

## **APPENDIX 6**

### **OTHER RELEVANT DATA**

- (1) Record of Technical Discussions (July 31, 2001)
- (2) Record of Technical Discussions (December 4, 2001)
- (3) Transmission Plan and Publicity Plan for Shifting from  
Medium Wave / Long Wave to Short Wave Broadcasting
- (4) Estimation of Project Effects
- (5) Rough Cost Estimation for Operation and Maintenance

**Record of Technical Discussions  
on the Basic Design Study  
on the Project for Rehabilitation of Radio Broadcasting Network  
in Mongolia**

As described in the Minutes of Discussions of July 5, 2001, the Team composed of consultants continued the site survey, collection of data and information, and technical discussions, all required for the Study, until July 31, 2001, in line with the Inception Report and the Questionnaire.

The attachment is the record of such technical discussions. The record has been prepared for mutual understanding of the technical discussions, and is not intended to commit or imply realization of any part of the Project.

The Study has been and will be made under the guidelines of JICA according to Japan's grand aid scheme; therefore, any record that may conflict with the guidelines in any respect shall be deemed as invalid.

Should additional data and information or further technical discussions be required in the course of the studies in Japan, it shall be made between the undersigned by the means of e-mail or facsimile.

Ulaanbaatar, July 31, 2001

葛西隆

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Attachment:

Record of Technical Discussions

## Record of Technical Discussions

### 1. Frequencies to be Allotted for the Project

MRTV clarified that the frequencies listed in Attachment A should be used for planning of the Project, stating that all the frequencies had been actually used for radio transmission without causing any interference with neighboring countries.

### 2. Service Area, Electric Filed Strength, and Changeover of Frequencies

It is understood that electric filed strength within the service area set forth by the Project shall be above sensitivity of the short-wave radios generally available on the local market. The service area is as shown in Annex 1 of the Minutes of Discussions of July 5, 2001. The electric filed strength shall be achieved by changeover of the frequencies described in Item 1 by the time zone, or by the season, or by a combination of the preceding two.

### 3. Murun Transmitting Station

MRTV reiterated that a new short-wave transmitter, antenna and associated equipment should be provided at the Murun transmitting station as an important component of the Project. Attachment B is an explanatory note prepared by MRTV on this issue.

### 4. Geological Conditions of the Existing Transmitting Stations

Very little data or information on the geological conditions of the existing transmitting stations was made available to the Team. It can be readily assumed, however, that installation of new antennas in the vicinity of the existing short-wave antennas would not create any design or construction problems. The Team will further study results of the field surveys and set up design conditions for the Project.

### 5. Consideration of the Existing Conditions

It is generally understood that the Study shall be made to produce an optimum plan in consideration of the existing conditions, with an emphasis on the continuity and reliability of the radio transmission.

### 6. Scope of Work

In line with agreements in the Minutes of Discussions of July 5, 2001, MRTV shall take all necessary measures so that new transmitters, antennas and associated equipment provided under the Project can be smoothly installed, erected, connected, and satisfactorily commissioned. Detailed Scope of Work for the Study is as

exhibited in Attachment C. Any new items that may come up in the future shall be, in principle, interpreted in the following manner:

- i) Any addition, or deletion, or removal, or change, or restoration, or the like, required for the Project, to any part of the existing buildings, structures, foundations, utility services, mechanical and electrical facilities shall fall on the responsibility of MRTV. Any items whose actual structural or mechanical or electrical strength or condition is not known and may cause unexpected injuries or hazards during the implementation of the Project shall also be interpreted as included in the scope of MRTV.
- ii) New equipment as listed in "Items Requested by the Mongolian Side" shall fall on the scope of the Project. Any items that affect performance of the new equipment and that are technically and functionally inseparable from the new equipment shall also be interpreted as included in the scope of the Project.

#### **7. Studio-to-Transmitter Link (STL)**

MRTV made a formal request that rehabilitation of the existing STL between MRTV broadcasting station and Honhor radio transmitting station via Bayanzurkh relay station should be included in the scope of the Project as shown in Attachment D. The Team will deliver the message to JICA.

#### **8. PCM / PDM and Pre-evaluation of the Project**

The Team explained to MRTV about methodology on Project Cycle Management (PCM) and Project Design Matrix (PDM) as well as pre-evaluation of the Project. The Team will further study indices suitable for measurement of benefits resulting from implementation of the Project. The indices will be used for pre- and post-evaluation of the Project.



Attachment A

РАДИО ТЕЛЕВИЗИЙН ХЭРЭГ ЭРХЛЭХ ГАЗАР

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To: Ms. TSAGAAN

Fax : 368167

- 1. Ulaanbaatar 4850 , 7260, 9305 kHz
- Altai 4830, 5950, 9430 kHz
- 3. Meren 4895, 6100, 9560 kHz

үнийг төслийн хүмүүст дамжуулна уу. ᠲᠡᠭᠦᠭᠠᠨ ᠲᠡᠭᠠᠭᠠᠨ ᠪᠠᠨᠵᠢᠷᠠᠭᠴᠢ

ДБЯ. *[Signature]* Банзрагч.

*[Signature]*

*[Signature]*

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Attachment B

Report on the shortwave radio broadcast network and Murun station

The reception footprint covered by the Project has been revised to show the best shortwave propagation time, which is in winter and in the evening. Summer daytime offers worse conditions for shortwave propagation, and the footprint is then more limited.

A chart (below) has been drawn up to show the propagation footprint for a winter day, evening, and summer daytime. The electric field strength for the diagram comprised 100mkV/m. The chart is estimated, based on information gathered since the establishment of the shortwave radio broadcast network, the recommended rated method of the ABU international office, and results of measurements taken during operations.

Shortwave propagation conditions depend on efficiency of station, kind of antenna, frequency bandwidth and other major specifications. The chart is laid out using the frequency 3.2 MHz, for the \*Zenith\* antenna, type ATZI.

We give added explanation for the Project propagation mapping for proposed new placement of the shortwave stations in Ulaanbaatar, Altai and Murun, as follows:

	Name of station	Territory		%
		Winter evening	Summer evening, Winter day	Summer day
1	Ulaanbaatar	65.0 %	47.0 %	31.0 %
2	Altai	33.5 %	24.5 %	17.5 %
3	Murun	25.0 %	16.4 %	12.0 %
4	Total of reception area (when 3 stations are established)	95.0 %	79.0 %	62.5 %

The Project aims are, in UB, Altai, Murun, to achieve shortwave reception in:


- 95.0 % of the total territory in winter evenings;
- 79.0 % of the total territory in summer evenings;
- 62.5 % of the total territory in summer days.

For shortwave broadcasting to reach all Mongolia, not less than three stations are needed. This is the main task of the Project.

One essential condition for the establishment of such a shortwave broadcast network is reliability and backup. When there is program interruption because of technical operations faults or a power shortage in either of the shortwave stations in Altai or Murun, the reception of the other station must be not less than 40 % of the footprint of the station having problems. This is very important for users /listeners/ and is a vital part of this shortwave network Project.

## The need to establish a shortwave station in Murun

1. With the establishment of an effective shortwave station in Murun, the radio broadcast footprint would reach 25% of the area of Mongolia.
2. The Khuvsgul area is very mountainous, which demands shortwave for best reception.
3. Khuvsgul aimag is a most important part of the Khangai area of Mongolia, and has a larger population than the other Khangai aimags - 119,800 persons from statistical data in 2000; thus it is important to establish a shortwave station in this aimag.
4. In the north of Khuvsgul there is a small nomadic population of **Tsaatan**, who inhabit a high mountainous area. For this small population to receive the information they need, the only practical way is by radio, especially since the Government is devoting particular attention to these people.

  
(6/11)

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## Attachment C

## Detailed Scope of Work

No.	Item	Requirements	Mongol. side	Japan. side
1	Power supply	1) Three phase, 380V +/-10%, 50Hz +/-10% 2) Power capacity shall meet required power of new transmitters 3) The terminal points shall be at the outgoing feeder of electrically nearest panel: <u>Ulaanbaatar:</u> i) Upstream side of the terminal point including provision of terminal lugs ii) Downstream side of the terminal point (supply of cable) iii) Installation and connection of cable supplied by the Japanese side into the new transmitter <u>Altai, Murun:</u> i) Upstream side of the terminal point including provision of terminal lugs ii) Downstream side of the terminal point (existing cables and terminal lugs shall be used) iii) Connection of the cable into the new transmitters	x x x x x x x x x	x
2	Water supply and drain	1) Provision of a city water tapping position with a valve as well as a drain pipe above the floor easily accessible from the new transmitter at the Ulaanbaatar transmitting station (required water pressure and quantity: later)	x	
3	Grounding	1) Provision of a grounding bar for easy connection of grounding wire / bar of the new equipment and power supply	x	
4	Program input	1) Provision of a exclusive program input line for easy connection with the new equipment 2) Required electrical characteristics: i) Output impedance: 600ohms +/-10%	x x	

M2



		ii) Output level: +10dBmW	x	
		iii) With shield terminal	x	
5	Access and storage	1) Construction or improvement of the access road to the Project site	x	
		2) Construction or improvement of the access to the new antenna location	x	
		3) Removal of any underground or aboveground obstacles for installation of new equipment	x	
		4) Removal of existing short-wave antennas, feeders, structures at Altai and Murun	x	
		5) Removal / restoration of doors or enlargement of openings for easy entry of new transmitters and associated equipment into their final locations	x	
		6) Provision of temporary indoor / outdoor storage and working space for new equipment	x	
6	Buildings	1) Provision of floor / wall openings and sealing and finishing of the openings, for instance, for air ducts, feeder pipes, ventilation units, and water pipes	x	
		2) Removal / restoration of partitions for the new transmitter room at Ulaanbaatar	x	
		3) Provision of doors and sealing (or improvement of sealing) for the new transmitter room at Ulaanbaatar	x	
		4) Provision or extension of floor cable ducts, vertical ducts and their covers	x	
		5) Removal of existing obstacles or unnecessary items of equipment	x	
		6) Reinforcement of the floor structures as well as floor leveling and finishing for the new transmitter room at Ulaanbaatar	x	
		7) Provision of sealing (or improvement of sealing) for the new transmitter room at Ulaanbaatar	x	
		8) Provision of lighting system and heating, ventilation, and air conditioning system all in accordance with the local laws	x	



Attachment D

# MONGOLIAN RADIO & TELEVISION

Huvisgalyn Zam-3  
Phone +976-11-326663

Ulaanbaatar-11  
MRTV@magicnet.mn

C.P.O. Box-365  
Fax +976-11-327234

Mongolia

Date  
2001-07-31

No. 210

Ulaanbaatar

To the JICA Study Team on the Project for Rehabilitation of  
Radio Broadcasting Network in Mongolia

Request

I am expressing my gratitude to the JICA and JICA Basic Design Study Team for conducting the Basic Design Study under Japan's Grant Aid scheme. With implementation of the Project, the reception area of the radio broadcasts and quality of reception for all people, and especially nomadic people, will be increased. This is very important, as laid down by the Mongolian Government guidelines. We hope that the reception of the first channel of the program of radio broadcasting will be extended and improved with the Project implementation. On this occasion, we are kindly requesting a positive decision for the Project to rehabilitate ~~the cable line~~ radio relay line from the Radio central station to the Khonkhor transmitting station, which currently does not meet technical requirements for reliable operations. We hope the Project will be very successful with this item settlement.

Thank you for your cooperation.



D-1



МОНГОЛ УЛСЫН ЗАСГИЙН ГАЗРЫН ХЭРЭГЖҮҮЛЭГЧ АГЕНТЛАГ

**РАДИО ТЕЛЕВИЗИЙН ХЭРЭГ  
ЭРХЛЭХ ГАЗАР**

210524 Улаанбаатар хот, Баянгол дүүрэг,  
Хувьсгалын зам 3, утас: 32-16-14, факс: 32-16-14  
E-mail: mitv@magicnet.mn

2001.07.30 № 210  
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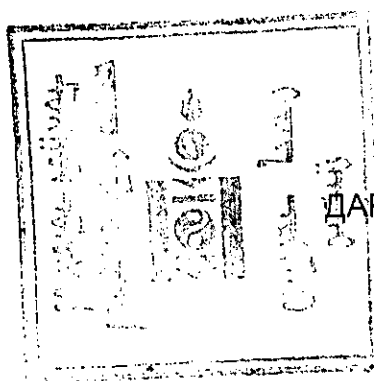
(モロル語)  
英文と同内容

МОНГОЛ УЛСЫН РАДИО НЭВТ-  
РҮҮЛГИЙН СҮЛЖЭЭГ СЭРГЭЭН  
ЗАСВАРЛАХ ТӨСЛИЙГ  
ХЭРЭГЖҮҮЛЭХ ЯПОНЫ ОЛОН  
УЛСЫН ХАМТЫН АЖИЛЛАГААНЫ  
АГЕНТЛАГИЙН СУДАЛГААНЫ  
ХЭСЭГТ

**Хүсэлт тавих тухай**

Японы Засгийн газрын буцалтгүй тусламжаар хэрэгжүүлэх энэхүү төслийн үндсэн загварын судалгааг гүйцэтгэж байгаа Японы олон улсын хамтын ажиллагааны агентлаг, судалгааны хэсэгт гүн талархалаа илэрхийлж байна. Энэ төсөл хэрэгжсэнээр үндэсний радио өргөн нэвтрүүлгийн сонсголын хүрээ нэмэгдэж, нийт хүн ам, ялангуяа хөдөөгийн малчдад хүргэх радиогийн сонсголын чанарыг сайжруулах Монгол улсын Засгийн газрын мөрийн хөтөлбөрт тусгагдсан зорилттой уялдаж байгаагаар онцгой ач холбогдолтой юм. Улаанбаатар, Алтай, Мөрөн хотод богино долгионы радио нэвтрүүлэх станц байгуулагдсанаар өргөн нэвтрүүлгийн 1-р программын сонсгол эрс сайжирна гэдэгт итгэлтэй байна.

Энэ ялдамд үндэсний радиогийн 1-р программыг радиогийн төв аппаратаас Улаанбаатарын радио нэвтрүүлэх төв станцад хүргэж байгаа бичил радио релейн шугам (18 сувгийн) нь техникийн өндөр шаардлага, найдвартай ажиллагааг хангаж чадахгүй байгааг харгалзан төслийн хүрээнд шинэчлэхээр оруулж шийдвэрлэхийг хичээнгүйлэн хүсч байна. Уг асуудлыг шийдвэрлэснээр төслийн үр дүн улам сайжирна гэж итгэж байна.



ДАРГА

Б.ГАНБОЛД

APPENDIX-6 (2)

**Record of Technical Discussions  
on the Basic Design Study  
on the Project for Improvement of Shortwave Radio Broadcasting Network  
in Mongolia**

The JICA team held a series of technical discussions with MRTV on the components and contents of the Draft Final Report. The attachment is the record of such technical discussions.

The record has been prepared for mutual understanding of the technical discussions, and is not intended to commit or imply realization of any part of the Project. Any record that may conflict with the separate minutes of meetings of July 5, 2001 and December 4, 2001 in any respect shall be deemed as invalid.

Ulaanbaatar, December 4, 2001

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Attachment:

Record of Technical Discussions

## Record of Technical Discussions

### 1. Short-wave Radio Broadcasting Commissioned by the Project

MRTV presented the JICA team with the following documents prepared by the Mongolian side:

- (1) A transition plan of existing Mongolian radio broadcasting network to short-wave broadcasting network (Attachment 1)
- (2) A proposed plan for announcement during Japanese grant aid project (Attachment 2)

MRTV explained that it would make every possible effort to get residents in the remote areas to listen to the short-wave radio broadcasting. The JICA team acknowledged receipt of these documents, and will report to relevant Japanese organizations on the plans as proposed and contained in the documents.

### 2. Components and Contents of the Draft Final Report

Following explanations made by the JICA team, MRTV reviewed and agreed to the components and contents of the Draft Final Report as well as of a separate Technical Specification. The latter was tabled for review; however, it was not handed over to MRTV

### 3. Service Area, System Configuration and Operation Plan

The anticipated service area is as shown in Basic Design Drawing C-11 "SW Transmission Service Area Plan" that was agreed to by MRTV. Basic system configuration and operation plan of the short-wave radio transmitting systems were also agreed to by MRTV.

### 4. Implementation Schedule

The JICA team explained to MRTV on the implementation schedule of the Project, as well as on time schedule, budgetary allocation, various formalities and procedures for the work of the Mongolian side. MRTV agreed to observance of its obligations as mentioned in the Draft Final Report.

### 5. Obligations of the Mongolian Side

#### 5-1 Procurement of materials and construction work

In line with agreements in the Minutes of Discussions of July 5, 2001 and Attachment C of the Record of Technical Discussions of July 31, 2001, scope of work was set forth as specified in Chapter 3 "Obligations of the Recipient Country" and related chapters / clauses / drawings in the Draft Final Report.



For civil and structural requirements for installation of the new equipment provided under the Project, supplementary drawings attached hereto as Attachment 3 were handed over to MRTV for clarification of scope of its work.

MRTV agreed that he was totally responsible for completion of all of its work that was specified in the relevant documents by the time as mentioned in the Draft Final Report. To this end, MRTV stated that it would apply for budget allocation in time for disbursement for the work to be completed before delivery of the short-wave transmitting systems to the sites.

MRTV also stated that it was responsible for any work that might not be specifically described in the relevant documents but was deemed necessary for satisfactory implementation of the Project (for details, see Item 6 "Scope of Work" of the Record of Technical Discussions of July 31, 2001).

#### 5-2 Frequencies to be Allotted for the Project

MRTV reconfirmed that there was no change to the frequencies as listed and confirmed in Attachment A of the Record of Technical Discussions of July 31, 2001; the frequencies shall be used for planning and designing of the Project. As for the frequency for the STL system for Ulaanbaatar station, MRTV agreed to select a suitable frequency among 162MHz-170MHz before procurement of the STL system.

#### 5-3 Environment Impact Assessment (EIA)

MRTV reconfirmed that it was fully responsible for clearance of the EIA as required under the Mongolian law and regulations, stating that the clearance would be completed before commencement of work at site.

### 6. Operation and Maintenance

MRTV assured the JICA team that they would complete basic training of the staff required for the Project before commencement of work at site, and that annual allocation of the budget would be timely made for procurement of spare parts, consumables and any other items necessary for proper operation and maintenance of the short-wave radio transmitting systems.

### 7. 'Soft Component' Training Program

MRTV agreed to implementation of the 'soft component' training program as described in the Draft Final Report, stating that their staff would be assigned to participate in the program.



## 8. Others

### 8-1 Public announcement for commissioning of short-wave radio broadcasting

MRTV reconfirmed that they would make a daily public announcement on the radio to get listeners of the short-wave radio broadcasting to understand that the program was made available as a result of the commissioning of the Project. A tentative plan for this purpose is as described in Attachment 2. The JICA team acknowledged receipt of the document, and will report to relevant Japanese organizations on the plan.

### 8-2 Privatization

MOI and MRTV reassured the JICA team that MRTV would not be privatized in the foreseen future.

### 8-3 Confidentiality

MRTV reassured the JICA team that it would strictly observe confidentiality as required in Clause 7-12 of the Minutes of Discussions of July 5, 2001. For record, a total of seven copies of the Draft Final Report were handed over to the following persons:

- 1) Ms. L. Nasanbuyan, MOFE
- 2) Ms. L. Banzragch, MOI
- 3) Mr. B. Ganbold, MRTV
- 4) Mr. T. Gantumur, MRTV
- 5) Mr. Z. Tsedenbaljir, MRTV
- 6) Mr. D. Bayasgalan, MRTV
- 7) Mr. O. Gankhuu, MRTV

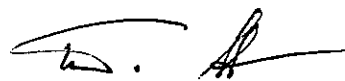
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#### Attachment:

1. A transition plan of existing Mongolian radio broadcasting network to short-wave broadcasting network
2. A proposed plan for announcement during Japanese grant aid project
3. Supplementary drawings (10 copies)

8.4 Technical Considerations (Draft Report Page 2-4, item(3))  
- 5) shall read as follows:  
5) the equipment adopts proven technology without limitation to any technological systems or equipment, and has sufficient field records.

Approved by :



T. Gantumur. Director RTVTC of Transmission System

Transition plan of existing Mongolian radio broadcasting network to shortwave wave broadcasting network.

Nov. 2001 year

№	Station Name	Type of the transmitter		LW, MW, SW	National radio broadcastig program №1 (per day 17 hour)				National radio broadcastig program №2 (per day 11 hour)			
					2003 year	2004 year	2005 year	2006 year	2003 year	2004 year	2005 year	2006 year
1	Ulaanbaatar	TLW-500	100 50	LW	██████████	██████████	██████████	██████████				
				SW					██████████	██████████	██████████	██████████
2	Altai	TLW-75x2	100 50	LW	██████████	██████████	██████████	██████████				
				SW		██████████	██████████	██████████				
3	Murun	TMW-75x2	100 50	LW	██████████					██████████		
				SW		██████████	██████████	██████████				
4	Dalanzadgad	TLW-75x2	100 50	LW	██████████	██████████	██████████					██████████
5	Choibalsan	TLW-75x2	100 50	LW	██████████	██████████	██████████					██████████
6	Ulgii	TLW-60	100 50	LW	██████████	██████████	██████████	██████████				
7	Sainshand	TSW-12	100 50	SW	██████████					██████████		

ATTACHMENT 1

Remark: ██████████ This line means broadcast station





ATTACHMENT 2

PROPOSED PLAN FOR ANNOUNCEMENT DURING  
JAPANESE GRANT AID PROJECT ON IMPROVEMENT OF THE  
SHORTWAVE RADIO BROADCASTING NETWORK IN MONGOLIA

28 November, 2001

No	Type of media	Description	Person Responsible	Explanation
1	National Television	Broadcast program about the Project importance and interview with Japanese & Mongolian specialists on each occasion	Ts. Enkhbat	
2		A 30 second publicity spot about the Project Twice a week	Ts. Enkhbat	
3	National Radio	Broadcast program about the Project importance and interview with Japanese & Mongolian specialists on each occasion	B. Purevdash	
4		A 30 second publicity spot about the Project and the frequency on which people can listen/ three times a week	B. Purevdash	
5		Distance training about the transition to Shortwave Radio broadcasts	B. Purevdash	
6	Press	Announcement in national & local press once every 2 months	B. Purevdash	
7		Publication of an informational calendar	T. Gantumur	
8	Public notices	Placing notices in public transport, aimag and soum noticeboards.	B. Ganbaatar	
9	Radio retail outlets	Information included with radio receivers when sold	O. Gankhuu	

\*Plan will be implemented after Note changing between Governments.



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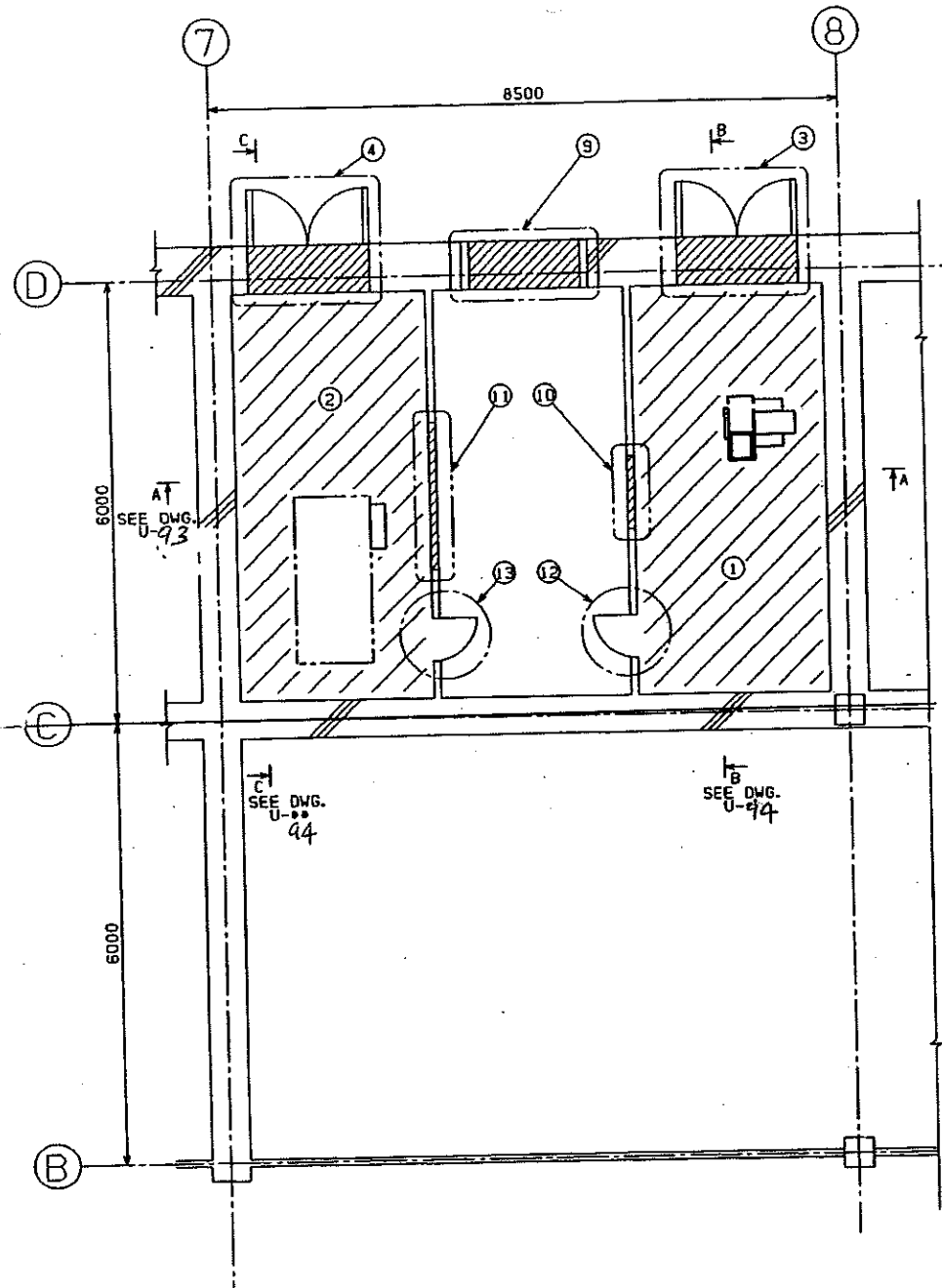
**Attachment 3**

**Supplementary Drawings**

The following drawings attached hereto are intended to outline requirements for modification of the buildings and foundations at the existing transmitting stations for the Project. Drawings are for reference only, and may be subject to change in the course of the detailed design by the Consultant or workshop design by the Contractor.

- U-91 Ulaanbaatar Station – Civil Requirement (1/4)
- U-92 Ulaanbaatar Station – Civil Requirement (2/4)
- U-93 Ulaanbaatar Station – Civil Requirement (3/4)
- U-94 Ulaanbaatar Station – Civil Requirement (4/4)
  
- A-91 Altai Station – Civil Requirement (1/4)
- A-92 Altai Station – Civil Requirement (2/4)
- A-93 Altai Station – (E/G Room) Civil Requirement (3/4)
- A-94 Altai Station – (E/G Room) Civil Requirement (4/4)
  
- M-91 Murun Station – Civil Requirement (1/2)
- M-92 Murun Station – Civil Requirement (2/2)



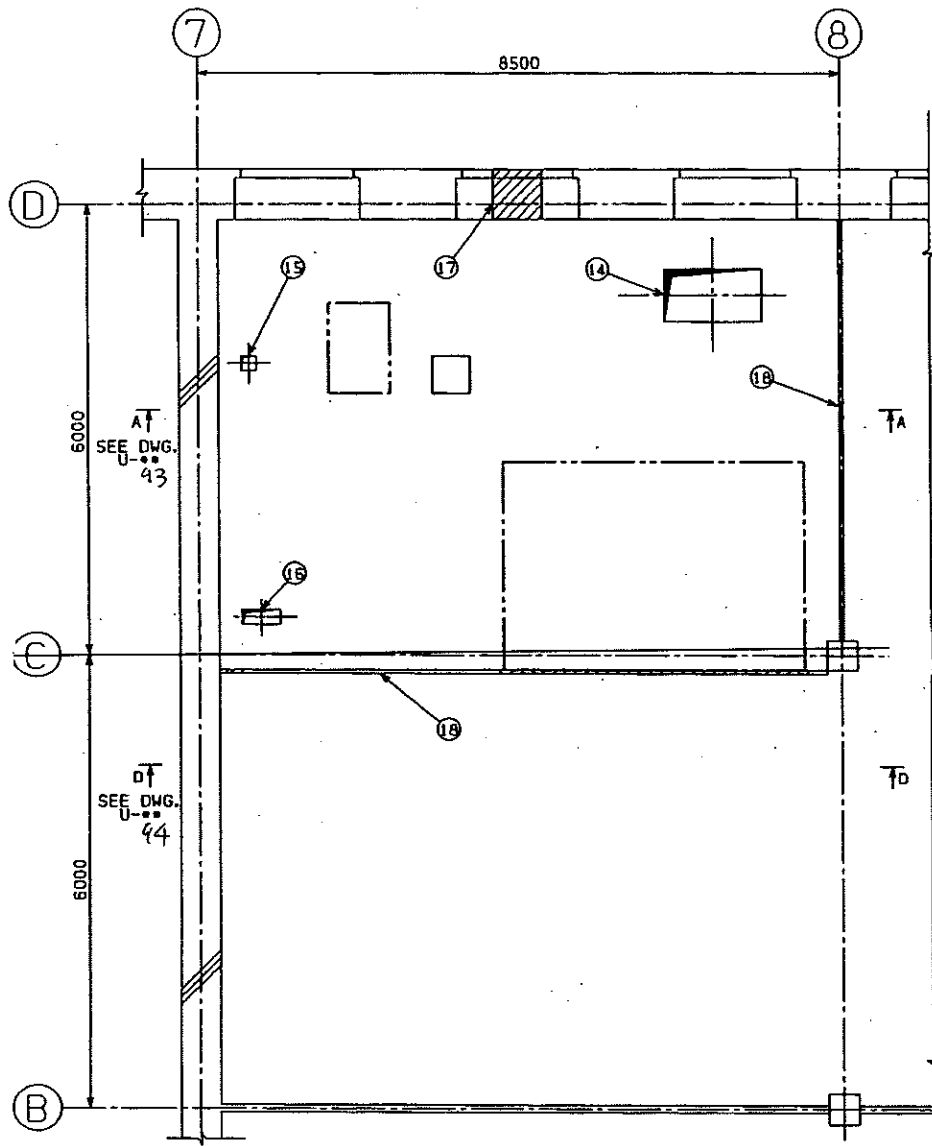


MODIFICATION OF BUILDING

No.	CONTENTS	SIZE
1	MODIFICATION TO FLAT FLOOR FOR BLOWER ROOM.	2600x5500x50
2	MODIFICATION TO FLAT FLOOR FOR DUMMY LOAD ROOM.	2600x5500x50
3	EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. FILL UP TO THE SURPLUS HOLE. NEW DOOR FOR BLOWER ROOM.	1500x2000"
4	EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. FILL UP TO THE SURPLUS HOLE. NEW DOOR FOR DUMMY LOAD ROOM.	1500x2000"
5	SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (BLOWER ROOM)	2000x1000
6	SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (DUMMY LOAD ROOM)	2000x1000
7	SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (AIR INTAKE ROOM)	2000x1000
8	PENETRATION HOLE FOR EXHAUST AIR DUCT OF DUMMY LOAD.	900x900
9	EXPANSION OF HOLE FOR FILTER FRAME IN AIR INTAKE ROOM.	1500x2000
10	PENETRATION HOLE FOR FILTER FRAME OF BLOWER ROOM.	1000x2000
11	PENETRATION HOLE FOR FILTER FRAME OF DUMMY LOAD ROOM.	2000x2000
12	PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. NEW DOOR FOR BLOWER ROOM.	600x1500
13	PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. NEW DOOR FOR DUMMY LOAD ROOM.	600x1500
14	PENETRATION HOLE FOR INTAKE AIR DUCT & RECYCL AIR DUCT.	1300x700
15	PENETRATION HOLE FOR INDOOR COAXIAL FEEDER.	200x200
16	PENETRATION HOLE FOR CABLE LADDER	500x200
17	PENETRATION HOLE FOR EXHAUST AIR DUCT OF TX.	650x650
18	PARTITION WALL. PENETRATION HOLE FOR TX AND INDOOR COAXIAL FEEDER	4100x2050 200x200
19	PENETRATION HOLE FOR EQUIPMENT ENTRANCE. AFTER INSTALLATION, SEAL UP THE EQUIPMENT ENTRANCE.	2000x2500
20	TEMPORARY SCAFFOLD FOR EQUIPMENT ENTRANCE	

GROUND FLOOR

U-91	ULAANBAATAR STATION CIVIL REQUIREMENT (1/4)
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MODIFICATION OF BUILDING

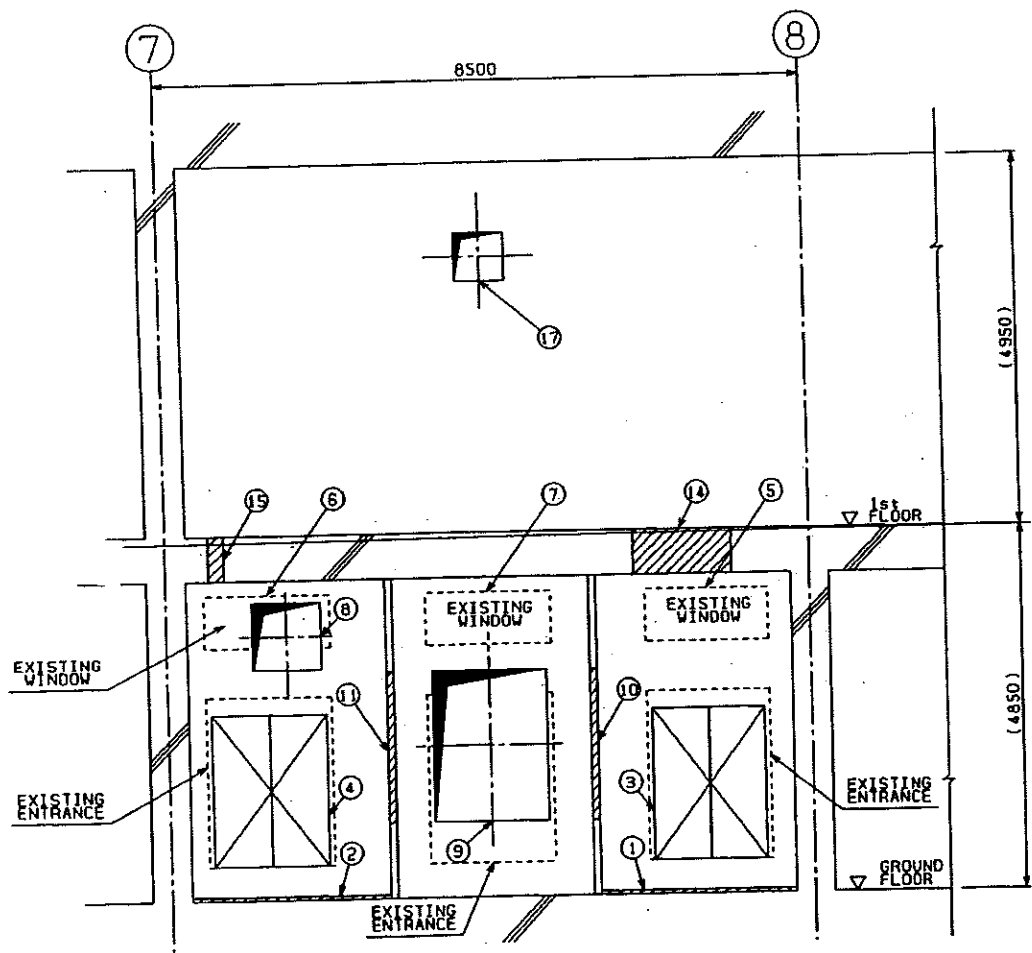
No.	CONTENTS	SIZE
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2	· MODIFICATION TO FLAT FLOOR FOR DUMMY LOAD ROOM.	2600x5500x50
3	· EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. · FILL UP TO THE SURPLUS HOLE. · NEW DOOR FOR BLOWER ROOM.	1500*2000*
4	· EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. · FILL UP TO THE SURPLUS HOLE. · NEW DOOR FOR DUMMY LOAD ROOM.	1500*2000*
5	· SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (BLOWER ROOM)	2000x1000
6	· SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (DUMMY LOAD ROOM)	2000x1000
7	· SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (AIR INTAKE ROOM)	2000x1000
8	· PENETRATION HOLE FOR EXHAUST AIR DUCT OF DUMMY LOAD.	900x900
9	· EXPANSION OF HOLE FOR FILTER FRAME IN AIR INTAKE ROOM.	1500x2000
10	· PENETRATION HOLE FOR FILTER FRAME OF BLOWER ROOM.	1000x2000
11	· PENETRATION HOLE FOR FILTER FRAME OF DUMMY LOAD ROOM.	2000x2000
12	· PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. · NEW DOOR FOR BLOWER ROOM.	600x1500
13	· PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. · NEW DOOR FOR DUMMY LOAD ROOM.	600x1500
14	· PENETRATION HOLE FOR INTAKE AIR DUCT & RECYCL AIR DUCT.	1300x700
15	· PENETRATION HOLE FOR INDOOR COAXIAL FEEDER.	200x200
16	· PENETRATION HOLE FOR CABLE LADDER	500x200
17	· PENETRATION HOLE FOR EXHAUST AIR DUCT OF TX.	650x650
18	· PARTITION WALL. · PENETRATION HOLE FOR TX AND INDOOR COAXIAL FEEDER	4100x2050 200x200
19	· PENETRATION HOLE FOR EQUIPMENT ENTRANCE. · AFTER INSTALLATION SEAL UP THE EQUIPMENT ENTRANCE.	2000x2500
20	· TEMPORARY SCAFFOLD FOR EQUIPMENT ENTRANCE	

1st FLOOR

U-92

ULAANBAATAR STATION  
CIVIL REQUIREMENT (3/4)

2/10

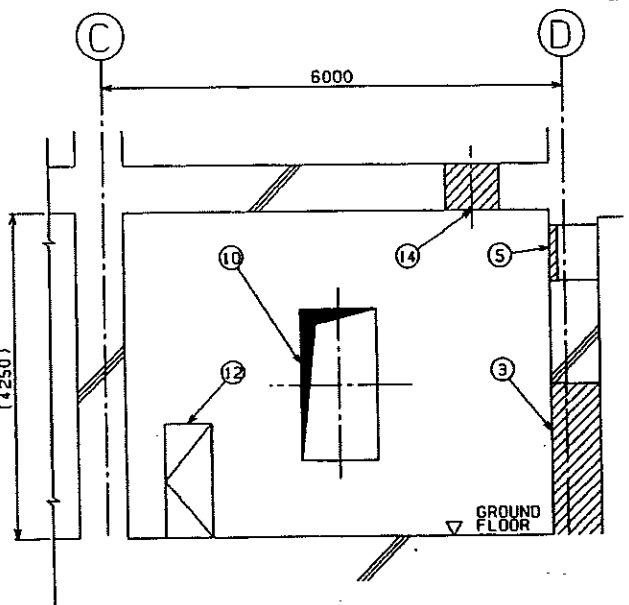


SECTION A-A  
 SEE DWG. U-93  
 41  
 42

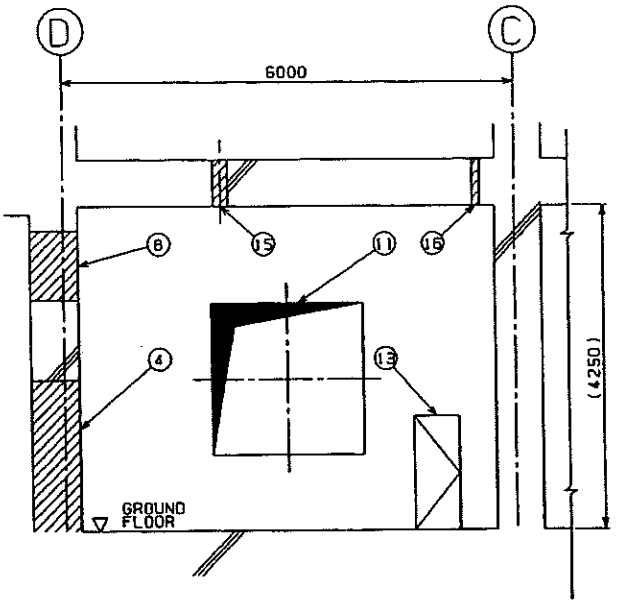
MODIFICATION OF BUILDING

No.	CONTENTS	SIZE
1	MODIFICATION TO FLAT FLOOR FOR BLOWER ROOM.	2600x5500x50
2	MODIFICATION TO FLAT FLOOR FOR DUMMY LOAD ROOM.	2600x5500x50
3	EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. FILL UP TO THE SURPLUS HOLE. NEW DOOR FOR BLOWER ROOM.	1500x2000"
4	EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. FILL UP TO THE SURPLUS HOLE. NEW DOOR FOR DUMMY LOAD ROOM.	1500x2000"
5	SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (BLOWER ROOM)	2000x1000
6	SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (DUMMY LOAD ROOM)	2000x1000
7	SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (AIR INTAKE ROOM)	2000x1000
8	PENETRATION HOLE FOR EXHAUST AIR DUCT OF DUMMY LOAD.	900x900
9	EXPANSION OF HOLE FOR FILTER FRAME IN AIR INTAKE ROOM.	1500x2000
10	PENETRATION HOLE FOR FILTER FRAME OF BLOWER ROOM.	1000x2000
11	PENETRATION HOLE FOR FILTER FRAME OF DUMMY LOAD ROOM.	2000x2000
12	PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. NEW DOOR FOR BLOWER ROOM.	600x1500
13	PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. NEW DOOR FOR DUMMY LOAD ROOM.	600x1500
14	PENETRATION HOLE FOR INTAKE AIR DUCT & RECYCL AIR DUCT.	1300x700
15	PENETRATION HOLE FOR INDOOR COAXIAL FEEDER.	200x200
16	PENETRATION HOLE FOR CABLE LADDER	500x200
17	PENETRATION HOLE FOR EXHAUST AIR DUCT OF TX.	650x650
18	PARTITION WALL. PENETRATION HOLE FOR TX AND INDOOR COAXIAL FEEDER	4100x2050 200x200
19	PENETRATION HOLE FOR EQUIPMENT ENTRANCE. AFTER INSTALLATION, SEAL UP THE EQUIPMENT ENTRANCE.	2000x2500
20	TEMPORARY SCAFFOLD FOR EQUIPMENT ENTRANCE	

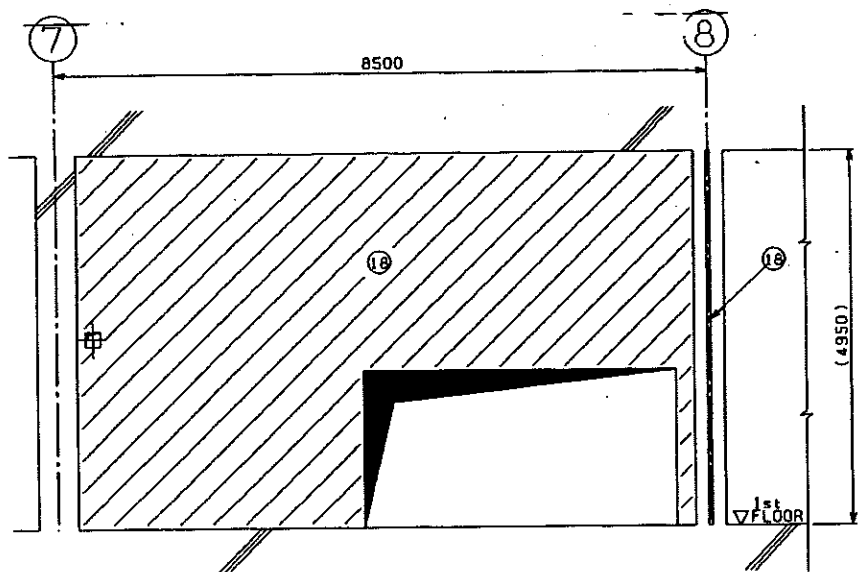
U-93 ULAANBAATAR STATION  
 CIVIL REQUIREMENT (3/4)



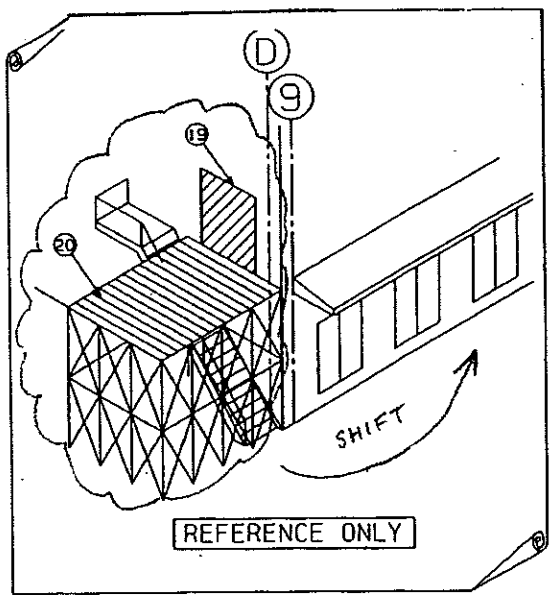
SECTION B-B  
SEE DWG. U-91  
91



SECTION C-C  
SEE DWG. U-91  
91



SECTION D-D  
SEE DWG. U-92  
92

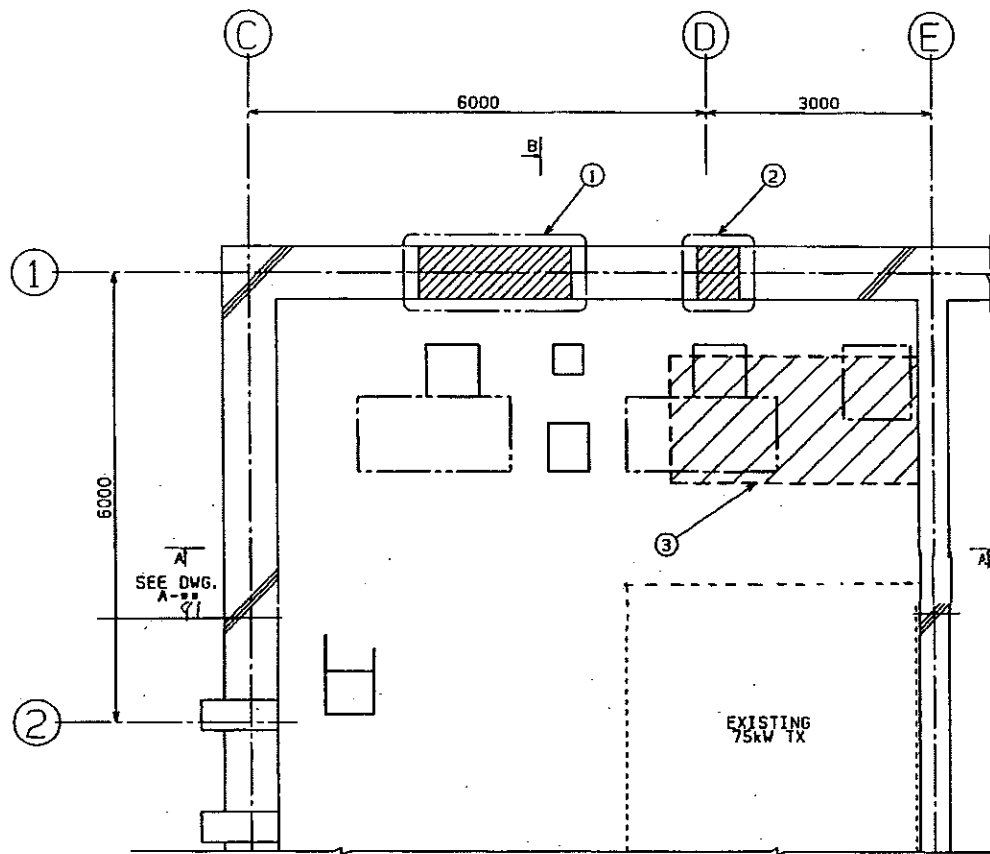


MODIFICATION OF BUILDING

No.	CONTENTS	SIZE
1	• MODIFICATION TO FLAT FLOOR FOR BLOWER ROOM.	2600x5500x50
2	• MODIFICATION TO FLAT FLOOR FOR DUMMY LOAD ROOM.	2600x5500x50
3	• EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. • FILL UP TO THE SURPLUS HOLE. • NEW DOOR FOR BLOWER ROOM.	1500*2000*
4	• EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE. • FILL UP TO THE SURPLUS HOLE. • NEW DOOR FOR DUMMY LOAD ROOM.	1500*2000*
5	• SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (BLOWER ROOM)	2000x1000
6	• SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (DUMMY LOAD ROOM)	2000x1000
7	• SEAL UP TO THE EXISTING WINDOW BY THE IRON PLATE. (AIR INTAKE ROOM)	2000x1000
8	• PENETRATION HOLE FOR EXHAUST AIR DUCT OF DUMMY LOAD.	900x900
9	• EXPANSION OF HOLE FOR FILTER FRAME IN AIR INTAKE ROOM.	1500x2000
10	• PENETRATION HOLE FOR FILTER FRAME OF BLOWER ROOM.	1000x2000
11	• PENETRATION HOLE FOR FILTER FRAME OF DUMMY LOAD ROOM.	2000x2000
12	• PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. • NEW DOOR FOR BLOWER ROOM.	600x1500
13	• PENETRATION HOLE FOR ENTRANCE OF THE MAINTENANCE. • NEW DOOR FOR DUMMY LOAD ROOM.	600x1500
14	• PENETRATION HOLE FOR INTAKE AIR DUCT & RECYCL AIR DUCT.	1300x700
15	• PENETRATION HOLE FOR INDOOR COAXIAL FEEDER.	200x200
16	• PENETRATION HOLE FOR CABLE LADDER	500x200
17	• PENETRATION HOLE FOR EXHAUST AIR DUCT OF TX.	650x650
18	• PARTITION WALL. • PENETRATION HOLE FOR TX AND INDOOR COAXIAL FEEDER	4100x2050 200x200
19	• PENETRATION HOLE FOR EQUIPMENT ENTRANCE. • AFTER INSTALLATION, SEAL UP THE EQUIPMENT ENTRANCE.	2000x2500
20	• TEMPORARY SCAFFOLD FOR EQUIPMENT ENTRANCE	

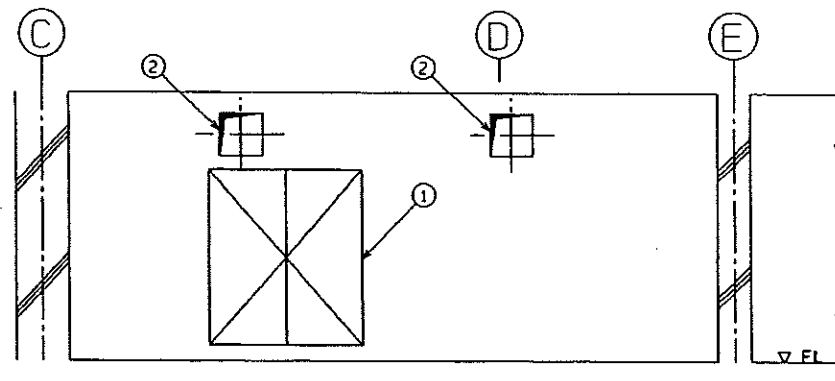
U-94 ULAANBAATAR STATION  
CIVIL REQUIREMENT (4/4)

6/2

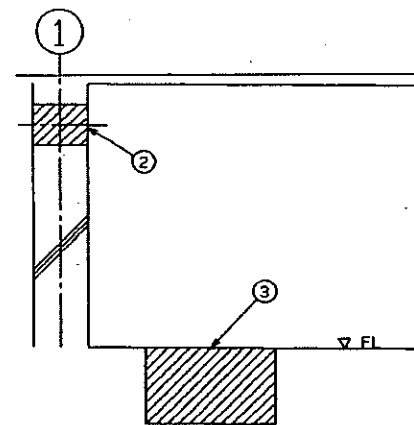


SEE DWG. A-91

SEE DWG. A-91



SECTION A-A  
SEE DWG. A-91



SECTION B-B  
SEE DWG. A-91

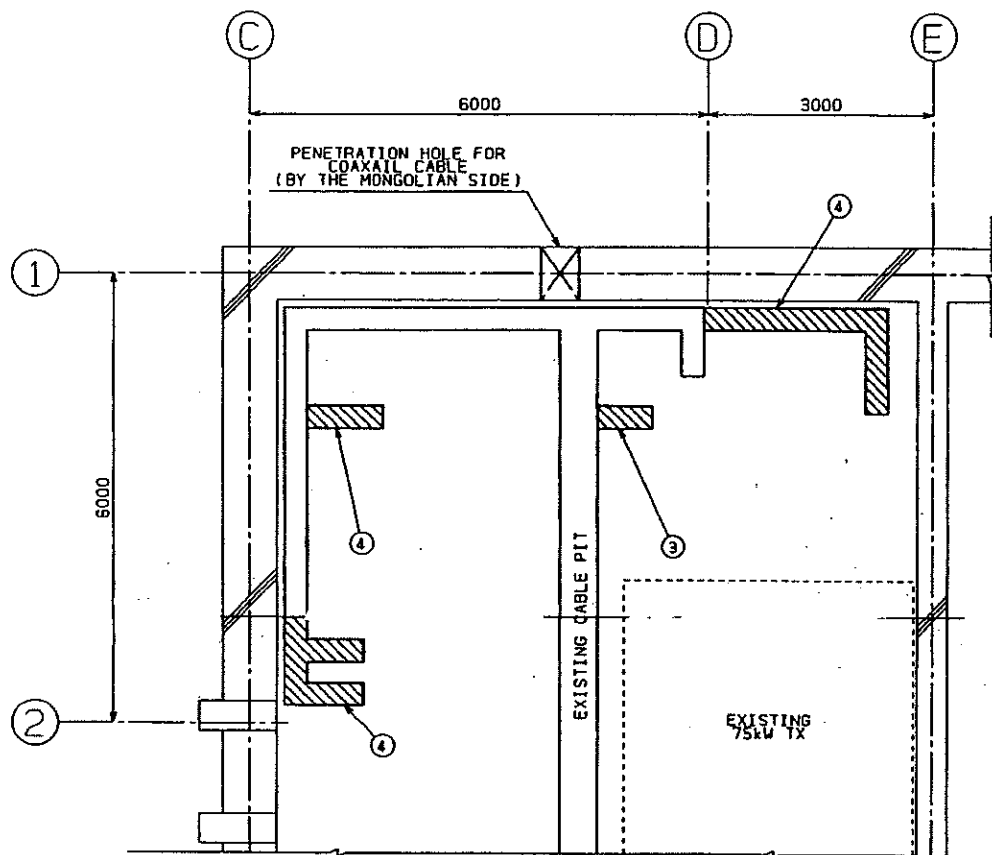
MODIFICATION OF BUILDING

No.	CONTENTS	SIZE
1	PENETRATION HOLE FOR EQUIPMENT ENTRANCE.	2000*2500*
2	PENETRATION HOLE FOR EXHAUST DUCT OF TX.	550*550
3	REPAIRING HOLE WITH CONCRETE.	1700*4800*1000
4	EXPANSION OF FLOOR PIT.	300*200*

A-91

ALTAI STATION  
CIVIL REQUIREMENT (1/4)

(5/10)



CABLE PIT ARRANGEMENT

MODIFICATION OF BUILDING

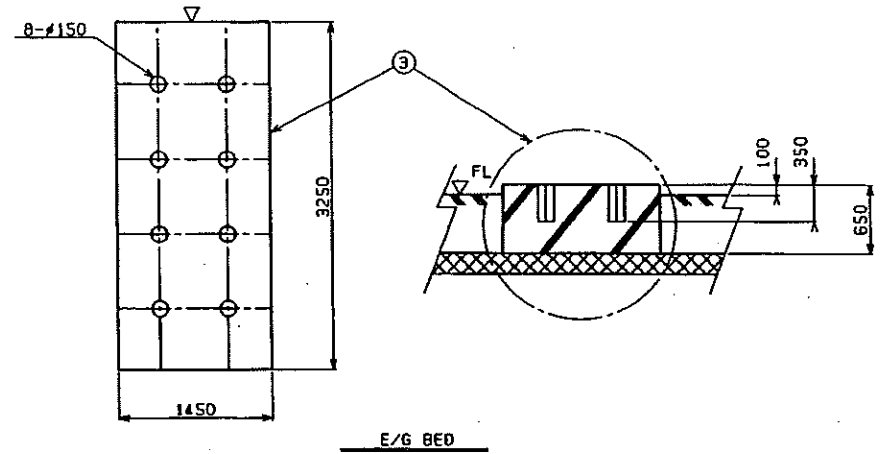
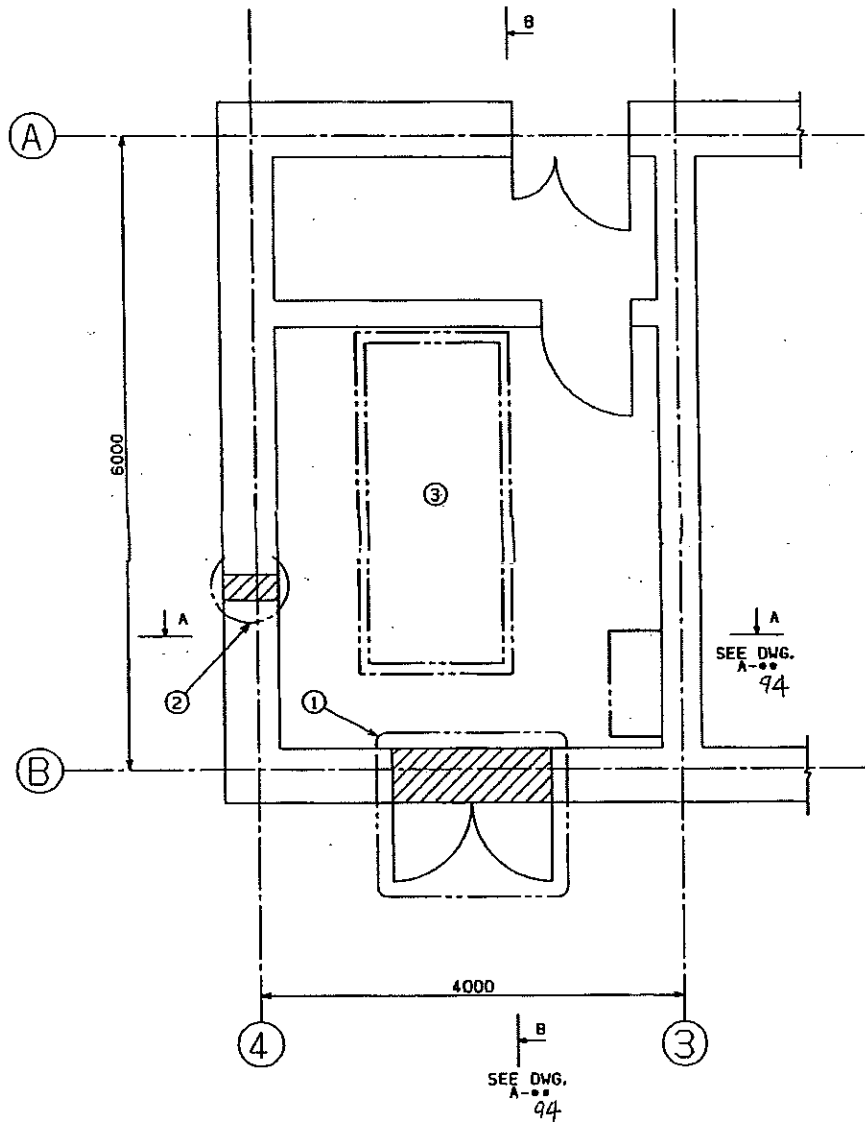
No.	CONTENTS	SIZE
1	PENETRATION HOLE FOR EQUIPMENT ENTRANCE.	2000"x2500"
2	PENETRATION HOLE FOR EXHAUST DUCT OF TX.	550x550
3	REPAIRING HOLE WITH CONCRETE.	1700x4800x1000
4	EXPANSION OF FLOOR PIT.	300"x200"

A-9Z

ALTAI STATION  
CIVIL REQUIREMENT (2/4)

6/10



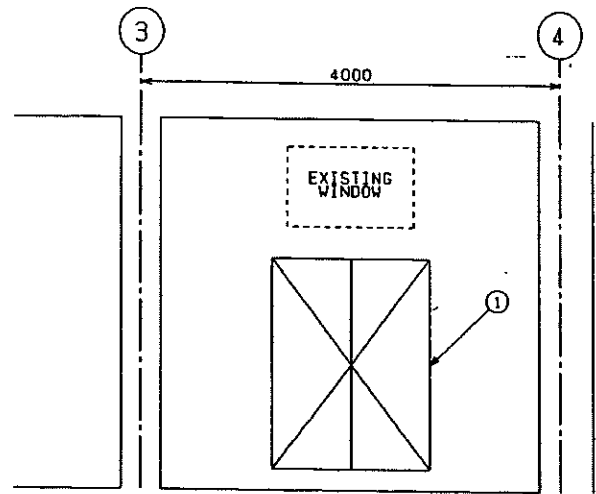


MODIFICATION OF BUILDING

No.	CONTENTS	SIZE
1	PENETRATION HOLE FOR EQUIPMENT ENTRANCE. (E/G ROOM)	1500*2000"
2	PENETRATION HOLE FOR MUFFLER.	#250
3	NEW CONCRETE BED.	1500x3300x800

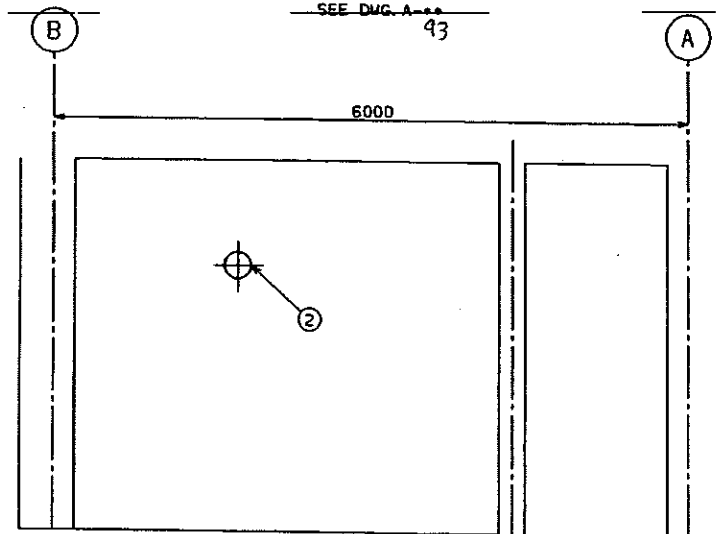
A-93	ALTAI STATION (E/G ROOM) CIVIL REQUIREMENT (3/4)
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7/12



SECTION A-A

SEE DWG. A-93



SECTION B-B

SEE DWG. A-93

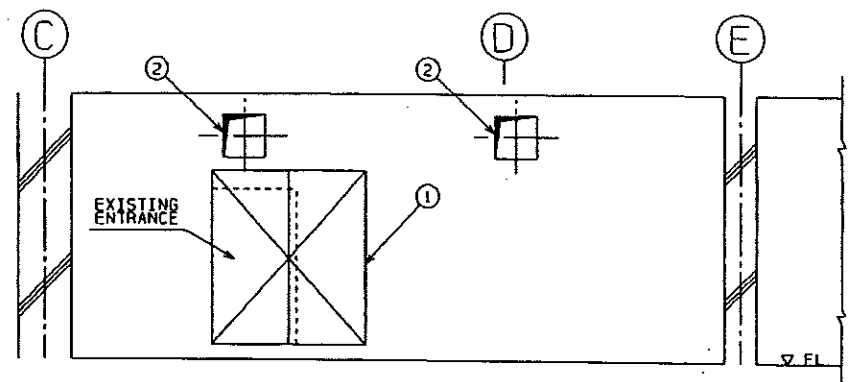
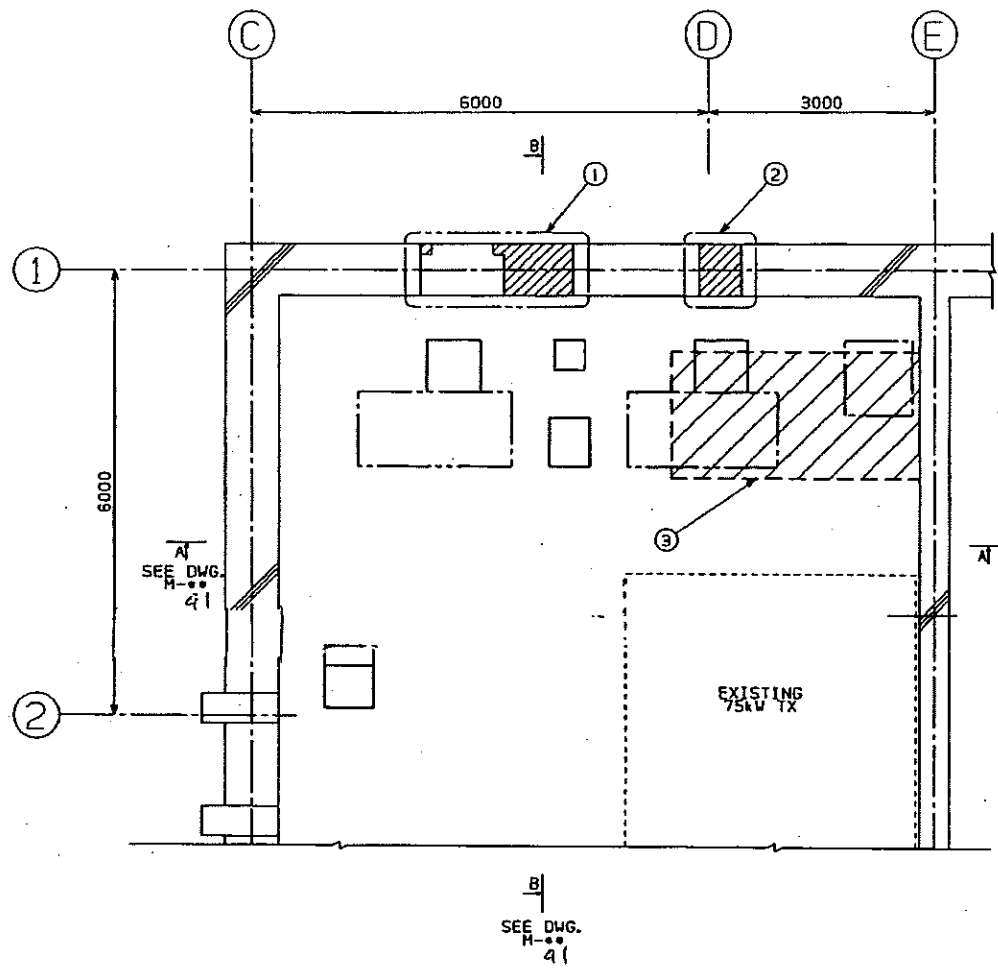
MODIFICATION OF BUILDING

No.	CONTENTS	SIZE
1	PENETRATION HOLE FOR EQUIPMENT ENTRANCE. (E/G ROOM)	1500*2000*
2	PENETRATION HOLE FOR MUFFLER.	∅250
3	NEW CONCRETE BED.	1500*3300*800

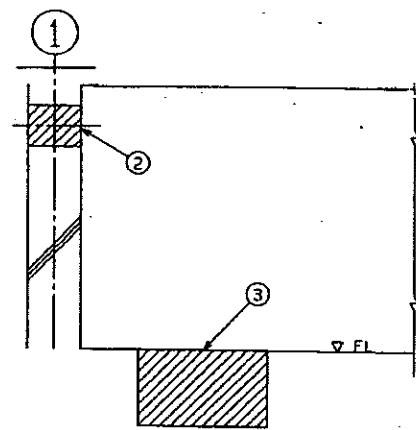
A-94

ALTAI STATION (E/G ROOM)  
CIVIL REQUIREMENT (4/A)

Mr



SECTION A-A  
SEE DWG. M-91



SECTION B-B  
SEE DWG. M-91

MODIFICATION OF BUILDING

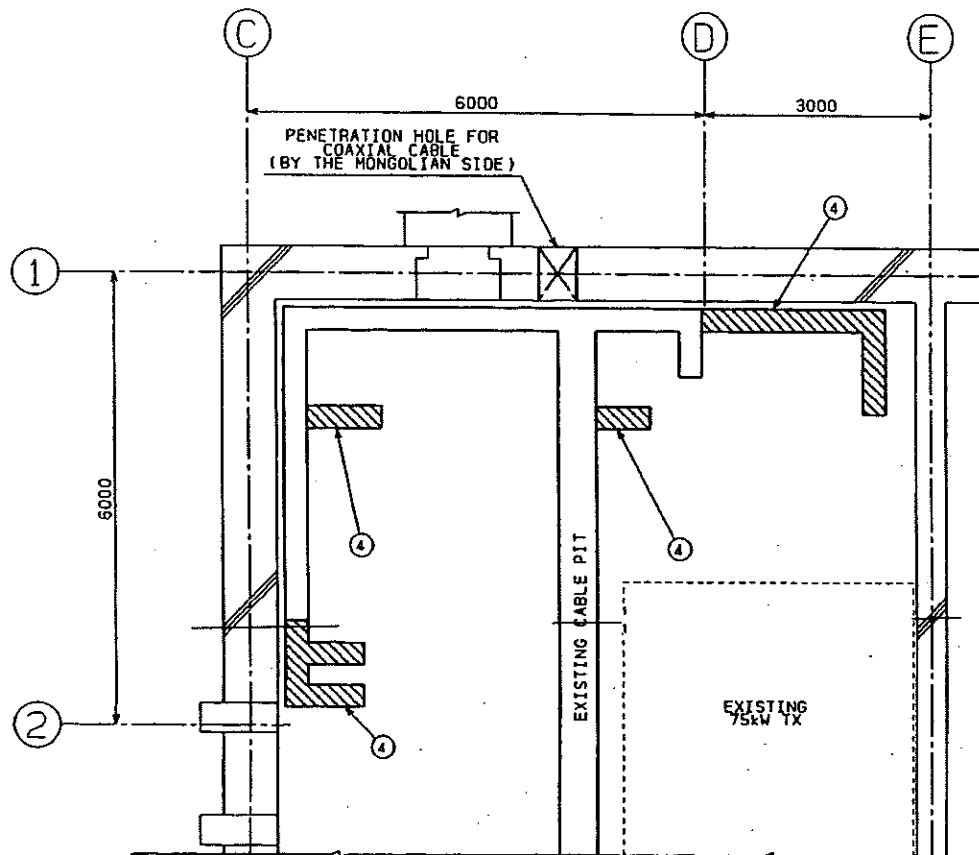
No.	CONTENTS	SIZE
1	EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE.	2000*2500*
2	PENETRATION HOLE FOR EXHAUST AIR DUCT OF TX.	550*550
3	REPAIRING HOLE WITH CONCRETE.	1700*4800*1000
4	EXPANSION OF FLOOR PIT.	300*200*

M-91	MURUN STATION CIVIL REQUIREMENT (1/2)
------	--

Mr

9/10

Mr



CABLE PIT ARRANGEMENT

MODIFICATION OF BUILDING

No.	CONTENTS	SIZE
1	EXPANSION TO THE HOLE FOR EQUIPMENT ENTRANCE.	2000"x2500"
2	PENETRATION HOLE FOR EXHAUST AIR DUCT OF TX.	550x550
3	REPAIRING HOLE WITH CONCRETE.	1700x4800x1000
4	EXPANSION OF FLOOR PIT.	300"x200"

Handwritten signature or initials.

M-92	MURUN STATION CIVIL REQUIREMENT (2/2)
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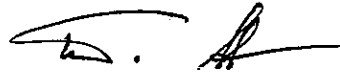
## **APPENDIX-6 (3)**

### **Transition Plan and Publicity Plan for Shifting from Medium Wave / Long Wave to Short Wave**

The implementing agency, MRTV, revealed a gradual shift plan of the operation from medium and long wave, which is the base of present radio broadcasting, to short wave in connection with implementation of the project. The tentative transition schedule shown on the next page assumes that the short wave transmitting systems will be installed at the three (3) stations by the second half of 2003, and accordingly, the transition will be completed in the period from 2003 to 2006. However, the service area of short wave broadcasting is strongly affected by the condition of ionosphere. Therefore, it is planned to continue the maintenance of long wave transmitting system in order to correspond by long wave broadcasting when the auditory level of short wave broadcasting declines.

In addition to the Transition Plan, MRTV is willing to carry out publicity activities to the listeners. The provisional contents of the activities are as shown after the transition schedule.

Approved by :



T. Gantumur. Director RTVTC of Transmission System

Transition plan of existing Mongolian radio broadcasting network to shortwave wave broadcasting network.

Nov. 2001 year

№	Station Name	Type of the transmitter		LW, MW, SW	National radio broadcastig program №1 (per day 17 hour)				National radio broadcastig program №2 (per day 11 hour)			
					2003 year	2004 year	2005 year	2006 year	2003 year	2004 year	2005 year	2006 year
1	Ulaanbaatar	TLW-500		LW	████████████████████							
		TSW	100	SW								
			50	SW	████████████████████				████████████████████			
2	Altai	TLW-75x2		LW	████████████████████							
		TSW-10x2		SW	████████████████████							
3	Murun	TMW-75x2		LW	████████████████████							
		TSW-10x2		SW	████████████████████							
4	Dalanzadgad	TLW-75x2		LW	████████████████████							
5	Choibalsan	TLW-75x2		LW	████████████████████							
6	Ulgii	TLW-60		LW	████████████████████							
7	Sainshand	TSW-12		SW	████████████████████							

Remark: ██████████ This line means broadcast station



PROPOSED PLAN FOR ANNOUNCEMENT DURING  
JAPANESE GRANT AID PROJECT ON IMPROVEMENT OF THE  
SHORTWAVE RADIO BROADCASTING NETWORK IN MONGOLIA

28 November, 2001

No	Type of media	Description	Person Responsible	Explanation
1	National Television	Broadcast program about the Project importance and interview with Japanese & Mongolian specialists on each occasion	Ts. Enkhbat	
2		A 30 second publicity spot about the Project Twice a week	Ts. Enkhbat	
3	National Radio	Broadcast program about the Project importance and interview with Japanese & Mongolian specialists on each occasion	B. Purevdash	
4		A 30 second publicity spot about the Project and the frequency on which people can listen/ three times a week	B. Purevdash	
5		Distance training about the transition to Shortwave Radio broadcasts	B. Purevdash	
6	Press	Announcement in national & local press once every 2 months	B. Purevdash	
7		Publication of an informational calendar	T. Gantumur	
8	Public notices	Placing notices in public transport, aimag and soum noticeboards.	B. Ganbaatar	
9	Radio retail outlets	Information included with radio receivers when sold	O. Gankhuu	

\*Plan will be implemented after Note changing between Governments.



02

## **APPENDIX-6 (4)**

### **Estimation of Project Effect**

By implementing the project, MRTV expects to increase the service area as of July, 2001(source MRTV) as shown in the next page to the service area shown in the basic design drawing "C-11 SW Transmission Service Area Plan", and cover about 94% of the population and 93% of the land area. MRTV presumes that only about 65% of the total population and 47% of the total land area is covered by the service area as of July, 2001. Therefore, improvement effects when implementing the Project are, 29 points for the population ratio and 46 points for the land area ratio.

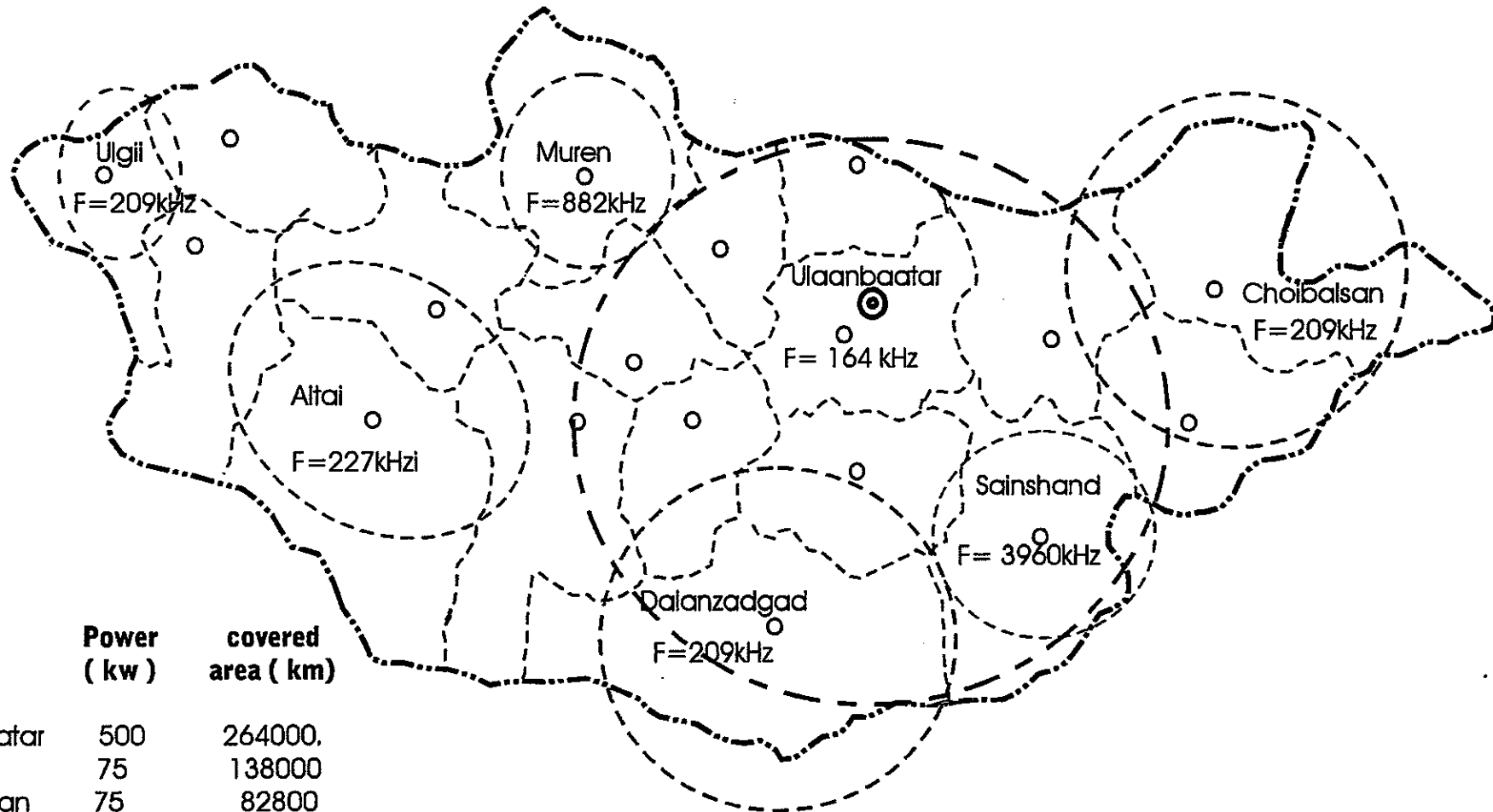
As stated in "8-3 The Transition Plan and Publicity Plan for Shifting from Medium Wave / Long Wave to Short Wave", MRTV is planning to gradually retire medium and long wave transmitting systems. However, it is planned to continue the maintenance of long wave transmitting system in order to correspond by long wave broadcasting when the auditory level of short wave broadcasting declines.

When the transition plan is implemented, MRTV expects to reduce the electricity expense from 570 million Tg. as of 2002 to about 366 million Tg. in 2006 and afterwards, although the expense will increase a little for a temporarily period. The above diminution of 204 million Tg. is equivalent to 36% of 570 million Tg. estimated for 2002. This is considered to be the amount of electricity-expense reduction brought by implementation of the project. It shall be noted that the above assumption is limited to the electricity expense for operation of Channel-1 and does not include electricity expense to operate Channel-2 or international broadcasting.

The increase in service area, increase in number of listeners, and the contents of calculation for the electricity expense reduction to be brought by the implementation of the Project are shown in the next pages.



Pic 1. COVERAGE AREA.  
MONGOLIAN NATIONAL RADIO



Location	Power ( kw )	covered area ( km )
Ulaanbaatar	500	264000.
Altai	75	138000
Choibalsan	75	82800
Muren	75	60000
Ulgii	30	33600
Dalanzadgad	75	120000
Sainshand	12	32000

TOTAL 730400

Source : MRTV

Service Area as of July 2001

## The coverage area to Shortwave propagation in Mongolia

ITEM	Territory, ( thous. Km <sup>2</sup> )	Resident population, ( thous. persons )
Major specifications; by aimags and capital of Mongolia	1564.1	2407.5
Bayan-Olgii ( output coverage area approx. 90% )	41.1	85.14
Uvs ( output coverage area approx. 50% )	37.00	43.4
Dornod ( output coverage area approx. 30% )	37.08	22.26
Bayan-Olgii + Uvs + Dornod ( all output coverage areas)	115.18	150.8
The total coverage area	1448.92 and 92.63%	2256.7 and 93.73%

*NOTE: THE ANTICIPATED COVERAGE AREA 100%  
FOR ALL AIMAGS AND CAPITAL WITH THE  
EXCEPTIONS MENTIONED HEREUNDER;  
( BAYAN-OLGII, UVS OR DORNOD )*

ESTIMATED COSTS OF TRANSMITTING BY NATIONAL  
 RADIO AFTER IMPLEMENTATION OF THE JAPANESE  
 GRANT AID PROJECT

\ million Tugrug\

	Expenses	2002	2003	2004	2005	2006
1	Total	856,2	874,,2	868,2	724,2	652,7
2	Energy	570,0	588,0	582,0	438,0,	366,0
3	Growth \+\ Fall \-\ comparatively to 2002	-	+18,0	<del>-6,0</del> +12.0	132,0	-204,0

## Appendix 6(5)

### Rough Cost Estimation for Operation and Maintenance

It is the electricity charge that amounts to about 80% of the operation and maintenance (O&M) expenses at each of the existing transmitting stations. In studying the O&M expenses incurred in implementing the Project, attention shall be paid to the electricity charge. As for personnel expenses, no special attention may be paid to the expenses, because there is no need for assigning any additional personnel to the O&M.

Electricity charge arising from operation of the new shortwave transmitting systems installed under the Project is estimated as follows. The electricity charge will then be compared with the one that will be needed for operation of the existing shortwave transmitting systems, which are still in operation or already retired, provided that those systems are forced to be operated at the same power output. This comparison may present an idea of the impact on the cost saving to be achieved by implementing the Project.

#### (1) Assumed Conditions on Calculation

- 1) Under the Project, 50kW transmitter will be installed at the Ulaanbaatar station, while 10kW transmitters will be installed each at the Altai and Murun stations on one hand. On the other hand, existing transmitters are assumed to be operated at the same power output as for the new transmitters, without the Project being implemented. Both cases will be discussed below.
- 2) Average modulation factor of the transmitter is assumed to be 50% for both cases.
- 3) It is assumed that efficiency of the new 50kW transmitter is 50% and efficiency for the existing transmitter is around 37%. For the 10kW transmitters, 43% and 30%, respectively, are assumed.
- 4) Operating hours per day of the transmitter is assumed to be 18 hours, coming to 6,570 hours per year.
- 5) Electricity rate is assumed to be 50 Tg/kWh for the Ulaanbaatar station, and about 100 Tg/kWh for the Altai and Murun stations.

#### (2) Electricity Charge at the Ulaanbaatar Station

- 1) Power Input (Pu1) at 50% modulation of the new transmitter:

$$Pu1 = 50(1 + 1/2(0.5)^2)/0.50 = 114kW$$

- 2) Power Input (Pu2) at 50% modulation of the existing transmitter:

$$Pu2 = 50(1 + 1/2(0.5)^2)/0.37 = 152\text{kW}$$

- 3) Electricity charge (Cuj) incurred in operation of the new transmitter:

$$Cuj = 114 \times 6,570 \times 50 = 37,449,000 \text{ Tg.}$$

- 4) Cost saving (Cus) in electricity charge per year:

$$Cus = (152 - 114) \times 6,570 \times 50 = 12,483,000 \text{ Tg.}$$

**(3) Electricity Charge at the Altai Station**

- 1) Power Input (Pa1) at 50% modulation of the new transmitter:

$$Pa1 = 10(1 + 1/2(0.5)^2)/0.43 = 26.2\text{kW}$$

- 2) Power Input (Pa2) at 50% modulation of the existing transmitter:

$$Pa2 = 10(1 + 1/2(0.5)^2)/0.30 = 37.5\text{kW}$$

- 3) Electricity charge (Caj) incurred in operation of the new transmitter:

$$Caj = 26.2 \times 6,570 \times 100 = 17,213,400 \text{ Tg.}$$

- 4) Cost saving (Cas) in electricity charge per year:

$$Cas = (37.5 - 26.2) \times 6,570 \times 100 = 7,424,100 \text{ Tg.}$$

**(4) Electricity Charge at the Murun Station**

- 1) Electricity charge (Cmj) incurred in operation of the new transmitter:

$$Cmj = 26.2 \times 6,570 \times 100 = 17,213,400 \text{ Tg.}$$

- 2) Cost saving (Cms) in electricity charge per year:

$$Cms = (37.5 - 26.2) \times 6,570 \times 100 = 7,424,100 \text{ Tg.}$$

**(5) Total Electricity Charge (Cj) for Three Stations :**

$$Cj = Cuj + Caj + Cmj = 37,449,000 + 17,213,400 + 17,213,400 = 71,875,800 \text{ Tg.}$$

**(6) Total Cost Saving (Cjs) in Electricity Charge for Three Stations:**

$$Cjs = Cus + Cas + Cms = 12,483,000 + 7,424,100 + 7,424,100 = 27,331,200 \text{ Tg.}$$