

2-2-3 Basic Design Drawing

Drawings are identified with three digits as shown below:

The first digit shows the following facilities:

- 0: General
- 1: Raw water intake facility
- 2: Raw water conveyance facility
- 3: Water treatment plant
- 4: Mechanical/electrical equipment
- 5: Transmission/distribution facility

The second digit shows the category of drawings as shown below:

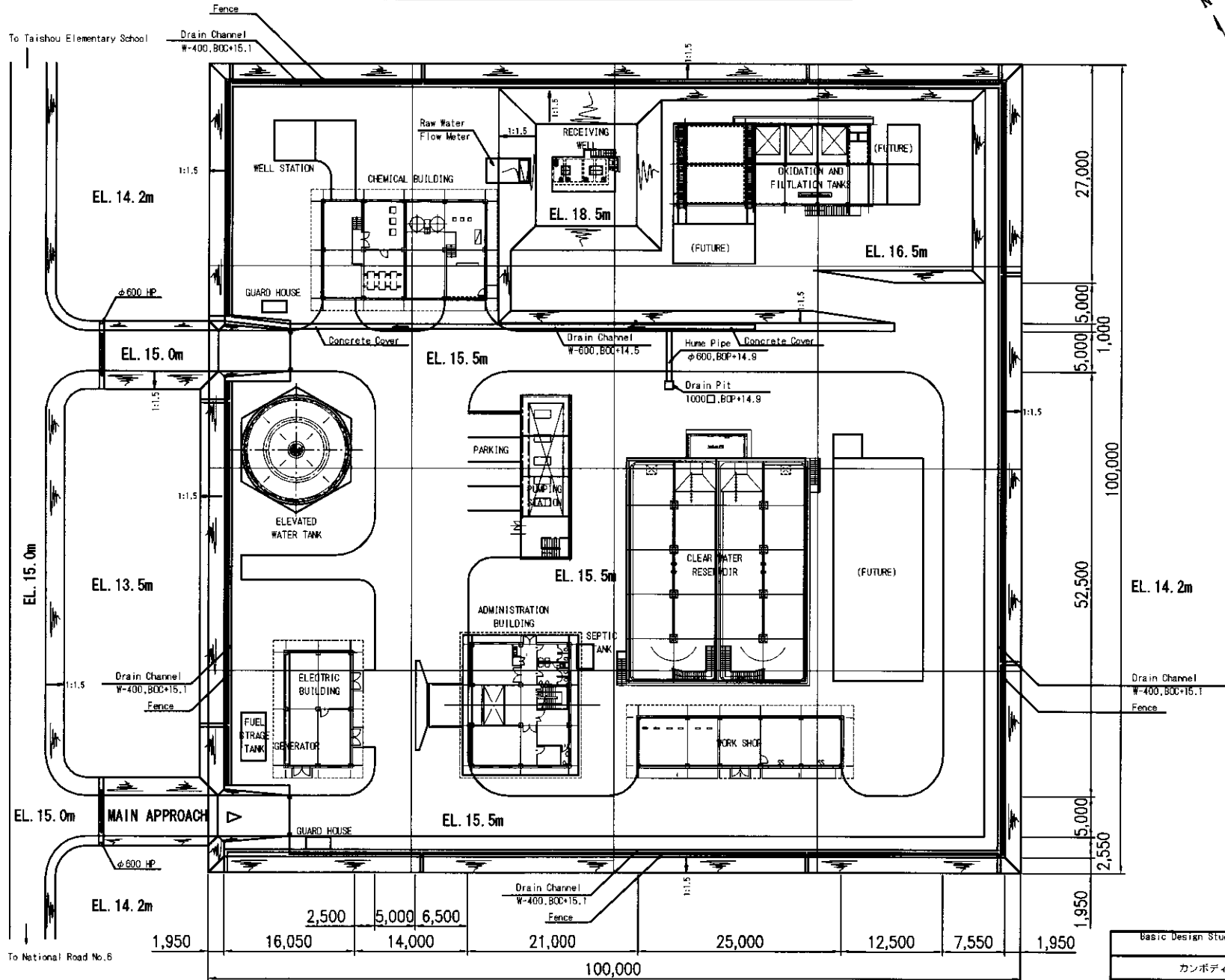
- G: General works
- C: Civil works
- A: Architectural works
- M: Mechanical works
- E: Electrical works

And the third digit shows the series number of the same category and facilities.

Table 2.24 Drawing List

Item No.	Drawing. No.	Title	Scale
1	0-G-1	Water Treatment Plant General Plan	1:500
2	0-G-2	Hydraulic Profile	N/A
3	2-C-1	Connecting Pipelines	As shown
4	2-C-2	Typical Cross Section of Connecting Pipelines	1:500
5	3-C-1	Receiving Well	1:200
6	3-C-2	Oxidation and Filtration Tanks 1	1:200
7	3-C-3	Oxidation and Filtration Tanks 2	1:200
8	3-C-4	Clear Water Reservoir	1:100,200
9	3-C-5	Pumping Station	1:200
10	3-C-6	Elevated Water Tank	1:200
11	3-C-7	Chemical Building	1:200
12	3-C-8	Electrical Building	1:200
13	3-C-9	Administration Building	1:200
14	3-C-10	Work Shop	1:200
15	3-C-11	Guard House	1:200
16	4-M-1	Process Schematic and Flow Diagram-No.1	N/A
17	4-M-2	Process Schematic and Flow Diagram-No.2	N/A
18	4-E-1	Flow Diagram for Instrumentation-No.1	N/A
19	4-E-2	Flow Diagram for Instrumentation-No.2	N/A
20	5-C-1	Distribution Pipelines	As shown
21	5-C-2	Typical Cross Section of Distribution Pipelines	As shown
22	5-C-3	Pipe Bridge	As shown

Water Treatment Plant General Plan

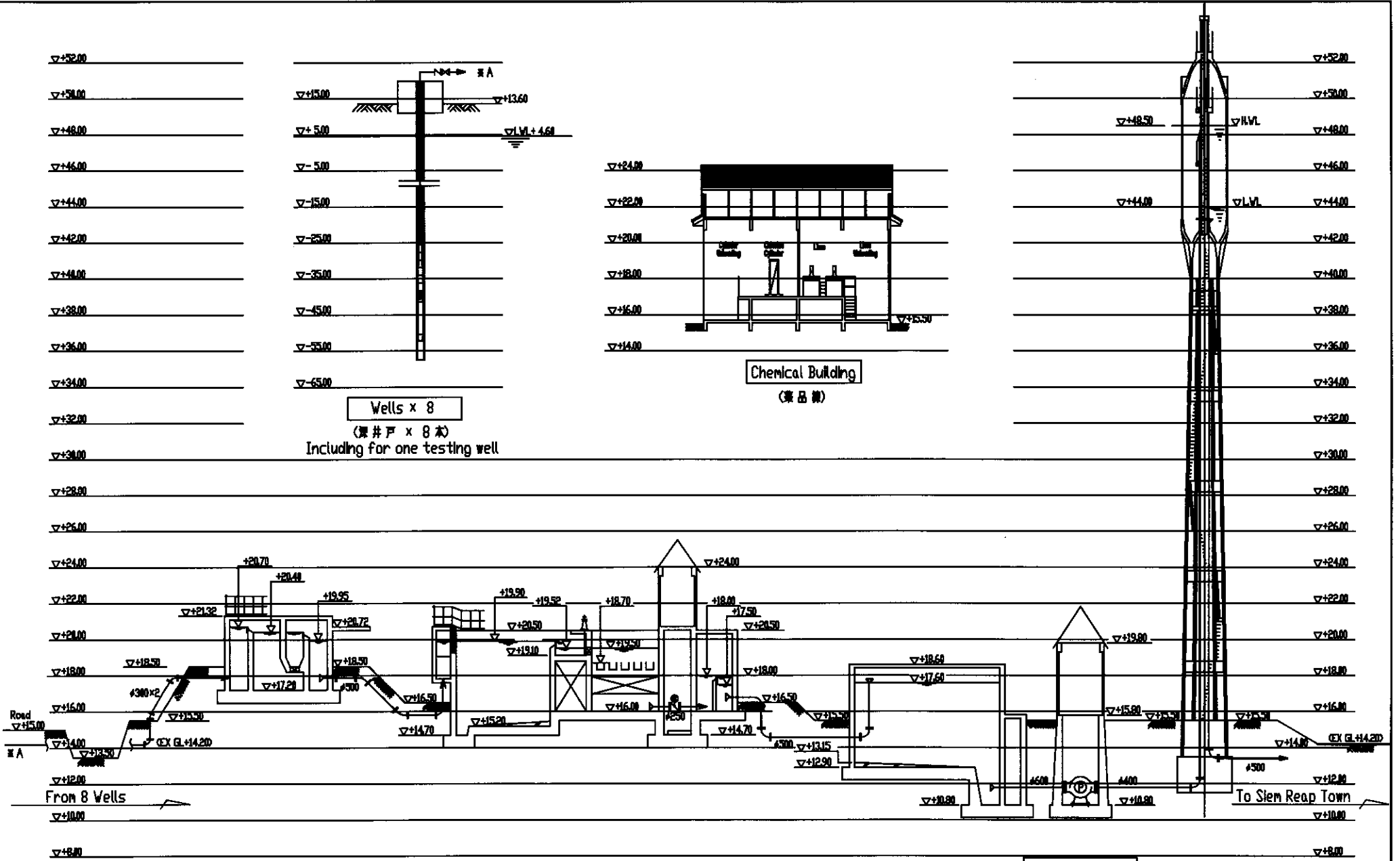


50

To National Road No.6

To Taishou Elementary School

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シェムリアップ水道整備計画基本設計調査	
Water Treatment Plant General Plan	SCALE: 1 : 500
一般平面図	DRAWING No.: 0-0-1



Wells x 8
 (深井戸 x 8本)
 Including for one testing well

Chemical Building
 (薬品棟)

Receiving Well
 (蓄水井)

Oxidation Tank
 (酸化池)

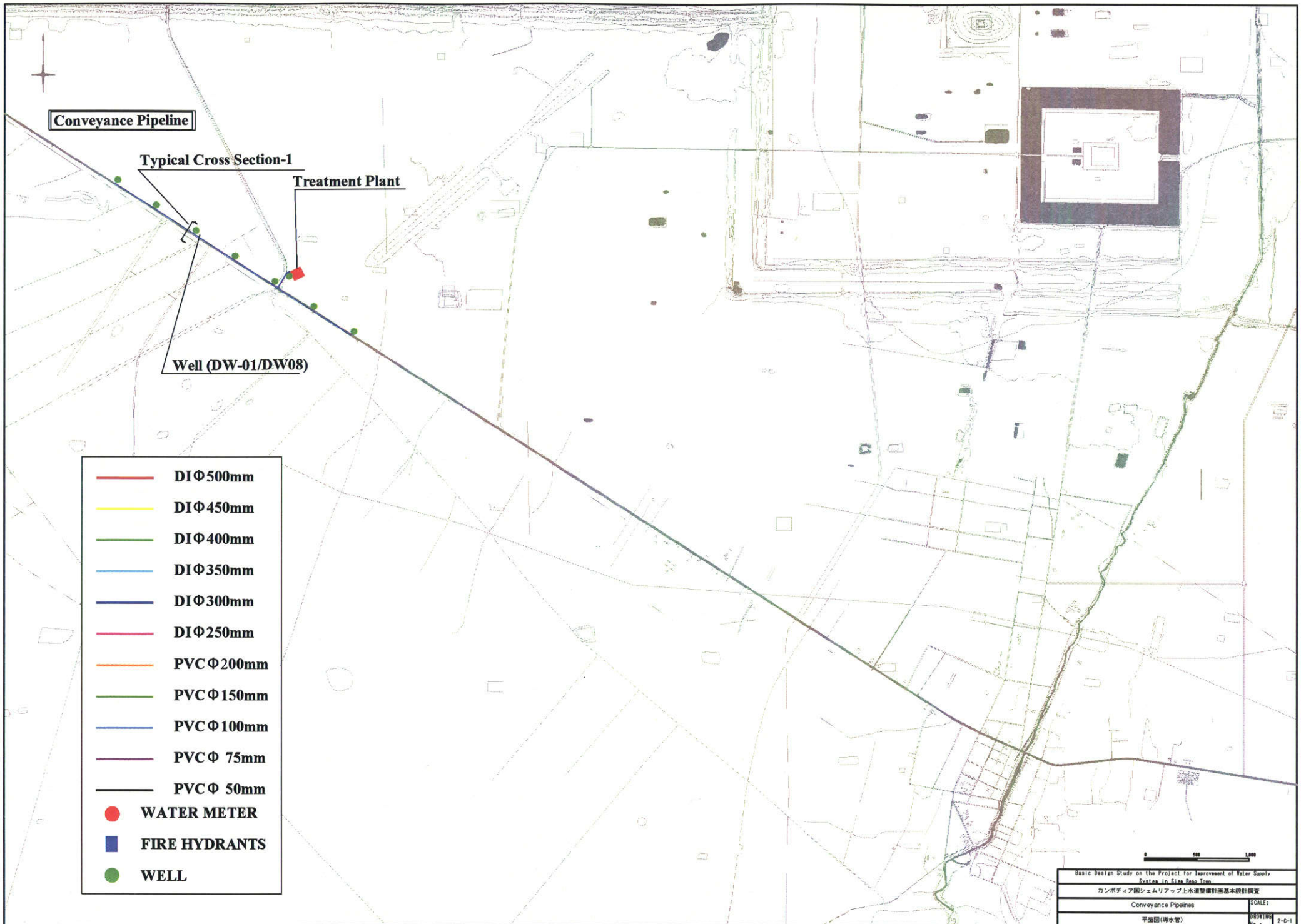
Filtration Tank
 (ろ過池)

Clear Water Reservoir
 (浄水池)

Pumping Station
 (ポンプ室)

Elevated Water Tank
 (高架水塔)

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シエムリアップ水道整備計画基本設計調査	
Hydraulic Profile	図名:
水位高低図	図号: 0-0-2



Conveyance Pipeline

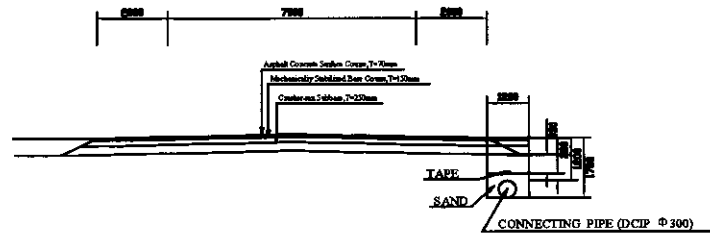
Typical Cross Section-1

Treatment Plant

Well (DW-01/DW08)

- DIΦ500mm
- DIΦ450mm
- DIΦ400mm
- DIΦ350mm
- DIΦ300mm
- DIΦ250mm
- PVCΦ200mm
- PVCΦ150mm
- PVCΦ100mm
- PVCΦ75mm
- PVCΦ50mm
- WATER METER
- FIRE HYDRANTS
- WELL

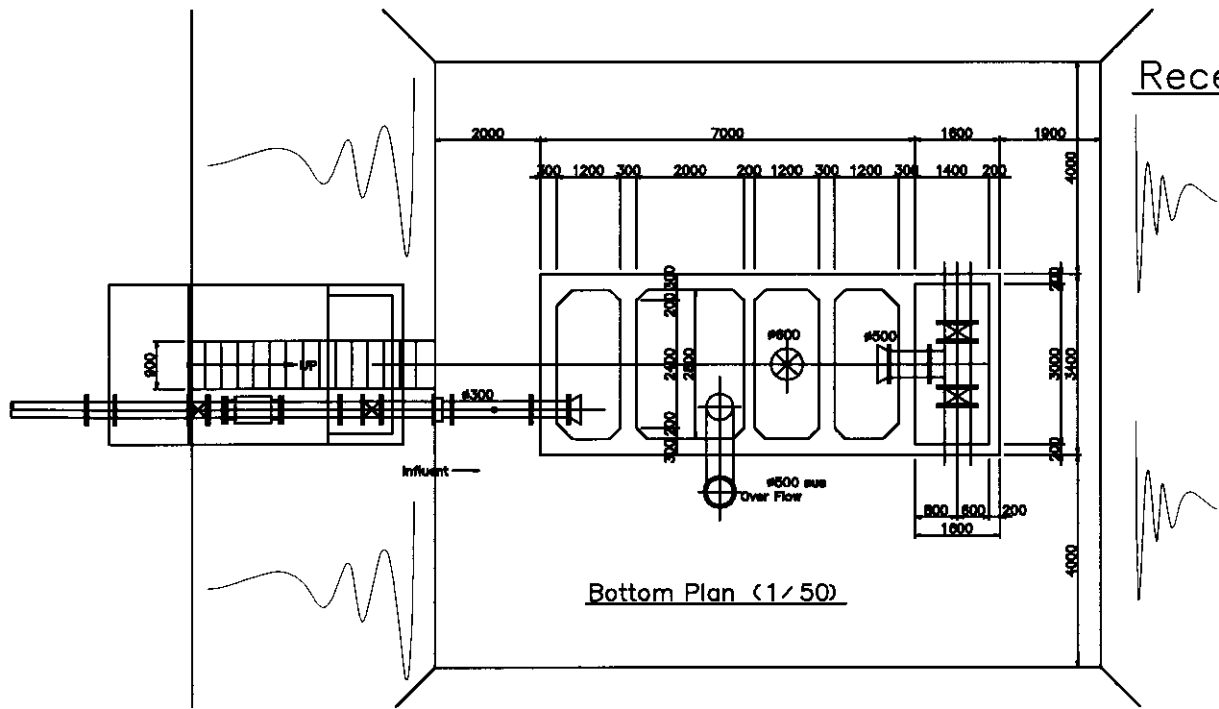
Basic Design Study on the Project for Improvement of Water Supply System in Sihan Bagan Inn	
カンボディア国シムリアップ上水道整備計画基本設計図書	
Conveyance Pipelines	SCALE:
平面図(導水管)	DRAWING No.: 2-C-1



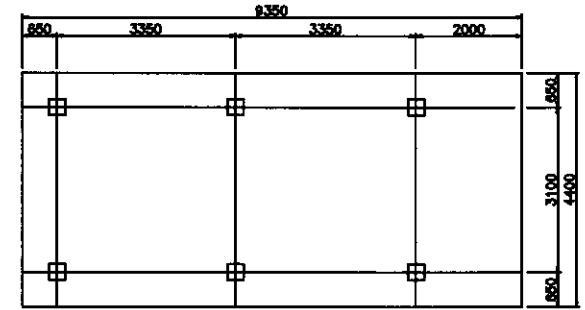
TYPICAL CROSS SECTION-1

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シェムリアップ上水道整備計画基本設計調査	
Typical Cross Section of Connecting Pipelines	SCALE: 1 : 150
標準断面図(導水管)	DRAWING No.: 2-C-2

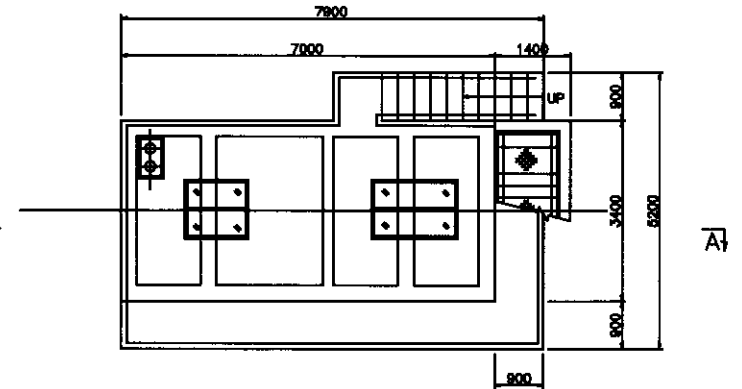
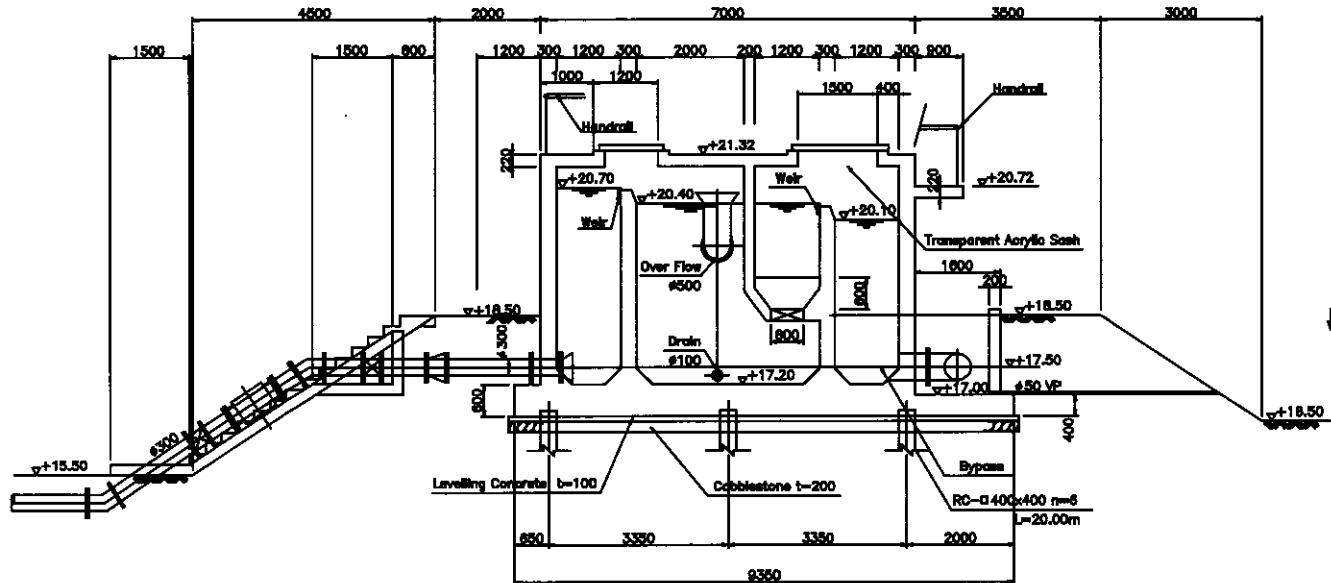
Receiving Well



Bottom Plan (1/50)

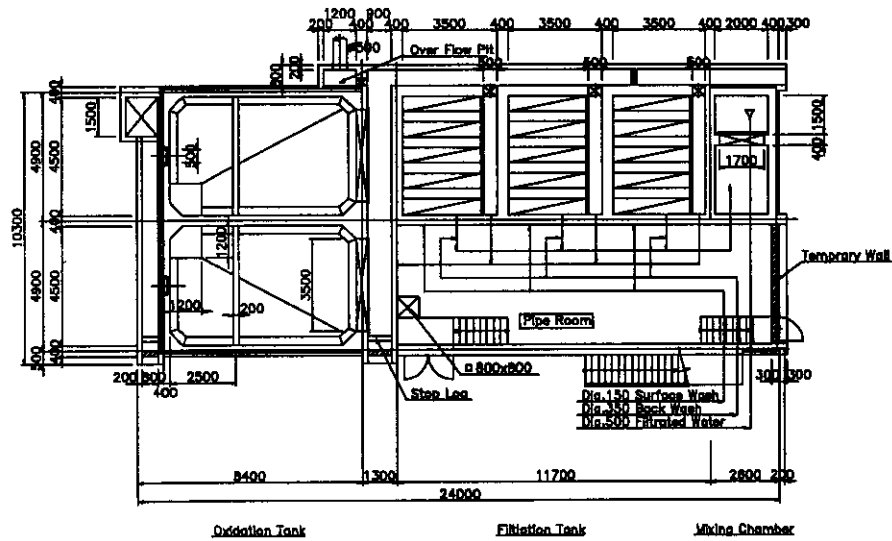


Pile Arrangement (1/50)

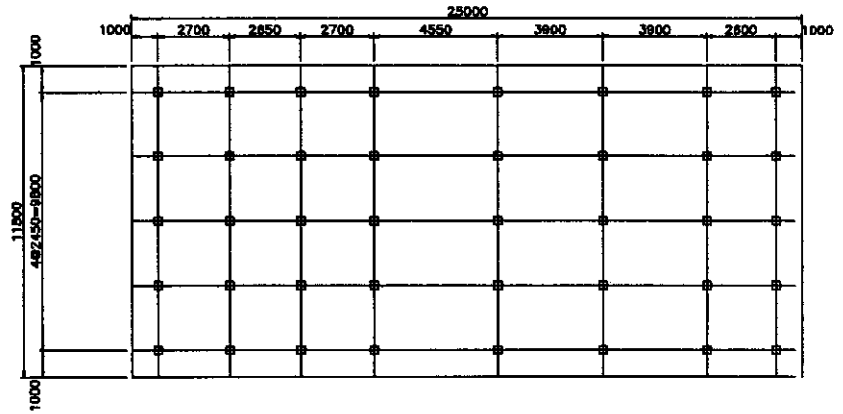


Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シェムリアップ上水運整備計画基本設計調査	
Receiving Well	SCALE: 1:200
着水井	図面番号: 3-0-1

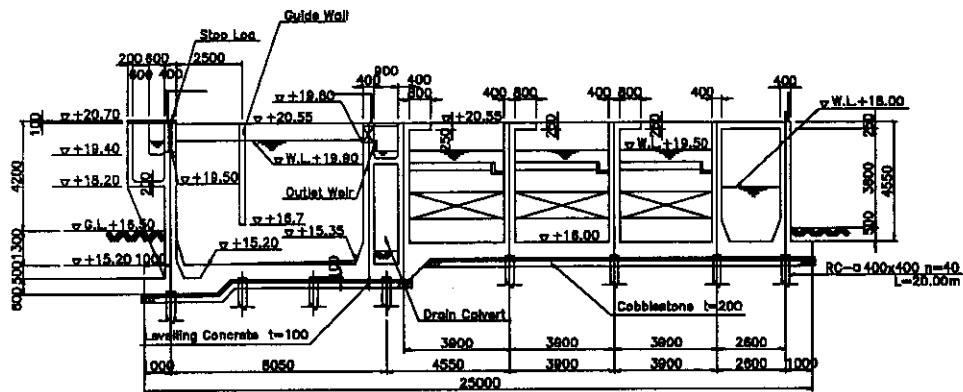
Oxidation & Filtration Tanks 1



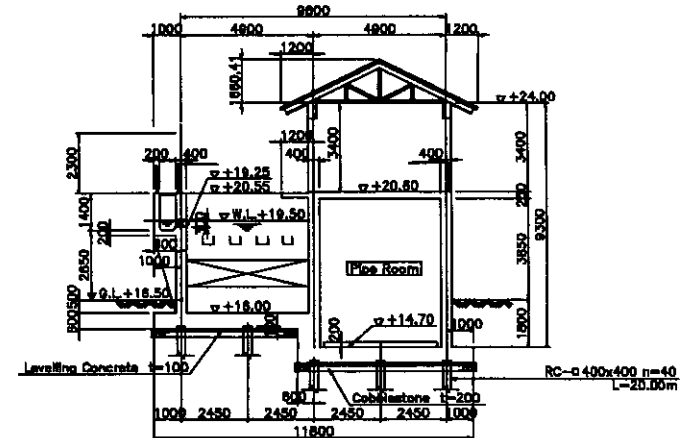
Bottom Plan (1/100)



Pile Arrangement (1/100)



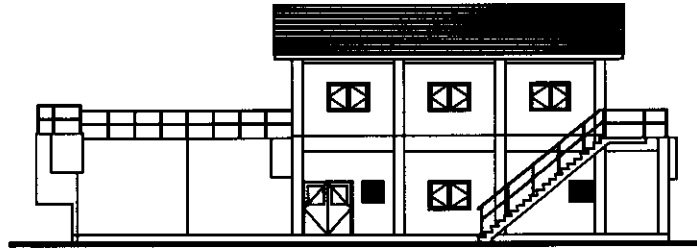
A-A Section (1/100)



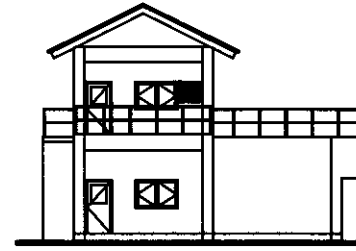
B-B Section (1/100)

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シエムリアップ上水道整備計画基本設計調査	
Oxidation & Filtration Tanks 1	SCALE 1 : 200
酸化池・ろ過池 (1)	DRAWING No. 3-0-2

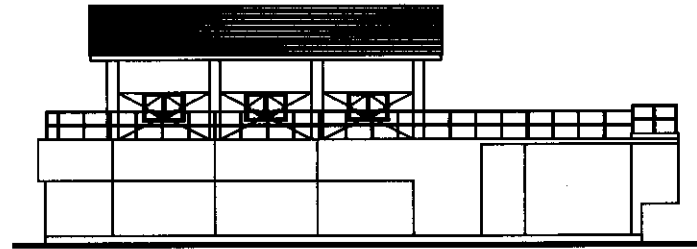
Oxidation & Filtration Tanks 2



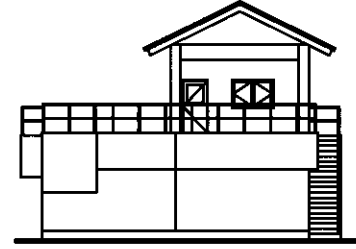
ELEVATION (S)



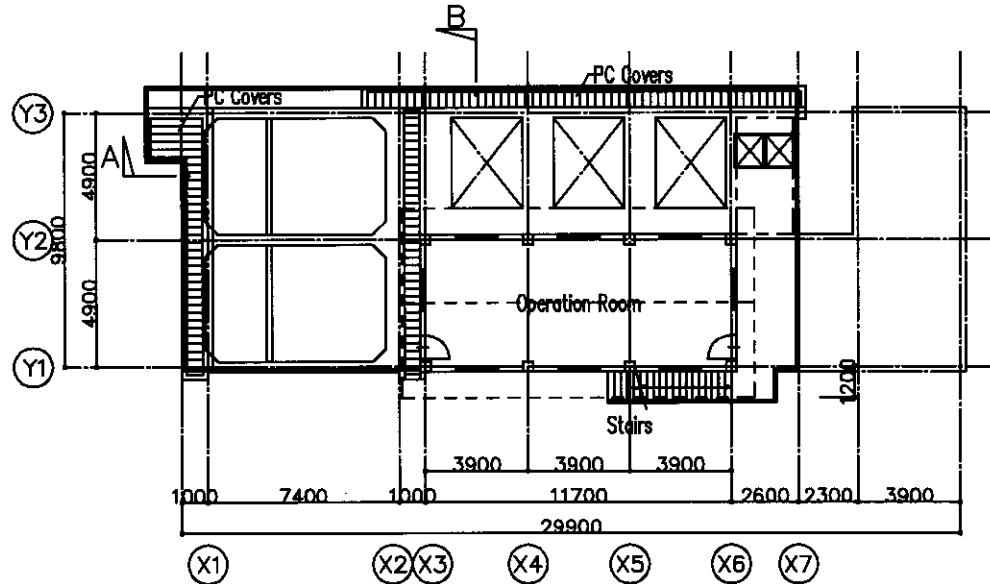
ELEVATION (E)



ELEVATION (N)



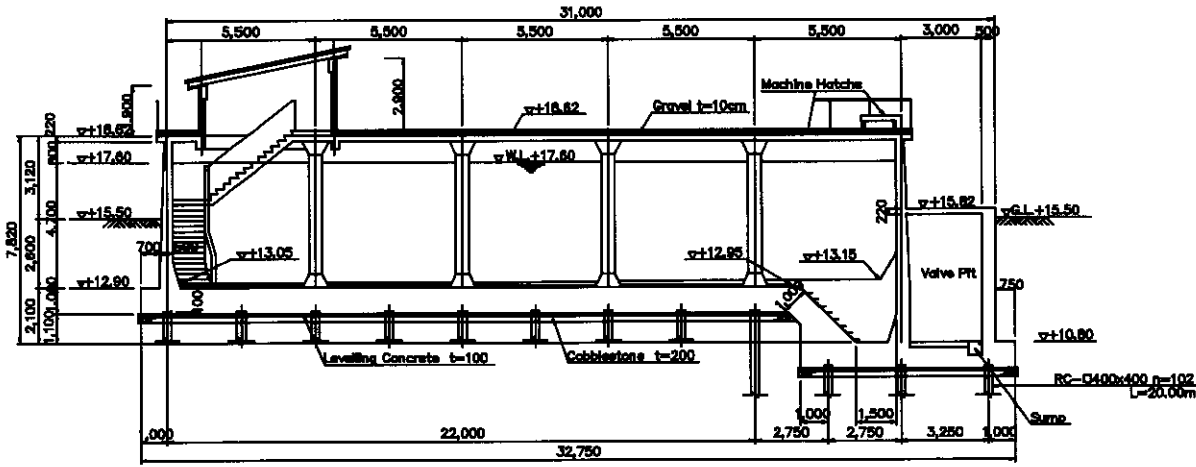
ELEVATION (W)



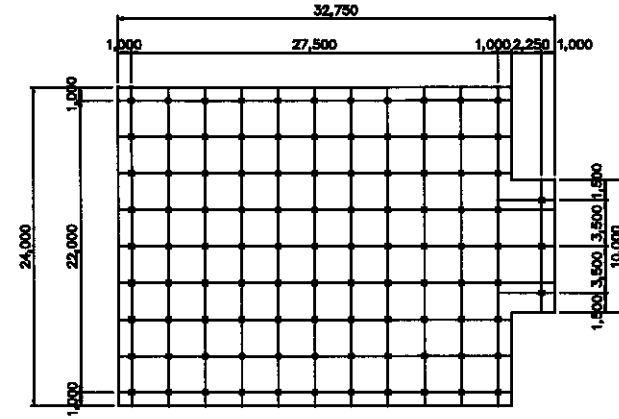
First Floor Plan

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シェムリアップ上水道整備計画基本設計調査	
Oxidation & Filtration Tanks 2	SCALE 1:200
酸化池・ろ過池 (2)	FIGURE No. 3-0-3

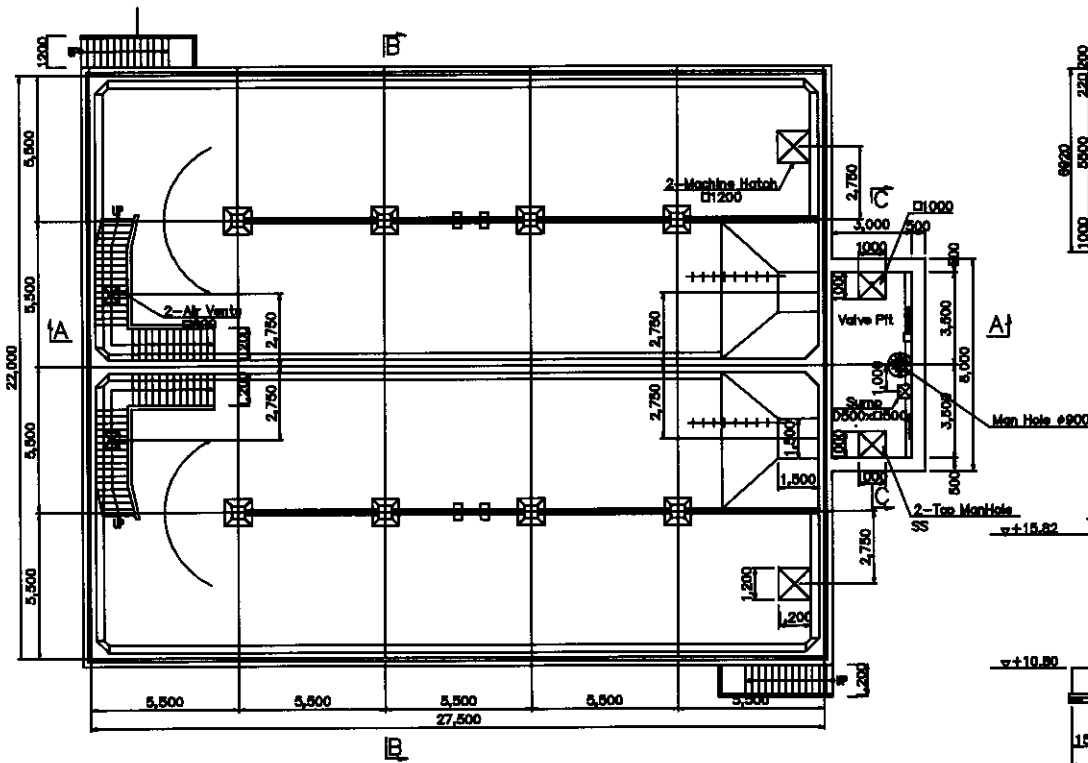
Clear Water Reservoir



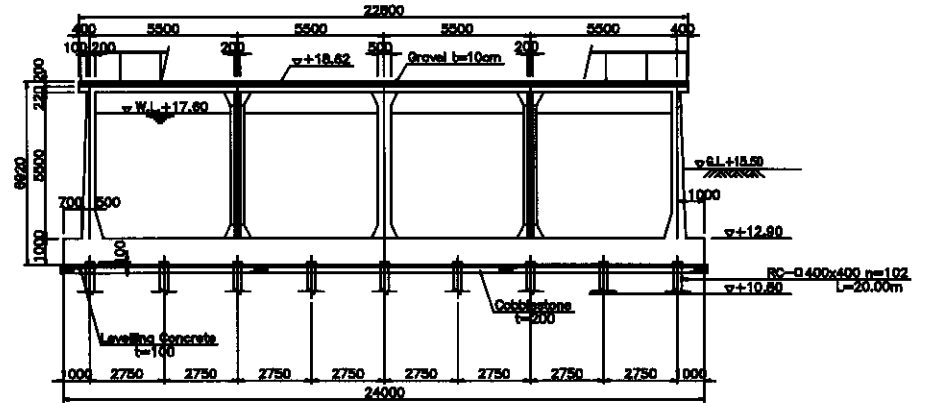
A-A Section (S=1/100)



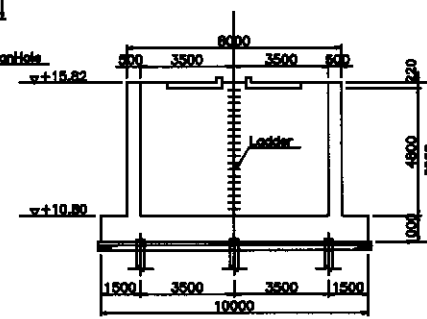
Pile Arrangement (S=1/200)



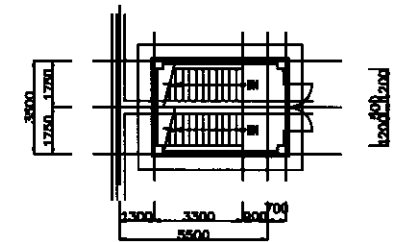
Bottom Plan (1/100)



B-B Section (1/100)

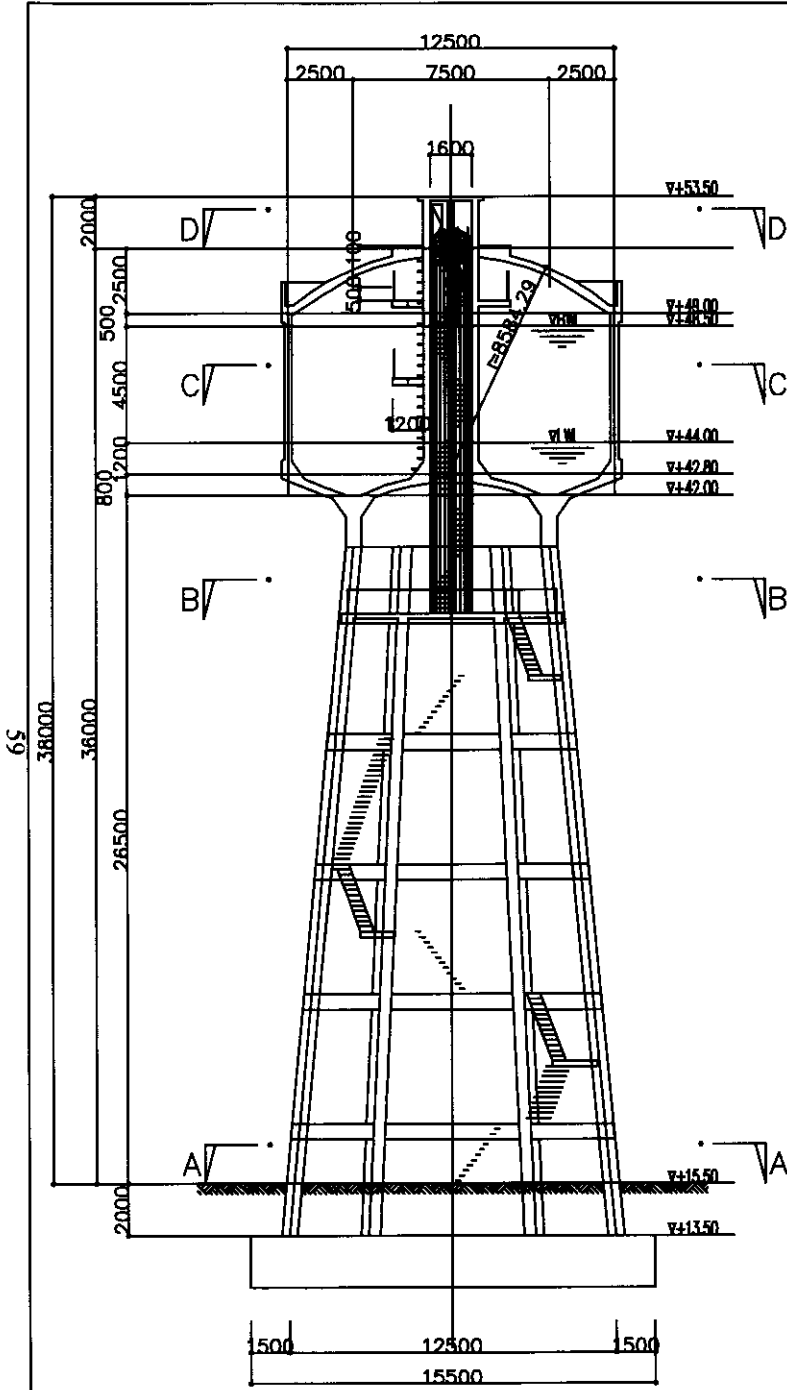


C-C Section (1/100)

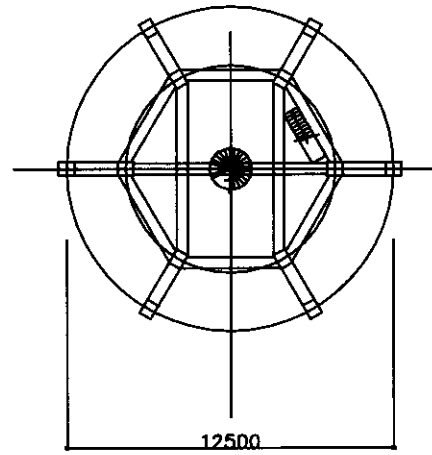


Pent House Plan (1/100)

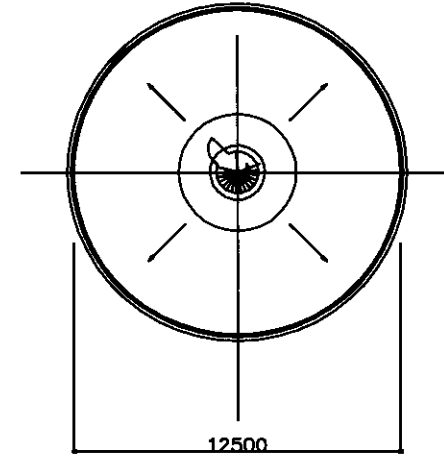
Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シェムリアップ上水道整備計画基本設計調査	
Clear Water Reservoir	SCALE: 1 : 100 - 200
浄水池	図面番号: 3-0-4



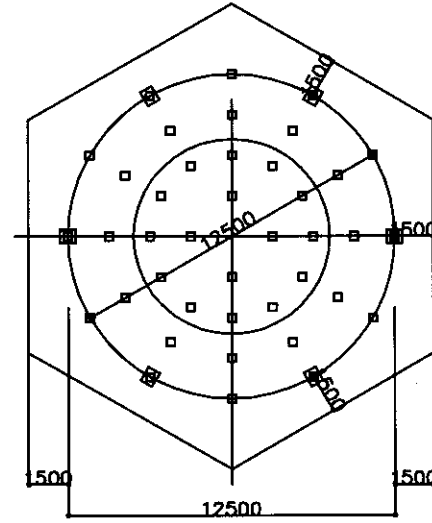
Section



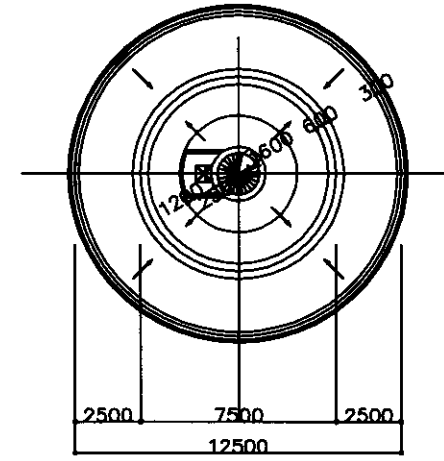
Plan B-B



Plan D-D

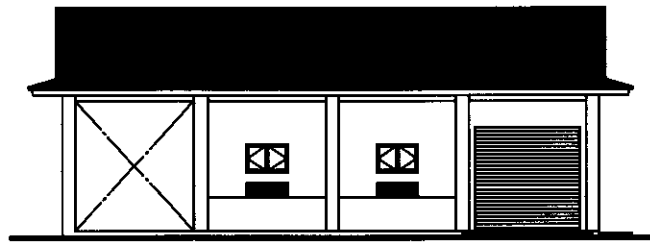


Plan A-A

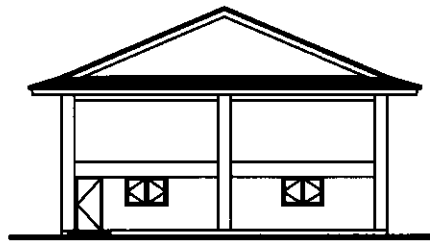


Plan C-C

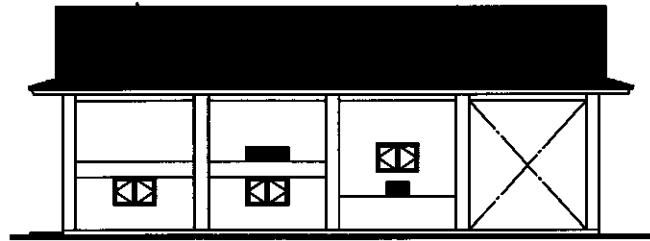
Basic Design Study on the Project for Improvement of Water Supply System in Sihanoukville	
カンボディア国シェムリアップ上水道整備計画基本設計調査	
Elevated Tank	SCALE: 1 : 200
高層水塔	FIGURE No.: 3-0-6



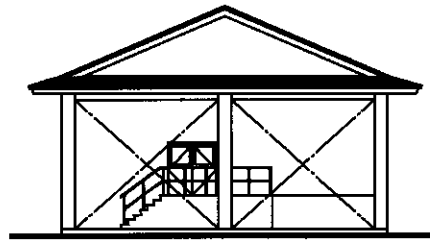
ELEVATION (S)



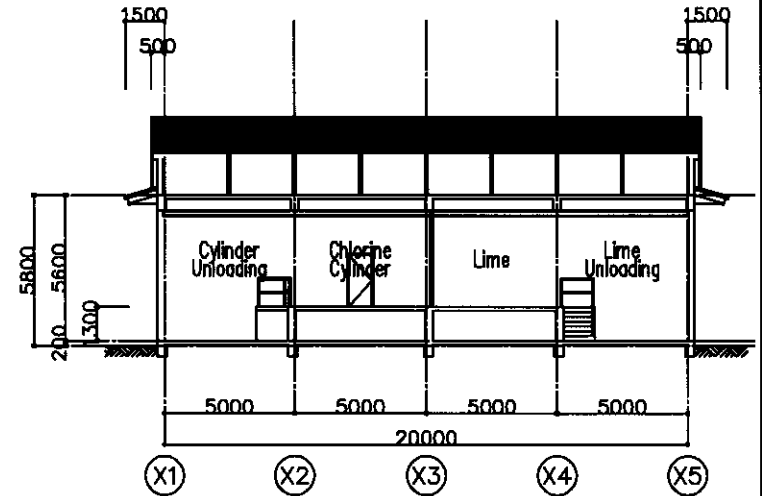
ELEVATION (E)



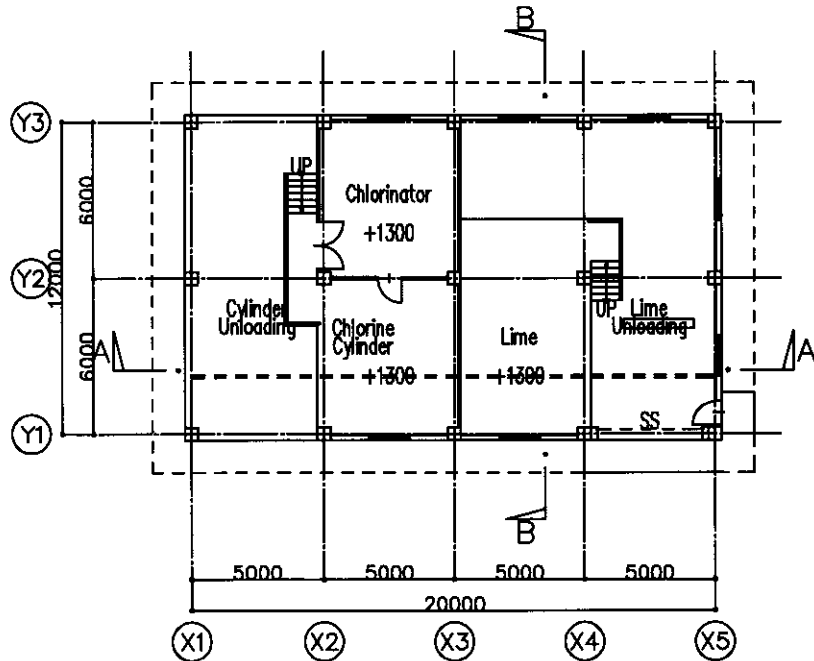
ELEVATION (N)



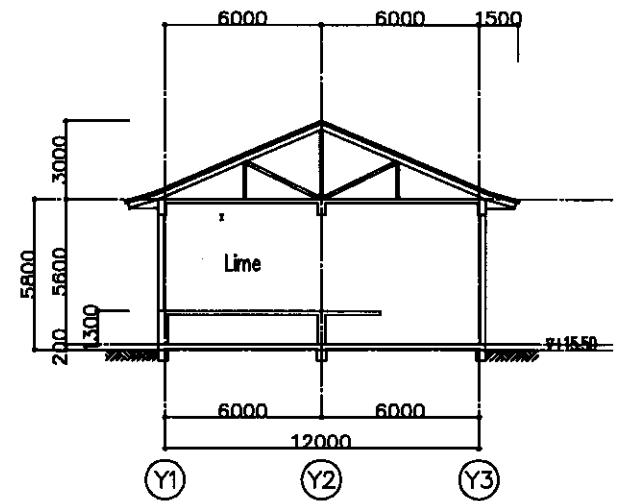
ELEVATION (W)



Section A-A



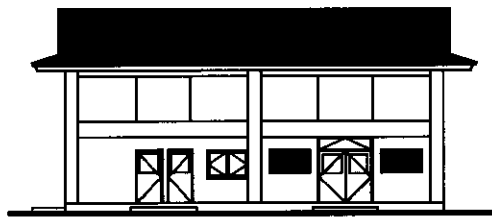
Ground Floor Plan



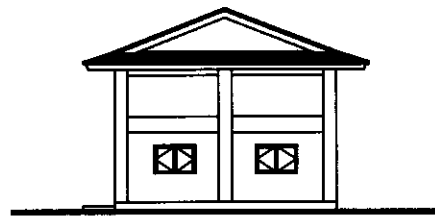
Section B-B

Basic Design Study on the Project for Improvement of Water Supply System in Srae Kamp Town	
カンボディア国シェムリアップ上水道整備計画基本設計調査	
Chemical Building	SCALE: 1 : 200
製品注入設備棟	図面番号: 3-0-7

ElectricBuild



ELEVATION (E)



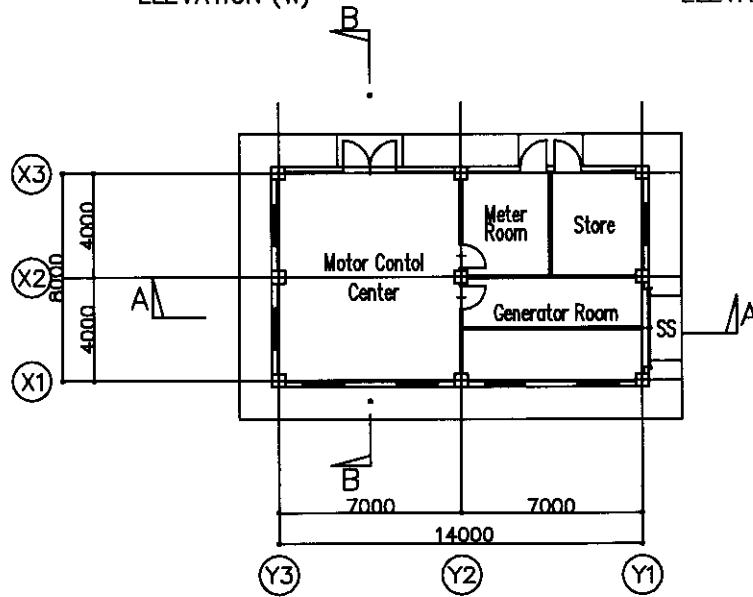
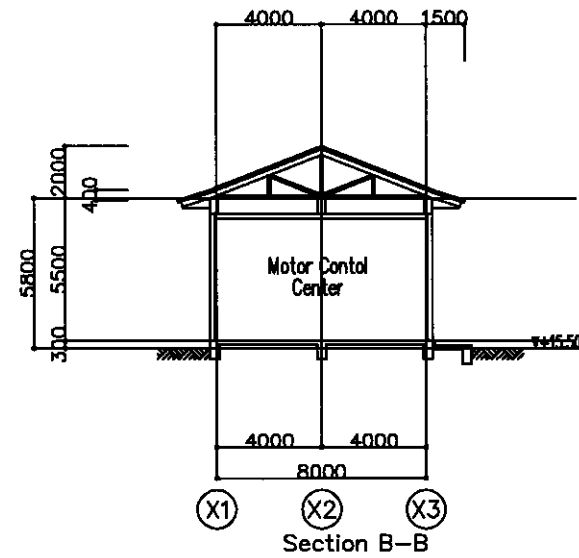
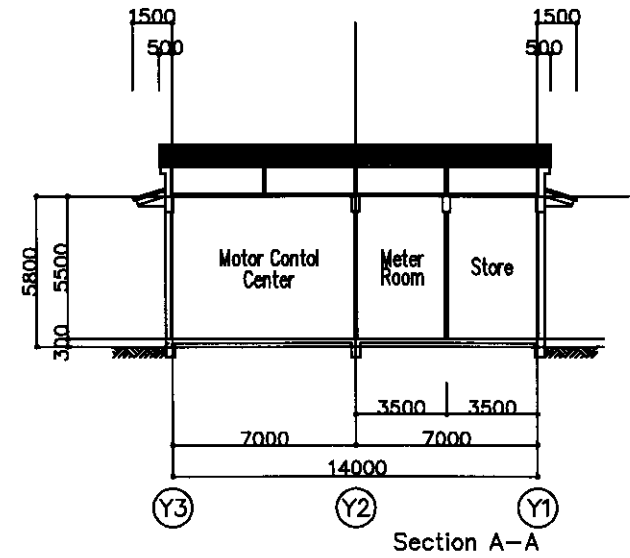
ELEVATION (N)



ELEVATION (W)

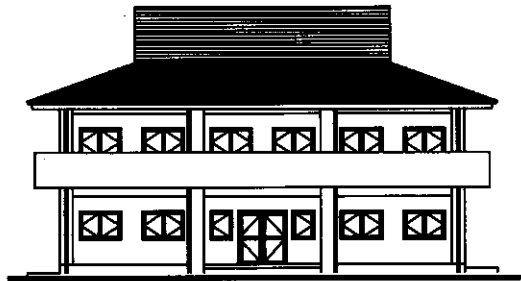


ELEVATION (S)

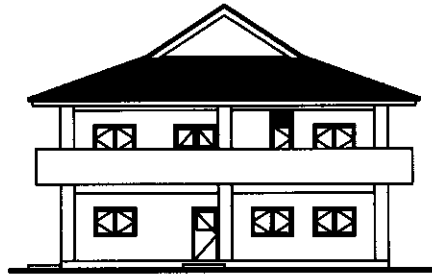


Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シムリアップ上水道整備計画基本設計調査	
Electric Building	SCALE: 1:200
予備発電・電気棟	DATE: 3-0-8

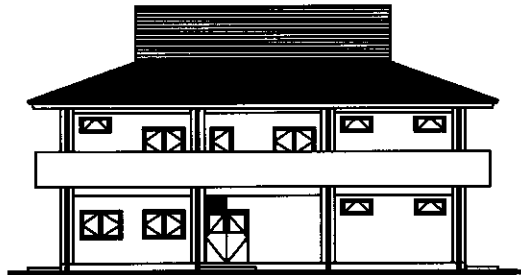
AdminBuild



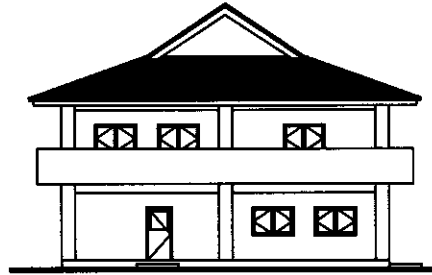
ELEVATION (W)



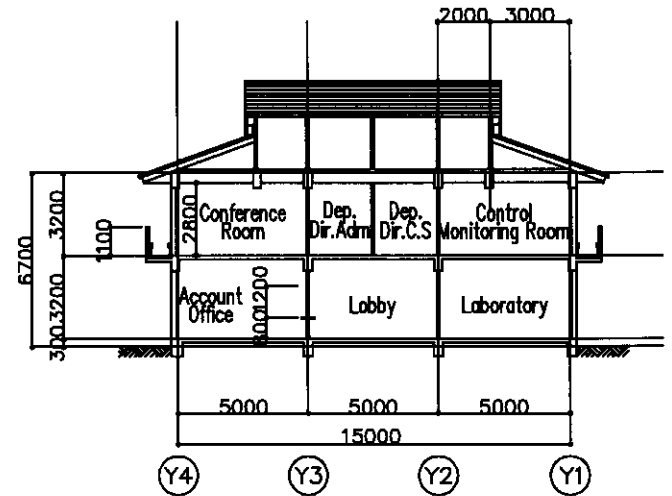
ELEVATION (S)



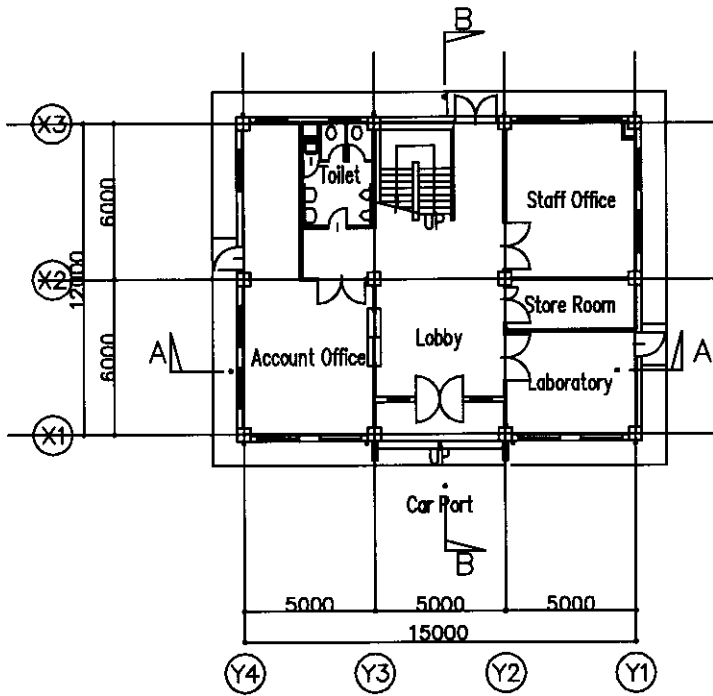
ELEVATION (E)



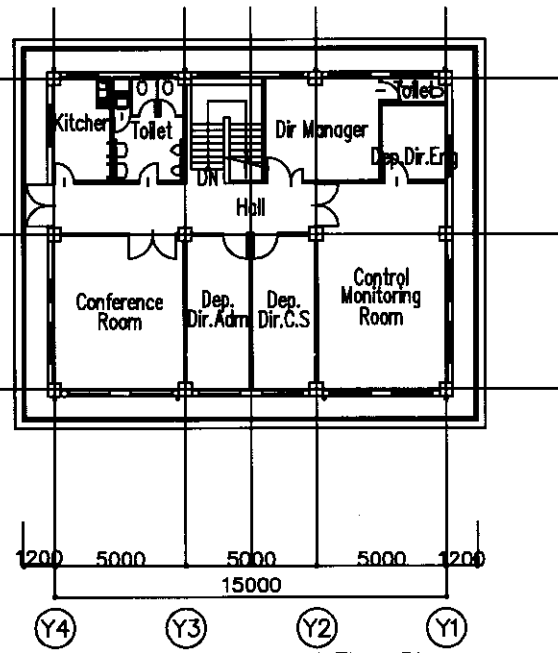
ELEVATION (N)



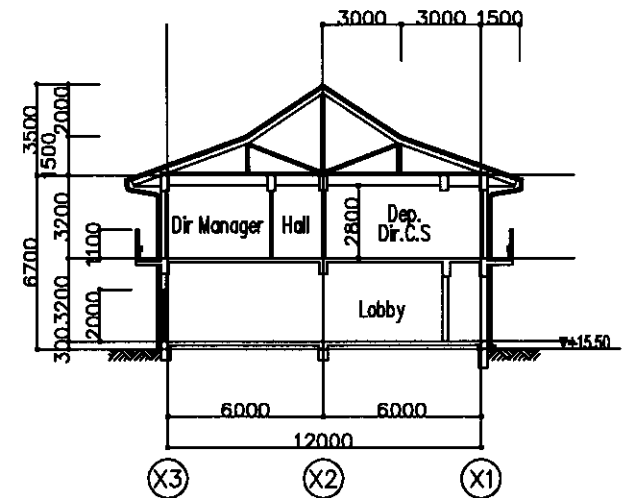
Section A-A



Ground Floor Plan



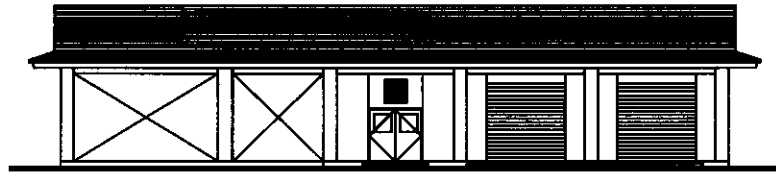
First Floor Plan



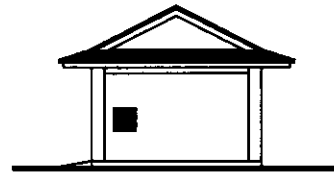
Section B-B

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シムリアップ水道整備計画基本設計調査	
Administration Building	SCALE: 1:200
管理棟	3-0-1

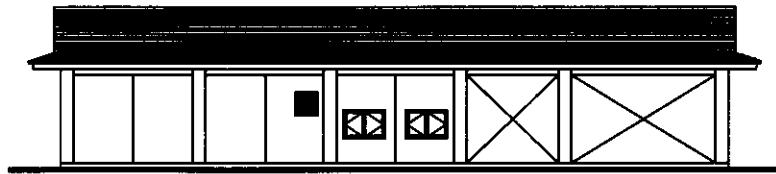
WorkShop



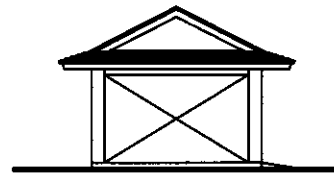
ELEVATION (S)



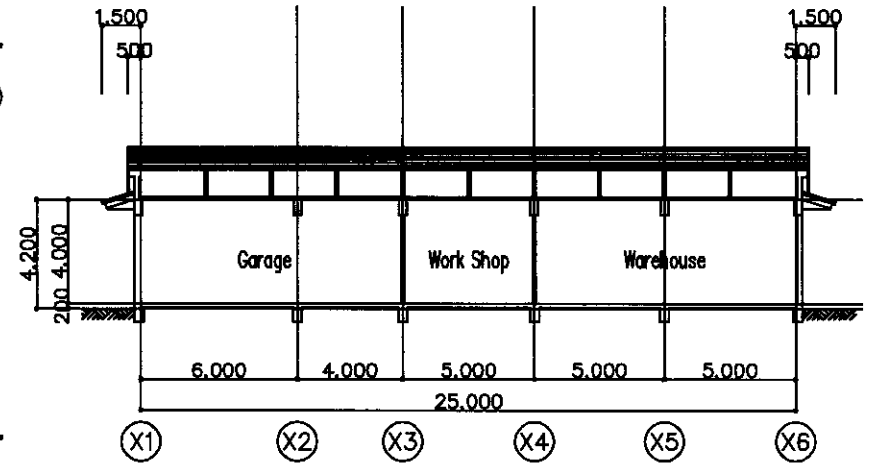
ELEVATION (E)



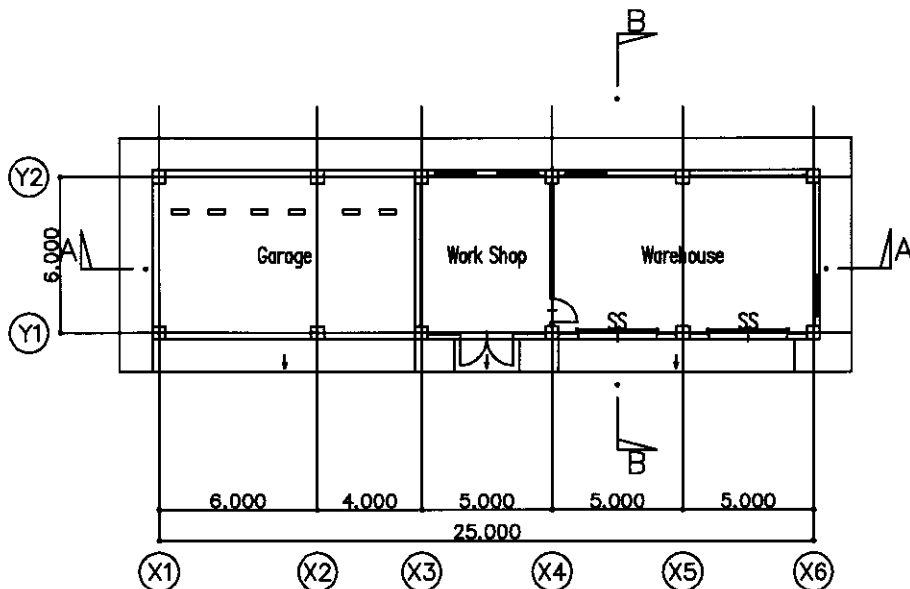
ELEVATION (N)



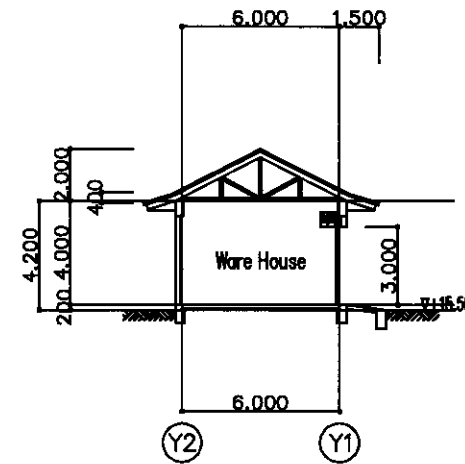
ELEVATION (W)



Section A-A



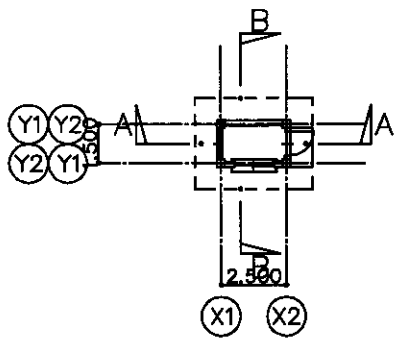
Ground Floor Plan



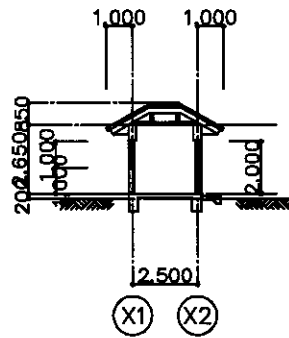
Section B-B

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シェムリアップ上水道整備計画基本設計調査	
Work Shop	FIGURE No. : 1 : 200
ワークショップ	DATE : 3-0-10

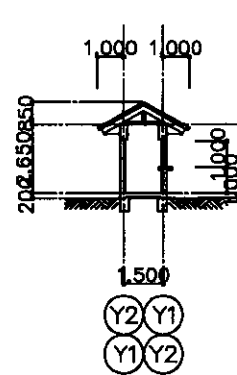
GurdHouse



Ground Floor Plan

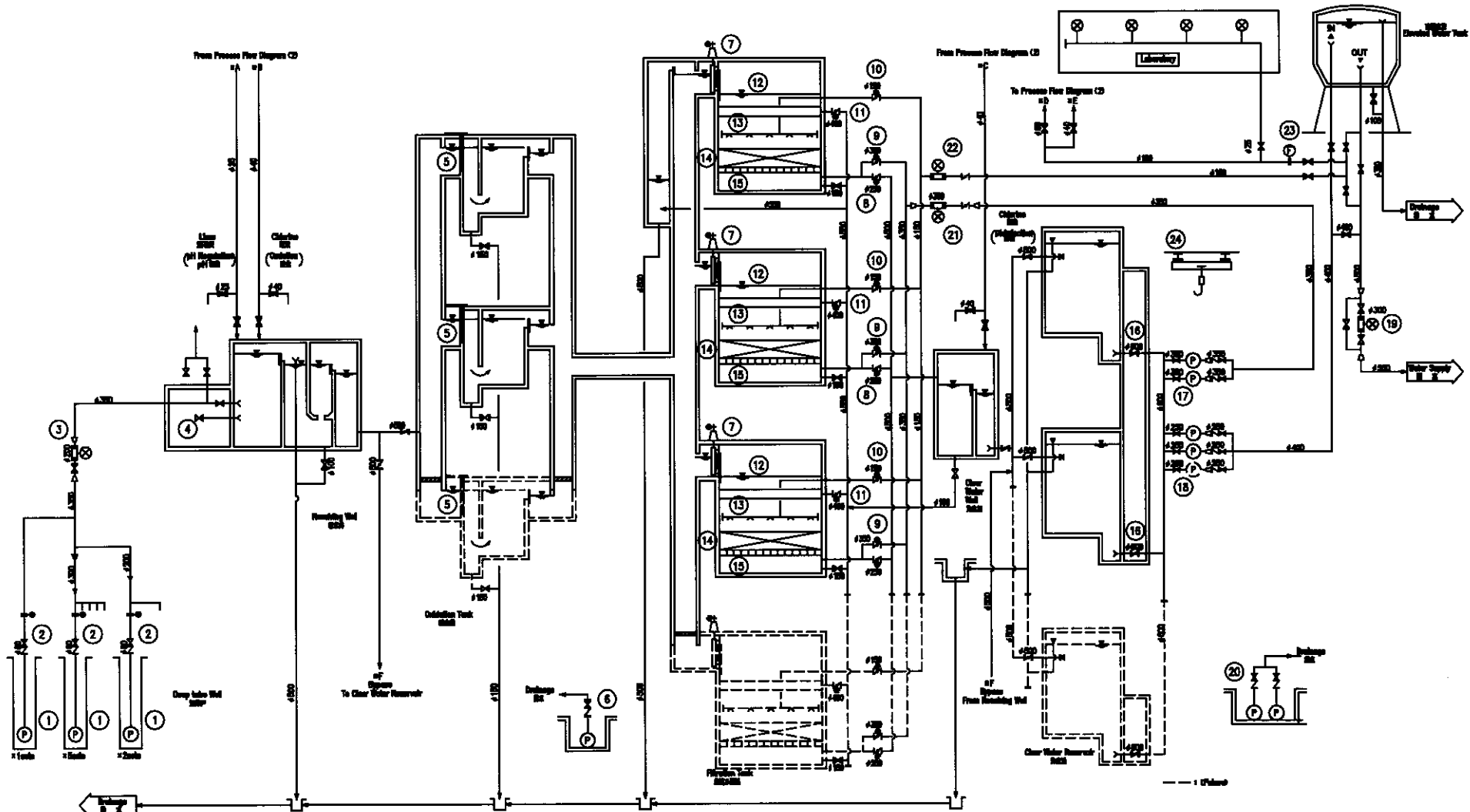


Section A-A



Section B-B

Basic Design Study on the Project for Improvement of Water Supply System in Siam Reap Town	
カンボディア国シェムリアップ水道整備計画基本設計調査	
Guard House	図号: 3-0-11
ガードハウス	図尺: 1:200

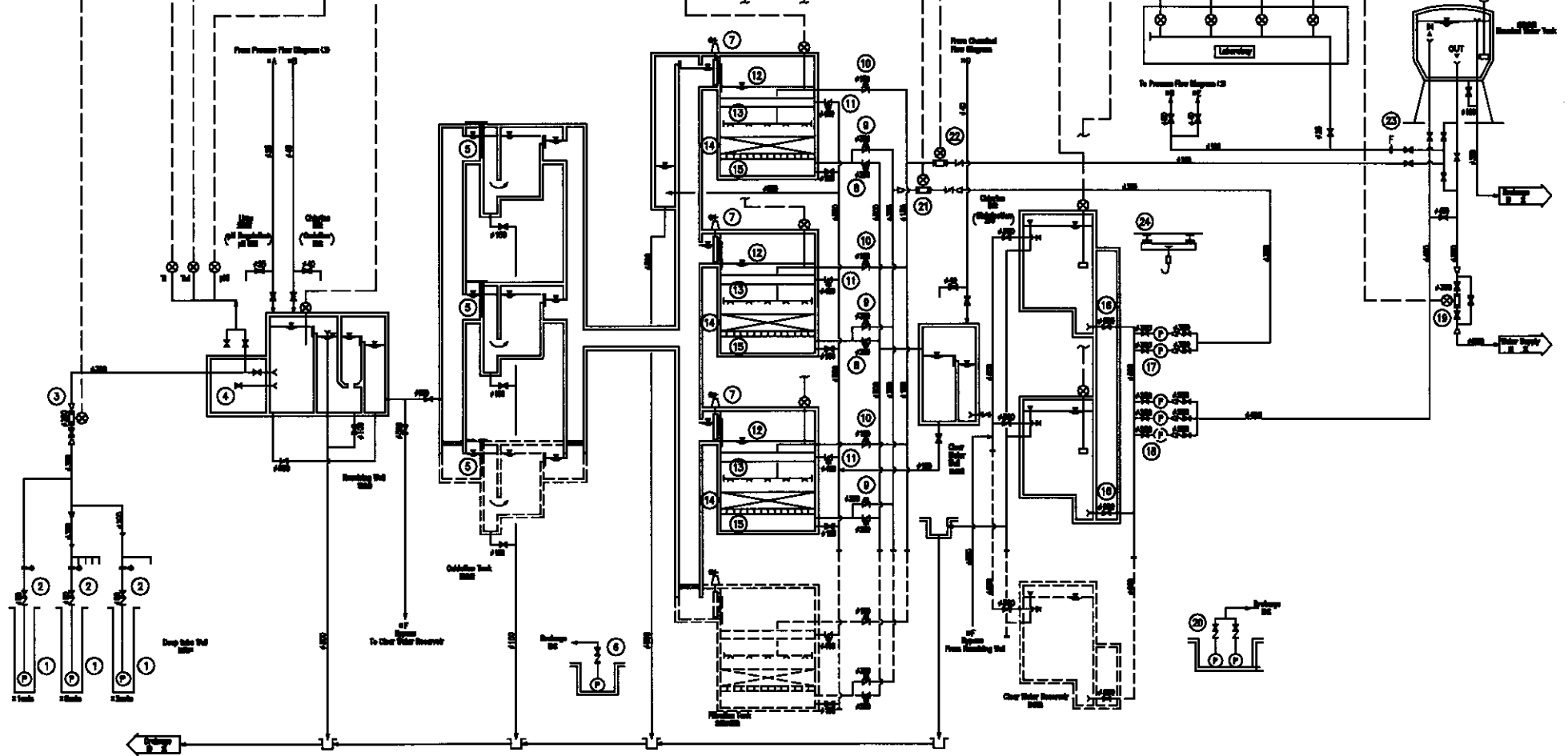


No.	1	2	3	4	5	6	7	8	9	10	11	12	13
NAME	DEEP WELL PUMP S202/177	DEEP WELL PUMP S202/177	DEEP WELL PUMP S202/177	DEEP WELL PUMP S202/177	OVERFLOW TANK STOP LOG S202/177	DRINKING PUMP (1) S202/177	NEW WATER GATE S202/177	FILTERED WATER VALVE S202/177	BACK WASH VALVE S202/177	SURFACE WATER VALVE S202/177	WATER VALVE S202/177	WATER VALVE S202/177	SURFACE WATER PIPE S202/177
TYPE	SCHEMATIC PUMP	SCHEMATIC PUMP	SCHEMATIC PUMP	SCHEMATIC PUMP	STOP LOG	SCHEMATIC PUMP	WATER GATE GATE	WATER VALVE VALVE	WATER VALVE VALVE	WATER VALVE VALVE	WATER VALVE VALVE	WATER VALVE VALVE	POSSIBLE TRIZLE TYPE
SPECIFICATION	0.7m ³ /min/27m				for future	4.0m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	100/100/50
No.	14	15	16	17	18	19	20	21	22	23	24		
NAME	FILTER MEDIA S202/177	UNDERDRINK SYSTEM S202/177	DRINKING WATER S202/177	BACK WASH PUMP S202/177	SLUDDING WATER TANK LEFT PUMP S202/177	CLEAR WATER FLOW METER S202/177	DRINKING PUMP (2) S202/177	BACK WASH FLOW METER S202/177	SURFACE WATER FLOW METER S202/177	LUMINARY WATER FLOW METER S202/177	ORING S202/177		
TYPE	SAND AND GRAVEL S202/177	POP-UP/BLIND S202/177	WATER VALVE VALVE S202/177	SCHEMATIC VALVE PUMP S202/177	SCHEMATIC VALVE PUMP S202/177	WATER FLOW METER S202/177	SCHEMATIC SLUDGE PUMP S202/177	WATER FLOW METER S202/177	WATER FLOW METER S202/177	WATER FLOW METER S202/177	ORING S202/177		
SPECIFICATION	0.7m ³ /min/27m					0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m	0.5m ³ /min/15m		

See Waterworks In Short Report
S202/177/2000
Process Flow Diagram (1)
700000-000000 (1)

Basis Design Study on the Project for Improvement of Water Supply System in Siam Reap Town
 ភ្នំពេញ ៖ ការសិក្សាស្រាវជ្រាវ និង ការប្រឡងគម្រោងសម្រាប់ការកែលម្អប្រព័ន្ធនីត្រឹមត្រូវ
 Process Automatic and Flow Diagram - No.1
 ទម្រង់ ១-១ (1)
 ទំព័រ ៤-៧-1

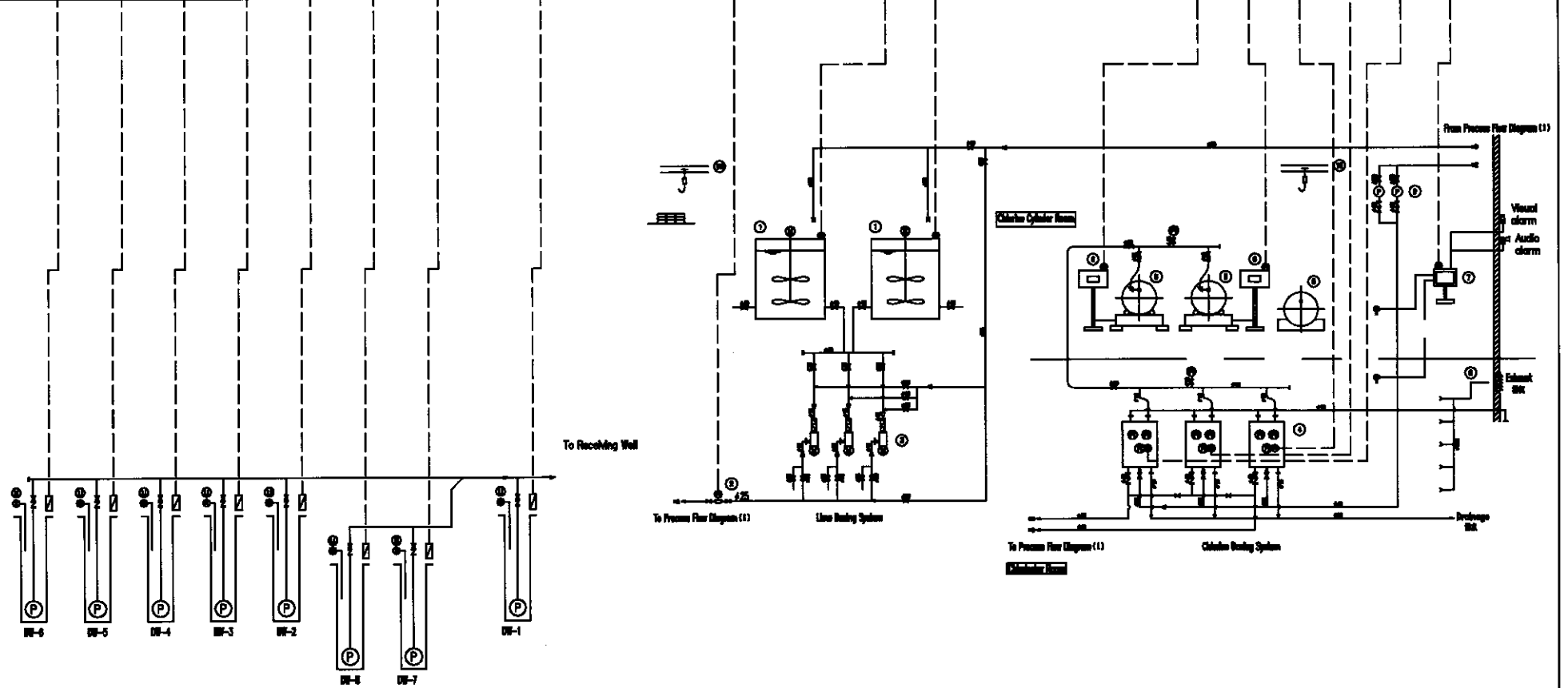
NAME	RAW WATER FLOW (LINE)	RAW WATER TEMPERATURE	RAW WATER TURBIDITY	RECEIVING WELL PH	RAW WATER LEVEL	No.1 FILLING TANK FLOW LEVEL	No.2 FILLING TANK FLOW LEVEL	No.3 FILLING TANK FLOW LEVEL	BACK WASH FLOW	SURFACE WASH FLOW	CLEAN WATER RESERVOIR LEVEL	CLEAN WATER RESERVOIR LEVEL	CLEAN WATER TEMPERATURE	CLEAN WATER PH	CLEAN WATER TURBIDITY	CLEAN WATER RESON CHLORINE	CLEAN WATER FLOW	CLEANED WATER TANK LEVEL
CONTROL MONITORING UNIT (Administration Building)	FI	TI	TuI	PH	LA	LA	LA	LA	FI	FI	LI	LI	TI	PH	TuI	Cl	FI	LI
INSTRUMENTATION PANEL (Electric Building)	FACI	TI	TuI	PH	LA	LA	LA	LA	FI	FI	LA	LA	TI	PH	TuI	Cl	FI	LA



NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NAME	DEEP TUBE WELL PUMP	RAW WATER TEMPERATURE	RAW WATER TURBIDITY	RAW WATER PH P.V.C.	RAW WATER LEVEL	DISCHARGE PUMP (1)	RAW WATER ONE	FILLING WATER WAVE	BACK WASH WAVE	SURFACE WASH WAVE	WASH WATER WAVE	WASH WATER WAVE	SURFACE WASH PIPE	FILLER HEAD
NO.	15	16	17	18	19	20	21	22	23	24				
NAME	UNDERGROUND SCREEN	UNDERGROUND SCREEN	BACK WASH PUMP	RECEIVING WELLS PUMP	CLEAN WATER FLOW METER	DISCHARGE PUMP (2)	BACK WASH PUMP METER	SURFACE WASH PUMP METER	CLEAN WATER FLOW METER	CONC.				

Basic Design Study on the Project for Improvement of Water Supply System in Siam Sam Teem
 カンボディア国シムレップ上水道整備増強基本設計図書
 Flow Diagram for Instrumentation - No.1
 計装フロー図(1)
 SCALE: 1/1000
 DRAWING No.: 4-E-1

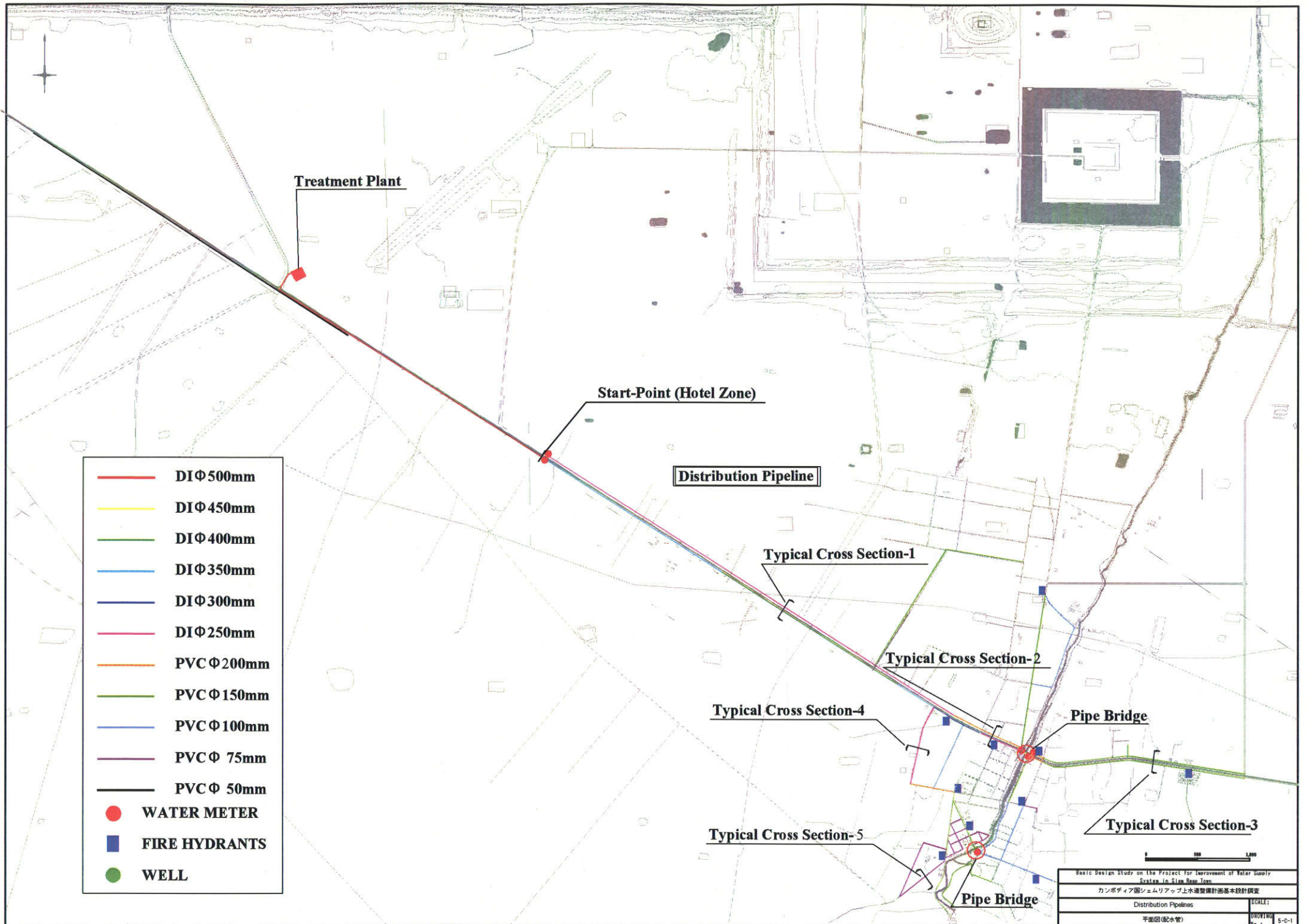
NAME	No.8 DWP LUMP SUM ALARM	No.5 DWP LUMP SUM ALARM	No.4 DWP LUMP SUM ALARM	No.3 DWP LUMP SUM ALARM	No.2 DWP LUMP SUM ALARM	No.8 DWP LUMP SUM ALARM	No.7 DWP LUMP SUM ALARM	No.1 DWP LUMP SUM ALARM	LINE DOSSING FLOW	No.1 LINE HOLDING TANK LEVEL	No.2 LINE HOLDING TANK LEVEL	No.1 CL2 CYLINDER WEIGHT	No.2 CL2 CYLINDER WEIGHT	No.1 CL2 GAS FLOW	No.2 CL2 GAS FLOW	No.3 CL2 GAS FLOW	CL2 GAS DETECTOR
CONTROL MONITORING UNIT (Administration Building)	LSA	LSA	LSA	LSA	LSA	LSA	LSA	LSA	FI	LJA	LJA	W	W	FI	FI	FI	G
INSTRUMENTATION PANEL (Electric Building)									FRQ	LJA	LJA	W	W	FRQ	FRQ	MG	G



Deep Tube Well Pumps

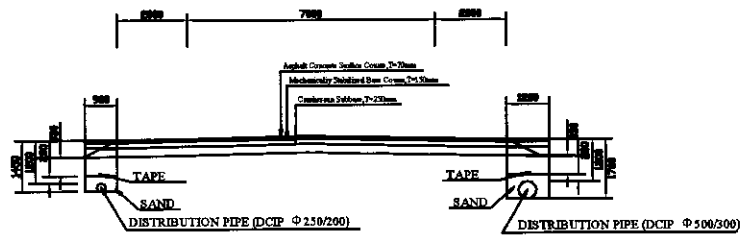
NO.	1	2	3	4	5	6	7	8	9	10
NAME	LINE DISSOLVING TANK	LINE DOSSING FLOW METER	LINE DOSSING PUMP	CHLORINATOR	CHLORINE CYLINDER	CYLINDER SCALE	CHLORINE GAS LEAK DETECTOR	EXHAUST FAN	ROTOR PUMP FOR CHLORINE	CHLORINE

Basic Design Study on the Project for Improvement of Water Supply System in Shinjuku Ward	
カネボウグループの環境・社会貢献活動	
Flow Diagram for Instrumentation - No.2	SCALE:
図面コード: 4-E-2	REVISED No.: 4-E-2

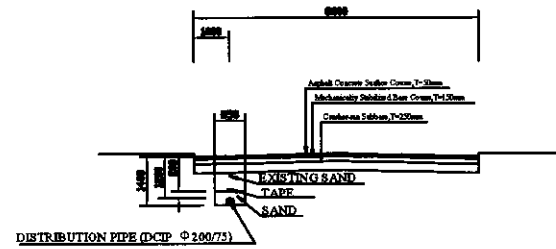


- DIΦ500mm
- DIΦ450mm
- DIΦ400mm
- DIΦ350mm
- DIΦ300mm
- DIΦ250mm
- PVCΦ200mm
- PVCΦ150mm
- PVCΦ100mm
- PVCΦ75mm
- PVCΦ50mm
- WATER METER
- FIRE HYDRANTS
- WELL

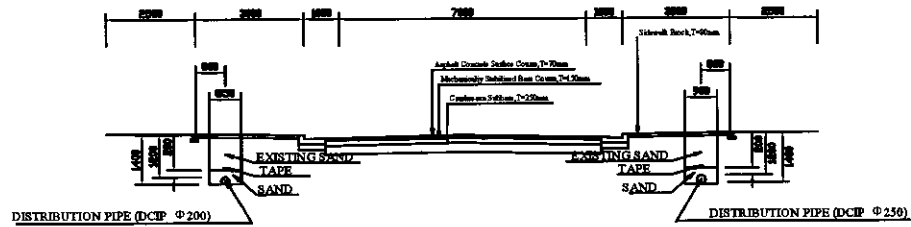
Basic Design Study on the Project for Improvement of Water Supply System in Siam Reap	
カンボディア国シェムリアップ上水道整備計画基本設計調査	
Distribution Pipelines	SCALE:
平面図 (配水管)	DRAWING No.: S-C-1



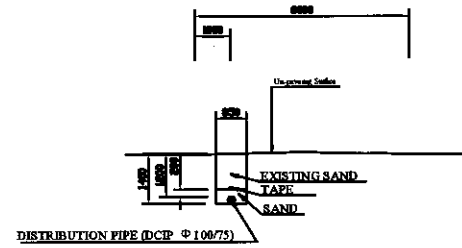
TYPICAL CROSS SECTION-1



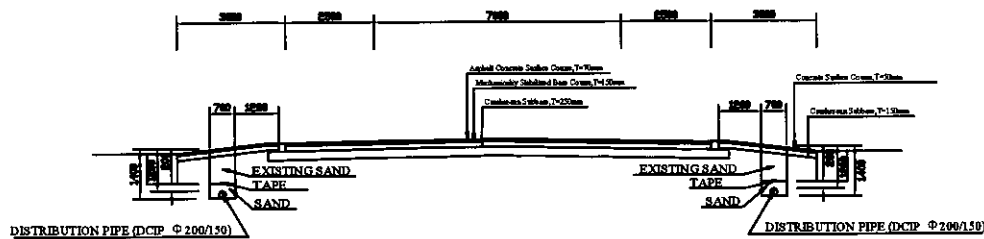
TYPICAL CROSS SECTION- 4



TYPICAL CROSS SECTION-2



TYPICAL CROSS SECTION-5

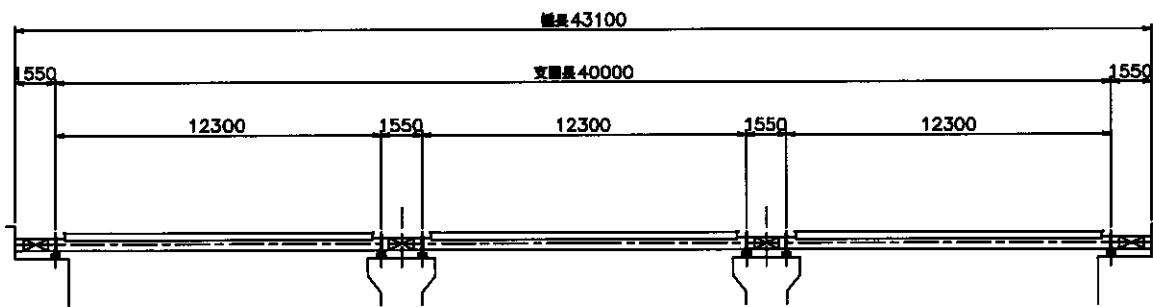


TYPICAL CROSS SECTION-3

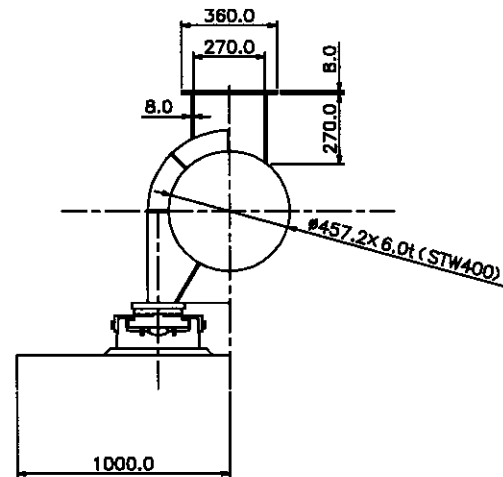
07

Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボジア国シエムリアップ上水道整備事業基本設計概説	
Typical Cross Section of Distribution Pipeline	SCALE: 1 : 150
標準断面図(配水管)	DRAWING No.: 5-C-2

A水管橋 (450A×40m)
3径简单純支持Ⅱ型補剛形式

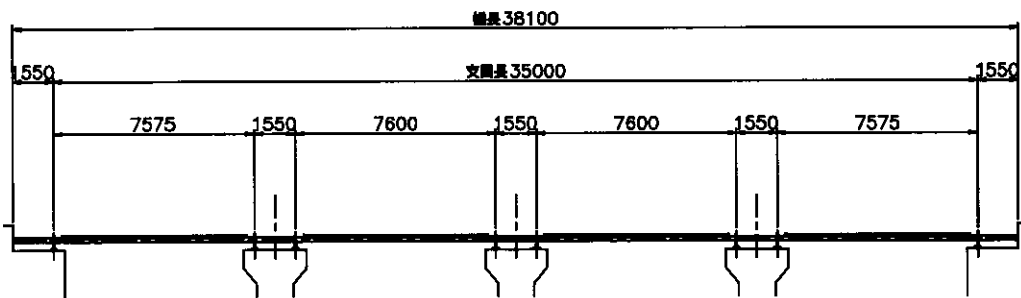


概算鋼重: 6.5 ton



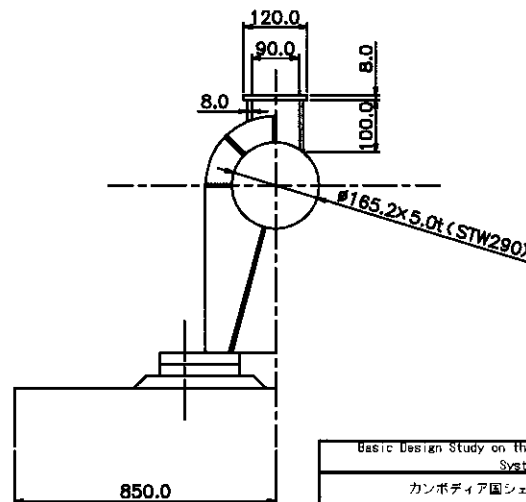
B水管橋 (150A×35m)
4径简单純支持Ⅱ型補剛形式

側面図



概算鋼重: 3.0 ton

断面図



Basic Design Study on the Project for Improvement of Water Supply System in Siem Reap Town	
カンボディア国シェムリアップ水道整備計画基本設計調査	
Pipe Bridge	SCALE: 1:200
水管橋	図号: 5-4-3

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The implementing agency of the Project is MIME in cooperation with the Siem Reap Provincial Government. The implementation system is shown below in Figure 2.19.

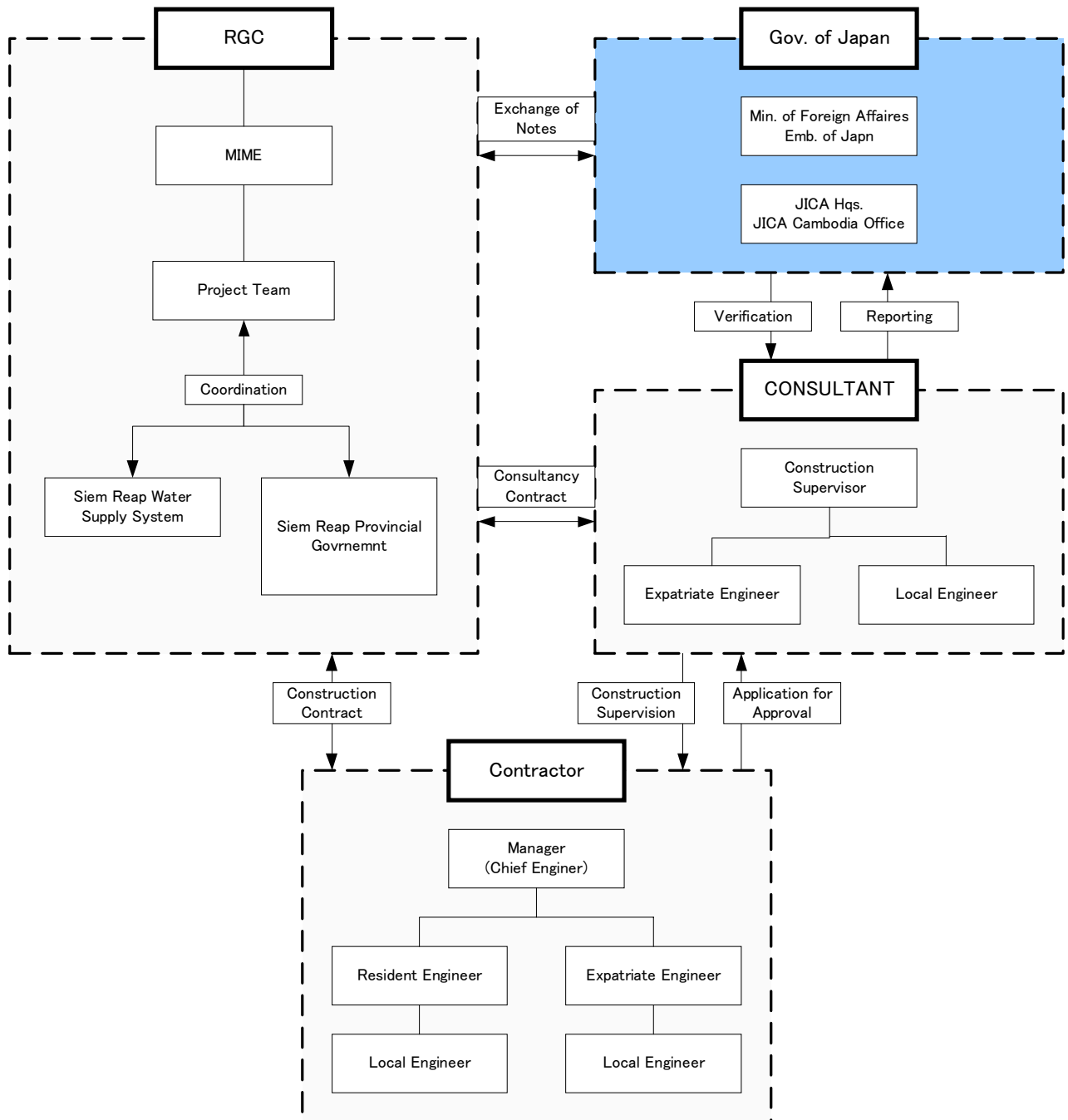


Figure 2.19 Project Implementation Diagram

The Project Team, which will be organized in MIME, shall be in charge of the Project implementation from the detailed design stage. The Project Team shall be responsible for the following work:

Reception of MIME for the Project

Liaison and adjustment with the divisions concerned in MIME

Liaison and cooperation with the external agencies (APSARA, Siem Reap Provincial Government, etc.) concerned with the Project

Arrangement of designing and bidding works as the client

Mobilization of staff required for an additional survey and test, if any

The Japanese Consultant will undertake the detailed design, bidding procedure and construction supervision in order to proceed with the construction work smoothly and to complete the scope of work within the given construction period. The Consultant will send a civil engineer, who will be stationed in Siem Reap, to provide supervisory services of the whole of the construction work and other engineers as required at the completion time of the major facilities and at the end of the fiscal year.

The main part of the Project is to construct a water supply system composed of intake, raw water transmission, treatment, clear water transmission, and distribution facilities including civil, architectural, mechanical and electrical facilities, and other pipe-laying works. It is considered appropriate that a Japanese civil engineering contractor who has experience in the construction of water supply facilities will undertake the Work.

In selecting the contractor, the open bid system will be adopted and the qualification and selection criteria for bidders will be defined during the preparatory work for bidding through negotiation and with confirmation from MIME.

During construction works, Japanese Contractor shall dispatch engineers headed by the manager, who will direct the construction works at the site directly so as to secure the quality control. The Contractor is not allowed to sublet the whole of the Work. The facilities will not function as a water supply system until such time that all processes including raw water intake, raw water transmission, treatment, clear water transmission, and distribution facilities are to be completed and connected appropriately.

2-2-4-2 Implementation Conditions

As discussed in the previous section, the Cambodian construction industry is still a small business. Due to weak technological background, the general contractors can not bear fully the responsibilities for construction of the Project facilities. Only pipe works in the Project may be applicable for the local contractor who has actual experiences on pipe installation works with the Japanese prime contractor in the Japan's Grant in aide Project in Phnom Penh.

There is little space for the Contractor's management office in the premises of the Proposed water treatment plant site, therefore the Contractor will be required to lease the private land taking into account the stockyard for piping materials for the Project. The following is the special consideration in the construction works.

MIME agreed that MIME will conduct mining investigation for the proposed project site in cooperation with CMAC at his own cost. However, there may be a possibility of mines being buried in the proposed project site, thus

construction works, especially pile work, shall be carefully conducted.

To date, buried ruin has not been found at the proposed project site. In the event that buried ruins would be found during construction works, it should be reported to MIME and to the concerned agencies including APSARA and UNESCO to take appropriate archeological measures.

In principle, pipe will be laid under the public roads. Adequate traffic control and safety precautions will be necessary especially for construction of pipe bridges along the busy national road No.6.

Rock excavation is not scheduled in the works. However, in case that rock excavation will be required due to the geological conditions, necessary precautions will be taken accordingly.

2-2-4-3 Scope of Works

Table 2.25 summarizes the scope of works to be undertaken by GOJ and RGC, respectively.

There are 9 sites to be acquired, namely i) eight well construction sites scattered along the national road No. 6 and ii) one water treatment plant site near the Siem Reap International Airport. One site out of eight sites for well construction is already settled as a test well site during the previous field survey. The land acquisition includes clearance of mines if found and investigation for buried ruins. Fence works should be completed couple of months before the completion of Project in January 2006. Construction of electric distribution line to the proposed WTP site should be completed by October 2005 before the test operation will be commenced. Installation of consumer flow meters to be procured under the Project should be completed by the target year 2008. Water supply works to the affected residents by the proposed groundwater development should be undertaken with a good coordination to the residents dependent on the Project implementation schedule.

Table 2.25 Scope of Works

Scope to be Undertaken by GOJ	Scope to be Undertaken by RGC
i) Construction of wells	i) Land acquisition, including removal of mines and archeological survey at the proposed project site.
ii) Construction of WTP	ii) Dispatch of the Project Team to the Project site
iii) Supply and installation of mechanical and electrical facilities/equipment	iii) Treatment of mines if found
iv) Procurement and supply of maintenance tools	iv) Treatment of buried ruins if found
	v) Fence works for the well sites and the WTP site
	vi) Construction of electric distribution line to the WTP site
	vii) Installation of consumer flow meters with appurtenances

2-2-4-4 Consultant Supervision

(1) Detailed Design

If the GOJ decides to implement the Project based on the result of the basic design study, the Exchange of Notes (E/N) for detailed design for the Project will be concluded between GOJ and RGC. After the E/N signing, a contract with a Japanese Consultant will be prepared, GOJ will verify the contract, and the Consultant will start the detailed design.

Upon commencement of the Work, the Consultant will conduct detailed site survey such as topographical survey and soil investigation, conduct a detailed design and prepare the required documents such as detailed design report and tender documents including tender drawings.

The detailed design includes three months of site survey and four months of detailed analysis in Japan, totaling seven months.

(2) Bidding

If GOJ decides to implement the construction works for the Project based on the detailed design prepared by the Consultant, another E/N for construction works for the Project including Consultants' construction supervisory services will be concluded between GOJ and RGC. After the E/N signing, a contract with a Japanese Consultant will be prepared, GOJ will verify the contract as same manner as the detailed design. Then, the Consultant will start their construction supervisory services. After the approval of all bidding documents by MIME, the Consultant will assist MIME to enter into the bidding stage which is expected to be for three months. As the agent of MIME, the Consultant will undertake a series of follow-up works for the smooth implementation of bidding.

To receive the prequalification applications from bidders one week after the notice to prequalification.

To appraise the prequalification applications immediately after receipt and select the prequalified bidders

To distribute the bidding documents to the prequalified bidders and conduct the bidding, after 45 days as preparation period, in the presence of the staff of MIME.

To assist in the contract negotiations and conclusion between the successful bidder and MIME.

(3) Construction Supervision

The construction work at the intake and water treatment plant consists of civil, architectural, mechanical, and electrical works, while transmission and distribution works are mainly pipe-laying. The resident engineer to be dispatched by the Consultant will be a civil engineer. A specialist on groundwater development will be dispatched for a short time during the well construction period. Further, because of the many construction sites for the intake, water treatment plant and distribution pipelines, local engineers will be hired to assist the Consultant's resident engineer.

The Consultant's resident engineer will hold close coordination with MIME, other agencies concerned and with the Japanese contractor in order to implement the Project.

(4) Technical Guidance for Plant Operation

At the time of completion, the Consultants will conduct "Soft Component Activities" concerning the operation and maintenance of the water supply system. The activities include training on design basis of each equipment/facility, theory of water treatment, O&M for intake, WTP, and transmission/distribution pipelines. Although the existing water treatment plant uses a similar process, it is just one fifth of the proposed water treatment plant. Therefore, training on operation and maintenance for the system shall be carefully conducted step by step. The Contractor will prepare operation manuals for each equipment/facilities and conduct specific training on O&M for the equipment/facilities.

2-2-4-5 Quality Control Plan

The structures to be constructed and goods to be used in the Project are required to have function and quality based on the standards and criteria specified in the general specifications studied and prepared in the detailed design stage. The civil and architectural structures to be constructed at the sites will be designed based on the Japanese Standards or the other national standards predominant in Cambodia. The quality of goods to be delivered to the sites will be confirmed to comply with the design requirements. The concrete quality will be checked through various tests for concrete strength, slump, water-cement ratio, etc. in the field in addition to the preliminary verification of concrete aggregate quality, concrete conditioning, concrete placement plan and so on.

The following standards and criteria will be applied to the materials and construction works.

- Recommendations for Concrete Design (Japan Society of Civil Engineering)
- Standard for Structural Calculation of Reinforced Concrete Structures (Architectural Institute of Japan)
- Standard for Structural Design of Wall Structure (Architectural Institute of Japan)
- Standard for Structural Calculation of Steel Structures (Architectural Institute of Japan)
- Guidelines for Design of Architectural Base Structure (Architectural Institute of Japan)
- Other relevant standards, guidelines, or recommendations internationally recognized

2-2-4-6 Procurement Plan

The construction materials necessary for the Project shall be procured in Cambodia to the greatest extent possible. However, construction materials which are not available in the country, of which the quality or specifications do not meet the design requirements, and cannot be reliably procured with regard to distribution volume or cost shall be procured from Japan or third countries. The following summarizes a procurement plan for the Project.

Construction equipment which are available at reasonable price in lease contract in Cambodia shall be procured in Cambodia. Reinforcement bars are distributed and imported from Thailand or Viet Nam. Even Japanese produced reinforcement bars, which are competitive in price, will be considered for the Project. As a result of technical and economic evaluation, the Thai-made reinforcement locally available shall be procured. Malaysian-manufactured consumer flow meters used in the Phnom Penh Water Supply Authority (PPWSA) supplied under a Japan's Grant Aid Project shall be procured. Pipe materials shall be selected from ductile iron pipe, uPVC, or others dependent upon the usage in consideration of physical strength, chemical requirements, and cost. Namely, ductile iron pipe proposed for the raw water conveyance shall be procured in Japan due to its specific specification to cater for low pH value of raw water quality. For transmission/distribution and miscellaneous use, which size of 250 mm or larger, DI shall be procured from the third country due to its low price. uPVC pipe for distribution pipelines, which size of 200 mm or smaller, shall be procured locally. Since the screen required for well construction is not available locally, products of Thai with a reasonable price shall be procured.

(1) Equipment/materials to be procured in Cambodia

Construction equipment, reinforcement bar, uPVC pipe, cement, sand, gravel, brick, formwork, light oil, gasoline, etc.

(2) Materials/equipment to be procured from Japan

Raw water intake pump, backwash pump, clear water lifting pump, chlorinator, chlorine motive water pump, chlorine leak detector, chemical tank, ductile iron pipe for raw water intake, valves and gates used at the intake and WTP, pipes for chemical facilities, electrical equipment (power receiving, distribution, instrumentation, etc.) flow meter, level meter, pressure gauge, etc.

(3) Third countries

Consumer flow meter (Malaysia), screen for well (Thai), ductile iron pipe for transmission/distribution (Taiwan)

If the volume of freight is beyond 1,500 F/T, a cargo vessel from Japan will transport directly to Sihanoukville port in Cambodia, otherwise via Singapore. The materials and equipment to be procured from Japan and/or third countries will be transported from Sihanoukville to a stockyard in Siem Reap via Route No. 4 and 6 which mileage is about 500 km.

2-2-4-7 Soft Component Plan

(1) Background

At present, water supply in Siem Reap is conducted by SRWSS, which belongs to the Siem Reap Province Office of the MIME. SRWSS is operated by 12 staff members, including seven permanent and five temporary staff, and provide water supply services to 593 customers in Siem Reap town. The Project targets to increase the water supply capacity to 8,000 m³/day and to provide water to 4,570 household customers and hotel business customers. This means that business volume will be expanded to around 8 times its current capacity.

However, the present capability of staff is not qualitatively and quantitatively sufficient to operate the new water supply facilities. Even though they have equivalent operational experiences with the proposed water supply system, they do not have sufficient operational knowledge and skills for a new water supply facility that can supply 8,000 m³/day to 4,570 household and hotel business customers. In addition, customer information management, meter readings, billing, and collection, which are presently operated by two staff is not sufficiently carried out. They do not conduct business operation in a systematic way based on rules and regulation, or properly supervised by management like in Phnom Penh.

MIME must provide sufficient staff and strengthening the organizational capability of SRWSS including the establishment of a clear and well-determined rules and regulations as well as the development of the capabilities of the staff to carry out water supply business in a sustainable way with high operational quality. However, MIME could not allocate a sufficient budget for staff training before the target year. Moreover, SRWSS must carry out public education and promotion of hygiene, along with the beneficiary role of a clean water supply of Siem Reap Town to potential customers. It is also necessary to ensure the financial stability of the water supply business.

To achieve the above objectives, a strong management and engineering support with the soft component program to establish the operational system and technology transfer for facility operation of a new system and organization are needed.

This soft component program will be conducted in close relation with “The Project on Capacity Building of the

Water Supply System in Cambodia” conducted under a technical cooperation program by the GOJ. “The Project on Capacity Building of the Water Supply System in Cambodia” will provide general knowledge for the water supply business. This soft component program will focus on the training on i) engineering component including knowledge and technology transfer for the new peculiar water intake, purification and distribution network systems and ii) management component including organizational strengthening and public education.

(2) Objectives

The objective of the Project is to provide safe and sustainable water supply to the people of Siem Reap with sufficient facility operation and management based on sound water supply business management.

This soft component program aims to support and achieve the project objective by strengthening the management system, transfer knowledge and technology for operation of the new facility, conduct public education to involve people of Siem Reap as the customer, and create a sustainable business situation.

(3) Outputs of Soft Component Program

This Soft Component Program will expect the following outputs:

i) Engineering training

- The proposed water supply system will be properly operated and maintained by the staff of SRWSS.

ii) Support for organizational strengthening

- The water supply system will be organizationally and financially managed.

iii) Support for public education program

- People of Siem Reap will have sufficient knowledge about drinking water and hygiene.
- People of Siem Reap will have the willingness to connect to the water supply system and pay water tariff.

(4) Style and Method of Implementation

This soft component program will be conducted by local consultants (experts of PPWSA, HRD (Human Resource Development), IT and NGO) under the supervision of Japanese consultants in a classroom training style, exercise training, on-the-job training, field training and system development. As there are not sufficient engineering experts of water supply system in Cambodia, Japanese consultants will be dispatched in this field as engineering trainers.

The basic roles and responsibility of Japanese consultants and local consultants are as follows:

Basic Roles of Japanese Consultants

i) Chief consultant for soft component

- Supervise implementation of the soft component program
- Plan the training program
- Supervise the training conducted by local consultants and conducting general assessment of the trainees evaluated by local consultants

- Plan computerization, design basic system requirements, supervise system development by local consultants, confirm of the system tests, plan IT operator training, supervise IT training, and develop management information system (MIS) by EXCEL.
- Plan workshop and public education programs, supervise public education, and conduct general evaluations based on the questionnaire survey distributed to the attendees.

ii) Engineers

- Conduct technical training on the proposed water treatment system (by a water purification engineer)
- Conduct technical training on the proposed distribution network (by a distribution network engineer)
- Operation and maintenance training on mechanical and electrical facilities (by the Contractor at the commissioning operation phase).

Basic roles of local consultants

i) HRD consultants

- Develop training material for ‘training for management’ based on the training plan and program
- Conduct training using developed training material and conduct trainees’ evaluation

ii) IT Consultants

- Designing, developing and testing of customer management system
- Conduct system operator training

iii) Public education consultants

- Conduct workshops based on public education program
- Conduct public education and analyze the questionnaires to survey attitudes of attendants.

Training Style

i) Engineering training

- Target : engineering and management staff of SRWSS (7 staff including director, 3 deputy directors, production chief, distribution chief, chemist of Laboratory)
- Training : classroom training using the design documents, field training and OJT using new facilities.

ii) Support for organizational strengthening

⇒ Management training

- Target : managers of SRWSS (8 staff including director, 3 deputy directors, accounting section chief, billing and computer section chief, production section chief, distribution section chief)
- Training Style: classroom training with exercise and discussion

⇒ Accounting

- Target : accounting section chief, billing and computer section chief, and staff of billing and computer

section

- Training Style: classroom training and OJT by experts of PPWSA

⇒ Customer management

- Target : billing and computer section chief and staff of billing and computer section

- Training Style: classroom training and OJT by experts of PPWSA

⇒ Public education, extension, and meter reading

- Target : staff of meter reading section

- Training Style: classroom training and OJT by experts of PPWSA

iii) Support for public education program

⇒ Workshop

- Target : stakeholders and people concerned about water supply system in Siem Reap including SRWSS, MIME, Ministry of Interior, Provincial Government of Siem Reap, APSARA, NGO, representative of water users (ex. managers of hotels and restaurants and residents)

- Training Style: workshop including presentation and discussion facilitated by NGO staff

⇒ Public education

- Target : people of Siem Reap

- Training Style: presentation and discussion for 30-40 selected residents in Siem Reap, and facilitated by NGO staff(to be hold six times in total)

(5) Activities

In this soft component program, the following activities will be conducted. The particulars are summarized in Table 2.26.

Engineering training

The program will transfer the basic knowledge and technology for operation and maintenance of the proposed water supply system including water intake, WTP, and water distribution network.

The program will be implemented following to the training courses conducted by “The Project on Capacity Building of the Water Supply System in Cambodia”, and will provide peculiar training for the proposed water supply system. Japanese engineering consultants will develop the operation and maintenance guideline as training material, will conduct basic training to understand the structure and objectives of the proposed water supply system, and will conduct theoretical training and OJT with the project equipment/facilities.

Main activities are as follows:

- Teach structure and objectives of the proposed water supply system including water intake, water purification and water transmission/distribution facilities,
- Teach hydraulic capacity of each process unit, including water intake, water purification, and water

transmission/ distribution systems,

- Teach water purification process,
- Conduct O&M trainings on the water supply system dependent on production capacity fluctuations, and
- Conduct O&M trainings on WTP dependent on raw water quality fluctuations.

<u>Technical Cooperation Programme</u>	<u>Consultant for the Project</u>	<u>Japanese Contractor for the Project</u>
“The Project on Capacity Building of the Water Supply System in Cambodia”	Soft Component	Operation training before handing over the project facilities/equipment
Training on general knowledge for the water supply business	Training on the peculiar knowledge and technology for the proposed water supply system, organizational strengthening, and public education	Training on O&M for the facilities/equipment for the Project.

The Contractor/Supplier of equipment/facility will provide the operation and maintenance manuals and conduct OJT training for each equipment/facility.

Support for organizational strengthening

The component consists mainly of four parts, namely i) managers’ training , ii) administration staff training, which will enhance the knowledge for business administration, iii) development of IT system functionally similar using in PPWSA, and iv) training for IT system operators, which will support accuracy and efficiency of data processing on business administration.

Main activities consists of the following four parts:

- i) Management training for transferring management techniques and knowledge to management of SRWSS
 - Teach necessary knowledge and techniques on organizational management including accounting and human resources management and development
 - Teach how to read management information using MIS monthly report
- ii) Administration staff training for transferring basic knowledge and business administration
 - Teach basic accounting knowledge including book keeping and financial reporting
 - Teach basic customer management knowledge including billing, collection, and consumption analysis
 - Teach basic operational knowledge for public education and meter reading
- iii) Development of IT system
 - Develop MIS using EXCEL
 - Develop customer management system including billing and collection, consumption analysis
- iv) Training for IT system operators
 - Conduct accounting system operation training

- Conduct customer management system operation training

Training will be conducted focusing on that the main target persons on the Table 2.26 who can effectively operate the system without assistance. Training consultants will confirm the achievement of training.

Support for public education program

The component consists mainly of two parts, namely i) workshop for understanding roles and responsibilities of stakeholders and obtaining a commitment to public education among attendees, and ii) public education for the people of Siem Reap based on the understandings and commitment obtained through the workshop.

Main activities are as follows:

i) Workshop

- Mutual understanding to promote public education for proper hygiene
- Understand roles and responsibilities of stakeholders with their mission, vision, objectives, target and issues
- Discuss possibility of cooperation and commitment for working together to public education of proper hygiene
- Understand the present state of drinking water sources and sustainable use of water resources in Siem Reap

The attendees who make a commitment in this workshop will be requested to take part in the following educational program:

ii) Public education for the people of Siem Reap

- Teach basic knowledge of health and proper hygiene
- Teach roles and benefit of water supply system and structure of water tariff
- Teach roles and benefit of sewerage system

This module aims to transfer technology to the staff of SRWSS for sustainable public education.

(6) Schedule, Outputs and Inputs Plan

Detail activities and inputs are summarized in Table 2.26. Detail schedule is shown in Figure 2.20.

In the total training plan, the training for management should be conducted first, followed by the training for business administration staff training, and engineering staff. Construction of the proposed water supply system will be completed at the beginning of the year 2006 and the training conducted by the “Project on Capacity Building for Water Supply System in Cambodia” at PPWSA is scheduled in October 2005. Considering these conditions, training for engineers should be conducted from November 2005 and followed immediately by the On-the-Job Training of the General Training of Operation and Maintenance under the Project, which is planned to be conducted for two months by January 2006 by the Contractor.

The preparing work for the workshop and public education should be started by July 2005 and its implementation should be started within July 2005. Then a series of public education will continue once every

month from July to December 2005, six times in total.

Therefore, the training program for management is needed to start its preparation in May 2005 and conduct training in July 2005. This means that MIME must recruit and provide the necessary staff before May 2005.

(7) Expected Results and Means of Evaluation

Objectives and outputs of each module are shown in Table 2.27. Instructors of the engineering training, training for management and training for business administration staff will check the training results using a checklist of output columns and evaluate trainees of their knowledge and understanding of transferred technology.

Implementation and development of the application systems are confirmed with system documents (system specification, program list and result of system test) and confirmation of system test by the chief consultant for soft component.

Training for IT system will be continued until two responsible persons (the chief of billing and computer section for the customer management system and the chief of accounting section for accounting system) can operate the system without assistance.

The facilitator of public education will evaluate and analyze the results of the questionnaire surveys distributed to the attendees. Based on this analysis, the chief consultant for soft component will confirm the result of public education.

Table 2.26 Summary of the Soft Component

Item No.	Activities	Outputs	Method and Approach	Inputs	Remarks
1	<p>Engineering Training</p> <ul style="list-style-type: none"> • Teach structure of the proposed water supply system including water intake, purification and transmission/distribution. • Teach structure and hydraulic capacity of water intake facility. • Teach structure and objectives of WTP. • Teach pipe size, material and hydraulic capacity of distribution network. • Teach how to investigate leakage of distribution pipelines. • Conduct training on O&M of intake facility to control intake capacity. • Conduct training on O&M of WTP to produce a drinking water dependent on the raw water quality. • Conduct training on O&M of WTP to produce/transmit the required capacity dependent on fluctuations of water demands. • Conduct training on control of water intake amount. • Conduct training on O&M for WTP, including control of production capacity, control of chemical facilities. • Conduct training on O&M for transmission/distribution system, including control of transmission/distribution amount, leakage, rehabilitation plan of pipe network, and washout. • Conduct training on water quality control using a training manual to be prepared, including quality control of raw water, process water, and distributed water. • Conduct training on the installation methods of consumer flow meters using the design drawings. 	<ul style="list-style-type: none"> • Training plan • Training material • O&M guideline • Evaluation by trainers 	<ul style="list-style-type: none"> • Classroom training using detail design drawings and documents • Field training on the proposed water supply system • OJT using new equipment/facility • Target: engineering staff of SRWSS (Total 7 staffs including director, 3 deputy directors, production section chief, distribution section chief, and chemist) 	<ul style="list-style-type: none"> • Water purification engineer (Japanese consultant) • Distribution network engineer (Japanese consultant) • Preparation of training and development of training materials: 2 Engineers x 0.5 months • Training: 2 Engineers x 1.5 months 	<ul style="list-style-type: none"> • Basic engineering training will be conducted beforehand by the “Project on Capacity Building for Water Supply System in Cambodia”

2 Organizational Strengthening					
2-1.	Training for management (transfer management knowledge to management staff of SRWSS) <ul style="list-style-type: none"> • Teach knowledge and techniques for managing the organization • Teach accounting and financial management including cost analysis and budget control • Teach human resources management including recruiting, personnel evaluation promotion, payment, incentives, human resources development, and motivation • Teach operational management including procurement, public education, water supply system and risk management • Teach public relations and risk communications • Teach facilitation and mentoring • Teach how to read information for management using MIS monthly report 	<ul style="list-style-type: none"> • Management training plan • Training material • Evaluation by trainers 	<ul style="list-style-type: none"> • Classroom training • Target : 8 SRWSS management staffs including director, 3 deputy directors and 4 section chiefs 	<ul style="list-style-type: none"> • Local consultants (Expert of management training) • Planning and development of teaching material: One local consultant x 10 days • Training: 2 local consultants x 19 days 	Use MIS monthly report designed in activity 2-3) as teaching material.
2-2.	Training for business administration staff (transfer knowledge of business administration to the business administration staff of SRWSS) <ul style="list-style-type: none"> • Teaching knowledge for accounting • Teaching knowledge for customer information management • Teaching knowledge for public education and meter reading 	<ul style="list-style-type: none"> • Training plan • Evaluation by trainers 	<ul style="list-style-type: none"> • Classroom training • Target : Accounting: chief of accounting section, chief of billing and computer section, staff of billing and computer section. Customer management: chief of billing and computer section, 2 staffs of billing and computer sections Public education and meter reading: 3 staffs of meter reading section 	<ul style="list-style-type: none"> • Expert of PPWSA • Planning and development of teaching material: 1 expert x 10 days • Training: 3 experts x 15 days 	

2-3.	<p>Development of IT system</p> <ul style="list-style-type: none"> • Design basic IT system requirement • Develop MIS based on EXCEL • Development of customer information management system 	<ul style="list-style-type: none"> • Basic IT System Requirement • System documents 	<ul style="list-style-type: none"> • System development 	<ul style="list-style-type: none"> • Local Consultants (IT consultants and System Engineers) • 2 local consultants x 40 days 	<ul style="list-style-type: none"> • MIS system will be developed by chief consultant for soft component.
2-4.	<p>Training for IT system operators</p> <ul style="list-style-type: none"> • Accounting system : This training targets mainly accounting chief, plus director, 2 deputy directors, and chief of billing and computer section. • Train accounting system operation, maintenance and management. • Customer management system : This training targets mainly 3 personnel; chief of billing and computer section and 2 staffs of billing and computer section, plus director, 3 deputy directors, and 3 staffs of meter reading. • Train operation, maintenance and management of the customer management system. 	<ul style="list-style-type: none"> • Training Plan 	<ul style="list-style-type: none"> • Training using developed IT system • Target: Total 11 staff, • Director, 3 deputy directors, chief of accounting, chief of billing and computer section, 2 staffs of billing and computer, and 3 staffs of meter reading section 	<ul style="list-style-type: none"> • Local Consultants (IT consultants) 2 local consultants x 15 Days, including system implementation of customer information system 	<ul style="list-style-type: none"> • IT Consultant who is involved in the system development will conduct this training

3 Workshop and Public Education on Hygiene for the People of Siem Reap					
3-1.	<p>Workshop</p> <ul style="list-style-type: none"> • Discuss necessary actions to promote public education about proper hygiene to the people of Siem Reap. • Share information, vision and objectives of stakeholders on water supply, sewerage and sanitation. • Discuss the present state of drinking water resources and sustainability of water utilization. • Discuss possibility of cooperation for public education. • Acquire commitments of attendees for cooperation to the public education. • Questionnaire survey for attendants. 	<ul style="list-style-type: none"> • Workshop plan • Questionnaires analysis results 	<ul style="list-style-type: none"> • Workshop Target: SRWSS, MIME, Ministry of Interior, Provincial Government of Siem Reap and other government staff, APSARA, NGO, representatives of business including hotel and restaurant, representatives of water users 	<ul style="list-style-type: none"> • Local consultant (NGO) • Preparation : One local consultant x 10 days • Workshop:2 local consultants x 3 days 	
3-2.	<p>Public Education</p> <ul style="list-style-type: none"> • Share knowledge about the benefits of proper hygiene • Explaining the role/importance of the water supply system and water tariff • Teach the benefits of a sewerage system • Conduct questionnaire survey for opinion and understanding of water supply system to attendees • Technology transferred to the counter parts of SRWSS for public education and questionnaire analysis 	<ul style="list-style-type: none"> • Public Training Plan • Analysis results of questionnaire survey 	<ul style="list-style-type: none"> • Classroom Training • Target : People of Siem Reap (30-40 people for each education class, total 6 times) 	<ul style="list-style-type: none"> • Local consultant (NGO) • Preparation: One local consultant x 20 days • Education:2 local consultants x 1 day x 6 times 	Acquire assistance and cooperation from stakeholders who attended the workshop and are committed to assist

Table 2.27 Objectives and Outputs of Each Module

Modules	Objectives	Detailed Outputs
1. Engineering Training		
	<p>Engineering personnel of SRWSS can properly operate and maintain the proposed water supply system based on the understanding of structure and design objective of each facility (water intake, water purification plant, water distribution pipe network) and can install the consumer flow meters.</p>	<p>Trainees can do following activities:</p> <ul style="list-style-type: none"> • Understand structure of well, materials, intake water volume, and allocation of water intake facility. • Understand diameter of pipe, pipe material and hydraulic capacity. • Understand detention time of each process unit. • Understand theory of iron removal. • Understand structure, material and allocation of lime facility. • Understand structure, material and allocation of chlorine facility. • Find distribution and leakage volume of water in each distribution block. • Plan the quantity of raw water intake dependent on the required water demand. • Operate the intake pumps dependent on the required water demand. • Operate the chemical feed facilities dependent on the required water demand and raw water quality. • Investigate the process water qualities(iron, manganese, turbidity and residual chlorine). • Operate the backwashing for filter units. • Distribute the required water amount into each distributing block. • Understand the installation method of consumer flow meter. • Operate the tools for installation of consumer flow meter.
2. Support for Organizational Strengthening		
2-1. Training for management: Transfer management knowledge to management of SRWSS		
	<p>Management of SRWSS can manage the organization, including financial management (e.g. budget control and cost analysis) and human resources management (e.g. personnel evaluation) using IT system based on the transferred management knowledge</p>	<p>Trainees can do following activities:</p> <ul style="list-style-type: none"> • Make financial report and report to top management • Understand how to control the budget and do budget control • Understand how to analyze cost and do cost analysis for proper water tariff structure • Manage human resources based on the labor laws, rules and regulation for employee and other internal regulation • Manage the activities of public relation, risk communication, public education and extension
2-2. Training for business administration staff: Transfer knowledge of business administration to the business administration staff of SRWSS		
	<p>Business administration staff can do clerical job including accounting (e.g. bookkeeping, financial reporting), public education, billing, collection and meter reading based on the transferred business administration knowledge as daily routine work</p>	<p>Trainees can do following activities:</p> <p>(Accounting)</p> <ul style="list-style-type: none"> • Manage cash income and cash payment • Bookkeeping • Make financial report • Cost allocation • Formulate budget plan <p>(Customer management)</p> <ul style="list-style-type: none"> • Register new customers • Calculate water consumption and tariff • Issue invoice • Follow up for tariff collection <p>(Public education, billing and collection, meter reading)</p> <ul style="list-style-type: none"> • Understand how to do public education • Understand how to do meter reading

		<ul style="list-style-type: none"> • Understand billing and collection
2-3. Development of IT system		
	Development of IT system for customer management and accounting.	<ul style="list-style-type: none"> • System documents will be prepared. • The customer management system will be confirmed to be operational. • The accounting system will be confirmed to be operational.
2-4. Training for IT system operators		
1)	10 trainees (chief of billing and computer section, 2 staffs of billing and computer section, director, 3 deputy directors, and 3 staffs of meter reading) can operate Customer Management Information System (CMIS)	<p>Trainees can do following activities:</p> <ul style="list-style-type: none"> • Manage customer information using CMIS • Manage water tariff bill using CMIS • Manage water tariff collection using CMIS • Solve customer complains using CMIS • Analyze suspected user based on the consumption analysis using CMIS
2)	5 trainees (chief of accounting section, director, 2 deputy directors, and chief of billing and computer section) can operate Accounting System (AS)	<p>Trainees can do following activities:</p> <ul style="list-style-type: none"> • Manage accounting information of SRWSS using AS: Accounting System • Proceed accounting using AS • Make financial report using AS • Make budget control report using AS • Cost analysis using AS
3. Workshop and public education on hygiene for the people of Siem Reap		
3-1. Workshop		
	Obtain from attendees the consensus and commitment for the people of Siem Reap to understand the necessity of proper hygiene and the roles/importance of water supply and sewerage	<ul style="list-style-type: none"> • Share the concerns, problems and issues of stakeholders of water supply system • Share the knowledge about public education and promotion of hygiene • Acquire commitment of cooperation of public education about proper hygiene, roles/importance of water supply system and sewerage from the people of Siem Reap
3-2. Public Education		
	<ul style="list-style-type: none"> • Make people of Siem Reap understand knowledge about proper hygiene • People understand knowledge about safe water and health • Increasing the willingness of people to connect to the water supply system and pay water tariff 	<ul style="list-style-type: none"> • Make the attendees of the public education meeting understand the necessity of proper hygiene and roles/importance of water supply and sewerage • Make knowledge and technology transfer to the counter parts of SRWSS about management and conduction of public education

2-2-4-8 Implementation Schedule

The total period of the Project is 25 months including 7 months for detailed design, 15 months for procurement and construction, and 3 months for bidding and others as shown in Figure 2.20.

Figure 2.20 Project Implementation Schedule

