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17 June, 1979

Mr. Bhogya Prasad Shah,
Acting Director General,
Department of Broadcasting,
Ministry of Communications,
His Majesty's Government of Nepal.

Dear Sir,

Re: Establishment Programme of Medium Wave Broadcasting Network in the Kingdom of Nepal

I have the honour to submit herewith the Interim Report of the Preliminary Design Study on the afore mentioned subject.

Yours faithfully,

Seikichi Sakakibara,
The Leader,
Japanese Study Team.

INTERIM REPORT OF THE PRELIMINARY DESIGN STUDY

ON

THE ESTABLISHMENT PROGRAM OF MEDIUM WAVE BROADCASTING NETWORK

IN

THE KINGDOM OF NEPAL

JUNE 1979

JAPAN INTERNATIONAL COOPERATION AGENCY

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INTRODUCTION

In response to the request of His Majesty's Government of Nepal, the Government of Japan despatched a mission to the Kingdom of Nepal from the 24th of May to the 22nd of June, 1979, for Preliminary design study on the establishment programme of Medium Wave Broadcasting Network in the Kingdom of Nepal. The survey team, with the cooperation of Radio Nepal Staff, carried out the necessary field survey and studies over three weeks to obtain the data to make up a preliminary design report for the establishment programme.

As for the matter of the result of the survey is concerned, according to the Scope of Work for the Preliminary Design Study on the programme, completed in the Draft Final Report, and a team will be despatched to the Kingdom of Nepal for supplementary explanation of the said report.

It is expected that the result of this survey will be useful not only for the establishment programme of the Broadcasting services, but also for the enhancement of friendly cooperation between the Kingdom of Nepal and Japan.

Finally, the members of the survey team wish to express their sincere thanks to the staff of the Department of Broadcasting, Ministry of Communications, and all other organizations concerned for the friendly cooperation they have provided to the Mission.

****

2-1 BASIC PLAN

According to the Objective of Study Which is established in the Scope of Work for Preliminary Design Study on the programme:

1) Transmitter Station of 100 KW with an emergency transmitter is planned in Kathmandu and Pokhara, based upon field measurement survey and other essential survey, for expansion of the Medium Wave Broadcasting Service in Central and Western Development Zone.

   As for the Studio facility:

2) A Studio centre of 1000 m^2 class accommodating 5 Studios is planned in Kathmandu to meet increasing demand of broadcasting production capacity. And the Studio Centre will be annexed to the existing Broadcasting House as far as broadcasting operation is concerned.

3) In Pokhara Transmitter Station, a production studio is planned to meet a need of local continuity operation or recording programme.

4) In addition, a Sound O.B.(Out side Broadcasting)Wagon is planned for a demand of O.B. recording programme covering Far Western Development Zone.

5) A STL and Engineering link is planned with UHF & VHF facility between studio center and transmitter station in Kathmandu because the site of transmitter lies on suburb of Kathmandu, and of the length of the span between them.

2-2 FACILITY PLAN

The plan of each complex is listed as follows, which is classified in group:

(1) KATHMANDU TRANSMITTER STATION

NO:	DESCRIPTION	QUANTITY
(1-1)	1. Transmitter 100KW	1
	2. Transmitter (Stand-by) 10KW	1
(1-2)	Attached Equipment	1 set.
(1-3)	Antenna (100 m Guyed Mast)	1
(1-4)	Power supply Equipment & Engine Generator (35KVA)	1 set.
(1-5)	STL (UHF Multiplex & VHF Engineering Link)	1 set.
(1-6)	-	-
(1-7)	Measuring Equipment & Tool	1 set.
(1-8)	Installation Material	1 set.
(1-9)	Spare Parts	1 set.
(1-10)	Building 600 Sq.m class.	1

(2) POKHARA TRANSMITTER STATION

NO:	DESCRIPTION	QUANTITY
(2-1)	1. Transmitter 100KW	1
	2. Transmitter (stand-by) 10KW	1
(2-2)	Attached Equipment	1 set
(2-3)	Antenna (100 m Guyed Mast)	1
(2-4)	Power Supply Equipment & Engine Generator (35 KVA)	1 set
(2-5)	-	-
(2-6)	Studio Facility	1 set
(2-7)	Measuring Equipment & Tool	1 set
(2-8)	Installation Material	1 set
(2-9)	Spare Parts	1 set
(2-10)	Building 600 Sq.m class	1
(2-11)	O.B. Van	1 set

(3) KATHMANDU STUDIO CENTRE

NO:	DESCRIPTION	QUANTITY
(3-1)	Master Control Facility (with X-tal Clock System & Continuity Production Facility)	1 set
(3-2)	Stuido Control Facility	4 set
(3-3)	Power Supply Equipment & Engine Generator (50 KVA Effective)	1 set
(3-4)	Measuring Equipment & Tool	1 set
(3-5)	Installation Material	1 set
(3-6)	Spare Parts	1 set
(3-7)	Building 1000 sq.m class.	1

2-3 BUILDING PLAN

2-3.1 Fundamental Design Concept

a. The basic building plan of the Studio Centre and the Transmitter Stations are based upon the result of the survey.

b. The plan of Preliminary Design will be completed according to the basic building plan. However, should modification and/or ammendments take place by Engineering design and/or by the arrangement of equipment, except considerable modifications in floor area and/or number of rooms.

c. Furniture for the above mentioned building will not be included in the drawing of preliminary design.

2-3.2 Site Plan ' Survey Map

As for the plan concerned, refer to attached drawings (Fig. 1 - Fig. 6). The site area shown on the Survey Maps occupy minimum area for the purpose.

2-3.3 Floor Plan

As for the plan concerned, refer to attached drawings (Fig. 7 - Fig. 9). The Studio Centre and Transmitter Stations are designed one-storied building.

2-3.4 STRUCTURE PLAN

1. Applied Standards

a. A.I.J.* Standards of reinforced concrete Structures.
b. A.I.J. Standards of Steel structures.
c. A.I.J. Standards of foundation structures.
d. J.I.S.**
e. Other applicable Japanese standards.

* A.I.J. (Architectural Institute of Japan)
** J.I.S. (Japan Industrial Standards)

2. Type of Structure:

a. Building.
Frame, roof and floor slab, foundation and quake resisting wall will be of reinforced concrete structure.

b. Tower. (Guy Type)
Mast and Guy will be of steel. Foundation will be of reinforced concrete structure.

3. Allowable Soil Bearing Capacity

Allowable soil bearing capacity will be decided according to the result of soil investigation or other data.

2-3.5 Finishing

The material of all external and internal finish will be selected on the point of functional and economical.

Special acoustic treatment is required in every Studio and Control Room.

2-3.6 BUILDING EQUIPMENT PLAN

1. Airconditioning, Heating & Ventilation

The airconditioning system will be provided for Musical Studio and Master Control Room. The mechanical ventilation and heating system will be installed for other various rooms.
The heating source will be supplied by electricity.

2. Plumbing

Water will be supplied by city-water. Sewage pipe will be connected to a septic-tank, and after it is purified, water will be lead to existing drain -gutter with another drainage pipe.

Fire hydrant equipment will be provided too.

3. Power Arrangement

The following equipment will be provided:

a. Lighting and Plug socket system.

b. Motor power distribution system.

c. Earthing and Lightning Conductor system.

d. Alarm system.

e. Main line conduit works for Broadcasting.

f. Conduit works for telephone system.

g. Conduit and wiring works for clock system.

h. Installation of various broadcasting boards.

2-4 SERVICE AREA ESTIMATION

To estimate service area in case that 100 KW transmitting station were established in Kathmandu and Pokhara, the field strength of existing Kathmandu Station (FC = 792 KHz, Po = 100KW) was measured in Southern Terrai District and on the way to Pokhara at several points. The field strength was calculated based upon Ground Conductivity which was estimated by Mr. Hendriks, I.T.U. Expert and the data which was the result of measurement done by the Study Mission.

Table 1 shows the result of the field strength measurement of existing Kathmandu Station.

Ground Conductivity of 3 sites was measured in proposed Kathmandu, Pokhara Transmitter Station. The summary is shown as follows:

KATHMANDU (Prop. Site)	POKHARA (Prop. Site)	JANAKPUR (JADP)
About $1m^s/m$	About $0.5m^s/m$	About $1.5\ m^s/m$

The result of estimated service area in field strength 1 micro V/m (60 dB/micro V/m is shown on Fig. 10.

TABLE 1

Survey of Field Strength
Kathmandu Station
(792 KHz, 100KW)

NUMBER (c.f. map)	PLACE	TIME	FIELD STRENGTH (dB/micro V/m)	REMARKS
1	10km from NAUBISE	D	61	
2	PALUNG	D	63	
3	DAMAN VIEW TOWER	D	70	
4-1	HETAUDA	M	53±5	
4-2	"	D	43 *1	*1 Behind the mountain.
4-3	"	E	55	
4-4	"	N	59±5	
5	ADHABAR	D	44 *2	*2 In the Jungle
6-1	BIRGUNJ	E	57	
6-2	"	N	59	
7	BAGMATI RIVER	D	53	
8-1	MAHUWA (JADP)	D	50	
8-2	"	E	48±5	
9	JANAKPUR	D	51	
10	NAUBISE	D	80	
11	SIMPANI	D	62	
12	BENIGHAT	D	55	
13	KURINGHAT	D	51	
14	POKHARA	E	45±5	

* Symbols are as follows:

M : Morning Time.
D : Day Time.
E : Evening Time.
N : Night Time.

2-5 CONSTRUCTION SCHEDULE

The construction schedule is attached herewith.
The total construction period is estimated 24 months from the date of Contract on the programe.

TABLE 2

CONSTRUCTION SCHEDUL

PROJECT \ MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1. KATHMANDU STUDIO CENTER																									
1 EQUIPMENT									MANUFACTURE							TRANSPORTATION					TEST	TRANSMISSION INSTALLATION			
2 BUILDING		TRANSPORTATION												CONSTRUCTION											
2. KATHMANDU TRANSMITTER STATION																									
1 EQUIPMENT									MANUFACTURE							TRANSPORTATION					TEST	TRANSMISSION INSTALLATION			
2 BUILDING		TRANSPORTATION															CONSTRUCTION								
3 ANTENNA		MANUFACTURE					TRANSPORTATION						CONSTRUCTION												
4 ANTENNA FOUNDATION	MANUFACTURE			TRANSPORTATION					CONSTRUCTION																
3. POKHARA TRANSMITTER STATION																									
1 EQUIPMENT									MANUFACTURE							TRANSPORTATION					TEST	TRANSMISSION INSTALLATION			
2 BUILDING		TRANSPORTATION															CONSTRUCTION								
3 ANTENNA		MANUFACTURE					TRANSPORTATION						CONSTRUCTION												
4 ANTENNA FOUNDATION	MANUFACTURE			TRANSPORTATION					CONSTRUCTION																

2-6 Personnel Plan and Training Program.

2-6-1 Personnel Plan

Requested Staff Organization Chart to cope with the expansion of the broadcasting service, due to the construction project, a tentative plan is proposed from Radio Nepal, which is listed as follows:

(1) New Studio Complex Grand total 63

Engineer (in-charge) 1

(1-1) Operation Group Total 40

	M.	D.	N.	Sub total
1) Assistant Engineer (one per shift)	1	1	1	3
2) Supervisors	1	1	1	3
3) Technical Assistant	5	5	5	15
4) Junior Tech. Asst.	4	4	4	12
5) Mechanics	1	1	1	3
6) Peon	1	2	1	4

(1-2) Maintenance & O.B. Group Total 22

1) Asst. Engineer	2
2) Technical Assistants	10
3) Junior Tech. Assistants	6
4) Mechanics	2
5) Peon	2

(2) Pokhara Studio Grand Total 16

(2-1) Operation Group Total 9

	M.	D.	N.	Sub Total
1) Shift Supervisor (Technician)	1	1	1	3
2) Tech. Assistant	1	1	1	3
3) Junior Tech. Assistants	1	1	1	3

(2-2) Maintenance & O.B. Group Total 7

1) Asst. Engineer (Studio Maintenance)	1
2) Tech. Asst.	2
3) Junior Tech. Asst.	2
4) Mechanics	2

(3) M.W. Transmitter Station Kathmandu/Pokhara Grand Total 123 Engineer (in-charge)

Each Station Total 61

(3-1) Operation Group Total 24

	M.	D.	N.	Sub total
1) Shift Engineer	1	1	1	3
2) Shift Supervisor (Technician)	1	1	1	3
3) Tech. Assistant	2	2	2	6
4) Junior Tech. Asst.	2	2	2	6
5) Mech. J.T.A.	1	1	1	3
6) Mechanics	1	1	1	3

(3-2) Maintenance Group Total 18

1) Asst. Engineer (Maintenance)	1
2) Tech. Asst. (Radio)	3
3) Tech. Asst. (Electrical)	2
4) Tech. Asst. (Mechanical)	2
5) Junior Tech. Asst.	4
6) Mech. J.T.A.	2
7) Mechanics	4

(3-3) Tech. Administration Group Total 19

1) Senior Clerk (NASU) (Administration)	1
2) Senior Clerk (NASU) (Stores)	1
3) Junior Clerk (Administration)	2
4) Junior Clerk (Stores)	4
5) Typist	2
6) Driver	1
7) Gardener	2
8) Peon	6

Grand Total of the Staff - 202

2-6-2 Traning Program.

To cope with the expansion of the broadcasting service, following plan was proposed from Radio Nepal:

1) Pre-Installation Training

	Studio Center	Kathmandu TX	Pokhara TX	Concurrent	Total
1) Engineer	2	2	2	2	8
2) Techincian	3	1	6		9

(2) Post - installation training (each year for 5 consecutive years)

1) Engineer 2
2) Techiician 4

(3) Prpgram producer training.

1st year	4
2nd "	2
3rd "	2
4th "	2
5th "	2
Total	12

(4) In - country training.

Expert service will be requested from the Government of Nepal to the Government of Japan. The service will cover the operation, maintenance and planning of the broadcasting system and facilities in addition to the in-country trainings. Terms and conditions are confirmed on the service.

2-7 INFRASTRUCTURE

As for the infrastructure which is required for the programme, fundamentally, construction schedule does not cover its arrangement and budget. However, the capacity of some supply is estimated as follows:

1. Electric Main Supply:

Kathmandu Studio Centre - 150 KVA
Kathmandu Transmitter Station - 600 KVA
Pokhara Transmitter Station - 600KVA

2. City Water Supply: (cf. P.74)

Kathmandu Studio Centre - 10 Ton/day
Kathmandu Transmitter Station - 5 Ton/day
Pokhara Transmitter Station - 5 Ton/day

The following items are to be completed prior to the beginning of the schedule:

1. Each construction site shall be cleared completely.
2. Land leveling of the site.
3. Access road.
4. If necessary, fence around the site and the gate.
5. Electric power supply shall be completed at drop point (6600V).
6. Necessary telecommunication channels are to be provided to the site.
7. Water supply and incidental drainage arrangement including complete sanitary facility.

APPENDIX 1

The place of the construction site

(1) Kathmandu Transmitter Station (Sainbu)
   1) Location: Lalitpur, Kathmandu
   2) Longitude: 85 degree 18' 30" E
   3) Latitude: 27 degree 39' 10" N
   4) Altitude: 1351 m A.S.L.*

(2) Pokhara Transmitter Station
   1) Location: Male patan, Pokhara
   2) Longitude: 83 degree 59' 00" E
   3) Latitude: 28 degree 13' 10" N
   4) Altitude: 902 m A.S.L.

(3) Kathmandu Studio Centre
   1) Location: Singh Durbar, Kathmandu
   2) Longitude: 85 degree 19' 35" E
   3) Latitude: 27 degree 41' 45" N
   4) Altitude: 1285 m A.S.L.

The above listed indication are decided by Radio Nepal, While, altitude of each site is refered to map sheet 10 (Kathmandu) which is a blue print sheet in Radio Nepal, and map sheet 7 (Pokhara) which is a blue print sheet in Department of Housing & physical Planning, H.M.G.

* A.S.L. (Above sea level)

付属資料 1－2 Record of Discussion

RECORD OF DISCUSSION BETWEEN THE JAPANESE STUDY TEAM AND THE DEPARTMENT OF BROADCASTING HMG OF NEPAL FOR THE PRELIMINARY DESIGN STUDY ON THE ESTABLISHMENT PROGRAMME OF MEDIUM WAVE BROADCASTING NETWORK IN THE KINGDOM OF NEPAL.

Attached herewith is the " Record of discussion " that has been agreed between the Japanese Study Team and the Department of Broadcasting, H. M. G. of Nepal for afore-mentioned subject.

It should be noted that this " Record of Discussion " does not legally bind both Governments.

榊原盛吉

Seiichi Sakakibara
The Leader
Japanese Study Team

Bhogya Prasad Shah
Acting Director General
Department of Broadcasting
(Radio Nepal)
Ministry of Communications
His Majesty's Government of Nepal.

Kathmandu
Dated the 18th June 1979.

RECORD OF DISCUSSION

Following points were discussed and agreed upon by the Prelimenary Design Survey Team (24th May to 22nd June 1979) of the Japan International Co-operation Agency and the Officials of the Department of Broadcasting, His Majesty's Government of Nepal.

1) Based upon Field Measurement Survey, Transmitting Stations of the 100 KW Power each complete with necessary equipments and Building have been planned at Kathmandu and Pokhara with emergency Transmitters of 10 KW power backed up by Engine Generator for expansion of the Medium Wave Broadcasting Service in the Central and Western Development Regions.

2) A studio Centre accomodating 5 studios with all necessary equipments and building has been planned in Kathmandu to meet the increasing demand of broadcasting production capacity. This will also have Standby Engine Generator.

3) In Pokhara Transmitting Station, a production studio has been planned to meet the needs of local continuity operation or recording programme. In addition, a sound outside broadcasting wagon has also been planned for Pokhara station.

4) A studio to transmitter link and engineering link with UHF and VHF facility between Studio Centre and the proposed transmitting station in Kathmandu has been planned.

5) The following requirements of the Department of Broadcasting, HMG of Nepal were taken note of by the Japanese Team : -

   i) Studio complex at separate location in Pokhara.
   ii) Sound Outside Broadcasting Wagon for Kathmandu Studio Centre.
   iii) Necessary equipment for news monitoring.
   iv) Requirement of station vehicles during and after installation.

6) Personnel Plan and Training Programme to cope with the expansion of the broadcasting services were also discussed. It was agreed that an official request should be made by HMG through proper channels to the Japanese Government for the training of Radio Nepal's technical and production staff in Japan and for the services of an Expert for in-country training as well as to assist the Department in operation, maintenance and planning for a period of 2 years.

7) The total construction period of the project was estimated as 24 months from the date of contract on the programme.

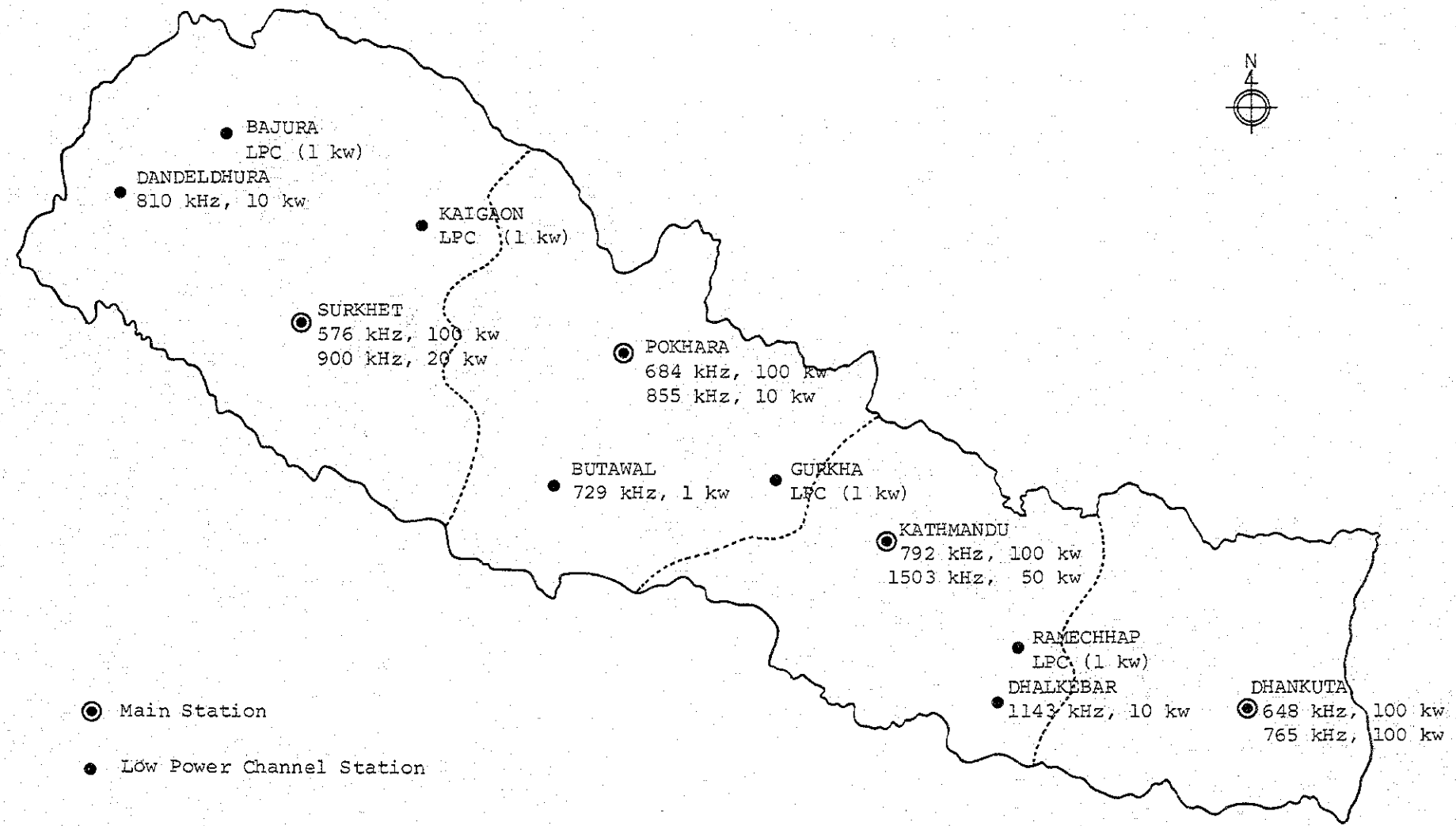
8) As for the infrastructure, which is required for the Programme, the following items are to be completed by HMG Nepal prior to the beginning of the construction schedule :

i) Acquisition of necessary land area at construction sites.
ii) Access Roads.
iii) Site Clearance, levelling and drainage.
iv) Security Fencing and gate.
v) Water supply and facility.
vi) Electric Power Supply at drop point. The drop point should be, according to Japanese Standard, either at 400 V, or 3.3 KV or 6.6 KV but not 11 KV.
vii) Necessary Programme and Engineering Link (including necessary converter equipments) from Kathmandu Studio Centre to Pokhara Transmitting Station shall be arranged and provided.

9) Necessary ancillary equipment, test and measuring equipment, tools and spare parts have been planned for the three stations.

付属資料　1－3　　WARC周波数割当

主官庁会議，最終文書，第1付属書に基づく，ネパール王国への周波数割当て。



M/F CHANNEL PLAN

Table A1-3-1

Final Acts of the Regional administrative LF/MF Broadcasting Conference (Regions 1 and 3) Geneva, 1975.
Annex 1, Plan for the Assignment of Frequencies to Broadcasting Stations in the Medium Frequency Bands.
(other than to stations using Low-Power Channels)

	Assigned frequency (kHz)	Name of transmitting station	Country symbol	Geographicl coordinates of of transmitting station	Necessary bandwidth (kHz)	Carrier power (kw)	Authorized radiation		Restrictions on radiation (For directional antennas only)		Antenna		Ground conduc-tivity (mS/m)	Hours of operation (GMT)	Remarks
							Maximum radiation (dB)	Azimuth of maximum radiation	Azimuths defining the sector of limited radiation	Maximum radiation in the sector (dB)	Type	Height (m)			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
36	792	KATMANDU	NPL	85E20 27N45	A20	100	20.4				A	100	4	2200-1900	
46	1503	KATMANDU	NPL	85E20 27N45	A20	50	17.4				A	50	4	2200-1900	
39	684	POKHRA	NPL	83E58 28N16	C 9	100	20.4				A	120	4	2200-1900	
23	855	POKHRA	NPL	83E58 28N16	A20	10	10.6				A	120	4	2200-1900	
32	576	SURKHET	NPL	81E38 28N36	A20	100	20.4				A	120	4	2200-1900	
51	900	SURKHET	NPL	81E38 28N36	A20	20	13.6				A	120	4	2200-1900	
44	648	DHANKUTA	NPL	87E19 27N00	A20	100	20.4				A	120	4	2200-1900	
30	765	DHANKUTA	NPL	87E19 27N00	A20	100	20.6				A	120	4	2200-1900	
31	810	DANDELDHURA	NPL	80E35 27N18	A20	10	10.4				A	60	4	2200-1900	
53	1143	DHALKEBAR	NPL	86E02 26N58	A20	10	10.4				A	60	4	2200-1900	
24	729	BUTAWAL	NPL	83E29 27N42	A20	1	0.4				A	60	4	2200-1900	

Appendix 1 to the Plan, Frequency Assignments to Stations in the Low-Power Channels.

	Assigned frequency (kHz) (Channel number)	Name of transmitting station	Country symbol	Geographical coordinates of transmitting station	Necessary bandwidth (kHz)	Carrier power (kw)	Effective monopole radiated power (e.m.r.p.) (kw)	Antenna height (m)	Ground conduc-tivity (mS/m)	Hours of operation (GMT)	Remarks
	1	2	3	4	5	6	7	8	9	10	11
1	1485	BAJURA	NPL	81E22 29N22	A20	1	0.50	60	5	2200-1900	
2	(107)	GORKHA	NPL	84E38 27N02	A20	1	0.50	60	5	2200-1900	
3	1485	KAIGAON	NPL	82E48 29N02	A20	1	0.50	60	5	2200-1900	
4	1485	RAMECHHAP	NPL	86E04 27N20	A20	1	0.50	60	5	2200-1900	
51	1584	BAJURA	NPL	81E22 29N22	A20	1	0.50	60	5	2200-1900	
52	1584	GORKHA	NPL	84E38 28N02	A20	1	0.50	60	5	2200-1900	
53	1584	KAIGAON	NPL	82E48 29N02	A20	1	0.50	60	5	2200-1900	
54	1584	RAMECHHAP	NPL	86E04 27N20	A20	1	0.50	60	5	2200-1900	
12	1602	BAJURA	NPL	81E22 29N22	A20	1	0.50	60	5	2200-1900	
13	1602	GORKHA	NPL	84E38 28N02	A20	1	0.50	60	5	2200-1900	
14	1602	KAIGAON	NPL	82E48 29N02	A20	1	0.50	60	5	2200-1900	
15	1602	RAMECHHAP	NPL	8-E04 27N20	A20	1	0.50	60	5	2200-1900	

付属資料　1－4　　放送区域（60dB(μV/m)）推定の根拠

主官庁会議，付属技術資料で提案された方法により計算したネパール王国における電界強度の最小値は60dB/0dB＝1μV（at 1MHz），公称実用電界強度（E nom）は，昼間地表サービス値63dB，夜間地表サービス値は，田園地帯に於いて71dB，都市地域に於いては77dBとなっている。

また日本に於ける受信機の種類別感度を調べた結果を下表に示した。また今回調査した南部Terai地域における実聴結果などを総合して，放送サービス区域を電界強度60dB（0dB＝1μV/m）の範囲と推定した。

Table A　1－4－1

機種	ポータブル形	カセットテープレコーダ付ラジオ	ホームラジオ	カーラジオ
(注) 雑音制限感度（dB）	49～76	54～60	58～59	35～37

(注)　S/N＝30dBで標準出力を得る最低の信号入力（0dB＝1μV/m）
「標準放送用受信機の性能調査（電波技術協会，調査委員会1977.5）」より抜すい。

付属資料　1－5　　電測データ

Kathmandu～南部Terai 地域に至る電測結果

Table A　1－5－1　　Kumartar　10KW（Kathmandu）電波電測結果。

Table A　1－5－2　　同地域に於ける外来電波の強度電測結果。

Table A1-5-1

Survey of Field Strength (Kathmandu Station 792 kHz, 10 KW) - 30. May ∿ 9. Jun/1979 -

Item No: cf. Map	Place	Time		Field Strength (dB/μV)	Remarks
1.	Metrang.	D	10:50 ∿	61	Naubise → 10 km South
2.	Palung	"	11:55 ∿	63	120 km to Raxaul
3.	Bhase Dhobau	"		70	Himalaya View Tower top (≃ 8000 ft high)
4.-(1)	Hetauda	M	6:00 ∿ 45	53±5	Fading
-(2)	"	D	13:25 ∿	43	at the River, Behind the mountain (Cf. Fig. A6-1)
-(3)	"	E	18:15 ∿ 45	55	17:00 E=54 dB
-(4)	"	N	21:45 ∿	59±5	Fading
5.	Adhabar	D	9:55 ∿	44	In the jungle
6.-(1)	Birganj	D	16:15 ∿ 30	57	Hotal SAMJANA top (Cf. Fig. A6-2)
-(2)	"	N	21:30 ∿	59	" Light Fading
7.	Bagmati River	D	12:10 ∿ 30	53	River West Side (Cf. Fig. A6-3)
8.-(1)	Mahuwa (JADP)	D	11:00 ∿	50	
-(2)	"	E	18:55 ∿	48±5	Fading (4 ∿ 5" cycle), about 1 kHz Beet.
9.	Janakpur	D	13:40 ∿	51	Airport
10.	Naubise	D	10:20 ∿	80	(Cf. Fig. A6-4)
11.	Simpani	"	11:00 ∿	62	
12.	Benighat	"	12:00 ∿	55	
13.	Kuringhat	"	12:41 ∿	51	
14.	Pokhara	E	18:30 ∿	45±5	Light Fading

Table A1-5-2

Survey of Field Strength (Another Station)

Item / No:	Place & Time	Frequency (kHz) *1	Field Strength (dB/μV)	Remarks
	Hetauda M (6:00 ∿)	915 1243 1340 1449	50 ∿ 60 39 ∿ 46 25 30 ∿ 35	Fading "
	E (18:15 ∿)	915 1135 1340	62 65 40	Prog. India " China?
	D (13:25 ∿) River	915	49	With about 1 kHz Beet
	N (21:45)	595 715 840 915 975 1135	∿ 50 ∿ 53 43±2 70±3 ∿ 63 ∿ ∿ 73	Prog. India, Fading ", Calcutta? " " ", Fading "
		3425 5005	70±10 60±10	} Radio Nepal (KTM) ", with Fading
	Birganj D (16:15 ∿) N (21:30 ∿)	595 915 985 1090 1140	55 72 60±2 55±1 75±4	Prog. India " ", Fading Fading
		3425 5005	75±7 70±5	R. Nepal, " " "
	Bagmati Rv. (Birgauj→Janak.) D (12:10)	675	37	other freq. nothing
	Janakpur (JADP) E (18:55 ∿)	660 695 1140	55 ∿ 70 64 58	
	(Air Port) D (13:40 ∿)	620 915	60 53	(Kathmandu)
	Pokhara E (18:40 ∿)	620 660 695 820 915 985 1010 1060 1085 1140 1240 1270 1300 1340 1450 1600	54±2 51±3 50±1 43±3 50±5 41±2 51 50 39 70±5 47±2 42±5 47±10 52±2 51±3 40	 Noisy, Fading Fading Noisy Fading (3 ∿ 5" cycle) Noisy Fading (deep) Noisy
		3425 5005	75±6 75±8	R. Nepal Fading (0.5 ∿ 1" cycle)

付属資料　1－6　　プロフィル

Kathmandu盆地内に送信所を置いた場合のプロフィル例。

Fig. A 1－6－1	Kathmandu	→	Hetauda.
Fig. A 1－6－2	Kathmandu	→	Birganj.
Fig. A 1－6－2′	Kathmandu	→	Uuti－Birganj.
Fig. A 1－6－3	Kathmandu	→	Malangwa.
Fig. A 1－6－3′	Kathmandu	→	Anti－Malangwa.
Fig. A 1－6－4	Kathmandu	→	Gurka, Pokhara.

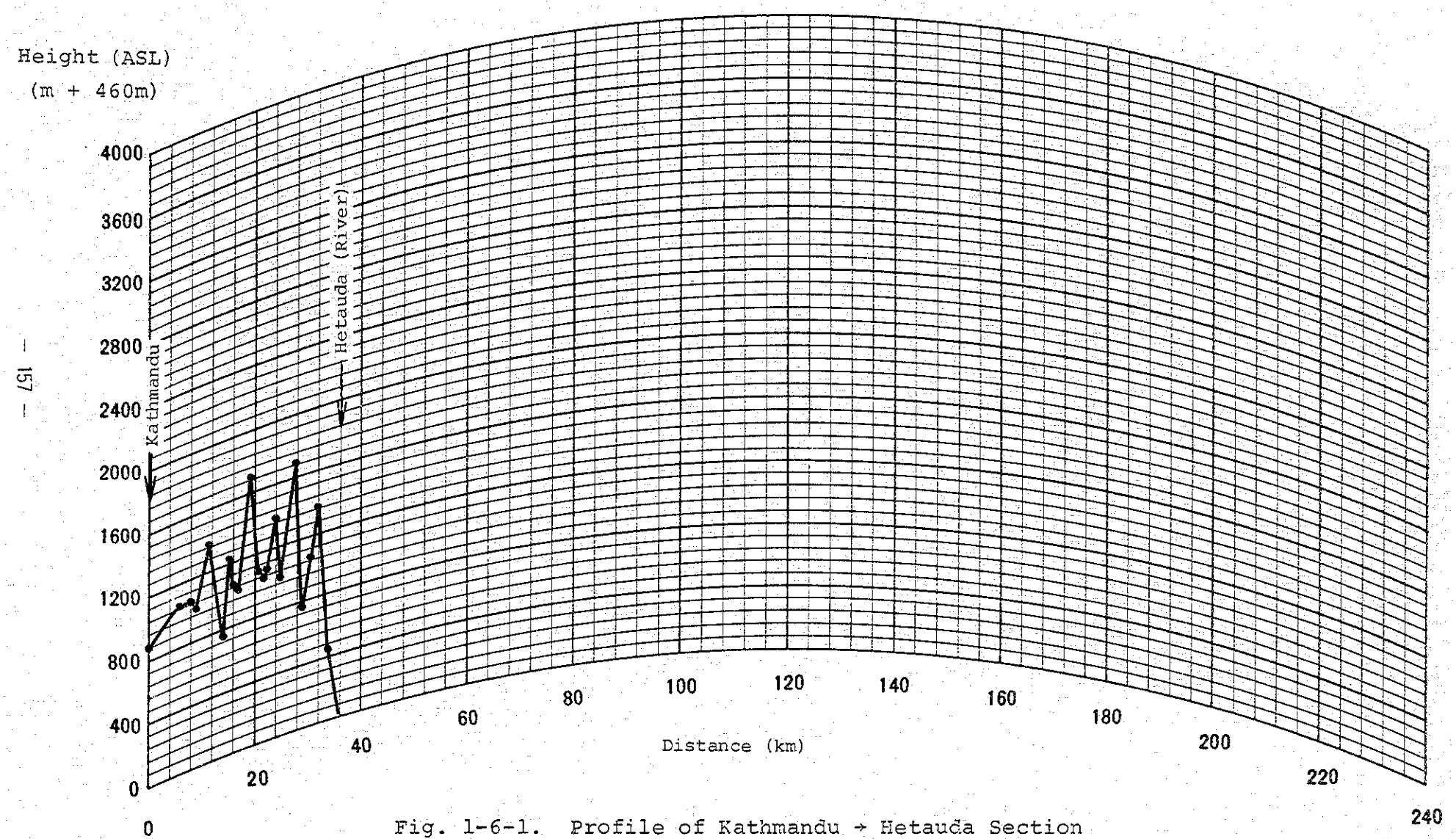


Fig. 1-6-1. Profile of Kathmandu → Hetauda Section

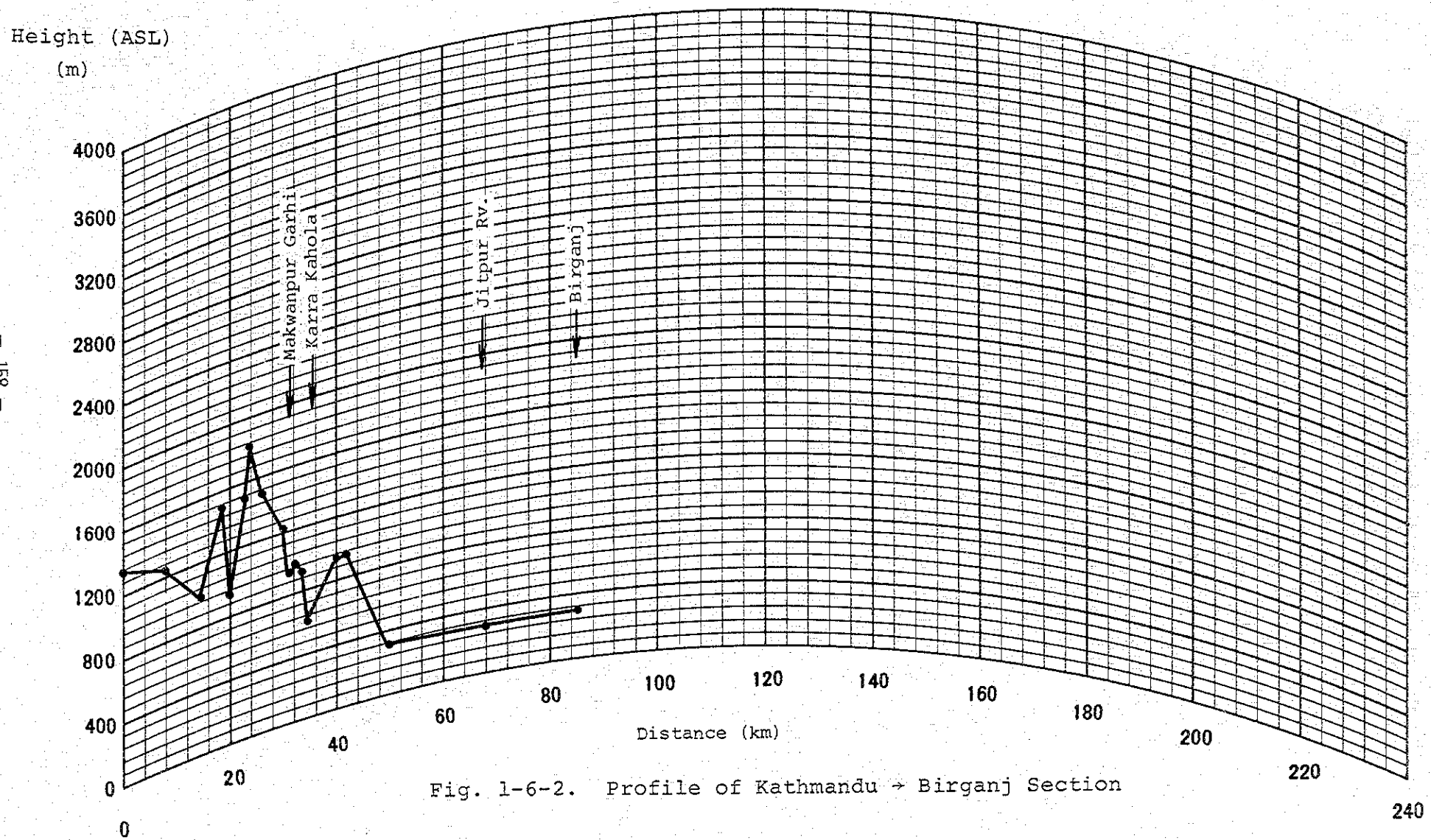


Fig. 1-6-2. Profile of Kathmandu → Birganj Section

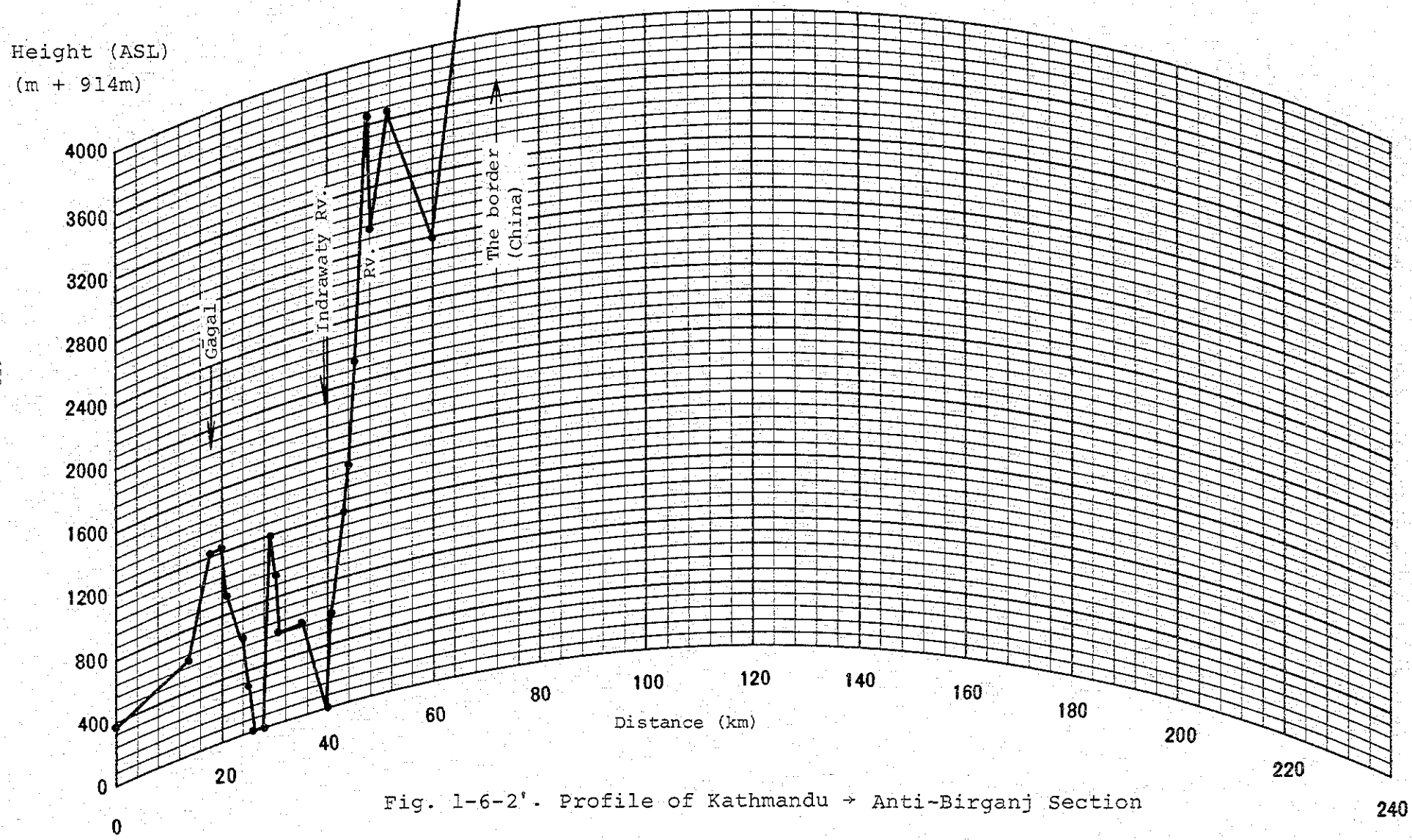


Fig. 1-6-2'. Profile of Kathmandu → Anti-Birganj Section

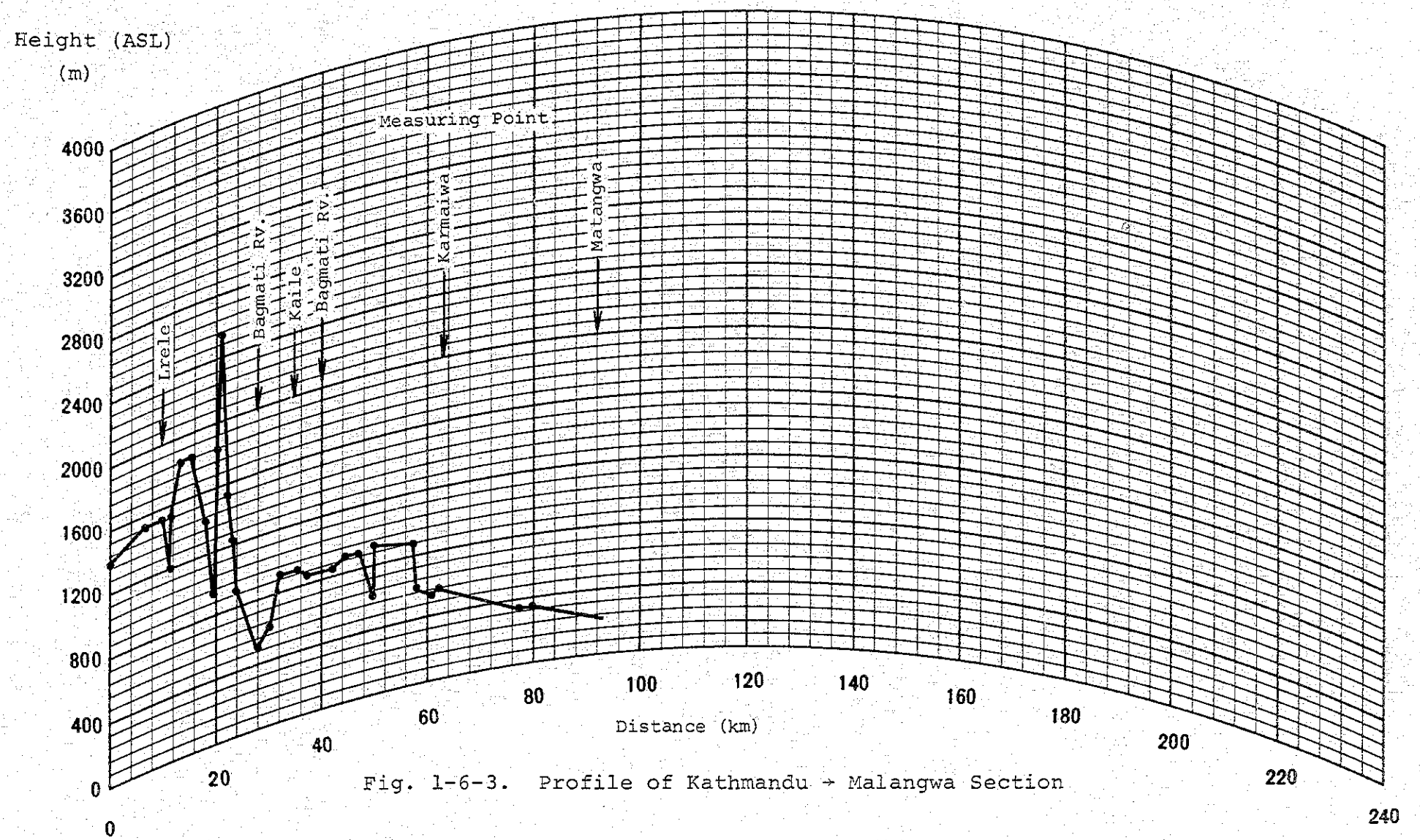


Fig. 1-6-3. Profile of Kathmandu → Malangwa Section

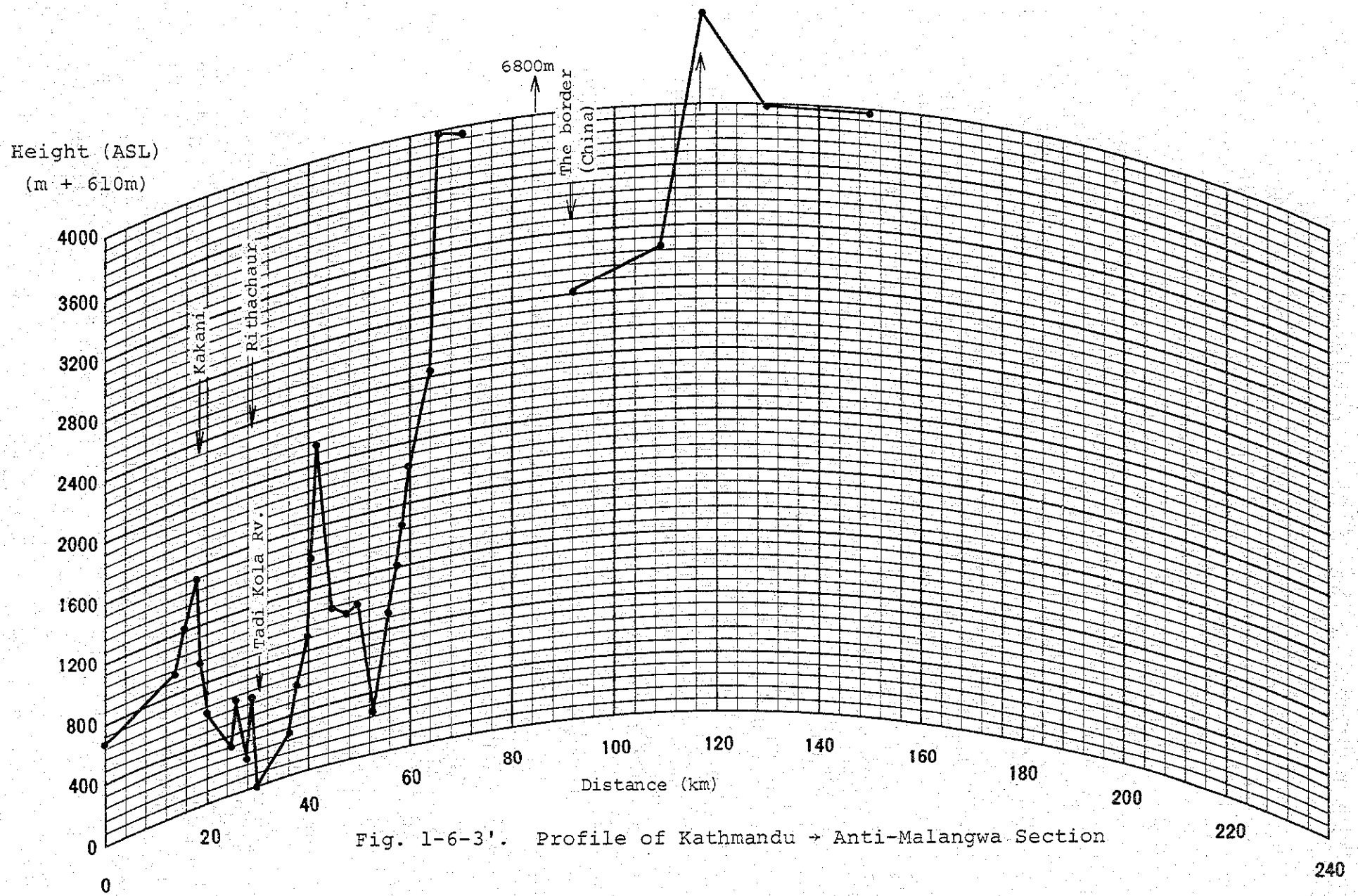


Fig. 1-6-3'. Profile of Kathmandu → Anti-Malangwa Section

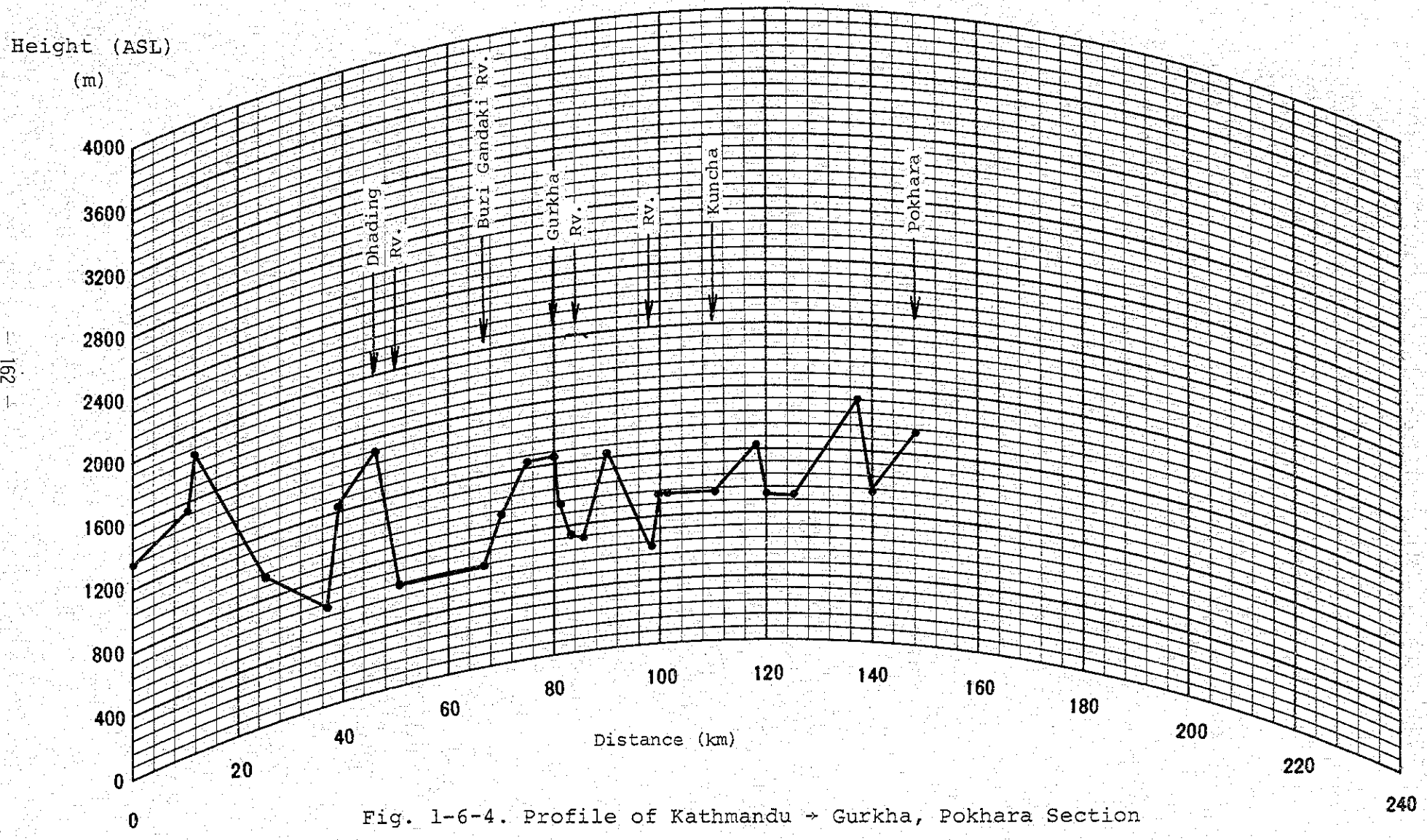
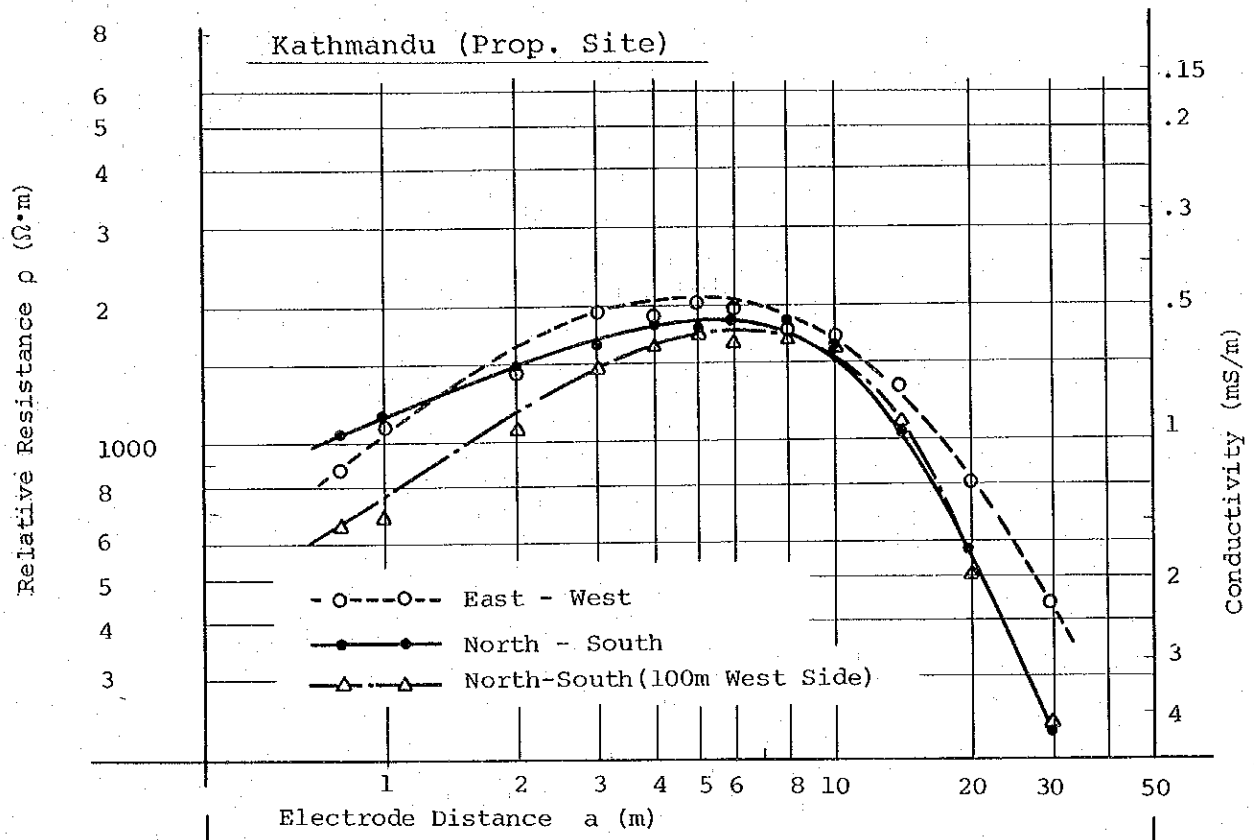


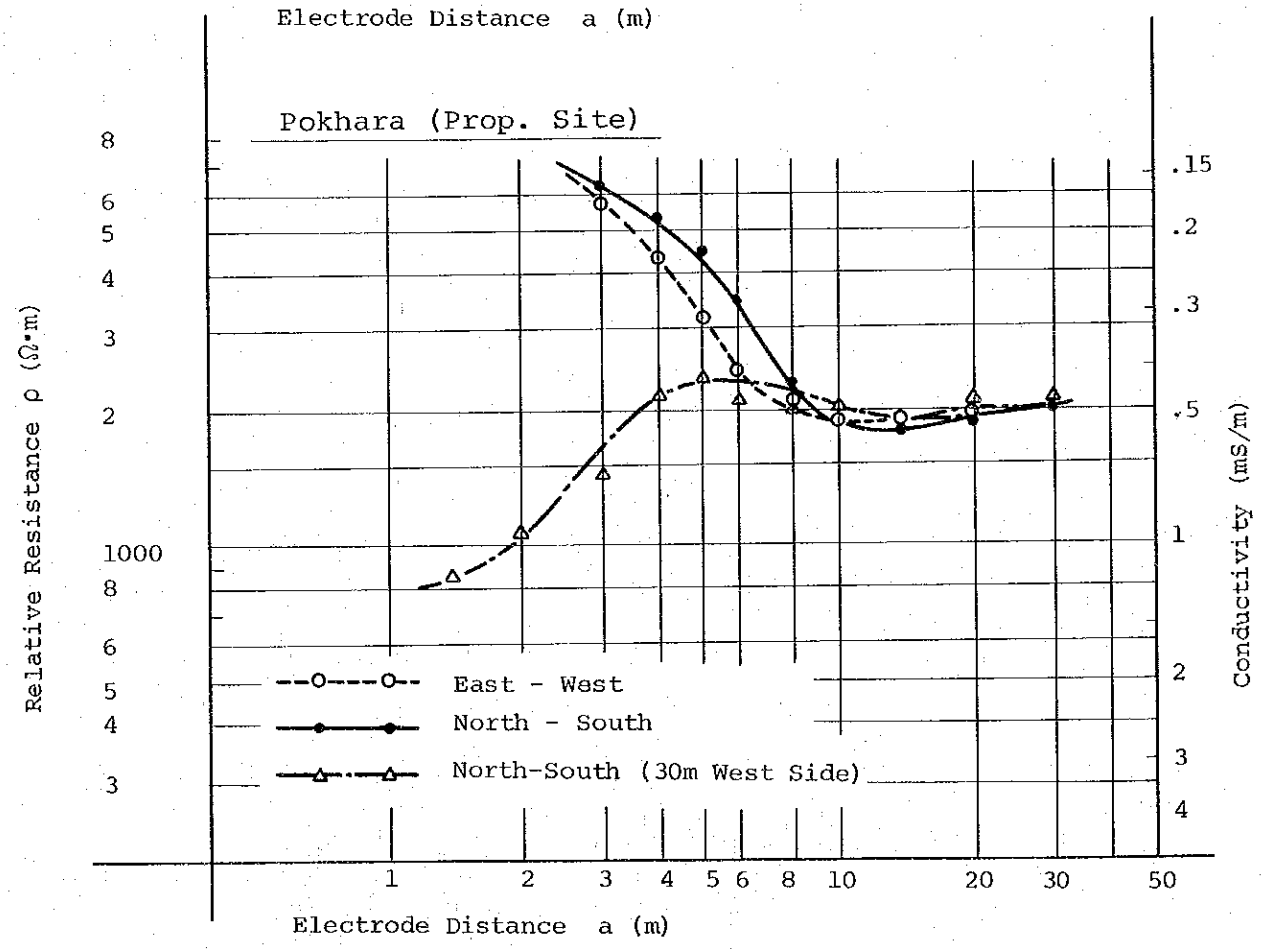
Fig. 1-6-4. Profile of Kathmandu → Gurkha, Pokhara Section

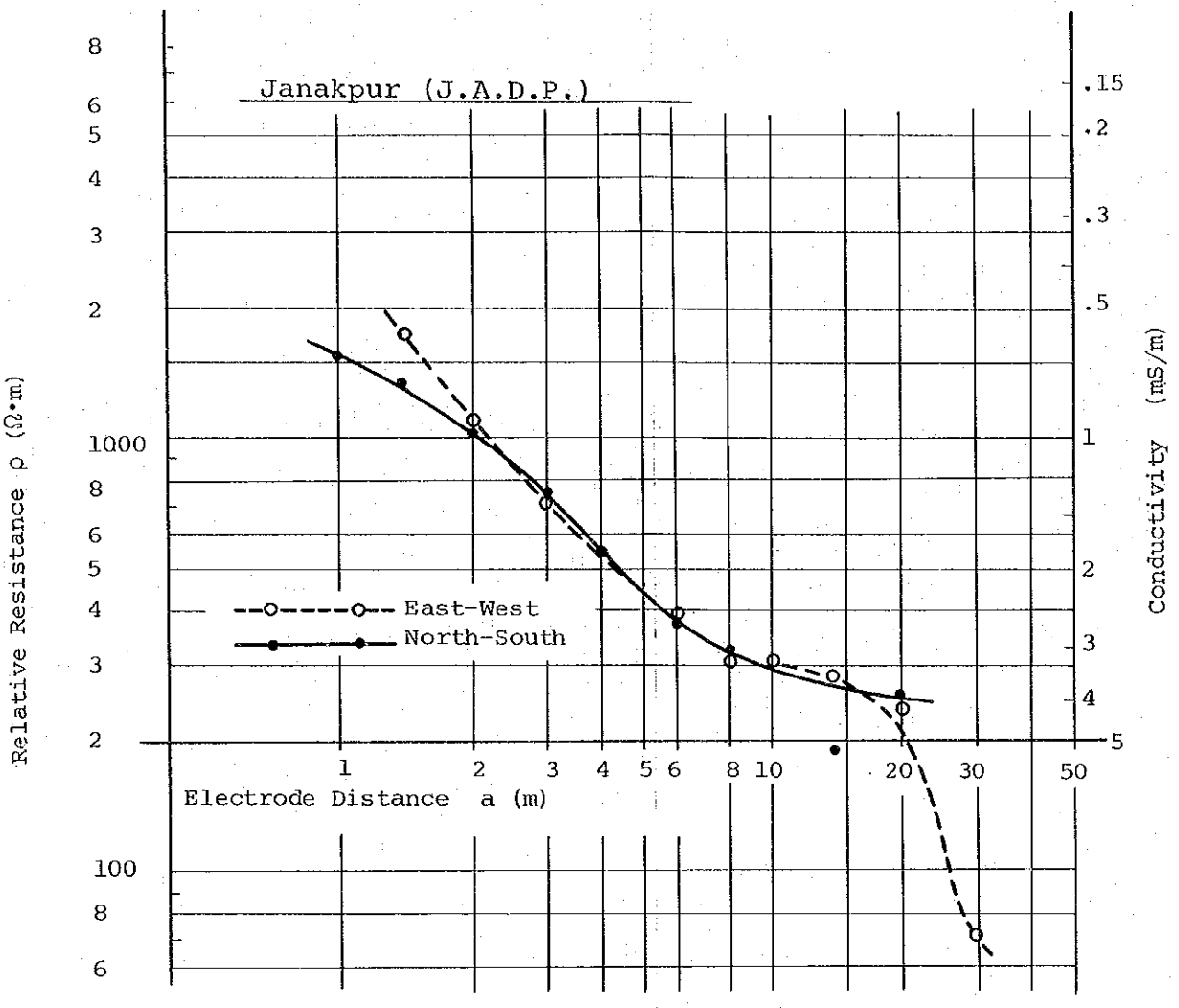
付属資料　1－7　　大地導電率測定データ

Kathmandu,Pokhara および Janakpur に於ける大地導電率測定結果。

Fig. A 1－7－1　　Result of Grand－Conductivity Measurement.


Kathmandu (Prop. Site)
Relative Resistance ρ (Ω•m)
Conductivity (mS/m)
East - West
North - South
North-South(100m West Side)
Electrode Distance a (m)


Pokhara (Prop. Site)
Relative Resistance ρ (Ω•m)
Conductivity (mS/m)
East - West
North - South
North-South (30m West Side)
Electrode Distance a (m)



Note:

Measurement Instrument : Type 3244 (Yokogawa Electric Co.)

Fig. A1-7-1. Result of Grand Conductivity Measurement

付属資料　1－8　付帯工事費概算

(1) 給電点（Drop Point）迄の配電線工事および給電点における接続工事

Kathmandu 演奏所

配電線	0.5 Km × 60,000Rs	=	30,000 Rs
引込関係	50m × 1,000Rs	=	50,000Rs
トランス	150KVA 11KV/400V	=	100,000Rs
	計		180,000 Rs

Kathmandu 送信所

配電線	1.5 Km × 90,000 Rs	=	135,000 Rs
引込関係	150m × 1,000Rs	=	150,000Rs
トランス	600KVA 11KV/400V	=	200,000Rs
	計		485,000 Rs

Pokhara 送信所

配電線	1.0 Km × 60,000 Rs	=	60,000 Rs
引込関係	200m × 1,000Rs	=	200,000Rs
トランス	600KVA 11KV/400V	=	200,000Rs
	計		460,000 Rs
	小計		1,125 Th. Rs
	（20,812,5千円）		

(2) 給水工事および給水点における接続工事。

Kathmandu 演奏所	50m × 200Rs	=	10,000 Rs
Kathmandu 送信所	2,000m × 120Rs	=	240,000 Rs
Pokhara 送信所	1,000m × 120Rs	=	120,000 Rs
	計		370 Th. Rs
	（6,845千円）		

(3) 建設現場の土地取得関係費

Kathmandu 送信所　$\frac{44,400}{506.25}$ Ropani × 10Th.Rs = 877Th.Rs

Pokhara 送信所　$\frac{50,870}{506.25}$ Ropani × 20Th.Rs = 2,010Th.Rs

計　2,887Th.Rs

（53,409,5千円）

(4) 建設現場の土木工事

Kathmandu 演奏所　1,300m² × 30Rs = 39,Th.Rs

Kathmandu 送信所　$\frac{44,400}{506.25}$ Ropani × 1,Th.Rs = 88,Th.Rs

Pokhara 送信所　$\frac{50,870}{506.25}$ Ropani × 1,Th.Rs = 100,Th.Rs

計　227,Th.Rs

（4,199.5 千円）

(5) 取 付 道 路

Kathmandu 演奏所　5m × 1,Th.Rs = 5,Th.Rs

Kathmandu 送信所　170m × 1,Th.Rs = 170,Th.Rs

Pokhara 送信所　250m × 1,Th.Rs = 250,Th.Rs

計　425 Th.Rs

（7,862.5千円）

(6) 柵および門柱

Kathmandu 演奏所　0

Kathmandu 送信所　（柵）810m × 310Rs = 251,100Rs

（門　柱）1ケ所　25,000Rs

Pokhara 送信所　950m × 380Rs = 361,000Rs

計　662 Th.Rs

（12,247 千円）

(7) 電気通信回線

ライン布設費

演奏所～Kathmandu T.C.C.

6 Km 10P ケーブルを布設

材　料　費　150,000Rs

工　事　費　120,000 Rs

計　270,000 Rs

Pokhara T.C.C. ～送信所

4 Km

材料費		100,000 Rs
工事費		40,000 Rs
	計	140,000 Rs

Channel Translator

1対向(MOD & DEM)

材料費		190,000 Rs
工事費		179,000 Rs
	計	369,000 Rs
	小計	779 Th. Rs
		(14,411.5 千円)

(8) 排水設備，浄化槽および接続工事

Kathmandu 演奏所

排水	150m ×	400 Rs	=	60,000 Rs
浄化槽および排水			=	100,000 Rs

Kathmandu 送信所

排水	500m ×	200 Rs	=	100,000 Rs
浄化槽			=	30,000 Rs

Pokhara 送信所

排水	150m ×	200 Rs	=	30,000 Rs
浄化槽			=	30,000 Rs
		計		350 Th. Rs
				(6,475 千円)

合計	6,825 Th. Rs
	(126,262.5 千円)

付属資料　１－９　　ボーリング ラボテスト結果

Tribhuwan University

Institute of Engineering
The Central Material Testing Laboratory

Report
on

Soil Investigation Programme of Medium Wave Broadcasting Network Construction Site Bhaisepati, Kathmandu.

Kathmandu Nepal

1979

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
CONSULTANCY SERVICES
ANANDA NIKETAN, PULCHOWK
LALITPUR, NEPAL. Ph. 21636

Ref. No.

Date

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ANANDA NIKETAN, PULCHOWK
LALITPUR, NEPAL. Ph. 21636

No. Date

Final Report on Soil Investigation Programme of Medium Wave Broadcasting Network Construction Site Bhaisepati, Kathmandu.

1) Introduction.

On the request of Japan International Co-operation Agency, Japan, The Institute of Engineering, Central Material Testing Laboratory proposed a programme of sub-soil investigation work of Medium Wave Broadcasting Network Construction Site at Bhaisepati in Kathmandu. The programme was approved by JICA, Japan and the work was carried out by the staff of Central Material Testing Laboratory. The approved programme included:

a) Site Inspection.
b) Field Work.
c) Laboratory Testing.
d) Recommendation.

2) Purpose of Investigation Work.

The purpose of soil investigation work was to reveal the soil conditions and obtain necessary data required to determine the bearing capacity of soil.

3) Site Inspection.

The site is located on a raised more or less level ground at a distance about 5 km. from Lalitpur town. It lies at the lower reach of Mahabharat range towards north and mainly is being used as a gravel quarry for local road construction.

P.T.O.

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4) Field Work.

The field work was started on 2nd June 1979 and completed on 14th June, 1979. A hard gravel stratum was encountered at elevation between 5.8 m to 15.5 m, so it was decided to terminate the bore hole at that point. An undisturbed sample was taken at elevation between 5.0 m to 5.8 m for direct shear test and at other elevations undisturbed samples could not be retrieved. The standard penetration test was conducted at every meter depth and altogether 13 disturbed samples were taken for laboratory tests.

5) Ground Water Position.

Position of ground water table could not be traced out upto investigated depth.

The laboratory testing work was done as per client's requirement. The results of laboratory testing has been supplied in the data summary sheet in the Appendix - 1.

7) Description of Soil Strata.

Between elevation 3.7 m to 5.0 m there is a layer of silt and clay sandwitched between two gravel layers at the top and underneath. The bore hole logs supplied in the Appendix - 2 gives the best representation of soil stratification, SPT values and natural moisture content.

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Recommendation

It is suggested to put down the foundation below elevation 5.0 m The no. of blows at this depth is 27. Based on this value and using the curve prescribed by Terzaghi's and Peck for a 3 m. wide foundation, the safe bearing capacity for a maximum settlement of 25 mm comes to be 25 tons/m^2.

Again from the direct shear test made on the sample obtained at this depth, the value of C = 1.7 ton/m^2 & ϕ = 37°.

For ϕ = 37°, the Terzaghi's Bearing Capacity Factors for local shear failure are :

$N_c' = 30$

$N_q' = 14$

$N_r' = 10$

Substituting revelant data in Terzaghi's equation we get,

$$q_{ult} = 1.3\, CN_c' + \gamma D_f N_q' + \tfrac{1}{2}\, b\gamma N_r'$$

$$= 1.3 \times 1.7 \times 30 + 1.8 \times 5 \times 14 + \tfrac{1}{2} \times 3 \times 1.8 \times 10$$

$$= 66.3 + 126 + 27$$

$$= 219.3$$

$$\therefore q_{safe} = \frac{219.3}{3}$$

$$= 73.3 \text{ t/m}^2 > 25 \text{t/m}^2$$

$\therefore$ Adopt safe bearing capacity = 25 t/m^2.

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APPENDIX - 1

TEST RESULT SHEET

Bore Hole No.:- 1

Location:- Bhaisen Pati.

Project:- Medium Wave Broadcasting Net Work

Date:- Radio Nepal

S. No.	Depth m.	Sieve Analysis % passing				Atterberg Limits			Natural M.C.	Density		S.P.T. blows	Sp.Gr	Direct Shear		qult	Consolidation				Compacti	
		Gravel %	Sand %	silt %	clay %	L.L.	P.L.	P.I.		Yw	YB			C kg/cm²	Ø	kg/cm²	a_v	m_v	c_v	k	OMC	Ydm
2.	0.60 to 2.15	26	22	39	13								2.66									
3.	2.15 to 3.70	49	13	15	23								2.70									
4.	3.70 to 4.15	0.12	5.88	59	35	29.5	17.35	12.15					2.62									
5.	4.15 to 4.75	0.76	9.24	55	35	29.4	16.55	12.85					2.62									
6.	4.75 to 5.00	1.26	14.74	48	36	24.9	16.44	8.46					2.68									
7.	5.00 to 5.80	1.54	14.46	61	23	28	-	-					2.665	0.17	37°							
8.	5.80 to 8.75	47.45	9.55	18	25	-	-	-					2.645									

TEST RESULT SHEET

Bore Hole No.:- 1

Location:- Bhaisen Pati.

Project:- Medium Wave Broadcasting Net Work

Late:- Radio Nepal

S. No.	Depth m.	Sieve Analysis % passing				Atterberg Limits			Natu-ral M.C.	Density		S.P.T. blows	Sp.Gr	Direct Shear		qult kg/cm²	Consolidation				Compactio	
		Gravel %	Sand %	silt %	clay %	L.L.	P.L.	P.I.	M.C.	Yw	YB			C kg/cm²	Ø		a_v	m_v	c_v	k	OMC	Ydm
9	8.75 to 11.75	58.75	9.25	9	23								2.69									
10.	11.75 to 12.40	20	18	44	18								2.67									
11.	12.40 to 12.75	44	29	10	17								2.65									
12.	12.75 to 15.00	37	13	29	21								2.635									
13.	15.00 to 15.50	34.44	23.56	22	20								2.69									

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Date

APPENDIX - 2

MEDIUM WAVE BROADCASTING NETWORK
CONSTRUCTION SITE
BHAISENPATI, KATHMANDU

BORE HOLE LOG 1

1	2	3	4	5	6	7	8
SCALE OF DEPTH IN METER	DEPTH IN METER	THICKNESS OF STRATA IN METER	SOIL DESCRIPTION	SYMBOL	S. P. T. N. VALUE	N.C. %	REMARK
	0·60	0·60	VEGITABLE TOP SOIL			10.71	
1.0		1·55	YELLOWISH GREY SILT WITH SOME SAND AND GRAVEL AND LITTLE CLAY		N=28	9.64	WE TAKE S. P. T. AT EVERY 1 METER
2.0	2·15				15CM/50 BLOWS 1 CM/NEXT 5 BLOWS	28·24	
3.0	3·70	1·55	YELLOWISH GREY GRAVEL WITH LITTLE SAND AND SILT AND SOME CLAY		17·5CM/50 BLOWS 0·5CM/NEXT 5 BLOWS	21·42	▨ IT DENOTES S.P.T. AT THAT METER
4.0		1·30	BLACK TO YELLOWISH BROWN SILT AND CLAY WITH LITTLE SAND AND TRACES OF GRAVEL		N=9	22·57	
5.0	5·0				N=27	23·88	N INDICATES NO. OF BLOWS
	5·80	0·80	YELLOWISH BROWN CLAYEY SILT WITH LITTLE SAND		10·5CM/50 BLOWS 0·5CM/NEXT 5 BLOWS	8·42	
6.0							
7.0					12CM/50 BLOWS 0·5CM/NEXT 5 BLOWS	14·41	
8.0			YELLOWISH GREY SILT WITH SOME SAND AND LITTLE CLAY AND SOME GRAVEL		9·8CM/50 BLOWS 0·2CM/NEXT 5 BLOWS	13·99	
9.0					7CM/50 BLOWS 0·3CM/NEXT 5 BLOWS	12·34	
10.0					20CM/50 BLOWS 0·8CM/NEXT 5 BLOWS	15·38	

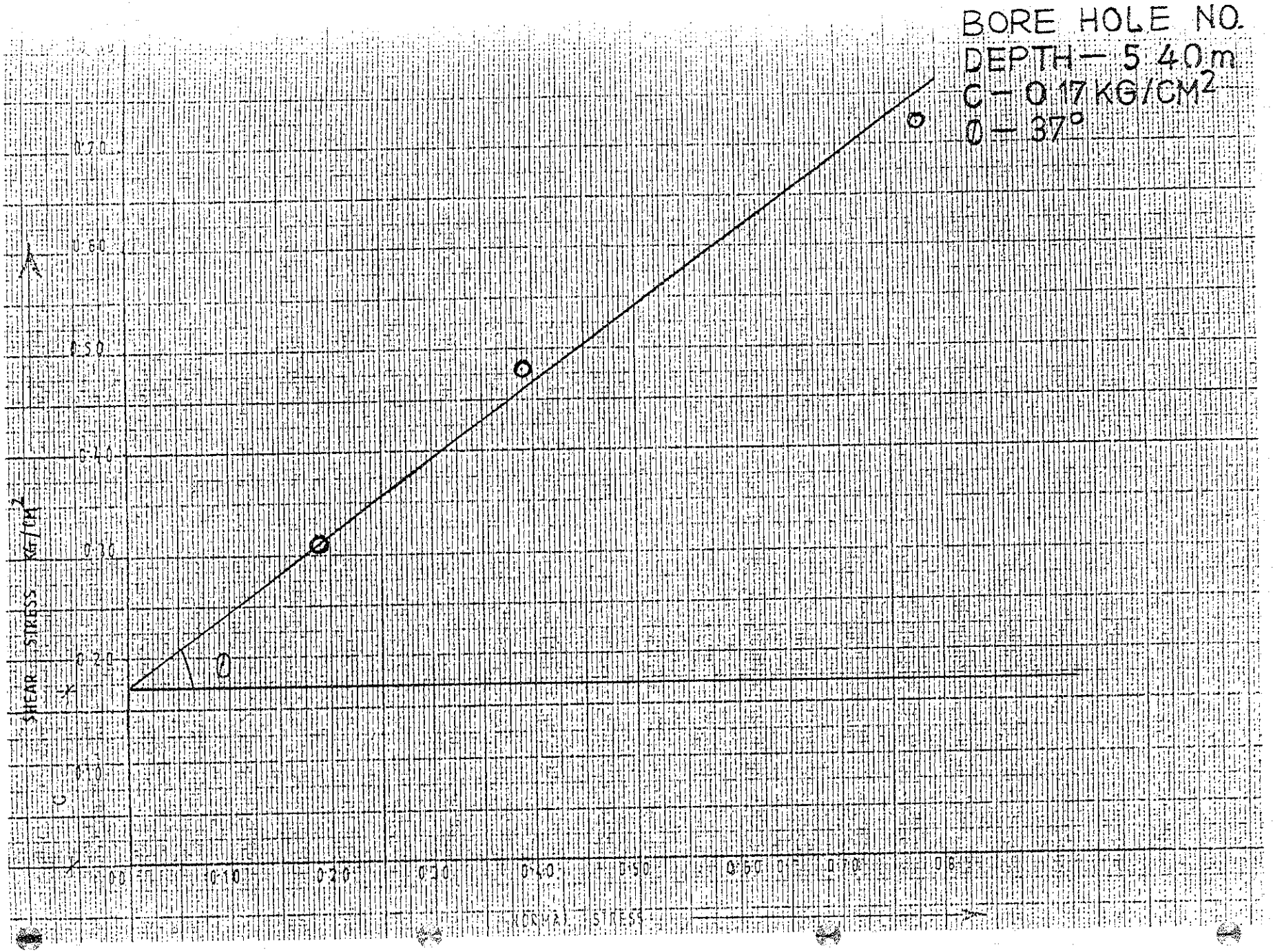
BORE HOLE NO. 1	PREPARED BY THE CENTRAL MATERIAL TESTING LABORATORY I. E. C. S.	DRAWN BY. R. PANT CHECKED BY. R. K. POUDEL DATE. 036/4/14

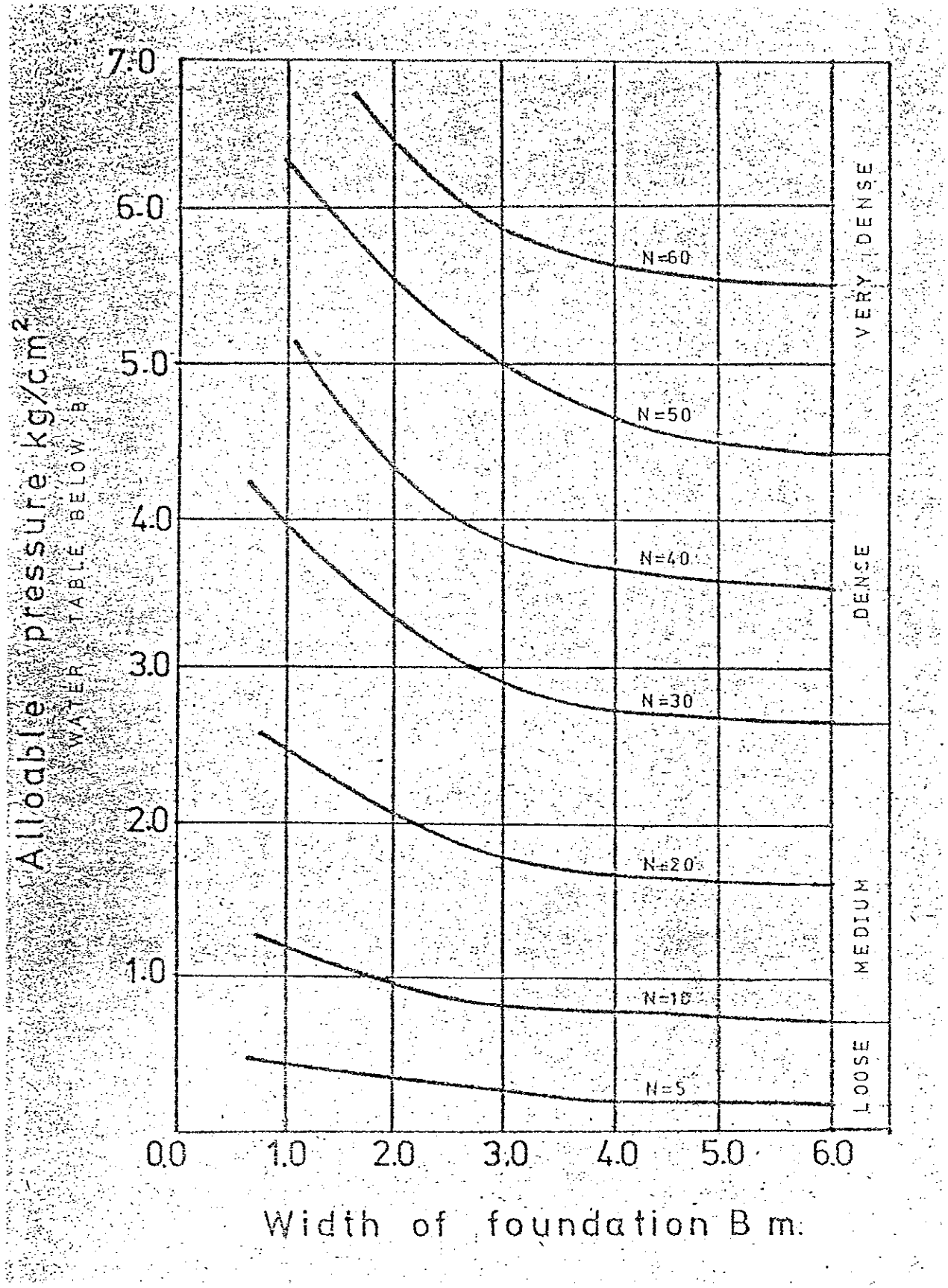
BORE HOLE LOG CONTD.

2

1	2	3	4	5	6	7	8
		5·95					
11.0					0·8CM/50 BLOWS 0·0CM/NEXT 5 BLOWS	10·08	
	11·75						
12.0		0·65	BLACK TO YELLOWISH GREY SILT WITH LITTLE SAND GRAVEL AND CLAY		6·0CM/50BLOWS 0·2CM/NEXT 5 BLOWS	15·66	
	12·40						
13.0					8·5CM/50 BLOWS 0·3CM/NEXT 5 BLOWS	12·12	
			YELLOWISH WHITE TO LIGHT BLUE GRAVEL WITH SAND SILT AND CLAY				
14.0		3·10			7·8CM/50 BLOWS 0·4CM/NEXT 5 BLOWS	10·12	
15.0					17CM/50 BLOWS 0·3CM/NEXT 5 BLOWS	20·35	
	15·50						
16.0							

BORE HOLE NO. 1	PREPARED BY C. M. T. L. I. E. C. S.	DRAWN BY. R. PANT CHECKED BY. R. K. POUDEL DATE. 036/4/14

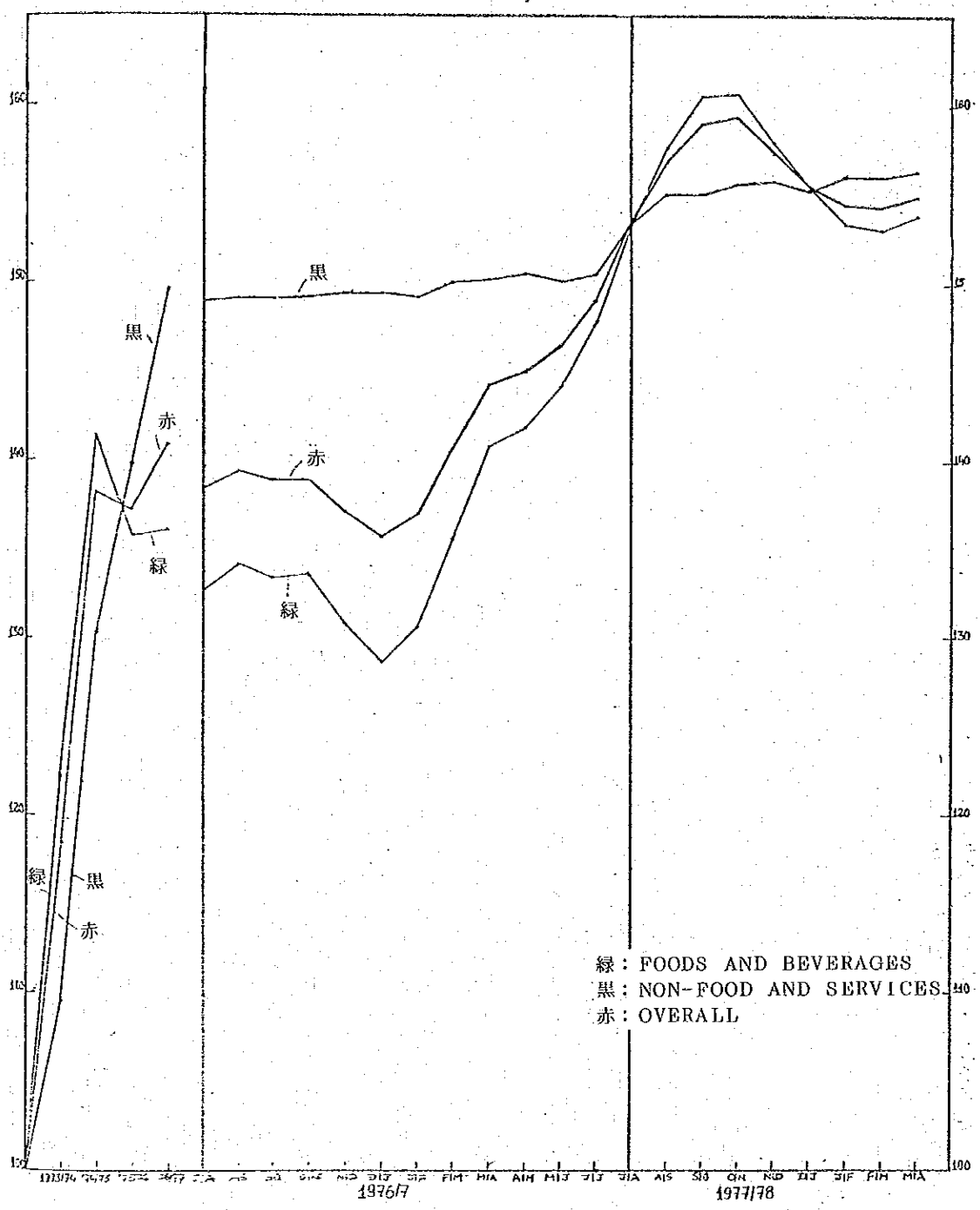

BORE HOLE NO.
DEPTH — 5.40m
C — 0.17 KG/CM2
θ — 37°
SHEAR STRESS KG/CM2
NORMAL STRESS
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
θ


Allowable pressure kg/cm²
WATER TABLE BELOW B
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Width of foundation B m.
N=60
N=50
N=40
N=30
N=20
N=10
N=5
VERY DENSE
DENSE
MEDIUM
LOOSE

付属資料　1－10　消費者物価指数

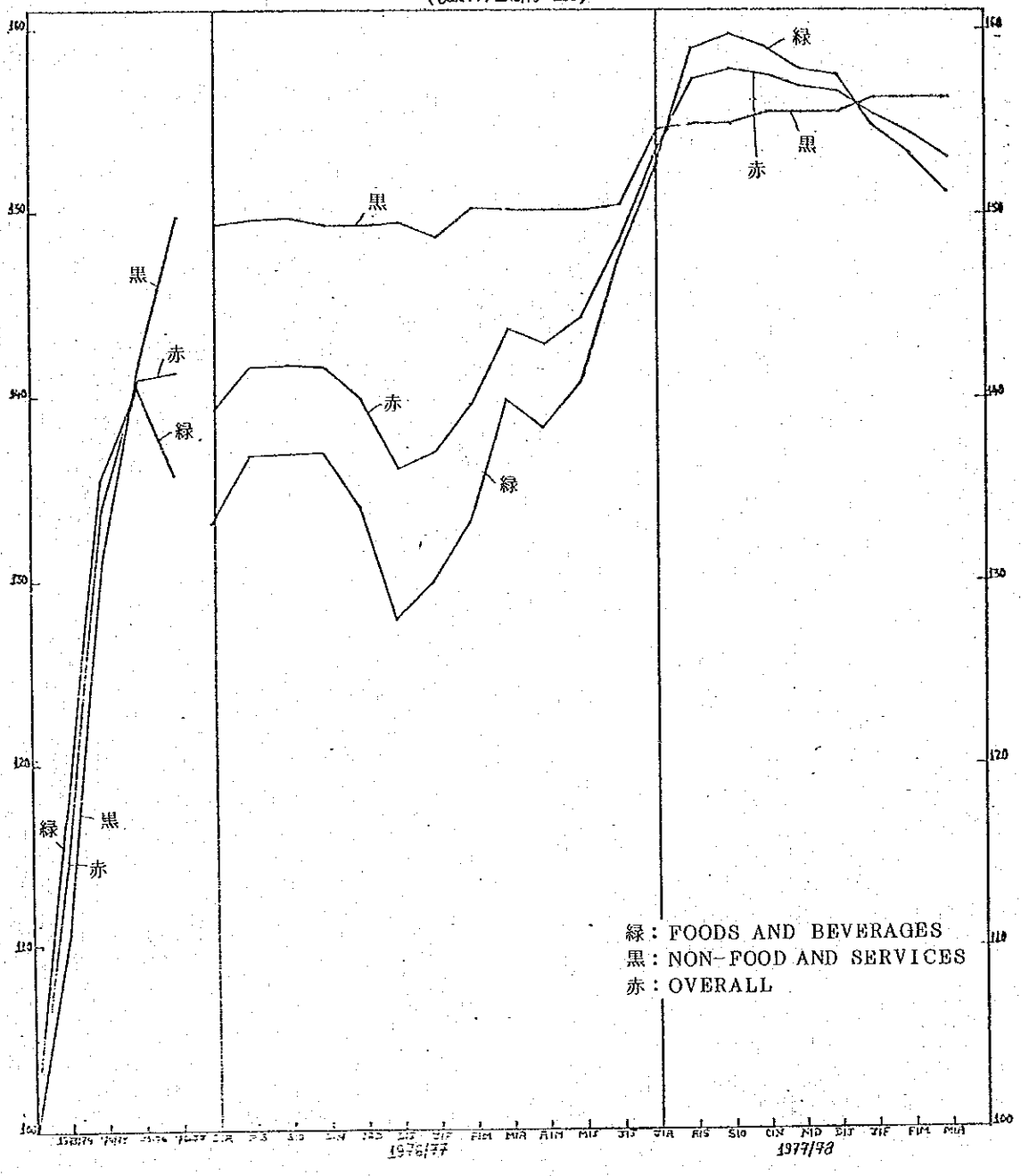
(a)　NATIONAL URBAN CONSUMER PRICE INDEX

(Base: FY 1972/73=100)



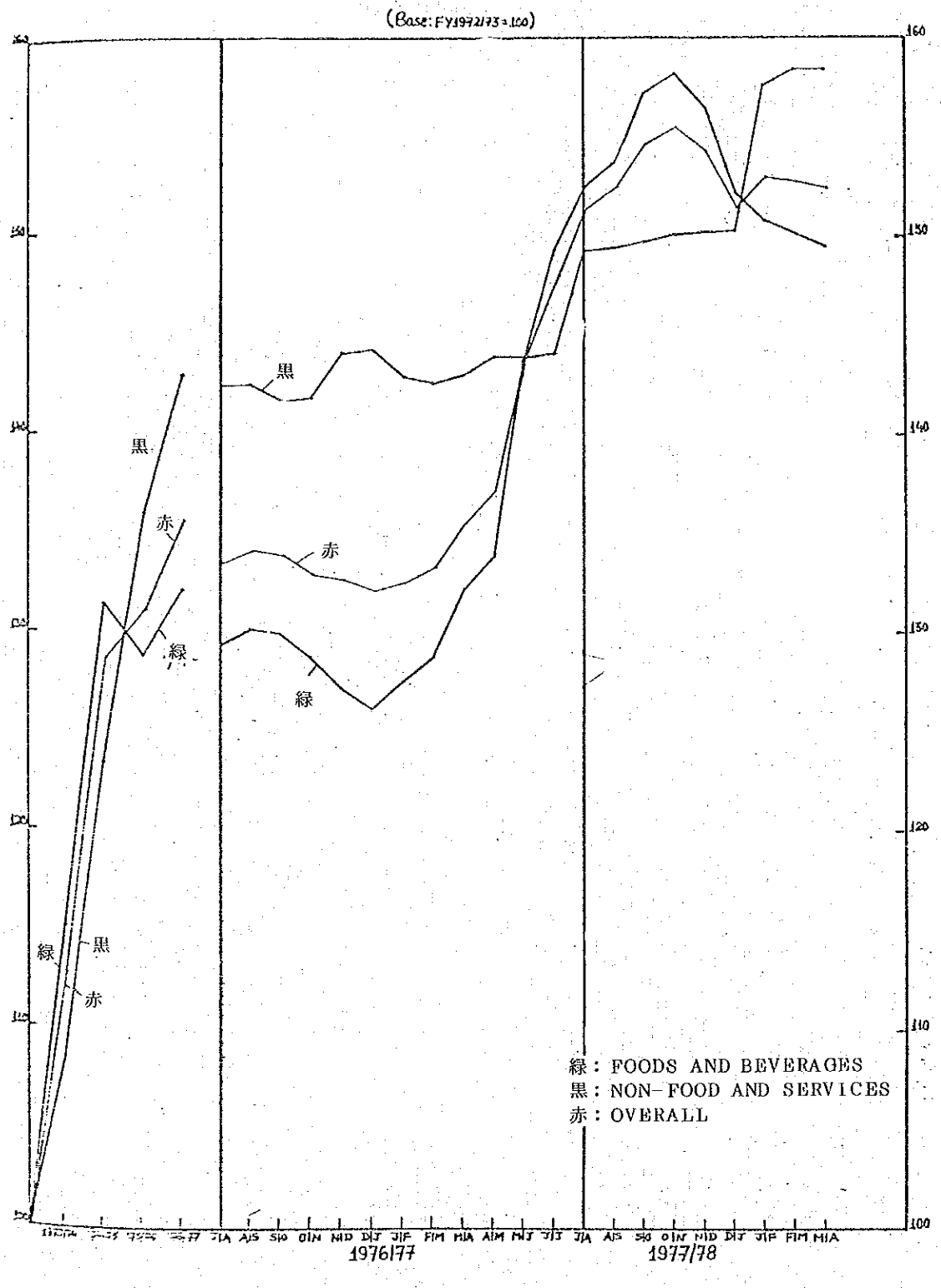
(b) URBAN CONSUMER PRICE INDEX
FOR
KATHMANDU

(Base: FY 1972/73 = 100)



(c) URBAN CONSUMER PRICE INDEX
FOR
POKHARA

(Base: FY1972/73 = 100)



INDEX NO. 1030 STATION KATHMANDU AIRPORT YEAR 1971

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY % Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	17.4	2.0	9.7	21.0 1	-1.0 24	0	6	93	54	3	3 /22	1	1	0	0	0	0
FEB	19.2	2.7	11.0	22.9 16	-1.0 2	0	7	84	45	6	6 /28	1	1	0	0	0	0
MAR	24.0	7.4	15.7	27.7 28	2.0 1	0	0	79	40	28	20 /1	4	3	1	0	0	0
APR	22.7	13.0	17.8	27.0 28	9.3 2	0	0	85	68	181	46 /12	18	12	5	1	0	0
MAY	25.1	15.1	20.1	28.2 29	12.0 16	0	0	79	62	110	19 /15	17	14	3	0	0	0
JUN	26.2	19.6	22.9	28.8 7	17.9 2	0	0	84	81	608	84 /12	24	9	4	8	3	0
JUL	26.9	20.0	23.4	29.6 15	19.0 28	0	0	83	79	205	30 /14	25	17	7	1	0	0
AUG	26.5	19.6	23.0	28.2 16	16.9 26	0	0	86	81	253	61 /26	22	15	4	2	1	0
SEP	26.2	17.9	22.0	28.5 20	15.3 19	0	0	85	78	36	11 /5	9	8	1	0	0	0
OCT	24.1	13.6	18.8	28.4 3	7.8 28	0	0	86	74	81	47 /18	9	7	1	1	0	0
NOV	20.6	6.7	13.6	23.2 5	2.8 28	0	0	92	66	0	0	0	0	0	0	0	0
DEC	18.2	2.8	10.5	21.0 12	0.1 17	0	0	95	63	0	0	0	0	0	0	0	0
Year	23.1	11.7	17.4	29.6 Jul	-1.8 Feb	0	13	86	66	1511	84 Jun	130	87	26	13	4	0

INDEX NO. 1030 STATION KATHMANDU AIRPORT YEAR 1972

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY %, Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	17.5	3.2	10.4	20.2 23	-0.7 16	0	2	94	61	1	1 /16	0	0	0	0	0	0
FEB	17.6	3.1	10.4	24.8 26	-1.2 18	0	1	89	51	26	11 /4	4	3	1	0	0	0
MAR	24.1	8.0	16.0	27.3 23	2.0 1	0	0	80	45	80	34 /27	5	2	2	1	0	0
APR	26.3	10.5	18.4	30.4 29	6.8 6	1	0	67	37	24	16 /6	4	3	1	0	0	0
MAY	29.3	16.1	22.7	32.4 13	11.0 5	15	0	63	48	57	19 /20	6	3	3	0	0	0
JUN	28.8	18.1	23.4	33.0 12	15.2 8	12	0	73	62	157	23 /22	16	8	8	0	0	0
JUL	27.3	20.2	23.8	30.6 13	18.8 29	1	0	85	79	481	103 /28	24	10	6	7	0	1
AUG	27.3	19.4	23.4	29.6 21	18.0 18	0	0	83	78	155	26 /13	17	11	5	1	0	0
SEP	25.3	17.6	21.4	29.0 20	15.6 25	0	0	86	78	174	42 /4	15	11	2	2	0	0
OCT	23.4	12.5	18.0	27.6 4	5.8 25	0	0	89	72	86	52 /30	4	1	2	0	1	0
NOV	21.0	7.3	14.2	23.9 7	3.1 25	0	0	93	68	20	14 /27	2	1	1	0	0	0
DEC	19.3	1.9	10.6	22.8 4	-0.5 24	0	2	92	63	0	0	0	0	0	0	0	0
Year	23.9	11.5	17.7	33.0 Jun	-1.2 Feb	29	5	83	62	1261	103 Jul	97	53	31	11	1	1

INDEX NO. 1030 STATION KATHMANDU AIRPORT YEAR 1973

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY % Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	17.2	3.4	10.3	19.6 1	-0.0 2	0	4	92	68	24	9 /9	5	5	0	0	0	0
FEB	19.0	4.5	12.2	22.5 24	1.4 2	0	0	90	58	32	23 /28	3	2	1	0	0	0
MAR	23.3	6.4	14.8	29.9 31	1.9 1	0	0	80	43	48	36 /7	5	4	0	1	0	0
APR	28.8	11.9	20.4	31.7 16	8.3 18	7	0	64	45	25	13 /26	3	1	2	0	0	0
MAY	26.7	15.9	21.3	29.9 10	12.2 12	0	0	76	60	81	20 /9	15	13	2	0	0	0
JUN	26.9	19.0	23.0	29.3 25	15.4 3	0	0	80	76	340	67 /10	20	10	6	2	2	0
JUL	27.8	19.8	23.8	29.2 18	18.0 18	0	0	83	80	456	102 /25	21	10	6	2	2	1
AUG	27.5	19.4	23.4	30.9 24	17.5 11	1	0	85	83	336	93 /11	22	11	8	2	1	0
SEP	26.2	18.2	22.2	29.4 7	13.6 27	0	0	88	84	321	47 /26	19	8	6	5	0	0
OCT	24.4	14.0	19.2	27.4 5	9.2 30	0	0	88	78	119	64 /13	8	5	1	1	1	0
NOV	21.3	6.6	14.0	24.0 9	3.6 30	0	0	91	72	16	10 /2	3	2	1	0	0	0
DEC	18.0	1.7	9.8	20.8 8	-1.6 27	0	7	96	70	0	0	0	0	0	0	0	0
Year	24.0	11.7	17.9	31.7 Apr	-1.6 Dec	8	11	84	68	1798	102 Jul	124	71	33	13	6	1

INDEX NO. 1030 STATION KATHMANDU AIRPORT YEAR 1974

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY % Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	16.8	1.8	9.3	19.7 26	-2.0 16	0	3	96	67	17	15 /15	2	1	1	0	0	0
FEB	20.1	3.0	11.6	25.2 25	-0.8 9	0	4	87	47	6	6 /13	1	1	0	0	0	0
MAR	23.9	7.8	15.8	27.9 16	5.0 19	0	0	81	54	23	10 /30	3	2	1	0	0	0
APR	27.3	13.0	20.2	31.7 24	8.0 10	7	0	(74)	(55)	31	14 /30	6	5	1	0	0	0
MAY	26.8	16.2	21.5	30.4 25	13.1 17	6	0	(78)	(65)	108	30 /10	10	5	4	1	0	0
JUN	28.2	18.9	23.6	30.6 13	14.2 8	3	0	(79)	(68)	75	32 /7	6	4	1	1	0	0
JUL	26.3	19.9	23.1	29.4 10	18.5 19	0	0	86	83	340	50 /31	23	10	9	3	1	0
AUG	26.6	20.1	23.4	28.8 8	18.9 5	0	0	89	85	364	71 /21	21	12	4	4	1	0
SEP	25.4	17.6	21.5	28.0 26	14.4 12	0	0	91	84	205	62 /11	15	9	3	2	1	0
OCT	25.8	15.6	20.7	27.8 18	8.5 31	0	0	90	78	46	38 /7	4	3	0	1	0	0
NOV	22.3	6.2	14.2	25.5 1	3.6 28	0	0	92	70	0	0	0	0	0	0	0	0
DEC	16.5	1.2	8.8	19.2 3	-0.9 22	0	8	97	64	11	5 /17	3	3	0	0	0	0
Year	23.8	11.8	17.8	31.7 Apr	-2.0 Jan	16	15	87	68	1226	71 Aug	94	55	24	12	3	0

INDEX NO. 1030 STATION KATHMANDU AIRPORT YEAR 1975

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY %, Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	16.2	1.8	8.8	19.5 28	-1.7 13	0	11	90	61	31	10 /2	6	6	0	0	0	0
FEB	18.9	4.1	11.5	23.4 20	0.2 3	0	0	95	50	25	11 /2	5	4	1	0	0	0
MAR	23.8	6.9	15.4	26.9 23	4.6 13	0	0	78	34	8	4 /31	2	2	0	0	0	0
APR	28.2	11.4	19.8	31.0 8	5.9 16	5	0	68	38	36	15 /26	5	3	2	0	0	0
MAY	28.2	15.3	21.8	30.6 2	11.4 23	5	0	75	59	75	12 /26	10	6	4	0	0	0
JUN	27.9	18.9	23.4	31.4 11	16.0 1	8	0	78	65	138	41 /21	13	8	4	1	0	0
JUL	26.1	19.7	22.9	28.8 9	18.0 22	0	0	86	76	436	80 /1	23	11	7	3	2	0
AUG	27.3	19.6	23.4	29.6 27	18.2 21	0	0	84	79	379	89 /3	20	9	7	2	2	0
SEP	25.3	18.1	21.7	28.4 23	15.9 29	0	0	90	81	268	41 /8	19	9	7	3	0	0
OCT	25.7	14.7	20.2	27.8 7	9.4 29	0	0	90	76	34	13 /7	5	3	2	0	0	0
NOV	20.8	6.3	13.6	23.0 1	1.3 28	0	0	96	73	0	0	0	0	0	0	0	0
DEC	17.8	2.5	10.2	21.5 5	0.0 29	0	1	96	69	0	0	0	0	0	0	0	0
Year	23.8	11.6	17.7	31.4 Jun	-1.7 Jan	18	12	86	63	1430	89 Aug	108	61	34	9	4	0

INDEX NO. 0804 STATION POKHARA AIRPORT YEAR 1971

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY %, Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	19.7	6.3	13.0	22.0 12	3.0 31	0	0	81	41	0	0	0	0	0	0	0	0
FEB	21.9	6.9	14.3	26.0 17	3.0 20	0	0	71	37	11	10 /28	1	0	1	0	0	0
MAR	26.4	10.7	18.5	33.0 28	5.0 6	8	0	58	31	41	18 /6	4	2	2	0	0	0
APR	26.1	11.0	18.5	30.0 29	6.0 21	2	0	70	55	226	48 /30	10	0	8	2	0	0
MAY	27.6	13.5	20.5	31.0 30	8.0 1	4	0	71	58	348	55 /18	17	7	4	4	2	0
JUN	28.7	15.6	22.1	31.5 23	12.0 26	14	0	85	68	699	45 /12	22	0	7	15	0	0
JUL	29.3	16.3	22.8	32.0 27	13.0 31	11	0	85	67	534	71 /17	27	11	9	3	4	0
AUG	28.5	18.0	23.2	30.1 22	13.8 18	6	0	87	72	584	90 /6	24	11	3	7	3	0
SEP	28.1	20.6	24.3	30.0 21	19.0 12	3	0	83	67	437	101 /30	19	9	4	4	1	1
OCT	25.6	16.6	21.1	29.8 2	11.4 22	0	0	82	66	329	59 /18	15	3	7	4	1	0
NOV	21.9	11.0	16.4	25.8 6	7.2 26	0	0	81	55	67	22 /18	7	4	3	0	0	0
DEC	19.3	7.5	13.4	22.0 11	5.4 20	0	0	84	52	0	0	0	0	0	0	0	0
Year	25.2	12.8	19.0	33.0 Mar	3.0 Jn,Fb	48	0	78	56	3276	101 Sep	146	47	48	39	11	1

INDEX NO. 0804 STATION POKHARA AIRPORT YEAR 1972

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY % Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs. & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	19.0	7.6	13.3	21.0 24	5.0 17	0	0	84		21	21 /29	1	0	1	0	0	0
FEB	19.0	7.9	13.4	25.3 27	4.0 18	0	0	77		46	24 /14	4	2	2	0	0	0
MAR	26.0	12.8	19.4	29.8 22	6.3 6	0	0	73		106	38 /28	5	0	3	2	0	0
APR	28.8	14.7	21.7	32.1 30	10.0 10	10	0	80		75	27 /17	8	4	3	1	0	0
MAY	31.0	19.7	25.3	34.4 11	15.6 4	20	0	63		397	114 /26	11	3	3	2	2	1
JUN	30.0	20.6	25.3	33.4 11	16.3 6	13	0	73		534	158 /18	19	6	5	7	0	1
JUL	28.6	22.2	25.4	32.4 13	20.6 6	11	0	87		1099	128 /25	26	5	5	7	7	2
AUG	29.2	21.8	25.5	31.8 21	20.8 28	9	0	85		413	76 /10	18	7	6	3	2	0
SEP	26.9	20.1	23.5	30.2 20	18.3 15	1	0	86		408	82 /4	18	10	1	4	3	0
OCT	24.9	16.3	20.6	28.6 3	10.4 24	0	0	84		77	33 /30	7	4	2	1	0	0
NOV	22.5	11.6	17.0	24.9 6	8.3 25	0	0	80		32	8 /27	6	6	0	0	0	0
DEC	19.8	7.7	13.7	23.3 3	5.4 30	0	0	81		0	0	0	0	0	0	0	0
Year	25.4	15.2	20.3	34.4 May	4.0 Feb	64	0	79		3208	158 Jun	123	47	31	27	14	4

INDEX NO. 0004 STATION POKHARA AIRPORT YEAR 1973

Month	AIR TEMPERATURE °C Mean Max.	Mean Min.	Mean Daily	Absolute extreme Max. date	Absolute extreme Min. date	Number of days Max. ≥ 30°	Number of days Min. ≤ 0°	RELATIVE HUMIDITY % Observed at 0840	1740	PRECIPITATION mm. Total	Maximum in 24 hrs & date	Number of rainy days ≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	18.4	9.6	14.0	20.9 20	5.8 2	0	0	87	72	40	12 /16	8	7	1	0	0	0
FEB	22.0	10.1	16.1	25.0 16	6.5 3	0	0	79	54	36	22 /28	4	3	1	0	0	0
MAR	26.1	12.1	19.1	33.1 31	7.5 8	7	0	65	40	43	29 /7	4	3	0	1	0	0
APR	32.1	17.5	24.8	35.0 15	14.7 9	27	0	53	41	50	16 /23	6	3	3	0	0	0
MAY	28.8	19.3	24.1	31.6 4	15.6 13	7	0	77	66	383	56 /25	24	14	5	3	2	0
JUN	28.7	22.0	25.4	30.9 3	18.6 3	10	0	86	76	628	75 /17	23	7	6	4	6	0
JUL	30.1	22.6	26.4	32.3 10	20.0 5	22	0	84	76	839	173 /26	20	5	6	0	8	1
AUG	29.4	22.2	25.8	32.4 24	20.8 14	13	0	88	76	846	132 /18	21	5	4	6	5	1
SEP	28.2	21.0	24.6	31.0 21	18.2 27	8	0	87	80	722	144 /17	17	4	4	3	5	1
OCT	20.7	16.6	18.7	28.8 6	13.5 24	0	0	85	79	460	136 /13	12	4	3	0	4	1
NOV	22.8	11.2	17.0	25.6 1	8.3 17	0	0	82	74	49	35 /5	3	2	0	1	0	0
DEC	19.3	7.1	13.2	20.8 31	4.5 27	0	0	84	67	0	0	0	0	0	0	0	0
Year	25.5	15.9	20.7	35.0 Apr	4.5 Dec	94	0	80	67	4096	173 Jul	142	57	33	18	30	4

INDEX NO. 0804 STATION POKHARA AIRPORT YEAR 1974

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY % Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0040	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	10.9	6.7	12.0	21.3 26	2.6 16	0	0	82	60	19	12 /15	2	1	1	0	0	0
FEB	22.1	8.0	15.0	28.2 23	3.9 9	0	0	73	43	4	3 /13	1	1	0	0	0	0
MAR	26.8	13.1	20.0	30.6 17	10.4 2	3	0	62	36	66	24 /26	7	4	3	0	0	0
APR	29.3	17.1	23.2	33.2 26	12.6 10	12	0	68	54	136	34 /29	9	4	3	2	0	0
MAY	29.1	18.4	23.8	32.3 28	14.4 23	10	0	73	67	384	57 /5	20	10	3	6	1	0
JUN	29.8	20.3	25.0	32.3 16	17.9 8	14	0	79	73	892	140 /15	23	6	4	7	4	2
JUL	28.4	21.6	25.0	31.0 12	19.8 3	4	0	88	78	862	102 /29	29	11	5	7	5	1
AUG	28.6	21.5	25.0	31.4 10	20.3 20	10	0	89	81	1429	205 /2	27	8	6	4	7	5
SEP	27.2	20.0	23.6	30.2 8	18.0 11	2	0	86	78	511	88 /4	19	7	3	6	3	0
OCT	27.6	18.4	23.0	29.4 18	12.6 30	0	0	84	76	293	76 /15	15	3	10	1	1	0
NOV	23.8	10.1	17.0	26.3 1	7.1 30	0	0	75	67	0	0	0	0	0	0	0	0
DEC	17.9	6.0	12.0	20.4 1	3.0 20	0	0	85	64	9	8 /16	1	1	0	0	0	0
Year	25.8	15.1	20.4	33.2 Apr	2.6 Jan	55	0	79	65	4605	205 Aug	153	53	38	33	21	8

INDEX NO. 0804 STATION POKHARA AIRPORT YEAR 1975

Month	AIR TEMPERATURE °C							RELATIVE HUMIDITY % Observed at		PRECIPITATION mm.							
	Mean			Absolute extreme		Number of days				Total	Maximum in 24 hrs & date	Number of rainy days					
	Max.	Min.	Daily	Max. date	Min. date	Max. ≥ 30°	Min. ≤ 0°	0840	1740			≥ 1.0	1.0 9.9	10.0 24.9	25.0 49.9	50.0 99.9	≥ 100.0
JAN	10.0	6.0	12.0	20.0 11	2.8 6	0	0	84	62	38	10 /25	7	5	2	0	0	0
FEB	20.9	8.4	14.6	24.6 28	3.4 2	0	0	80	54	37	10 /28	6	5	1	0	0	0
MAR	26.4	11.6	19.0	29.8 22	8.9 2	0	0	63	38	42	14 /7	4	1	3	0	0	0
APR	31.5	15.7	23.6	37.4 8	12.0 16	25	0	54	36	118	55 /20	4	1	1	1	1	0
MAY	29.8	17.8	23.8	33.1 2	15.0 24	17	0	69	68	446	135 /16	19	7	6	5	0	1
JUN	29.7	20.4	25.0	32.6 12	17.0 1	16	0	81	69	704	115 /15	20	6	5	4	4	1
JUL	28.2	20.7	24.4	30.7 10	18.4 1	9	0	88	81	1177	171 /1	28	4	9	6	8	1
AUG	29.6	21.2	25.4	32.2 27	19.0 25	16	0	86	77	650	110 /3	21	5	8	4	3	1
SEP	27.4	19.6	23.5	30.0 23	17.6 28	1	0	88	83	1096	148 /19	26	6	8	3	5	4
OCT	27.2	17.1	22.2	29.3 25	12.4 31	0	0	82	78	359	50 /10	12	2	2	6	2	0
NOV	22.4	10.0	16.2	24.3 6	5.6 28	0	0	80	68	0	0	0	0	0	0	0	0
DEC	19.5	7.5	13.5	21.2 1	5.9 29	0	0	86	65	0	0	0	0	0	0	0	0
Year	25.9	14.7	20.3	37.4 Apr	2.8 Jan	84	0	78	65	4667	171 Jul	147	42	45	29	23	8

ネパール王国　中波ラジオ放送網整備拡充計画　基本設計調査報告書　別冊

付属資料　1－12　建設主要資材単価表

主要資材の標準的単価をDepartment of Housing & Physical Planning から入手した資料を元に算出して下記に示す。これらには下請経費も含まれている。

（1ネパール・ルピーを20円として換算）

☆ 建 築 関 係

(1) 根　伐 (Ordinary Soil)	m³	134円
(2) 埋　戻　し（盛　土）	m³	1,192
(3) 基礎，床，1級品レンガ平敷き	m²	247
(4) 壁，1級品レンガ積セメント目地（1：6）	m³	7,037
(5) 〃　〃（1：4）	〃	7,943
(6) 〃　〃（1：3）	〃	8,724
(7) 石の割栗	m³	2,508
(8) 自然石積セメント目地（1：6）	m³	7,094
(9) 仝上 ライムモルタル（1：1）	m³	4,692
(10) 仕上石積セメント目地	m³	9,239
(11) 無筋コンクリート（1：2：4）	m³	16,820
(12) 〃（1：3：6）	〃	13,264
(13) 〃（1：4：8）	〃	11,366
(14) ライム・コンクリート（1：1：1：6）	m³	5,197
(15) 屋根ライム・コンクリート（3：3：10）	m³	6,083
(16) 防水モルタル（1：2：4）厚さ1 1/2″	m²	840
(17) セメントコンクリート床（1：2：4）厚さ1 1/2″	m²	741
(18) 〃　〃 2″	〃	892
(19) 〃　〃 3″	〃	1,317
(20) 〃　〃 4″	〃	—
(21) 床，人研（1：2：4）厚さ1″	m²	1,866
(22) 床，人研色付（1：2）〃 3/4″	〃	1,918
(23) 2″ 割栗石，上端セメントモルタル（1：4）	〃	2,316
(24) サローウッド建具枠	m³	67,460

No. 5720

(25)	厚さ1 1/2″ シャッター (Panelled Shutter)	m²	4,214
(26)	〃 (Glazed Shutter)	〃	4,359
(27)	厚さ1 1/2″ フラッシュ戸 (3㎜厚ベニア両面貼)	m²	4,578
(28)	〃 (3㎜厚チーク or ローズウッドベニヤ)	m²	6,103
(29)	パーティション (プライウッド両面貼)	m²	1,962
(30)	天井 サローウッド野縁 (3㎜プライウッド貼)	m²	1,598
(31)	〃 (1″ サルウッド貼)	〃	2,252
(32)	サルウッド 梁, 柱, まぐさ等 (付属金具共)	m³	61,977
(33)	厚さ1″ 軒板	m²	1,308
(34)	スチール・ローリング・シャッター	m²	15,984
(35)	アコーディオン・スチール・シャッター	m²	8,719
(36)	スチール・グリル (1/8″ × 3/4″)	m²	2,906
(37)	〃 (3/16″ × 1″)	m²	5,231
(38)	有刺鉄線塀	m	54
(39)	鉄筋コンクリート (1:2:4)	m³	17,449
(40)	鉄筋 (加工共)	Kg	127
(41)	型枠	m²	744
(42)	2 1/2″ 厚屋上レンガ手摺 (1:3)	m²	878
(43)	Sheet Roofing (G.I.シート)	m²	1,866
(44)	〃 (G.I.Plain シート)	〃	1,329
(45)	〃 (アスベスト・セメント・シート)	m	1,732
(46)	屋根, 天然スレート	m²	1,358
(47)	〃 Red Clay Tiles (Roof)	m²	488
(48)	〃 〃 (Ridge)	m	98
(49)	〃 ポリエチレン・シート	m²	195
(50)	床, 壁, 天井, 1/2″ セメントプラスター (1:2)	m²	477
(51)	〃 〃 (1:3)	〃	390
(52)	〃 〃 (1:4)	〃	323
(53)	〃 〃 (1:6)	〃	247
(54)	〃 3/4″ 〃 (1:4)	〃	448
(55)	〃 〃 (1:6)	〃	363

(56)	防水セメントペイント　2回塗	m²	189
(57)	ホワイトウオッシュ　2回塗	〃	32
(58)	Distemper　〃	〃	81
(59)	プライマー1回塗の上，エナメル2回塗	m²	317
(60)	エマルジョンペイント　2回塗	〃	305
(61)	木部　チャプラ　3回塗	〃	224
(62)	〃　D. B Linseed Oil　2回塗	〃	76
(63)	〃　フレンチ　ポリッシュ　2回塗	〃	102
(64)	鉄部プライマー1回塗の上，アルミペイント2回塗	m²	210
(65)	コールタールペイント　2回塗	m²	55
(66)	屋上防水タール・フェルト	m²	959
(67)	基礎　〃	〃	1,598

☆　設備関係単価

(1)	オリッサパン　23″（陶製，インド型）	個	28,944
(2)	大　便　器　（ロータンク付）20″	個	22,680
(3)	〃　（ハイタンク付）20″	〃	12,420
(4)	大　便　器，洗い流し（陶製，洋式）	〃	26,595
(5)	〃　（　〃　）	〃	32,697
(6)	洗　面　器　22″×16″	〃	10,125
(7)	〃　20″×16″	〃	9,855
(8)	〃　18″×12″	〃	6,912
(9)	医療流し　23″×17″	〃	16,848
(10)	実験流し　18″×12″×6″	個	6,831
(11)	〃　21″×17″×7″	〃	13,770
(12)	台所流し　24″×18″×8″	〃	22,140
(13)	〃　24″×18″×10″	〃	24,165

(14)	小型小便器（フラットバック） 18″×14″×10 1/2″	個	5,670円
(15)	〃 （アングルバック） 17″×14 1/2″×13 1/2″	〃	5,670
(16)	小 便 器（Squatting Plate） 23 1/2″×13 3/4″	〃	6,480
(17)	〃 （Large Flat Back） 24″×16″×15″	〃	19,980
(18)	ビ デ	〃	39,366
(19)	自動洗滌シスターン（1ガロン）鋳鉄製	個	4,050
(20)	〃 （2ガロン） 〃	〃	4,860
(21)	〃 （3ガロン） 〃	〃	6,210
(22)	〃 （1ガロン）陶磁製	〃	6,615
(23)	〃 （2ガロン） 〃	〃	9,180
(24)	〃 （3ガロン） 〃	〃	12,015
(25)	水 槽（G. I. Sheet）100ガロン	個	12,150
(26)	〃 〃 200ガロン	〃	22,280
(27)	〃 〃 300ガロン	〃	37,800
(28)	〃 〃 400ガロン	〃	60,350
(29)	電動ポンプ 1″×1/2 HP	台	54,270
(30)	〃 1″×1 HP	〃	74,520
(31)	〃 2″×2 HP	〃	115,155
(32)	ペーパーホールダー（陶磁製）	個	1,350
(33)	〃 （クローム・メッキ製）	〃	594
(34)	石鹸受け（クローム・メッキ）	個	594
(35)	水石鹸入れ（ 〃 ）	〃	1,458
(36)	タオル掛け（クローム・メッキ） 1/2″×24″	〃	810
(37)	〃 （ 〃 ） 1/2″×18″	〃	675
(38)	化 粧 棚 ℓ＝22″ （陶磁製）	〃	1,215
(39)	〃 ℓ＝24″ （ガラス製）	〃	945
(40)	タンブラー＆歯ブラシ，ホールダー 6″×3″	〃	1,431
(41)	化 粧 鏡 22″×16″	〃	2,295
(42)	〃 20″×16″	〃	2,025
(43)	〃 18″×12″	〃	1,701
(44)	シャワーローズ 4″	個	1,593

(45)	シャワーローズ　3″	個	1,890円
(46)	水　　栓　1/2″　(クローム・メッキ)	〃	810
(47)	〃　　〃　(真ちゅう)	〃	540
(48)	ストップ弁　1/2″　(クローム・メッキ)	〃	810
(49)	〃　　1/2″　(真ちゅう)	〃	540
(50)	2人立，小便器　パイプセット	組	5,400
(51)	ゲート弁 (砲金製) 1/2″	個	540
(52)	〃　　〃　3/4″	〃	945
(53)	〃　　〃　1″	〃	1,620
(54)	〃　　〃　1 1/4″	〃	2,052
(55)	〃　　〃　1 1/2″	〃	2,727
(56)	〃　　〃　2″	〃	3,780
(57)	〃　　〃　2 1/2″	〃	9,072
(58)	チャッキ弁 (砲金製) 1/2″	個	378
(59)	〃　　〃　3/4″	〃	594
(60)	〃　　〃　1″	〃	1,080
(61)	〃　　〃　1 1/4″	〃	1,350
(62)	〃　　〃　1 1/2″	〃	1,890
(63)	〃　　〃　2″	〃	2,970
(64)	〃　　〃　2 1/2″	〃	4,725
(65)	排水目皿 (クローム・メッキ) 4″	個	270
(66)	〃　(　〃　) 5″	〃	324
(67)	鋳鉄管　2″	m	1,594
(68)	〃　3″	〃	1,727
(69)	〃　4″	〃	1,860
(70)	鋳鉄管 (Rain Water 用)　3″	m	1,151
(71)	〃　(　〃　)　4″	〃	1,373
(72)	〃　(　〃　)　6″	〃	2,923
(73)	ストーン・ウェアー管　4″	m	1,063
(74)	〃　6″	〃	1,683
(75)	〃　9″	〃	2,391

(76)	白ガス管	(Aクラス) 1/2″ (Long lineの場合25%引) 材工共	m	620円
(77)	〃	(〃) 3/4″ 〃 〃	〃	974
(78)	〃	(〃) 1″ 〃 〃	〃	1,151
(79)	〃	(〃) 1 1/4″ 〃 〃	〃	1,329
(80)	〃	(〃) 1 1/2″ 〃 〃	〃	1,683
(81)	〃	(〃) 2″ 〃 〃	〃	2,126
(82)	鋳鉄接手	(チーズ, ベンド等) 2″	個	675
(83)	〃	(〃) 3″	〃	810
(84)	〃	(〃) 4″	〃	1,080
(85)	〃	(〃) 雨水用 3″	〃	675
(86)	〃	(〃) 〃 4″	〃	945
(87)	〃	(〃) 〃 6″	〃	1,620
(88)	鉛接合	(鋳鉄2″管)	個	459
(89)	〃	(〃 3″ 〃)	〃	675
(90)	〃	(〃 4″ 〃)	〃	891
(91)	浄化槽	(10人)	個	34,830
(92)	〃	(20人)	〃	93,040
(93)	〃	(30人)	〃	128,740
(94)	〃	(50人)	〃	169,000
(95)	〃	(100人)	〃	202,500
(96)	浸透槽	(1,000ガロンタンク)	〃	37,720

☆ 電気設備関係

(1)	Main Switch Board 630Amp (フューズ付)	面	138,510
(2)	0～500V A.C ボルトメーター (セレクタースイッチ付)	個	8,100
(3)	ボルトメーター, アンメーター両用		27,000
(4)	Iron Clad Switch 400Amp 3相(H.R.Cフューズ付)	個	87,210
(5)	〃 300 〃 (〃)	〃	67,500
(6)	〃 200 〃 (〃)	〃	51,705
(7)	〃 200 〃 (Rewirableフューズ付)	〃	27,945
(8)	〃 100 〃 〃	〃	24,300

(9)	Iron Clad Switch	100 Amp	単相 (H.R.C フューズ付)		個	34,020 円
(10)	〃	100	〃 (Rewirable フューズ付)		〃	20,925
(11)	〃	60	3 相 (H.R.C フューズ付)		〃	22,140
(12)	〃	60	〃 (Rewirable フューズ付)		〃	19,845
(13)	〃	60	単相 (H.R.C フューズ付)		〃	18,549
(14)	〃	60	〃 (Rewirable フューズ付)		〃	10,260
(15)	〃	30	3 相 (H.R.C フューズ付)		〃	9,720
(16)	〃	30	〃 (Rewirable フューズ付)		〃	8,235
(17)	〃	30	単相 (H.R.C フューズ付)		〃	4,995
(18)	〃	30	〃 (Rewirable フューズ付)		〃	8,235
(19)	〃	15	3 相 (〃)		〃	7,020
(20)	〃	15	単相 (〃)		〃	2,700
(21)	サーキット・ブレーカー	60 Amp	3 相		個	15,417
(22)	〃	〃	単相		〃	3,780
(23)	〃	30	3 相		〃	14,580
(24)	〃	〃	単相		〃	3,780
(25)	〃	15	〃		〃	3,780
(26)	〃	10	〃		〃	3,780
(27)	〃	5	〃		〃	3,645
(28)	〃	2	〃		〃	4,050
(29)	〃	1	〃		〃	4,050
(30)	配 電 盤	N way	15/30/60 Amp	Box 型	セット	5,967×N 6,210×〃 7,830×〃
(31)	〃	1 way	10/15/up to 60 Amp	〃	〃	1,809 1,890 2,430
(32)	〃	N way	15/30/60 Amp	木製板型	〃	675×N 810×〃 1,620×〃
(33)	コンセント (スイッチ付)	3pin 15A, 2pin 5A	結合型	動力用	個	1,890 取付共
(34)	〃	(〃)	3pin 15A	フラッシュ型	〃 〃	1,755 〃
(35)	〃	(スイッチなし)	〃	〃	〃 〃	1,350 〃
(36)	〃	(スイッチ付)	〃	Surface 型	〃 〃	1,080 〃

(37)	コンセント	(スイッチなし)	3pin	15A	Surface 型	動力用	個	945円	取付共
(38)	〃	(スイッチ付)	3pin	5A	フラッシュ型	〃	〃	918	〃
(39)	〃	(スイッチなし)	〃		〃	〃	〃	999	〃
(40)	〃	(スイッチ付)	〃		Surface 型	〃	〃	945	〃
(41)	〃	(スイッチなし)	〃		〃	〃	〃	756	〃
(42)	〃	〃	2pin	5A	フラッシュ型	照明用	〃	972	〃
(43)	〃	〃	〃		Surface 型	〃	〃	627	〃
(44)	〃	(スイッチ付)	〃		フラッシュ型	〃	〃	1,134	〃
(45)	〃	〃	〃		Surface 型	〃	〃	891	〃
(46)	電話用アウトレット	(スイッチなし)	2pin		Surface 型		〃	621	〃
(47)	〃	〃	〃		フラッシュ型		〃	972	〃
(48)	蛍光灯	40W×1	アクリカバー付		フラッシュ型		セット	16,119	〃
(49)	〃	〃	〃		Surface 型		〃	15,444	〃
(50)	〃	〃	ルーバー付		フラッシュ型		〃	14,175	〃
(51)	〃	〃	〃		Surface 型		〃	13,500	〃
(52)	〃	40W×2	アクリカバー付		フラッシュ型		〃	22,980	〃
(53)	〃	〃	ルーバー付		Surface 型		〃	21,090	〃
(54)	〃	〃	アクリカバー付		〃		〃	22,300	〃
(55)	〃	〃	ルーバー付		フラッシュ型		〃	22,980	〃
(56)	〃	20W×2	〃		Surface 型		〃	21,600	〃
(57)	〃	20W×4	アクリカバー付		フラッシュ型		〃	33,615	〃
(58)	〃	〃	〃		Surface 型		〃	32,940	〃
(59)	〃	〃	ルーバー付		フラッシュ型		〃	28,485	〃
(60)	〃	〃	〃		Surface 型		〃	27,945	〃
(61)	〃	20W×6	アクリカバー付		フラッシュ型		〃	37,611	〃
(62)	〃	〃	〃		Surface 型		〃	37,071	〃
(63)	〃	〃	ルーバー付		フラッシュ型		〃	30,402	〃
(64)	〃	〃	〃		Surface 型		〃	29,997	〃
(65)	〃	40W×1	(Industrial)				〃	13,770	〃
(66)	〃	40W×2	〃				〃	16,200	〃
(67)	〃	20W×1	(Ordinary)				〃	3,375	〃

(68)	蛍光灯	20W×2	(Ordinary)	セット	7,641円	取付共
(69)	〃	40W×1	(〃)	〃	6,750	〃
(70)	〃	40W×2	(〃)	〃	9,639	〃
(71)	白熱灯	100W	(12″ Flat Dome 型)	〃	2,700	〃
(72)	〃	60W	(8″ 〃)	〃	2,349	〃
(73)	〃	〃	(12″ Round Dome 型)	〃	2,700	〃
(74)	〃	〃	(8″ 〃)	〃	2,349	〃
(75)	〃	〃	(6″ 〃)	〃	1,350	〃
(76)	〃	60W	ブラケット型 (カラー・グラス)	〃	1,215	〃
(77)	〃	60W×2	〃 (〃)	〃	3,105	〃
(78)	〃	60W	〃 (アルミ, リフレクター付)	〃	1,215	〃
(79)	〃	60W	ペンダント (fancy shade)	〃	2,700	〃
(80)	〃	60W	〃 (普通型) リフレクター付	〃	675	〃
(81)	〃	〃	〃 〃 リフレクターなし	〃	540	〃
(82)	投光照明	白熱	1,000W	セット	97,200	〃
(83)	〃	ハロゲン	1,000W	〃	48,600	〃
(84)	〃	白熱	150W	〃	8,100	〃
(85)	〃	水銀灯	400W	〃	8,100	〃
(86)	外灯		60W (Weather Proof)	〃	2,160	〃
(87)	街灯 (ポール付)	水銀灯	80W×1 (Post top)	セット	24,300	〃
(88)	〃	〃	〃 80W×2 (〃)	〃	—	〃
(89)	〃	〃	〃 125W×1 (〃)	〃	28,080	〃
(90)	〃	〃	〃 125W×2 (〃)	〃	—	〃
(91)	〃	〃	〃 80W (Side entry)	〃	21,600	〃
(92)	〃	〃	〃 125W (〃)	〃	22,950	〃
(93)	〃	〃	〃 250W (〃)	〃	52,650	〃
(94)	〃	〃	〃 400W (〃)	〃	55,350	〃
(95)	Spot & Display 灯		半露出スポット型	セット	5,400	〃
(96)	〃		天井スポット型	〃	5,130	〃
(97)	〃		短距り投光用	〃	6,750	〃
(98)	天井ファン		48″ φ	〃	16,200	〃

(99)	天井ファン	42″φ			セット	16,200円
(100)	〃	36″φ			〃	16,200
(101)	排気ファン	18″φ			〃	31,725
(102)	〃	12″φ			〃	28,620
(103)	電気ベル	(普通型)	インジケータ付		〃	4,320
(104)	電気ブザー				〃	1,890
(105)	電気ベル	(普通型)			〃	1,350
(106)	配線，銅単線(PVC管内)		材工共	1.5㎟	m	95
(107)	〃	〃	〃	〃	2.5㎟	〃	110
(108)	〃	〃	〃	〃	4.0㎟	〃	162
(109)	〃	〃	〃	〃	6.0㎟	〃	203
(110)	〃	〃	〃	〃	10㎟	〃	284
(111)	〃	〃	〃	〃	16㎟	〃	432
(112)	〃	〃	〃	〃	25㎟	〃	486
(113)	〃	アルミ単線(PVC管内)		材工共	1.5㎟	m	69
(114)	〃	〃	〃	〃	2.5㎟	〃	72
(115)	〃	〃	〃	〃	4.0㎟	〃	102
(116)	〃	〃	〃	〃	6.0㎟	〃	110
(117)	〃	〃	〃	〃	10㎟	〃	135
(118)	〃	〃	〃	〃	25㎟	〃	220
(119)	〃	〃	〃	〃	35㎟	〃	908
(120)	〃	〃	(コンジット管内)	〃	1.5㎟	m	165
(121)	〃	〃	〃	〃	2.5㎟	〃	168
(122)	〃	〃	〃	〃	4.0㎟	〃	176
(123)	〃	〃	〃	〃	6.0㎟	〃	184
(124)	〃	〃	〃	〃	10㎟	〃	273
(125)	〃	〃	〃	〃	25㎟	〃	338
(126)	〃	銅単線(コンジット管内)		〃	1.5㎟	m	191
(127)	〃	〃	〃	〃	2.5㎟	〃	206
(128)	〃	〃	〃	〃	4.0㎟	〃	237
(129)	〃	〃	〃	〃	6.0㎟	〃	277

(130)	配　　線，銅　単　線（コンジット管内）	材工共	10 ㎟	m	347円	
(131)	〃　　〃　　〃	〃	16 ㎟	〃	558	
(132)	〃　　〃　　〃	〃	25 ㎟	〃	604	
(133)	〃　　〃　（Surface Wiring）	材工共	1.5 ㎟	〃	76	
(134)	〃　　〃　　〃	〃	2.5 ㎟	〃	91	
(135)	〃　　〃　　〃	〃	4.0 ㎟	〃	122	
(136)	〃　　〃　　〃	〃	6.0 ㎟	〃	162	
(137)	〃　　〃　　〃	〃	10 ㎟	〃	243	
(138)	〃　　〃　　〃	〃	25 ㎟	〃	380	
(139)	〃　　アルミ単線（Surface Wiring）	〃	1.5 ㎟	〃	50	
(140)	〃　　〃　　〃	〃	2.5 ㎟	〃	53	
(141)	〃　　〃　　〃	〃	4.0 ㎟	〃	61	
(142)	〃　　〃　　〃	〃	6.0 ㎟	〃	69	
(143)	〃　　〃　　〃	〃	10 ㎟	〃	95	
(144)	〃　　〃　　〃	〃	25 ㎟	〃	160	
(145)	アース銅線（アース銅板共）　ゲージ No. 18			m	48	
(146)	〃　　〃　　〃　No. 16			〃	54	
(147)	〃　　〃　　〃　No. 12			〃	351	
(148)	〃　　〃　　〃　No. 8			〃	1,080	
(149)	避　雷　器　　トランス避雷器			個	6,615	
(150)	地下埋設被覆電力ケーブル（アルミ）2 core ケーブル		2.5 ㎟	m	702	工ヒ共
(151)	〃　　〃　　〃		4 ㎟	〃	729	〃
(152)	〃　　〃　　〃		6 ㎟	〃	783	〃
(153)	〃　　〃　　〃		10 ㎟	〃	864	〃
(154)	〃　　〃　　〃		16 ㎟	〃	1,053	〃
(155)	〃　　〃　　〃		25 ㎟	〃	1,404	〃
(156)	〃　　〃　　〃		35 ㎟	〃	1,620	〃
(157)	〃　　〃　　〃		50 ㎟	〃	1,890	〃
(158)	〃　　〃　　3 core ケーブル		2.5 ㎟	〃	756	〃
(159)	〃　　〃　　〃		4 ㎟	〃	783	〃
(160)	〃　　〃　　〃		6 ㎟	〃	810	〃

(161)	地下埋設被覆電力ケーブル（アルミ）	3 core ケーブル	10 ㎟	m	972円	工ヒ共
(162)	〃	〃	〃	16 ㎟	〃	1,215	〃
(163)	〃	〃	〃	25 ㎟	〃	1,539	〃
(164)	〃	〃	〃	35 ㎟	〃	1,782	〃
(165)	〃	〃	〃	50 ㎟	〃	1,971	〃
(166)	〃	〃	〃	70 ㎟	〃	2,714	〃
(167)	〃	〃	〃	95 ㎟	〃	3,362	〃
(168)	〃	〃	3 1/2 core ケーブル	25 ㎟	〃	1,728	〃
(169)	〃	〃	〃	35 ㎟	〃	1,890	〃
(170)	〃	〃	〃	50 ㎟	〃	2,376	〃
(171)	〃	〃	〃	70 ㎟	〃	3,173	〃
(172)	〃	〃	〃	95 ㎟	〃	3,767	〃
(173)	〃	〃	〃	120 ㎟	〃	5,225	〃
(174)	〃	〃	〃	150 ㎟	〃	5,333	〃
(175)	〃	〃	〃	185 ㎟	〃	6,413	〃
(176)	〃	〃	〃	225 ㎟	〃	6,413	〃
(177)	〃	〃	〃	250 ㎟	〃	8,438	〃
(178)	〃	〃	〃	300 ㎟	〃	9,437	〃
(179)	〃	〃	〃	400 ㎟	〃	13,379	〃
(180)	〃	〃	4 core ケーブル	2.5 ㎟	〃	783	〃
(181)	〃	〃	〃	4 ㎟	〃	845	〃
(182)	〃	〃	〃	6 ㎟	〃	953	〃
(183)	〃	〃	〃	10 ㎟	〃	1,088	〃
(184)	〃	〃	〃	16 ㎟	〃	1,412	〃
(185)	〃	〃	〃	25 ㎟	〃	1,790	〃
(186)	〃	〃	〃	35 ㎟	〃	2,114	〃
(187)	〃	〃	〃	50 ㎟	〃	2,492	〃
(188)	トランス	25 KVA	T. P. N		基	565,137	
(189)	〃	50 KVA	〃		〃	483,561	
(190)	〃	63 KVA	〃		〃	716,688	
(191)	〃	100 KVA	〃		〃	1,081,080	

(192)	11 KV　100A　Drop カットアウトフューズ	基	30,591 円
(193)	トランス用ポール　35 ft		27,000
(194)	トランス　150 KVA		595,490
(195)	〃　400 KVA		2,644,000
(196)	〃　500 KVA		—
(197)	1/44　Pre Single Core 銅コイル	91 m	2,000
(198)	3/029　〃　〃	〃	2,560
(199)	3/036　〃　〃	〃	3,400
(200)	7/029　〃　〃	〃	5,000
(201)	7/036　〃　〃	〃	7,400
(202)	7/044　〃　〃	〃	13,500
(203)	7/064　〃　〃	〃	24,000
(204)	電　球　15 W	個	105
(205)	〃　25 W	〃	105
(206)	〃　40 W	〃	110
(207)	〃　60 W	〃	115
(208)	〃　100 W	〃	135

以　上

付　属　資　料　2

付属資料　2　　要員および訓練計画

要員計画については，本建設計画に伴ない放送業務が拡張される分野の人員構成と現在の状況を比較し，増員が必要な分野を次に表示する。結論としては，124名の増員が必要であり，その中で事務関係が33名を占めるが，之は増員枠の約27％となっている。人員構成についてはRadio Nepal から日本側基本設計調査団に提案された要員構成表（参考資料1－1，P14，2－6－1，Personnel Plan 参照）を用いた。

			Existing Staff	Required Staff after the project	Increase in number
(1)	Engineer in charge		0	2	2
(2)	Asst.Engineer or Shift Engineer		5	14	9
(3)	Tech, Officer		2	0	−2
(4)	Supervisor or Technician		0	12	12
(5)	Tech. Asst.	R		48	
		E	30	4	26
		M		4	
(6)	Junior Tech.Asst.	R	28	43	25
		M		10	
(7)	Mechanics		2	21	19
	以上技術関係者　小　計		67	158	91
(8)	Senior Clerk	Adm.	0	2	2
		Str.	0	2	2
(9)	Junior Clerk	Adm.	0	4	4
		Str.	0	8	8
(10)	Typist		0	4	4
(11)	Driver		2	2	0
(12)	Gardener		1	4	3
(13)	Peon		8	18	10
	合　計		78	202	124

訓練計画については，Radio Nepal から日本側基本設計調査団に提案されたものがある（付属資料1－1，P16，2－6－2 Training Program 参照）。その合計数を次に示す。

1. 技術部門

(1) 建設前研修　（合計）

1) Engineer	8	スタジオ技術	2
		送信技術	4
		綜合	2
2) Technician	10	スタジオ技術	3
		送信技術	7

(2) 建設後研修（毎年連続5年間）

	（計）	（合計）
1) Engineer	2	10
2) Technician	4	20

(1)＋(2)の総計　（総計）

1) Engineer	18
2) Technician	30

この総計の人員数と，前項の要員計画の人員数を次に比較する。この両者の差は，建設後5年間の増員計画数と云える。

	訓練計画	人員計画	差
1) Engineer or Asst. Engineer	18	11	7
2) Supervisor or Technician	30	12	18

2. 番組部門 …… Program Producer の研修

第1年度	4
第2年度	2
第3年度	2
第4年度	2
第5年度	2
計	12

現在のRadio Nepal の番組関係部門における国家公務員3等級（Gazetted Third Class）以上の人員数は次のとおりであり，上記の研修要員に該当すると思われる。

1) Programming Section　　7

2) News Section　　5

計　　12

訓練計画に関する検討

(1) 国外における訓練は，元来，国内における訓練より更に高度な水準又は，新しい分野について受けるべき性格のものであり，ラジオ技術およびラジオ番組制作の分野についてはRadio Nepalは世界各国と同等の水準を保持していると云える。

(2) 今回のラジオ放送網整備拡充計画に伴ない，Radio Nepalが国外訓練計画を企図する理由は次の2点にあると云える。

1) 外国の放送事情およびこれに関連する事業を調査し，将来における放送事業の動向を研究すること。

2) 関係する専門分野において，外国の関係者と意見の交換を行うこと。

(3) 上記の条件により，訓練計画を検討すれば，帰国後，その分野において国内研修の指導に当ることができる者が望ましく，資格上から云えば，国家公務員3等級以上の要員にしぼられて来ることが考えられる。これは，技術部門ではAssistant Engineer 以上の要員となる。

(4) 建設前訓練については，現在の或る部門の責任者の全員（例えばAssistant Engineer全員）を一時に外国訓練に派遣することは組織運用の上から不可能であり，最大限にみても，半数毎の訓練となる。

(5) そこで当面する訓練計画としては，現在の在席要員のみに限ることとすれば次のようになる。

	Engineer or Asst. Engineer	Program Producer or News Man
第1年度	4	2
第2年度	4	2
第3年度	2	2
第4年度	2	2
第5年度	2	2
第6年度	2	2
計	16	12

ただし，

1) 第2年度迄を建設前訓練とする。

2) Engineering訓練は，第2年度迄訓練した8名を第3年度以降において，再度前回派遣した外国以外の国へ派遣し，技術的視野を広めることを仮定している。

(6) 要員数が増加した場合は，訓練計画を修正又は延長する必要がある。