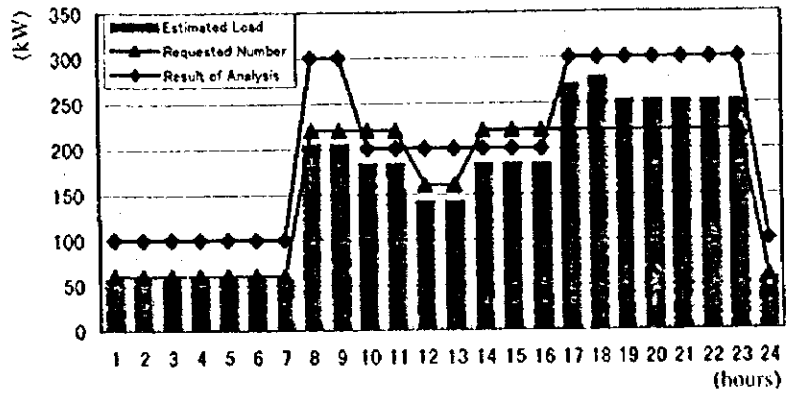


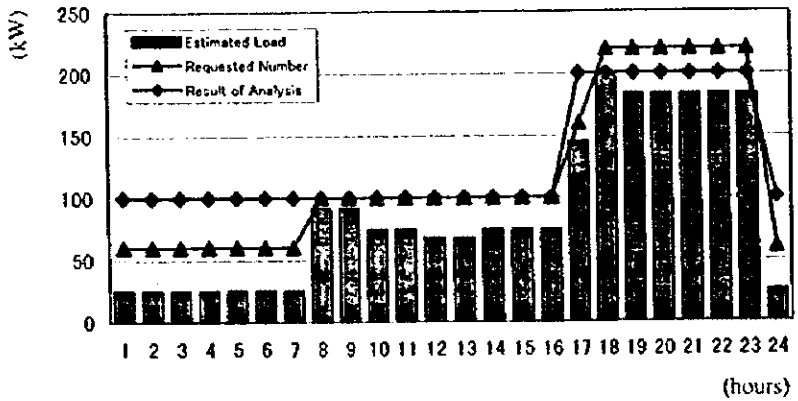
## **FIGURES**

Figure 2.1-1 Daily Load Pattern and Number of Operating Generators

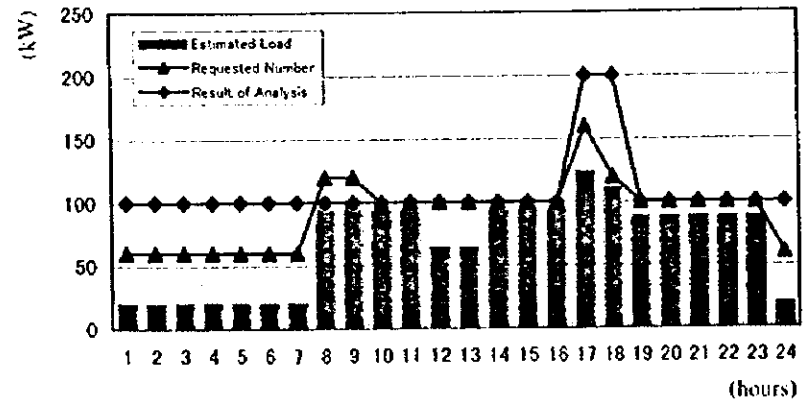
Aimag	Bulgan
Sum	Teshig
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Bajan-Ulgii
Sum	Deluun
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 2 60 x 0



Aimag	UBS
Sum	Zuungobi
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 2 60 x 0



Aimag	UBS
Sum	Zuunkhangai
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0

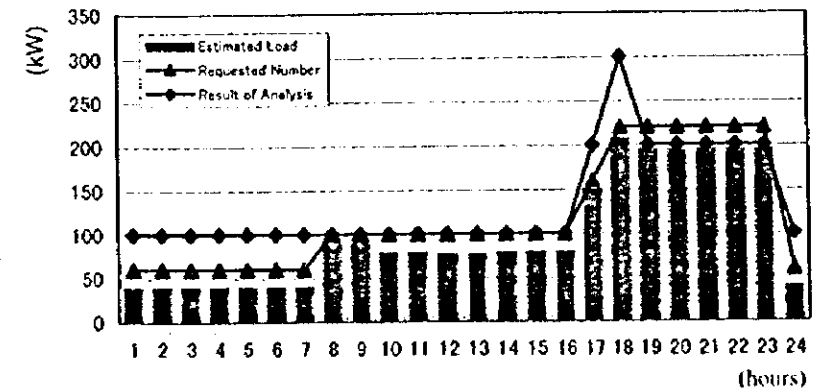
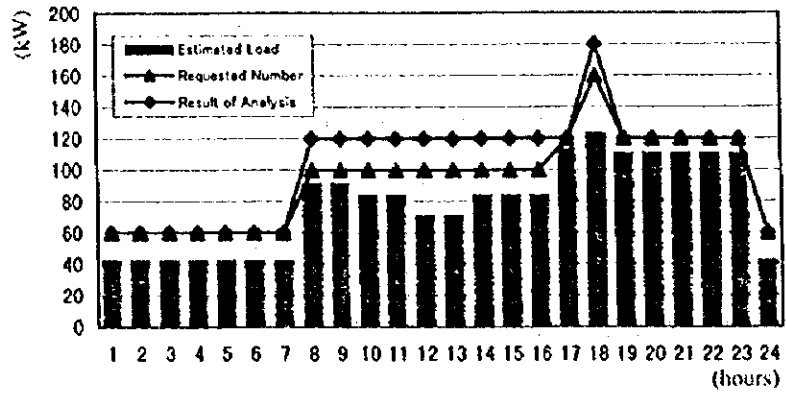
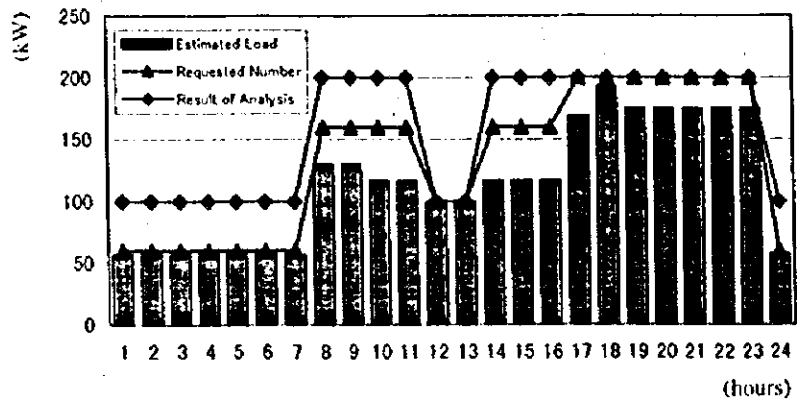


Figure 2.1-2 Daily Load Pattern and Number of Operating Generators

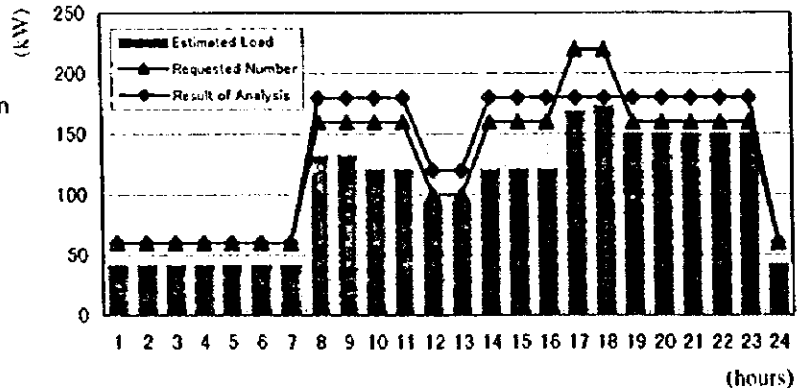
Aimag	UBS
Sum	Malchin
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	UBS
Sum	Tes
Requested Number	100 x 2 60 x 1
Result of Analysis	100 x 2 60 x 0



Aimag	UBS
Sum	Tsagaankhairkhan
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	UBS
Sum	Hyargas
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3

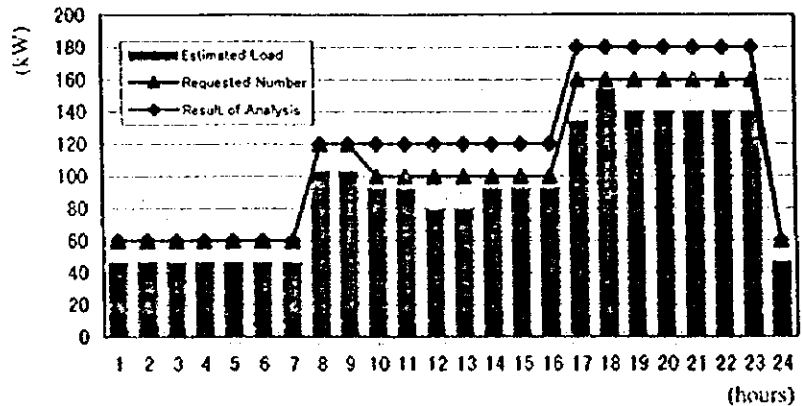
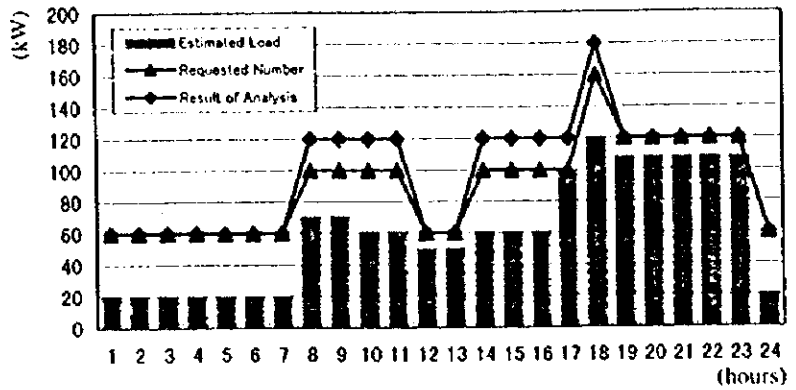
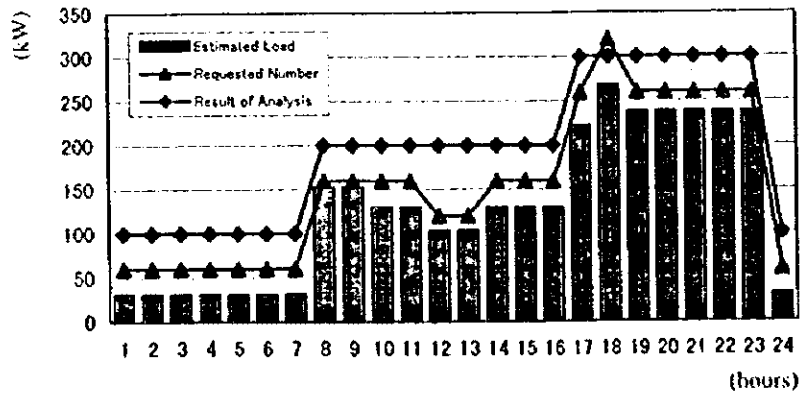


Figure 2.1-3 Daily Load Pattern and Number of Operating Generators

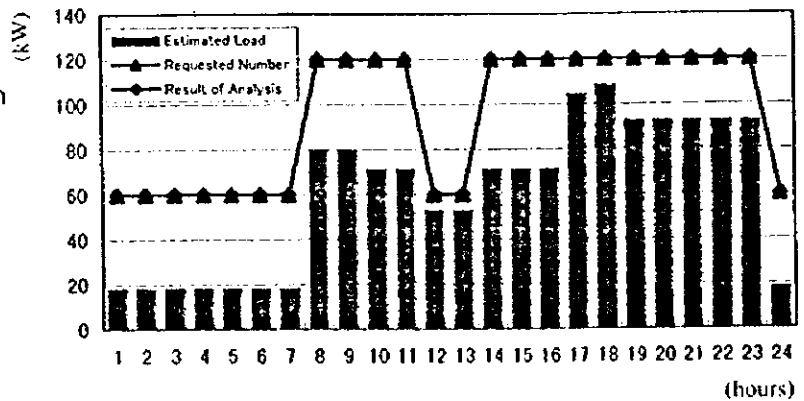
Aimag	Khovd
Sum	Tsetseg
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	Khovd
Sum	Bulgan
Requested Number	100 x 2 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Khovd
Sum	Munkhkhairkhan
Requested Number	100 x 0 60 x 2
Result of Analysis	100 x 0 60 x 2



Aimag	Bayankhongor
Sum	Buutsagaan
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 2 60 x 0

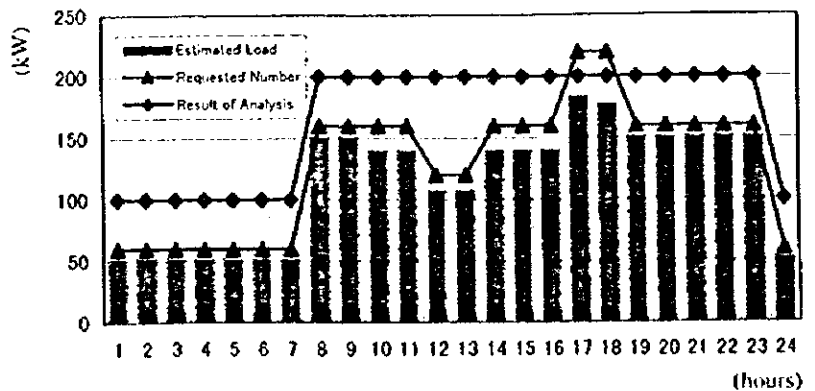
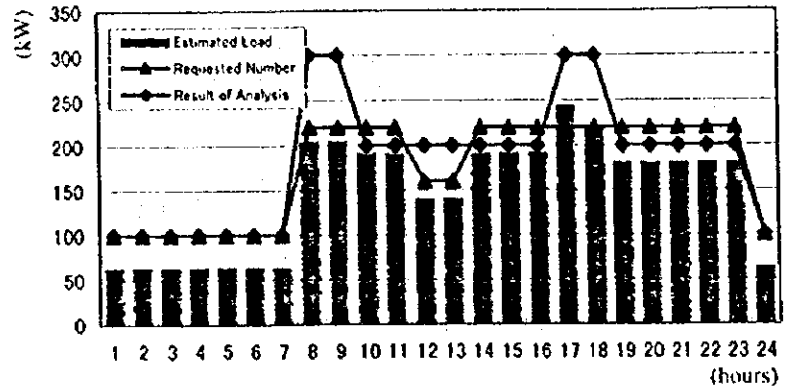
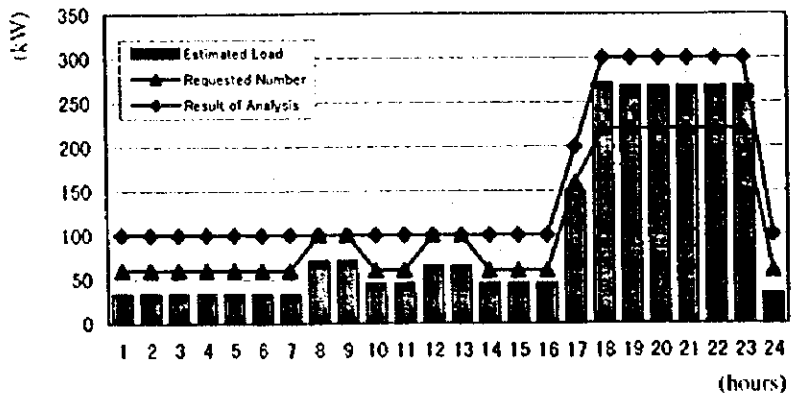


Figure 2.1-4 Daily Load Pattern and Number of Operating Generators

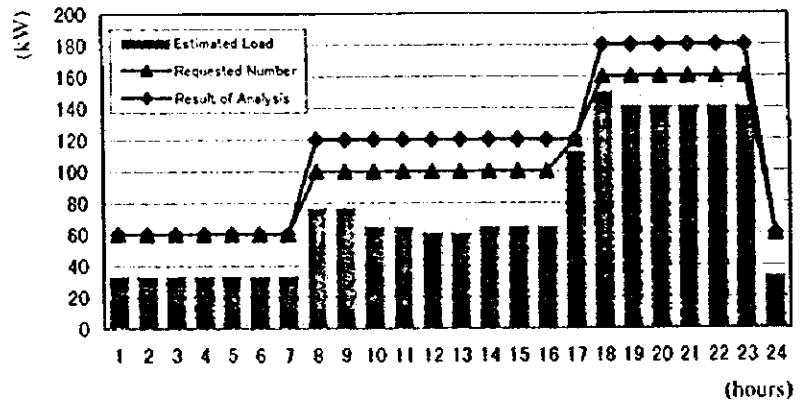
Aimag	Bayankhongor
Sum	Bayan-Undur
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Bayankhongor
Sum	Bayantsagaan
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Govi-Altai
Sum	Altai
Requested Number	100 x 1 60 x 3
Result of Analysis	100 x 0 60 x 3



Aimag	Govi-Altai
Sum	Biger
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 2

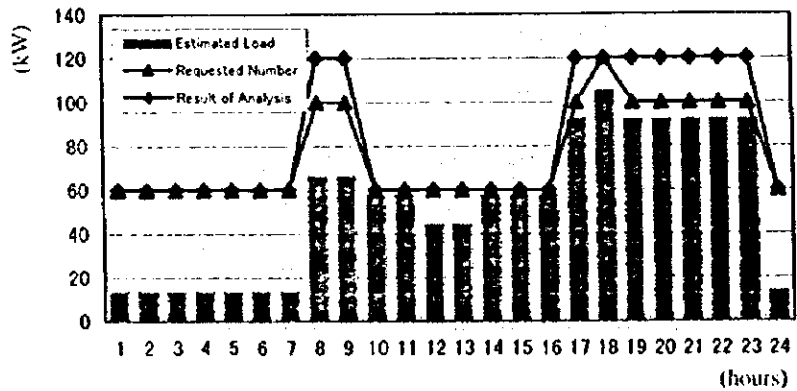
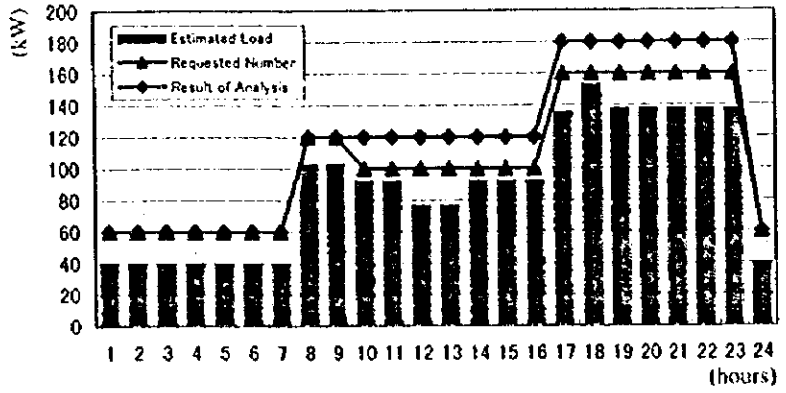
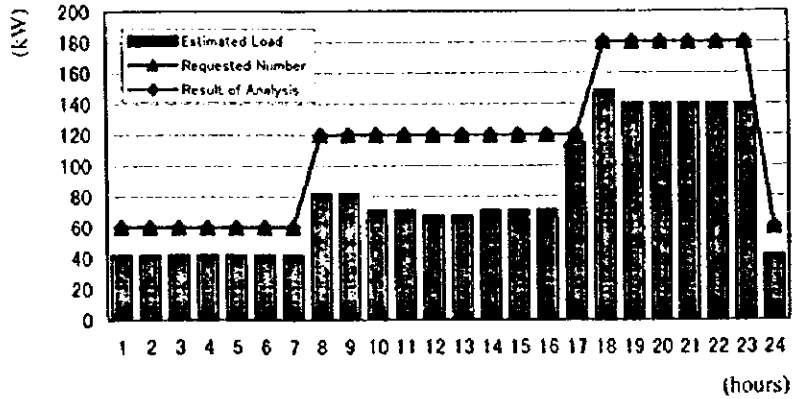


Figure 2.1-5 Daily Load Pattern and Number of Operating Generators

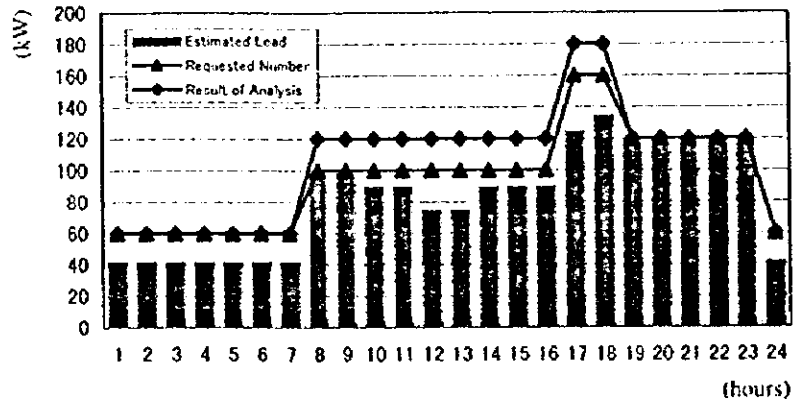
Aimag	Govi-Altai
Sum	Tonkhil
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	Govi-Altai
Sum	Khukhmorit
Requested Number	100 x 0 60 x 3
Result of Analysis	100 x 0 60 x 3



Aimag	Govi-Altai
Sum	Dariv
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	Govi-Altai
Sum	Chandmani
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0

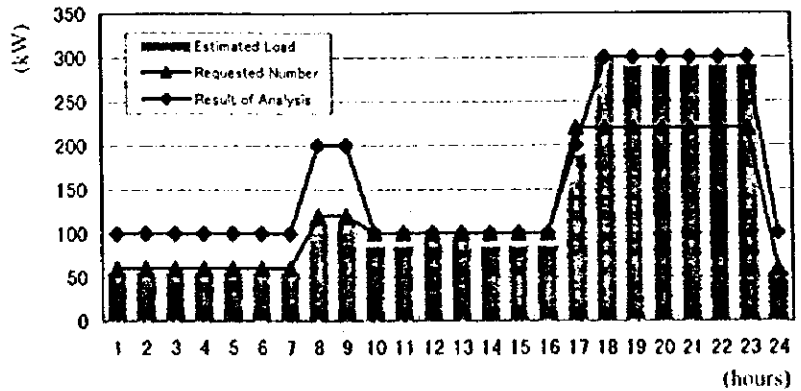
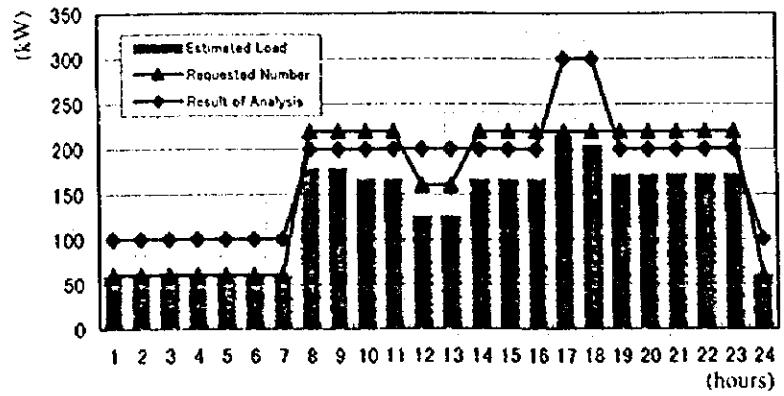
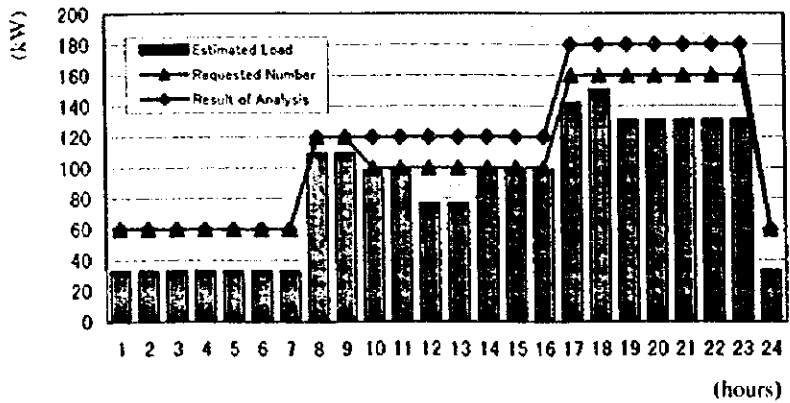


Figure 2.1-6 Daily Load Pattern and Number of Operating Generators

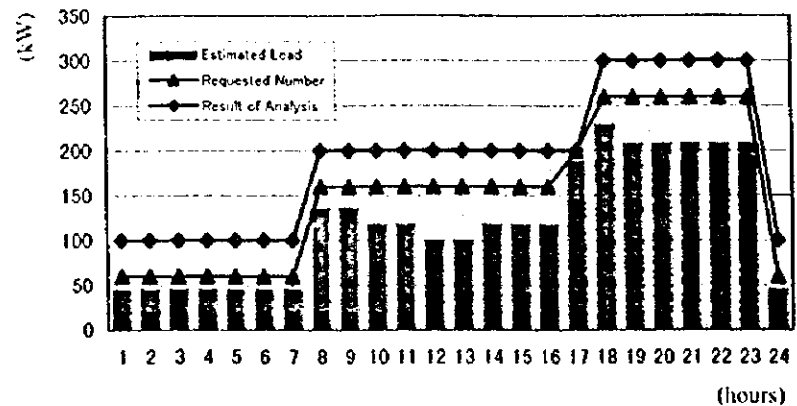
Aimag	Govi-Altai
Sum	Tsogt
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Govi-Altai
Sum	Tseel
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	Govi-Altai
Sum	Erdene
Requested Number	100 x 2 60 x 1
Result of Analysis	100 x 3 60 x 0



Aimag	Dornogobi
Sum	Khuvsgul
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3

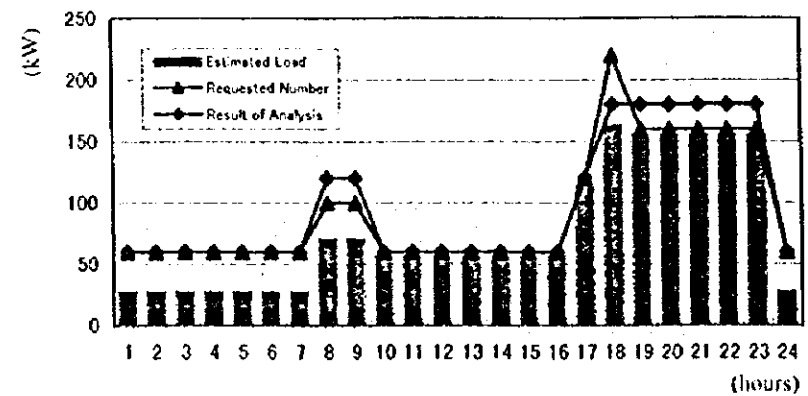
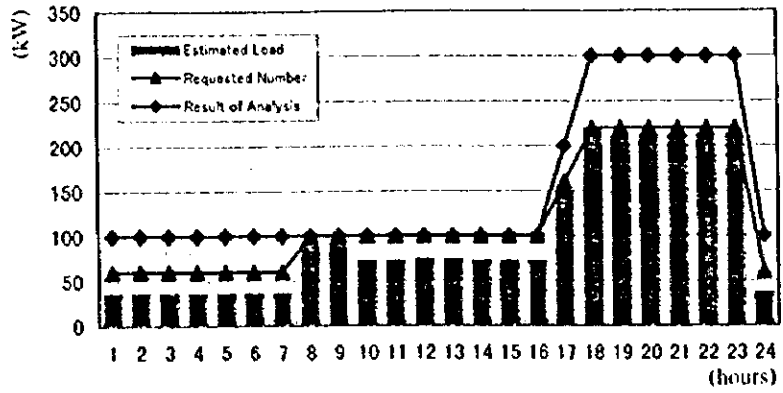
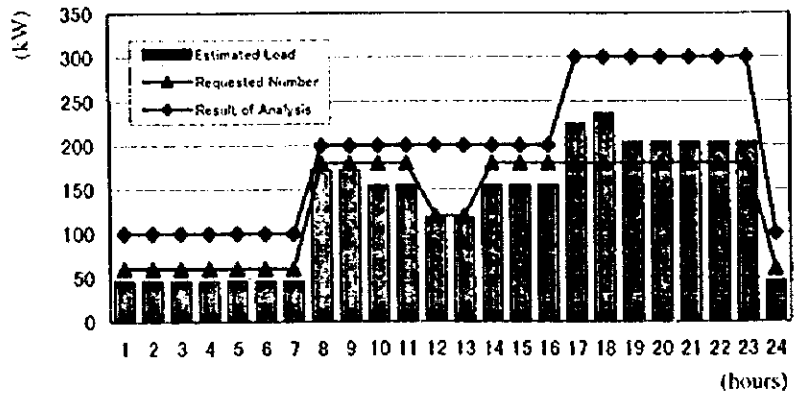


Figure 2.1-7 Daily Load Pattern and Number of Operating Generators

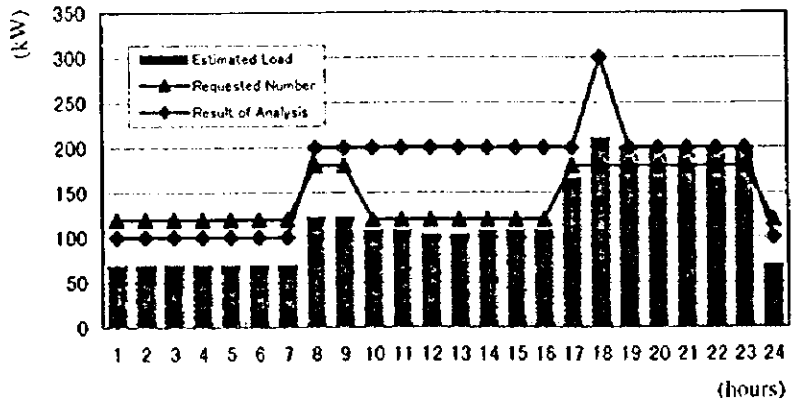
Aimag	Dornogobi
Sum	Khatanbulag
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Zavkhan
Sum	Tsetsen-Uul
Requested Number	100 x 0 60 x 3
Result of Analysis	100 x 3 60 x 0



Aimag	Zavkhan
Sum	Erdenekhairkhan
Requested Number	100 x 0 60 x 3
Result of Analysis	100 x 3 60 x 0



Aimag	Zavkhan
Sum	Songino
Requested Number	100 x 0 60 x 3
Result of Analysis	100 x 3 60 x 0

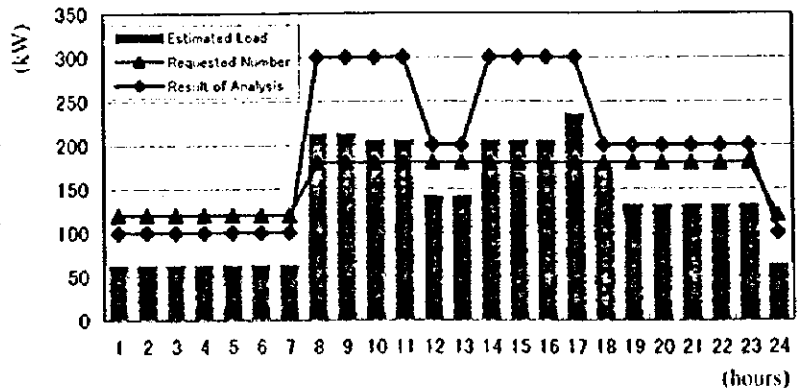
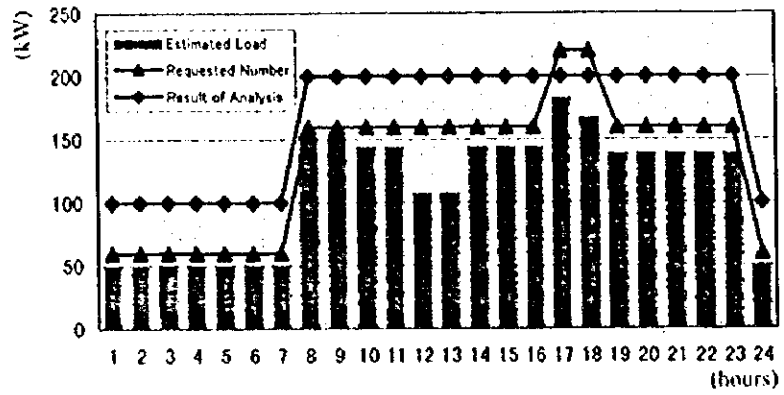


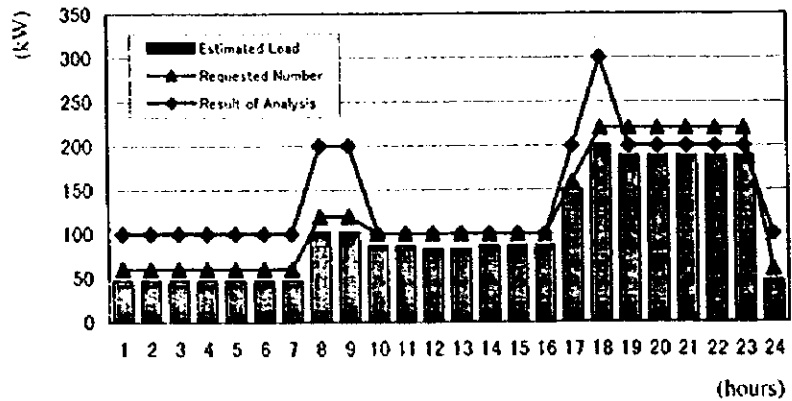


Figure 2.1-8 Daily Load Pattern and Number of Operating Generators

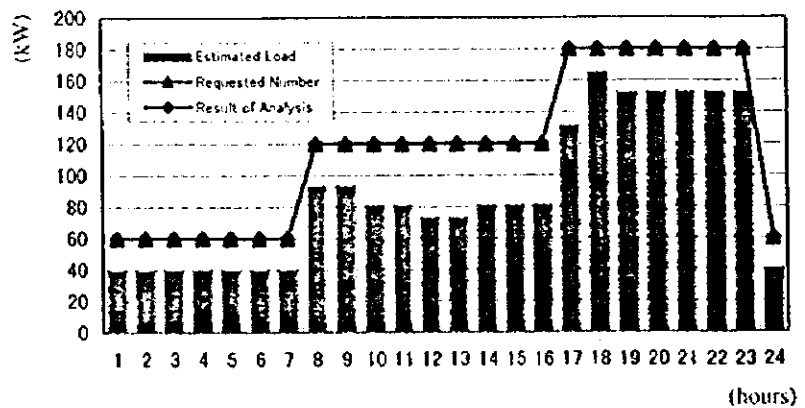
Aimag	Zavkhan
Sum	Numrug
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 2 60 x 0



Aimag	Zavkhan
Sum	Zavkhanmandal
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Zavkhan
Sum	Santmargats
Requested Number	100 x 0 60 x 3
Result of Analysis	100 x 0 60 x 3



Aimag	Zavkhan
Sum	Urgamal
Requested Number	100 x 0 60 x 3
Result of Analysis	100 x 2 60 x 0

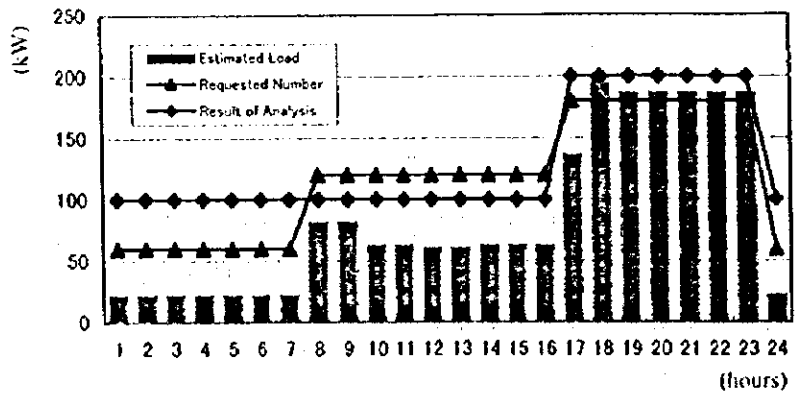
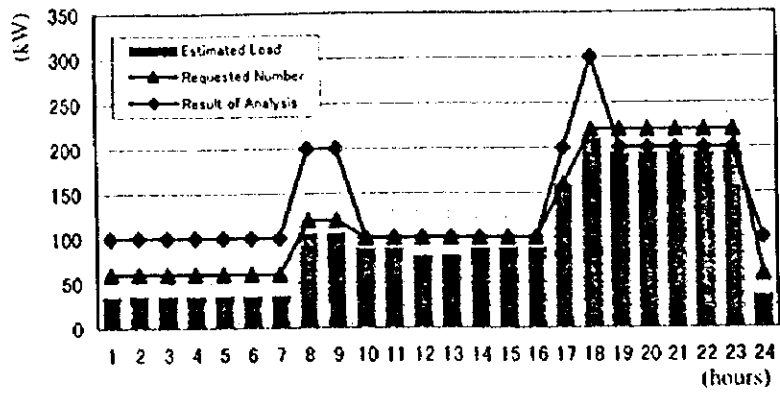
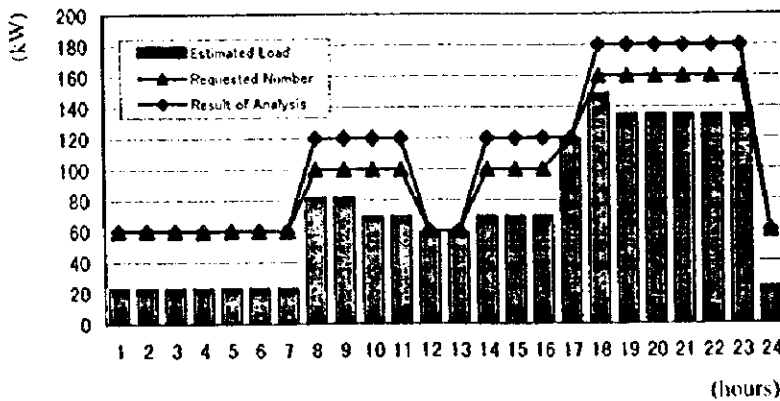


Figure 2.1-9 Daily Load Pattern and Number of Operating Generators

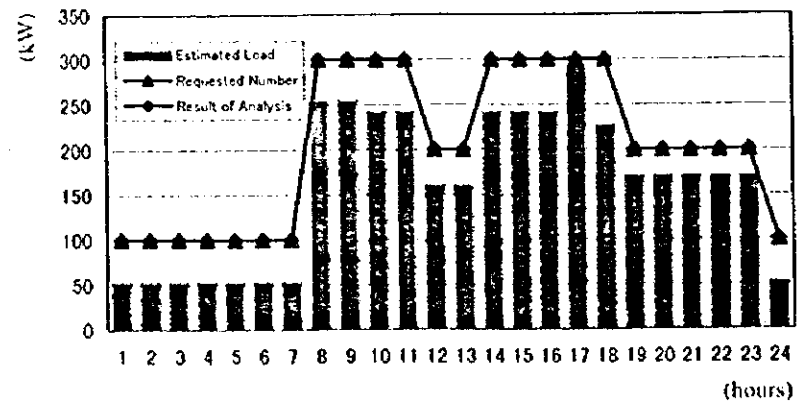
Aimag	Zavkhan
Sum	Durvuljin
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Zavkhan
Sum	Ider
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	Zavkhan
Sum	Tes
Requested Number	100 x 3 60 x 0
Result of Analysis	100 x 3 60 x 0



Aimag	Zavkhan
Sum	Asgat
Requested Number	100 x 2 60 x 2
Result of Analysis	100 x 0 60 x 3

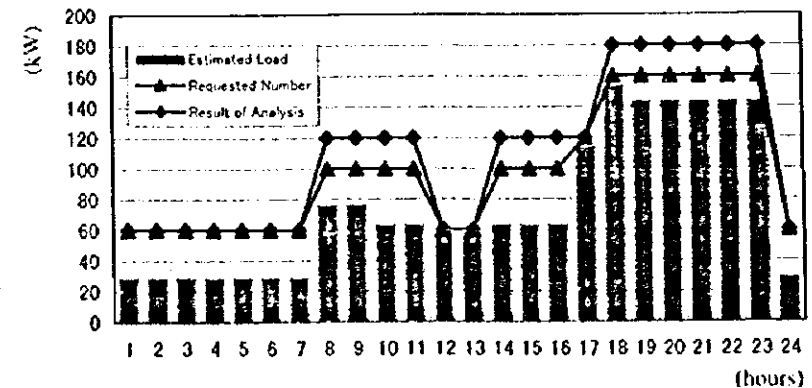
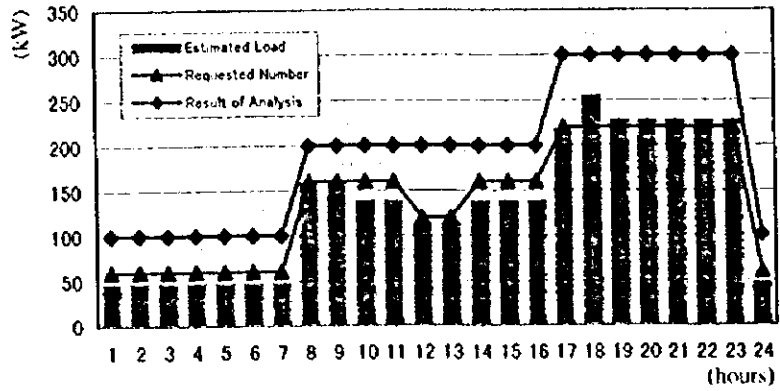
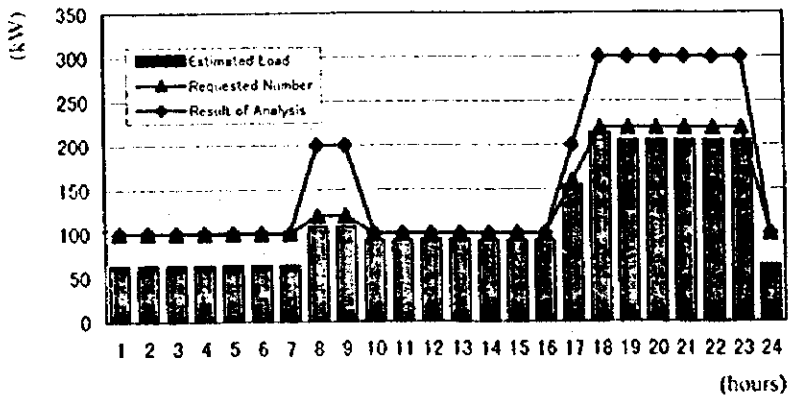


Figure 2.1-10 Daily Load Pattern and Number of Operating Generators

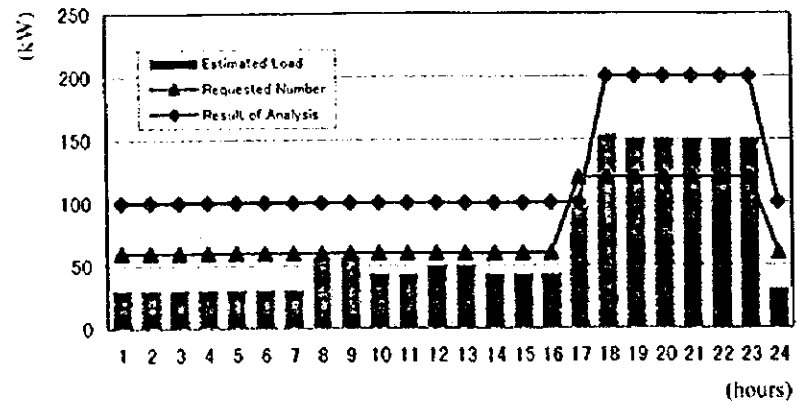
Aimag	Uvurkhangai
Sum	Bogd
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Sukhbaatar
Sum	Erdenetsagaan
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0



Aimag	Sukhbaatar
Sum	Naran
Requested Number	100 x 0 60 x 2
Result of Analysis	100 x 2 60 x 0



Aimag	Dornodo
Sum	Tsagaan-Ovoo
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 3 60 x 0

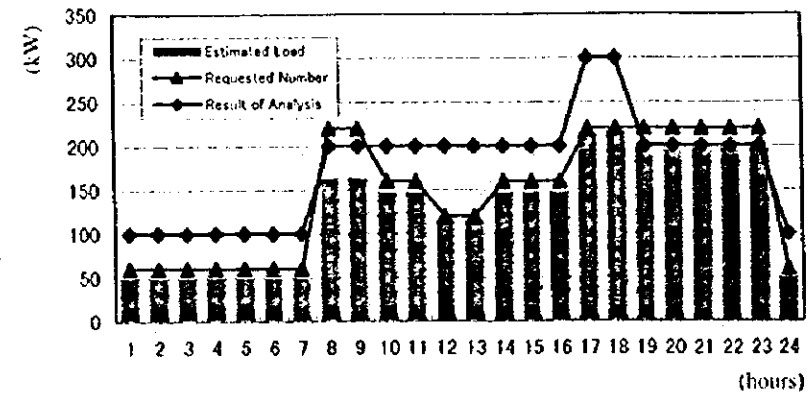
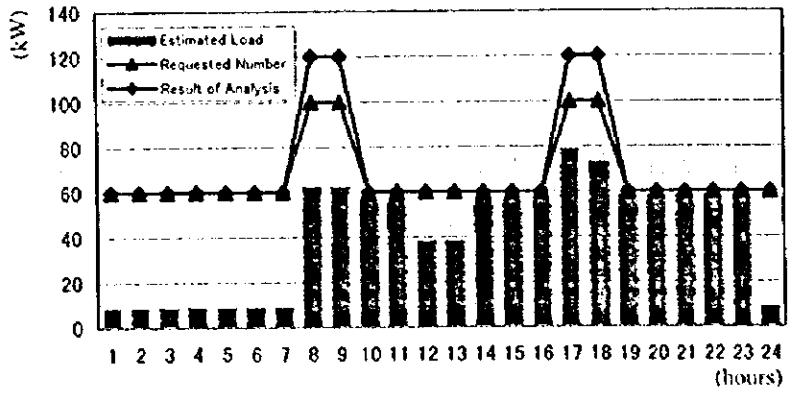
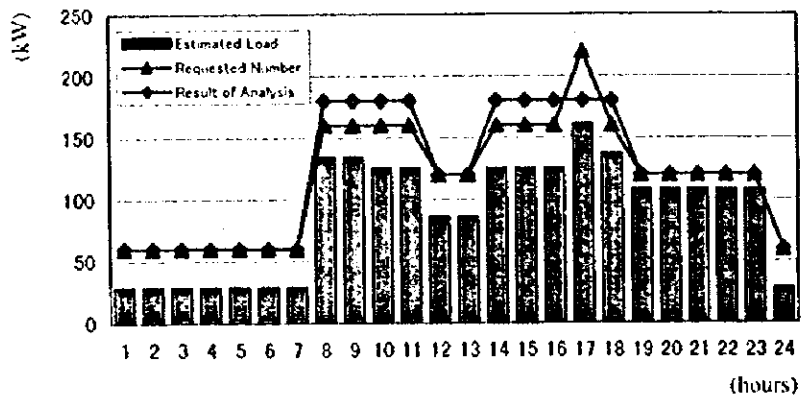


Figure 2.1-11 Daily Load Pattern and Number of Operating Generators

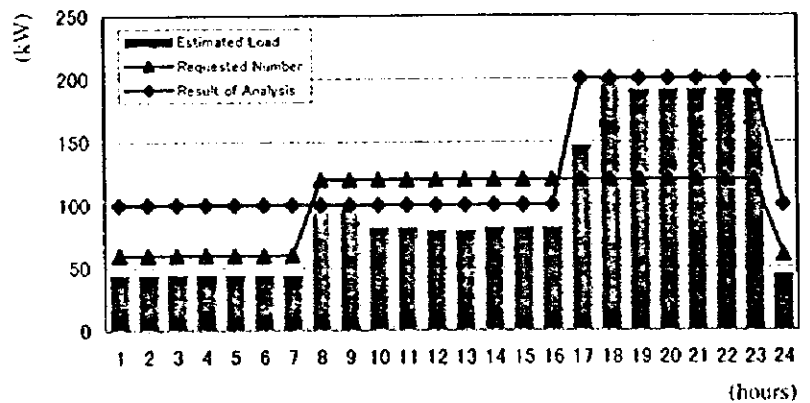
Aimag	Dornodo
Sum	Khulunbuir
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 2



Aimag	Khuvsgul
Sum	Tsagaan-Uur
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 0 60 x 3



Aimag	Khuvsgul
Sum	Tsagaannuur
Requested Number	100 x 0 60 x 2
Result of Analysis	100 x 2 60 x 0



Aimag	Khuvsgul
Sum	Renchinkhunbe
Requested Number	100 x 0 60 x 2
Result of Analysis	100 x 2 60 x 0

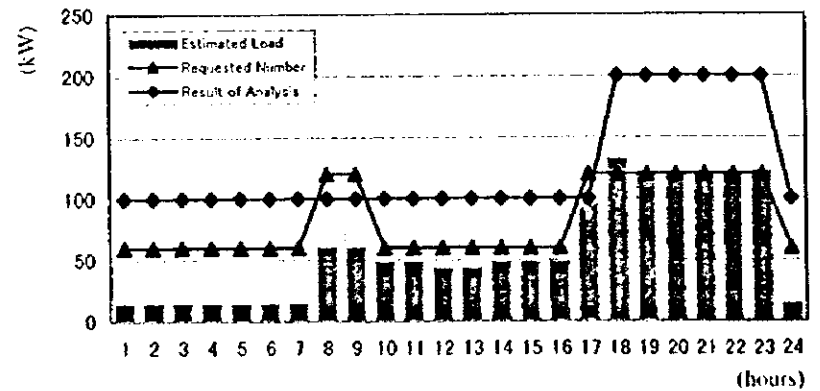
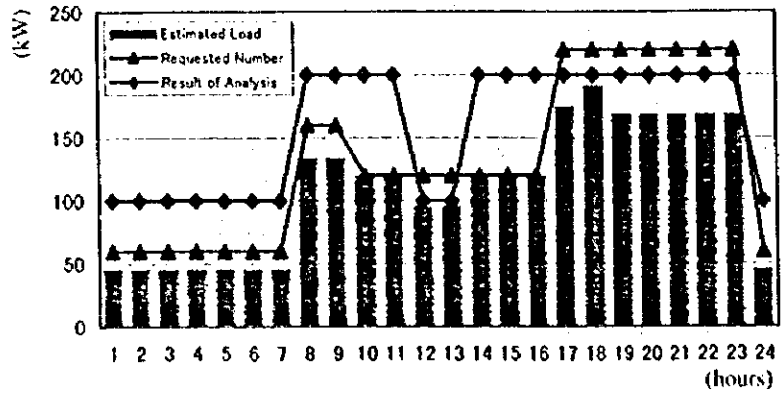


Figure 2.1-12 Daily Load Pattern and Number of Operating Generators

Aimag	Khuvsgul
Sum	Erdenebulgan
Requested Number	100 x 1 60 x 2
Result of Analysis	100 x 2 60 x 0







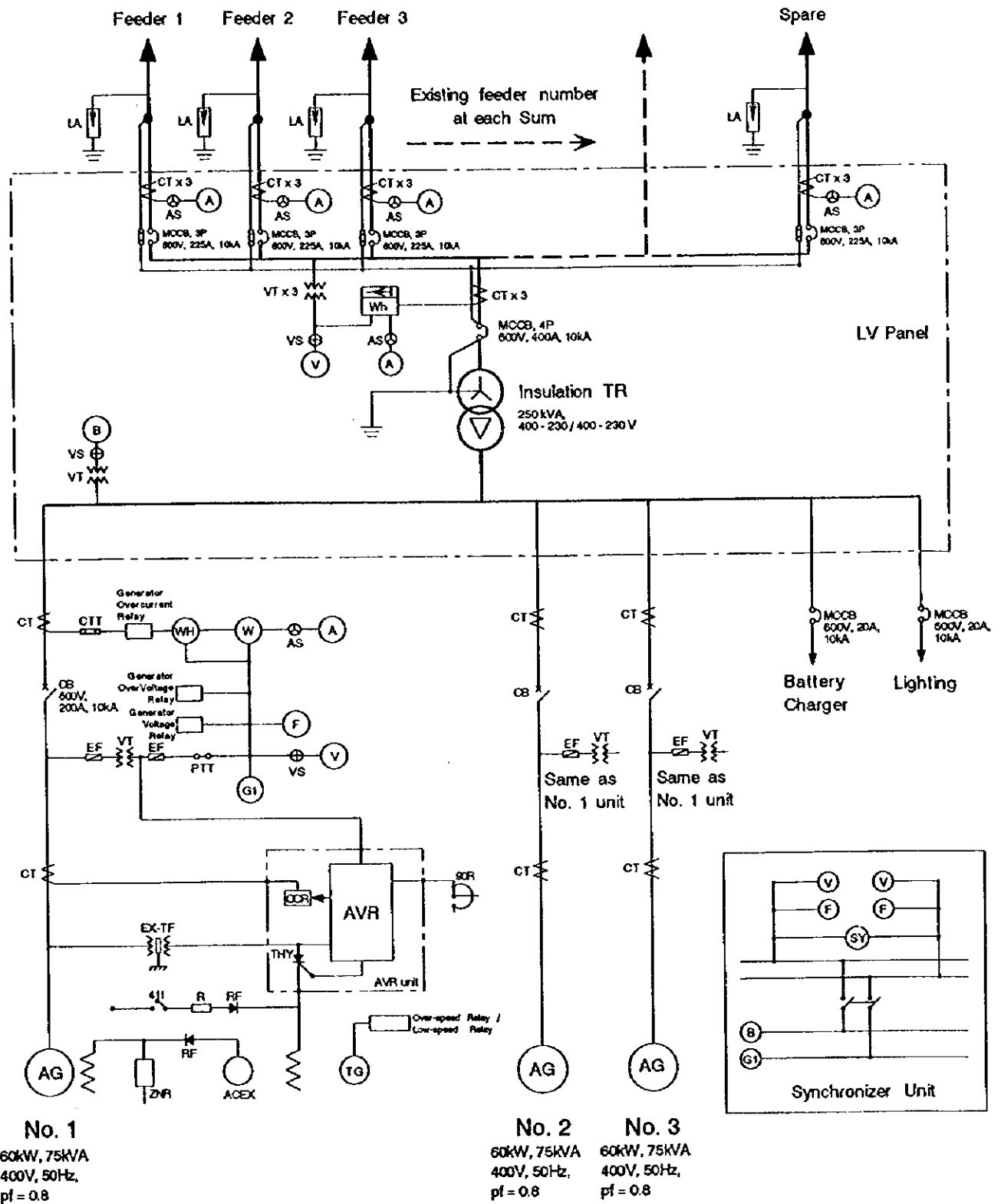


Figure 2.2 - 3 Single Line Diagram of Diesel Power Station (60 kW x 3)



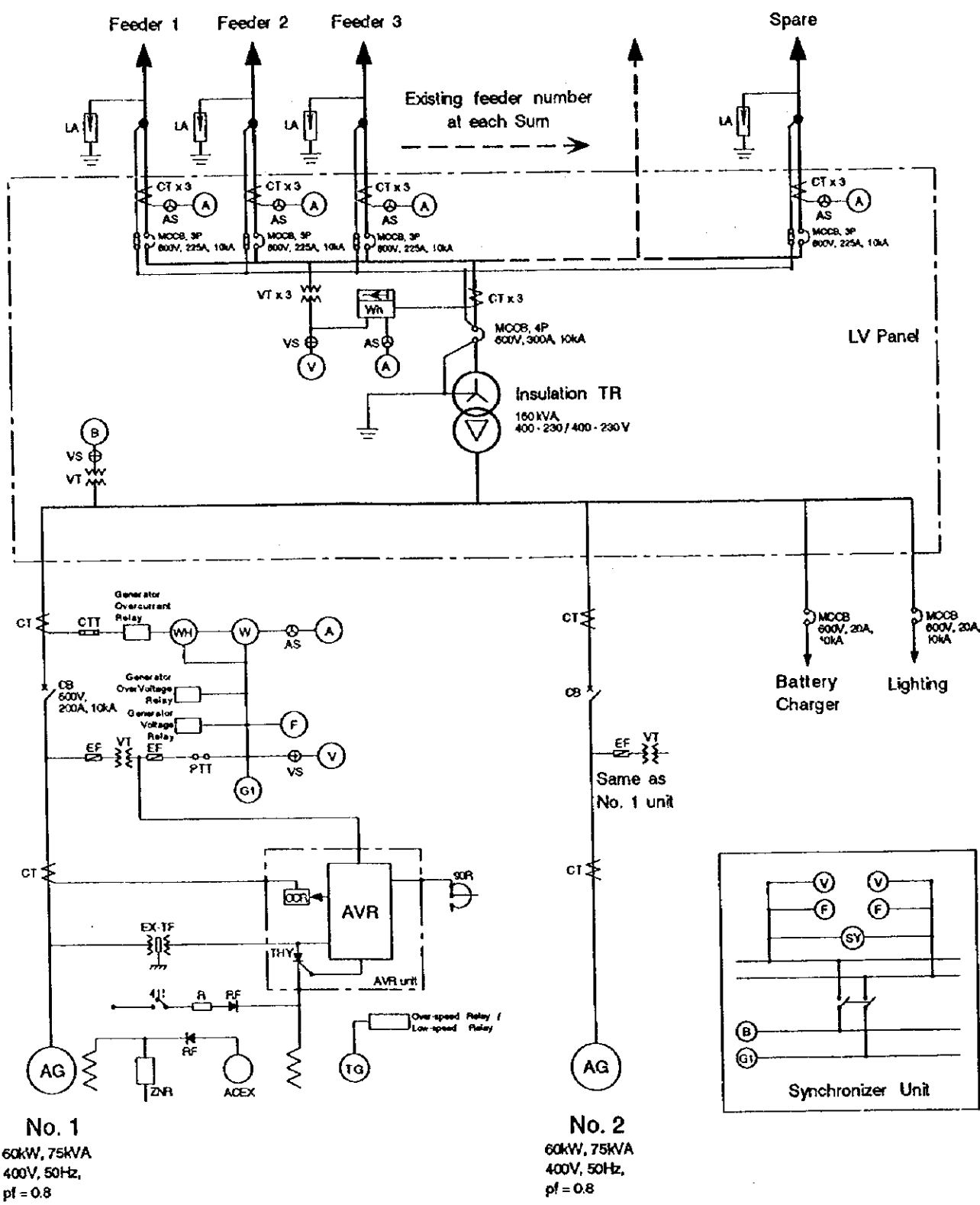
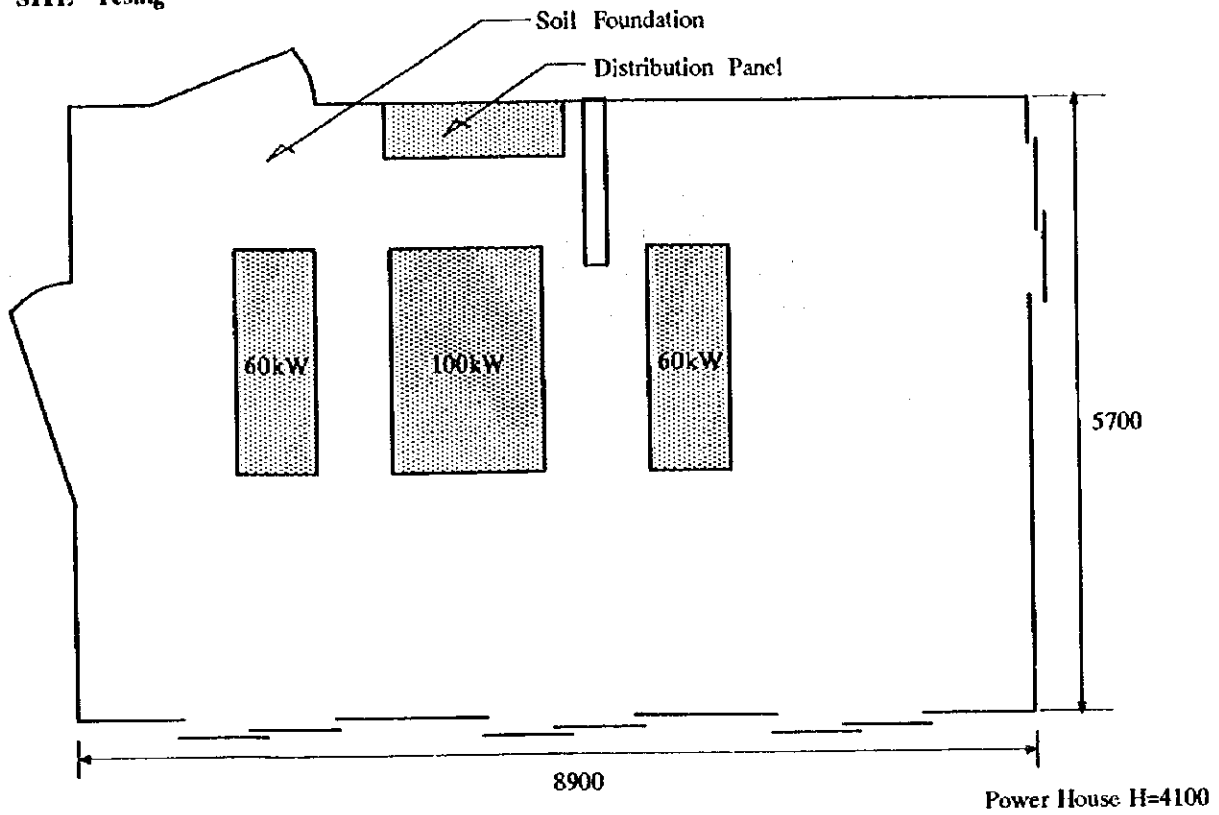


Figure 2.2 - 4 Single Line Diagram of Diesel Power Station (60 kW x 2)

AIMAG BULGAN  
SITE Teshig

### Existing Layout



### Layout Plan

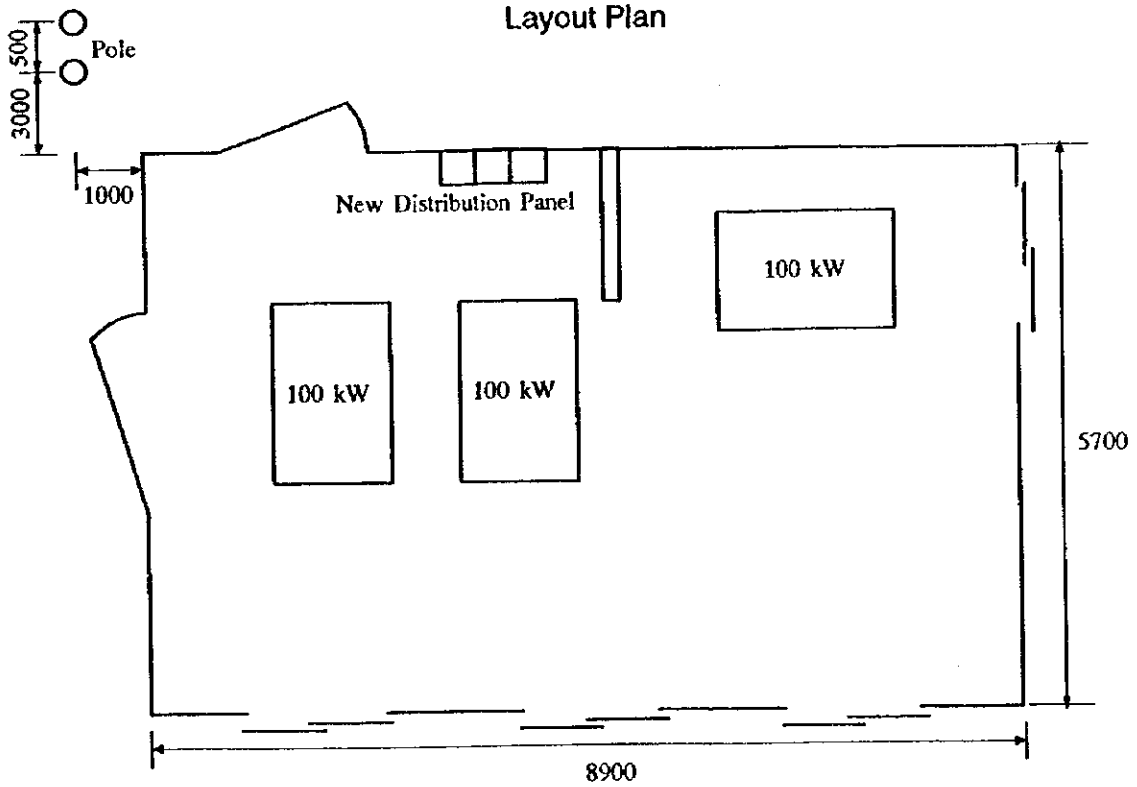
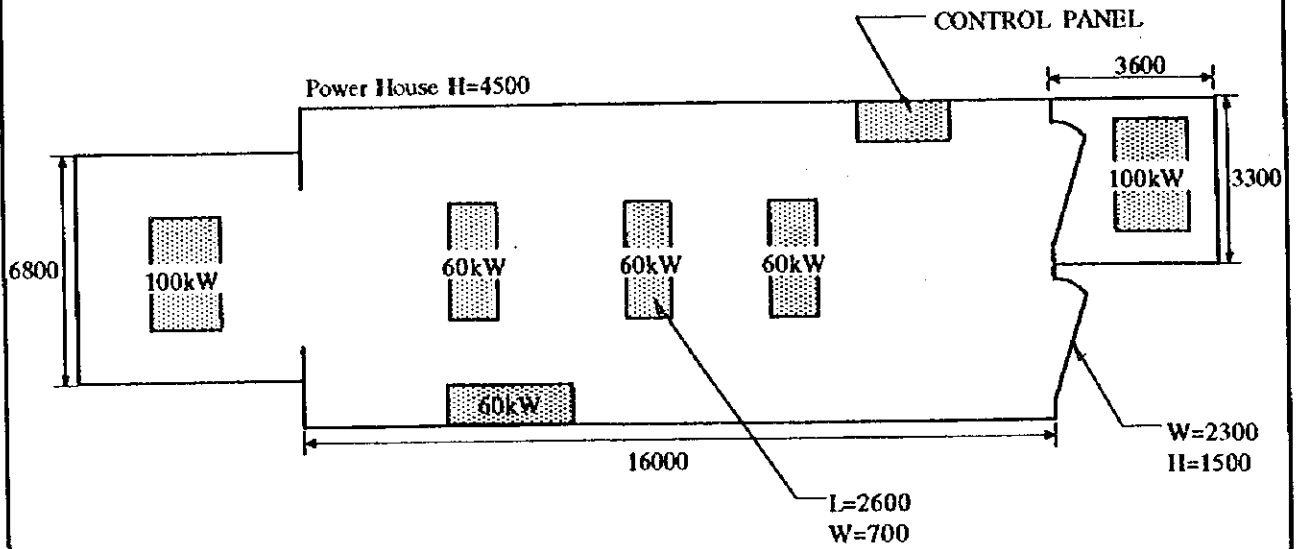


Figure 2.3 - 1 Layout Drawing of Teshig

AIMAG BAYAN-ULGI  
SITE Deluum

### Existing Layout



### Layout Plan

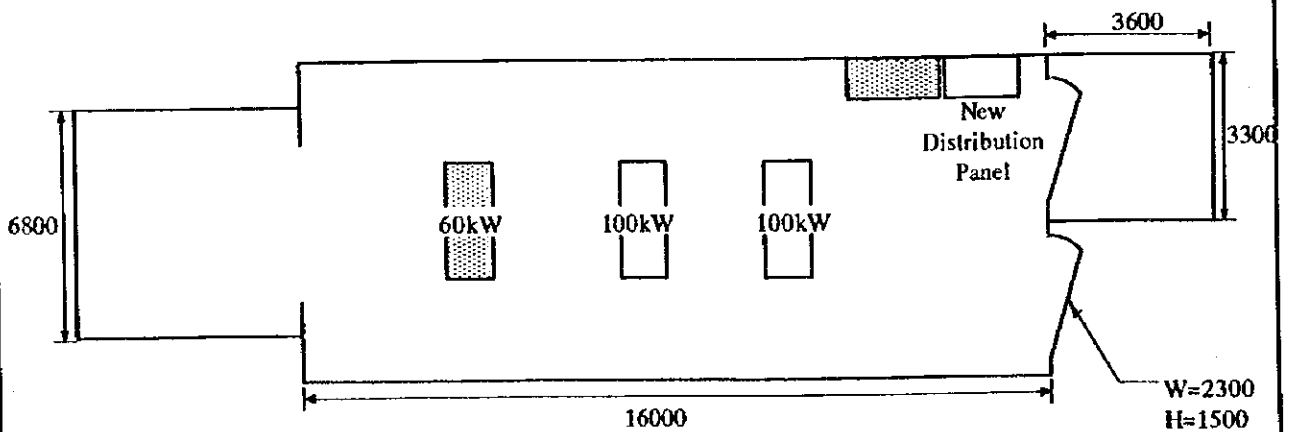
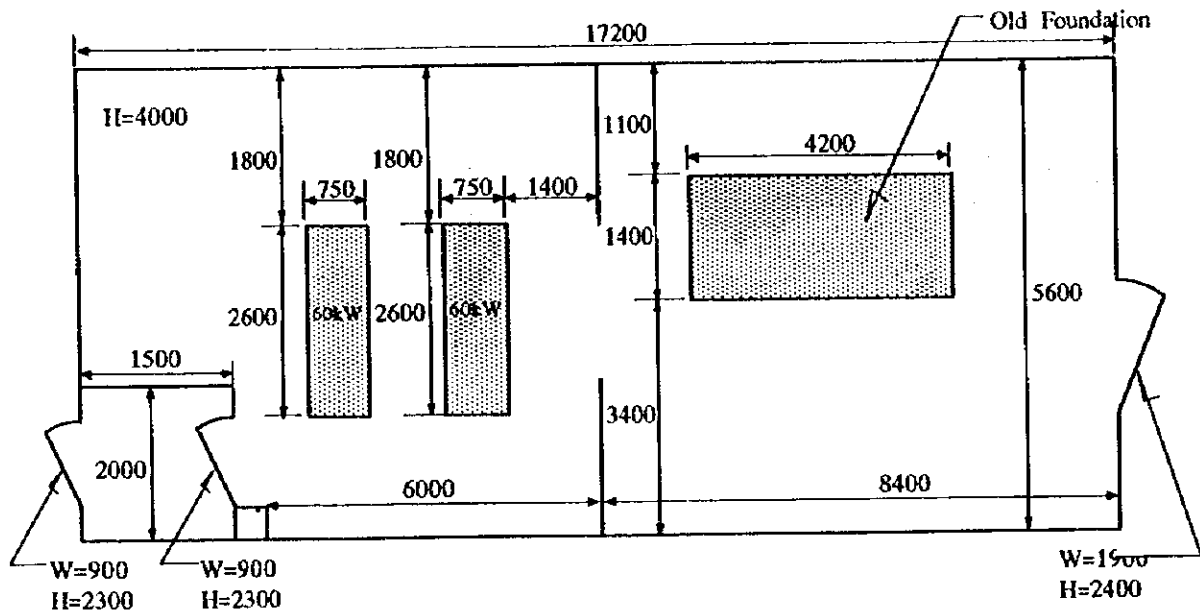


Figure 2.3 - 2 Layout Drawing of Delun

AIMAG UBS  
SITE Zuungobi

Existing Layout



Layout Plan

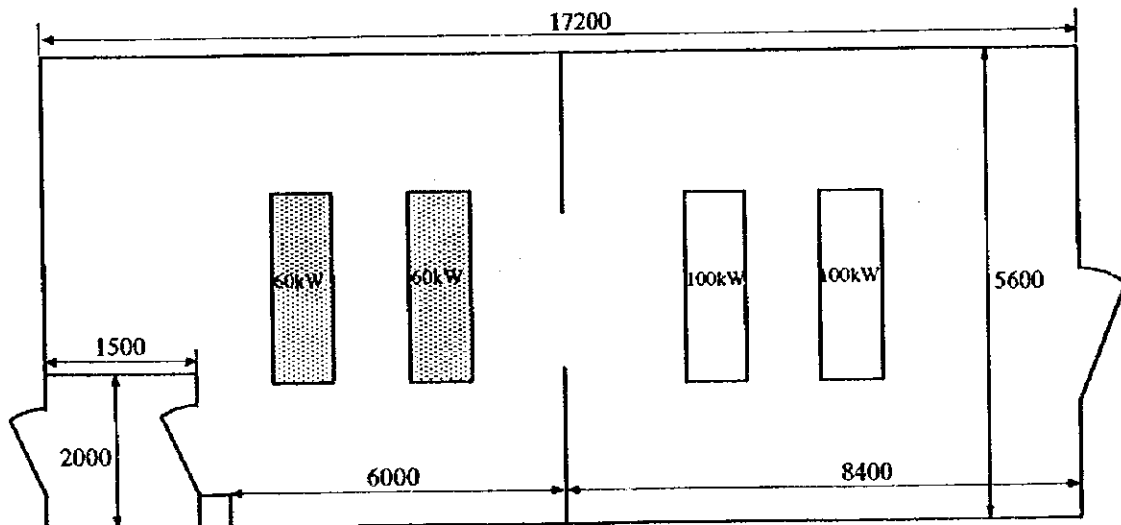


Figure 2.3 - 3 Layout Drawing of Zuungobi

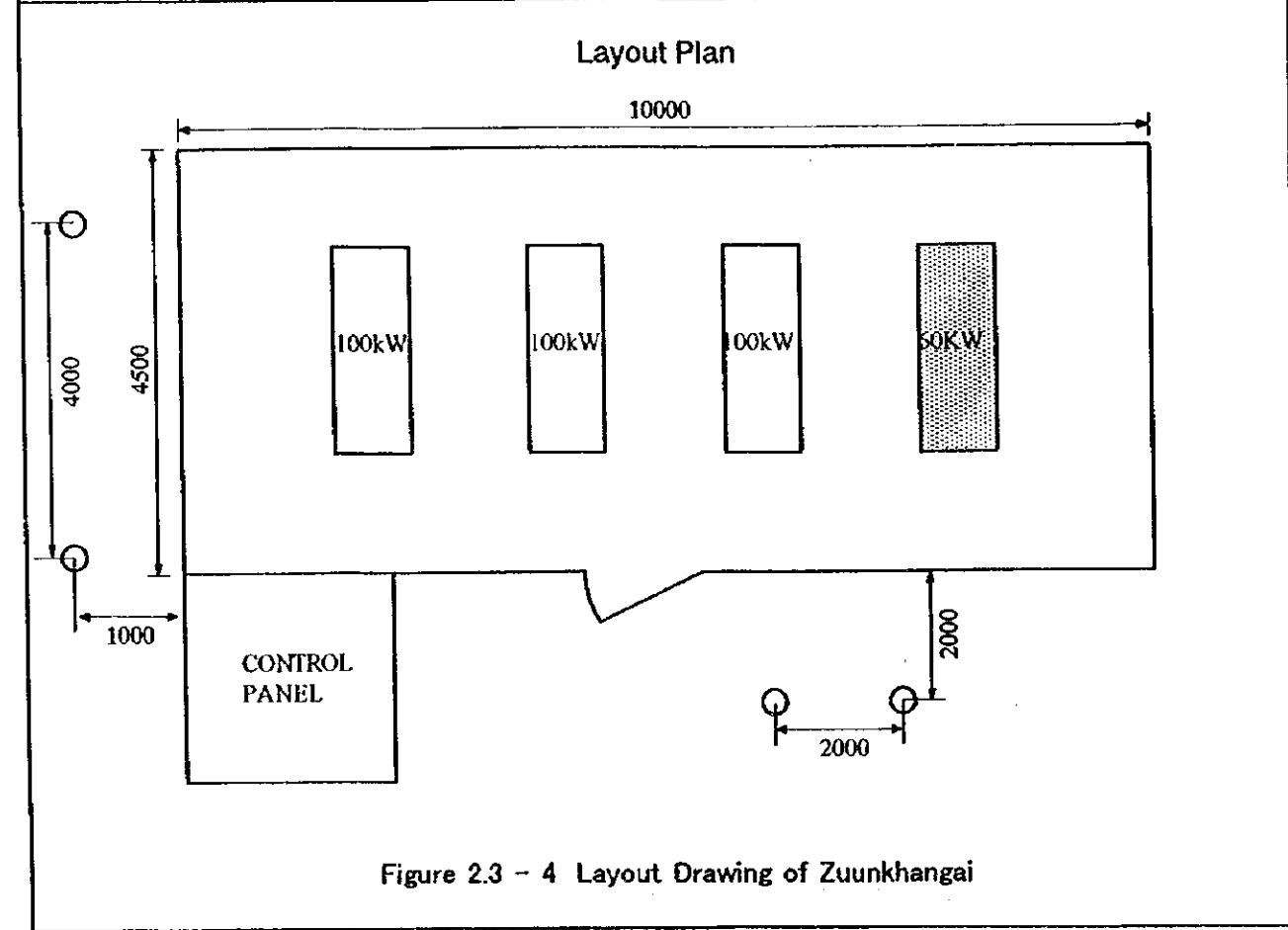
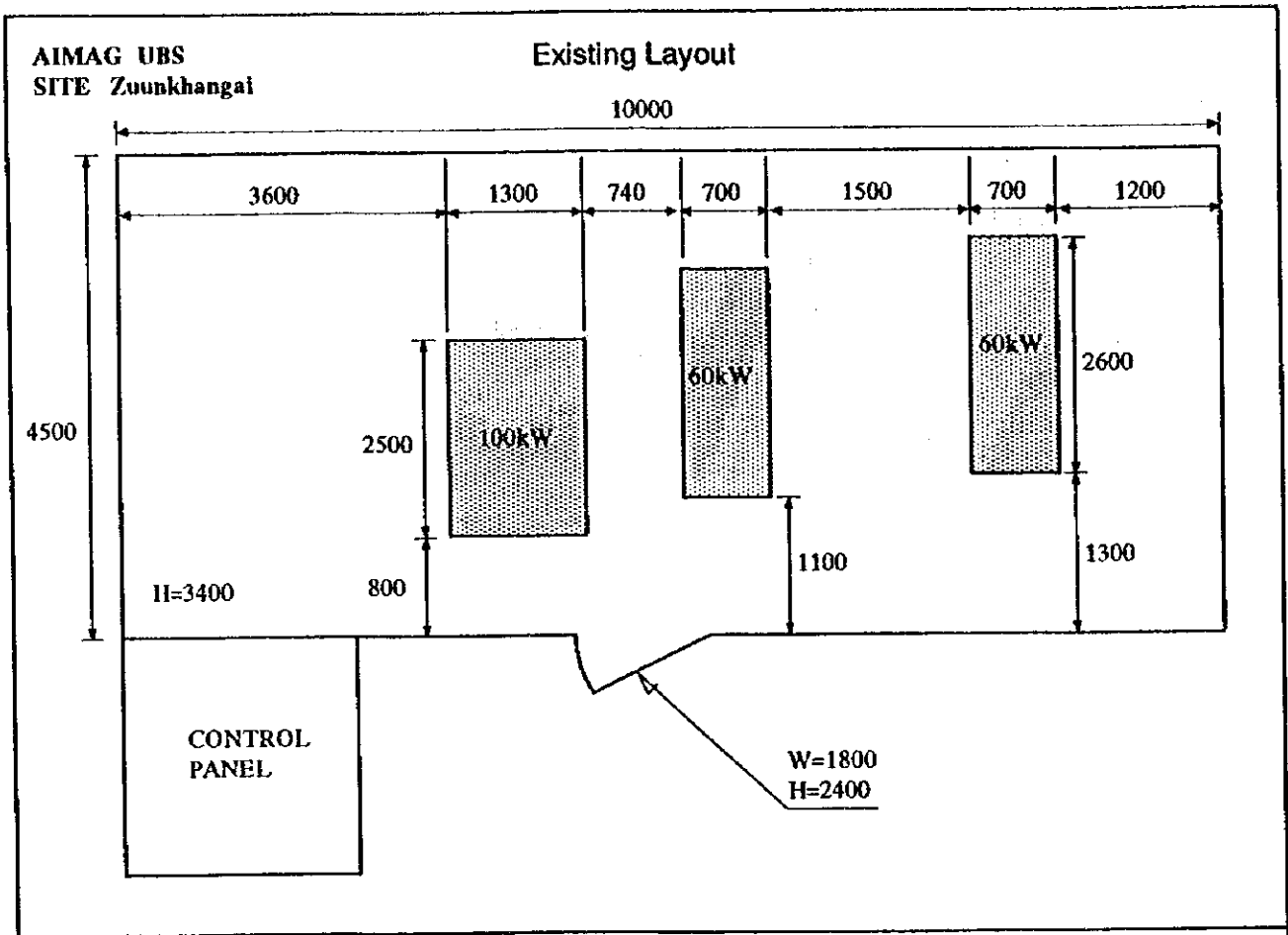
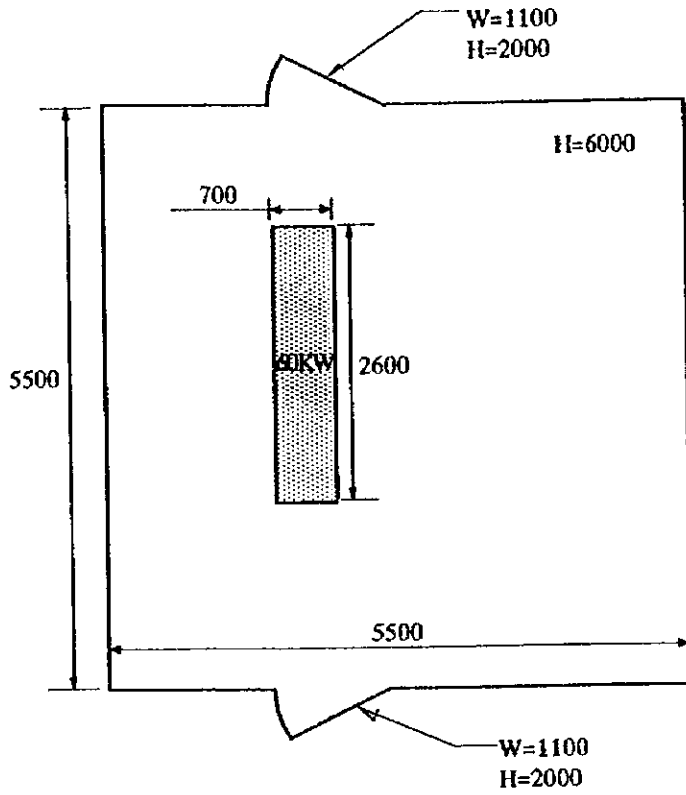


Figure 2.3 - 4 Layout Drawing of Zuunkhangai

AIMAG UBS  
SITE Malchin

### Existing Layout



### Layout Plan

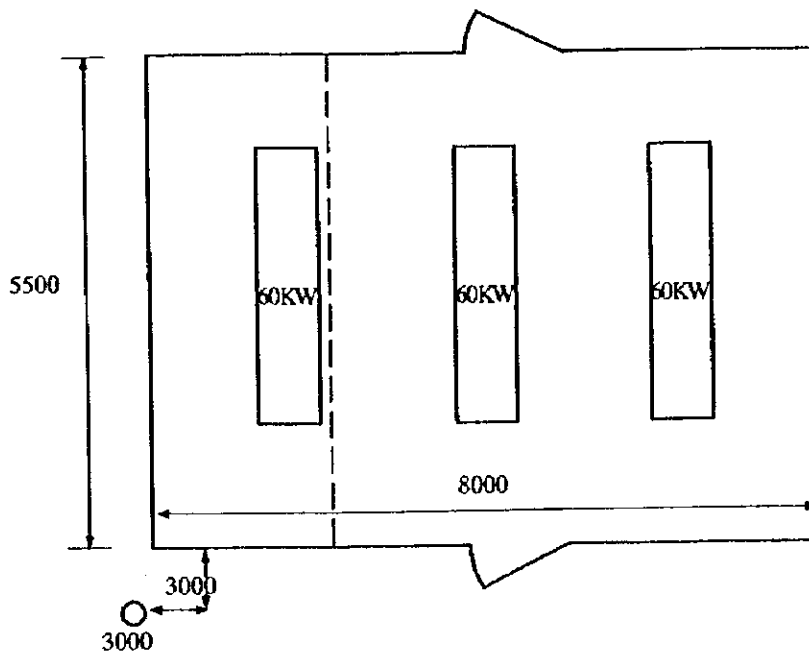
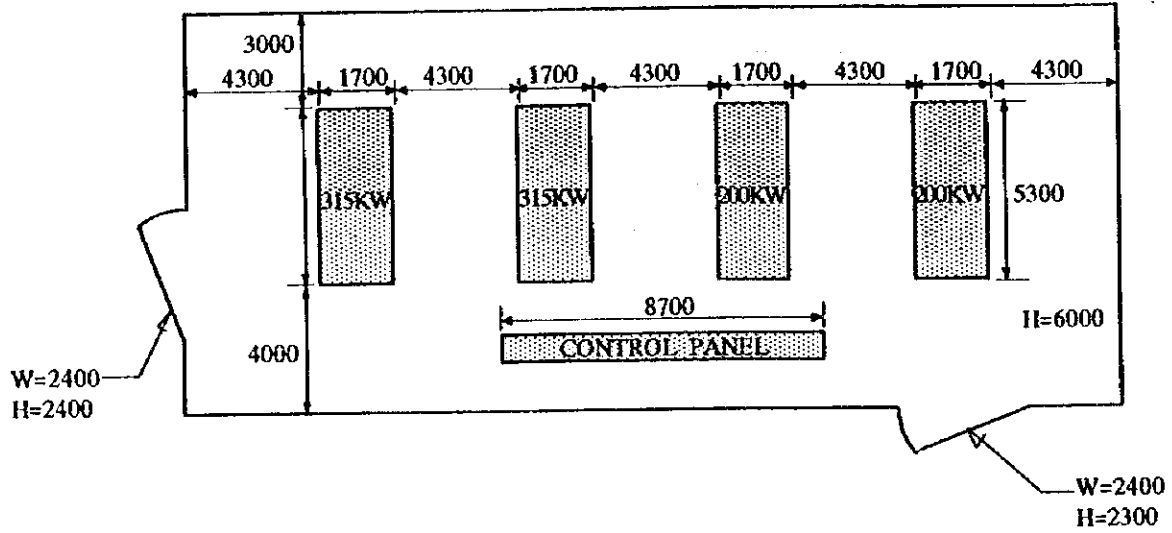


Figure 2.3 - 5 Layout Drawing of Malchin

AIMAG UBS  
SITE Tes

Existing Layout



Layout Plan

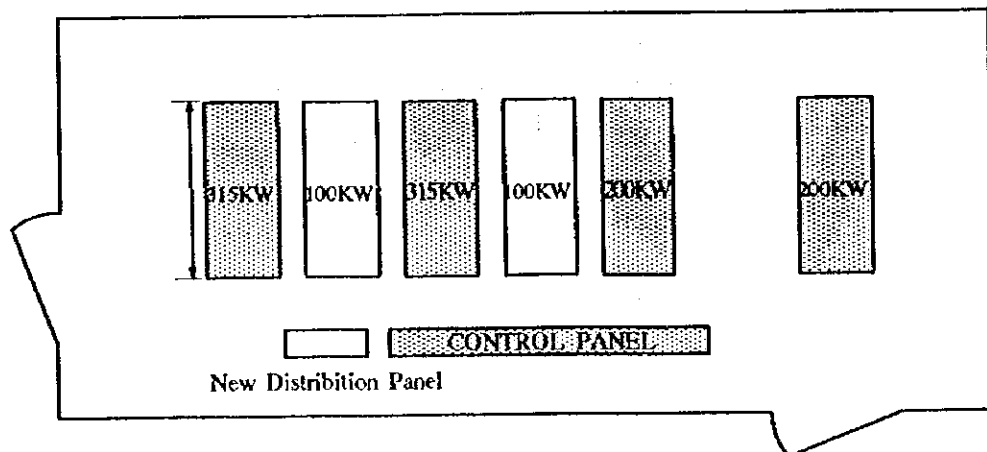
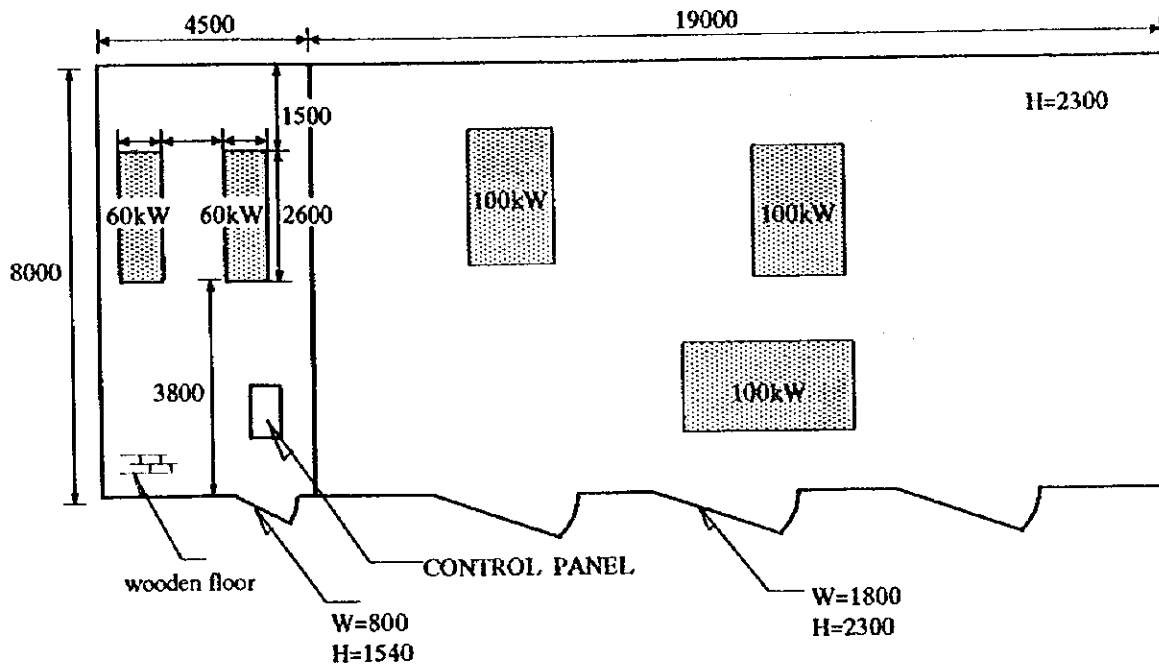


Figure 2.3 - 6 Layout Drawing of Tes

AIMAG UBS  
SITE Tsagaankhairkhan

Existing Layout



Layout Plan

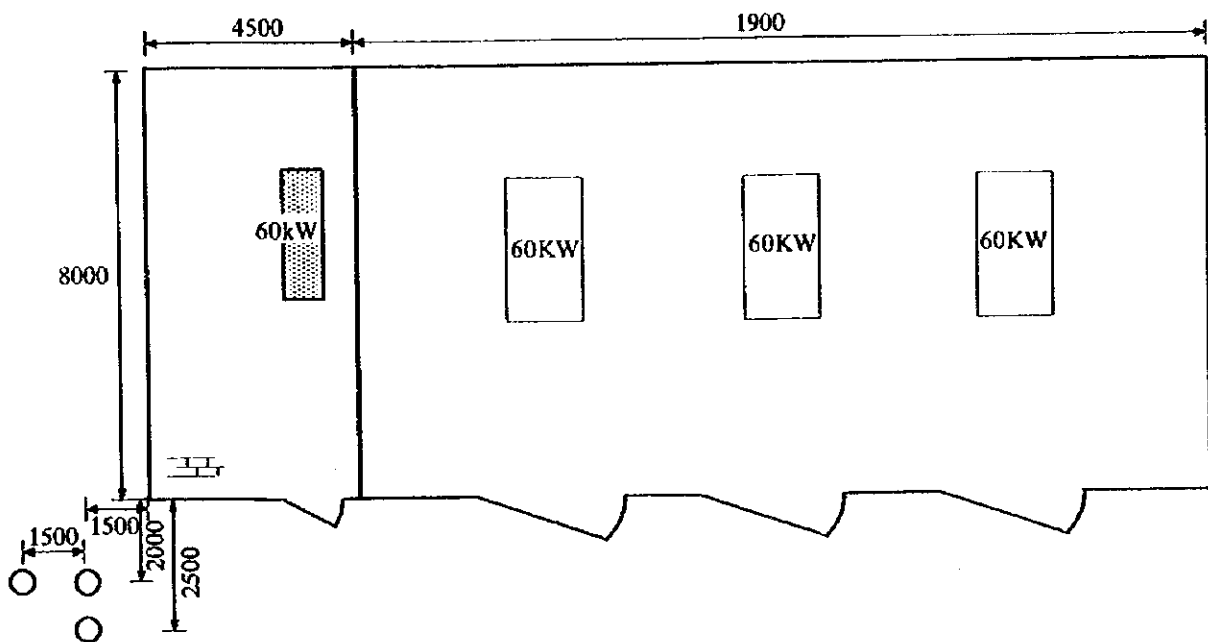
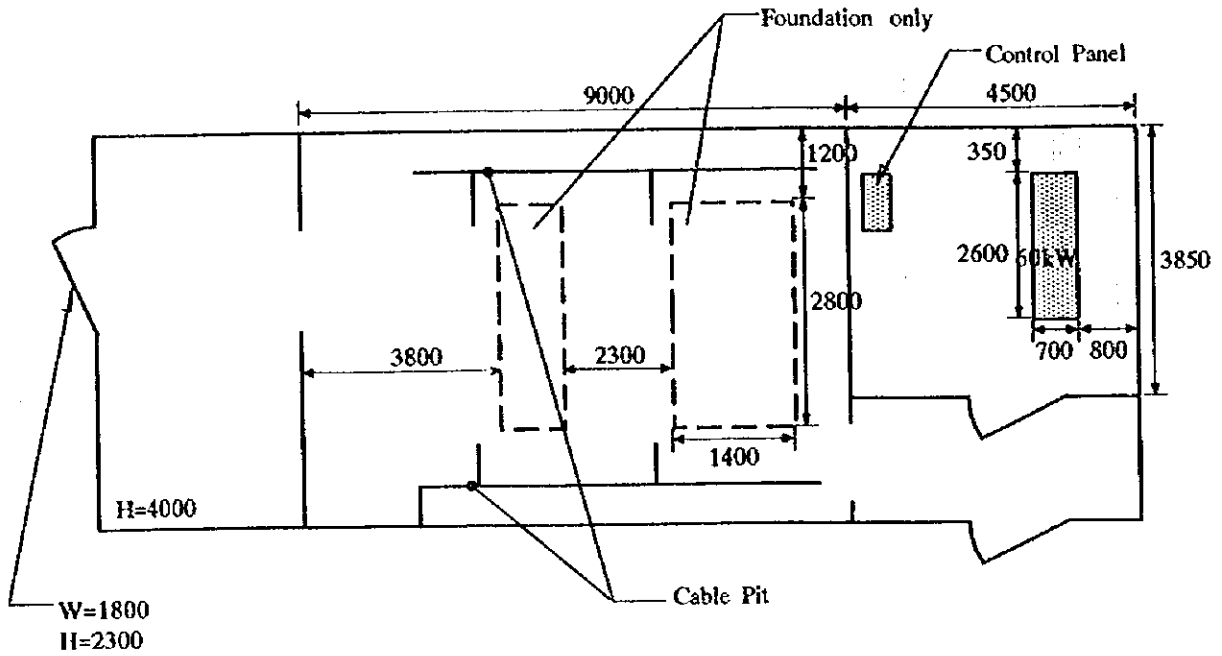


Figure 2.3 - 7 Layout Drawing of Tsagaankhairkhan



AIMAG UBS  
SITE Khyargas

### Existing Layout



### Layout Plan

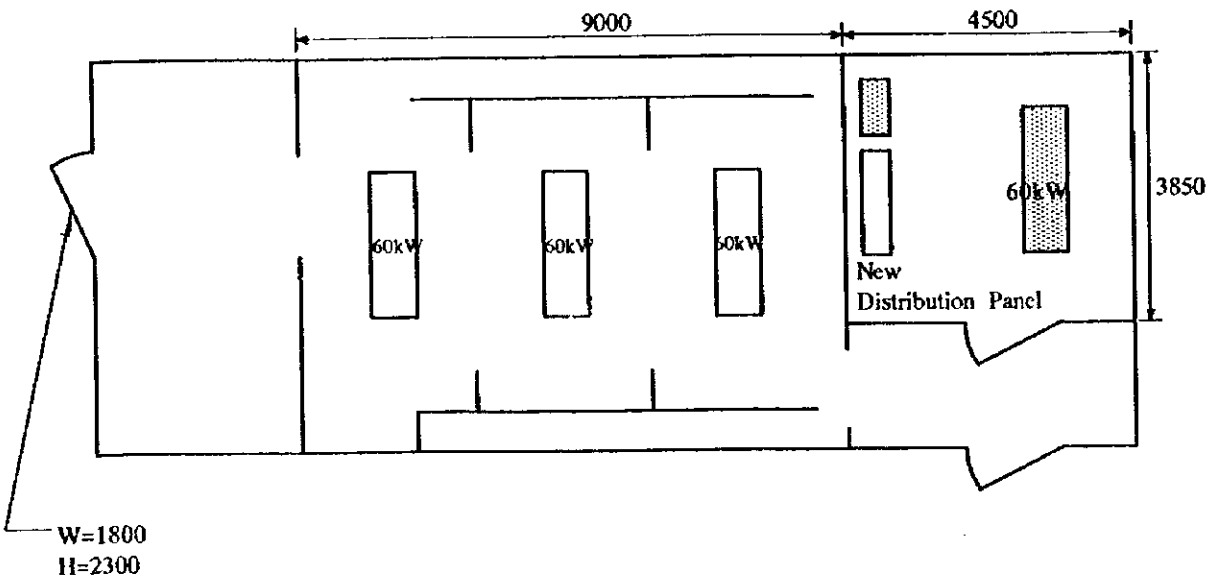
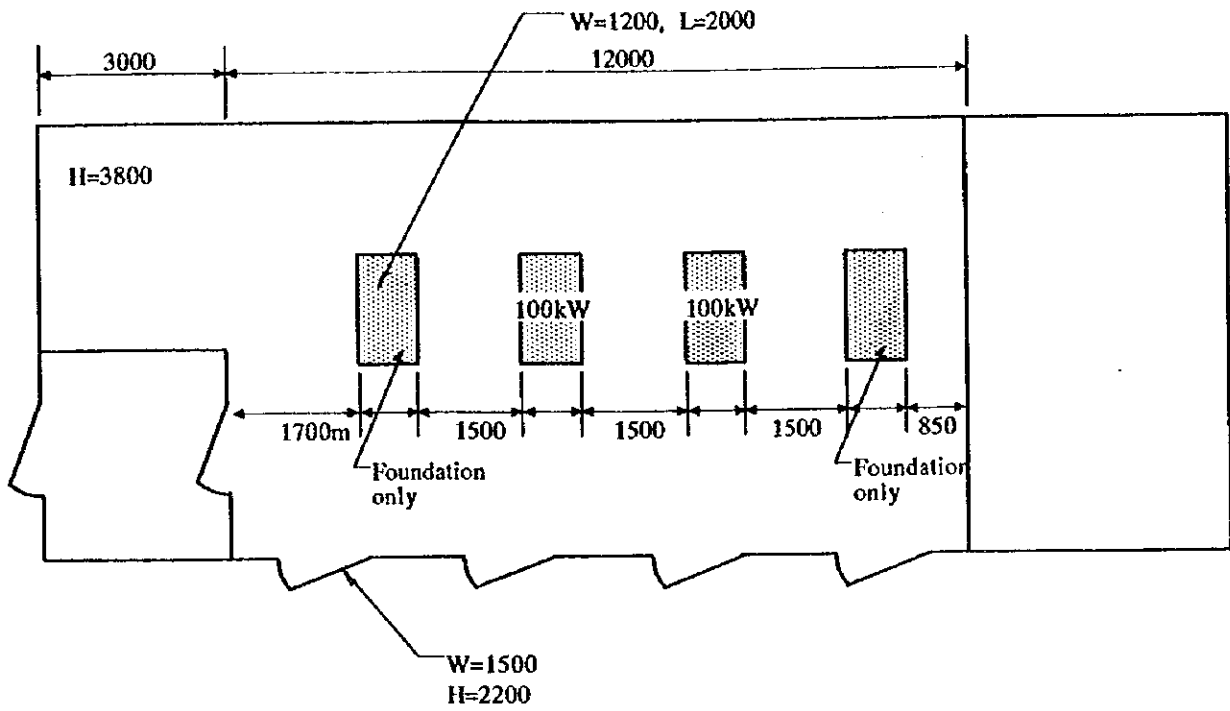


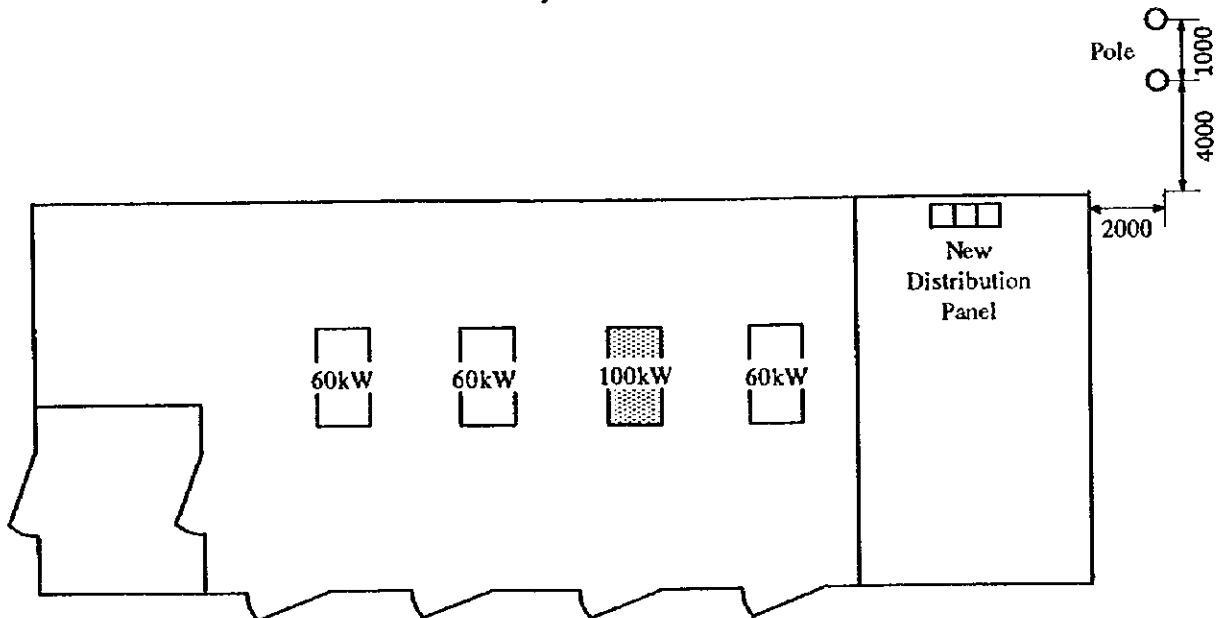
Figure 2.3 - 8 Layout Drawing of Khyargas

**AIMAG KHOVD  
SITE Tsetseg**

**Existing Layout**



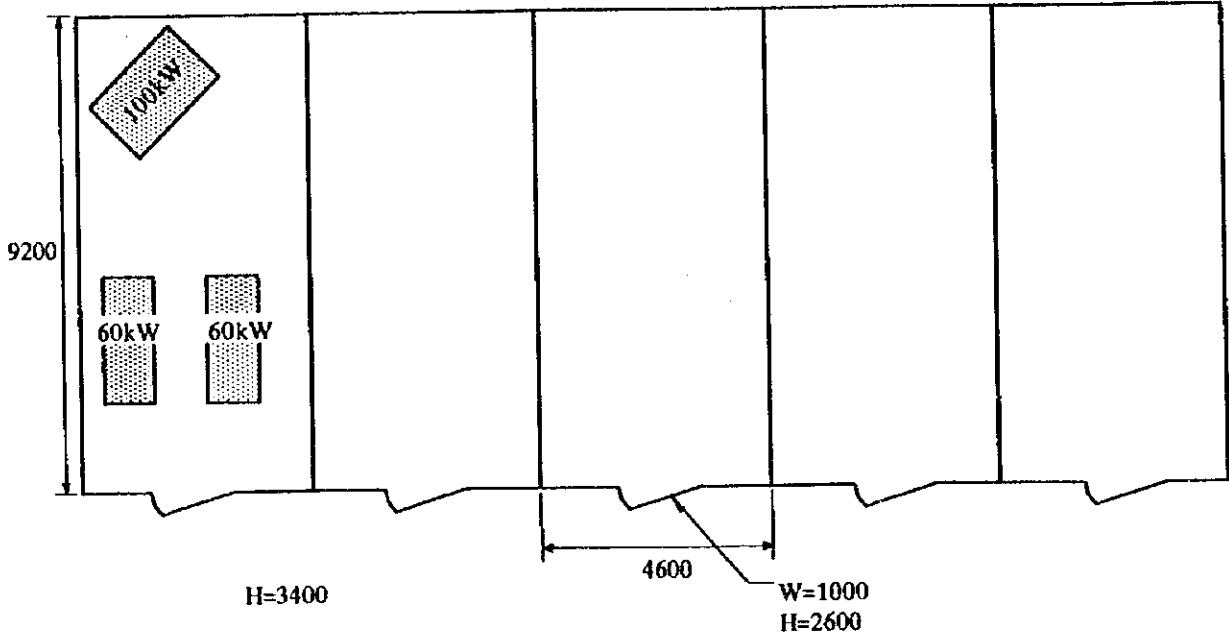
**Layout Plan**



**Figure 2.3 - 9 Layout Drawing of Tstseg**

AIMAG KHOVD  
SITE Bulgan

### Existing Layout



### Layout Plan

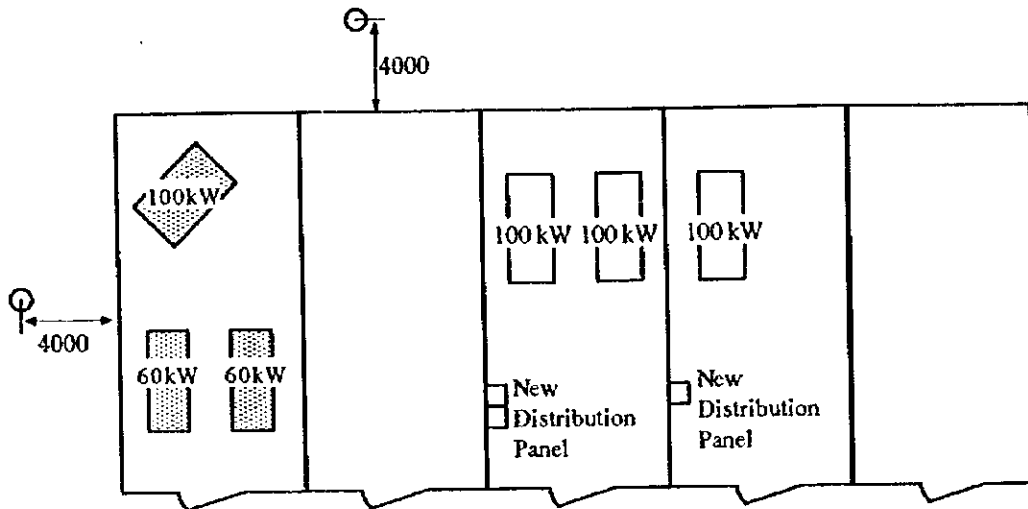
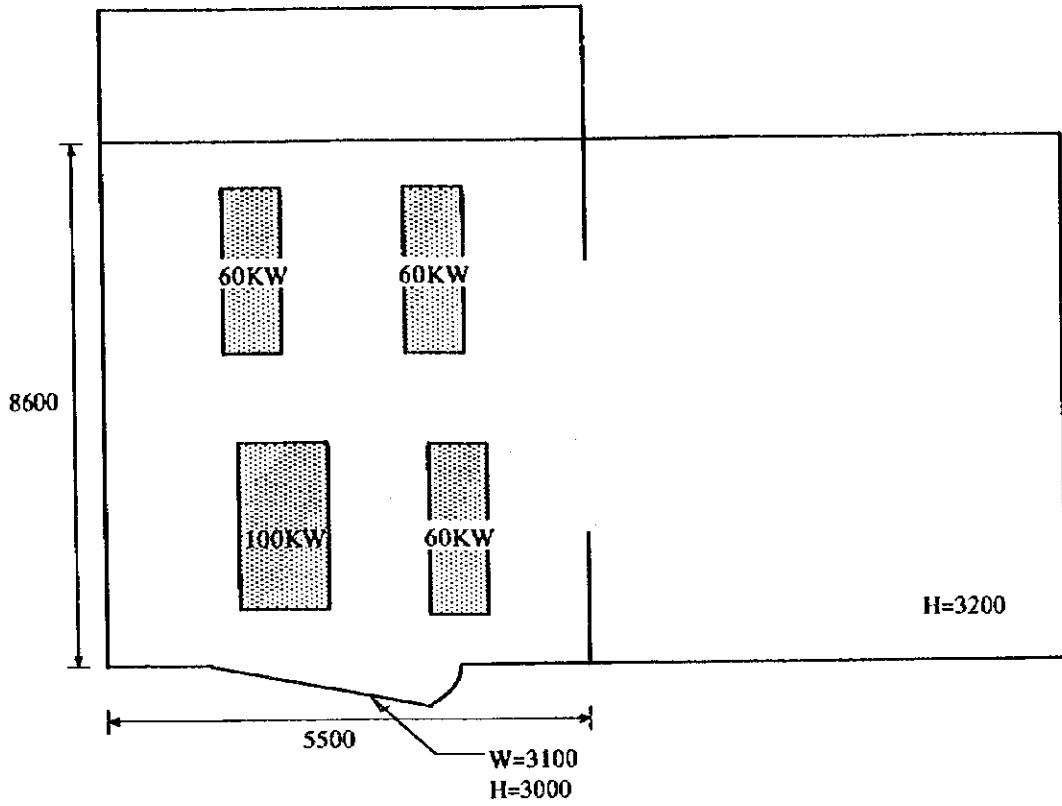


Figure 2.3 - 10 Layout Drawing of Bulgan

AIMAG KHOVD  
SITE Munkhairkhan

Existing Layout



Layout Plan

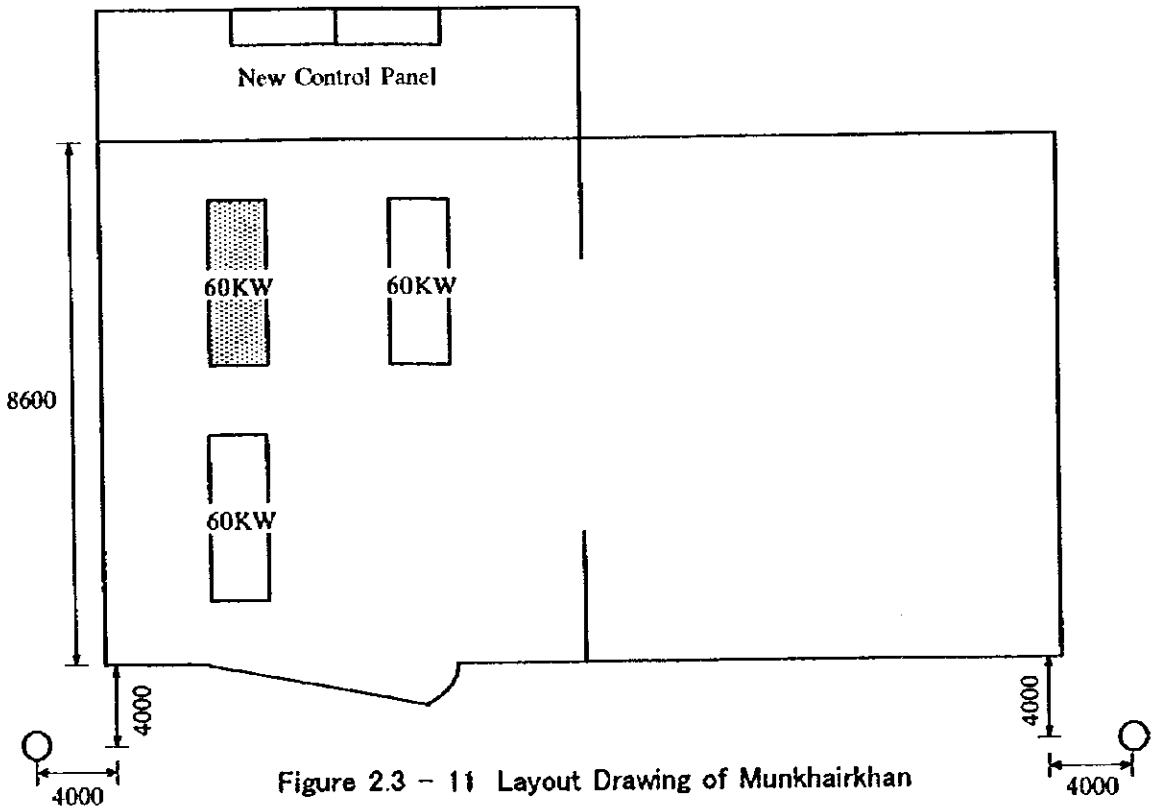
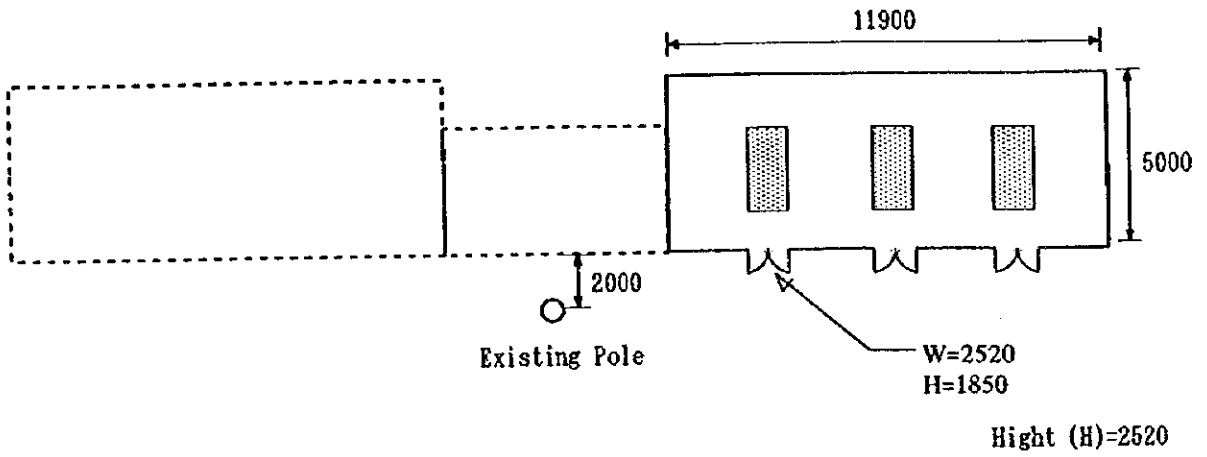


Figure 2.3 - 11 Layout Drawing of Munkhairkhan

AIMAG: BAYANHONGOR  
SITE: Buutsagaan

Existing Layout



Layout Plan

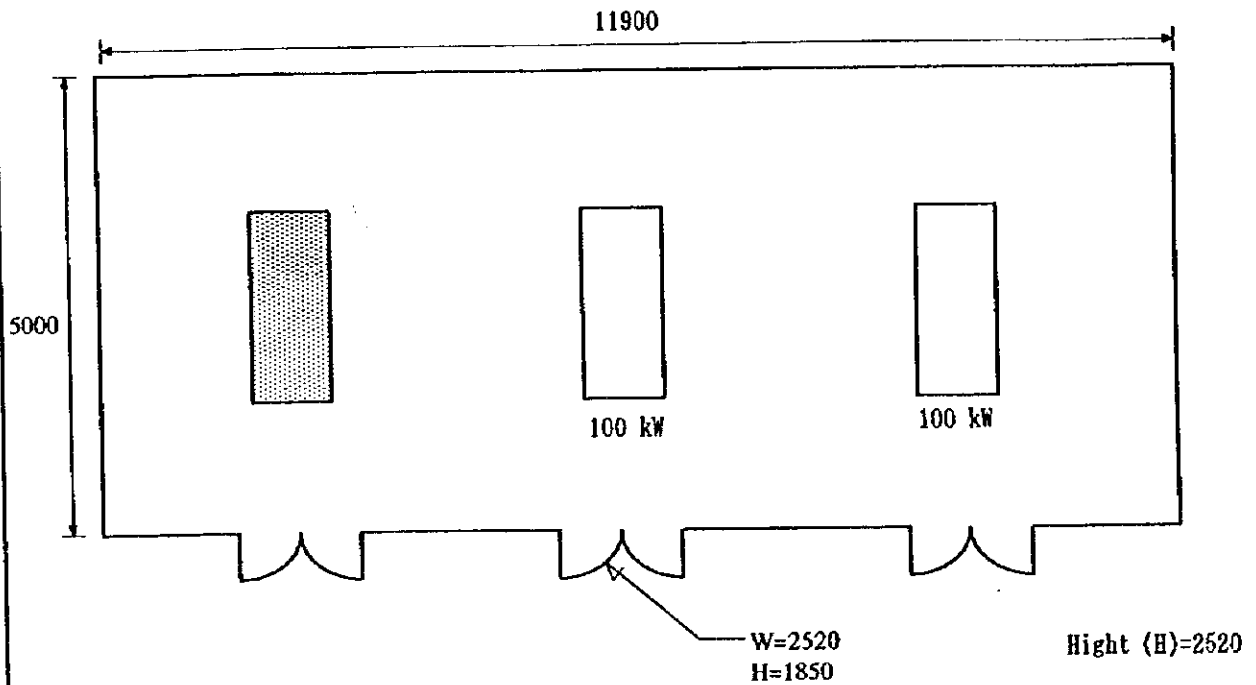
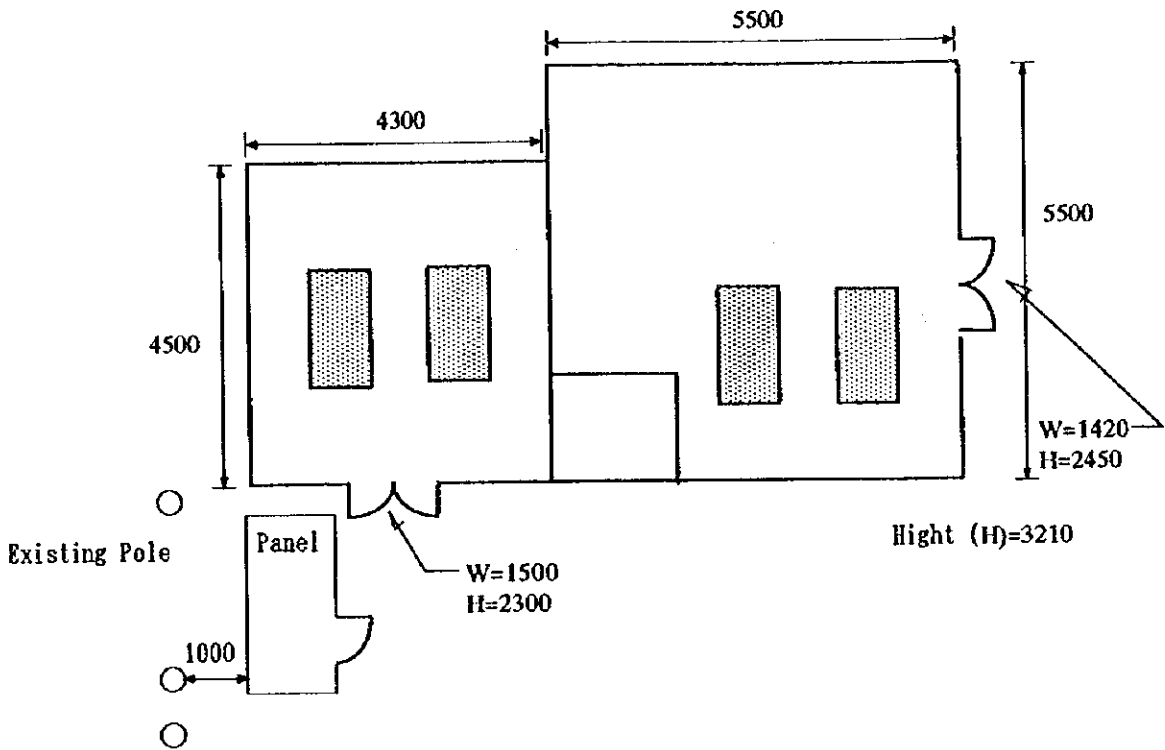


Figure 2.3 - 12 Layout Drawing of Buutsagaan

AIMAG: BAYANHONGOR  
SITE: Bayan-Undor

### Existing Layout



### Layout Plan

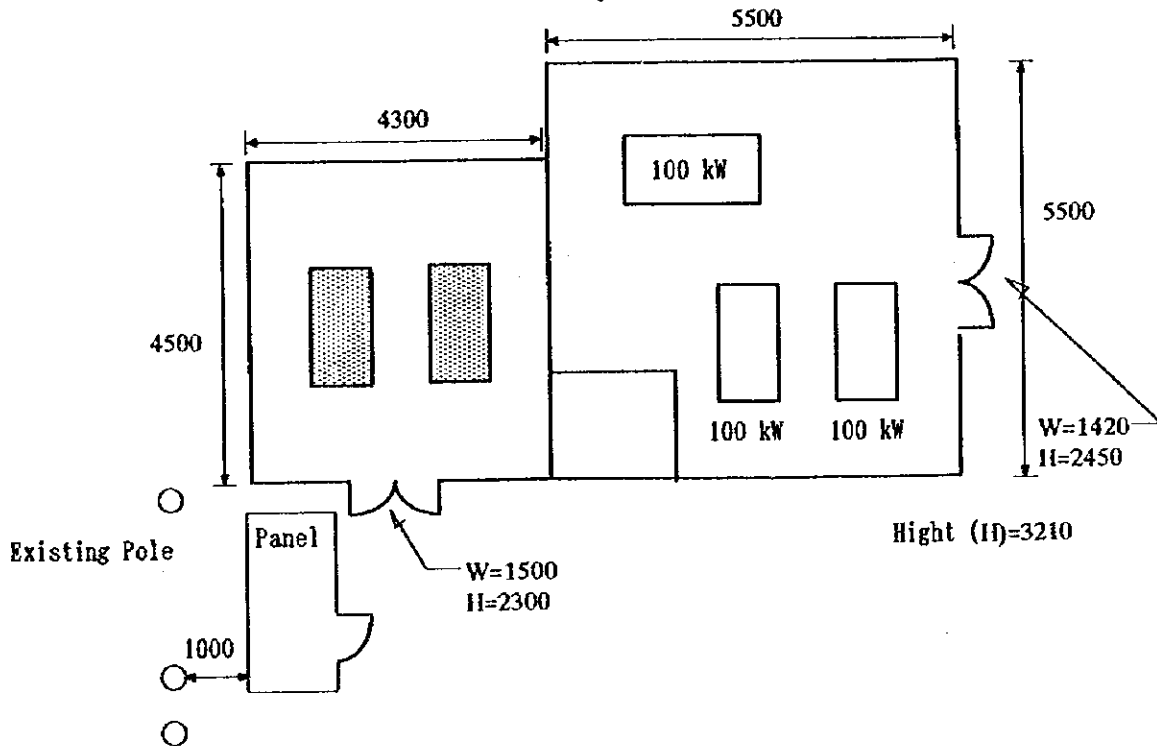
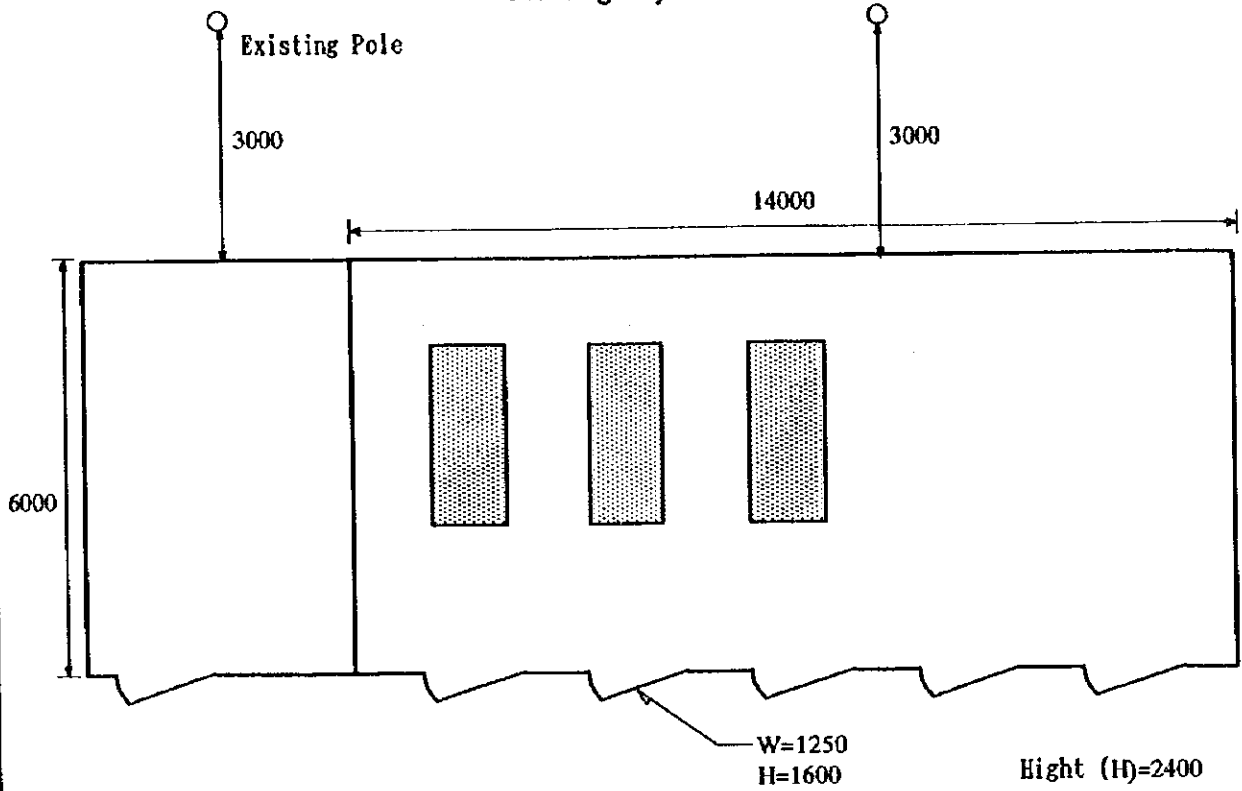


Figure 2.3 - 13 Layout Drawing of Bayan-Under

AIMAG: BAYANHONGOR  
SITE: Bayantsagaan

Existing Layout



Layout Plan

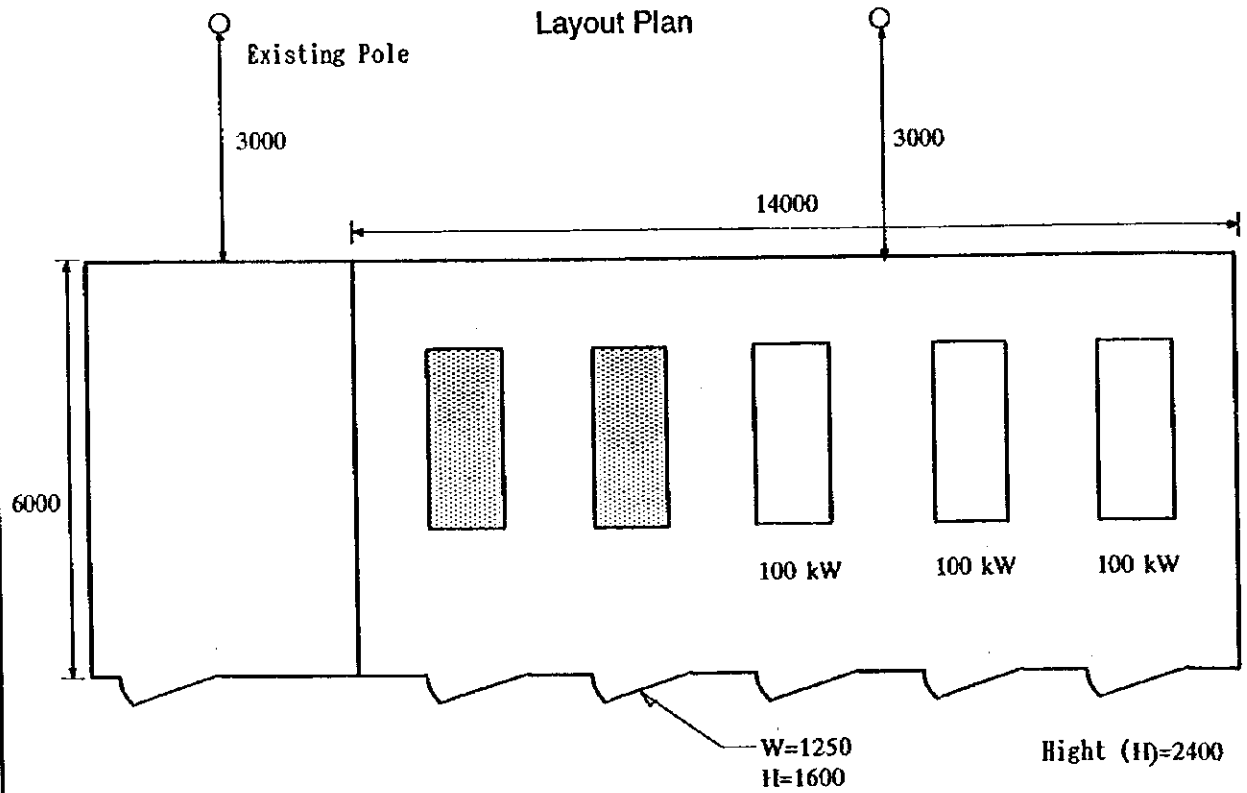
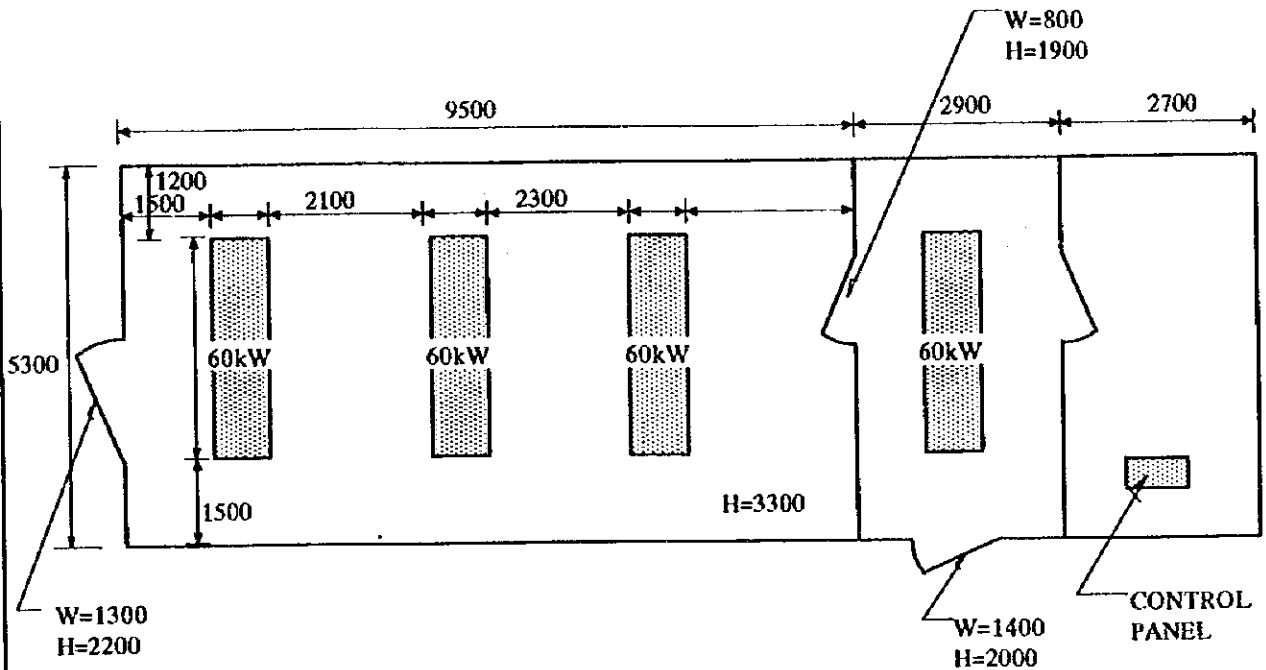


Figure 2.3 - 14 Layout Drawing of Bayantsagaan

AIMAG GOBI-ALTAI  
SITE Altai

Existing Layout



Layout Plan

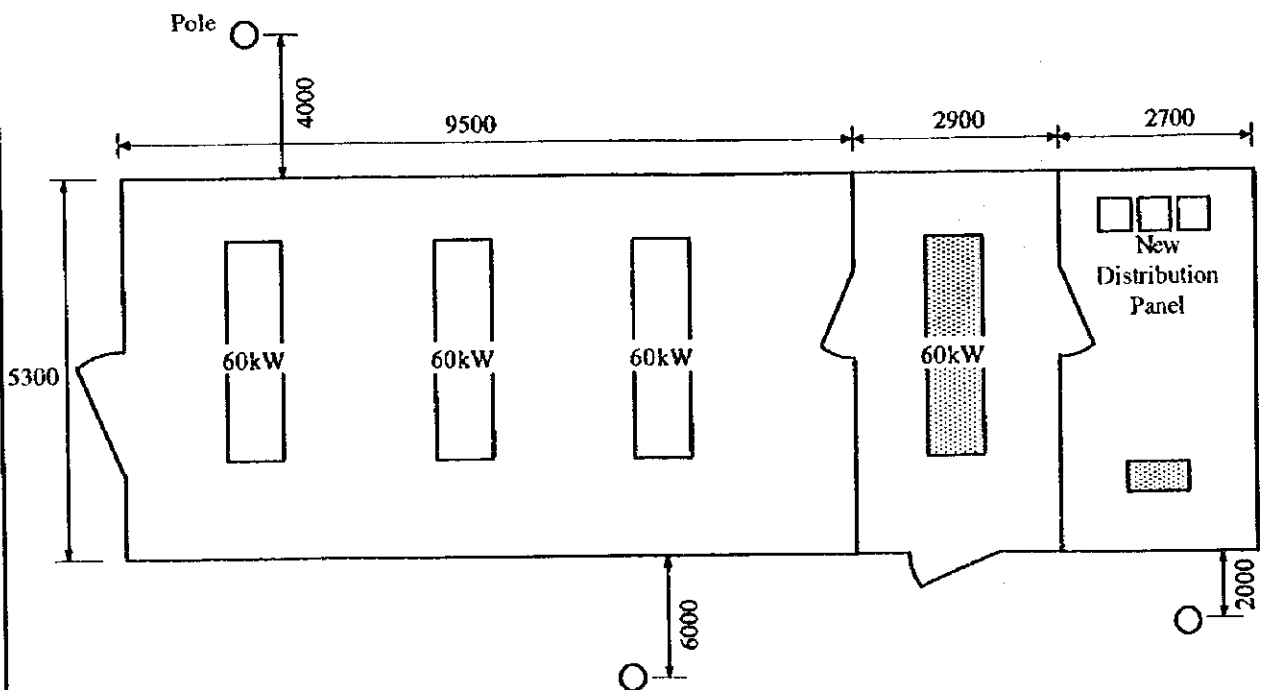
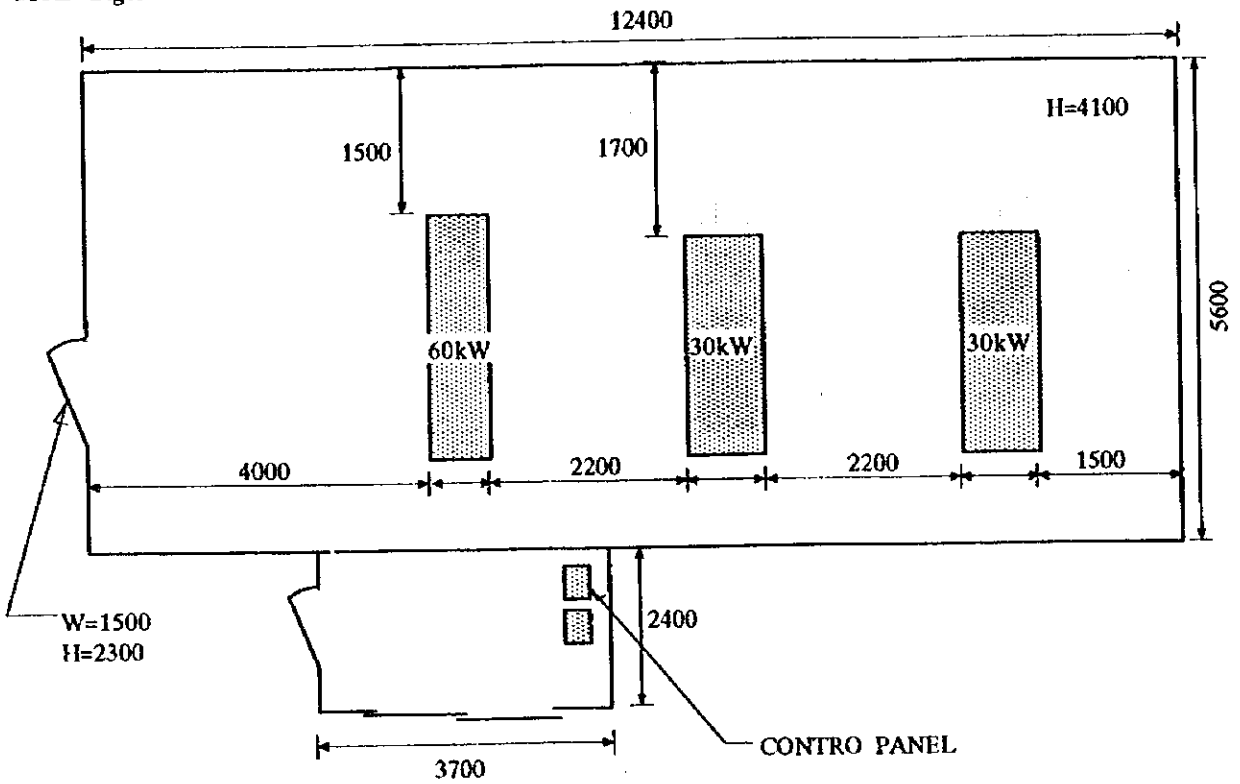


Figure 2.3 - 15 Layout Drawing of Altai



AIMAG GOBI-ALTAI  
SITE Biger

### Existing Layout



### Layout Plan

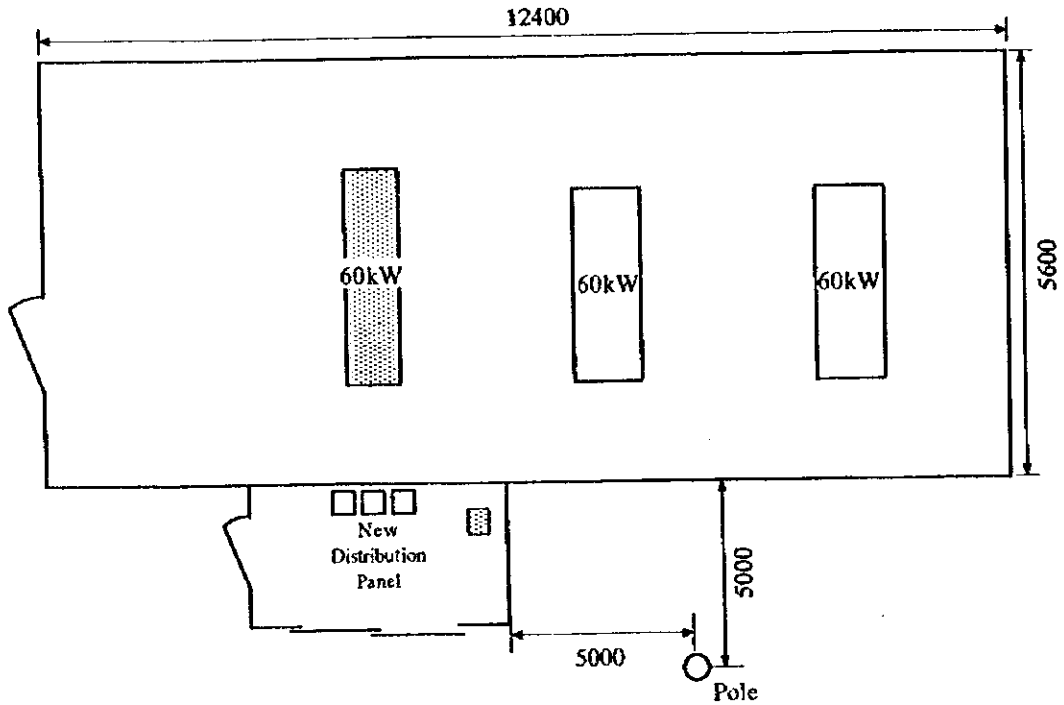
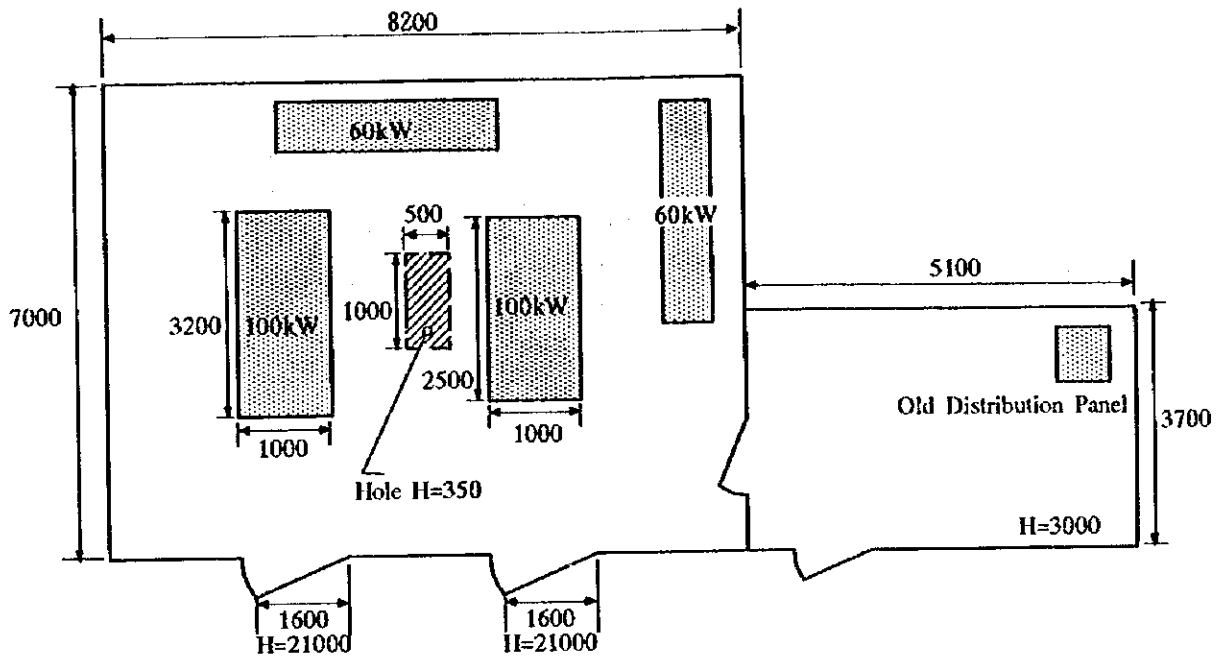


Figure 2.3 - 16 Layout Drawing of Biger

AIMAG GOBI-ALTAI  
SITE Tonkhil

Existing Layout



Layout Plan

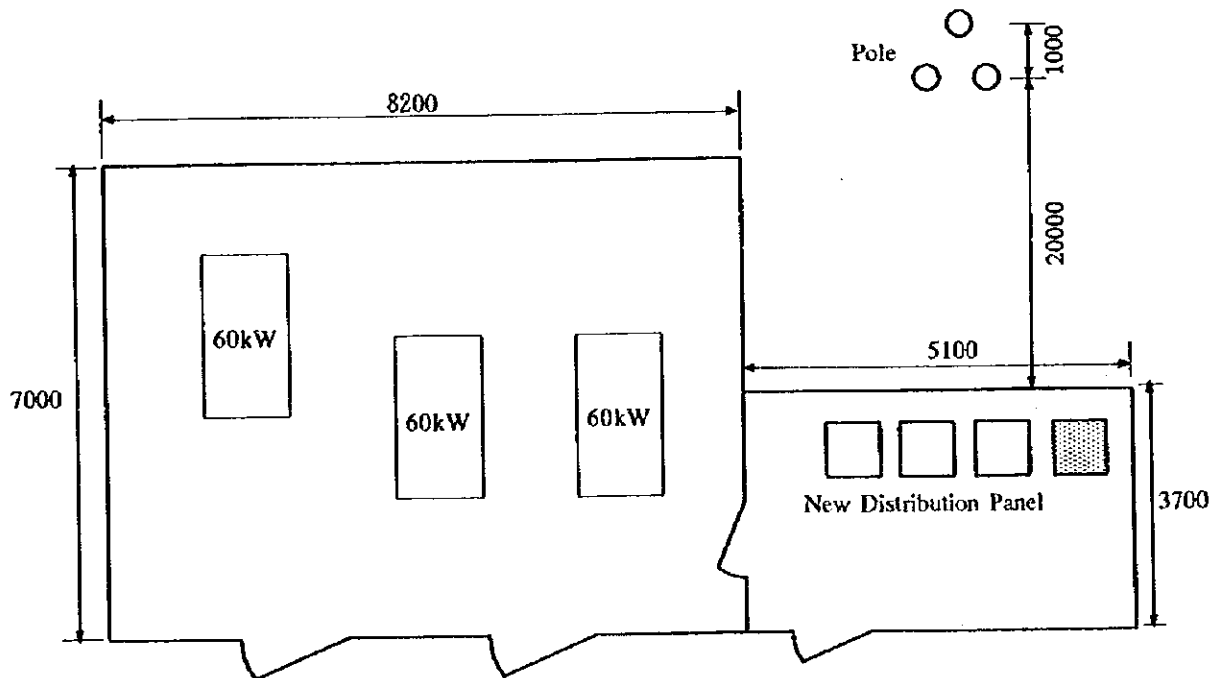
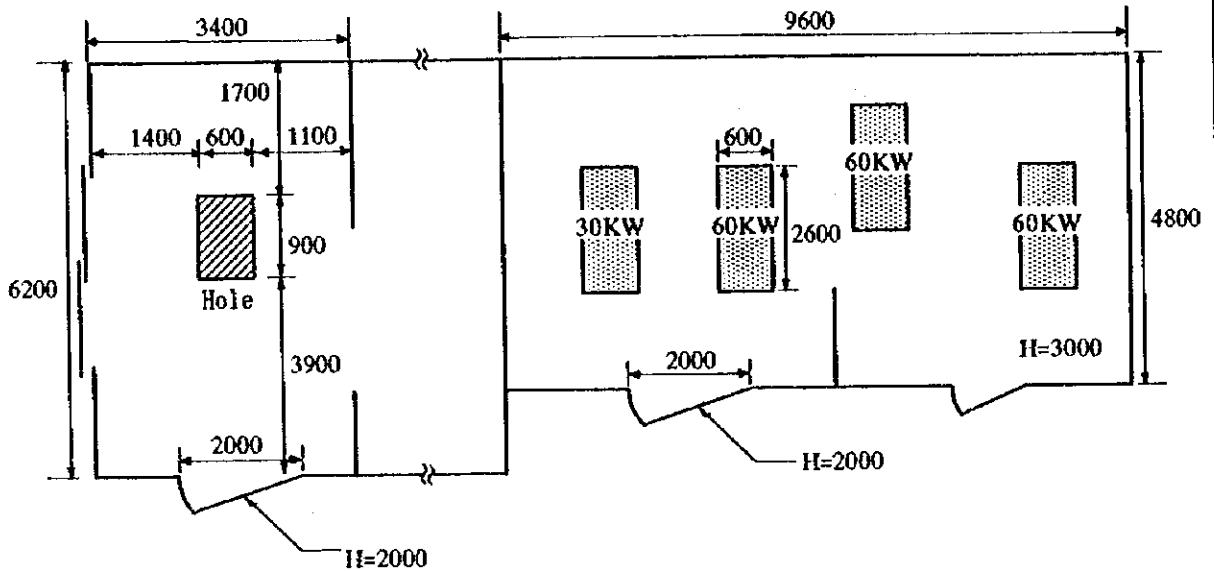


Figure 2.3 - 17 Layout Drawing of Tonkhil

AIMAG GOBI-ALTAI  
SITE Khukhmorit

Existing Layout



Layout Plan

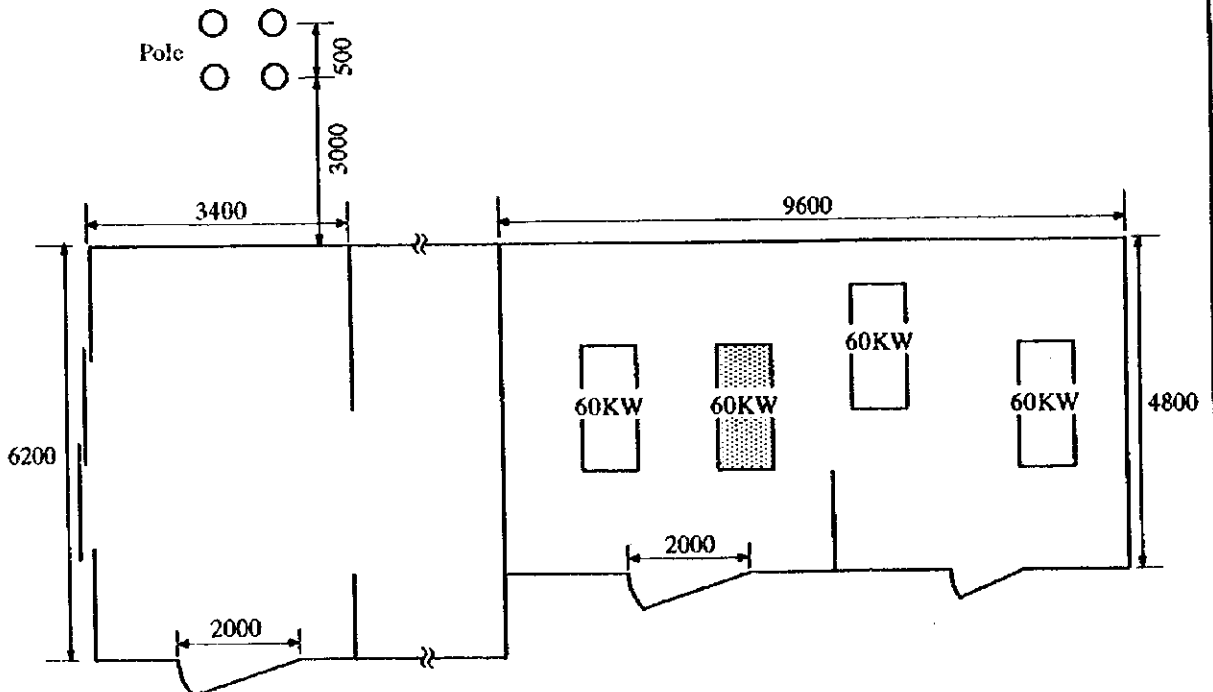
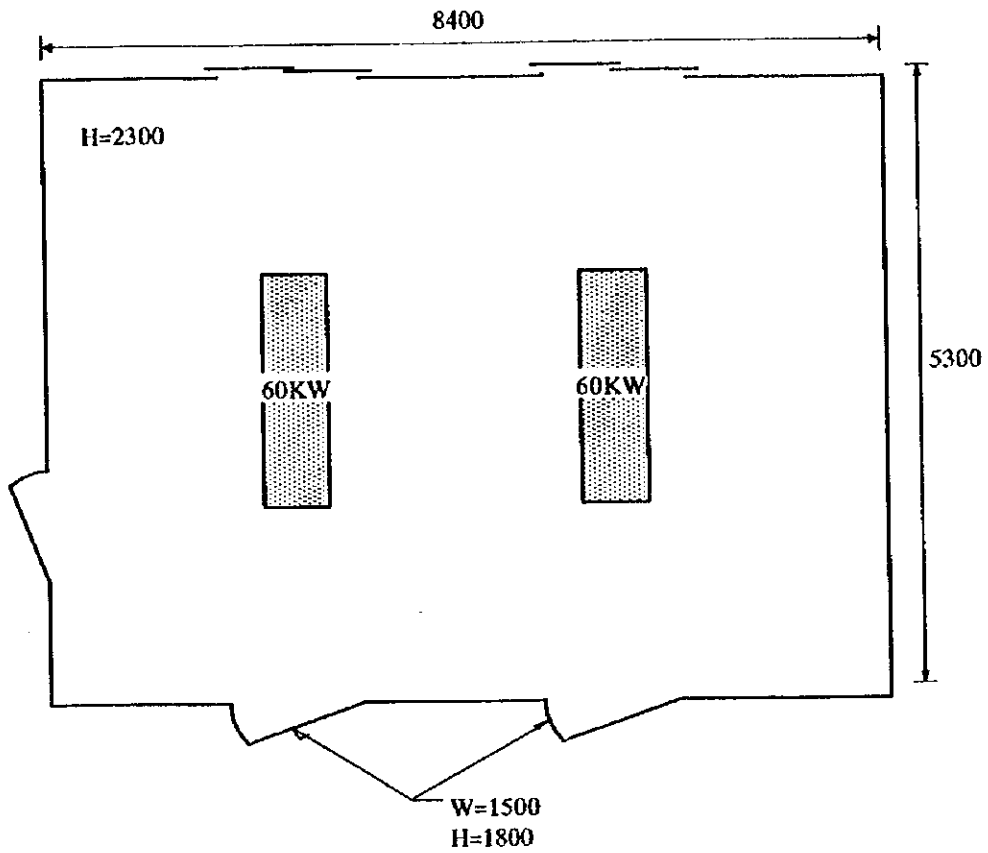


Figure 2.3 - 18 Layout Drawing of Khukhmorit

AIMAG GOBI-ALTAI  
SITE Dariv

Existing Layout



Layout Plan

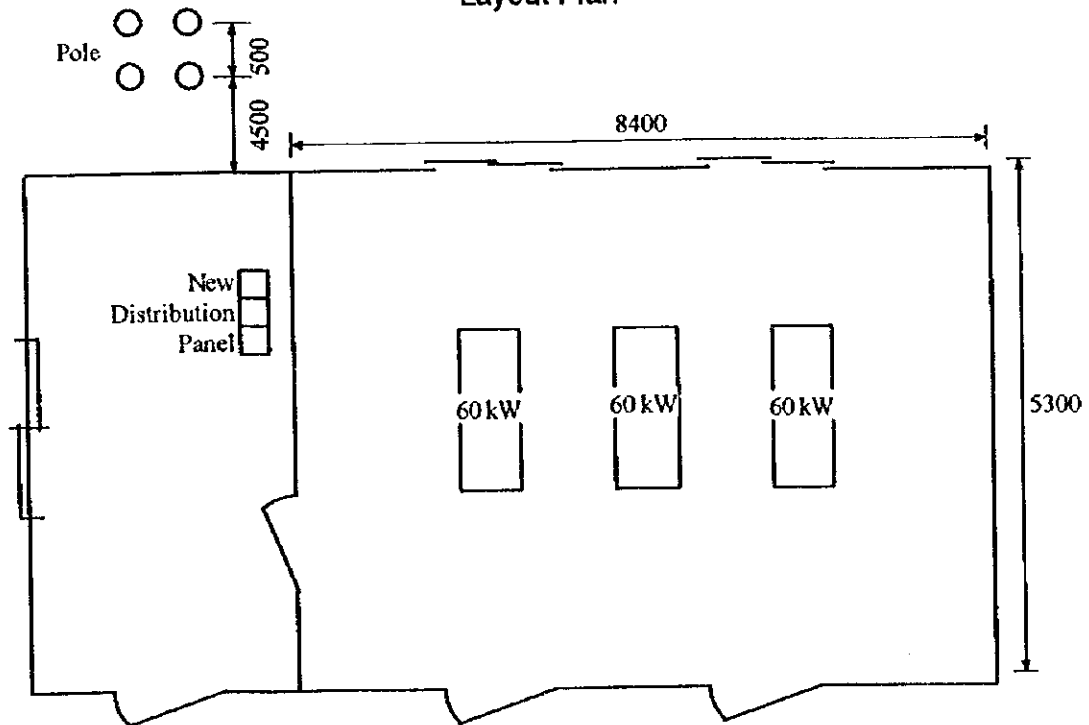
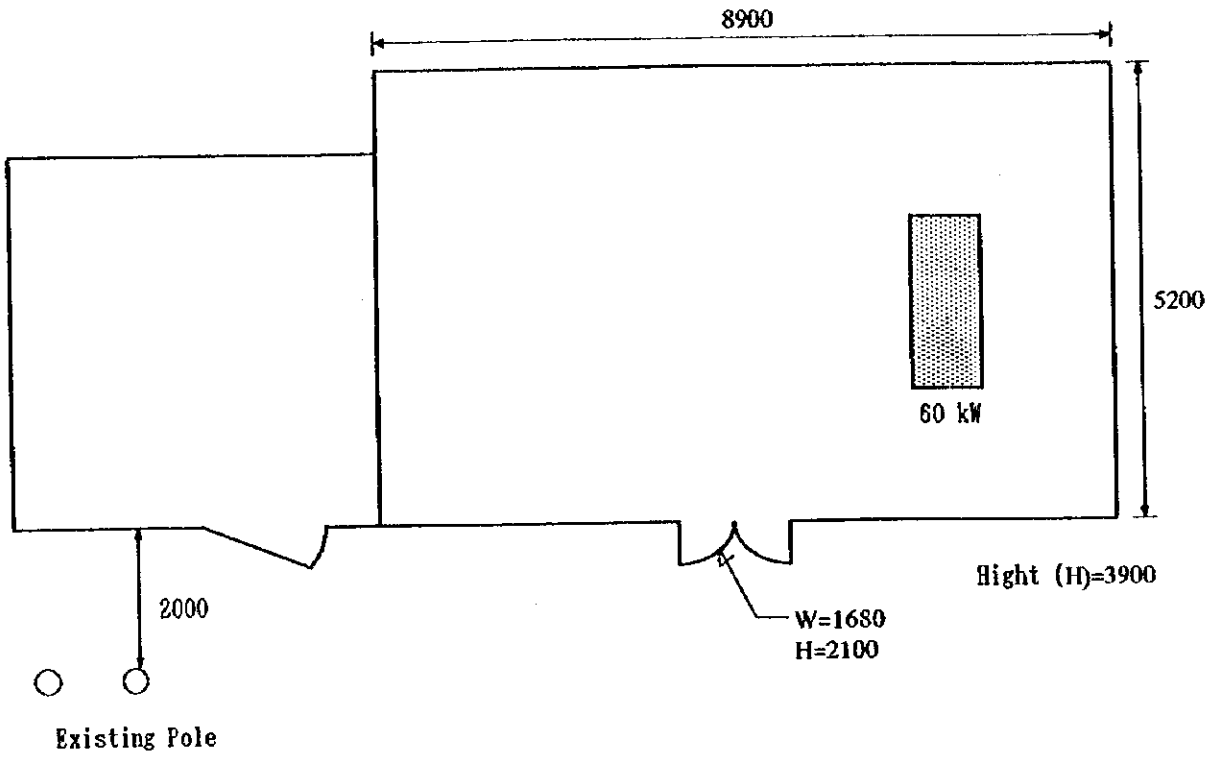


Figure 2.3 - 19 Layout Drawing of Dariv

AIMAG: GOBI-ALTAI  
SITE: Chandamani

### Existing Layout



### Layout Plan

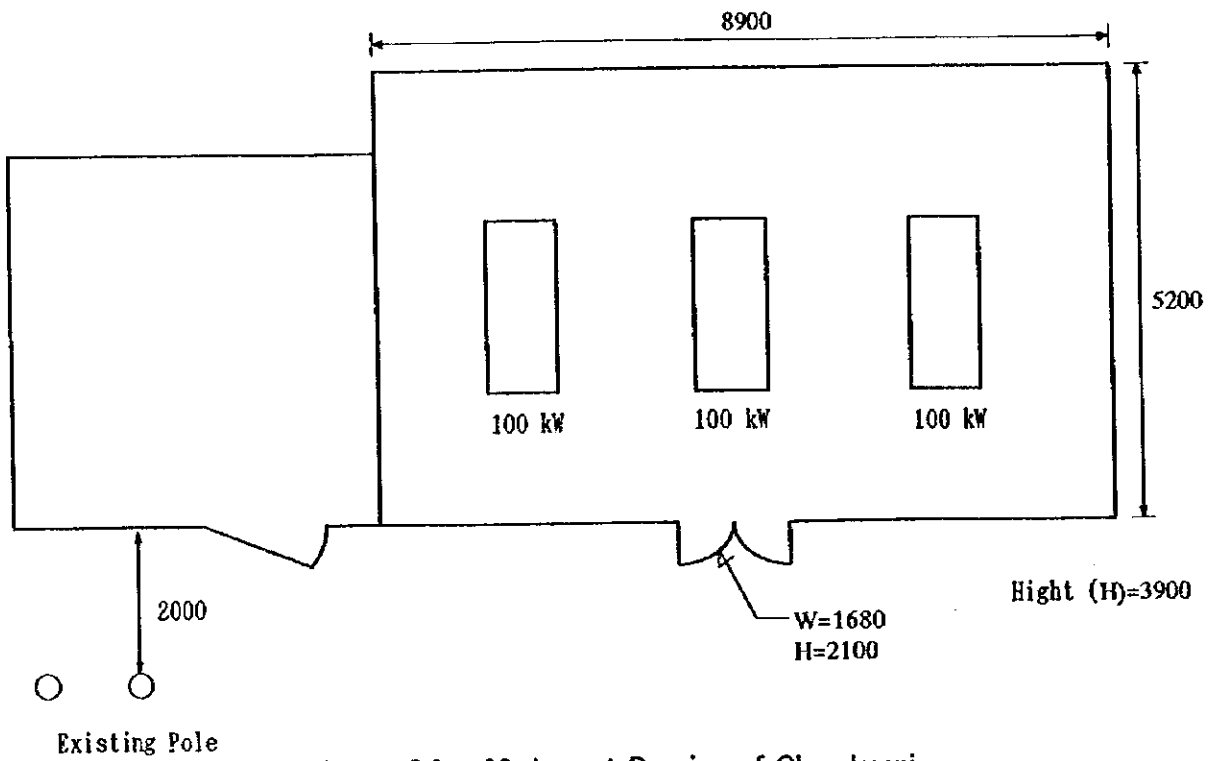
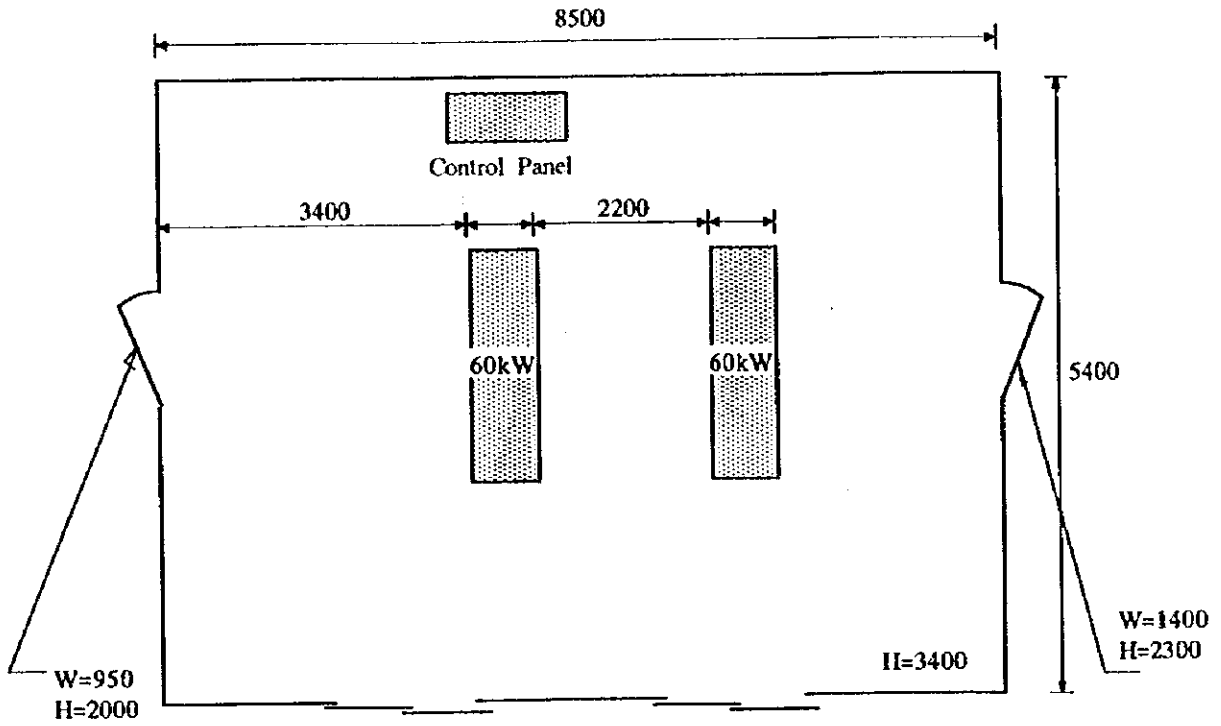


Figure 2.3 - 20 Layout Drawing of Chandamani

AIMAG GOBI-ALTAI  
SITE Tsogt

Existing Layout



Layout Plan

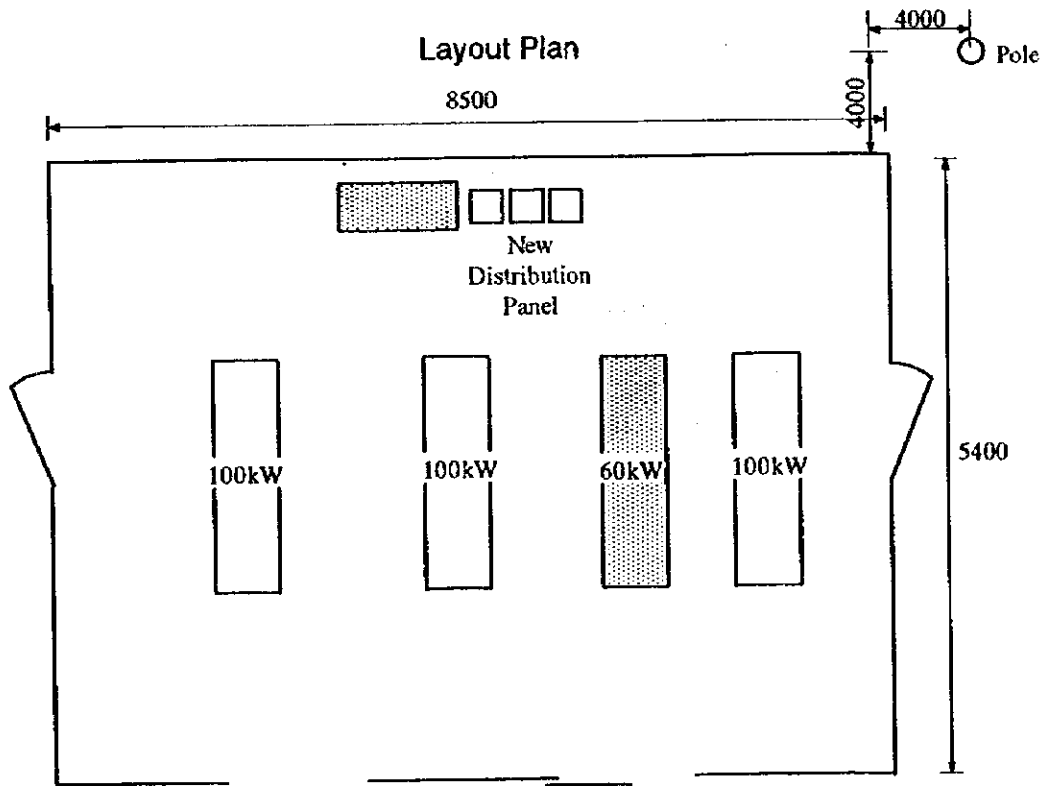
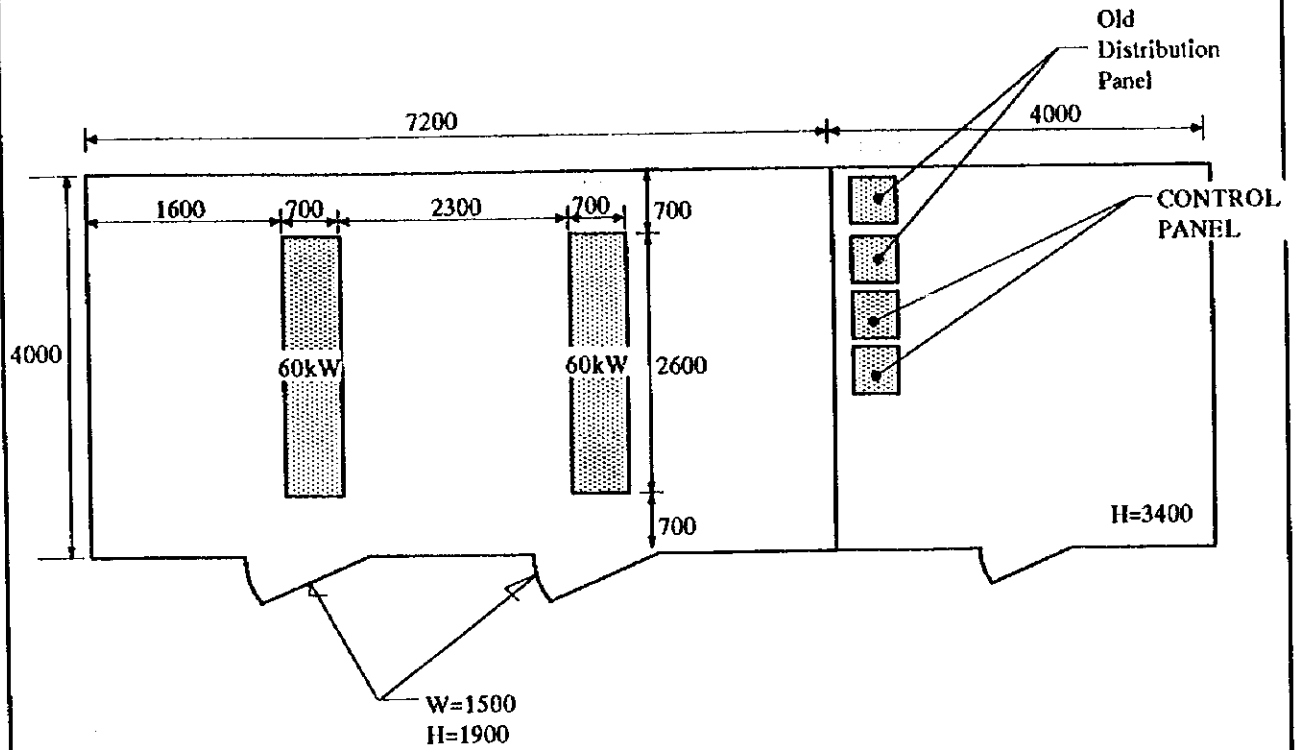


Figure 2.3 - 21 Layout Drawing of Tsogt

AIMAG GOBI-ALTAI  
SITE Tseel

### Existing Layout



### Layout Plan

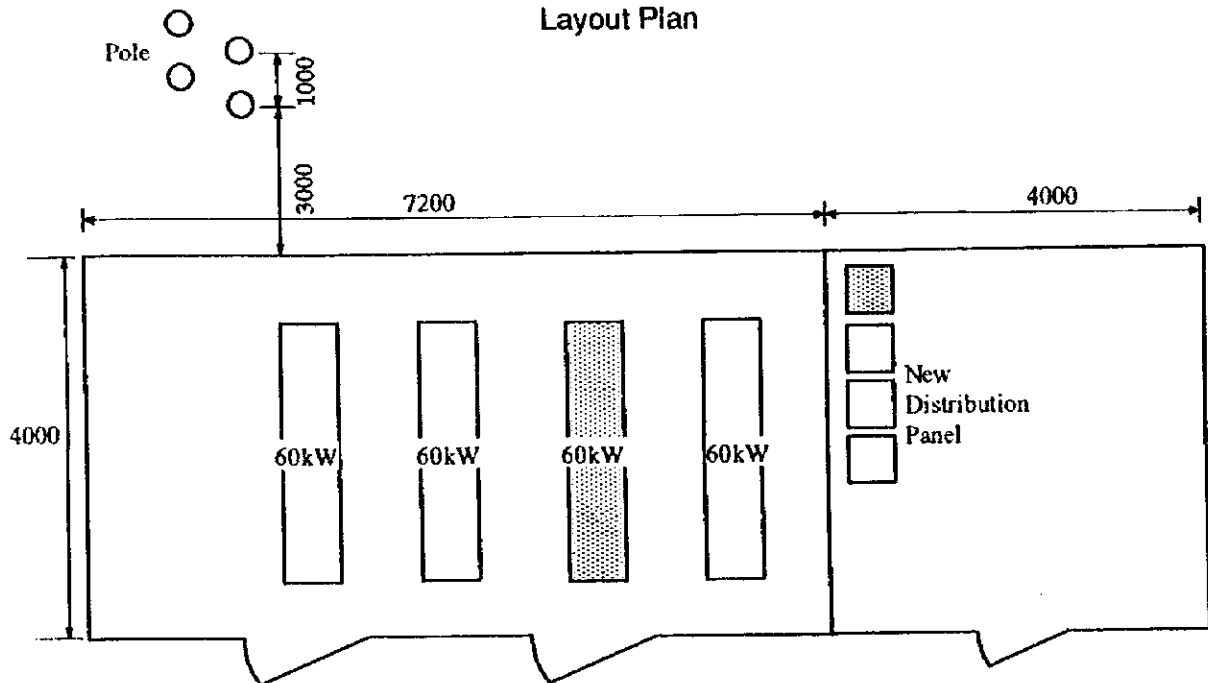
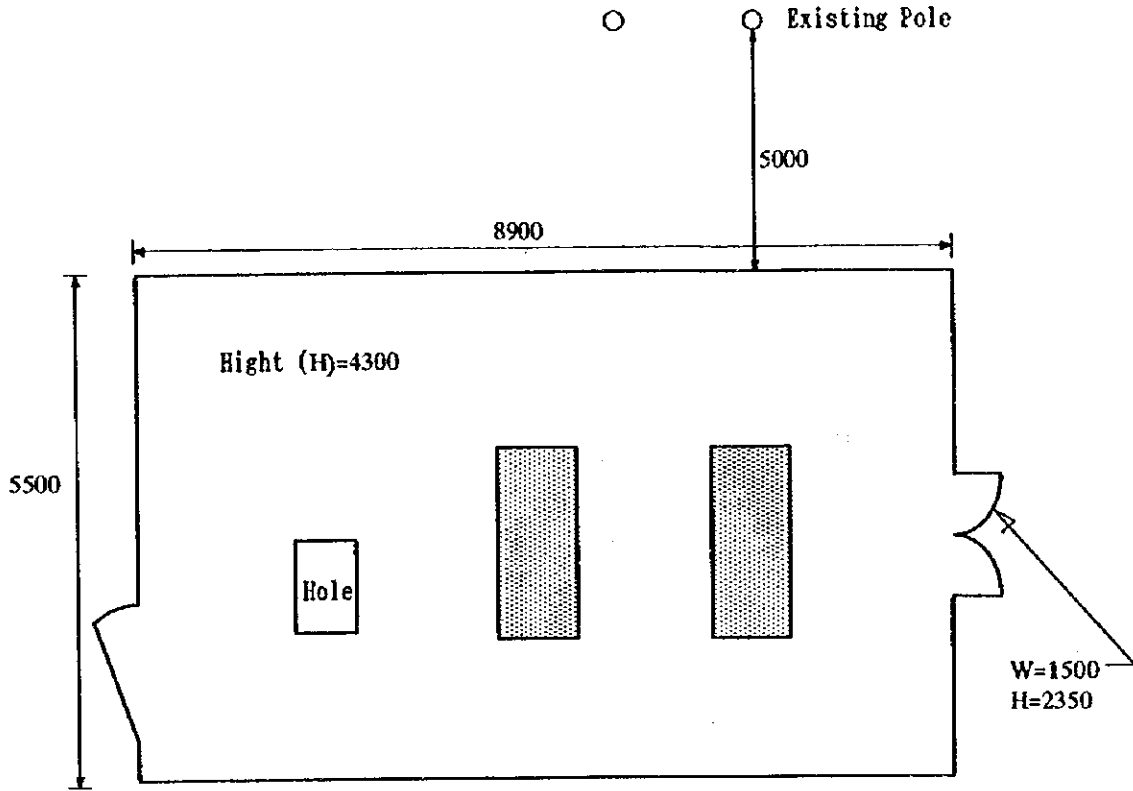


Figure 2.3 - 22 Layout Drawing of Tseel

AIMAG: GOBI-ALTAI  
SITE: Erdene

Existing Layout



Layout Plan

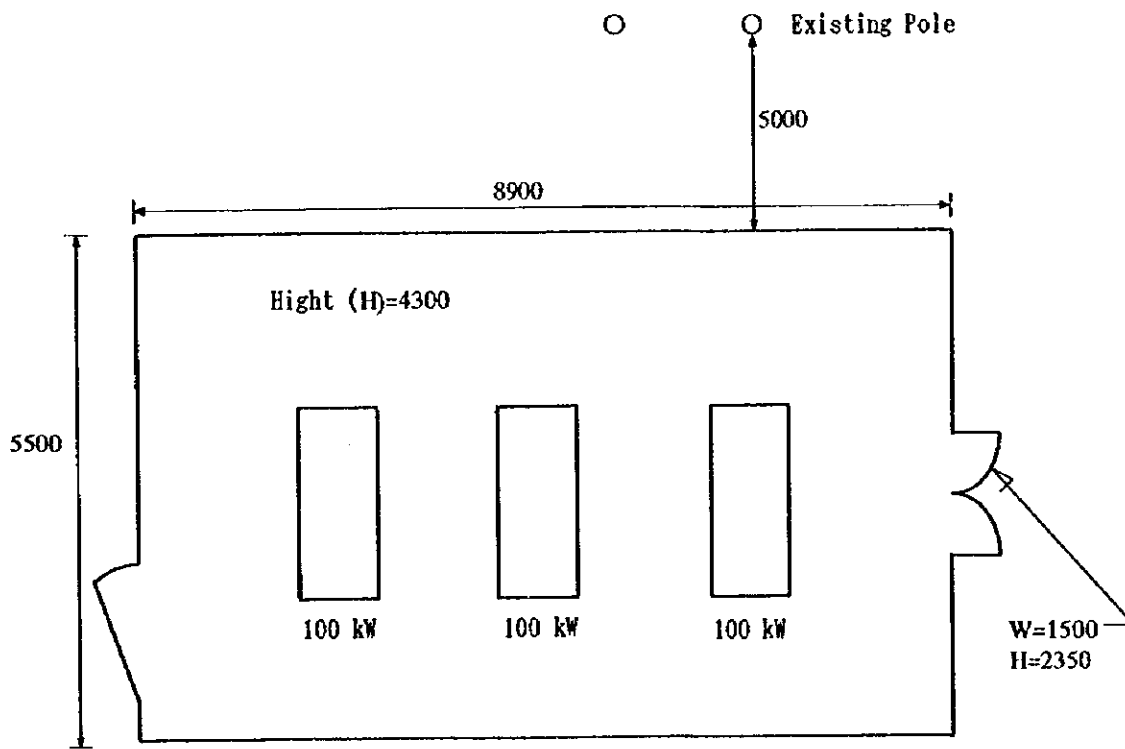
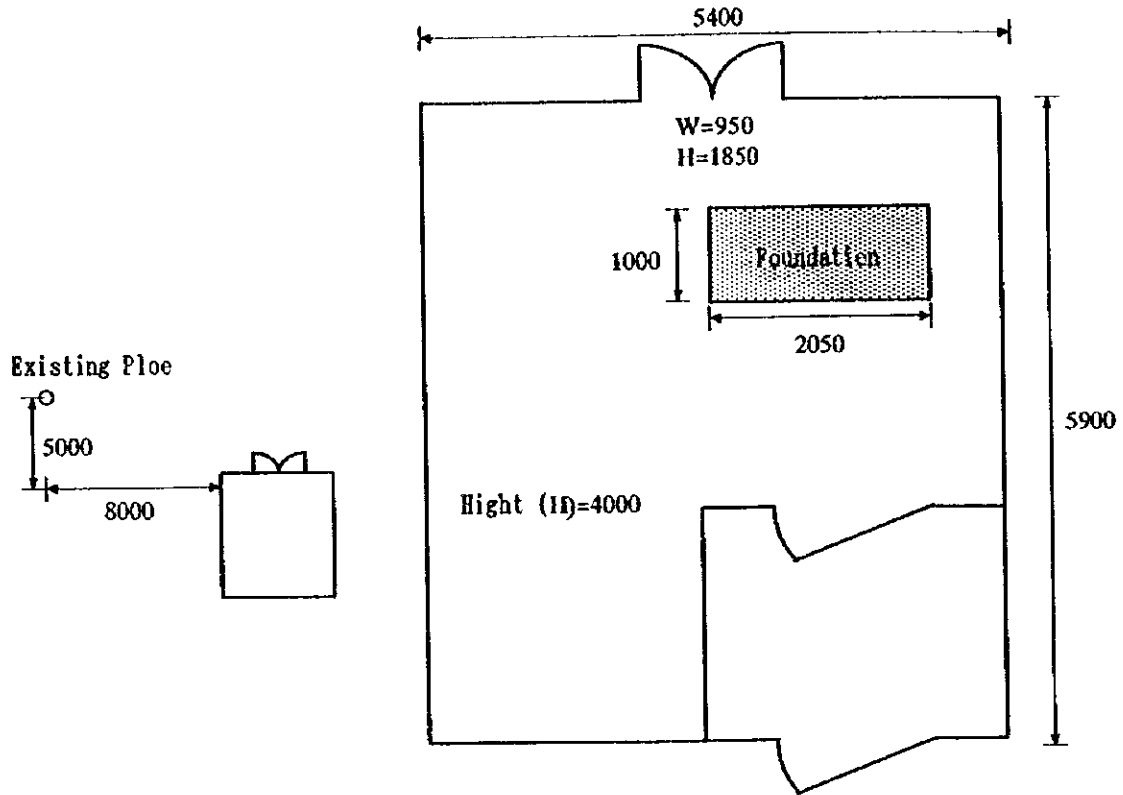


Figure 2.3 - 23 Layout Drawing of Erdene



AIMAG: DORNOGOBI  
SITE : Huvsgel

### Existing Layout



### Layout Plan

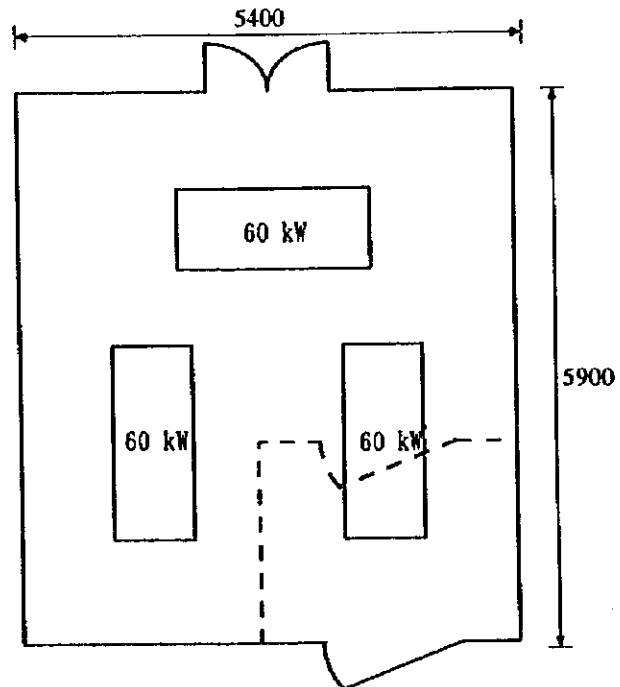
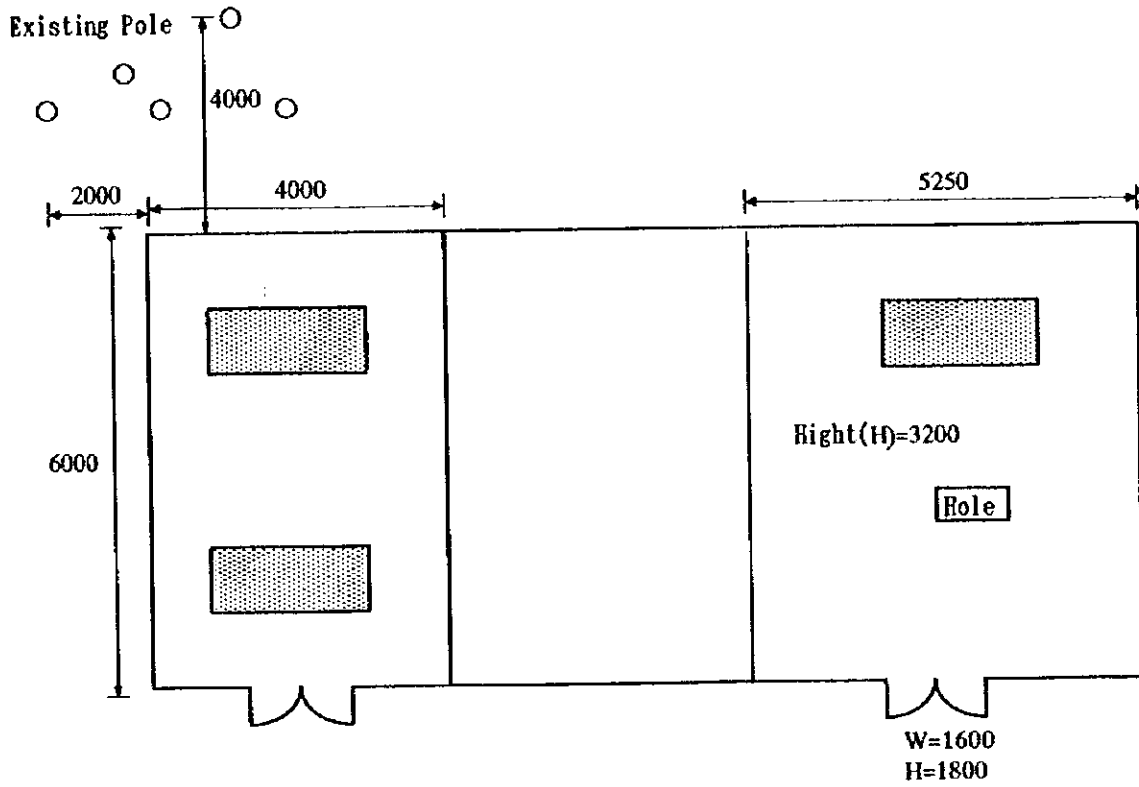


Figure 2.3 - 24 Layout Drawing of Khuvsgel

AIMAG: DORNOGOBI  
SITE: Khatanbulag

### Existing Layout



### Layout Plan

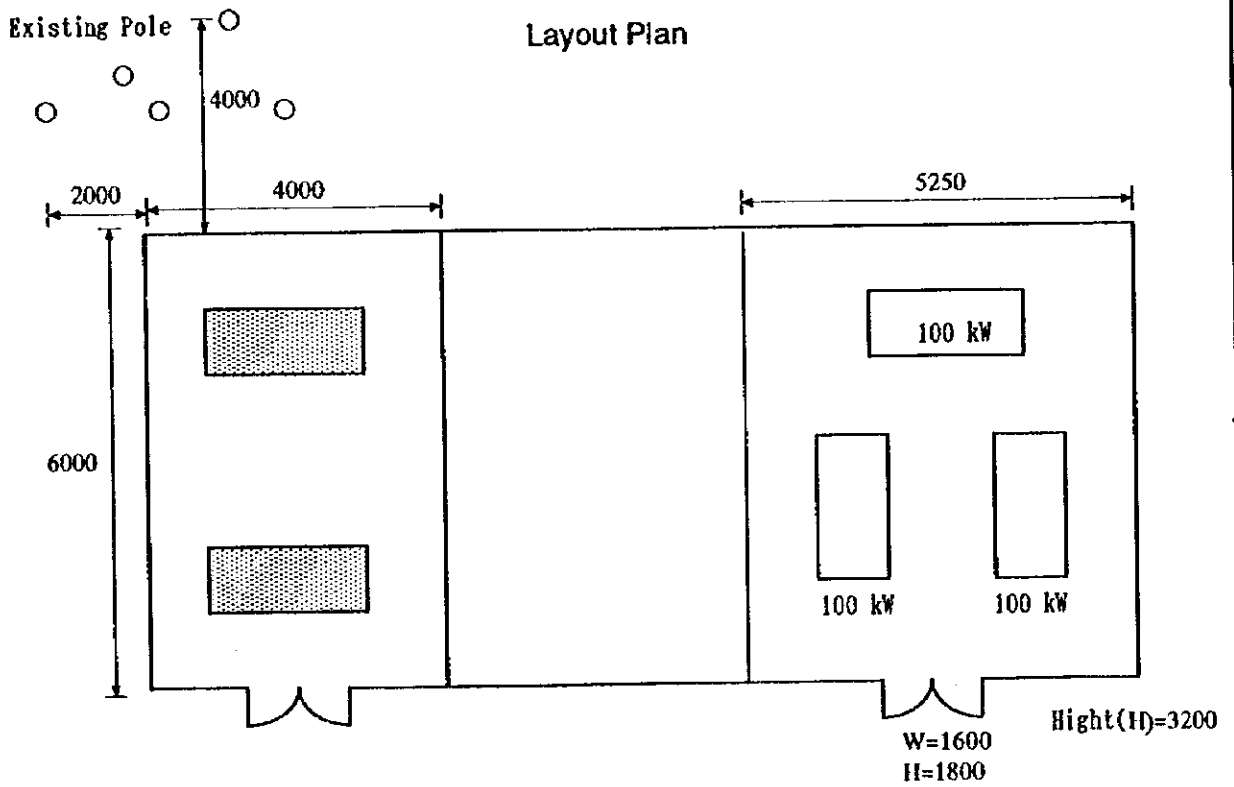
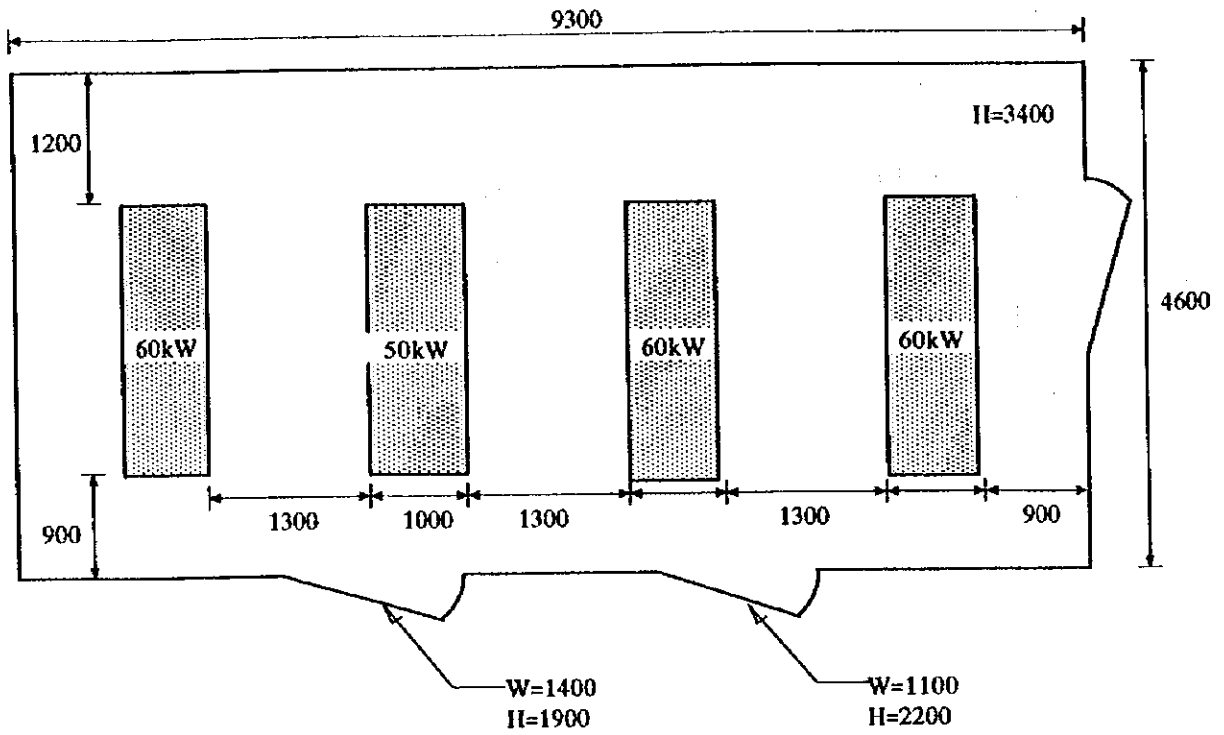


Figure 2.3 - 25 Layout Drawing of Khatanbulag

AIMAG ZAVKHAN  
SITE Tsetsen-Uul

### Existing Layout



### Layout Plan

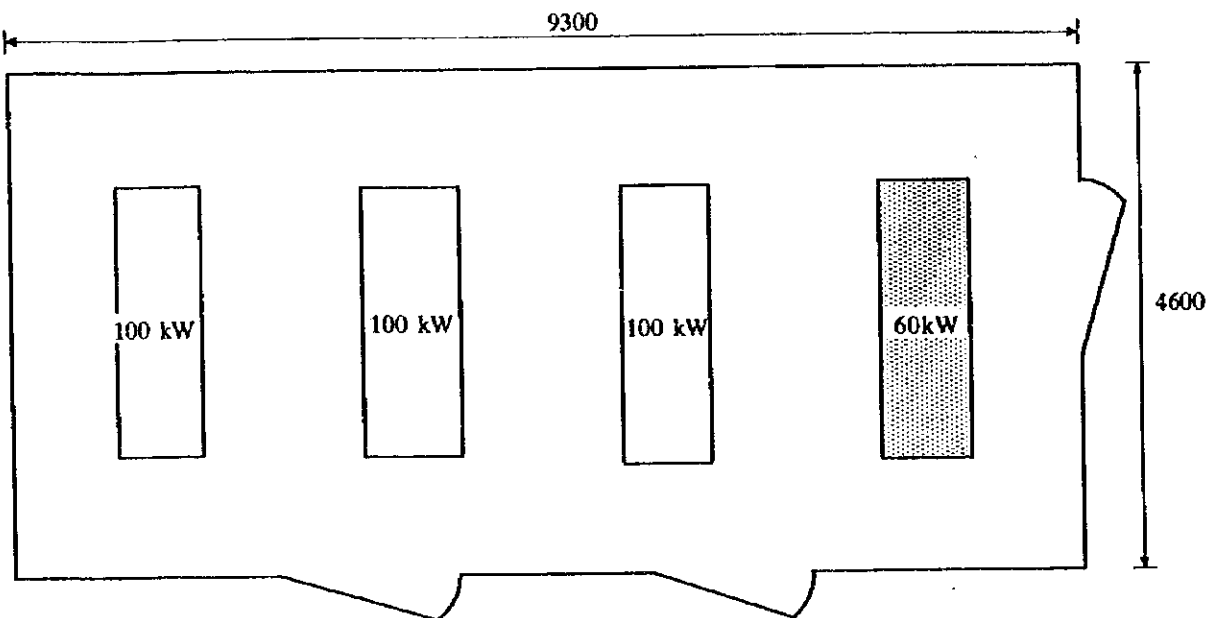
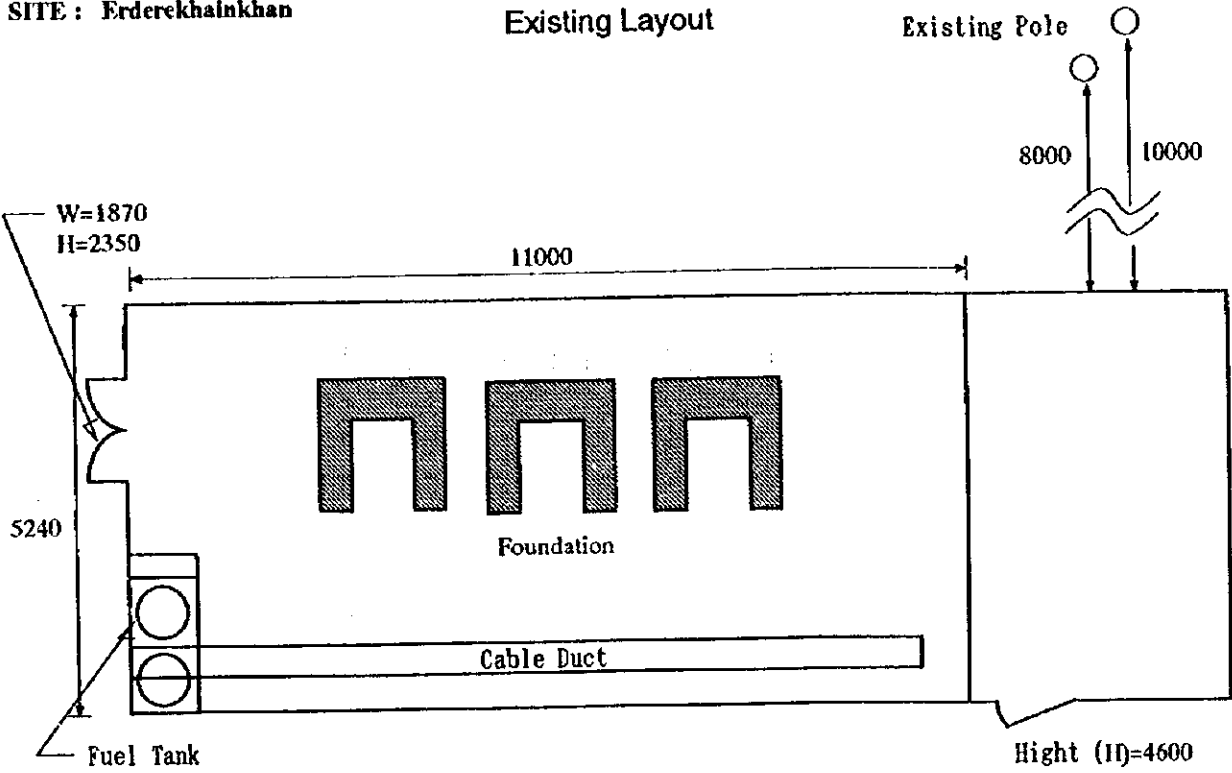


Figure 2.3 - 26 Layout Drawing of Tsetsen-Uul

AIMAG: ZAVKHIAN  
SITE : Erderekhainkhan

Existing Layout

Existing Pole



Layout Plan

Existing Pole

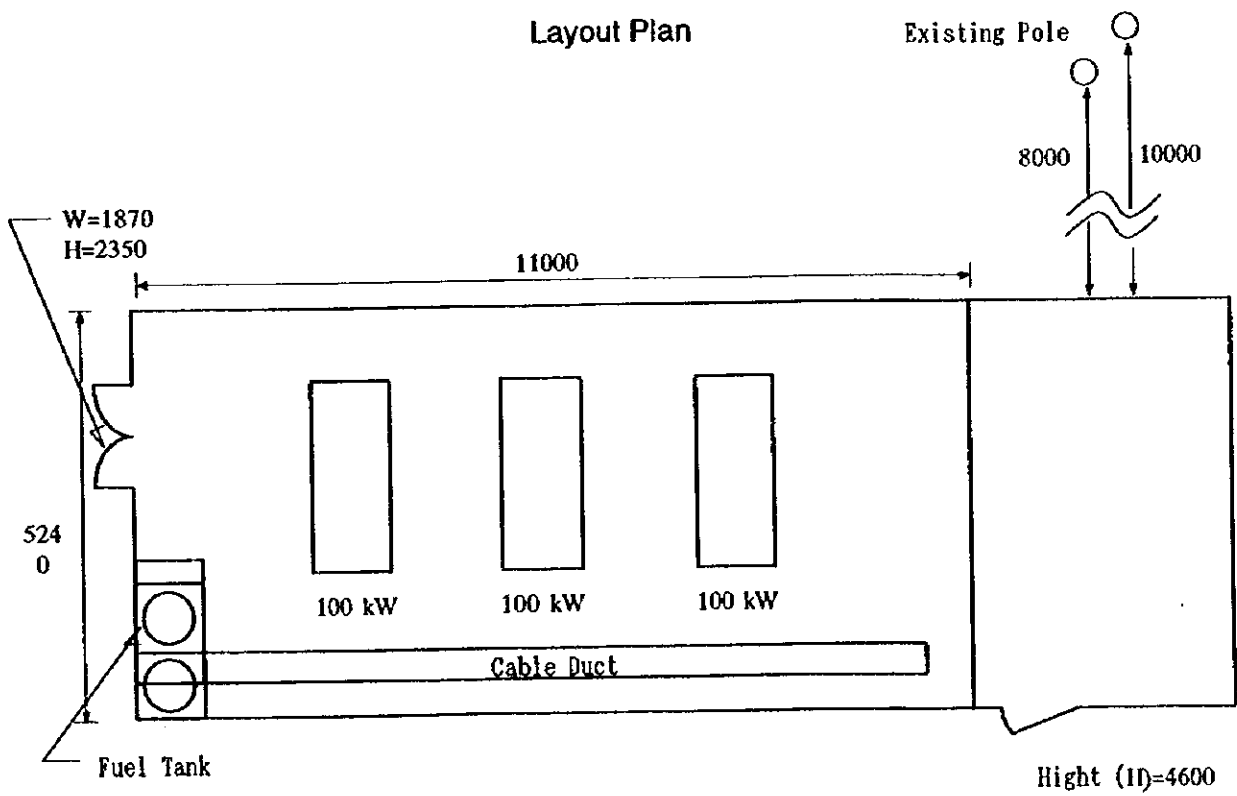
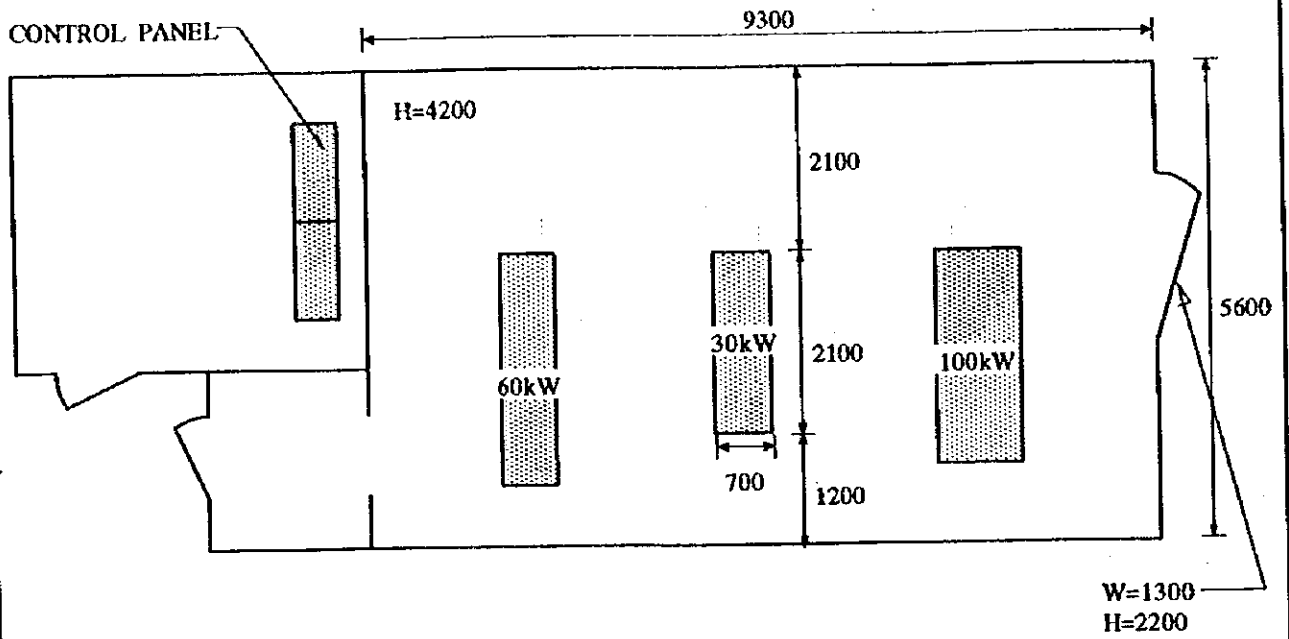


Figure 2.3 - 27 Layout Drawing of Erdenehairkhan

AIMAG ZAVKHAN  
SITE Songino

### Existing Layout



### Layout Plan

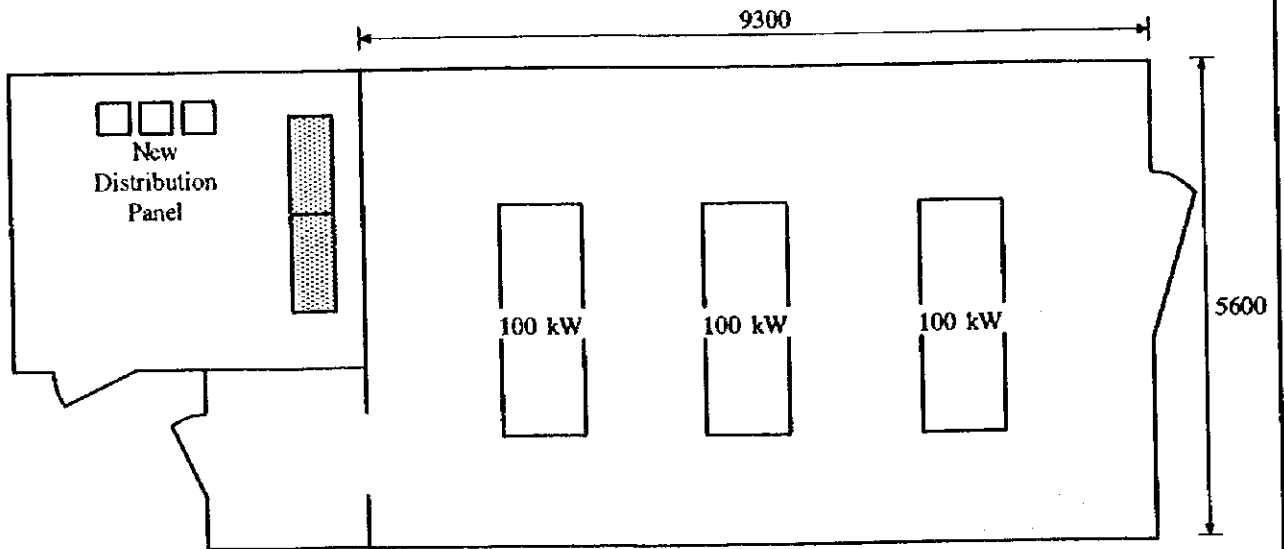
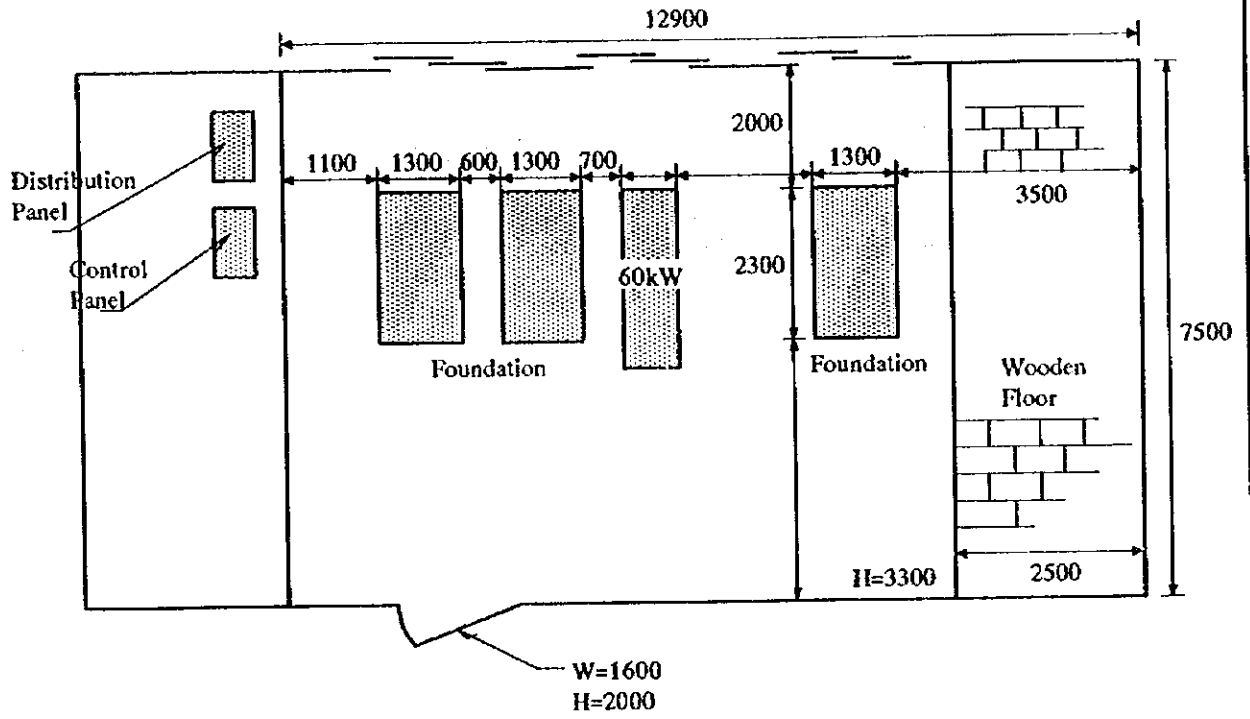


Figure 2.3 - 28 Layout Drawing of Songino

AIMAG ZAVKHAN  
SITE Numreg

### Existing Layout



### Layout Plan

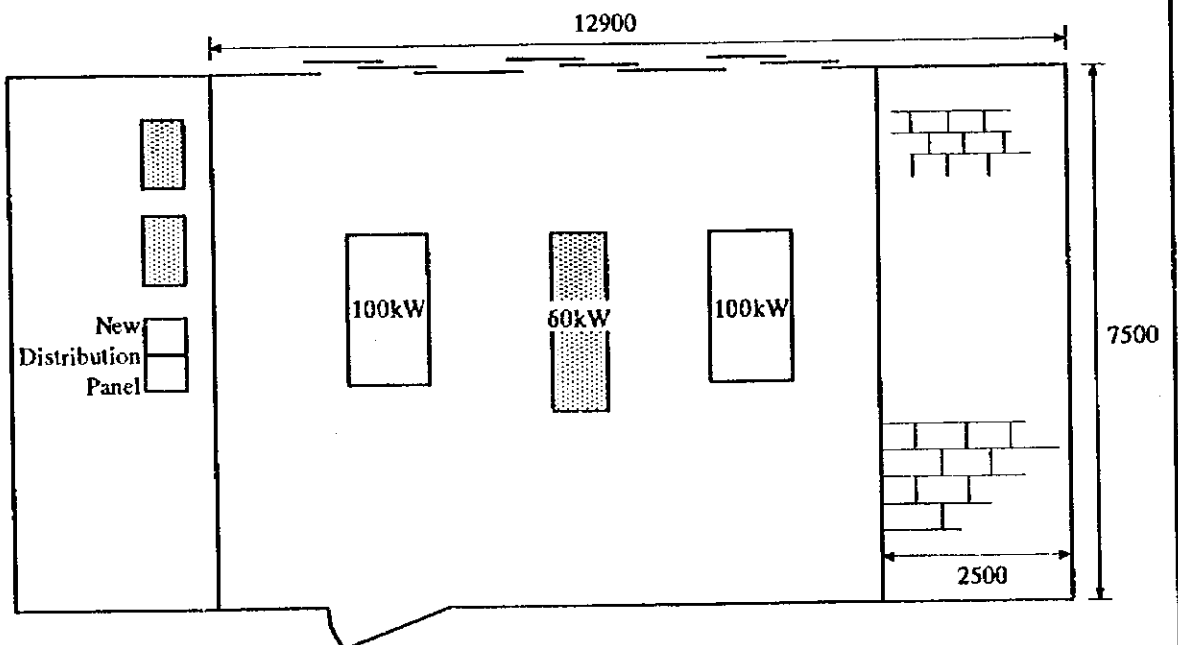
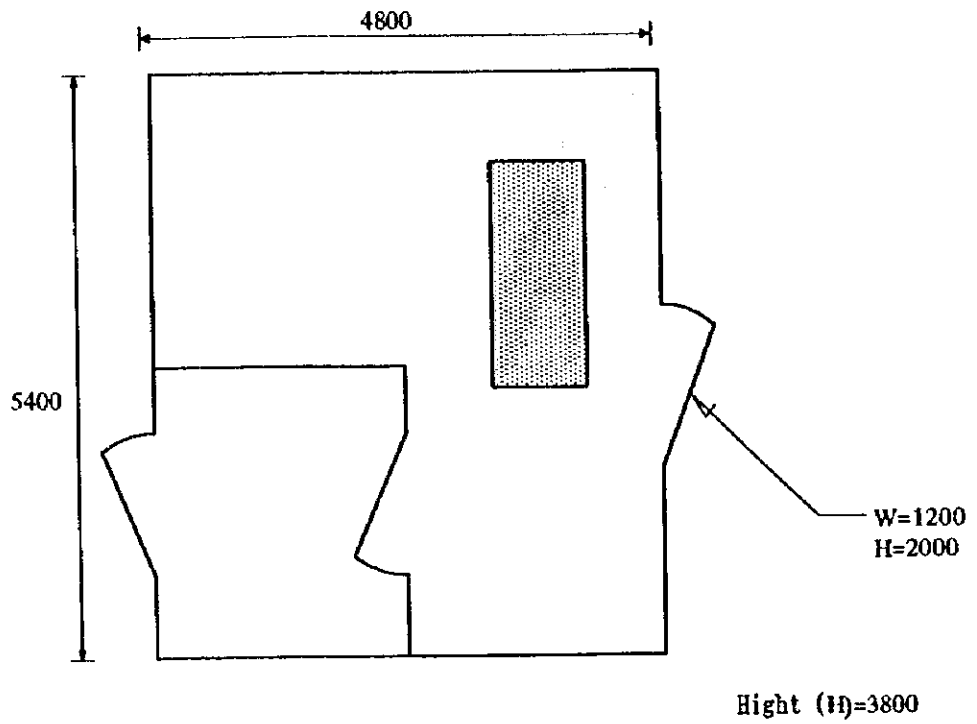


Figure 2.3 - 29 Layout Drawing of Numreg

AIMAG: ZAVKHAN  
SITE: Zavkhanmandal

### Existing Layout



### Layout Plan

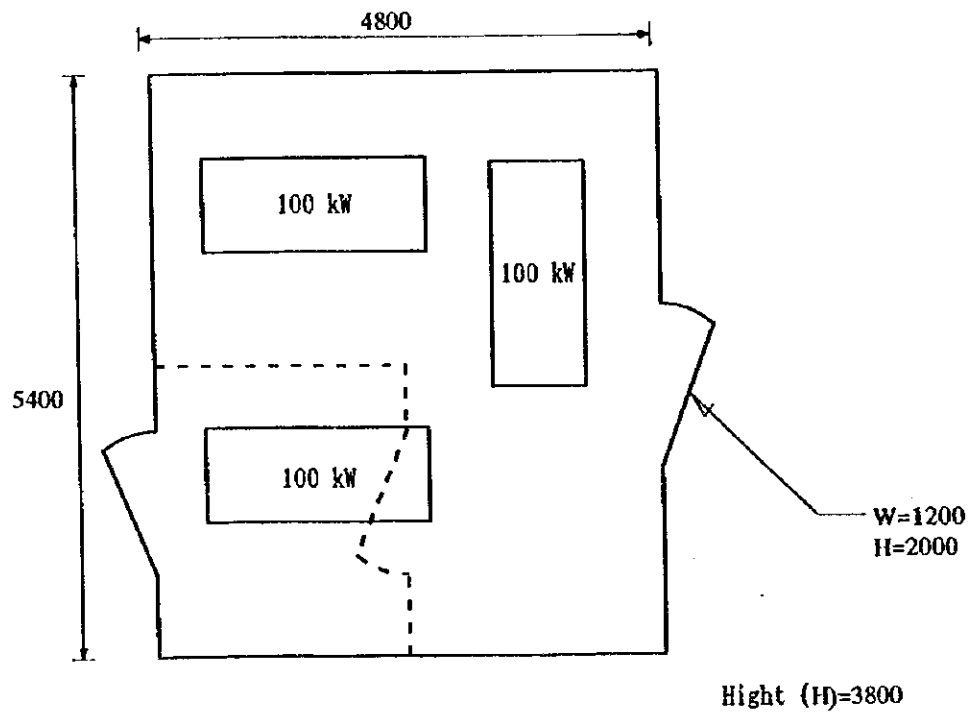
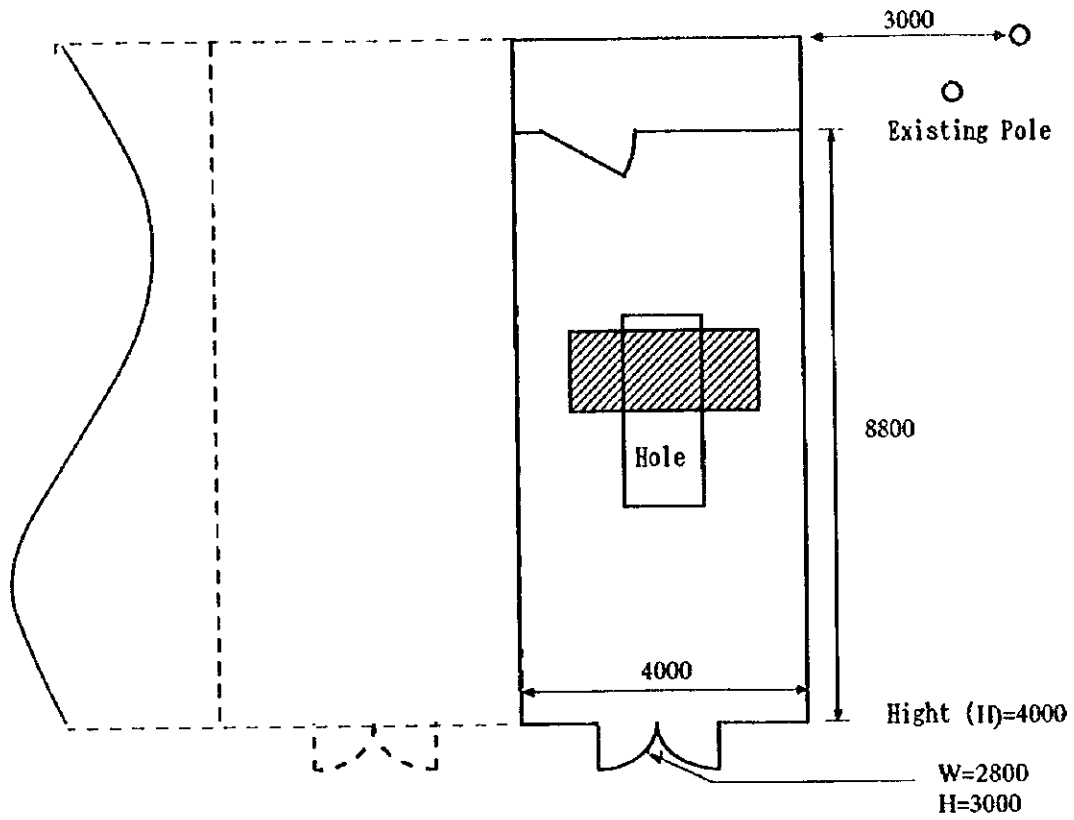


Figure 2.3 - 30 Layout Drwaing of Zavkhanmandal

AIMAG: ZAVKHAN  
SITE : Santamargats

### Existing Layout



### Layout Plan

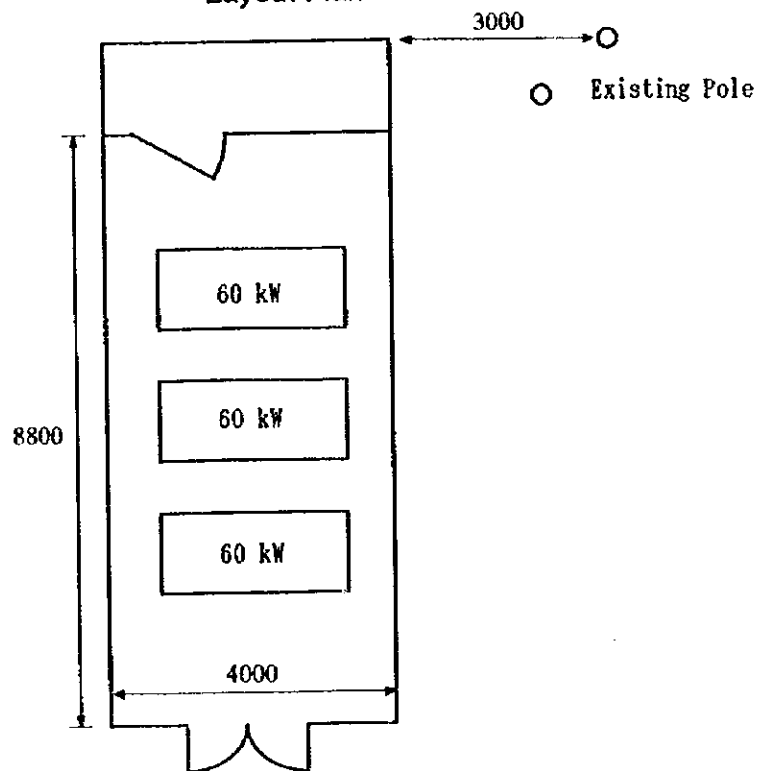
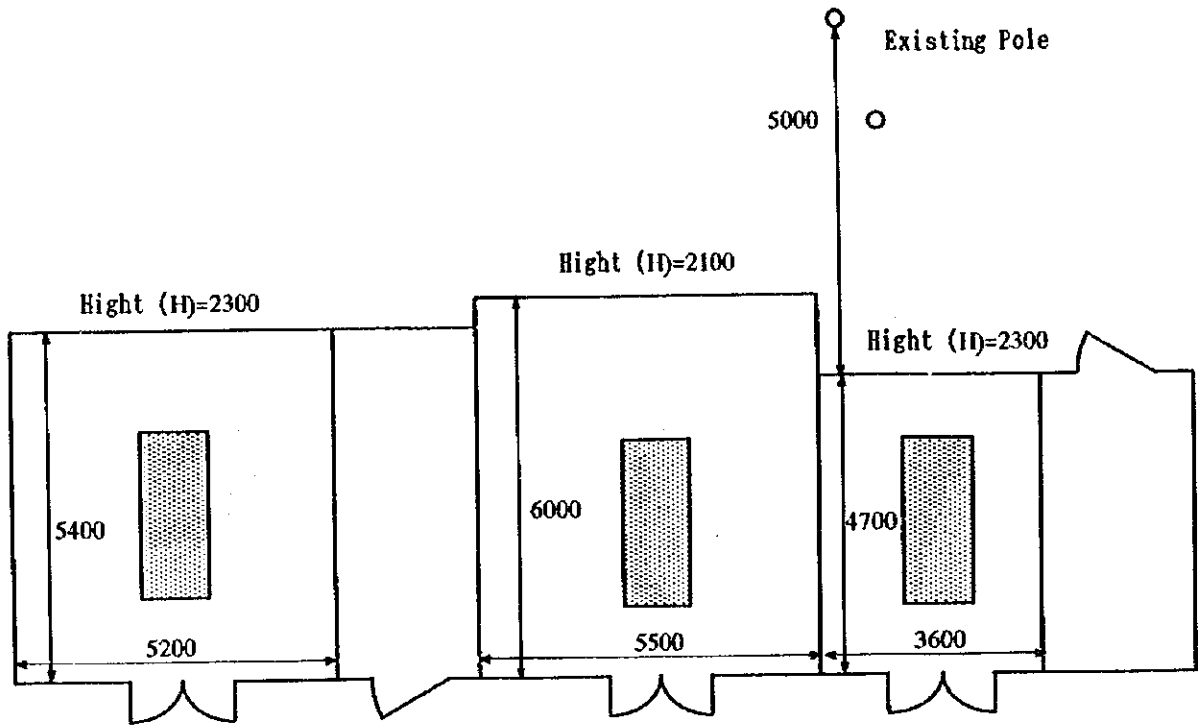


Figure 2.3 - 31 Layout Drawing of Santmargats



AIMAG: ZAVKHAN  
SITE: Urgamal

### Existing Layout



### Layout Plan

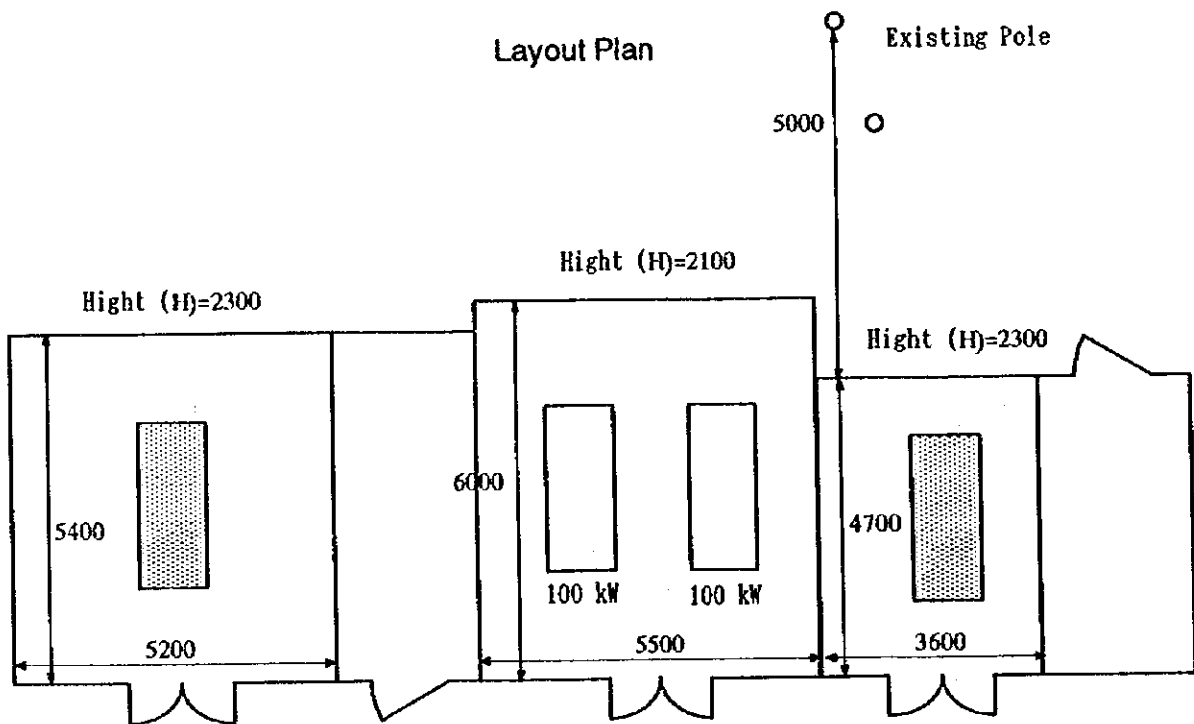
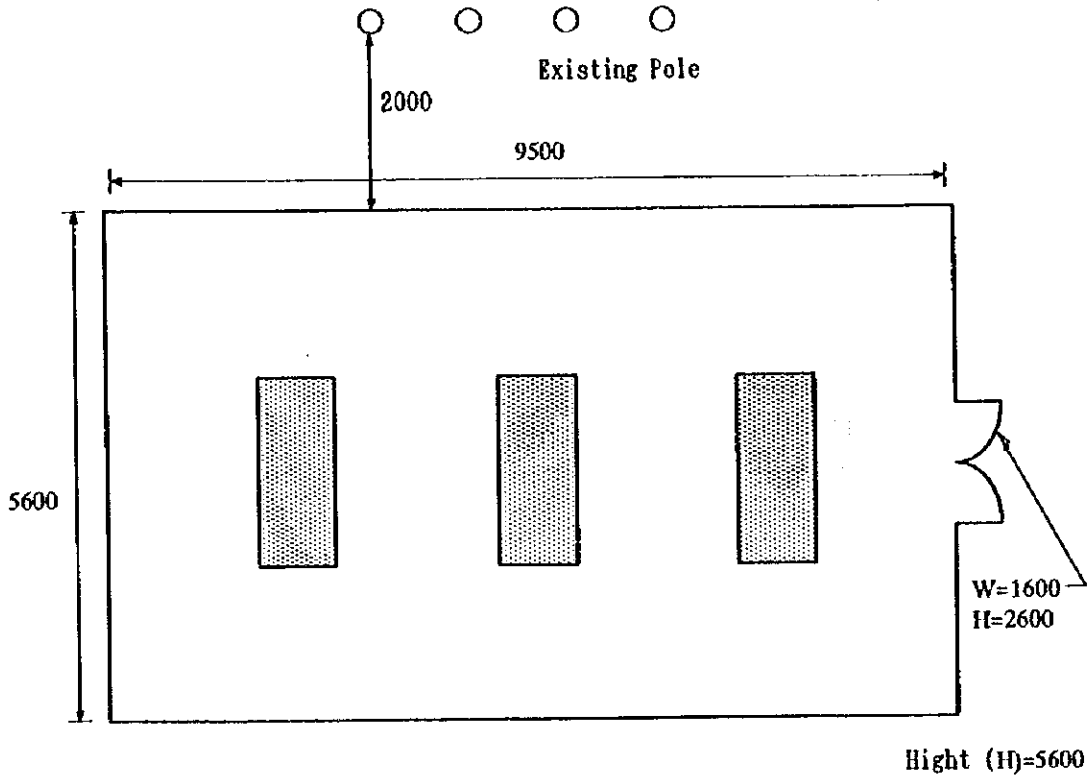


Figure 2.3 - 32 Layout Drawing of Urgamal

AIMAG: ZAVKHAN  
SITE: Durveljin

### Existing Layout



### Layout Plan

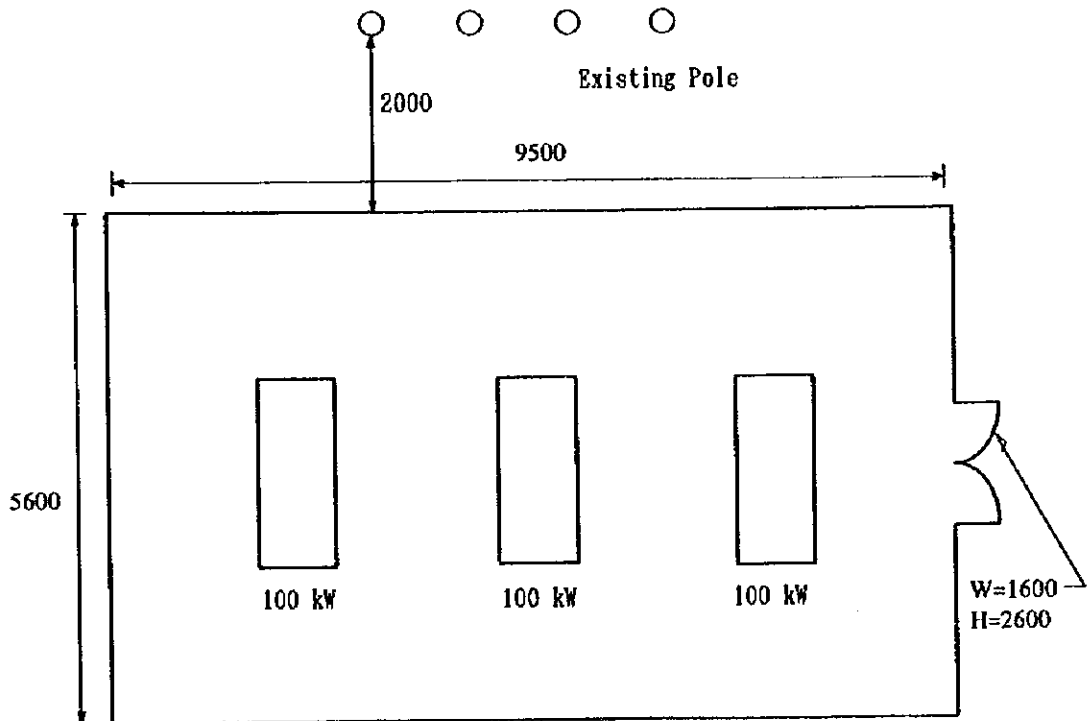
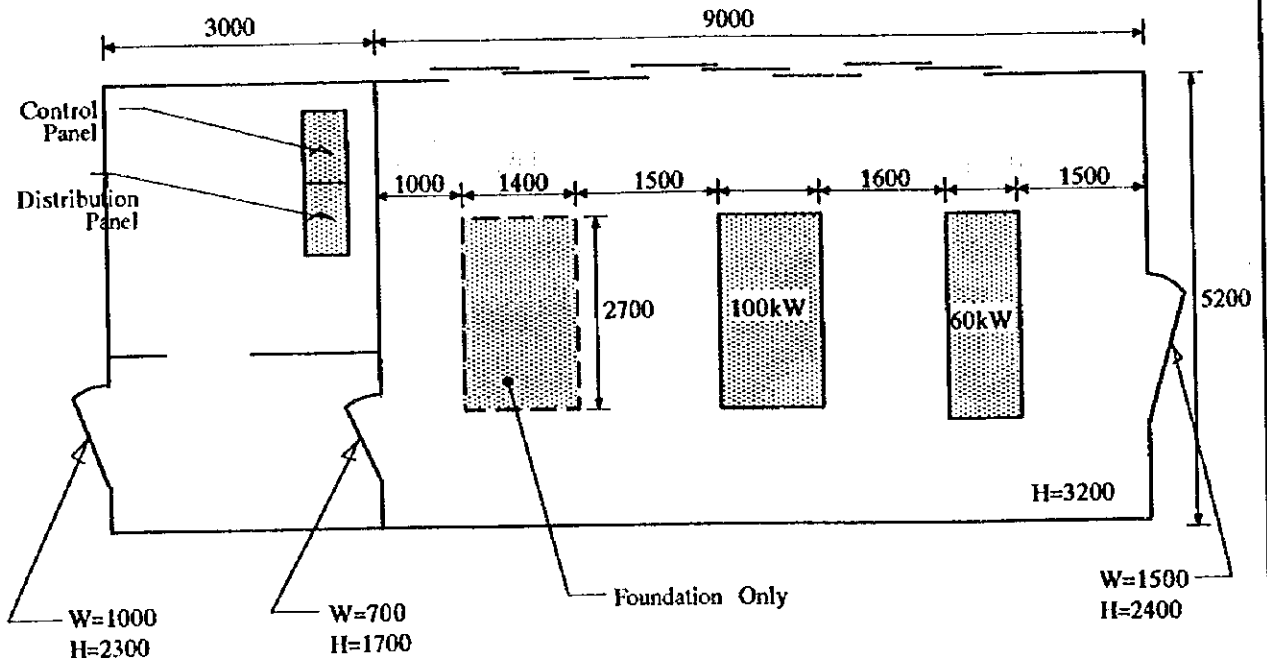


Figure 2.3 - 33 Layout Drawing of Dervejin

AIMAG ZAVKIIAN  
SITE Ider

Existing Layout



Layout Plan

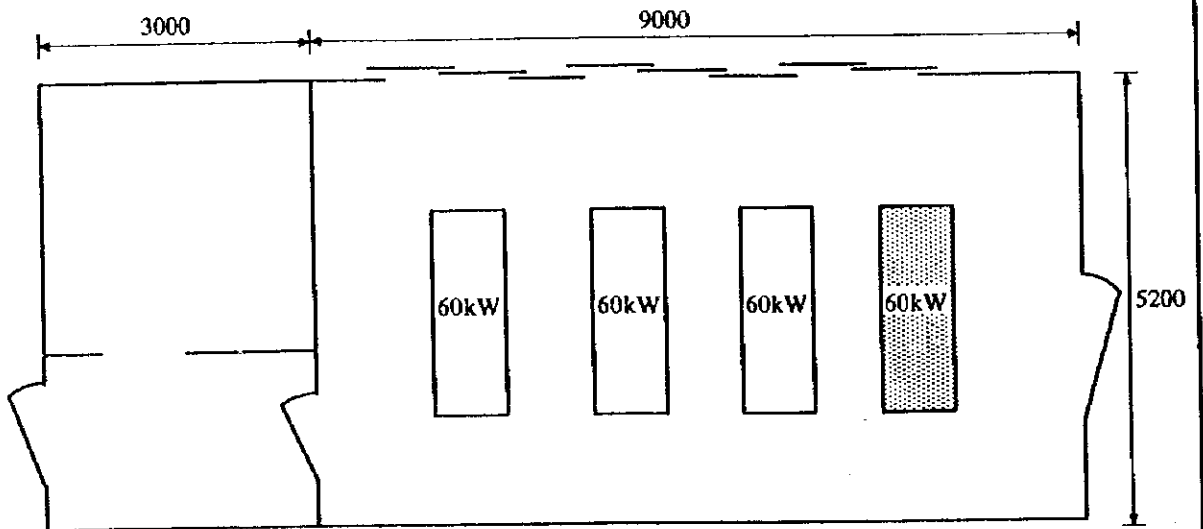
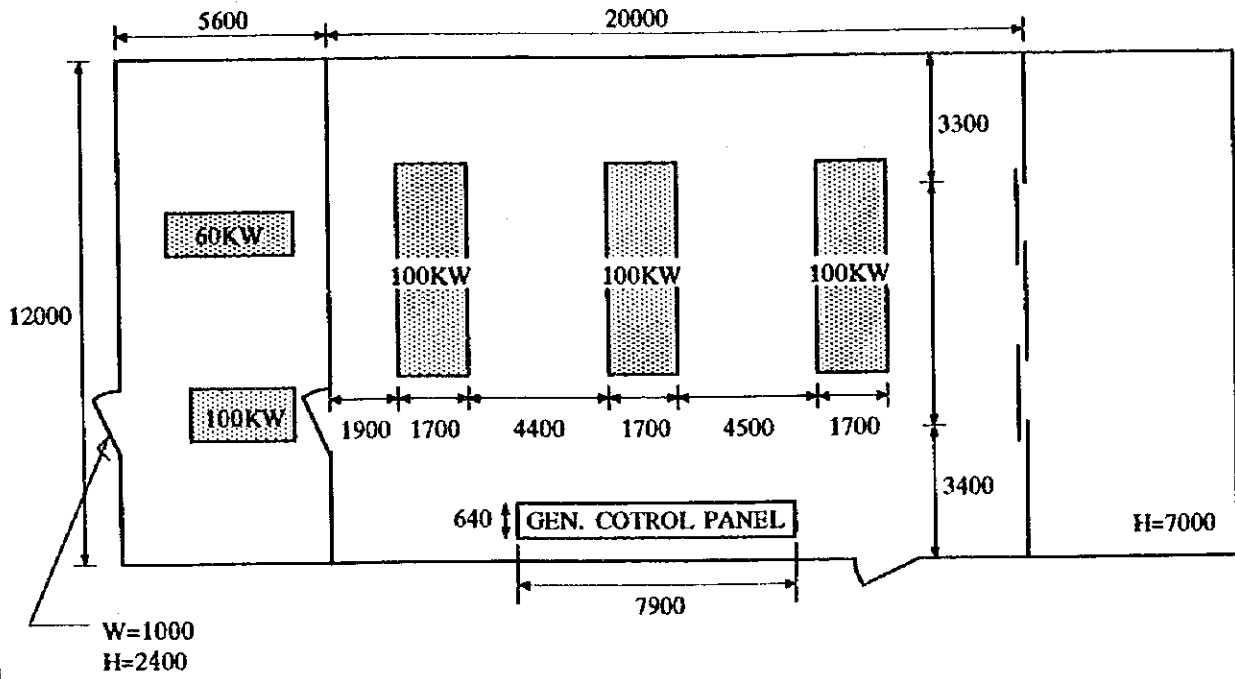


Figure 2.3 - 34 Layout Drawing of Ider

AIMAG ZAVKHAN  
SITE Tes

Existing Layout



Layout Plan

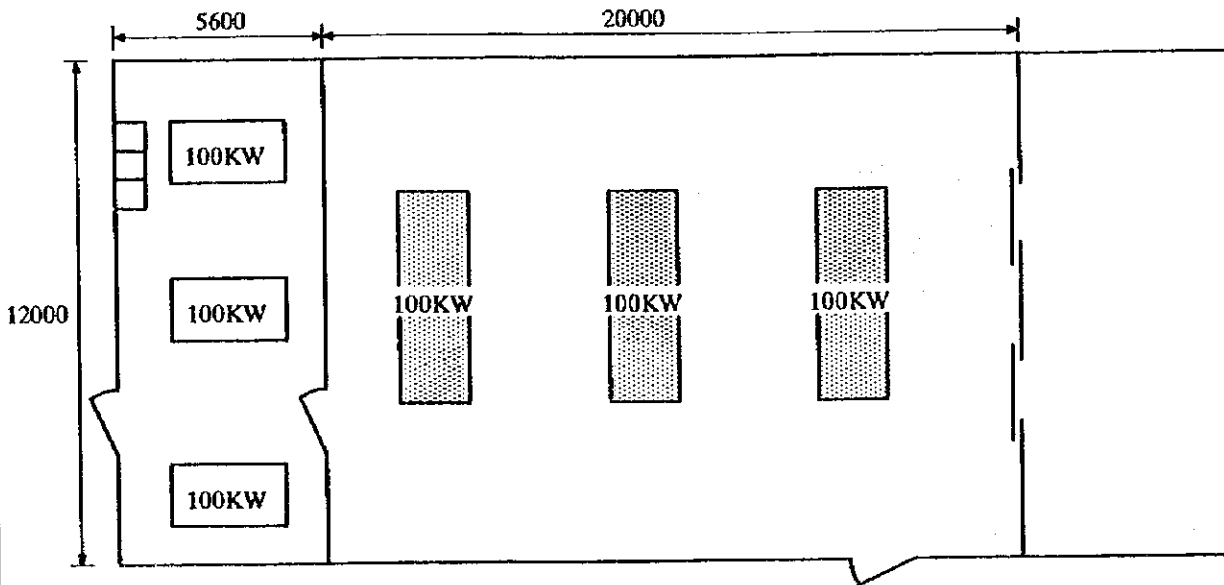
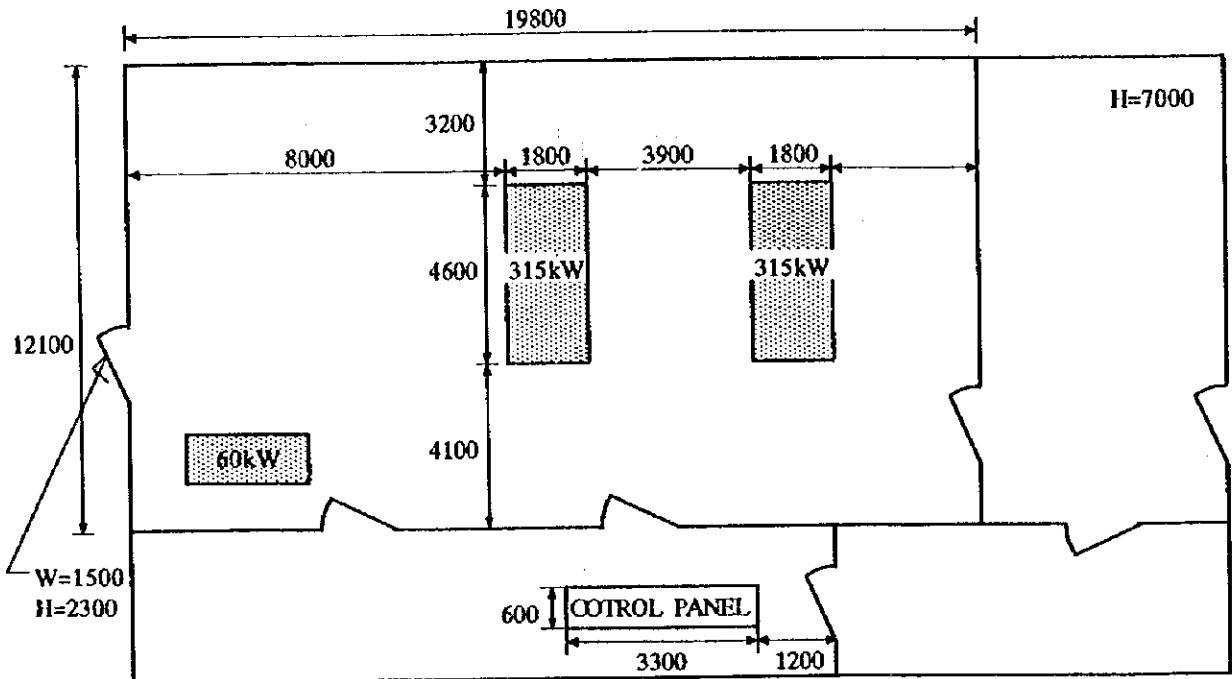


Figure 2.3 - 35 Layout Drawing of Tes

AIMAG ZAVKHIAN  
SITE Asgat

### Existing Layout



### Layout Plan

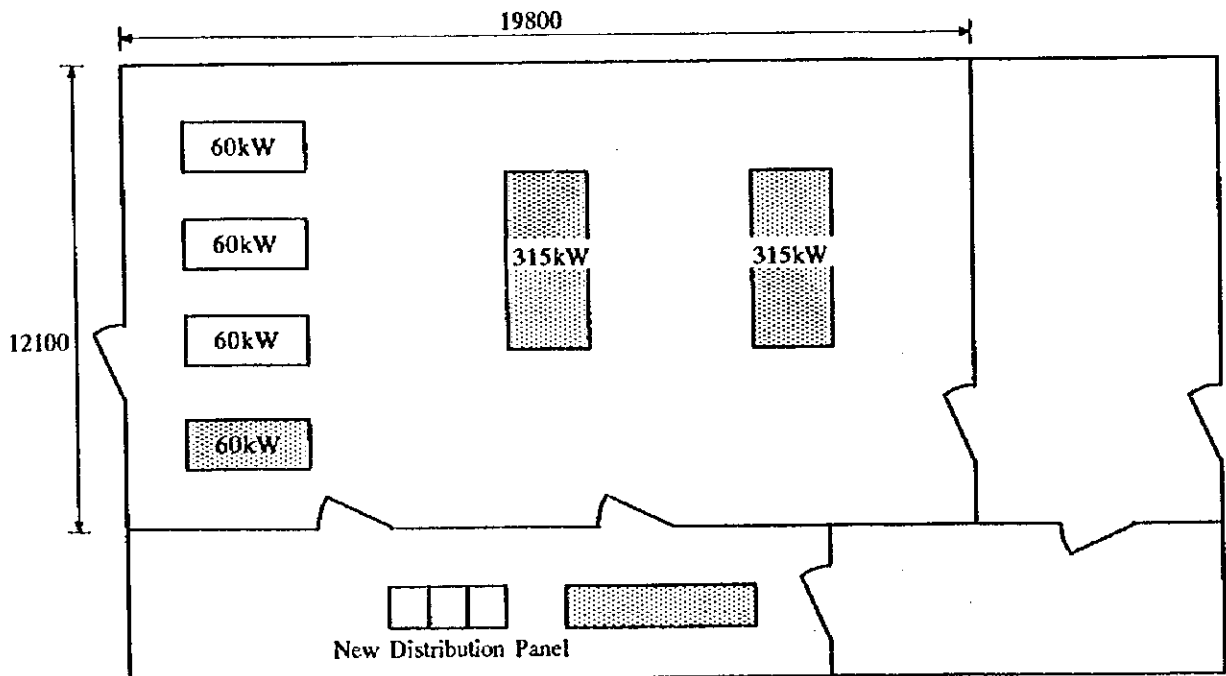
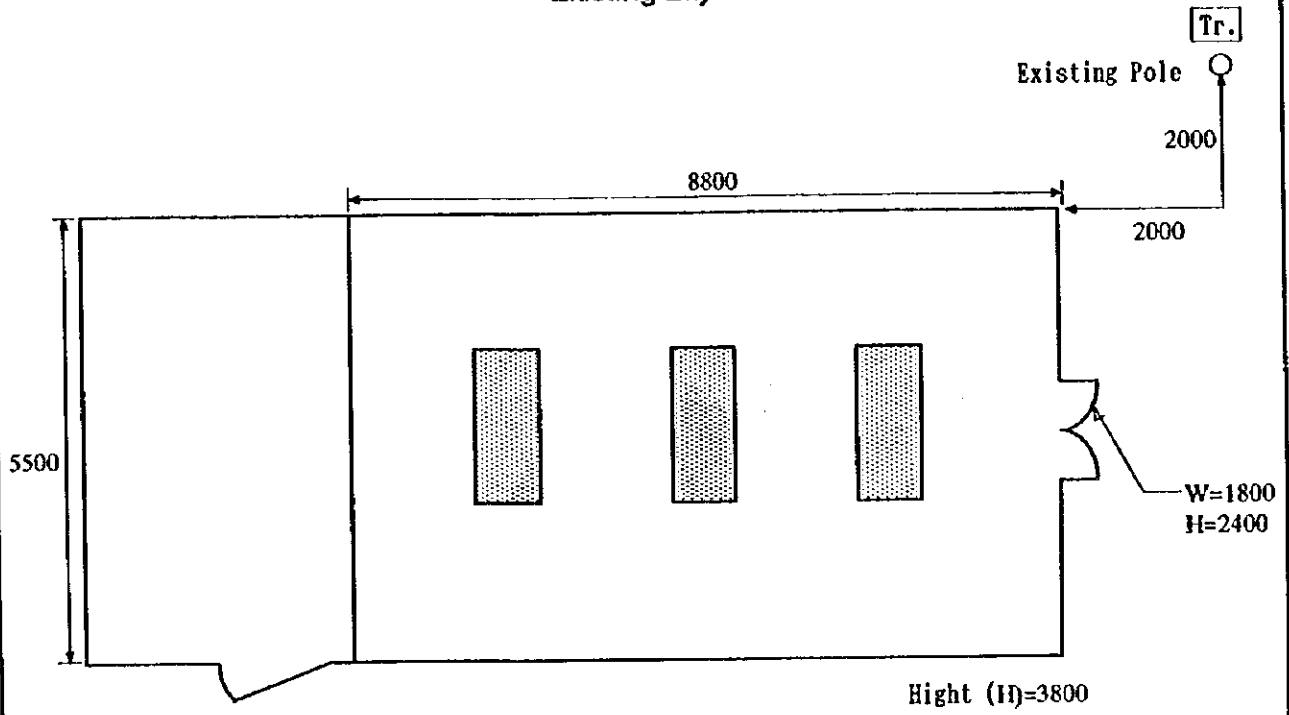


Figure 2.3 - 36 Layout Drawing of Asgat

AIMAG: UVERKILANGAI  
SITE: Bogd

### Existing Layout



### Layout Plan

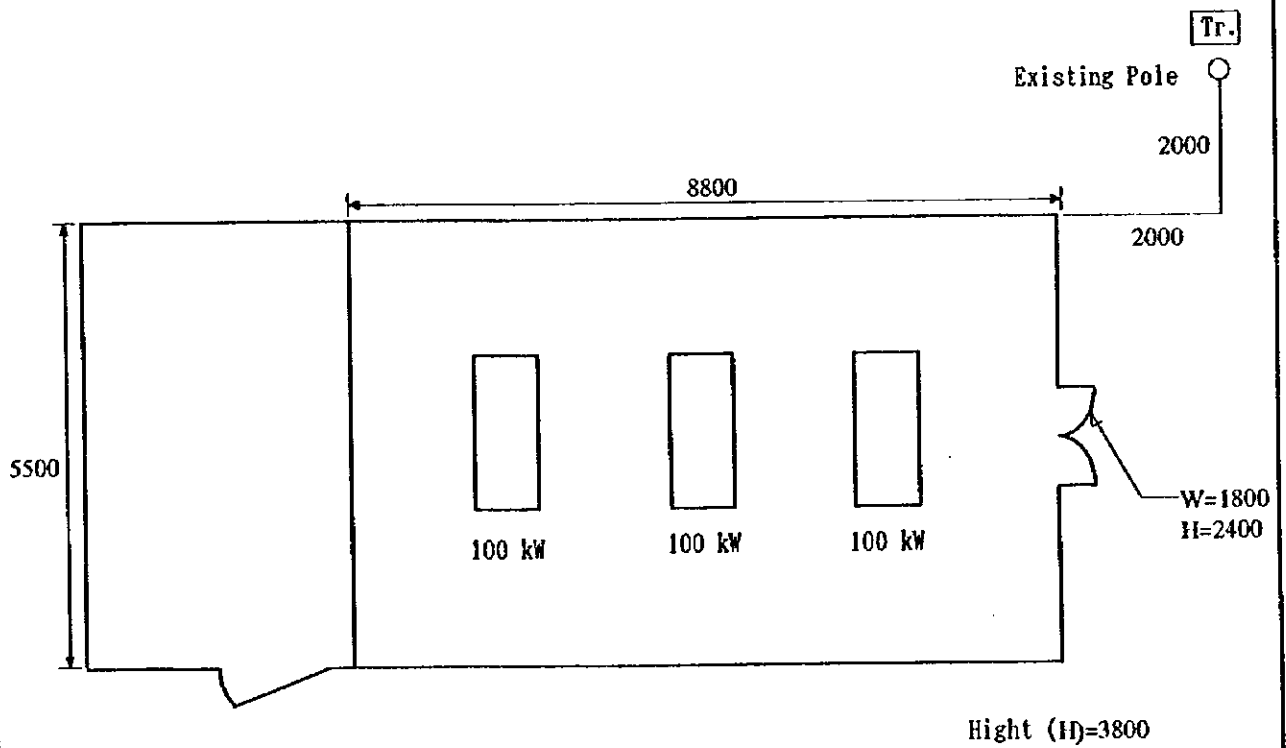
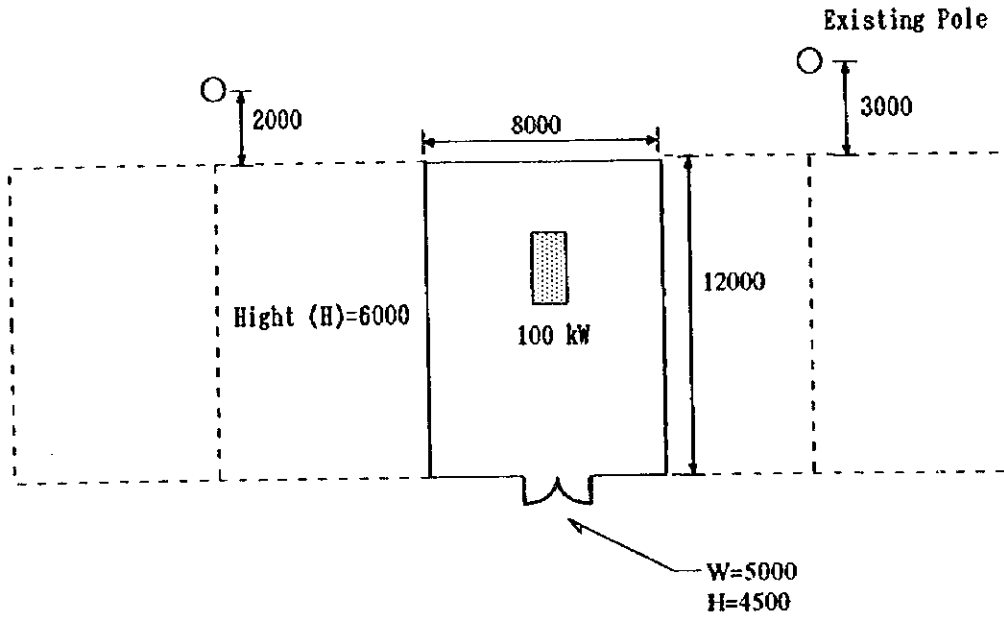


Figure 2.3 - 37 Layout Drawing of Bogd

AIMAG: SUKHBAATAR  
SITE: Erdenetsagaan

### Existing Layout



### Layout Plan

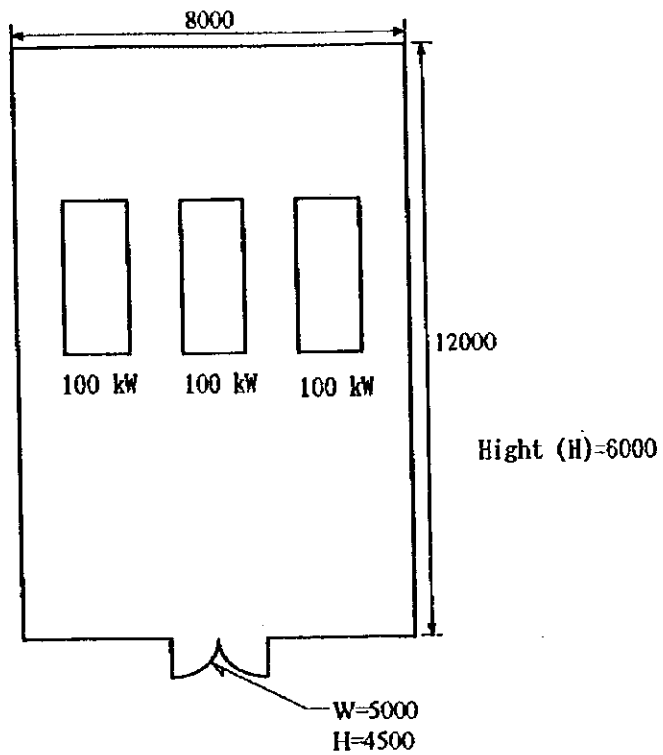
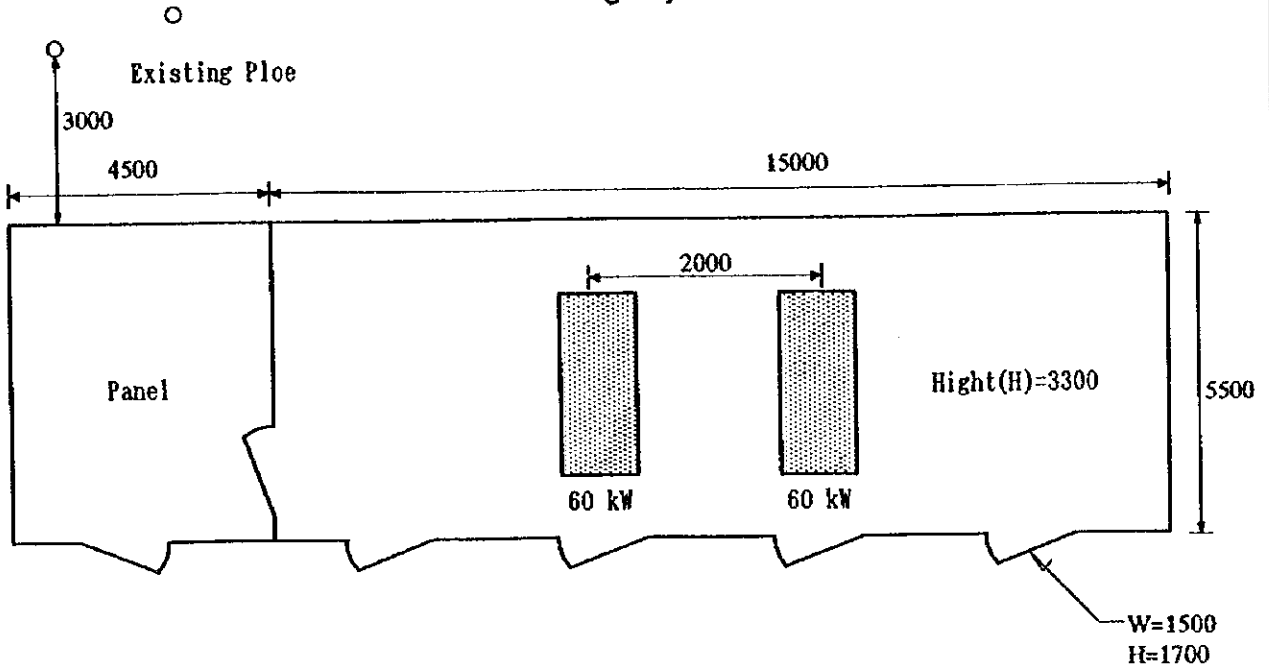


Figure 2.3 - 38 Layout Drawing of Erdenetsagaan

AIMAG: SUKHBAATAR  
SITE: Naran

### Existing Layout



### Layout Plan

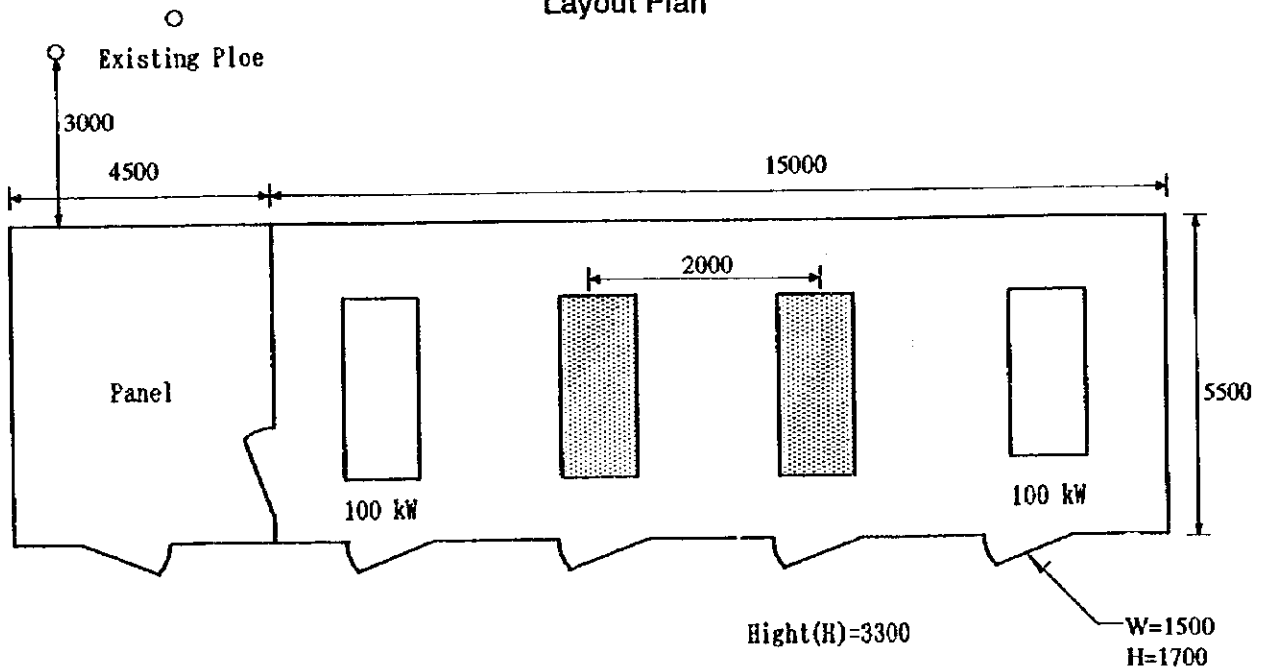
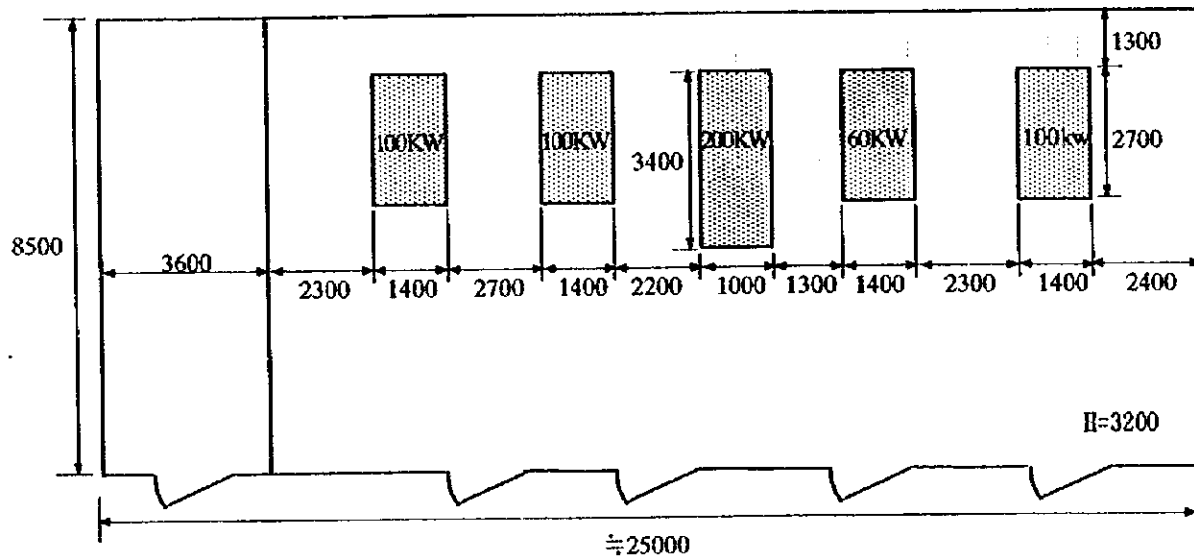


Figure 2.3 - 39 Layout Drawing of Naran



AIMAG DORNODO  
SITE Tsagaan-Ovoo

Existing Layout



Layout Plan

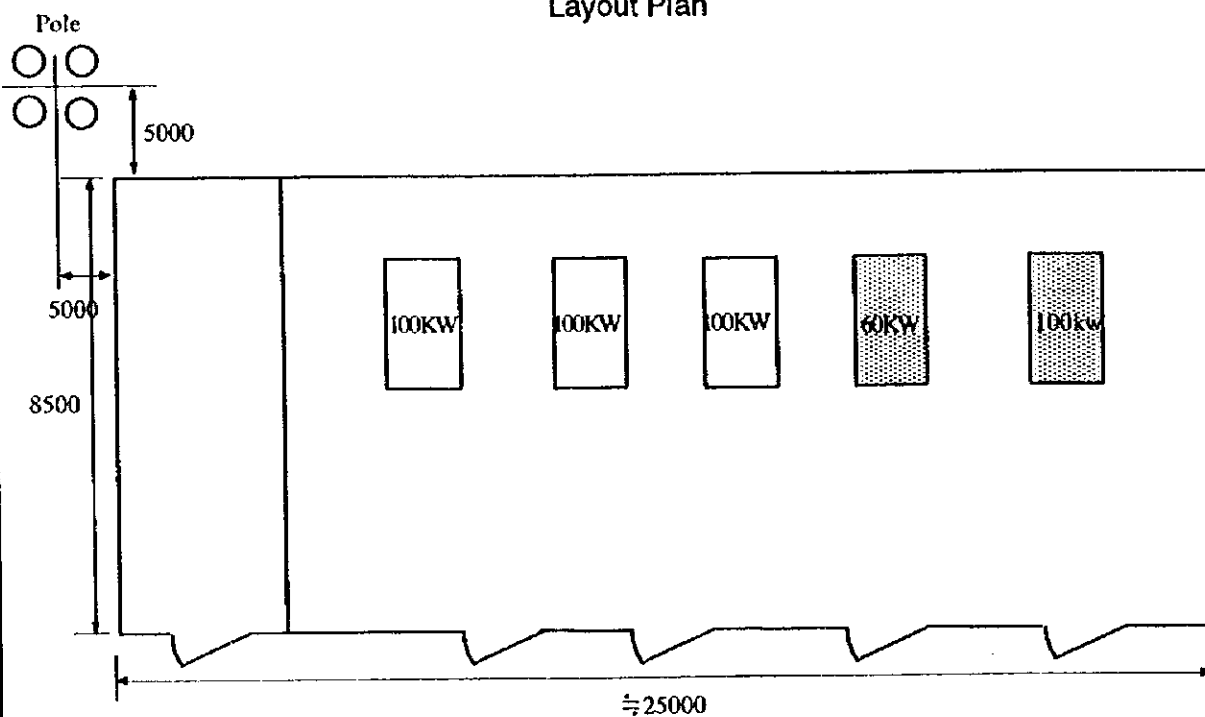
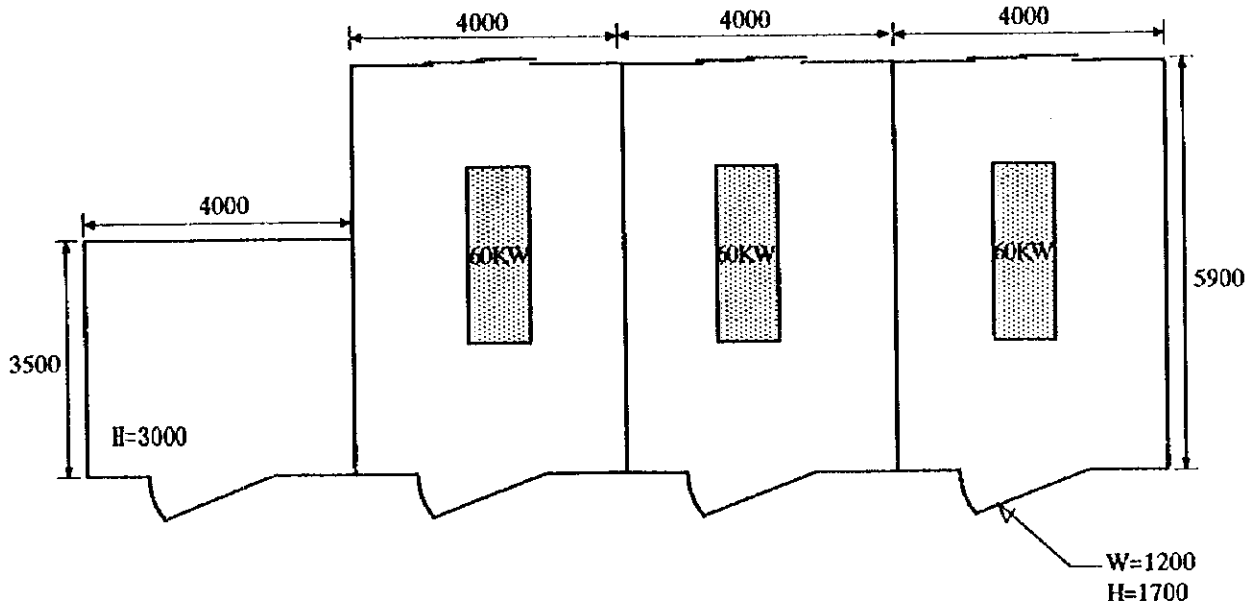


Figure 2.3 - 40 Layout Drawing of Tsagaan-Ovoo

AIMAG DORNODO  
SITE Khulunbuir

### Existing Layout



### Layout Plan

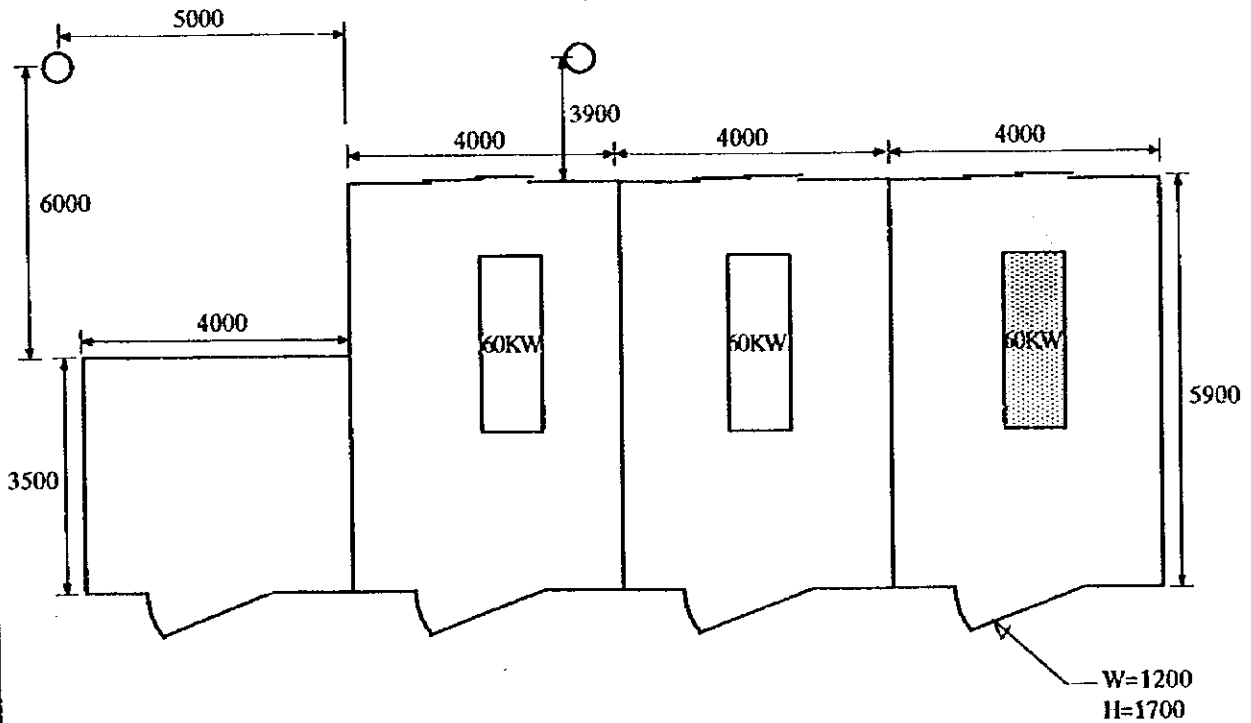
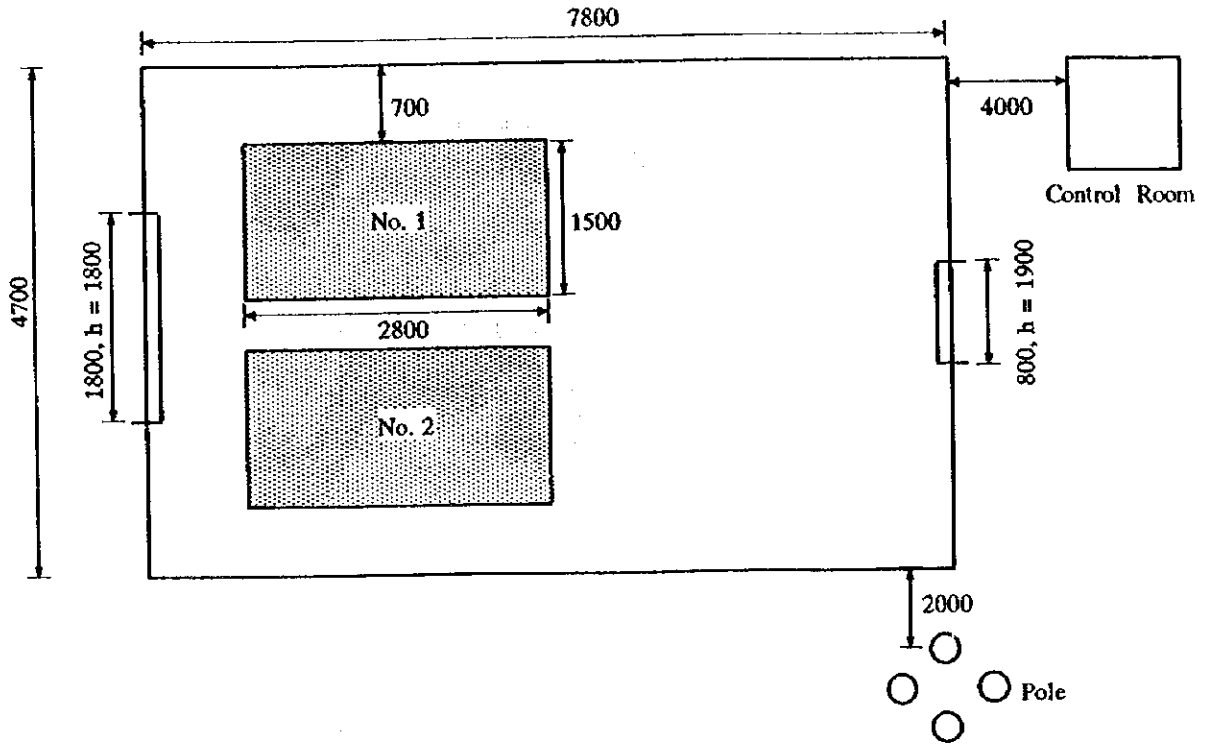


Figure 2.3 - 41 Layout Drawing of Khulunbuir

AIMAG KHUVSGEL  
SITE Tsagaan-Uur

### Existing Layout



### Layout Plan

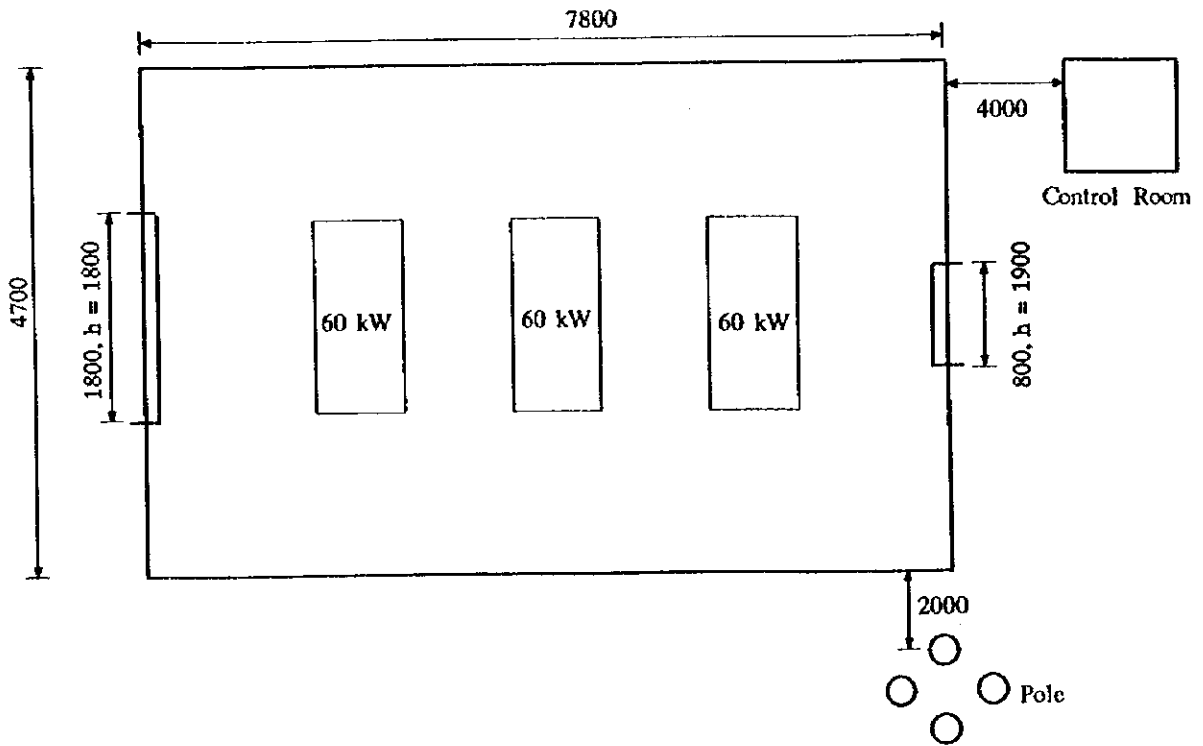
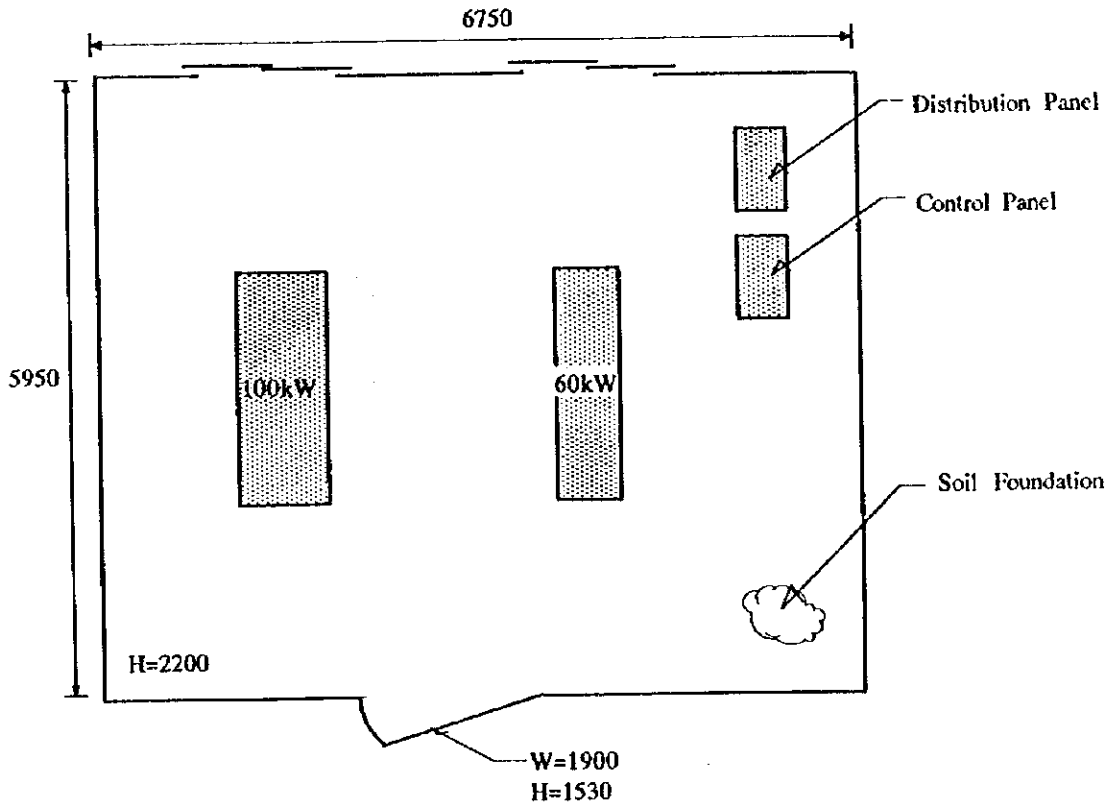


Figure 2.3 - 42 Layout Drawing of Tsagaan-Uur

AIMAG KHUVSGEL  
SITE Tsagaannuur

### Existing Layout



### Layout Plan

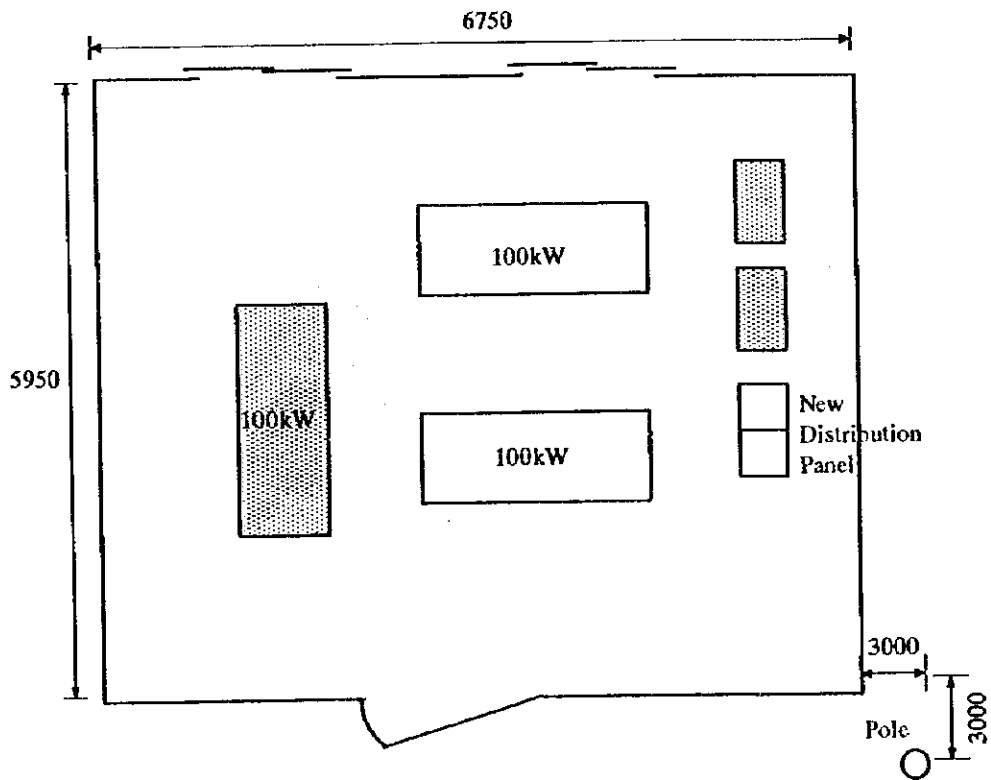
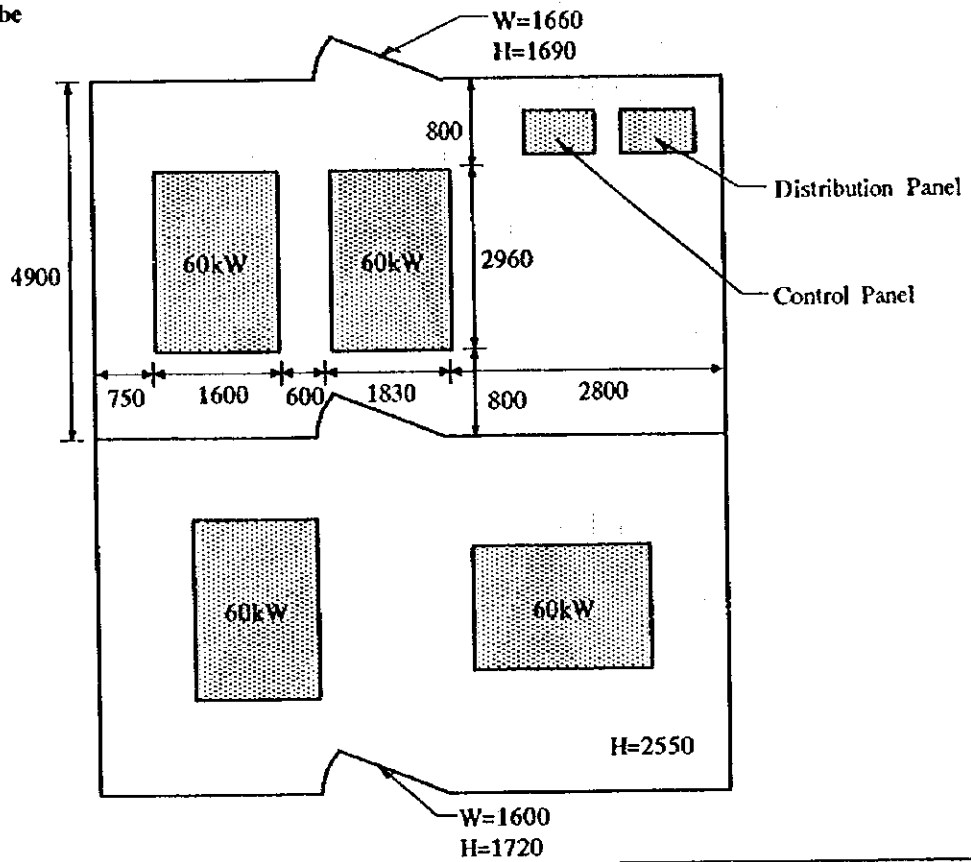


Figure 2.3 - 43 Layout Drawing of Tsagaannuur

AIMAG KHUVSGEL  
SITE Renchinlhumbe

Existing Layout



Layout Plan

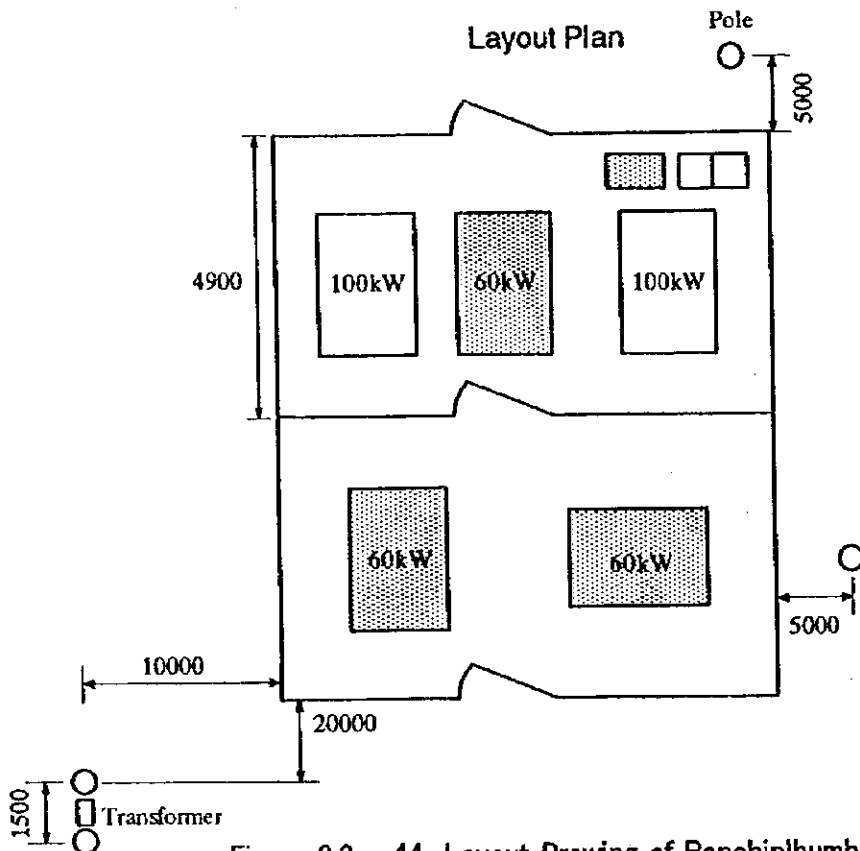
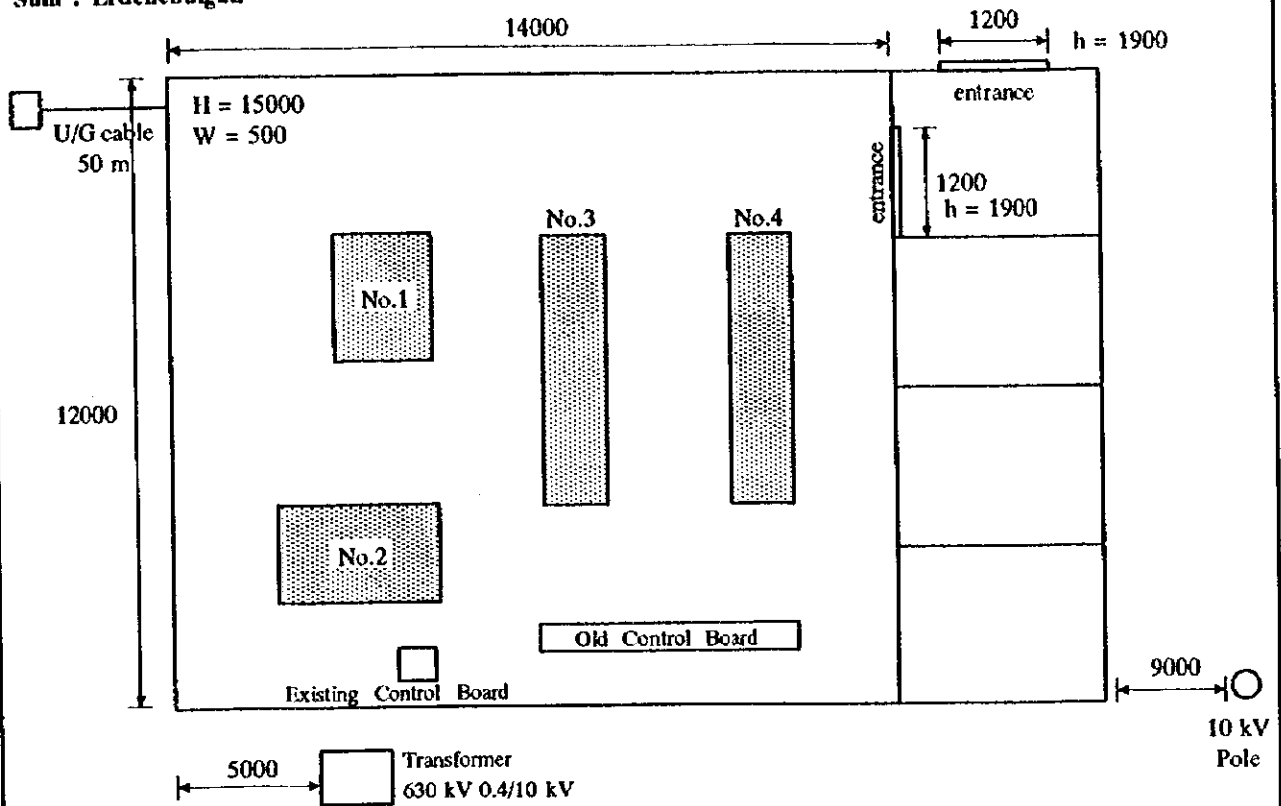


Figure 2.3 - 44 Layout Drawing of Renchinlhumbe

Aimag : Khubsgul  
Sum : Erdenebulgan

### Existing Layout



### Layout Plan

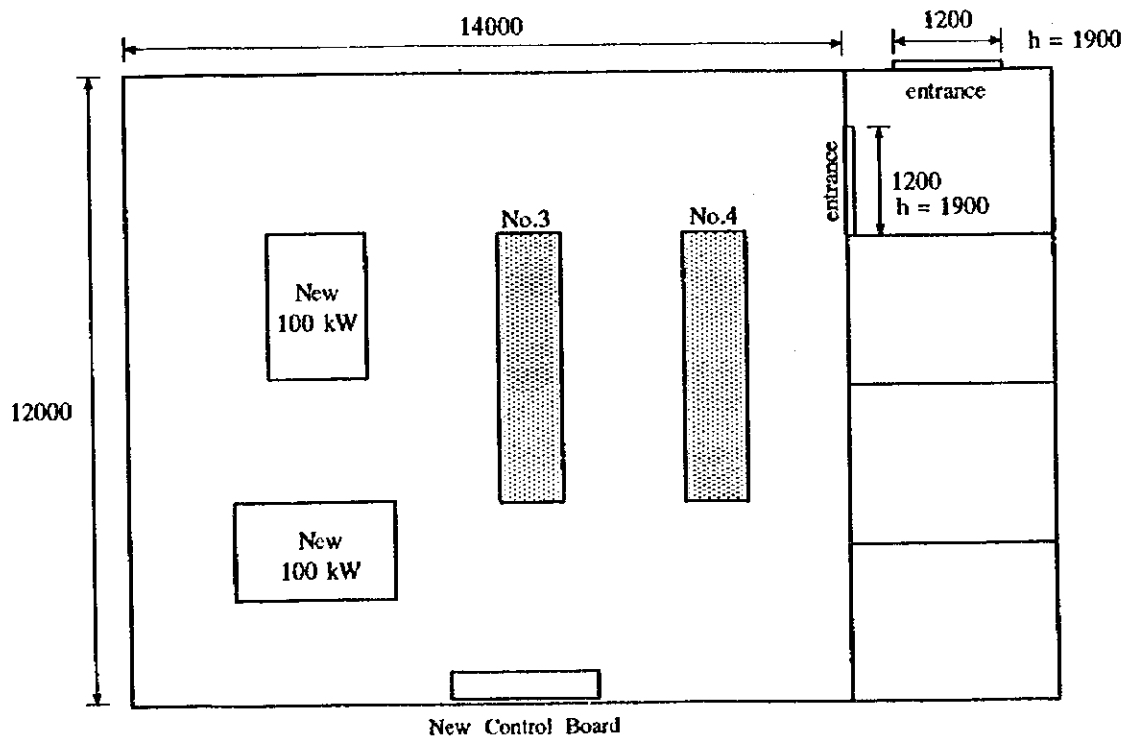


Figure 2.3 - 45 Layout Drawing of Erdenebulgan

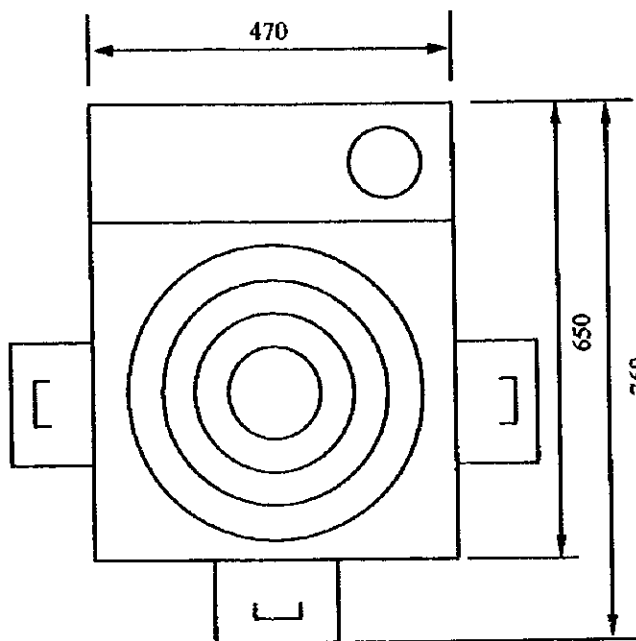
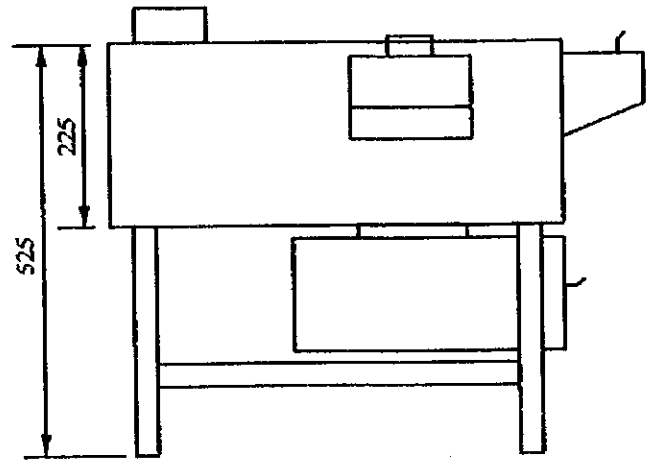
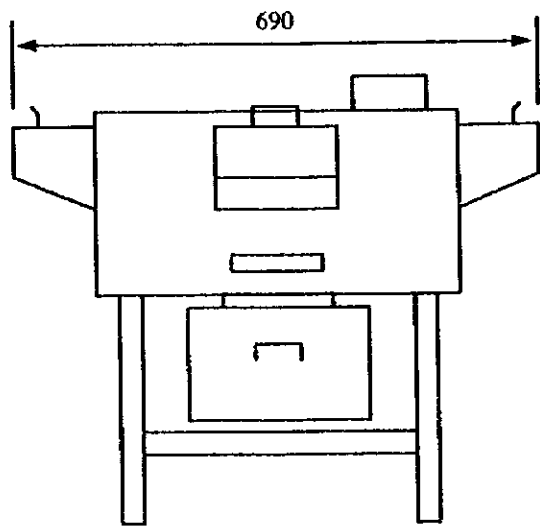
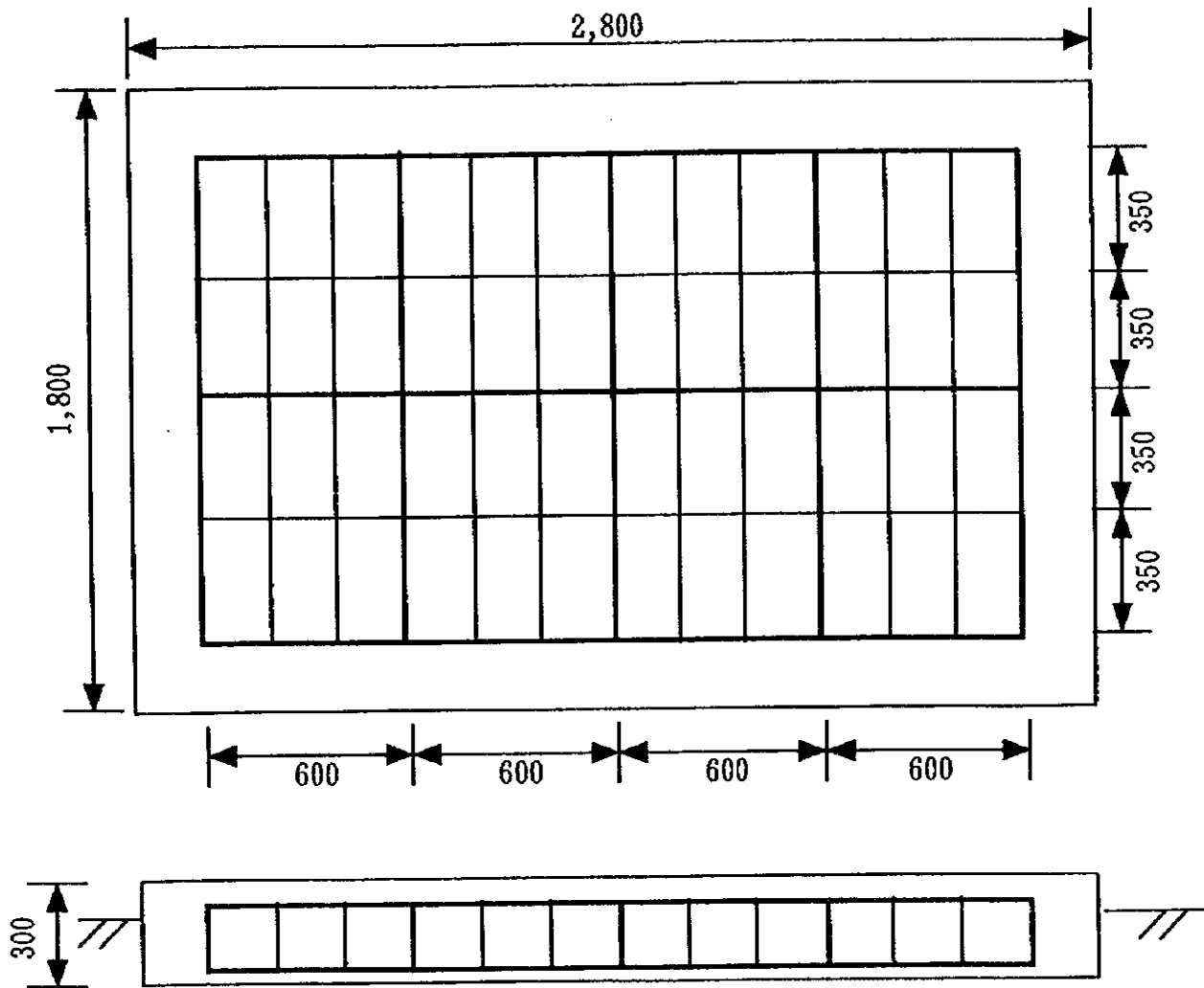


Figure 2.4 Outline View of Stove



Dimension 2,800mm x 1,800mm x 300mm (1.512 M3)

Reinforcing bar  $\phi 19\text{mm}$  : 2,600mm x 6本  
 $\phi 19\text{mm}$  : 1,600mm x 10本  
 $\phi 10\text{mm}$  : 2,600mm x 4本  
 $\phi 10\text{mm}$  : 1,600mm x 16本

Figure 2.5 Pre-fabricated Foundation



## **APPENDICES**

## Appendix 1 Member of the Survey Team

### Member List

No.	In Charge	Name	Organization
1.	Leader	Kenji MATUMOTO	Deputy Director, Coordination and Appraisal Division Grant Aid Project Study Department, JICA
2.	Coordinator	Takeharu KOJIMA	First Project Study Division Grant Aid Project Study Department, JICA
3.	Chief Consultant/ Operation and Maintenance Planner	Yoshitomo WATANABE	Nippon Koei Co., Ltd.
4.	Electricity Supply Planner	Tomoyasu FUKUCHI	Nippon Koei Co., Ltd.
5.	Equipment Planuer	Hiroshi KAWAKAMI	Nippon Koei Co., Ltd.
6.	Procurement Specialist / Cost Estimator	Tsutomu MORI	Nippon Koei Co., Ltd.
7.	Translator	Akira KAMIMURA	Nippon Koei Co., Ltd.

## Appendix 2 Survey Schedule (1/2)

No.	Date	Day	Schedule			Accommodation
			Officials	Consultant Team A	Consultant Team B	
1	5/27	wed	Depart Kansai for ULN by OM904			ULN
2	5/28	thu	C/Call to JICA Office, Embassy of Japan, Ministry of External Relations and Ministry of Infrastructure Development (MID)			ULN
3	5/29	fri	C/Call and Joint Meeting with MID			ULN
4	5/30	sat	Internal Meeting			ULN
5	5/31	sun	Day Off			ULN
6	6/1	mon	Depart ULN for Site by Helicopter 1 (ULN - Choibalsan)			Site
7	6/2	tue	Observation of Sum by Helicopter 1 (Choibalsan - Tsagaan-Ovoo - Khulunbuir - Choibalsan)			Site
8	6/3	wed	Depart Site for ULN by Helicopter 1 (Choibalsan - ULN)			ULN
9	6/4	thu	Finalization of the Draft of the Minutes of Discussion (M/D)			ULN
10	6/5	fri	Signing of the M/D Report to JICA Office, Embassy of Japan		Arrangement for Site Survey	ULN
11	6/6	sat	Depart ULN for Narita by OM903	Depart ULN for Site by Helicopter 1 (HL1) (ULN - BaruunUrt)	Depart ULN for Site by Helicopter 2 (HL2) (ULN - Ulaangom)	Site
12	6/7	sun	Observation of Sites by HL1 (BaruunUrt - Erdenetsagaan - Naran - BaruunUrt - Sainshand)		Observation of Sites by HL2 (Ulaangom - Tes - Zuungobi - Malchin - Ulaangom)	Site
13	6/8	mon	Observation of Sites by HL 1 (Sainshand - Huvsgel - Khatanbulag - Dalanzadgad)	Observation of Sites by HL 2 (Ulaangom - Zuunhangai - Tsagaan Khaikhan - Hayargas - Ulaangom)		Site
14	6/9	tue	Observation of Sites by HL 1 (Dalanzadgad - Bogd - Arvaiheer)	Observation of Sites by HL 2 (Ulaangom - Deluun - Hovd (Aimag))		Site
15	6/10	wed	Observation of Sites by HL 1 (Arvaiheer - Bayanhongor - Bayantsagaan - Bayan-Under - Bayanhongor)	Observation of Sites by HL 2 (Hovd - Munkh Khaikhan - Bulgan - - Tsetseg - Altai (Aimag))		Site
16	6/11	thu	Observation of Sites by HL 1 (Bayanhongor - Erdene - Chandamani - Buutsagaan - Bayanhongor)	Observation of Sites by HL 2 (Altai - Khukhmorit - Dariv - Tonkhil - Altai)		Site
17	6/12	fri	Observation of Sites by HL 1 (Bayanhongor - ULN)	Observation of Sites by HL 2 (Altai - Tseel - Altai (sum) - Tsogt - Altai)		ULN / Site
18	6/13	sat	Data Collection	Observation of Sites by HL 2 (Altai - Biger - Bayanhongor - ULN)		ULN

## Appendix 2 Survey Schedule (2/2)

No.	Date	Day	Schedule		Accommodation
			Consultant Team A	Consultant Team B	
19	6/14	sun	Internal Meeting		ULN
20	6/15	mon	Depart ULN for Project Site by Helicopter (ULN - Uliastai)		Site
			Observation of Site by Car (Uliastai - Erdenekhairkhan)	Observation of Site by Car (Uliastai - Ider)	
21	6/16	tue	Observation of Site by Car (Erdenehairhan - Zavkhanmandal - Durveljin - Urgamal)	Observation of Site by Car (Ider - Numreg - Asgat - Tes)	Site
22	6/17	wed	Observation of Site by Car (Urgamal - Santmargats - Uliastai)	Observation of Site by Car (Tes - Songino - TsetsenUul - Uliastai)	Site
23	6/18	thu	Depart Site for ULN by Helicopter (Uliastai - ULN)		ULN
24	6/19	fri	Internal Meeting and Data Collection		ULN
25	6/20	sat	Day Off		ULN
26	6/21	sun	Depart ULN for Project Site by Helicopter (ULN - Teshlg - Murun)		Site
			Transportation to Site by Car (Murun - Ulaan-Uur)	Transportation to Site by Car (Murun - Erdenebulgan)	
27	6/22	mon	Observation of Site by Car (Ulaan-Uur - Tsagaannuur - Renchinlumbe)	Observation of Site by Car (Erdenebulgan - Tsagaan-Uur)	Site
28	6/23	tue	Observation of Site by Car (Renchinlumbe - Murun)	Observation of Site by Car (Tsagaan-Uur - Khatgal*1 - Murun)	Site
29	6/24	wed	Visit to Aimag Center's Deisel Power Station Depart Site for ULN by Helicopter (Murun - ULN)		ULN
30	6/25	thu	Data Collection and Meeting with MID		ULN
31	6/26	fri	Data Collection and Meeting with MID		ULN
32	6/27	sat	Data Collection and Internal Meeting		ULN
33	6/28	sun	Day Off		ULN
34	6/29	mon	Data Collection and Meeting with MID		ULN
35	6/30	thu	Report to JICA Office and Embassy of Japan		ULN
36	7/1	wed	Depart ULN for Kansai by OM903		

**Bolded Site ; Objective Sums of this Project (45 Sums)**

\*1 An Objective Sum of the Grassroots Grant Aid

### **Appendix 3 Member List of Party Concerned In the Recipient Country**

**1) Ministry of Infrastructure Development**

<b>Mr. G. Yondongombo</b>	<b>Minister</b>
<b>Mr. G. Damdinsuren</b>	<b>State Secretary</b>
<b>Mr. H. O. Sambalhunder</b>	<b>Specialist</b>

**2) Ministry of External Relations**

<b>Mr. L. Dawagir</b>	<b>Minister</b>
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**3) Other Donner**

<b>USAID</b>	<b>D. Beg</b>	<b>Senior Advisor of International Resources Group</b>
	<b>K. Mc Cann</b>	<b>Energy Advisor of USAID Energy Programme</b>
<b>ADB</b>	<b>B. Jamtsai</b>	<b>Project Manager of Heat Efficiency Project (Energy Authority)</b>
	<b>G. Adilbish</b>	<b>Project Manager of Energy Conservation Project (Energy Authority)</b>
<b>TACIS</b>	<b>K. O'Kane</b>	<b>Team Leader of Rational Use of Energy Project</b>
<b>WB</b>	<b>B. Erdenebileg</b>	<b>Head of International Cooperation Department (Energy Authority)</b>

4) Aimags and Objective Sums

Aimag	Sum	Name	Position
BULGAN	Tesig	Batbayar	Sum Chief
		Ganbat	Deputy Sum Chief
BAYAN-ULGII	Deluun	U. Beket	Sum Chief
		Z. Rakhyn	In Charge of Energy
UBS	Aimag Center	Ts. Baatar	Governor
		Ts. Batsuuri	Vice-governor
	Zuungobi	S. Gankhuyag	In Charge of Infrastructure
		B. Yadomsuren	Sum Chief
	Zuunhangai	D. Nergui	In Charge of Energy
		B. Bat-Erdene	Sum Chief
	Malchin	G. Purevdorj	In Charge of Energy
		O. Yanjir	Sum Chief
	Tes	B. sharaa	In Charge of Energy
		N. chimid	Sum Chief
	Tsagaanhairhan	T. Dmiram	In Charge of Energy
		T. boldbaatar	Sum Chief
	Hyargas	I. Gambaatar	In Charge of Energy
		Ts. Tseveenravdan Baatar	Sum Chief In Charge of Energy
HOVD	Aimag Center	Zonorov Haidav	Vice-governor
		Tsedendamba	Sum Chief
	Tsetseg	Navaansuren	In Charge of Energy
		L. chuluunat	Sum Chief
	Bulgan	Ch. Bayansaihan	In Charge of Energy
		S. Burnet	Sum Chief
Munhhairhan	O. Otgonnasan	In Charge of Energy	
BAYANHONGOR	Aimag Center	B. Bayarsaikhan	Governor
		P. Zorigbaatar	General Affairs
	Buutsagaan	Ch. Enkhdalai	Sum Chief
		Ts. Lhagvasuren	Financial Manager
	Bayan-Undor	Tsetsegmaa	Sum Chief
		Otgontsagaan	In Charge of Energy
Bayantsagaan	Mandah	Sum Chief	
	Dashdondog	Chairman of Sum Assembly	

Aimag	Sum	Name	Position
GOBI-ALTAI	Aimag Center		Governor
		Vold Dorucchi	In Charge of Energy
	Altai	B. Altangerel	Sum Chief
		Ya. Gan-Erdene	In Charge of Energy
	Biger	T. Vitumen	Sum Chief
		D. gombo	In Charge of Energy
	Tonkhil	Sh. Munkhbaatar	Sum Chief
		K. Davaadori	In Charge of Energy
	Khukhmorit	G. boaran	Sum Chief
		L. Summakhun	In Charge of Energy
	Dariv	Dogisuren	Sum Chief
		Tserendash	In Charge of Energy
	Chandamani	Radnaased	Chairman of Sum Assembly
		Turbat	Electrical Engineer
	Tsogt	P. Urtnasan	Sum Chief
	M. Gantumur	In Charge of Energy	
		Sum Chief	
		In Charge of Energy	
	Erdene	Sh. Dorjgotov	Chairman of Sum Assembly
		D. Avirmed	General Affairs
DORNOGOBI	Aimag Center	Ishdorj	Governor
		Uhnaa	In Charge of Infrastructure
	Hubsgel	Batmunk	Sum Chief
		N. Borkhuu	Chairman of Sum Assembly
	Hatanbulag	M. Dush	Sum Chief
		Terbish	In Charge of Accounting
UBURHANGAI	Aimag Center	Mijidsuren	Manager of Finance and Economy
		Badrakh	In Charge of Infrastructure
	Bogd	Lhagvasuren	Sum Chief
		P. Chuluun	In Charge of Energy
SUIHBAATAR	Aimag Center	G. Adiya	Vice-governor
		D. Narantsatsalt	In Charge of Energy
	Erdenetsagaan	Jargalsaikhan	Sum Chief
	Naran	Ch. Purevdorj	Sum Chief
		R. Namsrai	In Charge of Energy

Aimag	Sum	Name	Position
DORNODO	Aimag Center	Dulamszov	In Charge of Energy
		Banzurazu	Chief Engineer
	Tsagaan-Ovoo	G. Batbold	Sum Chief
		B. amarsaihan	Chairman of Sum Assembly
Khulunbuir	B. Gunsennorov	Chief of P/S	
ZAVKHIAN	Aimag Center		Governor
		B. Ganbold	Vice-governor
	Tsetsen-Uur	Ganbold	Sum Chief
		Bayanbatsogt	In Charge of Energy
	Erdenehairhan	Merdbayar	In Charge of Energy
		B. Erdene	Vice-Sum Chief
	Songino	Kh. Ochir	Sum Chief
		J. Serdamba	In Charge of Energy
	Numreg	Ts. Sbirender	Sum Chief
		Y. Nyamsuren	In Charge of Energy
	Zavhanmandal	Delgersainhan	Sum Chief
		Zandansuren	In Charge of Energy
	Santamargats	Nyamdorg	Sum Chief
		Sukhbat	General Affairs
	Urgamal	Ganbaatar	Sum Chief
		Ganbayar	General Affairs
	Durveljin	Gungaanyan	General Affairs
Gatragch		In Charge of Energy	
Ider	B. Goncbigdorj	Sum Chief	
	J. Munkhtogtokh	In Charge of Energy	
Tes	S. Vanchinsuren	Sum Chief	
	Ganbold	In Charge of Energy	
Asgat	L. Battumur	Sum Chief	
	Ts. Namstrai	In Charge of Energy	
HUVSGEL	Aimag Center	Batsuuri	Governor
		Galbadrakh	Vice-governor
		Batmunkh	In Charge of Energy
	Tsagaannuur	G. Batbayar	General Affairs
		P. Sadnomorj	Generator Operator
	Tsagaan-Uur		Sum Chief
			In Charge of Energy
Renchinhumbc	Odhuu	Vice-Sum Chief	
	Nyamaa	General Affairs	
Erdenebulgan	D. Baterdene	Sum Chief	
	B. Jahtsansambu	In Charge of Energy	



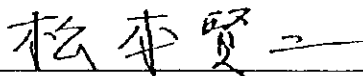
MINUTES OF DISCUSSIONS  
BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION OF  
POWER PLANTS OF SUM CENTERS, PHASE II,  
MONGOLIA

In a response to a request from the Government of Mongolia, the Japan International Cooperation Agency (JICA) decided to conduct a Basic Design on the Project for the Rehabilitation of Power Plants in Sum Centers (herein after referred to "the Project").

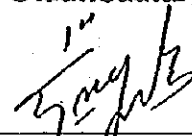
JICA sent to Mongolia a study team (herein after referred to "the Team"), which is headed by Mr. Kenji Matsumoto, Deputy Director, Grant Aid Study Department, JICA and is scheduled to stay in the country from May 27 to June 6, 1998. The team held discussions with the officials concerned of the Government of Mongolia (herein after referred to "GOM") and conducted a field survey at the study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design on the Project.

Ulaanbaatar, June 5, 1998



Kenji Matsumoto  
Leader  
Basic Design Study Team  
JICA



Gendensuren Yondongombo  
Director General  
Energy Department  
Ministry of Infrastructure Development



Luvsantorj Dawagiv  
Director of the 1st Department  
Ministry of External Relations

## ATTACHMENT

### 1. Objective

The final objective of the Project is to supply sufficient electricity, and to establish a sustainable electricity supply system, which will improve the welfare of citizens in the sites listed in Annex- I .

### 2. Sites

The sites are located throughout Mongolia which is shown in Annex- I

### 3. Responsible and Implementing Agencies

(1) Responsible Agency of the Project

Ministry of Infrastructure Development

(2) Implementing Agencies of the Project

- Energy Department, Ministry of Infrastructure Development
- Sum Centers

### 4. Items requested by the Mongolia side.

The final items, quantity and specifications requested by the Mongolia side under Japan's Grant Aid is as shown in Annex- II .

### 5. Japan's Grant Aid system

(1) GOM has understood the system of Japanese Grant Aid; described in Annex- III, explained by the team.

(2) GOM will take the necessary measures, described in Annex- IV, for smooth implementation of the Project on condition that the Grant Aid assistance by the Government of Japan (herein after referred to "GOJ") is extended to the Project.

### 6. Schedule of the study

(1) The consultants will proceed to future studies in Mongolia until July 1. GOM shall also provide the consultants with all necessary information and data.

(2) JICA will prepare the draft report in English and Mongolian and

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dispatch a mission in order to explain its contents around end of August, 1998.

(3) In case that the contents of the report is accepted in principle by GOM, JICA will complete the final report and send it to GOM by October, 1998.

### 7. Other Relevant Issues

The Mongolia Side and the Basic Design Study Team has confirmed the following issues.

(1) The total number of the sums under this project is 45.

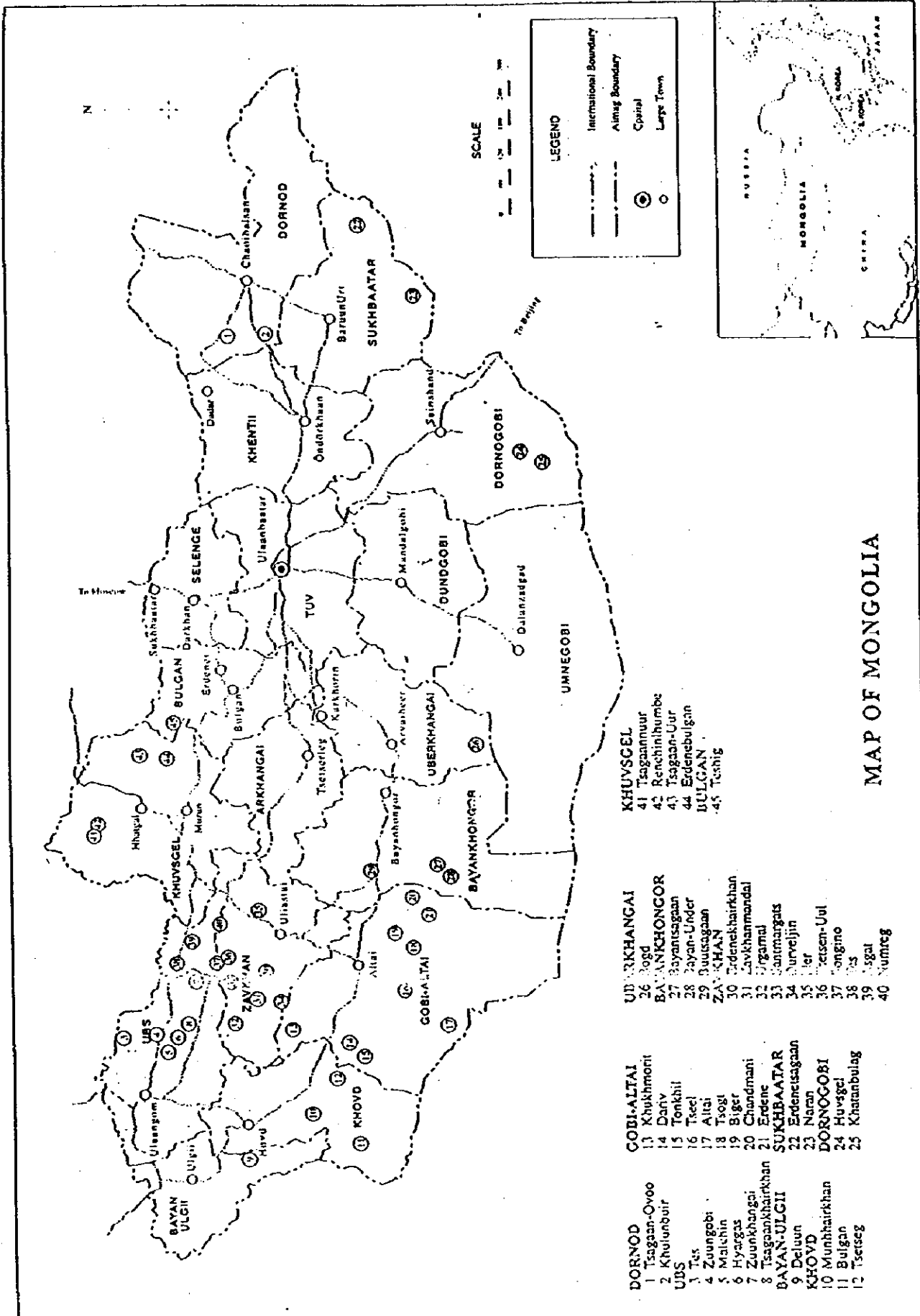
(2) The electricity supply conditions of each sum is expected to be different. For sums whose site survey could not be accomplished due to weather conditions and etc., generators will be procured only if the Basic Design Study Team is provided with enough information and data of the sums to understand their present conditions.

(3) The original request for this grant aid is the procurement of the generators. Therefore, the installation of the generators, as well as the operation and maintenance of the electricity supply system in each sum must be done by the Mongolian Side.

(4) The Mongolian Side requested that the installation of the generators, including the construction of the foundation, be executed by the Japanese Side.

(5) The Mongolian Side mentioned that a service team for maintenance and repair of the generators is planned to be stationed in each Aimag. The Mongolian Side also requested for a procurement of tools and training of personnel for the service teams.

*By u.d. #*



- DORNOD**
  - 1 Tsagaan-Ovoo
  - 2 Khulunbuir
- UBS**
  - 3 Tes
  - 4 Zuungebi
  - 5 Malchin
  - 6 Hyargas
  - 7 Zuunkhangai
- BAYAN-ULGII**
  - 8 Tsagaankhairkhan
  - 9 Deluun
  - 10 Munbhairkhan
  - 11 Bulgan
  - 12 Tsetseg
- GOBI-ALTAI**
  - 13 Khukhmorit
  - 14 Darv
  - 15 Tonkhil
  - 16 Tseel
  - 17 Altai
  - 18 Tsogi
  - 19 Biger
  - 20 Chandmani
- SUKHBAATAR**
  - 21 Erdene
  - 22 Erdenetsagaan
  - 23 Naran
- DORNOGObI**
  - 24 Huvsgel
  - 25 Khatanbulag
- UBSUKHANGAI**
  - 26 Bogd
- BAVANKHONGOR**
  - 27 Bayantsagaan
  - 28 Bayan-Under
  - 29 Buusagaan
- ZAVKHAN**
  - 30 Erdenekhairkhan
  - 31 Lavkhammandal
  - 32 Urgamal
  - 33 Santmargas
  - 34 Durveljin
  - 35 Her
  - 36 Tsetsen-Uul
  - 37 Songino
  - 38 Ts
  - 39 Isgal
  - 40 Yuntreg
- ARKHANGAI**
  - 41 Tsagaanuur
  - 42 Renchinlhumbe
  - 43 Tsagaan-Uur
  - 44 Erdenebulgan
  - 45 Tshig

MAP OF MONGOLIA

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Annex- II Items requested by the Government of Mongolia side

After discussions with the Basic Design Study team, the following items for the following sums were requested by the Mongolia side. The final number and specifications will be determined by the Japanese Side by further studies in Mongolia and Japan.

Aimags	Sum	100kw	60kw
Bulgan	Teshig	2	1
Bayan-Ulgii	Deluun	1	2
Ubs	Zuungobi	1	2
	Zuunkhangai	1	2
	Malchin	1	2
	Tes	2	1
	Tsagaankhairkhan	1	2
	Hyargas	1	2
Khovd	Tsetseg	1	2
	Bulgan	2	2
	Munkhkhairkhan	0	2
Bayankhongor	Buutsagaan	1	2
	Bayan-Under	1	2
	Bayantsagaan	1	2
Gobi-Altai	Altai	0	4
	Biger	1	2
	Tonkhil	1	2
	Khuklanom	0	3
	Dariv	1	2
	Chandmani	1	2
	Tsogt	1	2
	Tseel	1	2
	Erdene	2	1
Domogobi	Huvsgel	1	2
	Khatanbulag	1	2

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Aimag	Sum	100kw	60kw
Zavkhan	Tsetsen-Uul	0	3
	Erdenekhairkhan	0	3
	Songino	0	3
	Numreg	1	2
	Zavkhanmandal	1	2
	Santmargats	0	3
	Urgamal	0	3
	Durveljin	1	2
	Ider	1	2
	Tes	3	0
	Asgat	2	2
Uverkhangai	Bogd	1	2
Sukhbaatar	Erdenetsagaan	1	2
	Naran	0	2
Domod	Tsagaan-Ovoo	1	2
	Khulunbuir	1	2
Khuvsgel	Tsagaan-Uur	1	2
	Tsagaannuur	0	2
	Renchinlumbe	0	2
	Erdenebulgan	0	2
subtotal		40	93
Total		133	

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## Annex- III JAPAN'S GRANT AID PROGRAM

### 1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by the following procedures.

- Application (request made by a recipient country)
- Study (Preliminary Study / Basic Design Study conducted by JICA)
- Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
- Determination of Implementation (Exchange of Notes between both Governments)
- Implementation (Implementation of the Project)

(2) Firstly, an application or a request for a project made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to see whether or not it is suitable for Japan's Grant Aid. If the request is deemed suitable, the Government of Japan entrusts a study on the request to JICA (Japan International Cooperation Agency).

Secondly, JICA conducts the Study (Basic Design Study), using a Japanese consulting firm. If the background and objective of the requested project are not clear, a Preliminary Study is conducted prior to a Basic Design Study.

Thirdly, the Government of Japan appraises to see whether or not the Project is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA and the results are then submitted for approval by the Cabinet.

Fourthly, the Project approved by the Cabinet becomes official when pledged by the Exchange of Notes signed by both Governments.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and so on.

## 2. Contents of the Study

### (1) Contents of the Study

The purpose of the Study (Preliminary Study / Basic Design Study) conducted on a project requested by JICA is to provide a basic document necessary for appraisal of the project by the Japanese Government. The contents of the Study are as follows:

- a) to confirm background, objectives, benefits of the project and also institutional capacity of agencies concerned of the recipient country necessary for project implementation,
- b) to evaluate appropriateness of the Project for the Grant Aid Scheme from a technical, social and economical point of view,
- c) to confirm items agreed on by both parties concerning a basic concept of the project,
- d) to prepare a basic design of the project,
- e) to estimate cost involved in the project.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request.

Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes.

### (2) Selecting (a) Consulting Firm(s)

For smooth implementation of the study, JICA uses (a) consulting firm(s) registered. JICA selects (a) firm(s) through proposals submitted by firms which are interested. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference made by JICA.



The consulting firm(s) used for the study is(are) recommended by JICA to a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is repeated.

(3) Status of a Preliminary Study in the Grant Aid Program

A Preliminary Study is conducted during the second step of a project formulation & preparation as mentioned above.

A result of the study will be utilized in Japan to decide if the Project is to be suitable for a Basic Design Study.

Based on the result of the Basic Design Study, the Government would proceed to the stage of decision making process (appraisal and approval).

It is important to notice that at the stage of Preliminary Study, no commitment is made by the Japanese side concerning the realization of the Project in the scheme of Grant Aid Program.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non reimbursable funds needed to procure facilities, equipment and services for economic and social development of the country under the following principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not in a form of donation or such.

(2) Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes by both Governments, in which the objectives of the Project, period of execution, conditions and amount of the Grant, etc. are confirmed.

(3) "The period of the Grant Aid" means one Japanese fiscal year

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which the Cabinet approves the Project for. Within the fiscal year, all procedure such as Exchange of Notes, concluding a contract with (a) consulting firm(s) and (a) contractor(s) and a final payment to them must be completed.

- (4) Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased. When the two Governments deem it necessary, the Grant may be used for the purchase of products or services of a third country origin.

However the prime contractors, namely, consulting, contractor and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons.)

- (5) Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude into contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

- (6) Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid, the recipient country is required to undertake necessary measures such as the following:

- a) to secure land necessary for the sites of the project and to clear and level the land prior to commencement of the construction work,
- b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) to secure buildings prior to the installation work in case the

- Project is providing equipment,
- d) to ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
  - e) to exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
  - f) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7) Proper Use

The recipient country is required to maintain and use facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for their operation and maintenance as well as to bear all expenses other than those to be borne by the Grant Aid.

(8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

(9) Banking Arrangement (B/A)

- a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank" ). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the contracts

verified.

- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to pay issued by the Government of the recipient country or its designated authority.

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Annex- IV Necessary measures to be taken by the Government of Mongolia on condition that Japan's Grant Aid is extended.

- 1.To bear commissions to the Japanese foreign exchange bank to execute the banking services based upon the banking arrangement.
- 2.To ensure prompt unloading and customs clearance at port of disembarkation in Mongolia and facilitate internal transportation therein of the products purchased under the Grant.
- 3.To ensure the customs clearance at the port, inland transportation from the port to Faisalabad with Mongolia's expense, and to bear the cost for bonded storage at the port.
- 4.To exempt Japanese nationals from custom duties, internal taxes and other fiscal levies which may be imposed in Mongolia with respect to the supply of the products and services under the verified contracts. And to take necessary measures for such tax exemption.
- 5.To accord Japanese nationals, whose services may be required in connection with the supply of products and services under the verified contracts, such facilities as may be necessary for their entry into Mongolia and stay therein for the performance of their work.
- 6.To use and maintain properly and effectively all the equipment purchased under the Grant.
- 7.To bear all the expenses other than those covered by the Grant, necessary for the execution of the Project.
- 8.To provide necessary data and information for the project.
- 9.To assign exclusive counterpart engineers and technicians for the Project.

*B. U.S.*

**MINUTES OF DISCUSSION FOR THECNICAL MATTERS  
ON THE BASIC DESIGN STUDY  
ON THE PROJECT FOR REHABILITATION OF POWER PLANTS  
OF SUM CENTERS, PHASE II, MONGOLIA**

In reference to the minutes of discussions signed on June 5, 1998 between the Study Team of the Japan International Cooperation Agency (JICA) and the officials concerned of the Government of Mongolia (GOM) for the captioned project (the Project), the consultant member of the Study Team (the Consultant Team) and GOM have continued further discussion based on the results of site reconnaissance and investigation.

In such discussion, the Consultant Team and GOM agreed to note down the following matters in this minutes of discussion. However, the both parties understand that the final scheme and scope of the Project will be decided by JICA in Tokyo through the further examination on the study results.

1. **Modification of Request Number and Capacity:** The requested numbers and capacity of the diesel generator sets were modified in two sum centers as follows:

<u>Aimag</u>	<u>Sum</u>	<u>original request</u>	<u>modified request</u>
Gobi-Altai	Altai	4 x 60 kW	1 x 100 kW, 3 x 60 kW
Khuvsgul	Erdenebulgan	2 x 60 kW	1 x 100 kW, 2 x 60 kW

2. **Unity or Not of Rated Output of Engine:** The actual output of diesel engine varies depend on the altitude of the installation site. In order to perform the high efficiency of fuel consumption, more than one size of the rated output shall be applied according to the altitude of the sites. However, the compatibility of the spare parts of the engine may be lost between the different size of engine.

Regarding this matter, GOM set the priority for decision making as given below:

- First: high efficiency of fuel consumption
- Second: good compatibility of spare parts

3. **Soft Component:** GOM requested the soft component such as seminar for operation and maintenance at Aimag centers or Ulaanbaatar.
4. **Counter Part Training:** GOM intends to request the counter part training in Japan for operation and maintenance of the diesel generator sets in compliance with the official procedure of JICA.

(14)

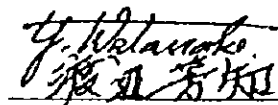
5. **Dismantling Work:** GOM assured the Consultant Team that necessary dismantling work of the existing diesel generators in sum centers would be carried out by the beginning of July 1999.
6. **Refurbishment of Power House:** GOM assured the Consultant Team that all the necessary refurbishment work of the power houses pointed out by the Consultant Team during the site reconnaissance would be carried out by the beginning of July 1999.
7. **Maintenance Tools in Sum Centers:** GOM requested to provide one set of standard maintenance tools for each diesel generator in sum center.
8. **Spare Parts:** GOM requested to provide one set of spare parts for each diesel generator enough to sustain ordinary operation for three years in sum center.
9. **Remind of Requests:** GOM reminded the Consultant Team the following requests which were made in the meeting held on May 29, 1998.
  - Installation work including preparation of foundation under the Grant Aid
  - Procurement of maintenance tools for each aimag center for maintenance team
  - Considering pre-heating method of diesel engine in winter time

Regarding the above, GOM clarified the meaning of the "maintenance tools" as stated below:

- all the tools enable the maintenance groups to execute the overhaul of the diesel generator sets
- all the necessary measuring instruments
- one maintenance vehicle to keep and carry the above tools and instruments for each aimag center

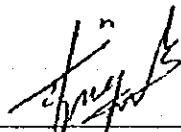
June 30, 1998

Ulaanbaatar, Mongolia



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Mr. Yoshitomo Watanabe  
Chief Consultant  
(Nippon Koei Co., Ltd.)  
Basic Design Study Team  
JICA



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Mr. Gendensuren Yondongombo  
Director General  
Energy Department  
Ministry of Infrastructure Development

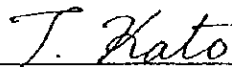
**MINUTES OF DISCUSSIONS**  
**BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION OF POWER**  
**PLANTS OF SUM CENTERS, PHASE II, MONGOLIA**  
**(Consultation on Draft Report)**

In May 1998, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for Rehabilitation of Power Plants of Sum Centers, Phase II, Mongolia (hereinafter referred as "the Project") to Mongolia, and through discussions, field survey, and technical examination of the results in Japan, has prepared the draft report of the study.

In order to explain and to consult the Mongolian side on the components of the draft report, JICA sent to Mongolia a study team, which is headed by Mr. Toshiki Kato, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, and is scheduled to stay in the country from August 22 to August 28, 1998.

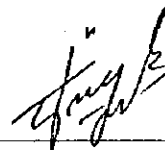
As a result of discussions, both parties confirmed the main items described on the attached sheets.

Ulaanbaatar, August 26, 1998



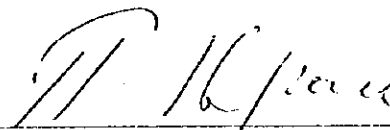
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T. Kato  
Leader  
Basic Design Study Team  
JICA



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G. Yondongombo  
Director General  
Energy Department  
Ministry of Infrastructure Development



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P. Narangua  
Deputy Director  
Foreign Trade and Economic Cooperation  
Department  
Ministry of External Relations



## **ATTACHMENT**

### **1. Components of the Draft Report**

The Government of Mongolia has agreed and accepted in principle the components of the Draft Report proposed by the team.

### **2. Japan's Grant Aid System**

- (1) The Government of Mongolia has understood the system of Japanese Grant Aid, described in Annex-I, explained by the team
- (2) The Government of Mongolia will take the necessary measures, described in Annex-II, for smooth implementation of the Project on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

### **3. Further Schedule**

The team will make the Final Report in accordance with the confirmed items, and send it to the Government of Mongolia by the end of October, 1998.

### **4. Other Relevant Issues**

The following items were confirmed by both sides.

- (1) The Government of Mongolia explained the operation and management plan of the aimag mobile repairing teams for the power plants in sum centers by the letter as attached in Annex-III.
- (2) Six (6) nos. of maintenance vehicle with repairing tools for the aimag mobile repairing teams will be provided under the Project.
- (3) The Government of Mongolia assured that all the necessary refurbishment works of the power houses and dismantling work of the existing power plants in the sum centers would be completed by the designated time in the implementation schedule to be shown in the detail design period.
- (4) In executing the soft component, the Government of Mongolia takes responsible for the following matters:
  - Provision of appropriate sites and facilities for seminar and training
  - Supporting works related to the seminar and training
  - Collection of monitoring sheets
  - All the transportation cost and hotel expenses of trainees
- (5) The engineers of the objective aimag centers of the glass roots and the Phase I grant aid projects will also take part in the soft component.
- (6) The Government of Mongolia requested that the training of overhaul level be given to the aimag centers' engineers in the soft component.

## **Annex-I JAPAN'S GRANT AID PROGRAM**

### **1. Japan's Grant Aid Procedures**

(1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Preliminary Study/Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet of Japan)
Determination of Implementation	(Exchange of Notes exchanged between the Governments)
Implementation	(Implementation of the Project)

(2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Government of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contract and so on.

### **2. Contents of the Study**

(1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study") conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

- a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- d) Preparation of a basic design of the Project
- e) Estimation of costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid Project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organization of the recipient country through the Minutes of Discussions.

## (2) Selection of Consultants

For smooth implementation of the study, JICA uses (a) registered consultant firm(s). JICA select (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

## (3) Status of a Preliminary Study of the Grant Aid Program

A Preliminary Study is conducted during the second step of a project formulation & mentioned above.

A result of the study will be utilized in Japan to decide if the Project is to be suitable for a Basic Design Study.

Based on the result of the Basic Design Study, the Government would proceed to the stage of decision making process (appraisal and approval).

It is important to notice that at the stage of Preliminary Study, no commitment is made by the Japanese side concerning the realization of the Project in the scheme of Grant Aid Program.

### 3. Japan's Grant Aid Scheme

#### (1) What is Grant Aid?

The Grant Aid Program provide a recipient country with non-reimbursable funds needed to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under the principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

#### (2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant, etc., are confirmed.

#### (3) "The period of the Grant Aid" means the one fiscal year in which the Cabinet approves the Project. Within the fiscal year, all procedures such as exchange of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Government.

#### (4) Under the Grant aid, in principle, Japanese products and services including transport of those of the recipient country are to be purchased.

When both Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese Yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(6) Undertakings required of the Government of the recipient country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

- 1) to secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- 2) to provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- 3) to secure buildings prior to the procurement in case the installation of the equipment.
- 4) to ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- 5) to exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
- 6) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such

facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and equipment under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese Yen to cover the obligations incurred by the government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

*H.K.*

*T.K.*

**Annex-II Necessary measures to be taken by the Government of Mongolia in case that Japan's Grant Aid is extended**

1. To bear commissions to the Japanese bank to execute the banking services based upon the banking arrangement.
2. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment brought for the project at the port of disembarkation.
3. To accord Japanese nationals, whose services may be required in connection with the supply of products and services under the verified contracts, such facilities as may be necessary for their entry into Mongolia and stay therein for the performance of their work.
4. To use and maintain properly and effectively all the equipment purchased under the Grant.
5. To bear all the expenses other than those covered by the Grant, necessary for the execution of the Project.
6. To assign the necessary staff and secure the necessary budget for operation and maintenance of the equipment purchased under the Grant.

*[Handwritten signature]*  
P.K.

*[Handwritten signature]*  
T.K.

МОНГОЛ УЛС  
ДЭД БҮТЭЙН  
ХӨГЖЛИЙН  
ЯАМ



МОНГОЛ  
МИНИСТЕРСТВО  
ИНФРАСТРУКТУРЫ  
РАЗВИТИЯ

date 26.08.98  
№ 9/2010

TO: Ministry of Foreign affairs of Japan  
From: Ministry of Infrastructure Development of  
Mongolia  
Subject: Rehabilitation of power plants in sum centres

Dear,

We appreciate for your excellent assistance to rehabilitate the rural power plants. We would request an additional offer for regular (overhaul) services and maintenance of those plants.

1. Necessity and Objectives to establish the mobile maintenance group

- a) There is no technical and engineering skill/knowledge about Japanese made diesel power plants due to the first experience to introduce those power plants. Then the special group is required to exclusively maintain the Japanese made power plants.
- b) Technicians and operators in sum centres have lack of skill and knowledge to deal with heavy faults of diesel power plants. Such kind of repairing works and special inspection like overhaul with high level of knowledge become just available by engineers in aimag centres through appropriate training.
- c) No maintenance and repairing tools exist to perform the above mentioned repairing works and special inspection in aimag centres as well as sum centres. For the effective use of such tools and to minimise nos. of set of those, it is essential to establish the maintenance group in aimag centres.

Therefore MOID decided to establish a mobile maintenance group in each aimag centre.

Telephone: MGL-21064

Tel: 976-11-1111

МОНГОЛ УЛС  
ДЭД БҮТЭЙН  
ХӨГЖЛИЙН  
ЯАМ

МОНГОЛ  
МИНИСТЕРСТВО  
ИНФРАСТРУКТУРЫ  
РАЗВИТИЯ

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*T.R*



2. The institutional structure of mobile maintenance group

MOID will organise the following stuff for a mobile maintenance group at each aimag centre.

- One mechanician
- One worker for electrical service
- One driver and service man of engine.

Diesel power plant in each aimag centre will have responsibility for the maintenance group under the control of the Energy Authority.

3. Activities of the group

The established group will make the regular and overhaul services of the diesel power plants installed at each sum centre with the close communication with sun centre, and make repair of heavy fault by sum's request.

4. Financial arrangement for the Group

All the stuff in the Group normally work at the operation and maintenance division of the aimag's Diesel power plant. Their salary and various allowance will be paid by the Energy Authority through each aimag's Diesel power plant. Even after establishment of the Group, this condition will be continued. Therefore, there is not special problem on the financial arrangement at all.

In case of sudden fault occurrence or overhaul of the diesel power plant in each sum centre, the Group will repair and provide the maintenance services. The necessary cost such as used various parts, consumed oil, etc. will be paid by each sum to the aimag's power plant. The aimag's diesel power plant will take care for all cost and spare parts, etc. of the maintenance car.

5. The mobile maintenance group would be placed in the aimag centre of Hovd, Gobi-Altai, Hubsgul, Sukhbaatar, Zavkhan and Bayanhongor.

Yours sincerely,



G. YONDONGOMBO  
DIRECTOR GENERAL OF  
ENERGY DEPARTMENT



P. H.

T. K.

## Appendix 5 Cost Estimation Borne by the Recipient Country

No.	Item	Q'ty	Unit Price	Budget
1	Remove of Old Generator	78	Tg. 300,000	Tg. 23,400,000
2	Repairing of Power Station			Tg. 8,400,000
	Light Damage	6	Tg. 100,000	Tg. 600,000
	Serious Damage	39	Tg. 200,000	Tg. 7,800,000
3	Digging for Concrete Foundation Panel	122	Tg. 100,000	Tg. 12,200,000
4	Others		Tg. 4,190,000	Tg. 4,190,000
<b>Total</b>				<b>Tg. 48,190,000</b> <b>(US\$ 57,369.05)</b>

Notes) 1 US\$ = 840 Tg.









JICA