

## 9. CONCLUSION AND RECOMMENDATION

The Government of Japan has shown a great enthusiasm for the development of Greater Dacca City of East Pakistan, despatching its preliminary survey team in 1962 and the survey team in 1964 to East Pakistan for the construction project of the Burhiganga River Bridge. The survey team is so desirous that the engineers of both Japan and East Pakistan should conclude the discussion about the final design and construction preparations in order to materialize the proposed bridge as soon as possible. Hereby it is advised to the Government of East Pakistan and Japan as well what to be taken as the next steps, as follows:-

### 1. Advice to Government of East Pakistan.

#### (1) Development of South Bank Area of Brhiganga River.

The purpose of the proposed bridge is to connect Dacca City and the Keraniganj. Should the Keraniganj area be left as it is at the present, therefore, the construction of the bridge would lose its significance. As for the area of about 10,000 acres lying between the Burhiganga River and the Dhaleswari River, the immediate steps should be taken for the survey, planning and design especially for the road construction, and the budgetary measures to carry out the reclamation, development and urbanization of the area, keeping up with the bridge construction. At the same time, the housing project should be drawn up so early as to provide the sufficient land with the inhabitants who should be moved away by the slum clearance from the proposed bridge site on the north bank of the Burhiganga River. A draft plan for the development of the area is proposed in the Part II of the Report, and

it is recommended that the immediate execution of the plan should be realized at least for the proposed area of land. The accurate plane surveying, elevation surveying and geological survey should be conducted to set up a precise plan at first.

(2) Slum Clearance and Redevelopment in the Old Dacca on the North Bank of Burhiganga River.

Owing to the poor structures, sanitary defects, overspill population, bad arrangement and narrowness of streets, the old town area of Dacca City is on the way to become a slum. It has been already stressed in the City Planning Master Plan that the clearance of slum and redevelopment should be carried out. Especially, the proposed bridge would run through the slum area by the elevated bridge by means of a ramp connecting with the 100 feet wide north-to-south arterial road, so the minimum construction site should be secured at least before the construction work starts, preceding the total slum clearance project. The neighbourhood of Buckland Bank should also be reconstructed to make out a park area in harmony with the modern bridge. Since the chief objective of the bridge lies at the vehicle traffic, the adequate consideration should be paid to the selection of traffic lane and its alignment so the vehicle might enter into the city smoothly across the bridge.

(3) Construction of North-to-South Arterial Road.

In order to link up the old and new cities and to relieve the heavy traffic congestion on the Nawabpur Road, an arterial road construction (80 ft. + 2@10 ft. of footpath) is demanded and carried under the planning.

Further, the road construction should be accelerated for the purpose of not only linking-up of the old city and new city by allowing the traffic from bridge to city or from city to opposite bank across the bridge, but also connecting Dacca City with the Keraniganj area.

In any way, the land required should be secured and in the point there might be found the bottleneck to proceed with the project. Therefore, an early settlement of the evacuation problem should be worked out, inclusive of the compensation of removal and the substitute land.

The construction of the Burhiganga River Bridge cannot be independent at all from the three projects, and the Japanese Government is so much concerned with the execution of the three projects as the bridge construction.

#### (4) Replenishment and Training of Engineers of Dacca Improvement Trust.

The Dacca Improvement Trust was established recently and put its emphasis on the development of the projects. It is clear that in the very near future the construction would become active in the Dacca area, and eventually the construction engineers (for road, bridge, water-supply and sewerage) should be strengthened in quality and number. The execution of modern projects would require modernized construction works with surveying and measuring instruments, geological survey instruments and construction equipments. Some construction might be occasioned to shorten the periods. Consequently, the engineers must be enough trained and experienced to meet such requirements. In relation to the construction work of the bridge, the training of engineers should be included in the plan, and it is desirous to study an abroad training program on the Colombo plan.

(5) Discussion about Final Design, Construction Preparation.

It is requested that the Government of East Pakistan should make the full study on the project upon receipt of the Report, and that at the earliest possible opportunity both Japanese and Pakistani engineers should discuss the following subjects at Dacca or Tokyo to take up the final design and construction preparations:-

- a. Results of Preliminary, Comparative Design
- b. Schedule of Construction
- c. Estimated Cost of Construction
- d. Method of Prestressing for P.C. Girder

Accordingly, the engineering works which should be taken up after the discussion would be:-

- a. Final Design of Bridge (including approaches) and Protection Work
- b. Details of Specifications for Construction Work
- c. Detailed Estimate with Bill of Quantity of Materials
- d. List of Machinery and Plant with Specifications
- e. Preparation of Tender Documents
- f. Advice on Tenders Received
- g. Contract Documents Preparation
- h. Details of the Bridge Works during Construction and Trial after the Construction of the Bridge is over.

The period and expenses necessary for the above itemized work should be studied to come to a conclusion.

## 2. Advice to Government of Japan.

Based on the data and results from the detailed site investigation, the preliminary design was drawn up to make clear the outline of the construction project of the proposed bridge, and to obtain the more accurate technical factors and values than those shown in the Report of 1962.

However, the type of superstructure of bridge could not be decided from the technical, traffic and constructional points of view only. Especially, in the case of the Burhiganga River Bridge of being a monumental structure, an aesthetic judgement will play an important role in designing.

Concerning the technics of bridge construction, it is evident that the Japanese engineers stand on the higher level than the Pakistani engineers, but is afraid that the over-evaluation of the construction cost might take place with too much dangerous factors anticipated owing to the foreign work. For this reason, the Pakistani should be given, to some extent, the right of choice and debate to conclude a final layout and construction preparations.

Consequently, the Japanese Government is hereby requested to arrange the opportunity at which both Japanese and Pakistani engineers might have the joint technical conference for the purpose.

3. It was studied and made clear that the projected Burhiganga Bridge connecting Dacca City and the South Dacca at Sadarghat should be

inevitably necessary for not only the further development of Grest City Dacca but the economical growth of East Pakistan at large.

From the technical point of view, the favorable conditions are rather provided to the construction, and there is no particular difficult problems for the reparian engineering and soil conditions in the proposed bridge site.

Moreover, the economical feasibility was studied to prove that the profitability should be enough assured to run a toll bridge. The conservative estimate indicated that the refundment should be completed in 1980 for the total project cost, saving a part of the construction cost of a second Burhiganga Bridge. Accordingly, in 1982, the bridge might be opened free from the tollage for the public.

The successful completion of the bridge should be accompanied by:-

- (1) The unified cooperation on the bridge project made between the competent authorities concerned for the city planning, flood prevention and road planning.
- (2) The successful low interest loan to be given for a long-term of 15 years. (The financed money should be refunded on deferred payment basis after the 5th year from the commencement of construction work.)

--- END ---

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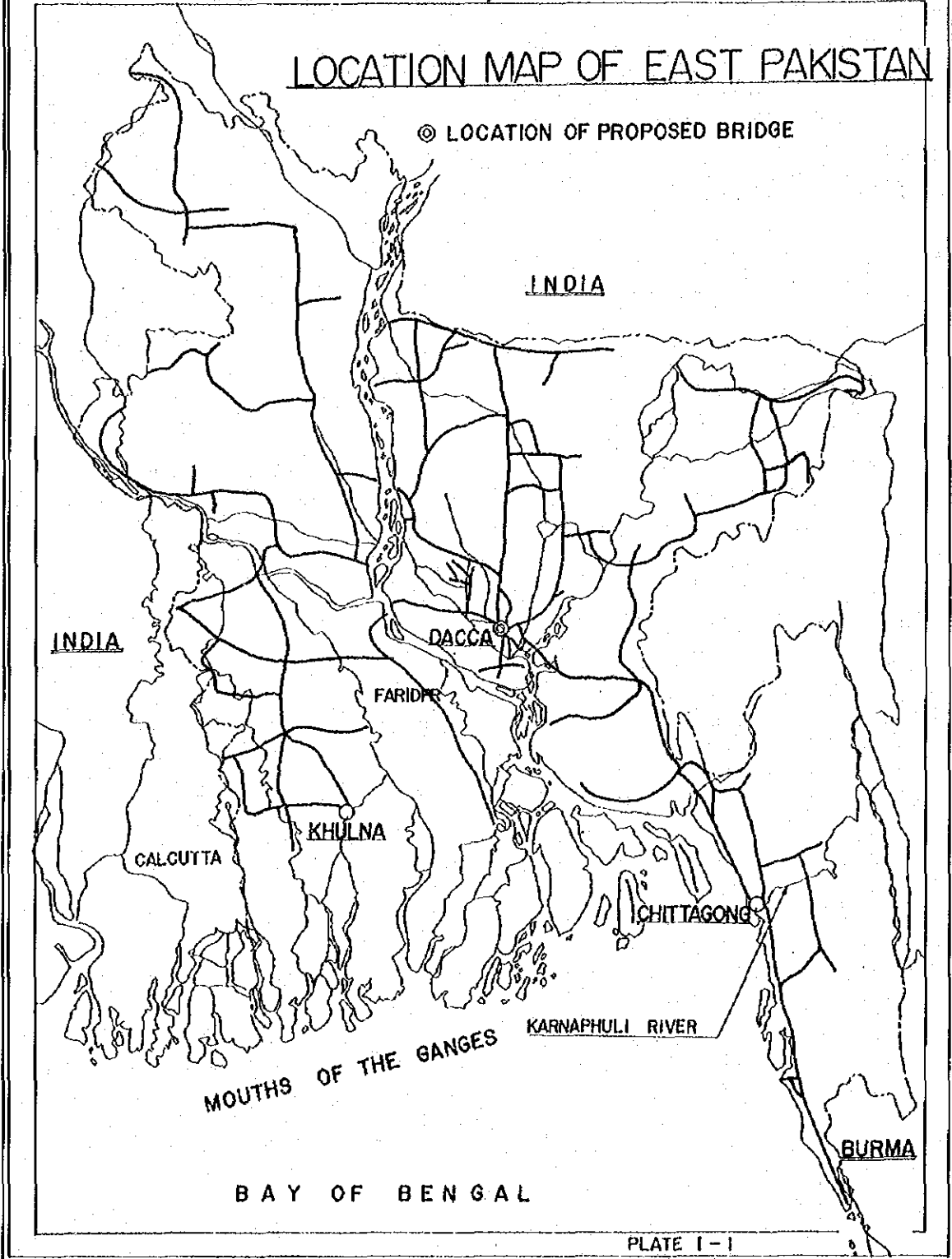
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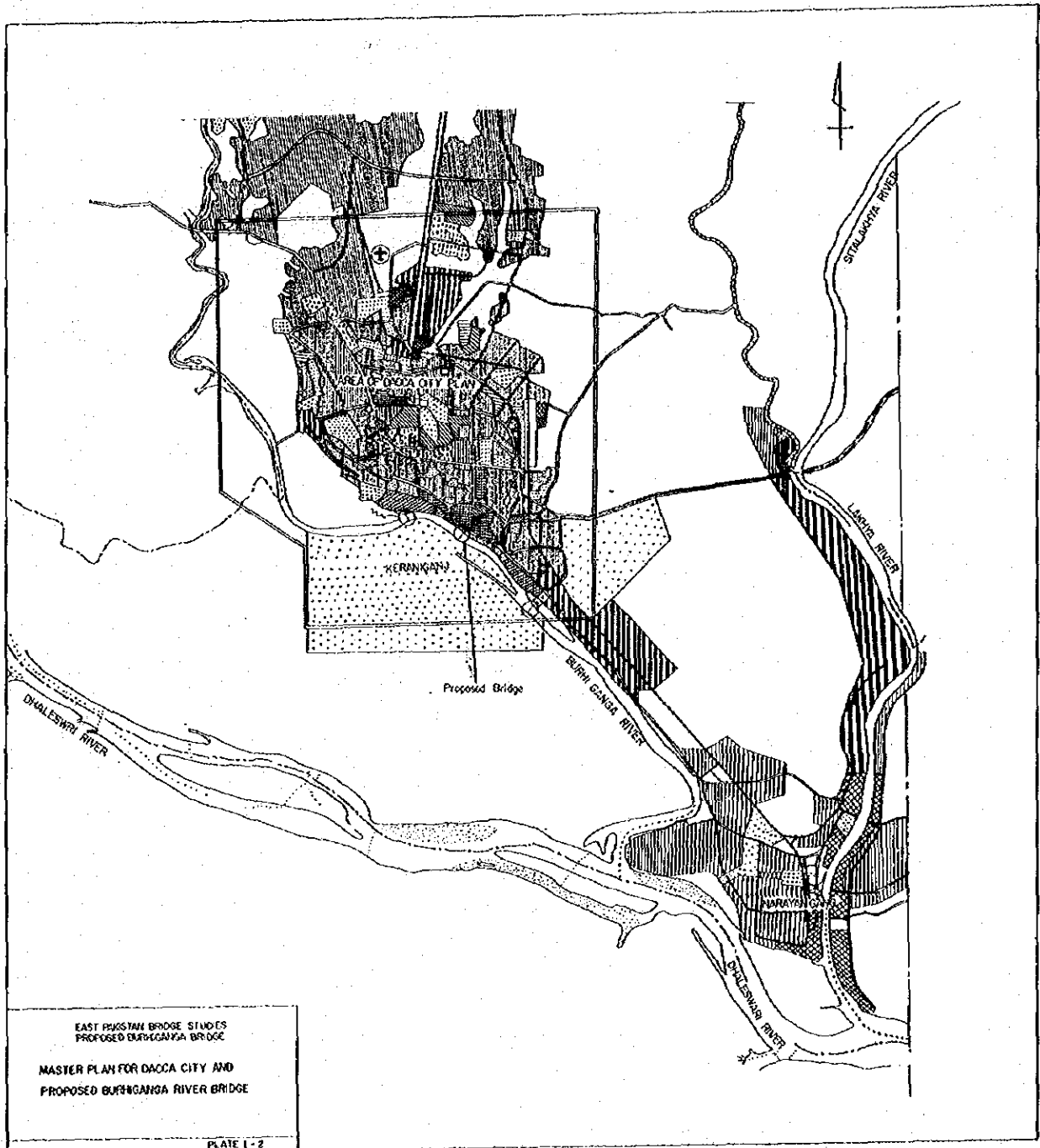
6. Triangulation station No. 4 (On the right shore)
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15. Boring at No. B1
16. Adjustment of boring machines
17. Boring at No. B2
18. Ditto
19. Boring machine starting operation
20. Ditto
21. Water pump
22. Mixer
23. Vane test
24. Raymond sampler for standard penetration test
25. Preparations for boring in the river
26. Boring at No. 3
27. Boring at No. 4
28. Ditto
29. Boring at No. 5
30. Boring at No. 6
31. Ditto
32. Soil test at the site
33. Uniaxial compression test

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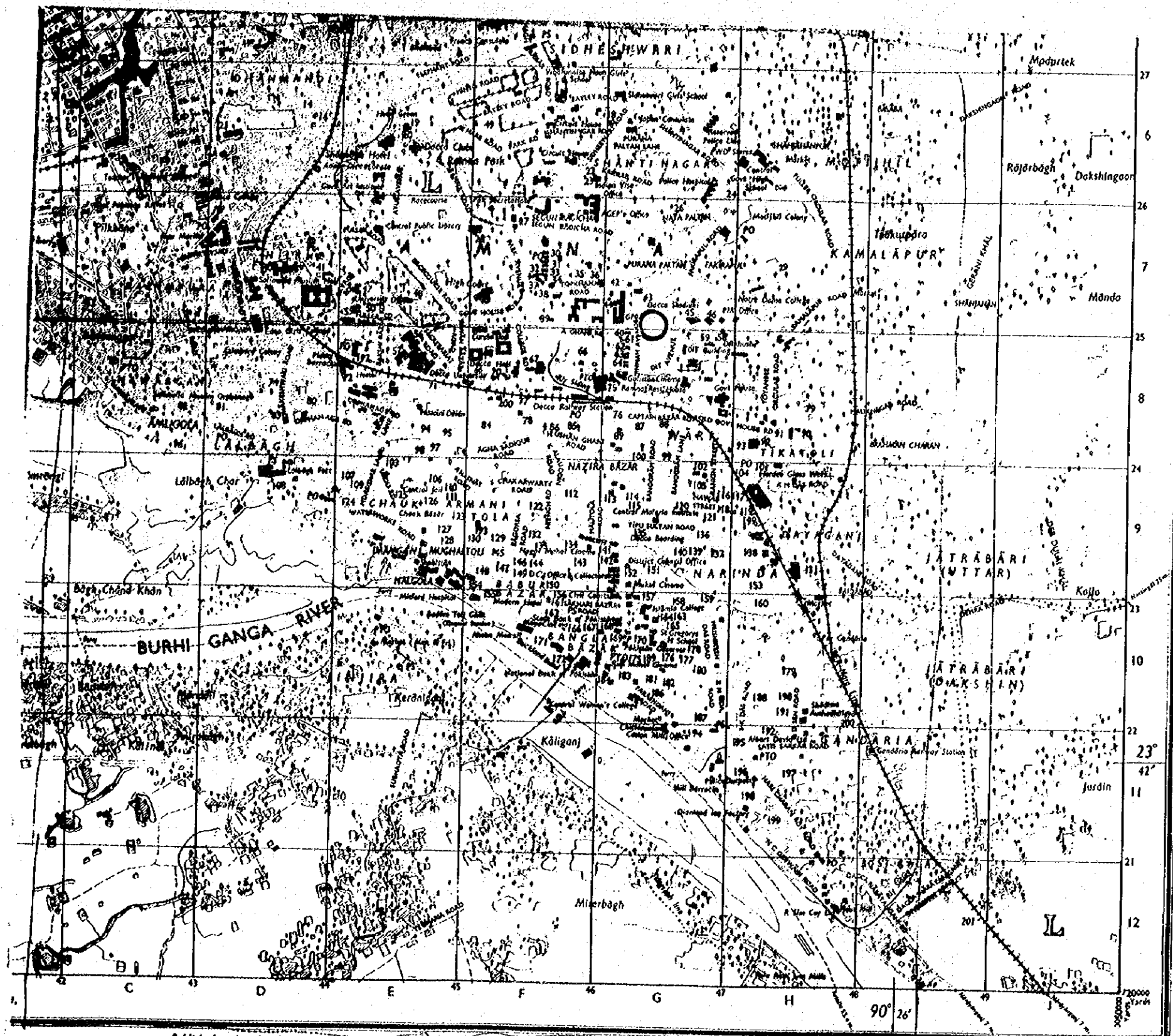
# LOCATION MAP OF EAST PAKISTAN

⊙ LOCATION OF PROPOSED BRIDGE





EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURIGANGA BRIDGE  
MASTER PLAN FOR DACCA CITY AND  
PROPOSED BURIGANGA RIVER BRIDGE  
PLATE I-2



113	Night Cinema	G-4
119	North Mustady Road	G-9
23	Office of the Director General	F-6
	Industries Trade and Commerce	F-6
49	P. A. F. Recruiting Centre	F-8
140	Padmehal Lane	G-9
170	Pakistan Lane	G-10
67	P. E. Railway Hospital	F-8
66	P. E. Railway Office	F-8
50	E.P.I.D.C. House	G-8
13	E.P.I.D.C. Rest House	E-5
104	Plyani Old Road	G-10
44	Post Master General's Office	G-7
	Poultry Farm	C-3
97	Pressing Match factory	E-8
26	Press Club	F-7
49	President House	F-6
20	Public Health Office	F-7
92	Quinnia Girls' High School	H-8
19	Radio Pakistan Dacca Office	E-4
146	Allendra Banarjee Street	F-9
197	Rajani Chowdhury Road	H-10
90	Ramkrishna Mission School	H-8
34	Rationing Office	F-7
22	Regional Employment Exchange	F-6
21	Regional Laboratories of Pakistan	D-4
103	R.P. Chandee Das Road	G-10
184	Sadrulhik Rd (Chittaranjan Ave)	G-10
130	Sattulish College	G-9
160	Sarat Gupta Road	H-10
190	Sashi Bhushan Chatterjee Lane	H-10
130	Shah Sibbi Lane	H-9
87	Shah Sibbi's Bazar Lane	D-4
10	Shahid Khan Road	B-4
131	Shahi Aushadhatya	H-9
100	Sharmilata Lane	H-10
176	Shyama Prasad Choudhury Lane	G-10
85	Siddique Bazar Lane	F-8
86	Siddique Bazar Road	F-8
172	Simpson Road	F-10
98	Sir Mstammad Road	E-8
29	State Bank Colony	H-7
109	State Bank of India	G-10
76	Station Road	G-8
178	Subhas Bose Avenue	G-10
82	Subal Das Road	C-8
144	Syed Hasan Ali Lane	F-9
100	Tahlegh Lane	G-8
109	Tamil Bazar Road	F-9
5	Telegraph Training Centre	E-3
80	Teakri Bazar Road	G-8
123	Training College Road	E-9
42	U. K. High Commission	G-7
54	Umash Dutta Road	E-8
34	U. S. I. S.	F-7
2	V-Aid Training Institute	B-2
77	Veterinary Hospital	F-6
187	Water Road	G-10
166	Wingfield Road	F-10
121	Wyer Street	G-9
133	Yousaf Road	F-9
149	Zindab Bazar Lane	F-9

Published under the direction of A.R. Qureshi, T.C.A., F.R.I.C.S., M.I.S. (Ind.), Surveyor General of Pakistan.  
 Corrected up to 1960.  
 Scale 3.17 Inches to a Mile or 1:20,000.

Yards 1000 500 0 1000 2000 Yards  
 Furlongs 7 6 5 4 3 2 1 0 1 Mile

Church, Mosque, Temple, Tomb. . . . .  
 Bamboo, Trees: palm; other; plantain. . . . .  
 Scrub and undergrowth, Cultivation limit, Vegetable garden. . . . .  
 Graves, Well, Fountain. . . . .  
 Buildings: Important; other Temporary huts. . . . .

EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURIGANGA BRIDGE

AEROGRAPH FOR PROPOSED SITE  
OF BURIGANGA RIVER BRIDGE

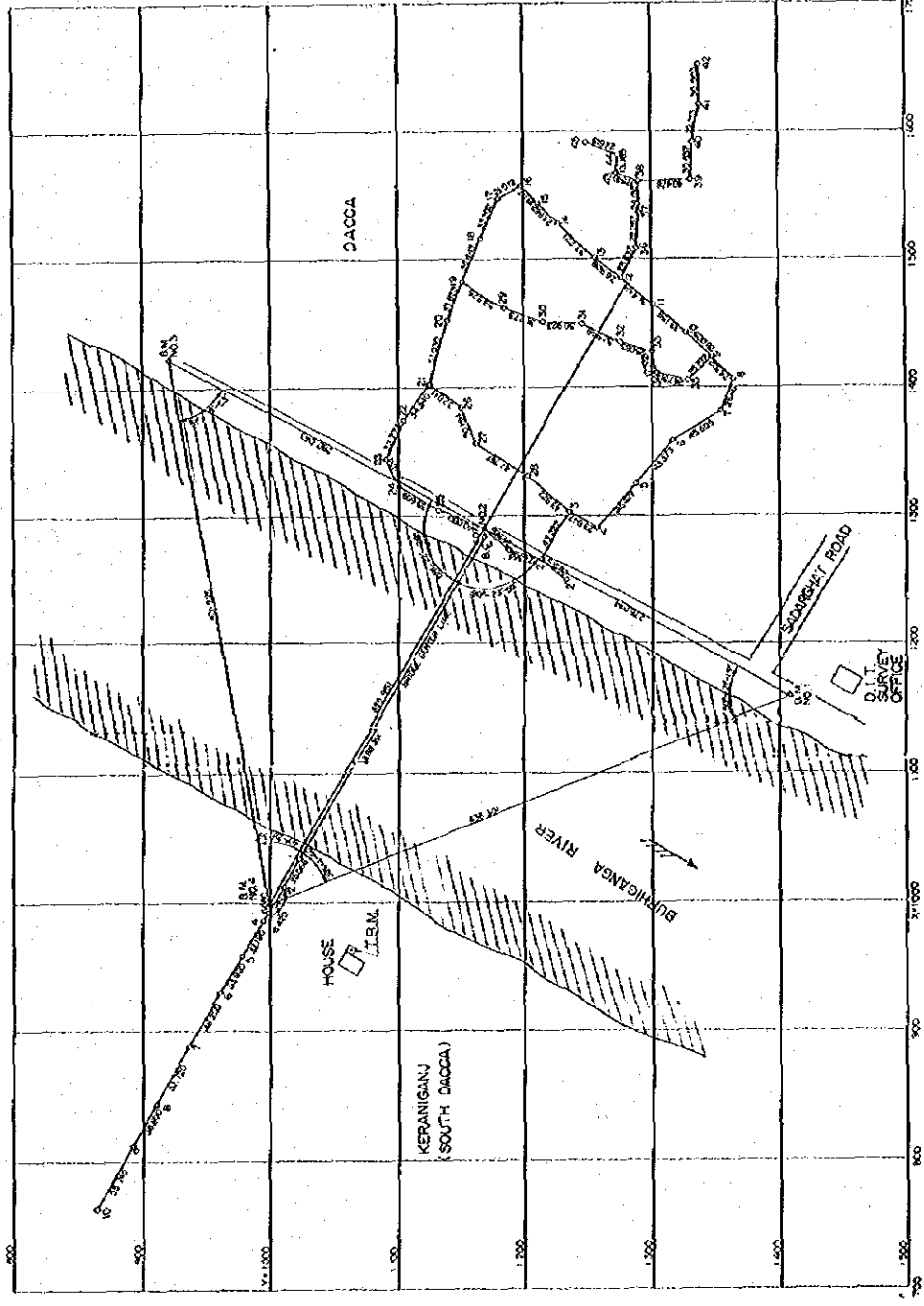
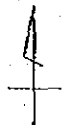
PLATE 1-C



# NETWORK MAP OF TRIANGULATION AND TRAVERSING POINTS

MAR. 1964

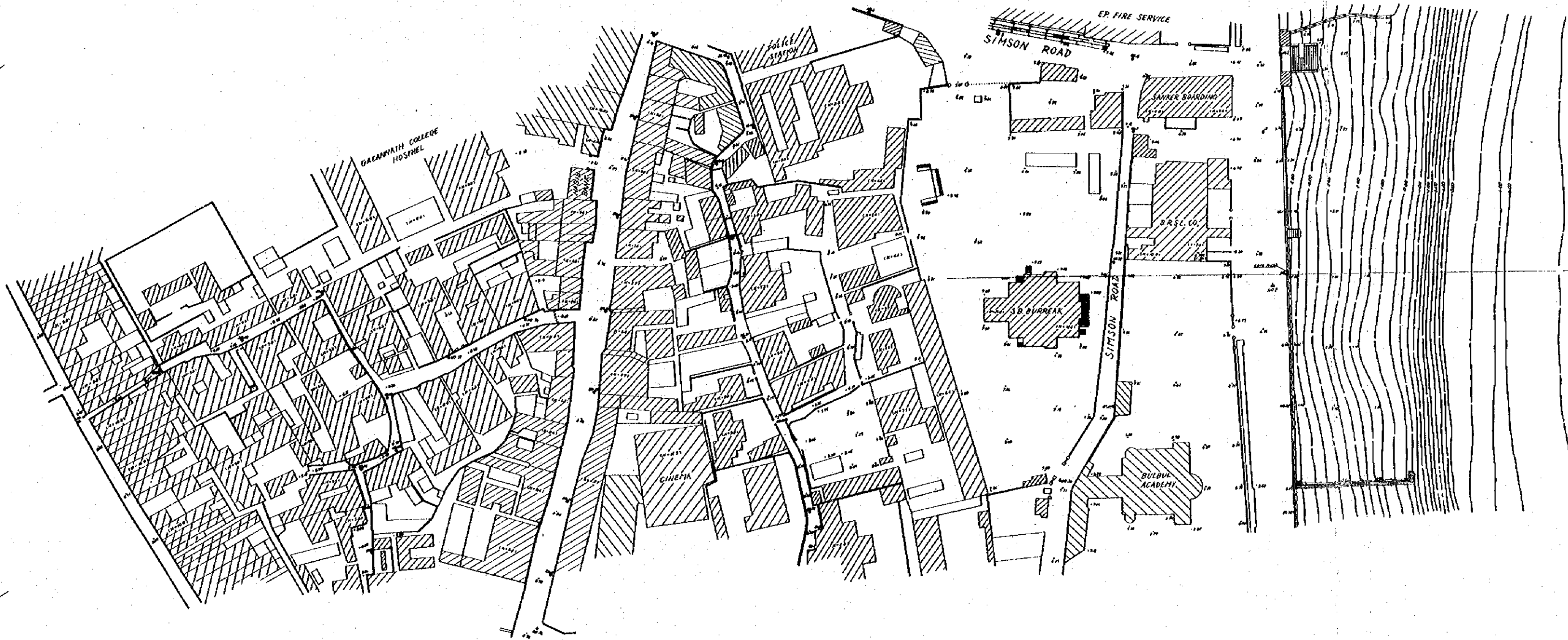
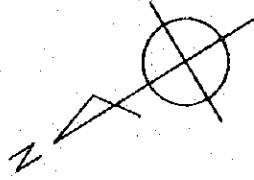
LENGTHS IN METERS



EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURIGANGA BRIDGE

NETWORK MAP OF TRIANGULATION  
AND TRAVERSING POINTS

PLAN OF PROPOSED SITE  
PLAN



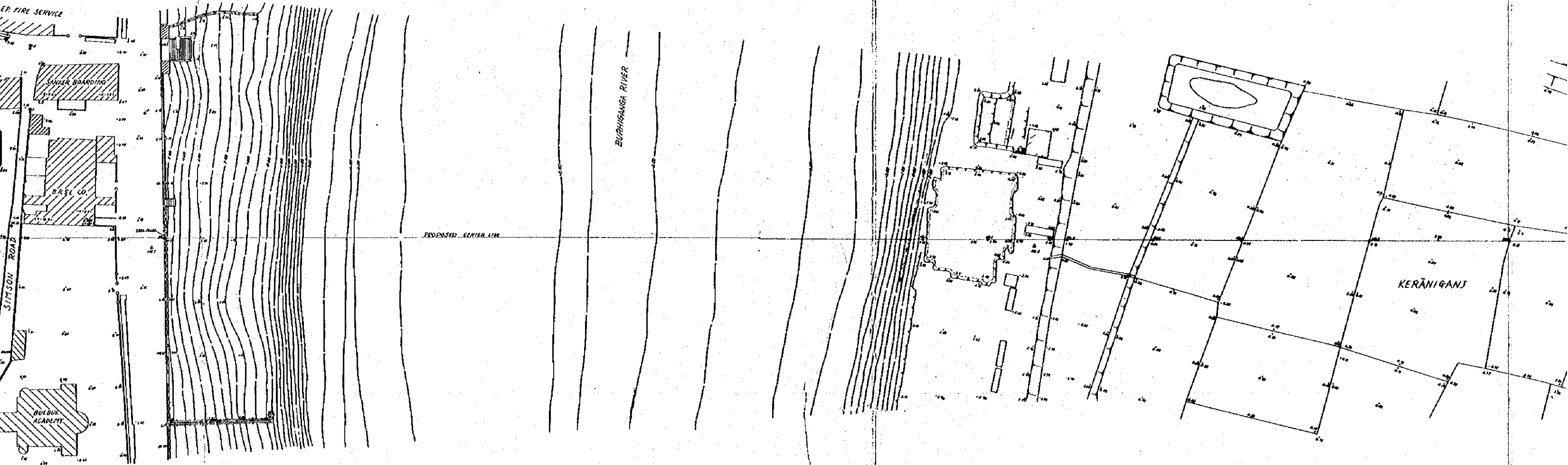
PROPOSED CENTER



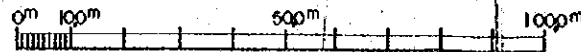
PLAN OF PROPOSED SITE

PLAN

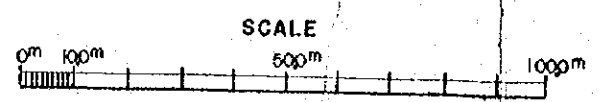
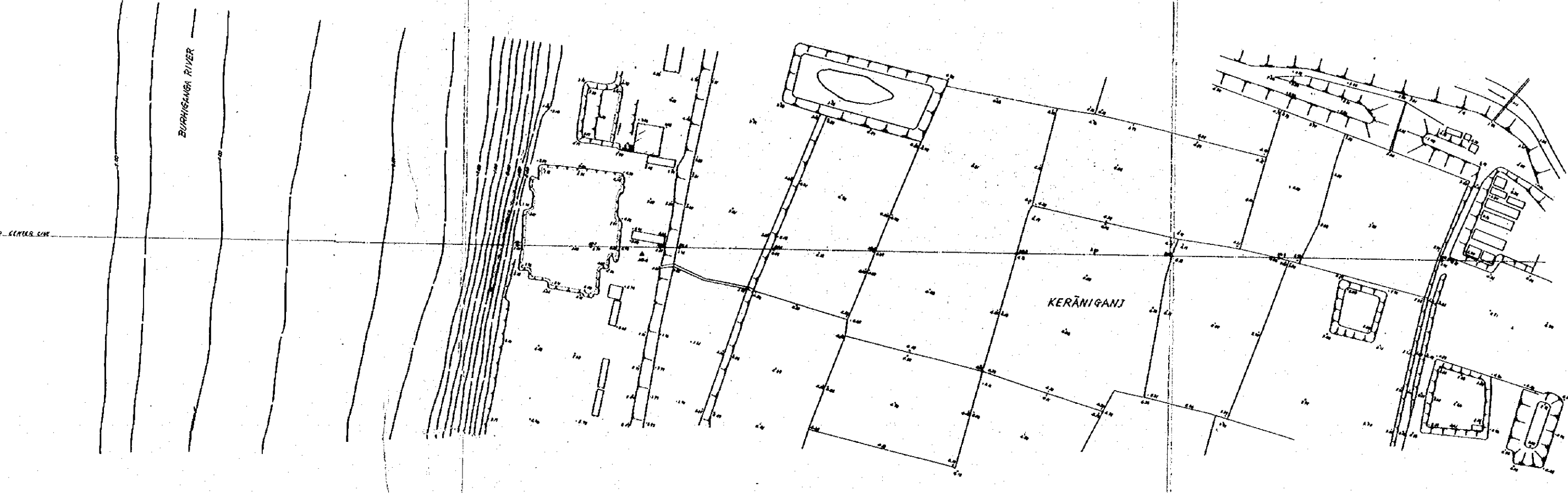
MEASURED IN METERS.  
IN MARCH 1964



SCALE



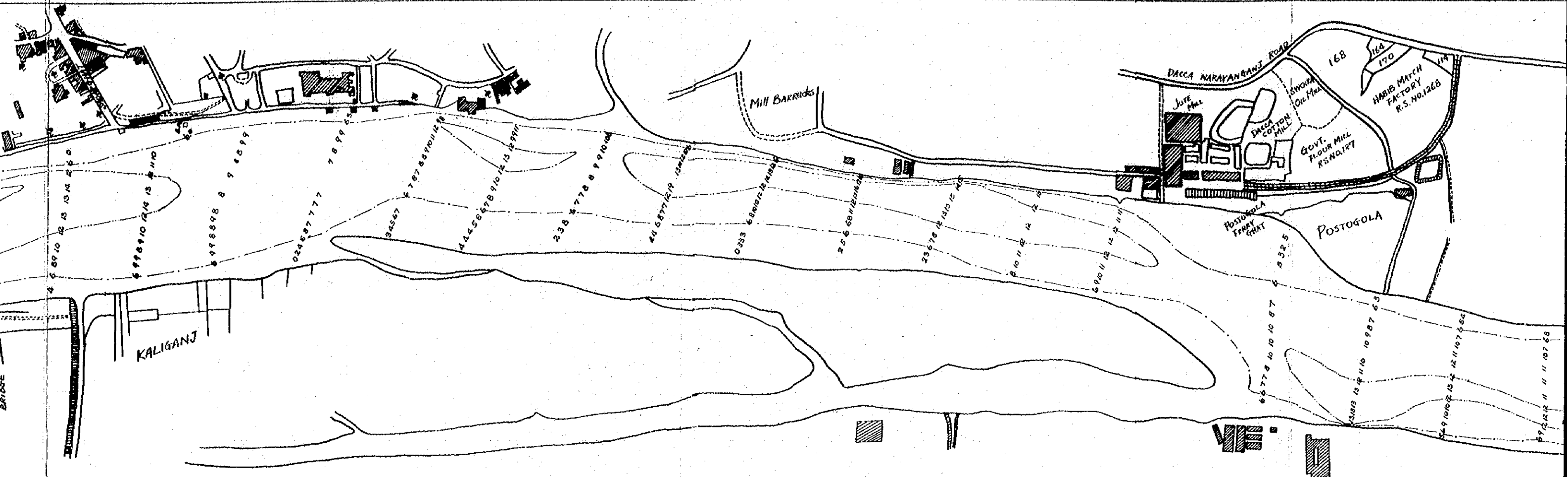
MEASURED IN METERS,  
IN MARCH 1964



EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE  
  
PLAN OF PROPOSED SITE  
FOR BURHIGANGA RIVER BRIDGE  
  
PLATE 1-6



SOUNDING MAP OF BURHIGANGA RIVER



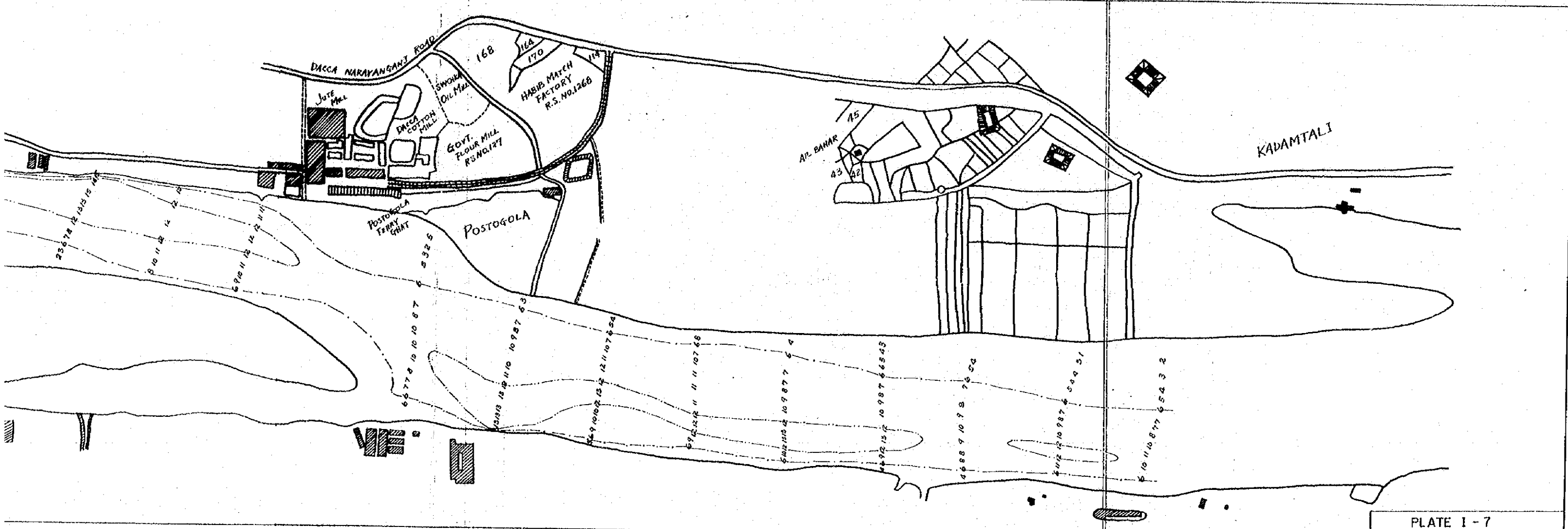


PLATE I - 7

CROSS SECTION OF  
BURIGONGA RIVER AT POSTOGOLA

SCALE HOR. : 40' : 1"  
VER. : 20' : 1"

← TO POSTOGOLA DACCA (NORTH)

STARTING FROM AN IRON PILLAR WHICH IS  
28' WEST FROM A MEDDA TREE & 2.26 FT  
FROM GROUND & 7' SOUTH OF SOUTHERN RAIL  
OF A RAIL LINE AT POSTOGOLA (C & B) (COAL-DUMP)  
R.L. ON THE PILLAR IS 21.65

H.F.L. IN 1955 R.L. 19.85

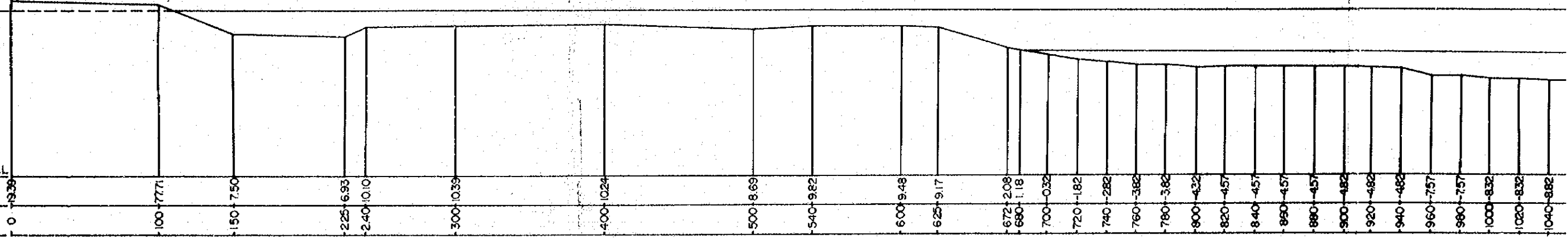
H.F.L. IN 1966 = 19.85

N.H.F.L. IN 1961 = 15.82

DATUM 40' BELOW M.S.L.

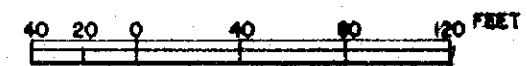
REDUCED LEVEL

DISTANCE IN FEET



SCALE FOR HORIZONTAL

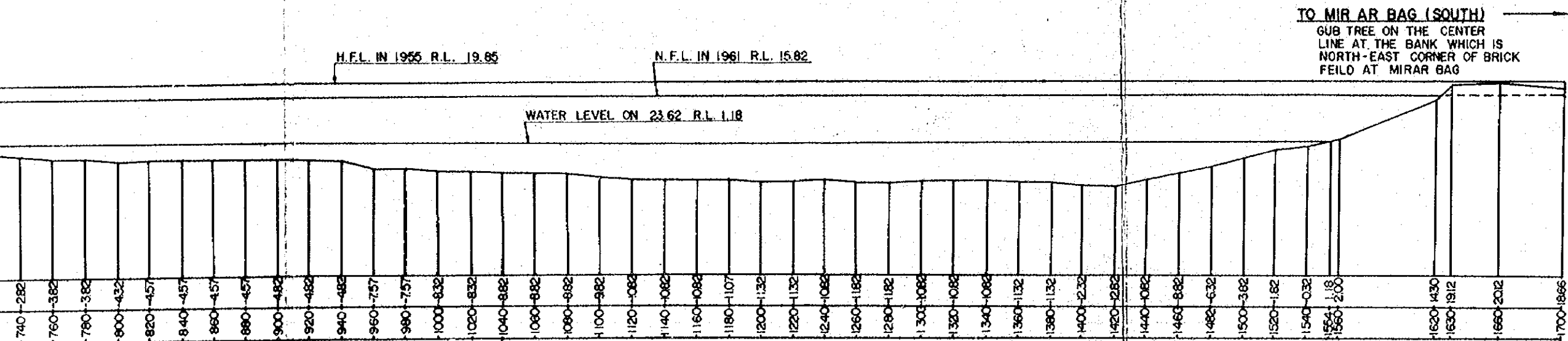
SCALE FOR VERTICAL



CROSS SECTION OF  
BURHIGANGA RIVER AT POSTOGOLA

HOR : 40' : 1"  
VER : 20' : 1"

NOTE -  
I. G.T.S.B.M. TAKEN FROM  
DACCA R.L. STATION R.L. 25.27



EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE  
CROSS SECTION OF BURHIGANGA  
RIVER AT POSTOGOLA  
PLATE 1-8

CROSS SECTION OF  
BURIGONGA RIVER AT JINJIRA

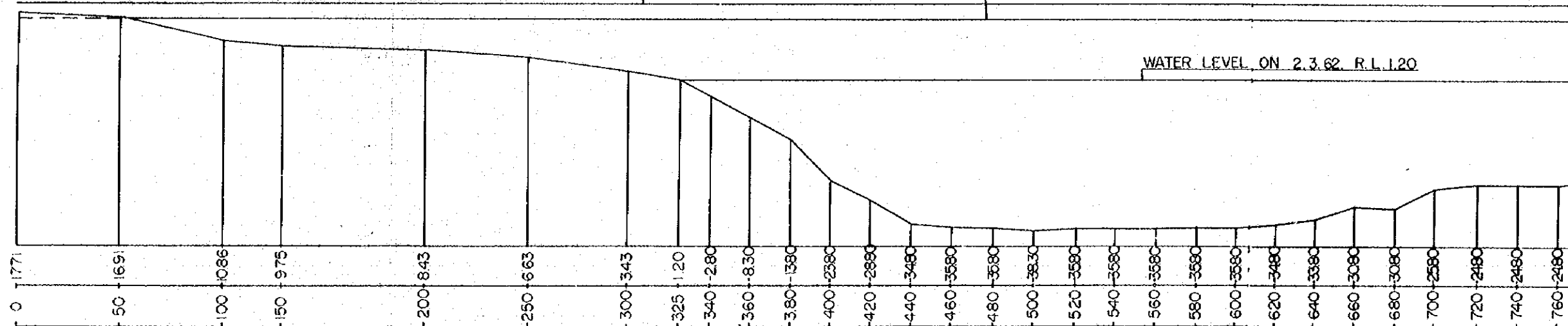
SCALE HOR. : 40' : 1"  
VER. : 20' : 1"

← TO GHANIMIAR HAT DACCA (NOUTH)  
STATING FROM A GOLDEN BISCUIT FACTORY  
R.L. ON THE G.B FACTORIE'S PLINTH IS 19.46

H.F.L. IN 1955 R.L. 20.00

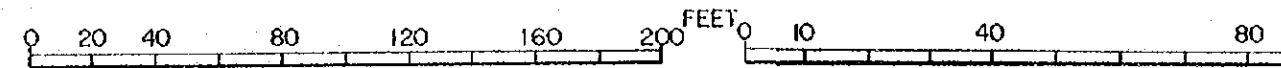
N.F.L. IN 1961 R.L. 16.10

WATER LEVEL ON 2.3.62 R.L. 12.0



SCALE FOR HORIZONTAL

SCALE FOR VERTICAL





**CROSS SECTION OF  
BURIGONGA RIVER AT JINJIRA**

SCALE HOR. : 40' : 1"  
VER. : 20' : 1"

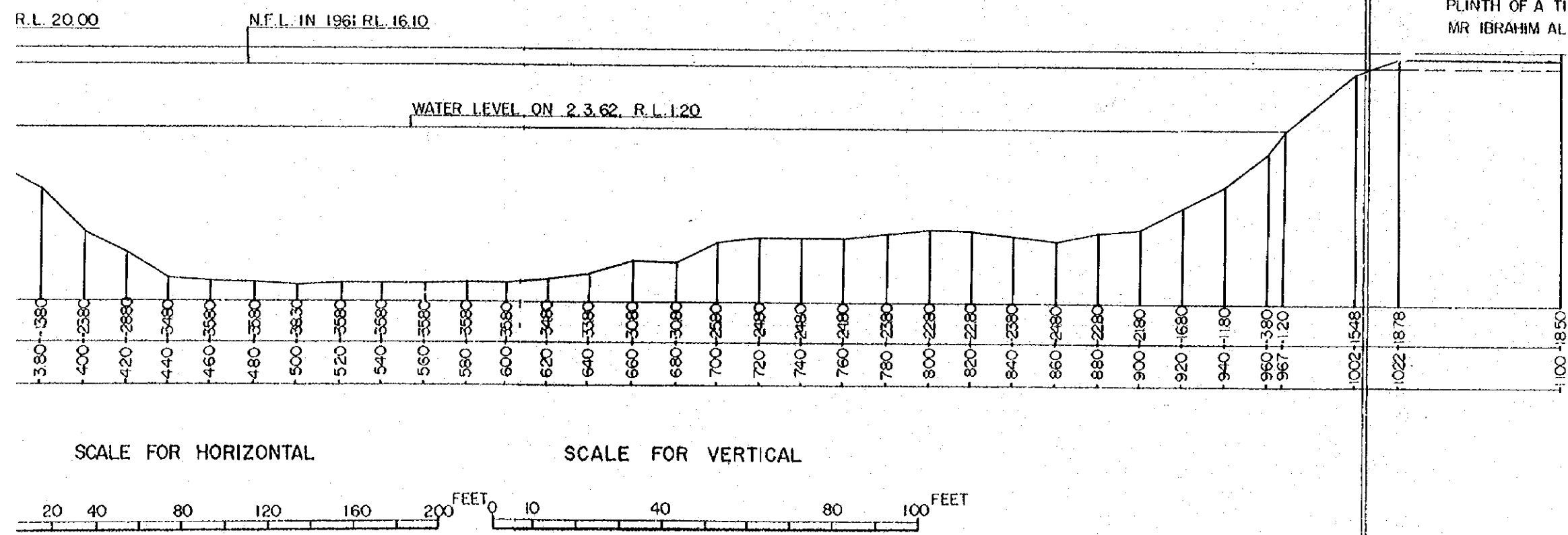
TO JINJIRA (SOUTH) →  
PLINTH OF A TIN SHED OF  
MR IBRAHIM ALI R.L. = 19.52

NOTE —  
I. G.T.S. B.M. TAKEN FROM  
DACCA R.L.Y. STATION R.L. 25.27

EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE

CROSS SECTION OF BURHIGANGA  
RIVER AT JINJIRA

PLATE I - 9



NOTE: DATUM LINE FOR HEIGHT IS  
± 0.00m OF P.W.D.

TO DACCA

P.W.D. ± 0.000

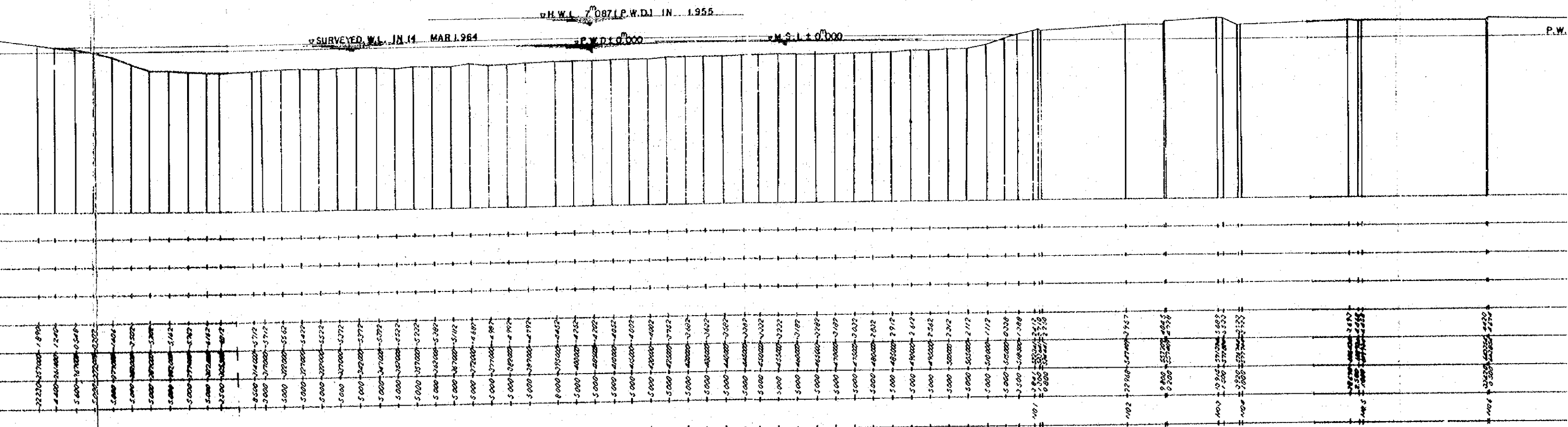
SURV

SLOPE	CUTTING HEIGHT	EMBANKMENT HEIGHT	PROPOSED HEIGHT	GROUND HEIGHT	ACUMULATIVE DISTANCE	DISTANCE	STATION	CURVE BAND
				0.050	0.000	0.000	0+000	
				0.100	0.000	0.000	0+000	
				0.150	0.000	0.000	0+000	
				0.200	0.000	0.000	0+000	
				0.255	0.000	0.000	0+000	
				0.300	0.000	0.000	0+000	
				0.350	0.000	0.000	0+000	
				0.400	0.000	0.000	0+000	
				0.450	0.000	0.000	0+000	
				0.500	0.000	0.000	0+000	
				0.550	0.000	0.000	0+000	
				0.600	0.000	0.000	0+000	
				0.650	0.000	0.000	0+000	
				0.700	0.000	0.000	0+000	
				0.750	0.000	0.000	0+000	
				0.800	0.000	0.000	0+000	
				0.850	0.000	0.000	0+000	
				0.900	0.000	0.000	0+000	
				0.950	0.000	0.000	0+000	
				1.000	0.000	0.000	0+000	
				1.050	0.000	0.000	0+000	
				1.100	0.000	0.000	0+000	
				1.150	0.000	0.000	0+000	
				1.200	0.000	0.000	0+000	
				1.250	0.000	0.000	0+000	
				1.300	0.000	0.000	0+000	
				1.350	0.000	0.000	0+000	
				1.400	0.000	0.000	0+000	
				1.450	0.000	0.000	0+000	
				1.500	0.000	0.000	0+000	
				1.550	0.000	0.000	0+000	
				1.600	0.000	0.000	0+000	
				1.650	0.000	0.000	0+000	
				1.700	0.000	0.000	0+000	
				1.750	0.000	0.000	0+000	
				1.800	0.000	0.000	0+000	
				1.850	0.000	0.000	0+000	
				1.900	0.000	0.000	0+000	
				1.950	0.000	0.000	0+000	
				2.000	0.000	0.000	0+000	
				2.050	0.000	0.000	0+000	
				2.100	0.000	0.000	0+000	
				2.150	0.000	0.000	0+000	
				2.200	0.000	0.000	0+000	
				2.250	0.000	0.000	0+000	
				2.300	0.000	0.000	0+000	
				2.350	0.000	0.000	0+000	
				2.400	0.000	0.000	0+000	
				2.450	0.000	0.000	0+000	
				2.500	0.000	0.000	0+000	
				2.550	0.000	0.000	0+000	
				2.600	0.000	0.000	0+000	
				2.650	0.000	0.000	0+000	
				2.700	0.000	0.000	0+000	
				2.750	0.000	0.000	0+000	
				2.800	0.000	0.000	0+000	
				2.850	0.000	0.000	0+000	
				2.900	0.000	0.000	0+000	
				2.950	0.000	0.000	0+000	
				3.000	0.000	0.000	0+000	
				3.050	0.000	0.000	0+000	
				3.100	0.000	0.000	0+000	
				3.150	0.000	0.000	0+000	
				3.200	0.000	0.000	0+000	
				3.250	0.000	0.000	0+000	
				3.300	0.000	0.000	0+000	
				3.350	0.000	0.000	0+000	
				3.400	0.000	0.000	0+000	
				3.450	0.000	0.000	0+000	
				3.500	0.000	0.000	0+000	
				3.550	0.000	0.000	0+000	
				3.600	0.000	0.000	0+000	
				3.650	0.000	0.000	0+000	
				3.700	0.000	0.000	0+000	
				3.750	0.000	0.000	0+000	
				3.800	0.000	0.000	0+000	
				3.850	0.000	0.000	0+000	
				3.900	0.000	0.000	0+000	
				3.950	0.000	0.000	0+000	
				4.000	0.000	0.000	0+000	
				4.050	0.000	0.000	0+000	
				4.100	0.000	0.000	0+000	
				4.150	0.000	0.000	0+000	
				4.200	0.000	0.000	0+000	
				4.250	0.000	0.000	0+000	
				4.300	0.000	0.000	0+000	
				4.350	0.000	0.000	0+000	
				4.400	0.000	0.000	0+000	
				4.450	0.000	0.000	0+000	
				4.500	0.000	0.000	0+000	
				4.550	0.000	0.000	0+000	
				4.600	0.000	0.000	0+000	
				4.650	0.000	0.000	0+000	
				4.700	0.000	0.000	0+000	
				4.750	0.000	0.000	0+000	
				4.800	0.000	0.000	0+000	
				4.850	0.000	0.000	0+000	
				4.900	0.000	0.000	0+000	
				4.950	0.000	0.000	0+000	
				5.000	0.000	0.000	0+000	
				5.050	0.000	0.000	0+000	
				5.100	0.000	0.000	0+000	
				5.150	0.000	0.000	0+000	
				5.200	0.000	0.000	0+000	
				5.250	0.000	0.000	0+000	
				5.300	0.000	0.000	0+000	
				5.350	0.000	0.000	0+000	
				5.400	0.000	0.000	0+000	
				5.450	0.000	0.000	0+000	
				5.500	0.000	0.000	0+000	
				5.550	0.000	0.000	0+000	
				5.600	0.000	0.000	0+000	
				5.650	0.000	0.000	0+000	
				5.700	0.000	0.000	0+000	
				5.750	0.000	0.000	0+000	
				5.800	0.000	0.000	0+000	
				5.850	0.000	0.000	0+000	
				5.900	0.000	0.000	0+000	
				5.950	0.000	0.000	0+000	
				6.000	0.000	0.000	0+000	

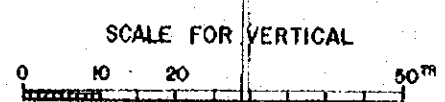
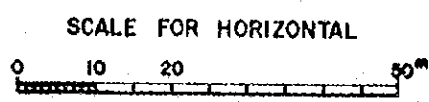
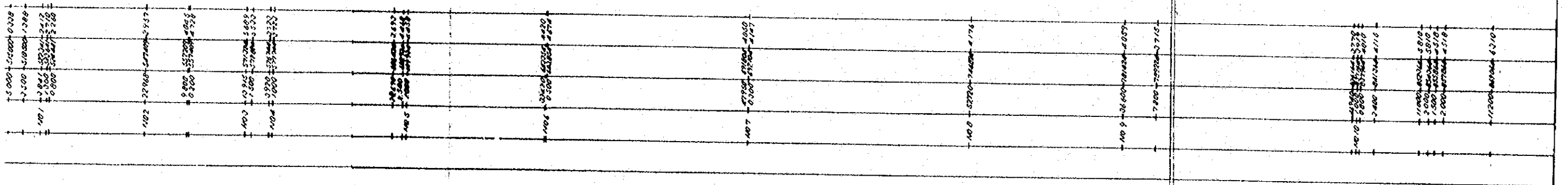
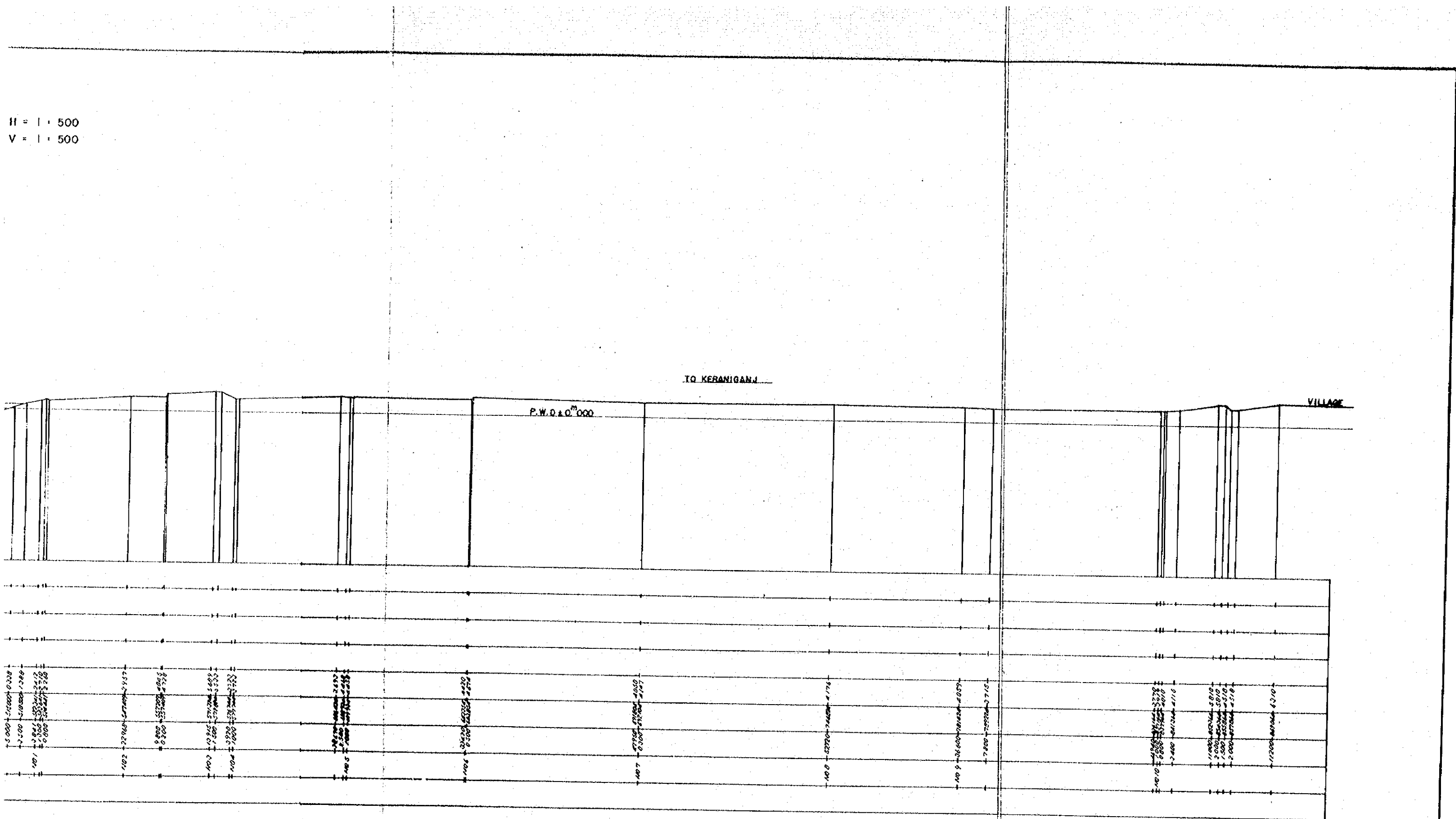
PROFILE AT PROPOSED BRIDGE  
 CROSSING OVER BURHIGANGA RIVER, SURVEYED  
 ON 15TH OF MAY, 1964

SCALE H = 1 : 500  
 V = 1 : 500

LINE FOR HEIGHT IS  
 OF P.W.D.

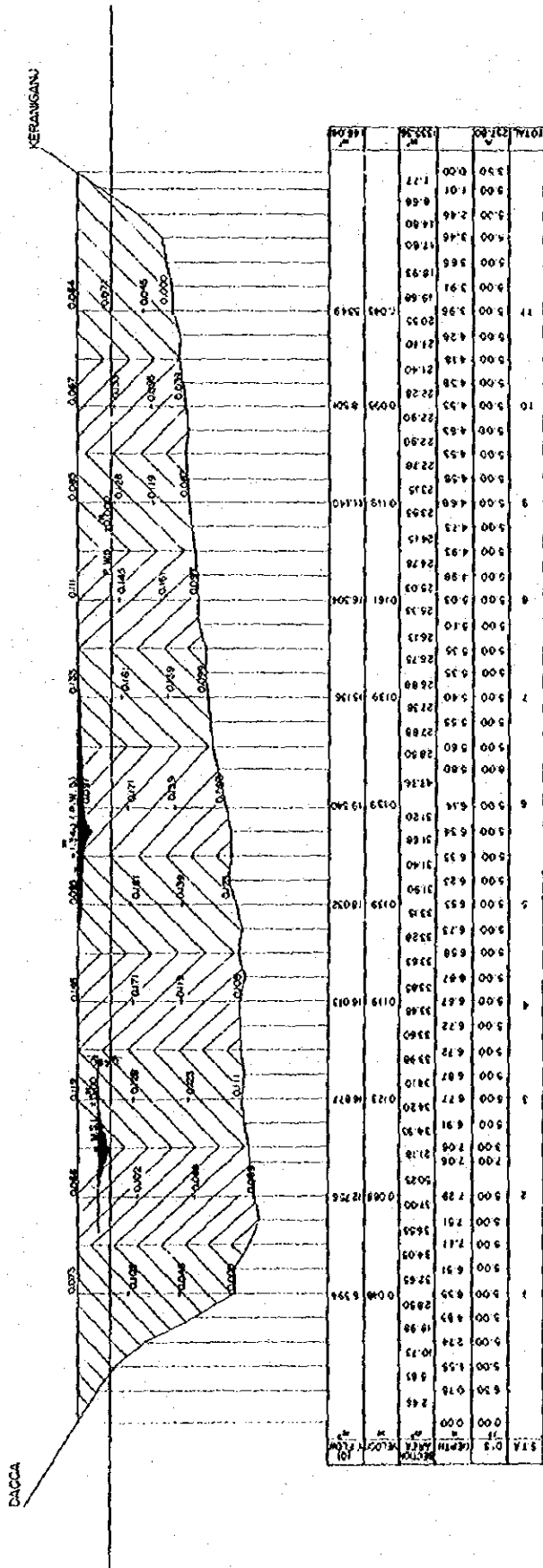


H = 1 : 500  
 V = 1 : 500

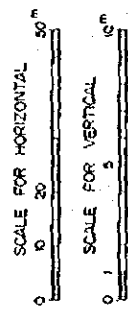


EAST PAKISTAN BRIDGE STUDIES  
 PROPOSED BURHIGANGA BRIDGE  
 PROFILE AT PROPOSED BRIDGE  
 CROSSING OVER BURHIGANGA RIVER  
 SERVEYED ON 15 TH OF MAY  
 1964

VELOCITY MEASUREMENT OF BURHIGANGA RIVER  
 AT PROPOSED BRIDGE SITE, ON 15TH OF MAY, 1964  
 (VELOCITY IN m/sec)



EAST PAKISTAN BRIDGE STUDIES  
 PROPOSED BURHIGANGA BRIDGE  
 VELOCITY MEASUREMENT OF BURHIGANGA  
 RIVER AT PROPOSED BRIDGE SITE, ON  
 15TH OF MAY, 1964



$$V = 0.46 m^{0.52} \times 0.109$$

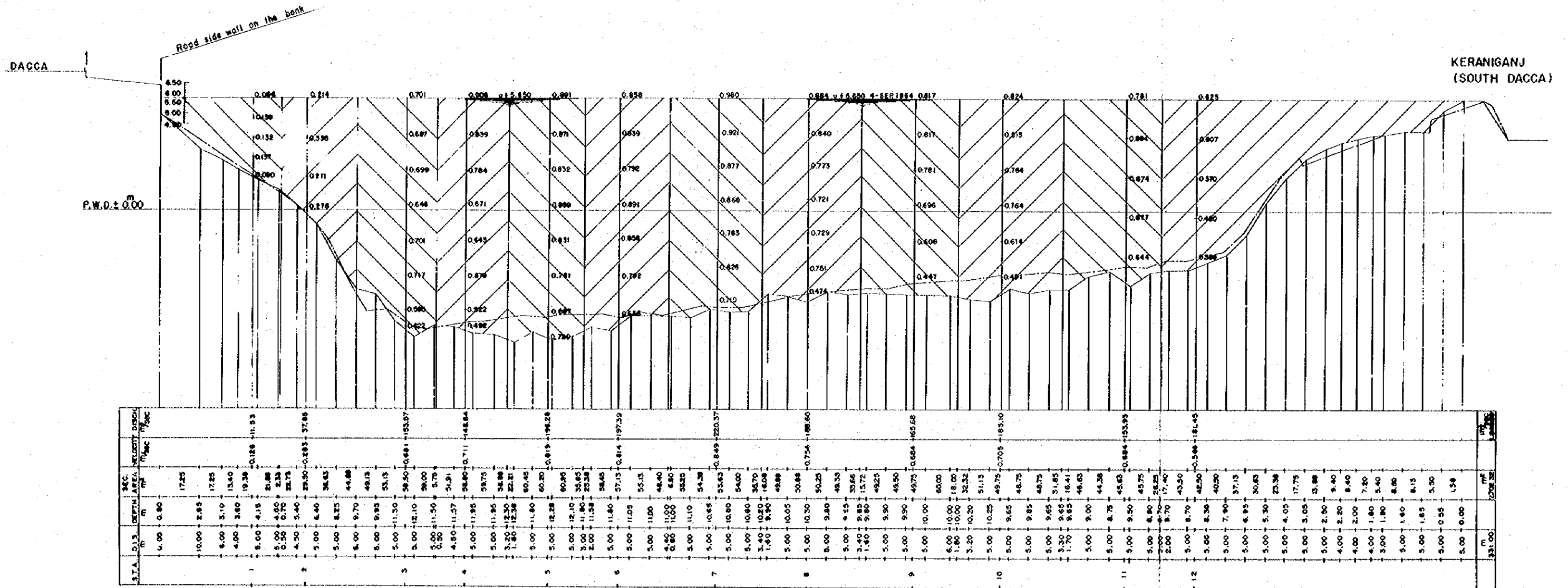
$$Q = 1.555 m^{1.560}$$

# VELOCITY MEASUREMENT OF BURHIGANGA RIVER AT THE PROPOSED BRIDGE SITE

SCALE: H = 1: 500  
V = 1: 100

REMARKS:

VELOCITY WAS MEASURED ON THE  
3RD, 4TH AND 5TH OF SEPTEMBER 1964  
VELOCITY IS EXPRESSED IN m/sec.

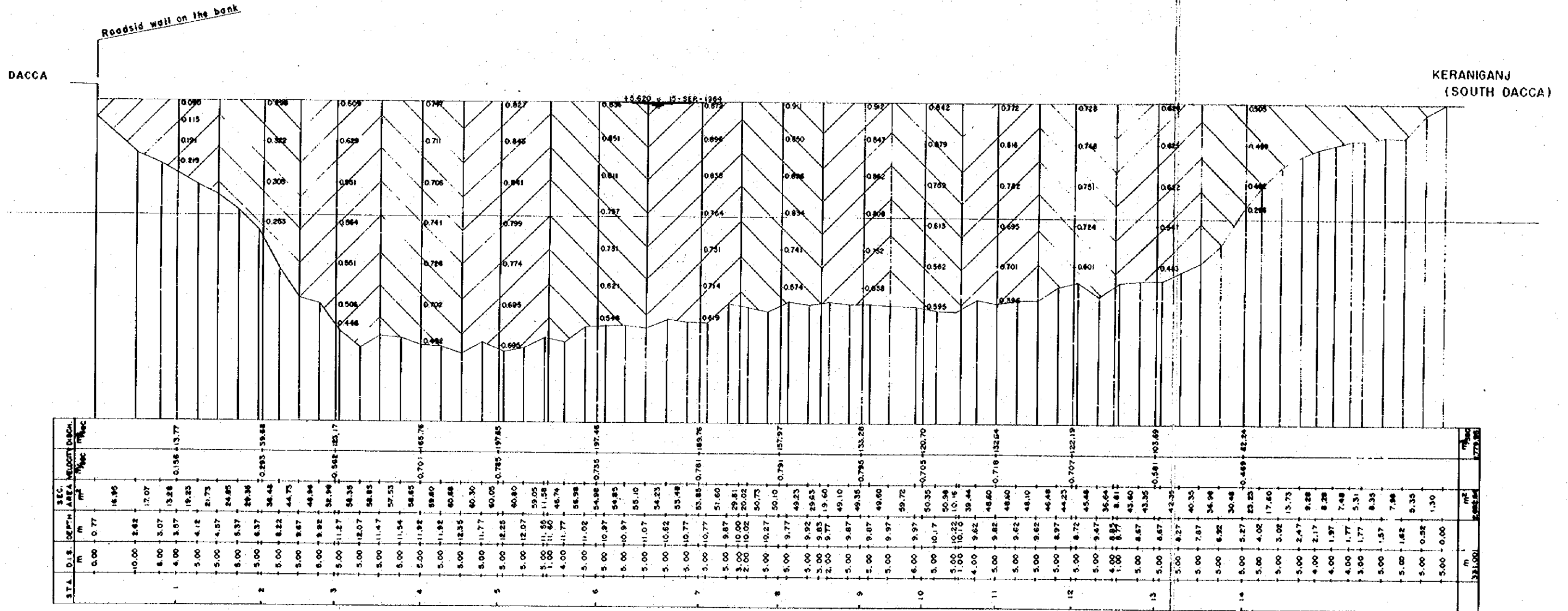


# VELOCITY MEASUREMENT OF BURHIGANGA RIVER AT THE PROPOSED BRIDGE SITE

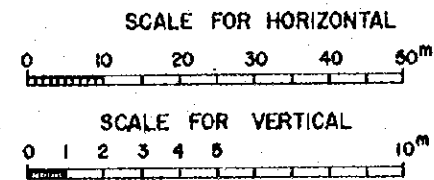
SCALE : H = 1 : 500  
V = 1 : 100

REMARKS :

VELOCITY WAS MEASURED ON THE  
14TH AND 15TH OF SEPTEMBER IN 1964  
VELOCITY IS EXPRESSED IN m/sec.



all figures are in metric unit

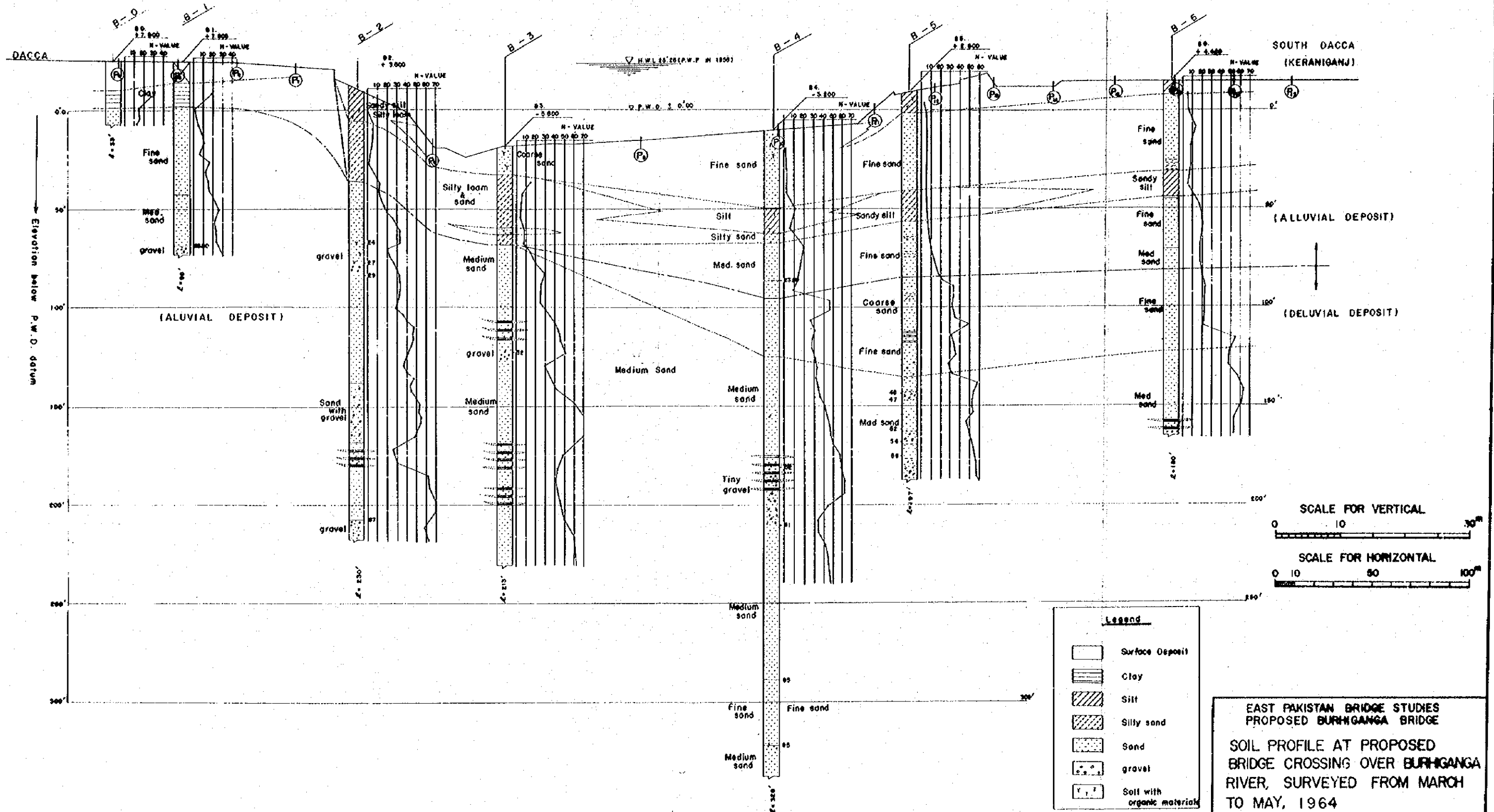


EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE  
VELOCITY MEASUREMENT OF  
BURHIGANGA RIVER AT PROPOSED  
BRIDGE SITE, ON 14.15.  
OF SEPTEMBER, 1964

PROFILE OF SUBSURFACE MATERIALS  
AT THE PROPOSED BRIDGE SITE  
ACROSS BURHIGANGA RIVER  
DACCA CITY, EAST PAKISTAN  
AS DETERMINED BY BORINGS

NOTE:  
ALL FIGURES ARE SHOWN IN METERS,  
EXCEPT THOSE SPECIFIED.  
DEPTHS OF BORING ARE SHOWN  
FROM GROUND SURFACE OR RIVER BED

SCALE V = 1 : 300  
H = 1 : 1000





SOIL TEST RESULTS FOR BORING NO. B<sub>0</sub>

NO. 0		SOIL EXPLORATION RESULTS		SURVEY PERIOD FROM 21/5/64 TO 22/5/64		JAPANESE BRIDGE SURVEY MISSION																	
PROJECT BURHIGANGA RIVER BRIDGE SURVEY		BORING SITE SADRGHAT SIDE		ELEVATION OF OPERATOR OF		REMARKS																	
LOCATION DAQQA CITY		BORING NO. B <sub>0</sub>		GROUND-WATER LEVEL +7.800		BORING MACHINE I.ZENKE																	
DEPTH (M)	DEPT (M)	SOL PROFIL	THICKNESS OF STRATA (M)	BY ON-THE-SPOT SURVEY	BY JIS	BY CASGRAINDE METHOD	OBSERVATIONS	SAMPLING NO.	SOIL MAP	NATURAL WATER CONTENT RATIO	LIQUID LIMIT	PLASTIC LIMIT	W	LL	PL	PERCENTAGE OF GRAVEL	PERCENTAGE OF SAND	PERCENTAGE OF SILT	PERCENTAGE OF CLAY	DEPT (M)	STANDARD PENETRATION (157)	BLOWS (CM)	SCALE (M)
5.65	5.65	5.65	5.65	FILL-UP SOIL			WITH PLENTY OF BRICKS AND BROWN WOOD CHIPS		GRAVEL SAND SILT CLAY											5.70	1000	1000	1
6.65	6.65	6.65	6.65	CLAY			WITH RED BROWN ARE IN PART	5.20 19 0-11												6.00	1000	1000	2
7.65	7.65	7.65	7.65	FINE SAND			WITH MICA FLAKES THROUGH OUT	7.20 80-1R												7.20	1000	1000	3
10.00	10.00	10.00	10.00					10.00 80-2.8												10.00	1000	1000	4

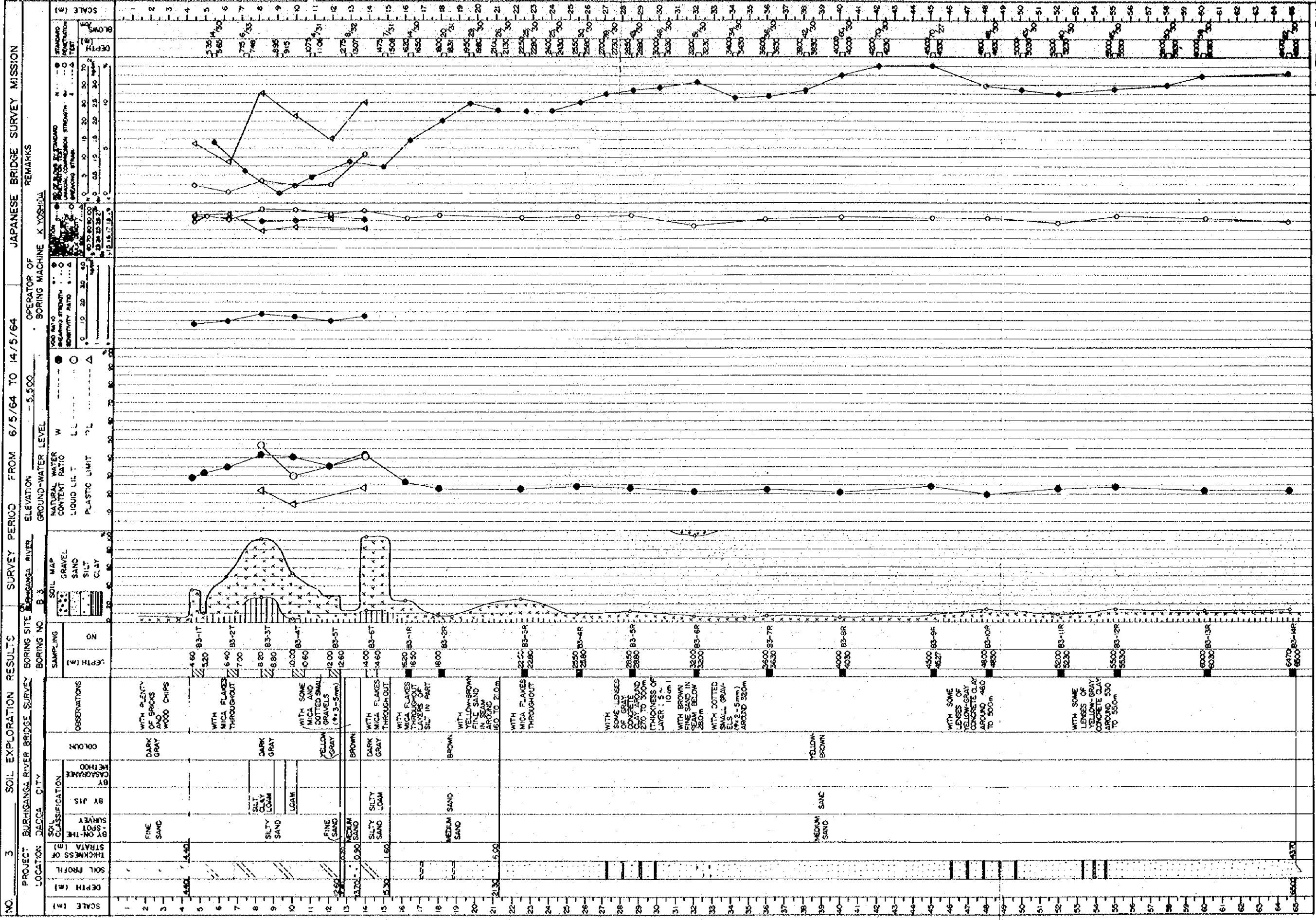
PLATE I-15-1

EAST PAKISTAN BRIDGE STUDIES, PROPOSED BURHIGANGA BRIDGE

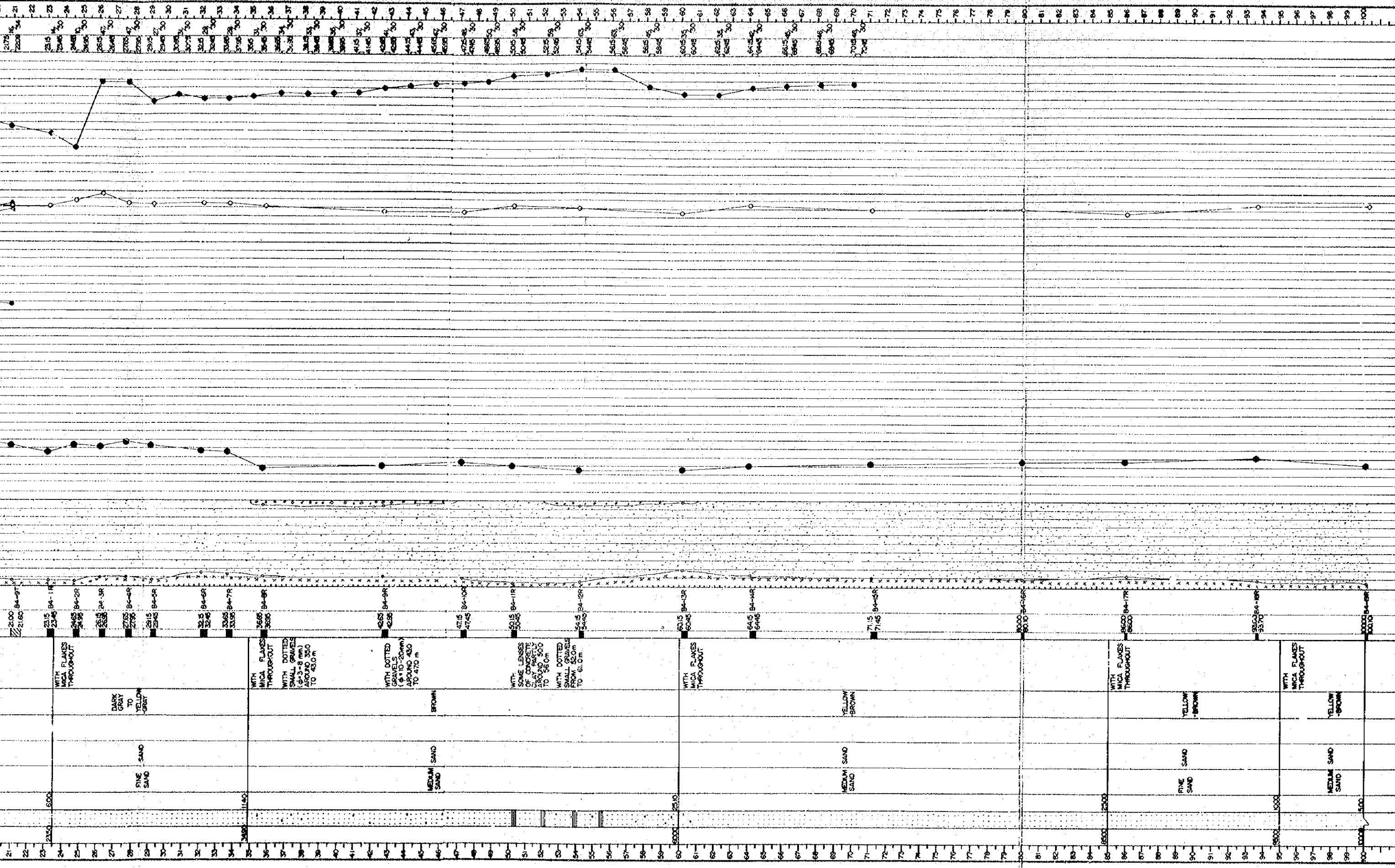




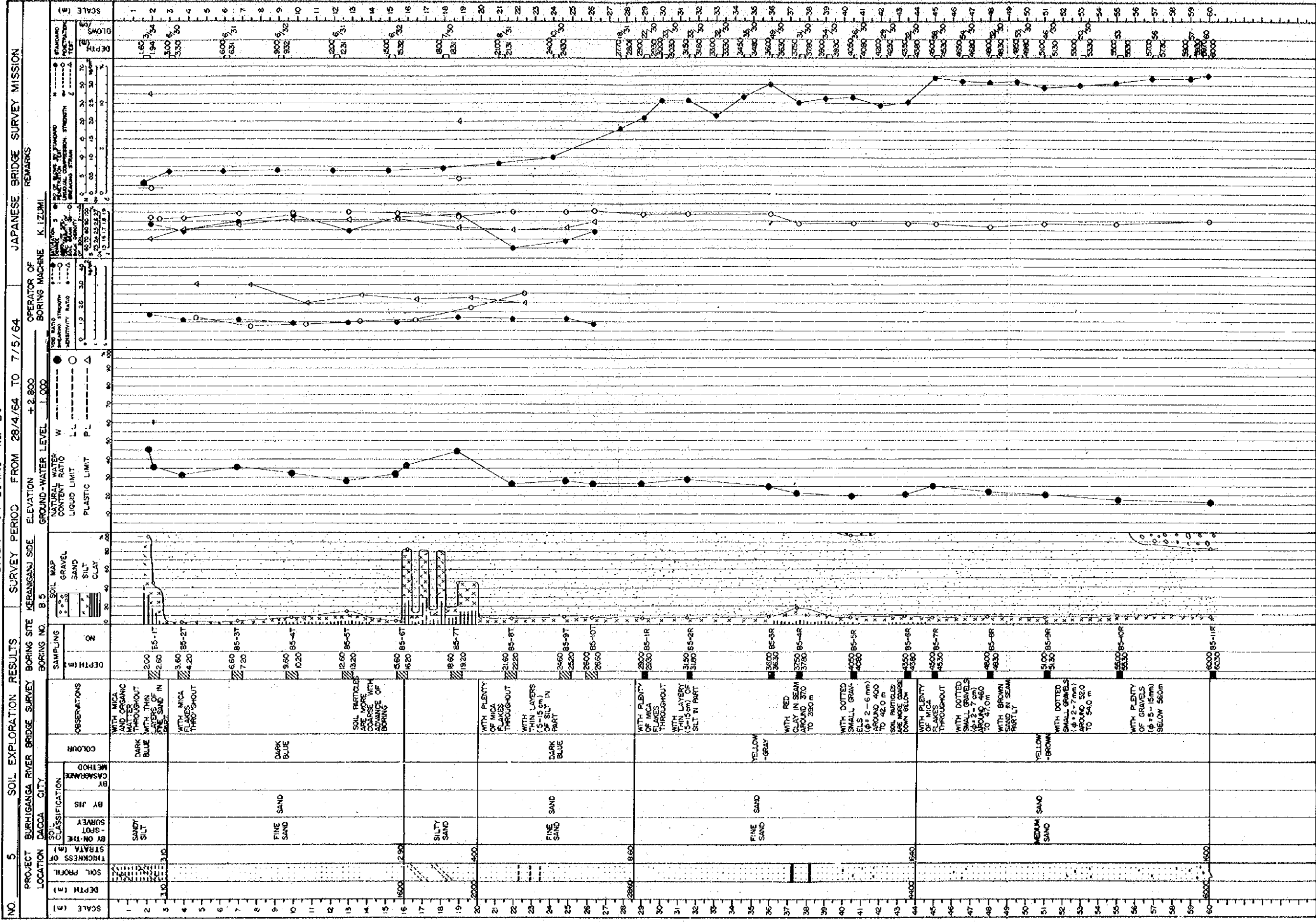
SOIL TEST RESULTS FOR BORING NO. B3







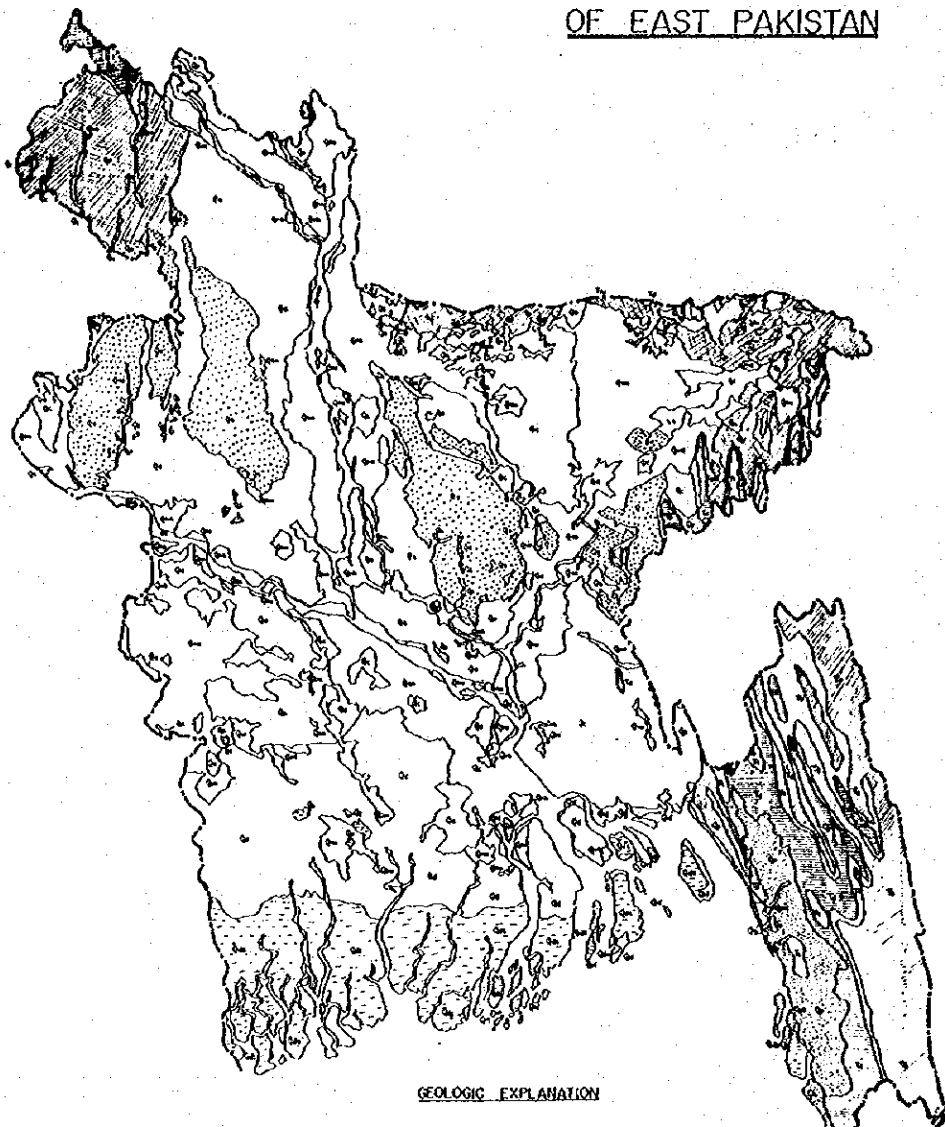
SOIL TEST RESULTS FOR BORING NO. B 5







# GEOLOGICAL MAP OF EAST PAKISTAN

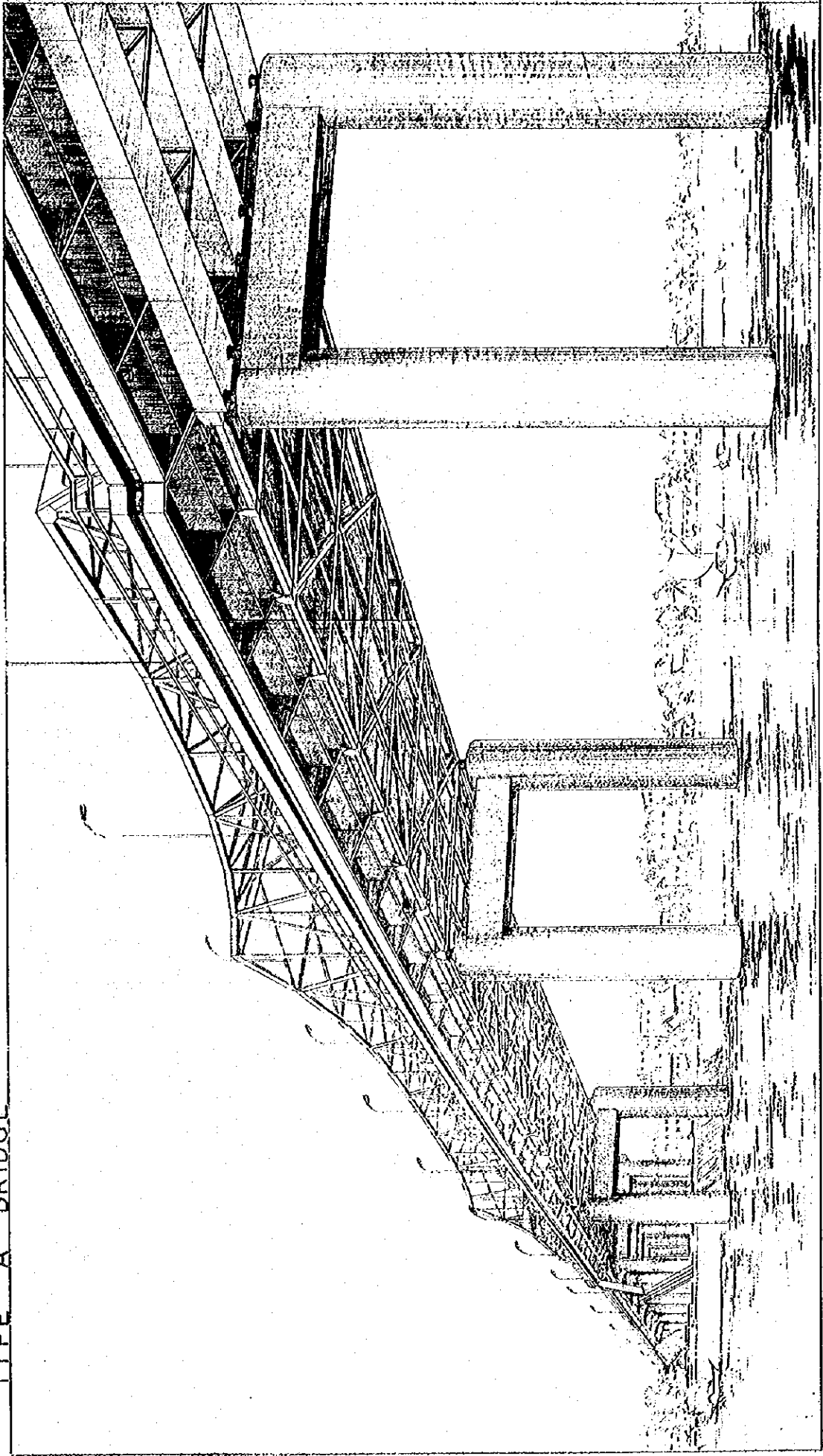


### GEOLOGIC EXPLANATION

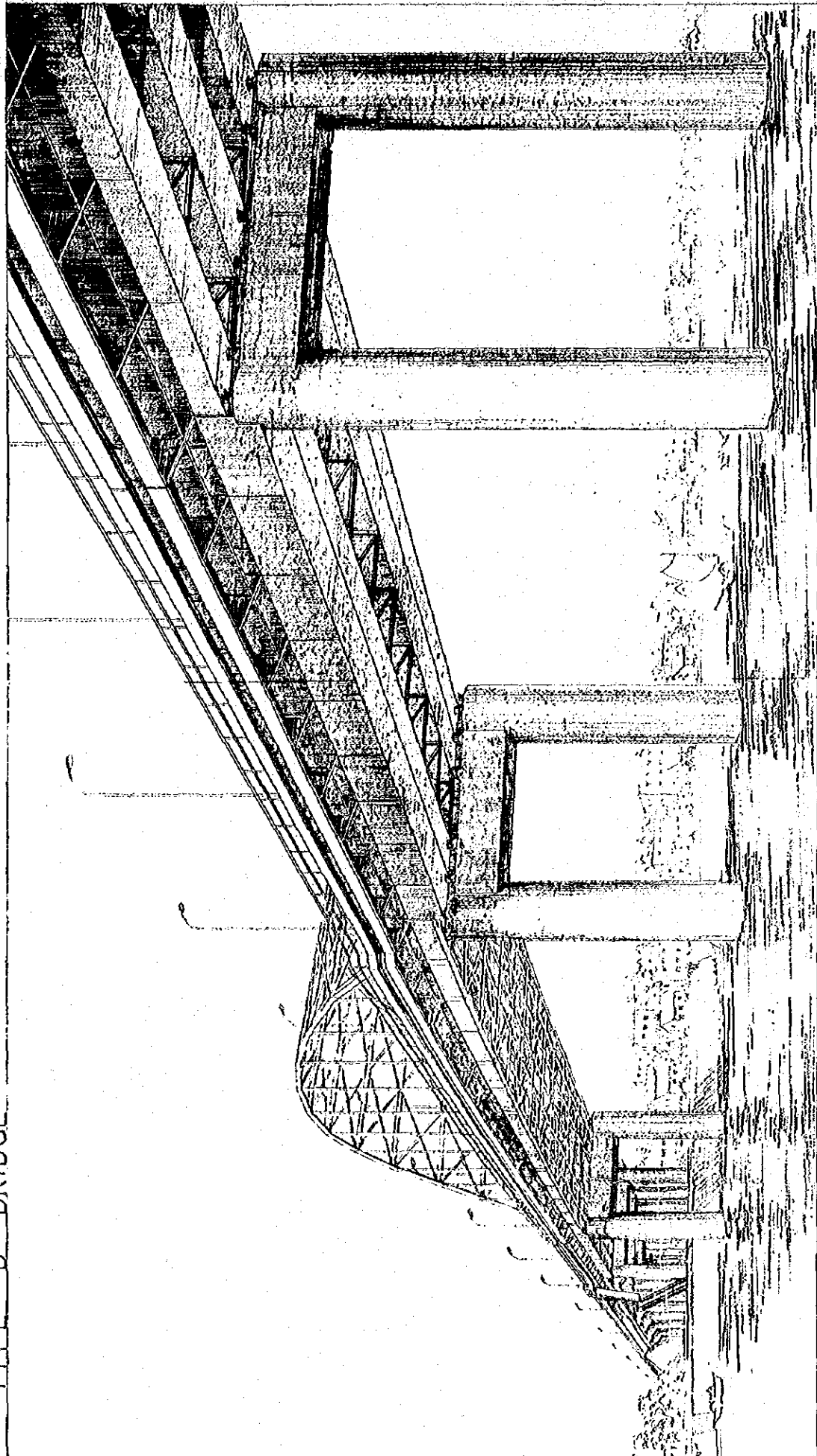
QUATERNARY		TERTIARY	
<p><b>Recent</b></p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">Q<sub>1</sub></div> <p>Recent deposits</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">Q<sub>2</sub> Q<sub>3</sub></div> <p>Q<sub>2</sub>, Beach deposits Q<sub>3</sub>, Tidal flat deposits</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">Q<sub>4</sub> Q<sub>5</sub> Q<sub>6</sub> Q<sub>7</sub></div> <p>Q<sub>4</sub>, Swamp deposits Q<sub>5</sub>, Deltaic deposits Q<sub>6</sub>, Swamp and deltaic deposits, undifferentiated</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">Q<sub>8</sub></div> <p>Redwood deposits</p>	<p><b>Pleistocene</b></p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">Q<sub>1</sub></div> <p>Interstream alluvial deposits</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">Q<sub>2</sub> Q<sub>3</sub></div> <p>Older alluvial deposits</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">Q<sub>4</sub></div> <p>Q<sub>4</sub>, Terrace and meander deposits, including swamp deposits in some areas</p>	<div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">T<sub>1</sub></div> <p>Dhing and Dipfita Formations, undifferentiated</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">T<sub>2</sub></div> <p>Tapa Formation</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">T<sub>3</sub></div> <p>Suria Formation</p> <div style="border: 1px solid black; width: 20px; height: 10px; margin: 0 auto; text-align: center; font-size: 8px;">T<sub>4</sub></div> <p>Sybil Limestone</p>	<p style="text-align: center;">} Miocene to Pleistocene</p> <p style="text-align: center;">} Miocene Oligocene</p> <p style="text-align: center;">} Eocene</p>

EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE  
  
GEOLOGICAL MAP  
OF EAST PAKISTAN

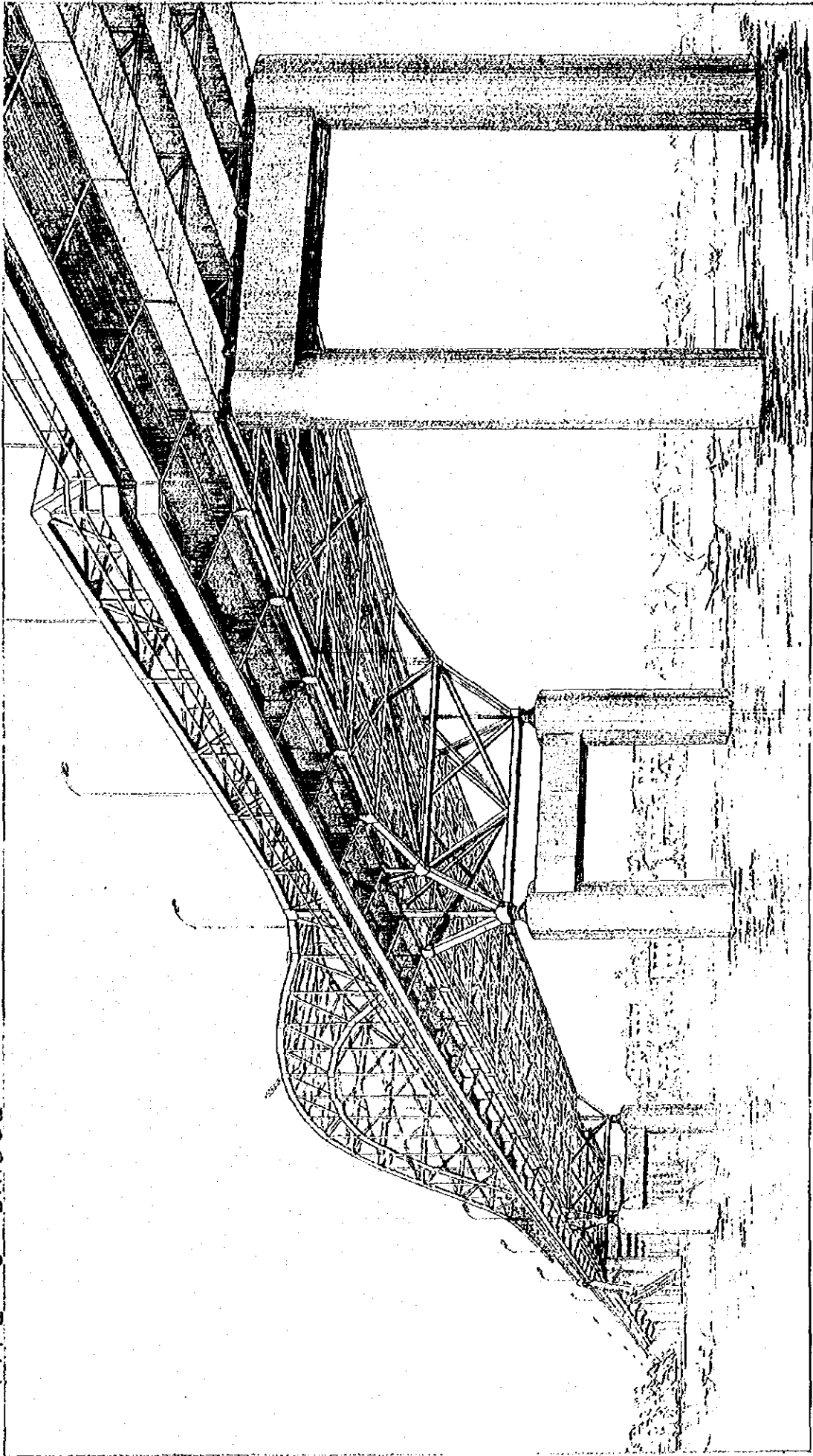
TYPE 'A' BRIDGE



TYPE 'B' BRIDGE

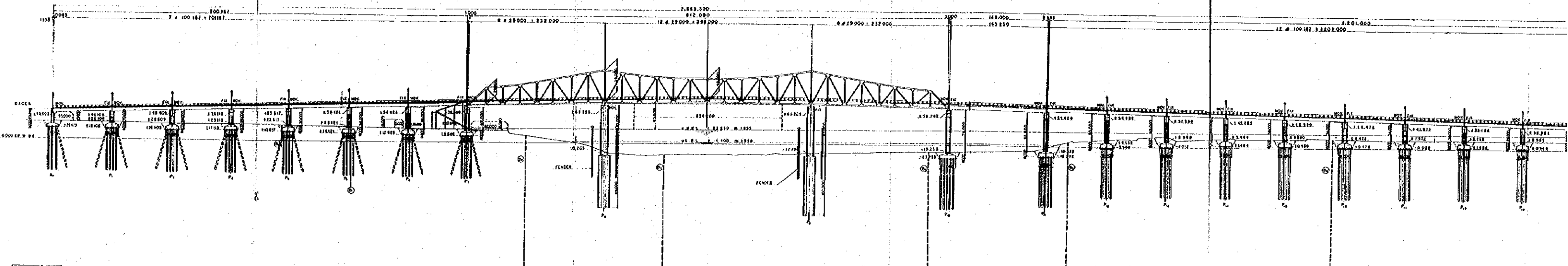


TYPE 'C' BRIDGE

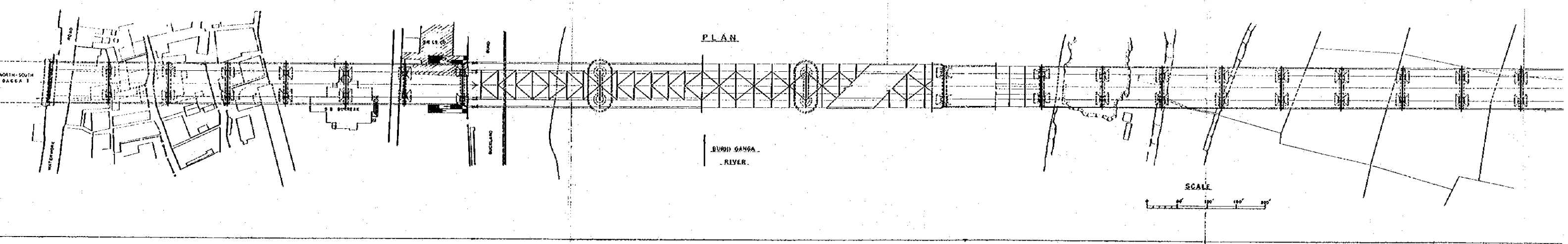


PROFILE & SIDEVIEW OF DACCA MEMORIAL BRIDGE  
(FIGURE IS SHOWN IN FEET)

SCALE • 1 : 500



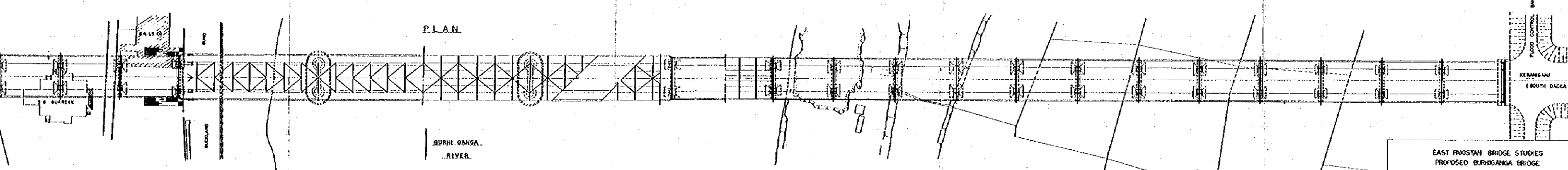
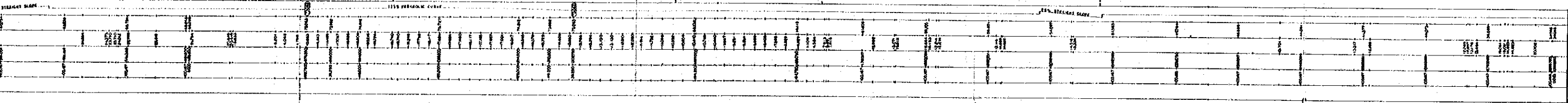
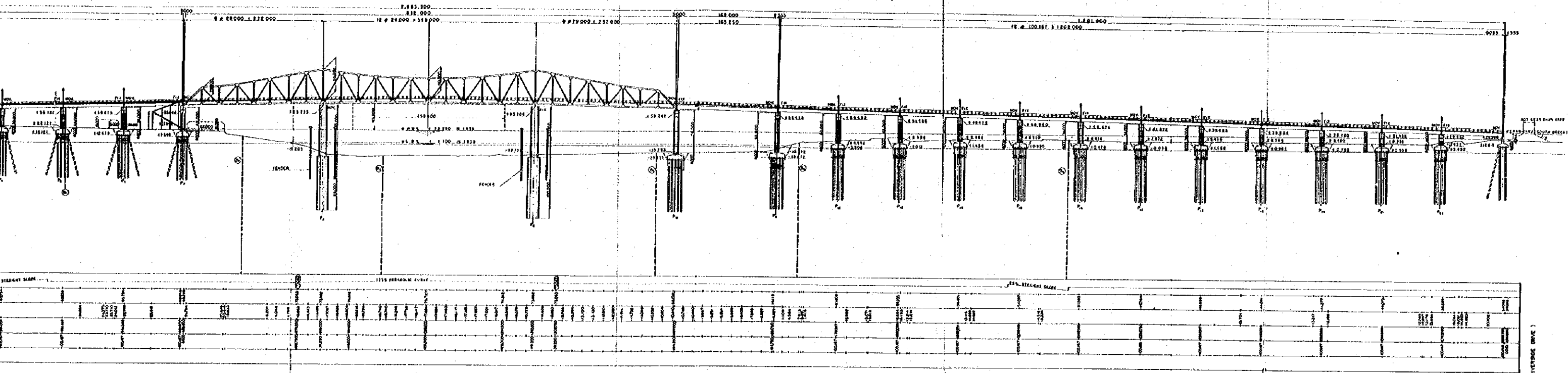
STATION	DISTANCE	HEIGHT	PROPOSED	SLOPE
0+00	0	100	100	1:1
0+10	10	100	100	1:1
0+20	20	100	100	1:1
0+30	30	100	100	1:1
0+40	40	100	100	1:1
0+50	50	100	100	1:1
0+60	60	100	100	1:1
0+70	70	100	100	1:1
0+80	80	100	100	1:1
0+90	90	100	100	1:1
1+00	100	100	100	1:1
1+10	110	100	100	1:1
1+20	120	100	100	1:1
1+30	130	100	100	1:1
1+40	140	100	100	1:1
1+50	150	100	100	1:1
1+60	160	100	100	1:1
1+70	170	100	100	1:1
1+80	180	100	100	1:1
1+90	190	100	100	1:1
2+00	200	100	100	1:1
2+10	210	100	100	1:1
2+20	220	100	100	1:1
2+30	230	100	100	1:1
2+40	240	100	100	1:1
2+50	250	100	100	1:1
2+60	260	100	100	1:1
2+70	270	100	100	1:1
2+80	280	100	100	1:1
2+90	290	100	100	1:1
3+00	300	100	100	1:1
3+10	310	100	100	1:1
3+20	320	100	100	1:1
3+30	330	100	100	1:1
3+40	340	100	100	1:1
3+50	350	100	100	1:1
3+60	360	100	100	1:1
3+70	370	100	100	1:1
3+80	380	100	100	1:1
3+90	390	100	100	1:1
4+00	400	100	100	1:1
4+10	410	100	100	1:1
4+20	420	100	100	1:1
4+30	430	100	100	1:1
4+40	440	100	100	1:1
4+50	450	100	100	1:1
4+60	460	100	100	1:1
4+70	470	100	100	1:1
4+80	480	100	100	1:1
4+90	490	100	100	1:1
5+00	500	100	100	1:1



SCALE

PROFILE & SIDEVIEW OF DACCA MEMORIAL BRIDGE.  
(FIGURE IS SHOWN IN FEET)

SCALE = 1:500

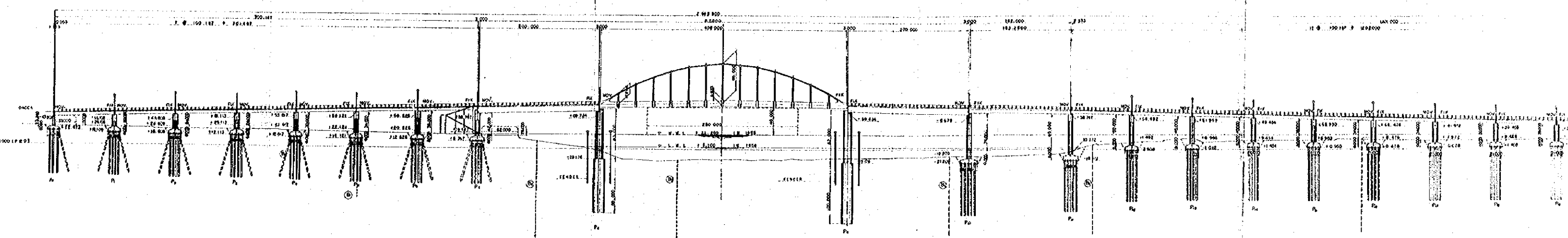


SCALE  
0' 10' 20'

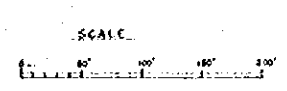
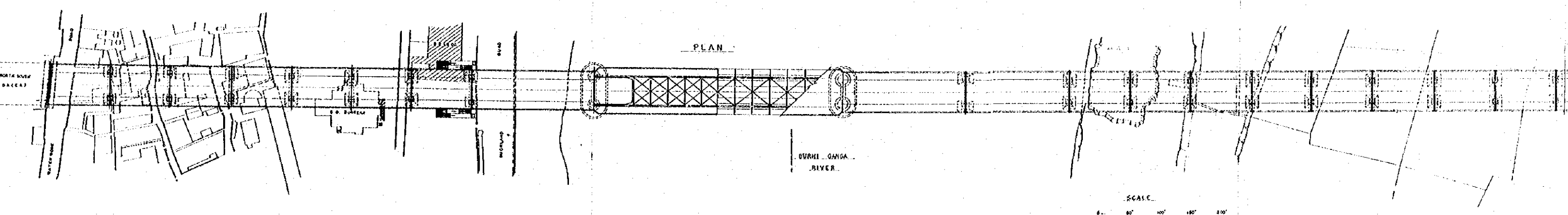
EAST RAOSTAN BRIDGE STUDIES  
PROPOSED BURIGANGA BRIDGE  
GENERAL VIEW  
TYPE 'A' BRIDGE

PROFILE & SIDE VIEW OF DACCA MEMORIAL BRIDGE SCALE 1 : 500

(FIGURE IS SHOWN IN FEET)

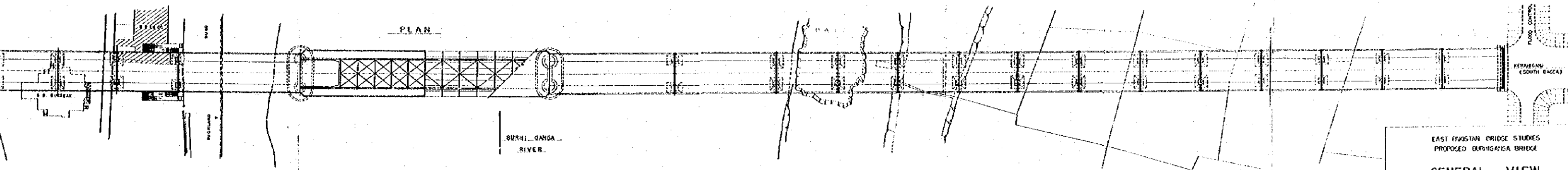
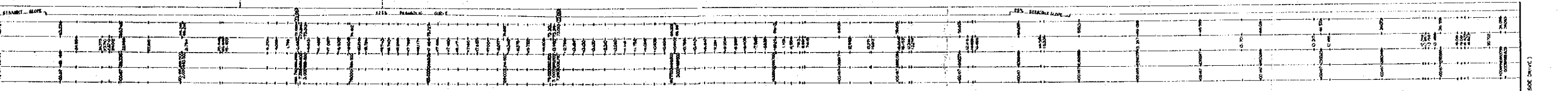
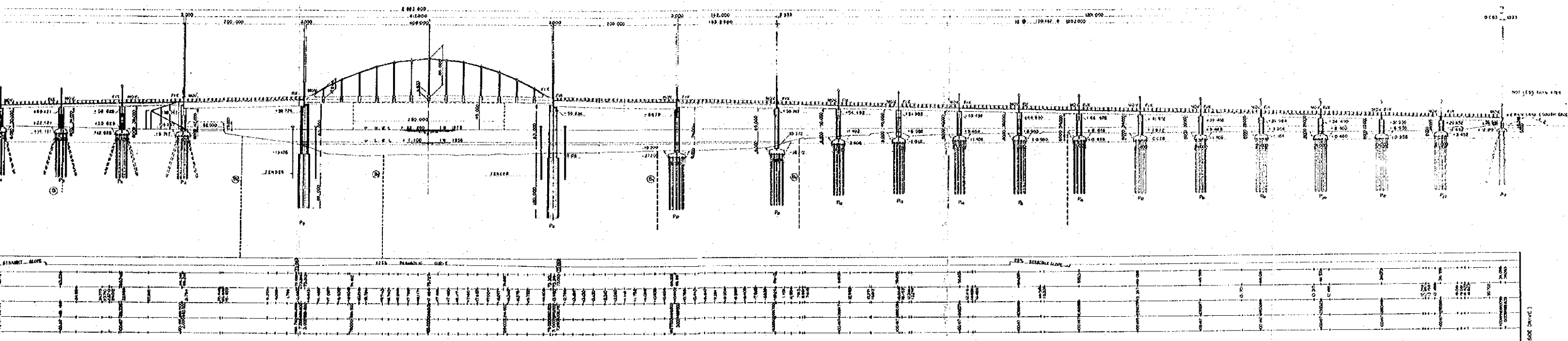


SLOPE	PROPOSED HEIGHT	GROUND HEIGHT	HEIGHT	STATION
1:1	10.00	10.00	0.00	0+00
1:1	10.00	10.00	0.00	0+10
1:1	10.00	10.00	0.00	0+20
1:1	10.00	10.00	0.00	0+30
1:1	10.00	10.00	0.00	0+40
1:1	10.00	10.00	0.00	0+50
1:1	10.00	10.00	0.00	0+60
1:1	10.00	10.00	0.00	0+70
1:1	10.00	10.00	0.00	0+80
1:1	10.00	10.00	0.00	0+90
1:1	10.00	10.00	0.00	1+00
1:1	10.00	10.00	0.00	1+10
1:1	10.00	10.00	0.00	1+20
1:1	10.00	10.00	0.00	1+30
1:1	10.00	10.00	0.00	1+40
1:1	10.00	10.00	0.00	1+50
1:1	10.00	10.00	0.00	1+60
1:1	10.00	10.00	0.00	1+70
1:1	10.00	10.00	0.00	1+80
1:1	10.00	10.00	0.00	1+90
1:1	10.00	10.00	0.00	2+00
1:1	10.00	10.00	0.00	2+10
1:1	10.00	10.00	0.00	2+20
1:1	10.00	10.00	0.00	2+30
1:1	10.00	10.00	0.00	2+40
1:1	10.00	10.00	0.00	2+50
1:1	10.00	10.00	0.00	2+60
1:1	10.00	10.00	0.00	2+70
1:1	10.00	10.00	0.00	2+80
1:1	10.00	10.00	0.00	2+90
1:1	10.00	10.00	0.00	3+00
1:1	10.00	10.00	0.00	3+10
1:1	10.00	10.00	0.00	3+20
1:1	10.00	10.00	0.00	3+30
1:1	10.00	10.00	0.00	3+40
1:1	10.00	10.00	0.00	3+50
1:1	10.00	10.00	0.00	3+60
1:1	10.00	10.00	0.00	3+70
1:1	10.00	10.00	0.00	3+80
1:1	10.00	10.00	0.00	3+90
1:1	10.00	10.00	0.00	4+00
1:1	10.00	10.00	0.00	4+10
1:1	10.00	10.00	0.00	4+20
1:1	10.00	10.00	0.00	4+30
1:1	10.00	10.00	0.00	4+40
1:1	10.00	10.00	0.00	4+50
1:1	10.00	10.00	0.00	4+60
1:1	10.00	10.00	0.00	4+70
1:1	10.00	10.00	0.00	4+80
1:1	10.00	10.00	0.00	4+90
1:1	10.00	10.00	0.00	5+00
1:1	10.00	10.00	0.00	5+10
1:1	10.00	10.00	0.00	5+20
1:1	10.00	10.00	0.00	5+30
1:1	10.00	10.00	0.00	5+40
1:1	10.00	10.00	0.00	5+50
1:1	10.00	10.00	0.00	5+60
1:1	10.00	10.00	0.00	5+70
1:1	10.00	10.00	0.00	5+80
1:1	10.00	10.00	0.00	5+90
1:1	10.00	10.00	0.00	6+00
1:1	10.00	10.00	0.00	6+10
1:1	10.00	10.00	0.00	6+20
1:1	10.00	10.00	0.00	6+30
1:1	10.00	10.00	0.00	6+40
1:1	10.00	10.00	0.00	6+50
1:1	10.00	10.00	0.00	6+60
1:1	10.00	10.00	0.00	6+70
1:1	10.00	10.00	0.00	6+80
1:1	10.00	10.00	0.00	6+90
1:1	10.00	10.00	0.00	7+00
1:1	10.00	10.00	0.00	7+10
1:1	10.00	10.00	0.00	7+20
1:1	10.00	10.00	0.00	7+30
1:1	10.00	10.00	0.00	7+40
1:1	10.00	10.00	0.00	7+50
1:1	10.00	10.00	0.00	7+60
1:1	10.00	10.00	0.00	7+70
1:1	10.00	10.00	0.00	7+80
1:1	10.00	10.00	0.00	7+90
1:1	10.00	10.00	0.00	8+00
1:1	10.00	10.00	0.00	8+10
1:1	10.00	10.00	0.00	8+20
1:1	10.00	10.00	0.00	8+30
1:1	10.00	10.00	0.00	8+40
1:1	10.00	10.00	0.00	8+50
1:1	10.00	10.00	0.00	8+60
1:1	10.00	10.00	0.00	8+70
1:1	10.00	10.00	0.00	8+80
1:1	10.00	10.00	0.00	8+90
1:1	10.00	10.00	0.00	9+00
1:1	10.00	10.00	0.00	9+10
1:1	10.00	10.00	0.00	9+20
1:1	10.00	10.00	0.00	9+30
1:1	10.00	10.00	0.00	9+40
1:1	10.00	10.00	0.00	9+50
1:1	10.00	10.00	0.00	9+60
1:1	10.00	10.00	0.00	9+70
1:1	10.00	10.00	0.00	9+80
1:1	10.00	10.00	0.00	9+90
1:1	10.00	10.00	0.00	10+00



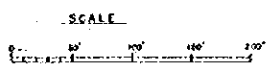
PROFILE & SIDE VIEW OF DACCA MEMORIAL BRIDGE SCALE 1 : 500

(FIGURE IS SHOWN IN FEET)



PLAN

BURHI GANGA RIVER

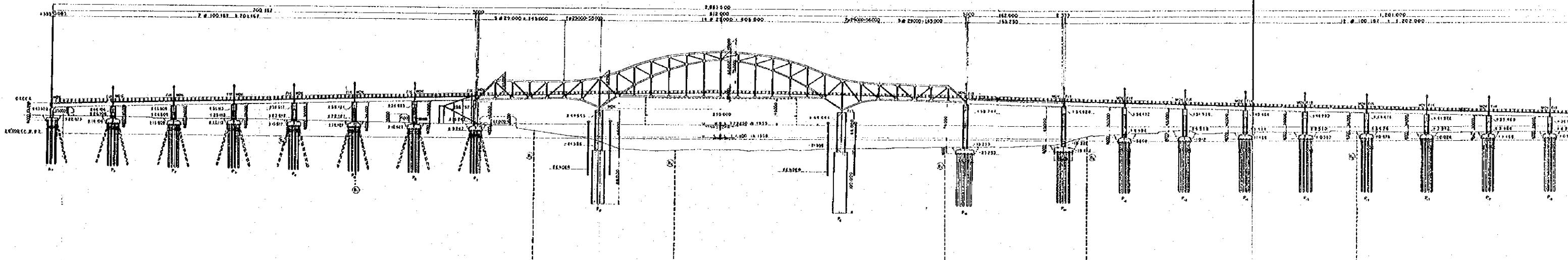


EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE  
GENERAL VIEW  
TYPE 'B' BRIDGE

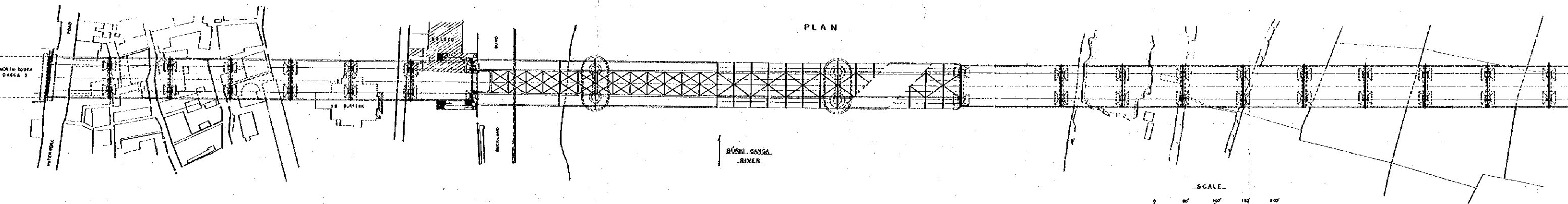


PROFILE & SIDE VIEW OF DACCA MEMORIAL BRIDGE  
(FIGURE IS SHOWN IN FEET)

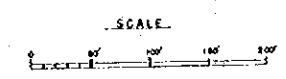
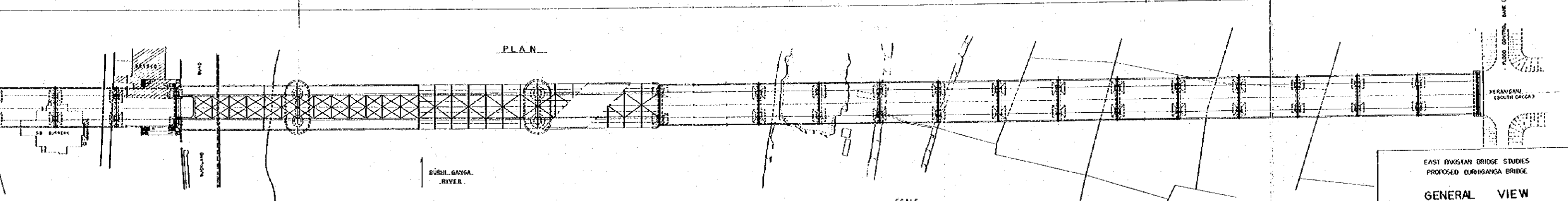
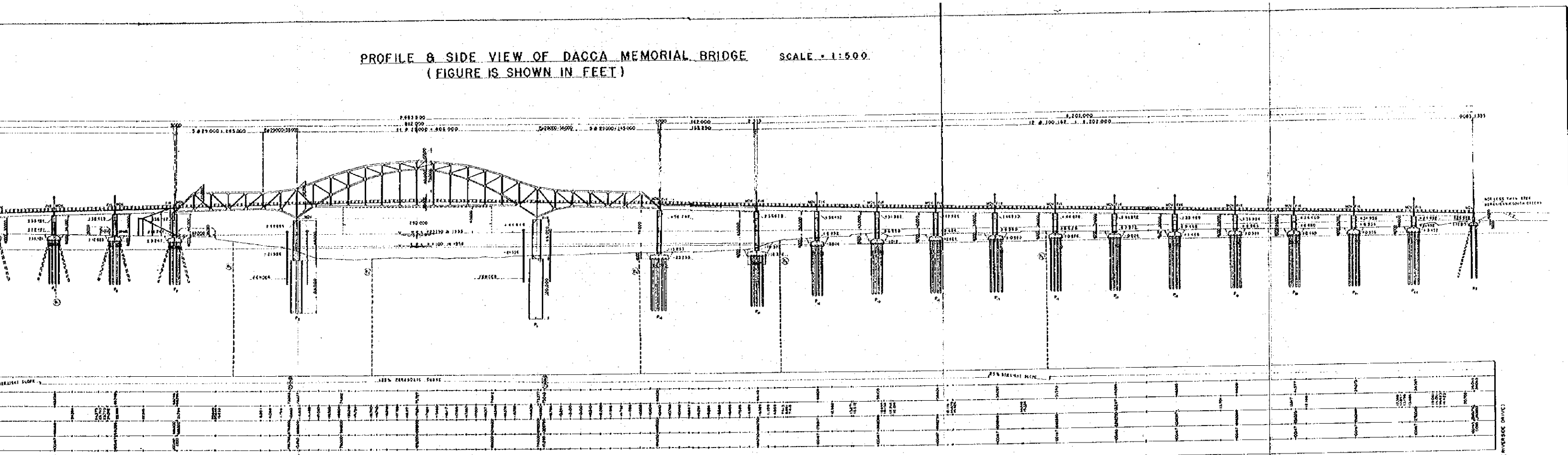
SCALE = 1:500



SCOPE	PROPOSED HEIGHT	GROUND LEVEL	HORIZONTAL DISTANCE	STATION
1	27.000	27.000	0.000	0+00
2	27.000	27.000	10.000	0+10
3	27.000	27.000	20.000	0+20
4	27.000	27.000	30.000	0+30
5	27.000	27.000	40.000	0+40
6	27.000	27.000	50.000	0+50
7	27.000	27.000	60.000	0+60
8	27.000	27.000	70.000	0+70
9	27.000	27.000	80.000	0+80
10	27.000	27.000	90.000	0+90
11	27.000	27.000	100.000	0+100
12	27.000	27.000	110.000	0+110
13	27.000	27.000	120.000	0+120
14	27.000	27.000	130.000	0+130
15	27.000	27.000	140.000	0+140
16	27.000	27.000	150.000	0+150
17	27.000	27.000	160.000	0+160
18	27.000	27.000	170.000	0+170
19	27.000	27.000	180.000	0+180
20	27.000	27.000	190.000	0+190
21	27.000	27.000	200.000	0+200
22	27.000	27.000	210.000	0+210
23	27.000	27.000	220.000	0+220
24	27.000	27.000	230.000	0+230
25	27.000	27.000	240.000	0+240
26	27.000	27.000	250.000	0+250
27	27.000	27.000	260.000	0+260
28	27.000	27.000	270.000	0+270
29	27.000	27.000	280.000	0+280
30	27.000	27.000	290.000	0+290
31	27.000	27.000	300.000	0+300
32	27.000	27.000	310.000	0+310
33	27.000	27.000	320.000	0+320
34	27.000	27.000	330.000	0+330
35	27.000	27.000	340.000	0+340
36	27.000	27.000	350.000	0+350
37	27.000	27.000	360.000	0+360
38	27.000	27.000	370.000	0+370
39	27.000	27.000	380.000	0+380
40	27.000	27.000	390.000	0+390
41	27.000	27.000	400.000	0+400
42	27.000	27.000	410.000	0+410
43	27.000	27.000	420.000	0+420
44	27.000	27.000	430.000	0+430
45	27.000	27.000	440.000	0+440
46	27.000	27.000	450.000	0+450
47	27.000	27.000	460.000	0+460
48	27.000	27.000	470.000	0+470
49	27.000	27.000	480.000	0+480
50	27.000	27.000	490.000	0+490
51	27.000	27.000	500.000	0+500



PROFILE & SIDE VIEW OF DACCA MEMORIAL BRIDGE SCALE = 1:500.  
 (FIGURE IS SHOWN IN FEET)



EAST BANGALORE BRIDGE STUDIES  
 PROPOSED EURYGANGA BRIDGE  
 GENERAL VIEW  
 TYPE 'C' BRIDGE

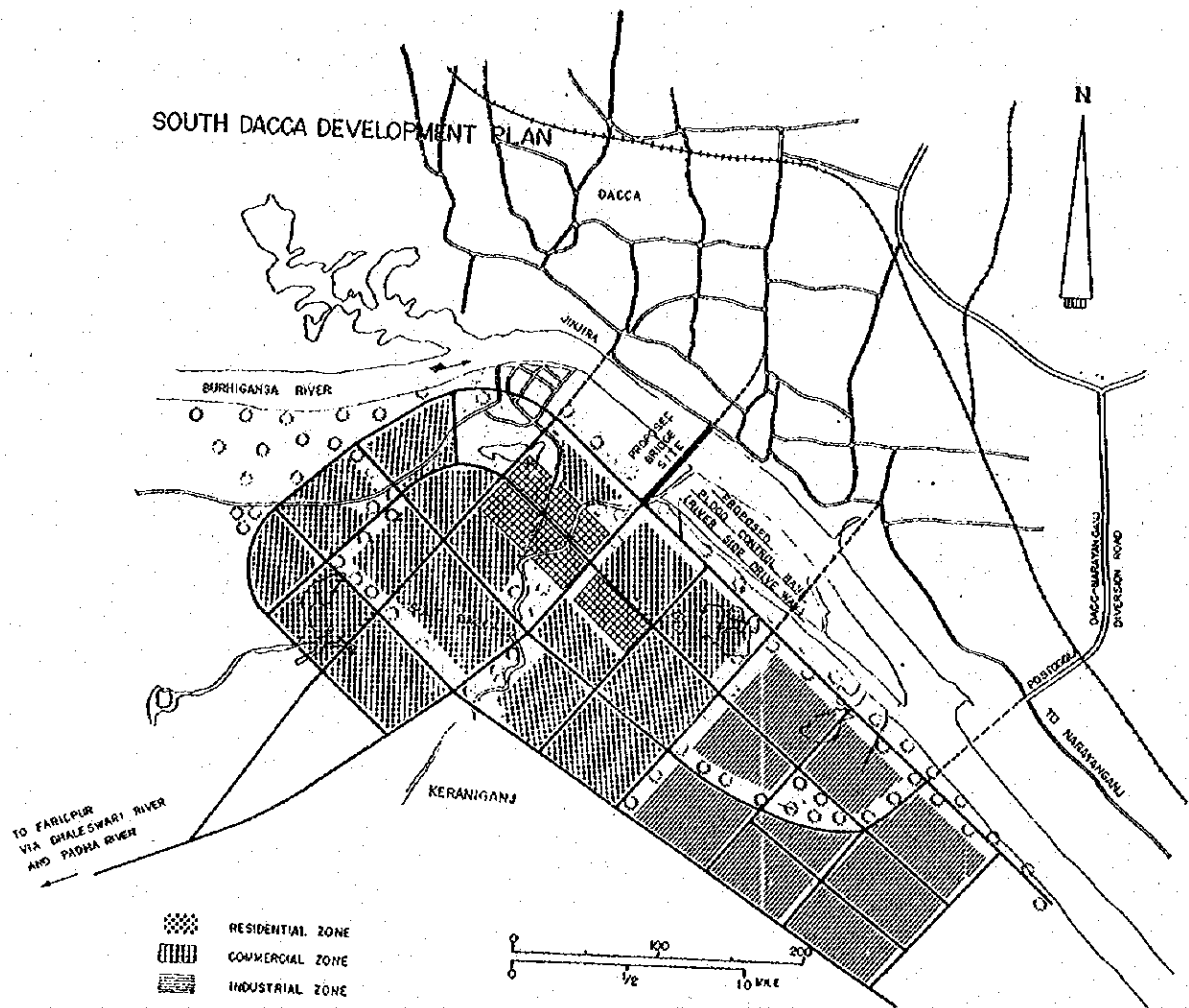
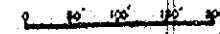


PLATE I-4

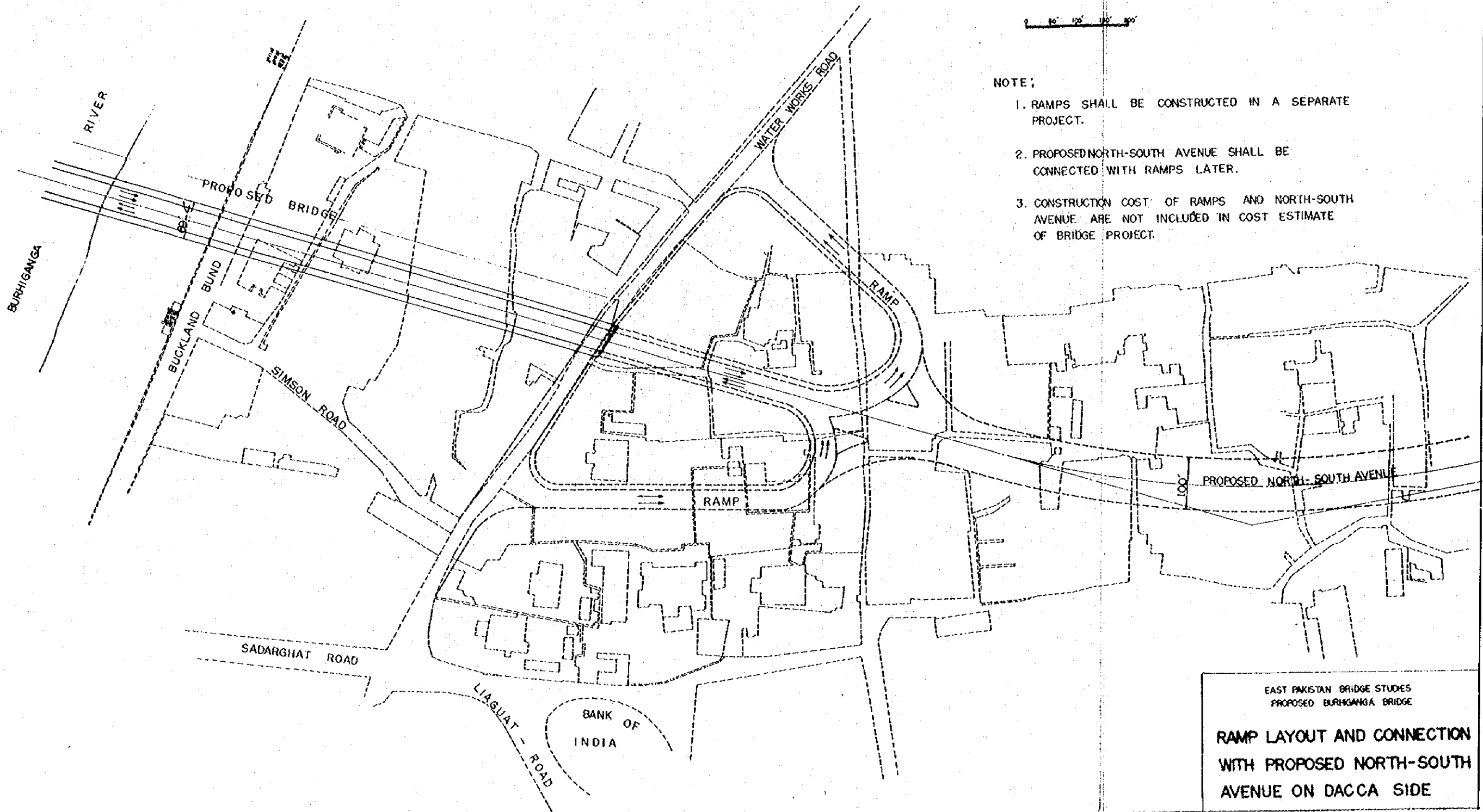
**RAMP LAYOUT AND CONNECTION  
WITH PROPOSED NORTH-SOUTH AVENUE  
ON DACCA SIDE**

SCALE



NOTE:

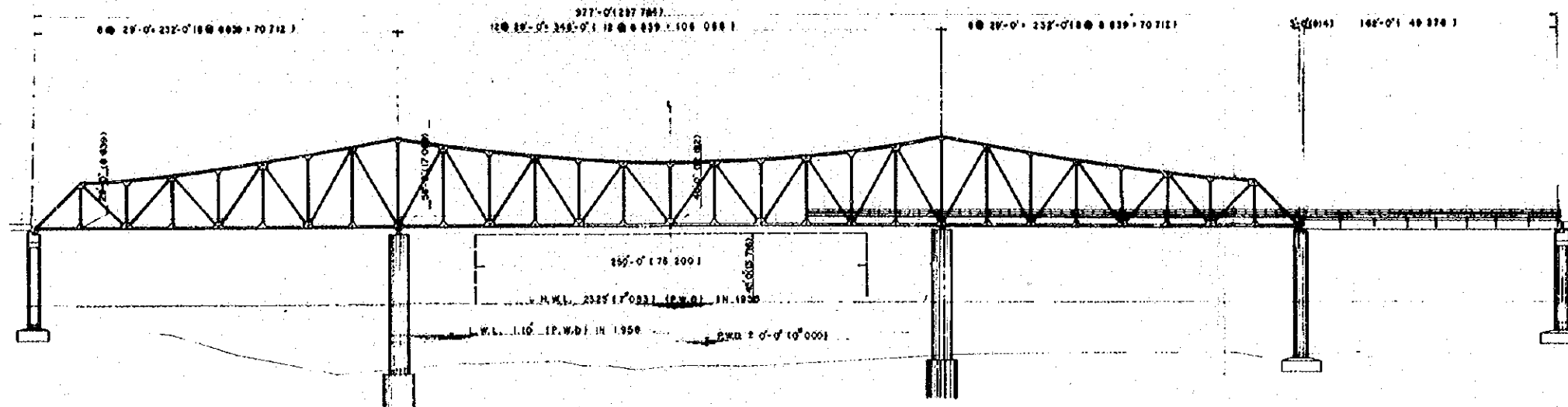
1. RAMPS SHALL BE CONSTRUCTED IN A SEPARATE PROJECT.
2. PROPOSED NORTH-SOUTH AVENUE SHALL BE CONNECTED WITH RAMPS LATER.
3. CONSTRUCTION COST OF RAMPS AND NORTH-SOUTH AVENUE ARE NOT INCLUDED IN COST ESTIMATE OF BRIDGE PROJECT.



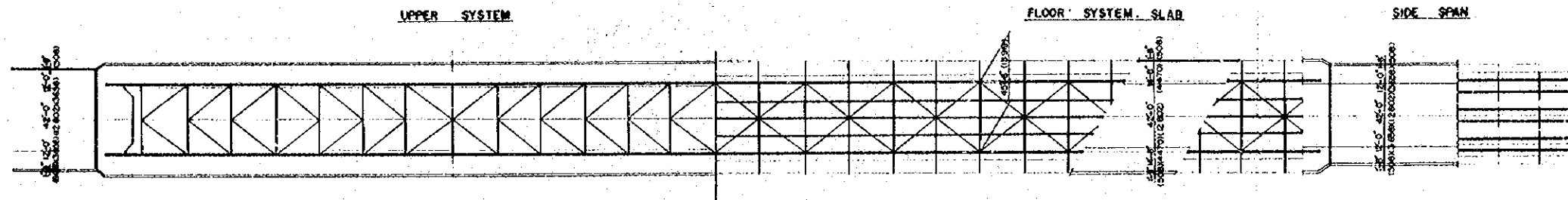
EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE  
**RAMP LAYOUT AND CONNECTION  
WITH PROPOSED NORTH-SOUTH  
AVENUE ON DACCA SIDE**

GENERAL VIEW OF MAIN SPAN S = 1:400

ELEVATION



PLAN



CROSS SECTION S = 1:100

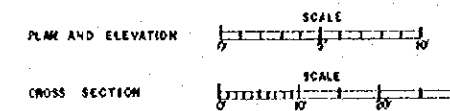
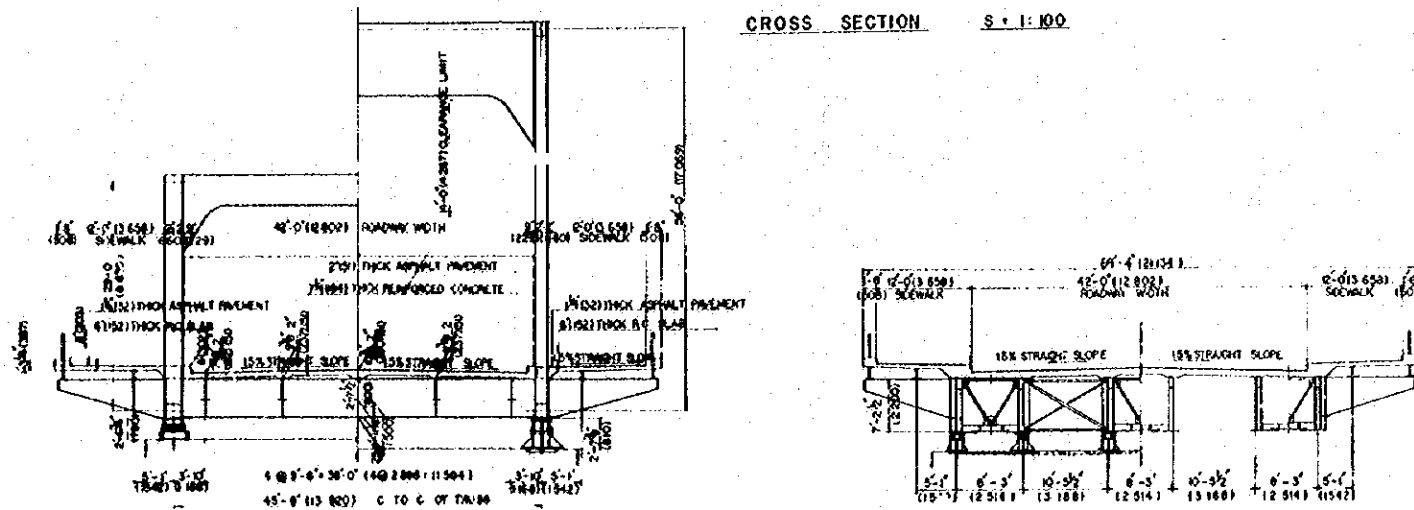
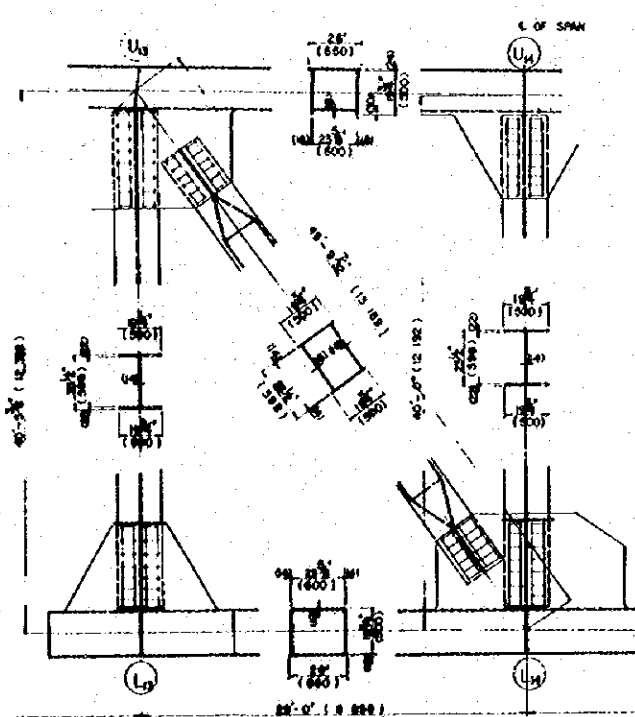
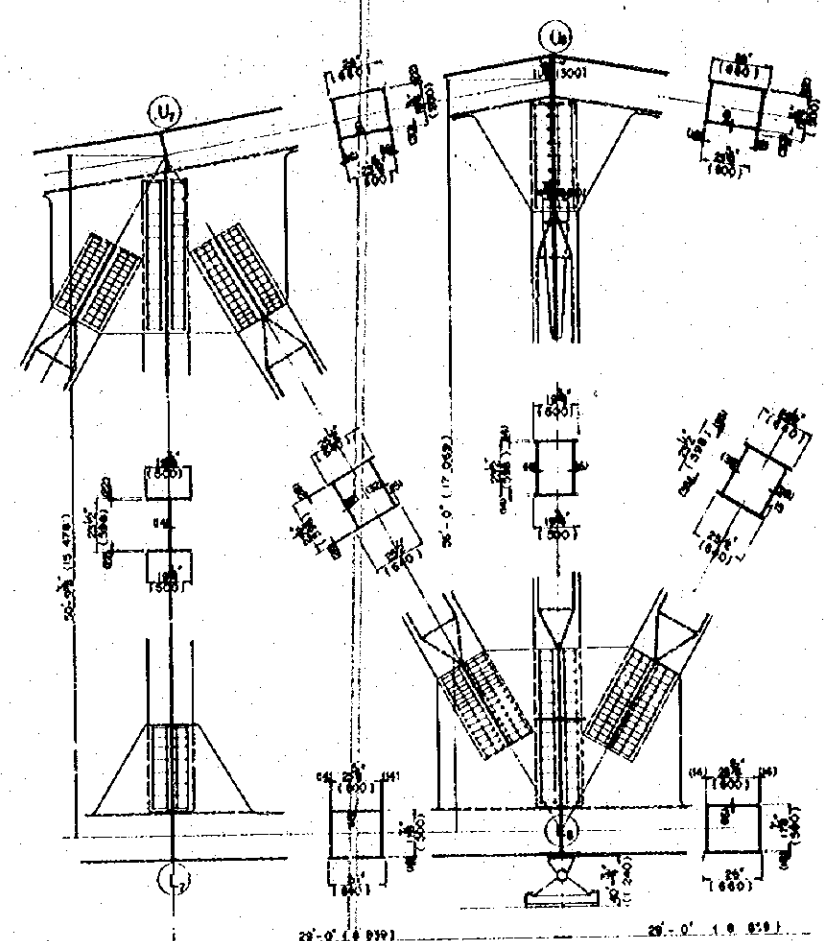
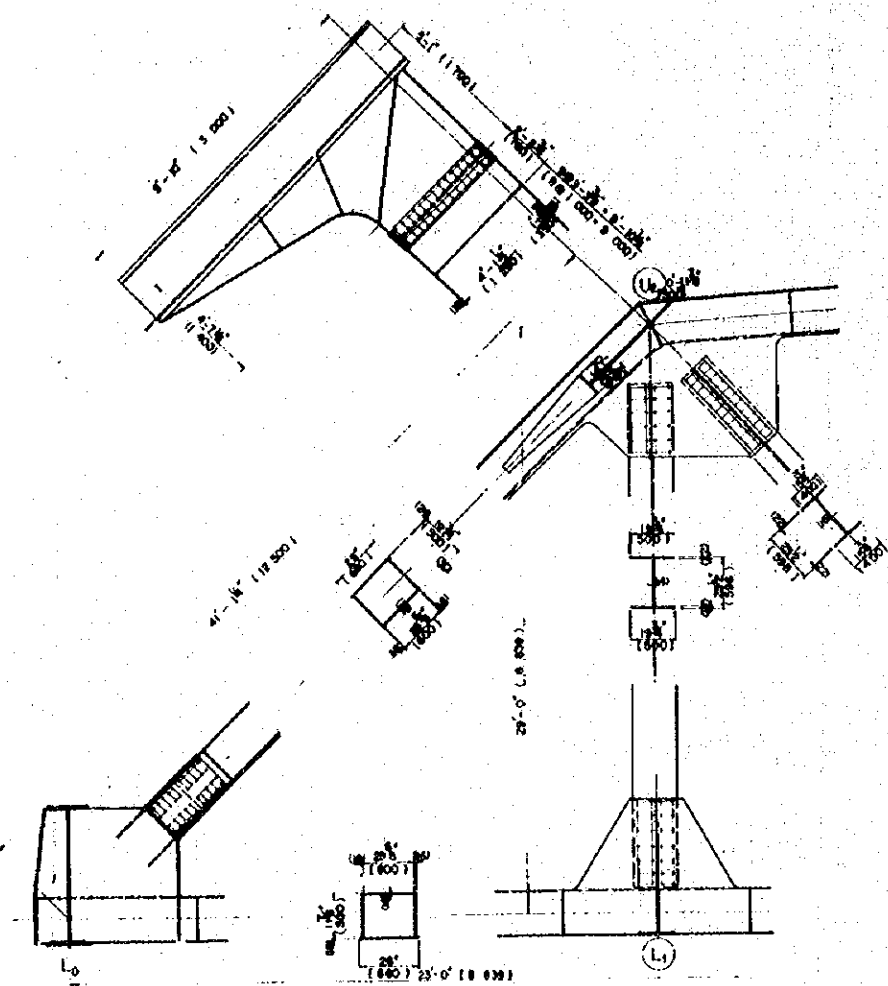


FIGURE IN PARENTHESIS IS IN MM.

EAST PAKISTAN BRIDGE STUDIES  
 PROPOSED BURHGANGA BRIDGE  
**PLAN AND ELEVATION**  
**TYPE 'A'**  
**MAIN SPANS**

DETAIL S = 1:30



SHOE

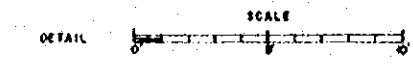
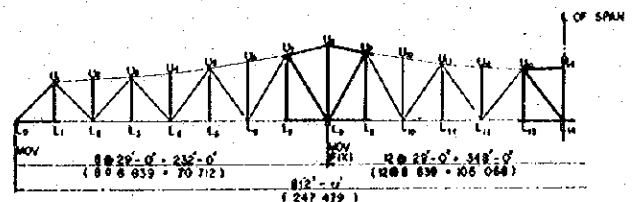
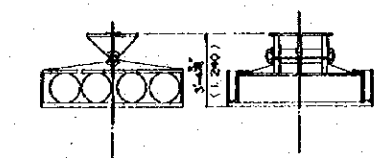


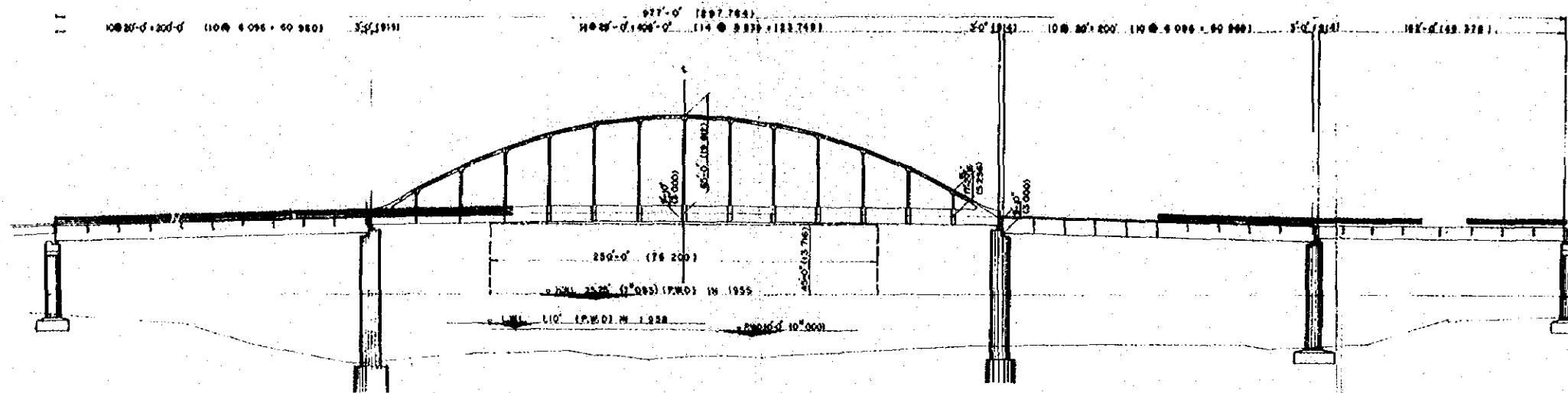
FIGURE IN PARENTHESES IS IN MM.

EAST PAKISTAN BRIDGE STUDIES  
 PROPOSED BURHANGANGA BRIDGE  
 TYPICAL DETAILS  
 TYPE 'A'  
 MAIN SPANS-(1)



GENERAL VIEW OF MAIN SPAN S = 1:400

ELEVATION

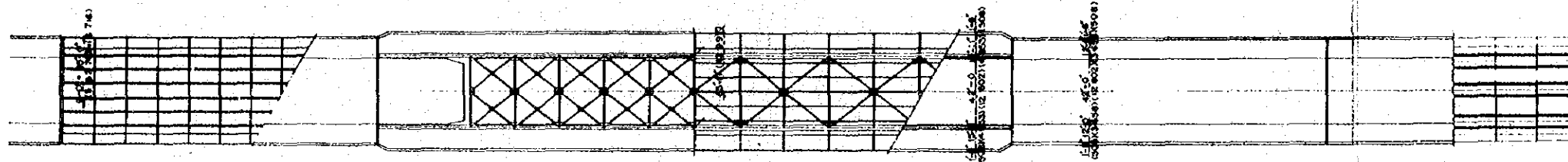


PLAN

FLOOR SYSTEM

UPPER SYSTEM

FLOOR SYSTEM, SLAB



CROSS SECTION S = 1:100

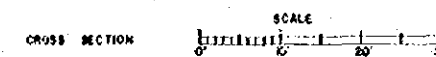
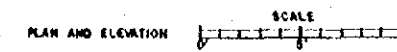
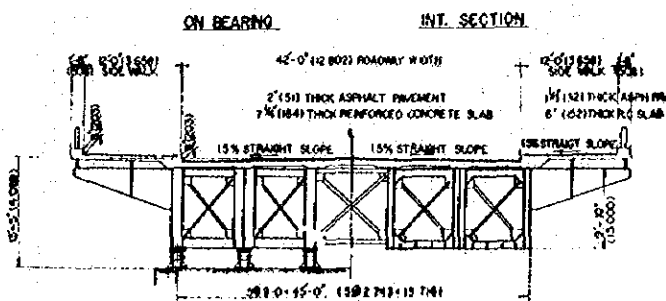
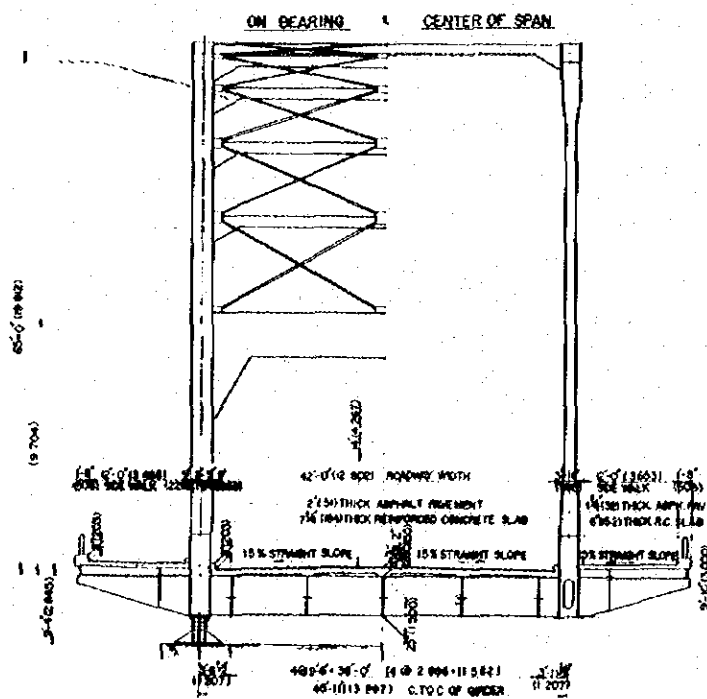
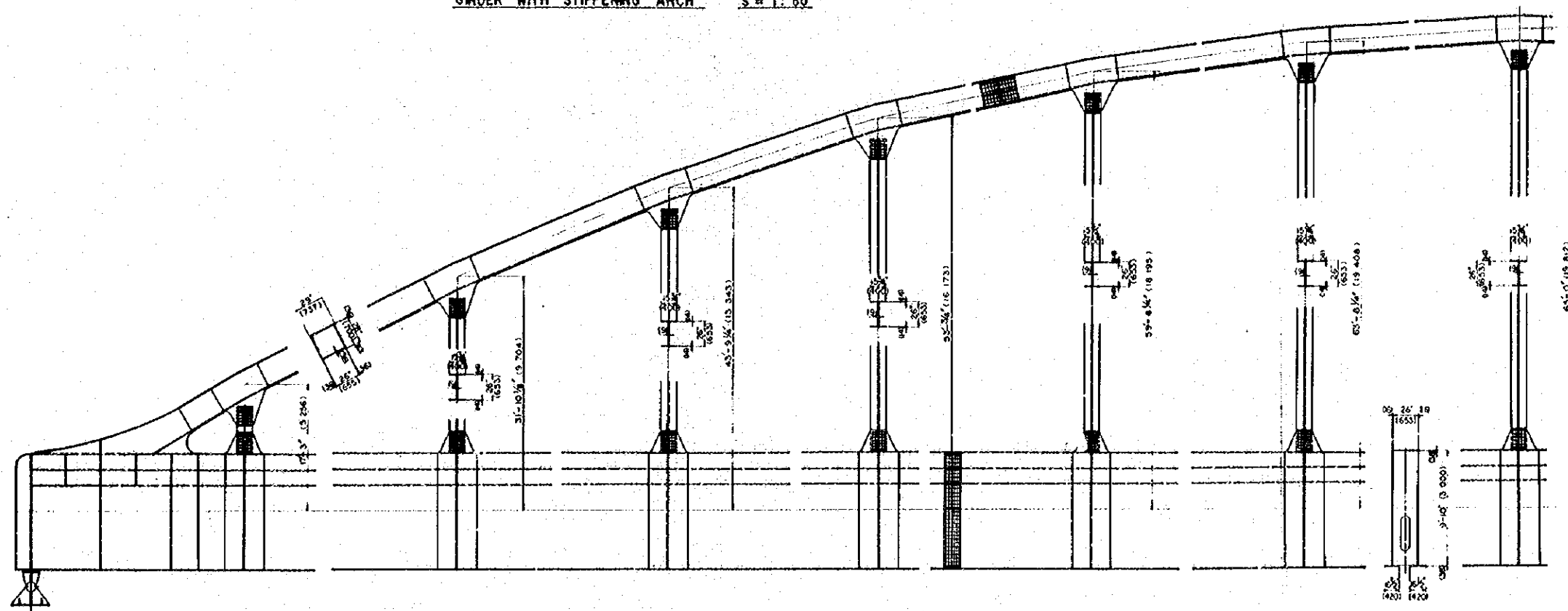


FIGURE IN PARENTHESES IS IN M.M.

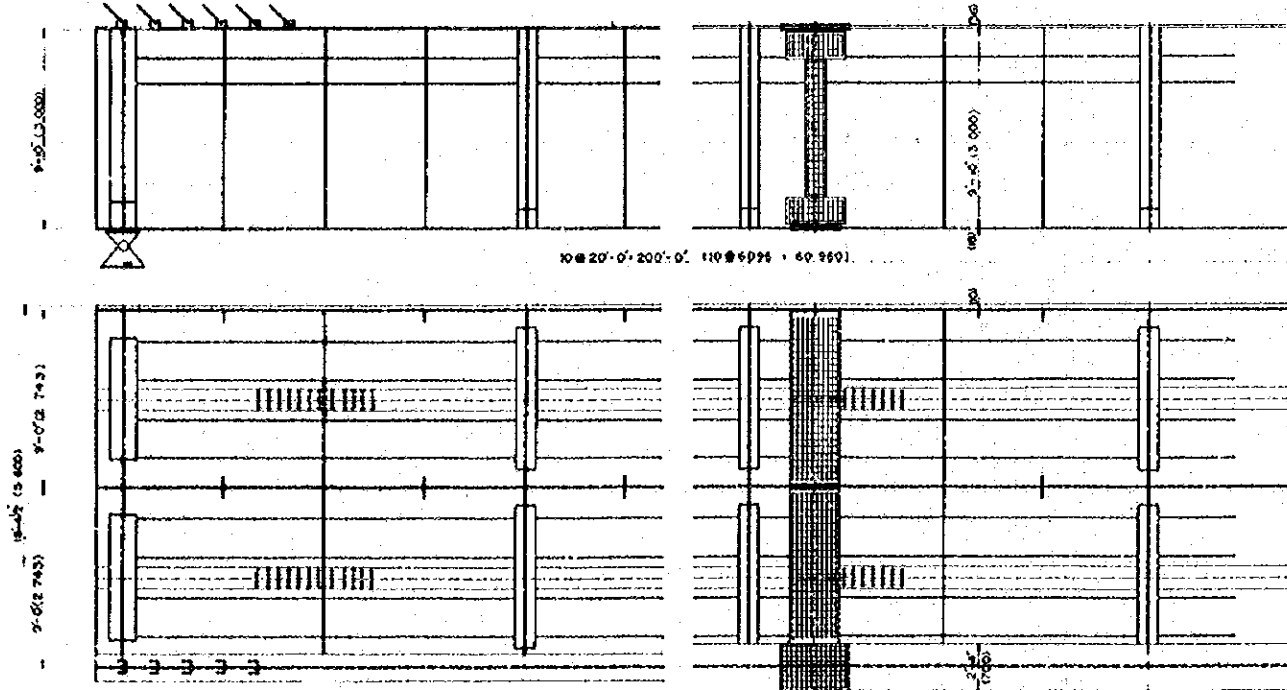
EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHANGANGA BRIDGE  
PLAN AND ELEVATION  
TYPE 'B'  
MAIN SPANS



GIRDER WITH STIFFENING ARCH S = 1: 50



COMPOSITE BOX GIRDER S = 1: 40



MARKING DIAGRAM

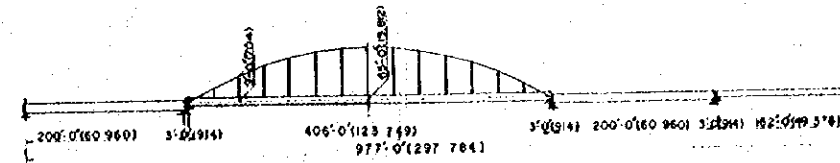
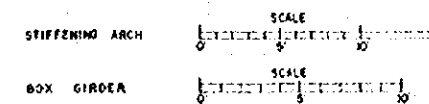
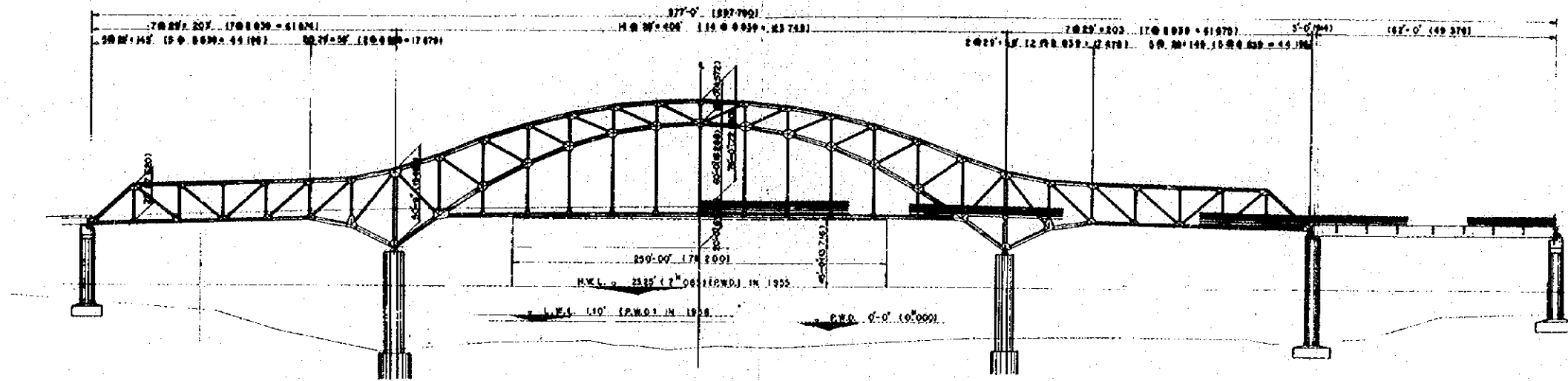


FIGURE IN PARENTHESES IS IN MM.



EAST PAKISTAN BRIDGE STUDIES  
 PROPOSED BURHIGANGA BRIDGE  
**TYPICAL DETAILS**  
**TYPE 'B'**  
**MAIN SPANS**

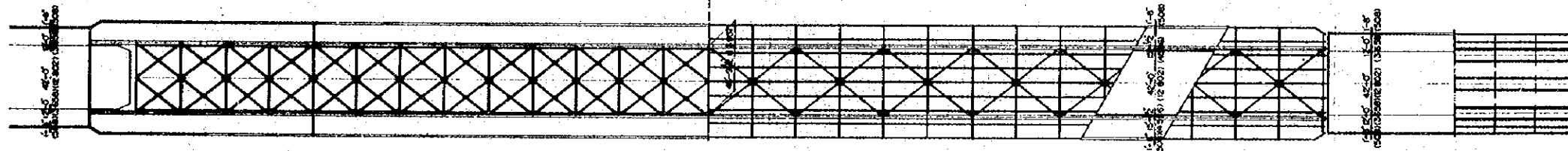
GENERAL VIEW OF MAIN SPAN S = 1:400  
ELEVATION



PLAN

UPPER SYSTEM

FLOOR SYSTEM, SLAB



CROSS SECTION S = 1:100

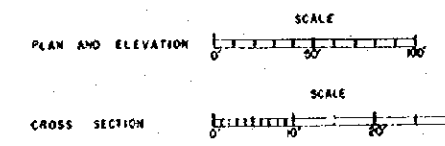
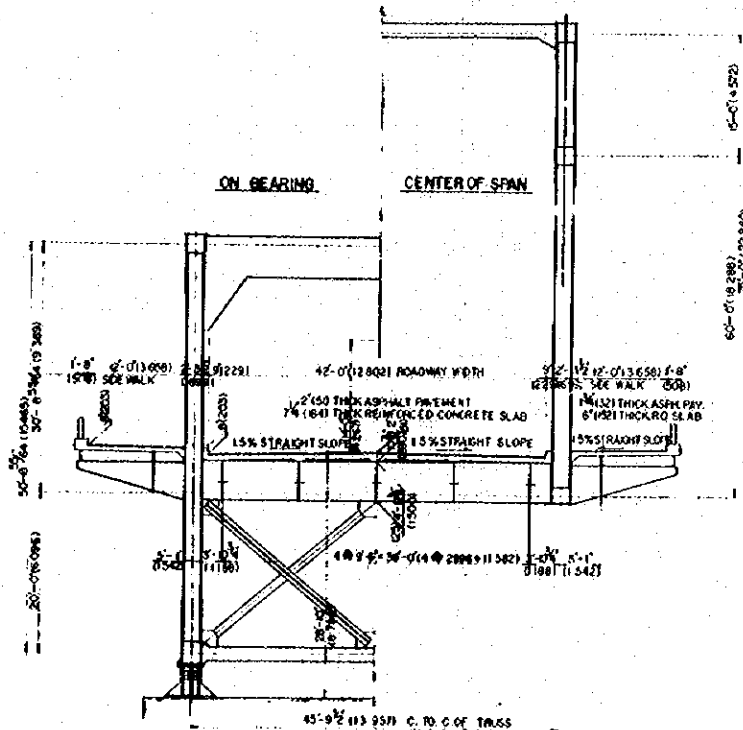


FIGURE IN PARENTHESIS IS IN M.M.

EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHGANGA BRIDGE  
**PLAN AND ELEVATION  
TYPE 'C'  
MAIN SPANS**

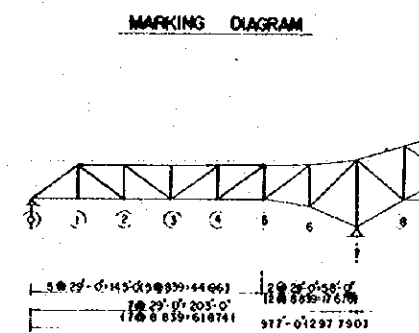
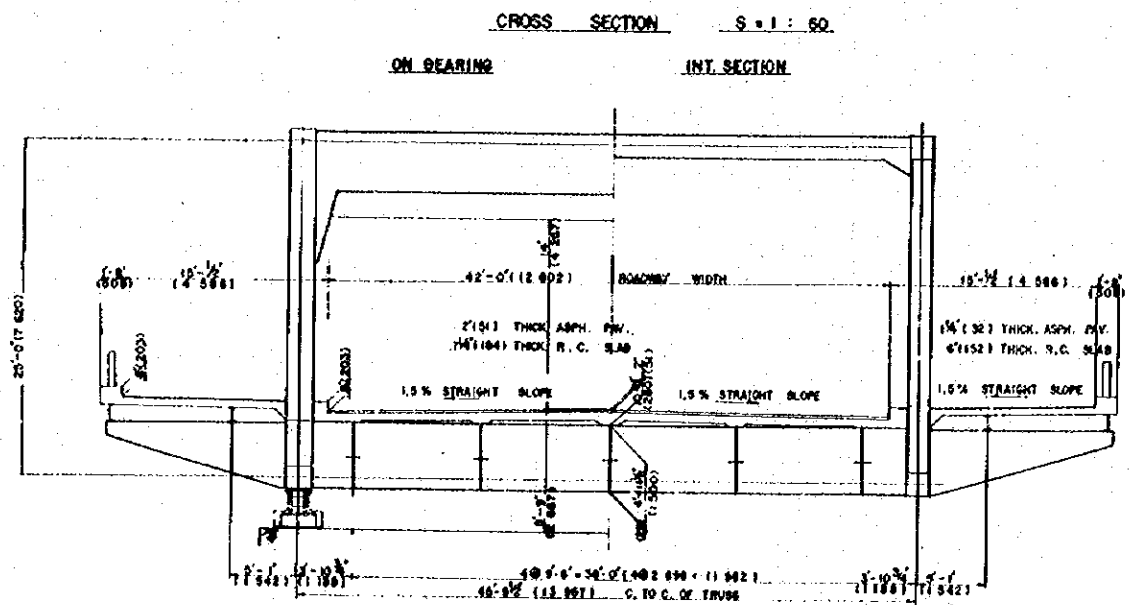
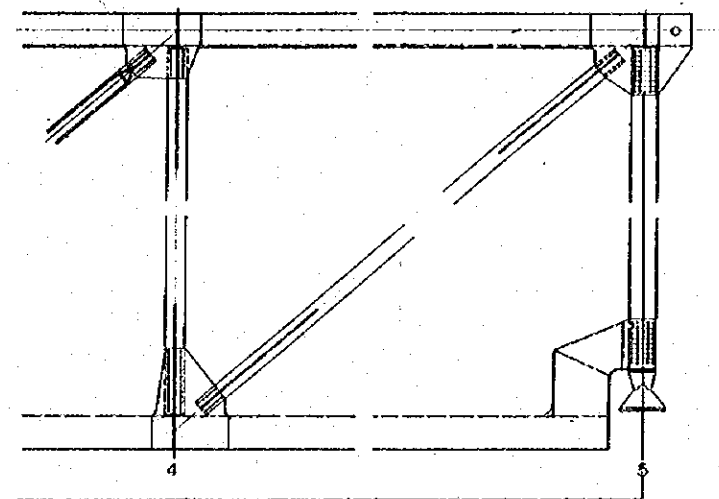
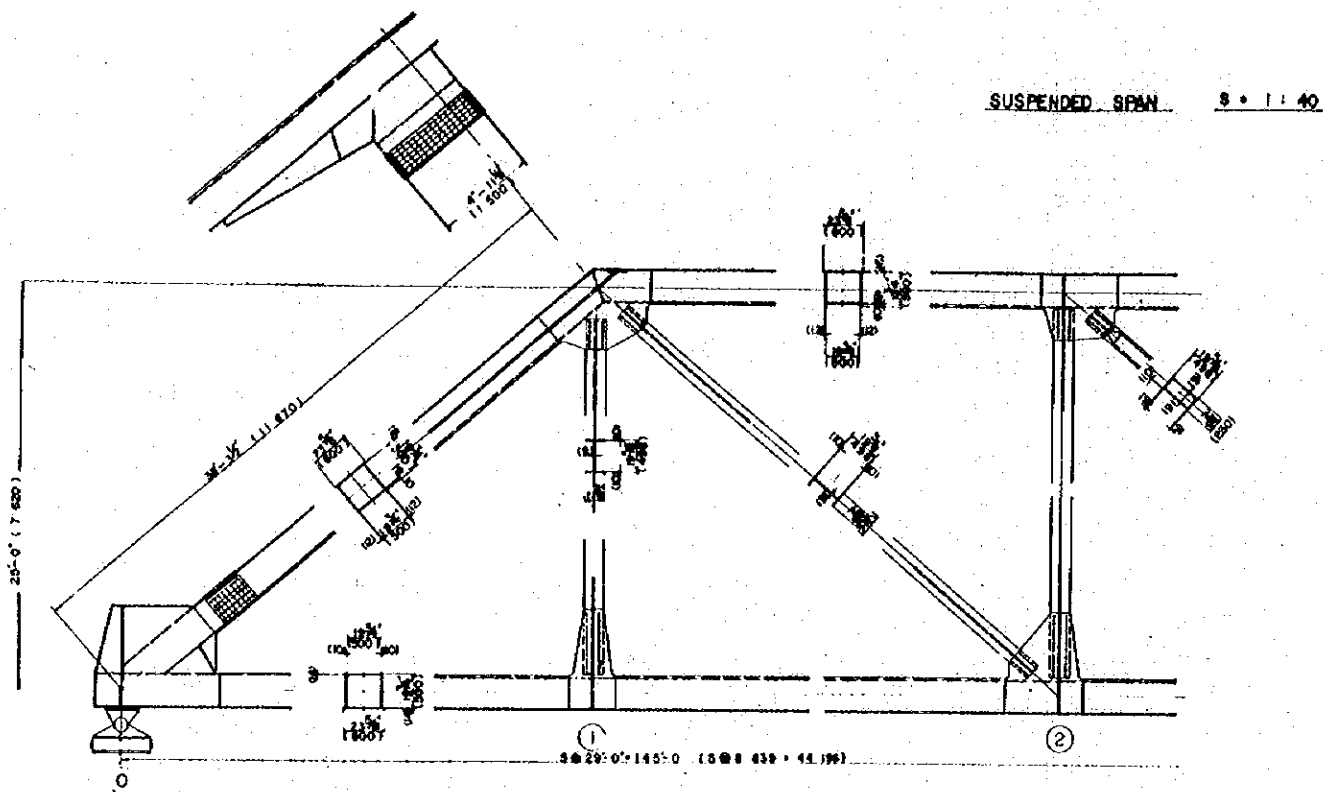
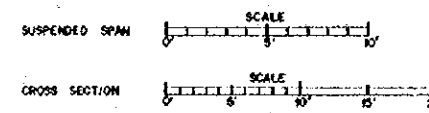


FIGURE IN PARENTHESES IS IN MM.

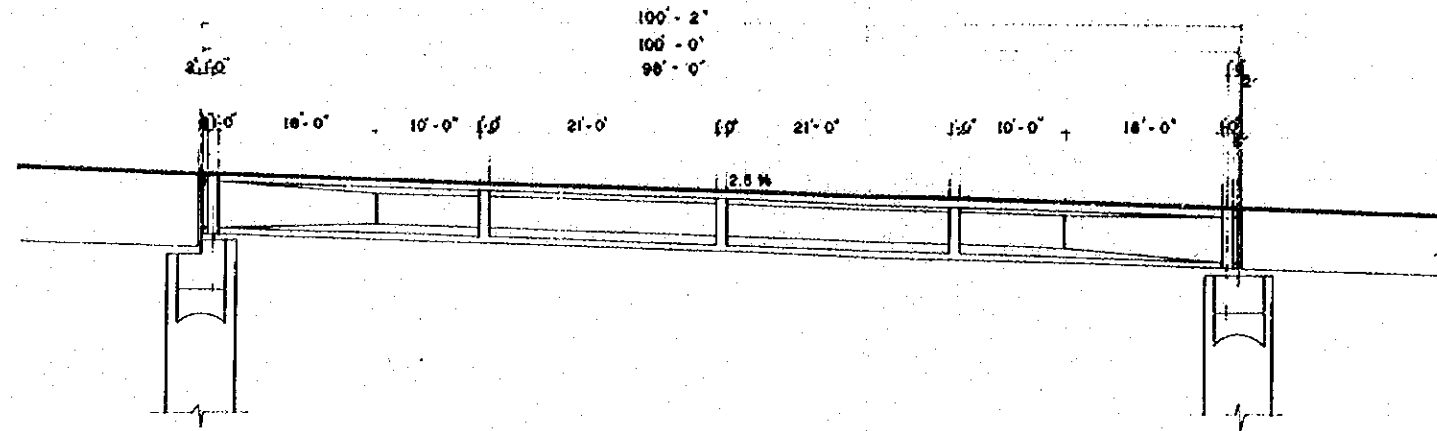


EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE

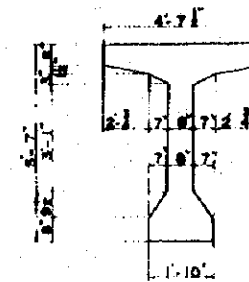
**TYPICAL DETAILS**  
**TYPE 'C'**  
**MAIN SPANS - (1)**



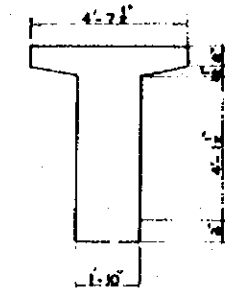
SIDE VIEW



CROSS SECTION  
AT THE CENTER OF SPAN



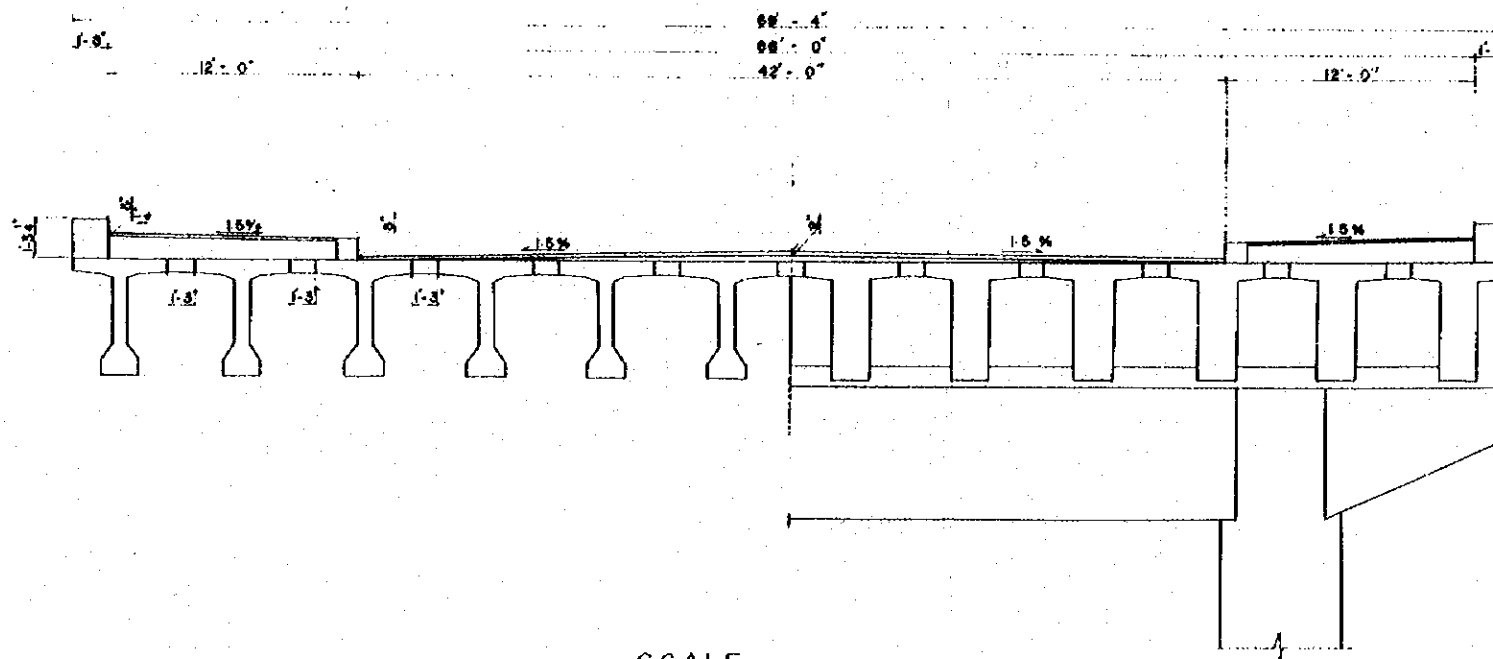
CROSS SECTION  
AT THE GIRDER END



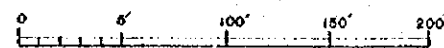
SCALE



CROSS SECTION

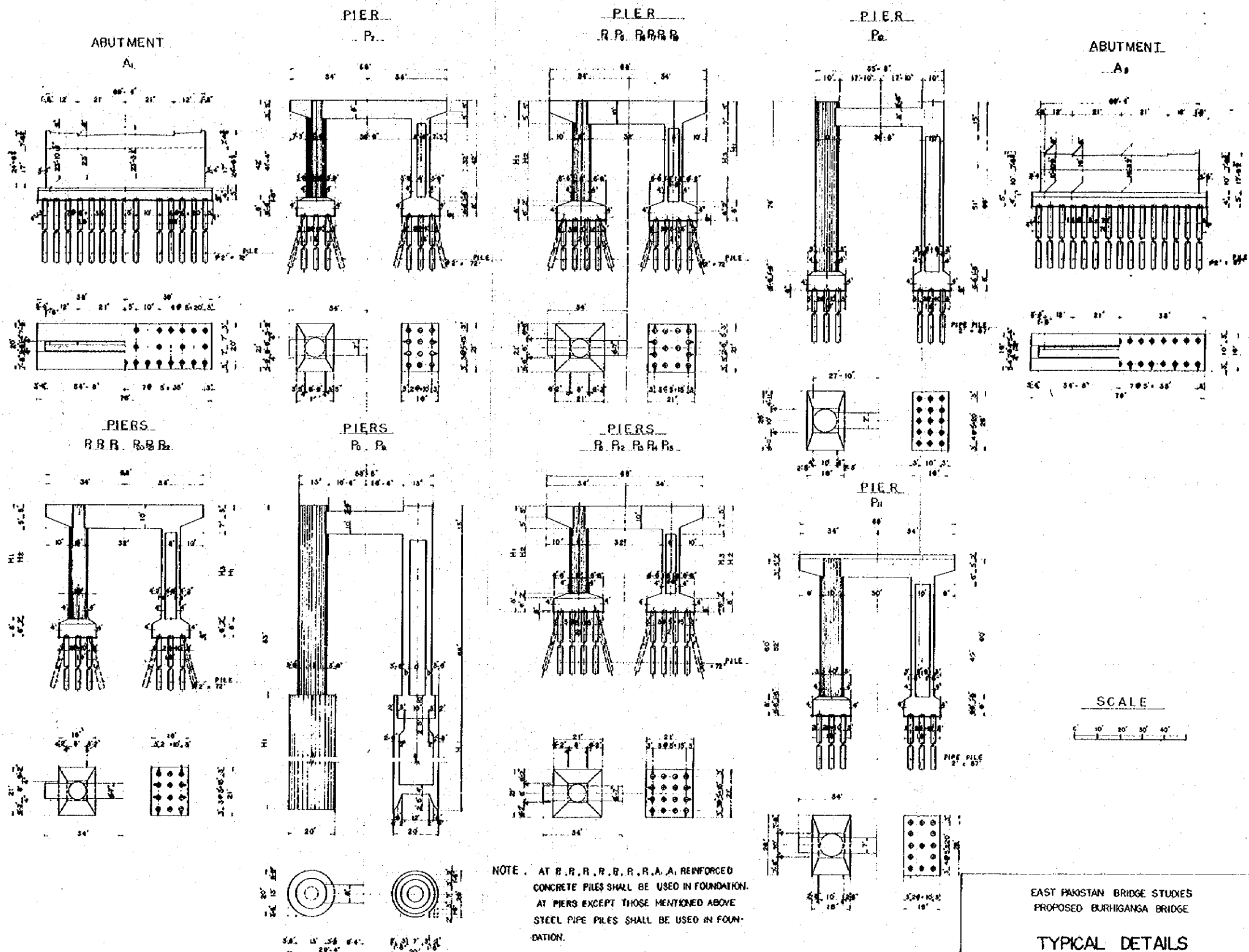


SCALE



EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE  
  
TYPICAL DETAILS  
PRESTRESSED CONCRETE GIRDERS  
APPROACH SPANS

	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	b	d
P <sub>1</sub>	20'	10'	6'		
P <sub>2</sub>	24'	14'	12'		
P <sub>3</sub>	26'	16'	14'		
P <sub>4</sub>	30'	20'	18'		
P <sub>5</sub>	34'	24'	22'		
P <sub>6</sub>	38'	28'	26'		
P <sub>7</sub>	40'	30'	28'	3'	7'
P <sub>8</sub>	40'	30'	28'	4'	6'
P <sub>9</sub>	48'	36'	33'		
P <sub>10</sub>	40'	30'	28'		
P <sub>11</sub>	38'	28'	26'		
P <sub>12</sub>	36'	26'	24'		
P <sub>13</sub>	34'	24'	22'		
P <sub>14</sub>	30'	20'	18'		
P <sub>15</sub>	28'	18'	16'		
P <sub>16</sub>	26'	16'	14'		
P <sub>17</sub>	24'	14'	12'		
P <sub>18</sub>	20'	10'	6'		



NOTE . AT R.R.R.R.R.R.R.A.A. REINFORCED CONCRETE PILES SHALL BE USED IN FOUNDATION. AT PIERS EXCEPT THOSE MENTIONED ABOVE STEEL PIPE PILES SHALL BE USED IN FOUNDATION.

EAST PAKISTAN BRIDGE STUDIES  
 PROPOSED BURHIGANGA BRIDGE  
 TYPICAL DETAILS  
 SUBSTRUCTURES AND FOUNDATION  
 (1)



TABLE I - 1

Elevation of Major Stations

(1) Height of Triangulation Points and Bench Marks on P.W.D. Level

Point	Height of Station Peg at Top	Ground Height	Remarks
No.1	6.289 m		Triangulation Point (on Left Bank)
No.2	6.244 m		Do.
No.3	6.323 m		Do.
No.4	5.876 m		Triangulation Point (on Right Bank)
(R)B.M.	6.772 m		Bench Mark at Con- crete House (on Right Bank)
(L)B.M.	7.277 m		Bench Mark at Column of B.R.S.L. Co. (on Left Bank)
I.W.T.A. B.M.	6.470 m		On Top of Pillar (on Left Bank)
(L)BB	6.284 m		Rivet on Quay Wall (on Left Bank)
W.G.O <sup>m</sup>	0.838 m		Zero Meter of Water Gauge on Right Bank

Note: Difference between Mean Sea Level and Datum of  
Public Works Department (P.W.D.) is 1.509 feet  
= 0.460 m



(2) Height of Traversing Points

On Right Bank of River

Point	On Top of Station Peg	Ground Height	Point	On Top of Station Peg	Ground Height
No.1	2.602 m	2.402m	No.2	4.075 m	3.947m
No.3	5.864	5.679	No.4	3.853	3.713
No.5	4.648	4.458	No.6	4.761	4.664
No.7	4.256	4.137	No.8	4.323	4.166
No.9	4.162	4.049	No.10	3.987	3.909

On Left Bank of River

No.1	6.261 m		No.24	6.351 m	
No.2	6.596	6.544 m	No.25	6.318	
No.3	6.946		No.26	7.250	
No.4	7.342	7.300	No.27	7.160	
No.5	7.257	7.235	No.28	7.238	
No.6	7.390		No.29	8.159	
No.7	7.662	7.639	No.30	8.200	
No.8	7.997		No.31	8.178	
No.9	8.092		No.32	8.162	
No.10	8.278		No.33	8.065	
No.11	8.457		No.34	8.005	
No.12	8.738		No.35	7.984	
No.13	8.817		No.36	8.683	
No.14	8.827		No.37	8.636	
No.15	8.705		No.38	8.765	
No.16	8.660		No.39	8.982	8.947m
No.17	8.256		No.40	8.920	
No.18	8.234		No.41	9.206	
No.19	7.878		No.42	9.242	
No.20	7.580		No.43	8.713	
No.21	7.293		No.44	8.754	
No.22	6.544		No.45	8.826	
No.23	6.258	6.256			

TABLE I - 2

Tabulation of Highest Water Level and Lowest Water  
Level of Burhiganga River in Dacca by Year  
From 1909 to 1964

On P.W.D. Level

Year	Highest Water Level		Lowest Water Level	
	Date	Water Level (ft.)	Date	Water Level (ft.)
1909	Sep. 5	19.35	Feb. 7	2.93
1910	Aug. 9 - 10	21.35	Feb. 3 - 4	3.53
1911	July 31, Aug. 1	19.95	March 25	2.75
1912	Aug. 31	18.65	Feb. 14	2.85
1913	Oct. 2 - 3	14.39	Feb. 10 - 11	2.85
1914	Aug. 26	17.79	March. 5 - 6	2.09
1915	Aug. 31	21.19	Feb. 22	1.79
1916	Aug. 15 - 19	19.59	Feb. 15	2.09
1917	-	-	Feb. 3-4, 17, Mar. 3	2.49
1918	Sep. 1	20.64	Feb. 7	2.89
1919	Aug. 2	18.29	Jan. 30	1.59
1920	Sep. 16 - 17	18.19	Feb. 16	2.39
1921	July 28	19.89	Feb. 19	2.39
1922	Aug. 10	19.49	Jan. 31	2.49
1923	July 31	17.64	March 14	2.29
1924	Aug. 28 - 29	20.31	Feb. 14	1.57
1925	Sep. 8	20.01	March 5	2.39
1926	Aug. 15	19.60	Feb. 9	2.20
1927	Sep. 17	18.70	Feb. 27, Mar. 12-13	2.10
1928	Aug. 22	20.00	Feb. 16	2.20

Year	Highest Water Level		Lowest Water Level	
	Date	Water Level (ft.)	Date	Water Level (ft.)
1929	July 13	17.80	Feb. 21	2.00
1930	Sep. 12	18.65	Feb. 24	2.30
1931	Aug. 22	21.80	Feb. 28	2.20
1932	July 13 - 14	16.85	Feb. 18	1.80
1933	Sep. 7	17.80	Feb. 6	2.10
1934	Aug. 18	19.45	Mar. 26	2.40
1935	Sep. 1	19.80	Feb. 15	1.70
1936	Aug. 20 - 21	19.35	Mar. 3	1.90
1937	Sep. 7 - 9	18.30	Feb. 7	2.70
1938	Aug. 2	21.00	Feb. 25 - 26	2.40
1939	Aug. 3	19.10	Mar. 1	2.40
1940	Aug. 9	17.25	Jan. 20	2.00
1941	Sep. 10	17.70	Mar. 8	2.10
1942	Sep. 1	18.00	Feb. 11	2.60
1943	July 19 - 20	17.75	Feb. 15, Mar. 17	2.60
1944	Sep. 22 - 24	16.80	Mar. 4 - 5	2.30
1945	Aug. 19-20, 27	19.80	Mar. 10	2.10
1946	Aug. 1	19.90	Feb. 26	2.00
1947	Aug. 4 - 5	18.60	Feb. 16	1.90
1948	Aug. 11	20.70	Mar. 4 - 5	2.10
1949	Aug. 30, Sep. 1-2	19.70	Feb. 9, Mar. 10-11 24	-2.20
1950	Sep. 2	18.90	Feb. 27	1.70
1951	July 31	19.50	Feb. 18	2.45
1952	Sep. 10 - 11	18.00	Apr. 5 - 6	1.70

Year	Highest Water Level		Lowest Water Level	
	Date	Water Level (ft.)	Date	Water Level (ft.)
1953	Aug. 5, Sep. 27	18.70	Jan. 26	1.90
1954	Sep. 2 - 3	23.15	Feb. 27	2.20
1955	Aug. 18, 20 - 21	23.25	Feb. 17	2.30
1956	July 3 - 4	18.65	Feb. 7 - 8	1.00
1957	Aug. 17	17.60	Mar. 12, 27 - 28	1.20
1958	Sep. 2	21.15	Feb. 1 - 2	1.10
1959	Aug. 23, 25	18.95	Feb. 19	2.40
1960	Sep. 25	20.00	Apr. 7	1.60
1961	Sep. 2	18.10	Feb. 11	1.60
1962	Aug. 31	22.15	Mar. 15 - 16	2.51
1963	-	-	Feb. 20	2.28
1964	Aug. 12	21.66	-	-

TABLE 1 - 3

Water Level and Discharge of the Turag River

Date	Water Level (ft)	Discharge (ft/sec)
1960, June 12	17.81	6,908
July 12	22.00	11,710
28	24.37	20,266
Aug. 17	24.65	15,226
29	23.30	14,726
Sep. 10	24.90	16,242
Oct. 9	24.60	15,290
27	19.15	7,607
Nov. 10	15.15	2,346
24	11.80	1,350
Dec. 15	10.00	824
1961, May 7	11.35	1,345
20	13.15	2,602
June 5	18.57	8,015
26	20.50	10,760
July 18	21.90	12,890
30	22.80	16,900
Aug. 17	23.65	18,600
30	26.00	21,300
Sep. 26	22.80	16,300
Oct. 10	22.20	14,600
25	20.95	12,200

Date	Water Level (ft)	Discharge (ft/seo)
1961, Nov. 14	15.90	3,350
Dec. 14	10.40	770
1962, May 28	15.85	5,080
June 13	19.65	8,830
29	21.28	13,300
Sep. 28	25.28	17,300
1963, May 27	13.68	2,870
June 12	18.13	7,130
28	22.25	16,400
July 13	22.80	15,100
27	25.38	17,700
Aug. 11	25.80	19,800
30	26.75	21,150
Sep. 14	26.70	19,400
26	23.00	16,900
Oct. 12	21.60	11,100
27	19.65	7,990
Nov. 12	16.35	4,330
25	13.23	1,820
Dec. 10	11.00	1,110

TABLE I - 4

Water Level Measured at Proposed Construction  
Site and at Millbarracks

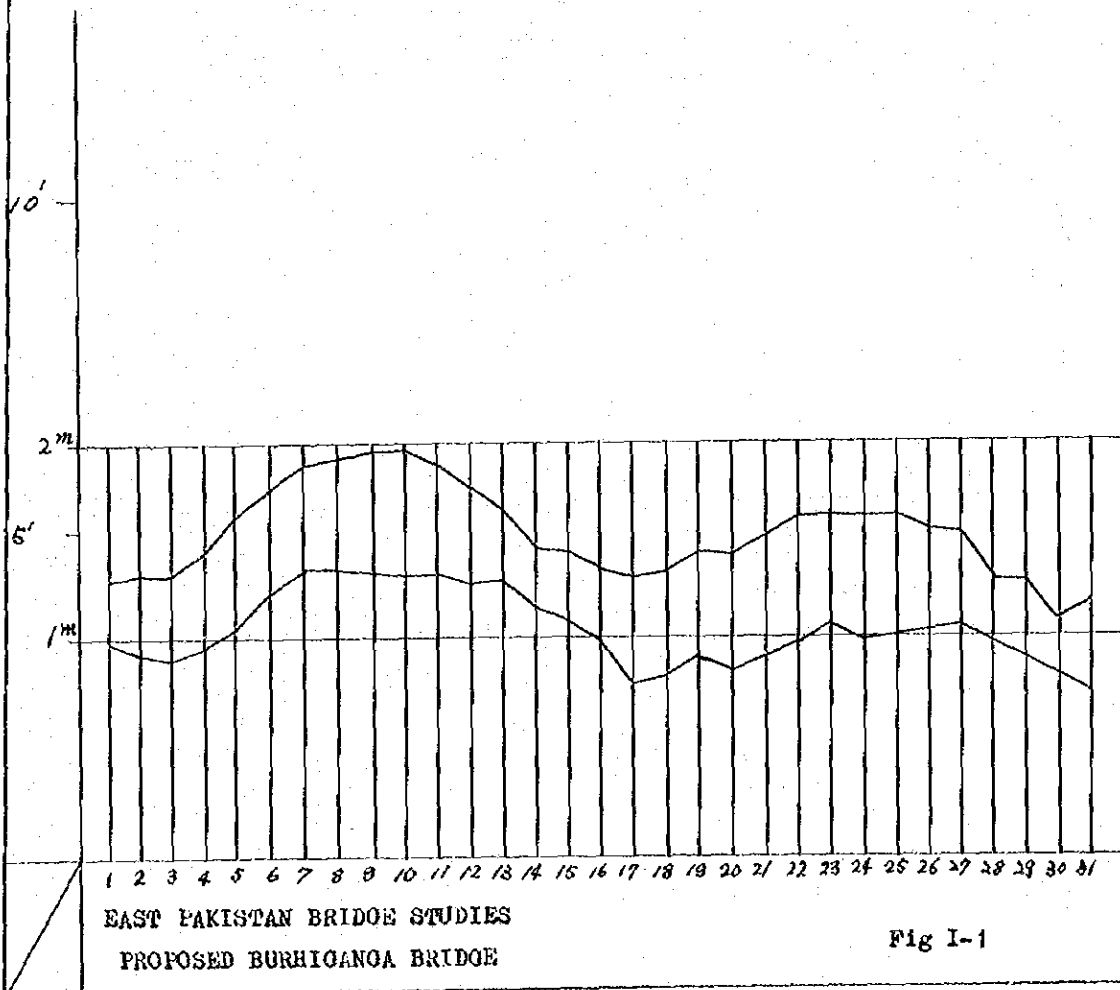
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From September 2, 1964  
To September 30, 1964

Date	Water Level at Proposed Construction Site		Water Level at Millbarracks (ft)	Difference of Water Level (ft)
	(m)	(ft)		
1964, Sep.				
2	5.62	18.44	18.30	0.14
3	5.62	18.44	18.40	0.04
4	5.62	18.47	18.29	0.18
5	5.63	18.47	18.33	0.14
6	5.62	18.44	18.31	0.13
7	5.62	18.44	18.35	0.09
8	5.63	18.47	18.40	0.07
9	-	-	18.50	-
10	5.67	18.60	18.54	0.06
11	-	-	18.55	-
12	5.66	18.57	18.51	0.06
13	-	-	18.50	-
14	5.62	18.44	18.32	0.12
15	5.59	18.34	18.25	0.09
16	5.58	18.31	18.19	0.12
17	5.57	18.27	18.17	0.10
18	5.56	18.24	18.10	0.14
19	5.56	18.24	18.10	0.14
20	-	-	18.07	-
21	5.55	18.21	18.07	0.14
22	5.59	18.34	18.20	0.14
23	5.60	18.37	18.25	0.12
24	5.65	18.54		
25	5.67	18.60		Total 2.02 ft.
26	5.62	18.44		Mean 0.112 ft.
27	-	-		-0.034/m
28	5.52	18.11		
29	-	-		
30	5.30	17.39		

Highest water level and lowest water level  
of the Burhiganga Bridge

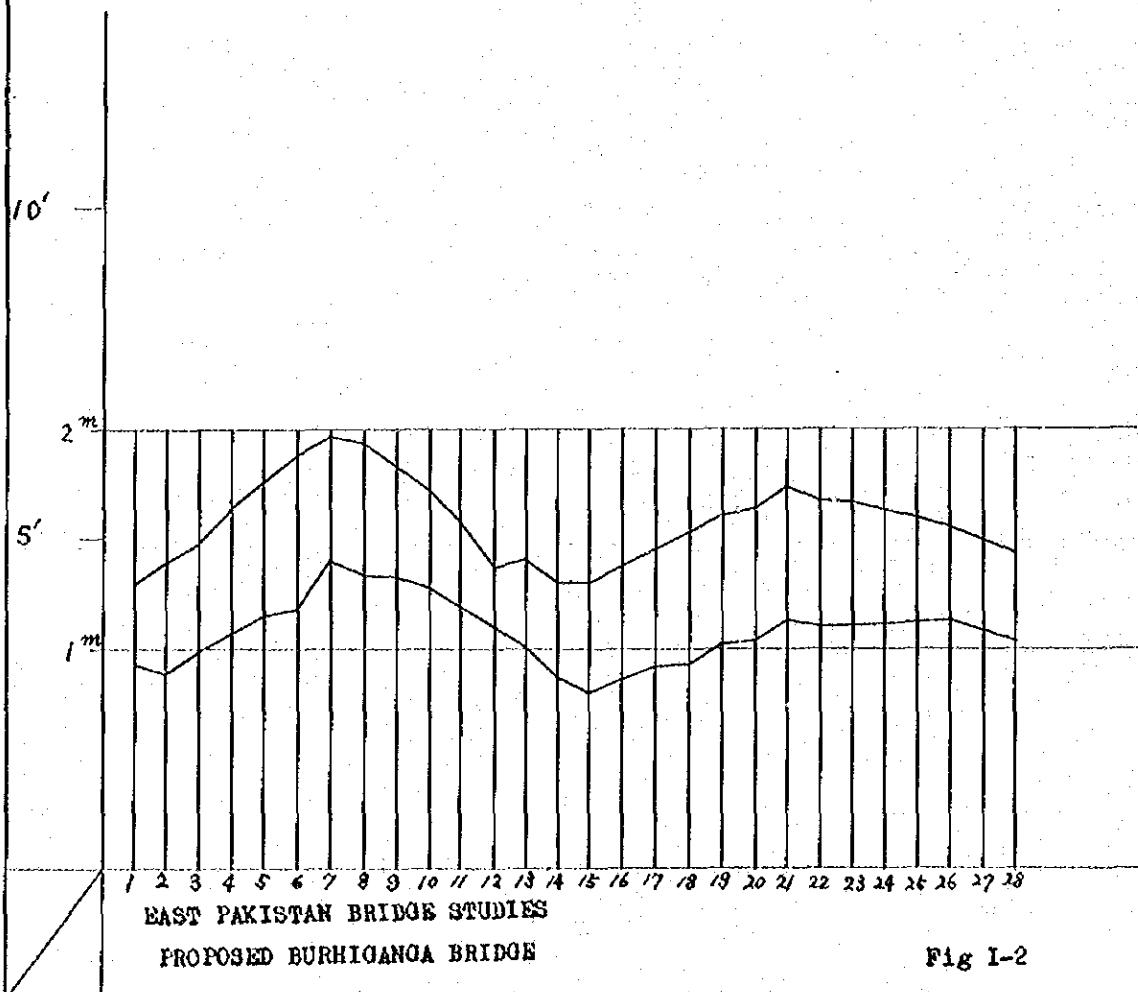
January 1962



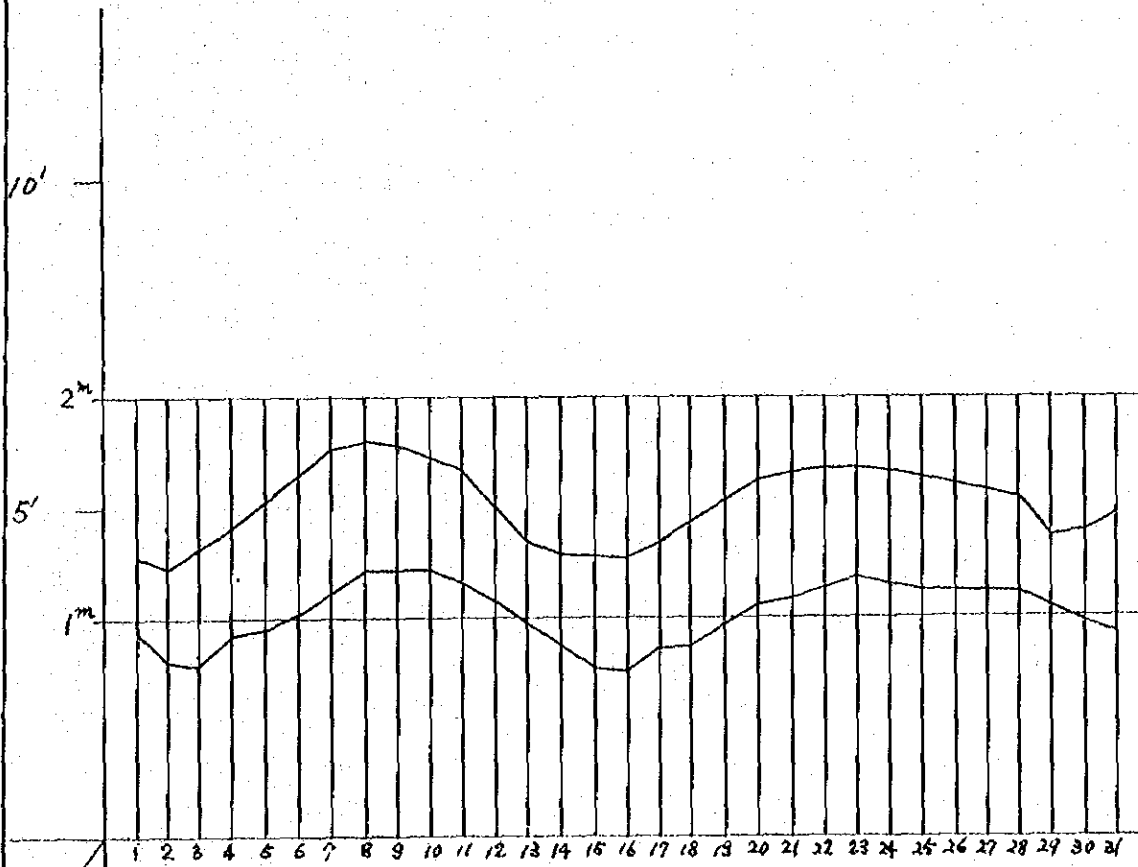


Highest water level and lowest water level  
of the Burhiganga River

February 1962



Highest water level and lowest water level  
of the Burhiganga River  
March 1962

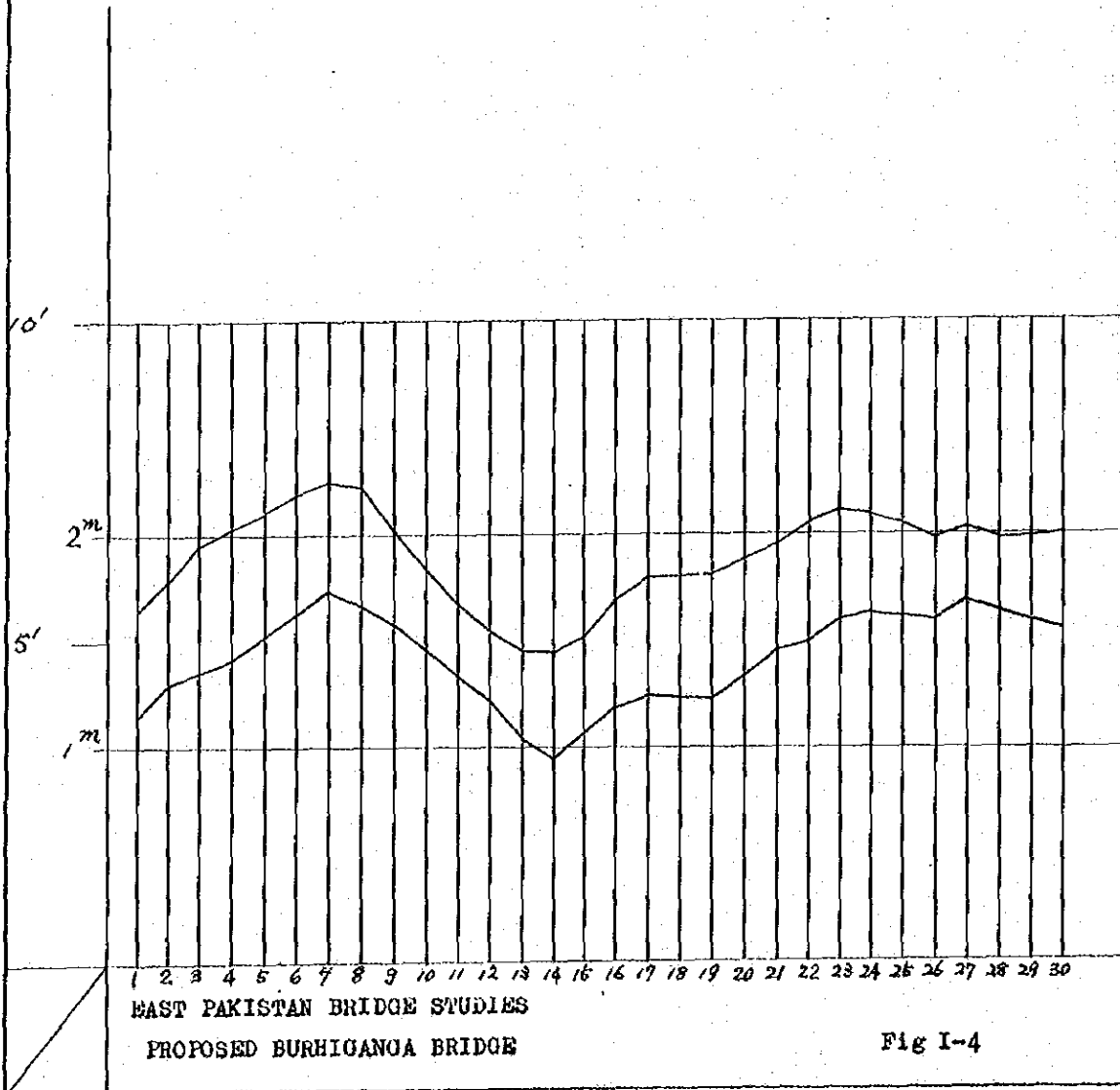


EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE

Fig I-3

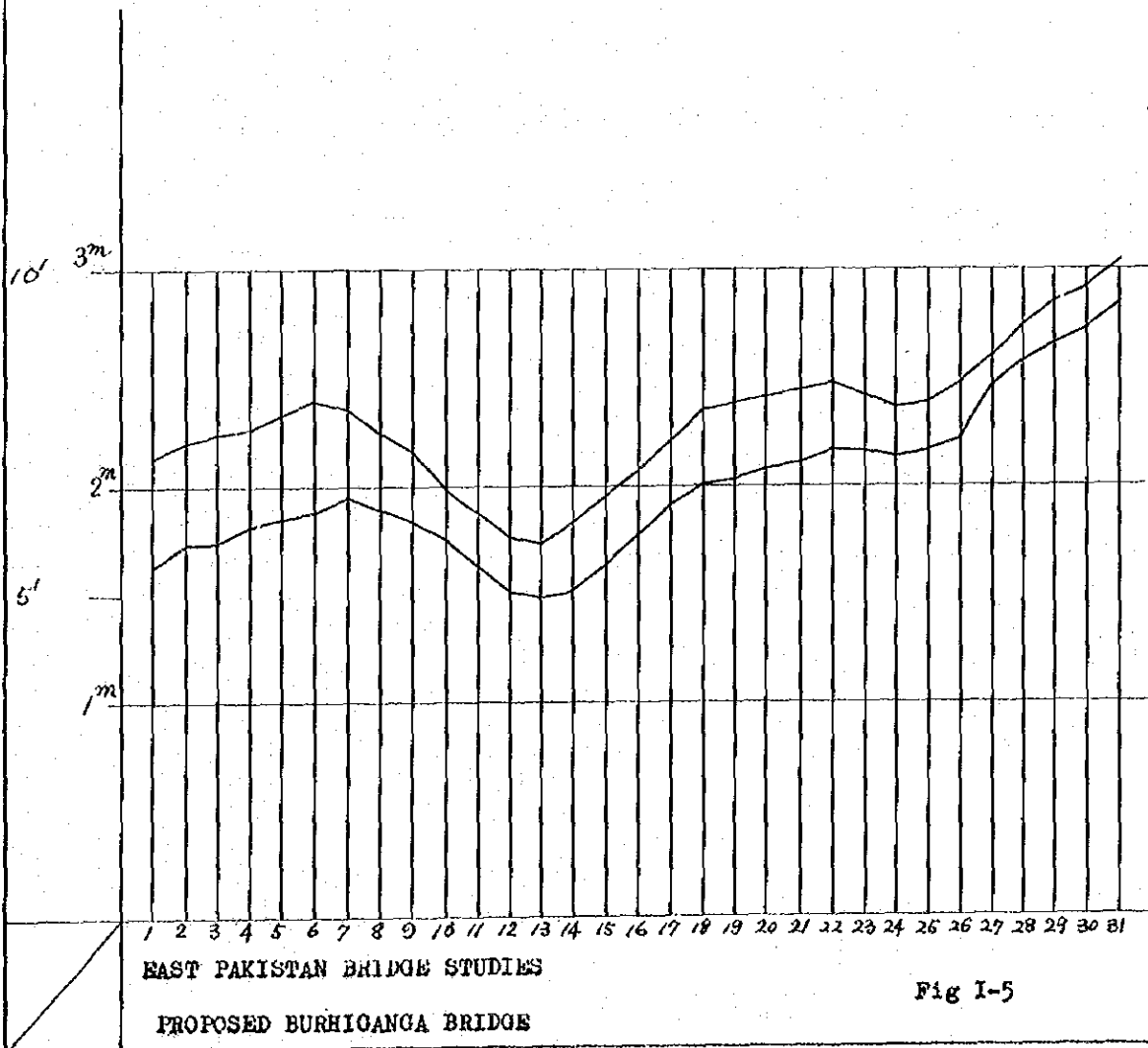
Highest water level and lowest water level  
of the Bruhiganga River

April 1962



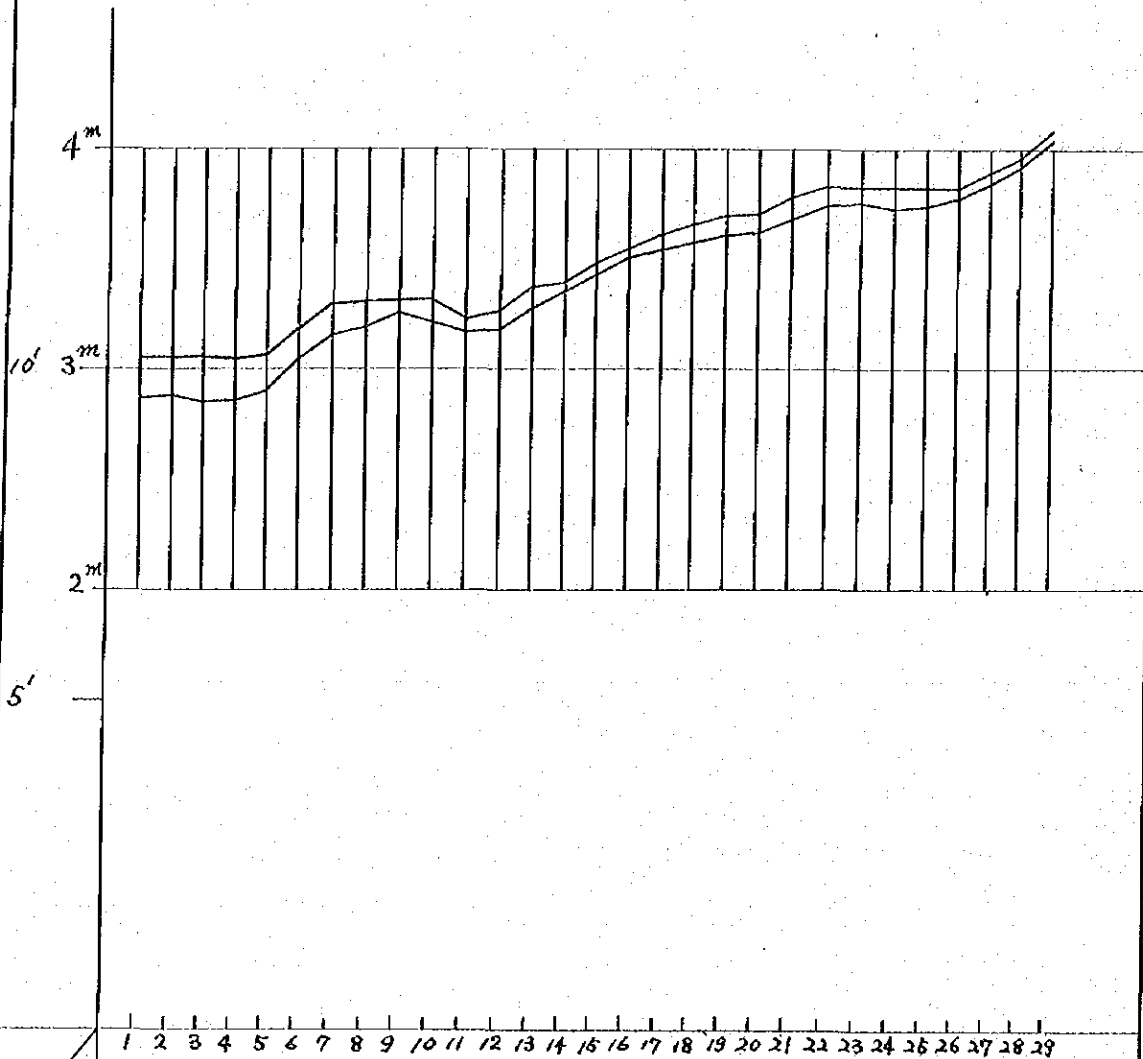
Highest water level and lowest water level  
of the Burhiganga River

May 1962



Highest water level and lowest water level  
of the Burhiganga River

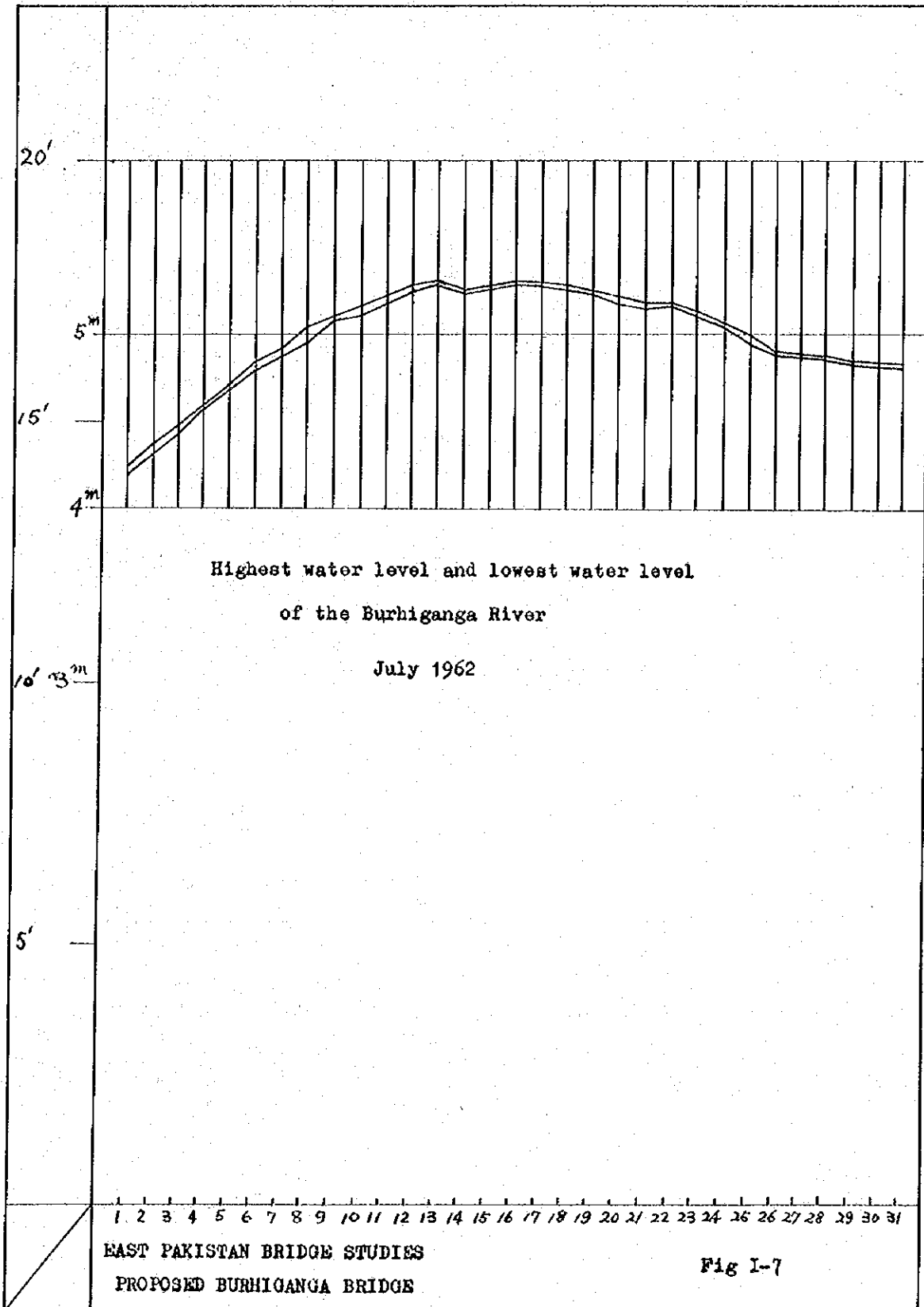
June 1962

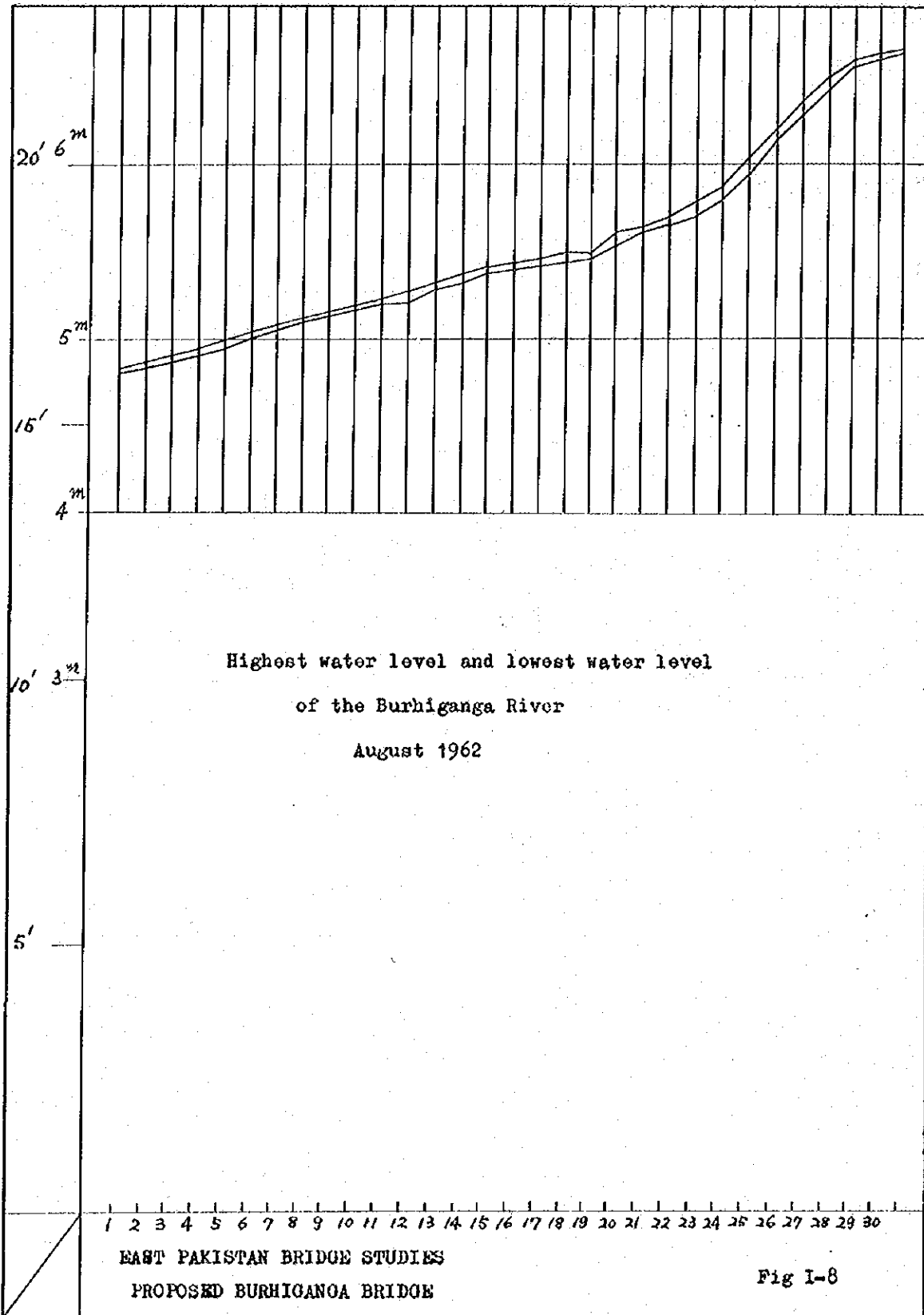


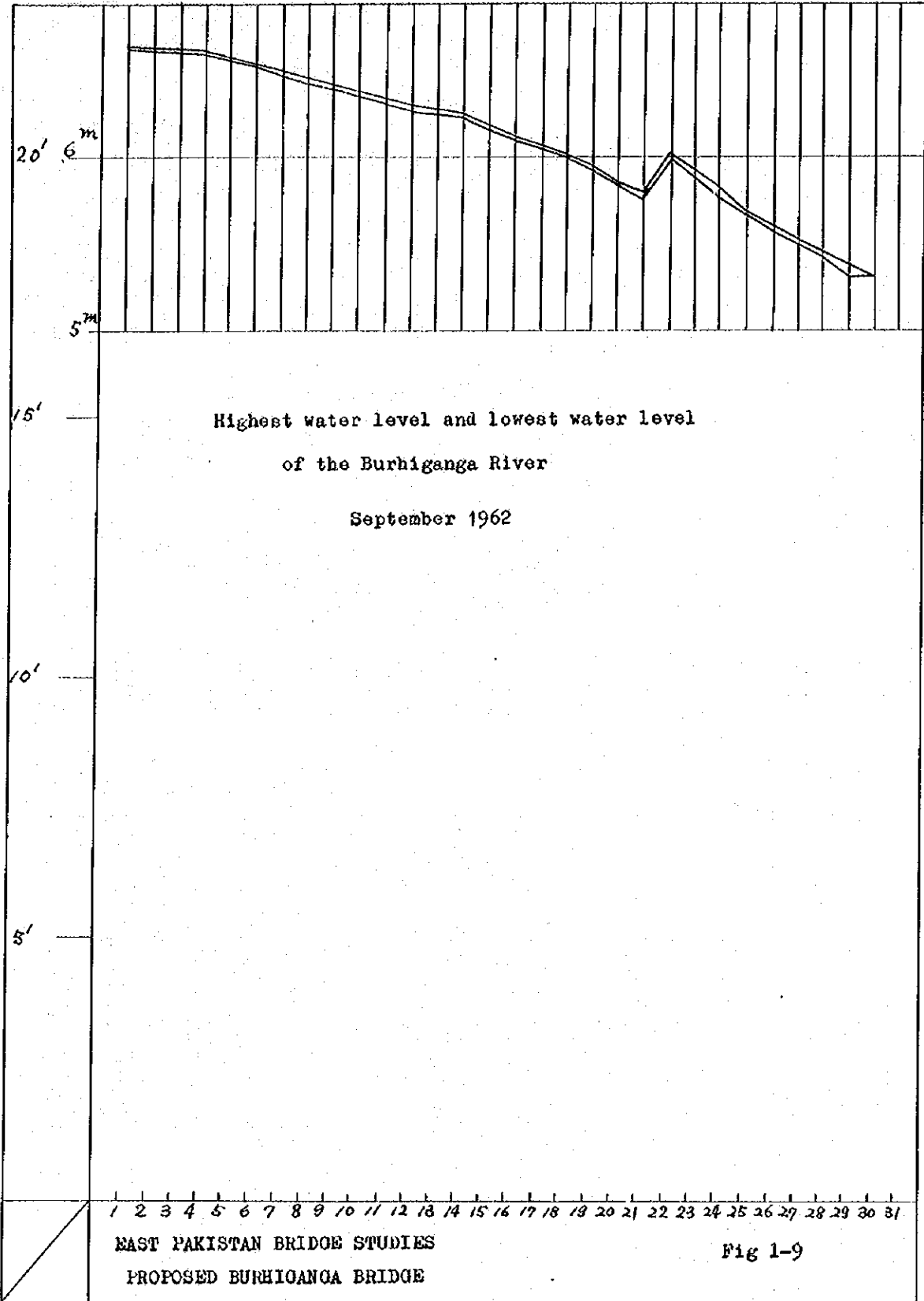
EAST PAKISTAN BRIDGE STUDIES

PROPOSED BURHIGANGA BRIDGE

Fig I-6



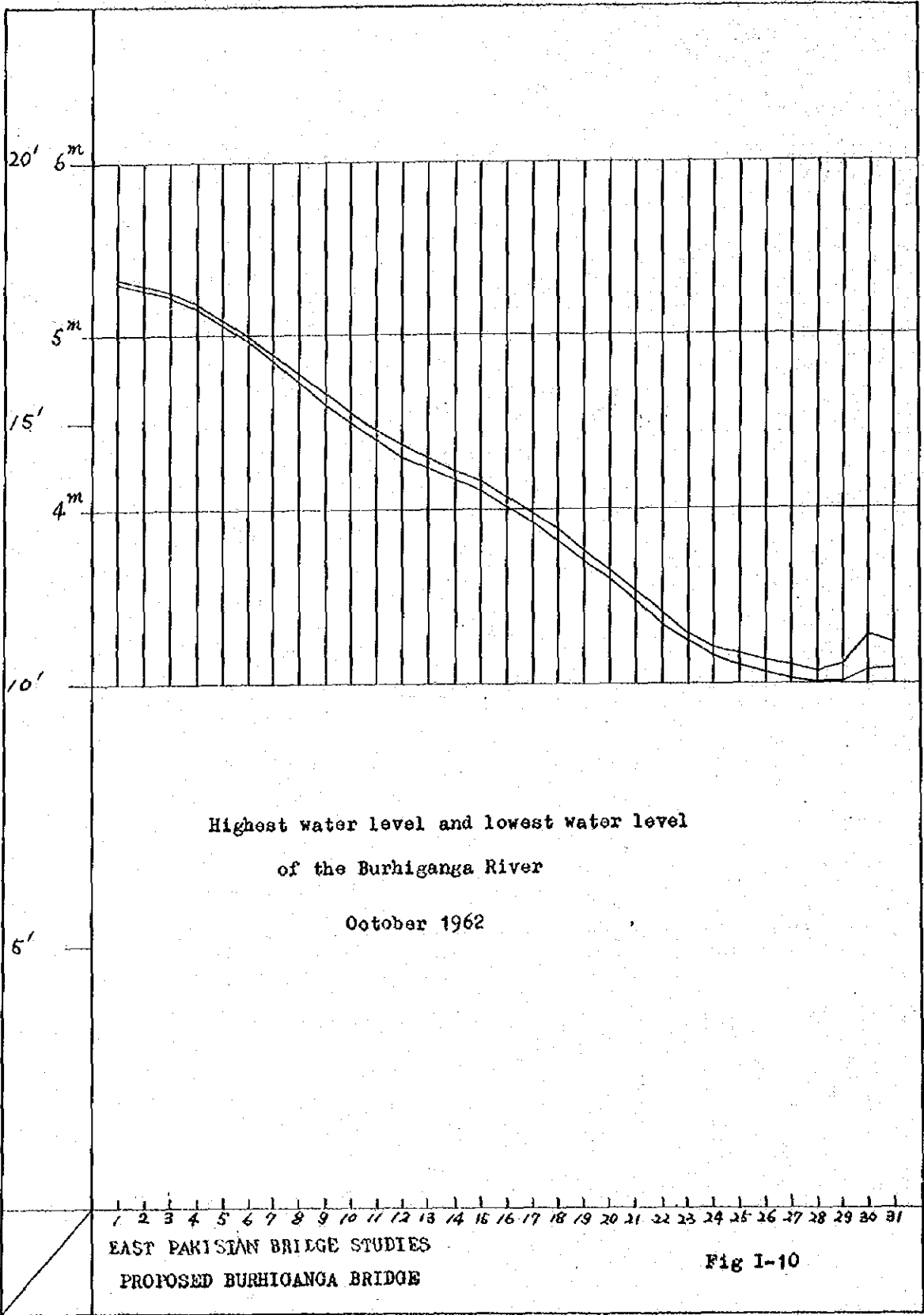




EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE

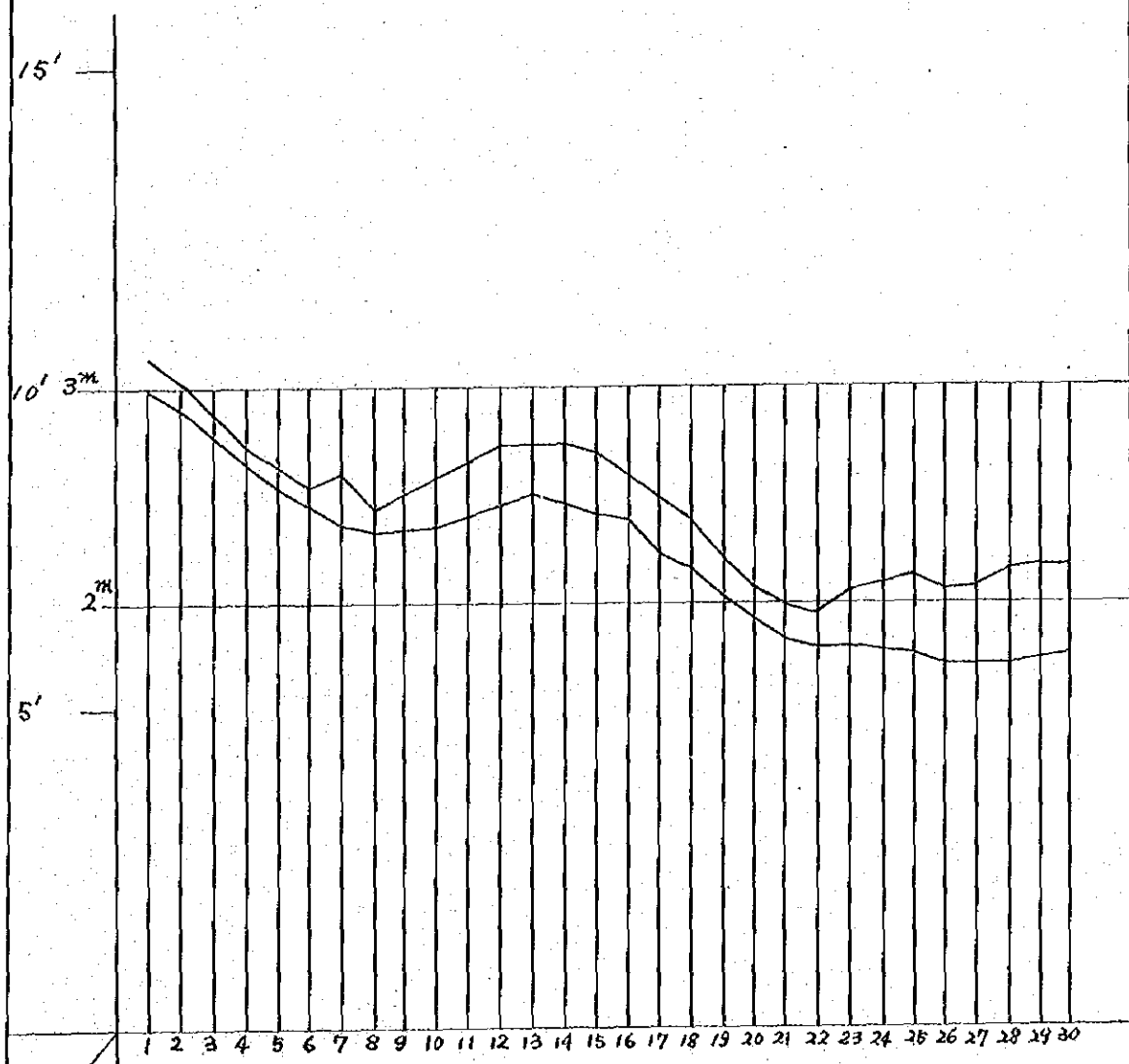
Fig 1-9





Highest water level and lowest water level  
of the Burhiganga River

November 1962

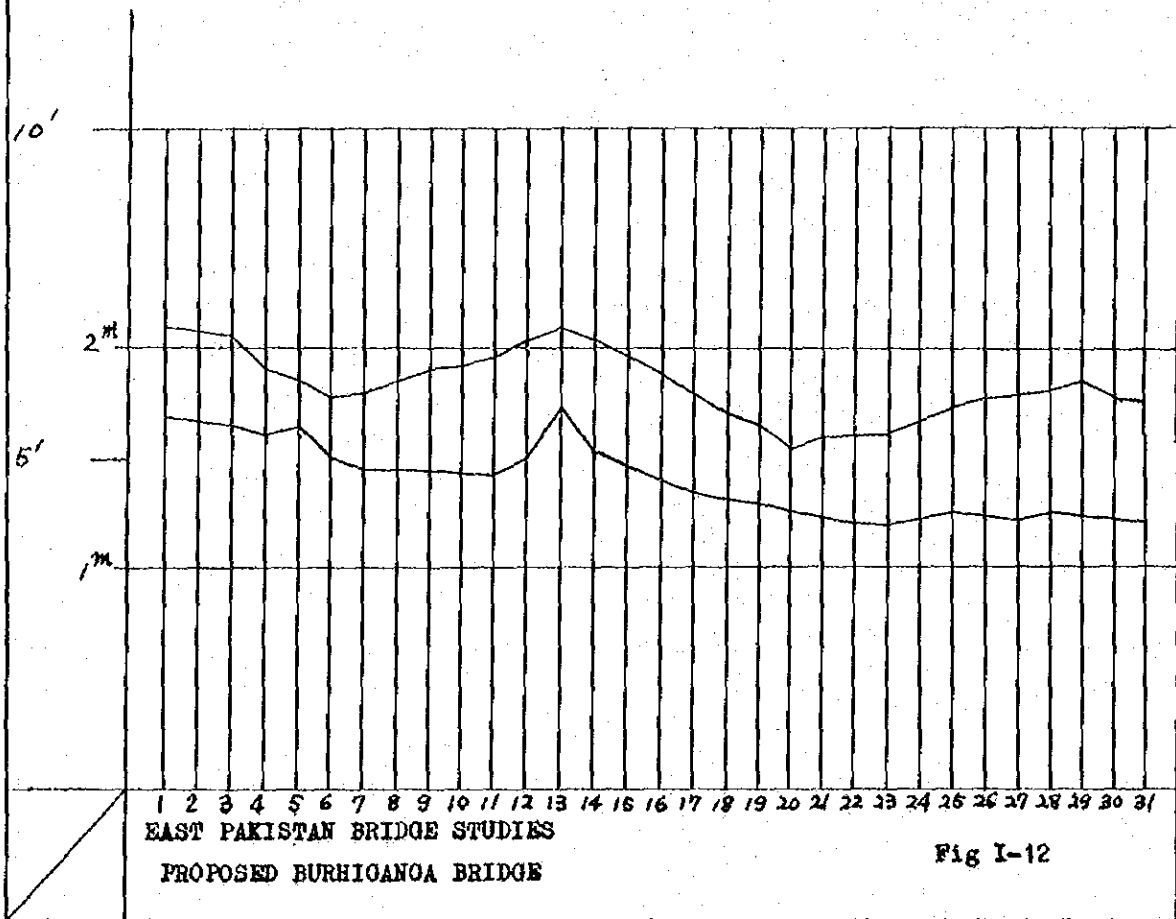


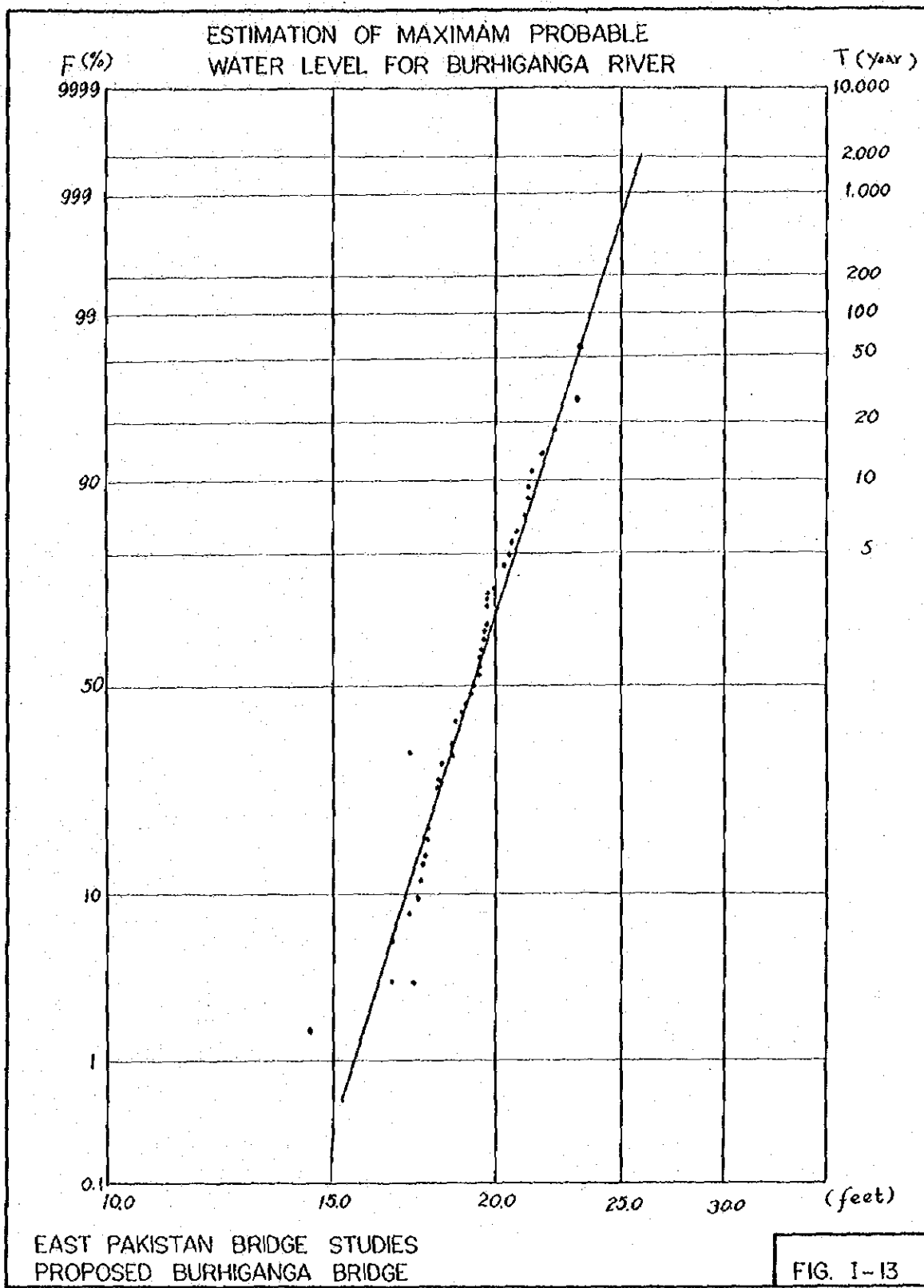
EAST PAKISTAN BRIDGE STUDIES  
PROPOSED BURHIGANGA BRIDGE

Fig I-11

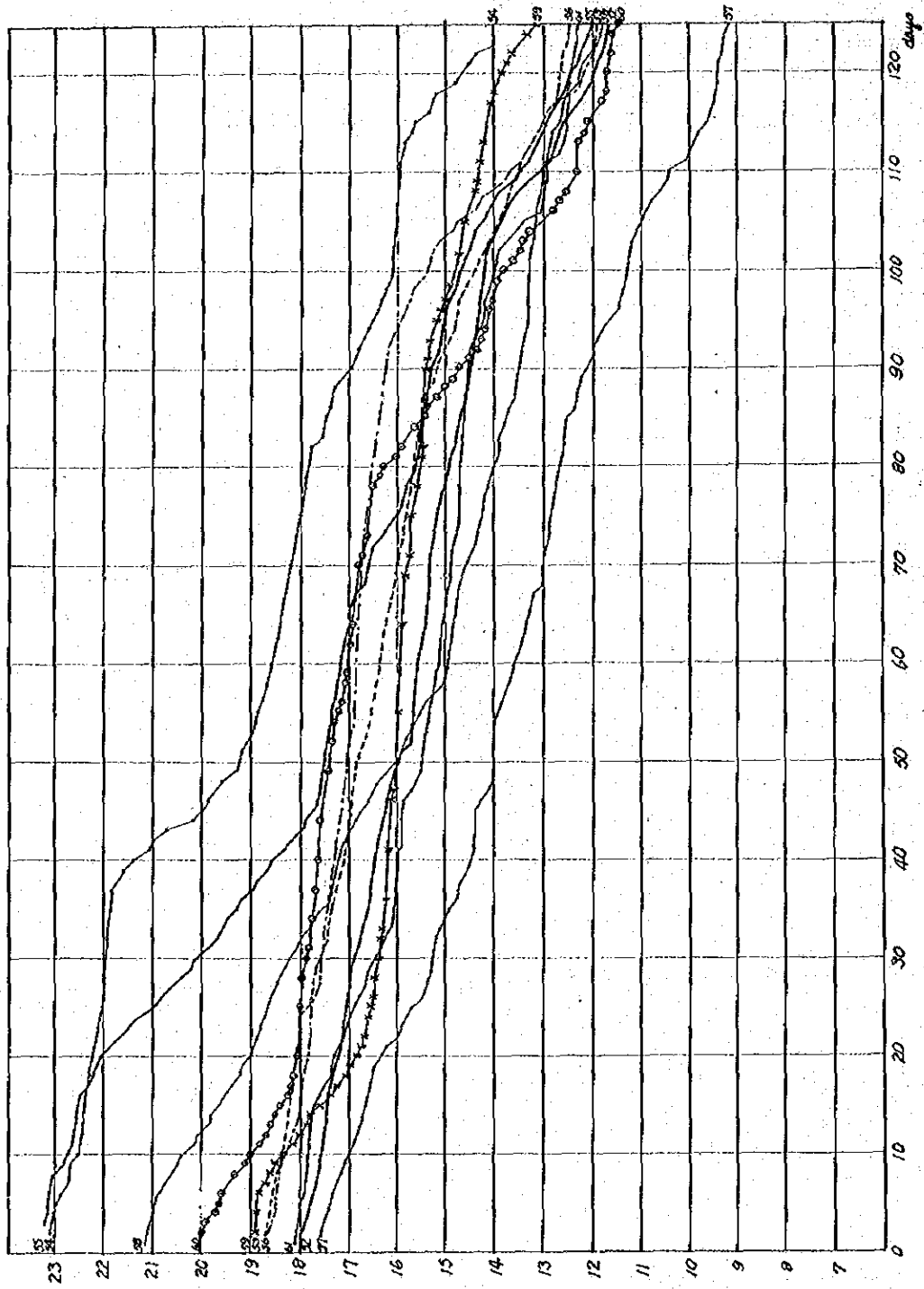
Highest water level and lowest water level  
of the Burhiganga River

December 1962





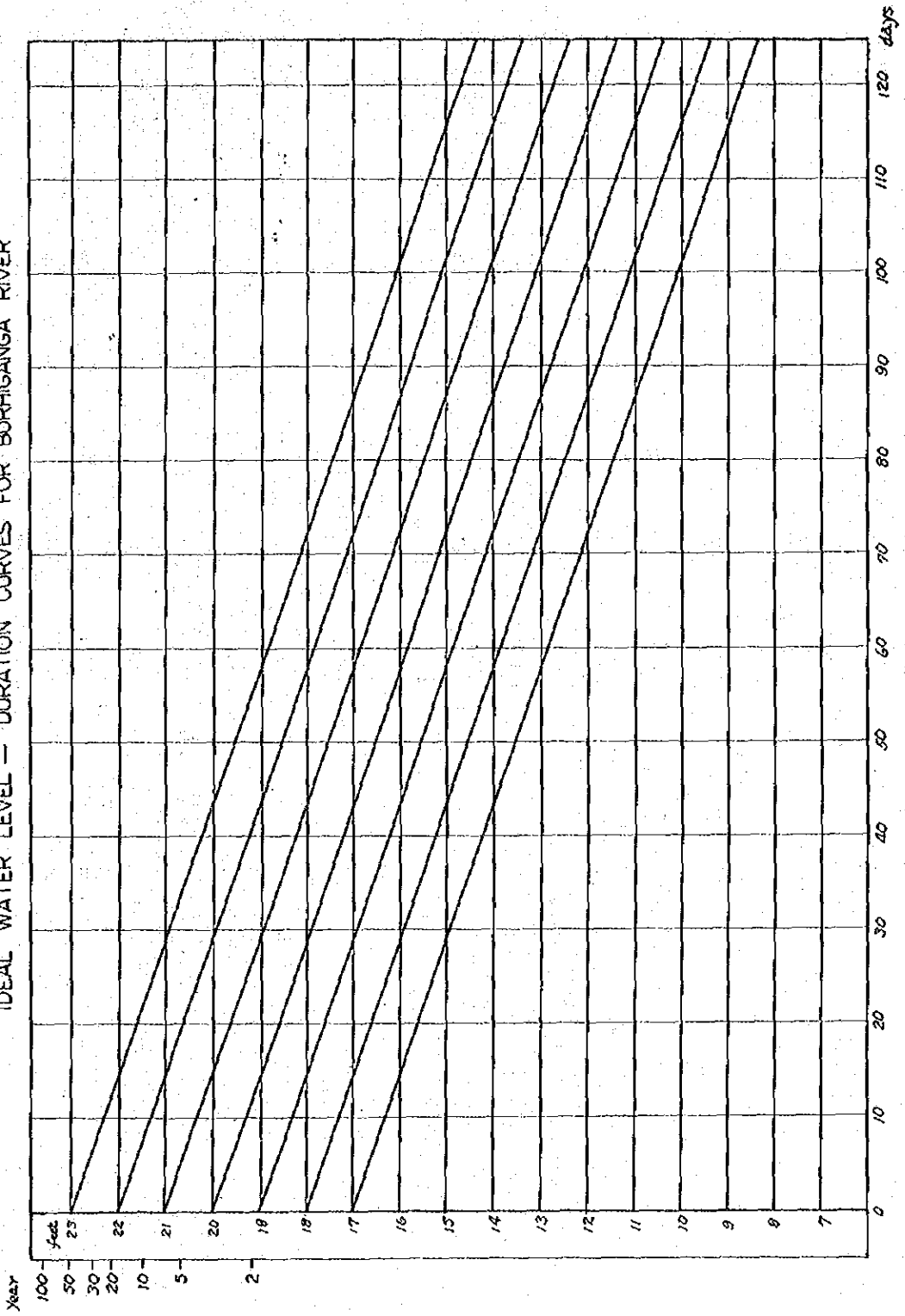
WATER LEVEL AND DURATION CURVES FOR BURHIGANGA RIVER



EAST PAKISTAN BRIDGE STUDIES, PROPOSED BURHIGANGA BRIDGE

FIG. I-14

IDEAL WATER LEVEL — DURATION CURVES FOR BURHIGANGA RIVER



EAST PAKISTAN BRIDGE STUDIES, PROPOSED BURHIGANGA BRIDGE

FIG. 1-15.

DISCHARGE - WATER LEVEL CURVE FOR TURAG RIVER

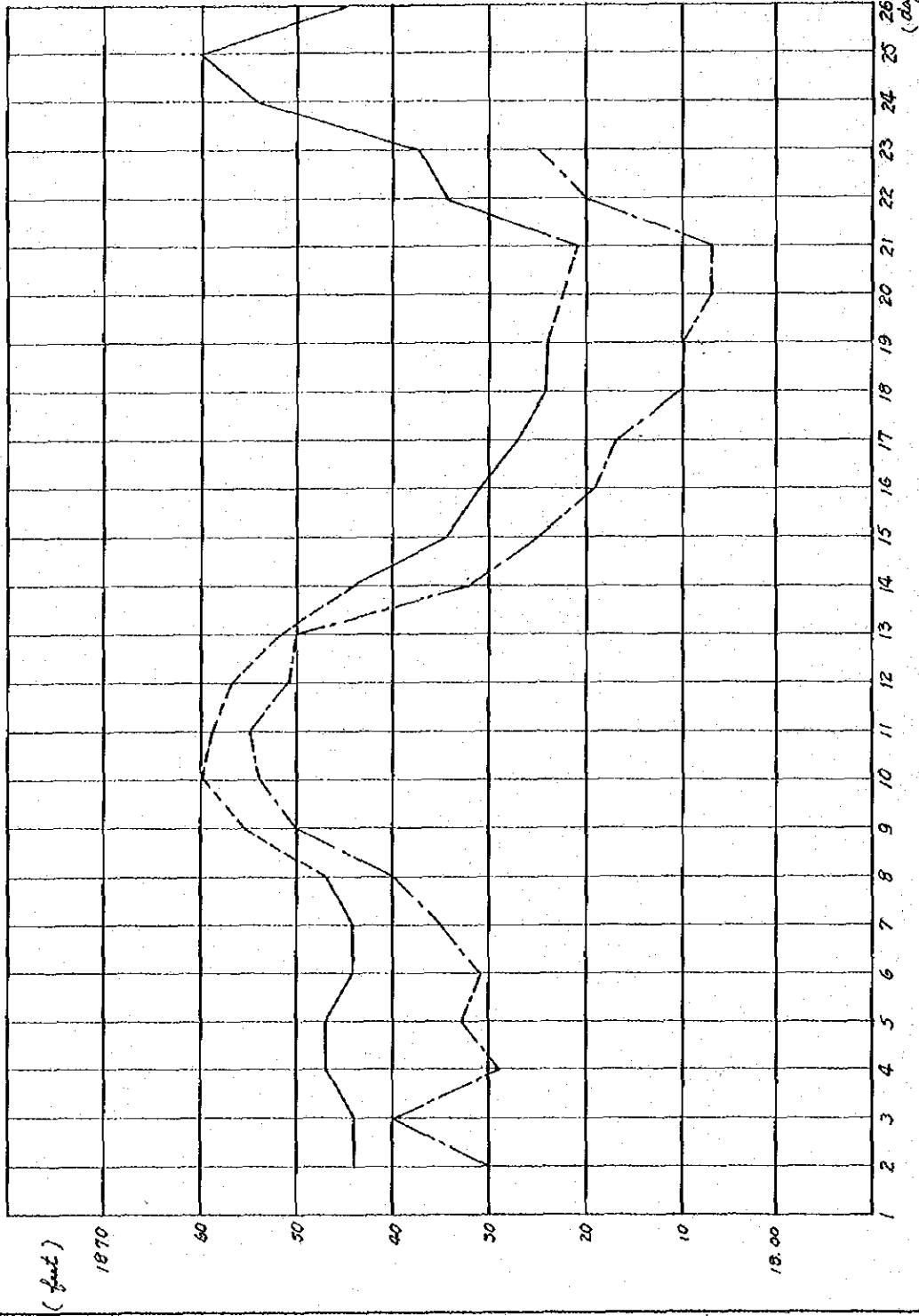
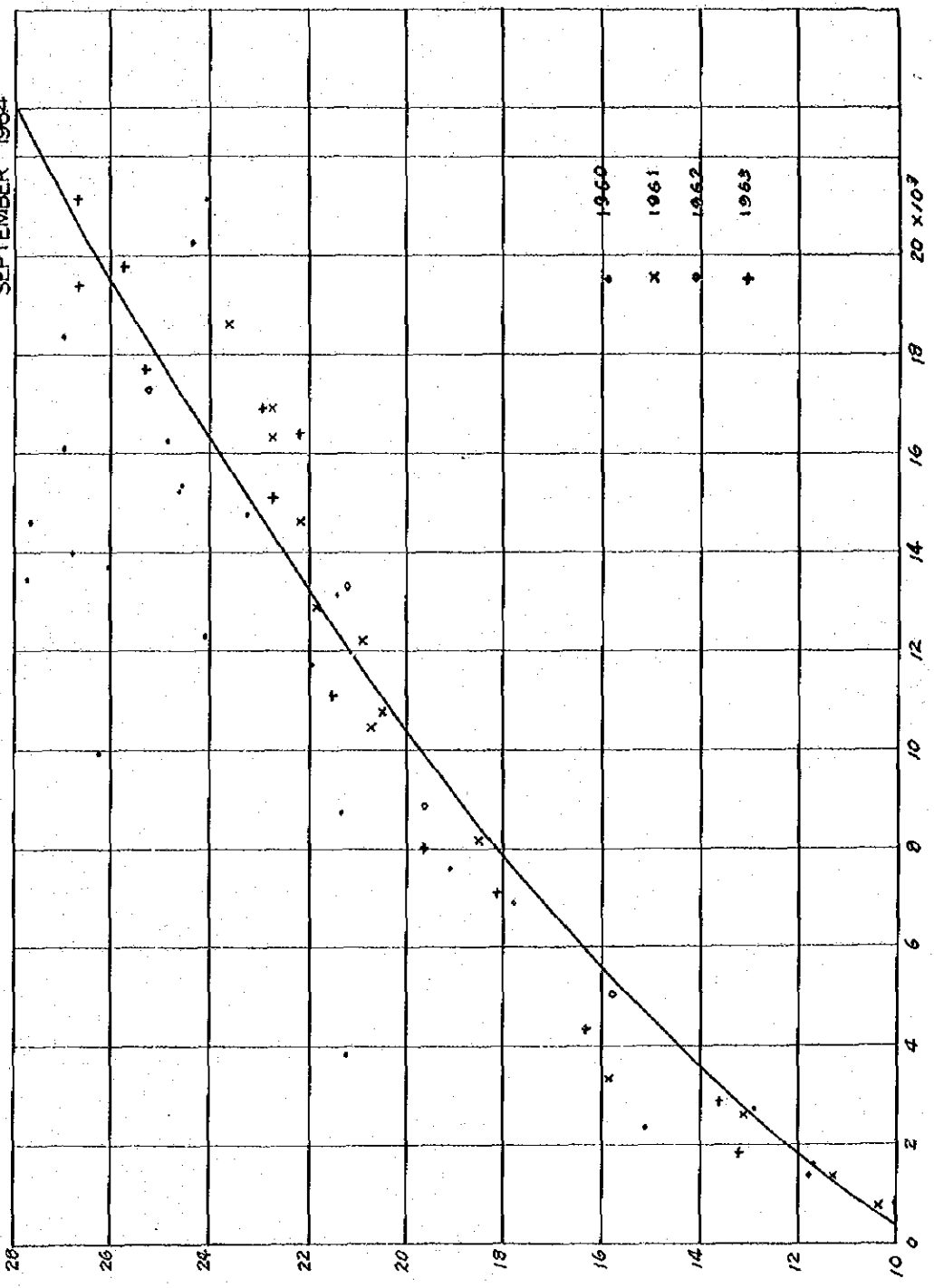


FIG. I-16

EAST PAKISTAN BRIDGE STUDIES, PROPOSED BURHIGANGA BRIDGE

WATER LEVELS AT PROPOSED BRIDGE SITE AND AT MILL BARRACKS, 2 SEPTEMBER TO 26, SEPTEMBER 1964



EAST PAKISTAN BRIDGE STUDIES, PROPOSED BURHIGANGA BRIDGE

FIG I-17



WATER DEPTHS OF DHALESWARI RIVER AT SITE  
OF DHALESWARI BRIDGE, IN 1961 AND 1964

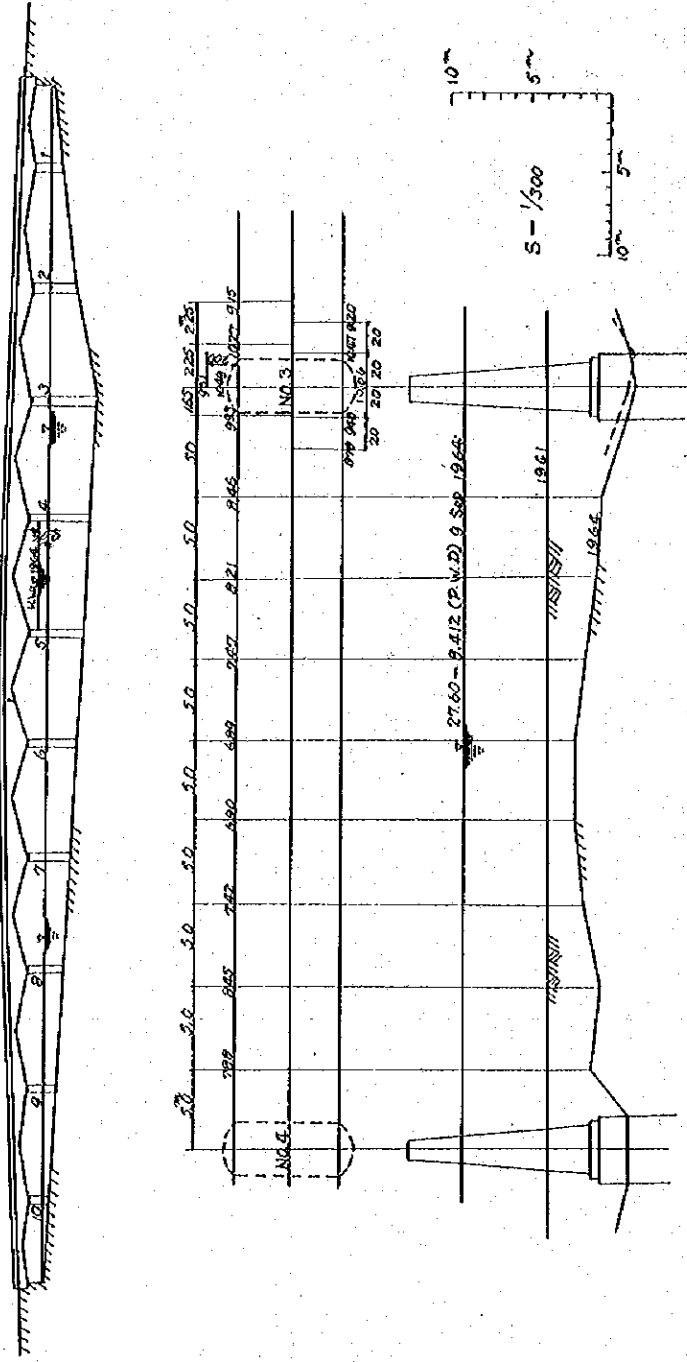


FIG. 1-18

EAST PAKISTAN BRIDGE STUDIES, PROPOSED BURHIGANGA BRIDGE

RELATION OF MAXIMUM SCOURED DEPTH AT PIER WITH WATER DEPTH (STUDY OF E. M. LAURSEN)

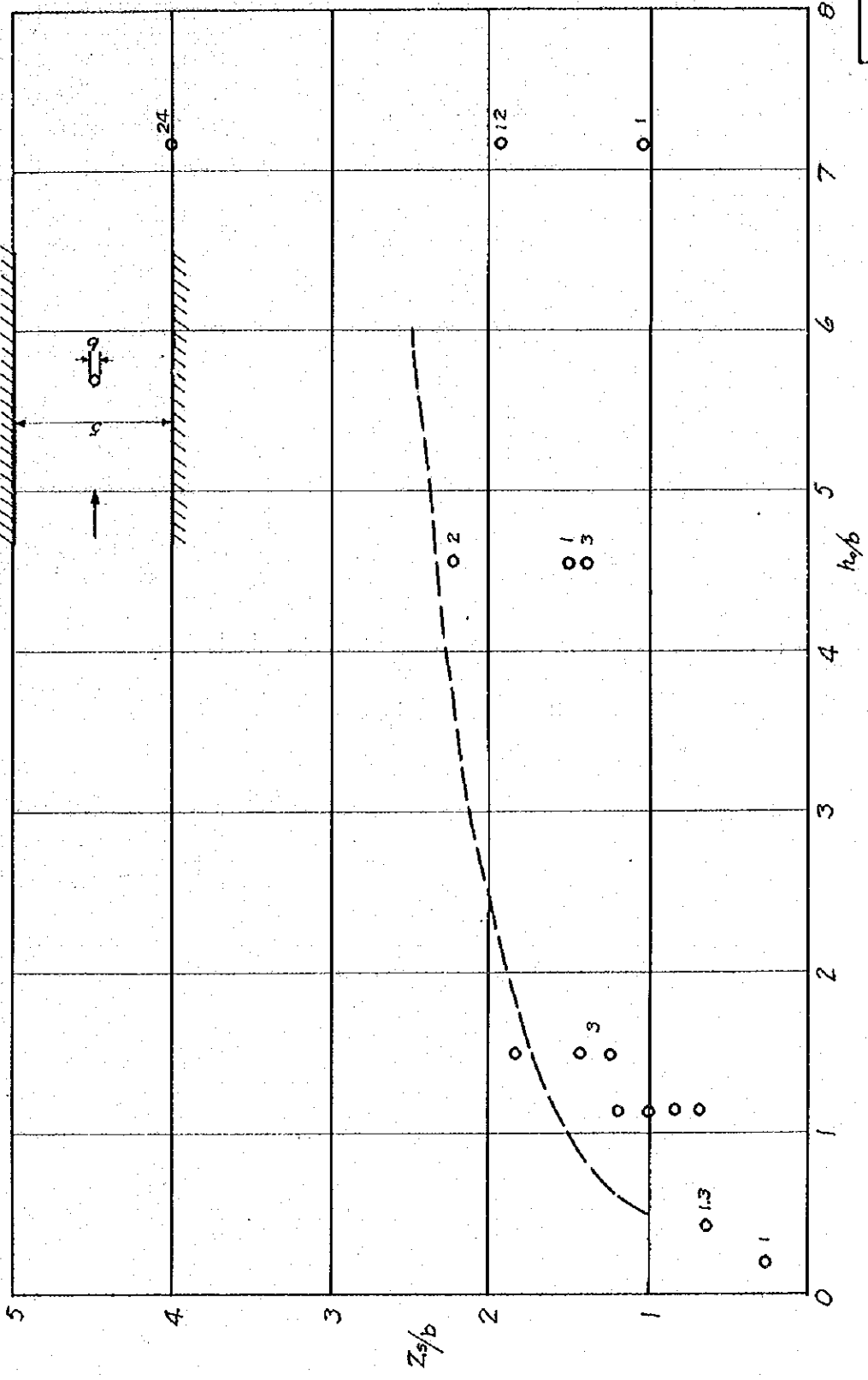


FIG. I-19

EAST PAKISTAN BRIDGE STUDIES, PROPOSED BURHIGANGA BRIDGE

## SURVEY FEE FOR THE BURRIGANGA BRIDGE.

The allotment of Japanese Government on the survey work at the site, preliminary design, planning of construction, cost estimation of construction for the proposed bridge over the Burhiganga at Dacca, is an amount of Rs.2.1 Lakhs converted from Japanese Yen.

The details of total Rs.2.1 Lakhs are specified as follows:

(1). Travelling Expenses ( Travel Allowance, Air Fee, Hotel Charges, Daily Allowance).	Rs.46,500
(2). Purchase of stationeries and Instruments for Triangulation Survey, Topographical Survey, River Survey, Plane Survey.	Rs. 6,500
(3). Fee of site Investigation Works	
(a) For Boring Work including purchase of Boring Machinery and Soil Exploration Equipment	Rs.103,000
(b) For Inland travel fee, taxi fare, Conference fee, Postage, etc.	Rs.12,000
(4). Transportation Fee of Machinery, Instruments, Equipments, etc. between Japan and Chittagong.	Rs. 4,000
(5). Office Work Fee in Japan (Map Making, Design -Calculation and Drawing, Planning of construction, Cost Estimation of construction)	Rs.29,500
(6). Report Making Fee in Japan	Rs. 8,500

---

Total: Rs.210,000

= Rs.2.1 Lakhs

SOIL EXPLORATING EQUIPMENTS

Item No.	Description of Goods	Quantity
<b>1. <u>Drilling Machines and Other Equipments</u></b>		
	Drilling machine, Tone Model UD-5	2 units
	Diesel engine for the above, Yanmar Model NT-95K	2 units
	Water pump, Tone Model NB3-60A	1 unit
	Diesel engine for the above, Yanmar Model NT-85K	1 unit
	Water pump, Tone Model BN	1 unit
	Diesel engine for the above, Yanmar Model NT-70K	1 unit
	Mud mixer, Tone Model MCE-100	1 unit
	Diesel engine for the above, Yanmar Model NT-65K	1 unit
<b>2. <u>Soil Explorating Tools and Accessories</u></b>		
	Drill rods, 40.5 mm x 3 m	53 pcs.
	Drill rods, 40.5 mm x 1.5 m	4 pcs.
	Drill rods, 40.5 mm x 1.0 m	4 pcs.
	Double tube core barrel, D-1B type 40.5mm x 75mm x 1.5m	1 set
	Double tube core barrel D-10 type 40.5mm x 75mm x 1.5m	1 set
	Standard penetration tester	2 sets
	Split spoon sampler for the above	2 sets
	Thin wall tube sampler, stationary piston type	2 sets
	Vane test apparatus	1 set
	Guide pipe, 105 mm x 3 m	13 pcs.
	Guide pipe, 105 mm x 1.5 m	1 pc.
	Guide pipe, 105 mm x 0.5 m	5 pcs.
	Casing pipe, 97 mm x 3 m	20 pcs.
	Casing pipe, 97 mm x 1.5 m	2 pcs.
	Casing pipe, 97 mm x 1.0 m	2 pcs.
	Casing pipe, 97 mm x 0.3 m	3 pcs.
	Hoisting swivel, B type, 40.5 mm	2 pcs.
	Water swivel, 40.5 mm	2 pcs.
	Hoisting swivel, 40.5 mm	2 pcs.
	Snutch block, 200 mm	2 pcs.
	Hoisting rope, 9 mm x 15 m	2 pcs.
	Rod safety clamp, A-20 type, 40.5 mm	2 sets

Item No.	Description of Goods	Quantity
	Rod safety valve, 40.5 mm	2 pcs.
	Flat bit, 40.5 mm x 101 mm	3 pcs.
	Flat bit, 40.5 mm x 86 mm	3 pcs.
	Fish-tail bit, 40.5 mm x 131 mm	1 pc.
	Cross bit, 40.5 mm x 101 mm x 86 mm	1 pc.
	Cross bit, 40.5 mm x 86 mm x 76 mm	1 pc.
	Guide pipe swivel, 40.5 mm x 105 mm	2 pcs.
	Guide pipe head, 105 mm	2 pcs.
	Guide pipe shoe, 105 mm	2 pcs.
	Guide pipe band, 105 mm	2 sets
	Casing pipe band, 97 mm	2 sets
	Casing pipe swivel, 40.5 mm x 97 mm	2 sets
	Drill rod band, 40.5 mm	2 sets
	Knocking block, 40.5 mm	2 pcs.
	Casing tap, 97 mm	1 pc.
	Core tube tap, 99 mm	1 pc.
	Core tube tap, 84 mm	1 pc.
	Core tube tap, 74 mm	1 pc.
	Rod inside tap, 40.5 mm	1 pc.
	Rod outside tap, 40.5 mm	1 pc.
	Suction hose with foot valve, 38 mm x 3 m	1 pc.
	Suction hose with foot valve, 32 mm x 3 m	1 pc.
	Delivery hose, 19 mm x 10 m	2 pcs.
	Delivery hose, 19 mm x 6 m	2 pcs.

### 3. Engineering Tools and Disassembling Tools

Engineering tools kit, A type	1 set
Disassembling tools, UD-5	2 sets
Disassembling tools, NB3-60A	1 set
Disassembling tools, BN	1 set
Disassembling tools, NT-95K	2 sets
Disassembling tools, NT-85K	1 set
Disassembling tools, NT-70K	1 set

Item No.	Description of Goods	Quantity
	Disassembling tools, NT-65K	1 set
4.	<u>Soil Testing Apparatus</u>	
	Testing apparatus for physical property	1 set
	Testing apparatus for mechanical property	1 set
	Accessories	1 set
5.	<u>Derrick and Accessories</u>	
	Tripod steel pipe derrick, 9 m	1 set
	Wire rope, 9 mm x 30 m	5 pcs.
	Ancker, 50 kg	4 pcs.
	Hipperer, 1 ton	2 pcs.
	Tirfer	2 pcs.
6.	<u>Wearing Tools for Soil Sampling</u>	
	TN metal crown, 101 mm	10 pcs.
	TN metal crown, 86 mm	20 pcs.
	TN metal crown, 76 mm	10 pcs.
	Single core tube, 99 mm x 1.5 m	2 pcs.
	Single core tube, 84 mm x 1.5 m	2 pcs.
	Single core tube, 74 mm x 1.5 m	2 pcs.
	Core tube coupling, 40.5 mm x 99 mm	2 pcs.
	Core tube coupling, 40.5 mm x 84 mm	2 pcs.
	Core tube coupling, 40.5 mm x 74 mm	2 pcs.
	Core shell complete, 99 mm	2 sets.
	Core shell complete, 84 mm	2 sets
	Core shell complete, 74 mm	2 sets
	Core lifter, 99 mm	6 pcs.
	Core lifter, 84 mm	6 pcs.
	Core lifter, 74 mm	6 pcs.
	TN metal, 5 x 5 x 8 mm	200 pcs.
	TN metal, 6 x 6 x 8 mm	50 pcs.

Item No.	Description of Goods	Quantity
	Flat bit, 40.5 mm x 99 mm	1 pc.
	Reverse bit, 40.5 mm x 99 mm	1 pc.
	Reverse bit, 40.5 mm x 84 mm	1 pc.
	Reverse bit, 40.5 mm x 74 mm	1 pc.
	Casing crown, 97 mm	7 pcs.
	TN metal crown, D-1B, 76 mm	10 sets
	Outer tube, D-1B, 74 mm x 1.5 m	1 pc.
	Inner tube, D-1B, 74 mm x 1.5 m	1 pc.
	Thin wall tube, 71.5 mm x 750 mm	50 pcs.
	Thin wall tube sampler, open drive, 71.5 mm x 750 mm	1 set
	Drive shoe for split spoon sampler	10 pcs.

7. Wearing Parts for Machines

Chuck piece, UD-5, 40.5 mm	2 sets
Chuck bolt, UD-5	1 set
Conical valve, C type, NB3-60A	4 pcs.
Valve seat, NB3-60A	4 pcs.
V packing, NB3-60A	22 pcs.
Piston, NB3-60A	2 pcs.
Cylinder liner, NB3-60A	1 pc.
Piston rod, NB3-60A	1 pc.
Valve rubber, NB3-60A	4 pcs.
Nozzle, NT-95K, 85K, 70K, 65K	ea. 1 set
Plunger with barrel. NT-95K, 85K, 70K & 65K	ea. 1 set
Piston packing, BN	2 sets
Valve seat, BN	1 set
Valve, BN	1 set
Gland packing, BN	5 sets

8. Fuel Oil, Lubricant Oil and Bentonite

Cup grease, 3 kg.	2 pails
Mobile oil, #30, 18 lit	5 pails

Item No.	Description of Goods	Quantity
	Diesel oil, 200 lit	4 pails
	Bentonite, 300 mesh, 25 kg.	125 bags
9.	<u>Miscellaneous</u>	
	Squire timber, 120 mm x 120 mm x 4000 mm	15 pcs.
	Angle, 80 mm x 80 mm x 3000 mm	12 pcs.
	Log, 2.5" x 3 m	6 pcs.
	Clamp, 200 mm x $\frac{1}{2}$ "	20 pcs.
	Wire clip, $\frac{1}{2}$ "	20 pcs.
	Corch screw	30 pcs.
	Bolt, $\frac{1}{2}$ " x 140 mm	20 pcs.
	Bolt, $\frac{1}{2}$ " x 250 mm	20 pcs.
	Iron wire, #8	10 kg.
	Wooden plate, 1"	6 tsabo
	Scoop	1 pc.
	Pick	1 pc.
	Saw	1 pc.
	Hatchet	1 pc.
	Nail puller	1 pc.
	Paraffine, 10 kg.	1 pc.
	Cap for thin wall tube	100 pcs.
	Manila rope, 6 mm x 100 m	1 roll
	Wooden tripod, 6 m	1 set
	Drum can, 200 L	2 drums
	Drum can, 100 L	2 drums



List of Personnel in Pakistan related to Japanese Bridge Survey Mission to East Pakistan, 1964.

The Government of East Pakistan:

His Excellency Abdul Monem Khan	Governor of East Pakistan
Mr. Ali Asghar	Chief Secretary, Secretariat
Mr. Qamar-ul-Islam	Additional Chief Secretary (Planning)
Mr. H. T. Ali	Additional Chief Secretary (Services & General Administration)
Mr. A. M. S. Ahmad	Secretary of Basic Democracies & Local Government Department
Mr. M. Koramat Ali	Secretary of Railways, Waterways & Road Transport Department
Mr. H. A. Khan	Chief Engineer, Roads & Highways
Mr. S. D. Khan	Joint Secretary, B.D. & L.G. Dept.
Mr. A. N. Haq	Deputy Secretary, B.D. & L.G. Dept.
Mr. S. J. A. Dighvi	Section Officer, B.D. & L.G. Dept.
Mr. A. H. S. Alam	Member of Planning Board, Planning Department
Mr. M. M. Rahman	Deputy Secretary, Planning Department
Mr. S. Rahman	Secretary, Works, Power & Irrigation Department
Mr. Nul Talukdar	Executive Engineer, Roads & Highways

Dacca Improvement Trust:

Mr. G. A. Madani	Chairman
Mr. M. Noman	Chief Engineer
Mr. F. Ahmad	Secretary
Mr. M. A. Hafiz (Proj.)	Executive Engineer
Mr. M. A. Jabbar	Executive Engineer
Mr. A. S. M. Ahsan	Finance Officer
Mr. K. R. Chouhury	Assistant Town Planner
Mr. A. B. M. Siddique Rahman	Assistant Engineer
Mr. Abdur Rashid	Assistant Engineer

Other East Pakistan Persons:

Mr. G. Rahman	Chairman, Chittagong Development Authority
Mr. Faiz Ahmed	Director, Hydrology, East Pakistan Water and Power Development Authority

Mr. Abdul Barik Bhuiyan

Mr. A. I. M. Dara

Mr. S. H. Khoja

Deputy Director, Hydrology, EPWAPDA

Assist. Technical Officer, EPWAPDA

Chief Engineer, I. W. T. A.

The Government of Pakistan:

Mr. Osman Ali

Secretary, Economic Affairs Division  
President Secretariat

Mr. M. A. Memon

Deputy Secretary, Do

Mr. G. Rabbani

Section Officer, Do

Consulate-General of Japan, Dacca:

Mr. K. Takenaka

Consul-General

Mr. J. Asai

Consul

Mr. S. Matsumoto

Vice-Consul

Mr. M. Karim

Secretary

Mr. Hideo Mori

Chief of Pakistan Japan Agriculture  
Extension Trading Institute

Embassy of Japan, Karachi:

Mr. M. Kakitsubo

Ambassador

Mr. T. Oyamada

Counsellor

Mr. I. Iwanishi

Agricultural Secretary

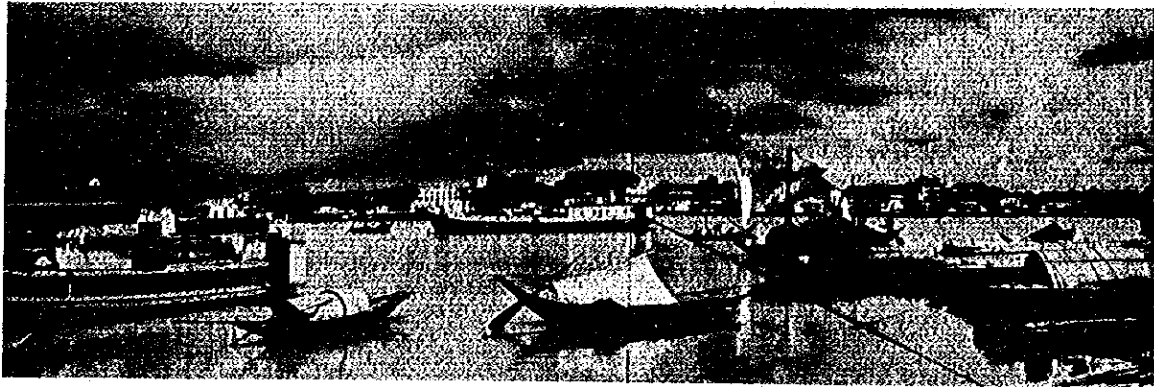


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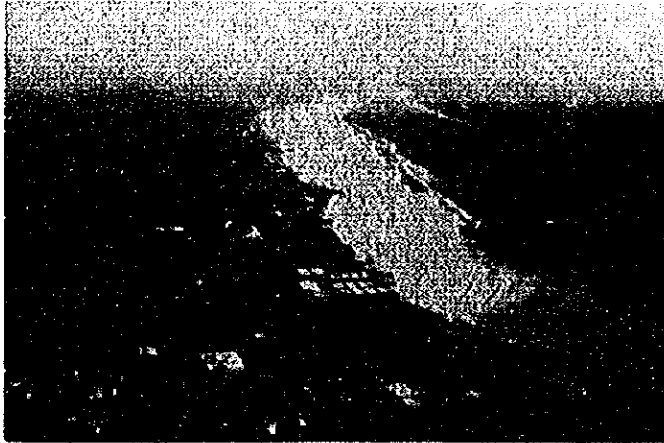


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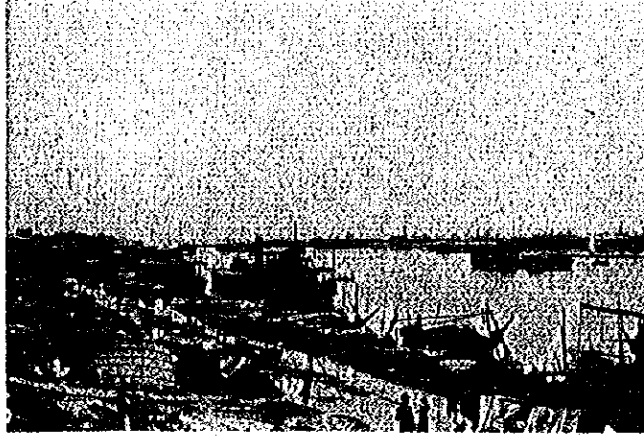


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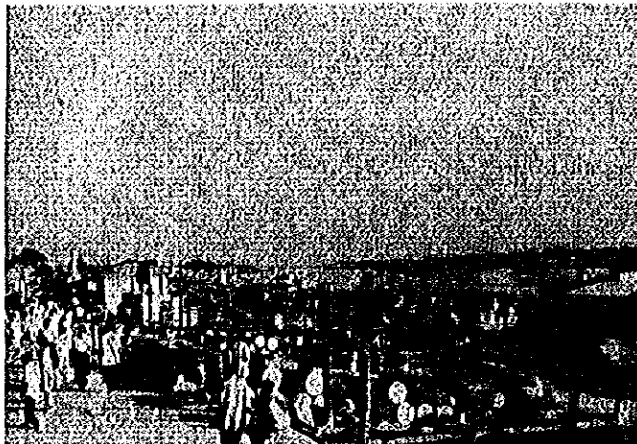


Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10

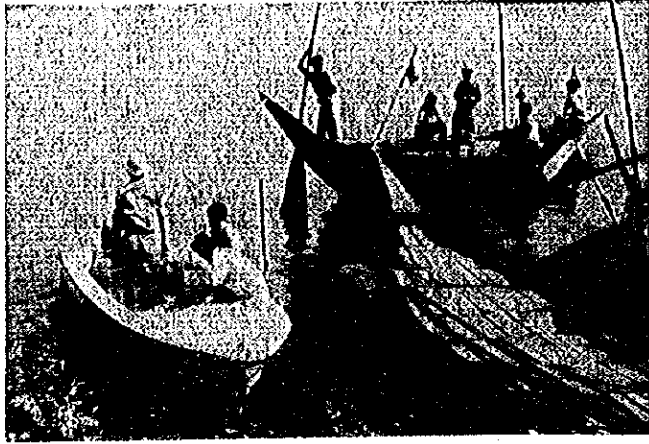


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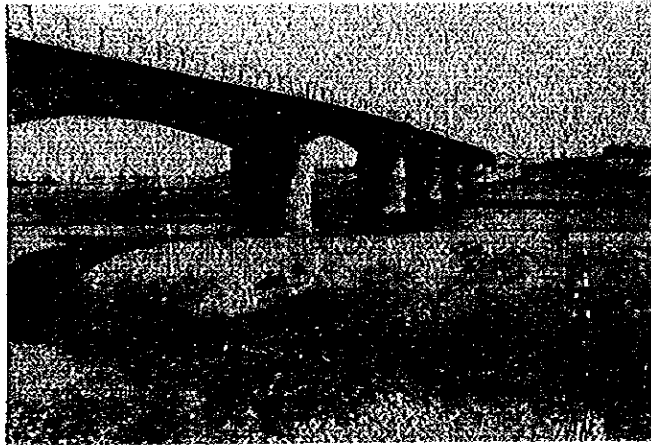


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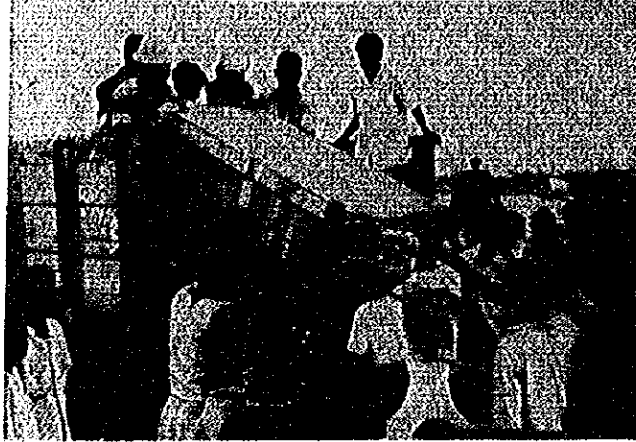


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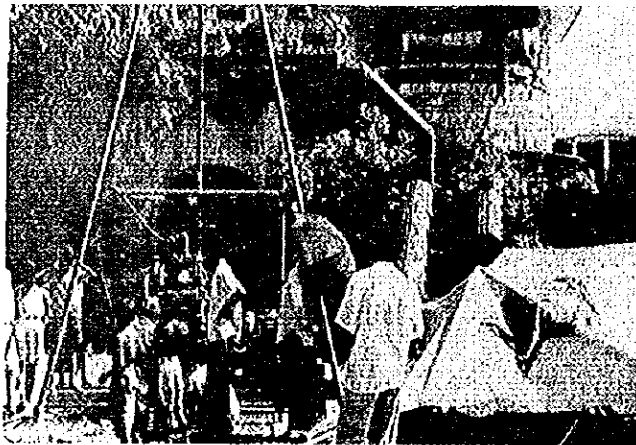


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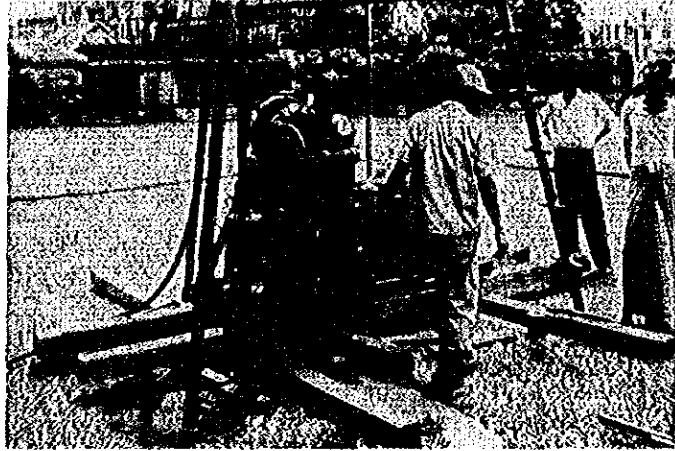


Photo 15



Photo 16

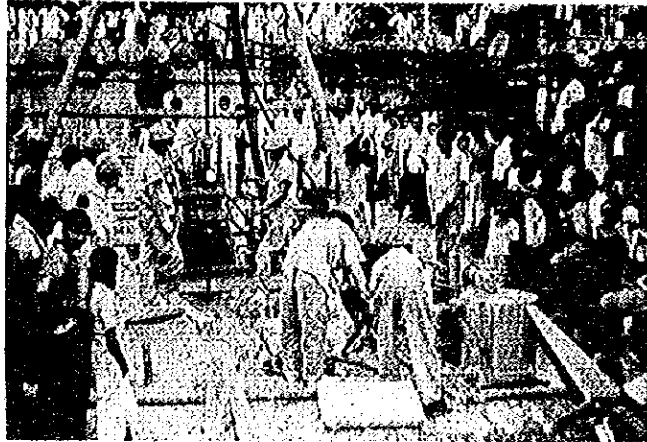


Photo 17



Photo 18



Photo 19

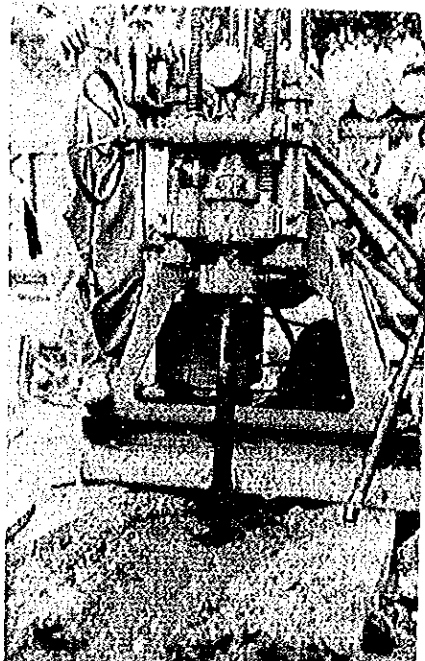


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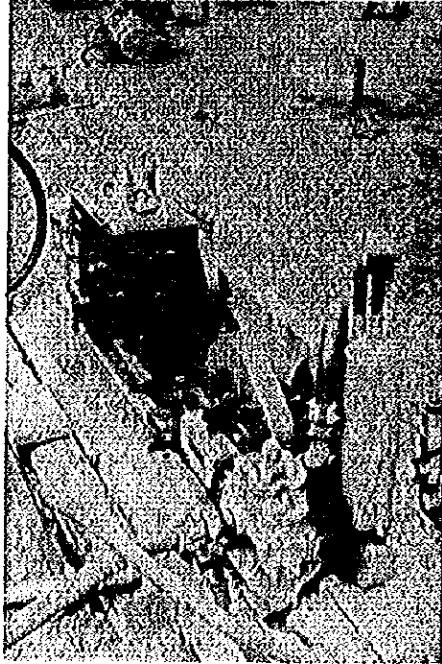


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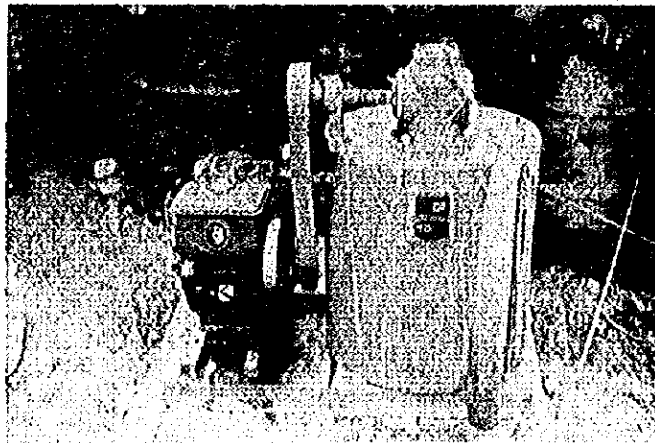


Photo 22



Photo 23

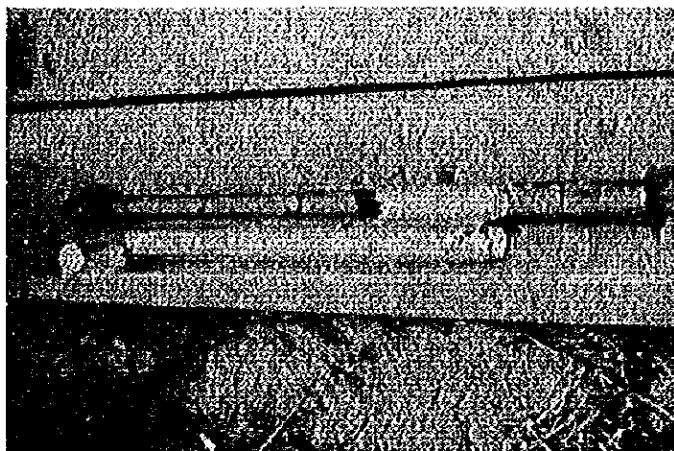


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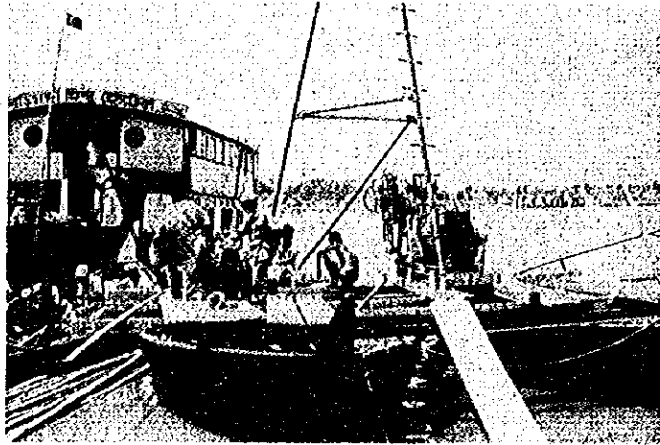


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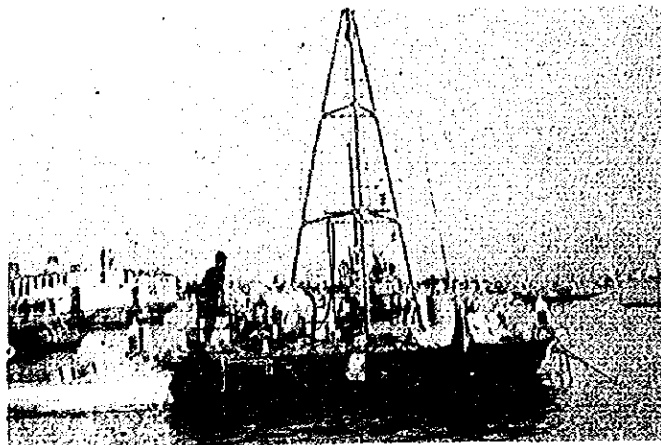


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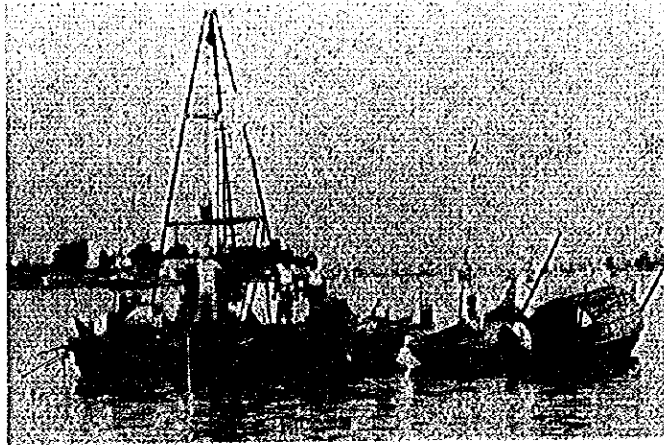


Photo 27



Photo 28



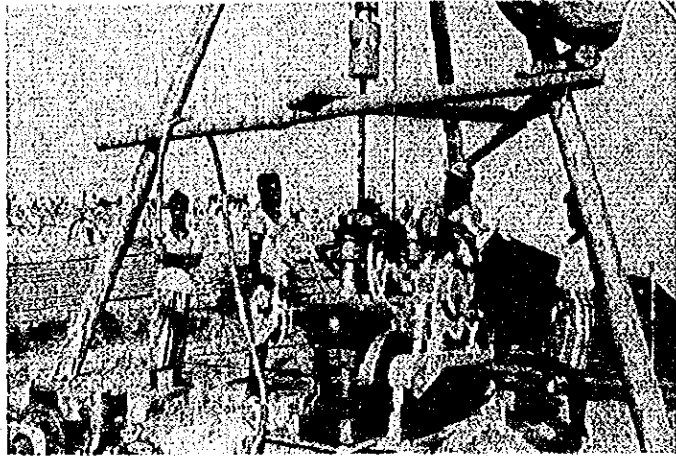


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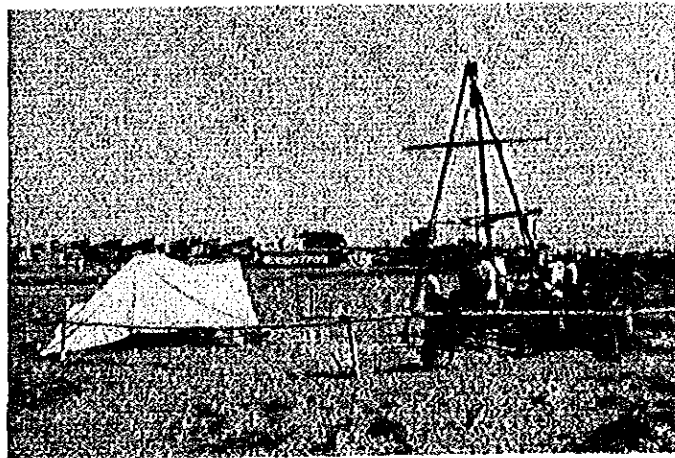


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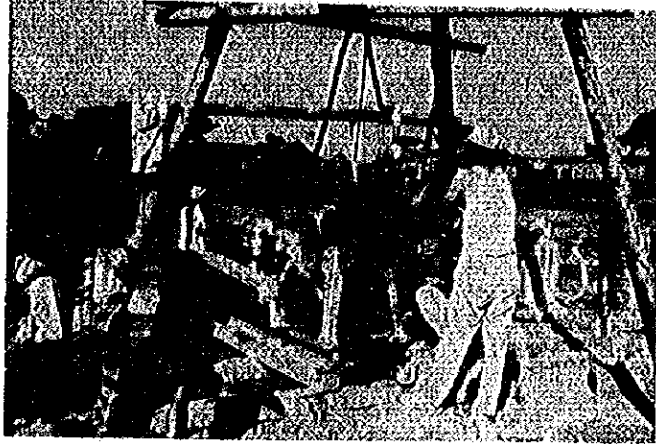


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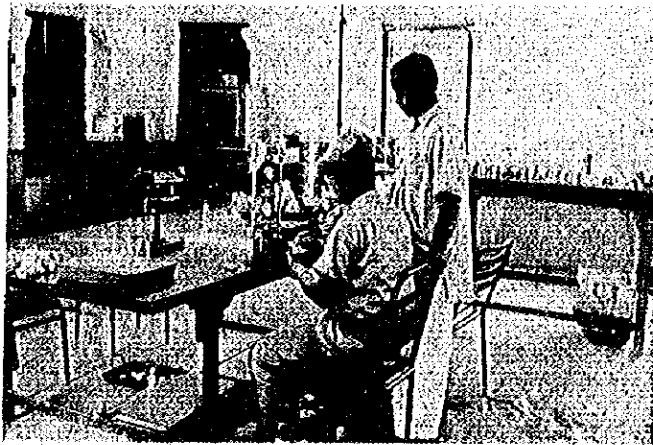


Photo 32



Photo 33

REPORT ON INVESTIGATIONS FOR CONSTRUCTION OF THE BURRIGANGA RIVER BRIDGE EAST PAKISTAN

101  
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