社会開発協力部報告書

No. 7

THE PEOPLE'S REPUBLIC OF BANGLADESH

FEASIBILITY STUDY
ON
MEGHNA, MEGHNA-GUMTI BRIDGES CONSTRUCTION PROJECT

FINAL REPORT
DRAWINGS

MARCH, 1985

JAPAN INTERNATIONAL COOPERATION AGENCY

SDF
CR (10)
85-047 (3/3)

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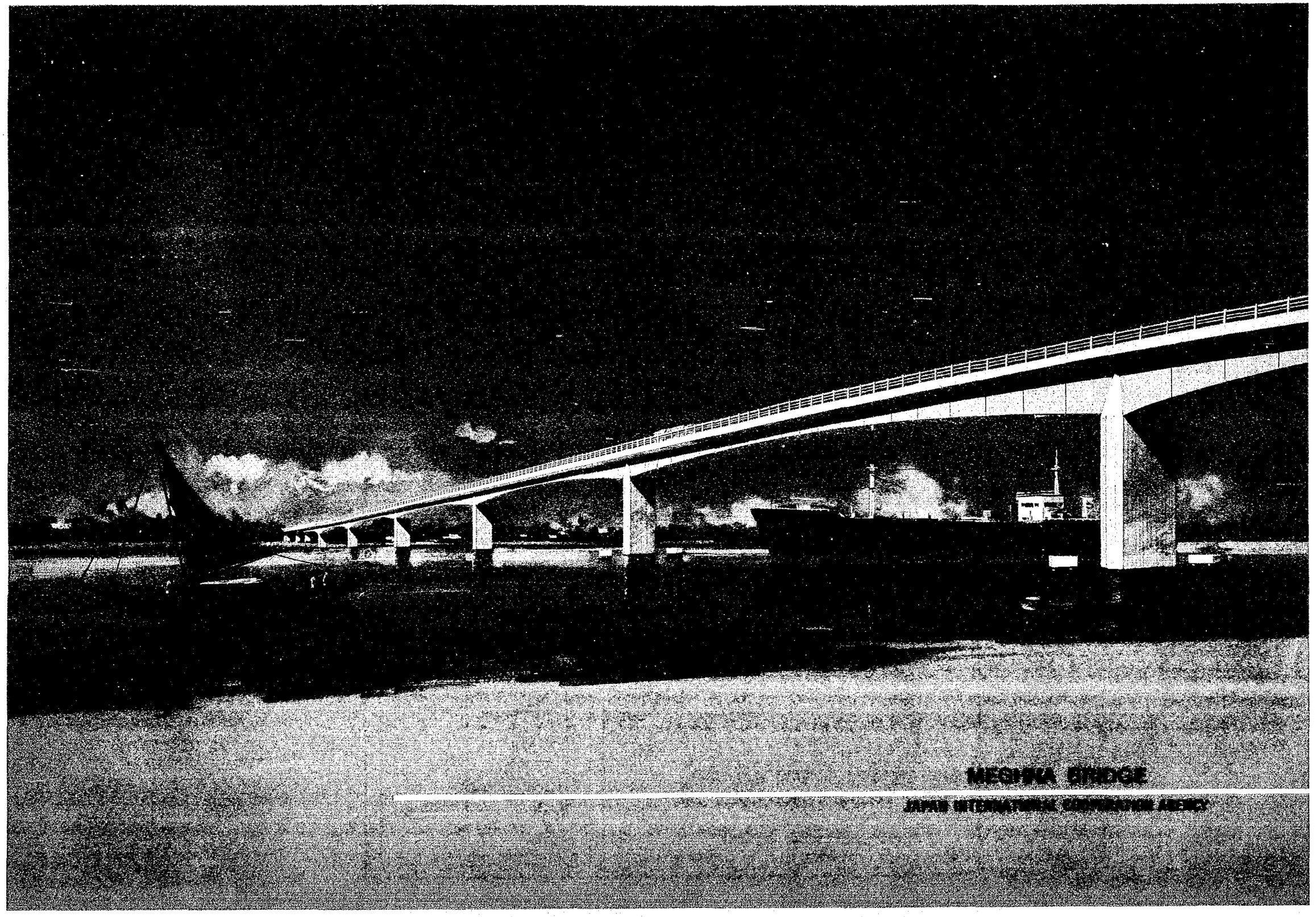
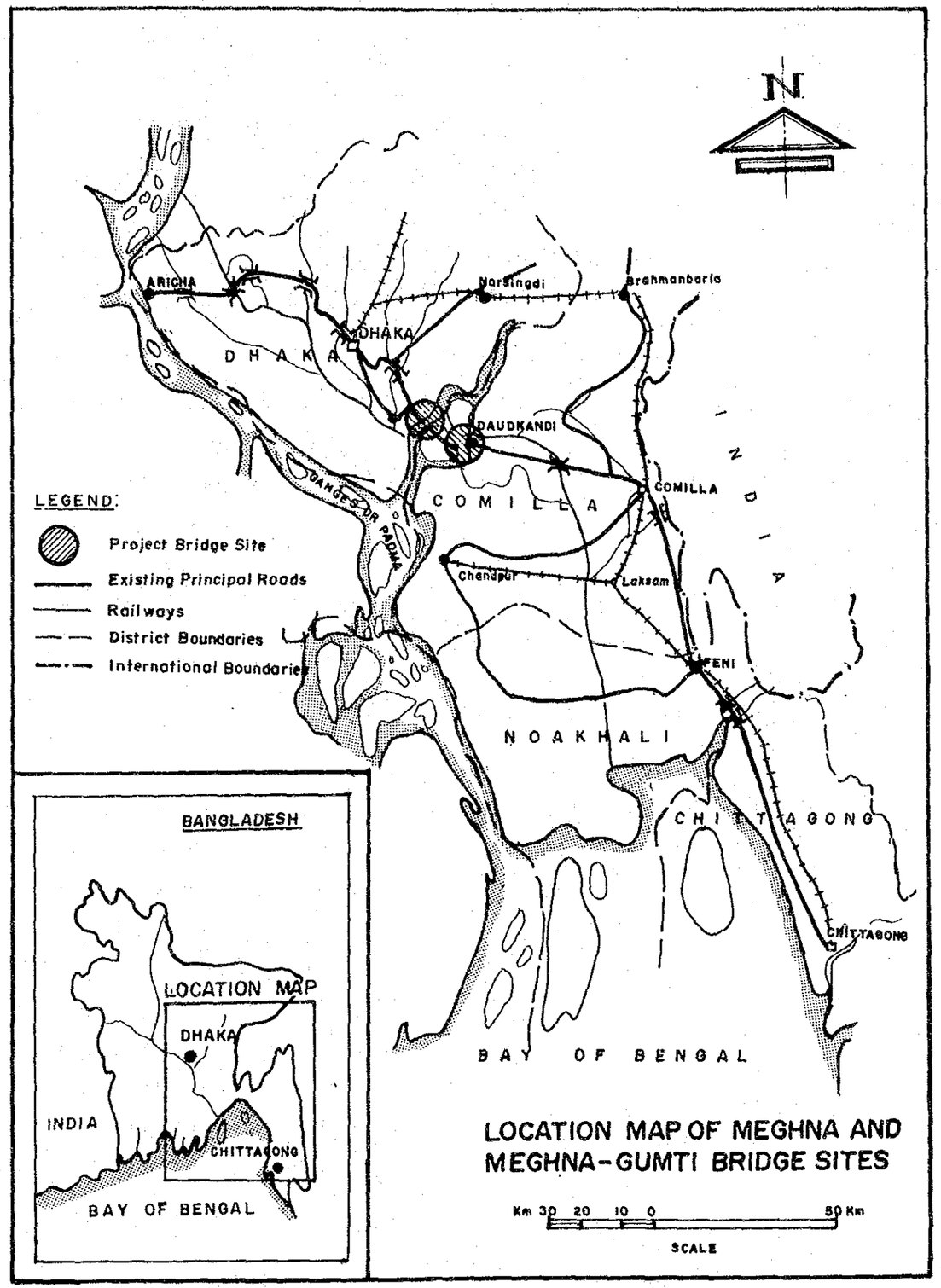


MEGHNA BRIDGE

JAPAN INTERNATIONAL COOPERATION AGENCY


N
ARICHA
Narsingdi
Brahmanbaria
DHAKA
DHAKA
DAUDKANDI
COMILLA
COMILLA
Chandpur
Laksam
FENI
NOAKHALI
CHITTAGONG
CHITTAGONG
BAY OF BENGAL
LEGEND:
Project Bridge Site
Existing Principal Roads
Railways
District Boundaries
International Boundaries
BANGLADESH
LOCATION MAP
DHAKA
INDIA
CHITTAGONG
BAY OF BENGAL
LOCATION MAP OF MEGHNA AND MEGHNA-GUMTI BRIDGE SITES
Km 30 20 10 0 50 Km
SCALE

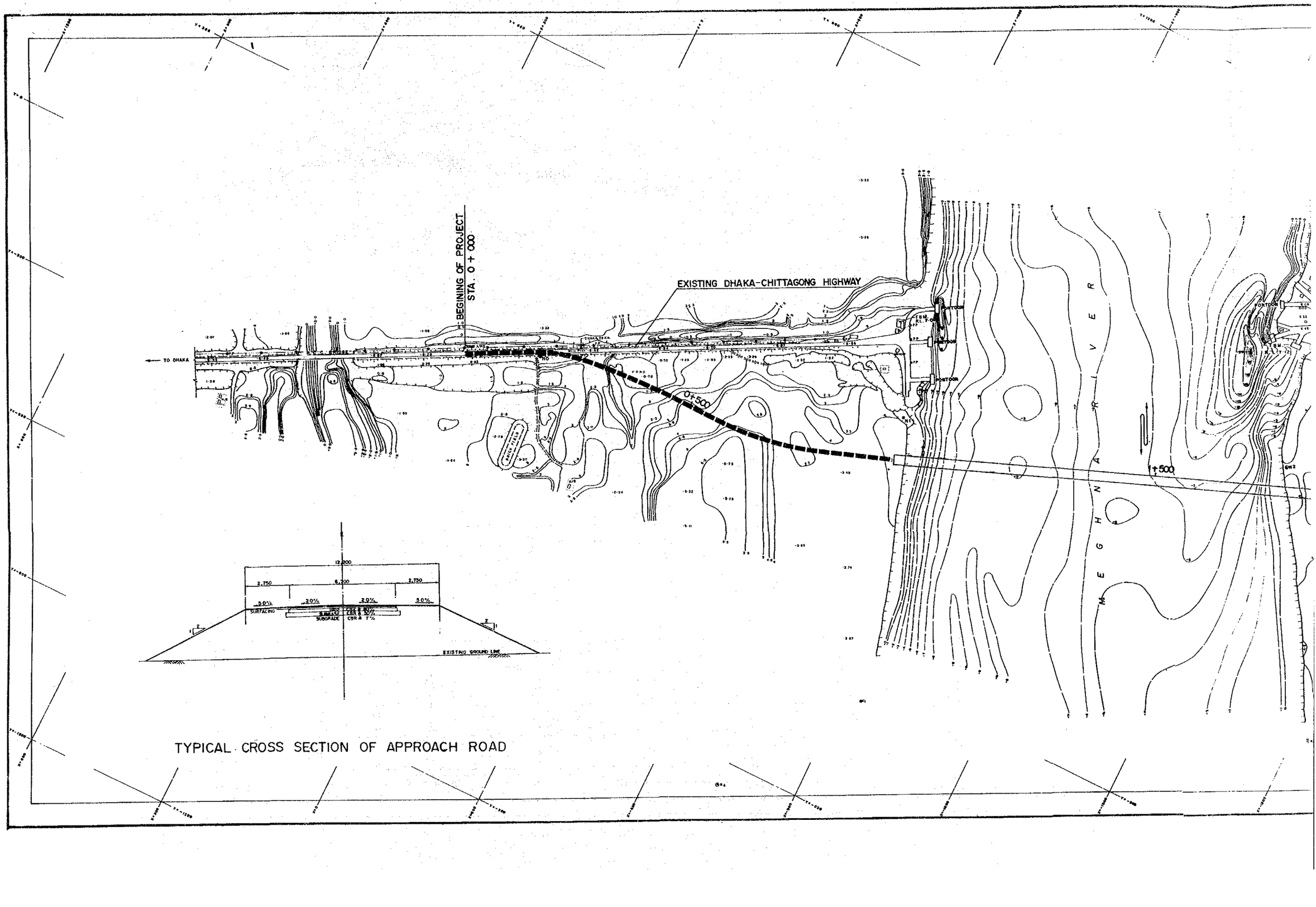
DRAWINGS

CONTENTS

PROJECT	DRAWING. No	TOTAL SHEET
	1	

MAP OF PROJECT AREA

Daulatpur
Sympur
DHAKA
Dhamgar
Dhankunda
Lakshman Khole
Barapara
Tipura
Baidya Bazar
Mugar Char
Manikar Char
Sonakandi
Chhalibhangu
Ferry
Nabiganj
SITALAKHYA R.
NARAYANGANG
Dudhghala
Meghna Bride Site
Gazaria par
MEGHNA RIVER
Char Pathalia
Bara Lakshmipur
Bara Alipur
Sakirgaon
Bhabanipur
Karimabad
KALATIA R.
N
Tengar Char
Husaindi
Bajanibari
Sona Char
Balukandi
Gotgharia kandi
DHALESWARI RIVER
Char Hogla
Goalgaon
Uttar Fuldi
Bhitikandi
DHAKA-CHITTAGONG HIGHWAY
BM 16.72
Hasnabad
Dim Char
Puron Bausia
Chengakandi
MEGHNA RIVER
Nagar Char
FULDI RIVER
Bausia
BRANCH MEGHNA R.
GUMTI R.
Meghna-Gumti Bridge Site
Ramjanbeg
Daudkandi
Barajakuri
COMILLA
Nayanagar
Ramjanbeg
Guagachhia
Nobyo Char
Basur Char
Paschimkandi
MEGHNA RIVER
MEGHNA RIVER



TYPICAL CROSS SECTION OF APPROACH ROAD

PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	2	

MAP OF PROJECT ROAD

APPROX MAGNETIC NORTH

N

EXISTING DHAKA-CHITTAGONG HIGHWAY

END OF PROJECT STA. 2+895

CHOTA BALUA KANDI

TO COMILLA

BALUA KANDI

HOME STEAD

TBM RL. 7·332

PONTOON

Power Line (Under Const.)

2+500

1+500

2

M E G H N A R I V E R

F U L G I N A D I

LEGEND:

Trees ... ...

Power Line (Under Construction) ... ...

NOTE:

All the elevation's appearing in this sheet refer to T.B.M. on the south-east corner of the bottom of railing of a culvert on Dhaka-Comilla road which is about 225 metre-east from the Meghna ghat (Comilla Bank) R.L. 7·332 (P.W.D)

H.F.L. 6·189m. on 10-8-1974.

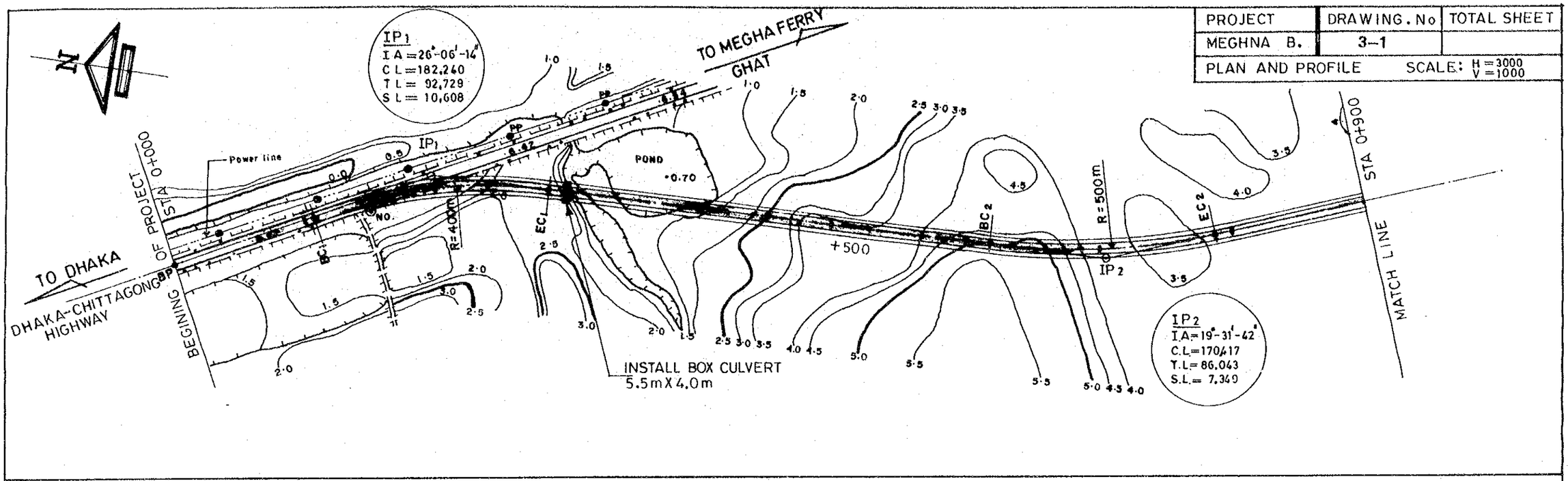
Contour interval 0·50m.

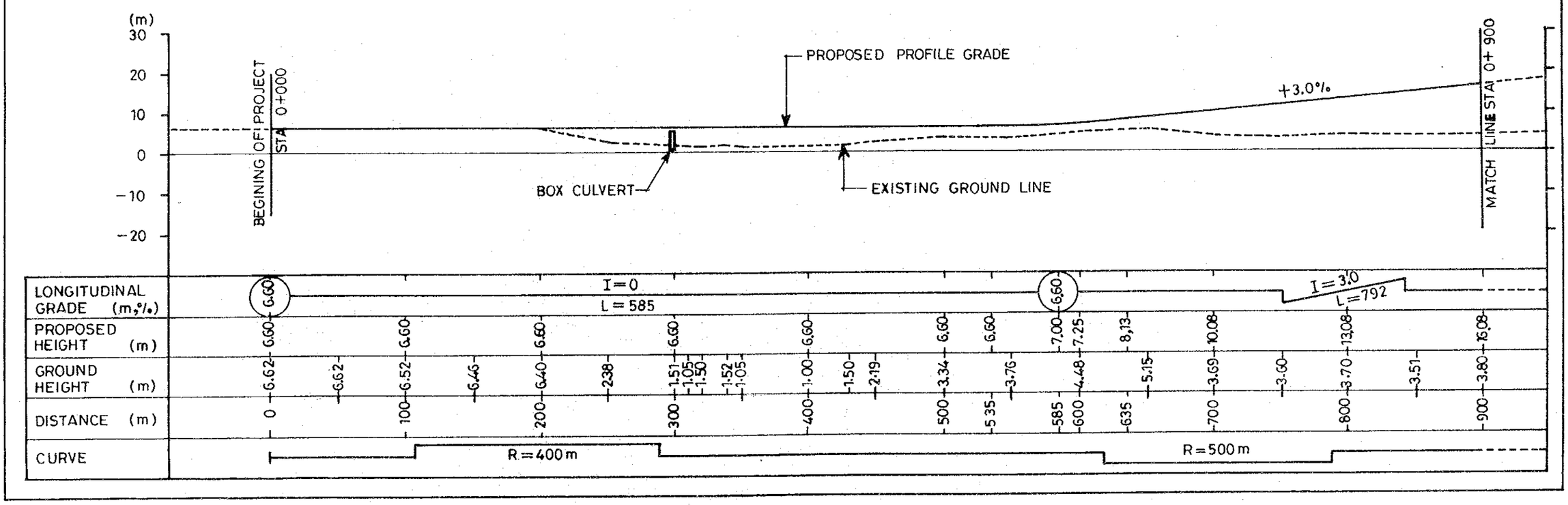
Local Coodinates are shown in this sheet.

METRE 50 0 50 100 150 200 250 300 350 400

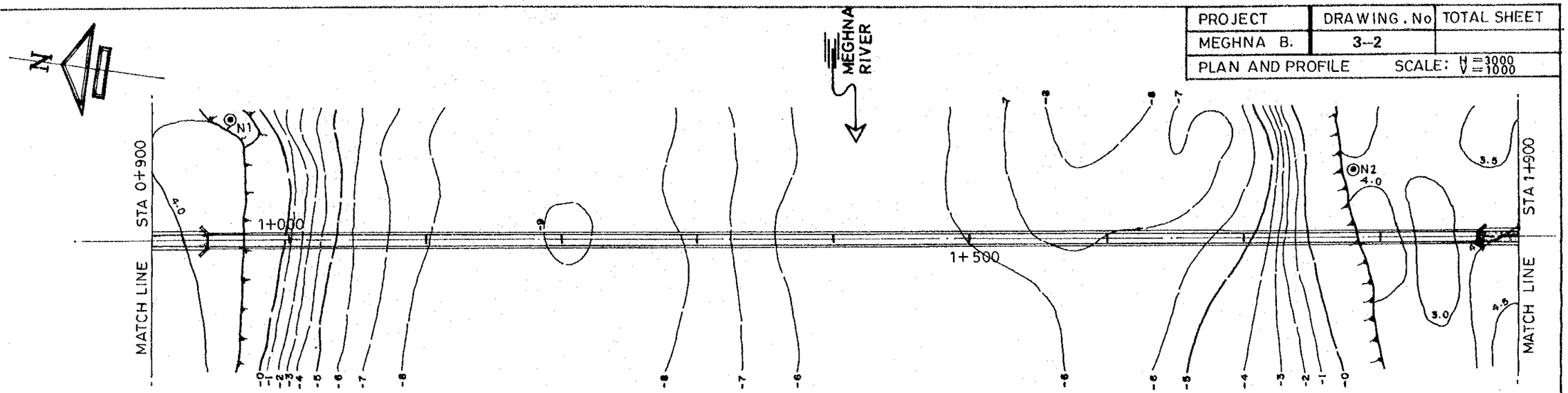
SCALE 1=3000

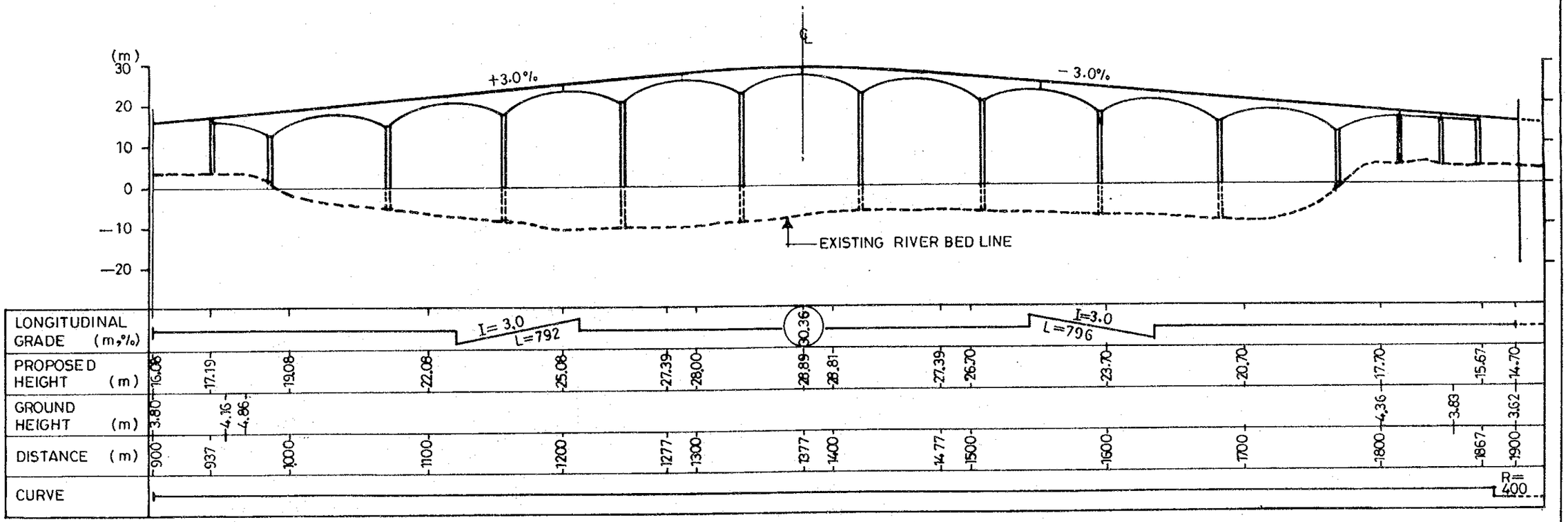
PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA B.	3–1	
PLAN AND PROFILE	SCALE: H = 3000, V = 1000	



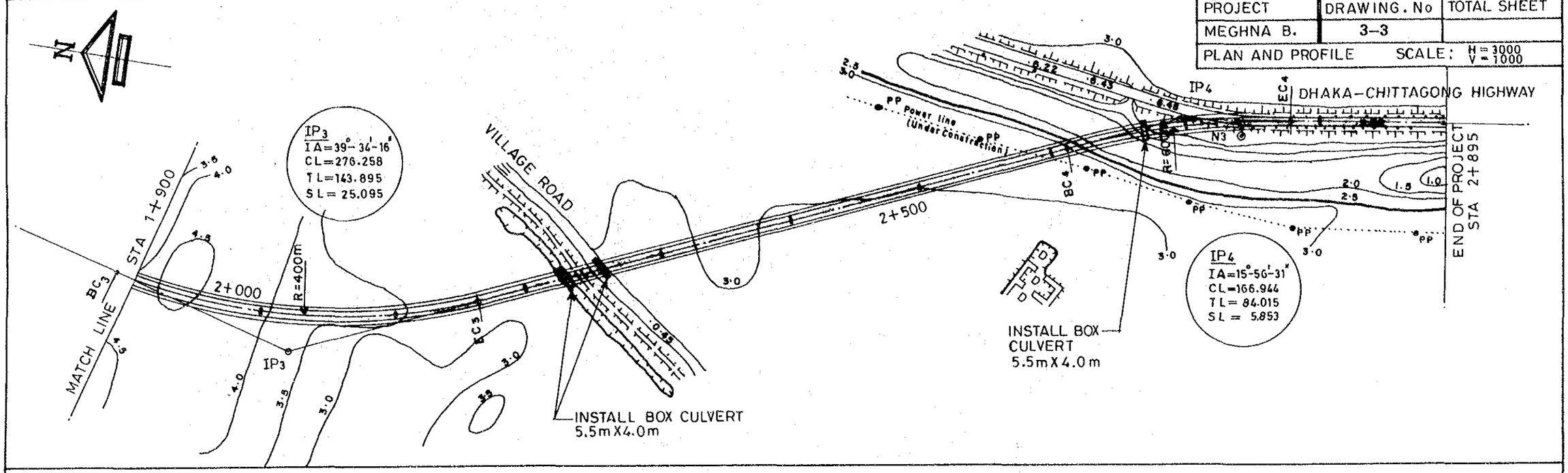


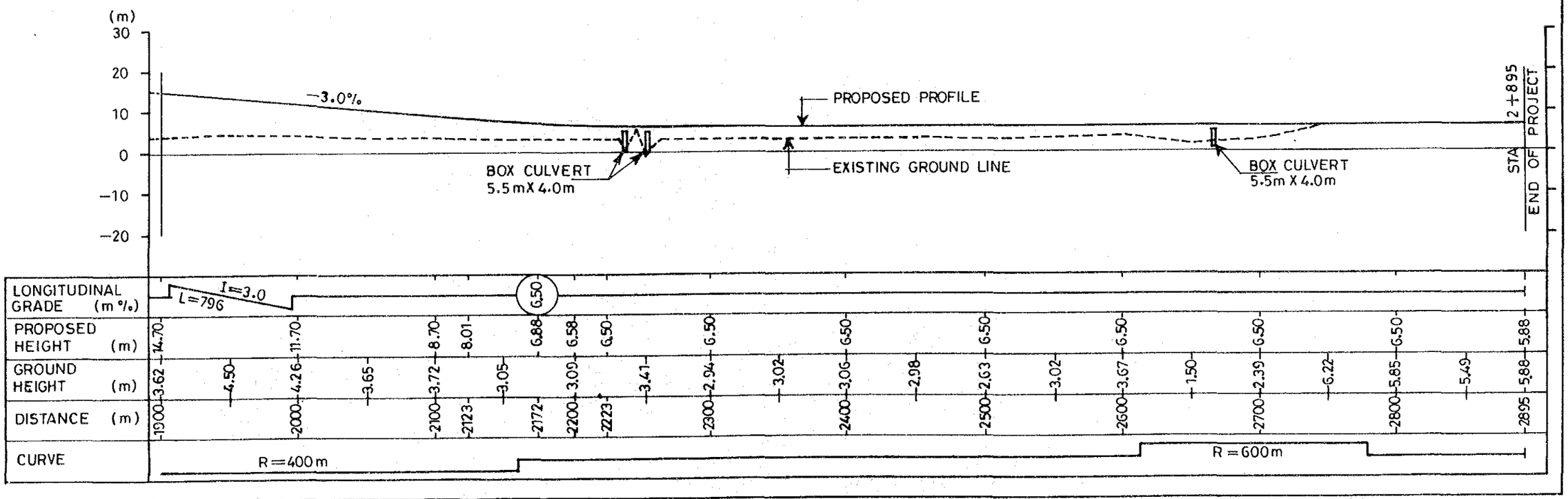
PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA B.	3-2	
PLAN AND PROFILE	SCALE: H=3000 V=1000	



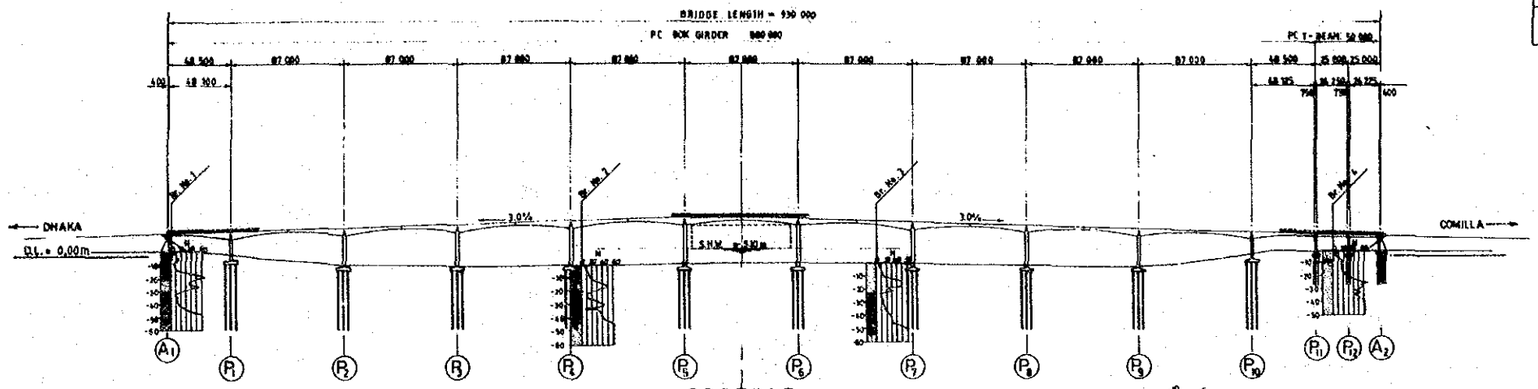


PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA B.	3–3	
PLAN AND PROFILE	SCALE: H = 1000 V = 1000	

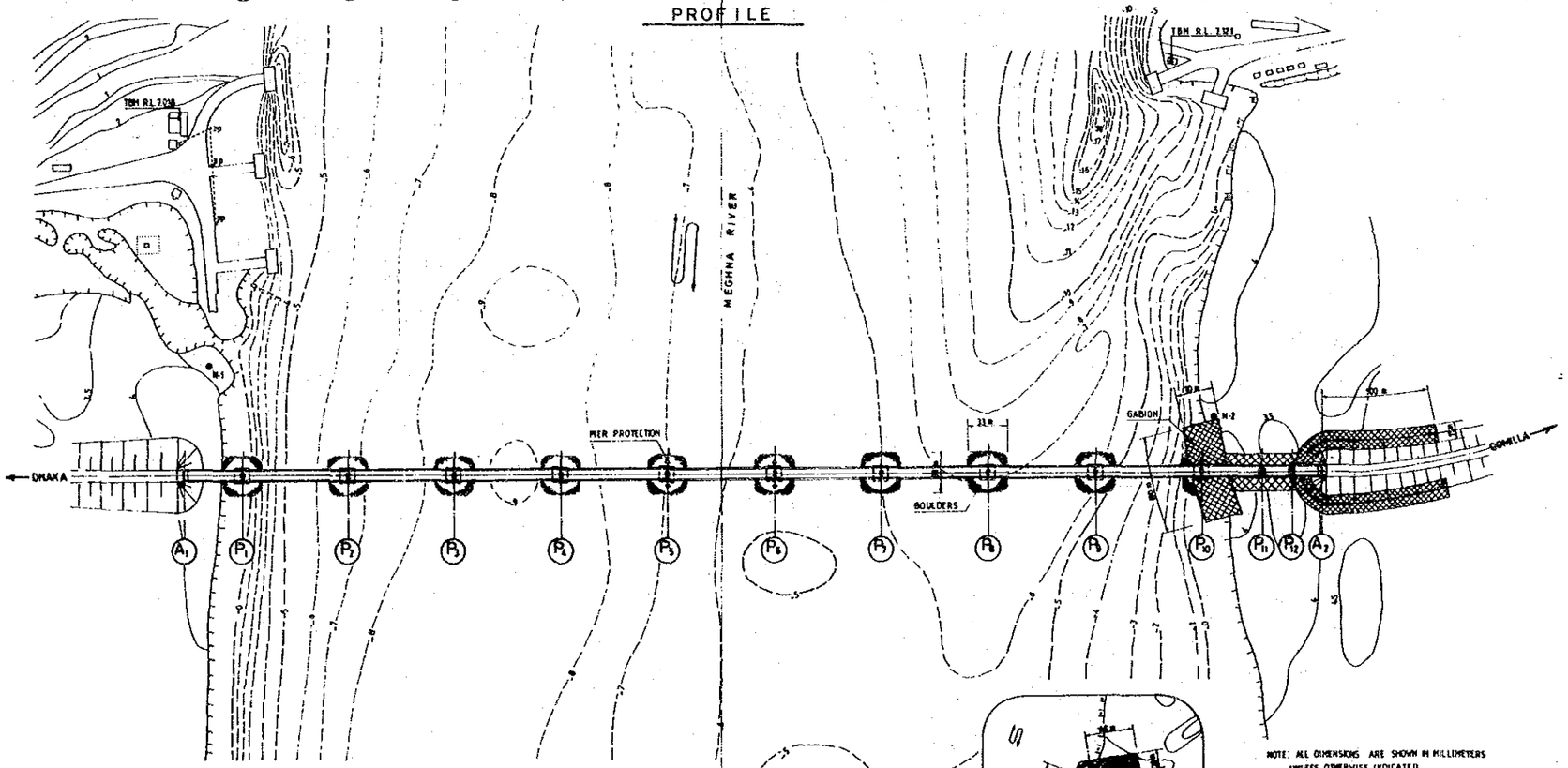




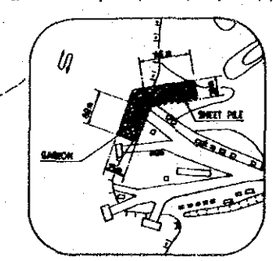
PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	4	
GENERAL VIEW		



PROFILE



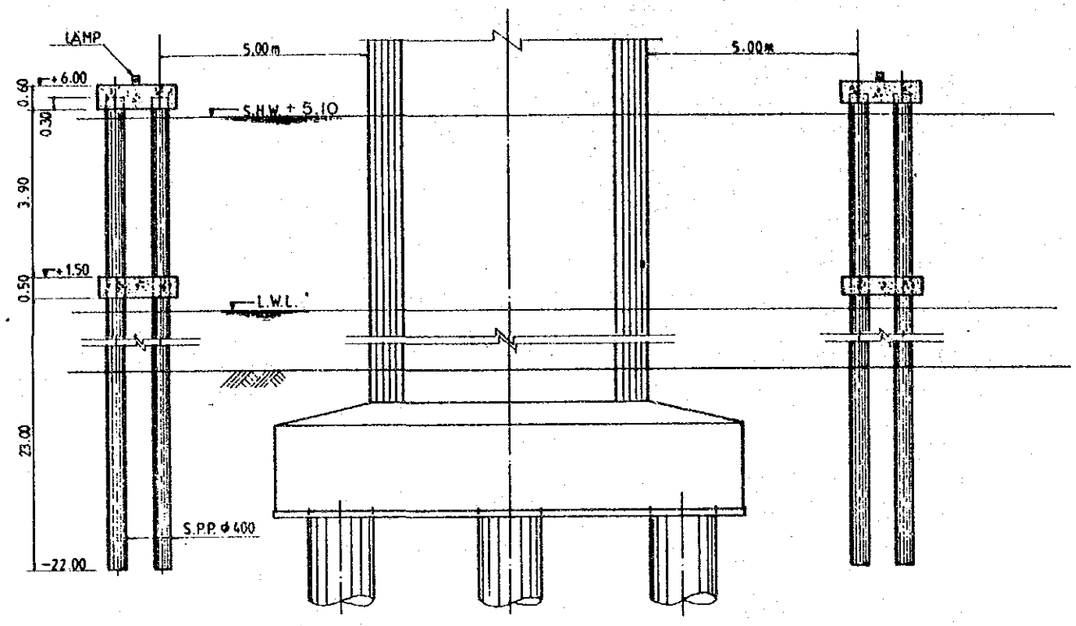
PLAN



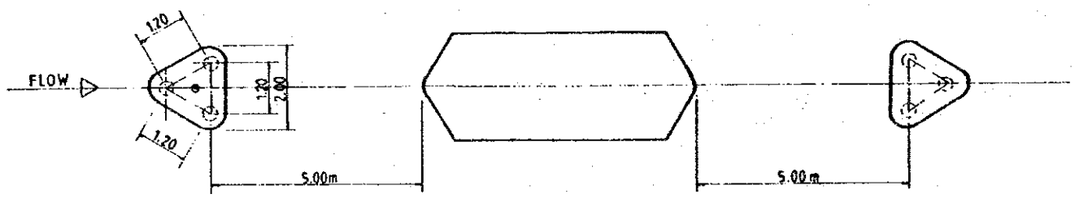
PROTECTION OF FERRY GHAT

NOTE: ALL DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE INDICATED

PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	5	
CROSS SECTION AND PIER PROTECTION		

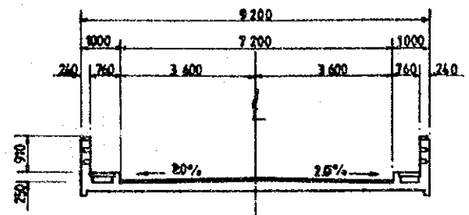


SIDE ELEVATION

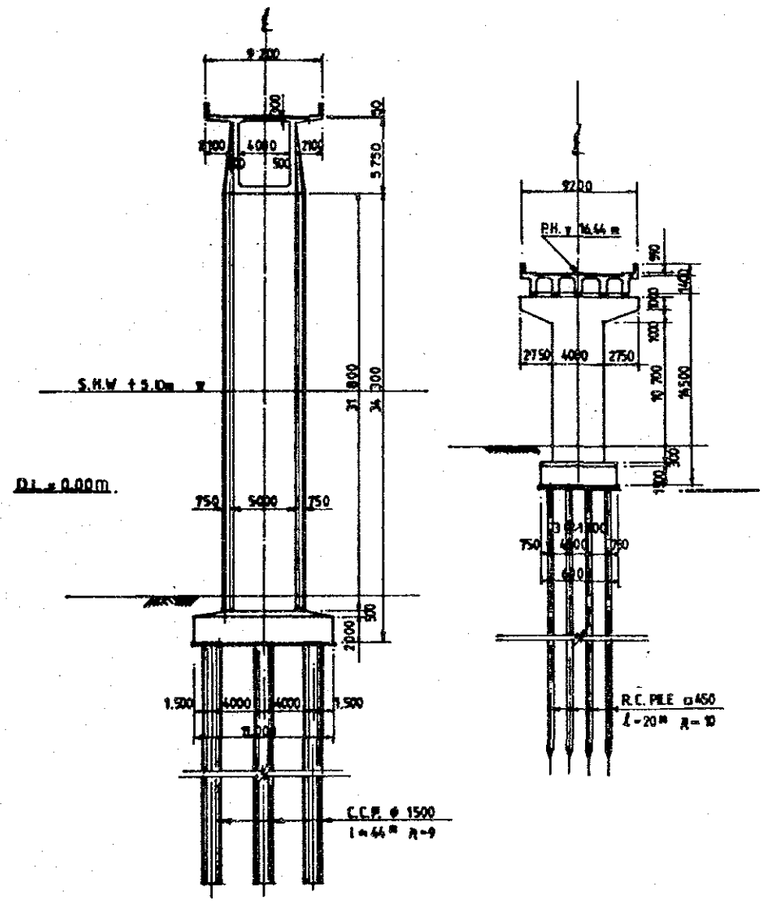


PLAN

PIER PROTECTION

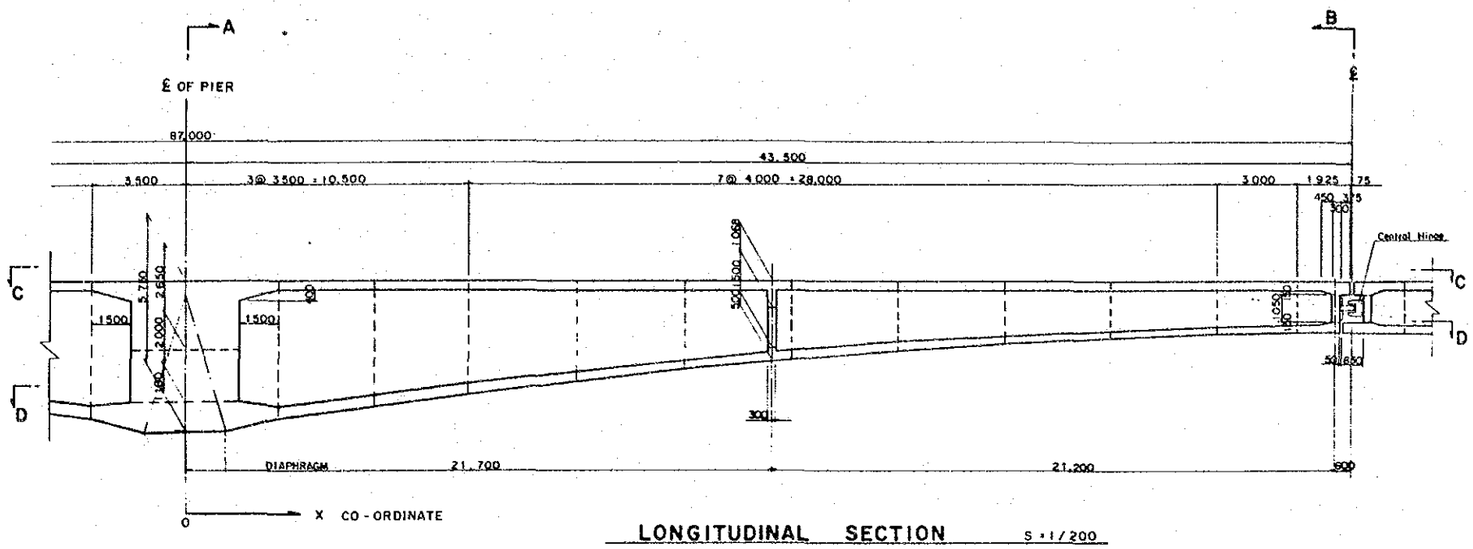


TYPICAL CROSS SECTION OF BRIDGE DECK



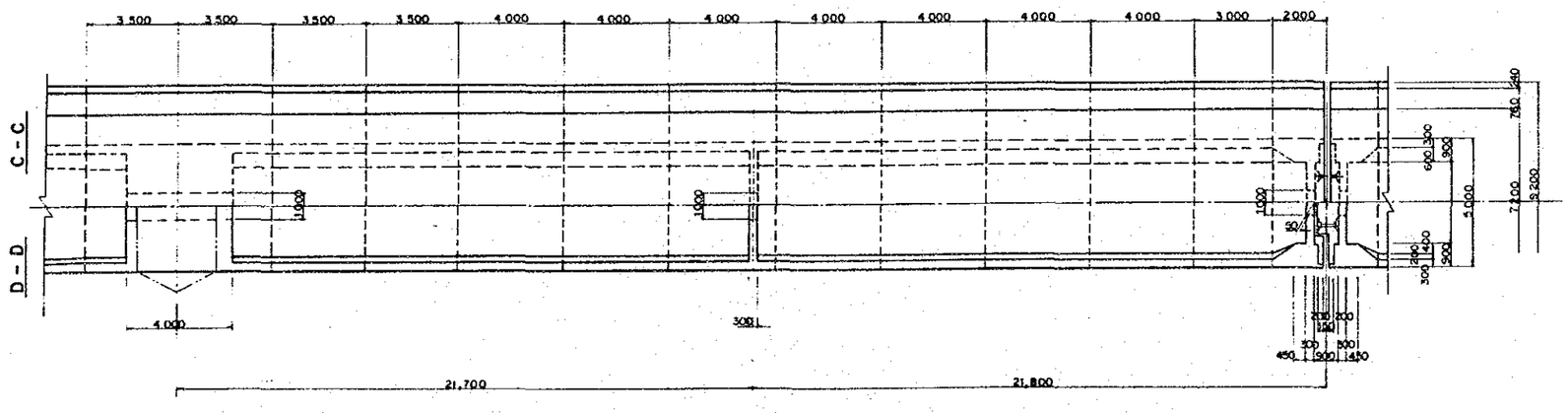
TYPICAL CROSS SECTION

PROJECT	DRAWING NO.	TOTAL SHEET
MEGHNA B R.	6	
STANDARD ELEMENT OF SUPERSTRUCTURE		



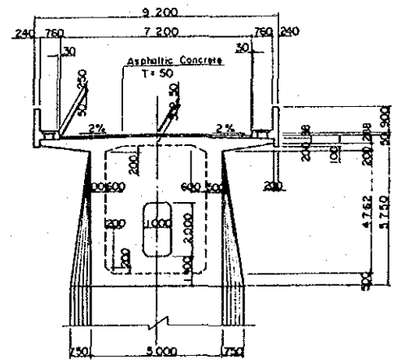
LONGITUDINAL SECTION S = 1/200

DEPTH OF GIRDER	5.750	5.271	4.800	4.343	3.850	3.336	3.068	2.991	2.644	2.361	2.149	2.012	1.960	1.950
X CO-ORDINATE	0	3.500	7.000	10.500	14.500	18.500	21.700	22.500	26.500	30.500	34.500	38.500	41.500	43.425

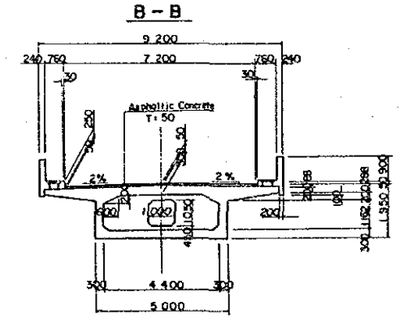


PLAN S = 1/200

A - A



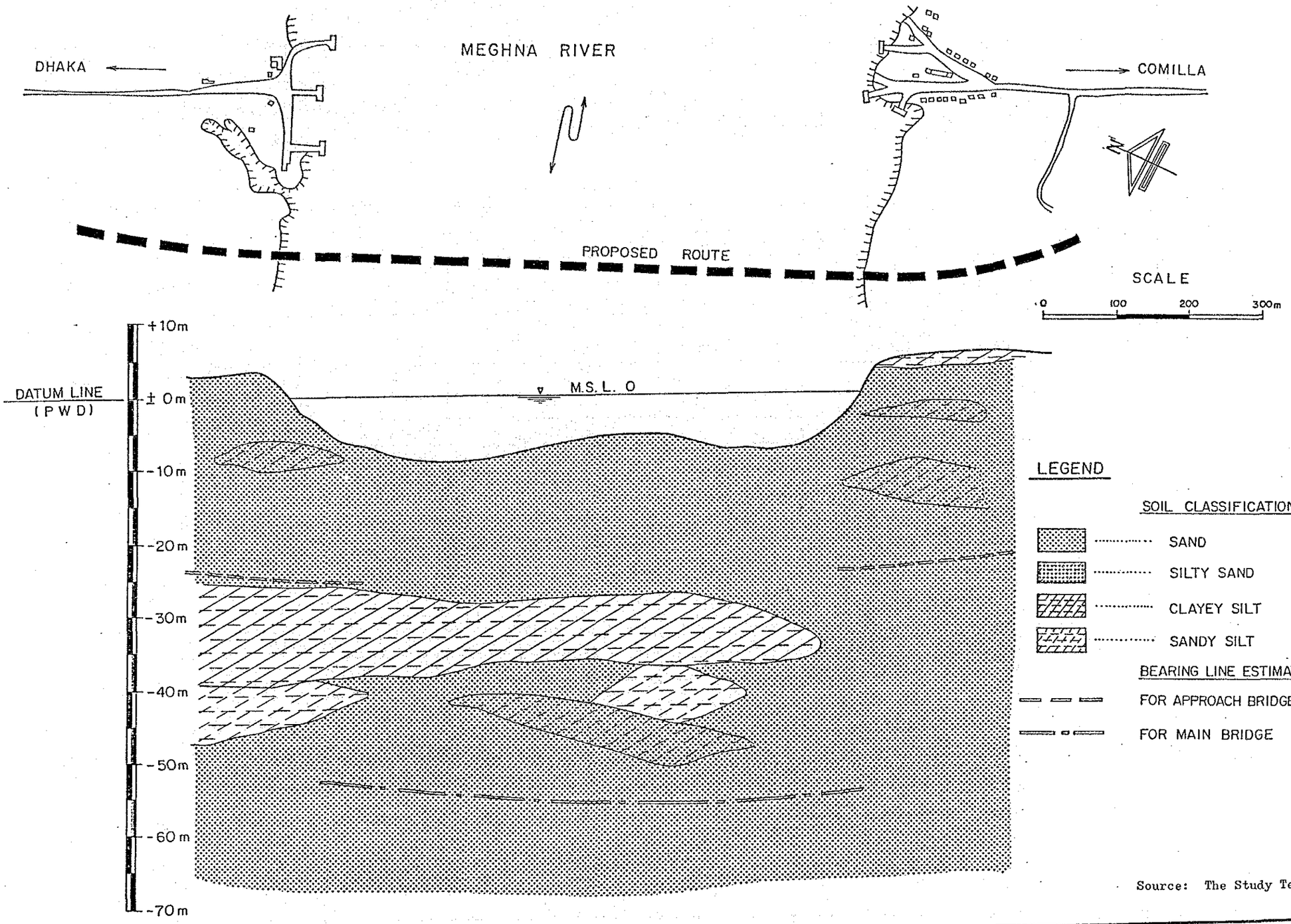
B - B



CROSS SECTION S = 1/200

NOTE : ALL DIMENSIONS ARE SHOWN IN MILLIMETRES (MM).

PROJECT	DRAWING NO.	TOTAL SHEET
MEGHNA B.	7	
SOIL PROFILE	SCALE:	H = 1/5,000 V = 1/500



Source: The Study Team

PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	8	
TEST RESULTS OF M 2 (BOTTOM)		

SOILTECH

SOIL MECHANICS & MATERIAL TESTING LABORATORY

DHAKA

SUMMARY OF LABORATORY TEST RESULTS

JICA STUDY TEAM

MEGHNA RIVER

Borehole No.		M2											
Sample No.		U-1	D-13	D-14	D-15	D-16	D-17	D-18	D-19	D-20	D-21	D-22	D-23
Depth in metre		24.00 to 24.40	24.60 to 25.00	26.60 to 27.00	28.60 to 29.00	30.60 to 31.00	32.60 to 33.00	34.60 to 35.00	39.60 to 40.00	44.60 to 45.00	49.60 to 50.00	54.60 to 55.00	59.60 to 60.00
Moisture content (Natural)		65.66	57.20	67.00	19.60	18.90	42.00	15.30	16.00	19.80	18.80	18.60	16.85
Specific gravity		2.654	2.650	2.648	2.663	2.663	2.660	2.663	2.663	2.665	2.665	2.671	2.668
Atterberg limits	Liquid limit, Lw	58.15	63.30	64.20		N.P.	49.00	N.P.		N.P.		N.P.	
	Plastic limit, Pw	29.60	31.50	38.60			26.80						
Density	Wet (lbs/cft)	102.40											
	Dry (lbs/cft)	65.66											
Grain size analysis	Gravel (%)												
	Sand (%)	12		14		82		68		87		89	
	Silt (%)	66		63		18		32		13		11	
	Clay (%)	22		23		—		—		—		—	
Consolidation tests	Natural void ratio, eo	1.50											
	Compression index, Cc	0.580											
Unconfined compression tests	Strain at failure (%)	7.14											
	Stress undist. (lbs/sq.inch)	16.00											
	Stress remould. (lbs/sq.inch)	7.85											
	Sensitivity	2.03											
Tri-axial compression Qc tests	ϕ (degree)	2.10											
	C (p.s.i.)	9.60											
F.M. Tests						1.03		0.58		1.17		1.20	

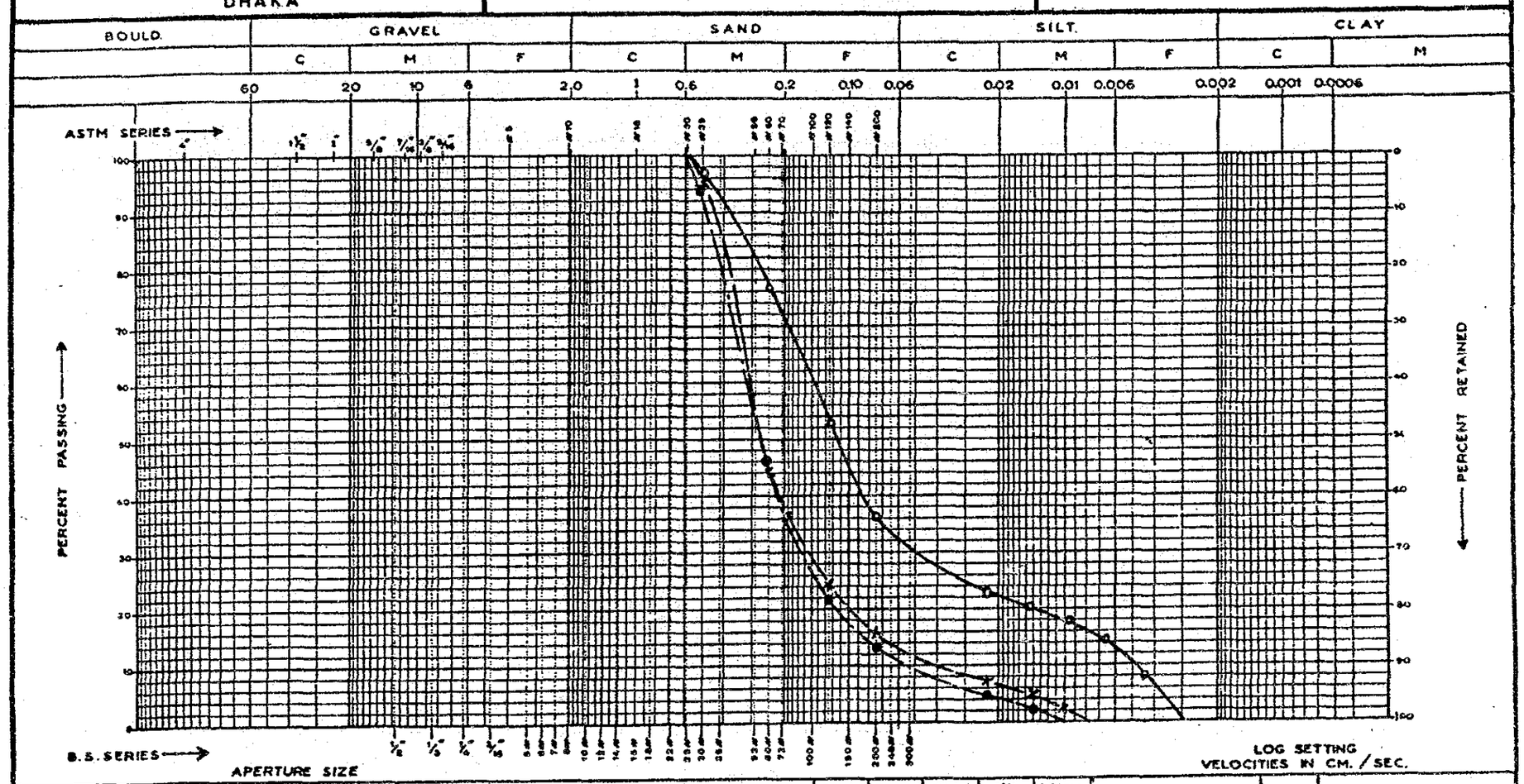
SOILTECH INTERNATIONAL LTD. DRN:- DATE:-15-7-84 PLAN No: SL-12048/D

PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	9	
SIEVE ANALYSIS OF M 2 (BOTTOM)		

SOILTECH
SOIL MECHANICS & MATERIAL TESTING LABORATORY
DHAKA

GRAIN SIZE DISTRIBUTION

CLIENT:- JICA STUDY TEAM
SITE:- MEGHNA RIVER



Lab No.	Symb.	Bore	Sample	Depth in m.	Classification	Bould. %	Gravel %	Sand %	Silt %	Clay %		C_u	Remarks
		M2	D-18	34·60 to 35·00	Silty fine to med. SAND			68	32	—	F.M. = 0,58		(Silty SAND)
		"	D-20	44·60 to 45·00	Med. to fine SAND with silt			87	13	—	F.M. = 1·17		(SAND)
		"	D-22	54·60 to 55·00	" " "			89	11	—	F.M. = 1·20		(SAND)

SOILTECH INTERNATIONAL LTD. DRN. Samad DATE:- 13-7-84 PLAN NO. SL-12015/D

PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	10	
TEST RESULTS OF M 3 (BOTTOM)		

SOILTECH

SOIL MECHANICS & MATERIAL TESTING LABORATORY

DHAKA

SUMMARY OF LABORATORY TEST RESULTS

JICA STUDY TEAM
MEGHNA RIVER

Borehole No.		M3											
Sample No.		D-13	D-14	D-15	U-2	D-16	D-17	D-18	D-19	D-20	D-21	D-22	D-23
Depth in metre		24.60 to 25.00	26.60 to 27.00	28.60 to 29.00	30.00 to 30.40	30.60 to 31.00	32.60 to 33.00	34.60 to 35.00	39.60 to 40.00	44.60 to 45.00	49.60 to 50.00	54.60 to 55.00	59.60 to 60.00
Moisture content (Natural)		53.00	57.80	57.50	40.40	50.54	46.11	23.30	17.46	18.18	17.80	23.14	21.68
Specific gravity		2.56	2.651	2.654	2.648	2.651	2.651	2.654	2.660	2.660	2.663	2.666	2.660
Atterberg limits	Liquid limit, Lw		63.70		53.66	74.16		40.50		N.P.		N.P.	
	Plastic limit, Pw		37.40		29.60	38.00		25.00					
Density	Wet (lbs/cft)				110.33								
	Dry (lbs/cft)				78.58								
Grain size analysis	Gravel (%)												
	Sand (%)		8		8	10		24		72		85	
	Silt (%)		73		75	67		61		28		15	
	Clay (%)		19		17	23		15		—		—	
Consolidation tests	Natural void ratio, e_o				1.045								
	Compression index, Cc				0.30								
Unconfined compression tests	Strain at failure (%)				8.92								
	Stress undist. (lbs/sq.inch)				17.95								
	Stress remould (lbs/sq.inch)				11.10								
	Sensitivity				1.617								
Tri-axial compression Qc tests	ϕ (degree)				7.75								
	C (p.s.i.)				8.80								
F.M. Tests								0.12		0.75		0.76	

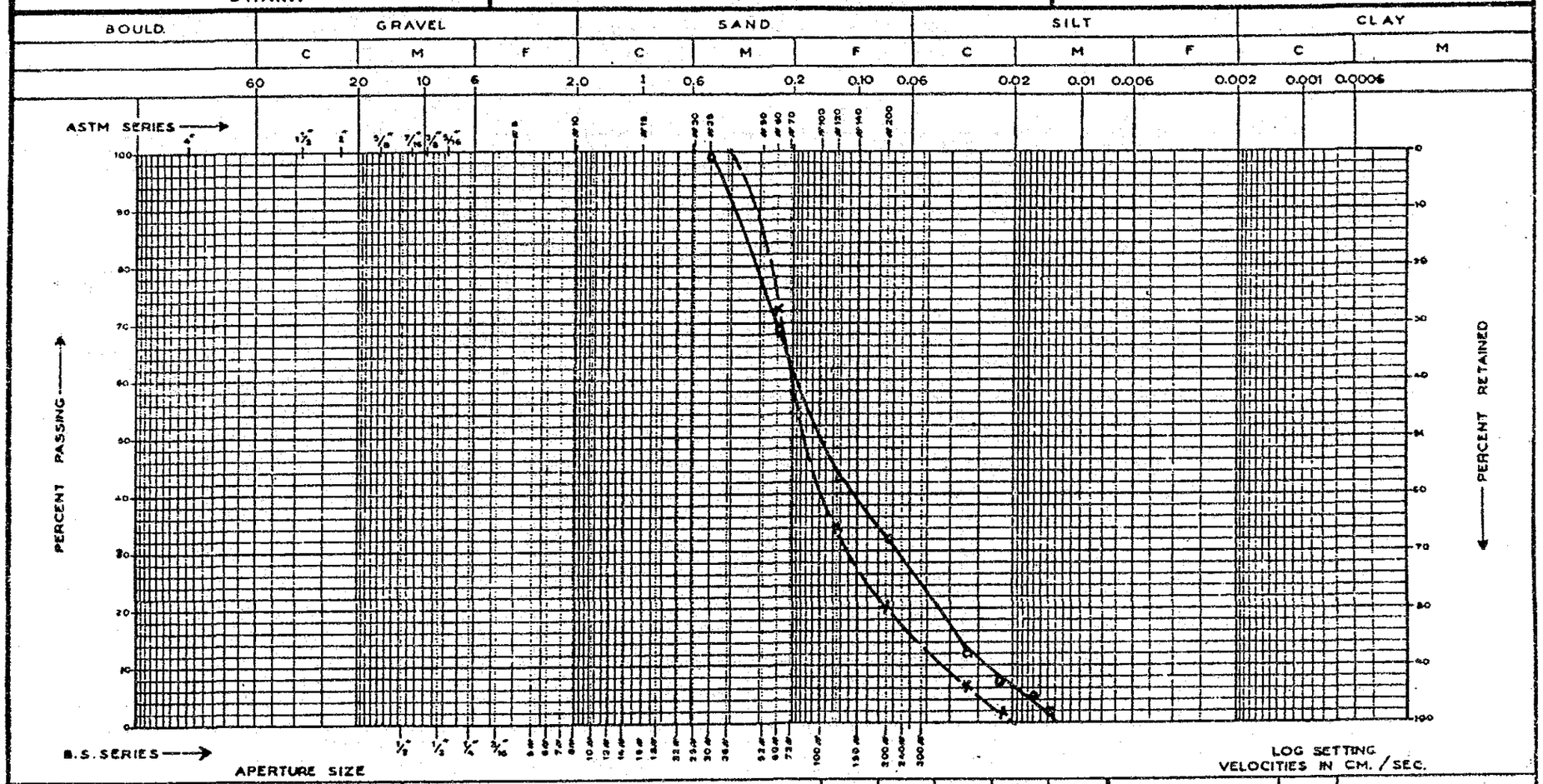
SOILTECH INTERNATIONAL LTD. DRN. DATE:-15-7-84 PLAN No. SL-12050/D

PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	11	
SIEVE ANALYSIS OF M 3 (BOTTOM)		

SOILTECH
SOIL MECHANICS & MATERIAL TESTING LABORATORY
DHAKA

GRAIN SIZE DISTRIBUTION

CLIENT:- JICA STUDY TEAM
SITE:- MEGHNA RIVER



Lab No.	Symb.	Bore	Sample	Depth in m.	Classification	Bould. %	Gravel %	Sand %	Silt %	Clay %		C_u	Remarks
	—o—o—	M3	D-20	44·60 to 45·00	Silty fine to med. SAND			72	28		F. M. = 0.75		Silty SAND
	—x—x—	"	D-22	54·60 to 55·00	Med. to fine SAND with silt			84	16		F. M. = 0.76		SAND

SOILTECH INTERNATIONAL LTD. DRN. Samad DATE:-15-7-84 PLAN NO. SL-12023/D

PROJECT	DRAWING. No	TOTAL SHEET
MEGHNA	12	
TEST RESULTS OF M 4 (BOTTOM)		

SOILTECH

SOIL MECHANICS & MATERIAL TESTING LABORATORY

DHAKA

SUMMARY OF LABORATORY TEST RESULTS

JICA STUDY TEAM

MEGHNA, RIVER

Borehole No.		M4									
Sample No.		D-12	D-13	D-14	D-15	D-16	D-17	D-18	D-19	D-20	D-21
Depth in metre		22.60 to 23.00	24.60 to 25.00	26.60 to 27.00	28.60 to 29.00	30.60 to 31.00	32.60 to 33.00	34.60 to 35.00	39.60 to 40.00	44.60 to 45.00	49.60 to 50.00
Moisture content (Natural)		25.90	22.00	26.60	26.90	22.40	19.70	25.80	25.30	24.50	27.30
Specific gravity		2.668	2.671	2.659	2.662	2.671	2.671	2.677	2.671	2.662	2.671
Atterberg limits	Liquid limit, Lw	N.P.		N.P.		N.P.		N.P.		N.P.	
	Plastic limit, Pw										
Density	Wet (lbs/cft)										
	Dry (lbs/cft)										
Grain size analysis	Gravel (%)										
	Sand (%)	93		90		94		97		92	
	Silt (%)	7		10		6		3		8	
	Clay (%)	—		—		—		—		—	
Consolidation Tests	Natural void ratio, e_o										
	Compression index, Cc										
Unconfined compression tests	Strain at failure (%)										
	Stress undist. (lbs/sq·inch)										
	Stress remould (lbs/sq·inch)										
	Sensitivity										
Tri-axial compression Qc tests	ϕ (degree)										
	C (p.s.i.)										
F. M. Tests		0.69		0.36		1.13		1.39		1.41	

SOILTECH INTERNATIONAL LTD. DRN. DATE:-12-7-84 PLAN No. SL-12052/C

PROJECT	DRAWING, No	TOTAL SHEET
MEGHNA	13	
CBR TESTS FOR MEGHNA APPROACH ROAD		

SOILTECH
INTERNATIONAL LIMITED
DHAKA

SUMMARY OF
COMPACTION & C B R TEST RESULTS

JICA STUDY TEAM
MEGHNA RIVER

SAMPLE NUMBER		M-1			M-4			SAND BAR	
		A	B	C	A	B	C	A	B
MOISTURE CONTENT (Natural)		23.50	26.10	26.66	31.00	27.00	28.65	24.40	25.00
SPECIFIC GRAVITY		2.662	2.659	2.659	2.651	2.654	2.657	2.671	2.665
MAXIMUM DRY DENSITY Lbs/cu.ft		103.90	103.90	102.85	103.50	104.40	105.80	106.00	105.50
OPTIMUM MOISTURE CONTENT (%)		14.40	14.50	17.80	16.80	18.60	19.30	12.40	13.50
CORRECTED C B R VALUES		8.90	10.40	8.00	7.40	7.00	8.60	9.90	10.20
GRAIN SIZE ANALYSIS	SAND (%)	83	77	65	8	8	9	94	93
	SILT (%)	17	23	35	85	81	88	6	7
	CLAY (%)	—	—	—	7	11	3	—	—
ATTERBERG LIMITS	Liquid Limit LW	N.P.	N.P.	N.P.	35.64	42.80	31.60	N.P.	N.P.
	Plastic Limit PW.				21.40	24.00	20.40		

SOILTECH INTERNATIONAL LIMITED DRN DATE:- 7-8-84 PLAN NO. SIL-12064/0