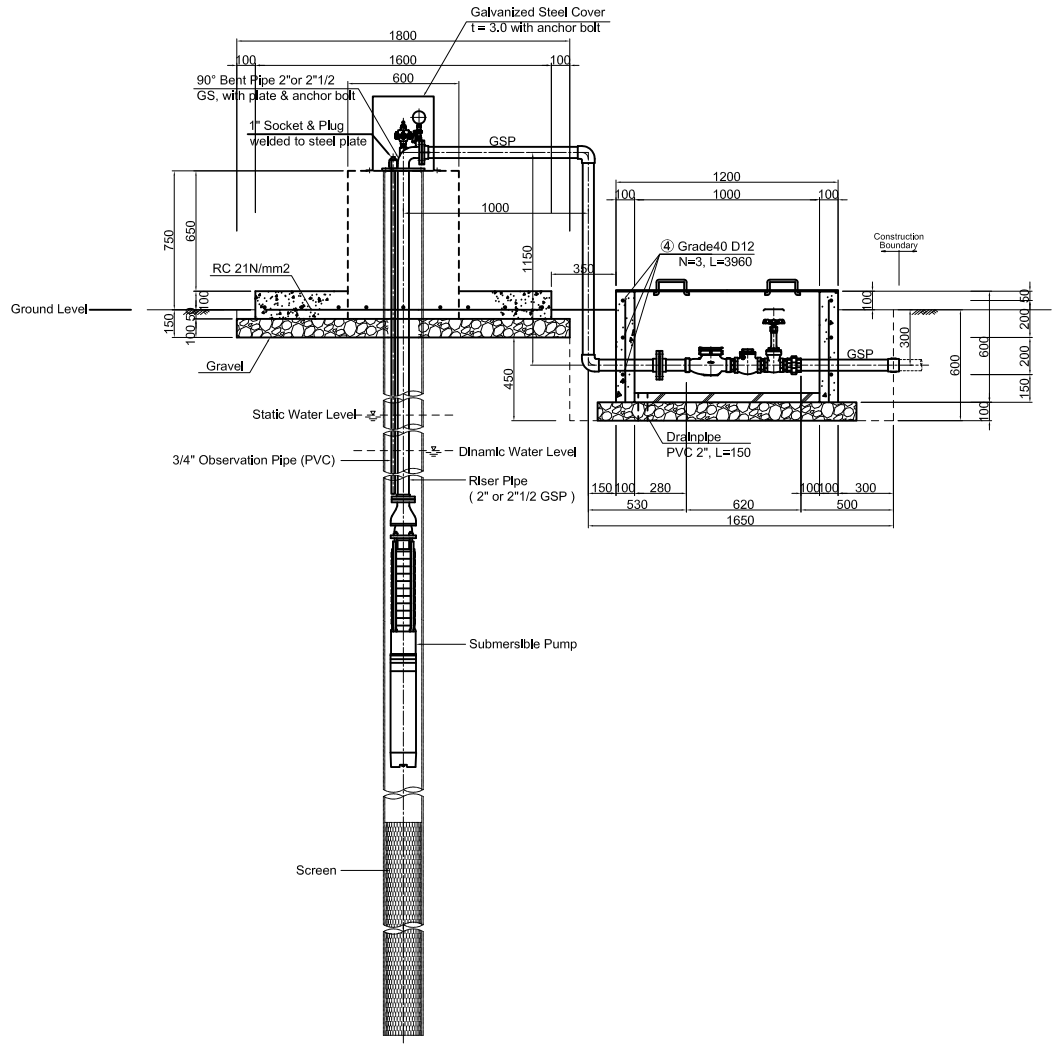
Plan View



Bar arrangement drawing (Plan View)

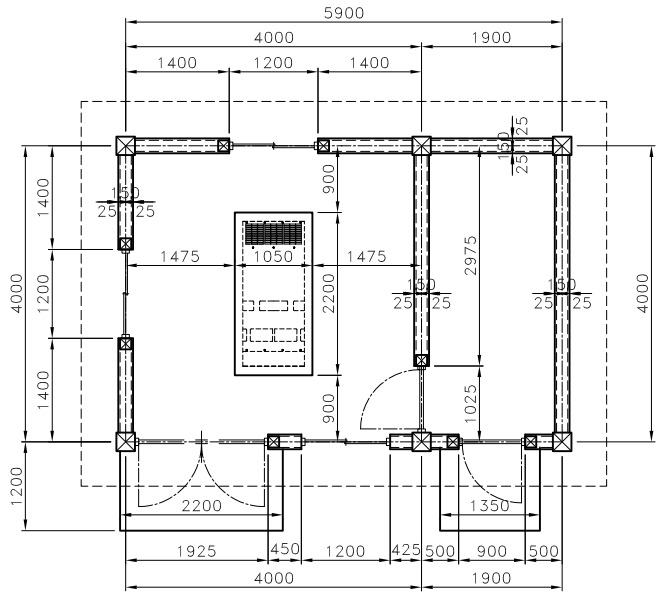


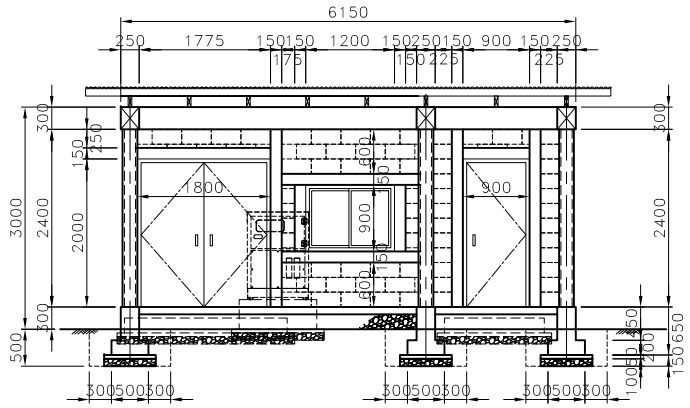
Side View

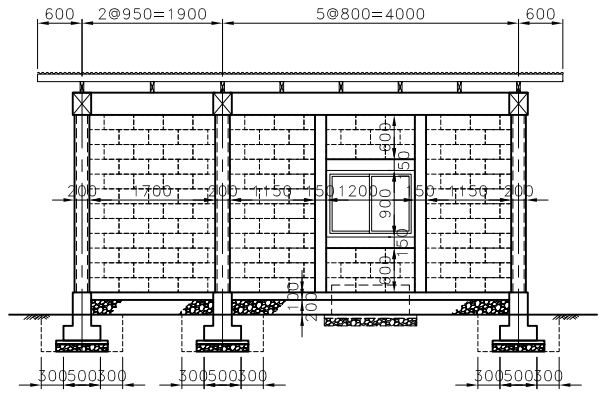


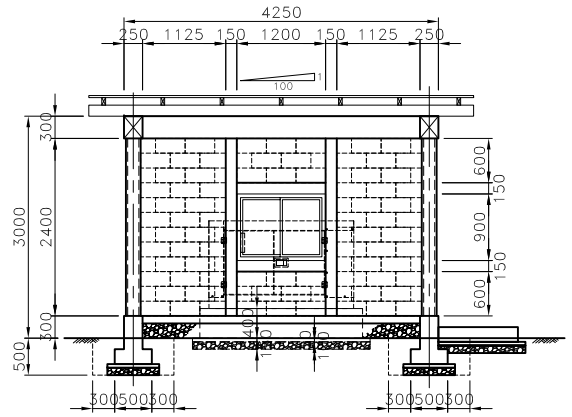
The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 11	Date : JULY, 2009
Drawing Title : Basic design drawing (Motorized pump setting #2)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA **KOKUSAI KOGYO CO., LTD.**	

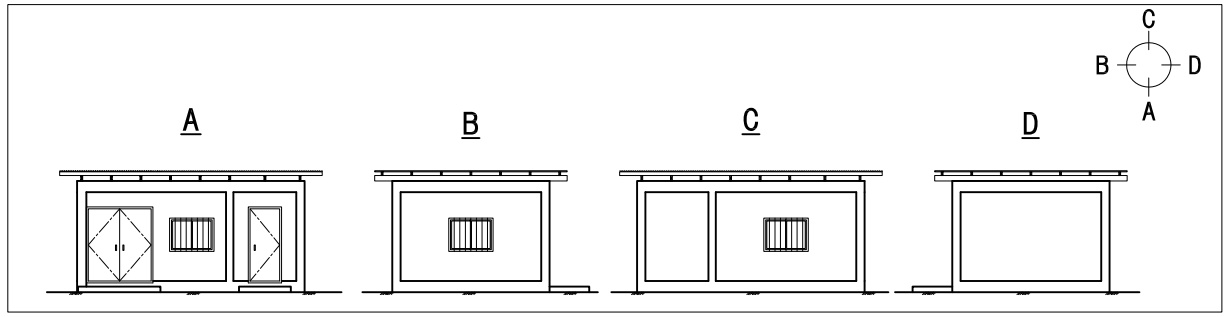
Generator House

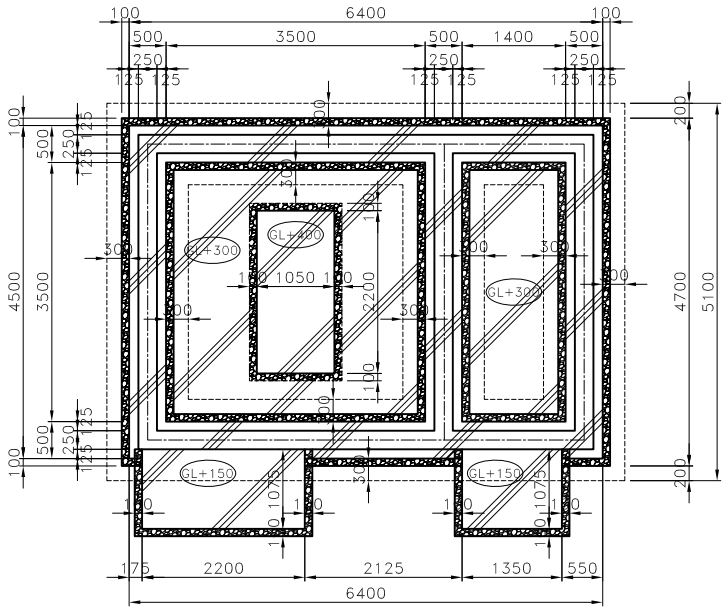


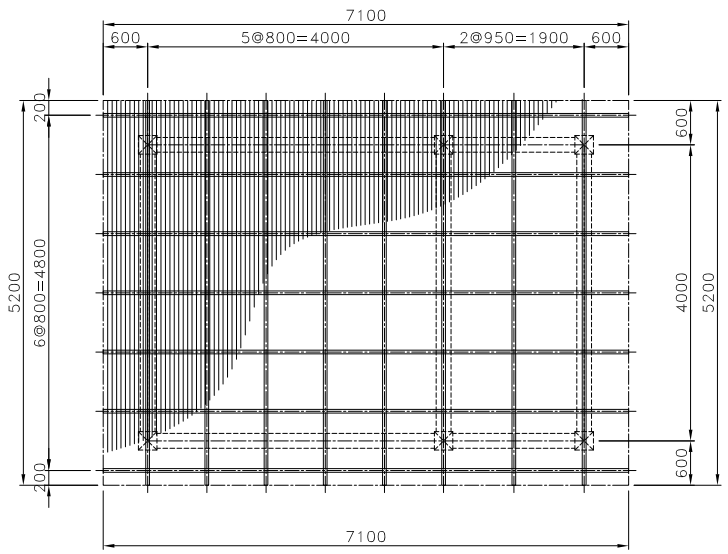


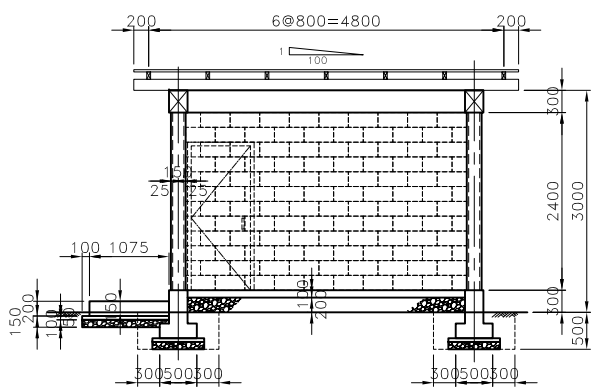




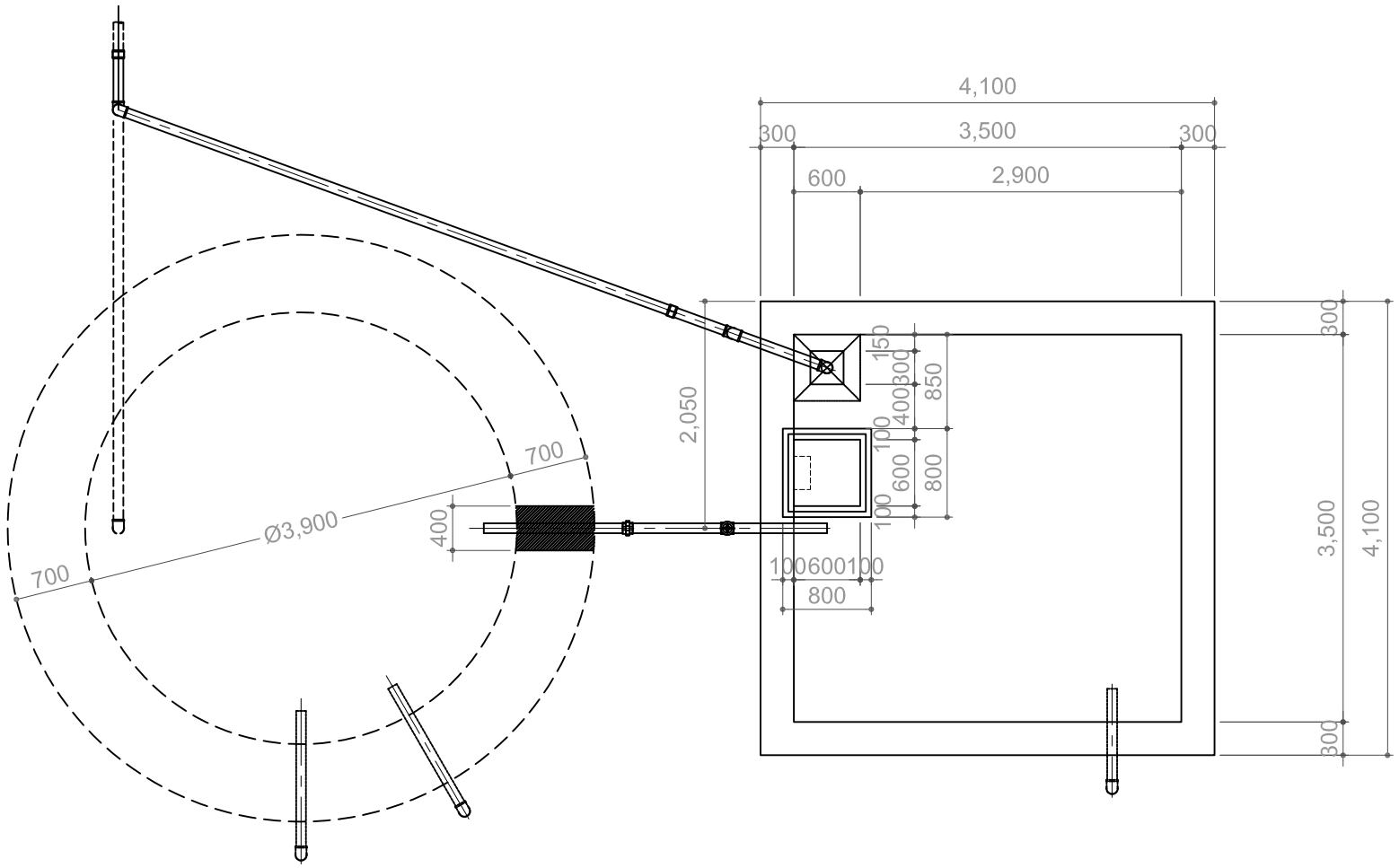


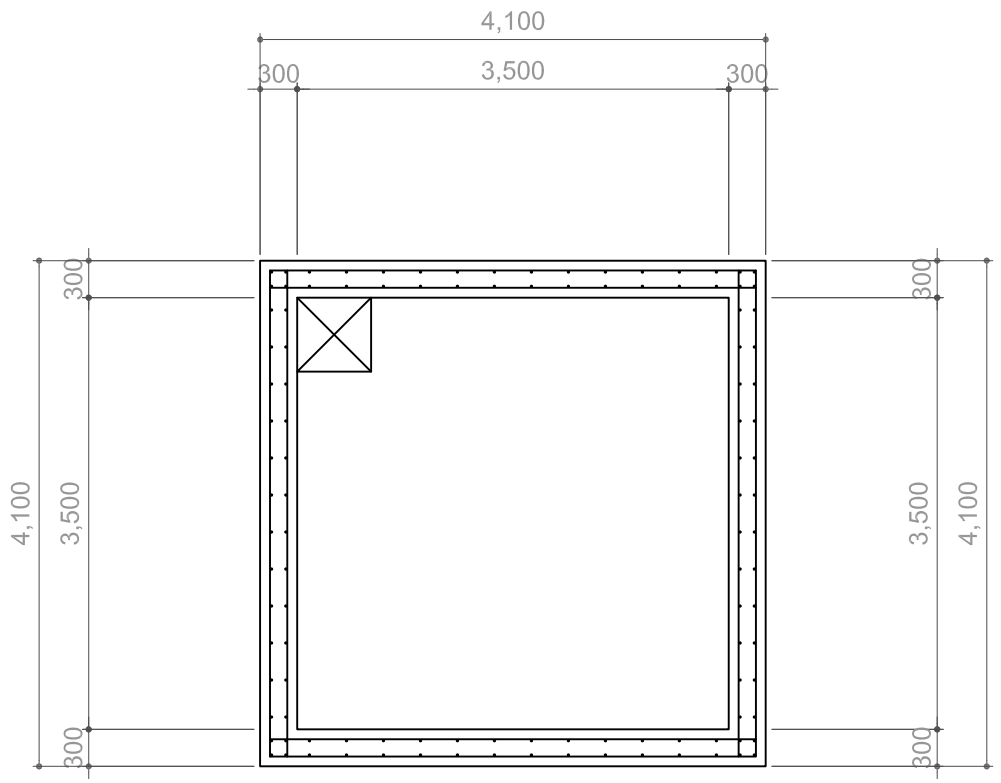


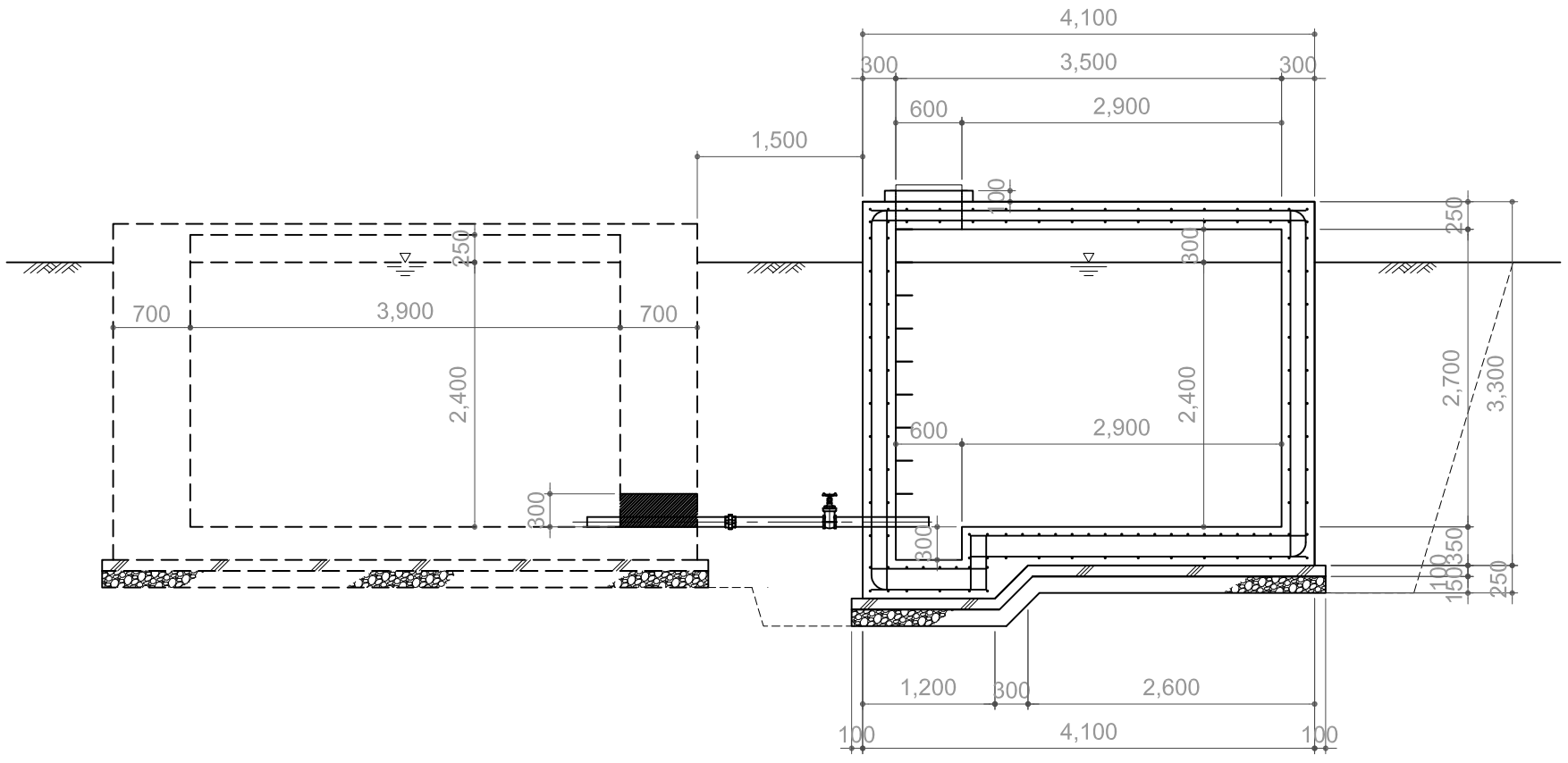


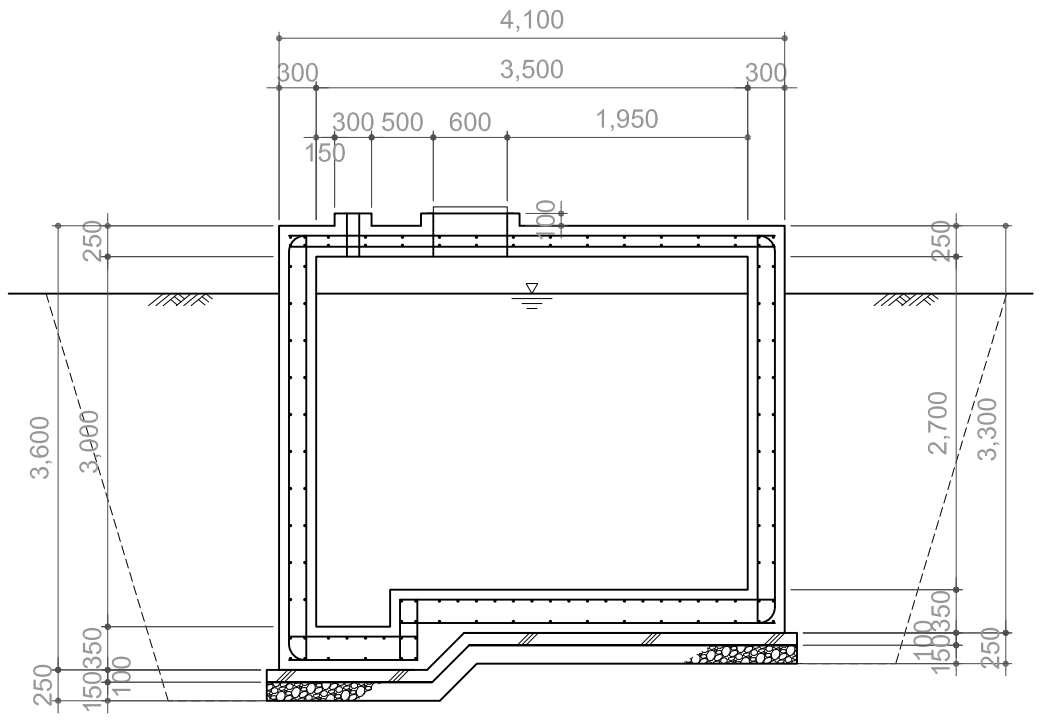


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 12	Date : JULY, 2012
Drawing Title : Basic design drawing (Generator house)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA **KOKUSAI KOGYO CO., LTD.**	

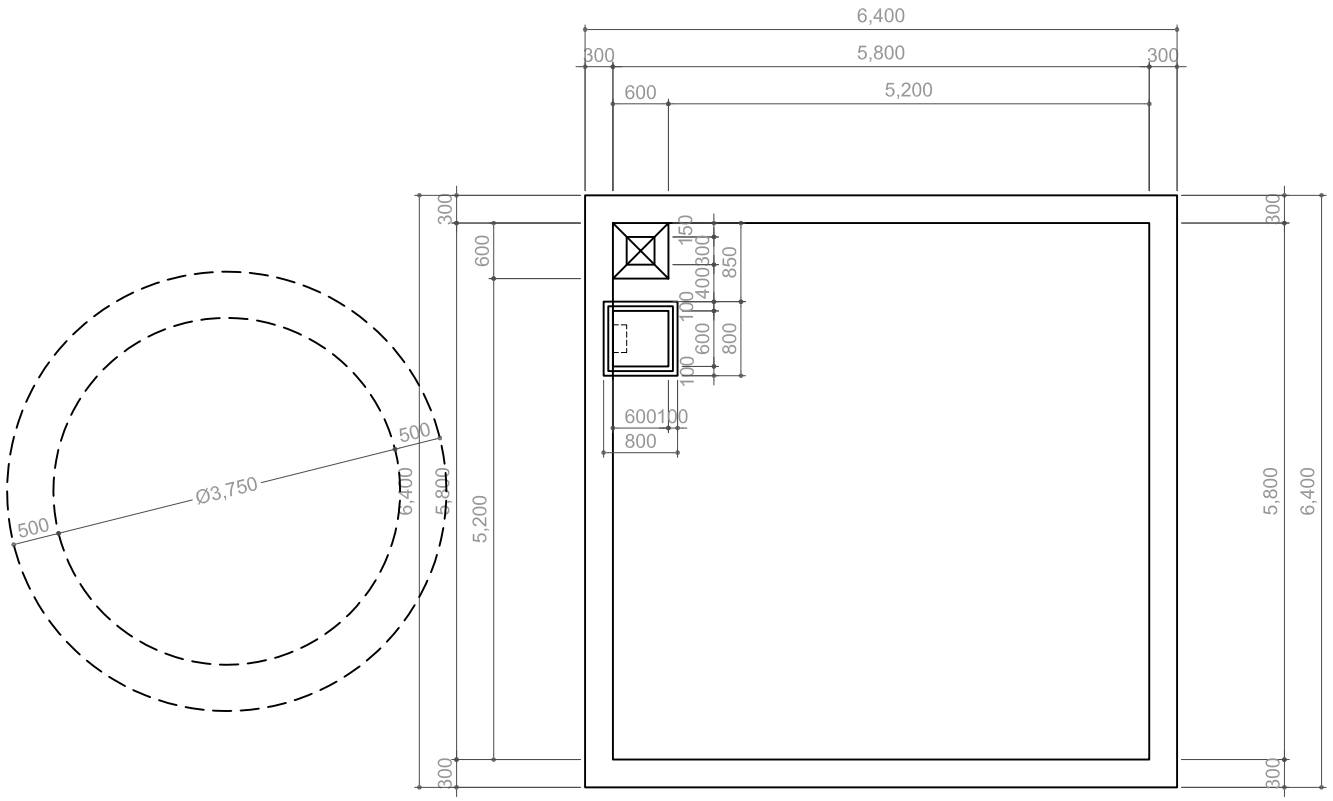


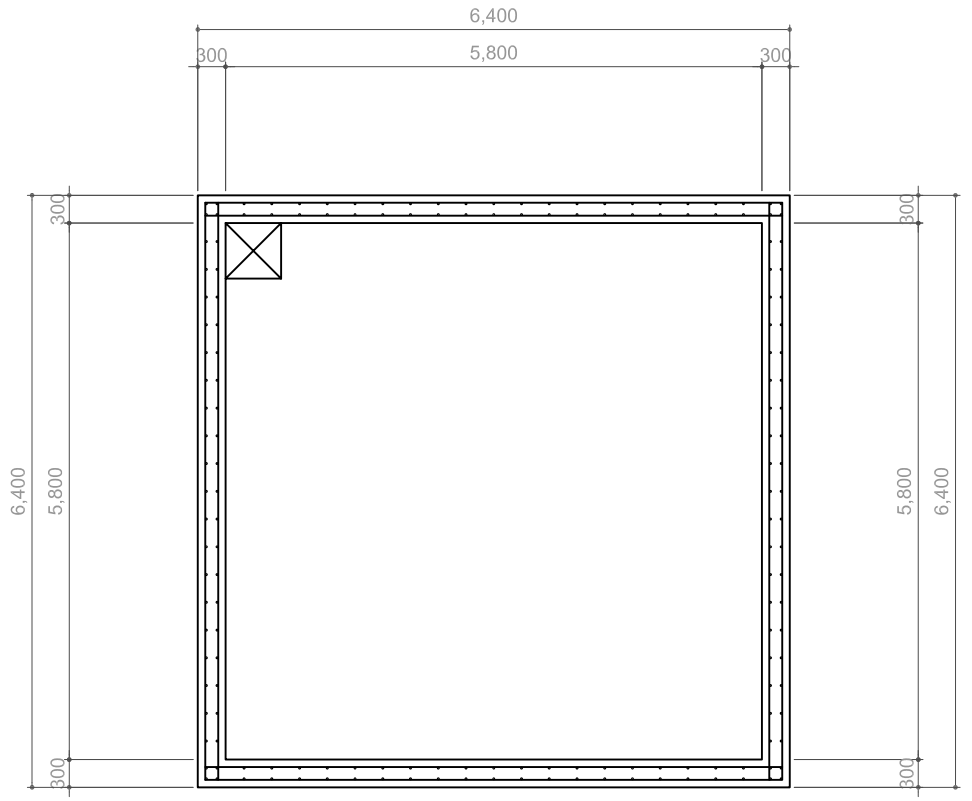


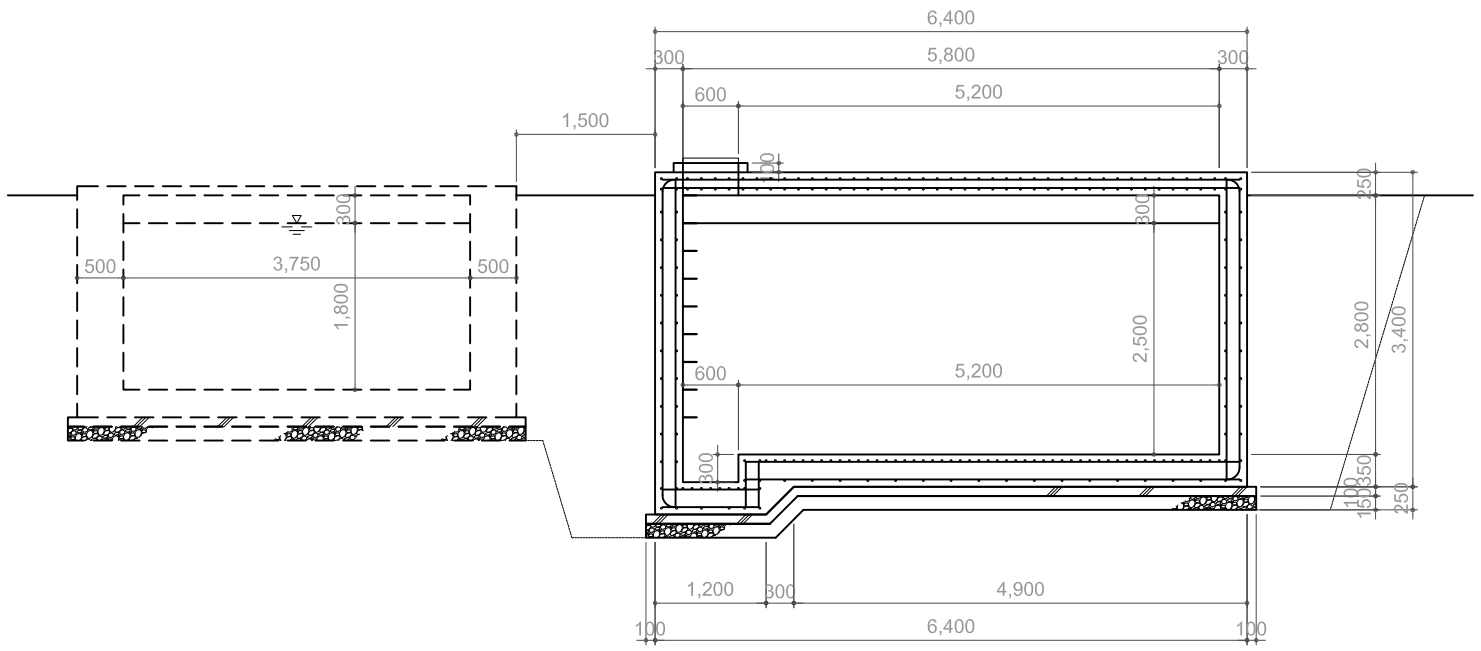


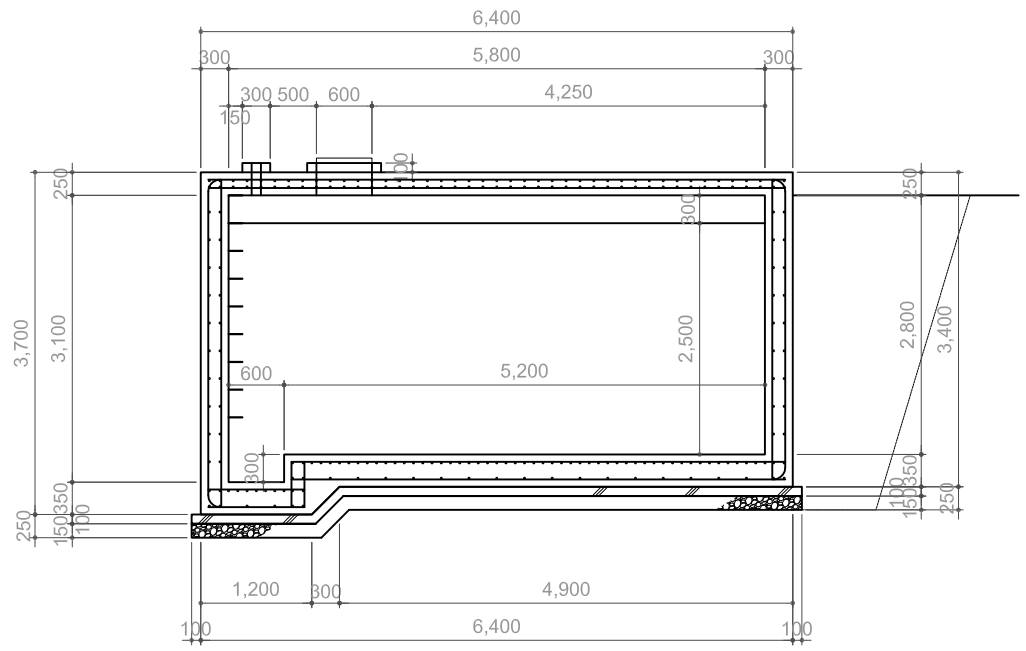


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 13	Date : JULY, 2012
Drawing Title : Basic design drawing (Ground reservoir tank #1) Collection Chamber (Mertule Maryam)	Scale : NTS Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA **KOKUSAI KOGYO CO., LTD.**	

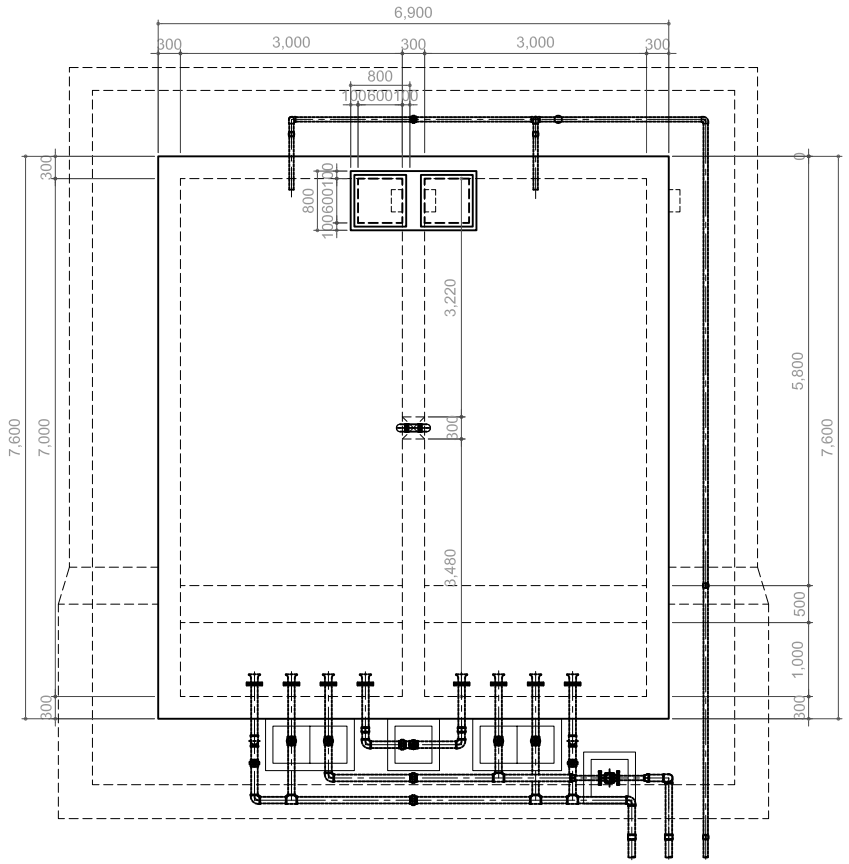


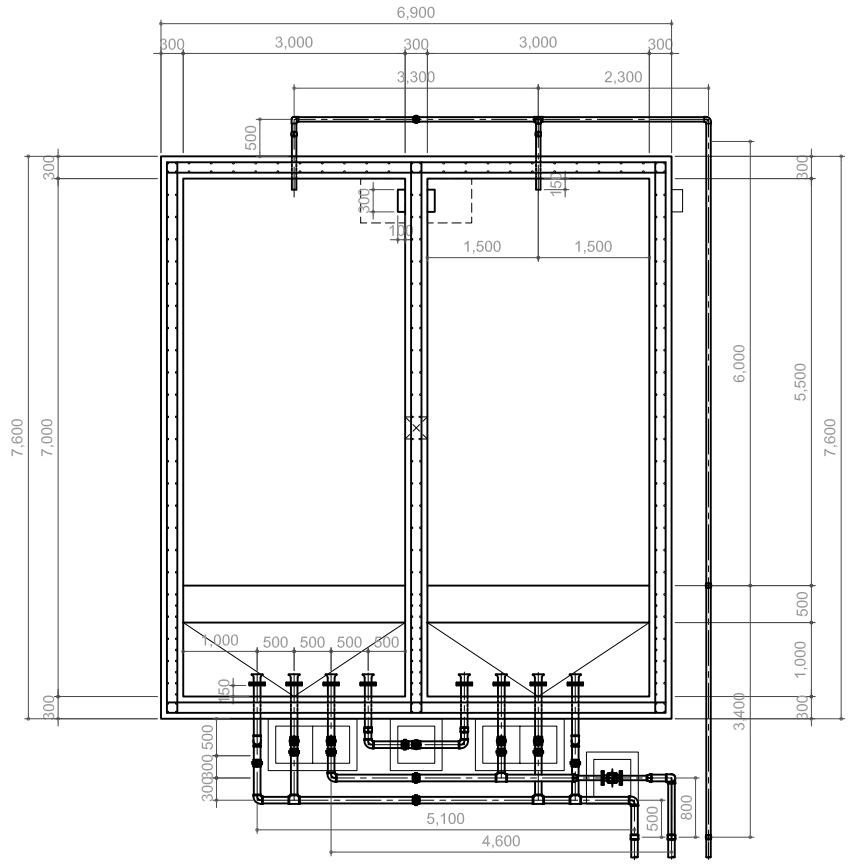


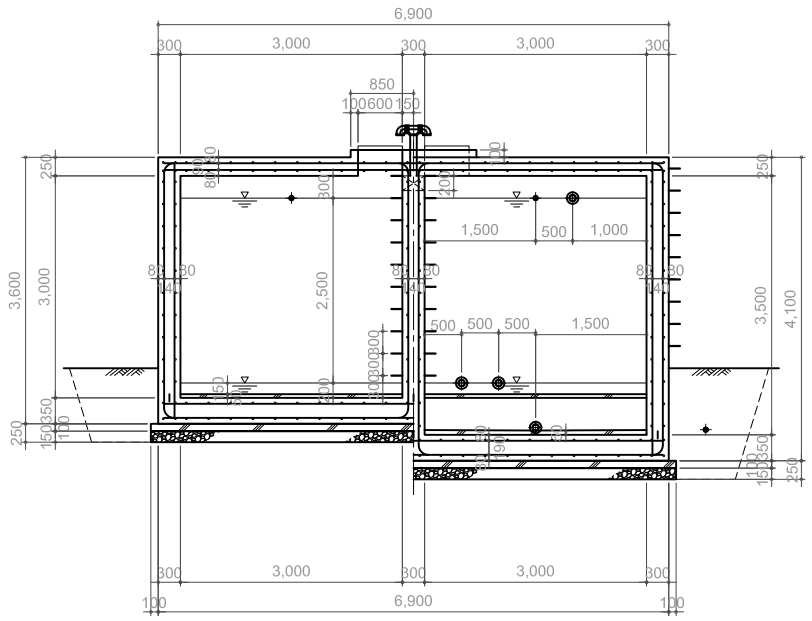


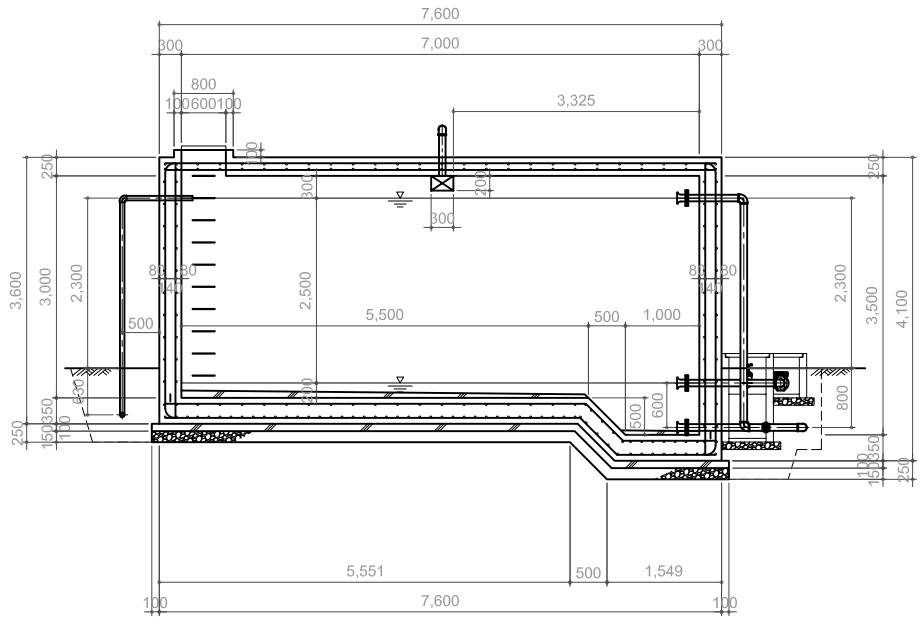


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 14	Date : JULY, 2012
Drawing Title : Basic design drawing (Ground reservoir tank #2) Collection Chamber (Gobeze Maryam, V=80m3)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA KOKUSAI KOGYO CO., LTD.	

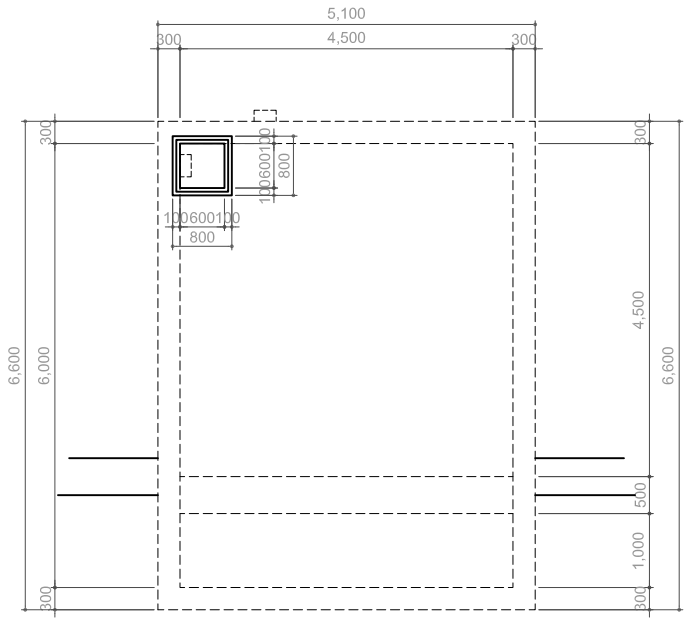


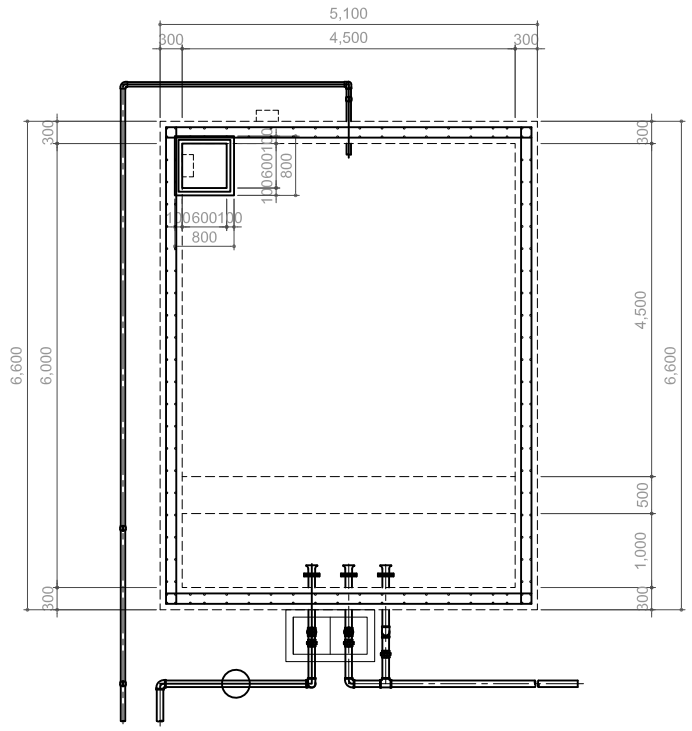


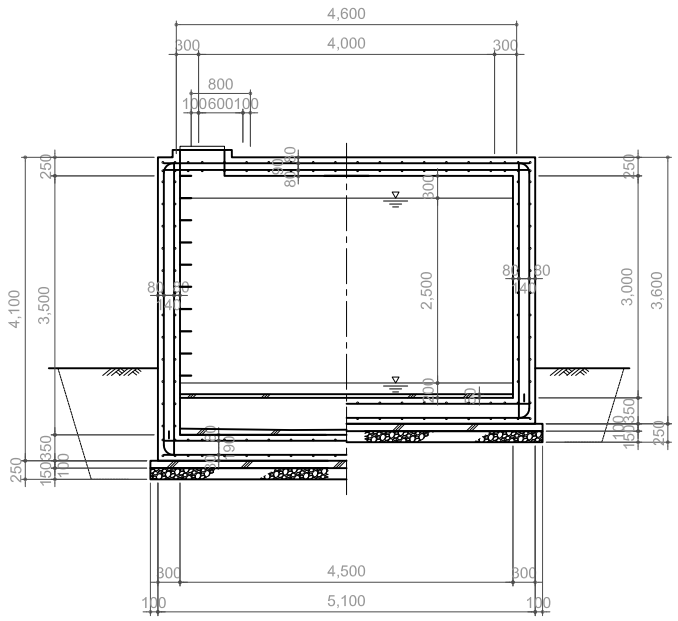


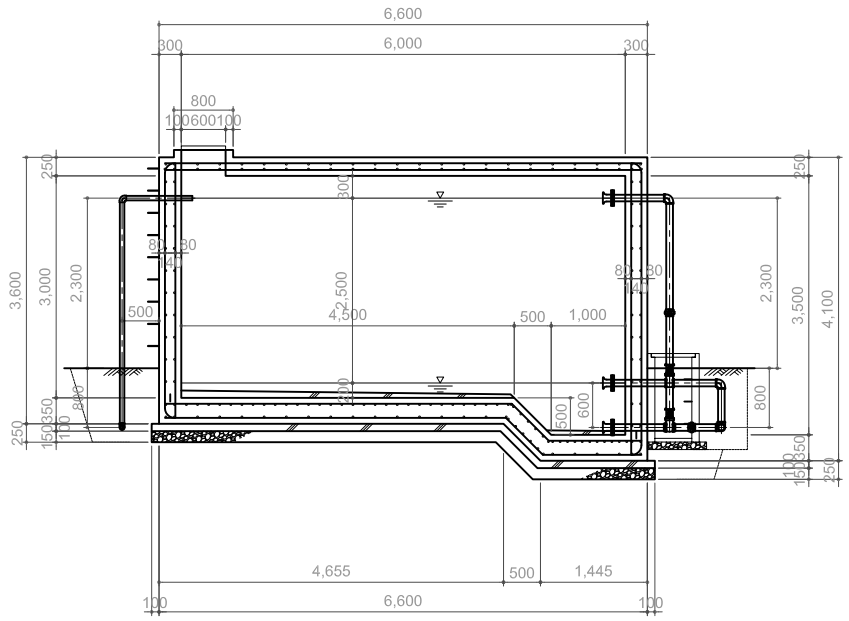


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 15	Date : JULY, 2012
Drawing Title : Basic design drawing (Ground reservoir tank #3) (V=100m3)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA KOKUSAI KOGYO CO., LTD.	

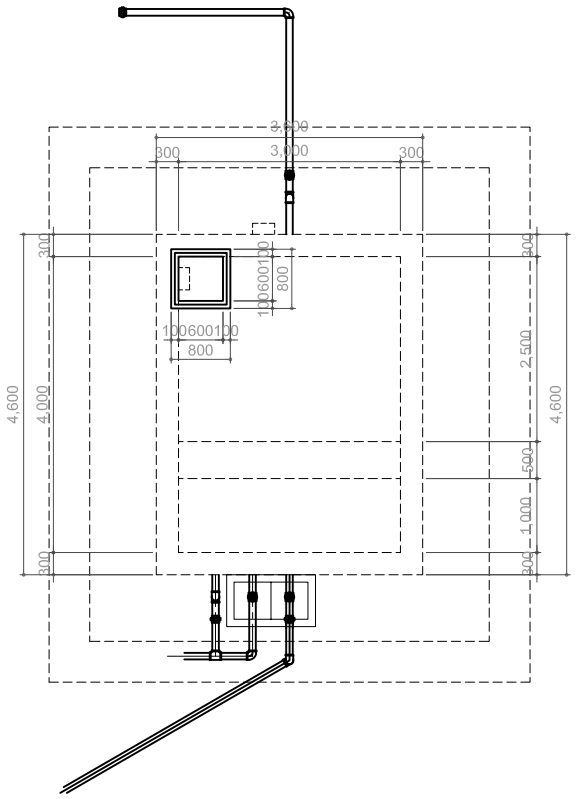


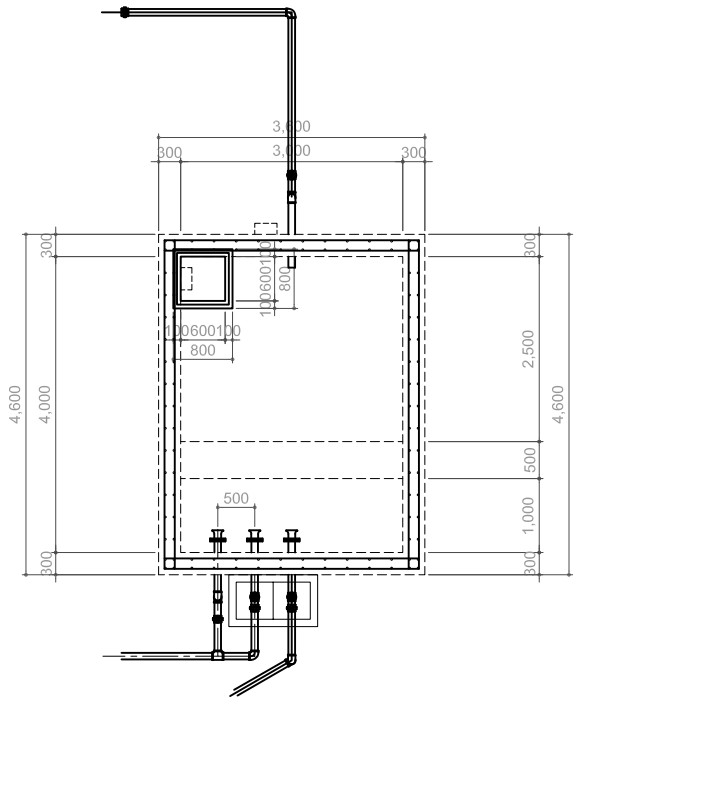


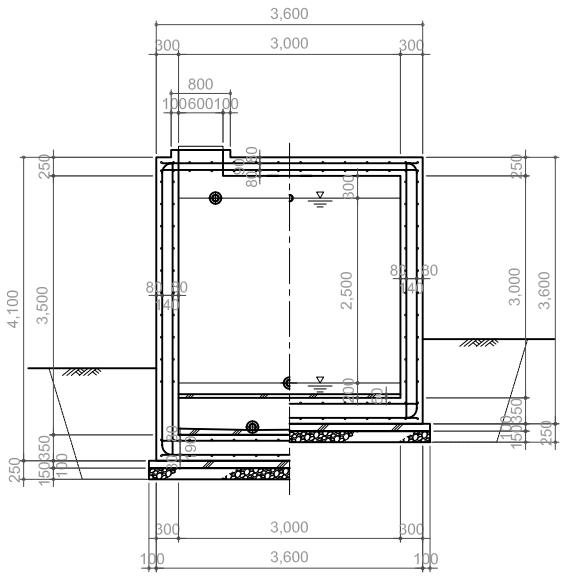


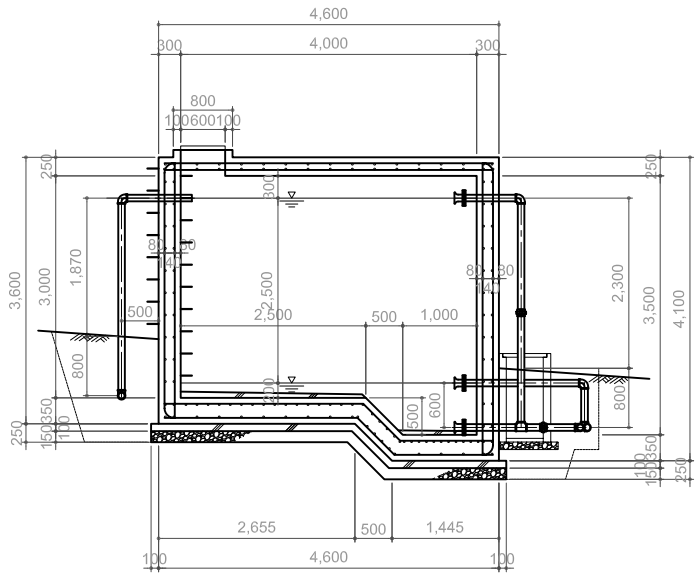


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 16	Date : JULY, 2012
Drawing Title : Basic design drawing (Ground reservoir tank #4) (V=70m3)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA KOKUSAI KOGYO CO., LTD.	

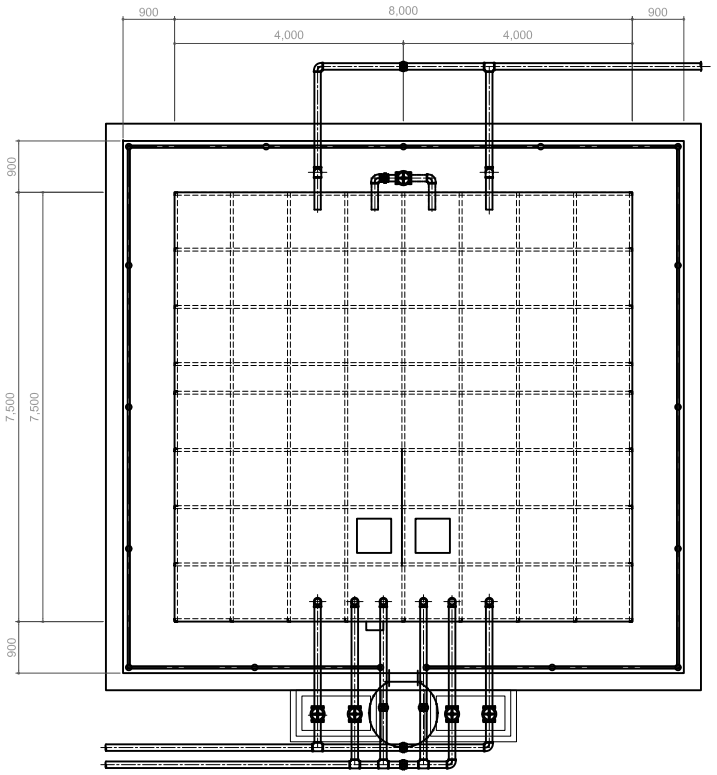


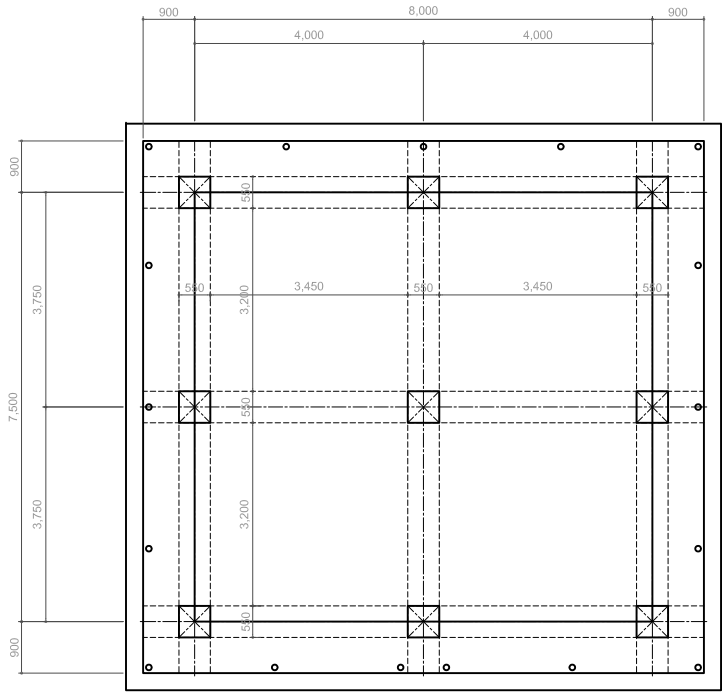


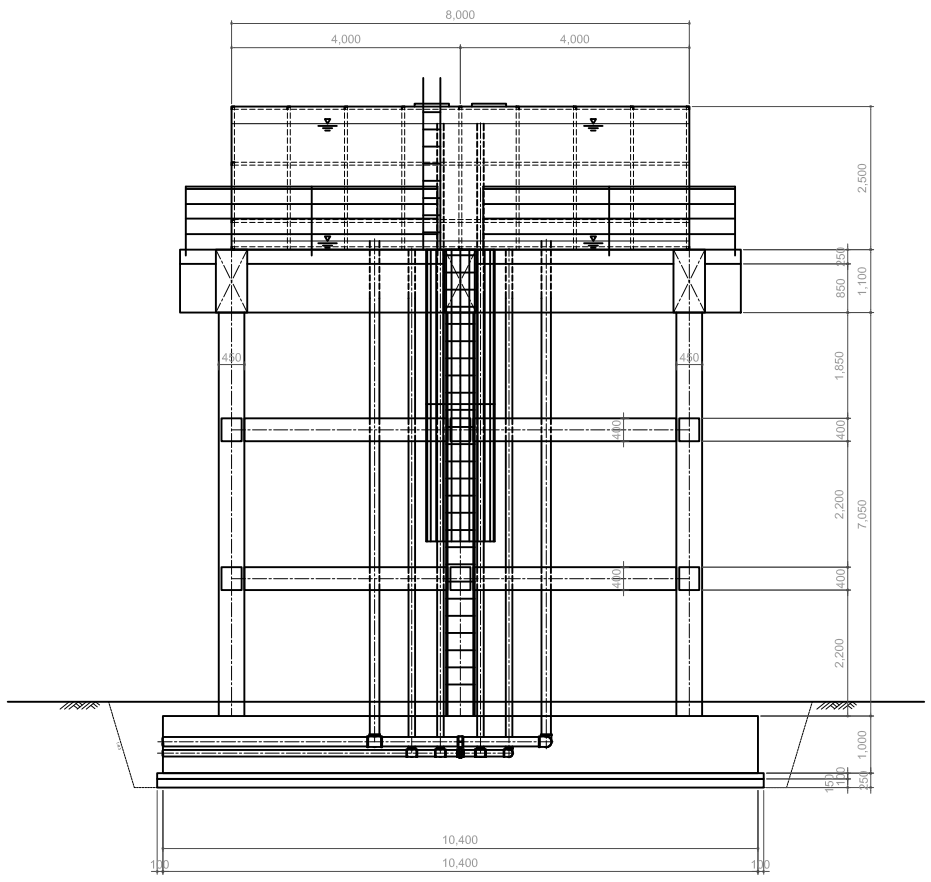


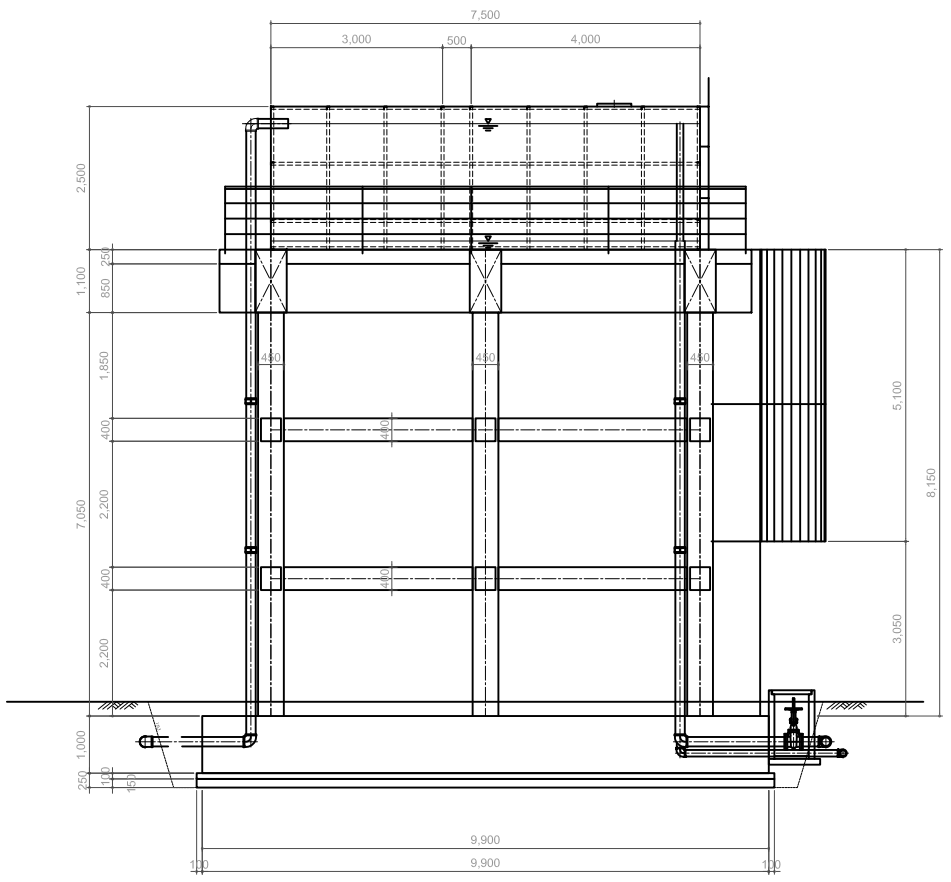


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 17	Date : JULY, 2012
Drawing Title : Basic design drawing (Ground reservoir tank #5) (V=30m3)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA KOKUSAI KOGYO CO., LTD.	

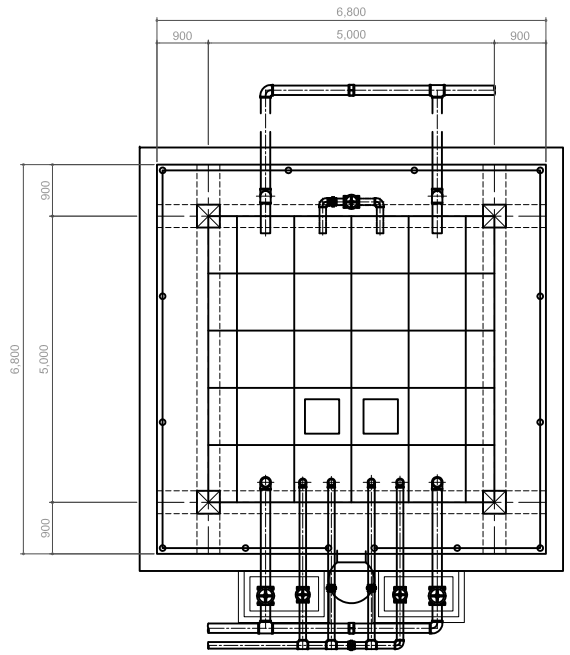


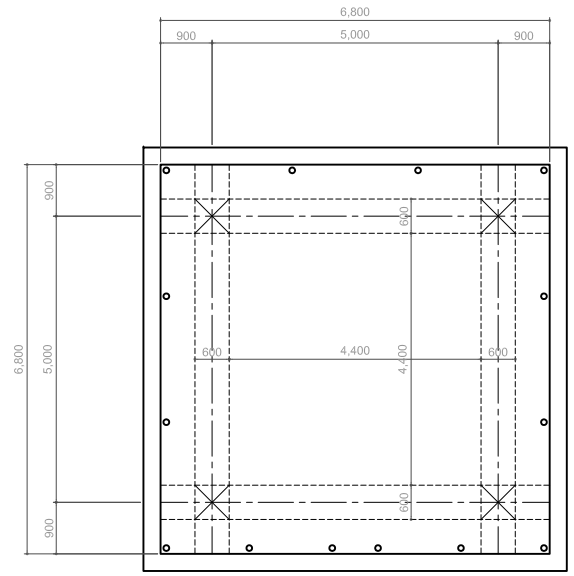


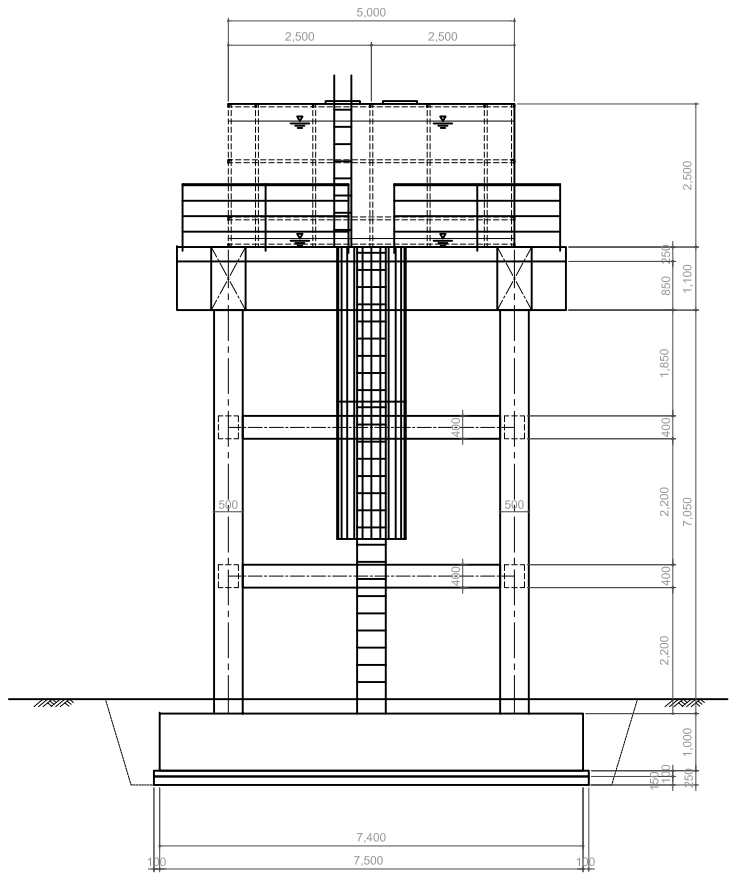


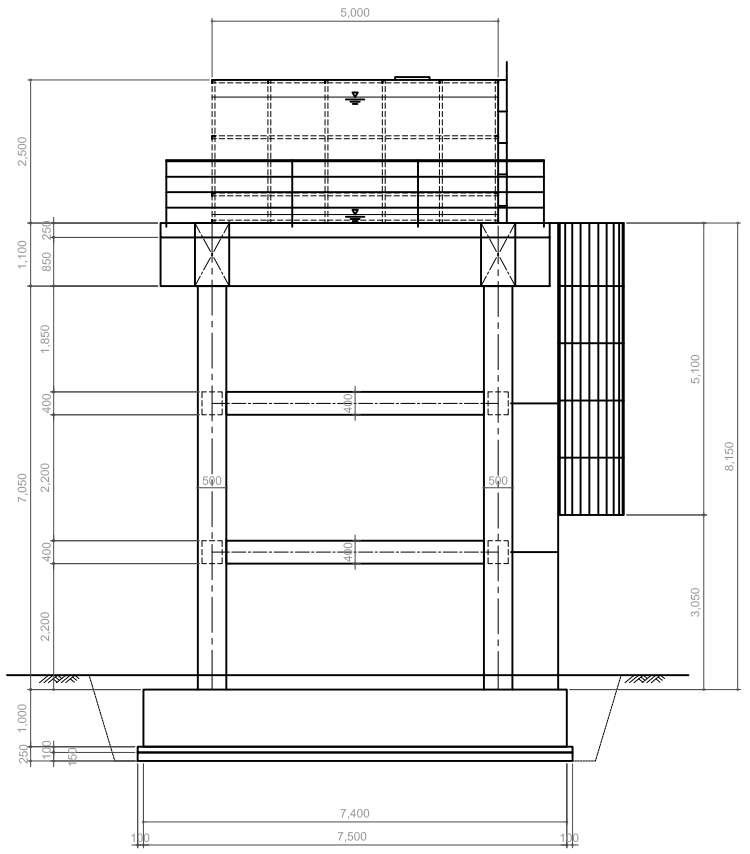


The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 18	Date : JULY, 2012
Drawing Title : Basic design drawing (Elevated reservoir tank #1) (V=120m3)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA KOKUSAI KOGYO CO., LTD.	

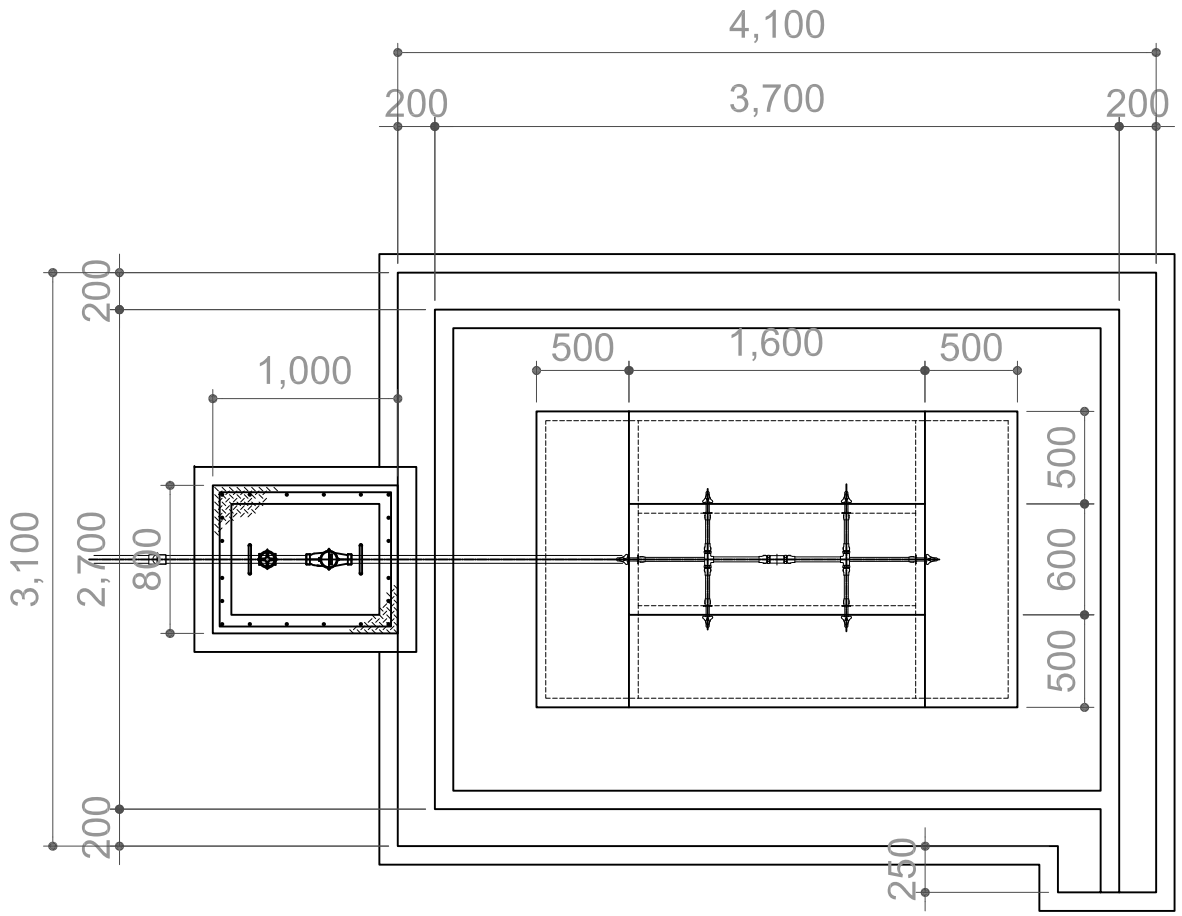




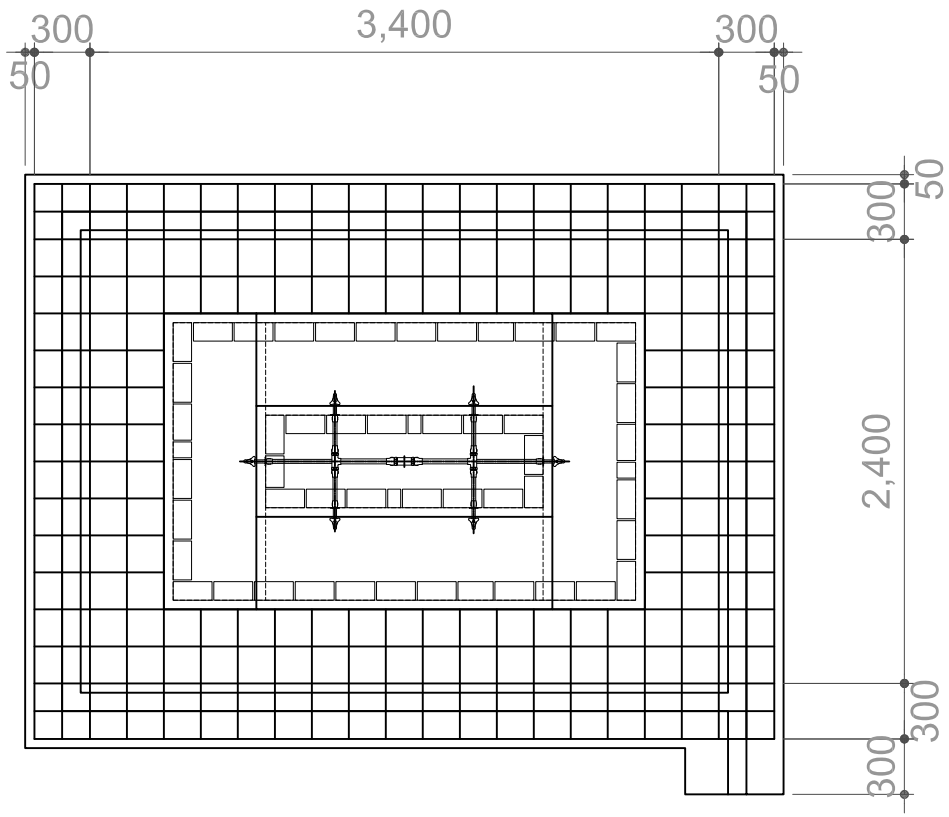




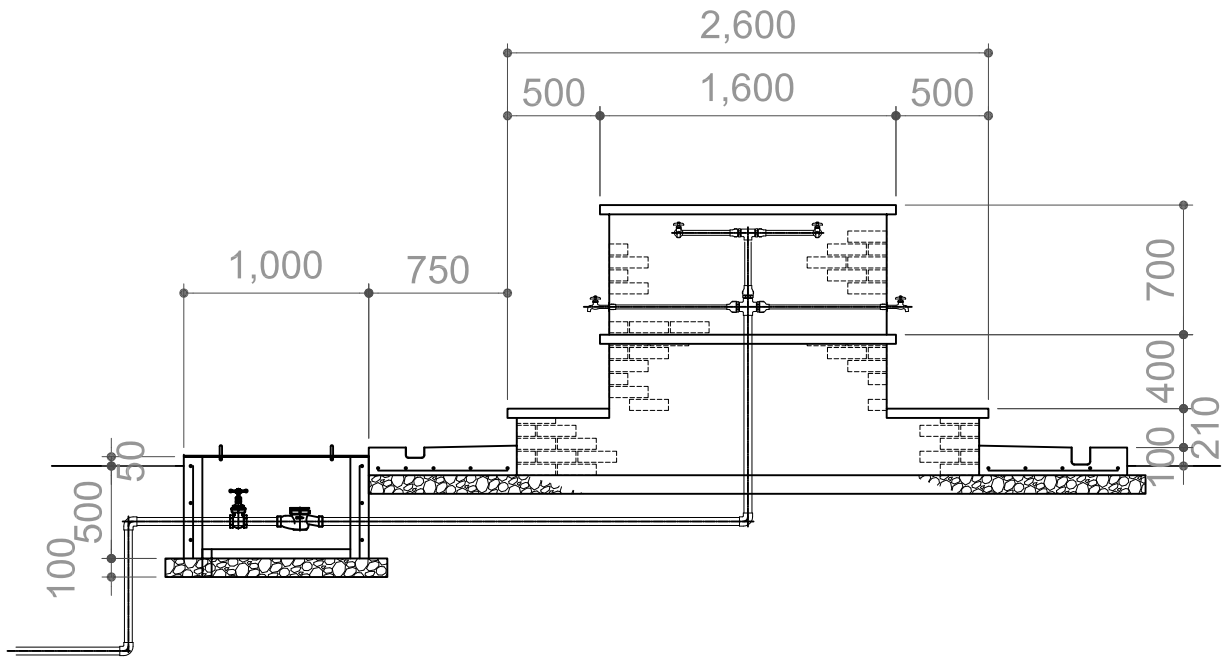
The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 19	Date : JULY, 2012
Drawing Title : Basic design drawing (Elevated reservoir tank #2) (V=50m3)	Scale : NTS Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA KOKUSAI KOGYO CO., LTD.	



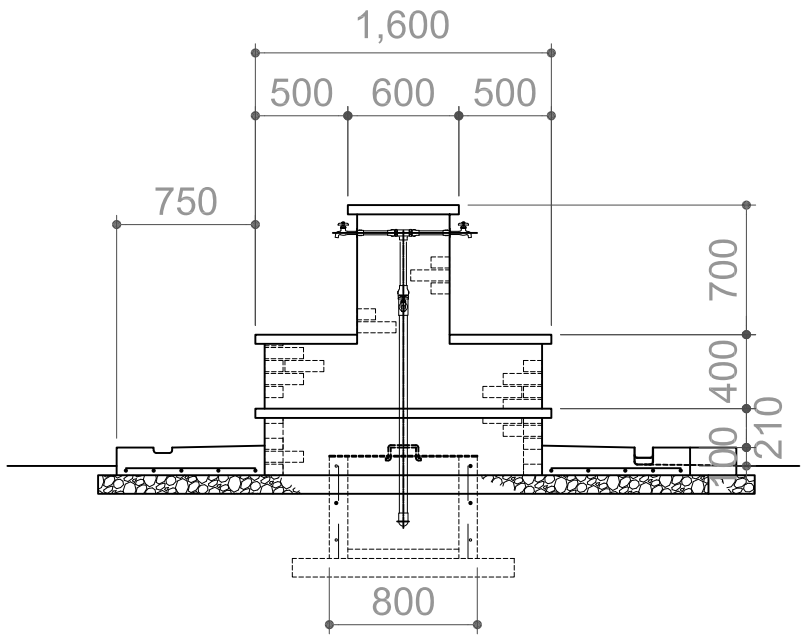
PLAN



PLAN



FRONT VIEW & SECTION



SIDE VIEW & SECTION

The Project for Small Town Water Supply In Southern Part of the Amhara Regional State	
Sheet No. : 20	Date : JULY, 2012
Drawing Title : Basic design drawing (Public faucet)	Scale : NTS
	Revision No. :
BUREAU OF WATER RESOURCE DEVELOPMENT, AMHARA REGIONAL STATE, THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA KOKUSAI KOGYO CO., LTD.	

2-3-3 Implementation Plan

2-3-3-1 Implementation Policy

(1) Construction Division

Construction will be conducted simultaneously at three (3) separate sites, namely Bahir Dar, Debre Marcos and Mota. This is because the target sites are spread over such a wide area, making it difficult to manage the construction from one location.

Table 2-10: Construction division

Consutruction division	Target site
Bahir Dar	Gobeze Maryam、Bikolo
Debre Marcos	Yetimen、Lumame、Wojel、Amanuel
Mota	Mertule Maryam、Sedie、Dibo

(2) Construction Term

The target sites pose no hindrance to the planned construction work, therefore, as far as possible, the main components of construction - such as pipe laying, construction of the housing for the generators and for the water supply pumps, and construction of the water supply reservoir - will be started at the same time and/or conducted simultaneously.

The critical path of the Project is the plumbing work including the procurement of pipe materials. A total of eighteen (18) months has been allocated to complete this work. The envisaged breakdown being: four (4) months of preparation work such as procurement of pipe materials and construction of the site office; thirteen (13) months for the pipe laying works; and one (1) month for removal of equipment and site clean-up. This is the total time envisaged for all of the works, because all of the other work can be completed during this period.

Table 2-11: Assumed implementation term

Construction item			Term
Preparation	Office construction and equipment procuremet etc.		4.0 months
Pipe installation work	Bahir Dar	10.7 months	13.0 months
	Debre Marcos (Critical Path)	13.0 months	
	Mota	11.2 months	
Site clearance	Office clearance and document filling etc.		1.0 month
Total			18.0 months

(3) Water Supply System

There are existing public faucet-type water service facilities in eight of the nine towns targeted in the Project; therefore it is judged that the water management organizations in these towns are capable of maintaining and operating water supply facilities. The water management organization, comprised mainly of local residents, however, is not considered capable of operation and maintenance of advanced management systems such as electronic control devices. Therefore, it is planned to make the

facilities as simple as possible and to make sure that locally procurable materials and equipment are used in construction to ensure that they are easy to operate and maintain.

2-3-3-2 Implementation Conditions

(1) Access Conditions

As mentioned above, since the majority of the target sites are located on the highway, therefore, the access to the target sites is possible even in the rainy season. However, it may be difficult to access some of the construction places in the sites. Therefore when setting the time schedules of the works it is necessary to consider the accessibility to the various sites according to season.

(2) Use of Local Contractors, Materials and Equipment

Local construction companies are judged to have sufficient construction management expertise for the scale and specifications of the works of the Project. Therefore the Project will actively use their services under the management of Japanese engineers.

In principle, materials and equipment necessary for construction in the Project are to be procured locally. However, items will be procured from Japan or a third country in cases where local procurement is impossible, or when there are qualities or logistical issues, or when it cannot be obtained within a certain timeframe. Moreover, the cost of such items will be compared in Japan and third countries, and the cheaper option adopted.

2-3-3-3 Scope of Works

The scope of works for the Project to be implemented by Japanese Grant Aid of the Japanese and Ethiopian sides is shown below:

Table 2-12: Scope of works

Item	Ethiopian side	Japanese side	Remarks
Securement of water source		○	Conduted on this survey
Securement of construction land	○		AWRDB and Woreda water office
Securement of storage area for equipment	○		AWRDB and Woreda water office
Construction of water supply facility		○	
Construction of fence around public faucet	○		WMO
Providing of commercial electrical power	○		AWRDB and Woreda water office

2-3-3-4 Consultant Supervision

The Project will be implemented under Japanese Grant Aid by the Government of Japan, and the Government of Ethiopia will enter into an agreement with a Consultant recommended by the Japan International Cooperating Agency (JICA) for detailed design survey and construction supervision. The construction of water supply facilities will be conducted by the Japanese Contractor to be contracted with Ethiopian side. The Consultant will dispatch supervision/management personnel as

shown below:

Table 2-13: Personnel dispatch plan for supervision by the Consultant

Member	Person	In charge	Duration
Chief consultant	1	Overall project management	On-spot
Resident engineer	1	Construct supervision	Full time
Final inspector	1	Final inspection	On-spot

2-3-3-5 Quality Control Plan

(1) Concrete

1) Trial Mix and Concrete Testing

Prior to commencement of the works, trial concrete mix will be conducted to decide the content of concrete mix using approved materials for each level of concrete strength. Successful trial mix proportions shall comply with the following conditions. Concrete strength shall be set for target compressive strength for each grade of concrete and fresh concrete slump test results shall be within allowable tolerance. Setting up concrete strength shall also accommodate standard deviation.

2) Concrete production

It is difficult to secure ready-mixed concrete in this Project area and thus the concrete shall be mixed at the site using a concrete mixing machine.

3) Slump Testing

A fresh concrete slump test shall be conducted at the time of concrete casing. The allowable tolerance of slump figure shall be set at plus-minus 2.5 cm.

4) Concrete Compressive Strength Test

Concrete compressive strength test will be conducted at a laboratory in Bahir Dar, taking a testing sample of each casting and within 100 m^3. Each sample will include three (3) pieces.

Table 2-14: Concrete compressive strength test

Item	Spec.	Unit amount per facility (m^3)	No. of facility	Total amount (m^3)	No.of casting per facility	Total No. of casting
Generator house		11.22	9	100.98	3	27
Ground reservoir tank	30 m^3	27.20	1	27.20	4	4
	70 m^3	47.60	3	142.80	4	12
	100 m^3	70.50	2	141.00	4	8
Elevated reservoir tank	50 m^3	88.80	1	88.80	1	1
	120 m^3	167.00	2	334.00	1	2
Total				834.78		54

(2) Iron reinforcing Bar

Tensile test of iron reinforcing bars (D10, 12, 16 and 20) will be carried out four times.

(3) Aggregate

The following fine and coarse aggregate tests will be conducted:

- Density and absorbing water rate test
- Sieve-analyst test
- Fine grain quantity test
- Mass of unit volume test
- Abrasion test
- Alkali-Silica reaction test

(4) Water Flow

The total length of the water supply pipes (61.8 km) will be tested for water flow.

(5) Bearing Capacity

Plate bearing tests will be conducted to assess the subgrade reaction at the three sites where the reinforced concrete and steel frame elevated tanks will be constructed.

2-3-3-6 Procurement Plan

(1) Materials for construction

In principle, materials and equipment necessary for construction are to be procured locally. However, items will be procured from Japan or a third country in cases where local procurement is impossible, or when there are quality or logistical issues, or when it cannot be obtained within a certain timeframe.

Materials for construction such as cement, aggregate, wood, power pumps and generators can be procured in Bahir Dar or Debre Marcos. However, the manufacturers cannot be identified and the reliability and quality, such as deformations, are often a problem. Meanwhile, in Addis Ababa it is easy to procure high quality and very reliable materials and spare parts. Therefore, materials, in principle, will be procured in Addis Ababa.

On the other hand, while local outlets stock items such as galvanized steel pipe, valves, measurement equipment such as pressure gauges and flow meters, and electrical and machine parts related to the pump facilities, these are in scarce supply and they are difficult to procure within a limited timeframe. Therefore, these materials will be procured from Japan or a third country as appropriate. Meanwhile, reinforcing bars will be procured from Japan, because it is cheaper than Ethiopia.

The sources of procurement of the materials for construction in the Project are as follows:

Table 2-15: Sources of procurement of the materials

Item to be procured	Procurement country			Reason
	Japan	Ethiopia	Third country	
Cement		○		
Fine aggregate		○		
Course aggregate		○		
Steel product	○	○		
Form material		○		
Timber		○		
Fuel		○		
Steel pipe (GS pipe)	○			Procurement of high quality GS pipe in Japan is more cheaper
Valve	○		○	Procurement of valve is difficult in Ethiopia
Motor pump		○		
Generator		○		

(2) Machinery for Construction

The general construction machines such as backhoes, dump trucks and concrete mixers, are possible to lease locally. Therefore, in consideration of shipping charges and the number of days they will be used, and because it is cheaper to lease them than to procure from Japan or a third nation, they will be leased locally.

(3) Transport Packing Plan

In general, when procuring materials from Japan or a third country, it is loaded onto a ship at a major port in that country and transported by container ship to the port in the neighboring country, Djibouti. After unloading, it is transported into Ethiopia by land. This will take six (6) to nine (9) weeks for the marine transportation from Japan to the Djibouti port.

It is a trip of approximately 980 km from the Djibouti port to the Amhara regional state which is the target site, but will take around three (3) to five (5) weeks until arrival when taking into account the time it will take for the various necessary procedures.

2-3-3-7 Initial Operation Guidance and Operational Planning Guidance

Initial operation guidance and operational planning guidance are not conducted in the Project.

2-3-3-8 Soft Component (Technical Assistance) Plan

(1) Background of Planning the Soft Component

1) Present Situation and the Problem

In the target sites, the structure of operation and maintenance (O&M) for water supply facilities by existing Water Management Organization (WMO). However, the capability of planning to reserve O&M fee, collecting and managing water fee, and operating the water supply facilities are poor. The water supply facilities are left unrepaired and unattended, causing minor accidents. In the meantime, the role of Woreda water office of regular maintenance in order to avoid the accidents before they happen is not clear, and the budget and manpower are also insufficient. Therefore, the current problems of O&M by WMO are as follows:

- The structure of O&M is not secured.
- WMO cannot correspond to equipment operation and minor repairs.
- The capability of collecting and managing water fee (O&M cost) is poor by WMO.

2) Necessity of Soft Component

As mentioned above, there is the structure of O&M by existing WMO, however the capability of planning to reserve O&M fee, collecting and managing water fee, and operating the water supply facilities are poor. And the capability of minor repairs is also poor. The water supply facilities in the Project are planned as the composition and scale in order to conduct O&M by WMO, however, the structure of O&M and technique of existing WMO are poor. Therefore, in order to secure the commencement of the Project smoothly, technical assistance is given in the soft component, and supports to strengthen of the capability of O&M of WMO and Woreda office. In the target sites, water supply facilities exist, hygiene philosophy is already made in the habitants; therefore hygiene education is not conducted in the soft component. The contents of technical support is placed priority on strengthening the capability of O&M (soft side); however, technical support of equipment operation and minor repairs (hard side) is also conducted in cooperation with the Ethiopian Water Technology Centre (EWTEC).

(2) Objective of Soft Component

1) Objective

The objective of soft component is for O&M to be properly conducted by WMO. Moreover, the overall goal is defined as: long-term utilization of the constructed facilities after completion of the Project. In other words, the target is that the facilities will be utilized sustainably by O&M of the WMO after the completion of the Project. Project Design Matrix (PDM) of soft component is shown below.

Table 2-16: PDM (Soft component)

Summary of the Project	Indicator	Measurement	External condition
Overall goal Long-term utilization of facilities after completion of the Project.	Decline of percentage of the water-born disease rate of residents.	* Statistical report about health hygiene. * Result of the questionnaire to residents	
Target of the Soft Component Operation and maintenance are properly conducted by WMO	* All facilities in Project area work throughout the year * Increase safe water supply population in Project area.	* Operation records of the facilities * Log of facility users	AWRDB does not change the policy of O&M by WMO
Output 1. Executive system of the operation and maintenance of the facilities will be established.	1.1 The consciousness of the implementing agency of the need for citizen participation in O&M is increased and a concrete support system for the VWC is developed. 1.2 The VWC of residents is formed or reorganized in each village. 1.3 Each organization and all residents concerned have a clear understanding of their roles.	* Questionnaire to persons concerned * Workshop Report * Chart of support system for O&M * User rules * Organization Chart for WMO * O&M plan * Questionnaire to persons concerned * Organization Chart for all concerned	Organization concerned have no objection against the fact facilities are operated by residents.
2. The concerned organizations acquire the necessary skills and knowledge for operation and maintenance.	2.1 The period of breakdown is shortened and the frequency of breakdown is reduced. 2.2 The records of administration containing the fee collection are prepared in the WMO. 2.3 The monitoring and evaluation for the activities are carried out and reflected in the activities of the soft component	* Records of the activities of the organization concerned * Operation records of the facilities * Report of the technical training * Maintenance and repair regulations * Log of fee collection * Log of facility users * Implement report of soft component	
Activities			Precondition
1.1 Formulate a support system of AWRDB and Woreda 1.2 Formulate the O&M activities 1.3 Obtain an understanding of the O&M activities 2.1 Conduct the technical training (hard side) for the maintenance and repair of the facilities 2.2 Conduct the technical training (soft side) of administrative tasks such as accountancy, record keeping and reporting 2.3 Conduct monitoring, evaluation and modification of the plan			All organizations concerned take an active part in the Project.

2) Considerations for the Support System

In the Project, O&M by the WMOs will be conducted for each site in two (2) phases: "Phase 1: Establishment of executive system," which is to be undertaken before the construction of facilities", and "Phase 2: Acquisition of O&M skills" during the construction. Concerning the technical O&M of the facilities, two (2) instructors from the Ethiopian Water Technology Centre (EWTEC) conducted the technical training for all persons concerned.

(3) Output of Soft Component

The expected outputs of the Soft Component are summarized as follows:

Output 1: Executive system of the O&M of the facilities will be established

The existing facilities are operated by the WMO of each site. But they cannot cope with various problems like repairs of malfunctions or inability of users to pay water rates. Other organizations such as AWRDB and Woreda water offices are in a position to fulfill this role, but their concrete support system also has not functioned smoothly.

With the soft component, the concrete support system will be established after reviewing the function of each organization with regard to WMO. In addition, concrete outcomes of the soft component will be ensured by establishing a plan of O&M which includes specific rules for the use of facilities.

Output 2: The concerned organizations acquire the necessary skills and knowledge for O&M

In order to conduct O&M by the WMO, it is necessary to compensate for the current lack of technical skills. After establishing a support system by administrative agency, the technical training (on hard and soft sides) for the persons in charge at the WMO and Woreda is executed to ensure they acquire the capacity to cope with concrete problems. With the technical training on hard side, the WMO will have the ability to repair slight troubles and if WMO is unable to handle a repair, the Woreda will be given the capacity to repair complicated problems. Consequently, the role of each organization will be clearly defined under the executive system of O&M. In addition, for O&M to be truly sustainable, it is paramount that the facility utilization fees are collected and managed properly. Therefore the chairman and accountants of WMO and Woreda will receive technical training on methods of accounting management (soft side).

Furthermore, in order to keep records of facilities usage and work done, the persons in charge at WMO and Woreda are given training on this and how to produce the records. The records made by WMO are presented to AWRDB through Woreda. With this joint information, the problems of fee collection or leaving facilities broken down will decrease.

(4) Indicator of Output Achievement

The indicator and measurement used to confirm the achievement of the two (2) output items are given in the table below.

Table 2-17: Indicator of output achievement

Output	Indicator	Measurement
Executive system of the O&M of the facilities will be established.	1. The consciousness of the implementing agency of the need for citizen participation in O&M is increased and a concrete support system for the WMO is developed.	● Questionnaire to person concerned ● Workshop Report ● Organization Chart for O&M ● User rules
	2. The WMO of residents is formed or reorganized in each village.	● Organization Chart for WMO ● O&M plan
	3. Each organization and all residents concerned have a clear understanding of their roles.	● Questionnaire to person concerned ● Organization Chart of all concerned
The concerned organizations acquire the necessary skills and knowledge for O&M.	1. The period of breakdown is shortened and the frequency of breakdowns is reduced.	● Records of the agency concerned ● Operation records of the facilities ● Technical training report ● Maintenance and repair regulations
	2. The records of administration containing the fee collection are prepared by the WMO.	● Log of fee collection ● Log of utilization
	3. The monitoring and evaluation for the activities are carried out and reflected in the activities of the soft component	● Monitoring/evaluation records ● Soft component report

(5) Plan of Soft Component Activities (Input Plan)

1) Division of the Activities

The Soft Component activities are categorized into two (2) phases: 1-Before construction and 2-During construction and after completion of main facilities. The activities will be carried out by the Japanese consultant with the cooperation of regional government staff such as AWRDB and Woreda. As to the technical training like inspection and repair of the facilities, it will be implemented with the cooperation of EWTEC.

2) Division of Roles

The role of the Japanese consultant and Woreda staff and EWTEC instructors are summarized as follows:

Japanese Consultant

Overall responsibility for the Soft Component and is in charge of:

- Supervision and implementation of this Project.
- Activities for commencing a workshop and a seminar.
- Meetings with AWRDB and implementation of workshops for Woreda staff..
- Cooperating and communicating with other donors and NGOs.
- Preparation of the support system for WMO of AWRDB and Woreda.

- Conduct a technical training (hard side) for the maintenance and repair of the facilities by EWTEC instructors.
- Technical training (soft side) for the administration.
- Preparation of O&M manual.
- Assistance for the drafting of all rules.
- Assistance for a preparation of all records.
- Monitoring of the activities and review of the evaluation.
- Review and the feedback of the results of each activity in each phase.
- Report to the AWRDB and JICA.

Woreda Staff

Woreda staff will take part continuously in the entire Project, taking charge of activities to execute the work plan. During the Japanese consultant's absence, Woreda staff will keep a constant check on the progress of each activity. And also when the Japanese consultant is on site, they will arrange with the organization concerned and assist the activities.

- Support the establishment of WMOs by citizens in villages with water facilities.
- Organize resident meetings in each village.
- Confirm the situation of O&M in each site and report to the Japanese consultant.
- Organize the technical training (hard side) by EWTEC instructors.
- Cooperative support and regular inspection for the O&M of WMO.
- Assist the monitoring to the persons concerned.
- Adjustment with the organization concerned in absence of the Japanese consultant.

EWTEC instructors

EWTEC instructors, as part of technical training (hard side) for the Woreda staff and WMO staff, are to teach:

- Basic knowledge about the new facilities.
- Method of the daily inspection.
- Method in case of failure (in case of slight damage and serious damage).
- Purchase of spare parts of the facilities.
- Rules of the facilities user.
- Cleaning of the facilities.

(6) Plan of the activities

The concrete content of the activities is as follows.

<Before the construction of main facilities - Establishment of executive system>

Activity 1-1: Formulate a Support System of AWRDB and Woreda for the WMO

At the beginning of the Project, discussions will be held with the implementing agency, AWRDB concerning the objective, necessity and content of the Project, as well as the implementation plan.

Then a workshop will be held targeting the Woreda staff directly responsible for O&M activities in order to understand the condition of usage for the existing facilities, and the necessity and importance of O&M by the residents.

Through this workshop, Woreda staff will acquire the techniques needed to encourage resident participation by staff of WMO and the residents. Japanese consultants produce the organization chart after considering the relation with the WMO and the clarification of the problem at the hearing for Woreda staff. Additionally, the concrete plan for the management system including the membership which is selected in Activity 1-2, their role, the method of member selection, the management resources, and the user regulation will be formulated by the Japanese consultant and Woreda staff.

Target participants:	AWRDB staff and Woreda staff
Implementer:	Japanese consultant (10 days), Vehicle
Output:	Organization chart for the support system

Activity 1-2: Formulate the O&M activities of WMO

A workshop will be held in order to make sure of the function and clarify the problems of the nine (9) sites in which the new facilities will be constructed. Considering the results, under the leadership of Woreda staff, the appropriate membership for the future O&M, its role, and the method of member selection should be presented to get the understanding for the current staff.

With regard to the implementation of O&M, the relation between WMO and residents will be reconsidered, and a plan that is appropriate to the level of cooperation and capacity of each WMO will be drafted prior to the next resident committee meeting. Especially regarding the remuneration of organization staff and the resources of management, the appropriate water fee, the method of collection, should be determined at this Stage 1-2 to submit to the resident committee at the Activity 1-3.

Target participants:	WMO Staff
Implementer:	Japanese consultant (9 days), Woreda staff (9 days), Vehicle
Outputs:	Organization chart for WMO, Draft of O&M activities

Activities 1-3: Obtain an understanding of the O&M activities

A workshop will be held targeting the residents based on the results of 1-1, 1-2 activities after explaining the short summary of O&M by Woreda staff who control each site. Through this workshop, it is necessary for the residents to understand the environmental management of the facilities for the sustainable water supply services, the importance of the participation in O&M for facilities according to the user rules, especially the necessity for the collection of the water fee. WMO staff will provide the draft of O&M that they compiled in Activity 1-2, and ask the residents for their cooperation.

Target participants:	Residents, Village council
Implementer:	Japanese consultant (9 days), Woreda staff (9 days), WMO staff (9 days), Vehicle

<During construction to after completion of main facilities - Acquirement of skills of O&M>

Activity 2-1: Conduct technical training for the maintenance and repair of the facilities

EWTEC instructors are to teach through on-the-job training (OJT) the Woreda office staff and the WMO member in charge of management of the facilities: basic knowledge for technical training, the method of O&M, the method of daily maintenance, how to deal with breakdowns and techniques for minor repairs. This technical training will be conducted three (3) times, after construction is completed at the third, sixth and ninth (and final) site.

At the end of training, the repair manual for the malfunctions and operation record produced by the consultants shall be distributed to the related personnel so that they can practice the regular O&M measures by using the technique and knowledge of O&M.

Target participants:	Woreda staff, WMO staff
Implementer:	EWTEC instructors (21 days x 2 persons), Japanese consultant (15 days), Vehicle
Outputs:	Repair manual for the malfunctions, Activity record, Facility's operation record, Technical training report

Activity 2-2: Conduct technical training of administrative tasks such as accountancy, record keeping and reporting

In order to acquire the techniques of O&M for facilities, Woreda staff, WMO staff and accountants receive OJT from consultants who are expert in the abovementioned fields. In the OJT, technical training concerning the administrative task as described below will be conducted.

- Setting a water facility utilization fee
- Fee collection management methods
- Expense of facility management
- Remuneration for staff

- Cost of spare parts in case of repair
- Method of calculation for repair fee
- Operation of facility, and
- Method of recording for operation.

Same as the Activity 2-1, manual concerning the administrative task, financial records for the collection fee would be formulated beforehand by the consultants. In case of any changes in the manual, modification should be done and distributed to the related persons.

Target participants:	Woreda staff, WMO staff, Residents
Implementer:	Japanese consultant (12 days), Vehicle
Outputs:	Manual for O&M, Financial records for the collection fee, Log of utilization

Activity 2-3: Conduct monitoring and evaluation, modification of the plan

Monitoring and evaluation will be conducted by the related persons in order to confirm if the result of technical training regarding O&M facilities and administrative tasks is reflected in the activity faithfully. Japanese consultant provides the related person some guidance so that they can use the result for the activity of next site. Additionally after the completion of the Project, the related persons themselves will continue the monitoring and evaluation, and modify the plan of O&M on each occasion, as necessary.

Target participants:	Woreda staff, WMO staff, Residents
Implementer:	Japanese consultant (10 days), Vehicle
Outputs:	Monitoring plan

Table 2-18: Contents of soft component activity

	Activity Items	Feature	Target Audience	Implementer
Preparation of Executive system	1.1 Formulate a support system of AWRDB and Woreda for the WMO	Meeting Workshop	AWRDB Woreda	Japanese consultant
	1.2 Formulate the O&M activities of WMO	Workshop	WMO	Japanese consultant Woreda staff
	1.3 Obtain an understanding of the O&M activities.	Resident meeting OJT	Inhabitants	Japanese consultant Woreda staff WMO
Acquisition of the skills for O&M	2.1 Conduct technical training for the maintenance and repair of the facilities	Seminar OJT	Woreda WMO	Japanese consultant EWTEC
	2.2 Conduct technical training of administrative tasks such as accountancy, record keeping and reporting	Seminar OJT	Woreda WMO	Japanese consultant
	2.3 Conduct monitoring, evaluation, and modification of the plan	Monitoring/ Evaluation	Woreda WMO	Japanese consultant

(7) Supply a human resources for the Soft Component

The Project will be under the supervision of the Japanese consultant, however the technical training (on-the-job training) on various O&M and repair tasks will be conducted with the cooperation of EWTEC; meanwhile the persons in charge at Woreda and WMO will support training in each activity.

(8) Implementation Schedule

1) Implementation Content

It is proper that some activities shall be implemented before commencement of construction, therefore the activities to be implemented in the soft component are divided into the following two (2) phases: “Phase 1: Before construction (28 days)” and “Phase 2: During construction (37 days)”. The period of activity of the Japanese consultant will be assumed 65 days. Either the persons in charge at the WMO or in the Woreda office will accompany the Japanese consultants to participate in each activity at the various sites.

The technical training by EWTEC will be implemented over five days, and the Japanese consultant will accompany all this period to prepare a manual of technical maintenance. In addition, the monitoring and evaluation will be implemented by the persons concerned under the supervision of the Woreda staff.

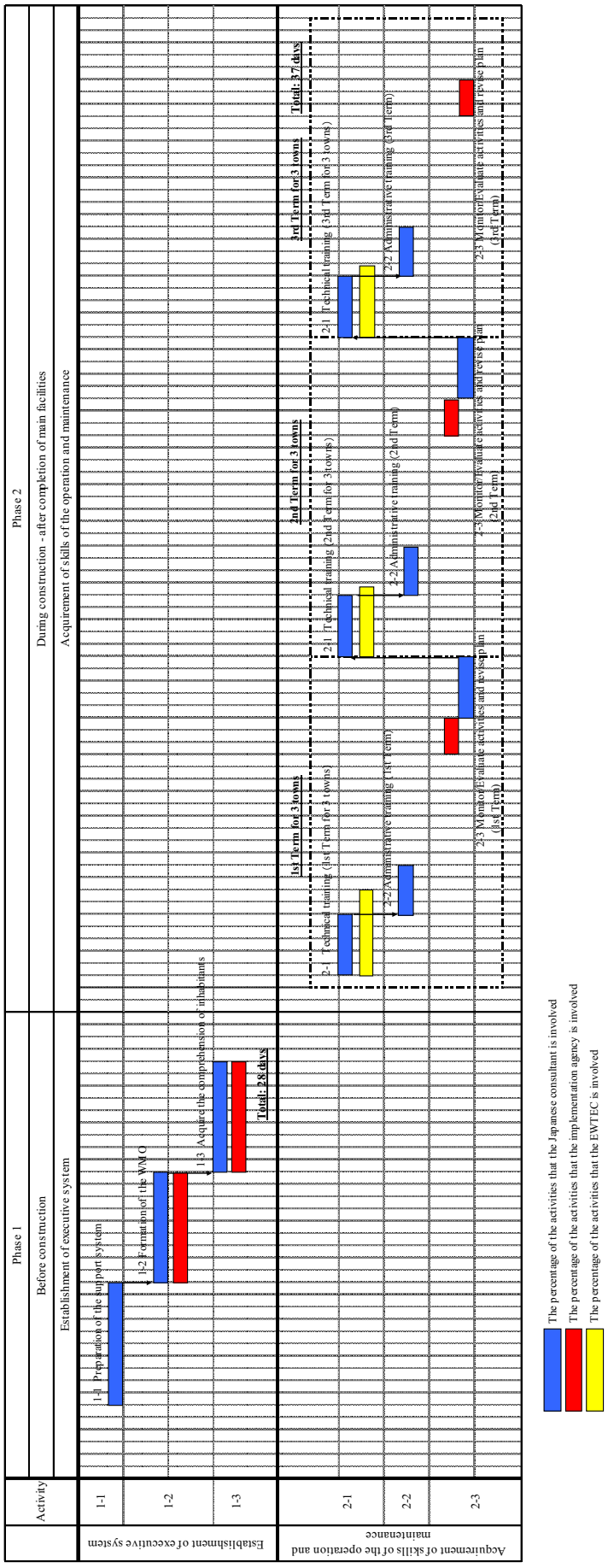


Figure 2-25: Conceptual plan for the implementation of O&M

Table 2-19: Basis for calculating the necessary number of days for the soft component

	Activities No.	Activity items	Target Audience	Implementer	Numbers of days for the works		Number of days to transfer		Total	
					Japanese consultant (1)	Local staff (EWTEC×2)	Japanese consultant (1)	Local staff (EWTEC×2)	Japanese consultant (1)	Local staff (EWTEC×2)
Phase 1 (before construction)	1-1	Formulate a support system of AWRDB and Woreda for the WMO	AWRDB staff Woreda staff	Japanese consultant	10		4		32	
	1-2	Formulate the O&M activities of WMO	WMO staff	Japanese consultant Woreda staff	9					
	1-3	Obtain an understanding of the O&M activities.	Residents Village council	Woreda staff WMO staff Japanese consultant	9					
1. Establishment of executive system										
2. Acquirement of skills of the operation and maintenance	1st Term (3 towns)	2-1 Conduct the technical training (hard side) for the maintenance and repair of the facilities	WMO staff Woreda staff	EWTEC instructors Japanese consultant	5	5	4	2 2	18	14
		2-2 Conduct the technical training of administrative tasks such as accountancy, record keeping and reporting		Japanese consultant	4					
		2-3 Conduct monitoring and evaluation, modification of the plan.			5					
	2nd Term (3 towns)	2-1 Conduct the technical training (hard side) for the maintenance and repair for the facilities	WMO staff Woreda staff	EWTEC instructors Japanese consultant	5	5	4	2 2	18	14
		2-2 Conduct the technical training of accountant, record, report concerning administration.		Japanese consultant	4					
		2-3 Conduct monitoring and evaluation, modification of the plan.			5					
	3rd Term (3 towns)	2-1 Conduct the technical training (hard side) for the maintenance and repair for the facilities	WMO staff Woreda staff	EWTEC instructor Japanese consultant	5	5	4	2 2	13	14
		2-2 Conduct the technical training of administrative tasks such as accountancy, record keeping and reporting		Japanese consultant	4					
		2-3 Conduct monitoring and evaluation, modification of the plan.		Woreda staff						
Phase 2 (During construction - after completion of main facilities)					65	30	16	12	81	42

2) Examination of validity of the number of and term of dispatches of the Japanese consultant

Japanese consultants will be dispatched four times into the field for O&M activities, and after considering the contents and the timing of execution, the activities will be conducted in two (2) phases; “Preparation of executive system (before construction)” and “Acquisition of the skills for O&M (during construction)”.

The Japanese consultant will participate in all of the activities intended for the implementation organization. In the first phase, it is important to make an agreement with the persons concerned, and so it is necessary to confirm the activities in each period by the Japanese consultant. Similarly in phase 2, the Japanese consultant should stay at the site for the entire time during each activity to prepare a manual and records, and to give advice on the running of the OJT. Therefore, the dispatch term and the number of times of dispatches of the Japanese consultant are considered appropriate for the Project.

(9) Outputs of the soft component activities

The documents as outputs of the Project are as follows:

- Organizational framework of support system (Activity 1-1)
- User rules (Activity 1-1)
- Organizational framework of WMO (Activity 1-2)
- O&M plan (Activity 1-2)
- Repairing manual (Activity 2-1)
- Activity records (Activity 2-1)
- Operating records of facilities (Activity 2-1)
- Technical training report (Activity 2-1)
- O&M manual (Activity 2-2)
- Account book of water rates (Activity 2-2)
- Log of utilization (Activity 2-2)
- Monitoring plan (Activity 2-3
- Implementation report of soft component (for each dispatch period of Japanese consultants)
- Final report (to be submitted to Ethiopian and Japanese sides after Project completion)

(10) Obligation of Recipient Country

In the implementation of the soft component, the concerned organization of recipient country is required to undertake certain measures, as follows:

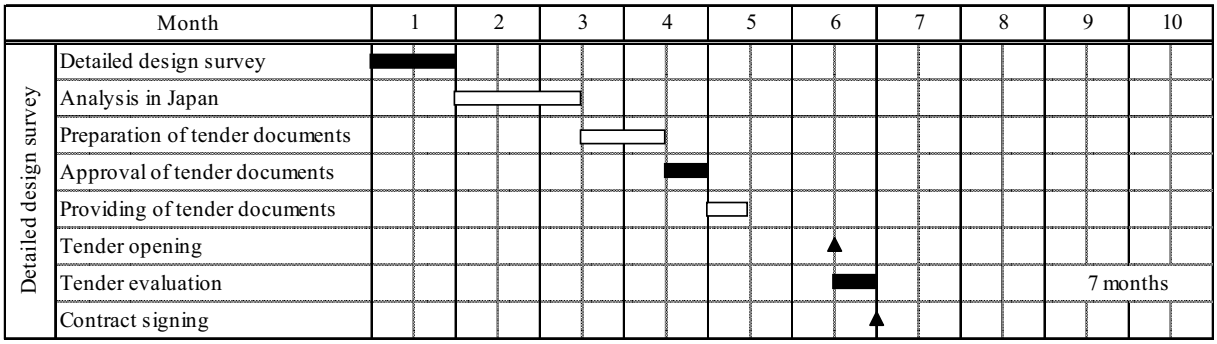
- Supervision during the entire program in cooperation with the Japanese consultant.
- Reports to the upper level organizations concerned.
- Request for cooperation to other organizations concerned in carrying out the soft component.
- Provide staff of the organization concerned and cover their expense for the activities in the field, transportation, their daily allowance and accommodation charge.

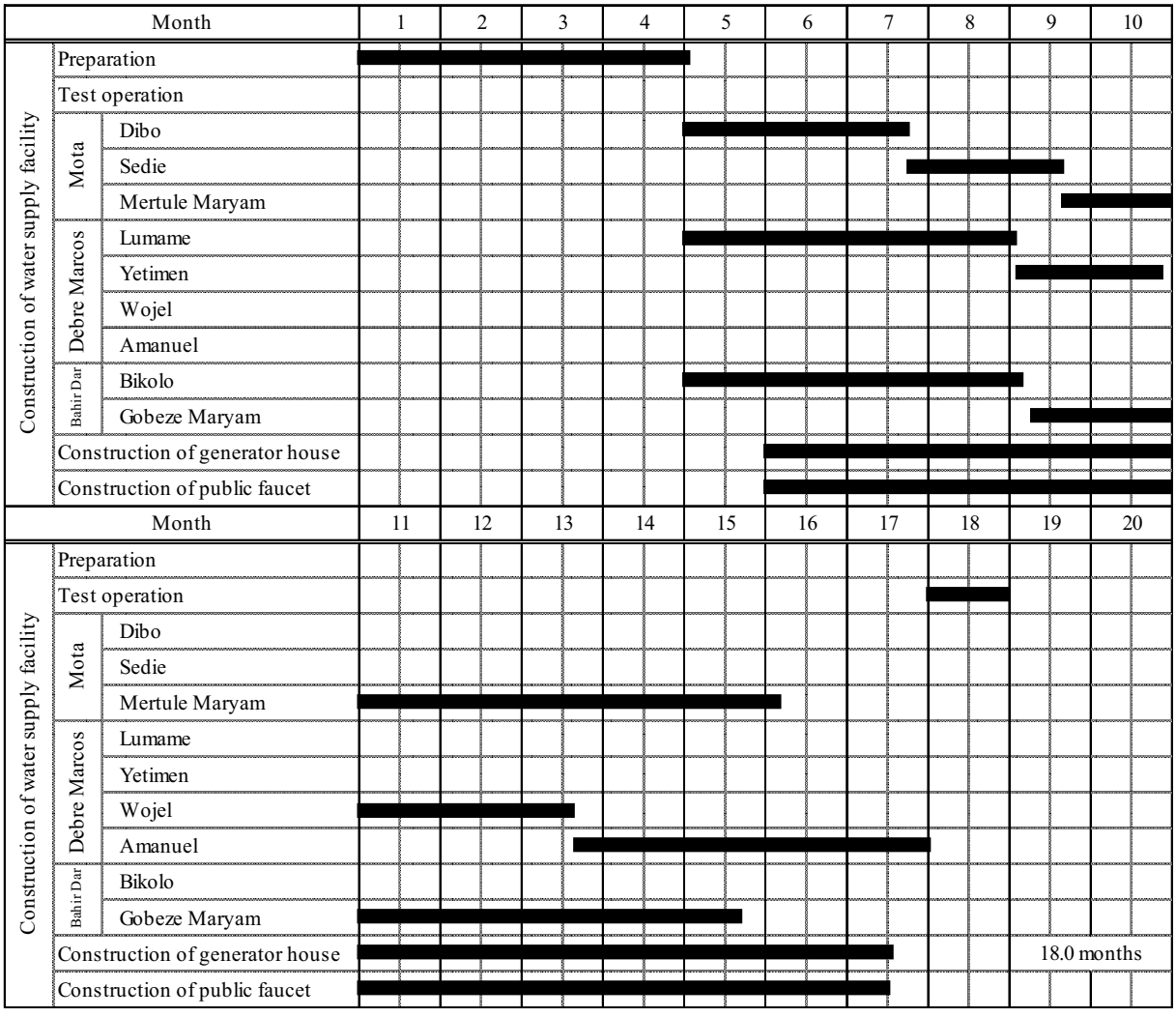
- Coordination of lectures of technical training by the instructor of EWTEC.
- Burden of the working expenses for the preparation of the workshop space and for the joint committee meeting.

2-3-3-9 Implementation Schedule

Implementation schedule for the Project is shown below.

Table 2-20: Implementation schedule





2-4 Obligations of Recipient Country

2-4-1 Specific Items for this Project

The following special items are required to be undertaken by the Ethiopian side when carrying out the Japanese Grant Aid scheme.

- To provide the acquisition of the water rights of the water source for the construction of water supply facilities.
- To provide the land acquisition of the water supply facilities.
- To construct and maintain the access roads from public main roads to the construction sites.
- To assign Counterpart Personnel (C/P) at own expense.
- To provide temporary land for base camp and office for the contractor.
- To secure budget and construct the commercial electrical lines for motorized pump operation.
- To assign personnel at own expense for the soft component program,
- To secure organization, personnel and budget for O&M after handing over water supply facility.
- To maintain the monitoring structure for O&M after handing over water supply facility.

2-4-2 General Items

In the implementation of the Japanese Grant Aid scheme, recipient country is required to undertake certain measures as follows.

- To explain, inform, communicate with the government agencies concerned and the related organizations for recognition of the Project.
- To permit the acquisition and transfer to Japan all the data and information necessary to conduct the Project.
- To bear the salary and other allowance for staff on the Ethiopian side.
- To ensure the prompt execution of unloading, customs, clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- To exempt Japanese nationals and the employees of third country peoples, who are employed by Japanese consultant and/or contractor, from custom duties, internal taxes and other fiscal levies, this will be imposed in the recipient country with respect to the supply of the products and service under the verified contracts.
- Also, recipient country shall issue the entry visas and work permits to the above Japanese nationals and the employees of third country peoples to execute this Project.
- The recipient country is requested to operate and maintain the facilities constructed under the Grant Aid properly and effectively and to assign staff necessary for this O&M as well as to bear all expenses other than those covered by the Grant Aid.
- The products purchased under the Grant Aid should not be re-exported from recipient country and/or sold off to third parties.
- The government of the recipient country or its designated authority should open an account in

the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (herein after referred to as "the Bank"). The Government of Japan will execute the Grant by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under verified contracts. The payment will be made when payment request are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued the Government of the recipient country or its designated authority.

- The Government of the recipient country should bear the advising commission for the Authorization to Pay and payment commissions to the Bank.

2-5 Project Operation Plan

2-5-1 System of Operation and Maintenance

The water supply facilities are operated and maintained by the Water Management Organization (WMO) that is established for each site. A system will be established where the organizations report their activities to Woreda water offices or to AWRDB in order to receive technical support when necessary.

The system of O&M of water supply facilities in Amhara regional state is as follows:

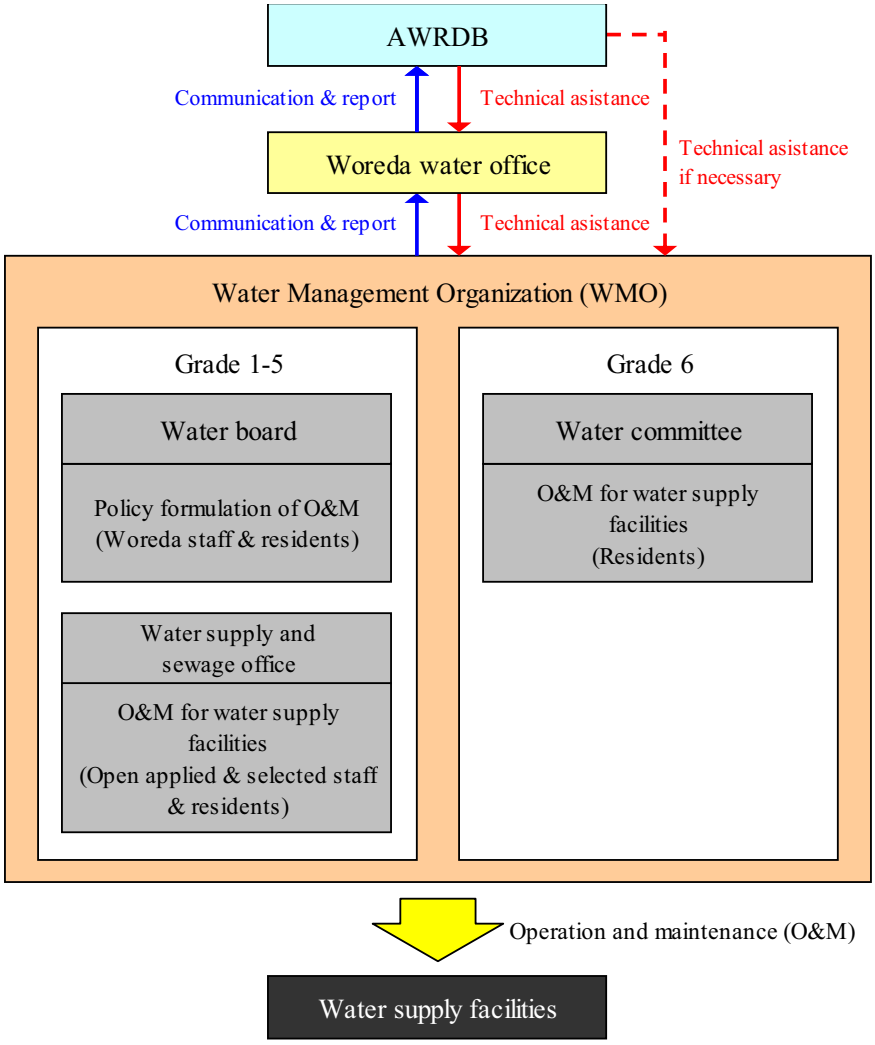


Figure 2-26: Operation and maintenance system of water supply facilities

In Amhara regional state, the capacity of government administrative organizations are comprehensively evaluated (grade) based on the twelve (12) criterion determined by the government. WMOs are established depending on this rank and the subsidies and support from the regional government also depend on this grade.

Table 2-21: Comprehensive evaluation criterion of grade decision

Each evaluation criteria	
1. Population	7. Capacity of electric supply
2. Amount of deposit	8. Population of labor
3. Annual deposit	9. Potential and economic advantage (capital)
4. Number of beneficiary	10. Feasibility of future project
5. No. of water source	11. Capacity of water fee collection
6. No. of public faucets	12. Maintenance expense and auxiliary budget

Comprehensive evaluation

Grade	Capacity
1	65-90 %
2	30-64 %
3	14-29 %
4	9-13 %
5	6-8 %
6	Less than 6 %

WMOs that are to be established or re-organized for nine (9) target sites are as follows:

Table 2-22: Category of WMO organized in target sites

Grade	Capacity	Town	WMO
1	65-90 %	n.a.	Water board & Water supply and sewage office
2	30-64 %	n.a.	
3	14-29 %	n.a.	
4	9-13 %	n.a.	
5	6-8 %	Mertule Maryam, Lumame, Amanuel	
6	Less than 6 %	Yetimen, Wojel, Sedie, Dibo, Gobeze Maryam, Bikolo	Water committee

Only the Amhara regional capital Bahir Dar and small towns of Debre Marcos and Gondar are categorized under Grade 1. All these towns have sufficient infrastructure and their financial status is stable. Thus these towns do not need to depend on support from the regional government to conduct O&M of water supply facilities. As the grade goes down, the intervention of Woreda office or the regional government becomes larger.

2-5-2 Water Management Organization

Water supply facilities are operated and maintained by WMO organized based on capacity (grade) of each site. As shown above, either water board and water supply and sewage office are organized in case of Grade 1-5, and water committee is organized in case of Grade 6. The number of person in charge of WMO depends on the extent of capacity of organization and water supply facilities operations.

As the Project has passed, water fee (O&M cost) will have been properly and adequately collected and managed. The town may improve its general evaluation in water supply capacity.

(1) Water Board

The water board is composed of two members from the community and some members from Woreda water offices. Those from Woreda water offices are paid by the Woreda water office but they additionally receive incentive payments from the water board. The board conduct simple repair of water supply facilities and water quality tests and other basic tasks. If there is an issue that the water

board can not handle, they first contact water office for assistance, and if the issue is beyond the capacity of the water office, AWRDB will take care of the issue.

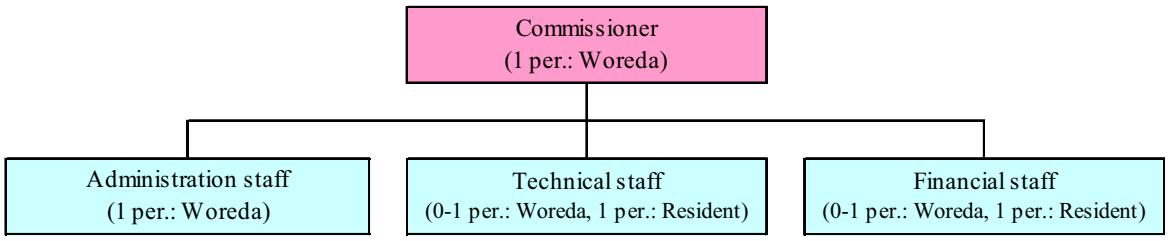


Figure 2-27: Structure of water board

(2) Water Supply and Sewage Office

Water supply and sewage office is placed under town council if one exists in the town. Otherwise it is placed under Woreda water office. The office is an independent public organization composed of staff members selected through open application and selection. No members are from Woreda water office. The water board commissions O&M of water supply facilities to the office, and the salary of the office staff and O&M costs are paid by the commission fee which is generated from the sales of water.

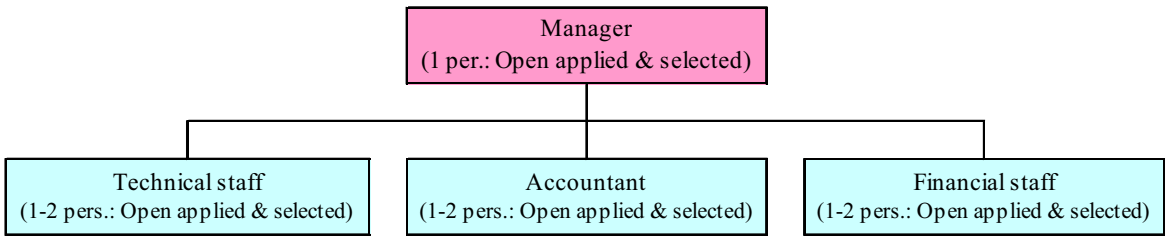


Figure 2-28: Structure of water supply and sewage office

(3) Water Committee

Water committee is a management organization made up of community members. The committee has functions of both the water board and water supply and sewage office that are explained above. However, the size of the organization is smaller and the technical level is not very high. Thus, the committee inevitably depends on support from Woreda water offices. The head of the committee is the leader who specifically works for the committee and is not a leader of the community or a political body.

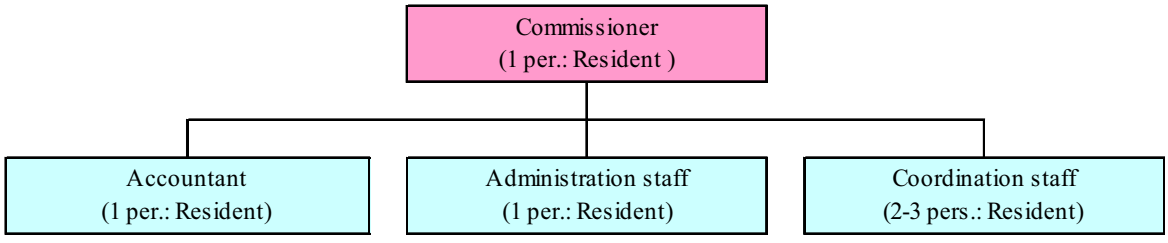


Figure 2-29: Structure of water committee

2-5-3 Basic Policy of Operation and Maintenance

Water supply facility to be constructed is operated and maintained by WMOs. For minor repairs such as replacement of spare parts, the cost is covered from the O&M cost (Water fee), replacement and repair are carried out by WMO staff. Also, if necessary, Woreda water office performs technical support for WMO.

When repairs that require highly skilled labor and special equipment is required, WMO contacts and reports to Woreda water office, then Woreda water office or AWRDB repair them.

The cost of operation and maintenance of water supply facility is appropriated from water fee (O&M cost) which is collected basically from the inhabitants.

2-5-4 Structure of Spare Parts Supply

Spare parts for water supply facility such as pumps and generators, it is difficult to procure at the target site. Since the implementation of the Project, it is possible to procure the spare parts in the neighborhood of the target site. However, because it is unknown at this time, procurement plan for spare parts is planned in the Addis Ababa. The standard spare parts, repair tools etc. are possible to be procured in Addis Ababa.

WMO may not know the whereabouts and contacts of distributors for spare parts, and these are far away from the target site in Addis Ababa. Therefore, it is not realistic that WMO will go to distributors to procure spare parts directly. At this time, for the procurement of spare parts, the following methods can be considered. These are considered the best way for the type of project implementation.

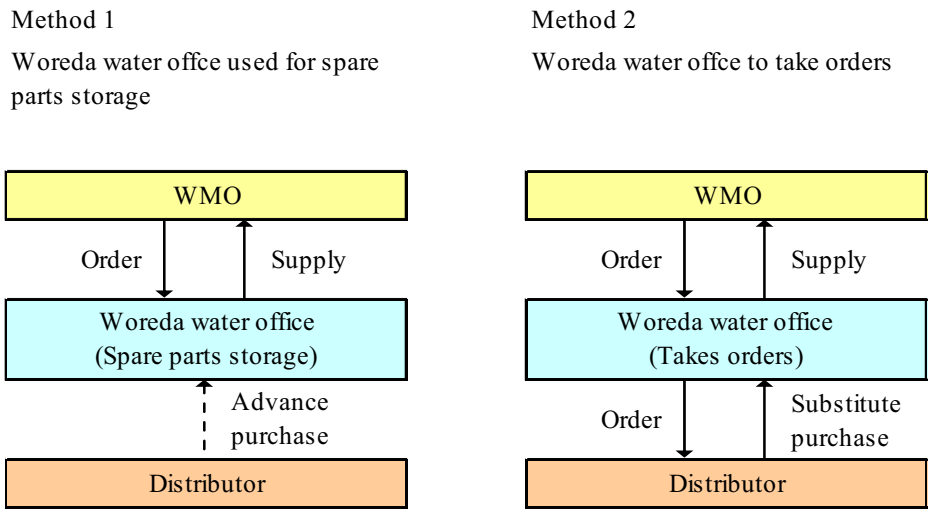


Figure 2-30: Structure of spare parts supply

2-6 Project Cost Estimation

2-6-1 Initial Cost Estimation

2-6-1-1 Obligation of Ethiopian Side

The following cost shall be the burden of the Ethiopian side.

Table 2-23: Cost borne by the Ethiopian side

Description	Estimated cost (Birr)
Construction of the power line	2,173,913
Allowance for the soft component work	73,000
Commissions of Authorization to Pay (A/P)	130,891
Total	2,377,804

2-6-1-2 Condition of Quotation

(1) Time of Estimation

The Project cost was estimated in July 2012 when the field survey of the Second Preparatory Survey was completed.

(2) Exchange Rate

The Project cost was estimated using the average rate over six (6) months from January 1 to June 31, 2012.

1 USD = 80.77 JPY

1 Birr = 0.05 USD

1 Birr = 4.60 JPY

(3) Construction Schedule

Construction schedule is eighteen (18.0) months shown in the implementing schedule.

(4) Others

The Project cost was estimated according to the Guideline of Japanese Grant Aid.

2-6-2 Operation and Maintenance Cost

Cost of operation and maintenance (O&M) and water fee receipts of each water supply facility, which were calculated using the year 2012 unit price, is as follows. In calculating the cost of O&M, the following indispensable items for O&M of water facilities were added up.

(1) Operation Cost

In all sites, regardless of type of water source (deep well or spring water), water will be transmitted by pump to reservoirs. For this reason, the electricity for pumping is procured from the power company, in the event of a power failure or emergency situation, the pump is operated using a generator. In all target sites, electricity to the towns are already supplied, although there are occasional power outages, electric power supply is generally easier than using a generator. Therefore, in the calculation of the operating cost, it was calculated and expected 10 % of the power required by a generator.

(2) Repair Cost

Cost of repair will be accumulated for repairing machines (pump and generator). Amortization period is set as ten (10) years. By the same token, cost of repair will be accumulated over forty (40) years for pipes and fittings, and fifty (50) years for structures. As a result, the cost of repairs is reflected in water charge.

(3) Personnel Expenses

As for personnel expenses, the cost of management of the water management organization and the cost concerning O&M and water fee collection are taken into consideration. Both Water Boards and Water Supply and Sewage Offices are managed in Mertule Maryam, Lumame and Amanuel as WMO. Water Committees are managed in another six (6) towns, so these personnel expenses of the WMOs are added up from the necessity of making it reflected in water charge. One (1) person to each pump operation is set for O&M. But at Mertule Maryam where there are five (5) water sources and they are scattered, pump is used in only one (1) water source, so additional one (1) person is set for O&M for another water facility. One (1) person is set to each water faucet for collecting water fees. In the case of water supply to individual houses, one (1) person will collect water fees for each site (town).

(4) Sundry Expenses

Sundry expenses were allocated for communication costs and administrative expenses.

Table 2-24: Cost of O&M per month

Town			Water source	Method of transmission	Spec of pump	Generator		Operation cost	Repairing cost		Personnel expenses (Birr)			Labor cost (Birr)			Sundry expenses	Total amount of O&M	Average water supply	Cost of water/m^3
						PWR	Fuel consumption		Machinery (10 years)	Structure (40, 50 years)	Water board	Water supply and sewage office	Water committee	Operation	Fare collection					
															Water faucet	Private				
					kw	kVA	L/h	Birr	Birr	Birr							Birr	Birr	m^3/day	Birr
East Gojam	9	Mertule Maryam	Spring	Pump	3.7	20kVA	3.0	2,241.26	2,858.79	36,593.96	5,000.00	6,000.00	—	1,000.00	21,000.00	1,091.00	514.99	76,300.00	392.73	6.39
	10	Yetimen	Borehole	Pump	5.5	20kVA	3.0	2,514.95	2,858.79	8,458.83	—	—	5,000.00	500.00	8,000.00	268.00	599.42	28,200.00	89.55	10.35
	12	Lumame	Borehole	Pump	5.5	20kVA	3.0	10,485.33	9,524.13	26,344.16	5,000.00	6,000.00	—	1,500.00	10,500.00	528.00	518.38	82,400.00	297.95	9.09
			Borehole	Pump	5.5	20kVA	3.0													
			Borehole	Pump	15	50kVA	5.7													
	14	Wojel	Borehole	Pump	7.5	37kVA	4.7	3,760.97	3,219.38	10,649.15	—	—	5,000.00	500.00	10,000.00	21.00	549.50	33,700.00	87.84	12.61
	15	Sedie	Borehole	Pump	7.5	37kVA	4.7	3,760.97	3,219.38	8,279.82	—	—	2,500.00	400.00	5,200.00	0.00	539.83	23,900.00	92.75	8.47
	16	Dibo	Borehole	Pump	7.5	20kVA	3.0	2,819.05	2,858.79	11,166.40	—	—	2,500.00	400.00	5,600.00	0.00	555.76	25,900.00	64.65	13.17
	---	Amanuel	Borehole	Pump	13	50kVA	5.7	11,685.74	8,576.37	24,876.56	5,000.00	6,000.00	—	1,500.00	12,000.00	1,000.00	561.33	83,200.00	284.14	9.63
			Relay-Tank	Pump	9.2	37kVA	4.7													
			Borehole	Pump	5.5	20kVA	3.0													
West Gojam	27	Gobeze Maryam	Spring	Pump	11	37kVA	4.7	4,293.15	3,221.24	14,557.02	—	—	5,000.00	500.00	11,500.00	232.00	596.59	39,900.00	163.10	8.04
	---	Bikolo	Borehole	Pump	11	37kVA	4.7	4,293.15	3,221.24	20,221.16	—	—	5,000.00	500.00	5,500.00	254.00	510.45	39,500.00	131.47	9.88

Table 2-25: Fare receipts per month

Town			Population 2016	Number of household			Water fee			Expenditure/household		Total fare receipts (a) Birr	Total amount of O&M (b) Birr	(a) - (b) Birr
				Water faucet	Private customer	Total	Water faucet		Private customer Birr/m^3	Water faucet	Private customer			
							Birr/20 L	Birr/m^3						
East Gojam	9	Mertule Maryam	17,829	3,154	1,091	4,245	0.15	7.50	6.00	21.11	16.88	84,986.38	76,300.00	8,686.38
	10	Yetimen	3,877	655	268	923	0.25	12.50	11.00	36.89	32.46	32,861.34	28,200.00	4,661.34
	12	Lumame	13,451	2,675	528	3,203	0.20	10.00	9.00	28.29	25.46	89,132.52	82,400.00	6,732.52
	14	Wojel	3,758	874	21	895	0.30	15.00	12.00	44.78	35.82	39,888.93	33,700.00	6,188.93
	15	Sedie	3,947	940	0	940	0.20	10.00	0.00	30.01	0.00	28,211.46	23,900.00	4,311.46
	16	Dibo	2,510	598	0	598	0.30	15.00	0.00	49.33	0.00	29,496.56	25,900.00	3,596.56
	---	Amanuel	12,694	2,022	1,000	3,022	0.25	12.50	9.00	35.75	25.74	98,022.78	83,200.00	14,822.78
West Gojam	27	Gobeze Maryam	6,908	1,338	232	1,570	0.20	10.00	7.00	31.60	22.12	47,410.33	39,900.00	7,510.33
	---	Bikolo	5,811	1,067	254	1,321	0.25	12.50	9.00	37.84	27.24	47,294.84	39,500.00	7,794.84

With regard to setting water fees, the fee per unit was set up so that the amount collected will be sufficient to cover the cost of O&M. The unit price is set at 0.05 Birr for public faucets, assuming that water is collected using a jerry can (20 L). Regarding water supply to private houses, water fees are currently collected by the inspection of a water meter. Although water supply facilities are designed based on the public faucet as a premise of this Project, about calculation of water fee receipts, water charge per cubic meter (m^3) for private connections are also calculated according to the present condition. With regard to setting water fee, payments per month per household of current sites are approximately from 20 to 50 Birr. Those payments are within the range that beneficiaries capable of paying after completion of the facilities. So there is no problem with the O&M of the facilities.

2-7 Other Relevant Issues

(1) Acquisition of the Rights of Water Source and Land

At the time of the Preparatory Survey, AWRDB confirmed that issues over rights of water source and land have not occurred at the target towns. However, there is a possibility that claims about these rights from some landowners (land user) may be lodged after the implementation of the Project. Therefore, before the commencement of the Project, AWRDB and Woreda water office should explain to the authority concerned the outline of this Project and acquire these rights to avoid any of trouble over rights.

(2) Installation of Commercial Electric Power Lines

It is a precondition of construction of the water supply facilities that the Ethiopia side construct the commercial electric power lines at target nine (9) towns. In the Preparatory Survey, this matter has been confirmed that the Ethiopia side will conduct the electric power construction. However, at the time of the Detailed Design Survey, the progress and situation of the budget measures and preparation of the electric power construction by the Ethiopia side will be confirmed.

(3) Custom Clearance, Tax Exemption, Entry and Residence Permit

The delay of the protocols of custom clearance, tax exemption, approval of visas and work permits for foreigners has much effect on the implementation schedule and project budget. Therefore, these protocols must be cleared quickly with the support and cooperation by the Ethiopian side.

(4) Construction Schedule during the Rainy Season

All target towns can be accessed in every season. However, some areas in the target towns will become muddy and it will be difficult for heavy machines to access during the rainy season. Therefore it is necessary to make a detailed construction schedule considering the rainy season for implementing of the Project.

(5) Price Escalation of Construction Material and Manpower

Large fluctuations in oil, steel and cereal prices are causing high construction material and labor costs in Ethiopia. It is thought that there is a risk of a large price increases during implementing of the Project. At the time of the Detailed Design Survey, the price escalation will be observed and the contents of the Project will be re-examined

(6) Formulation of Spare Parts Procurement System

Spare parts procurement system is not unified currently. In the implementation stage, therefore, the procurement system will be formulated based on the discussion with WMO, Woreda water office, AWRDB and the supplier.

Chapter 3
Project Evaluation

Chapter 3 Project Evaluation

3-1 Preconditions

(1) Securing Steady Budget and Personnel

It is required to take appropriate measures to secure the budget and personnel of AWRDB and Woreda water office with respect to the Project implementation and the soft component activities.

3-2 Necessary Inputs by Recipient Country

(1) Using EWTEC Staff

It is requested to put the staff members, who joined the past the Ethiopian Water Technology Centre (EWTEC), in this Project so that they can make use of their technical knowledge and know-how actively for this Project.

(2) Dealing with the 4 Towns Eliminated from the Project

Four (4) towns, Keranyo, Addisalem, Kuch and Kunzila were eliminated from the target towns in this Project since they were found to be difficult to develop groundwater or to find springs. However, these towns are also suffering from water shortages due to depletion. Therefore, AWRDB is requested to formulate the water source development plan for these four (4) towns as soon as possible, using the experience of the past projects.

3-3 Import Assumption

(1) Monitoring by AWRDB and Woreda Water Office

Water supply facilities to be constructed in the Project will be operated and managed by the WMO established in the each town. Woreda water office and AWRDB are requested not only to support the establishment of the WMO, but also to cooperate with the committee tightly to grasp the availability of water supply facilities so that they make a proposal technically and assist repair of the equipment. For a long term usage of water supply facilities, it is important to secure stated water quantity, grasp the water quantity fluctuation with seasons and worsening of water quality. Therefore, Woreda water office and AWRDB are requested to implement periodical monitoring.

(2) Commoditizing the Data

It is found that the central offices (AWRDB, AWWCE and ADSWE etc.) and local offices (Woreda water office etc.) do not share the well drilling data implemented in the past, result of the water quality analysis and needs from the residents on water supply facilities accurately. Therefore, the data of target nine (9) towns which will be obtained through the Project implementation shall be shared by the central and local offices properly.

3-4 Project Evaluation

3-4-1 Relevancy

The Project implementation by Grant Aid is evaluated to be reasonable based on the result of this survey for the following reasons.

- Target of this Project is 56,912 people of target nine (9) towns in the southern part of the Amhara regional state, a considerable number of whom are in the "worse off" category.
- The villagers in the target nine (9) towns use poor water sources (water quality and quantity). The implementation of this Project will enable the distribution safe and sustainable water to the villagers and contribute to improving their lives.
- The Government of Ethiopia aims at "improving living conditions and hygienic conditions in small towns" as an overall goal. Therefore, implementation of this Project aims to achieve this objective.
- AWRDB and Woreda office, as an implementing agency, has enough capability and experience in rehabilitation, operation and maintenance. In addition, water supply facilities to be constructed in this Project are of a common level in Ethiopia, and special techniques are not needed.
- This Project is not a profit-earning project.
- Negative impact on the environment is not generated by the Project implementation according to the Environment Impact Assessment (EIA).
- The Project implementation by Japanese Grant Aid scheme is not particularly difficult.

3-4-2 Effectivity

(1) Quantitative Impact

Quantitative impact to be expected by implementation of this Project is mentioned below.

Table 3-1: Quantitative Impact after Implementation of this Project

Indicator	Baseline (2012)	Target value (2016)
Water coverage ratio at target 9 towns	23.0 %	80.4 %
Population of water coverage at target 9 towns	13,810 people	56,912 people
WMO to be able to operate and maintain water supply facilities sustainably	0	9

(2) Qualitative Impact

Qualitative impact to be expected by implementation of this Project is mentioned below.

- Mitigation of workload (time) for fetching water
- Mitigation of water related diseases
- Improvement of enrollment ratio of children
- Mitigation of household budget expenditure (economical improvement)

From the above-mentioned contents, implementation of this Project is assessed reasonable and effective.