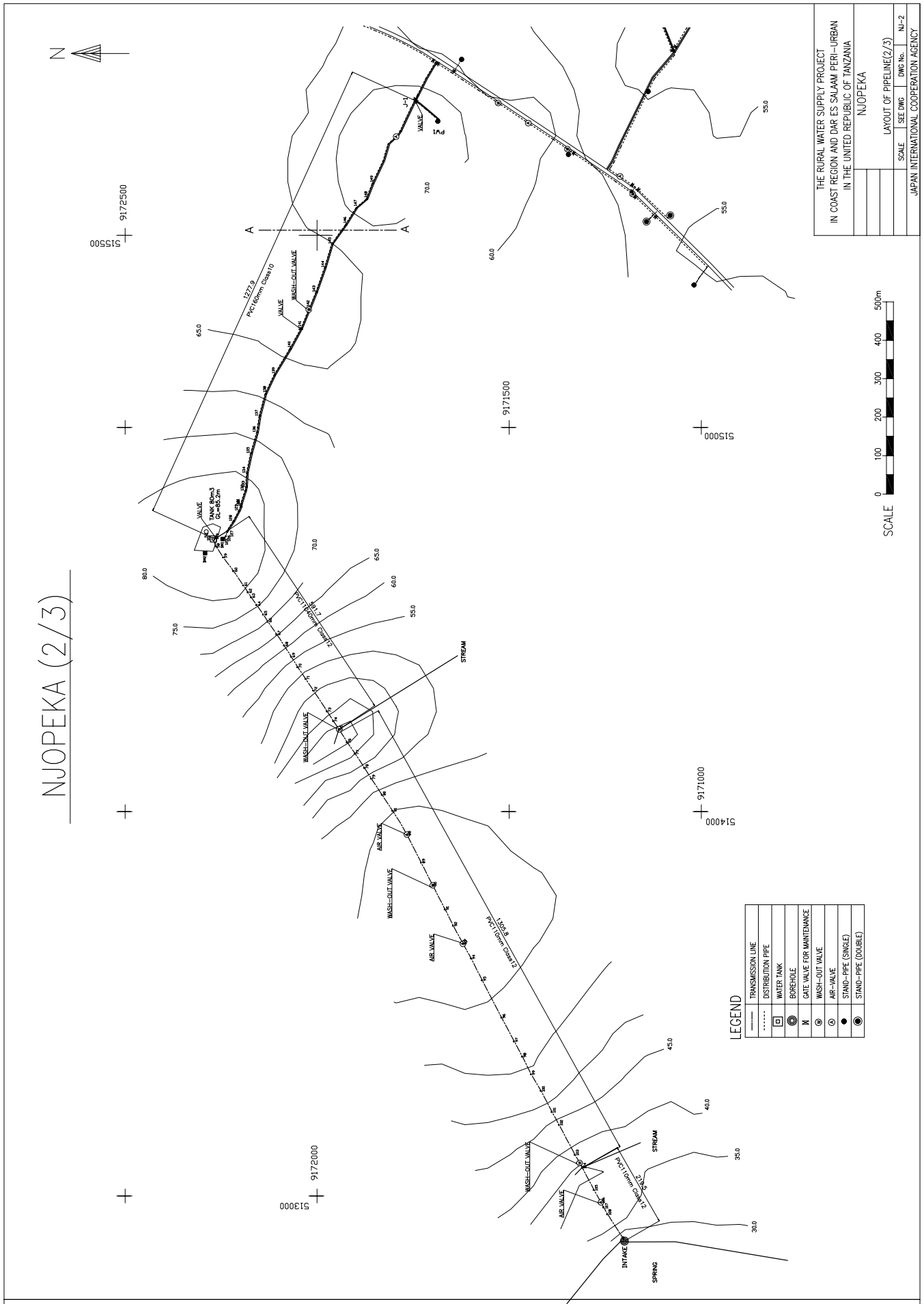


Figure 2.15 Layout Plan of Water Supply Facility (Njopeka)

Basic Degign Study on Rural Water Supply Project in Coast Region and Dar es Salaam Peri-Urban | JICA

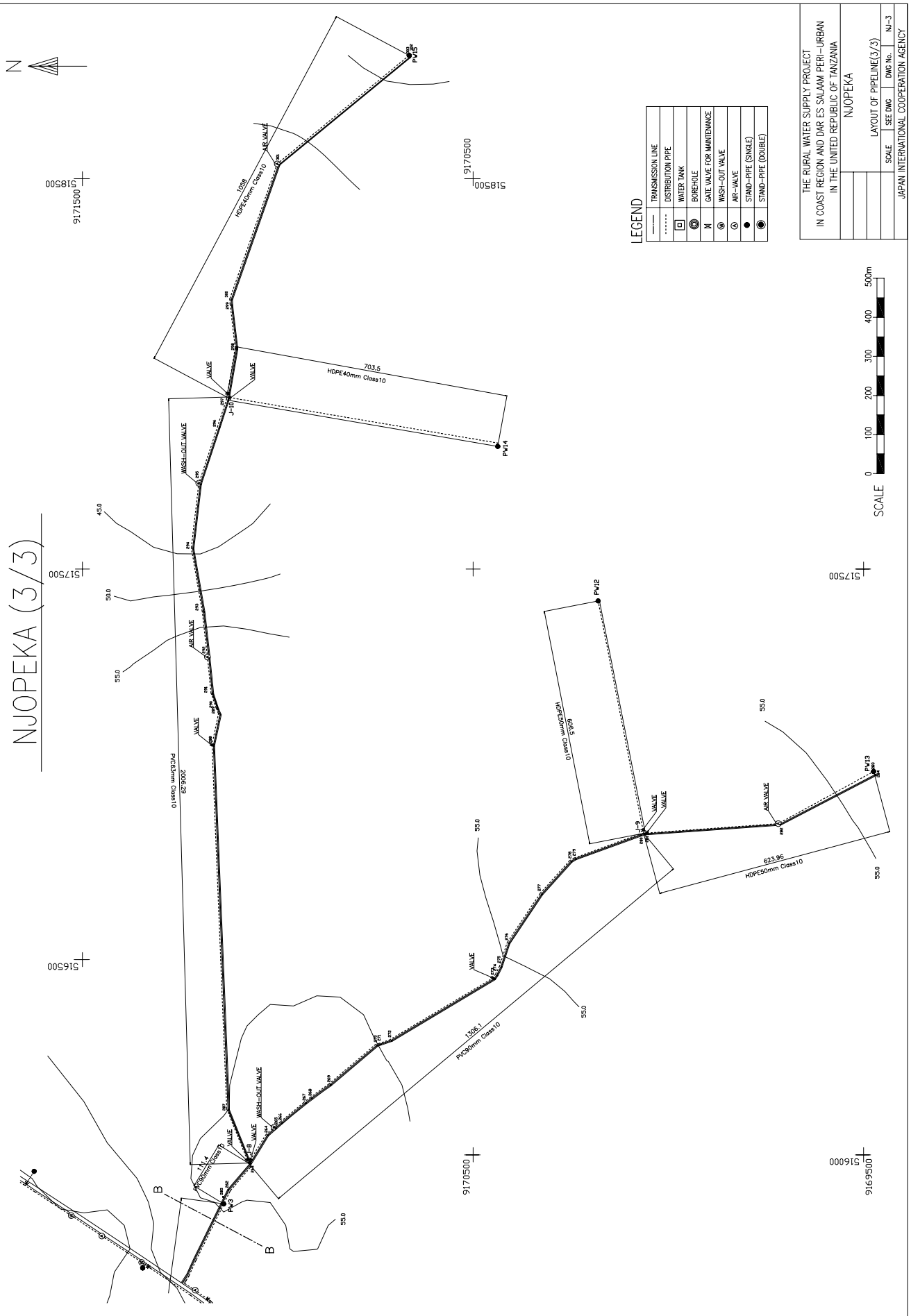


Figure 2.15 Layout Plan of Water Supply Facility (Njopeka)

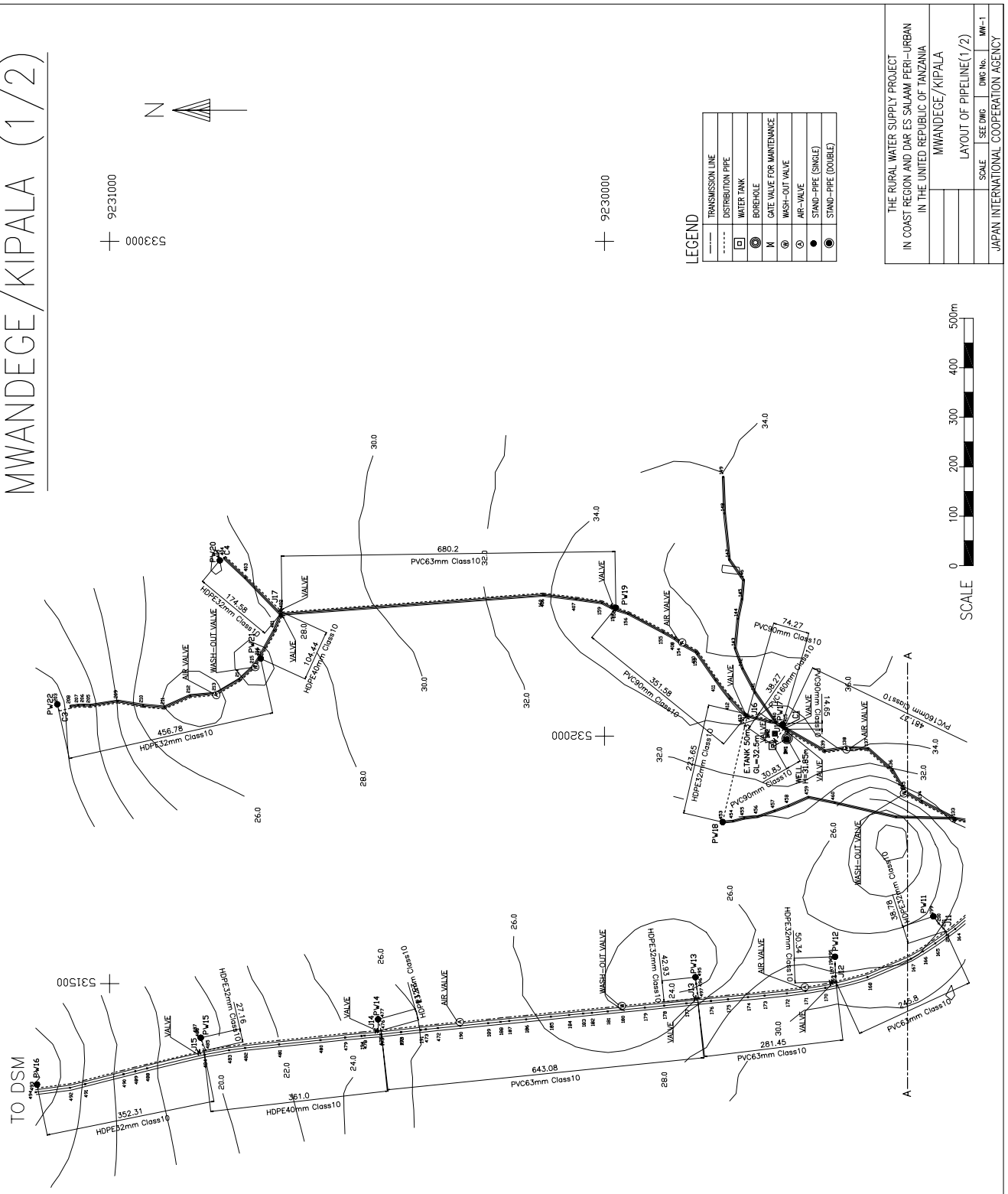


Figure 2.16 Layout Plan of Water Supply Facility (Mwandege/Kipala)

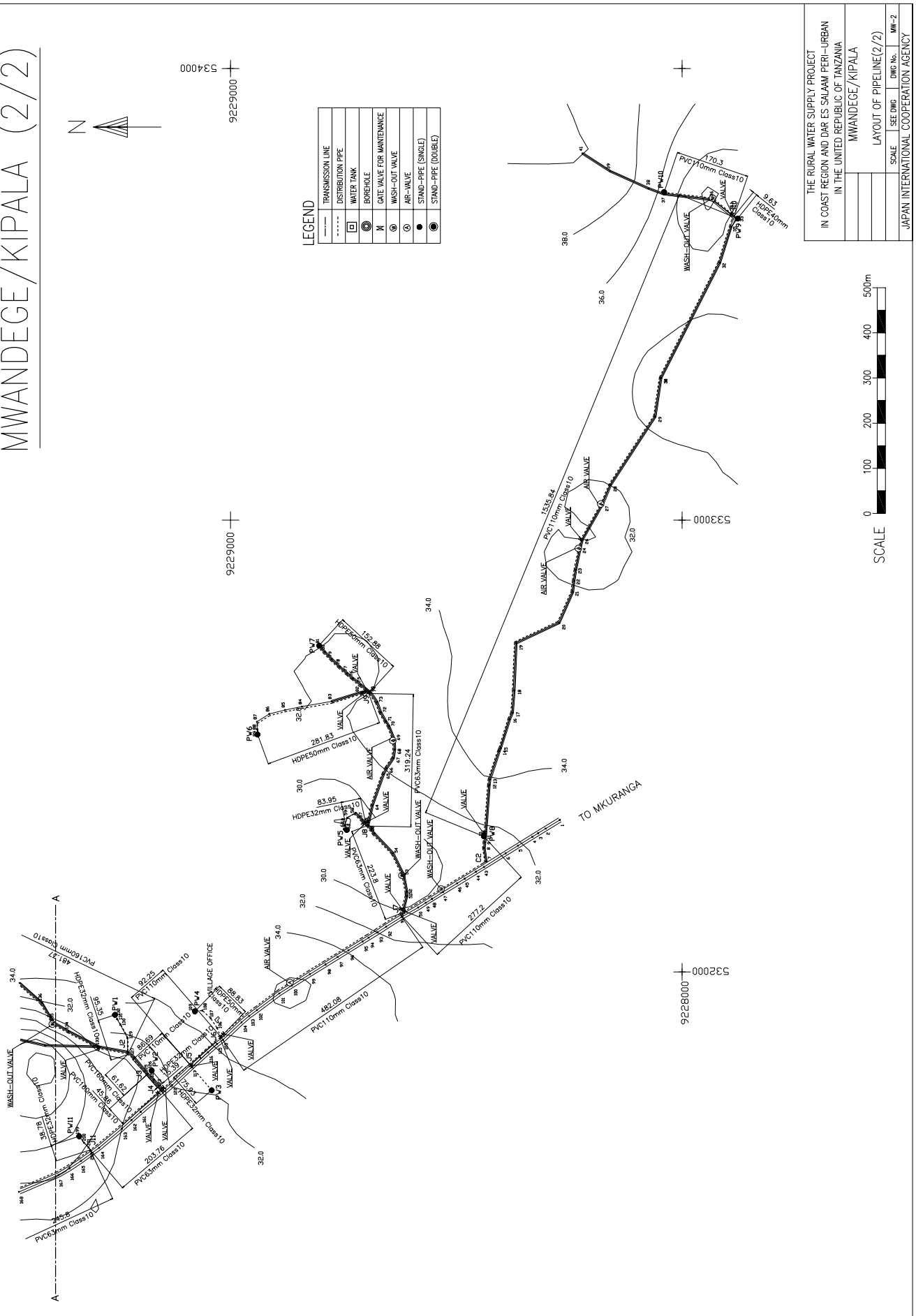


Figure 2.16 Layout Plan of Water Supply Facility (Mwandege/Kipala)

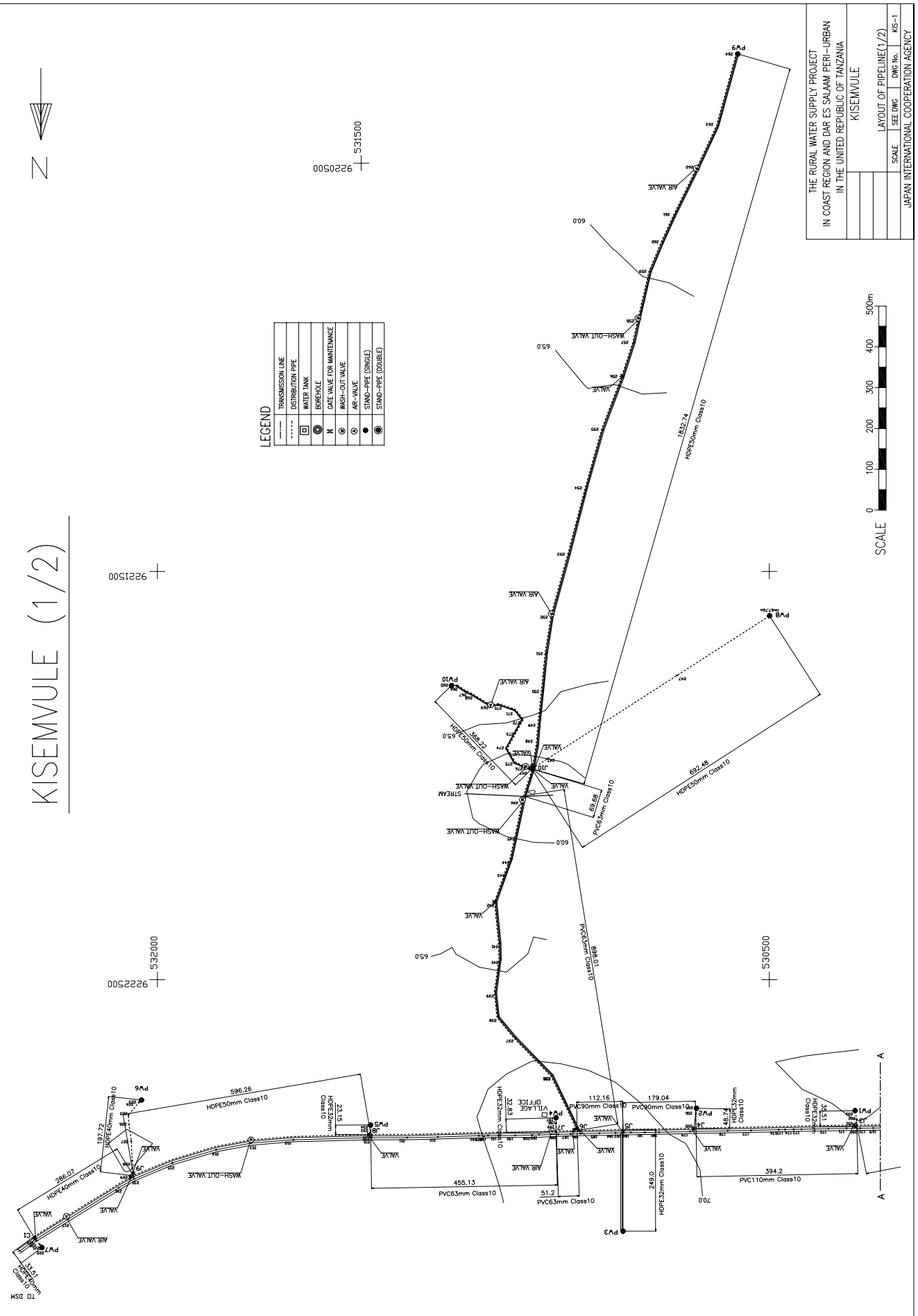


Figure 2.17 Layout Plan of Water Supply Facility (Kisemvule)

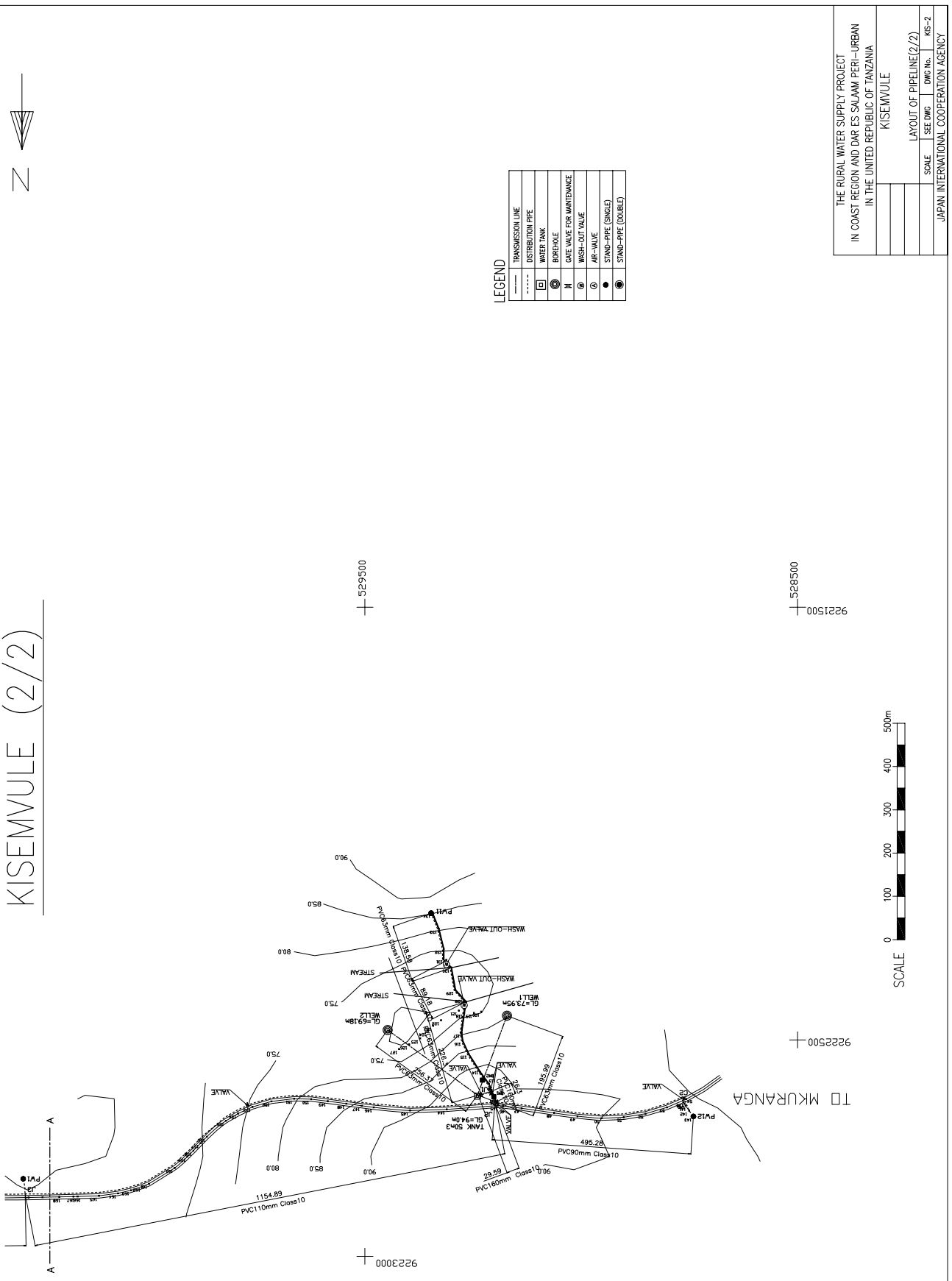


Figure 2.17 Layout Plan of Water Supply Facility (Kisemvule)

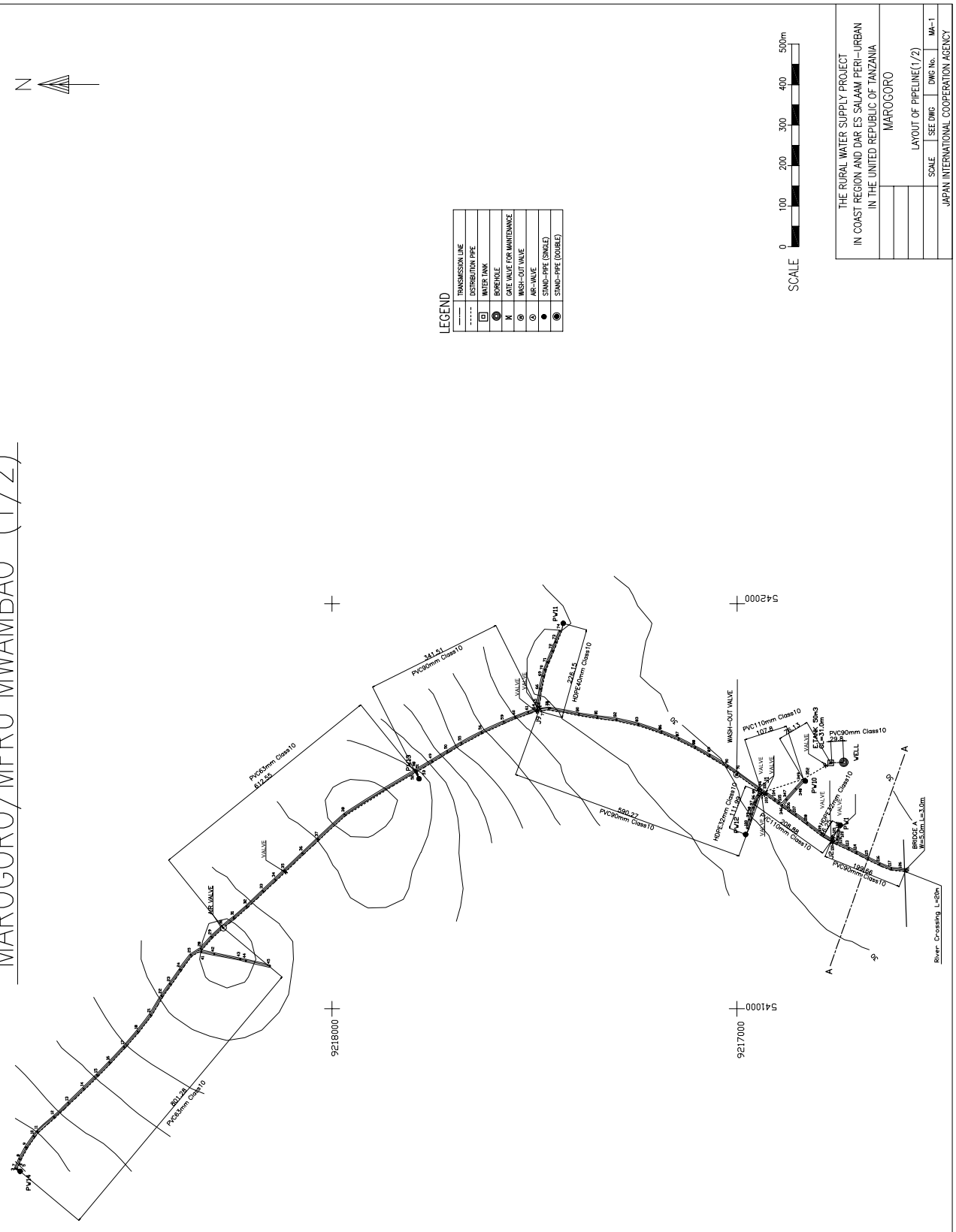


Figure 2.18 Layout Plan of Water Supply Facility (Marogoro/Mfuru Mwambao)

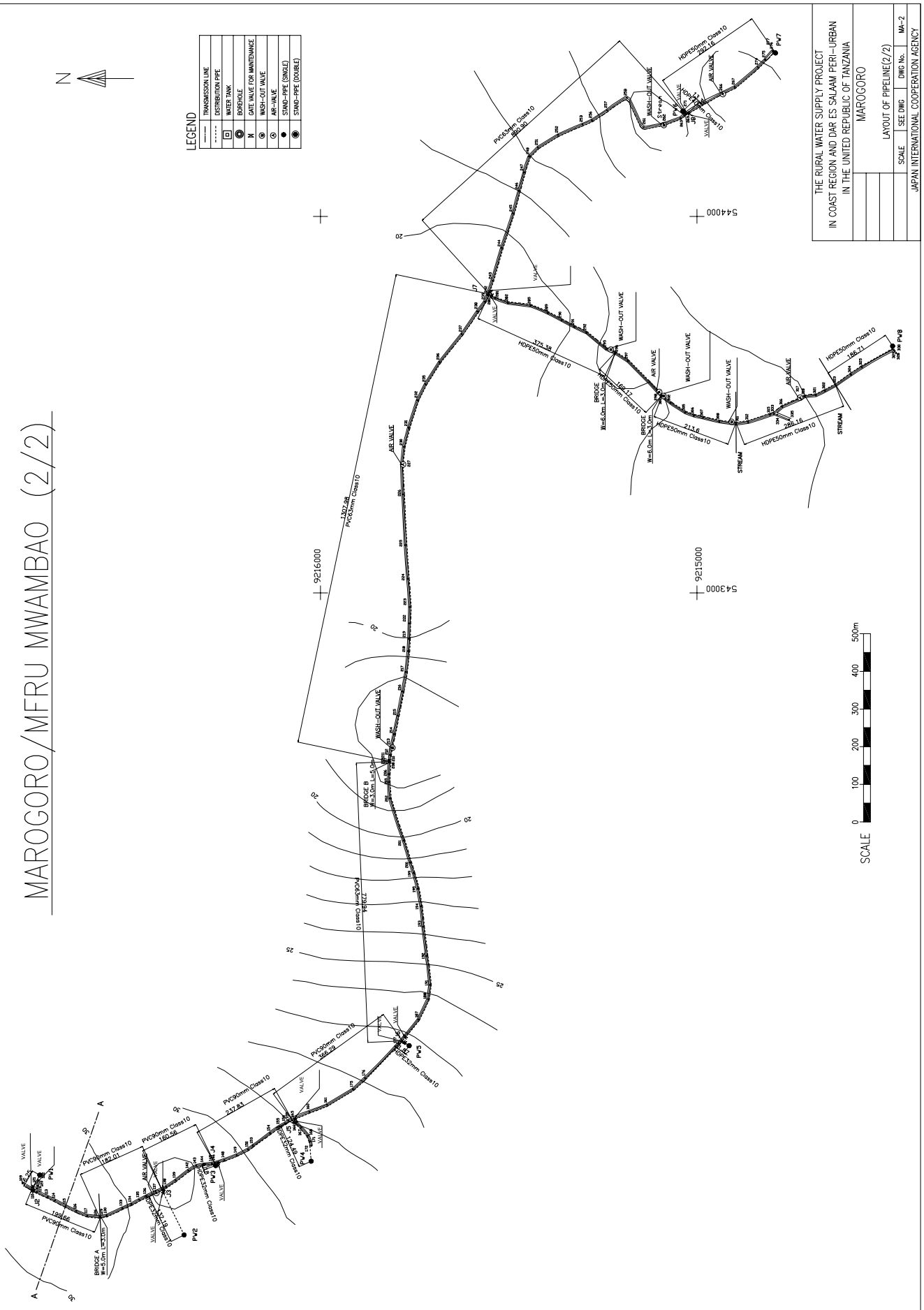


Figure 2.18 Layout Plan of Water Supply Facility (Marogoro/Mfuru Mwambao)

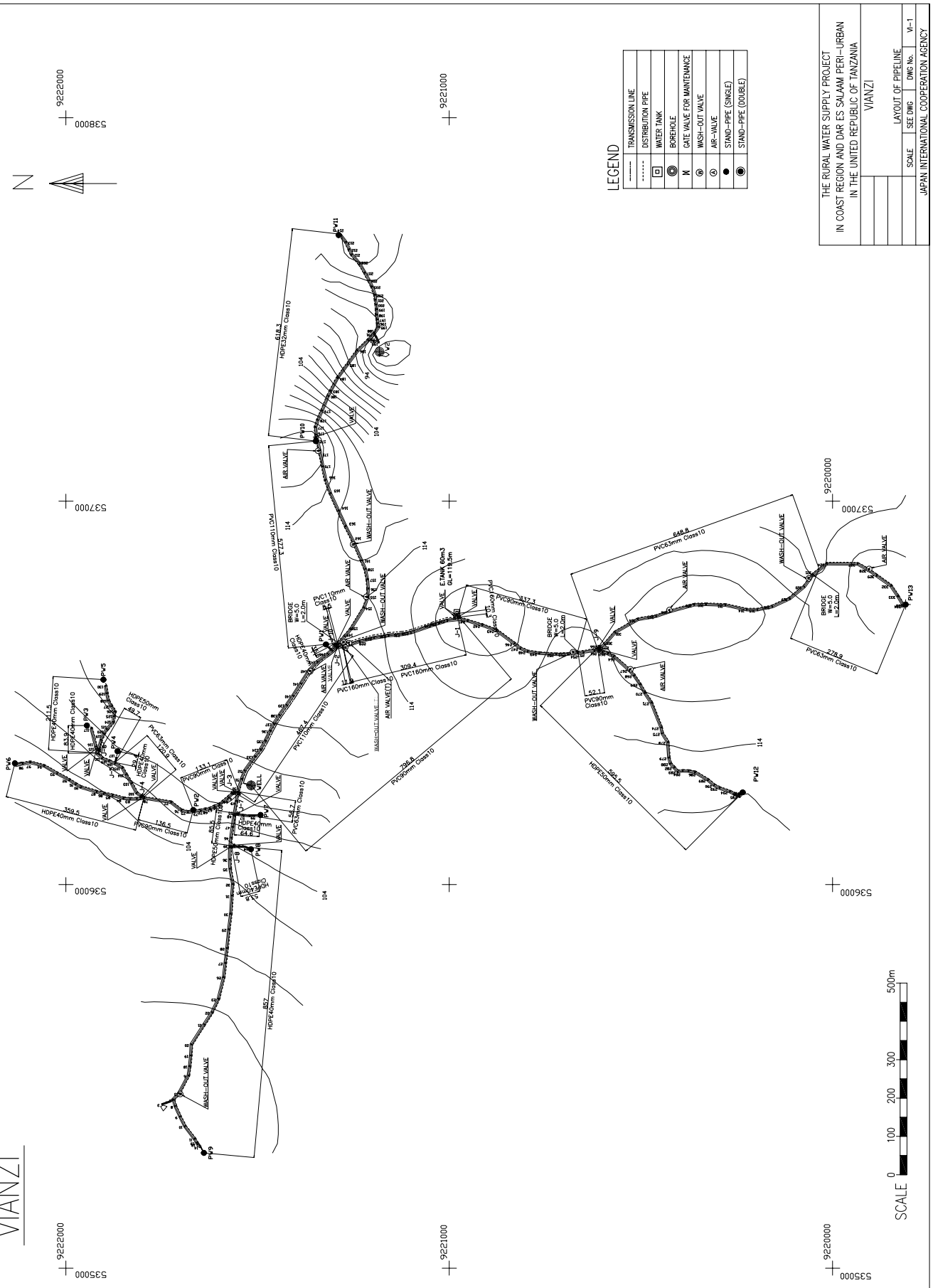


Figure 2.19 Layout Plan of Water Supply Facility (Vianzi)

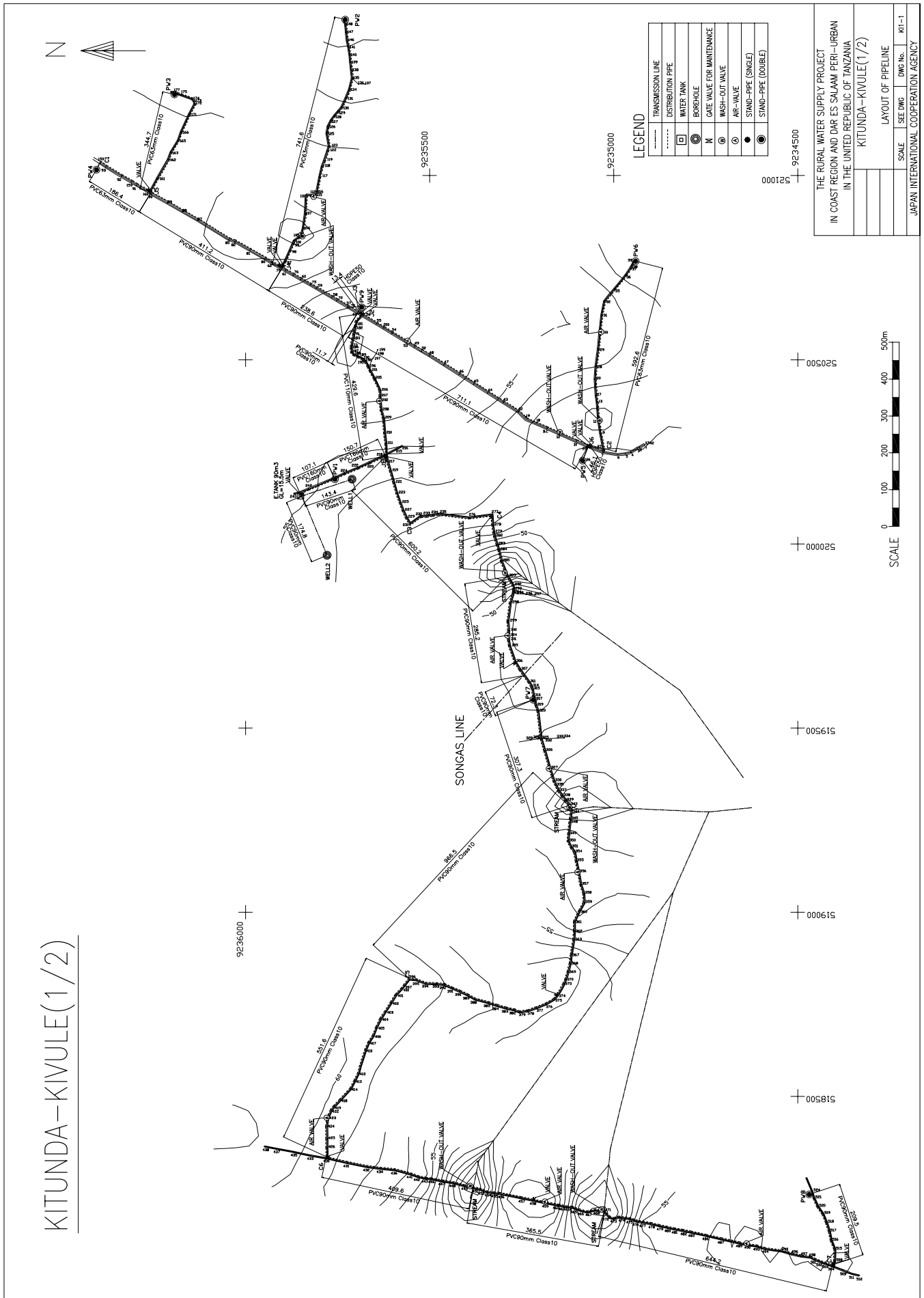


Figure 2.20 Layout Plan of Water Supply Facility (Kitunda-Kivule(1/2))

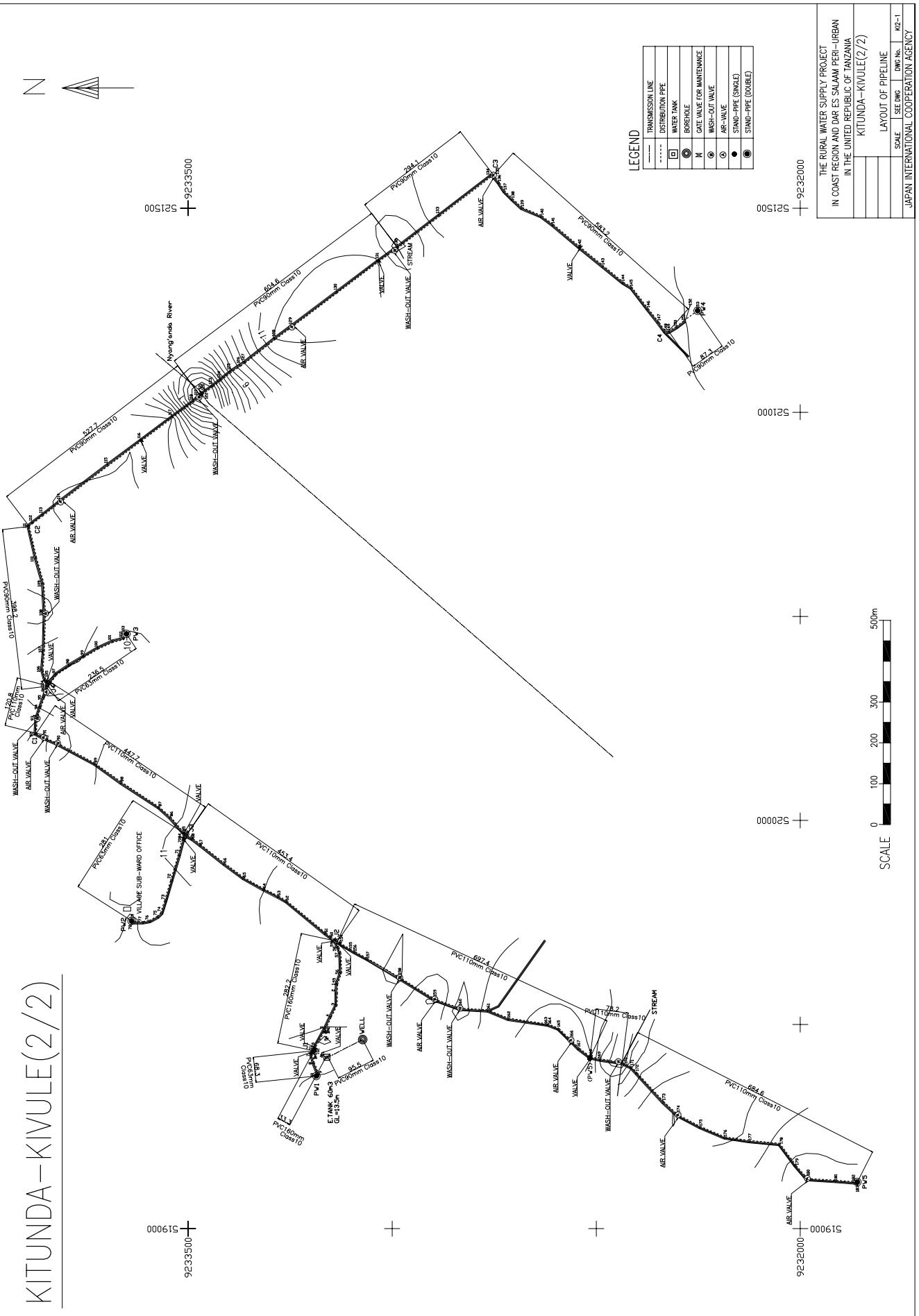


Figure 2.21 Layout Plan of Water Supply Facility (Kitunda–Kivule(2/2))

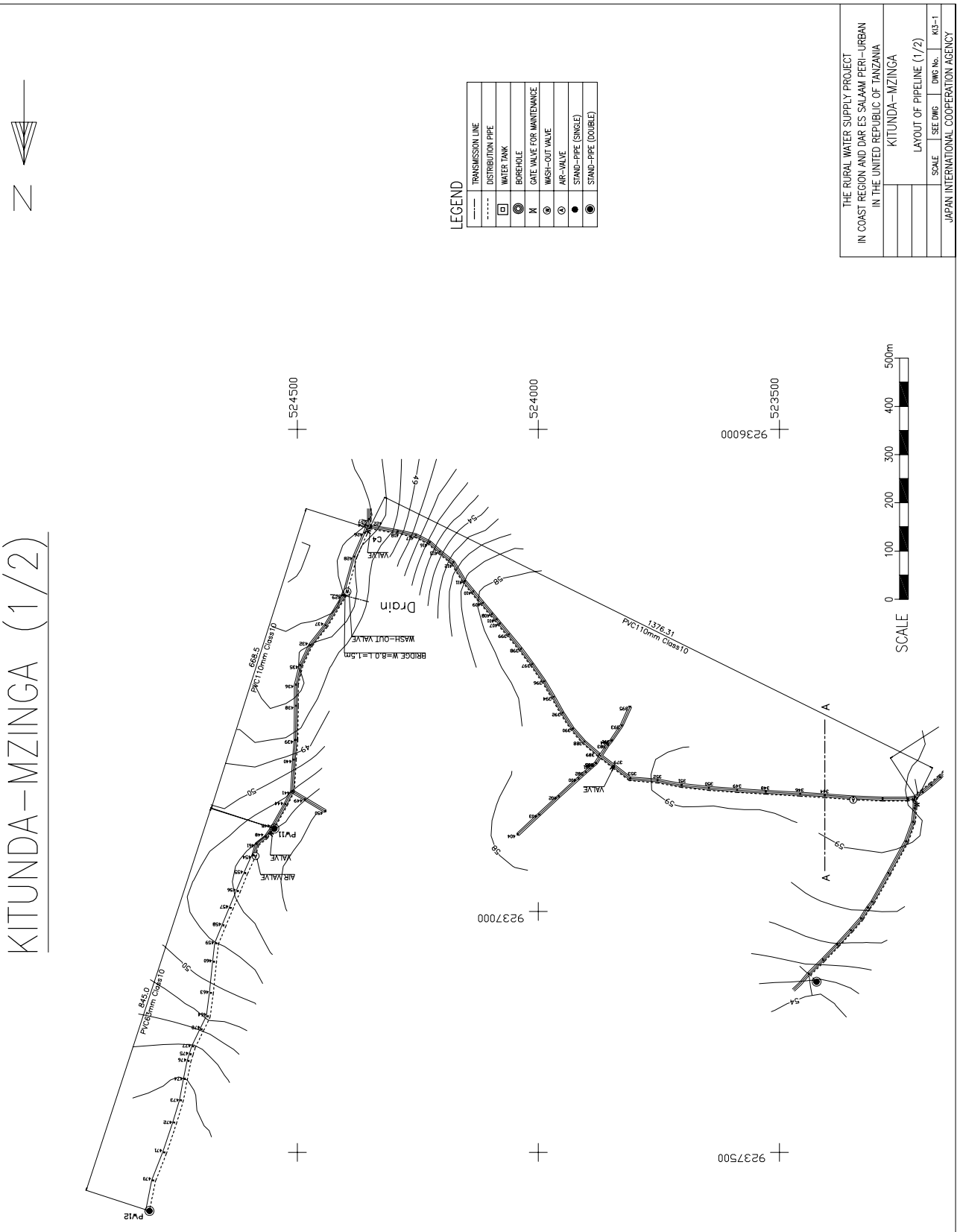


Figure 2.22 Layout Plan of Water Supply Facility (Kitunda-Mzinga)

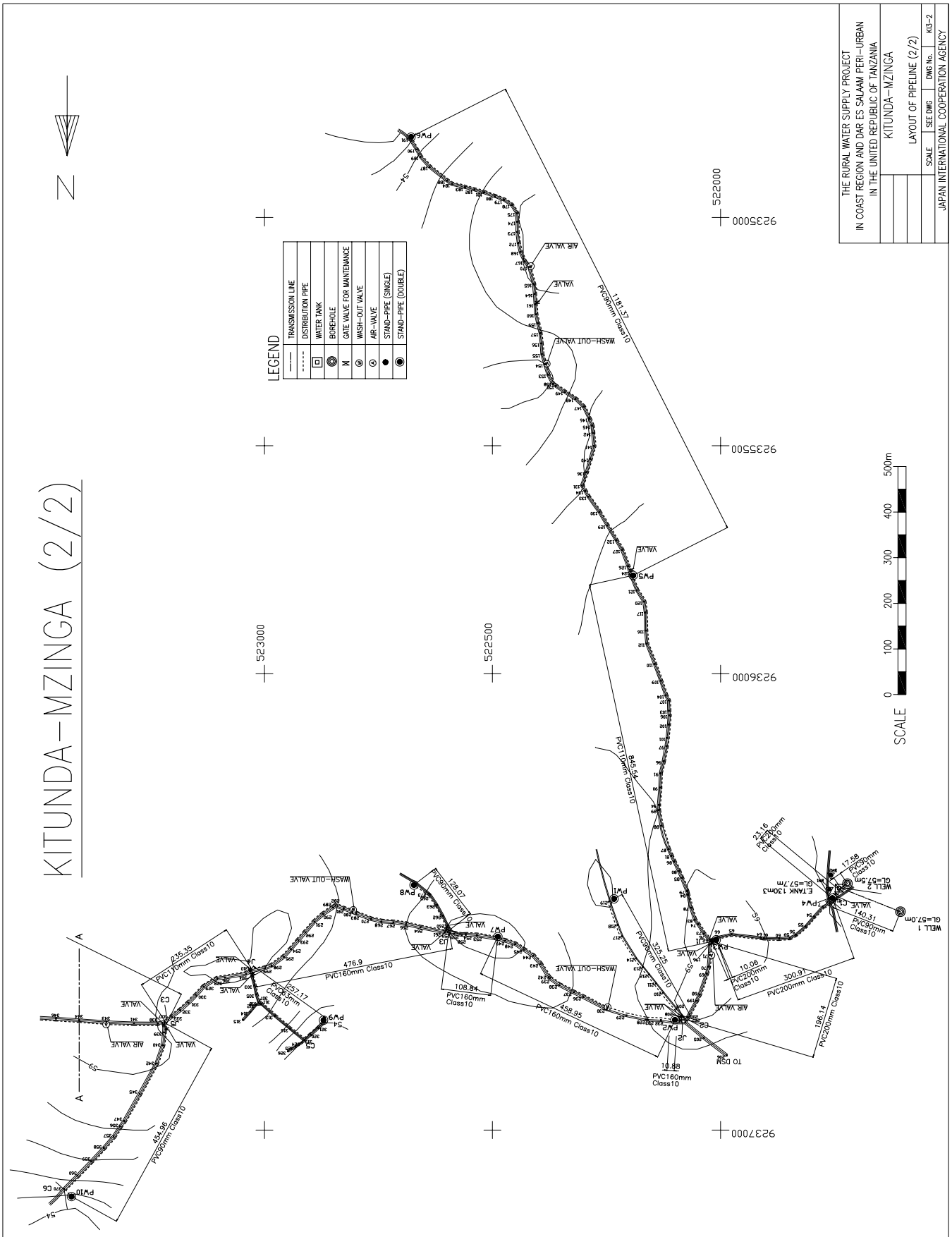


Figure 2.22 Layout Plan of Water Supply Facility (Kitunda–Mzinga)

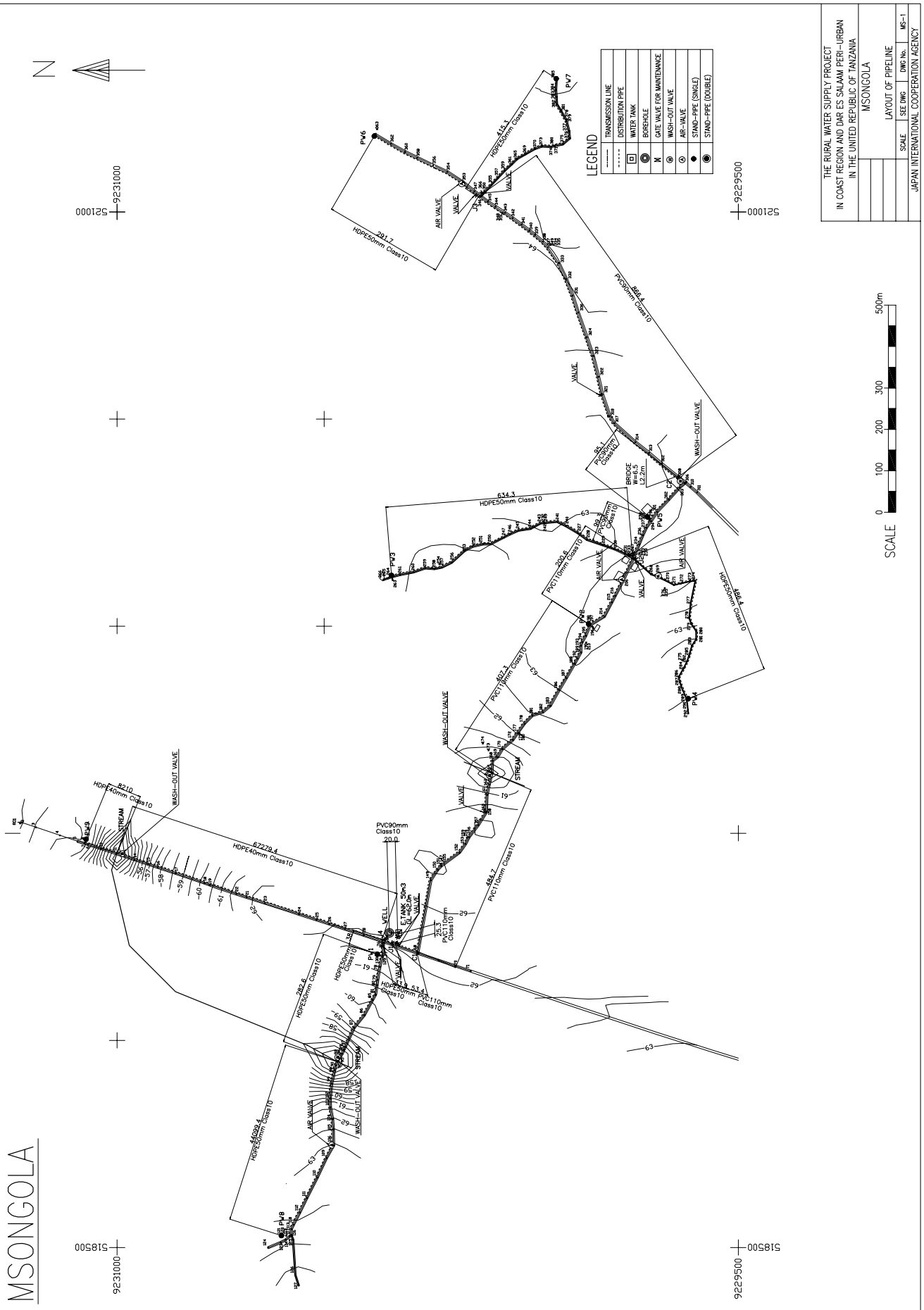


Figure 2.23 Layout Plan of Water Supply Facility (Msongola)

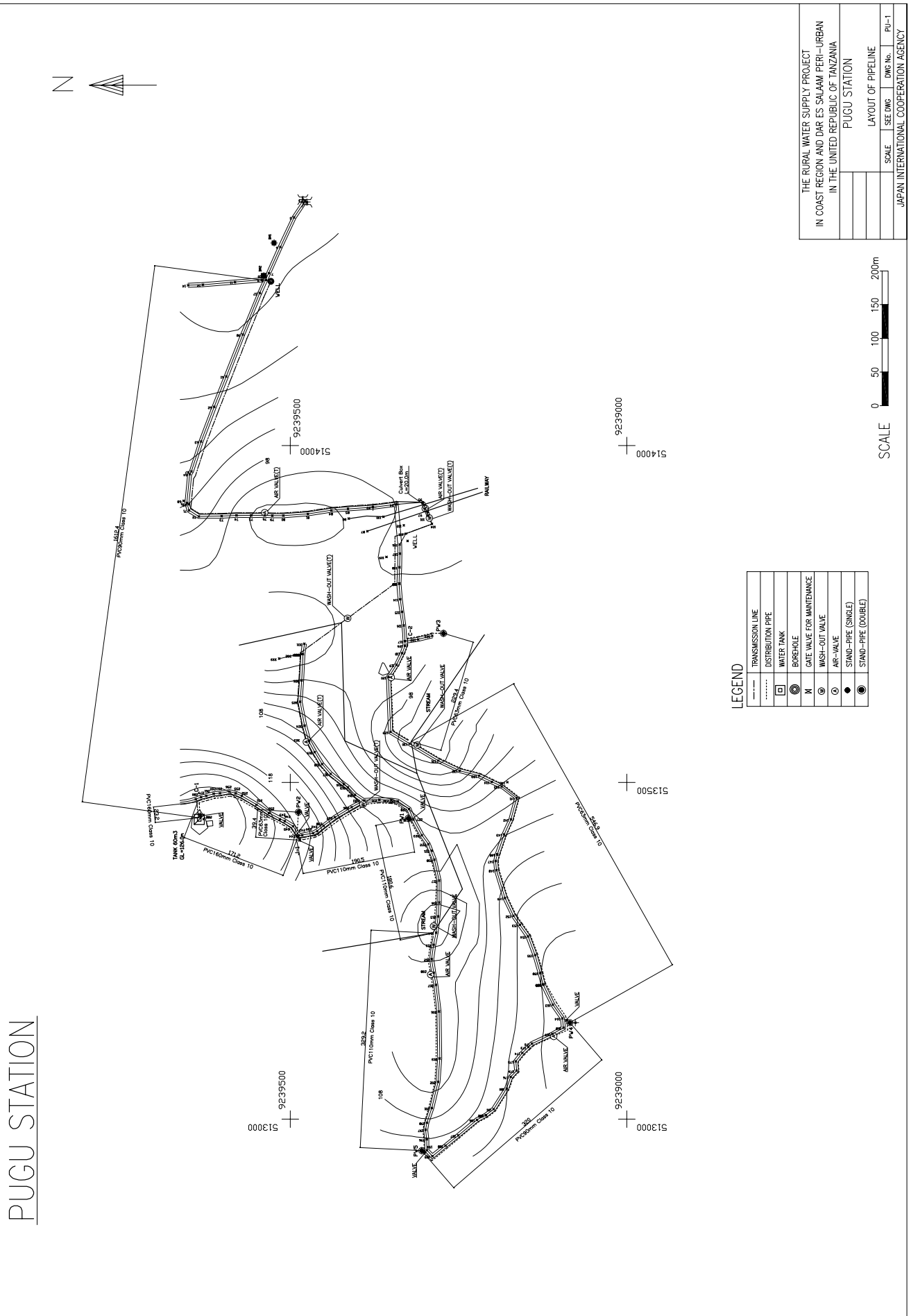


Figure 2.24 Layout Plan of Water Supply Facility (Pugu Station)

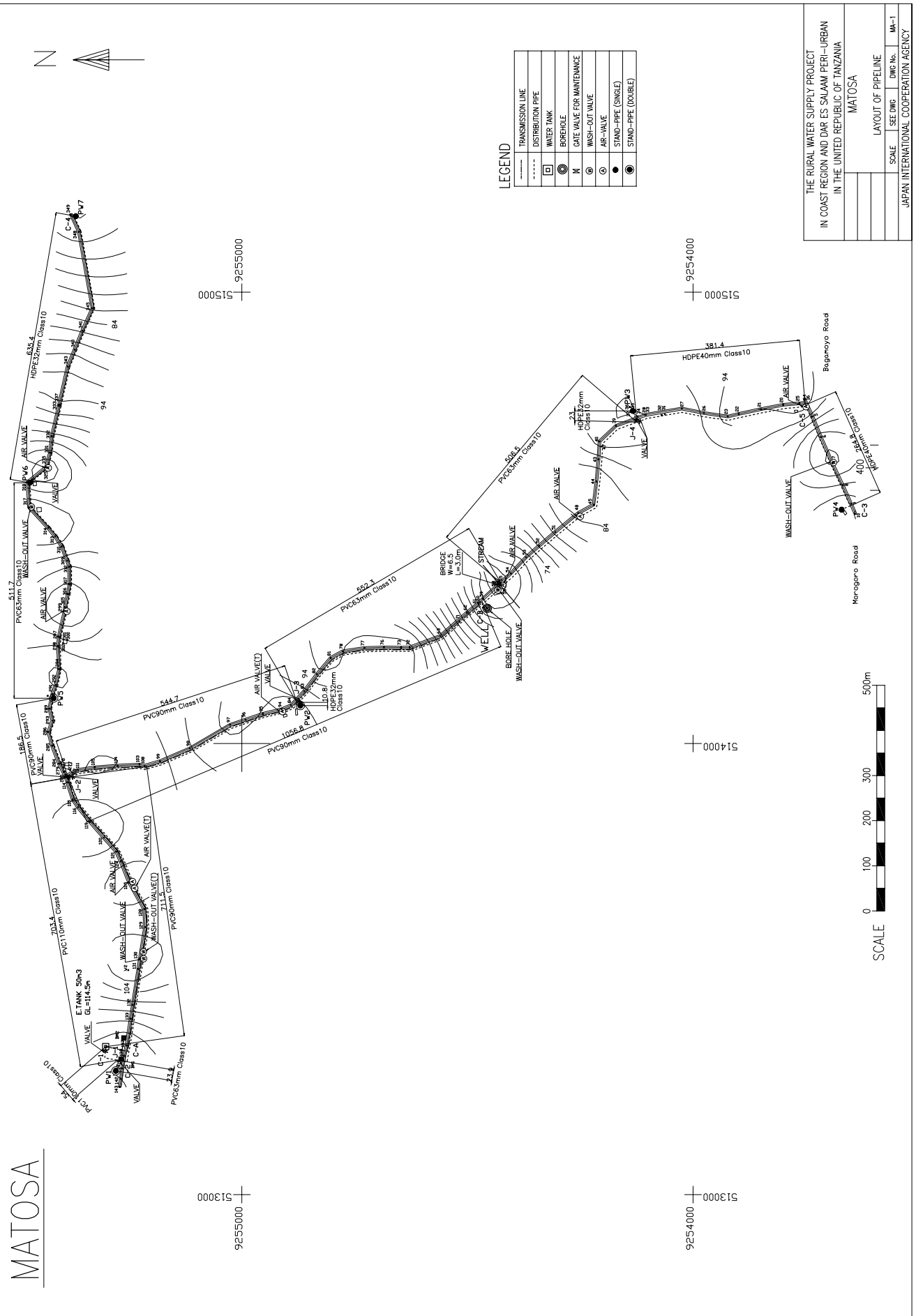


Figure 2.25 Layout Plan of Water Supply Facility (Matosa)

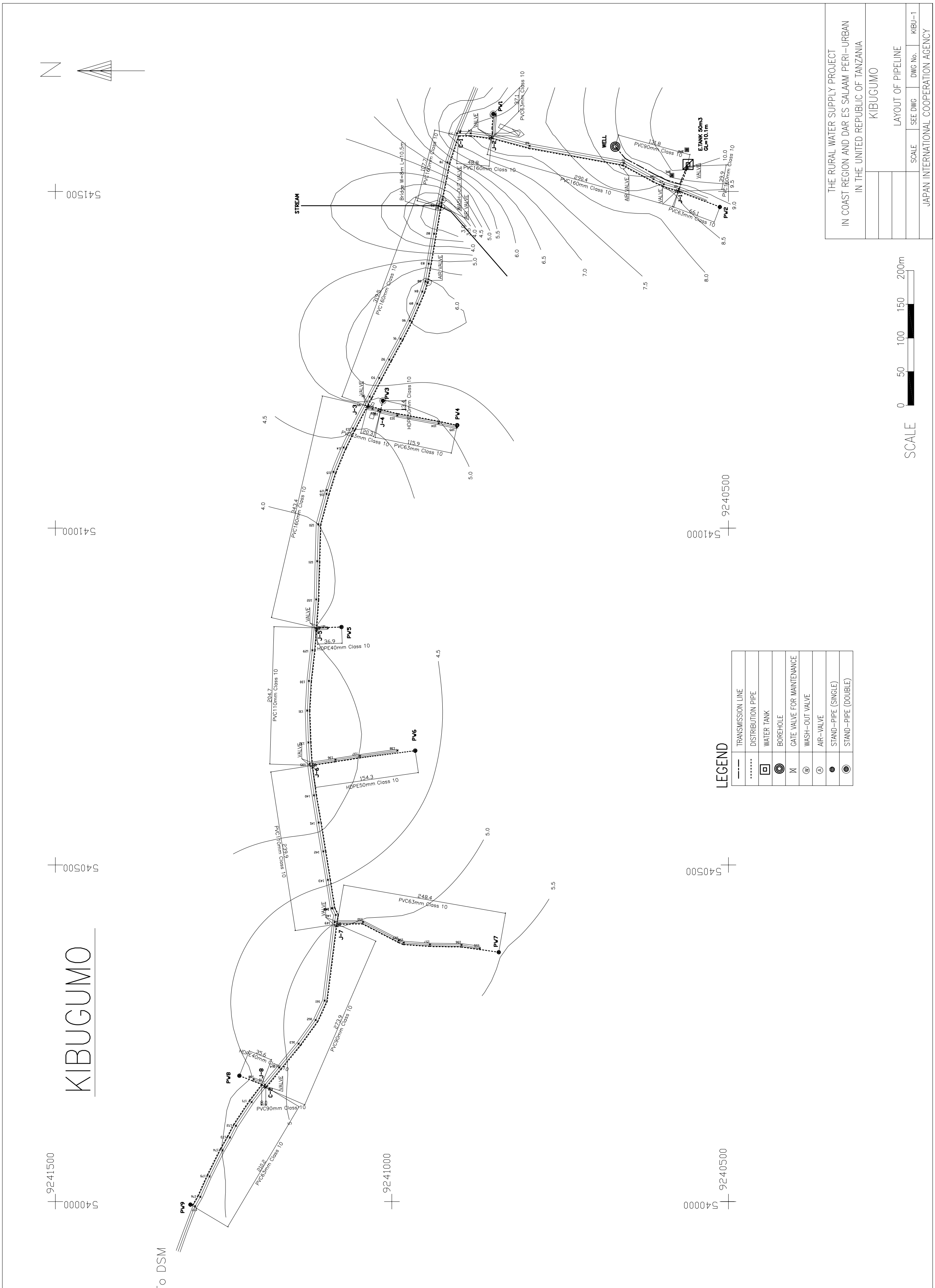


Figure 2.26 Layout Plan of Water Supply Facility (Kibugumo)

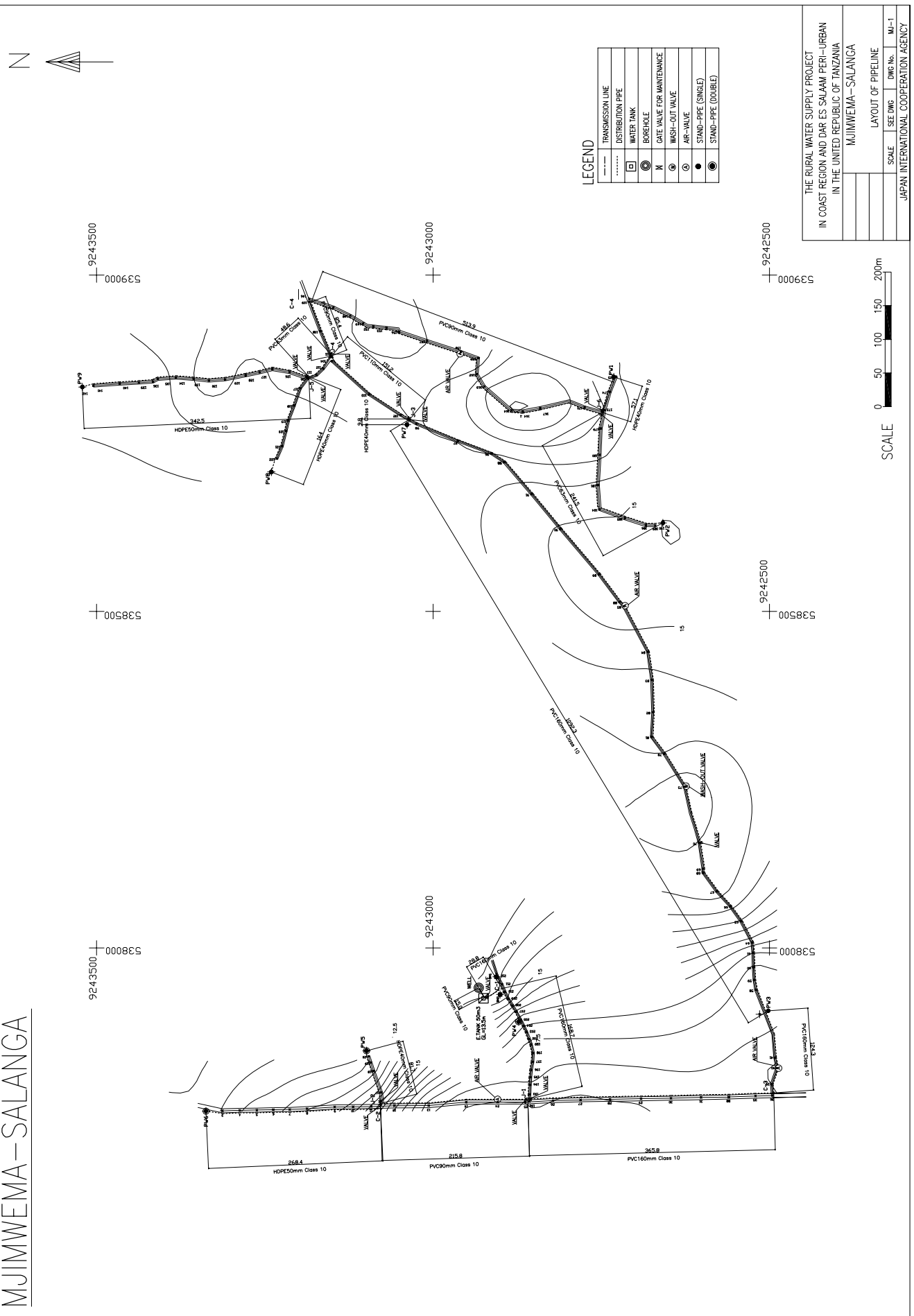


Figure 2.27 Layout Plan of Water Supply Facility (Mjimwema-Salanga)

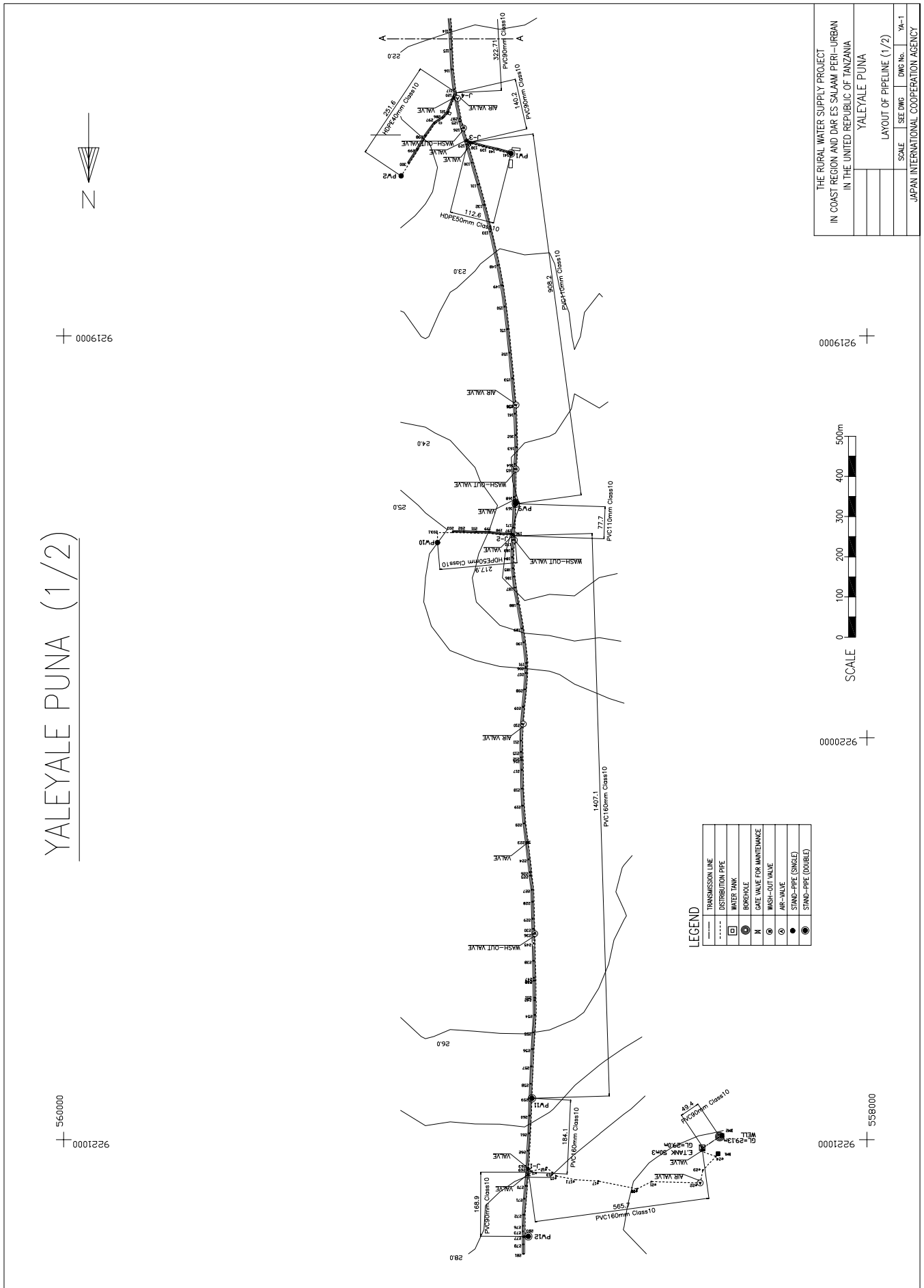


Figure 2.28 Layout Plan of Water Supply Facility (Yaleyale Puna)

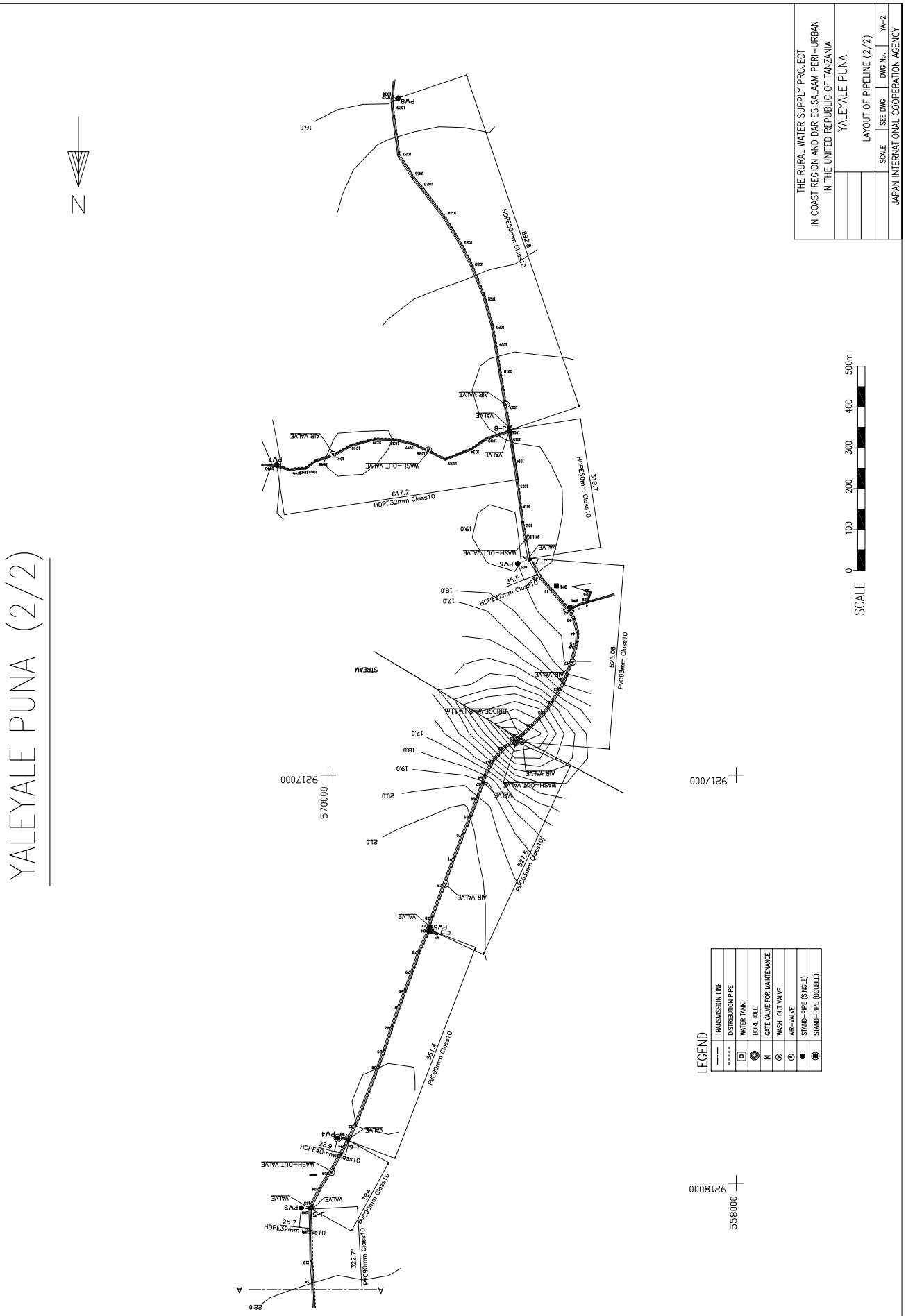


Figure 2.28 Layout Plan of Water Supply Facility (Yaleyale Puna)

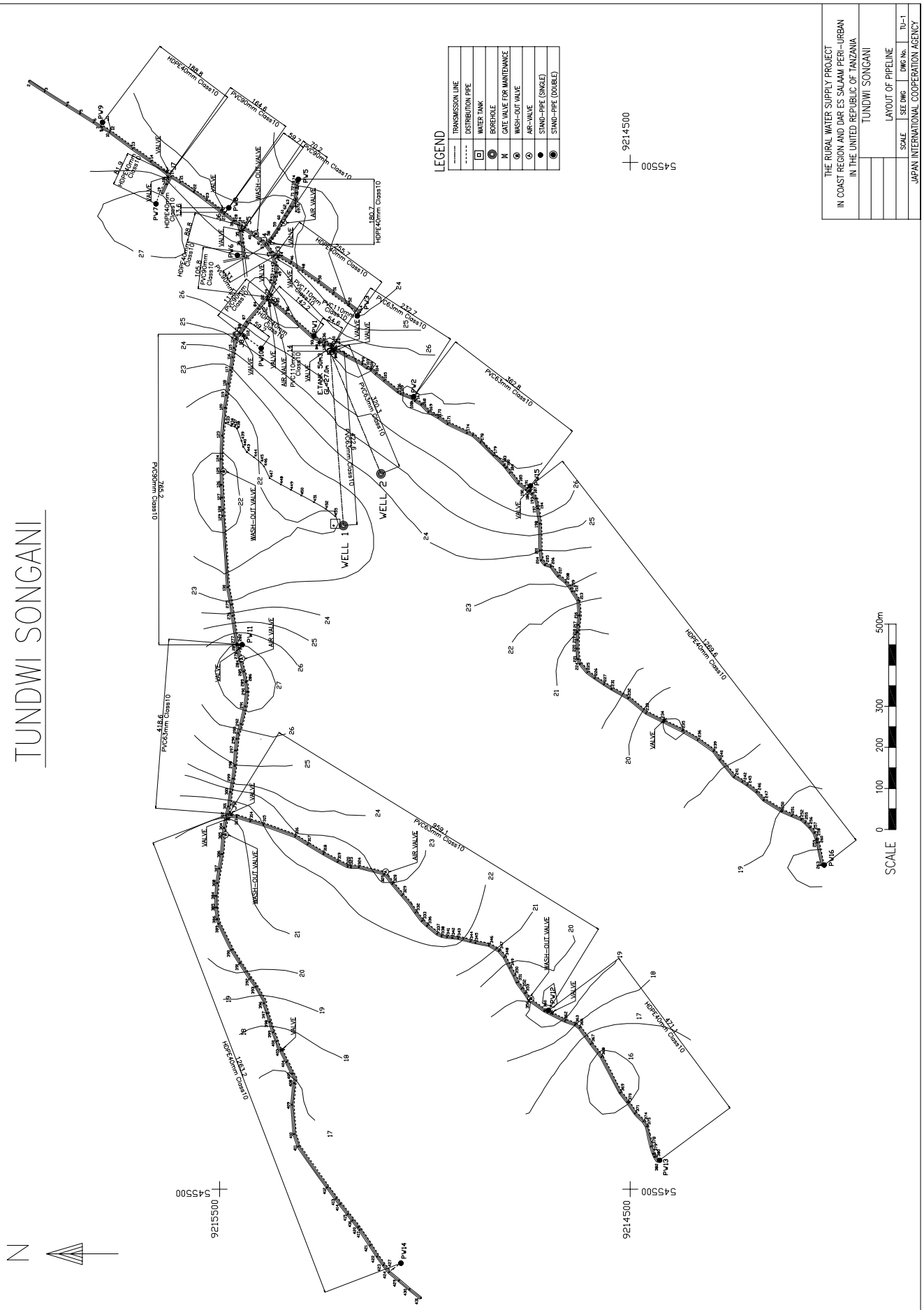


Figure 2.29 Layout Plan of Water Supply Facility (Tundwi Songani)

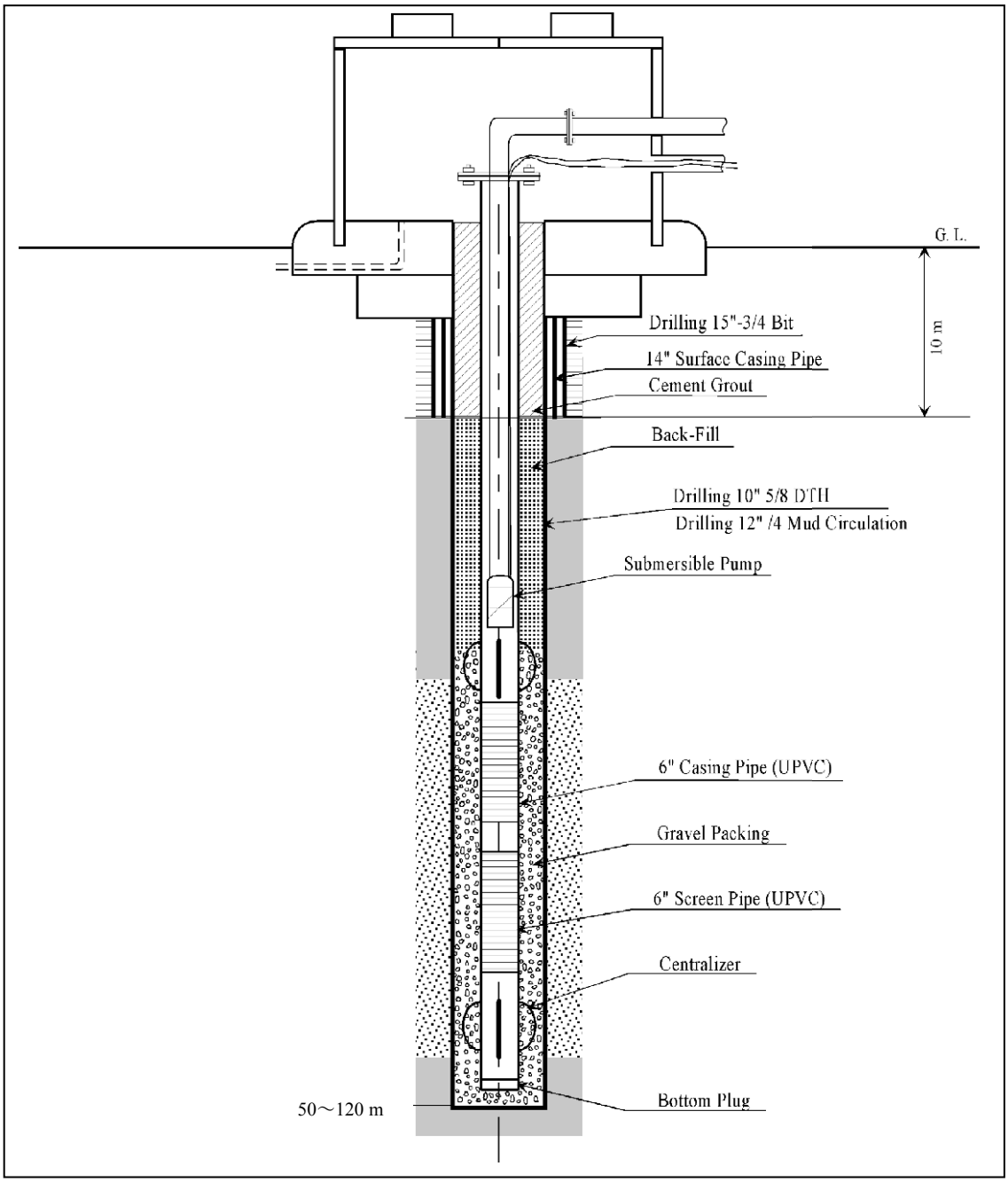


Figure 2.30 Structure of Deep Well for Level-2

Rural Water Supply Project in Coast and DSM Peri-Urban	JICA

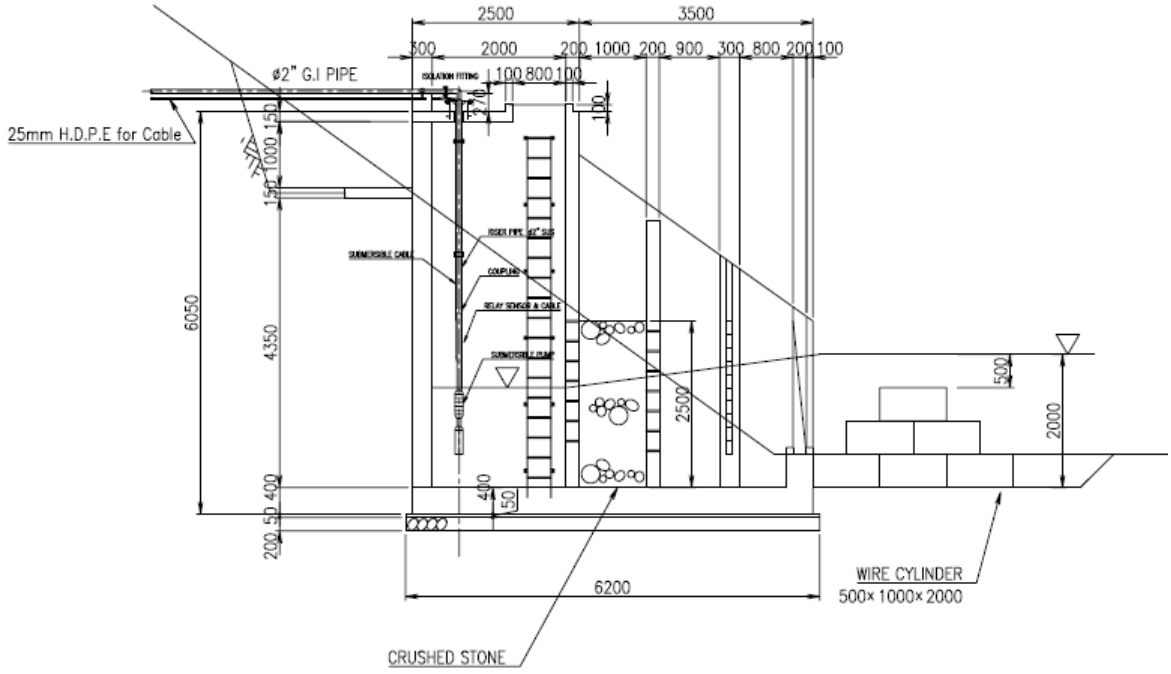


Figure 2.31 Structure of Intake Facility (Njopeka, Mkuranga District)

Rural Water Supply Project in Coast and DSM Peri-Urban	JICA

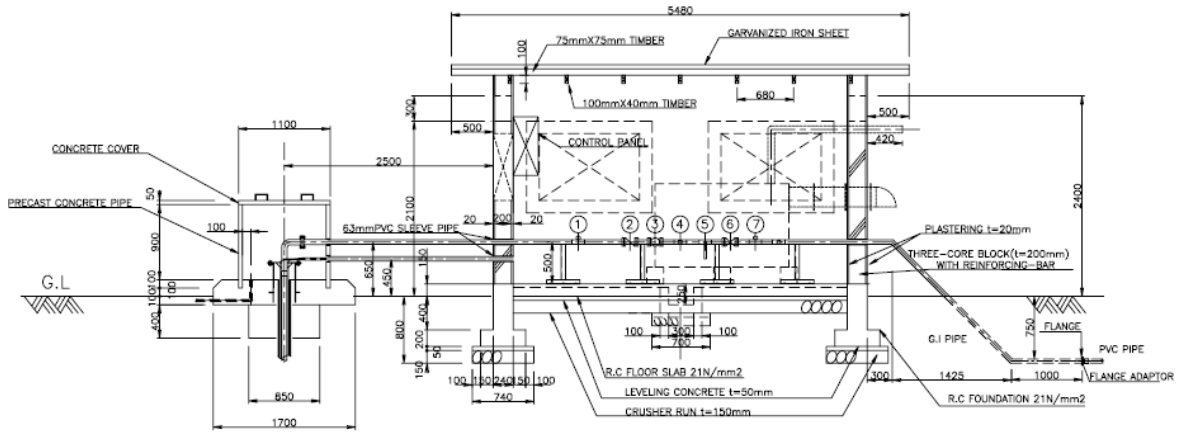
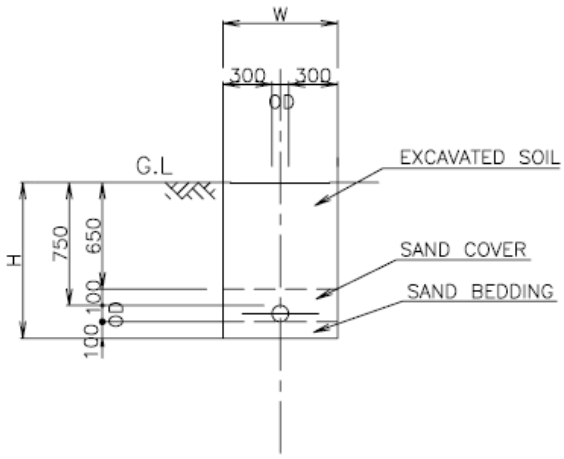


Figure 2.32 Structure of Control House



DIMENSIONS TABLE OF STANDRD PIPE LAYING

OUTSIDE DIA(mm)	W (mm)	H (mm)
32	650	900
40	650	900
50	650	900
63	700	950
90	700	950
110	750	1000
160	800	1050
200	800	1050

Figure 2.33 Layout Design for Transmission and Distribution Lines

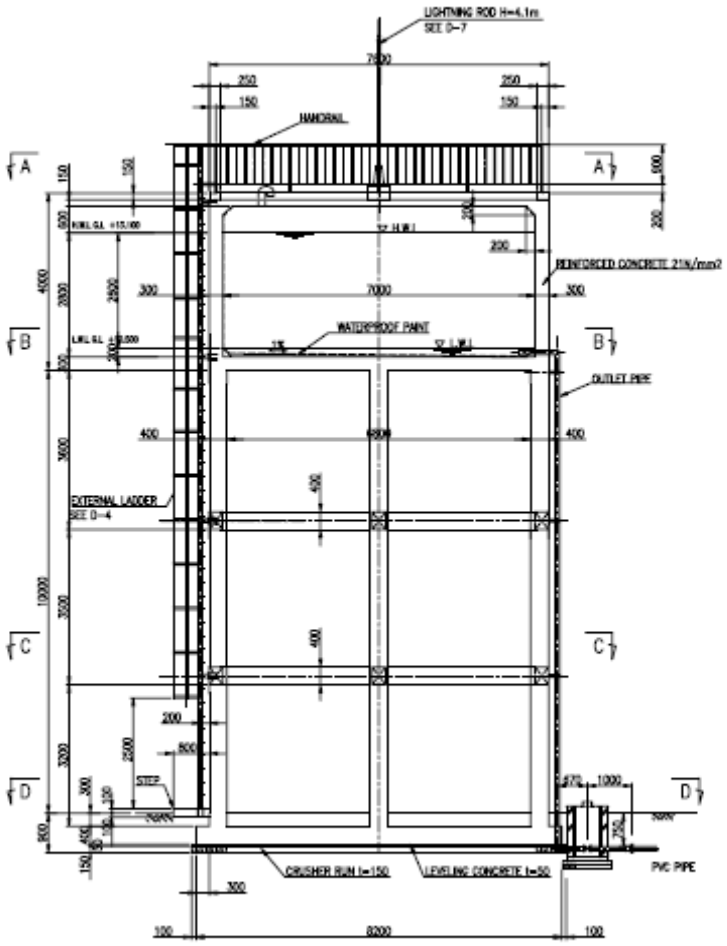


Figure 2.34 Structure of Distribution Tank (Elevated Type)

Rural Water Supply Project in Coast and DSM Peri-Urban	JICA

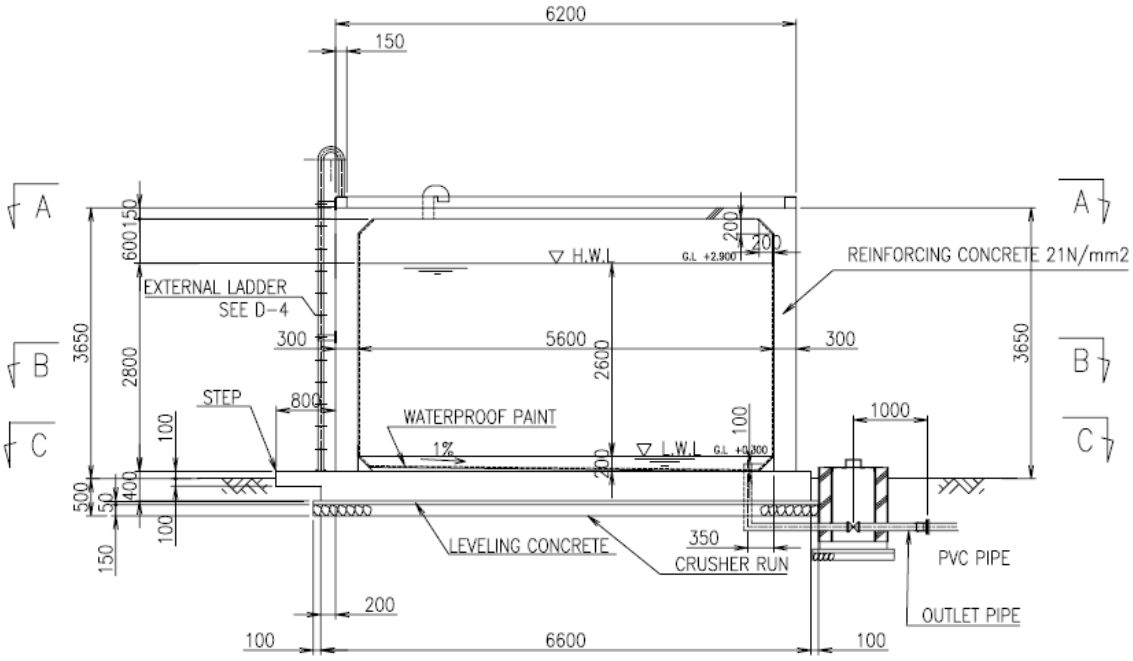
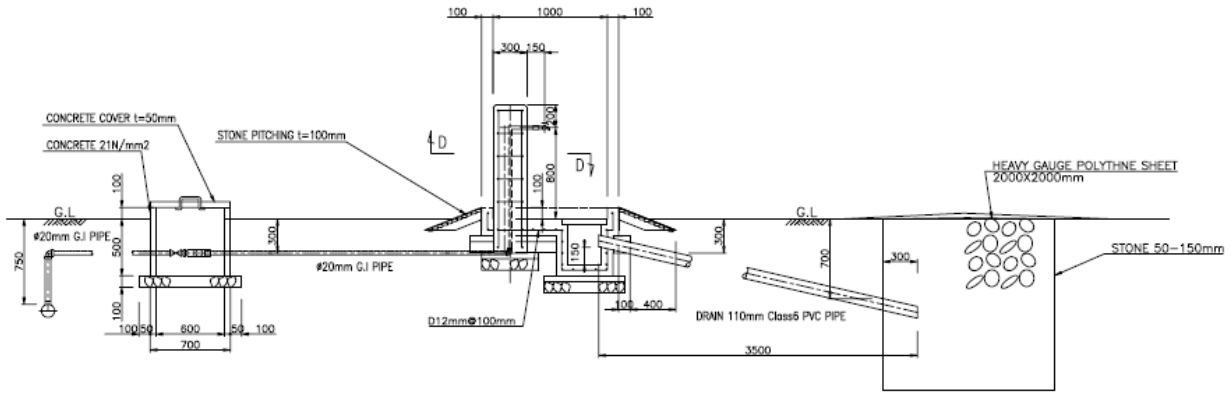
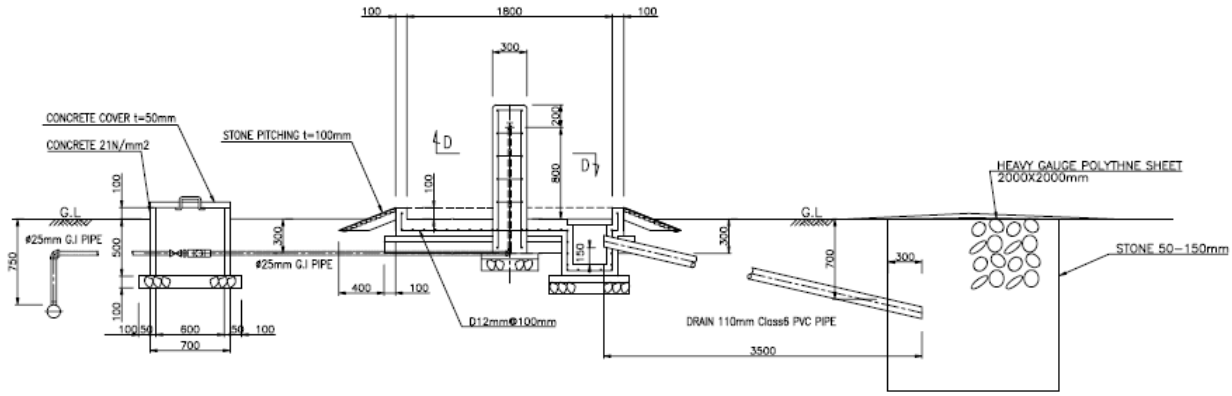


Figure 2.35 Structure of Distribution Tank (Ground Type)

Rural Water Supply Project in Coast and DSM Peri-Urban	JICA



(Single Tap)



(Double Tap)

Figure 2.36 Structure of Public Water Point

Rural Water Supply Project in Coast and DSM Peri-Urban	JICA

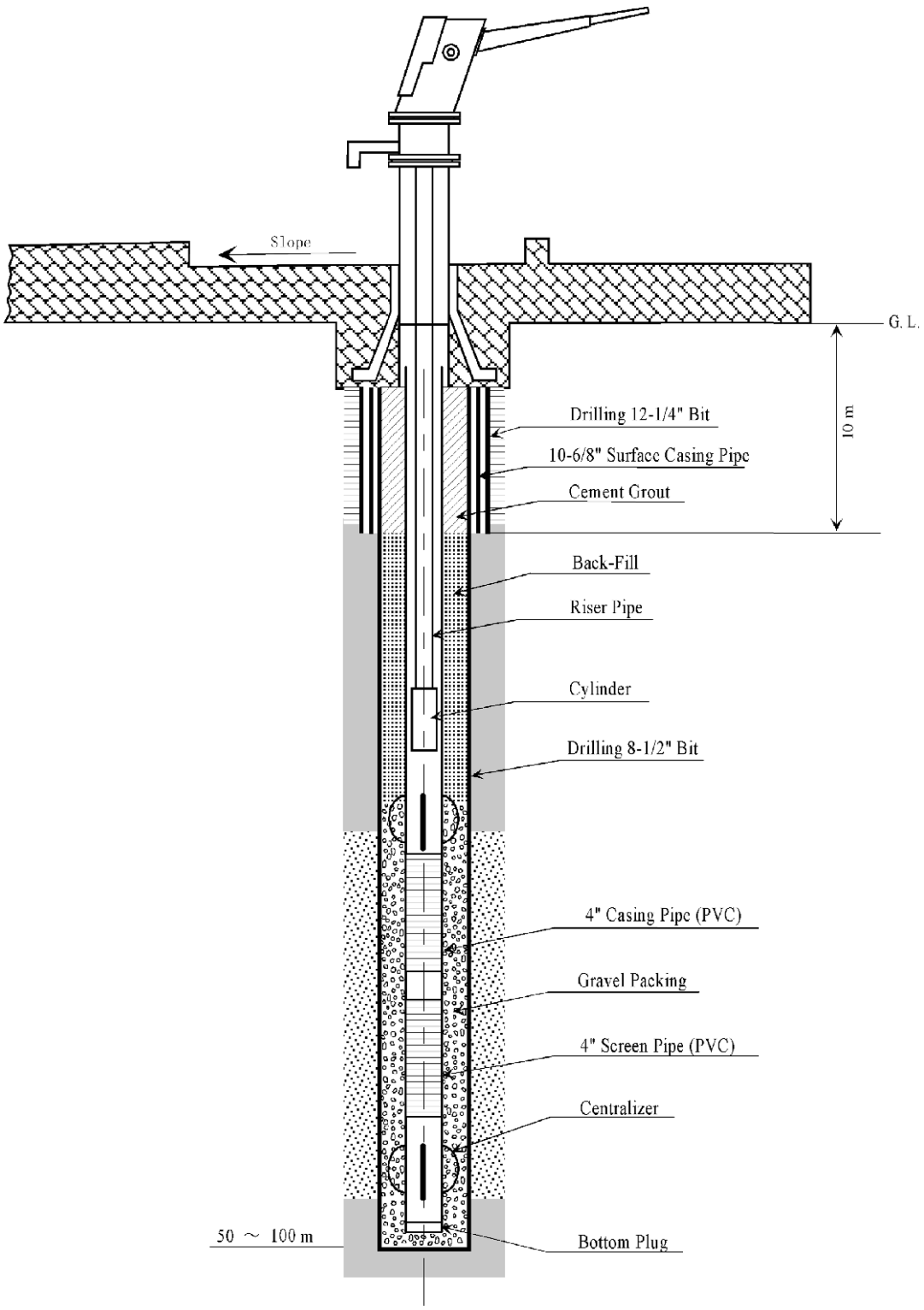


Figure 2.37 Structure of Deep Well with Handpump (Level-1)

Rural Water Supply Project in Coast and DSM Peri-Urban	JICA

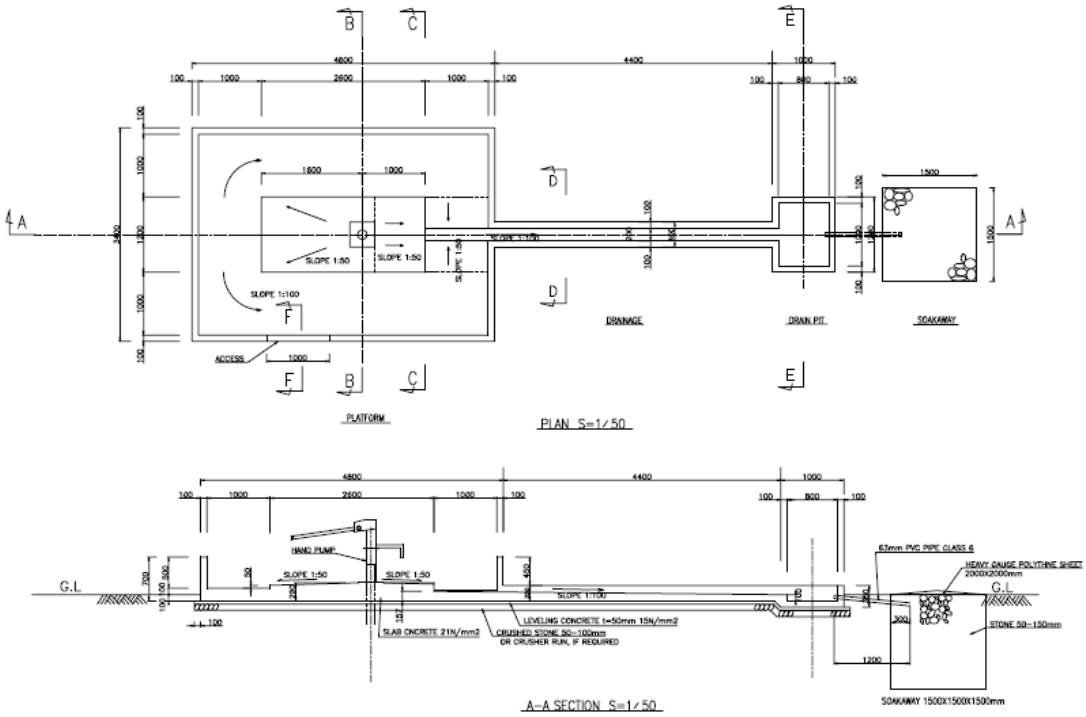


Figure 2.38 Structure of Platform

Rural Water Supply Project in Coast and DSM Peri-Urban	JICA

2.2.4 IMPLEMENTATION PLAN

1) Implementation Policy

Main contractor of construction of water supply facilities designed in the Study shall be a Japanese contractor.

Construction work is composed of deep well drilling, construction of distribution tank, laying out of transmission/distribution lines, construction of public water points and installation of handpump. These works are carried out by local contractor(s) under the supervision by the Japanese contractor.

The implementation agency of the Project is Ministry of Water (MoW), Tanzania. Keeping close relationship with MoW is required in the construction period. In addition, District/Municipal Water Engineer's Office should be involved in order for smooth implementation during the construction works

Materials and machineries to be applied to the construction works should be ones possible to be procured in Tanzania considering well maintenance of the water supply facilities.

2) Implementation Conditions

Accesses to the target villages of the project sometimes become muddy and slippery in rainy season. Construction in such villages shall be carried in mainly dry season.

Pipes are laid along or under the roads operated in service, therefore, it shall be considered to provide safety sign boards and to equip prevention facilities. Furthermore, a point duty is assigned at each site.

Fence for guard is placed at each site office of the contractor, especially around the stock yard of materials.

3) Scope of Works

Scope of Works is divided by both Governments, Tanzania and Japan as shown in Table 2.31.

Table 2.31 Scope of Work for the Tanzanian and Japanese Government

Construction Works	Japanese side	Tanzanian side
1. Construction of Intake		
1.1 Acquisition of land		○
1.2 Provision of land for temporary works		○
1.3 Provision of access road		○
1.4 Construction of intake structure	○	
1.5 Road construction in the site	○	
1.6 Construction of fence and gate	○	
1.7 Electric work up to incoming panel		○
2. Pipe Laying Work for Transmission and Distribution Lines	○	
2.1 Land acquisition		○
2.2 Provision of access road		○
3. Construction of Distribution Tank		
3.1 Land acquisition		○
3.2 Provision of access road		○
3.3 Construction of distribution tank	○	
3.4 Road construction in the site	○	
3.5 Placing fence and gate	○	
3.6 Construction of drainage canal		○
3. Construction of public water point		
4.1 Land acquisition		○
4.2 Construction of public water point	○	
4.3 Construction of drainage canal		○

4) Consultant Supervision

(1) General

The project is implemented under the Japan's Grant Aid Assistance scheme based on the conditions described in the Exchange of Note (E/N) which will be concluded between the Tanzanian Government and the Japanese Government. The implementation agency in Tanzania is Ministry of Water (MoW). Division of rural Water Supply (DRWS) is responsible organization for technical issues in MoW. Supervision and inspection of the construction works are carried out by DRWS.

A Japanese consultant will be employed by MoW for services of the detailed design study, preparation of tender document, assistance in tendering process and construction supervision. In the construction stage, the Japanese consultant supervise the construction works as well as report to and discuss with Embassy of Japan and JICA Office.

Conceptual structure for the project implementation is shown in Figure 2.39.

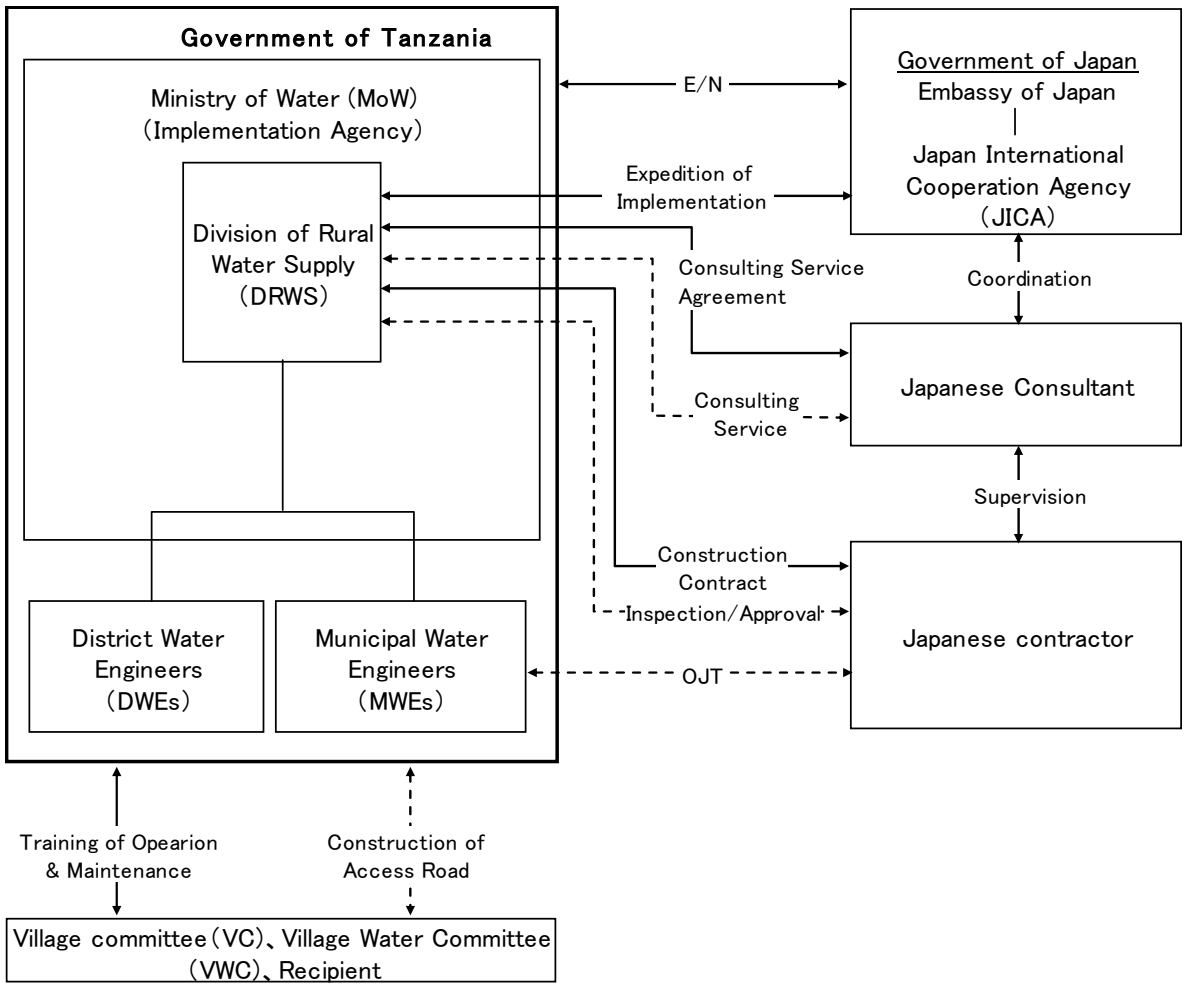


Figure 2.39 Conceptual Structure for the Project Implementation

(2) Basic Concept during Detailed Design Stage

In the detailed design study stage, following works will be conducted.

- In the field work, following works are carried out:
  Site reconnaissance of pipeline routes, investigation of underground structures and other obstacles (electric pole, aerial cable, etc.)
- Geophysical prospecting and test well drilling for water source
- Reviewing of basic design based on the field survey including test well drilling
- Comparison on construction method, structural and temporary planning for decision of implementation plan
- Structural calculation and calculation for temporary works
- Preparation of location map, plans, longitudinal section, detail drawings and structural drawings
- Preparation of calculation sheets on all that necessary for construction
- Confirmation on basic conditions, comparison examination, validity of design, consistency of drawings and calculation sheets

- Reviewing of cost estimation in the basic design stage, based on the decided scale of facilities and quantities
- Preparation of tender documents along the line of the guideline of Japan's Grant Aid Assistance scheme
- Assistance to MoW in the selection of a contractor in line with the tendering procedure stipulated the guideline above

(3) Basic Concept during the Construction Supervision Stage

Major issues of the construction supervision stage are summarized as follows:

- Close coordination with parties concerned for completing the construction work as scheduled in the implementation program of the Project
- Precise and timely advises to the contractor and the executing agency to construct the facilities consistent to design drawing / contract document
- Proper transfer of knowledge to the staff of MoW and DWEs'/MWEs' office on construction methods and techniques to maximize the expected effects of the Grant Aid Project in the form of on-the-job training (OJT)
- Adequate advice and guidance on operation and maintenance of the constructed facilities to facilitate the proper operation of the Project
- To minimize interference to traffic of National Highways in the pipe laying works by cooperation with MoW and DWEs'/MWEs' offices
- In order to achieve project objectives from the early stage, the consultants would pay attention to the progress of construction of distribution pipelines, from the preparatory to construction stages. The consultants will assist its designing and planning to coordinate whole progress of the Project.
- Preparation of Operation and Maintenance (O&M) manual for equipment and pipelines.
  Each manual for equipment or facilities would be made by the manufactures. And the consultants will combine the manuals into a comprehensive O&M manual. It will be used for training in commissioning. Necessary modifications shall be made, if any.

The above supervision works include the following duties and responsibilities:

- Supervision of construction program and quality control, such as approval and inspection of construction materials and works at each step of the construction work.
- Inspection and approval of dimensions, and numbers of the constructed works and facilities.
- Change order to the contraction as required.
- Preparation of reports and papers required as specified by JICA

The above consulting services will be required from the commencement to the completion of the all construction works. Throughout the construction period, a resident engineer will be assigned who coordinates the construction works. In addition, experts in several disciplines will be dispatched to the site in addition to the resident engineers for smooth implementation of the work.

5) Procurement Plan

(1) Local Contractor

Concerning procurement of labors, local staff for labor control will be employed under the Japanese engineers. Local foremen will be positioned under them. Technical transfer will be conducted throughout the construction period in the form of On the Job Training. Common labors are also to be procured locally.

(2) Construction Materials

i) Cement, Reinforcement, Aggregates and Others

Cement is produced in Tanzania by three (3) major manufacturers. Reinforcement is made from basic steel imported from South Africa. Since materials such as sand, aggregates, wooden form, etc. are widely circulated in the local market, it is possible to procure them through local contractors and dealers.

ii) Pipes

PVC and HDPE pipes to be used in the project are processed by two (2) major manufacturers in Tanzania using raw chips imported from Middle Eastern countries. Quality of these is good enough to be used in the project. They are widely used and are obtainable through local agents. As for GPS pipes to be used for road crossing, ones locally processed and/or imported from South Arica are available. Submersible pumps and engine generator should be imported from Japan or the third countries considering the supplying of spare parts and after services.

Table 2.32 Procurement Plan for Major Materials

Material	Tanzania	Japan/Third Country
Cement	◎	
Reinforcement	◎	
Aggregate	◎	
Wooden Form	◎	
PVC Pipe	◎	
HDPE	◎	
Deformed pipe, Valve	◎	○
Submersible pump		◎
Engine generator		◎

Note） ◎: First priority ○: Second priority

iii) Construction Machineries

Construction machineries for civil works are possessed by major contractors in Tanzania. Since no special machineries are required for the construction work of the project, it is possible to lease these machineries from the contractors.

iv) Inland Transportation

Among the materials and equipment, those to be imported from Japan are transported to the stock yard in Dar es Salaam after unshipped at Dar es Salaam Port and then separately transported to each site. Part ways of the transportation route to each site are paved main roads, therefore, road condition is no problem. Although the routes from the main roads are not paved, no problem is found for transportation. However, some sections of the route require maintenance in rainy seasons. Time for transpiration to each site form Dar es Salaam is shown in Table 2.33.

Table 2.33 Time for Transpiration to Each Site form Dar es Salaam

Site	Time for Transportation
Bagamoyo District	4 to 5 hours
Kibaha District	3 hours
Kisarawe District	1.5 to 4 hours
Mkuranga District	1 to 2 hours
Ilala Municipality	1 to 2 hours
Kinondoni Municipality	1 hour
Temeke Municipality	1 to 3 hours

6) Quality Control Plan

Quality control plan for the project is summarized in Table 2.34.

Table 2.34 Quality Control Plan for Major Type of Works

Type of Works	Quality Control Items	Test Method
Placement of concrete	Strength of concrete	Compression stress: 3 test pieces/placement
	Salt contents of concrete	Salt contents test: each placement
	Viscosity of concrete	Slump test: each placement
	Strength of coarse aggregate	Sieve analysis: each supplier
	Strength of fine aggregate	Sieve analysis: each supplier
Process and assembling of reinforcement	Strength of reinforcement	Tensile test of reinforcement: each supplier
Pipe laying work	Condition of pipe connection	Water pressure test: Every distribution lines

7) Operational Guidance Plan

Among the water supply facilities, facilities and machineries necessary to guide the operation and maintenance at the initial stage are summarized in Table 2.35.

Table 2.35 Operational Guidance Plan for Water Supply Facilities and Machineries

Type of Facility	Target facility	Contents of Guidance	Method of Guidance
Level-2	Intake	Operation of generator	Will be done by the contractor using manuals prepared by makers during the test operation and delivery of facilities.
		Operation of submersible pump and control box	
		Maintenance of pipes in the control house	Will be done by the consultant during the test operation and delivery of facilities.
	Distribution Tank	Check and maintenance of ball taps	Will be done by the consultant when delivery of facilities.
	Pipelines	Operation of valve	
		Leakage control	
	Public Water Points	Maintenance of flow meter	
		Wearing of packing	
Level-1	Handpump	Exchange of valve	
		Cleaning of well site	

8) Software Component Plan

Introducing of COWSO is proposed for Operation and Maintenance (O&M) of the water supply facilities constructed in the project to keep proper O&M after transferring the facilities to the villages. Assistance by DWST organized in Districts and Municipalities is indispensable for smooth introduction of COWSO. Therefore, a software component programme is proposed at the initial stage of the project to assist the developing capacity of persons of Districts and Municipalities concerned to the DWST.

(1) Expected Output

i) Community-based operation and maintenance mechanism is established and enhanced in the target community

ii) Capacity of District/Municipal Council to provide technical guidance for the communities is improved

(i) Objectives

In order to achieve the project objective of “safe and stable water is supplied to and consumed by the target communities through the water supply scheme constructed by the Project” and assure sustainability of impact brought by the Project, the software component of the Project is

implemented to establish community-based operation and maintenance mechanism and enhance capacity of local authorities in provision of technical guidance to the target communities.

(ii) Activities and Output

Activities of software component is composed of (1) establishment and enhancement of O&M system of the water supply facility in the target villages and (2) capacity development of staff of Districts and Municipalities concerned with the project to assist the target villages. Activities, objectives, target audience and output are summarized in Table 2.36.

Table 2.36 Activity Plan for Software Component Programme

Activity	Output	Target	Means of Implementation	Period	Implementer【Responsibility】	Output of Submission
Stage 1：Pre-Planning						
☐ Preparation of Field Manual 【Contents of Manual】 ➢ Leadership Skill ➢ Organizational Management Skill ➢ Financial Management ➢ Technical Operation and Maintenance ➢ PHAST (Participatory Health and Sanitation Transformation) ➢ Participatory Monitoring and Evaluation	Field implementation manual for trainers, which is utilized in the implementation of field activities, is prepared.	4 Districts 3 Municipalities	Consultation and needs assessment with implementing agency, preparation and development	20 days	Japanese Consultant NGO/Local Consultant 【Japanese Side】	Field Manual
☐ Formation of DWST/MWST (District/Municipal Water and Sanitation Team	DWST/MWST, which composes of district/municipal staff involved in development of water and sanitation sector, is formed in each district and municipality, and multi sector approaches can be introduced.	4 Districts 3 Municipalities	Request to each district and municipality by implementing agency	0.5 month/ district, municipality	MoW, District/Municipal Council 【Tanzanian Side】	Member list of DWST/MWST
☐ Provision of TOT (Training of Trainers) for DWST/MWST and Preparation of DWST/MWST Action Plan 【Contents】 ➢ Leadership Skill ➢ Organizational Management Skill ➢ Financial Management ➢ Technical Operation and Maintenance ➢ PHAST (Participatory Health and Sanitation Transformation) ➢ Participatory Monitoring and Evaluation	Utilizing field implementation manual, facilitation skills of DWST/MWST are improved, and DWST/MWST Action Plan for the implementation of software component program is prepared.	4 DWST 3 MWST	Workshop seminar	5 days/ district, municipality	Japanese Consultant NGO/Local Consultant 【Japanese Side】	Workshop Report DWST/MWST Action Plan

Activity	Output	Target	Means of Implementation	Period	Implementer【Responsibility】	Output of Submission
Stage 2: Participatory Planning						
☐ Community Consultative Meeting, and Confirmation of Pre-Conditions for Construction	Communities understand project purpose, expected output, and detail activities and willingness to collaborate the project is enhanced. In particular, User-Pay-Principle is understood. Pre-condition (WUA formation and registration) for the construction of improved water supply system is confirmed.	All of Target Communities	Meetings	0.5 day/Community	Japanese Consultant NGO/Local Consultant DWST/MWST【Japanese Side】	Minutes of Meeting
☐ Participatory Community Assessment, and Preparation of Community Action Plan (CAP)	Problems and concerns in operation and maintenance of improved water supply scheme are identified and analyzed, and Community Action Plan (CAP), which indicated community task, and means of implementation, is developed in participatory manner.	All of Target Communities	Participatory field workshop	1.0 day/community	Japanese Consultant NGO/Local Consultant DWST/MWST【Japanese Side】	Workshop Report Community Action Plan (CAP)
☐ Community Consultative Meeting (Consensus Building for Community Action Plan)	Community consensus for CAP is made.	All of Target Communities	Meeting	0.5 day/community	Japanese Consultant NGO/Local Consultant DWST/MWST【Japanese Side】	Agreed CAP
Stage 3: Construction/Implementation						
☐ Preparation of Constitution for community-based operation and maintenance, and orientation on the WSS (Water Supply and Sanitation) Management Option under Sector Reform	Various WSS management options under sector reform are introduced to the communities, and constitutions of WUA for community-based management are prepared.	All of Target Communities（WUA）	Participatory field workshop	0.5 day/community	Japanese Consultant NGO/Local Consultant DWST/MWST【Japanese Side】	WUA Constitution Workshop Report
☐ Capacity Building of Communities in Operation and Maintenance, Implementation of Health and Sanitation Education, and OJT (On-the-Job Training) ➢ Facilitation of Community Participation ➢ Improvement of Leadership Skill of WUA	Capacity of community in management, operation and maintenance of improved water supply scheme and community awareness in health and sanitation is improved, and facilitation skills of DWST/MWST is enhanced through OJT.	All of Target Communities DWST/MWST CORPs	Participatory field workshop	5.0 days/ Community	Japanese Consultant NGO/Local Consultant DWST/MWST【Japanese Side】	Training Report

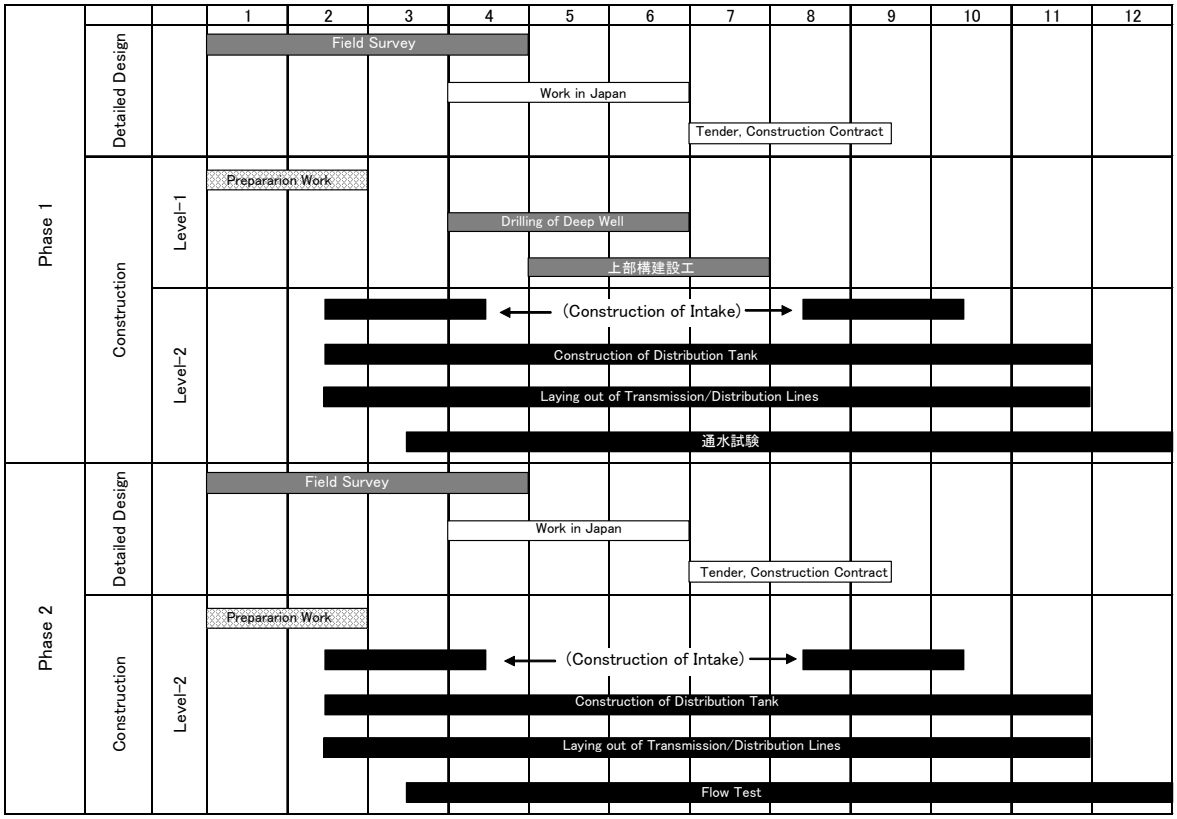
Activity	Output	Target	Means of Implementation	Period	Implementer【Responsibility】	Output of Submission
➢ Enhancement of Financial Management for WUA Accountant ➢ Technical Training for WUA Artisan in Operation and Maintenance ➢ Training for CORPs (Community Resource Persons) in PHAST (Participatory Health and Sanitation Transformation), and Health and Sanitation Education						
☐ Follow-up Activities for Capacity Building, and Health and Sanitation Education	Sense of community ownership, capacity of community in operation and maintenance, and awareness in health and sanitation is improved.	All of Target Communities	Participatory Field Workshop	2.0 days/ Community	NGO/Local Consultant DWST/MWST【Japanese Side】	Minutes of Meeting
Stage 4: Operation and Maintenance						
☐ Follow-up Training for WUA (Strengthening Community Capacity in Operation and Maintenance)	Through actual operation and maintenance of improved water supply scheme, training needs are identified, and training package to strengthen community capacity is prepared and provided.	All of Target Communities (WUA)	Participatory Field Workshop	2.0 days/ Community	NGO/Local Consultant DWST/MWST【Japanese Side】	Training Report
Stage 5: Monitoring and Follow-up						
☐ Preparation of Monitoring and Follow-up Check List of DWST/MWST	Issues to monitor and follow-up is identified, and monitoring and follow-up check list of DWST/MWST, which includes indicators and means of verification, is prepared.	4 Districts 3 Municipalities	Workshop	1.0 days/ District, Municipality	NGO/Local Consultant DWST/MWST【Japanese Side】	Monitoring and Follow-up Check List
☐ Monitoring and Follow-up	Monitoring and follow-up activities are provided by DWST/MWST	All of Target Communities	Field Investigation	2.0 days/ month/ community	DWST【Tanzanian Side】	Monitoring Report

9) Implementation Schedule

Implementation period of the project is divided into two (2) phases as shown in Table 2.37.

Soft component programme will start before commencement of construction work and continue up to the completion of the construction work.

Table 2.37 Implementation Schedule



2.3 OBLIGATION OF THE GOVERNMENT OF TANZANIA

If the Government of Japan decides to implement the project under the Japan's Grant Aid Scheme, the Government of Tanzania shall take necessary procedures described in 2.4.3 and items below.

- To provide data and information necessary for Detailed Design Study
- To secure lands necessary for construction of intake facility and distribution tank and access road to the sites
- To provide the storage space for equipment and materials, and for temporary works during the project implementation
- To provide mud disposal yard for residual clay and drainage basin
- To construct ancillary works such as drainage channel
- To provide water right for water sources
- To obtain approvals necessary for the construction works (especially railway and road crossing)

- To take necessary measures for obtaining of cooperation of residents and traffic control
- To provide and cost burden for banking arrangement and Authorization to Pay for the project
- To arrange tax exemption and smooth custom clearance for importing of equipment and materials necessary for the project
- To arrange smooth entry to and departure from Tanzania for Japanese nationals who are involved in the project based on the contract
- Proper operation and maintenance of the water supply facilities constructed under the Japan's Grant Aid project
- Cost burden for those not included in the Japan's Grant Aid scheme but necessary for the implementation of the project

2.4 PROJECT OPERATION PLAN

The Community-responsible principles based on a participatory model of community-based management and provision of technical guidance to the communities by local (District/Municipal) Councils, in particular, District/Municipal Water Engineer Office, has been adopted for the establishment of operation and maintenance system for rural water supply schemes. In this approach, community-based organization has been encouraged to actively participate and develop their capacities in operation and maintenance of the supply schemes, while local council and District/Municipal Water Engineer Office in particular is responsible for provision of training and monitoring to develop capacity of the communities in operation and maintenance of the supply schemes. Following this approaches employed as a sub-sector strategy in the country, the project operation planning under the Study adopts the basic framework of; 1) facilitation of participatory model of community-based operation and maintenance through formation and capacity development of the community-based organization, and, 2) enhancement of preparedness in provision of technical guidance by local councils.

Taking consideration on problems in operation and maintenance of existing water supply scheme, the following issues shall be given significance in preparation of project operation plan.

1) Formation of Community-Based Organization with Enhanced Awareness on Ownership

In the target area of the Project, conventional Village Water Committee (VWC), which is appointed by and formed under Village Council, has been expected functional in operation and maintenance of rural water supply scheme. However, organizational nature of VWC can be regarded as "consumer group", which has less awareness and expertise for the scheme management as "service provider". Thus, in the most cases in the Project area, VWCs are not performing their expected roles and responsibilities in the scheme management.

While the limited capacity of VWCs in operation and management of the supply scheme has been pointed out, various forms of community-based water supply organization has been developed and introduced, among which those organizations become established in the country, such as Water User Group (WUG), Water User Association (WUA), Water Trust/Cooperative, Water Company by Guarantee, and Water Company by Share. Those community-based water supply organizations are

established by the beneficiary group and legal ownership of the scheme is vested with, facilitating their awareness and capacity in the scheme management through the processes such as community consensus building on management options, election of executive members, preparation of constitutions, registration of organization under appropriate authority, training provided by local authority or NGOs/local consultant for capacity development of the community-based organization in the scheme management. Through those process of formation, community awareness and capacity in the scheme management and sense of ownership is enhanced, which can be regarded as feature of those community-based water supply organizations. The final draft of National Water Sector Development Strategy 2005-2015 advocates establishment of community-based operation and maintenance in rural water supply development, facilitating legalization of community ownership through registration process of the community-based organizations, which are defined as "Community-Owned Water Supply Organization (COWSO)". Concept of COWSO, defined in the National Water Sector Development Strategy, is introduced in the operation and maintenance plan of the Project.

2) Capacity Building of Community in Operation and Maintenance

While establishment of COWSO is facilitated that is expected to take initiative in operation and maintenance of the supply scheme, capacity development of the organization in the scheme management is also desirable. However, most of the target communities has less experienced in organizational management of the supply scheme. Survey results and findings, gained through the Study and the development study conducted prior to the Study, identify the training needs for the target communities and suggest provision of training for improvement of their capacity in the following concerns to assure sustainability in the community-based operation and management;

- Leadership skill
- Community communication skills
- Organizational/Institutional management skills
- Tariff setting and collection methods
- Financial management skills such as budget preparation, accounting, and fund management
- Technical operation and maintenance, and trouble shooting
- Participatory monitoring and evaluation with preparation of monitoring check list

3) Interfacing COWSO with Local Administrations

Lack of institutional support, such as technical guidance for the community in formation of community-based organization, organizational management, financial management and accounting, and follow-up and monitoring, has been regarded as one of major problem in operation and maintenance of rural water supply scheme, which is also regarded as one of causes for low functional rate of the supply scheme in the Project area. Although MoW is the implementing agency responsible for the Project, in the operation and maintenance stage, District/Municipal Water Engineer office (DWE/MWE) under District/Municipal Council is responsible in provision of technical

guidance to the communities. Thus, capacity development of DWE/MWE in provision of technical guidance to the community is indispensable for the sustainability of the Project. Under the Project, capacity development of District/Municipal Council is facilitated, through formation of and provision of training packages to the District/Municipal Water and Sanitation Team (DWST/MWST). In general, DWST/MWST is formed under each District/Municipal Council and consists of District/Municipal Water Engineer (DWE/MWE), District/Municipal Planning Officer, District/Municipal Health Officer, District/Municipal Community Development, of which composition enables integrated approach for the sub-sector development. In the operation and maintenance plan of the Project, capacity of DWST/MWST is improved to form community-based operation and maintenance structures, and functional roles and responsibilities of the organization to provide technical guidance and monitoring for the communities in the subsequent stages are also enhanced. Capacity development of DWST/MWST is intended through On-the-Job training provided by local consultant/NGO employed for the project implementation. Figure 2.40 illustrates the operation and maintenance structure in the Project plan.

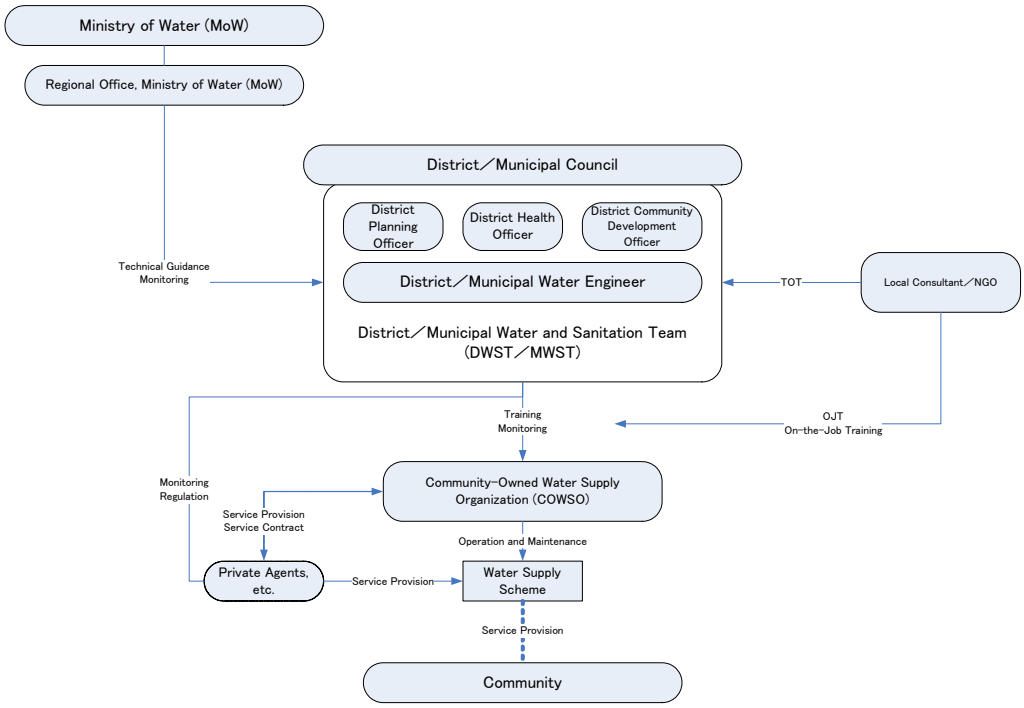


Figure 2.40 Operation and Maintenance Structure in the Project Plan

4) Cost Recovery for Operation and Maintenance

User-Pay-Principle (UPP) is introduced in the operation and maintenance of the supply schemes. The operation and maintenance costs implicated for each scheme is further analyzed in the following section of 5.2.

5) Necessity of Capacity Development

For the establishment of operation and maintenance structure mentioned above, capacity building and

institutional development of concerned organizations are supported under the Project implementation in order to realize sustainable service provision by the supply scheme constructed and achieve the expected output in the earliest period, while taking consideration on the principle set in policy of Japanese Grant Aid that undertakings in operation and maintenance shall be assured by the recipient country. Detail contents of capacity and institutional development, planned in Software Component Program under the Project, is described already in 2.2.4 (8).

2.5 PROJECT COST ESTIMATION

2.5.1 INITIAL COST ESTIMATION

If the project is implemented, the project cost is estimated approximately 14.84 million US$. Costs borne by both countries are estimated as shown in Table 2.38 and Table 2.38 following the Scope of Work described in 2.4.3. In estimation, conditions mentioned in (3) are applied.

1) Japanese Side

Table 2.38 Implementation Cost borne by Japanese Government

Approximate Implementation Cost: 14.80 Million US$

Item				Implementation Cost (Million US$)	
Facility	Level-2	Construction of Intake	Intake Facility Control House	1.97	12.50
		Construction of Distribution Tank	Distribution Tank	1.81	
		Construction of Pipeline	Transmission Line Distribution Line	7.86	
		Construction of Public Water Point	Public Water Point Platform	0.41	
	Level-1	Construction of well, Pumping Test, Water Quality Analyses, and, Installation of Handpump and Platform		0.45	
Equipment	－			0	
Detailed Design/construction Supervision					2.30

2) Tanzania Side

Table 2.39 Implementation Cost borne by Tanzanian Government

Approximate Implementation Cost: 51.46 Million Tsh (0.04 Million US$)

Item	Implementation Cost (Million Tsh)
Maintenance of access road to the sites	51.46
Preparation of land for intake and distribution tank	－
Preparation of land for stock yard and temporary works	－
Maintenance around the drainage and adjacent facilities of public water points and handpump	－
Acquisition of water right	－
Getting approval for crossing of railway and main road	－
Announcement to villages before commencement of construction works	－
Announcement to villages about crossing of paved main road	－

3) Conditions for Estimation

i) Date of cost estimation : July 2006

ii) Exchange rate: 1 US$ ＝ 116.76 Japanese Yen
1 US$ ＝ 1,231.71 Tsh
1 Tsh ＝ 0.095 Japanese Yen
1 EUR ＝ 144.85 Japanese Yen
1 EUR ＝ 1.24 US$

iii) Construction period: The construction works are carried out in two (2) phases. Implementation schedule for Detailed Design Study and construction works in each phase are shown in Table 2.36.

iv) Other: The project is implemented under the Japan's Grand Aid Assistance scheme.

2.5.2 OPERATION AND MAINTENANCE COST

1) Operation and Maintenance Cost for Level-2

Operation and Maintenance cost for Level-2 is estimated as mentioned below. The cost includes ones for following items.

① Operation const of water supply facility (fuel, chemicals, personal cost)
② Maintenance cost of water supply facility
③ Depreciation expense/Replacement cost
④ Insurance/Inflation

i) Condition of Cost Estimation

Following conditions are considered.

① Conditions shown in Table 2.6 (Chapter 2).
② Personnel cost includes following salaries. Cost for administrant of public water point varies according to the number of taps.

Table 2.40 Personnel Cost for Operation and Maintenance of Water Supply Scheme

Item	Basis		Unit	Q'ty	Amount (USD)
Operator	Mean Annual Income at	100%	90.8	3	272.4
Kiosk Attendant	Mean Annual Income at	25%	22.7		*
Security Guard	Mean Annual Income at	100%	90.8	3	272.4
Commission for COWS	Mean Annual Income at	20%	18.2	5	90.8
Scheme Manager	Mean Annual Income at	250%	227.0	1	227.0
Accountant	Mean Annual Income at	200%	181.6	1	181.6
Overhaul of Pump	Cost for Pump	3%	120.0	1	120.0
Total Personnel Cost					1,164.2

*: to be in proportion of number of public water points

③ Estimation of replacement cost for water supply facilities are based on the initial cost (i.e. construction cost of local standard. Cost for tank is excluded. The target planning period is set 10 years from the year 2010 when the construction is completed. Cost for each year is estimated considering the size of population. Average yearly cost for this period is assumed as the yearly average cost.

④ Service population of water supply facility is the population in the target year 2015 as shown in Table 2.24.

⑤ 80 % of service population pay the water tariff.

ii) Operation and Maintenance Cost (Level-2)

Table 2.41 shows the estimated average yearly operation and maintenance cost in 10 years from 2010 and obligation fee per capita.

Table 2.41 Operation and Maintenance Cost for Water Supply Scheme (US$/year)

		Average Fuel Cost	Chemical Cost	Personnel Cost ①	Personnel Cost ②	Total Personnel Cost	Total Ooeration Cost	Maintenanc e Cost	Depreciation/ Replacement	Insurance /Inflation	Total
Bagamoyo	Kibindu	17,914		1,164	409	1,573	19,487	11,655	7,770	389	39,301
Kibaha	Minazi Mikinda(1/2) /Kitomondo	4,319		1,164	204	1,368	5,687	8,608	5,739	287	20,322
Kisarawe	Chole	9,557		1,164	409	1,573	11,130	9,141	6,094	305	26,669
Mkuranga	Njopeka	9,168	215	1,164	340	1,505	10,888	10,392	6,928	346	28,555
	Mwandege/Kipala	8,308		1,164	499	1,664	9,972	8,703	5,802	290	24,767
	Kisemvule	6,876		1,164	272	1,437	8,313	8,148	5,432	272	22,163
	Morogoro /Mfuru Mwambao	3,438		1,164	295	1,459	4,897	10,251	6,834	342	22,325
	Vianzi	8,308		1,164	295	1,459	9,768	10,954	7,302	365	28,389
Ilala	Kitunda(1/2)	8,150		1,164	204	1,368	9,518	10,954	7,302	365	28,139
	Kitunda(2/2)	7,878		1,164	136	1,300	9,178	9,080	6,054	303	24,615
	Kitunda-Mzinqa	15,756		1,164	272	1,437	17,193	14,183	9,456	473	41,305
	Msongola	4,075		1,164	204	1,368	5,443	8,696	5,797	290	20,227
	Pugu Station	7,878		1,164	113	1,278	9,156	11,294	7,529	376	28,355
Kinondoni	Matosa	8,904		1,164	159	1,323	10,227	9,835	6,556	328	26,946
Temeke	Kibugumo	4,075		1,164	204	1,368	5,443	9,380	6,253	313	21,389
	Mjimwema-Salanga	3,260		1,164	204	1,368	4,628	8,473	5,649	282	19,032
	Yaleyale Puna	4,075		1,164	272	1,437	5,511	8,075	5,384	269	19,239
	Tundwi Songani	6,520		1,164	340	1,505	8,024	8,386	5,591	280	22,281

Note Personnel Cost ①: Opeartors for water supply facility (except for Kiosk Attendant)
Personnel Cost ②: Kiosk Attendant for publlic water points (changes according to the number of public water point)

Water tariff per litre necessary to recover the operation and maintenance cost shown in Table 2.40 and its proportion in household expenditure are tabulated in Table 2.41 assuming that residents in the village consume 25 L/day and 80 % of residents pay the water tariff.

Proportion of water tariff in household expenditure is within 7 %m therefore, the tariff is affordable for residents in the villages as studied in 2.1.1.

Water tariff is more than 1 Tsh/L in three (3) villages: Kisemvule in Mkuranga District and, Yaleyale Puna and Tundwi Songani in Temeke Municipality. It is evaluated that residents in these three (3) villages are capable to pay water tariff set in Table 2.40 considering the socio-economic conditions in these villages.

iii) Operation and Maintenance Cost for Level-1

Operation and maintenance cost for Handpump scheme (Level-1) is estimated as follows.

(i) Condition of cost estimation : Service population is 250 persons/scheme.

(ii) Operation and maintenance cost (Table 2.42) : 566.5 US$/year/scheme
(595,000 Tsh /year/scheme)

Table 2.42 Operation and Maintenance Cost for Level-1 (US$/year)

Cost	Item	O&M Cost (US$/year)
Maintenance	Wage (Administorator)	100
	Tools	10
	Consumables	40
	Spare parts	50
	Mechanic (Repairing)	80
	Private contract (daily maintenance and repaairing of handpump)	50
Administrative	Commission (Treasurer)	100
Replacement		130
Inflation & Others		6.5
Total		566..5

(iii) Operation and maintenance cost per capita:
US$ 2.3/year/capita (2,380 Tsh /year/capita)
US$ 0.19/month/capita (200 Tsh/month/capita)

iv) Ratio of O&M cost in expenditure of household

Operation and maintenance cost for water supply facilities, water tariff and proportion of water tariff in household expenditure are shown in Table 2.43.

Table 2.43 Water Tariff and Its Proportion in Household Expenditure

District/ Municipality	Village	OM Cost	Water Tariff	Proportion of Water in Household Expenditure
		(USD)	(Tsh/L)	(%)
Bagamoyo	Kibindu	39,301	1.0	6.2
Kibaha	Minazi Mikinda(1/2) /Kitomondo	20,322	1.0	6.1
Kisarawe	Chole	26,669	1.0	6.8
Mkuranga	Njopeka	28,555	0.9	5.0
	Mwandege/Kipala	24,767	1.0	6.3
	Kisemvule	22,163	1.2	6.9
	Morogoro /Mfuru Mwambao	22,325	1.0	4.5
	Vianzi	28,389	0.9	4.0
Ilala	Kitunda(1/2)	28,139	0.8	2.8
	Kitunda(2/2)	24,615	1.0	3.7
	Kitunda-Mzinqa	41,305	0.7	1.8
	Msongola	20,227	0.9	4.2
	Pugu Station	28,355	0.7	3.2
Kinondoni	Matosa	26,946	0.9	4.3
Temeke	Kibugumo	21,389	0.8	2.9
	Mjimwema-Salanga	19,032	0.9	3.2
	Yaleyale Puna	19,239	1.1	3.9
	Tundwi Songani	22,281	1.1	4.1

2.6 OTHER RELEVANT ISSUES

For smooth implementation of the project, the Tanzanian side is requested to pay consideration to following issues.

(1) Arrangement of water right for water source

(2) Obtaining of acceptance for crossing of railway and road of transmission/distribution pipelines

(3) Prior announcement to villages about pipe laying out crossing the paved main road at Mwandege, Kipala, Kisemvule and Njopeka in Mkuranga District, and Kibugumo in Temeke Municipality.

CHAPTER 3

PROJECT EVALUATION AND RECOMMENDATION

CHAPTER 3 PROJECT EVALUATION AND RECOMMENDATION

3.1 PROJECT EFFECTS

3.1.1 DIRECT EFFECTS

The project aims to improve the water supply conditions by constructing 18 piped water supply schemes (Level-2) in 18 villages and 14 deep wells with handpump (Level-1) in three villages. Following direct effects shown in Table 3.1 are expected by implementation of the project.

Table 3.1 Direct Effects Expected by Implementation of the Project

Current situation and Problems	Measures taken in the Project	Effects and Improved Aspects
Covering of water supply remains 23% in 2002, it is under the national level average 42%, due to delay of construction of water supply scheme	18 Level-2 schemes are constructed in 18 villages and 14 Level-1 schemes are constructed in 3 villages.	Covering of water supply is improved up to 65% (75.9 thousand persons) in 2015 from 23% (16.5 thousand persons) in 2002
Community people have been used 20 L/capita/day of unsafe water.	Water supply schemes are constructed to supply safe water satisfying the water demand in each village.	Community people become to use 25 L/Capita/day of safe water.
No safe water source is available in the target villages. Therefore, community people depend on unsafe water sources.	Safe water sources are developed for source of water supply schemes. But, spring water is supplied after treatment by chlorination.	Water quality is satisfied in every water supply scheme constructed by the project.
Fetching of water requires about30 minutes in case of short distance and more than 2 hours in case of long distance.	Public water points are constructed in the distance of 400m from houses considering the dwelling pattern. In case of Level-1, such distance is kept as much as possible although the locations are restricted by topographical and hydrogeological conditions..	Most of village people have access to safe water source within 400m.
In villages where no water sources is available, community people are obliged to buy water from venders at 50 to 300 Tsh/20L. It is hard for them to pay.	Construction of water supply schemes enables to supply water at proper tariff within the affordability to pay of community people.	Water tariff is 20 to 24 Tsh/20L. It eases the burden of community people
Collected water tariff is sometimes misappropriated to other purpose by village councils.	Organization of community-owned water supply organization (COWSO) is assisted by software component.	COWSO is organized in target villages and is registered to MoW or District according to the national policy.
People in the target villages have few experience of community participation type of operation and maintenance.	Assistance by software component is carried out to strengthen the ability of operation and maintenance.	Capability of operation and maintenance of village people is developed.

3.1.2 INDIRECT EFFECTS

The following indirect effects are expected by the implementation of the project.

① Cost to get water is eased in the villages where no water source is available and depends on water vendors.

② Fetching water is basically task of women and children. Time for fetching water is much reduced, and then times for participating in the social activities and chance to works of women, and chance to getting education of children are increased.

③ Reduction of infant mortality is expected by improved drinking water quality.

④ Medical cost is much reduced by improved drinking water quality.

⑤ Ownership of community people is improved by organizing of community participation type of operation and maintenance system.

3.2 RECOMMENDATIONS

3.2.1 ISSUES TO BE CONSIDERED BY THE TANZANIAN SIDE

① It is important to continue periodical monitoring of groundwater level and water quality. As for groundwater level, proper operation of water supply scheme so as not to cause groundwater recession due to over pumping. Checking of water quality is necessary to confirm the deterioration of water due to aging.

② Success of operation and maintenance of water supply scheme depends on the participation of communities. It is indispensable to improve living environment that community people uses safe water supplied by water supply schemes constructed by the project. Therefore, DWST and MWST are requested to instruct community people to use water supply schemes and to monitor the situation.

3.2.2 COLLABORATION WITH TECHNICAL ASSISTANCE PROJECT AND OTHER DONORS

1) Collaboration with Technical Assistance Project

In accordance with the purport of the software component program set by the guideline under Japan's Grant Aid scheme, that is initial cooperation to assure lowest necessary sustainability by minimum input in the limited period set for the Grant Aid, the Software Component Program under the Project limits the activities to "formation and capacity building of COWSO" and "improvement of capacity of District/Municipal Council to provide technical guidance to the communities" as described above.

However, there are other development issues and problems in the establishment of community-based management in the sub-sector and the target area. Therefore, the Study proposes that the following development issues advocated in National Water Sector Development Study (Draft Final, 2005-2015) shall be dealt in the Japan's Technical Cooperation Program planned in the sub-sector and the Project area.

Detailed contents of collaboration are proposed in Item 10 of Appendices 5 "Software Component Plan".

2) Cooperation with Mkuranga Water, Hygiene and Sanitation Project

AMREF is implementing "Cooperation with Mkuranga Water, Hygiene and Sanitation Project" in Mkuranga District. This project is composed of construction of water supply facilities (mainly deep well with handpump) and hygiene education as well as training of operation and maintenance of water supply facilities to community people. No duplication with the project is observed because target villages were adjustment between AMREF and the study team. One of the aim of the project is to improve the capability of community to operate and maintain the water supply schemes. Therefore, collaboration with AMREF project should be taken into consideration.

3.3 JUSTIFICATION OF PROJECT

It is justified to implement the project by the following respects.

① Coverage of water supply in the target villages is improved from 23% (16.7 thousand persons) in 2002 to 65% (75.9 thousand persons including service population by existing schemes) in 2015 by implementation of the project. It contributes realization of super goal.

② Community people are obliged to use unsafe water source and to spend time for fetching water about 30 minutes in case of short distance and more than two hours in case of the long distance. The project is to provide community people with accesses to safe water within around 400 m. Supplying safe water also provide women and children with more chance of participate in social activities and chance to works of women, and chance to getting education of children. Furthermore, reduction of infant mortality and medical cost is expected by improved drinking water quality. Thus, the project contributes the improvement of living environment of community people.

③ MoW, District and Municipality are capable to implement the project as the implementation agencies. No high technique is required for operation and maintenance of the water supply facilities by the community.

④ Poverty Reduction Strategy Paper (PRSP) stems from Vision 2025, and its target for water and sanitation sector is universal access to safe water within 400 m by 2025 through involvement of the private sector, and empowering local government and communities. The project contributes the achievement of the target.

⑤ Water tariff is set necessary for operation and maintenance of the water supply facility and of no excessive profit performance. Smooth operation and maintenance of the water supply facility is possible by using the water tariff collected.

⑥ Initial Environmental Evaluation (IEE) revealed that no negative impact is anticipated by the implementation of the project.

⑦ The project is possible to implement without any difficulties under the Japan's Grant Aid Scheme.

3.4 CONCLUSION

Aforesaid effects are expected by the implementation of the project. The project contributes to improve the water supply environment and basic human needs in the target communities. From these aspects, the Project is justified for implementation under the Japan's Grant Aid Scheme.

In addition, the following issues should be fully taken into consideration for smooth implementation and effective performance of the Project.

① Periodical monitoring on groundwater level and water quality should be carried out to avoid recession of groundwater level and deterioration of water quality due to aging.

② DWST and MWST are requested to instruct community people to use water supply facilities constructed under the project and to monitor its situation.

③ Collaboration with technical assistance project planned to be implemented should be taken into consideration to empower the ability of DWST and MWST for assistance to communities, and community-owned water supply organization in operation and maintenance of the water supply schemes. In addition, AMREF aims to improve the ability of community people to operate and maintenance of the water supply schemes through Mkuranga Water, Hygiene and Sanitation Project in Mkuranga District. Collaboration with this project should be also taken into consideration.

APPENDICES

APPENDIX 1

Member List of the Study Team

Appendix 1 Member List of the Study Team

(1) Basic Design Study

Mr. KINOMOTO Hiroyuki	Leader	Team Director, Water Resources Development and Environmental Management Team, Project Management Group III, Grant Aid Management Department, JICA
Mr. MURAKAMI Jun	Planning Management Officer	Water Resources Development and Environmental Management Team, Project Management Group III, Grant Aid Management Department, JICA
Mr. YAMASAKI Yasumasa	Chief Consultant / Water Supply Planner	Earth System Science Co., Ltd.
Dr. HATA Yuichi	Water Supply Facility Designer1 /Hydrogeologist1	Earth System Science Co., Ltd.
Mr. YABUTA Takuya	Hydrogeologist 2/ Geophysicist	Earth System Science Co., Ltd.
Mr. YOSHIKAWA Koji	Water Supply Facility Designer2 / Land Surveyor	Earth System Science Co., Ltd.
Mr. MORI Naoki	Socio-Economist/Operation and Maintenance Specialist	Japan Techno Co., Ltd.
Mr. HONMA Hironori	Implementation Planner /Cost Estimator	Earth System Science Co., Ltd. (P& D Inc.)

(2) Explanation of Draft Basic Design Report

Mr. MAKINO Koji	Leader	Deputy Resident Representative, Tanzania Office, JICA
Mr. MURAKAMI Jun	Planning Management Officer	Water Resources Development and Environmental Management Team, Project Management Group III, Grant Aid Management Department, JICA
Mr. YAMASAKI Yasumasa	Chief Consultant / Water Supply Planner	Earth System Science Co., Ltd.
Mr. YOSHIKAWA Koji	Water Supply Facility Designer2 / Land Surveyor	Earth System Science Co., Ltd.

APPENDIX 2

Study Schedule

Appendix 2　Study Schedule

（1）Field Survey

No.	Date		Itinerary
1	9-Jun	Fri	Travel (Tokyo-Bangkok-Dubai-Dar es Salaam)
2	10-Jun	Sat	Arrived in Dar es Salaam
3	11-Jun	Sun	Site Survey：Kibaha
4	12-Jun	Mon	Courtesy call to JICA　Tanzania Office and Embassy of Japan Submission of Inception Report to MoW
5	13-Jun	Tue	Explanation and Discussion of Inception Report
6	14-Jun	Wed	Discussion and Finalization of Minutes of Discussions
7	15-Jun	Thu	Site Survey：Ilala and Temeke
8	16-Jun	Fri	Signing of Minutes of Discussions, Report to JICA Office and Embassy of Jaoan
9	17-Jun	Sat	Data processing, Preperation of negotiation with Contractors, Inner Meeting
10	18-Jun	Sun	Data processing, Preperation of negotiation with Contractors
11	19-Jun	Mon	Negotiation of Contract
12	20-Jun	Tue	Census Office, Discussion with MoW
13	21-Jun	Wed	Negotiation of Contract
14	22-Jun	Thu	Site Survey：Kinondoni
15	23-Jun	Fri	Site Survey：Temeke
16	24-Jun	Sat	Site Survey：Ilala
17	25-Jun	Sun	Site Survey：Bagamoyo
18	26-Jun	Mon	Site Survey：Bagamoyo
19	27-Jun	Tue	Site Survey：Kibaha
20	28-Jun	Wed	Site Survey：Kisarawe
21	29-Jun	Thu	Site Survey：Mkuranga
22	30-Jun	Fri	Site Survey：Mkuranga
23	1-Jul	Sat	Site Survey：Mkuranga/Temeke
24	2-Jul	Sun	Site Survey：Ilala/Mkuranga
25	3-Jul	Mon	Site Survey：Kisarawe/Mkuranga
26	4-Jul	Tue	Site Survey：Temeke, Meeting on Water Qaulity analyses and Turbidity analysis
27	5-Jul	Wed	Signing of contract on Test Well Drilling
28	6-Jul	Thu	Discussion with MoWand Temeke Mun., Report to JICA Tanzania Office
29	7-Jul	Fri	Sitevisiting of existing project (Mtwara), Data processing
30	8-Jul	Sat	Sitevisiting of existing project (Mtwara), Data processing
31	9-Jul	Sun	Site Survey：Mkuranga, Data processing
32	10-Jul	Mon	Site Survey：Bagamoyo, Instruction of drilling position (Kinondoni)
33	11-Jul	Tue	Site Survey：Bagamoyo, Meeting with BTC
34	12-Jul	Wed	Discussion with MoW, Data processing
35	13-Jul	Thu	Discussion with MoW, Data processing
36	14-Jul	Fri	Confirmation of population (Kibaha)
37	15-Jul	Sat	Confirmation of population (Mkuranga, Temeke)
38	16-Jul	Sun	Data processing
39	17-Jul	Mon	Site Survey：Kisarawe, Confirmation of population (Ilala, Temeke)
40	18-Jul	Tue	Site Survey：Kisarawe, Discussion with MoW
41	19-Jul	Wed	Site Survey：Ilala, Meeting with laboratory on water quality analyses
42	20-Jul	Thu	Site Survey：Ilala, Discussion with MoW, Signing of Technical Note
43	21-Jul	Fri	Report to JICA Tanzania Office
44	22-Jul	Sat	Site Survey：Instruction of drilling point (Kisarawe), Inner meeting
45	23-Jul	Sun	Site Survey：Ilala
46	24-Jul	Mon	Site Survey：Ilala
47	25-Jul	Tue	Site Survey：Ilala
48	26-Jul	Wed	Site Survey：Ilala
49	27-Jul	Thu	Site Survey：Temeke
50	28-Jul	Fri	Site Survey：Temeke
51	29-Jul	Sat	Analysis of geophysical survey data
52	30-Jul	Sun	Site Survey：Temeke
53	31-Jul	Mon	Analysis of geophysical survey data

No.	Date		Itinerary
54	1-Aug	Tue	Site Survey：Mkuranga
55	2-Aug	Wed	Site Survey：Mkuranga
56	3-Aug	Thu	Site Survey：Mkuranga
57	4-Aug	Fri	Site Survey：Temeke
58	5-Aug	Sat	Analysis of geophysical survey data
59	6-Aug	Sun	Site Survey：Mkuranga
60	7-Aug	Mon	Analysis of geophysical survey data
61	8-Aug	Tue	Analysis of geophysical survey data
62	9-Aug	Wed	Site Survey：Mkuranga
63	10-Aug	Thu	Site Survey：Bagamoyo
64	11-Aug	Fri	Site Survey：Bagamoyo
65	12-Aug	Sat	Analysis of geophysical survey data
66	13-Aug	Sun	Supervision of test well drilling
67	14-Aug	Mon	Supervision of test well drilling
68	15-Aug	Tue	Site Survey：Ilala
69	16-Aug	Wed	Analysis of geophysical survey data
70	17-Aug	Thu	Analysis of geophysical survey data
71	18-Aug	Fri	Analysis of geophysical survey data
72	19-Aug	Sat	Site Survey：Kibaha
73	20-Aug	Sun	Site Survey：Ilala
74	21-Aug	Mon	Supervision of test well drilling
75	22-Aug	Tue	Analysis of geophysical survey data
76	23-Aug	Wed	Site Survey：Kibaha
77	24-Aug	Thu	Site Survey：Kibaha
78	25-Aug	Fri	Site Survey：Kibaha
79	26-Aug	Sat	Analysis of geophysical survey data
80	27-Aug	Sun	Site Survey：Kibaha
81	28-Aug	Mon	Site Survey：Kibaha
82	29-Aug	Tue	Analysis of geophysical survey data
83	30-Aug	Wed	Supervision of test well drilling
84	31-Aug	Thu	Analysis of geophysical survey data
85	1-Sep	Fri	Analysis of geophysical survey data
86	2-Sep	Sat	Analysis of geophysical survey data
87	3-Sep	Sun	Analysis of geophysical survey data
88	4-Sep	Mon	Supervision of test well drilling
89	5-Sep	Tue	Supervision of test well drilling
90	6-Sep	Wed	Supervision of test well drilling
91	7-Sep	Thu	Supervision of test well drilling
92	8-Sep	Fri	Supervision of test well drilling
93	9-Sep	Sat	Supervision of test well drilling
94	10-Sep	Sun	Supervision of test well drilling
95	11-Sep	Mon	Supervision of test well drilling
96	12-Sep	Tue	Report to JICA Office, Travel (Dar es Salaam-Dubai-Bangkok-Narita)
97	13-Sep	Wed	Arrived at Narita

(2) Explanation of Draft Basic Design Study Report

No.	Date		Itinerary
1	6-Jan	Sat	Travel (Kansai-Dubai-Dar es Salaam)
2	7-Jan	Sun	Arrived in Dar es Salaam
3	8-Jan	Mon	Courtesy call to JICA Ofiice and MOW, Submission of Draft Basic Design Study Repor
4	9-Jan	Tue	Discussion on Draft Basic Design Study Report
5	10-Jan	Wed	Discussion and Finalization of Minutes of Discussions
6	11-Jan	Thu	Signing of Minutes of Discussions, Report to JICA Office and Embassy of Jaoan
7	12-Jan	Fri	Site Survey：Kibaha・Kisarawe
8	13-Jan	Sat	Site Survey：Bagamoyo
9	14-Jan	Sun	Data processing
10	15-Jan	Mon	Site Survey：Kinondoni・Ilala
11	16-Jan	Tue	Report to JICA, Travel (Dar es Salaam-Dubai-Kansai)
12	17-Jan	Wed	Arrived at Kansai

APPENDIX 3

List of Parties Concerned in Tanzania

Appendix 3 List of Parties Concerned in Tanznia

1. Field Survey

(1) Embassy of Japan

Masuyama	Secretary
JICA Tanzania Office	Resident Representative
Naoki TAKAHASHI	Deputy Resident Representative
Koji MAKINO	Deputy Resident Representative
Daigo KOGA	Assistant Resident Representative
Takeshi OIKAWA	Assistant Resident Representative

(2) Ministry of Water (MoW)

Patrick Rutabanzibwa	Permanent Secretary
C.N. Sayi	Director, DRWS
R.N.T. Kwigizile	Assistant Director, DRWS
Salum M. Chusi	Mechanical Engineer, DRWS
A.T. Massawe	Water Engineer, DRWS
Ndunguru J.E.	Representative RAS Office DSM
Buze Angetile	Representative RAS Office Coast Region

(3) Water Engineer of District/Municipality

J.N. Raphael	Bagamoyo District
R. Simba Aiwala	Kibaha District
Omari J. Mazola	Kisarawe District
S.S. Kideka	Ilala Municipality
Gonsalves R.R.	Kinondoni Municipality
Robert Chenge	Temeke Municipality

2. Explanation of Draft Basic Design Study Report

(1) Embassy of Japan

Makoto Ito	Ambassador
Msasuyama	Secretary

(2) JICA Tanzania Office

Toshihiro OBATA	Resident Representative
Koji Makino	Deputy Resident Representative
Daigo Koga	Assistant Resident Representative

(3) Ministry of Water (MoW)

Patrick Rutabanzibwa	Permanent Secretary
C.N. Sayi	Deputy Permanent Secretary

J. A. Mukumwa	Acting Director, DRWS
R.N.T. Kwigizile	Assistant Director, DRWS
A.T. Massawe	Senior Engineer, DRWS
Yuichi Hata	Advisor to MoW (JICA Expert)
Joyce A. Bahati	Technical Advisor-Water, Coast Region

(4) Water Engineer of District/Municipality

J.N. Raphael	Bagamoyo District
Mkama M. Bwire	Kibaha District
Lyimo Grace	Kibaha Town
Anna Stephano	Mkuranga District
S.S. Kideka	Ilala Municipality
Gonsalves R.R.	Kinondoni Municipality
Primy Damas	Temeke Municipality