

# **Appendix-5**

## **Soft Component (Technical Assistance) Plan**

**Japan International Cooperation Agency**

**The Preparatory Survey  
on  
The Project of Micro Hydropower  
Development in Ratanakiri Province  
in  
The Kingdom of Cambodia**

**Soft Component (Technical Assistance) Plan**

**December 2012**

**Electric Power Development Co., Ltd.  
Chuden Engineering Consultants Co., Ltd.  
Chugoku Electric Power Co., Inc.**

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## **1 Background**

The Cambodian government requests the Japanese government the following four matters through the request for grant aid and the letter issued on August 23<sup>rd</sup>, 2012:

- (i) Development of O'Chum No.1 hydropower station
- (ii) Donation of equipment for management, operation and maintenance of the power stations
- (iii) Capacity building for hydropower engineering
- (iv) Capacity building for distribution engineering

In this project, the existing electro mechanical equipment of O'Chum No.2 hydropower station is replaced with new one in addition to construction of O'Chum No.1 hydropower station. Consequently, operators are requested to master how to operate the brand-new hydropower stations. Additionally, it is necessary for operators to manage the hydropower stations effectively which are arranged in a staircase pattern.

On the other hand, power distribution grid in Banlung city, to which the existing O'Chum No.2 hydropower station mainly supplied power, was connected to distribution grid for supplying electricity imported from Vietnam in May, 2012. Consequently, it is required to manage the connected distribution grid in consideration of electricity imported from Vietnam.

Considered the above, the aforesaid (iii) and (iv) are executed as soft component (technical assistance) plan in order to enhance technical capabilities.

## **2 Goal of Technical Assistance**

The goal of this technical assistance named as "Soft Component" is that O'Chum No.1 hydropower station which is newly constructed, O'Chum No.2 hydropower station which is renovated and the related distribution grid are appropriately operated and maintained as a result of transfer of knowledge and skill to staffs in EDC Ratanakiri.

## **3 Outcome of Technical Assistance**

The followings are regarded as outcomes as a result of this technical assistance.

- (i) Achievement to build up how to operate and maintain civil structures
- (ii) Achievement to build up how to operate and maintain hydropower station
- (iii) Achievement to build up how to operate and maintain distribution lines power system

## **4 Confirmation of Outcome**

The aforesaid outcomes are confirmed by the following, and they are written in the completion report finally. And, indicator to measure level of proficiency will be set in accordance with Chapter 4.2 in the table during the implementation of this technical assistance.

### **4.1 Achievement Plan of Operation and Maintenance**

- (1) Achievement to build up how to operate and maintain civil structures
  - Preparation of manual for operation and maintenance (O & M manual) of civil structures
  - Implementation of practical test for operation and maintenance of civil facilities
- (2) Achievement to build up how to operate and maintain hydropower station
  - Preparation of manual for operation and maintenance of hydropower station
  - Implementation of practical test for operation and maintenance of hydropower station
- (3) Achievement to build up how to operate and maintain distribution lines power system
  - Preparation of manual for operation and maintenance of distribution lines power system
  - Implementation of practical test for operation and maintenance of distribution lines power system

### **4.2 Evaluation Method for Achievement Plan**

As conducted the transfer technology of each achievement plan, the results of evaluation should be wrapped up in the final stage of the soft component. The method of the evaluation should be carried out as follows.

Operation and maintenance in actual training and/or oral examination to the counterparts, EDC Ratanakiri in such a way that there are three ranks;

A= more than 80 points

B= more than 70 points and

C= more than 60 points.

Items for Transfer Technology	Evaluation Method	Rank of Evaluation (A,B,C)
<p>(1)Micro Hydropower Civil Facility 1)Dam, Intake, Reservoir and Powerhouse</p> <p>2)Measurement of water flow</p> <p>3)O &amp; M manual</p> <p>4)Periodic inspection plan</p>	<p>1) Checking of small hydropower facility conditions and to make a report about daily and monthly patrols It is evaluated by the actual operation and examination according to the level of proficiency about design, theory and function for civil structures</p> <p>2) Measuring and recording water inflow at 3 points of the river and dam, and to reflect for appropriated water management. Method of the management will be advised.</p> <p>3) O &amp; M manual It is confirmed the work ability according to the O&amp;M manual (draft). Checking modification item or method, if necessary.</p> <p>4) Periodic Inspection Plan Preparing the periodic inspection and plan, and to reflect for annual budget plan. Method of the management will be advised.</p>	
<p>(2) Micro Hydropower Station 1)Electrical facility</p> <p>2)Operation and trouble shooting in the power system</p> <p>3)O &amp; M manual</p> <p>4)Periodic Inspection Plan</p>	<p>1) Checking of electrical facility conditions and to make a report about daily and monthly patrols It is evaluated by the examination according to the level of proficiency about design, theory and function for electrical equipment</p> <p>2) Confirming start and stop operation of the unit and recovery of troubles. Conducting actual training and/or oral examination of the unit, and understanding about sequence and block diagrams.</p> <p>3) It is confirmed the work ability according to the O&amp;M manual (draft). Checking modification item or method, if necessary.</p> <p>4) Periodic Inspection Plan Preparing the periodic inspection and plan, and to reflect for annual budget plan. Method of the management will be advised.</p>	
<p>(3) Distribution Lines Power System 1)Distribution lines</p>	<p>1) Checking of distribution facility conditions and to make a report about daily and monthly patrols It is evaluated by the actual operation and examination according to the level of proficiency about design, theory and</p>	

Items for Transfer Technology	Evaluation Method	Rank of Evaluation (A,B,C)
2) Operation and trouble shooting  3) O & M manual  4) Periodic Inspection Plan	function for electrical equipment 2) Confirming operation of the distribution facility and recovery of troubles. Conducting actual training and/or oral examination of the distribution facility, and understanding about relay setting and circuit breaker, etc. 3) O & M manual It is confirmed the work ability according to the O&M manual (draft). Checking modification item or method, if necessary. 4) Periodic Inspection Plan Preparing the periodic inspection and plan, and to reflect for annual budget plan. Method of the management will be advised.	

## 5 Outline of Technical Assistance

The following actions are taken for achievement of the aforesaid three outcomes.

### 5.1 Technical Assistance for Operation & Maintenance of Civil Structure

#### (1) Target of Assistance

The target of this assistance is one operator who belongs to operation and maintenance section in EDC Ratanakiri and two staff members who are newly employed.

#### (2) Time Period

The technical assistance is carried out twice in order to transfer knowledge and skill and to translate manual into Khmer. Before implementation of the technical assistance, half month is required for preparation of text in Japan. For detail, refer to Table 7.1.

First technical assistance is for half month :

The Consultant will prepare the soft component plan (draft) and to explain about the how to study and prepare the action plan by counterparts, EDC Ratanakiri. The counterparts have to study and improve their ability according to the action plan by the next soft component.

The second is for one month:

The Consultant will train and advise to the counterparts, EDC Ratanakiri based on the action plan, and to evaluate about actual operation of the facility and/or oral examination checking the level of improvement at site.

(3) Resource of Assistance

The technical assistance is done by one Japanese consultant.

(4) Item and Methodology of Assistance

Items	Contents	Period (days)
1)Lecture on outline and function of micro hydropower civil facility	The purpose of this lecture is to acquire fundamental of small hydropower facility and to recognize significant of existence of each staff.	Japan: 2 days Cambodia 1 <sup>st</sup> visit: 3days 2 <sup>nd</sup> visit:5days
2)Lecture on function and structure of micro hydropower civil facility	The lecture is aimed at getting trainees understood function and structure of dam, intake, reservoir and powerhouse for maintenance and repair in hydropower station.	Japan: 2 days Cambodia 1 <sup>st</sup> visit: 3days 2 <sup>nd</sup> visit:5days
3)Preparation of manual for operation and maintenance of micro hydropower civil facility	The manual for operation and maintenance is finalized on the basis of draft.	Japan: 9 days Cambodia 1 <sup>st</sup> visit: 6days 2 <sup>nd</sup> visit:15days
4)Lecture on inspection, maintenance and repair of micro hydropower civil facility	The purpose of this lecture is to achieve that trainees acquires way of daily inspection and can judge necessity of repair. And also, referring of the Power utility's data and records, it is confirmed how to record and preparing data sheets.	Japan: 2 days Cambodia 1 <sup>st</sup> visit: 3days 2 <sup>nd</sup> visit:5days

Work period

- 1) Work in Japan: total 15days
- 2) Work at site: total 45days (1<sup>st</sup> visit 15days, 2<sup>nd</sup> visit 30days)

(5) Object of Outcome

Objects of the outcome are manual for operation and maintenance of civil facilities and result of examination.

## 5.2 Technical Assistance for Operation & Maintenance of Power Stations

(1) Target of Assistance

The target of this assistance is seven operators who belong to operation and maintenance section in EDC Ratanakiri and three staff members who are newly employed.

(2) Time Period

The technical assistance is carried out twice in order to transfer knowledge and skill and to



translate manual into Khmer. Before implementation of the technical assistance, half month is required for preparation of text in Japan. For detail, refer to Table 7.1.

First technical assistance is for half month :

The Consultant will prepare the soft component plan (draft) and to explain about the how to study and prepare the action plan by counterparts, EDC Ratanakiri. The counterparts have to study and improve their ability according to the action plan by the next soft component.

The second is for half month:

The Consultant will train and advise to the counterparts, EDC Ratanakiri based on the action plan, and to evaluate about actual operation of the facility and/or oral examination checking the level of improvement at site.

(3) Resource of Assistance

The technical assistance is done by one Japanese consultant.

(4) Item and Methodology of Assistance

Items	Contents	Period (days)
(2) Micro Hydropower Station 1) Maintenance and Inspection Plan for Power Station	In order to appropriate operation for O'Chum No. 1 and 2 power stations, preparing annual inspection plan and its budget, it is evaluated about the judgment of the knowledge to ensure the volume and content of periodic inspection which will be necessary or not in accordance with repair and maintenance result of the equipment. And also, referring of the Power utility's data and records, it is confirmed how to record and preparing data sheets.	Japan: 3 days  Cambodia 1 <sup>st</sup> visit: 3days 2 <sup>nd</sup> visit:6days
2) O & M manual for Power Stations	Referring of the Power utility's O&M manual (draft) and through the work shop, it is provided work flow about maintenance and operation system such as operator's work shift in Cambodia, technical support system, etc. in order to prepare the manual according to actual conditions.	Japan: 9 days  Cambodia 1 <sup>st</sup> visit: 9days 2 <sup>nd</sup> visit:18days
3) Recovery Procedure at Power System Failure or Trouble	Preparing the recovery knowledge improved their ability to deal with accident as quickly as possible to the power system and electrical equipment which will be unexpected troubles after commencement of the commercial operation.	Japan: 3 days  Cambodia 1 <sup>st</sup> visit: 3days 2 <sup>nd</sup> visit:6days

Work period

- 1) Work in Japan: total 15days
- 2) Work at site: total 45days (1<sup>st</sup> visit 15days, 2<sup>nd</sup> visit 30days)

Guidance of Initial Run for Hydropower Station will be conducted by the Contractor.

(5) Object of Outcome

Objects of the outcome are manual for operation and maintenance of power generating facilities and result of examination.

### **5.3 Technical Assistance for Operation & Maintenance of Distribution Lines Power System**

(1) Target of Assistance

The target of this assistance is twenty staff members who belong to distribution section in EDC Ratanakiri.

(2) Time Period

The technical assistance is carried out twice in order to transfer knowledge and skill and to translate manual into Khmer. Before implementation of the technical assistance, half month is required for preparation of text in Japan. For detail, refer to Table 7.1.

First technical assistance is for half month :

The Consultant will prepare the soft component plan (draft) and to explain about the how to study and prepare the action plan by counterparts, EDC Ratanakiri. The counterparts have to study and improve their ability according to the action plan by the next soft component.

The second is for one month:

The Consultant will train and advise to the counterparts, EDC Ratanakiri based on the action plan, and to evaluate about actual operation of the facility and/or oral examination checking the level of improvement at site.

Furthermore, during this period, the Consultant of Vietnamese will train and advise about actual work method and operation at site.

(3) Resource of Assistance

The technical assistance is done by one Japanese consultant and one Vietnamese consultant.

(4) Item and Methodology of Assistance

Items	Contents	Period (days)
1) Lecture on outline and function of distribution lines power system	As for modification of Ratanakiri power system network due to the commencement of power supply by the small hydropower stations, the lecture is aimed at getting trainees understood function and structure of power system and improved their ability to deal with accident, especially to decipher relays system.	Japan: 5days  Cambodia 1 <sup>st</sup> visit: 5days 2 <sup>nd</sup> visit: 10days (Japanese: 5days) (Vietnamese: 5days)
2) Preparation of manual for operation and maintenance of distribution lines power system	The purpose of this lecture is to achieve that trainees acquires way of daily inspection and can judge necessity of repair referring of the Power utility's data and records, it is confirmed how to record and preparing data sheets. It is provided work flow about maintenance and operation system based on the manual in draft.  The stock system and procurement of spare parts will be reflected in the manual.	Japan: 10days  Cambodia 1 <sup>st</sup> visit: 10days 2 <sup>nd</sup> visit: 20days (Japanese: 10days) (Vietnamese: 10days)

Work period

- 1) Work in Japan: total 15days
- 2) Work at site: total 45days (1<sup>st</sup> visit 15days, 2<sup>nd</sup> visit 30days)

(5) Object of Outcome

Objects of the outcome are manual for operation and maintenance of distribution lines power system and result of examination.

## **6 Trainer & Content of Training**

O'Chum No.1 & No.2 hydropower stations are placed in a staircase pattern and such arrangement is the first case in Cambodia, and it is initial experience for operators in Cambodia to manage a series of hydropower stations which are arranged cascade-wise. Since appropriate person doesn't exist in Cambodia, there is no other choice to dispatch Japanese trainers who have wealth of knowledge of hydropower generation with abundant experience.

### **6.1 Contents of Technical Assistance for Operation & Maintenance of Civil Structure**

As explained above, this project combines upstream O'Chum No.1 hydropower station with the reservoir which can control amount of outflow year-round with downstream O'Chum No.2 hydropower station with the regulating reservoir which can control amount of outflow in daily base. In addition to inflow from O'Chum No.1 hydropower station, considerable amount of water flow into the regulating reservoir of O'Chum No.2 hydropower station from tributaries. In order to operate and manage these stepwise hydropower stations effectively, it is indispensable for operators to acquire both knowledge and skill for management of water resource to catch in the above reservoirs.

Additionally, guidance on inspection, maintenance and repair of civil structures such as dam, waterway, gate, steel penstock, etc., are given to operators in order to acquire fundamental technique for maintenance and repair.

### **6.2 Contents of Technical Assistance for Operation & Maintenance of Hydropower Station**

After the completion of O'Chum No.1 & No.2 hydropower stations, it is forecasted that these power sources have an important place in the electricity supply in Banlung city. Consequently, it is required that these hydropower stations recover from suspension of power generation. For recovery from shutdown, it is indispensable to find out cause of accident as well as to deal with accident. Unless appropriate measure is taken, hydropower station cannot produce electricity for a long time.

In order to solve problem promptly and properly, it is necessary for operators to decipher sequence and block diagram of electrical system. Therefore, it is focused in the technical assistance to get operators understood how to decode sequence and block diagram of electrical system.

And also, guidance on inspection, maintenance and repair for electro mechanical equipment including control device are done by trainer.

### 6.3 Contents of for Technical Assistance for Operation & Maintenance of Distribution Lines Power System

Distribution grid in Banlung city was connected to transmission line for import of electricity from Vietnam named as “Gialai PC” on May 2012, so that it is essential for distributor to understand characteristic of both the transmission of power from Vietnam and interconnected distribution grid in Banlung for advancement of quality of electric power. That’s why trainer dispatched from “Gialai PC” in addition to Japanese consultant give lecture.

## 7 Schedule of Implementation

The schedule to implement the soft component is shown in Table 7-1 as below.

**Table 7-1 Implementation Schedule of Soft Component**

Item \ Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Construction																								
Civil																								
EM & Distribution																								
Technical Assistance																								
Civil																								
EM																								
Distribution																								

## 8 Documents to be Submitted

The following documents shall be submitted to JICA as outcome of the soft component.

Title of Document(s)	Time to Be Submitted
Completion Report	After the completion of this project
Condition Report	After the completion of each activity on this soft component
Manual for Operation & Maintenance of Micro Hydropower Civil Facilities and Result of Examination	After the completion of this project
Manual for Operation & Maintenance for Micro Hydropower Station and Result of Examination	Ditto
Manual for Operation & Maintenance for Distribution Lines Power System and Result of Examination	Ditto

## **9 Obligations of Implementation Organization**

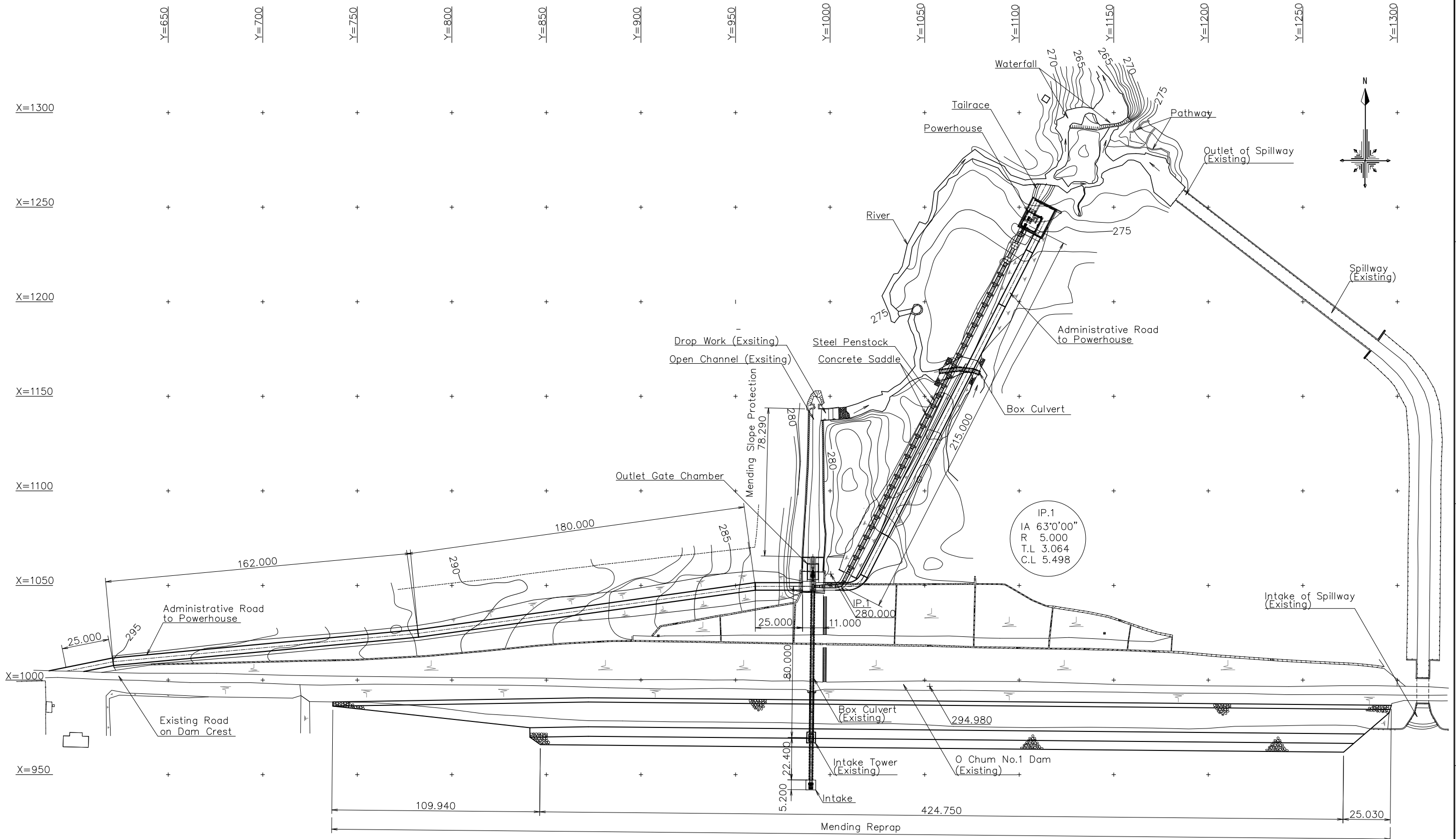
EDC, who is programmed to operate and maintain O'Chum No.1 & No.2 hydropower stations as well as is the counterpart of this project, is requested to execute the following in order to keep on suitable and effective management of these hydropower stations.

- (i) Personal assignment for establishment of management organization for these hydropower stations of which management representative of EDC Ratanakiri is at a peak.
- (ii) Acquisition of budget for implementation of the soft component
- (iii) Personal assignment for operation and maintenance of these hydropower stations
- (iv) Continuous assignment of skilled stuff
- (v) Application and radicating of manuals
- (vi) Support to translate manuals of these hydropower stations into Khmer

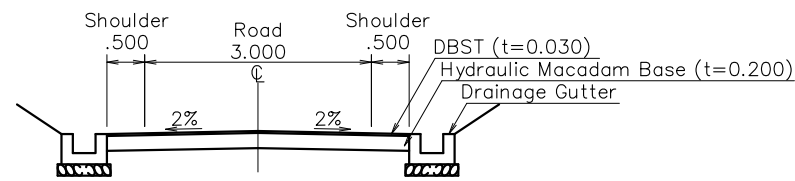
# **Appendix-6**

**Drawings (DWG No. 1-No.13)**

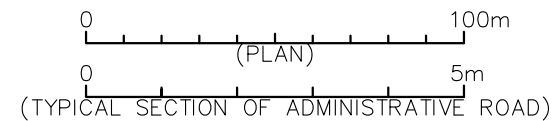
P L A N



TYPICAL SECTION OF ADMINISTRATIVE ROAD



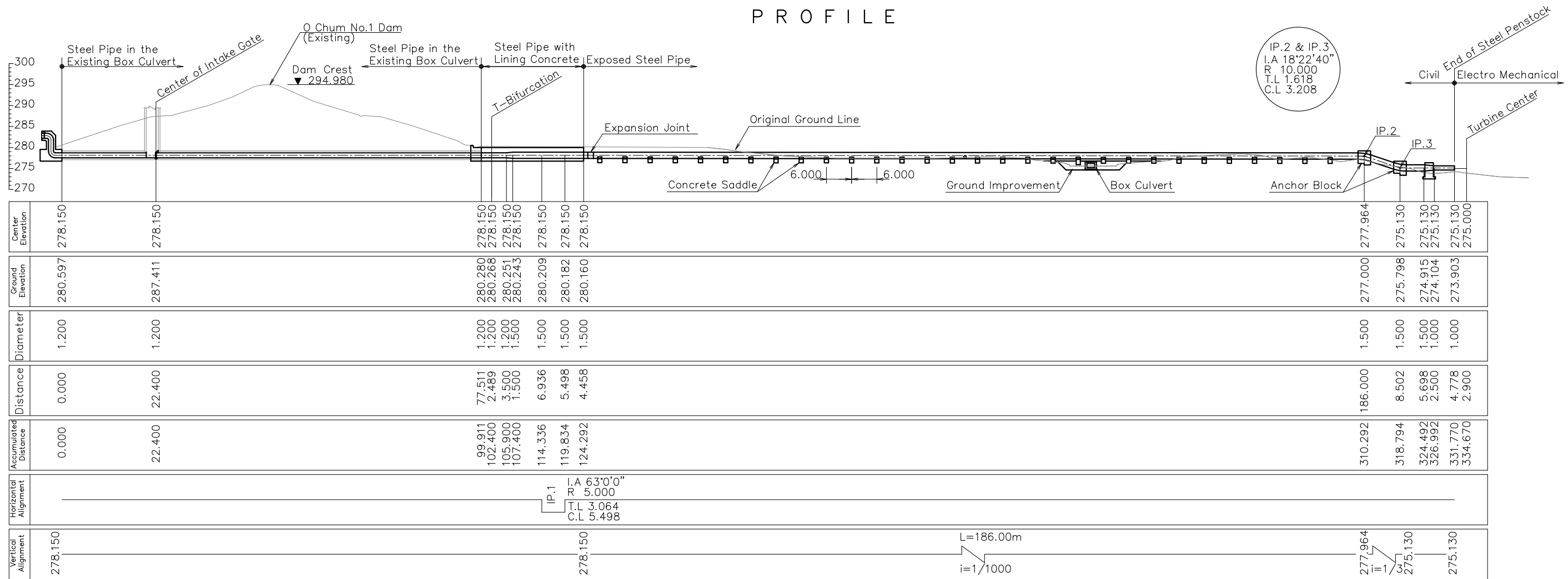
Notes:  
1."DBST" represents "double bituminous surface treatment".



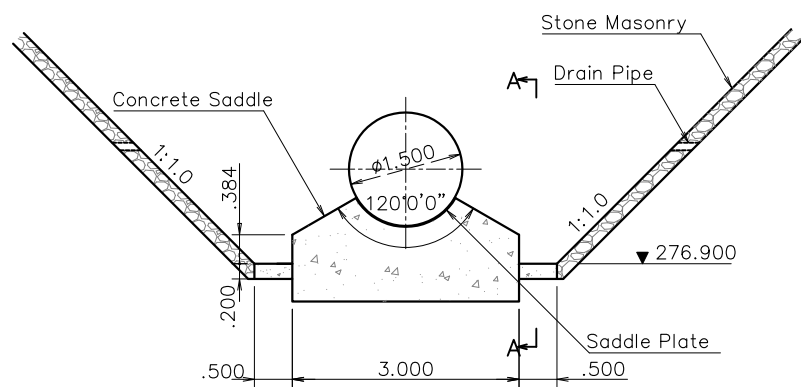
JAPAN INTERNATIONAL COOPERATION AGENCY
THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE
DWG. No.1
O'CHUM NO.1 HYDROPOWER STATION
GENERAL LAYOUT
ELECTRIC POWER DEVELOPMENT CO., LTD. CHUDEN ENGINEERING CONSULTANTS CO., LTD. THE CHUGOKU ELECTRIC POWER CO., INC.



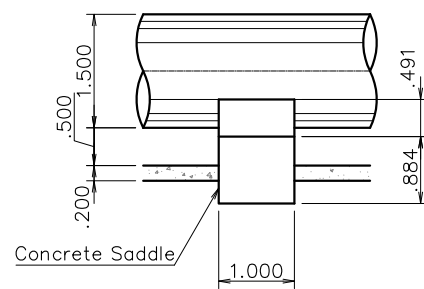
# P R O F I L E



TYPICAL SECTION OF EXPOSED PENSTOCK

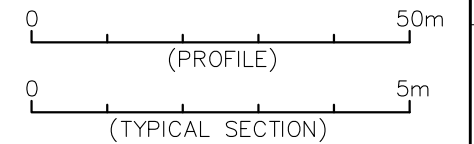


SECTION A-A



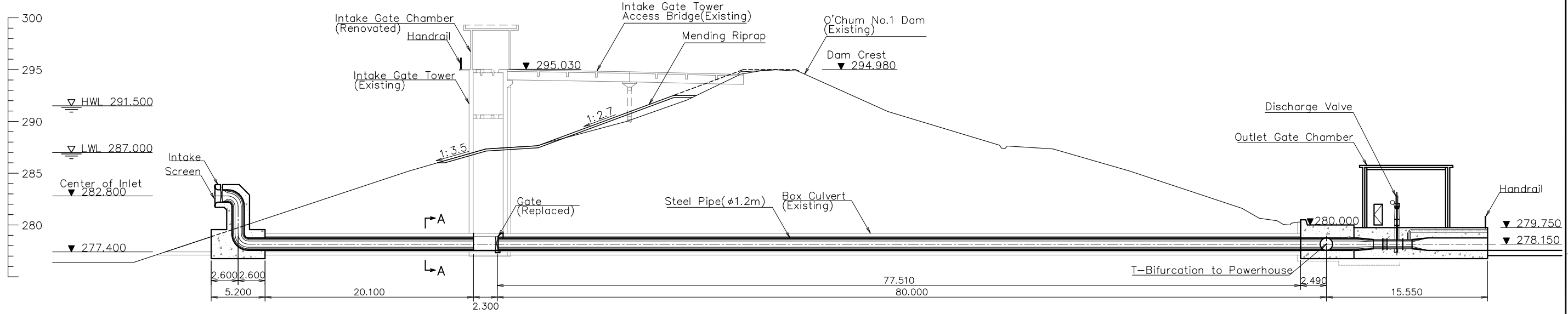
Notes:

1. Concrete saddle shall be placed per six meter in general.
2. Elevation of Lower Penstock which is tentatively EL.275.130m may be modified after finalization of design of electro mechanical equipment.

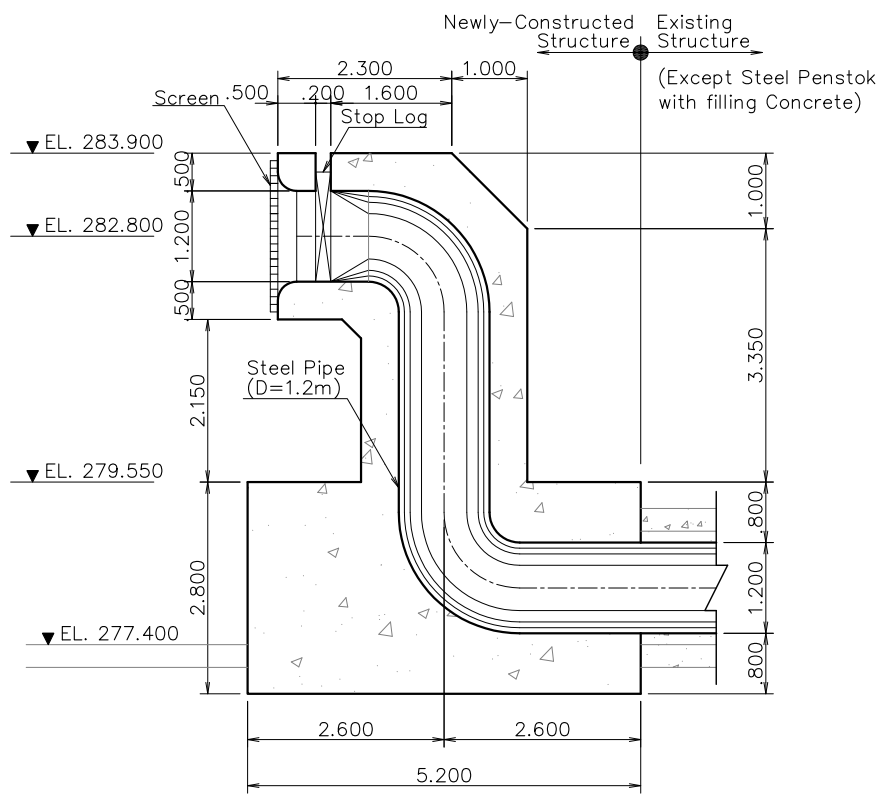


JAPAN INTERNATIONAL COOPERATION AGENCY
THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE
DWG. No.2 O'CHUM NO.1 HYDROPOWER STATION WATERWAY PROFILE
ELECTRIC POWER DEVELOPMENT CO., LTD. CHUDEN ENGINEERING CONSULTANTS CO., LTD. THE CHUGOKU ELECTRIC POWER CO., INC.

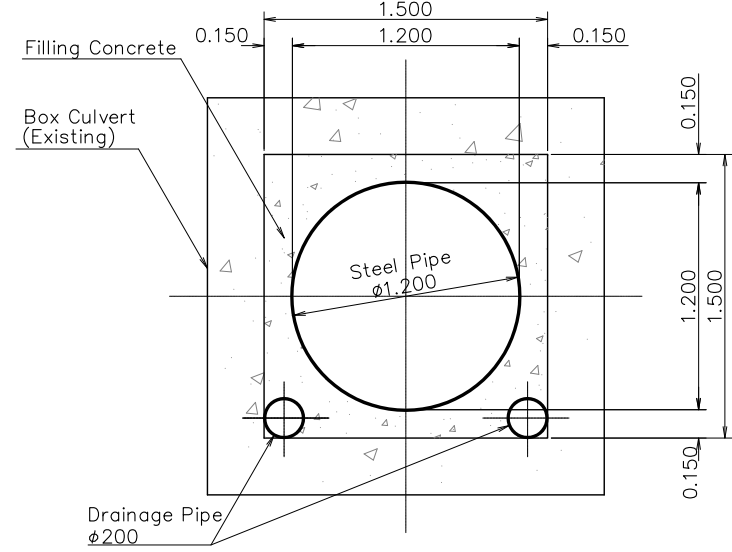
# PROFILE



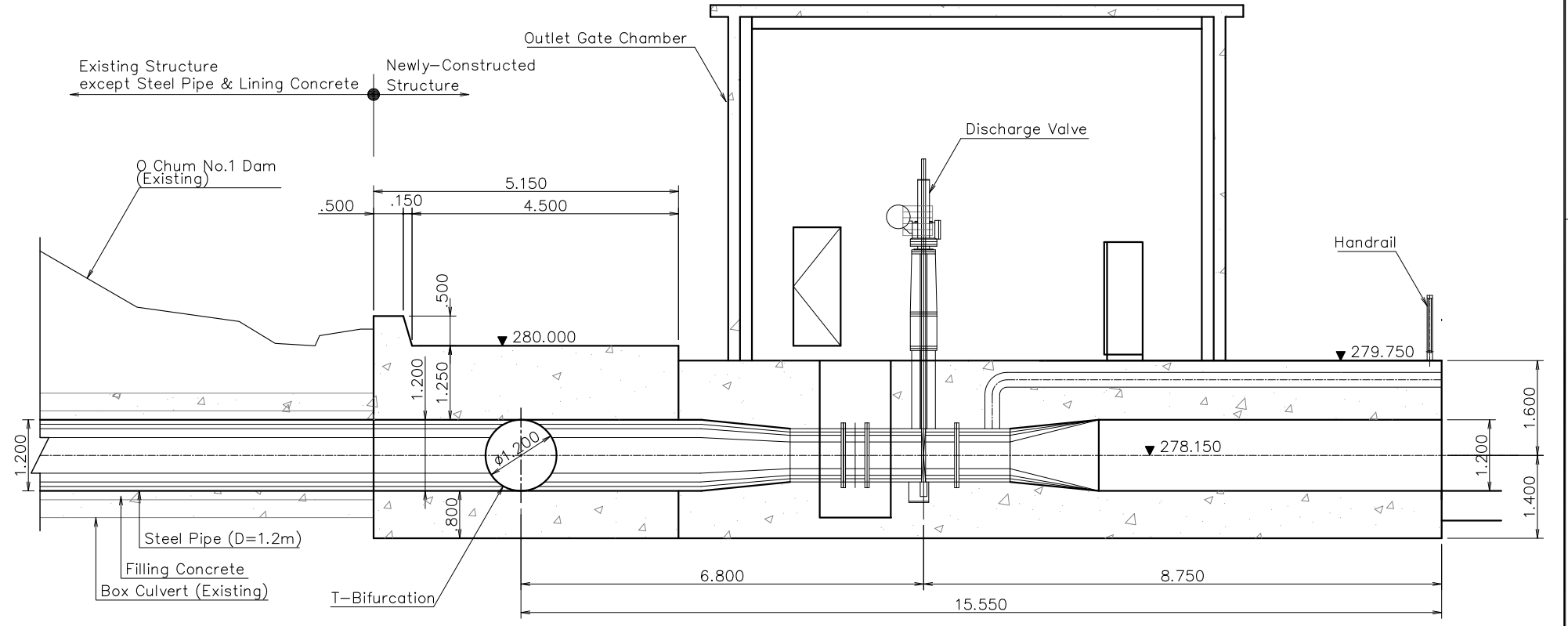
DETAIL OF INTAKE



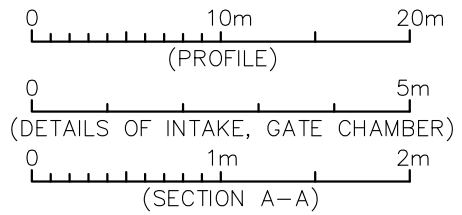
SECTION A-A



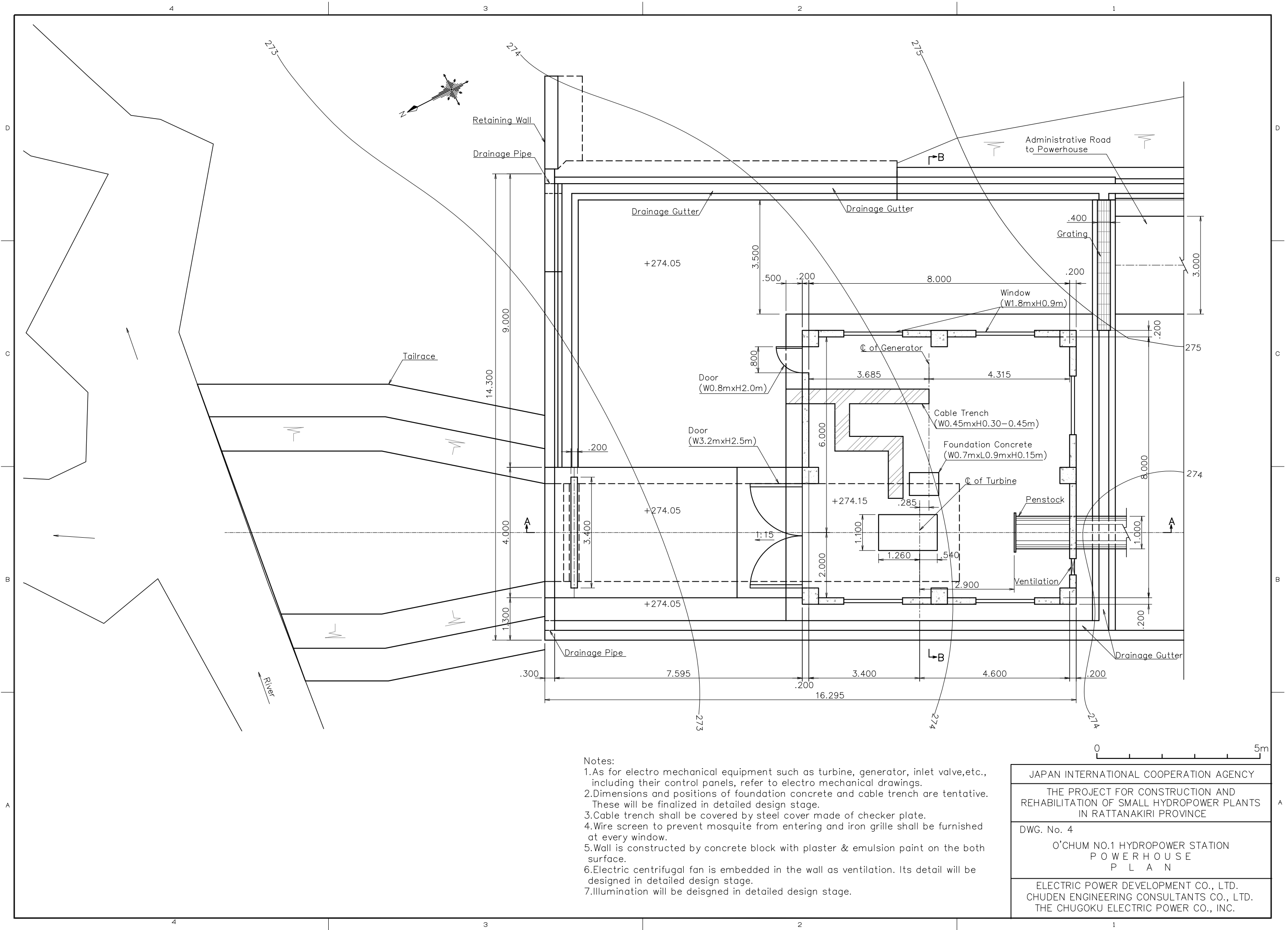
PROFILE OF OUTLET GATE CHAMBER



- Notes:
1. Soundness and dimension of the existing box culvert shall be inspected in the detailed design stage.
  2. Details of Intake Gate Chamber and Outlet Gate Chamber will be finalized in the detailed design stage.
  3. Filling concrete can be replaced with equivalent material.

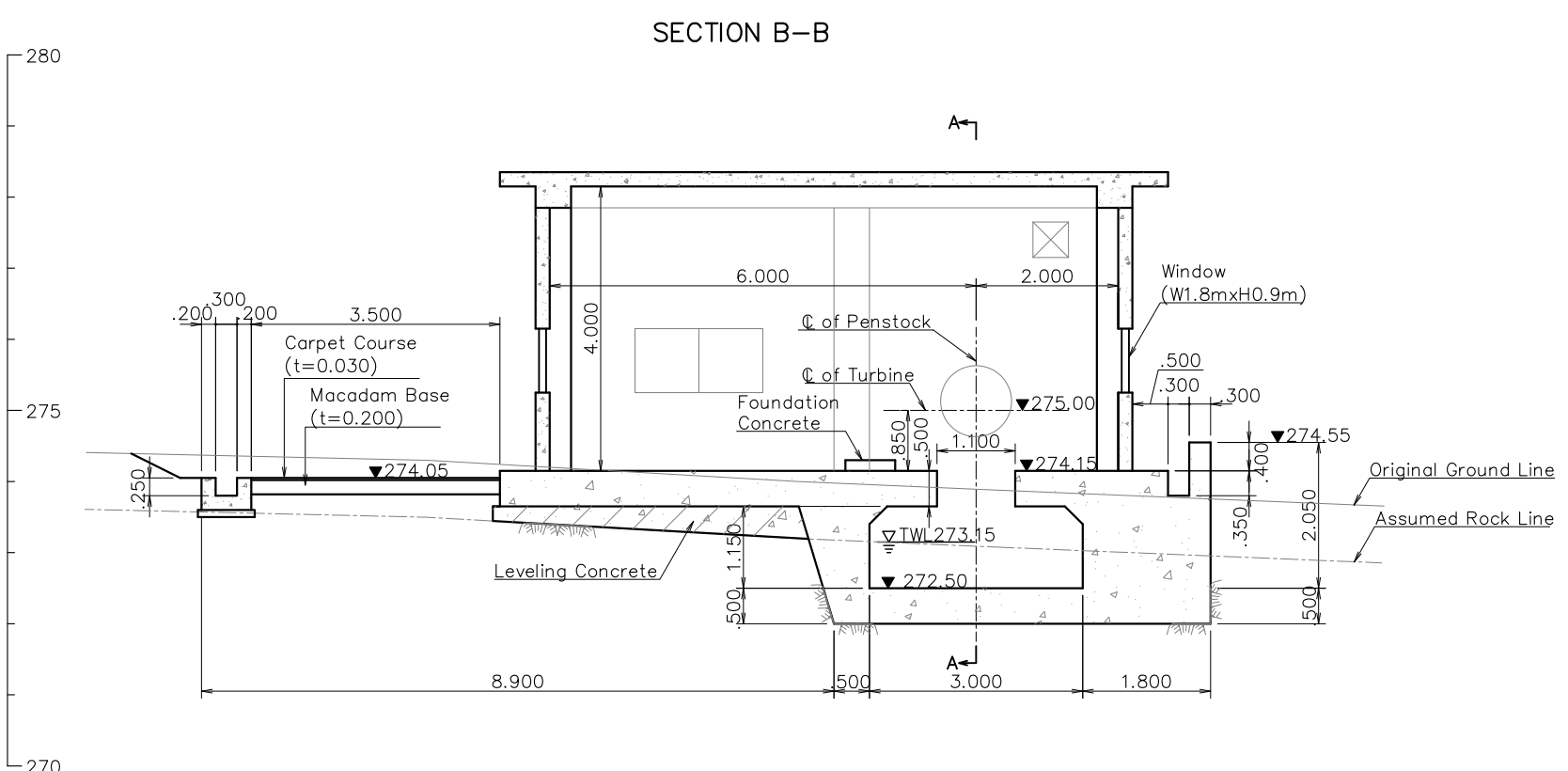
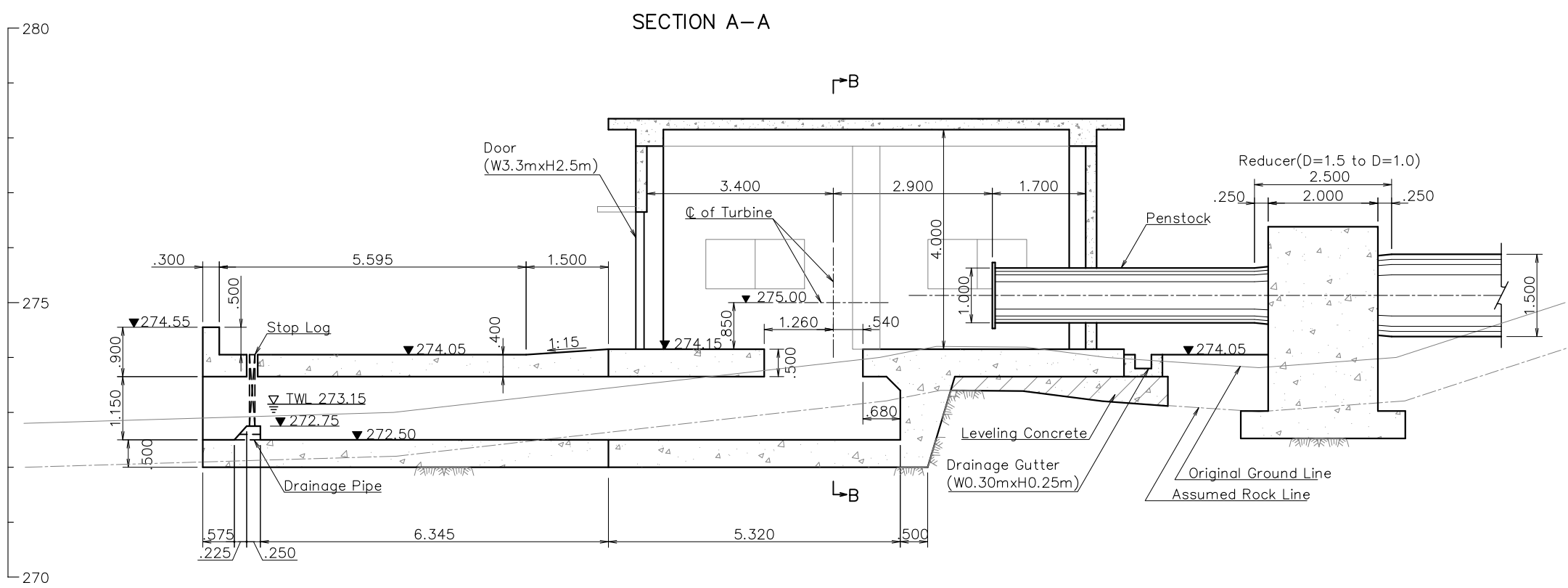


JAPAN INTERNATIONAL COOPERATION AGENCY
THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE
DWG. No.3
O'CHUM NO.1 HYDROPOWER STATION WATERWAY PROFILE (DAM SECTION)
ELECTRIC POWER DEVELOPMENT CO., LTD. CHUDEN ENGINEERING CONSULTANTS CO., LTD. THE CHUGOKU ELECTRIC POWER CO., INC.

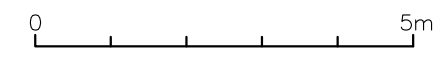


- Notes:
- 1.As for electro mechanical equipment such as turbine, generator, inlet valve,etc., including their control panels, refer to electro mechanical drawings.
  - 2.Dimensions and positions of foundation concrete and cable trench are tentative. These will be finalized in detailed design stage.
  - 3.Cable trench shall be covered by steel cover made of checker plate.
  - 4.Wire screen to prevent mosquito from entering and iron grille shall be furnished at every window.
  - 5.Wall is constructed by concrete block with plaster & emulsion paint on the both surface.
  - 6.Electric centrifugal fan is embedded in the wall as ventilation. Its detail will be designed in detailed design stage.
  - 7.Illumination will be deisgned in detailed design stage.

JAPAN INTERNATIONAL COOPERATION AGENCY
THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE
DWG. No. 4
O'CHUM NO.1 HYDROPOWER STATION POWERHOUSE PLAN
ELECTRIC POWER DEVELOPMENT CO., LTD. CHUDEN ENGINEERING CONSULTANTS CO., LTD. THE CHUGOKU ELECTRIC POWER CO., INC.



- Notes:
- 1.As for electro mechanical equipment such as turbine, generator, inlet valve,etc., including their control panels, refer to electro mechanical drawings.
  - 2.Dimensions and positions of foundation concrete and cable trench are tentative. These will be finalized in detailed design stage.
  - 3.Window screen for prevention of entering mosquito and iron grille shall be furnished at every window.
  - 4.Wall is constructed by concrete block with plaster & emulsion paint on the both surface.
  - 5.Waterproofing shall be placed on the roof.



JAPAN INTERNATIONAL COOPERATION AGENCY
THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE
DWG. No. 5 O'CHUM NO.1 HYDROPOWER STATION POWER HOUSE PROFILE & CROSS SECTION
ELECTRIC POWER DEVELOPMENT CO., LTD. CHUDEN ENGINEERING CONSULTANTS CO., LTD. THE CHUGOKU ELECTRIC POWER CO., INC.

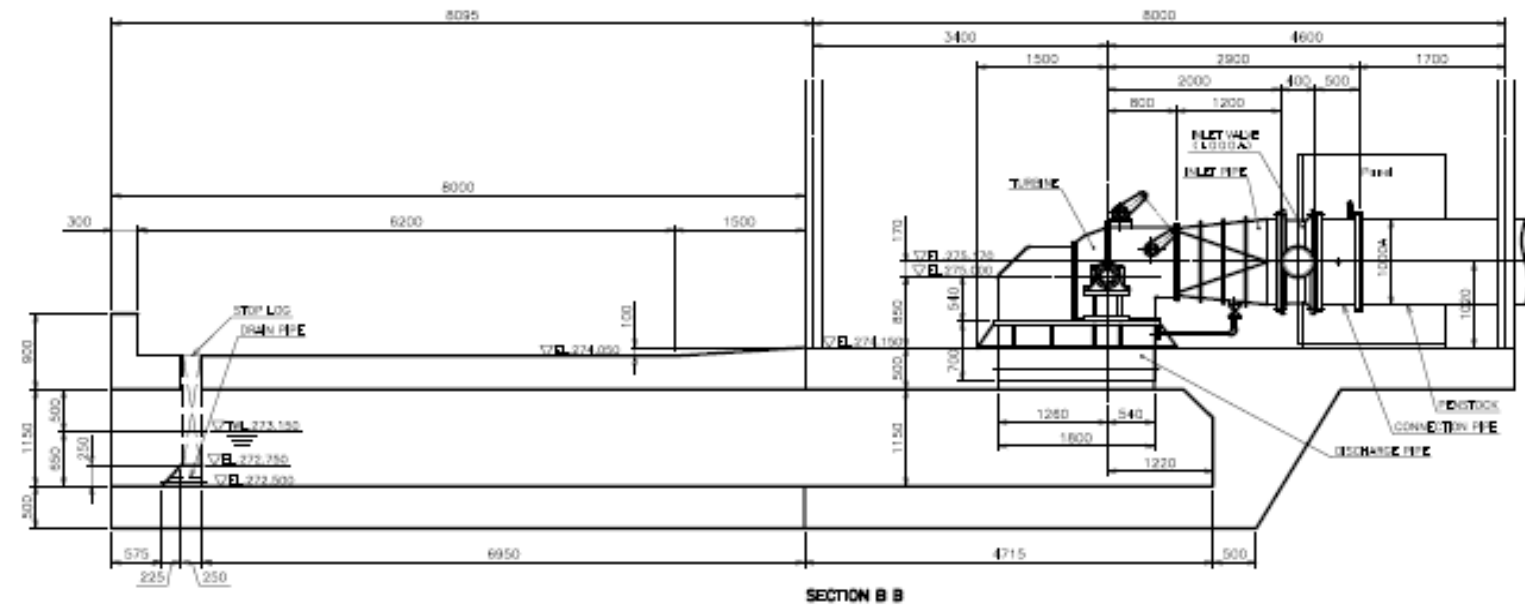
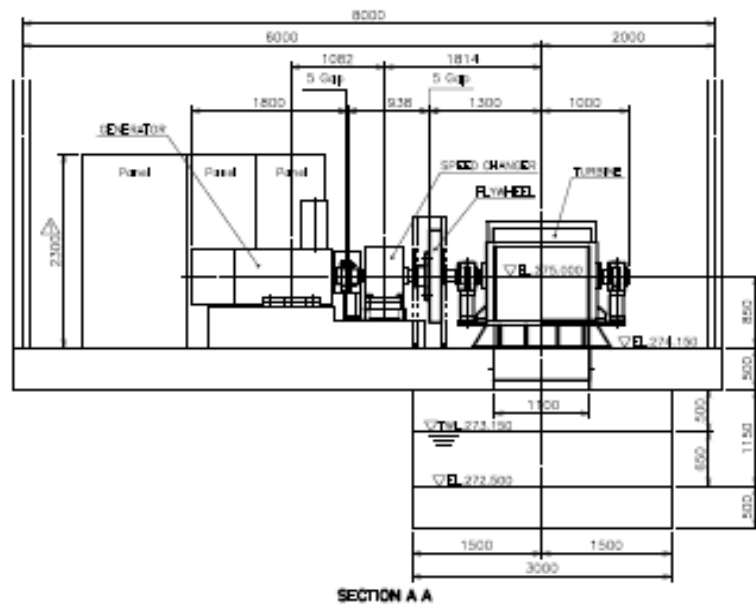
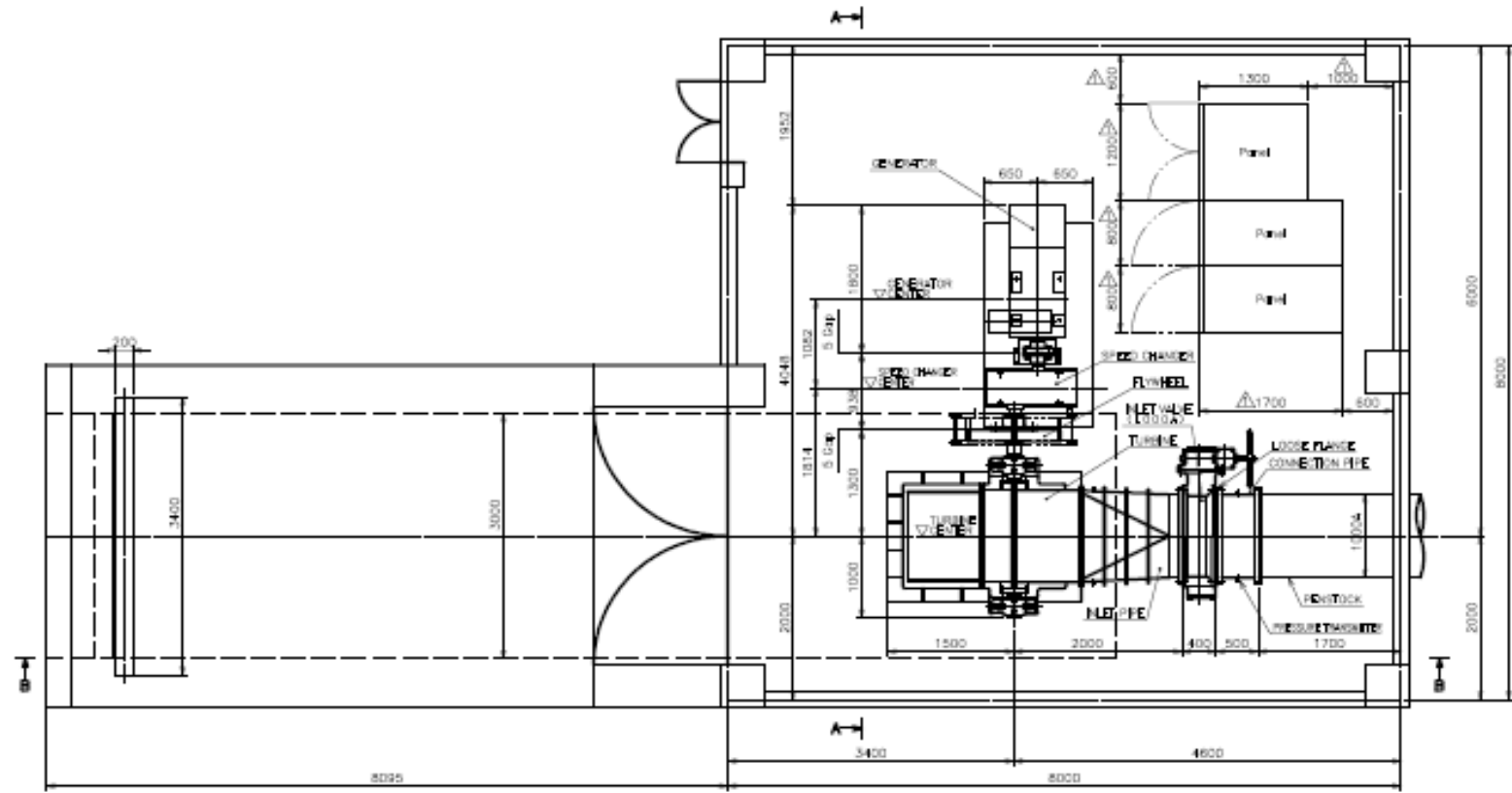
O'Chum No.1 Power Station

H: 14.85 m

Q: 2.6 m<sup>3</sup>/s

N: 174 min<sup>-1</sup>

P: 265 kW



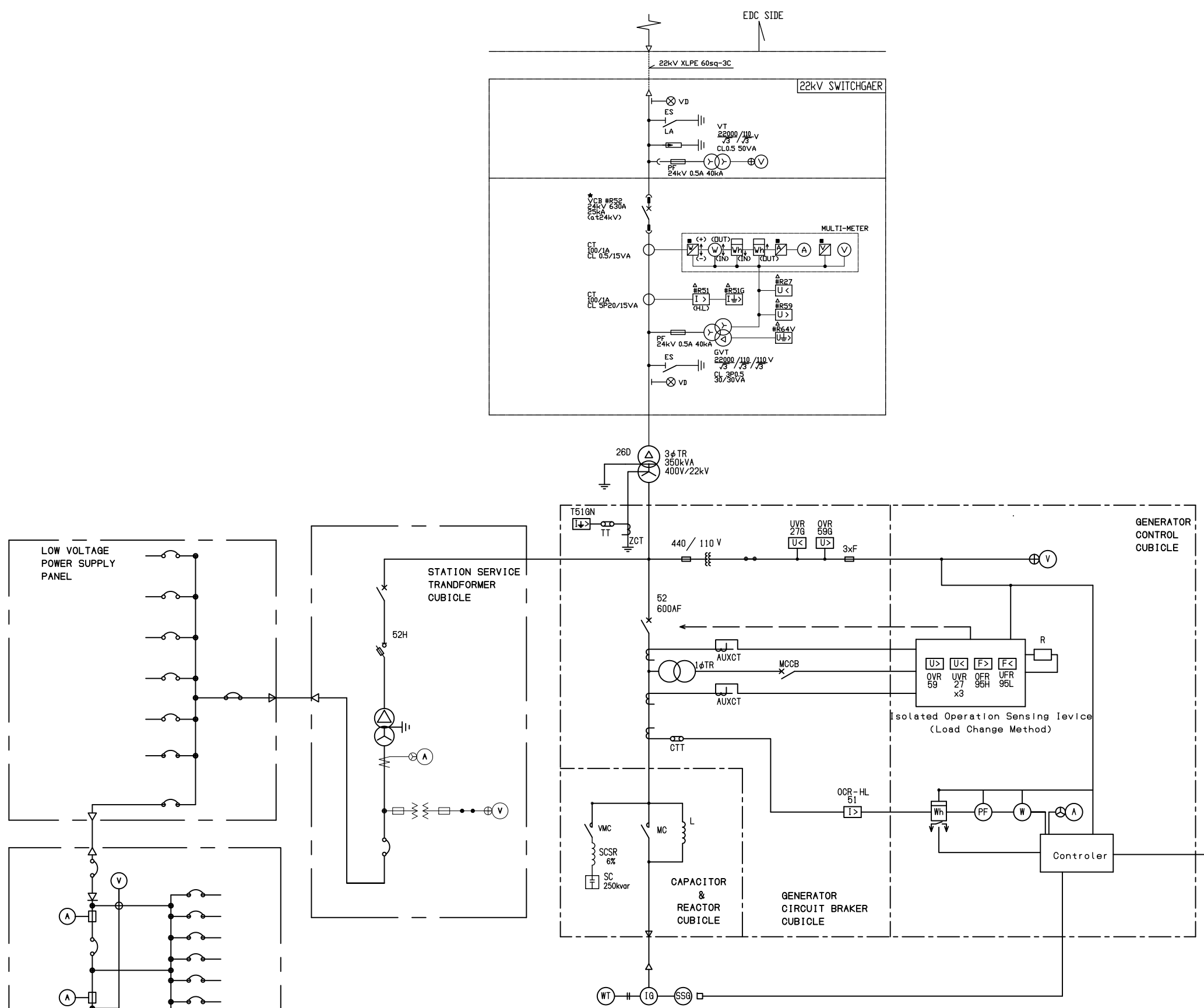
For reference

JAPAN INTERNATIONAL COOPERATION AGENCY  
 THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE  
 DWG. No.6  
**PLAN AND SECTION OF HYDROPOWER GENERATING EQUIPMENT FOR O'CHUM NO.1 POWER STATION**  
 ELECTRIC POWER DEVELOPMENT CO., LTD.  
 THE CHUGOKU ELECTRIC POWER CO., INC.  
 CHUDEN ENGINEERING CONSULTANTS CO., LTD.

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JAPAN INTERNATIONAL COOPERATION AGENCY

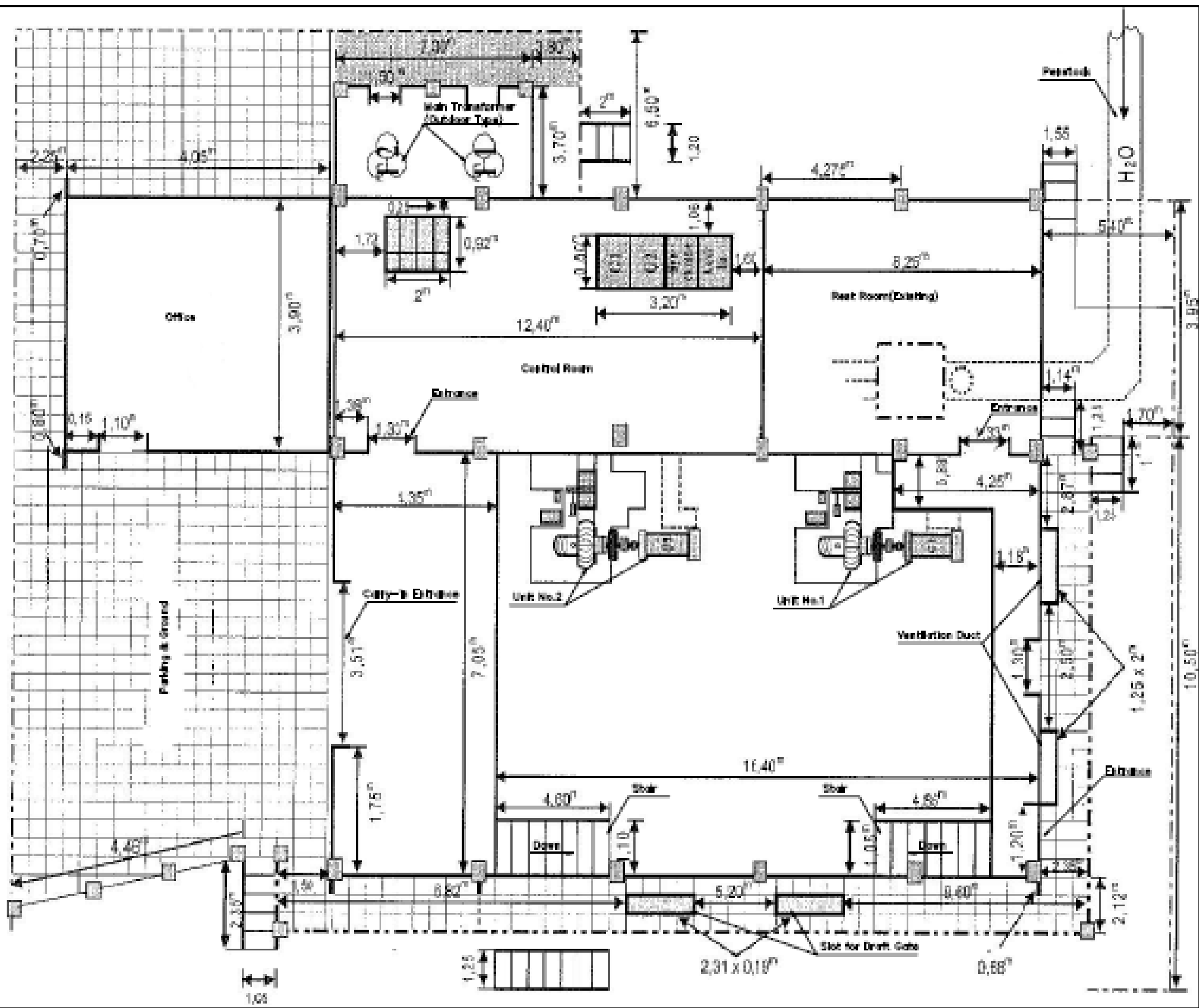
THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE

DWG. No. 7

**SINGLE LINE DIAGRAM FOR O'CHUM NO.1 POWER STATION**

ELECTRIC POWER DEVELOPMENT CO., LTD.  
THE CHUGOKU ELECTRIC POWER CO., INC.  
CHUDEN ENGINEERING CONSULTANTS CO., LTD.

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THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE

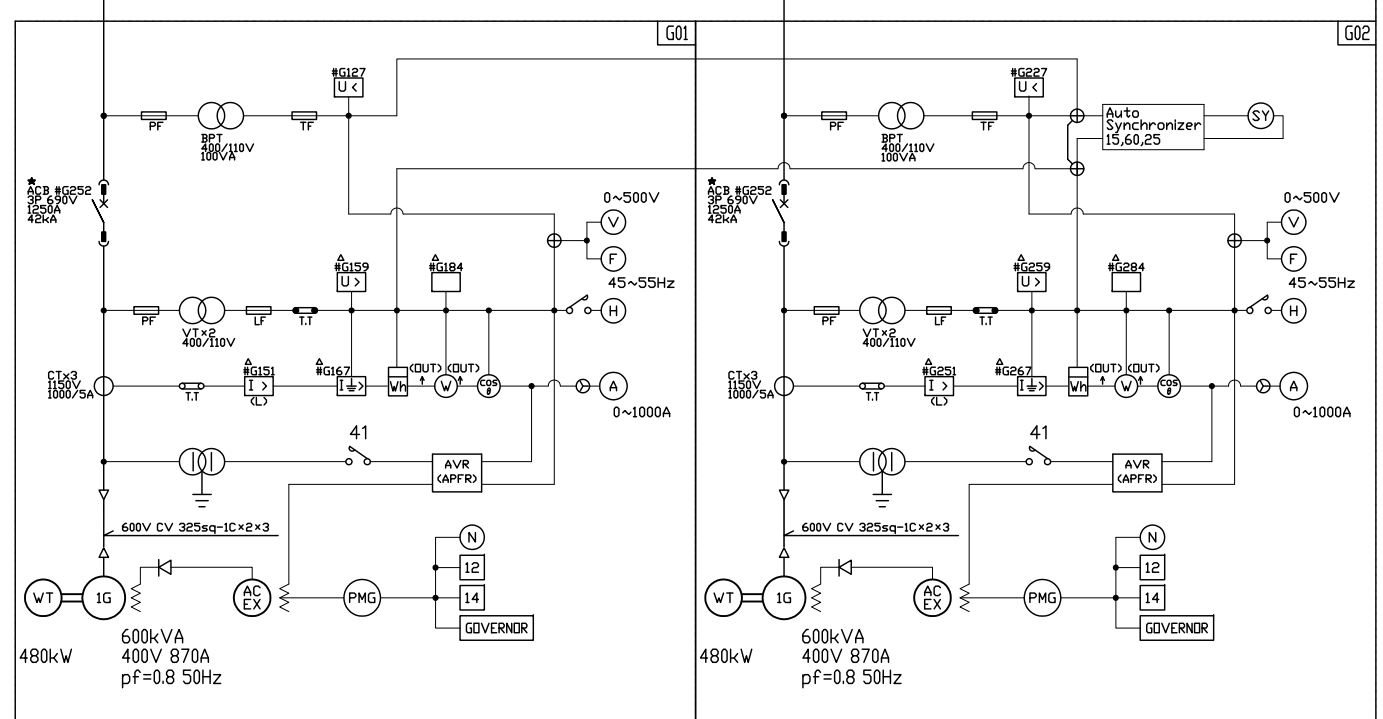
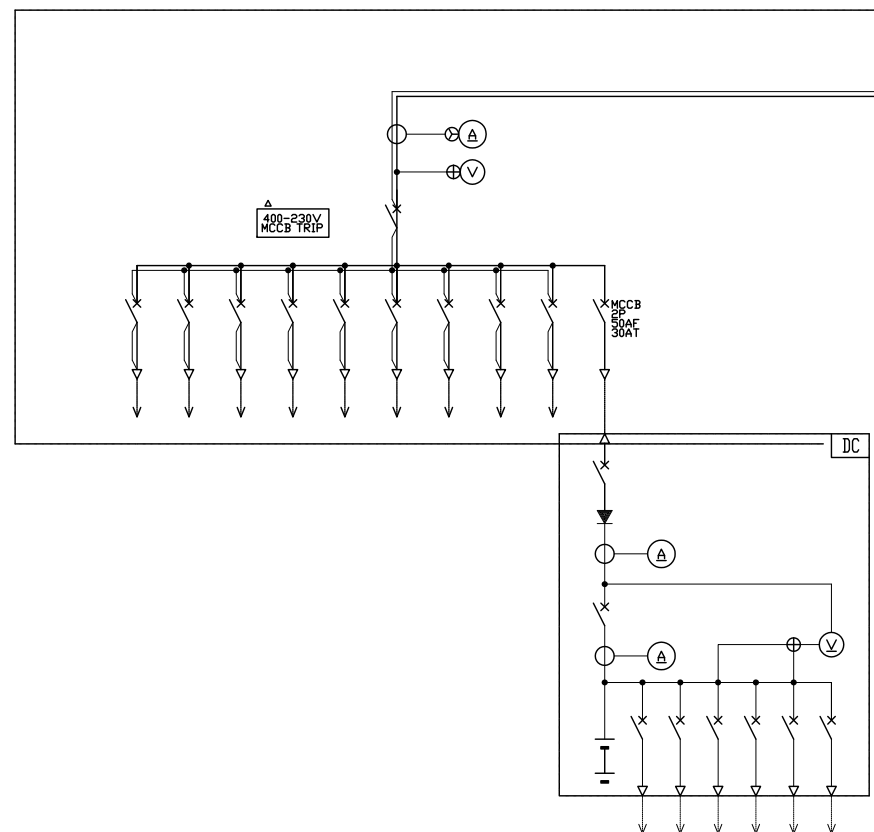
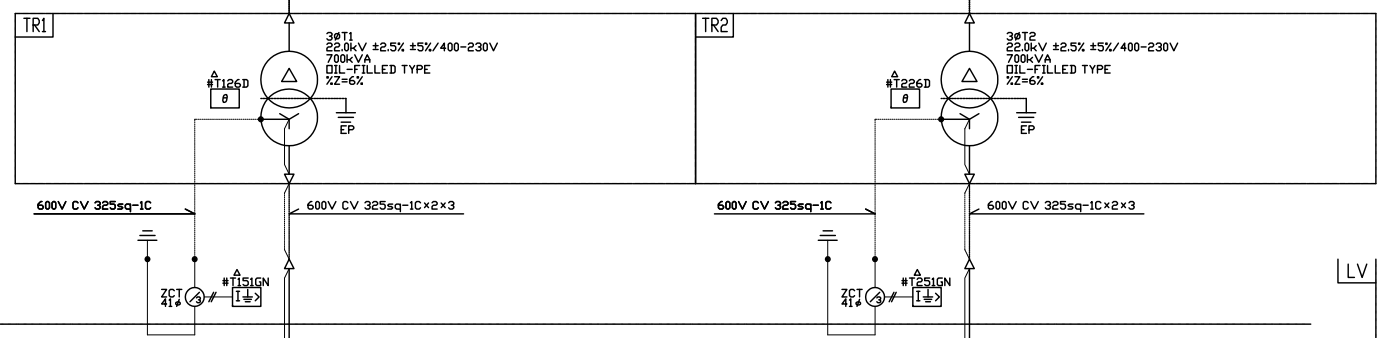
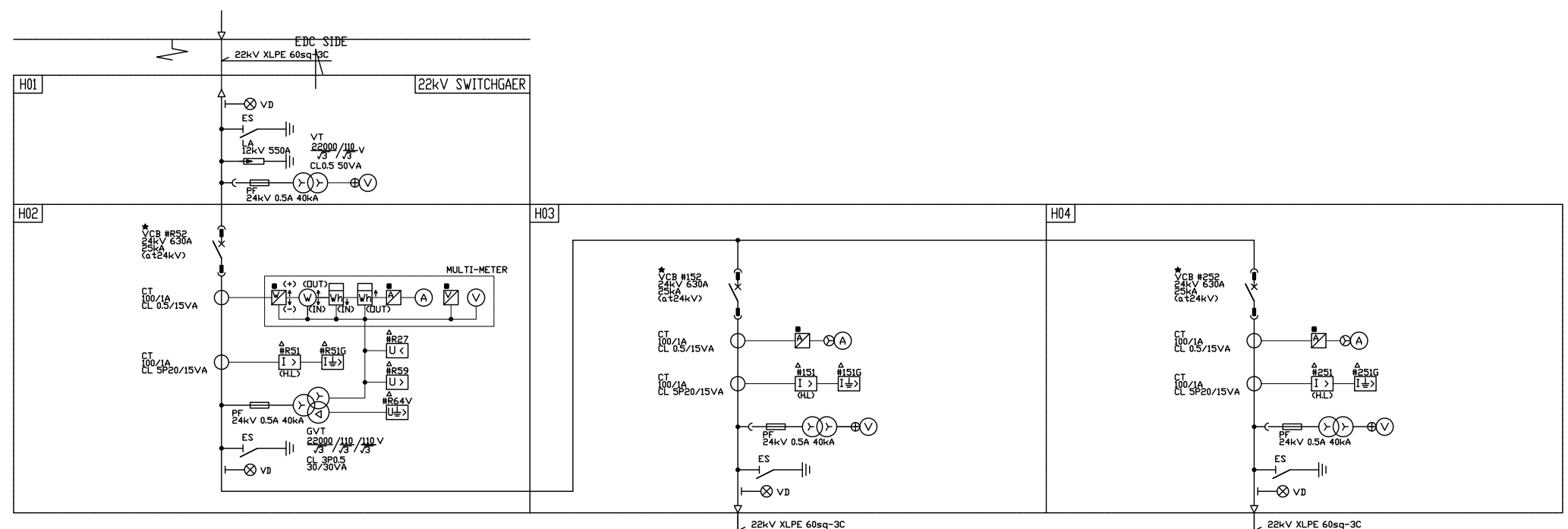
DWG. No.8

POWERHOUSE ARRANGEMENT OF HYDROPOWER GENERATING EQUIPMENT FOR O'CHUM NO.2 POWER STATION

ELECTRIC POWER DEVELOPMENT CO., LTD.  
 THE CHUGOKU ELECTRIC POWER CO., INC.  
 CHUDEN ENGINEERING CONSULTANTS CO., LTD.







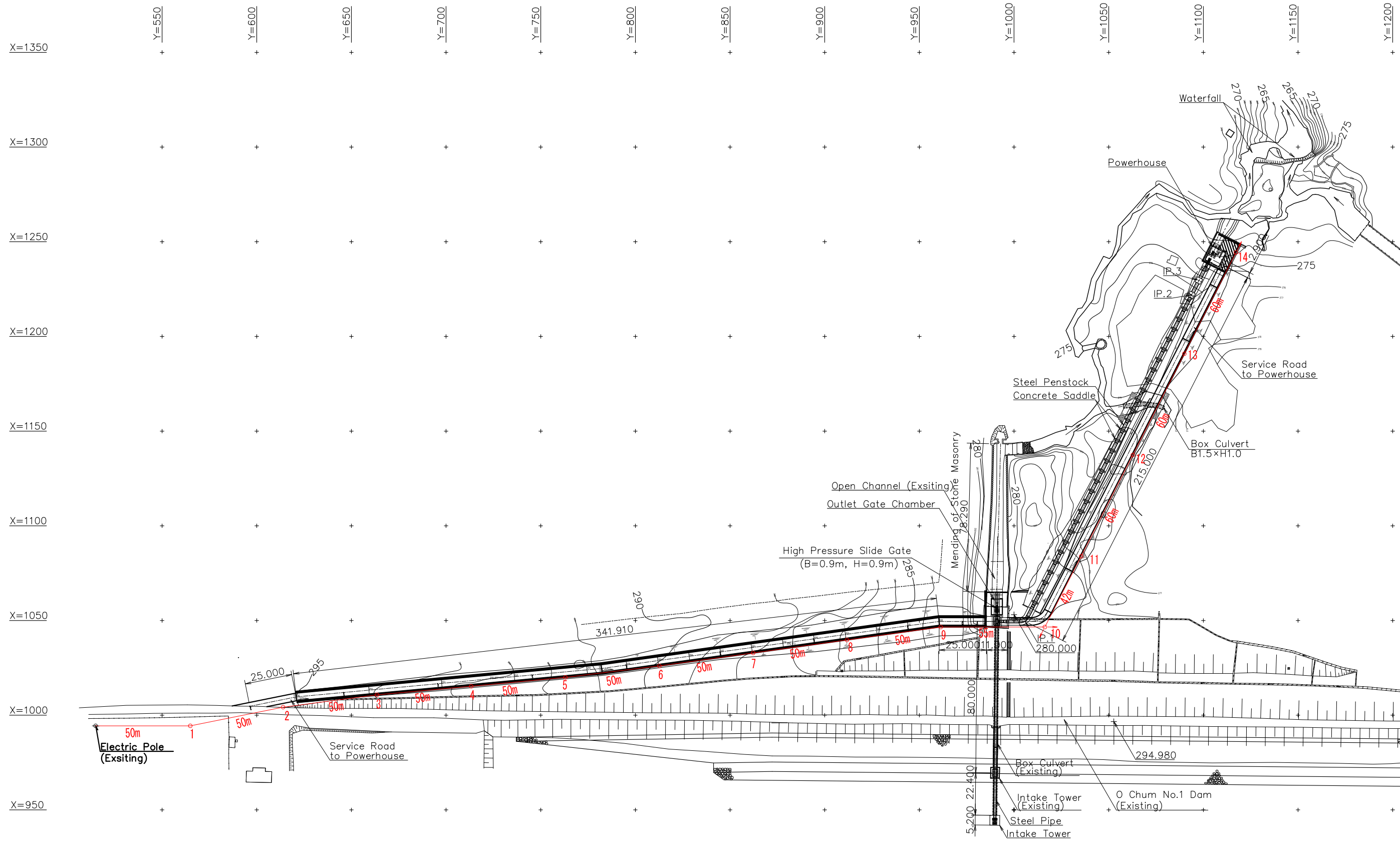
JAPAN INTERNATIONAL COOPERATION AGENCY

THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE

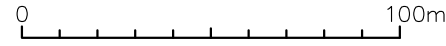
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**SINGLE LINE DIAGRAM FOR O'CHUM NO.2 POWER STATION**

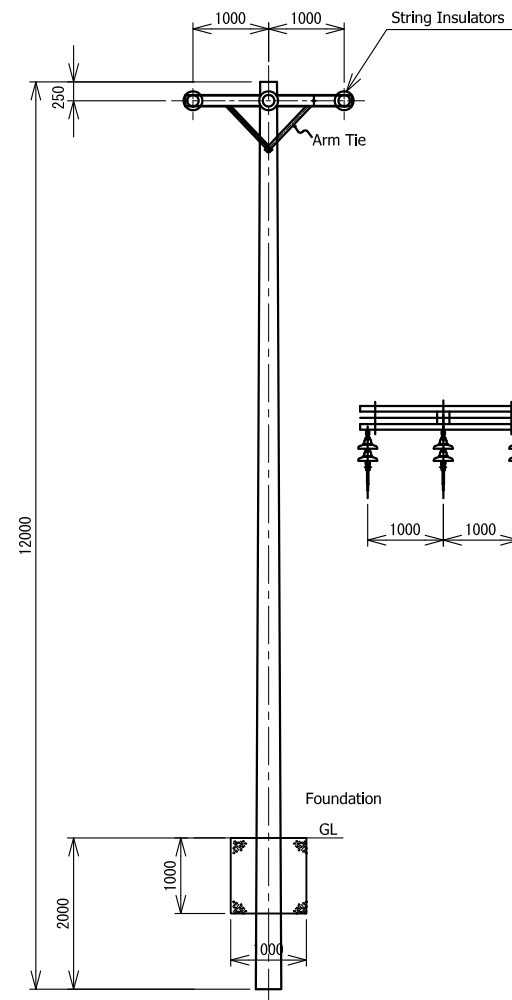
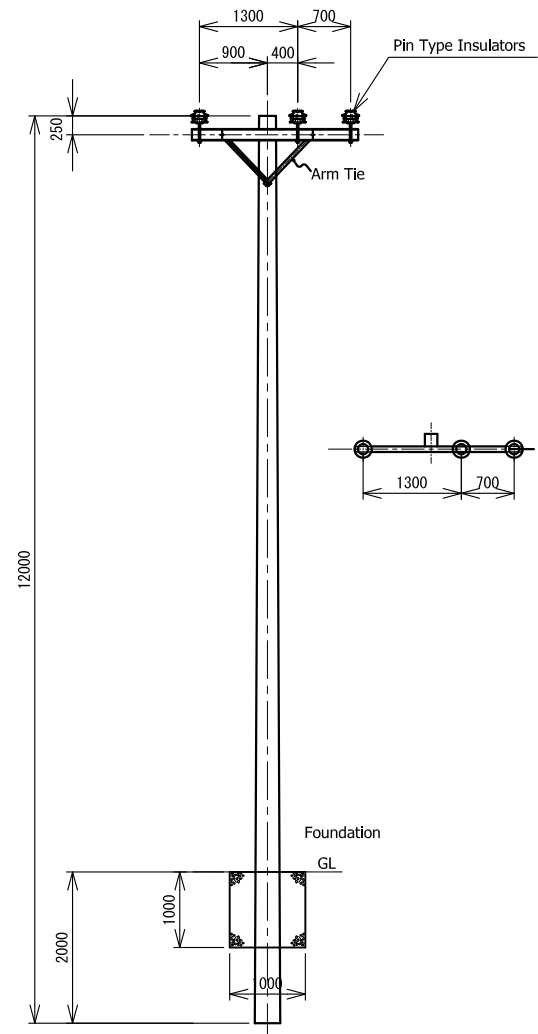
ELECTRIC POWER DEVELOPMENT CO., LTD.  
THE CHUGOKU ELECTRIC POWER CO., INC.  
CHUDEN ENGINEERING CONSULTANTS CO., LTD.



— Medium Voltage Lines

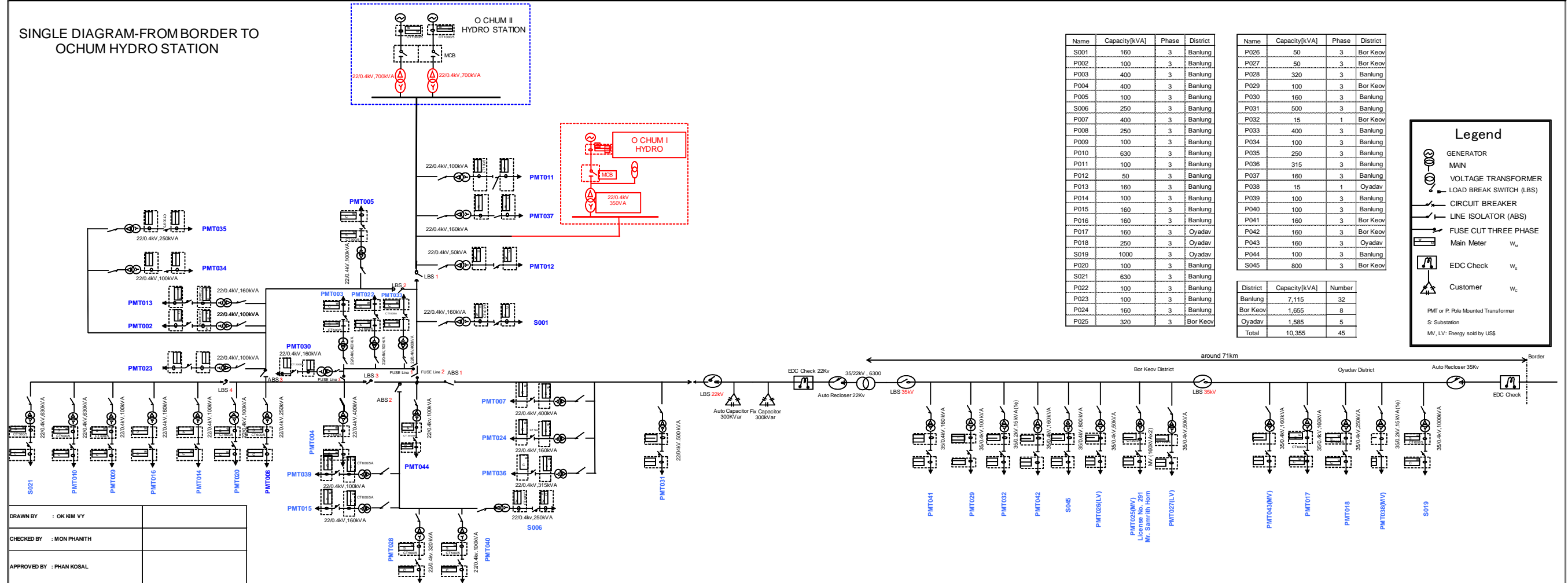
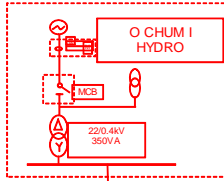
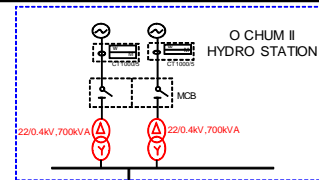


JAPAN INTERNATIONAL COOPERATION AGENCY  
 THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE  
 DWG. No.11  
 O CHUM NO.1 HYDROPOWER STATION  
 Route Map Medium Voltage Distribution Lines  
 ELECTRIC POWER DEVELOPMENT CO., LTD.  
 CHUDEN ENGINEERING CONSULTANTS CO., LTD.  
 THE CHUGOKU ELECTRIC POWER CO., INC.



JAPAN INTERNATIONAL COOPERATION AGENCY
THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE
DWG. No.12 O CHUM NO.1 HYDROPOWER STATION Medium Voltage Overhead Three Phase
ELECTRIC POWER DEVELOPMENT CO., LTD. CHUDEN ENGINEERING CONSULTANTS CO., LTD. THE CHUGOKU ELECTRIC POWER CO., INC.

SINGLE DIAGRAM-FROM BORDER TO OCHUM HYDRO STATION



Name	Capacity[kVA]	Phase	District
S001	160	3	Banlung
P002	100	3	Banlung
P003	400	3	Banlung
P004	400	3	Banlung
P005	100	3	Banlung
S006	250	3	Banlung
P007	400	3	Banlung
P008	250	3	Banlung
P009	100	3	Banlung
P010	630	3	Banlung
P011	100	3	Banlung
P012	50	3	Banlung
P013	160	3	Banlung
P014	100	3	Banlung
P015	160	3	Banlung
P016	160	3	Banlung
P017	160	3	Oyadav
P018	250	3	Oyadav
S019	1000	3	Oyadav
P020	100	3	Banlung
S021	630	3	Banlung
P022	100	3	Banlung
P023	100	3	Banlung
P024	160	3	Banlung
P025	320	3	Bor Keov

Name	Capacity[kVA]	Phase	District
P026	50	3	Bor Keov
P027	50	3	Bor Keov
P028	320	3	Banlung
P029	100	3	Bor Keov
P030	160	3	Banlung
P031	500	3	Banlung
P032	15	1	Bor Keov
P033	400	3	Banlung
P034	100	3	Banlung
P035	250	3	Banlung
P036	315	3	Banlung
P037	160	3	Banlung
P038	15	1	Oyadav
P039	100	3	Banlung
P040	100	3	Banlung
P041	160	3	Bor Keov
P042	160	3	Bor Keov
P043	160	3	Oyadav
P044	100	3	Banlung
S045	800	3	Bor Keov

District	Capacity[kVA]	Number
Banlung	7,115	32
Bor Keov	1,655	8
Oyadav	1,585	5
Total	10,355	45

**Legend**

- GENERATOR
- MAIN
- VOLTAGE TRANSFORMER
- LOAD BREAK SWITCH (LBS)
- CIRCUIT BREAKER
- LINE ISOLATOR (ABS)
- FUSE CUT THREE PHASE
- Main Meter  $W_m$
- EDC Check  $W_e$
- Customer  $W_c$

PMT or P-Pole Mounted Transformer  
 S: Substation  
 MV, LV: Energy sold by USS

DRAWN BY : OK KIM VY  
 CHECKED BY : MON PHANITH  
 APPROVED BY : PHAN KOSAL

JAPAN INTERNATIONAL COOPERATION AGENCY

THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF SMALL HYDROPOWER PLANTS IN RATTANAKIRI PROVINCE

DWG. No.13

SINGLE DIAGRAM-FROM BORDER TO OCHUM HYDRO STATION

ELECTRIC POWER DEVELOPMENT CO., LTD.  
 THE CHUGOKU ELECTRIC POWER CO., INC.  
 CHUDEN ENGINEERING CONSULTANTS CO., LTD.

# **Appendix-7**

## **Environmental Check list**

The items for environmental and social evaluation, the results of evaluation, its reasons and mitigation measures to be taken are summarized in the Environmental check list below.

The followings are meanings of the scores for evaluation results in the list.

- “A+/-” : Significant positive/negative impact is expected.
- “B+/-” : Positive/negative impact is expected to some extent.
- “C+/-” : Extent of positive/negative impact is unknown.  
(A further examination needed, and the impact could be clarified as the study progresses)
- “D” : No impact is expected.
- “N/A” : Not applicable for field survey
- “-” : Not item for evaluation

**Environmental Check list (1)—Pollution control—version1**

Category	Items to be checked	Evaluation Results		Reasons & Mitigation Measures to be taken
		During construction	After construction	
(1) water quality	<b>【Hydropower】</b>			
	a) Water quality in reservoir, & Quality standard  * a possibility that proliferation of phytoplankton and zooplankton	D	D	It is not expected that water quality will be affected since the project aims a renovation of the existing dam.  As for planktons concerned, a proliferation will hardly occur due to the following reasons.  Upgrading of an intake of O Chum No.1 dam makes the lowest water level for discharging higher, which causes an increase of dead storage water. The amount of the water is approximately 6.50 million cubic meters, while the total amount of inflow water to the reservoir is 34.4 million cubic meters. This means the dead storage water could be replaced 5 times a year. It is generally considered that proliferation of plankton does not happen when water stock is replaced more than twice a year. In addition, upstream of the reservoir is a depopulated area. Therefore, it may discharge less human sewage that may cause eutrophication leading proliferation of planktons.
	(b) Quality of water discharged	D	D	A civil engineering work during construction may cause muddy water, which, however, is not expected to reach quality standard.  When a dam renovation is concerned, in general, a temporary dike is constructed in order to dammed up river water, and water pipes are installed at the dike to make water flow to down stream. Those pipes take water from the surface of dammed water which is less turbid.  Turbidity of discharged water during construction period in dry season, in case it happens, would be as same as and/or less than that of natural river after rain fall in rainy season.

(1) water quality	(c) Woody vegetation in the reservoir	D	D	Woody vegetation in the reservoir was already cleared by the prior project.
	(d) Water quality degradation in downstream area caused by the reduced river flow	D	D	This project is renovation of existing dam facilities, so water quality in downstream will not change after the project. The civil work may affect water flow. A statistics of rain fall suggests that water volume in dry season becomes quite small. Water flow to downstream will be maintained even in construction period, so it is not expected water quality will be degraded. <b>【 Mitigation Measurement 】</b> By way of caution, to install water pipes at temporary dike to discharge water to downstream by 100 liter/sec., when river water exists in dry season.
	(e) Water discharged from the lower portion of the dam reservoir (the water temperature of the lower portion)	D	D	Water depth in the reservoir is 14.5 meters, and reserved water which lies in 4.5 meters from surface of water level will be used for generation. New water intake locates at 4.5 m higher from existing facilities. Therefore, water temperature will not become lower than now.
	<b>【 Transmission line 】</b>			
	(f) Degradation of water quality degradation caused by soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling water areas?	D	D	The project installs distribution lines but not build transmission tower. The line root will be along the existing street, therefore, no negative impacts happen to river..
(2) waste	<b>【 Hydropower 】</b>			
	(a) Treatment of earth and sand generated by excavation	D	D	The largest civil engineering work could be construction of temporary dike in the current reservoir in order to keep water from leaching an intake tower during its upgrading work. Soil in the reservoir (near spillway) will be used to build the dike. The dike will be removed, and the soil will be filled back to lower area within the reservoir after the upgrading work is completed. Therefore, soil erosion to downstream of the dam would hardly happen.
	(b) Pole transformer which contain PCB	D	D	The project does not replace any existing pole transformers.

**Environmental Check list (2) – Natural Environment – version 1**

Category	Items to be checked	Evaluation Results		Reasons & Mitigation Measures to be taken
		During construction	After construction	
(1) Protected area	<b>【Hydropower • Transmission line】</b>			
	(a) Location of protected area, Impacts on protected area	D	D	A protect area does not locate in/near to project area. There are two natural reserves protected by law in Ratanakiri province. They are Virachay National Park, and Lomphat Sanctuary both of which are far from project area by more than 35 km with direct distance.
(2) Ecosystem	<b>【Hydropower • Transmission line】</b>			
	(a) ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)	D	D	There are not such places.
	(b) protected habitats of endangered species	D	D	The project does not encompass such habitat.
	<b>【Hydropower】</b>			
	(c) Adversely impacts to downstream aquatic organisms, animals, plants, and ecosystems	D	D	In the region, rainy season and dry season are clearly divided. Water is dried up during dry season. The civil work that may affect water flow is planned to be conducted in dry season, then, it would not be expected to cause negative impacts on ecosystems.
	(d) Impacts on migratory fish species	D	D	There is no migratory fish species found in the project area.
(2) Ecosystem	<b>【Transmission line】</b>			
	(e) Significant ecological impacts on the ecosystem	D	D	No significant impacts are anticipated The project does not include a large-scale civil engineering work such as construction of transmission towers The line will be installed along the existing road.
	(f) Disruption of migration routes and habitat fragmentation of wildlife and livestock?	D	D	The project components do not include distribution line and/or construction work which disrupt migration routes of wildlife and livestock



(2) system	(g) Destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem	D	D	The project area does not include natural forest nor wetland areas. In addition, a scale of civil engineering work is relatively small.
	(h) Extensive loss of natural environments in undeveloped areas?	D	D	It's not applicable to this project. (The project site locates in developed area)
(3) Hydrology	<b>【Hydropower】</b>			
	(a) Hydrologic changes due to the installation of structures, such as weirs (especially in "run off the river generation" projects)	D	D	The project is not "run off the river" type. The project installs water pipe of which length is 250 m, and so, a flow of surface water will change only around that area. However, it will not bring negative impacts as a scale of the facility is small.
(4) Topography and Geology	<b>【Transmission line】</b>			
	(a) Reductions in sediment loads at downstream area, Sedimentation of the reservoir	D	D	It's not applicable (the project components does not include construction of dam reservoir) 。
	(b) A large-scale alteration of the topographic features and geologic structures in the surrounding areas	D	D	The physical scale of facilities in the project is small, and does not cause a large scale alteration of the topographic features. To make water intake higher location, the lowest water level in dry season become also higher. However, this does not means that maximum water level in the reservoir become higher nor bring a large scale alternation of the topographic features.
	<b>【Transmission line】</b>			
	(c) Slope failures or landslides	D	D	Distribution line does not run on the places where slope failures or landslides likely occur.
	(d) Civil works, such as cutting and filling causing slope failures or landslides	D	D	The civil work is relatively small, and could not bring slope failure nor land slope.
(e) Soil runoff resulting from cut and fill areas, waste soil disposal sites, and borrow sites.	D	D	The project does not bring such runoff since the civil work is relatively small.	

**Environmental Check list (3) – Social Environment – version 1**

Category	Items to be checked	Evaluation Results		Reasons & Mitigation Measures to be taken
		During construction	After construction	
(1) Resettlement	<b>【Hydropower • Transmission line】</b>			
	(a) Involuntary Resettlement	B <sup>-</sup>	B <sup>-</sup>	It is identified that two families plants cashew nuts trees near candidate site for construction of power plant on EDC's land.. These families are not allowed to continue to use this EDC's land, however, they can maintain their living at the same houses which locate in different place (at O'Chum village) <b>【Mitigation measure】</b> According to the policy stated in the JICA guideline (2010), stakeholders discussed this issue and concluded that EDC had paid 1000USD as compensation to the families and they moved away from EDC's land. It was also arranged that one family who had lost its main income source will be employed by EDC.
(2) Living and Livelihood	<b>【Hydropower • Transmission line】</b>			
	(a) Adversely impacts on the living conditions of inhabitants	D	D	A power plant will be constructed on the land of EDC, and distribution lines are laid along existing roads. The size of facilities is relatively small. Therefore, the project does not cause adversely impacts on living and livelihood of community members. According to the site survey, the access road and distribution line will be constructed at far from villages. Therefore, no negative impacts caused by vehicles for construction work is anticipated Even though it is recommended that constructor will inform community members of schedule and contents of civil works on site.
	(b) Diseases due to immigration of workers associated with the project	D	D	Operation and maintenance of the project facilities do not cause immigration. For construction work, most of workers except skilled ones could be employed from communities in/around the project site.
	<b>【Hydropower】</b>			
	(a) Change of land uses in the neighboring areas, adversely affecting livelihood of local people	C <sup>-</sup>	C <sup>-</sup>	Water level in O'Chun No1 dam reservoir goes up in dry season due to improvement of facilities. It was reported that someone plant vegetable at the places which appear in the reservoir only in dry season. The study team could not confirm that, therefore, EDC was asked to conduct follow-up survey. It is necessary for JICA to support EDC in case there is someone affected by the project.

(2) Living and Livelihood	(c) Change of land uses in the neighboring areas, adversely affecting livelihood of local people (continued)			<p><b>【Mitigation measurements】</b></p> <p>The followings are actions planed as mitigation measurements</p> <p>: Conduct field survey (January to March, 2013), in order to;</p> <p>+ confirm if there are persons do farming in the reservoir. and if there are;</p> <p>+ identify each persons' profile (name &amp; village to live), and kind of vegetables/crops planted,</p> <p>+ estimate their yields.</p> <p>: Then, conduct family survey to get the following information;</p> <p>+ socio-economic status of the families including total income, and land holding other than in the reservoir.</p> <p>: According to the JICA guideline, to estimate amount of compensation based on market prices of the vegetables/crops, and results of socio-economic status surveyed</p> <p>: Hold stakeholder meeting to make consensus on the followings</p> <p>+ compensation should be paid to persons concerned</p> <p>+ the persons should no longer do farming in the reservoir.</p> <p>: Pay compensation to the persons concerned.</p> <p>(by the end of April 2013)</p>
	(d) Negative impacts on traffic systems	D	D	<p>There is no water traffic.</p> <p>In observation, there was not so much traffic around the project area. Therefore the project will not bring negative impacts on the traffic and traffic sysytem.</p>
	(e) The minimum flow required for maintaining downstream water uses	B <sup>-</sup>	D	<p>According to the interview, water flow becomes small in dray season, but not dried up. A pipe to discharge water to downstream area should be installed in construction period.</p> <p><b>【Mittigation Measurement】</b></p> <p>By way of caution, to install water pipes at temporary dike to discharge water to downstream by 100 liters/sec., when river water exists in dry season.</p>
	(f) Reductions in water flow affecting water use and land uses in downstream area	B <sup>-</sup>	B <sup>+</sup>	<p>It is identified that water is used for washing, and rarely drinking when ceremony.</p> <p><b>【Mittigation Measurement】</b></p> <p>By way of caution, to install water pipes at temporary dike to discharge water to downstream by 100 liter/sec., when river water exists in dry season.。</p> <p>+++++</p> <p>After starting of operation of new hydro power plantation, water flow between O'Chum No1 and No2 becomes stable through year.</p>
	(g) Water-borne or water-related diseases	D	D	<p>Few possibilities are identified since the project components do not include construction of reservoir.</p>

(2) Living and Livelihood	(h) Fishery rights, water usage rights, and common usage rights	D	B <sup>+</sup>	In O'Chum dam No1 reservoir, community members release fish and manage it. The area for civil work in the reservoir is estimated to be 16,000 m <sup>2</sup> at maximum, which account for less than 1 % of total area of the reservoir. Therefore, no negative impact on fish will be anticipated. Due to improvement of facilities, water level in the reservoir goes up which may make better condition for fish to grows. <b>【Remarks】</b> Although no negative impacts on fishes in the reservoir is foreseen, it is recommended that fish should be released after construction if community member show their concern about this issue.
	<b>【Transmission line】</b>			
	(i) Radio interference	D	D	Distribution line by the project does not cause radio interference because of its low voltage capacity.
	(j) A compensations for transmission wires given in accordance with the domestic law	D	D	The project will install low voltage distribution line. Under the current regulations. EDC does not have legal obligation to pay compensation for ROW of distribution line.
3) Heritage	<b>【Hydropower • Transmission line】</b>			
	(a) Negative impacts on the local archeological, historical, cultural, and religious heritage	D	D	No heritage is identified in/around the project site.
(4) landscape	<b>【Hydropower • Transmission line】</b>			
	(a) Negative impacts on Landscape	B	B	There is small water fall in downstream area of O'Chum No1 dam. The construction site will be selected from four options in order to minimize negative impacts on this water fall. <b>【Mitigation measurement】</b> To minimize negative impacts on landscape, the generator house will be built at the place so that it is not directly seen from the downstream of the water fall. Also, trees around the generator house will not logged as much as possible.
(5) Ethnic minority	<b>【Hydropower • Transmission line】</b>			
	(a) Minimization of negative impacts on the culture and life style of ethnic minorities and indigenous peoples	D	D	Approximately 90 % of people in Ratanakiri province is ethnic minority. There are three villages around the project site where ethnic minorities; Kroeung, Tompuon and Prav are lining. It is observed that they still keep their own social and cultural characteristics as ethnic minority, and are now in assimilation into Khmer. The project components such as construction of power plant and transmission line will not adversely affect their culture and life style.

(5) Ethnic minority	(b) Respect on all of the rights of ethnic minorities and indigenous peoples in relation to land and resources	D	D	According to the interview with village leaders, they understand that the land for construction of project facilities belong to EDC which does not include places where they take natural resources.
	<b>【Hydropower • Transmission line】</b>			
	(a) laws and ordinances associated with the working conditions	D	D	To comply with related laws such as labour Law (1997)
(6) working conditions	(b) tangible safety considerations for working conditions	D	D	The followings are considered. -to always put helmet, - and put safety belt, safety boots and dust mask if necessary -to enclose dangerous area by fence, and put board for attention.
	(c) Intangible measures for working conditions	D	D	The followings are considered. -to establish emergency system with a local medical facility -to provide safety education to all workers -to confirm the procedure of the work, and instruct safety practice in daily meeting
(6) Working conditions	(d) Appropriate measures taken to ensure that security guards involved in the project not to violate safety of stakeholders	D	D	There is no serious issue on safety found in the project area. Community members do not look to be against the project. Security guard will be hired from communities, or security of the construction site is managed with cooperation of communities.
	(e) Land mine, UXO	D	D	Hearing from community members to confirm current status of land mines and UXOs

**Environmental Check list (4) – Others – version 1**

Category	Items to be checked	Evaluation Results		Reasons & Mitigation Measures to be taken
		During construction	After construction	
(1) impact during constructions	<b>【Hydropower • Transmission line】</b>			
	(a) impacts by noise, vibrations, turbid water, dust, exhaust gases, and wastes	D	–	The civil work doesn't require blasting operation, nor concrete aggregate plant. Therefore, any negative impact by noise, vibration, turbid water will not be anticipated. Residential area is far by 300 m from the construction site, so noise from heavy machinery will not affect them.  (see item (1) (c) of this check list (1) for turbid water, also see item(2)(c) of this check list (1) )
(2) Accident Prevention Measures	<b>【Hydropower】</b>			
	(a) warning system to alert the inhabitants to water discharge from the dam	D	D	No warning system required because of small volume of water discharged. (Planned water discharge is 2-3 m <sup>3</sup> /sec. which is as same level as now. Pls, water discharge from spill way is 4.5 m <sup>3</sup> /s )
(3) Monitoring	<b>【Hydropower • Transmission line】</b>			
	(a) Planning & implementation of monitoring program	B <sup>-</sup>	B <sup>-</sup>	Through overall consideration. Monitoring on environment is not required. Only monitoring for resettlement (* income status of farmers who left from EDC's land) should be planned and conducted.
	(b) Items, methods and frequencies of the monitoring program?	B <sup>-</sup>	B <sup>-</sup>	(See Table 2.2.3.1.7-1, and 2.2.3.2.6 -1 of the preparatory study report)
	(c) Monitoring organization, personnel	B <sup>-</sup>	B <sup>-</sup>	Monitoring items during construction period will be reported to local stakeholders (District office and commune) monthly. Monitoring as follow-up for resettlement (income status of one family) will be reported annually to JICA.
	(d) Report of monitoring	B <sup>-</sup>	B <sup>-</sup>	Same as above.
others	<b>【Hydropower • Transmission line】</b>			
	(a) Impacts to global issues	D	B <sup>+</sup>	The electricity generated by the project will replace those imported from Vietnam. It can be assumed that emission of CO <sub>2</sub> is reduced for this portion.

# **Appendix-8**

**Monitoring form**

## MONITORING FORM

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered.

### 1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

Not applicable.

Monitoring Item	Monitoring Results during Report Period
-	-

### 2. Mitigation Measures

#### 2.1 Air Quality (Emission Gas / Ambient Air Quality)

Not applicable.

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
SO <sub>2</sub>	N/A	-	-	-	-	-
NO <sub>2</sub>	N/A	-	-	-	-	-
CO	N/A	-	-	-	-	-
O <sub>3</sub>	N/A	-	-	-	-	-
Soot and dust	N/A	-	-	-	-	-
SPM	N/A	-	-	-	-	-
Dust	N/A	-	-	-	-	-

#### 2.2 Water Quality (Effluent/Wastewater/Ambient Water Quality)

Not applicable. *Handwritten signature*



Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
pH	-	-	-	-	-	-
SS (Suspended Solid)	-	-	-	-	-	-
BOD/COD	-	-	-	-	-	-
DO	-	-	-	-	-	-
Total Nitrogen NO <sub>3</sub>	-	-	-	-	-	-
Total Phosphorus <sub>3</sub> PO <sub>4</sub>	-	-	-	-	-	-
Heavy Metals	-	-	-	-	-	-
Hydrocarbons / Mineral Oils	-	-	-	-	-	-
Phenols	-	-	-	-	-	-
Cyanide	-	-	-	-	-	-
Temperature	-	-	-	-	-	-

### 2.3 Waste-

Not applicable

### 2.4 Noise / Vibration

Not applicable

### 2.5 Social Consideration

Category	Monitoring Items	Method, Frequency & Remarks
Water discharged to downstream area in O'Chum No1 dam during construction period (water utilization for villagers)	+ Volume of discharged + turbidity	+ discharged water from pipes installed at temporary dike. + Daily in dry season during construction period + by visual check + At least by 100 liters/sec when river water exists.

Monitoring should be conducted by a constructor

### 3. Livelihood Restoration Program

Conduct monitoring and report by EDC

Category	Items / Information for monitoring & reporting	Timing of monitoring/ reporting
Employment of the family head	+ Employment Contract (Copy of the document)	When employed ( January 2013)
Cash income of the family	+Total amount of cash income by the family + Amount paid by EDC as salary	+ Monitoring quarterly (first monitoring will be conducted April 2013) + Reporting Annually

## **Appendix-9**

**Letter of indemnity delivery**

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အမတ်ကြီး ဦးစော

အမတ်ကြီး ဦးစော



၂၀၁၂ ခုနှစ်၊ ဇူလိုင်လ ၁၅ ရက်

ព្រះ រាជាណាចក្រកម្ពុជា  
ជាតិ សាសនា ព្រះមហាក្សត្រ

បញ្ជីគ្រួសារ

ថ្ងៃទី 20 ខែ កញ្ញា ឆ្នាំ ២០១២

ល.រ	នាមក្រុមល មាមខ្ពស់	ភេទ	មុខងារ	ហត្ថលេខា
១	កាត - កុន	♂	កសិករ	[Signature]
២	ស៊ីន ក គុណ	✓	កសិករ	[Signature]
៣	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
៤	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
៥	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
៦	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
៧	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
៨	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
៩	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១០	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១១	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១២	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១៣	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១៤	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១៥	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១៦	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១៧	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១៨	ស៊ុន ក គុណ	♂	កសិករ	[Signature]
១៩	ស៊ុន ក គុណ	♂	កសិករ	[Signature]

**ព្រះ រា ជា ណា ច ក្រ ក ម្ព ជា**  
**ជាតិ សាសនា ព្រះមហាក្សត្រ**

**កំណត់ហេតុ**

**ស្តីពីការប្រគល់ប្រាក់ដោះស្រាយផលប៉ះពាល់លើការរុះរើខ្ទមនិងដំណាំ ចេញពីដីរដ្ឋ**  
**ត្រូវសាងសង់វារីអគ្គិសនីចុងតូច នៅស្រុកអូរជុំ**

ឆ្នាំពីរពាន់ដប់ពីរ ខែកញ្ញា ថ្ងៃទីម្ភៃ វេលាម៉ោងប្រាំបី និង ហាសិបនាទីព្រឹក នៅ សាលារៀនអូរជុំ មានបើកកិច្ចប្រជុំមួយក្រោមអធិបតីភាពរបស់ លោក សាវ៉ា សុខ អភិបាលស្រុកអូរជុំ ។

**សមាសភាពចូលរួម :**

- ជូនភ្ជាប់បញ្ជីវត្តមានមកជាមួយចំនួន០១ច្បាប់ ។
- ប្តង់បង្ហាញពីទីតាំងត្រូវដោះស្រាយចំនួន០១ច្បាប់ របស់ JICA ។

ជាកិច្ចចាប់ផ្តើមលោកអភិបាលស្រុកអូរជុំបានមានមតិស្វាគមន៍ចំពោះអង្គប្រជុំ និង លើកឡើងថា យើង បានមកជួបជុំគ្នាថ្ងៃនេះ ដែលមានមន្ត្រីអង្គការអគ្គិសនីវត្តមាន មេភូមិ មេឃុំ និងប្រជាពលរដ្ឋចំនួនពីរគ្រួសារ ត្រូវដោះស្រាយផលប៉ះពាល់លើការសាងសង់វារីអគ្គិសនីចុងតូចចំនួនមួយកន្លែងនៅស្រុកអូរជុំ ដូចនេះសុំអោយប្រជាពលរដ្ឋចំនួនពីរ គ្រួសារដែលមាន លោក ជ្រី-កំភុន និងតំណាងគ្រួសារ លោកយាយ ព្រីង-តិល (លោកស្រី ឡាំ-បិណម កូនបង្កើត និងប្តីឈ្មោះ លោក ជ្រវៀង-ប៉ាំង ជាកូនប្រសារ) មានយោបល់ស្នើសុំទៅខាងអគ្គិសនីវត្តមាន ដើម្បីដោះស្រាយ ផលប៉ះពាល់ ក្នុងការរុះរើខ្ទមនិងដំណាំចេញពីដីត្រូវសង់វារីចុងតូច ។

១-គ្រួសារលោក ជ្រី-កំភុន ស្នើសុំអោយអគ្គិសនីវត្តមាន ជួយដោះស្រាយថវិការចំនួន \$750 (ប្រាំពីររយ ហាសិបដុល្លាកត់) ដើម្បីរុះរើខ្ទមនិងដំណាំដែលបានដាំរយៈពេលប៉ុន្មានឆ្នាំកន្លងមកចេញពីដីសង់វារីចុងតូច ដោយស្ម័គ្រចិត្ត និងគ្មានការបង្ខិតបង្ខំទេ ។

២-លោក ជ្រវៀង-ប៉ាំង កូនប្រសារលោកយាយ ព្រីង-តិល ស្នើសុំអោយអគ្គិសនីវត្តមានជួយដោះស្រាយ ថវិការចំនួន \$250 (ពីររយហាសិបដុល្លាកត់) លើការខូចខាតដំណាំនិងរុះរើចេញពីដីនេះដោយស្ម័គ្រចិត្ត និងគ្មានការបង្ខិត បង្ខំដែរ ។

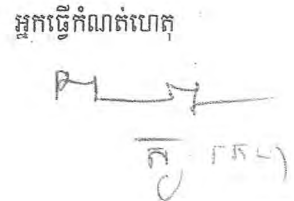
-ពេលនោះលោកប្រធានអគ្គិសនីវត្តមាន បានឯកភាពប្រគល់ប្រាក់ដោះស្រាយ តាមចំណុច០១និង០២ ខាងលើក្នុងពេលប្រជុំនោះតែម្តង ។

-លោក ផាន់ កុសល់ ប្រធានអគ្គិសនីវត្តមាន មានប្រសាសន៍ថា ក្រោយពីការប្រគល់ប្រាក់សំណង លើការប៉ះពាល់រួចរាល់ ត្រូវរុះរើខ្ទមនិងដំណាំដែលនៅលើដីត្រូវសាងសង់វារីចុងតូចនៅក្នុងថ្ងៃដែលនេះ ដោយមានមេភូមិ មេឃុំ អភិបាលស្រុក និងមន្ត្រីសុរិយោដីខេត្តចូលរួម ។

សរុបលោកអភិបាលស្រុក បានថ្លែងអំណរគុណទាំងអង្គការអគ្គិសនីរតនគិរី និង ប្រជាជនទាំងពីរគ្រួសារ  
ដែលបានដោះស្រាយលើផលប៉ះពាល់នៃក្នុងនីយយោគយល់ និងការយល់ដឹងអំពីកិច្ចការក្នុងសង្គមជាតិ ដោយទទួលខុស  
ត្រូវខ្ពស់ ។

អង្គប្រជុំក៏បានបញ្ចប់នៅវេលាម៉ោងដប់មួយថ្ងៃត្រង់ នាថ្ងៃខែឆ្នាំដែលប្រកបដោយស្មារតីទទួលខុសត្រូវ  
ខ្ពស់ ។

**ប្រធានអង្គប្រជុំ**  
  
លោក គុណ

**អ្នកធ្វើកំណត់ហេតុ**  
  
កុំ គុណ

**Kingdom of Cambodia  
Nation Religion King**

**Letter of Indemnity Delivery  
September 20, 2012**

EDC-Rattanakiri paid the money amount of \$USD 1,000 to the two families for replacement of the land parcel in the small-hydro's project site as following:

- 1- Mr. Chry Kamphun : the amount of \$USD 750 (Seven hundred fifty five US Dollars)
- 2- Mr. Chroveang Pang : the amount of \$USD 250 (Two hundred fifty US Dollars); (Mr. Chroveang Pang is a son in-law and his wife Mrs. Lam Binorm is a daughter of Mrs. Pring Til)

**Paid by:**

**Recipient**

- 1- Mr. Chry Kamphun
- 2- Mr. Chroveang Pang

**In presence of:**

- 1-Mrs Noun Veth (Chief of village)
- 2.Mrs Khanh Sory (Chief of Commune)
- 3.Mr. Chaven Saroeurn (Administrative Police post)

Recorded and approved by  
Head of O'Chum District.

Sak Son



**Kingdom of Cambodia  
Nation Religion King**

**Attendance List**  
**September 20, 2012**

No	Name	Sex	Position	Signature
1	Sak Son	M	Head of O'Chum District	
2	Phann Kosal	M	Chief of EDC Rattanakiri	
3	Ouk Sambath	M	Deputy Chief of Department of Land Management Urbanization and Construction	
4	Brach Vuttha	M	Deputy Chief of EDC Rattanakiri in charge of Technical	
5	Kim Kakkada	M	Deputy Chief of EDC Rattanakiri in charge of Business	
6	Prak Sambath	M	Deputy Chief of EDC Rattanakiri in charge of Administrative	
7	Morn Phanith	M	Chief of Distribution Division of EDC Rattanakiri	
8	So Sysambath	M	Chief of Business division of EDC Rattanakiri	
9	Sourng Sokyeth	F	Chief of Accounting Division of EDC Rattanakiri	
10	Sou Rathana	M	Chief of Administrative Division of EDC Rattanakiri	
11	Khanh Sovy	F	Chief of O'chum commune	
12	Chaven Sareun	M	Chief of Administrative Police Post of O'Chum Commune	
13	Noun Veth	F	Chief of O'Chum village	
14	Sandang Meourn	M	Member of O'Chum Commune	
15	Sim Plan	M	Member of O'Chum Commune Board	
16	Chry Kamphun	M	O'Chum's People	
17	Lam Pinorn	F	O'Chum's People	
18	Tra Samreb	F	O'Chum's People	
19	Chraveang Pang	M	O'Chum's People	

## **Appendix-10**

**Minutes of stakeholder meeting and attendance list**



មានការដឹកជញ្ជូនសំណង់បណ្តឹងទៅលើគ្រឹះស្ថាន O'Chum 2 ៧៩៩ មី

b. ហេតុអ្វីបានជាគ្រឹះស្ថានសុទ្ធតែត្រូវដំឡើងបែបនេះ?

c. បញ្ចប់តំបន់ប្រកាសប្រាសាទនេះ តើវាមានការបង្កបង្កាបប្រជាជនដូចម្តេចដែរ?

2. ការកែសម្រួលផ្លូវថ្នល់ មេត្តាជួយស្ត្រី

a. សូមជួយគ្រឹះស្ថានសុទ្ធតែត្រូវស្ត្រី ក្រសែ សុទ្ធតែត្រូវស្ត្រី ក្រសែ សុទ្ធតែត្រូវស្ត្រី CARE ជាមួយដំណើរការដំឡើង  
ប្រមាណប្រប្រដាប់សំបាប់ដំឡើង ៩ គ្រឿងសាខា បញ្ចប់តំបន់ប្រកាសប្រាសាទនេះ បញ្ចប់ការងារ

3. រថ ប្លង់ គេច្របូសប្រដាប់ប្រដាប់សុទ្ធតែត្រូវស្ត្រី : ដំឡើងសំបាប់សំបាប់គ្រឹះស្ថានសុទ្ធតែត្រូវស្ត្រី

4. ការកែសម្រួលផ្លូវថ្នល់ មេត្តាជួយស្ត្រី : ការកែសម្រួលផ្លូវថ្នល់ មេត្តាជួយស្ត្រី ១០០ ម៉ែត្រ  
មេត្តាជួយស្ត្រី ១០០ ម៉ែត្រ តំបន់ប្រកាសប្រាសាទនេះ ដំឡើងប្រដាប់សុទ្ធតែត្រូវស្ត្រី

5. ការកែសម្រួលផ្លូវថ្នល់ មេត្តាជួយស្ត្រី

a. សូមជួយគ្រឹះស្ថានសុទ្ធតែត្រូវស្ត្រី មេត្តាជួយស្ត្រី មេត្តាជួយស្ត្រី មេត្តាជួយស្ត្រី  
សុទ្ធតែត្រូវស្ត្រី EIA


b. សូមជួយគ្រឹះស្ថានសុទ្ធតែត្រូវស្ត្រី មេត្តាជួយស្ត្រី មេត្តាជួយស្ត្រី

តំបន់ប្រកាសប្រាសាទនេះ មានប្រជាជនរស់នៅជាច្រើន មេត្តាជួយស្ត្រី  
ដំឡើងប្រដាប់សុទ្ធតែត្រូវស្ត្រី មេត្តាជួយស្ត្រី មេត្តាជួយស្ត្រី

ដំឡើងប្រដាប់សុទ្ធតែត្រូវស្ត្រី មេត្តាជួយស្ត្រី មេត្តាជួយស្ត្រី

ប្រដាប់សុទ្ធតែត្រូវស្ត្រី មេត្តាជួយស្ត្រី មេត្តាជួយស្ត្រី

សុទ្ធតែត្រូវស្ត្រី មេត្តាជួយស្ត្រី មេត្តាជួយស្ត្រី ៣១ ខែ ១៤ ខែ ២០១២


តំណាងគ្រឹះស្ថានសុទ្ធតែត្រូវស្ត្រី : 

សុទ្ធតែត្រូវស្ត្រី មេត្តាជួយស្ត្រី

- Saylong -

តំណាងគ្រឹះស្ថានសុទ្ធតែត្រូវស្ត្រី : 

សិ ដានី

តំណាងគ្រឹះស្ថានសុទ្ធតែត្រូវស្ត្រី : 

**ព្រះរាជាណាចក្រកម្ពុជា**  
**ជាតិ សាសនា ព្រះមហាក្សត្រ**

រតនៈគីរី, ថ្ងៃទី 14 ខែ ធ្នូ ឆ្នាំ 2012

**បញ្ជីវត្តមានសមាជិកចូលរួមប្រជុំ**

ស្តីពី Stakeholder Meeting សម្រាប់អគ្គិសនីកម្ពុជា-JICA លើគម្រោងអភិវឌ្ឍន៍វារីអគ្គិសនីខ្នាតតូចនៅខេត្តរតនៈគីរី

ល.រ	នាម និង គោត្តនាម	ភេទ	តួនាទី/អង្គភាព	ហត្ថលេខា
1	លោក សាក់ សុន <i>(សាក់ សុន)</i>	ប្រុស	អភិបាលស្រុកអូរជុំ / ប្រ	<i>[Signature]</i>
2	លោកស្រី ខាញ់ សុវិ	ស្រី	មេឃុំអូរជុំ	<i>[Signature]</i>
3	លោកស្រី នួន រតន	ស្រី	មេភូមិអូរជុំ	<i>[Signature]</i>
4	លោក ព្រឹម ព្រៃន	ប្រុស	មេភូមិ ថាវ៉ងជង	<i>[Signature]</i>
5	លោក កានិន យ៉ុម	ប្រុស	មេភូមិថាវ៉ងស្វាយ	<i>[Signature]</i>
6	លោក ជូ សុភក្រ <i>(ជូ សុភក្រ)</i>	ប្រុស	ប្រធានមន្ទីរ បរិស្ថាន (ឧបករណ៍. បរិស្ថាន)	<i>[Signature]</i>
7	លោក សយ សុណា <i>(សយ សុណា)</i>	ប្រុស	ប្រធានមន្ទីរ កសិកម្ម (អនុវត្តន៍)	<i>[Signature]</i>
8	លោក ហែម វណ្ណឌី <i>(ហែម វណ្ណឌី)</i>	ប្រុស	ប្រធានមន្ទីរឧស្សាហកម្មរ៉ែ និងថាមពល <i>ឧស្សាហកម្មរ៉ែ និងថាមពល</i>	<i>[Signature]</i>
9	លោក ផល ច័ន្ទសត្យា	ប្រុស	ប្រធានអង្គការ ETEA Foundation	<i>[Signature]</i>
10	លោក ភិ សូម	ប្រុស	សហគមន៍ ភូមិអូរជុំ	<i>[Signature]</i>
11	លោក ស្រីង កាសែម	ប្រុស	សហគមន៍ ភូមិថាវ៉ងជង	<i>[Signature]</i>
12	លោក ងើច ផាត់	ប្រុស	សហគមន៍ ភូមិថាវ៉ងស្វាយ	<i>[Signature]</i>
13	លោក កាំភិន បាត់	ប្រុស	ប្រជាពលរដ្ឋ	
14	លោក ប្រិញ ណុច	ប្រុស	ប្រជាពលរដ្ឋ	<i>[Signature]</i>
15	លោក វិន ប្លង	ប្រុស	ប្រជាពលរដ្ឋ	<i>[Signature]</i>
16	លោកស្រី អ៊ុត ស្សាយ	ស្រី	ប្រជាពលរដ្ឋ	<i>[Signature]</i>
17	លោក ជួង យិន	ប្រុស	ប្រជាពលរដ្ឋ	<i>[Signature]</i>
18	លោក វង់ ដូង	ប្រុស	ប្រជាពលរដ្ឋ	<i>[Signature]</i>
19	លោក ព្រី ប៊ុនធឿន	ប្រុស	ប្រជាពលរដ្ឋ	<i>[Signature]</i>
20	លោក ញ៉ូ តែវ	ប្រុស	ប្រជាពលរដ្ឋ	<i>[Signature]</i>

១១. លោក *[Signature]* ប្រុស  
 ១២. លោក *[Signature]* ប្រុស

ប្រុស *[Signature]*  
 ប្រុស *[Signature]*

*[Signature]*

**ព្រះរាជាណាចក្រកម្ពុជា**  
**ជាតិ សាសនា ព្រះមហាក្សត្រ**

រតនៈគីរី, ថ្ងៃទី 14 ខែ ធ្នូ ឆ្នាំ 2012

**បញ្ជីវគ្គបណ្តុះបណ្តាលសមាជិកក្រុមការងារចូលរួមប្រជុំ**

ស្តីពី Stakeholder Meeting សម្រាប់អគ្គិសនីកម្ពុជា-JICA លើគម្រោងអភិវឌ្ឍន៍វារីអគ្គិសនីខ្នាតតូចនៅខេត្តរតនៈគីរី

ល.រ	នាម និង គោត្តនាម	ភេទ	តួនាទី/អង្គភាព	ហត្ថលេខា
<b>ក្រុមការងារ JICA</b>				
1	Mr. KATO KENJI	M	Chief Consultant/Planning of O&M/Development plan	
2	Mr. TSUCHIYA EIJI	M	Electrical/Mechanical/Protection/Control	
3	Mr. HIRAGA YUKITAKA	M	Electrical facility design	
4	Mr. SHINOHARA JUNYA	M	Power system Planning	
5	Mr. OGAWA HIROSHI	M	Environment & Social consideration	
<b>ក្រុមការងារអគ្គិសនីកម្ពុជា និងអគ្គិសនីរតនគីរី</b>				
6	ឯកឧត្តម អេង គន្ធា	ប្រុស	អគ្គនាយករងរដ្ឋបាលនៃអគ្គិសនីកម្ពុជា	
7	លោក ប្រាជ្ញ វុត្តា	ប្រុស	អនុប្រធានអគ្គិសនីរតនគីរី	
8	លោក ប៉ែន ផា	ប្រុស	ប្រធានការិយាល័យបច្ចេកទេសនៃនាយកដ្ឋានផលិតកម្ម	
9	លោក ហេង ពិសិដ្ឋ	ប្រុស	អនុប្រធានការិ.ផែនការផលិតកម្មនៃនាយកដ្ឋានផលិតកម្ម	
10	លោក អៀង ច័ន្ទធី	ប្រុស	ប្រធានផ្នែកផែនការផលិតកម្មនៃនាយកដ្ឋានផលិតកម្ម	
11	លោកស្រី សំ ផារី	ស្រី	ប្រធានលេខាធិការដ្ឋាននៃនាយកដ្ឋានផលិតកម្ម	
12	លោក ម៉ៅ វិសាល	ប្រុស	ប្រធានការិ.បរិស្ថាន សង្គម និងទំនាក់ទំនងសាធារណៈ	
13	លោក គឹម រតនា	ប្រុស	អនុប្រធានក្រុមការងារបច្ចេកទេស	
14	លោកស្រី ឈុន ធីតា	ស្រី	ប្រធានផ្នែកគណនេយ្យ	
15	លោកស្រី ឈុន ធីតា	ស្រី	ប្រធានផ្នែកគណនេយ្យ	
16	លោក គឹម រតនា	ប្រុស	ប្រធានផ្នែកគណនេយ្យ	
17	លោក គឹម រតនា	ប្រុស	ប្រធានផ្នែកគណនេយ្យ	
18	លោក គឹម រតនា	ប្រុស	ប្រធានផ្នែកគណនេយ្យ	
19				
20				

No1



Opinions/ questions raised by (Ms. Kanh Sovy, Chief of O'Chum Commune)
<p>1. What impact will be happen to community after construction of facilities? I've heard that transmission line is installed from O'Chum No1 to No2. How will it affect us?</p> <p>2. After O'Chum No1 new power plant is developed, Can electricity be supplied stability to community?</p> <p>3. After 265kW-new power plant is developed, doesn't EDC need to import electricity from Vietnam any more?</p>
Comments/Answer by ( H.E, Deputy Managing Director , EDC)
<p><i>Outline of the comments/answer</i></p> <p>1. After construction of facilities, EDC can extend distribution line to other villages as its abilities and yearly schedule plan.</p> <p>There is no plan of installation transmission line from O'Chum No.1 to O'Chum No.2. As JICA study team planned to connect transmission line from O'Chum No.1 to the existing transmission line on route 78A.</p> <p>2. After O'Chum No1 new power plant is developed, the electricity will be supplied more stability to community.</p> <p>3. After 265kW-new power plant is developed, EDC still need to import electricity from Vietnam. Because the capacity from Micro Hydropower plant is not meet the requirement of the demand in Banlung, Rattanakiri. So, the source from Vietname is the important source to improve the electricity supply in Rattanakiri areas.</p>
TODO (Action)
N/A

No2



Opinions/ questions raised by (Ms. Noun Ret, Chief of O'Chum village)
1. After construction of facilities, is it possible to connect line to one 2'ndary school in O'Chum village without any usage payment? Because, they are students.
Comments/Answer by ( H.E, Deputy Managing Director , EDC)
<i>Outline of the comments/answer</i> <i>All EDC's consumers required to pay electricity of their usage. i.e. the budget for electricity usage of secondary school must be planned and prepared by Ministry of Education.</i>
TODO (Action)
N/A



No3



Opinions/ questions raised by (Mr. Ven Plung, O'Chum villager)
1. Is it possible to make tariff price lower?
Comments/Answer by ( H.E, Deputy Managing Director , EDC)
<i>Outline of the comments/answer</i>
<i>1. The electricity tariff is already low compared to the private supplier.</i>
TODO (Action)
N/A

No4



Opinions/ questions raised by (Mr. Kamin Yom, Village Chief of Thrang Svay)
1. Is it possible to connect distribution line to each house by this project?
Comments/Answer by ( H.E, Deputy Managing Director , EDC)
<i>Outline of the comments/answer</i>
<i>1. This project didn't include distribution line connect to each house. In this case, it is depend on schedule extension plan of EDC.</i>
TODO (Action)
N/A

No5



Opinions/ questions raised by (Mr. Prin Sambo, Department of Environment)
1. Can you explain the detail of the impact on environment? 2. Extension of distribution line to Beung Kom San village?
Comments/Answer by (H.E, Deputy Managing Director, and Mr. Mao Visal, Chief of E&S PR, EDC)
<i>Outline of the comments/answer</i> <i>1. Regarding to the environment matter, the Ministry of Environment confirm that this project is lees environment impact and it is outside sub-decree which doesn't require EIA.</i> <i>2. The Extension of distribution line to Beung Kom San Village is in EDC's schedule extension plan year 2013.</i>
TODO (Action)
N/A

**Kingdom of Cambodia  
Nation Religion King**

**Attendance List  
14<sup>th</sup>, December, 2012**

No	Name	Sex	Position	Signature
1	Chheng Sopheap	M	Deputy head of O'Chum district	
2	Khanh Sovy	F	Major of O'Chum commune	
3	Noun Vet	F	Major of O'Chum village	
4	Prim Nhen	M	Major of Tarong Choung village	
5	Kanim Yum	M	Major of Tarong Svayvillage	
6	Prin Sambor	M	Chief of EIA office	
7	Nget Theara	M	Deputy of Agriculture department	
8	Hem Vannareth	M	Administrator of Industry, Mines and Energy department	
9	Phal Chan Sattya	M	Manager of ETEA Foundation Organization	
10	Phi Loum	M	Representative of O'Chum village	
11	Sreung Kasem	M	Representative of Tarong Choung village	
12	Ngerch Phath	M	Representative of Tarong Svay village	
13	Kamphin Batt	M	O'Chum's People	
14	Brenh Noch	M	O'Chum's People	
15	Vin Plorng	M	O'Chum's People	
16	Ourt Sabay	F	O'Chum's People	
17	Choung Yin	M	O'Chum's People	
18	Vong Dong	M	O'Chum's People	
19	Pri Bunturn	M	O'Chum's People	
20	New Teo	M	O'Chum's People	
21	Prorvang Bang	M	O'Chum's People	
22	Chry Kampon	M	O'Chum's People	

**Kingdom of Cambodia  
Nation Religion King**

**Attendance List  
14<sup>th</sup>, December, 2012**

No	Name	Sex	Position	Signature
<b>JICA Team</b>				
1	Mr. KATO KENJI	M	Chief Consultant/Planning of O&M/Development plan	
2	Mr. TSUCHIYA EIJI	M	Electrical/Mechanical/Protection/Control	
3	Mr. HIRAGA YUKITAKA	M	Electrical facility design	
4	Mr. SHINOHARA JUNYA	M	Power system Planning	
5	Mr. OGAWA HIROSHI	M	Environment & Social consideration	
<b>EDC Phnom Penh and Rattanak Kiri Team</b>				
6	HE. Eng Konthea	M	Deputy Director of Administrator of EDC	
7	Brach Vuttha	M	Deputy Chief of EDC Rattanakiri in charge of Technical	
8	Pen Pha	M	Chief of Technical office, GD, EDC	
9	Heng Piseth	M	Deputy Chief of Generation Planning office, GD, EDC	
10	Eang Chanthy	M	Chief of Generation Planning Division, GD, EDC	
11	Sam Phary	F	Chief of secretarial of GD, EDC	
12	Mao Visal	M	Chief of Environment, Social, and Public Relation, PD, EDC	
13	Kim Kakkada	M	Deputy Chief of EDC Rattanakiri	
14	Soung Sokyeth	F	Chief of Accounting of EDC Rattanakiri	
15	Meurng Phally	M	Chief of Production of EDC Rattanakiri	
16	Sou Rattna	M	Chief of Administrator of EDC Rattanakiri	
17	Mon Phanith	M	Chief of Transmission of EDC Rattanakiri	
18	Ouk Kimvy	M	Dispatch-Transmission staff of EDC Rattanakiri	