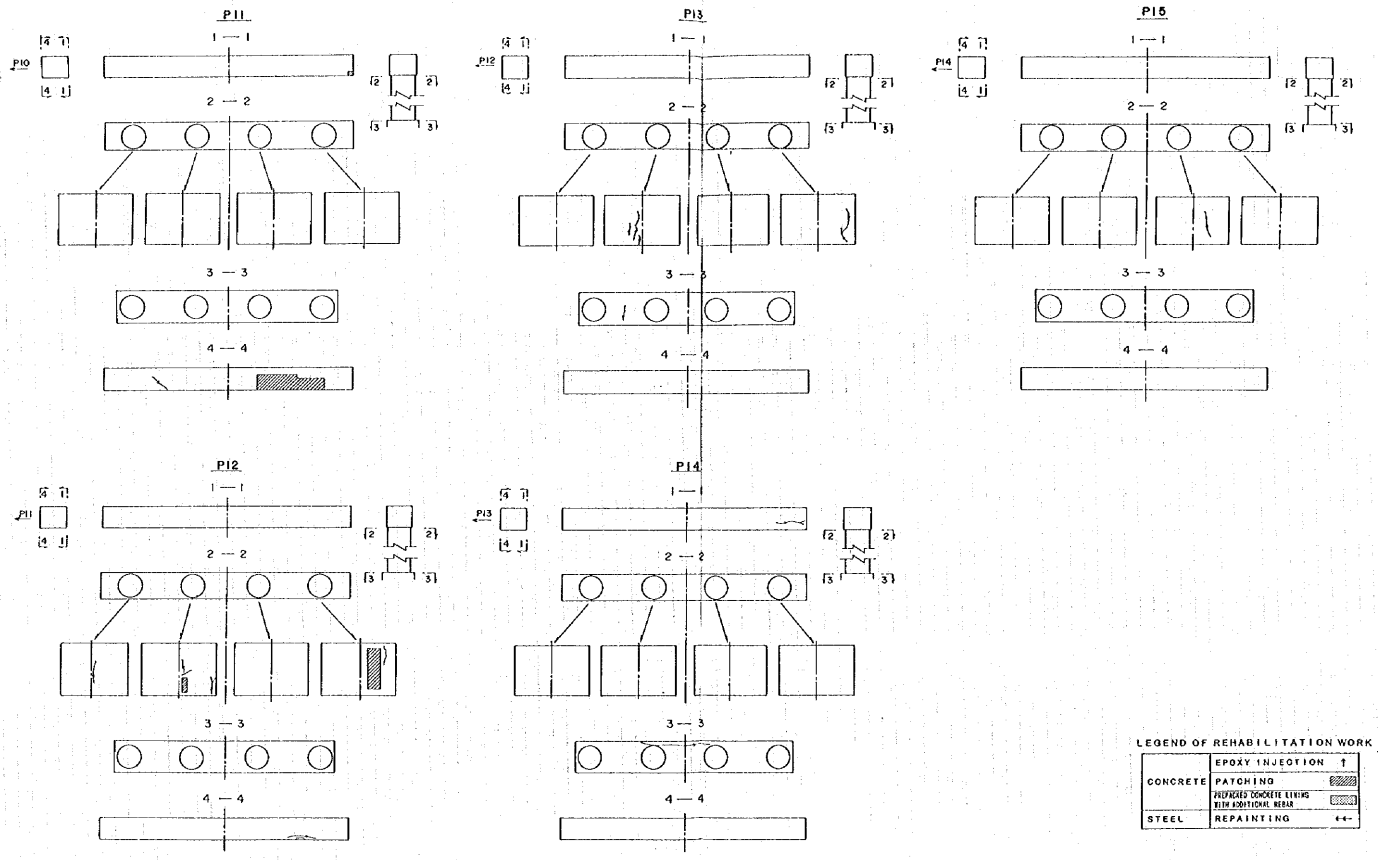
PROPOSED REHABILITATION PLAN FOR SER №7 (6)

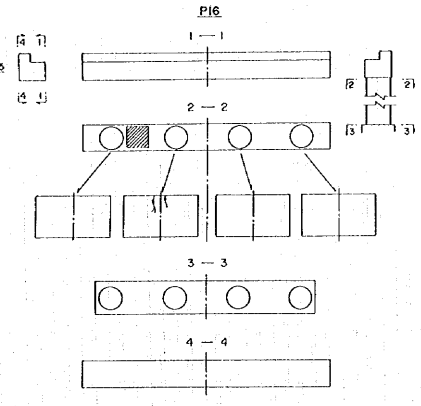


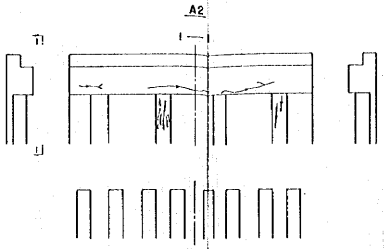
LEGEND OF REHABILITATION WORK

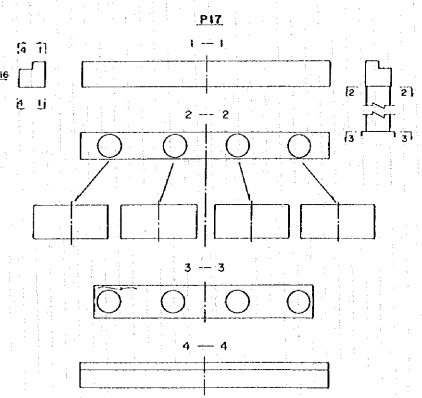
CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PREPACKED CONCRETE LINING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	↤

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
	PROPOSED REHABILITATION PLAN FOR SER №7 (1)	SER №7	AS SHOWN	MR-D-13

PROPOSED REHABILITATION PLAN FOR SER №7 (7)







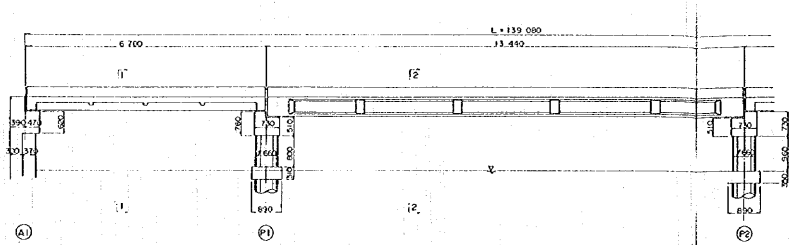
LEGEND OF REHABILITATION WORK

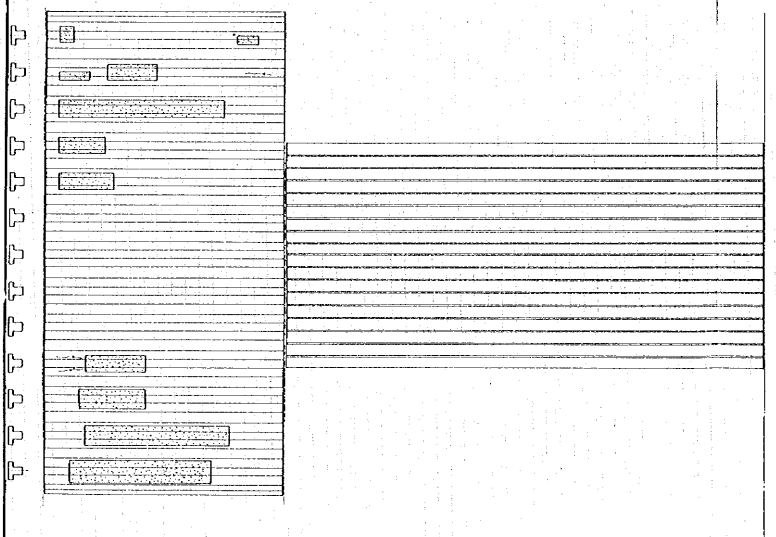
CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PREPACKED CONCRETE LAYING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	←←

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING: PROPOSED REHABILITATION PLAN FOR SER №7 (7)	BRIDGE NAME / NO.: SER №7	SCALE: AS SHOWN	DRAWING NO.: MK-D-14

PROPOSED REHABILITATION PLAN FOR SER №7 (8)

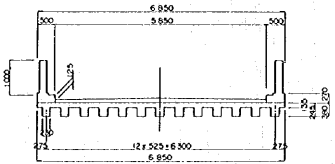
ELEVATION 1:50



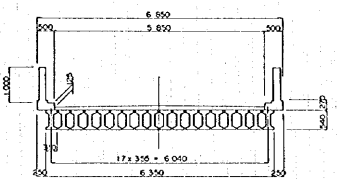


CROSS SECTION 1:50

1 — 1



2 — 2



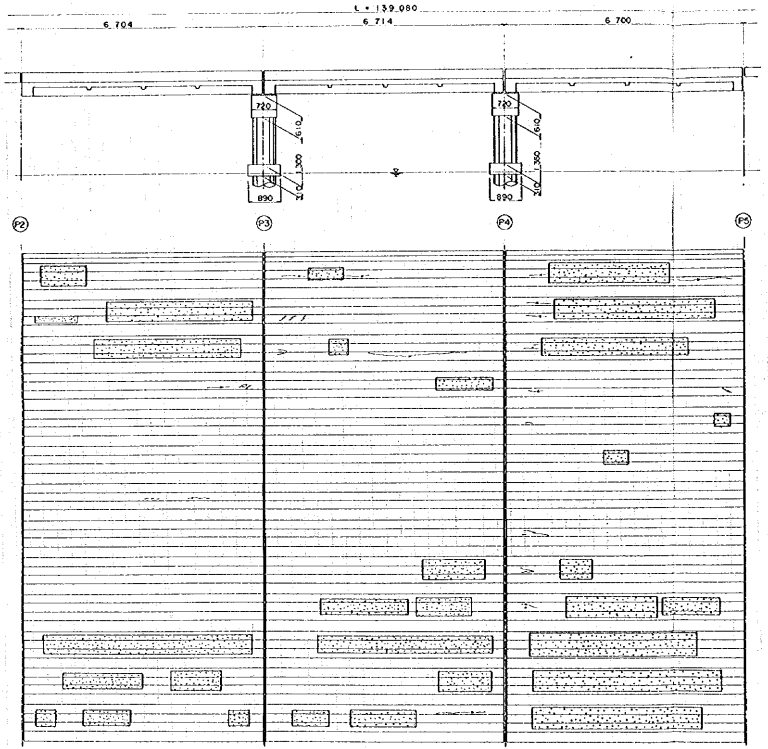
LEGEND OF REHABILITATION WORK

CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PRECASTED CONCRETE LINING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	++

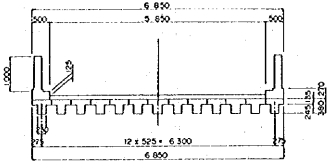
JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO
	PROPOSED REHABILITATION PLAN FOR SER №7 (1)	SER №7	AS SHOWN	MR-D-15

PROPOSED REHABILITATION PLAN FOR SER №7 (9)

ELEVATION 1:50



CROSS SECTION 1:50



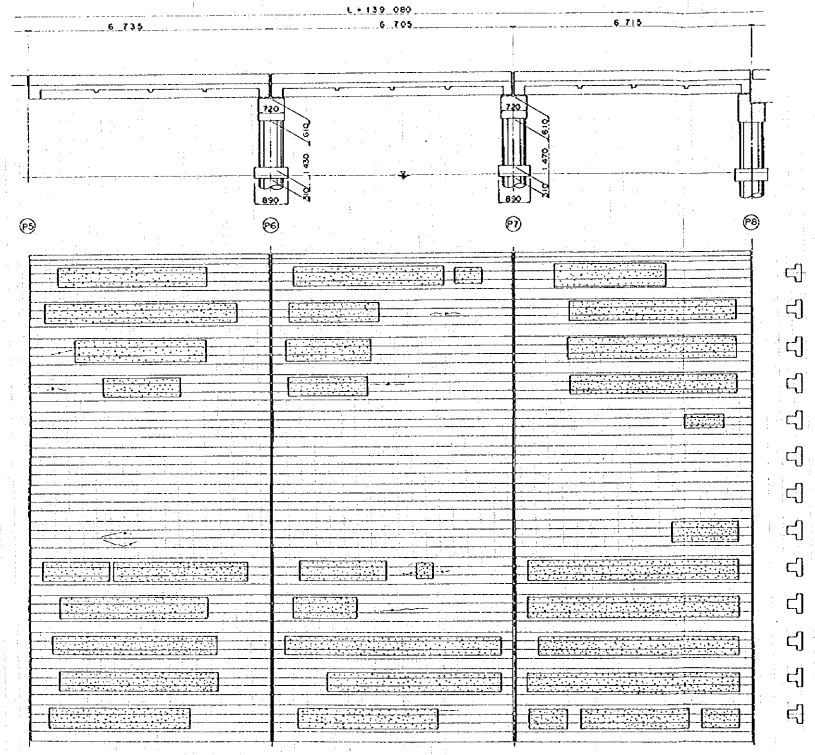
LEGEND OF REHABILITATION WORK

CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PREPACKED CONCRETE LINING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	←→

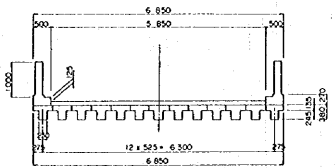
MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
TITLE OF DRAWING: PROPOSED REHABILITATION PLAN FOR SER №7 (9)	BRIDGE NAME / NO.: SER №7	SCALE: AS SHOWN	DRAWING NO.: MR-D-16

PROPOSED REHABILITATION PLAN FOR SER №7 (10)

ELEVATION 1:50



CROSS SECTION 1:50



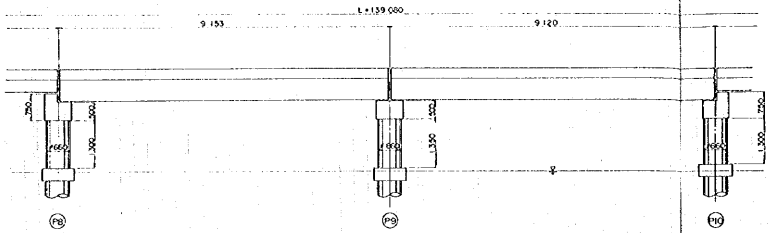
LEGEND OF REHABILITATION WORK

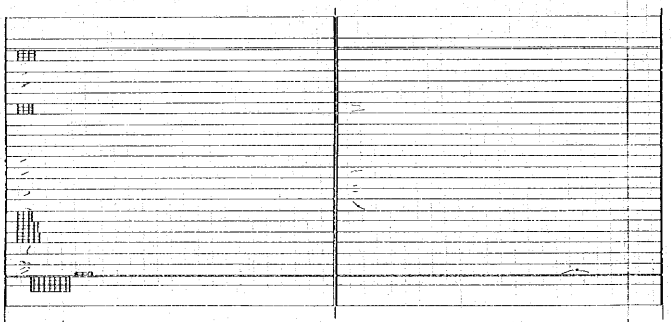
CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PREPACKED CONCRETE LINING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	←→

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO.
	PROPOSED REHABILITATION PLAN FOR SER №7 (10)	SER №7	AS SHOWN	MR-L-17

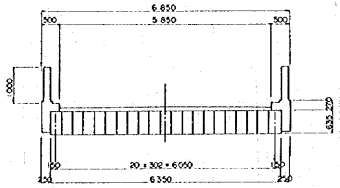
PROPOSED REHABILITATION PLAN FOR SER №7 (II)

ELEVATION 1:50





CROSS SECTION 1:50



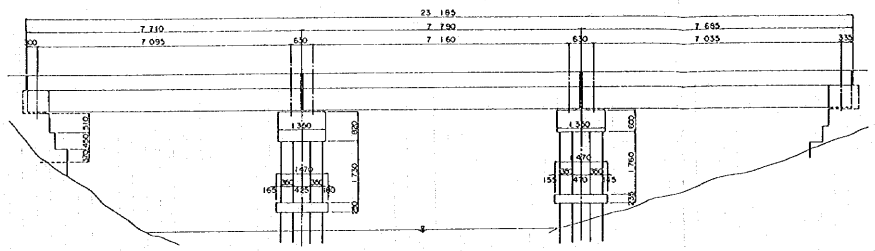
LEGEND OF REHABILITATION WORK

CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PREPACKED CONCRETE LINING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	←←

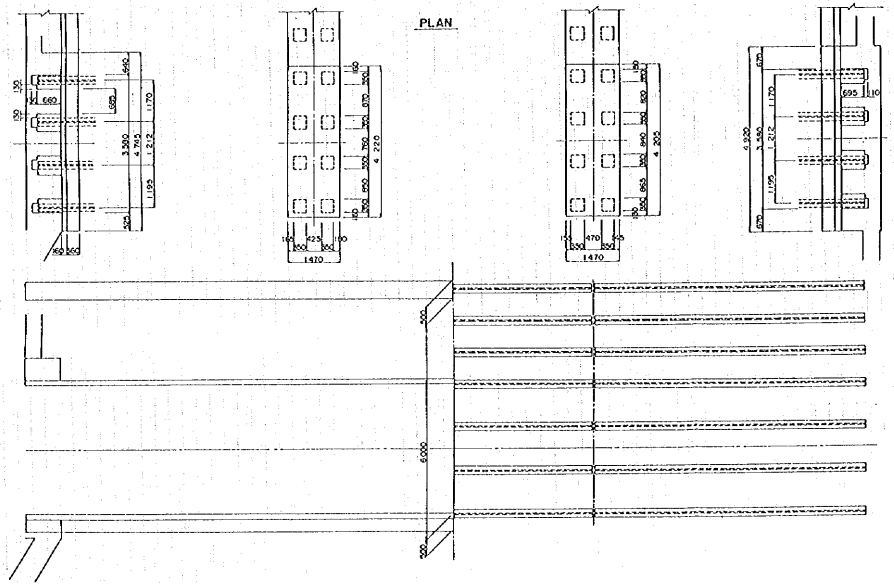
JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
	PROPOSED REHABILITATION PLAN FOR SER №7 (II)	SER №7	AS SHOWN	MR-D-12

PROPOSED REHABILITATION PLANFOR SER №211

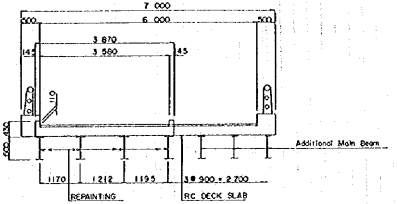
ELEVATION



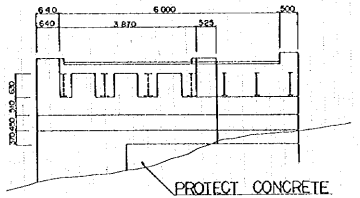
PLAN



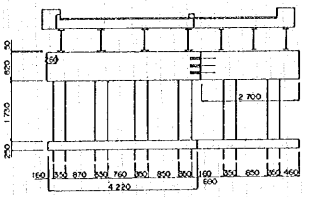
CROSS SECTION



A1



P1



LEGEND OF REHABILITATION WORK

CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PREPACKED CONCRETE LINING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	↔

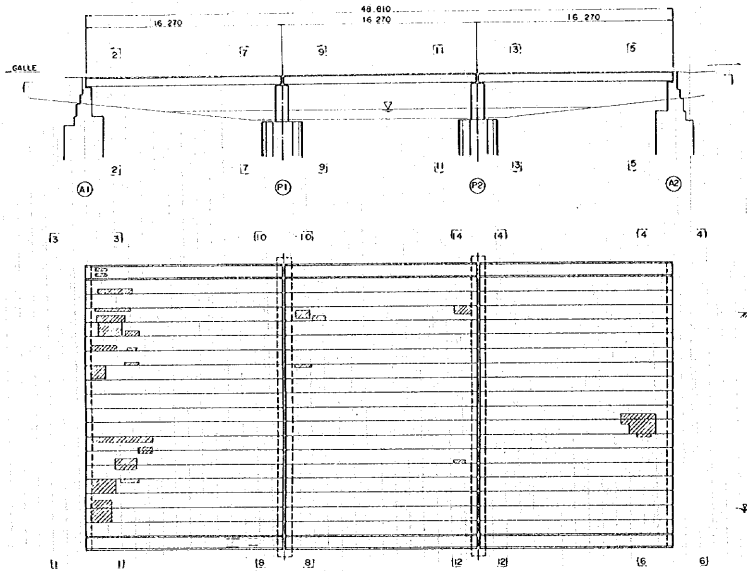
JICA

MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

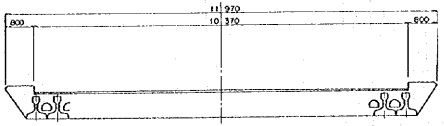
TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
PROPOSED REHABILITATION PLAN FOR SER №211	SER NO.211	AS SHOWN	MR-D-19

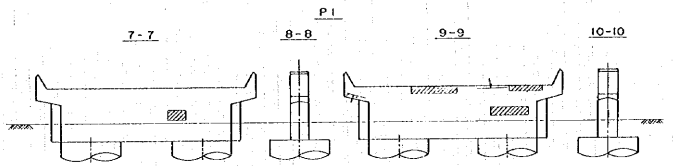
PROPOSED REHABILITATION PLAN FOR SER №212 BRIDGE

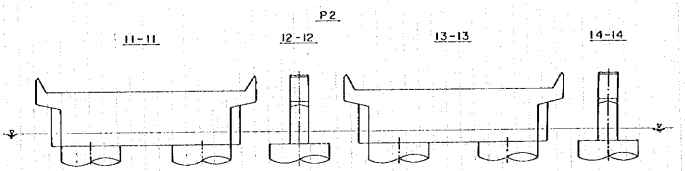
ELEVATION 1:150

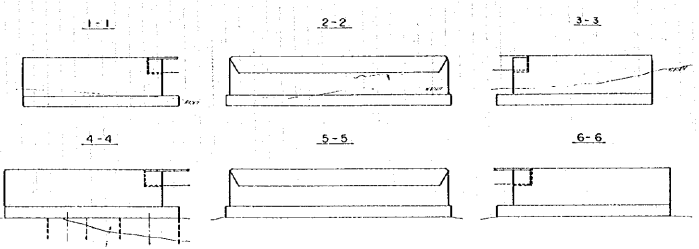


CROSS SECTION 1:50









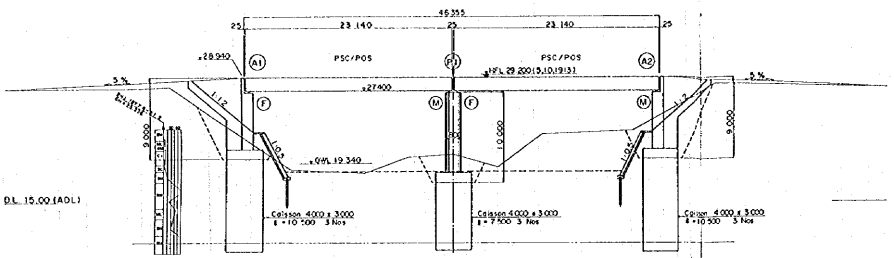
LEGEND OF REHABILITATION WORK

CONCRETE	EPOXY INJECTION	↑
	PATCHING	
	PREPACKED CONCRETE LINING WITH ADDITIONAL REBAR	
STEEL	REPAINTING	⟷

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO
	PROPOSED REHABILITATION PLAN FOR SER №212	SER №212	AS SHOWN	MK-D-20

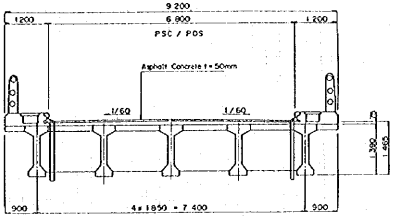
RECONSTRUCTION PLAN FOR SER NO. 53

ELEVATION 1:200

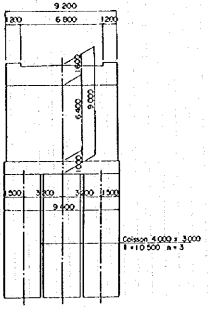


ELEVATIONS	27.82	28.24	26.96	18.32	18.22	20.32	18.82	22.56	26.32	22.86	28.33	27.05
DISTANCES	189.20	200.00	251.00	210.00	220.00	225.00	230.00	238.35	240.00	244.00	260.00	280.00

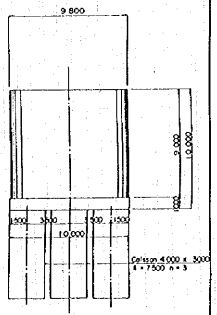
CROSS SECTION 1:50



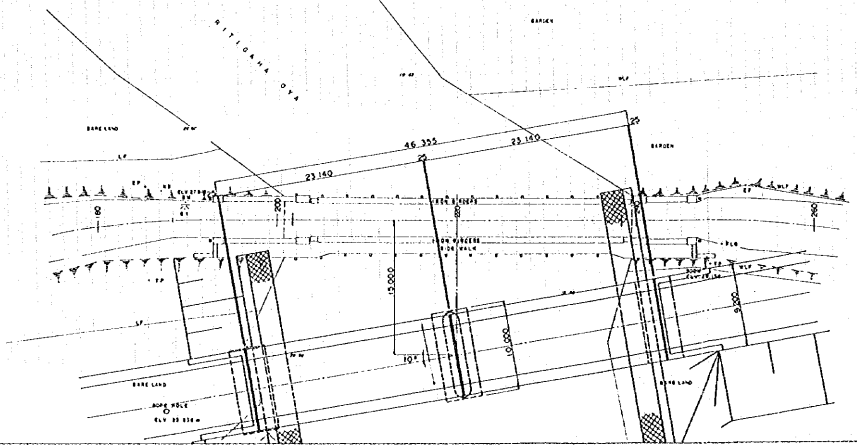
A1 ABUTMENT 1:150



P1 PIER 1:150



PLAN 1:200



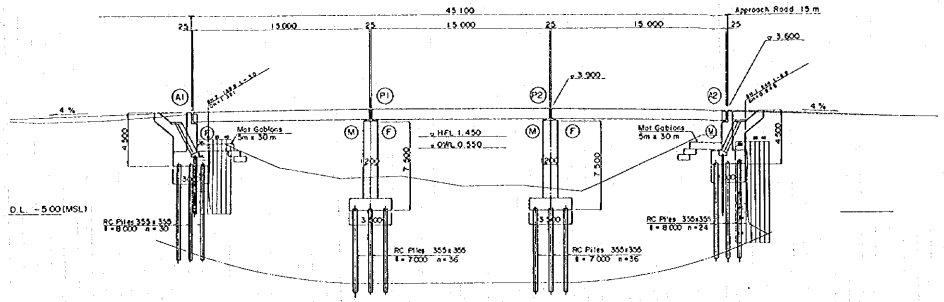
BRIDGE DATA:

BRIDGE NAME NO.	53	
DESIGN LIVE LOAD :	M.A.N.D HB LOADING (300KN/ES)	
MATERIAL YIELD STRENGTH :	CONCRETE	SUPERSTRUCTURE : BEAM GRADE 45 INSITU GRADE 40
	STEEL	REBAR : YIELD STRENGTH 460 N/mm2
TYPE OF SUPERSTRUCTURE :	PSC/POS	
TYPE OF SUBSTRUCTURE :	ABUTMENT	CAISSON
	PIER	CAISSON

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO
	RECONSTRUCTION PLAN FOR SER NO.53	SER NO. 53	AS SHOWN	

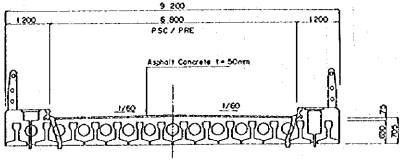
RECONSTRUCTION FOR SER NO.59

ELEVATION 1:150

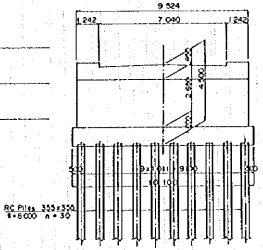


ELEVATIONS	3.36	0.96	0.93	1.22	2.13	1.95	2.84	2.69	3.30	0.94	1.42	3.34
DISTANCES	196.03	200.00	200.00	200.00	210.00	210.00	200.00	225.00	250.00	220.00	240.00	241.98

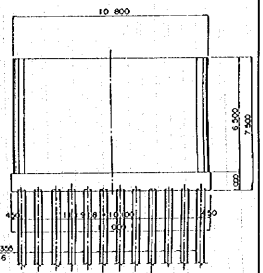
CROSS SECTION 1:50



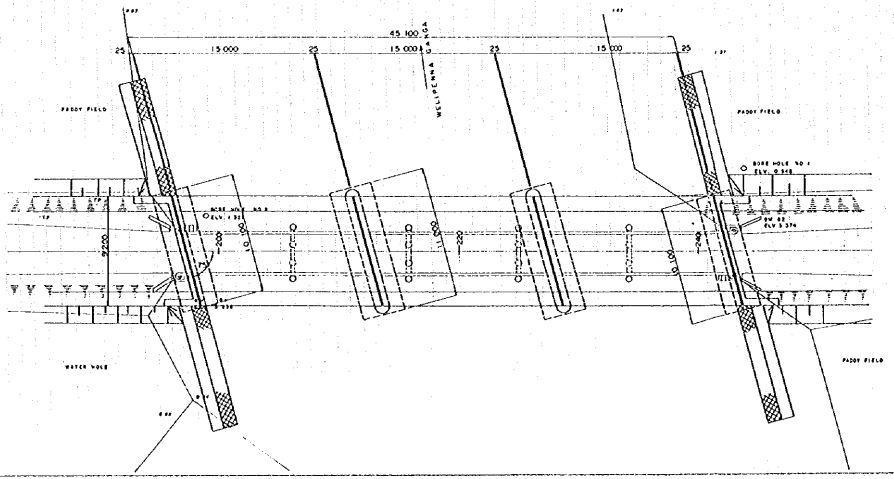
A1 ABUTMENT 1:100



P1 PIER 1:100



PLAN 1:150



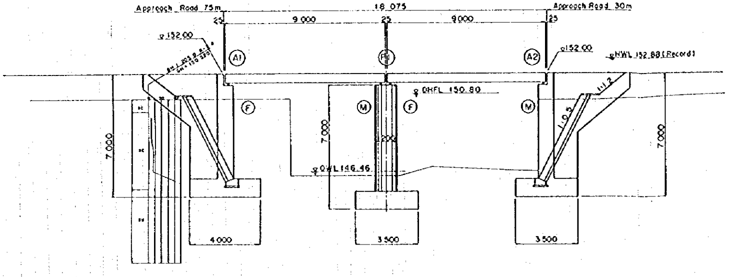
BRIDGE DATA :

BRIDGE NAME NO.	59		
DESIGN LIVE LOAD :	HA AND HB LOADING (COUNTS)		
MATERIAL YIELD STRENGTH :	CONCRETE	SUPERSTRUCTURE :	BEAM GRADE 45
			IN SITU GRADE 40
	STEEL	REBAR : YIELD STRENGTH 460 N/mm²	
TYPE OF SUPERSTRUCTURE :	PSC/PRE		
TYPE OF SUBSTRUCTURE :	ABUTMENT	R.C. PILES	
	PIER	R.C. PILES	

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO.
	RECONSTRUCTION PLAN FOR SER NO.59	SER NO.59	AS SHOWN	MR-1

RECONSTRUCTION PLAN FOR SER NO.20

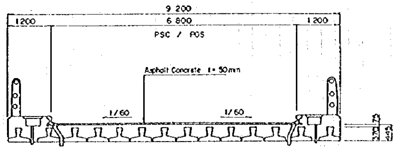
ELEVATION 1:100



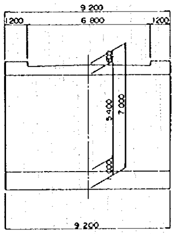
DL 140.00 (ADL)

		150.62					150.62	
ELEVATIONS	150.48	146.29	146.29	146.21	146.81	146.75	146.56	150.94
DISTANCES	200.00	213.29	215.00	219.10	210.90	225.00	226.71	240.00

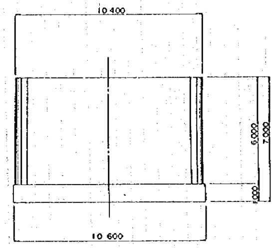
CROSS SECTION 1:50



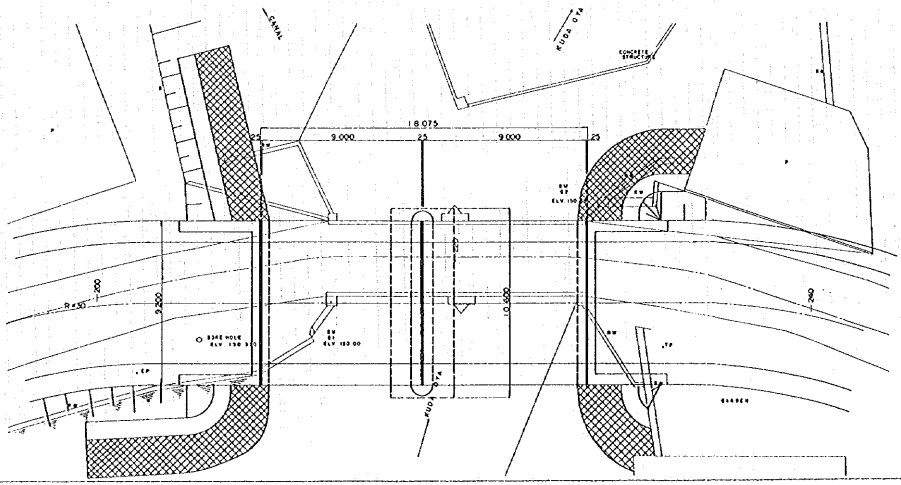
A1 ABUTMENT 1:100



P1 PIER 1:100



PLAN 1:100



BRIDGE DATA:

BRIDGE NAME NO.	20	
DESIGN LIVE LOAD :	HA AND HB LOADING (30UNITS)	
MATERIAL YIELD STRENGTH :	CONCRETE	SUPERSTRUCTURE : BEAM GRADE 45 INSITU GRADE 40
	STEEL	REBAR : YIELD STRENGTH 460 N/mm2
TYPE OF SUPERSTRUCTURE :	PSC/PRE	
TYPE OF SUBSTRUCTURE :	ABUTMENT	SPREAD
	PIER	SPREAD

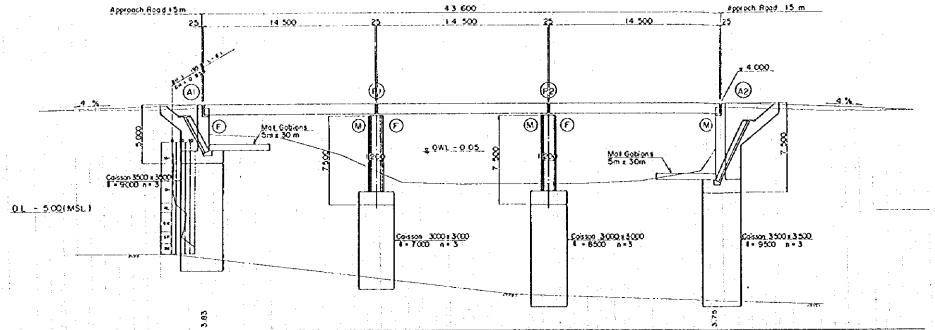
JICA

MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
RECONSTRUCTION PLAN FOR SER NO.20	SER NO. 20	AS SHOWN	MH-P-[illegible]

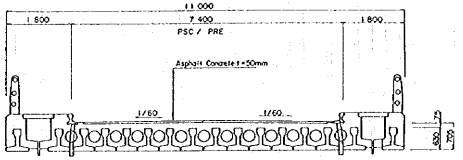
RECONSTRUCTION PLAN FOR SER NO. 70

ELEVATION 1:150

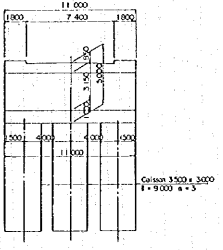


ELEVATIONS	1.43	3.83	1.40	1.23	0.29	2.61	2.75	2.68	2.61	2.45	1.66	0.82	3.75	
DISTANCES	198.70	200.00	200.00	200.00	210.00	215.00	220.00	225.00	230.00	235.00	240.00	241.24		

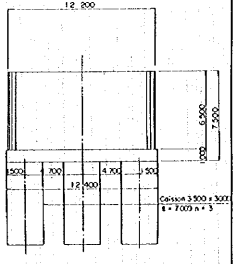
CROSS SECTION 1:50



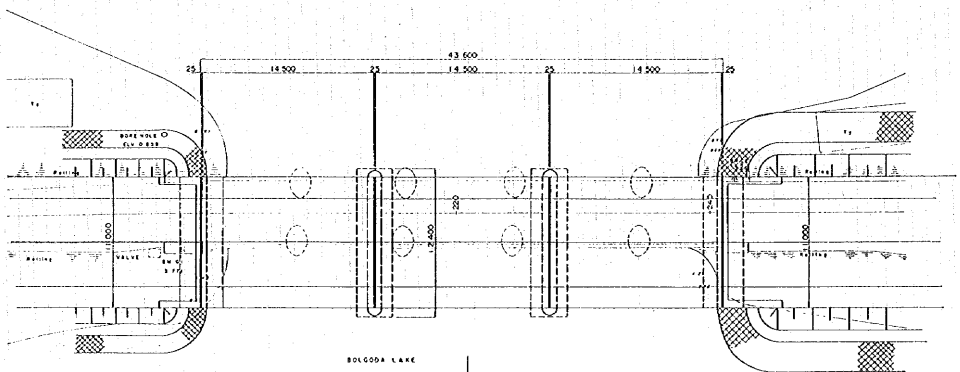
A1 ABUTMENT 1:150



P1 PIER 1:150



PLAN 1:150



BRIDGE DATA:

BRIDGE NAME NO.	70		
DESIGN LIVE LOAD :	HA AND HB LOADING (30UNITS)		
MATERIAL YIELD STRENGTH :	CONCRETE	SUPERSTRUCTURE :	BEAM GRADE 45
			INSITU GRADE 40
	STEEL	REBAR : YIELD STRENGTH 460 N/mm2	
TYPE OF SUPERSTRUCTURE :	PSC/PRE		
TYPE OF SUBSTRUCTURE :	ABUTMENT	CAISSON	
	PIER	CAISSON	

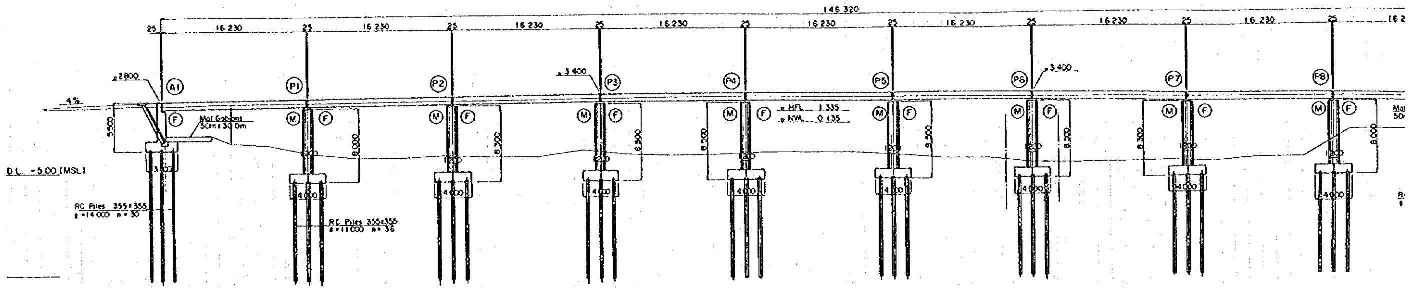
JICA

MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
RECONSTRUCTION PLAN FOR SER NO.70	SER NO 70	AS SHOWN	MP-(1)-24

RECONSTRUCTION PLAN FOR SER NO. 7

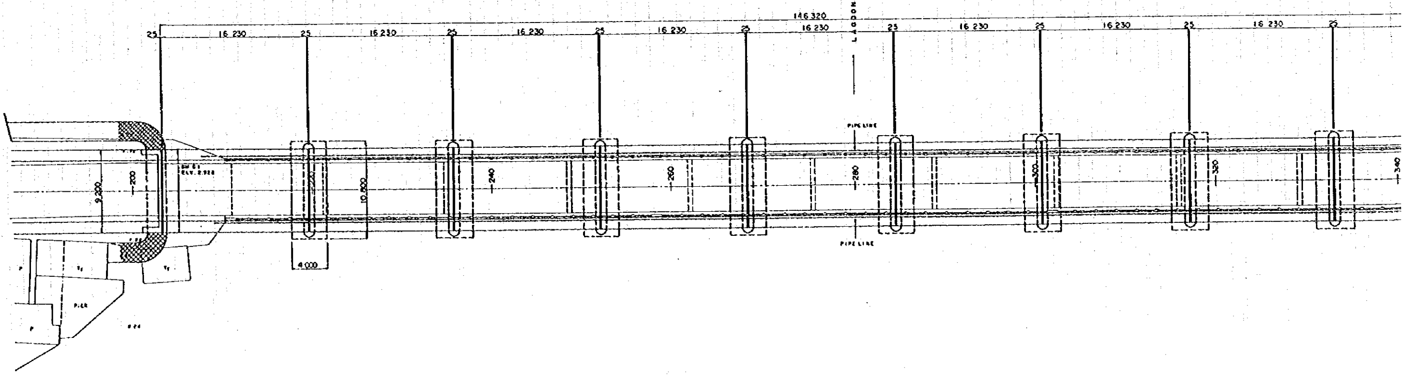
ELEVATION 1:200



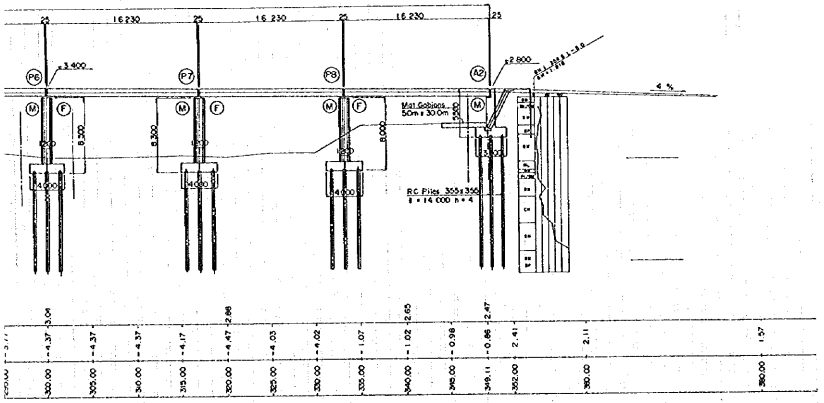
		2.44		2.60				2.88				3.04		
ELEVATIONS	2.15	-1.80	-2.08	-3.07	-3.57	-3.57	-3.27	-3.42	-3.40	-2.72	-3.21	-3.37	-3.27	-3.12
DISTANCES	200.00	210.89	215.00	220.00	225.00	230.00	235.00	240.00	245.00	250.00	255.00	260.00	265.00	270.00

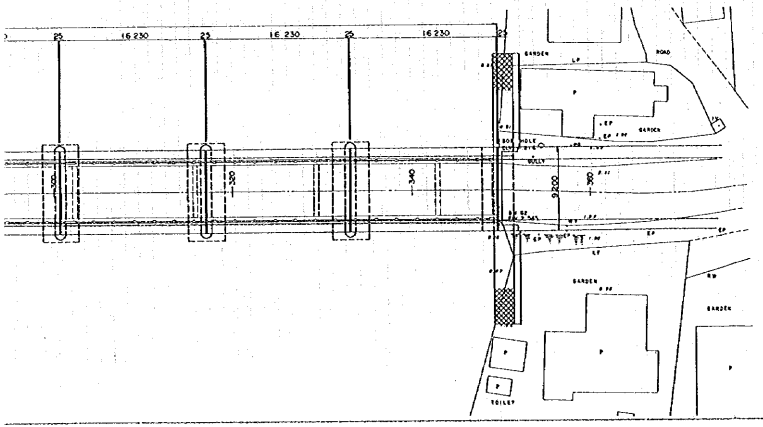
		3.02				3.04				2.83				2.65
ELEVATIONS	-3.15	-3.17	-3.37	-3.77	-3.77	-4.37	-4.37	-4.37	-4.17	-4.47	-4.03	-4.02	-1.07	-1.02
DISTANCES	275.00	280.00	285.00	290.00	295.00	300.00	305.00	310.00	315.00	320.00	325.00	330.00	335.00	340.00

PLAN 1:200

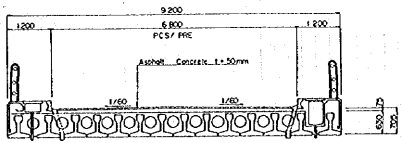


CONSTRUCTION PLAN FOR SER NO. 7

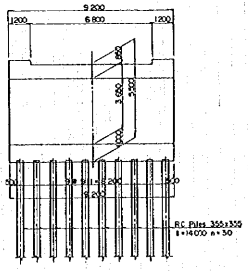




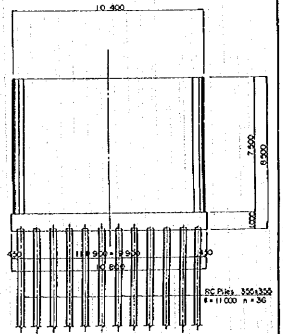
CROSS SECTION 1:50



A1 ABUTMENT 1:100



P3 PIER 1:100



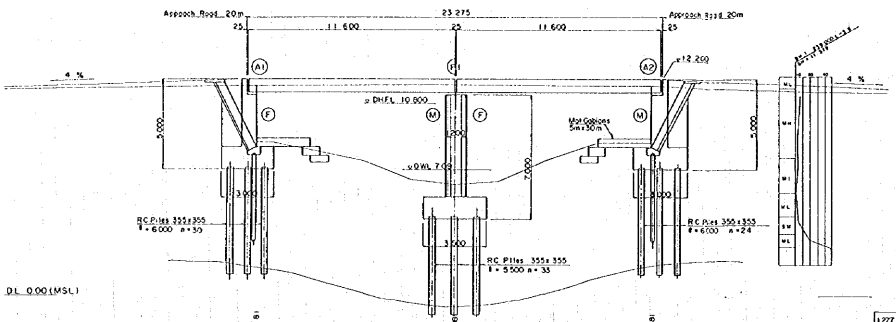
BRIDGE DATA:

BRIDGE NAME NO.	7	
DESIGN LIVE LOAD :	MA AND HB LOADING (COUNTER)	
MATERIAL YIELD STRENGTH :	CONCRETE	SUPERSTRUCTURE : BEAM GRADE 45 INSITU GRADE 40
	STEEL	REBAR : YIELD STRENGTH 460 N/mm2
TYPE OF SUPERSTRUCTURE :	PSC/PRE	
TYPE OF SUBSTRUCTURE :	ABUTMENT	R.C. PILES
	PIER	R.C. PILES

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
	RECONSTRUCTION PLAN FOR SER NO.7	SER NO.7	AS SHOWN	MR-D-25

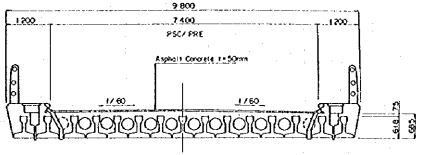
RECONSTRUCTION PLAN FOR SER NO. 211

ELEVATION 1:100

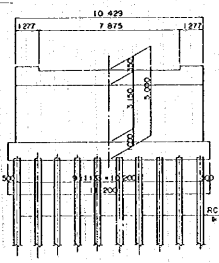


ELEVATIONS	8.66	11.81	7.60	6.54	6.21	11.88	6.49	8.59	8.59	11.81	11.51
DISDANCES	209.08		215.00	217.50	220.00		222.50	228.00	230.92		240.00

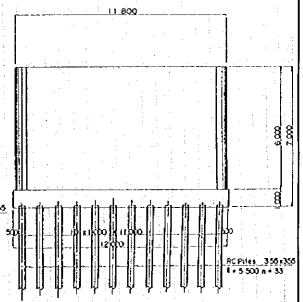
CROSS SECTION 1:50



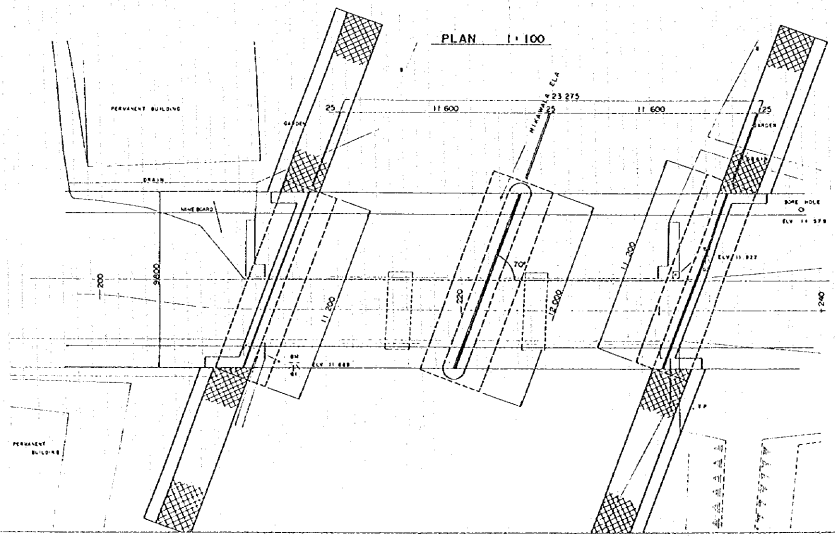
A1 ABUTMENT 1:100



P1 PIER 1:100



PLAN 1:100



BRIDGE DATA:

BRIDGE NAME NO.	211	
DESIGN LIVE LOAD :	HA AND HB LOADING (KOUNTS)	
MATERIAL YIELD STRENGTH :	CONCRETE	SUPERSTRUCTURE : BEAM GRADE 45 INSITU GRADE 40
	STEEL	REBAR : YIELD STRENGTH 460 N/mm2
TYPE OF SUPERSTRUCTURE :	PSC/PRE	
TYPE OF SUBSTRUCTURE :	ABUTMENT	R.C PILES
	PIER	R.C PILES

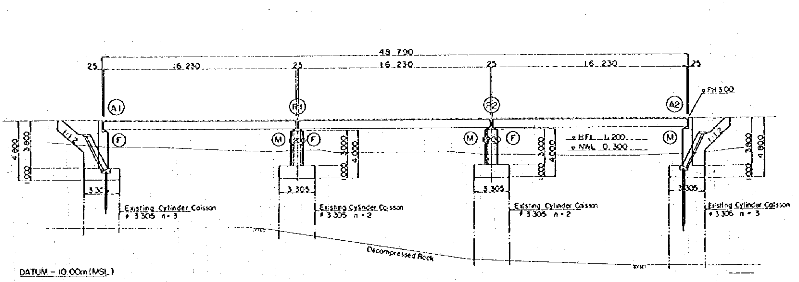
JICA

MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO
RECONSTRUCTION PLAN FOR SER NO. 211	SER NO. 211	AS SHOWN	M-BR-D-66

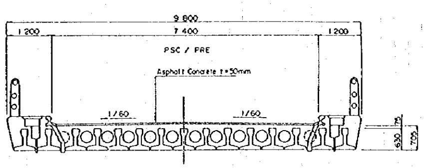
RECONSTRUCTION PLAN FOR SER NO.212

ELEVATION 1:150

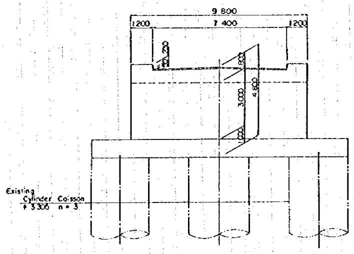


ELEVATIONS	0.85 2.90	0.85	0.50	0.50	0.25	0.00	0.00	0.15	0.00 2.94
DISTANCES	36.13	40.00	51.50	52.50	60.00	67.50	68.50	80.00	83.87

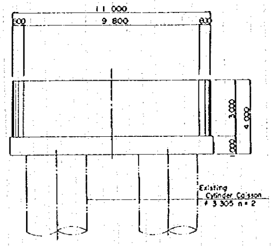
CROSS SECTION 1:50



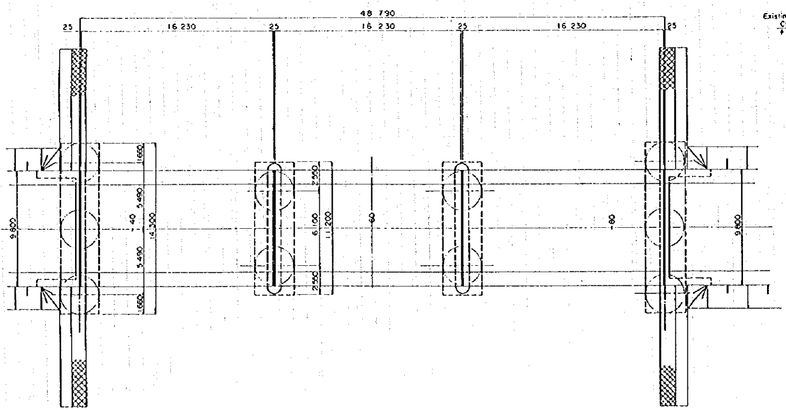
A1(A2) ABUTMENT 1:100



P1(P2) PIER 1:100



PLAN 1:150



BRIDGE DATA:

BRIDGE NAME NO.	212	
DESIGN LIVE LOAD :	HA AND HB LOADING (30UNITS)	
MATERIAL YIELD STRENGTH :	CONCRETE	SUPERSTRUCTURE : BEAM GRADE 45 INSITU GRADE 40
	STEEL	REBAR : YIELD STRENGTH 450 N/mm2
TYPE OF SUPERSTRUCTURE :	PSC/PRE	
TYPE OF SUBSTRUCTURE :	ABUTMENT	EXISTING CAISSON
	PIER	EXISTING CAISSON

JICA

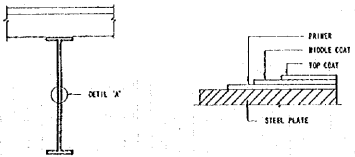
MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO
RECONSTRUCTION PLAN FOR SER NO.212	SER NO. 212	AS SHOWN	[illegible]

PROTECTION AND REINFORCEMENT TO STEEL MATERIAL

REMOVAL OF RUST AND REPAINTING

DETAIL 'A'



REMOVAL OF RUST AND REPAINTING

(A) Application Criteria

- Adequate load carrying capacity
- Non-active corrosion and paint deterioration

(B) Work Sequence

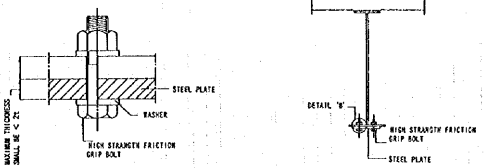
1) Thoroughly remove corrosion, foreign material, oil, grease, loose or peeling paint and all non-adherent residues from the steel surface by wire brushing or other approved means
2) Immediately after surface preparation brush applied a layer of primer.
3) Allow the primer to dry and brush applied a layer of middle coat.
4) Finally, brush applied a layer of top coat after the middle coat has dried up

(C) Specification

1) Conventional protective coatings
   a) Primer shall be lead based anti-rust paint and shall provide a minimum dry film thickness of 60 micron
   b) Middle coat shall be silicone-alkyd resin based paint and shall provide a minimum dry film thickness of 30 micron.
   c) Top coat shall be silicone-alkyd resin based paint and shall provide a minimum dry film thickness of 30 micron.
2) Heavy-duty coating
   a) Primer shall be epoxy based red oxide and shall provide a minimum dry film thickness of 100 micron.
   b) Middle coat shall be epoxy based aluminum and shall provide a minimum dry film thickness of 100 micron.
   c) Top coat shall be polyurethane resin based paint and shall provide a minimum dry film thickness of 50 micron.
3) Each layer of coatings shall be of different colours.

ATTACHMENT OF STEEL PLATE

DETAIL 'B'



ATTACHMENT OF STEEL PLATE

(A) Application Criteria

- Inadequate load carrying capacity
- Excess bending stress is less than 20% of allowable stress
- Non-active corrosion, paint deterioration

(B) Work Sequence

1) Mark the positions for the bolts and drill holes at the marked positions at both the beam and the steel plate
2) Thoroughly remove corrosion, oil, grease, foreign material, loose or peeling paint and all non-adherent residues from both the beam surface to be in contact with the steel plate as well as the steel plate.
3) Attach the plate to the beam by using high tension friction bolts as shown in the drawing
4) Protect the working area against corrosion once all the bolts have been tightened by applying protective coating

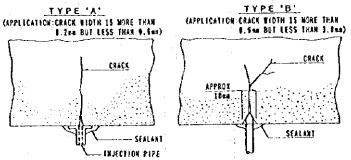
(C) Specification

1) Holes for high strength friction grip bolts shall comply with the requirements of JS
2) High strength friction grip bolts shall comply with the requirements of JS and use in accordance with JS
3) Steel plates shall comply with the requirements of JS
4) Protective coating shall follow the specification for removal of rust and repainting

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
	PROTECTION AND REINFORCEMENT TO STEEL MATERIAL		AS SHOWN	MR-D-22

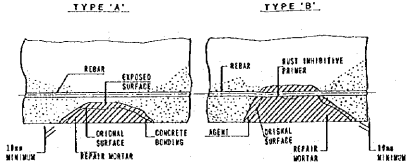
PROTECTION WORK FOR CONCRETE

INJECTION

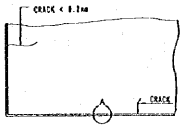


CONCRETE WIDTH (mm)	INJECTION PIPE INTERNAL (mm)
< 0.3	50 ~ 100
0.3 ~ 0.5	100 ~ 200
0.5 ~ 1.0	150 ~ 250
1.0 <	200 ~ 300

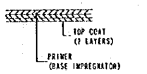
PATCHING



PROTECTIVE COATING



DETAIL 'A'



EPOXY RESIN INJECTION

(A) Applicable Criteria

- Cracks are not active and its surface width is more than 0.2mm, but less than 3.0mm ---- (1)
- Reason of the crack appearance is due to shrinkage on creep of concrete.
- No water leak and no liquid rust.
- No carbonation and no chloride attack.

(1): If surface crack width is more than 3.0mm, apply cement paste injection.

(B) Work Sequence

1) Remove any loose weak material on the surface and thoroughly clean the cracks with clean oil-free compressed air.
2) Sealed the cracks at the surface and marked the injection points. The spacing between injection points shall be as shown on the table above.
3) Fix the injection pipes into position by sealing its surrounding area.
4) Commence injection of epoxy resin from either the lowest injection point in a vertical crack or from either extreme end of a horizontal crack.
5) Remove the injection pipes and seal the holes as work proceeds.
6) Remove the sealing strip when the resin has cured and carry out final surface treatment if required.

(C) Specification

1) Minimum compressive strength of epoxy resin at 7 days shall be 80n/mm².

Property
a) Minimum strength at 7 days — 80N/mm².
b) Flexural strength — 55N/mm²
c) Flexural modulus — 3000N/mm²
d) Slant shear bond strength, Concrete / Concrete — 60N/mm²

2) Minimum curing time of epoxy resin shall be 24 hours.

PATCHING

(A) Applicable Criteria

- Defects such as honeycomb, flaking, cavity, etc are not active.
- Reason of these defects are mainly due to inferior concrete or poor workmanship.
- Minimum carbonation, no chloride attack and no water leak.
- Adequate concrete cover.
- Defective area is scattered.

(B) Work Sequence

1) All spalled, loose and defective concrete shall be removed until sound concrete is reached. In the event of rebar exposed, removal of concrete shall be carried out to a further depth of 20mm behind the rebar.
2) All exposed reinforcement shall be cleaned of corrosion by wire brushing or other approved means to achieve a surface finish complying with 2S. The reinforcement shall immediately be primed with zinc-rich type primer complying with the requirements of 2S.
3) Prior to patch repair, dampen the concrete and apply a thin layer of concrete bonding agent.
4) Firmly push into place the repair mortar by gloved hand or trowel.
5) Make good the finished surface using a trowel or wood float.

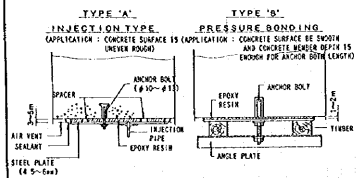
(C) Specification

1) Minimum compressive strength of repair mortar shall be 40N/mm².
2) Minimum dry film thickness of steel primer shall be 40 microns.

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
	PROTECTION WORK FOR CONCRETE		AS SHOWN	MR-D-20

REINFORCEMENT WORK TO CONCRETE

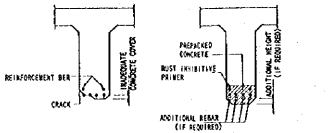
STELL PLATE BONDING



PREPACKED CONCRETE LINING WITH ADDITIONAL REBER

(APPLICATION : SOFFIT OF MEMBERS THERE IS DIFFICULT TO POUR CONCRETE SUCH AS SOFFIT OF BEAM & SLAB)

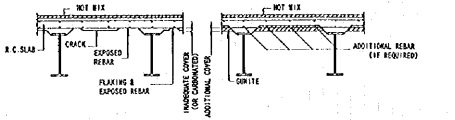
BEFORE REINFORCEMENT AFTER REINFORCEMENT



GUNITING WITH ADDITIONAL REBER

(APPLICATION : SOFFIT OF MEMBERS WHERE IS DIFFICULT TO POUR CONCRETE DUE TO NOT ENOUGH HEIGHT)

BEFORE REINFORCEMENT AFTER REINFORCEMENT



PREPACKED CONCRETE LINING WITH ADDITIONAL REBAR

(A) Application Criteria

- Inadequate loading capacity
- Various active cracks due to bending moment or shear force
- Inadequate concrete cover
- Suffered mild chloride attack or advanced carbonation
- Defective area is not extensive

(B) Work Schedule

1) Remove all spalled, loose and defective concrete until sound concrete is reached. Breaking out shall expose the full circumference of the rebar and to a further depth of 20mm behind the rebar if it is corroded.
2) All exposed reinforcement shall be cleaned of corrosion products by wire brushing or other approved means to achieve a surface finish complying with JS.
3) Apply prime coat within 2 hours after preparing and cleaning of the rebar.
4) Securely fix additional rebar and anchor bar as shown in the drawing if required.
5) Construct the formwork to form a minimum concrete cover of 70mm. Formwork shall be sufficiently rigid and tight to prevent the loss of grout and to maintain forms in their correct position, shape, profile and dimension.
6) Pack single sized coarse aggregate behind the forms to fill the voids.
7) Injection openings are to be provided at the bottom face of the form for the purpose of injecting grout into the prepacked aggregates.
8) Wet all concrete surfaces sufficiently prior to placing concrete.
9) Pump in the grout to fill the spaces between the aggregates by pressure grouting via the injection openings from the farthest point of the void.
10) Formwork shall be removed when the concrete has achieved the required strength and shall be immediately cured in accordance with good concrete practice.

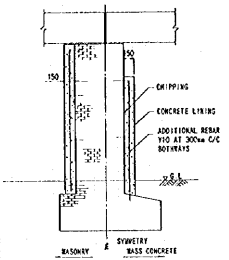
(C) Specification

1) The cement used shall be ordinary portland cement conforming to JS.
2) Minimum concrete cube strength at 28 days shall be 40N/mm²/20mm.
3) Minimum concrete cover to main reinforcement to be 70mm.
4) Bars shall be bent and measured in accordance with JS.
5) Reinforcement to be weld shall comply with the requirements of JS.
6) Welding shall be carried out in accordance with JS.
7) All mild steel and high yield bars to conform to JS.
8) Lap length to be 32 x diameter of bar.
9) Primer shall be zinc-rich type primer complying with the requirements of JS.

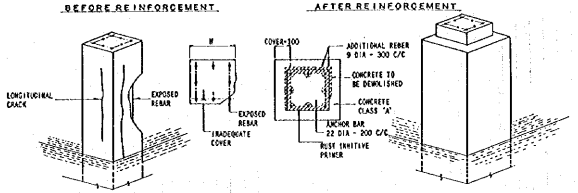
JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO.
	REINFORCEMENT WORK TO CONCRETE		AS SHOWN	MR-D-30

PROTECTION AND REINFORCEMENT TO SUBSTRUCTURE

CONCRETE LINVING TO MASONRY OR MASS CONCRETE (TYPE 'A')



CONCRETE LINING TO PILES (TYPE 'B')

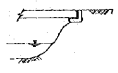


JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING: PROTECTION AND REINFORCEMENT TO SUBSTRUCTURE	BRIDGE NAME / NO.	SCALE: AS SHOWN	DRAWING NO.: NR-C-31

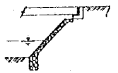
RIVER IMPLOVEMENT

SLOPE PROTECTION

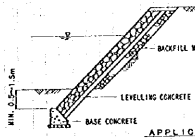
BEFORE REHABILITATION



AFTER REHABILITATION



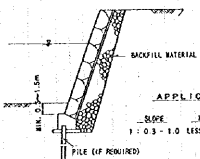
STONE MASONY (TYPE-A)



APPLICATION CRITERIA

SLOPE	HEIGHT	APPLICATION
1 : 0.5 ~ 1.5	LESS THAN 5m	SMALL TO MEDIUM SCALE RIVER

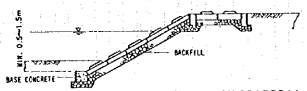
CONCRETE BROCK MASONRY (TYPE-B)



APPLICATION CRITERIA

SLOPE	HEIGHT	APPLICATION
1 : 0.3 ~ 1.0	LESS THAN 3m	RAPID STREAM AND SMALL TO MEDIUM SCALE RIVER

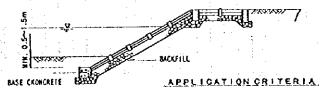
CONCRETE BLOCK PITCHING (TYPE-C)



APPLICATION CRITERIA

SLOPE	HEIGHT	APPLICATION
1 : 1.5 ~ 2.0	LESS THAN 5m	MEDIUM TO LARGE SCALE RIVER

CONCRETE FRAME (TYPE-D)



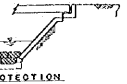
APPLICATION CRITERIA

SLOPE	HEIGHT	APPLICATION
1 : 1.5 ~ 2.0	LESS THAN 5m	TIDAL RIVER AND BANK SUBJECTED TO WAVE FORCE

FOOT PROTECTION

BEFORE REHABILITATION

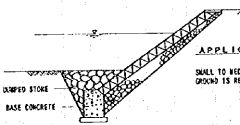
AFTER REHABILITATION



REQUITED WIDTH OF FOOTPROTECTION

	MEAN FLOOD FLOW VELOCITY (V)		
	2m/sec>V	2<V<4m/sec	V>4m/sec
WIDTH	2 ~ 5 m	4 ~ 8 m	MORE THAN 6m

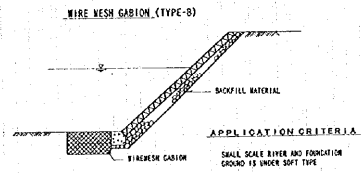
DUMPED STONE (TYPE-A)



APPLICATION CRITERIA

SMALL TO MEDIUM SCALE RIVER AND FOUNDATION GROUND IS RELATIVERY SOLID

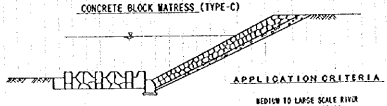
WIRE MESH GABION (TYPE-B)



APPLICATION CRITERIA

SMALL SCALE RIVER AND FOUNDATION GROUND IS UNDER SOFT TYPE

CONCRETE BLOCK MATRESS (TYPE-C)



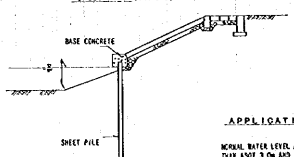
APPLICATION CRITERIA

MEDIUM TO LARGE SCALE RIVER OR RAPID FLOW VELOCITY

REQUITED WIDTH OF FOOT PROTECTION

	MEAN FLOOD FLOW VELOCITY (V)		
	2m/sec>V	2<V<4m/sec	V>4m/sec
HEIGHT	0.2 ~ 1.5 ton	1 ~ 3 ton	MORE THAN 2 ton

SHEET PILE (TYPE-D)

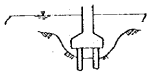


APPLICATION CRITERIA

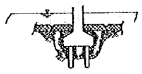
NORMAL WATER LEVEL AT SLOPE TOE IS MORE THAN ABOT 3.0m AND IT IS DIFFICULT TO PROVIDE BASE CONCRETE UNDER RIVER BED AT SLOPE TOE.

RIVER - BED PROTECTION

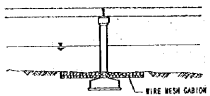
BEFORE REHABILITATION



AFTER REHABILITATION

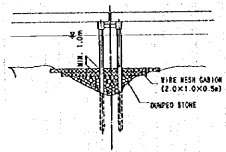


WIRE MESH GABION (TYPE-A)

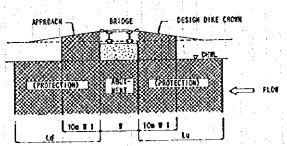


APPLICATION CRITERIA
FOUNDATION PROTECTION

DUMPED STONE & WIRE MESH GABION (TYPE-B)



APPLICATION CRITERIA
LOCAL SCOURING

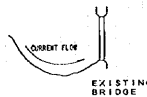


B : WIDTH OF BRIDGE ABUTMENT
Ld,Lu : LENGH OF REVETMENT DOWNSTREAM AND UPSTREAM SIDES OF THE ABUTMENT RESPECTIVELY
B I IS EQUAL TO B OR NOT MORE THAN 10m
Ld,Lu : NOT LESS THAN THE FOLLOWING LENGH

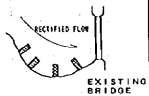
DESIGN DISCHARGE (Q m³/sec)	PROTECTION LENGTH (Ld, Lu)
Q<2000	10
2000≦Q<4000	15
4000≦Q<6000	20
6000≦Q<8000	25
Q≧8000	30

RIVER REALIGNMENT

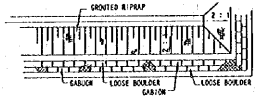
BEFORE REHABILITATION



AFTER REHABILITATION

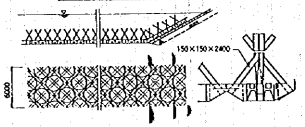


SPUR DIKE BY STONE MASONRY (TYPE-A)



APPLICATION CRITERIA
LARGE SCALE RIVER

GROYNE BY CONCRETE PILE (TYPE-B)

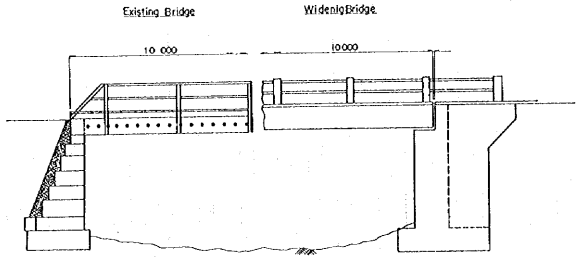


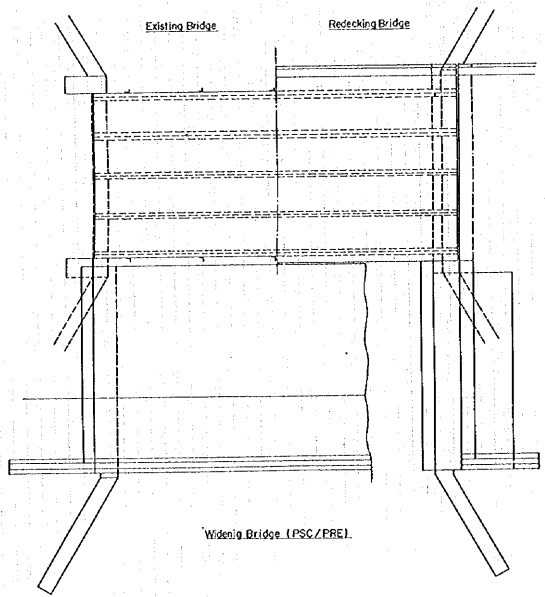
EXTENT OF REVETMENT AROUND BRIDGE ABUTMENT

JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
	RIVER IMPLOVEMENT		AS SHOWN	MR-[-32

PROPOSED REHABILITATION FOR RSJ/BUC & RSJ/COR

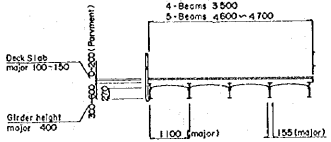
ELEVATION





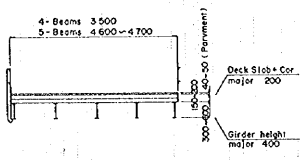
Existing Bridge

RSJ / BUC



OR

RSJ / COR

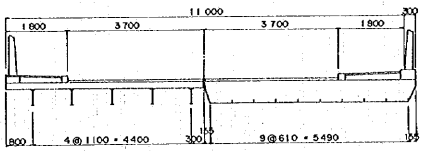


Redecking Bridge

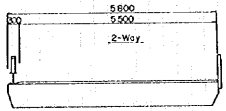
RSJ / RCS

Widening Bridge

PSC / PRE

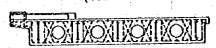


Under Construction



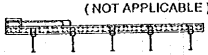
TYPE-2 R/F Concrete (coverd I beams)

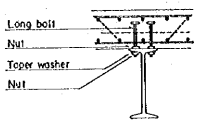
TYPE-3 R·C Hollow slab (coverd I beams)
(NOT APPLICABLE)



polythene bag filled with saw dust

TYPE-4 Composite beam
(NOT APPLICABLE)





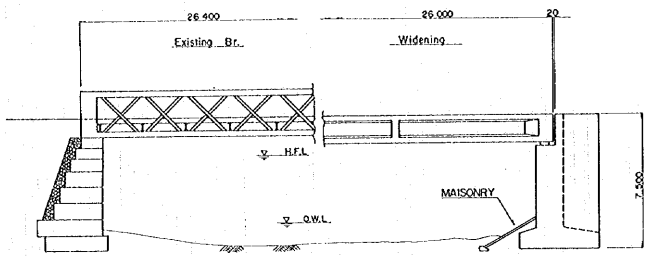
Construction Order

1. Construction of abutments for widening.
2. Construction of superstructure for widening. (PSC/PRE)
3. Diversion of existing traffic on the new bridge.
   Two lane can be obtained. (5.5m between curbs)
4. Redecking and repair of existing bridge.
   Curtain wall with R/F concrete to abutment.
5. Repair surface and footway of the new bridge.

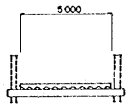
JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO	SCALE	DRAWING NO
	PROPOSED REHABILITATION FOR RSJ/BUC & RSJ/COR		AS SHOWN	MR-D-33

PROPOSED REHABILITATION FOR ST・TR/T

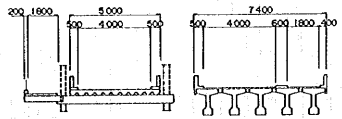
ELEVATION

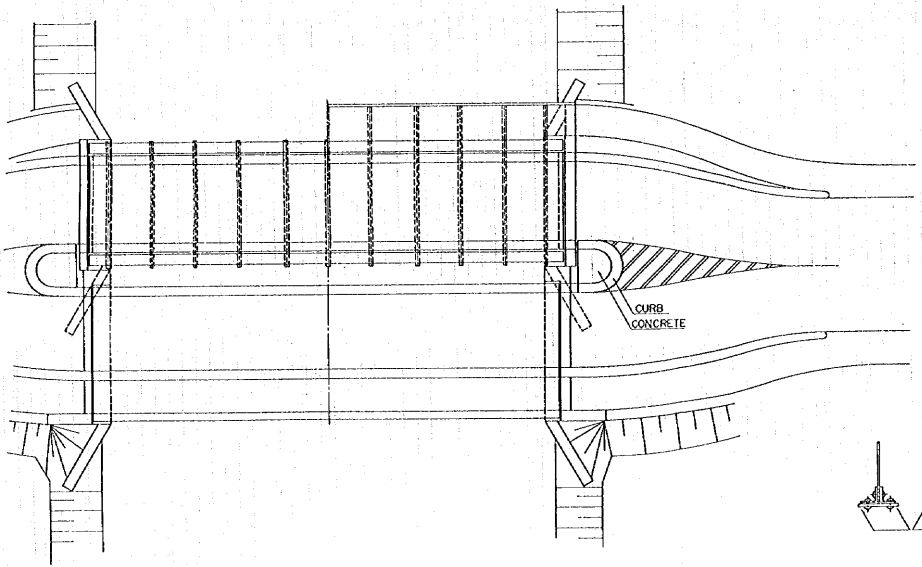


Existig Br.



Widening Footway Existing Br. Widening



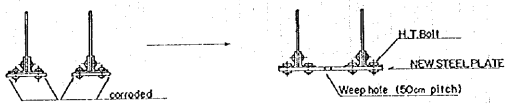


Redecking

Construction Order

1. Construction of abutments for widening.
2. Construction of superstructure for widening. (PSC/PRE)
3. Diversion of existing traffic on the new bridge.
   Two lane can be obtained. (6.4m between curbs)
4. Redecking and repair of existing bridge.
5. Widening of footway on side of existing bridge.

Lower Beam



JICA	MASTER PLAN STUDY ON BRIDGE DEVELOPMENT IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA			
	TITLE OF DRAWING	BRIDGE NAME / NO.	SCALE	DRAWING NO.
	PROPOSED REHABILITATION FOR ST-TR/T		AS SHOWN	MR-D-34