ジャッキは能力300 tonを2台用いる。縦送りの水平ジャッキに作用する水平力は1主構当り約60 tであり能力100 tonのジャッキを用いる。縦送り時B及びC橋脚に作用する水平力は左右主構合計で約51 tonである。

(5) 現部材の補強及び治具取付け方法

現部材は溶接用材料でないため部材の補強，治具の取付けの基本は高力ボルトで行い，やむを得ない場合は溶接により行った。

第3節 施 工 計 画

施工計画書（APPENDIX 3－2(3)に詳述する）ではSIMPLE SPAN及びANCHOR SPANの各のリセット工事の計画を行った。リセット方法は補修工事のため施工の容易さを特に考慮して計画した。SIMPLE SPANは可動各のセットボルトを取りはずし，端横桁で桁をジャッキアップし，上各のみを移動して，下各の中心に合わせる。ANCHOR SPAN及びリンク部は，C橋脚の固定各の下各とベースプレートとの溶接を切り離しANCHOR及びSUSPENDED SPAN 全体を縦移動することにより，各及びリンク部の修正を図る。

本リセット工事の施工順序を図－3.10，図－3.11に，工程表を図－3.12～図－3.14に示す。

第4節 特 記 仕 様 書

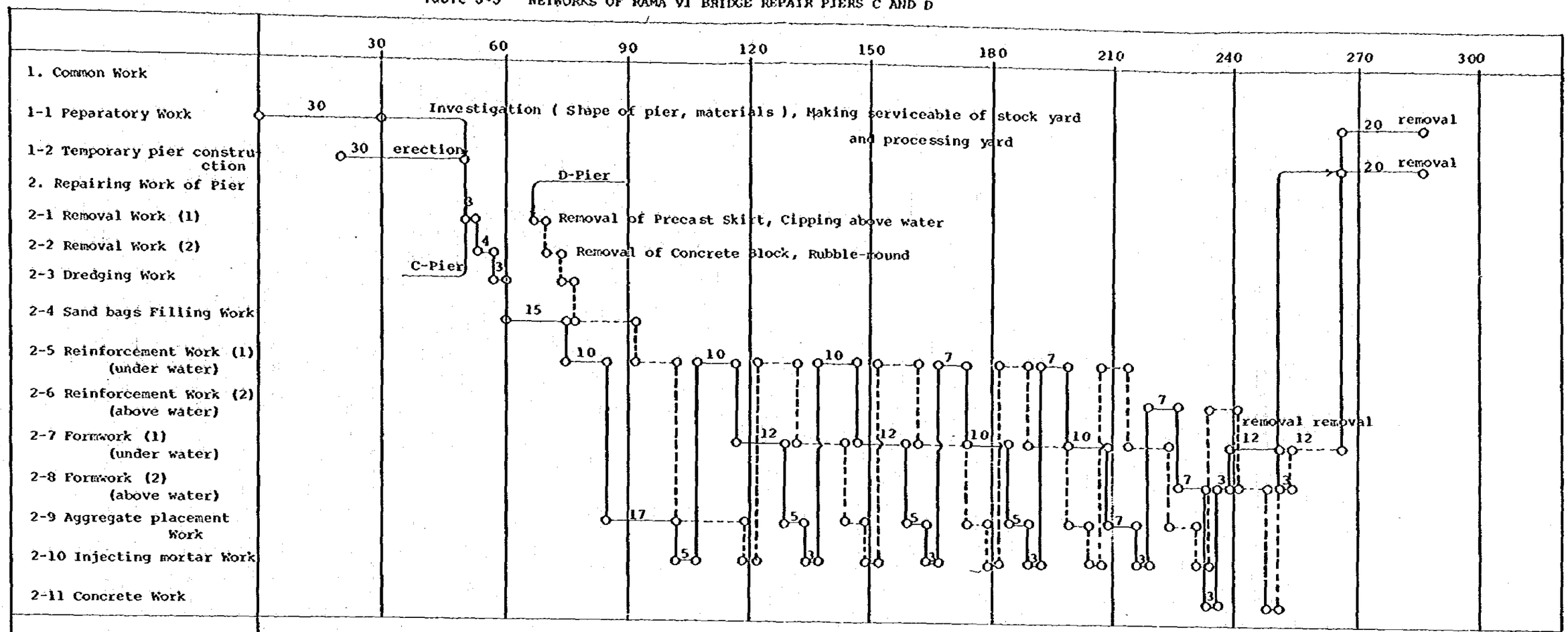
特記仕様書（APPENDIX 3－2(4)に詳述する）では，以下の項目にて本リセット工事の仕様を述べている。

1. 総　則
2. 桁及び各の補修
   - 2－1　材　料
   - 2－2　切断及び加工
   - 2－3　溶　接
   - 2－4　高力ボルト継手
   - 2－5　リベットの撤去
   - 2－6　塗　装
3. 台座の補修
   - 3－1　モルタル
   - 3－2　コンクリート
   - 3－3　埋込みボルトの取付け

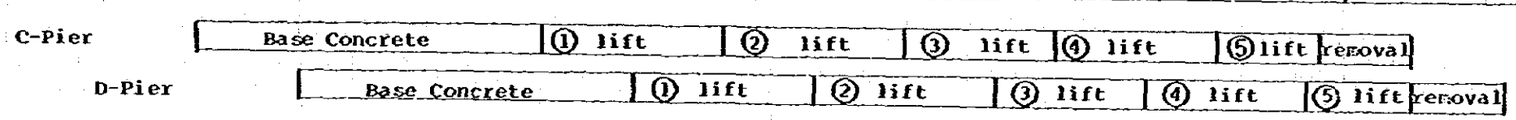
第5節 工事費の積算

別添の通りである。（Appandix 3－2(5)）

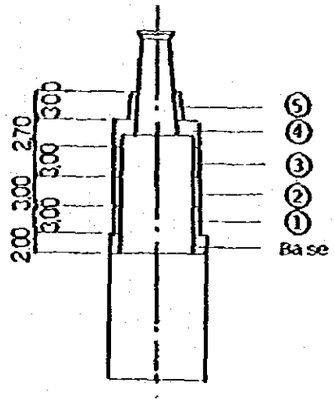
Table 3-3 NETWORKS OF RAMA VI BRIDGE REPAIR PIERS C AND D



Stage of Each Lift Work



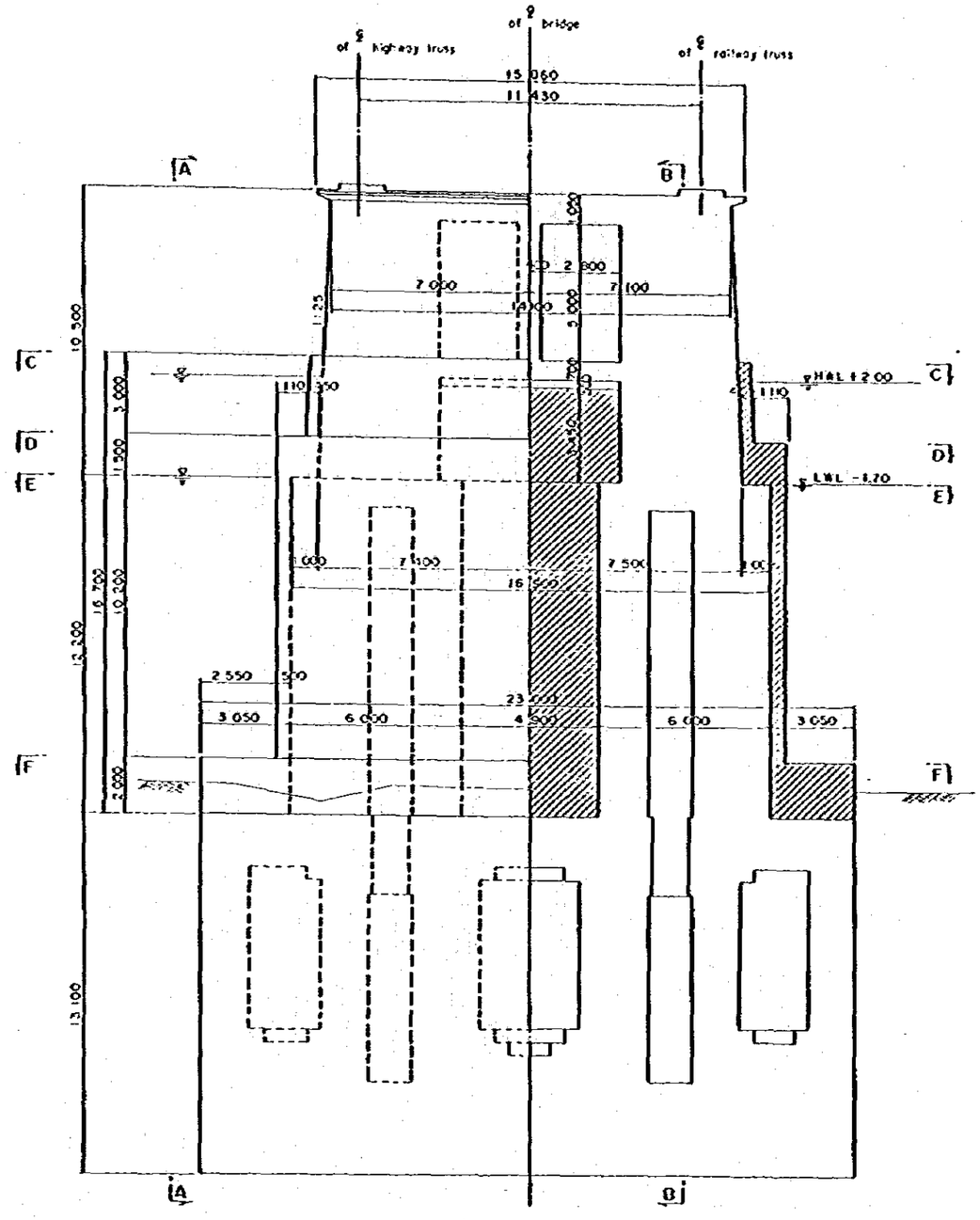
Outline of Shape



Outline of Quantity

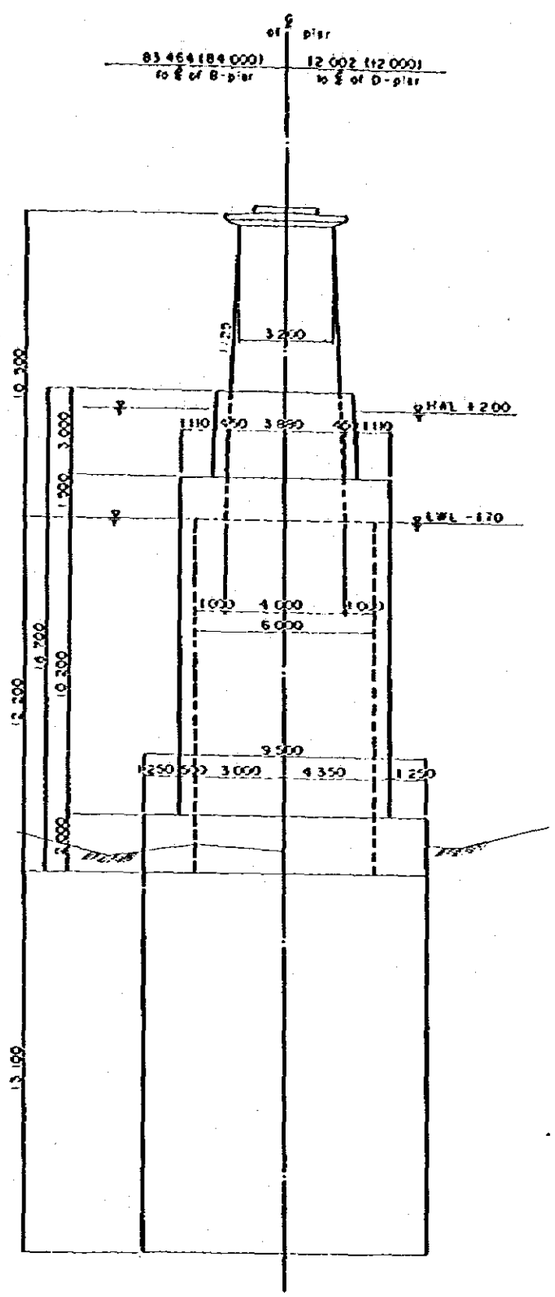
C-Pier	Concrete	Forms	D-Pier	Concrete	Forms
base concrete	286 m³		base concrete	273 m³	
①	175 "		①	154 "	
②	175 "		②	164 "	
③	175 "	503 m²	③	173 "	525 m²
④	206 "		④	194 "	
⑤	106 "	111 "	⑤	95 "	111 "

C - pier NO.1

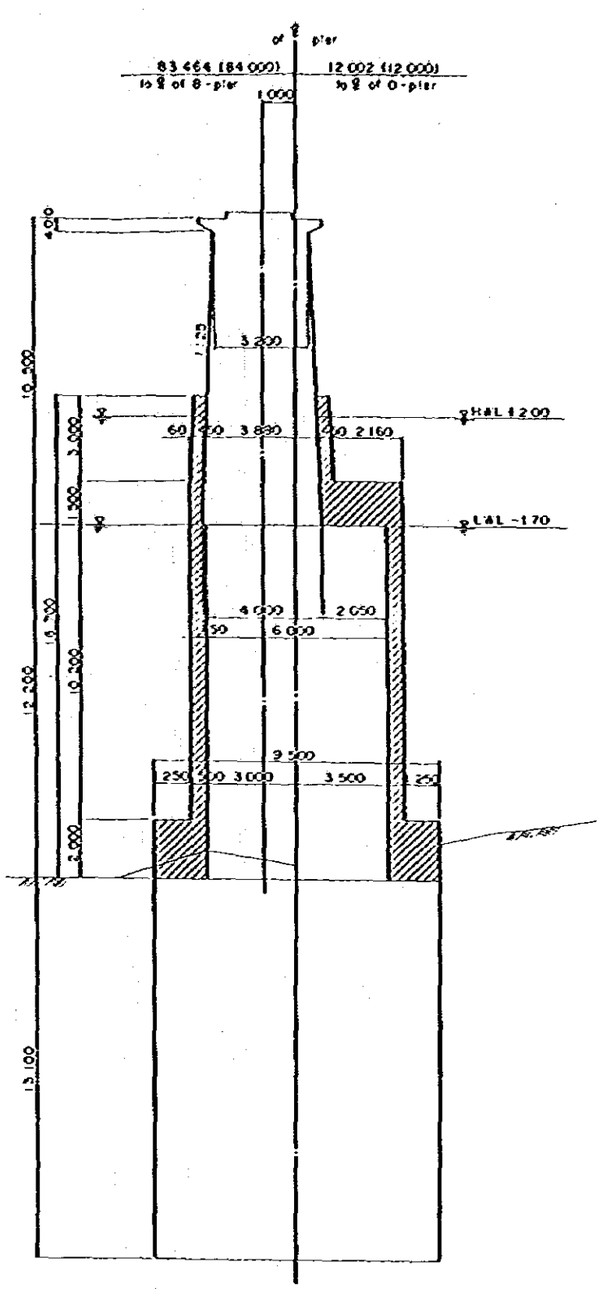


HALF ELEVATION

HALF SECTIONAL ELEVATION



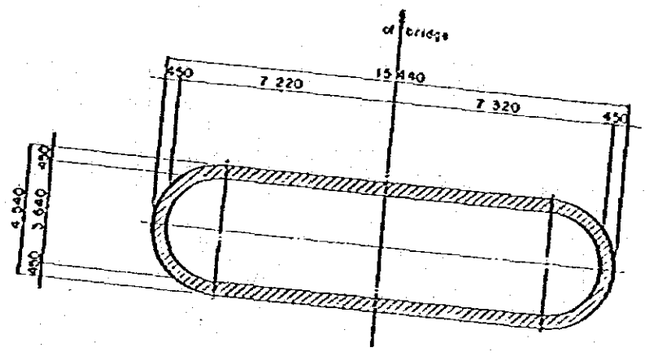
END ELEVATION
A - A



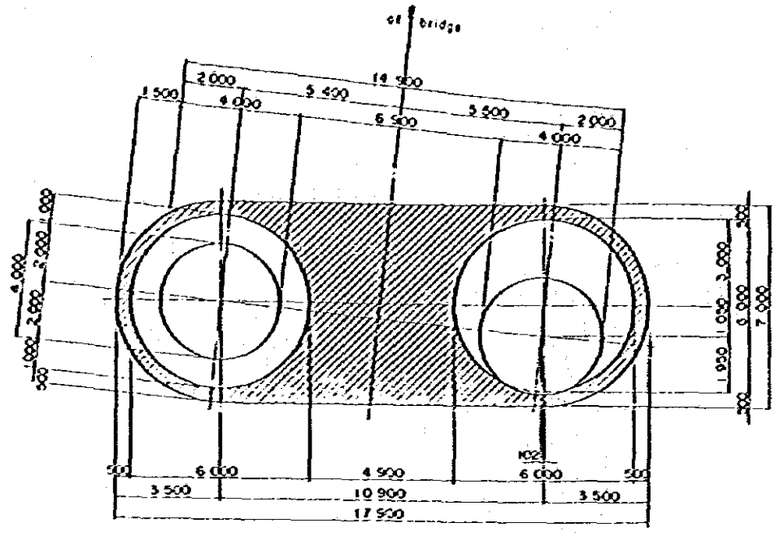
END ELEVATION
B - B

Fig. 3-1 C-Pier Rehabilitation Plan No. 1

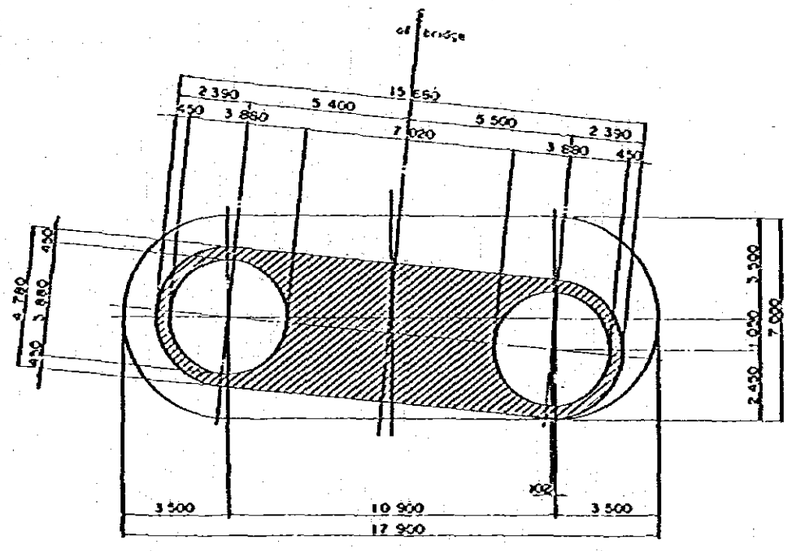
C - pier NO 2



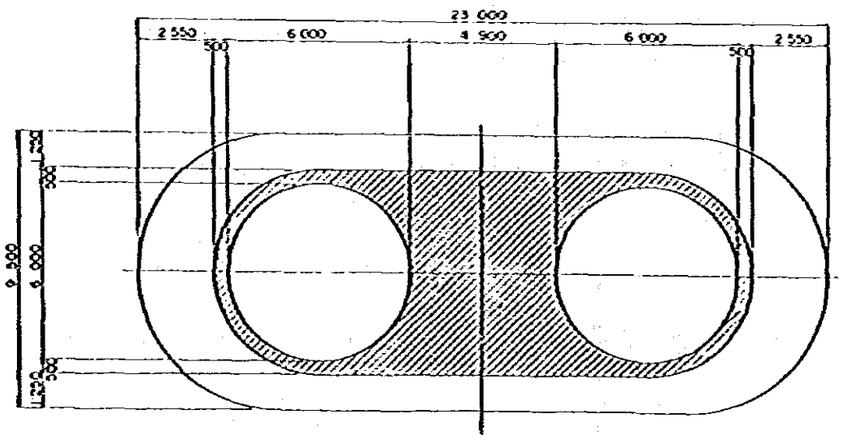
PLAN ON C — C



PLAN ON E - E



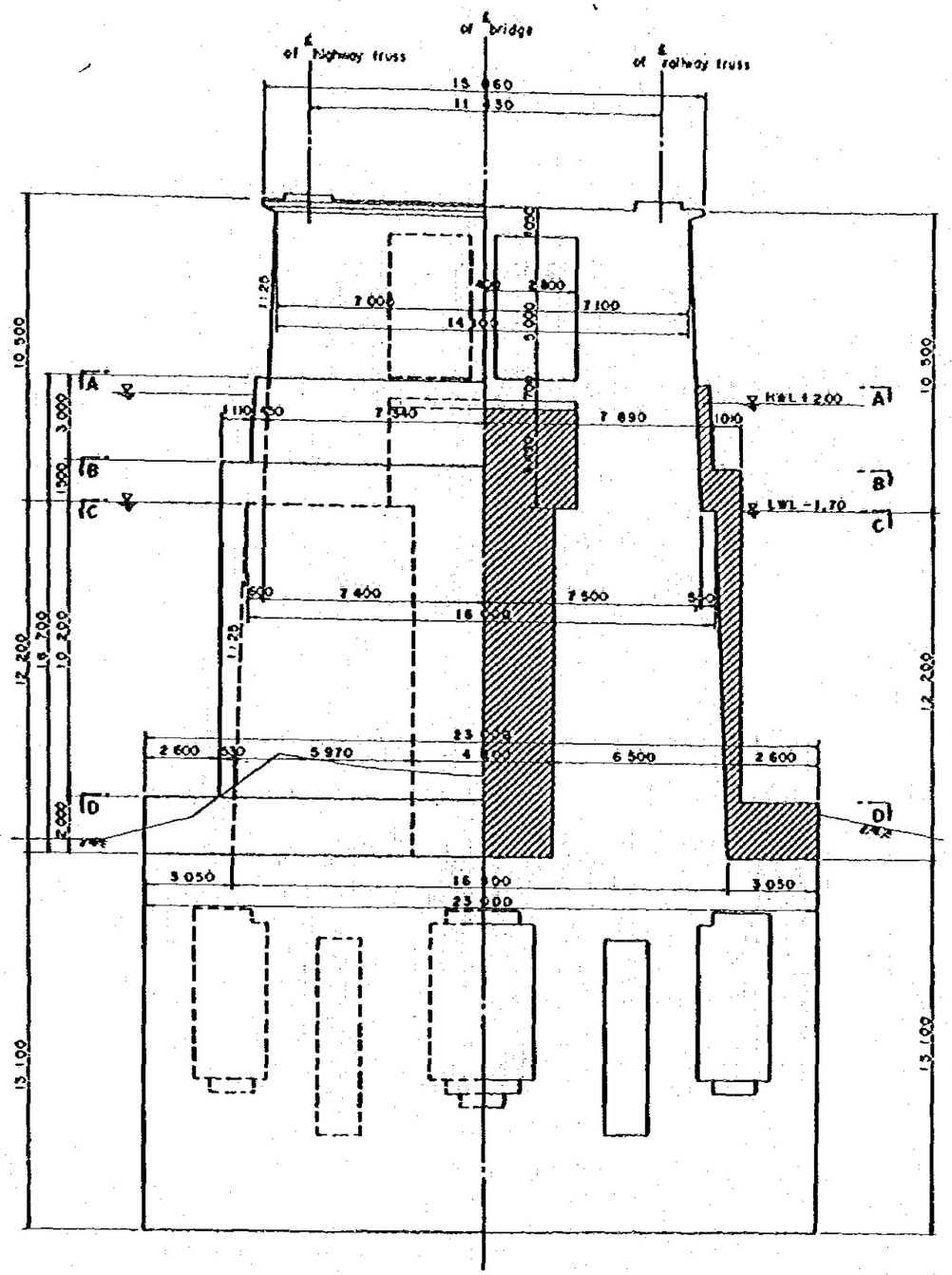
PLAN ON D - D



PLAN ON F - F

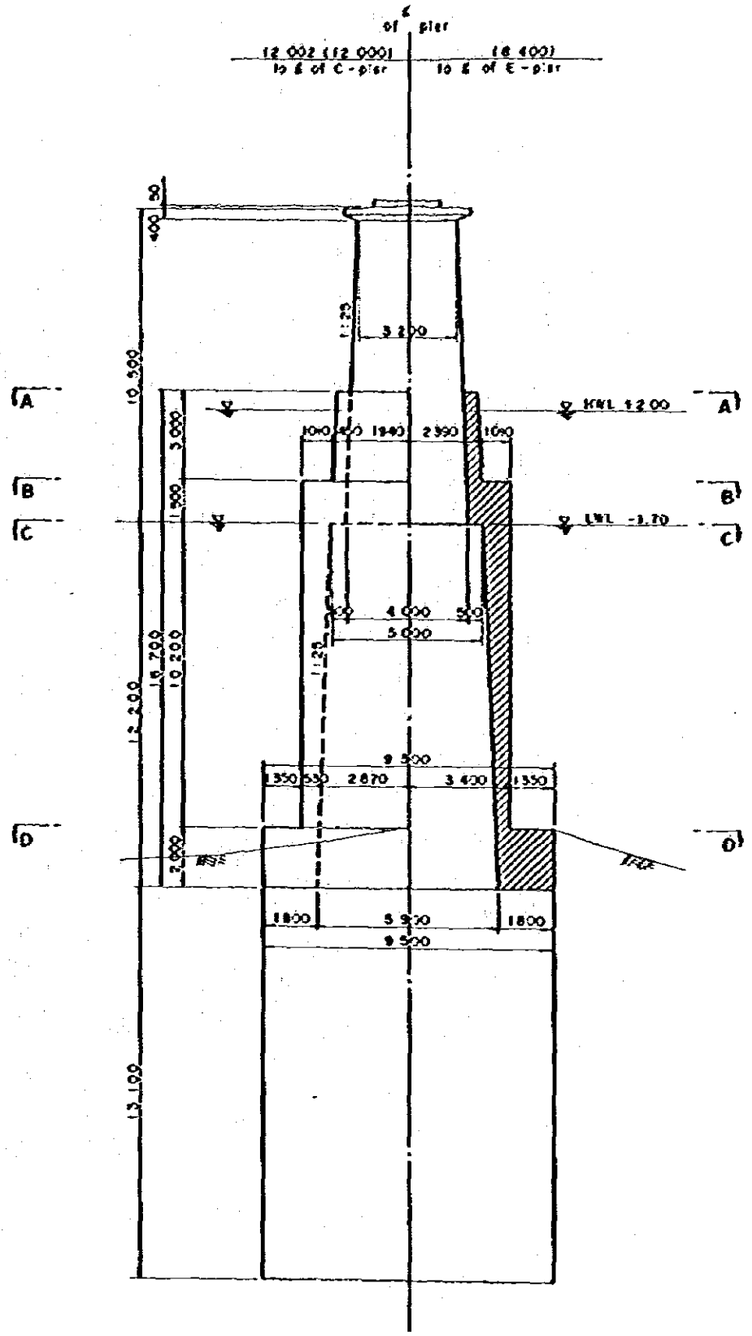
Fig. 3-2 C-Pier Rehabilitation Plan No. 2

D – PIER No 1 S = 1 : 100



HALF ELEVATION

HALF SECTIONAL ELEVATION

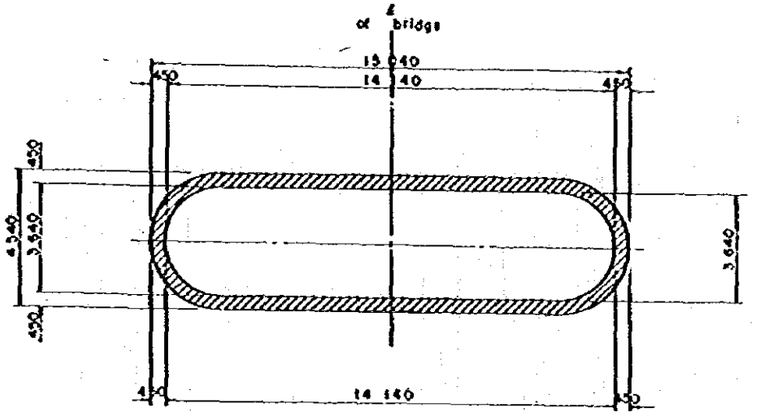


END ELEVATION

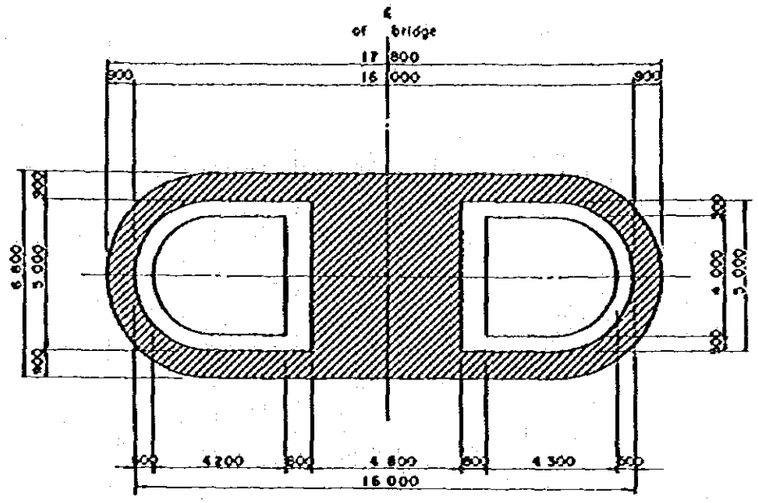
※ Hatching area means existing concrete

Fig. 3-3 D-Pier Rehabilitation Plan No. 1

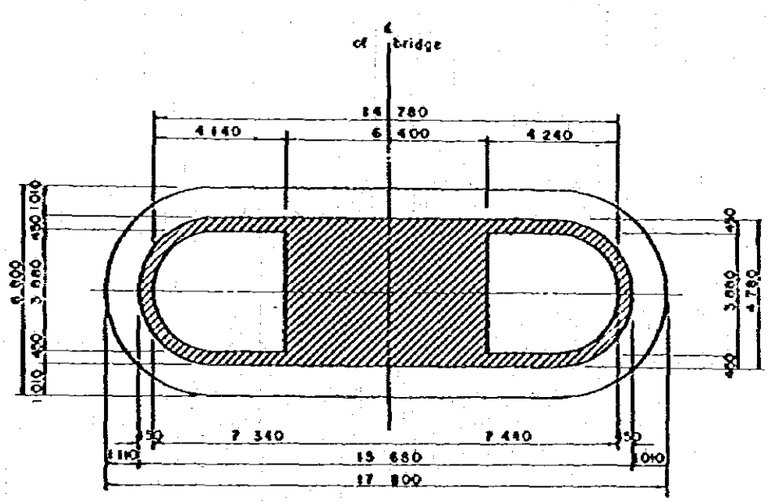
D-PIER No 2 S = 1:100



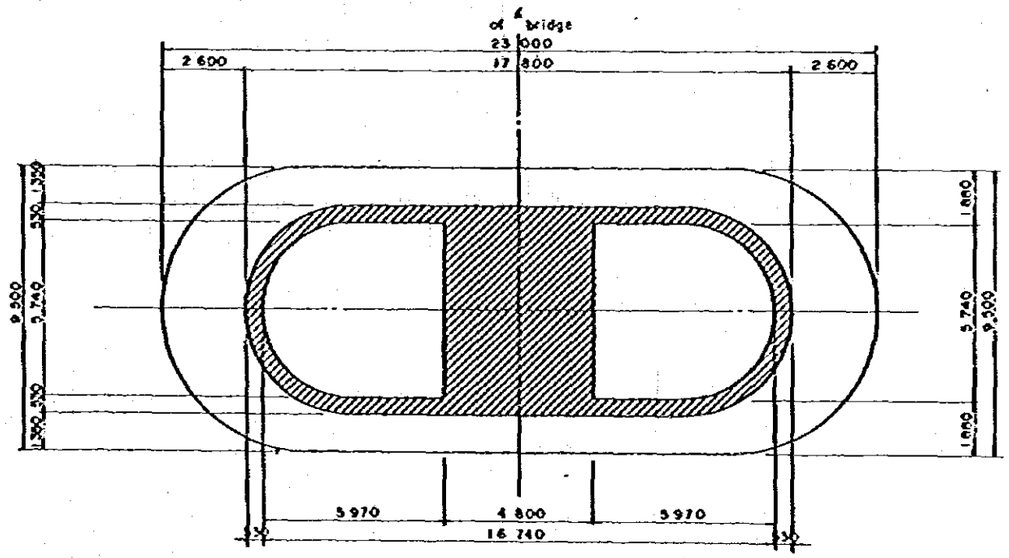
PLAN ON A-A



PLAN ON C-C



PLAN ON B-B



PLAN ON D-D

※ Hatching area means existing concrete

Fig. 3-4 D-Pier Rehabilitaiton Plan No. 2

START

PREPARATORY WORK

Confirmation of foundation shape

(by diver)

Removal of rubble-mound

Dredging

TEMPORARY PIER CONSTRUCTION

(underwater)

CONCRETE WORK AT THE BASE PART

((Prepacked Concrete))

Setting sand bags

Formwork

(use of sailing cloths)

Placing reinforcement bar

Setting grouting pipe

Casting Coarse aggregates

Injecting mortar

(on land)

Prefabricating reinforcing net

(underwater)

CONCRETE WORK COVERING LOWER PART OF PIER

repeat 4 times

((Prepacked Concrete))

Placing reinforcing rack

Formwork

Setting grouting pipes

Casting coarse aggregates

Injecting mortar

(above water)

CONCRETE WORK COVERING UPPER PART OF PIER

((Regular Concrete))

Placing reinforcement bar

Formwork

Pouring concrete

REMOVAL OF FORMS

COMPLETION

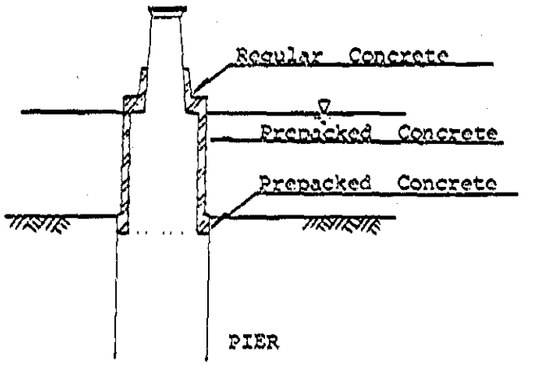
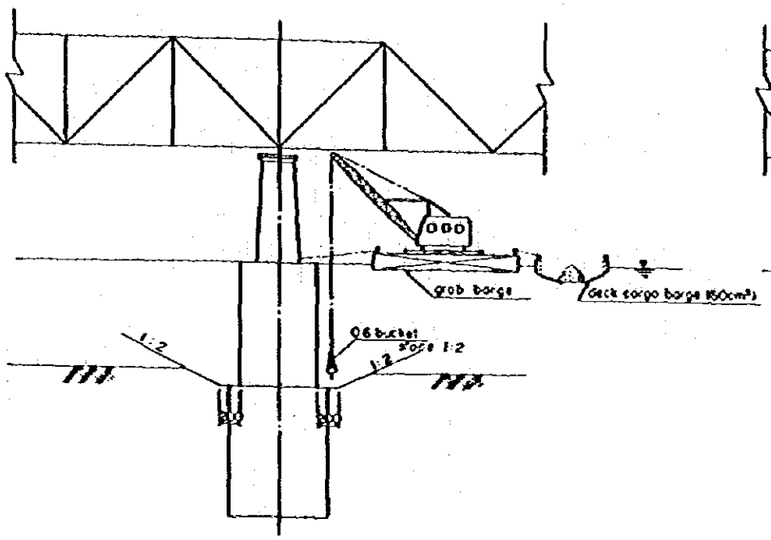
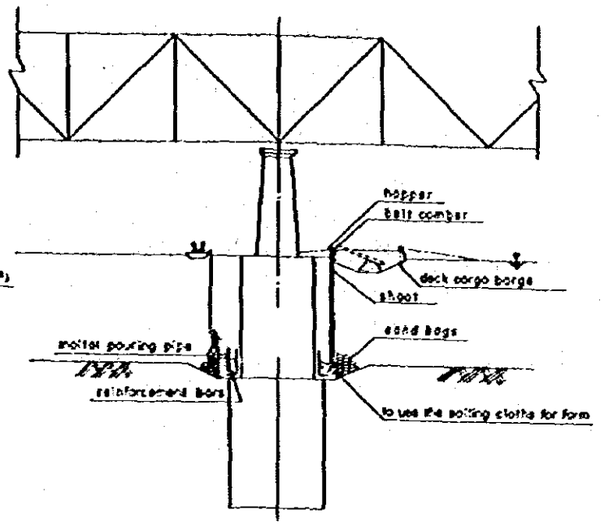


Fig. 3-5 Flow Chart of Construction



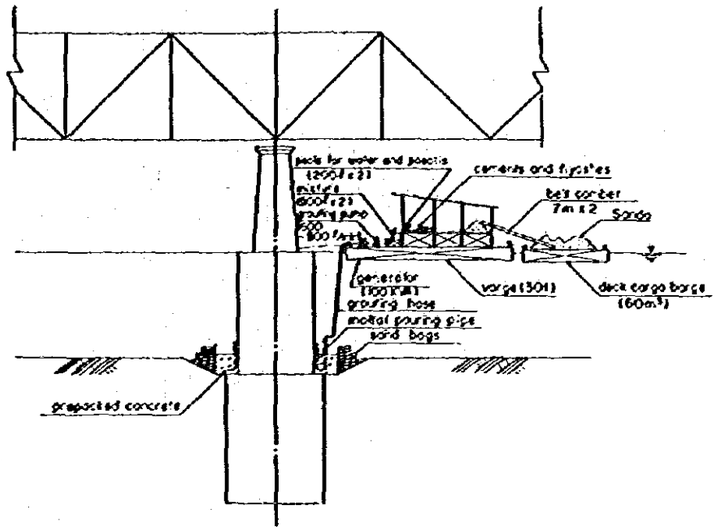
No. 1 Digging and removing work

1. To remove riprap at the top of the caisson
2. To remove failing precast slabs
3. To dig the ground at the width of 2.00 m from the surface of the pier until the top of the caisson can be seen.



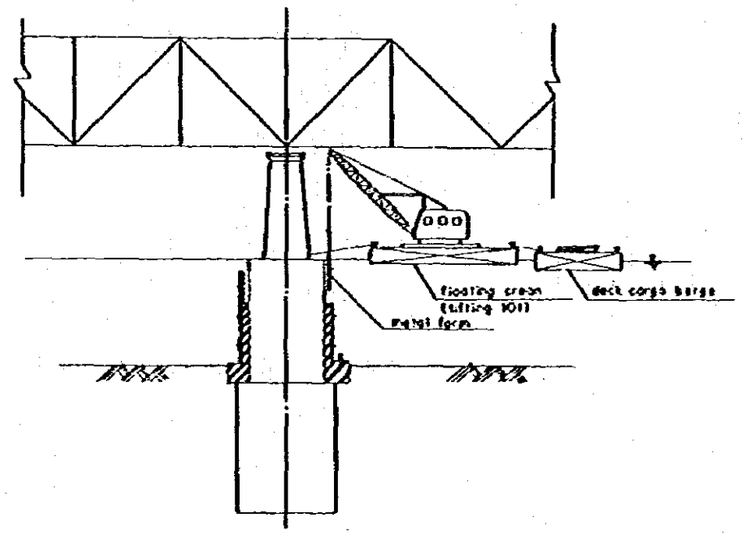
No. 2 Shooting of the aggregates

1. To use soiling cloths for foundation form and to make construction of base concrete at the width of 2.00 m from the surface of the pier, and at the height of 2.00 m from the top of the caisson.
2. Steel pipes of 4 1/2" are used for pouring, and to set them with reinforcement bars (1 pipe/2 m²)
3. To fall down aggregates (30~100 mm diameter) by the way of shoot from barge.
4. Diving works are 1) to make the ground flat, 2) to pile up sand bags, 3) to set soiling cloths, 4) to set pouring pipes, 5) to make the aggregates flat, 6) to clean the old pier in the water.



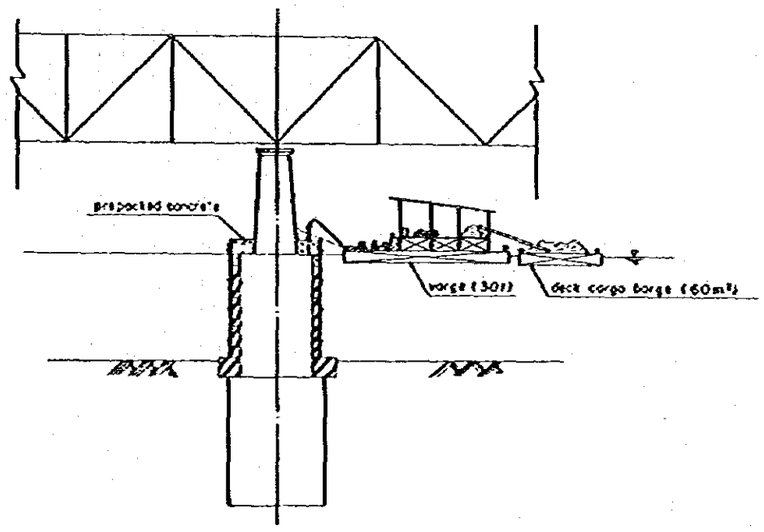
No. 3 Pouring the mortar

1. To connect a mortar plant boat with pouring pipes by grouting hose, and to grout the mortar by pump.
2. To pour the mortar every pipe in order to make the surface of the mortar flat.
3. To take off the pipes after pouring, to cure for specified days, and to take off the foundation form.



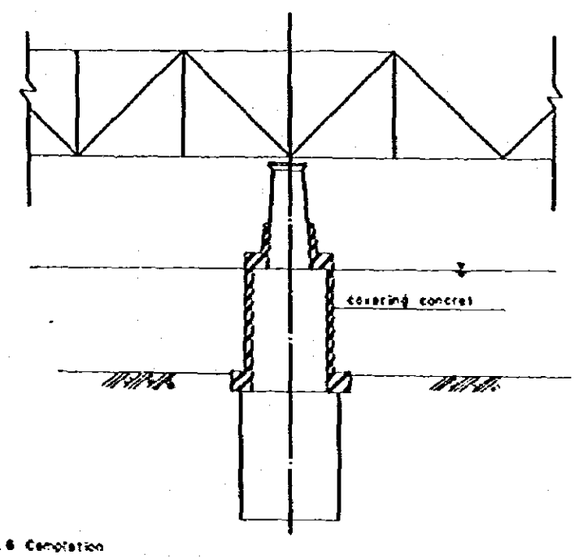
No. 4 Setting of reinforcement bars and metal form

1. To pour prepacked concrete 5 times for covering the pier.
2. To set reinforcement bars and metal form by lifting from a floating crane.



No. 5 Concreting

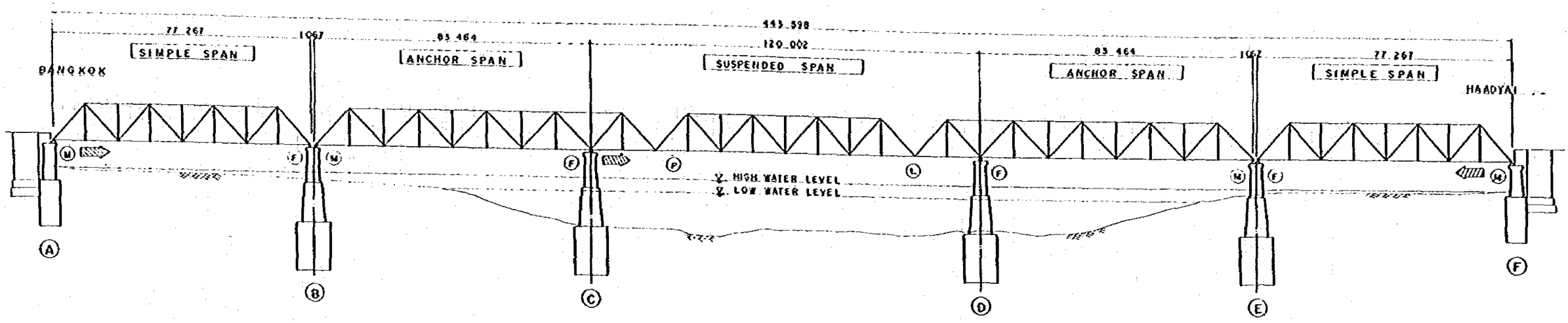
1. Covering concrete are used by prepacked concrete. The procedure is the same as No. 3.
2. The part above the water is to be chipped at the surface of the pier before concreting, and to be covered by portland cement concrete.

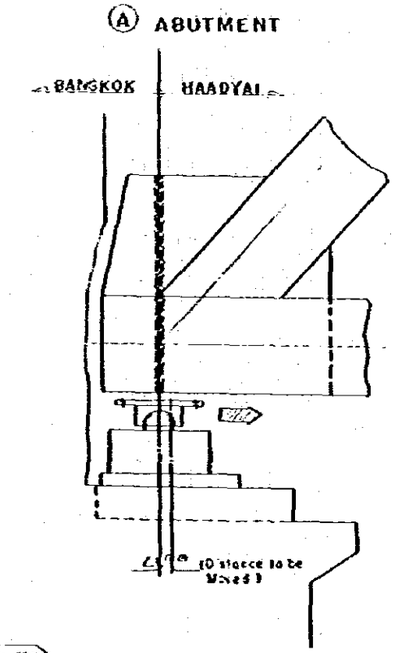


No. 6 Completion

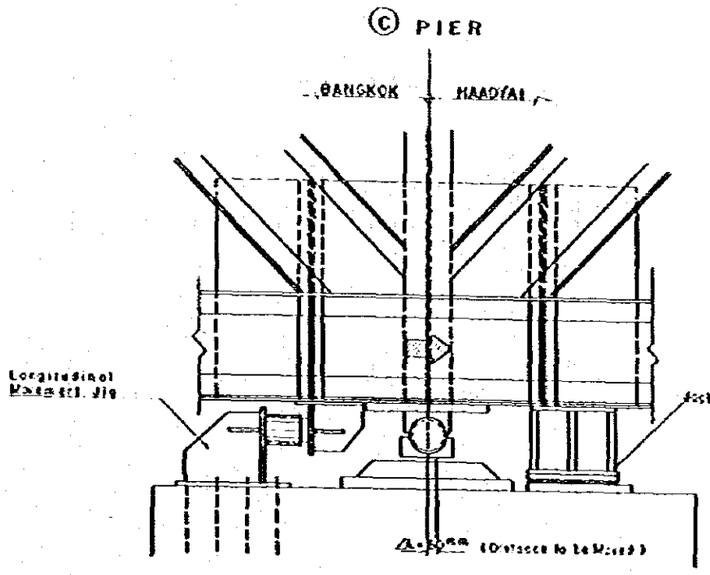
Fig. 3-6 Construction Procedure

Fig. 3-7 RESETTING SCHEME FOR BRIDGE BEARINGS SHOES

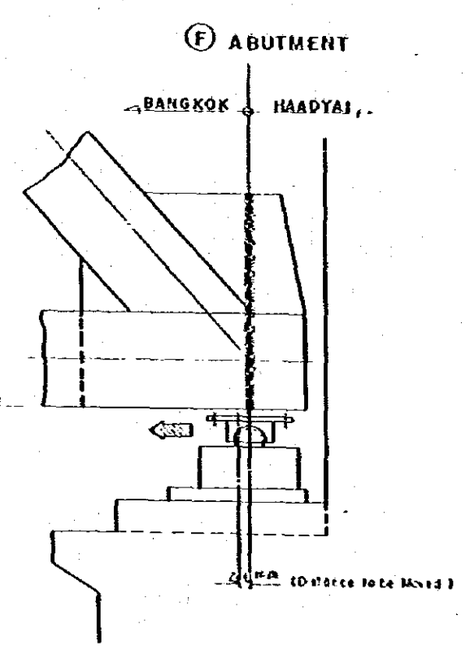




Remove the setting bolts from the upper Shoes, jack up the floor beam, and shift only the upper Shoes toward HAADYAI by ΔL mm.



Detach the lower Shoe from the baseplate at the welding spot, jack up the lower chord member, and shift the center span and suspended span toward HAADYAI by 60 mm.



Remove the setting bolts from the upper Shoes, jack up the floor beam, and shift only the upper Shoes toward BANGKOK by ΔL mm.

Displacement (mm) of Movable Shoes and Link Sections

Position	Truss	Before Reset B*	Before Reset H**	After Reset B*	After Reset H**
A	R	72			
	H	76			
B	R	56			4
	H	64		4	
L	R	61		1	
	H	66		6	
E	R	15		15	
	H	21		21	
F	R		76		
	H		63		

NOTES : * B denotes the displacement in the direction of BANGKOK.

** H denotes the displacement in the direction of HAADYAI.

R denotes the Railway Truss.

H denotes the Highway Truss

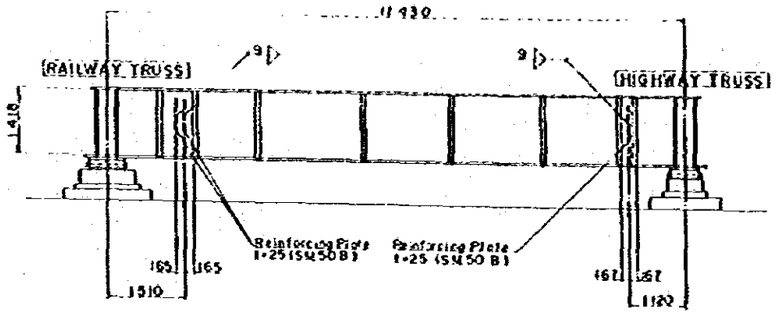
RAMA VI BRIDGE REHABILITATION PROJECT
RESETTING OF SHOES
RESETTING SCHEME FOR BRIDGE SHOES

Fig. 3-8 WORKING SEQUENCE FOR SIMPLE SPANS (MOVABLE SHOES) S. 1/60

① Reinforcement of Floor Beams

1 Erect stagings.

2 Perform the field welding of vertical reinforcement ribs

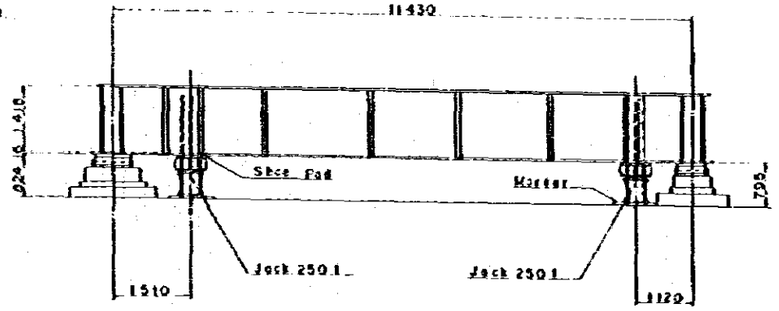


② Installation of Jacks

1 Place mortar at the positions where jacks are to be positioned.

2. Install jack boxes and pedestal with Shoe pad with recesses to protect rivet heads.

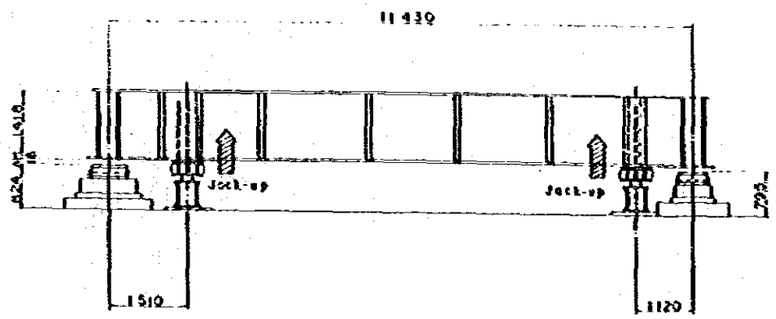
3 Remove rivets which will be in the way of the shifted upper Shoe plates and plug rivet holes.



③ Jack up Operation

1. Remove the setting bolts.

2 Jack up the beam.

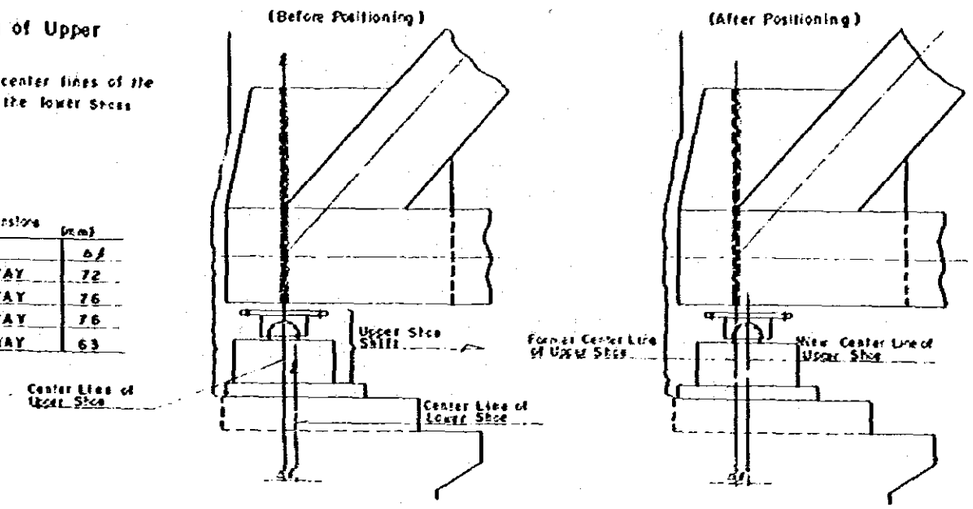


④ Positioning of Upper Shoes

1 Align the center lines of the upper and the lower Shoes

Table of Dimension (mm)

ABUTMENT	SIDE	
A	HIGH WAY	72
	RAIL WAY	76
F	HIGH WAY	76
	RAIL WAY	63



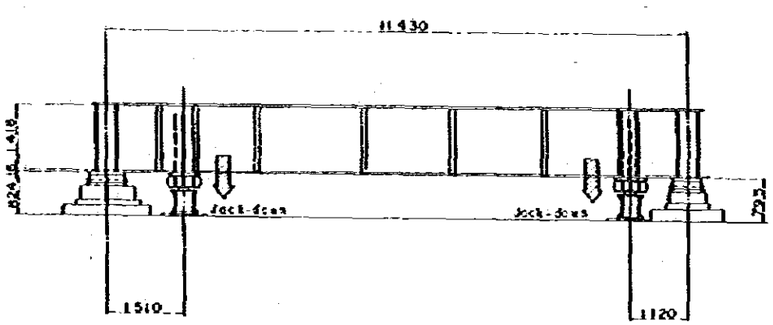
⑤ Lower Jack

1. Jack down the beam.

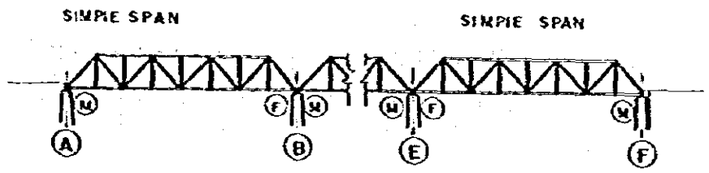
2 Drill bolt holes on the truss chord at spot corresponding with upper Shoe plate holes.

3 Insert the setting bolts and tighten them.

4. Plug the abandoned holes in the lower chord.



MARKING DIAGRAM



RAMA VI BRIDGE REHABILITATION PROJECT

RESETTING OF SHOES

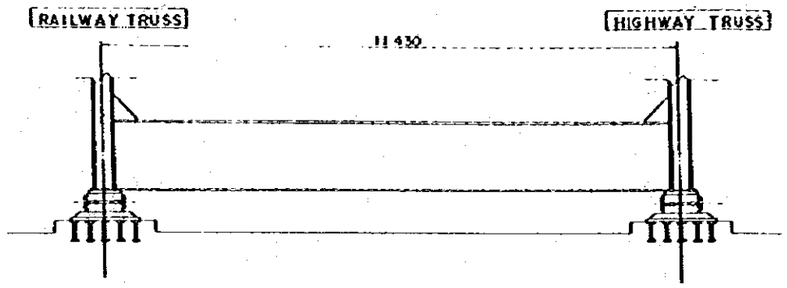
WORKING SEQUENCE FOR SIMPLE SPANS (MOVABLE SHOES)

2

Fig. 3-9 WORKING SEQUENCE FOR ANCHOR SPANS (FIXED SHOES)

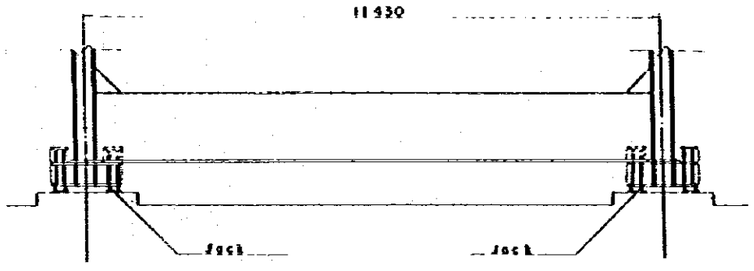
① Reinforcement of Lower Chord Members and Extension of Concrete Pedestals

1. Erect stagings.
2. Extend the concrete pedestals.
3. Install reinforcement stiffeners at the jack up location of the lower chord.
4. Install longitudinal movement jigs



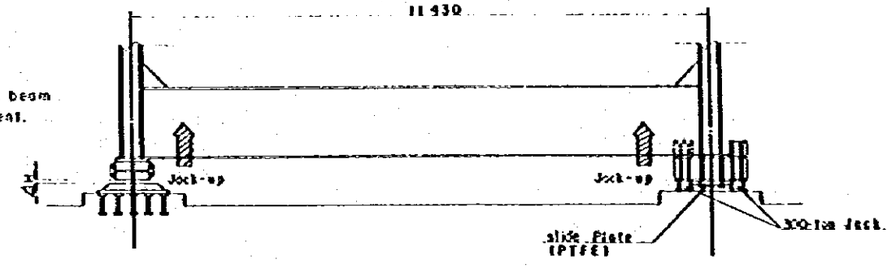
② Installation of Beam Jacking and Moving Equipment

1. Install beam jacking and moving equipment.



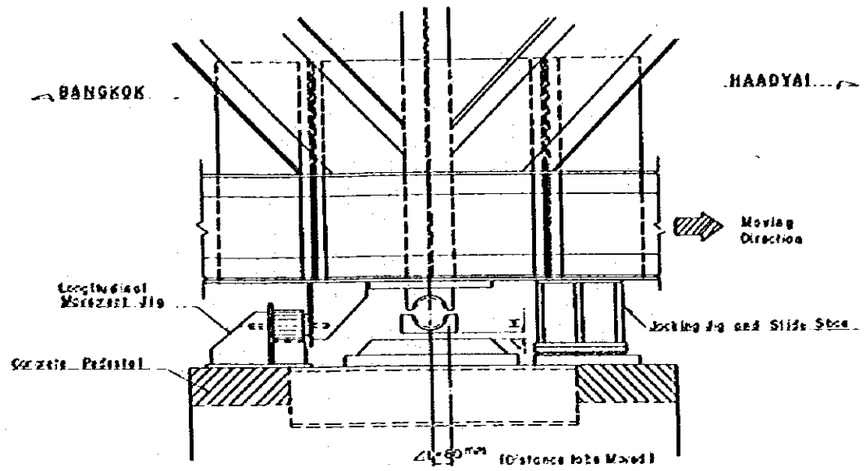
③ Jack-up Operation

1. Separate the lower Shoes from the Shoe baseplates by arc gouging.
2. Jack up the beam (δ = approx. 70mm)
3. Set the side plate on the beam jacking and moving equipment.



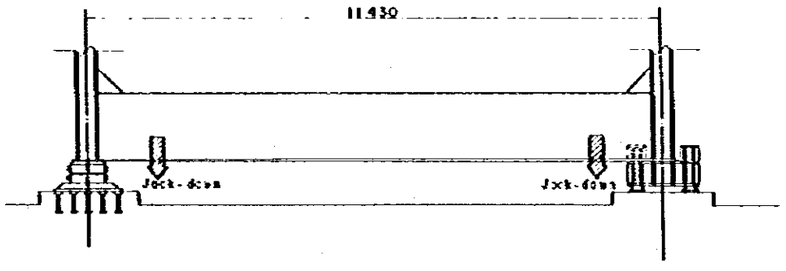
④ Movement toward HAADYAI

1. Clean the contact surfaces between the baseplate and the lower Shoe
2. Transfer the reaction to the side Shoe by lower jack.
3. Move the beam in the longitudinal direction.
4. Jack up the beam.
5. Remove the upper Shoes and slide plates of jacking jig.

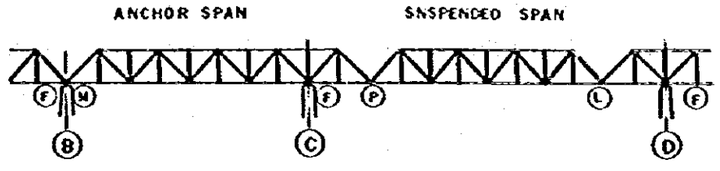


⑤ Lower Jack

1. Jack down the beam.
2. Weld the baseplates and lower Shoes together at the field.
3. Remove the jack.



MARKING DIAGRAM



RAMA VI BRIDGE REHABILITATION PROJECT

RESETTING OF SHOES

WORKING SEQUENCE FOR ANCHOR SPANS (FIXED SHOES)

6

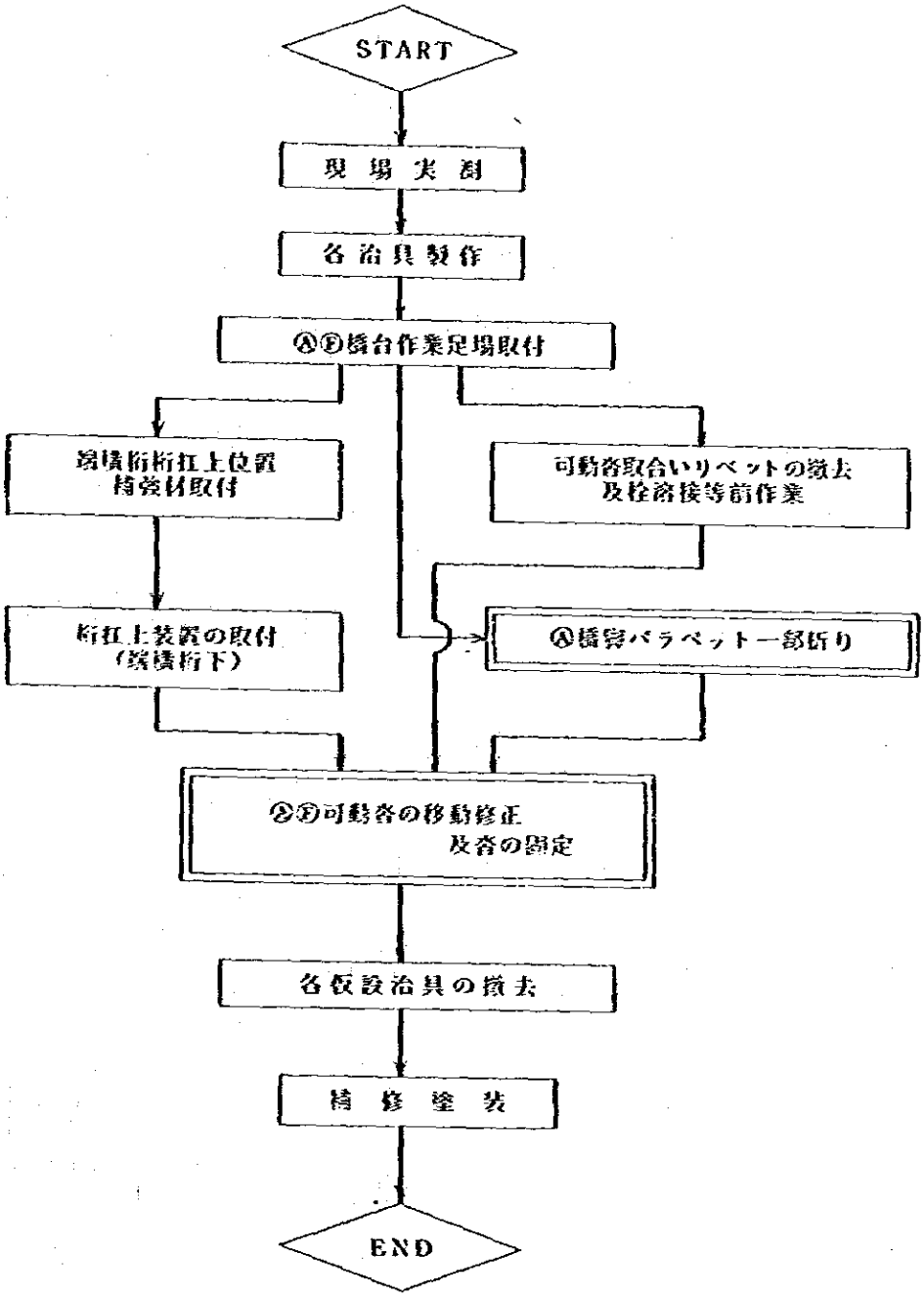
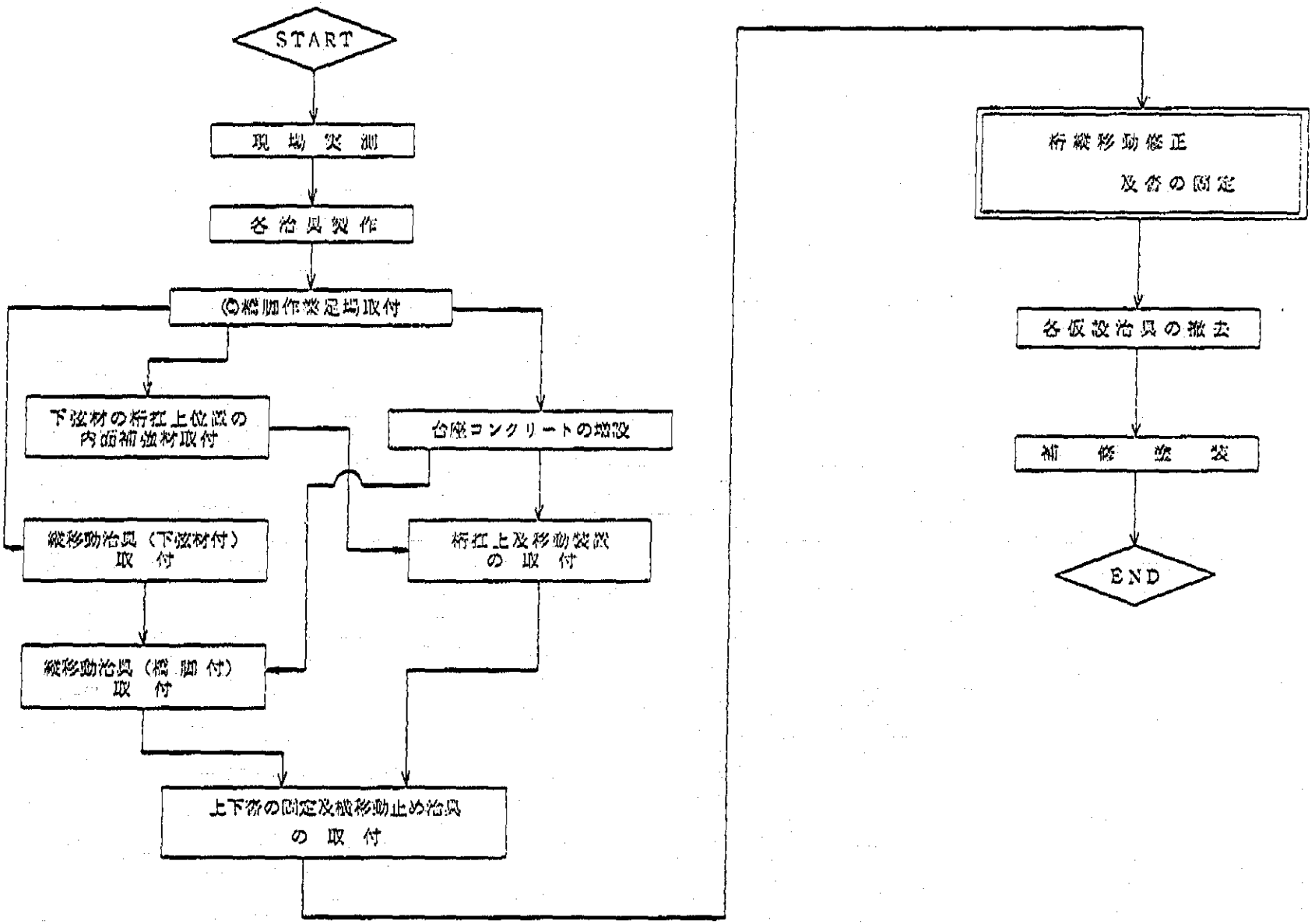


図3－10　施工フローチャート

Simple Span施工フローチャート



図－3.11　Anchor・Span 施工フローチャート

SCHEDULE

Fig. 3-12 OVERALL PROGRESS SCHEDULE

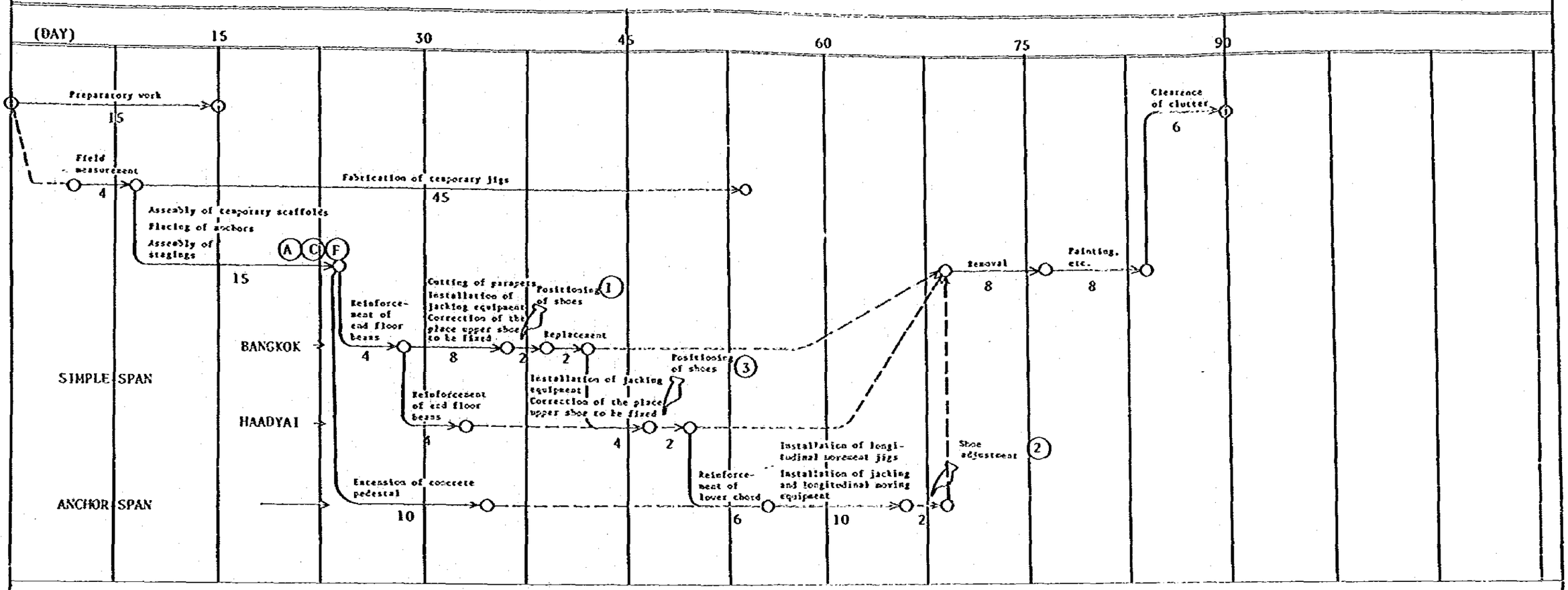


Fig. 3-13 Time Schedule of Simple Span Shoe Adjustment

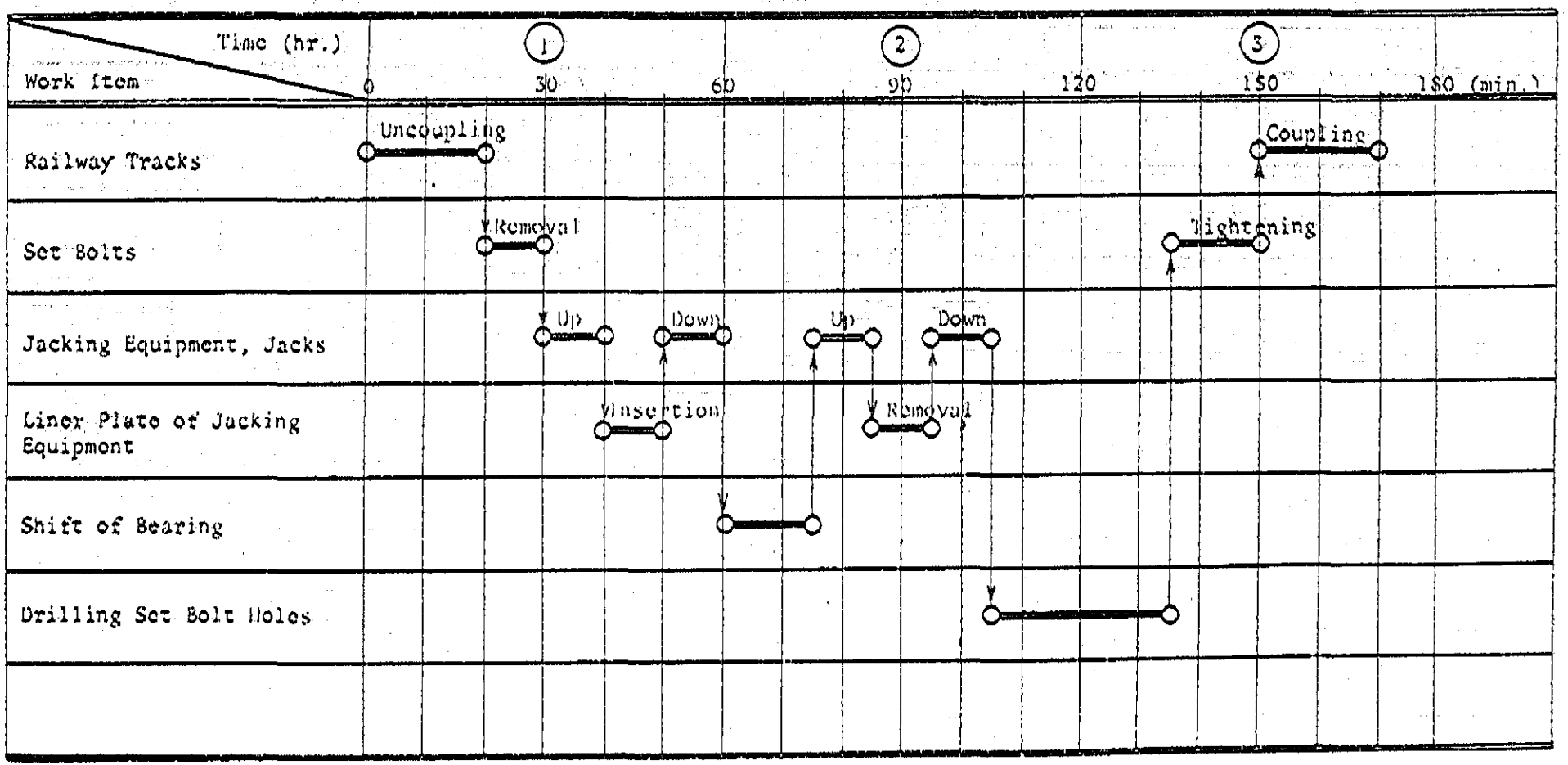
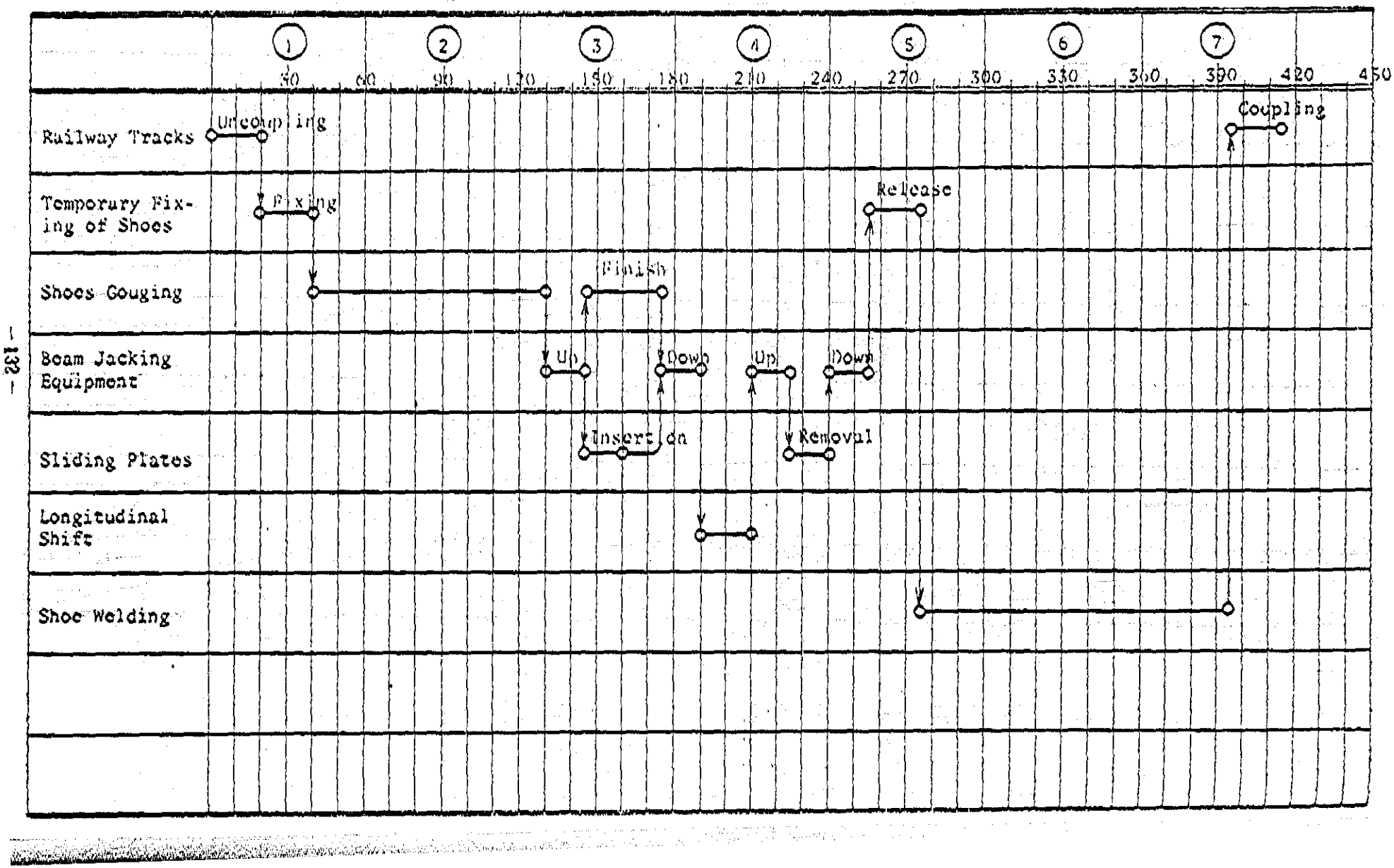


Fig. 3-14 Time Schedule of Anchor Span Shoe Adjustment



JICA