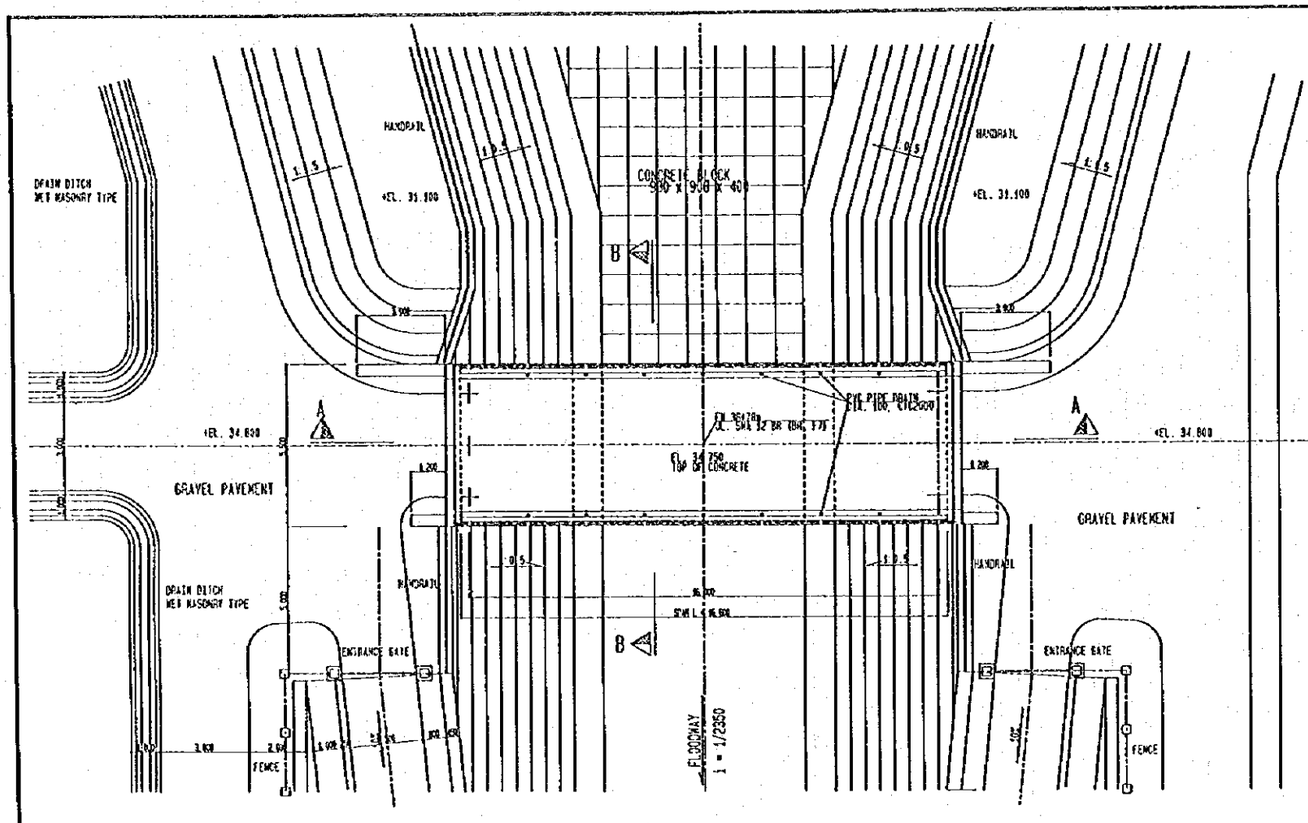
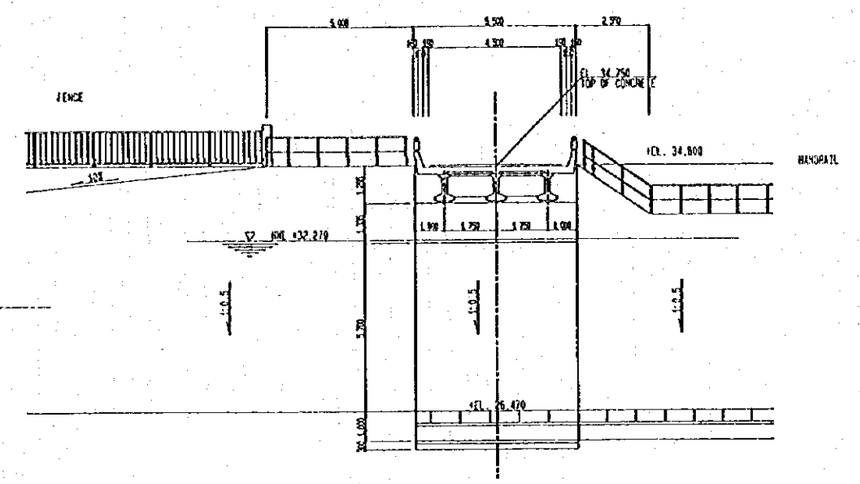
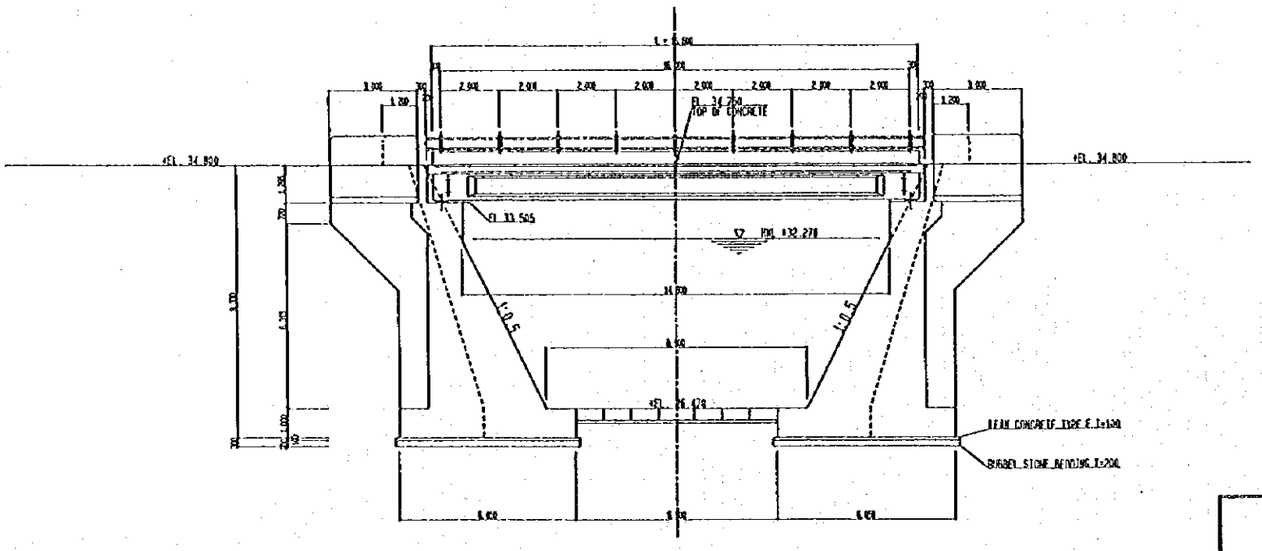


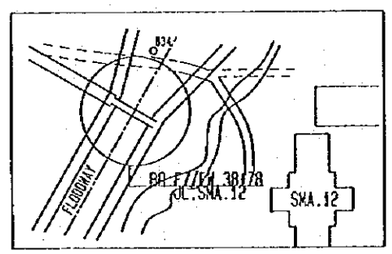

PLAN
SCALE A




SECTION B-B
SCALE A



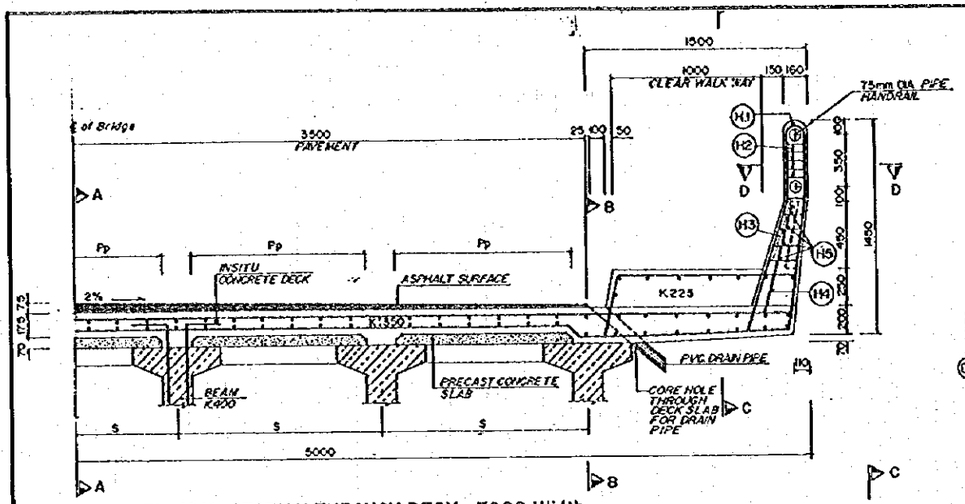

SECTION A-A
SCALE A



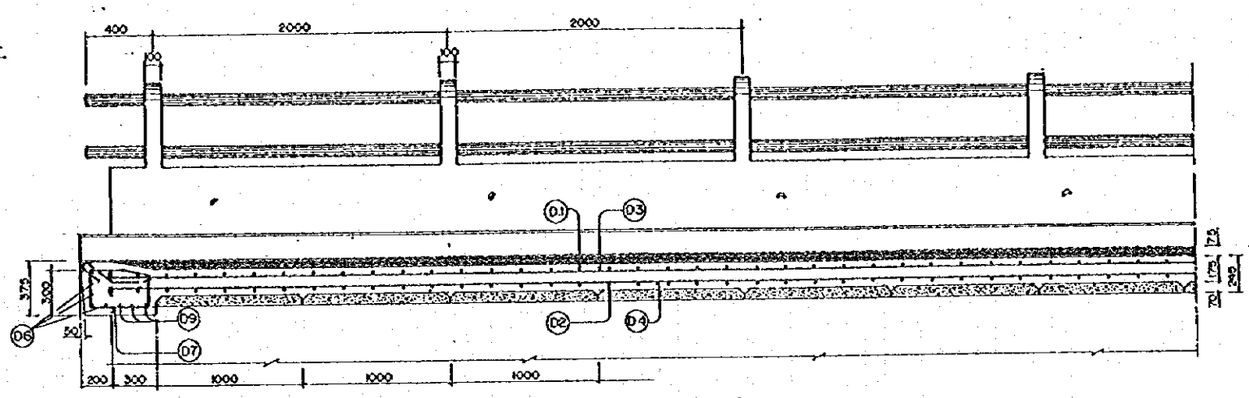

KYE PLAN
NOT TO SCALE

SCALES SCALE A (1:100)

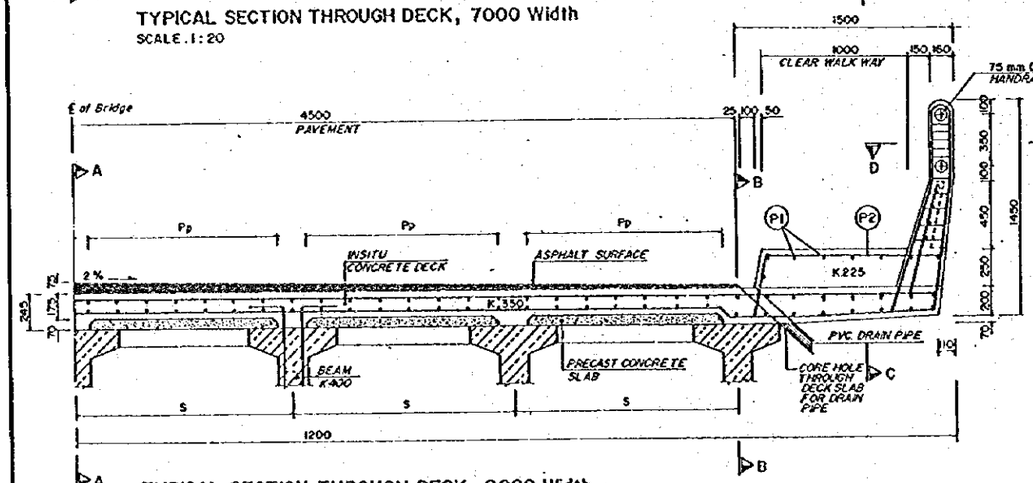
| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.13 GENERAL PLAN OF JL. SMA - 12 BRIDGE (F7) |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |



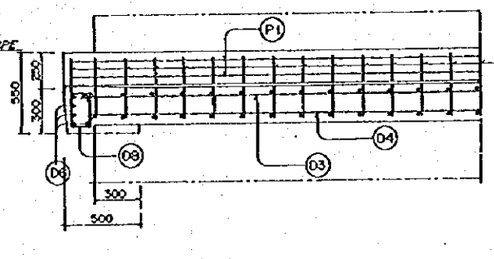

TYPICAL SECTION THROUGH DECK, 7000 Width
SCALE. 1 : 20



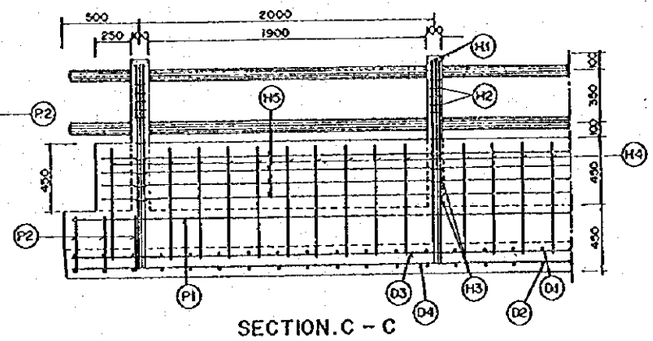

SECTION. A – A
SCALE. 1 : 20



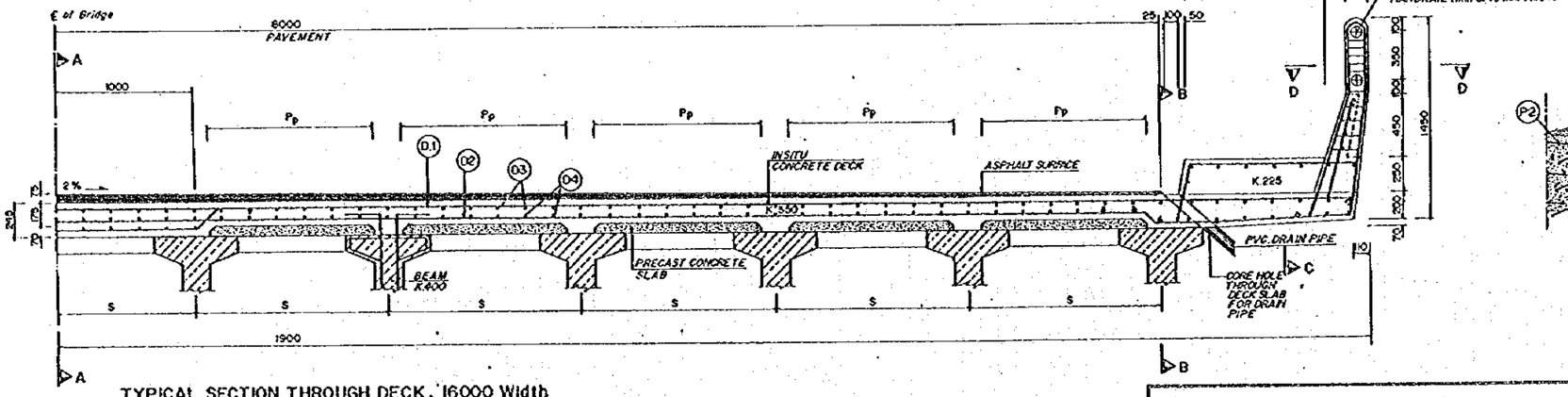

TYPICAL SECTION THROUGH DECK, 9000 Width
SCALE. 1 : 20



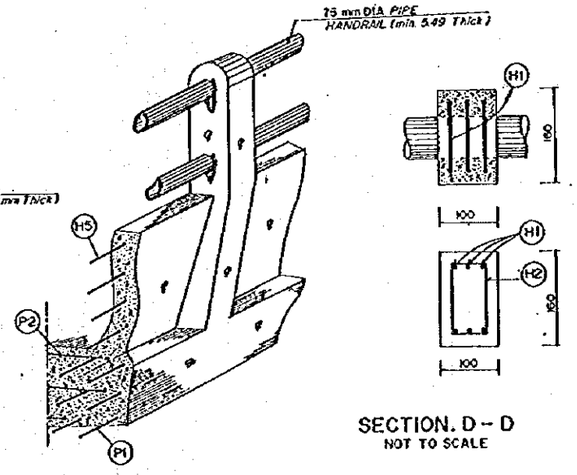

SECTION. B – B
SCALE. 1 : 20




SECTION. C – C
SCALE. 1 : 20




TYPICAL SECTION THROUGH DECK, 16000 Width
SCALE. 1 : 20

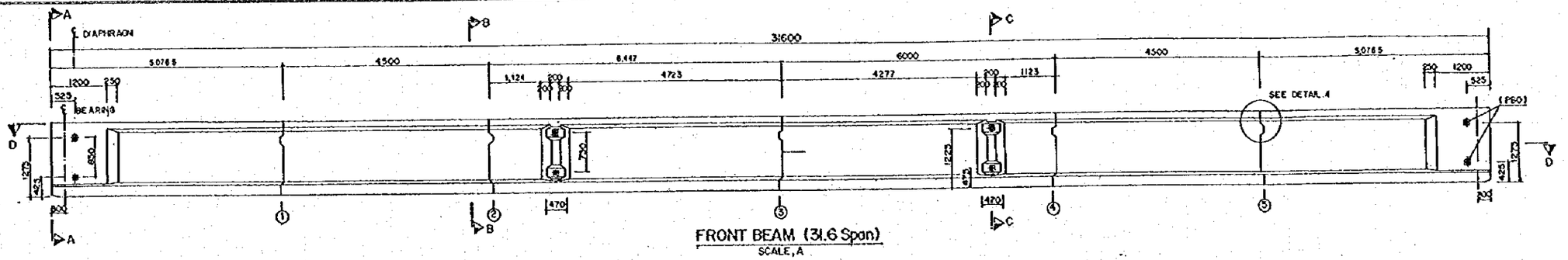



SECTION. D – D
NOT TO SCALE

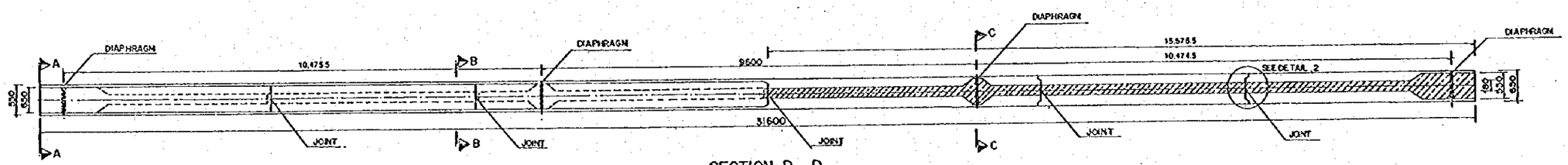
0 0.5 1.0 1.5 2.0 m
SCALE. 1 : 20

| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.14 DETAILS OF DECK SLAB, STANDARD DESIGN |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |

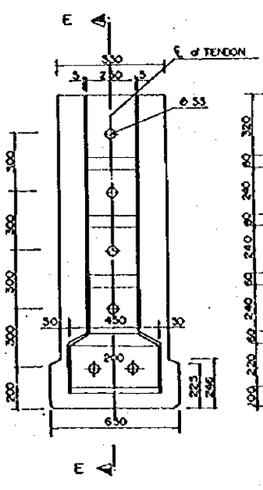
6-59



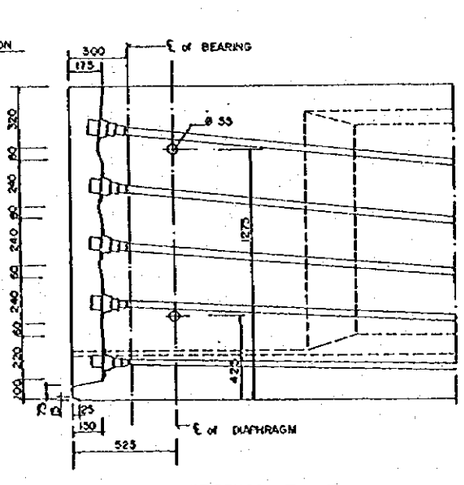

FRONT BEAM (31.6 Span)
SCALE, A



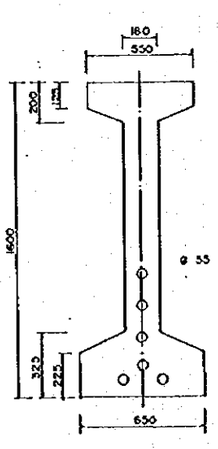

SECTION. D – D
SCALE, A



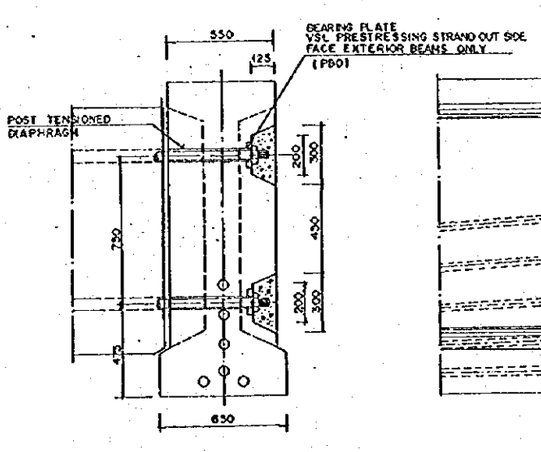

SECTION. A – A
SCALE, B



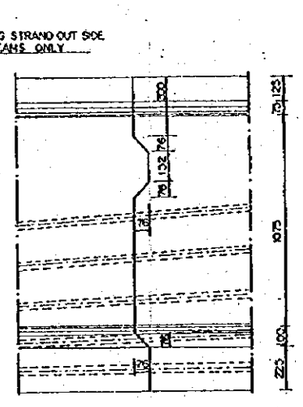

SECTION. E – E
SCALE, B



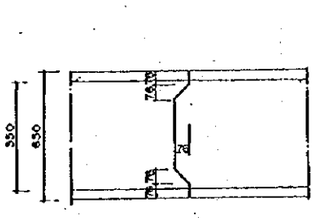

SECTION. B – B
SCALE, B



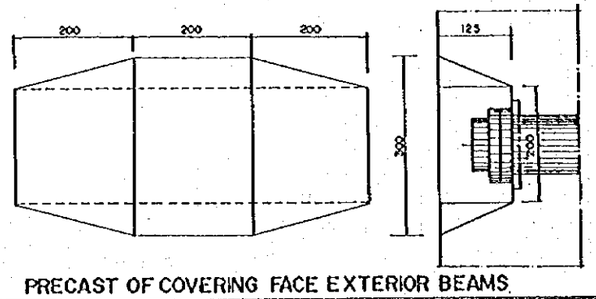

SECTION. C – C
SCALE, B



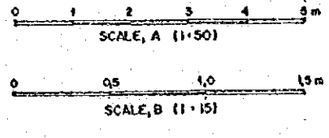

DETAIL. 1
SCALE, B



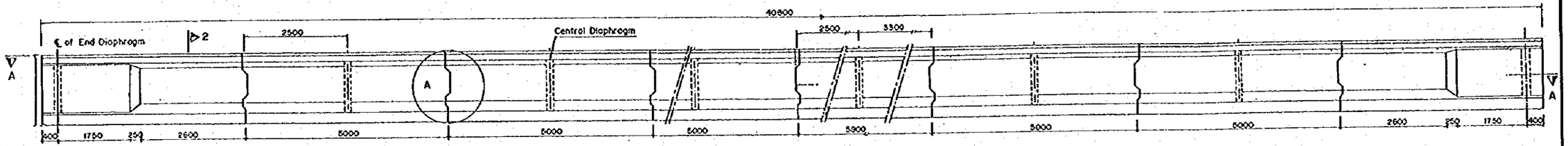

DETAIL. 2
SCALE, B



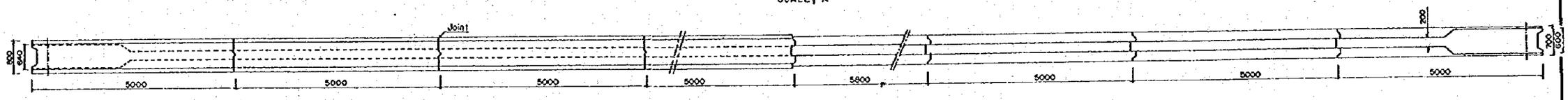

PRECAST OF COVERING FACE EXTERIOR BEAMS



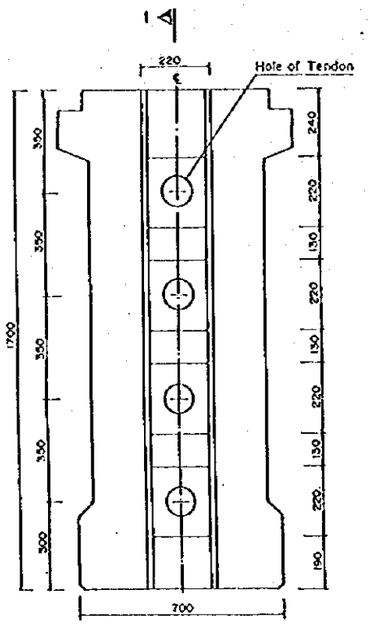

| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.15 DETAILS OF PC-GIRDER, STANDARD DESIGN, L = 31.6 M |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |



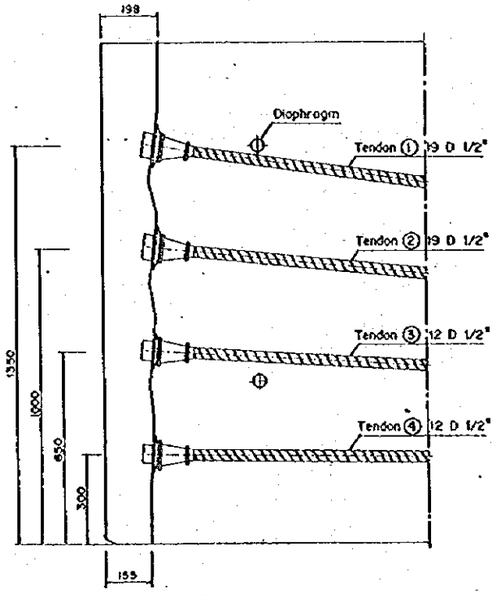

FRONT BEAM (40.80 Span)
SCALE, A



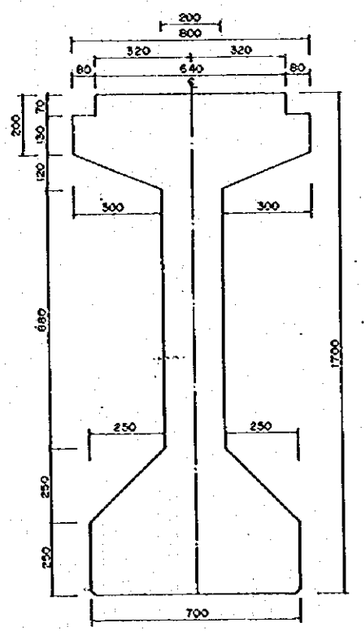

SECTION, A – A
SCALE, A



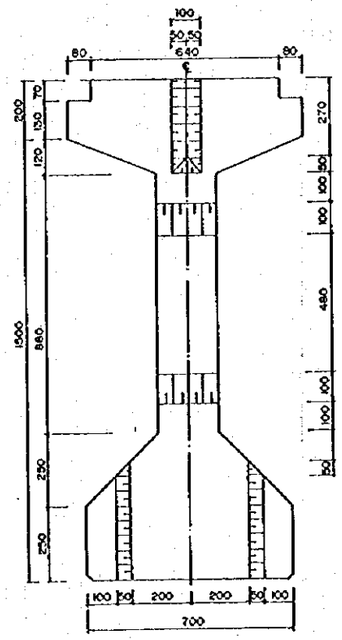

END VIEW
SCALE, B




SECTION, 1
SCALE, B

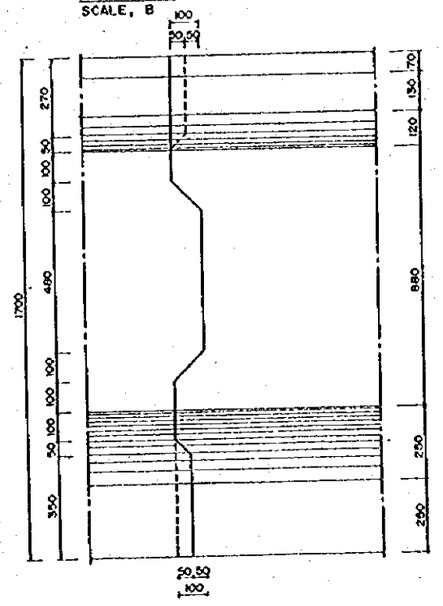


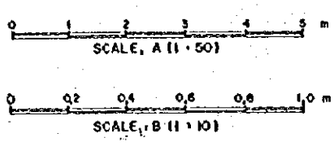

SECTION, 2
SCALE, B



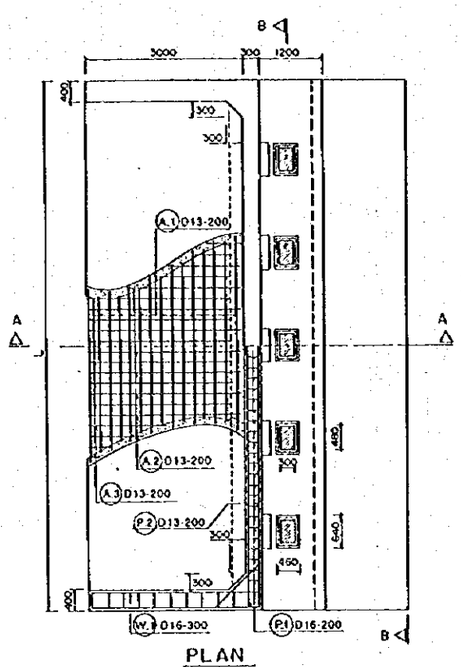

VIEW ON JOINT
SCALE, B

DETAIL, A
SCALE, B

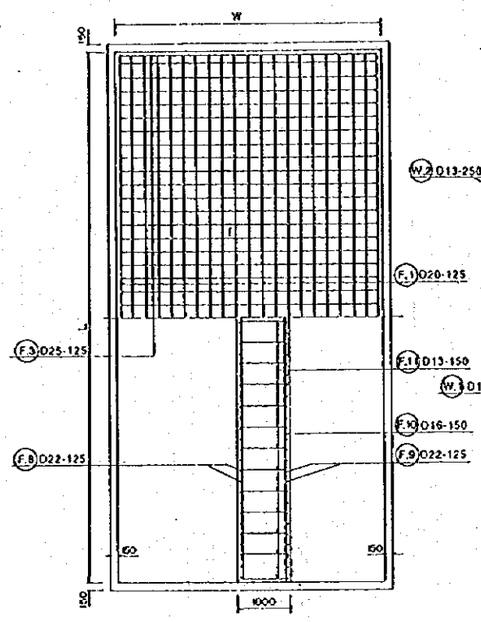


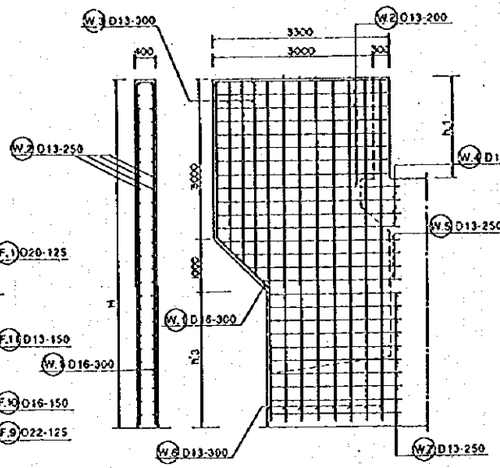

| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT<br>JAPAN INTERNATIONAL COOPERATION AGENCY | DWG. 6.3.16<br>DETAILS OF PC-GIRDER, STANDARD DESIGN, L = 40.8 M |



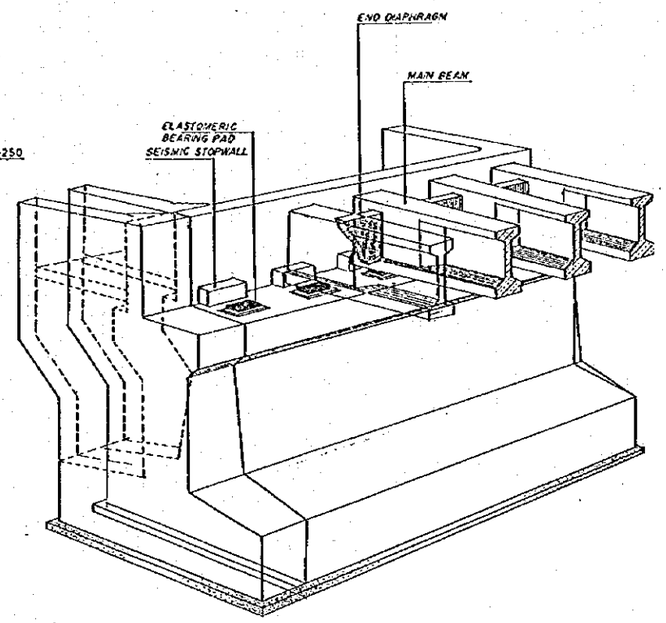

PLAN
SCALE , A



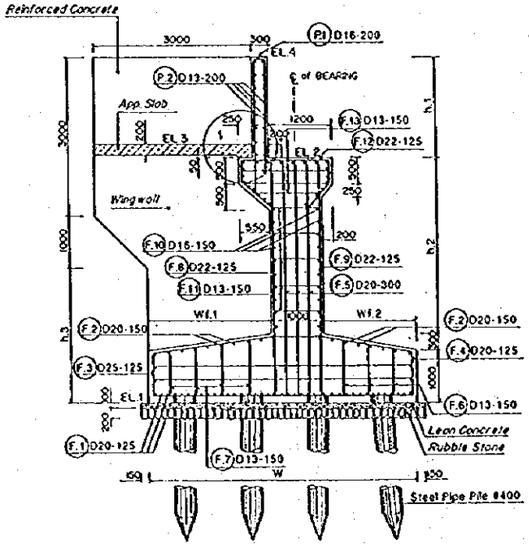

SECTION. C - C
SCALE , A



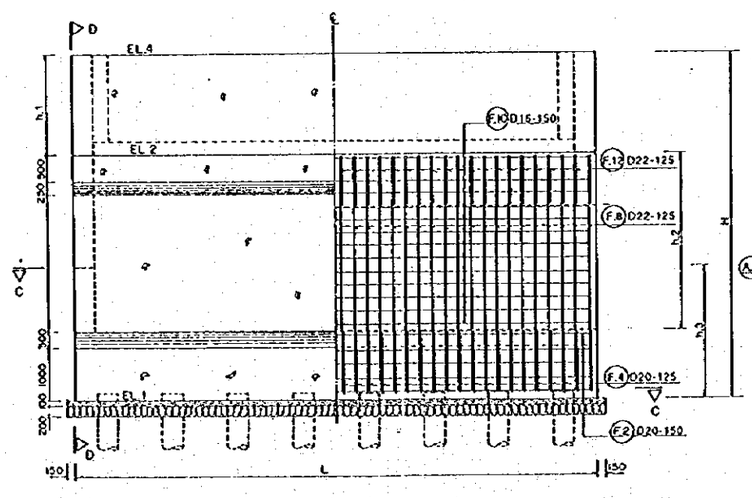

SECTION. D - D
SCALE , A



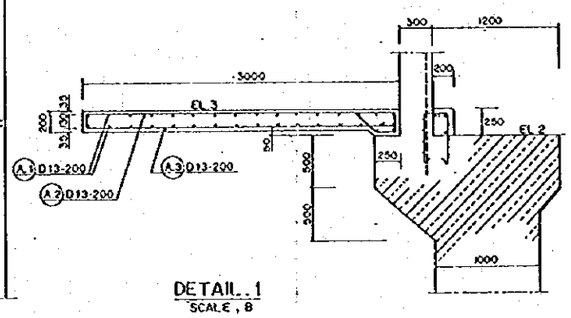

" ABUTMENT "




SECTION. A - A
SCALE , A




SECTION. B - B
SCALE , A

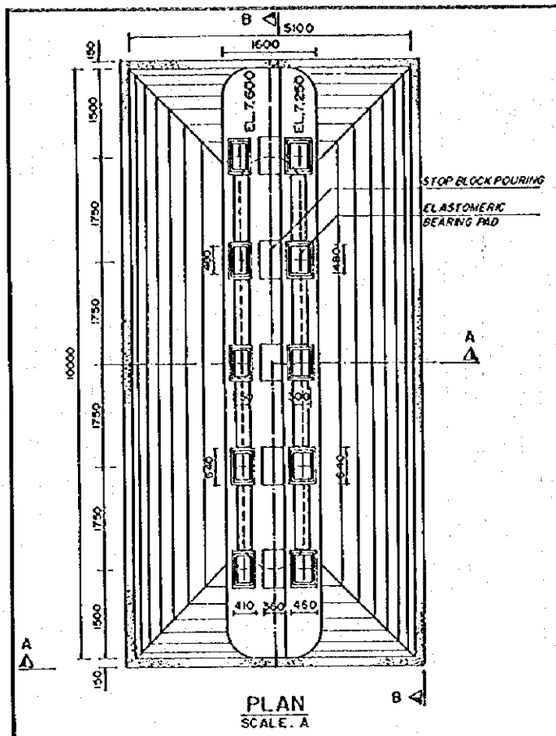



DETAIL. 1
SCALE , B

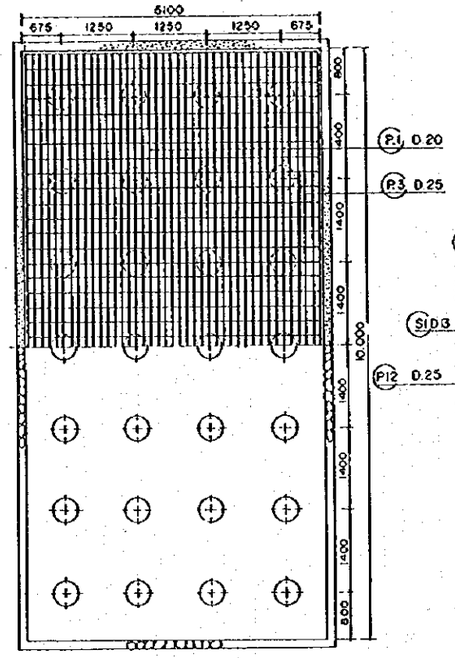
SCALE. A(1:50)
0 1 2 3 4 5m

SCALE. B(1:25)
0 0.5 1.0 1.5 2.0 2.5 m

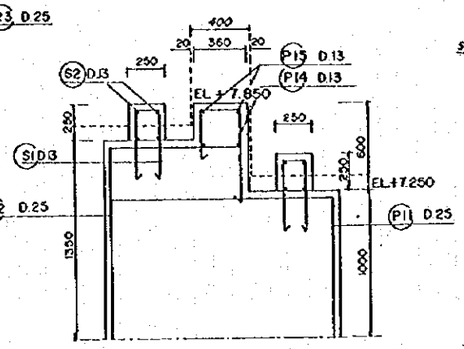
| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.17 TYPICAL DESIGN OF ABUTMENT |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |



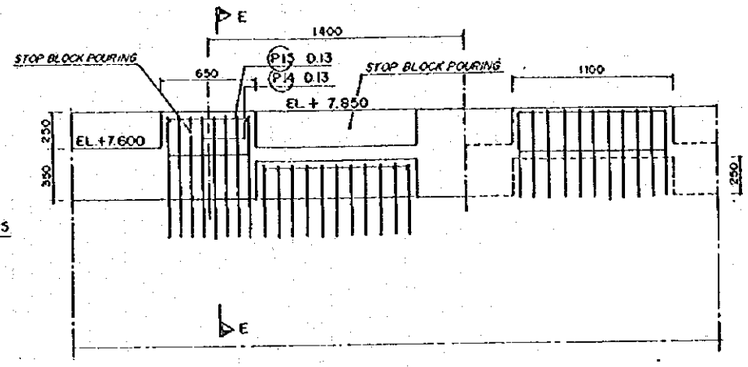

PLAN
SCALE. A



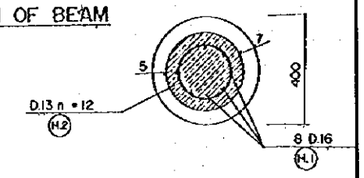

SECTION. D-D
SCALE. A

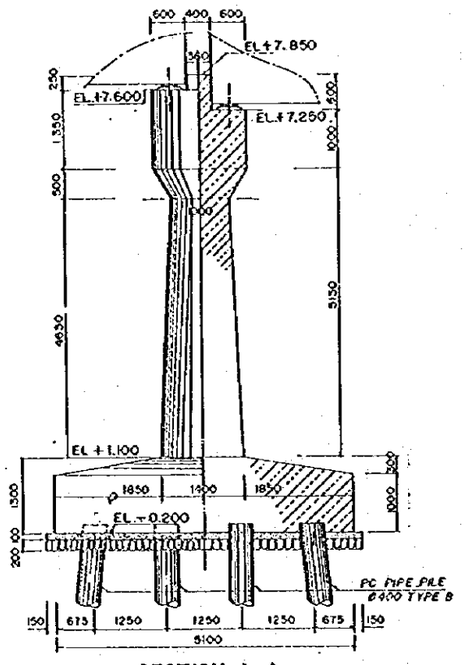



SECTION. E - E
SCALE. B

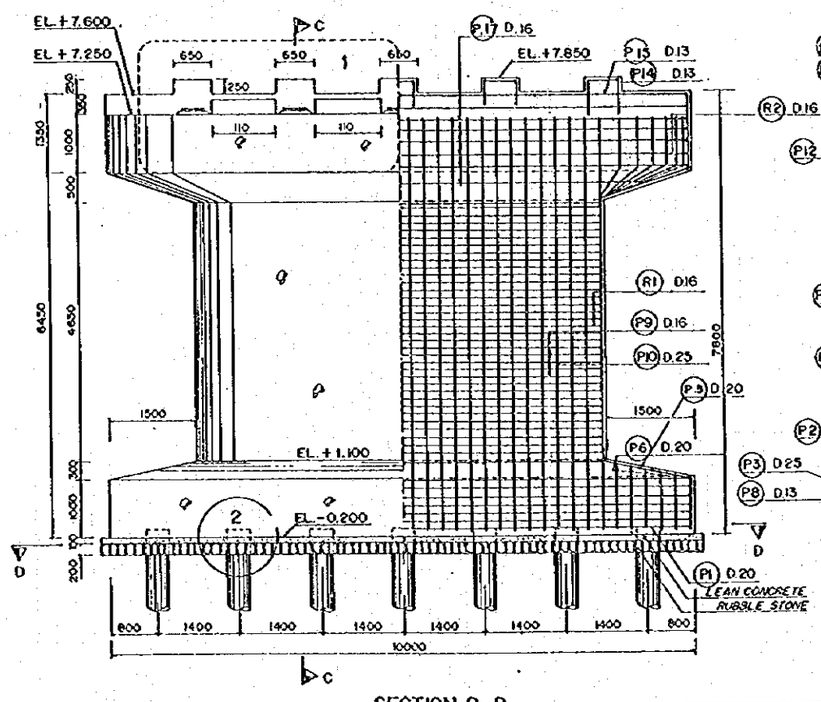



DETAIL. 1
SEISMIC STOP WALL AFTER ERECTION OF BEAM
SCALE. B

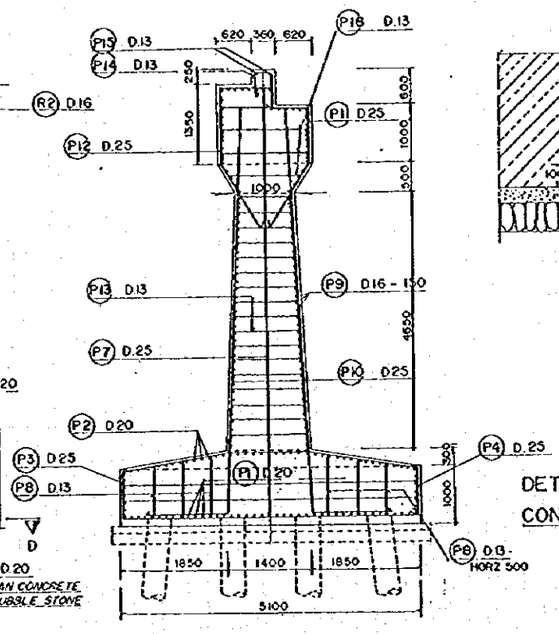


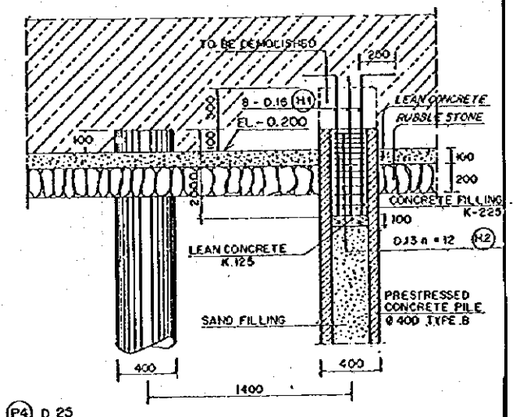

SECTION. A A
SCALE. A




SECTION. B-B
SCALE. A




SECTION. C-C
SCALE. A

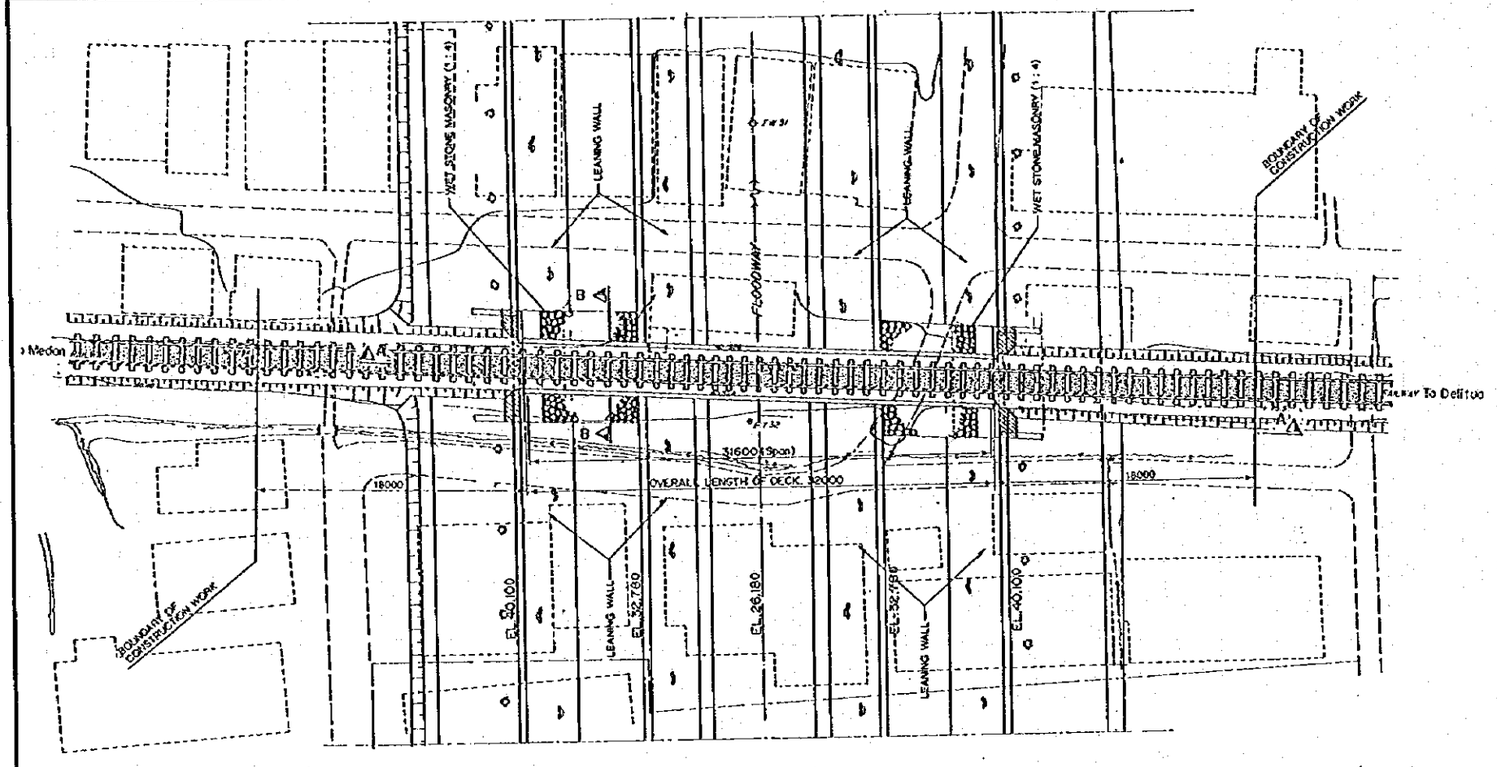



DETAIL. 2
CONNECTION OF PILE AND FOOTING
SCALE. B

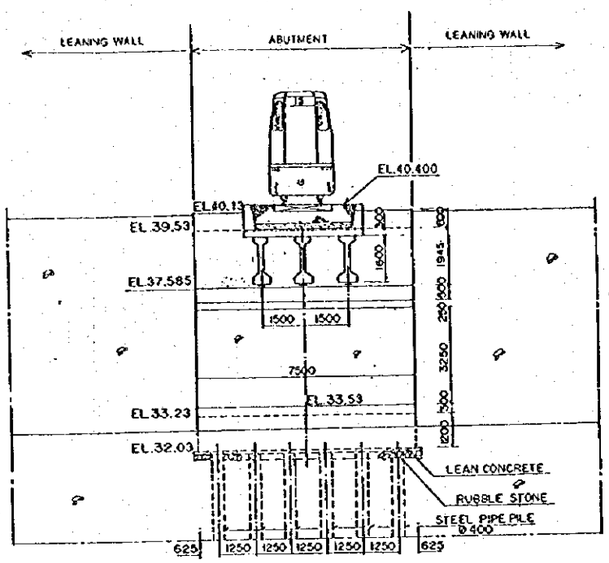
SCALE A, (1:50)

SCALE. B, (1:20)

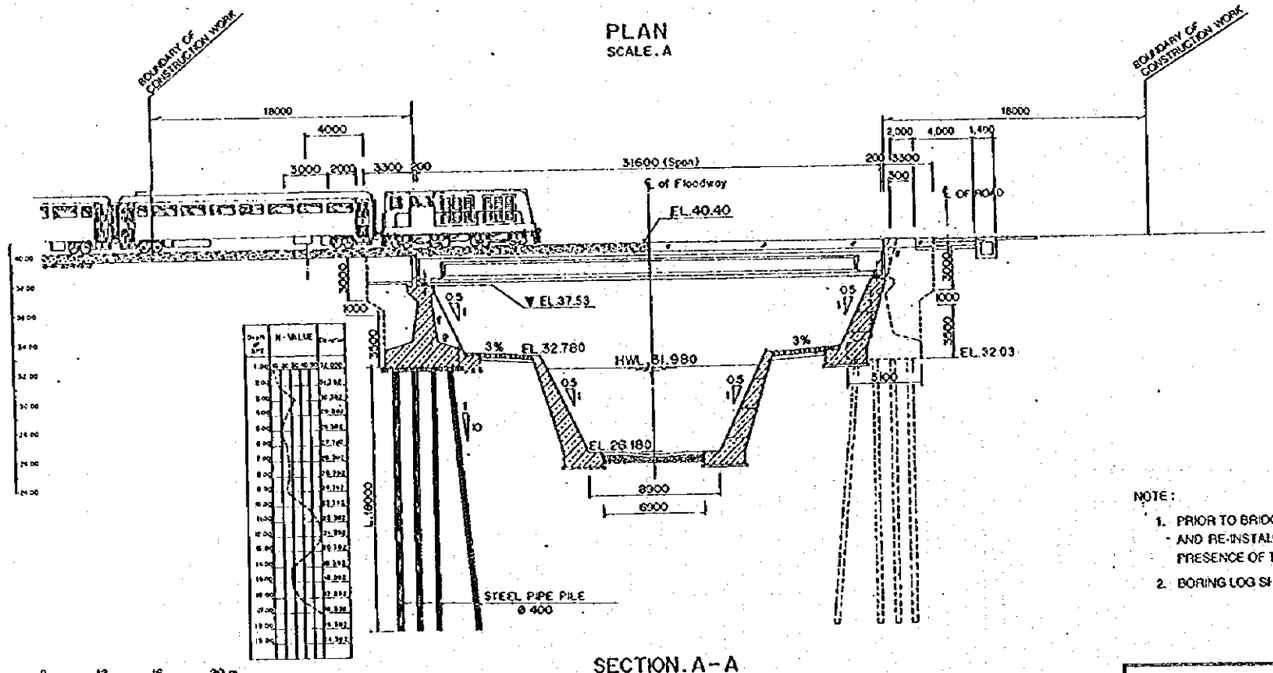
| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.18 TYPICAL DESIGN OF PIER |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |



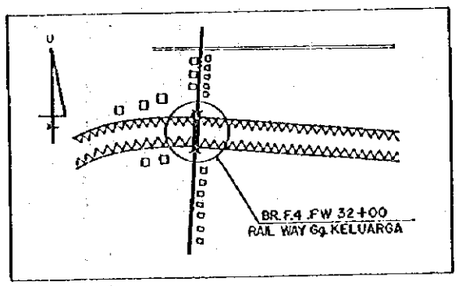

PLAN
SCALE . A




SECTION . B – B
SCALE . B




SECTION . A – A
SCALE . A




KEY PLAN
NOT TO SCALE

NOTE :

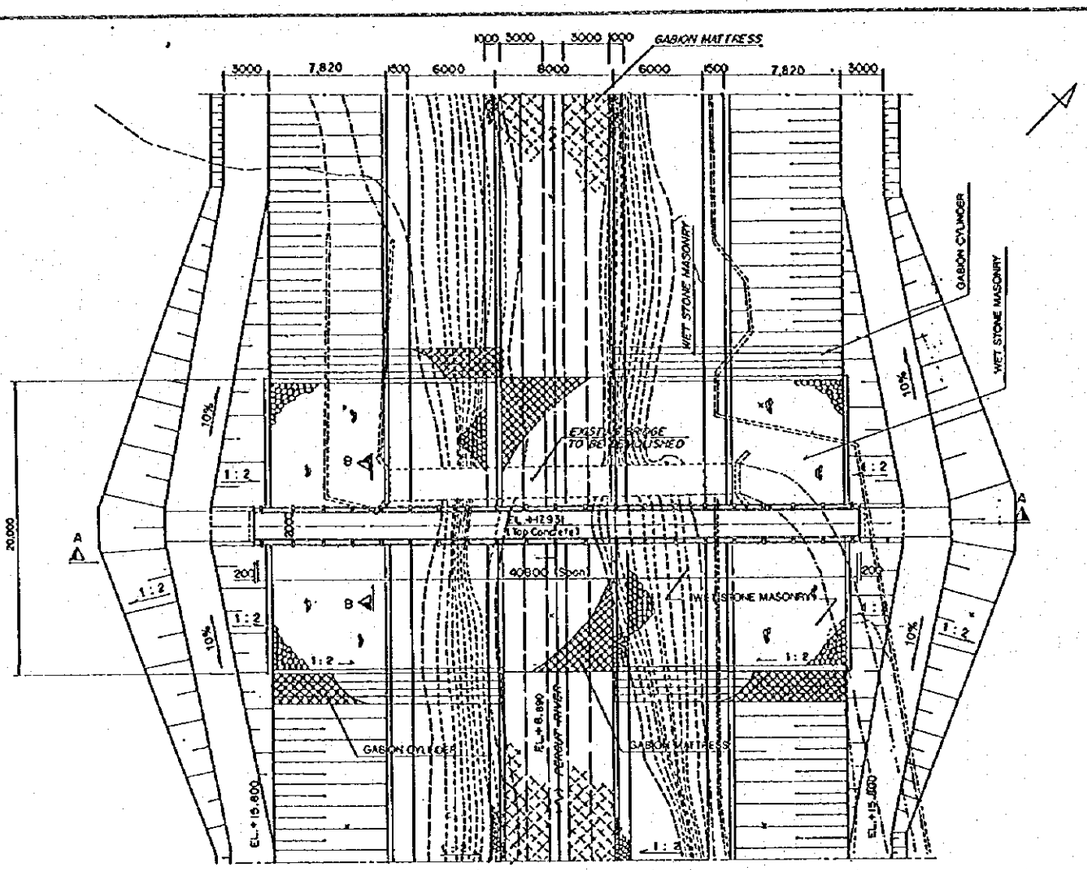
1. PRIOR TO BRIDGE WORK, THE EXISTING RAILS IN THE AREA DESIGNATED AND SHOWN ON THE DRAWING SHALL BE REMOVED, AND RE-INSTALLED ON THE BALLASTED FLOOR OF THE NEWLY BUILT BRIDGE. THE WORK SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER OF PJKA ( PERUSAHAAN JAWATAN KERETA API).
2. BORING LOG SHOWN ON THIS DRAWING IS FOR REFERENCE ONLY.

0 4 8 12 16 20 m
SCALE . A (1:200)

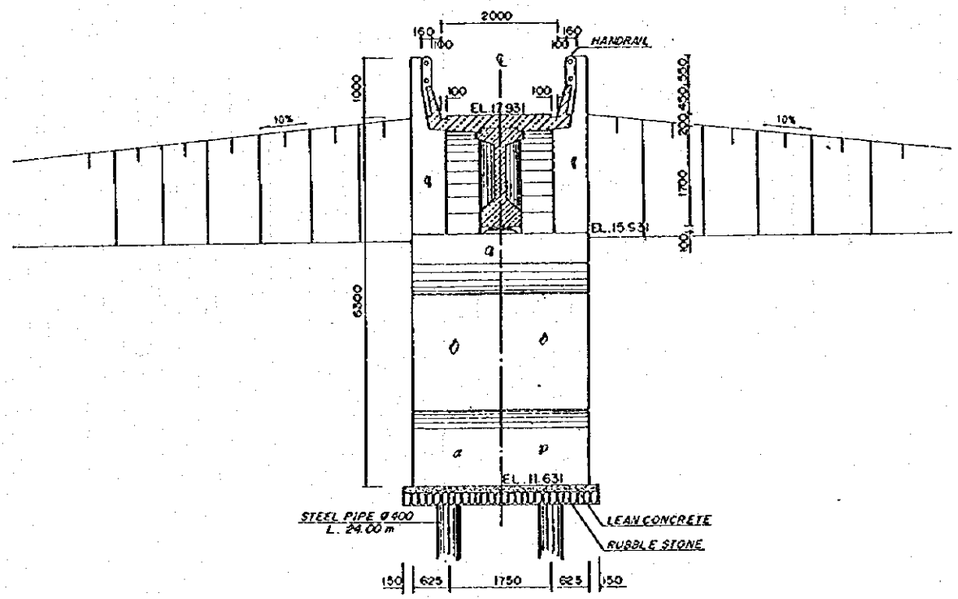
0 2 4 6 8 10m
SCALE . B (1:100)

| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.19 GENERAL PLAN OF RAILWAY BRIDGE (F4) |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |

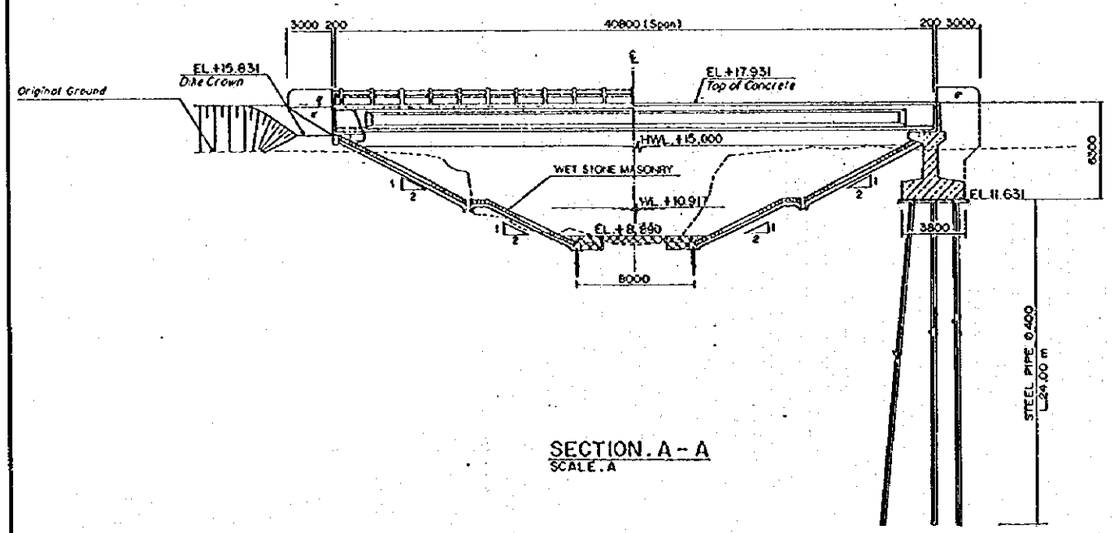
6-64



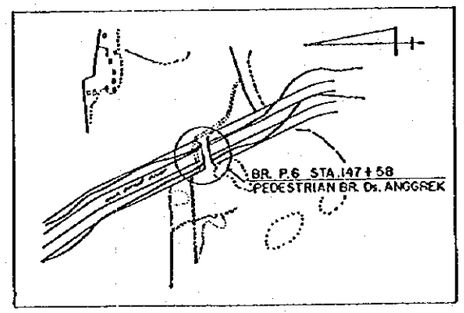

PLAN
SCALE. A




SECTION. B - B
SCALE. B




SECTION. A - A
SCALE. A

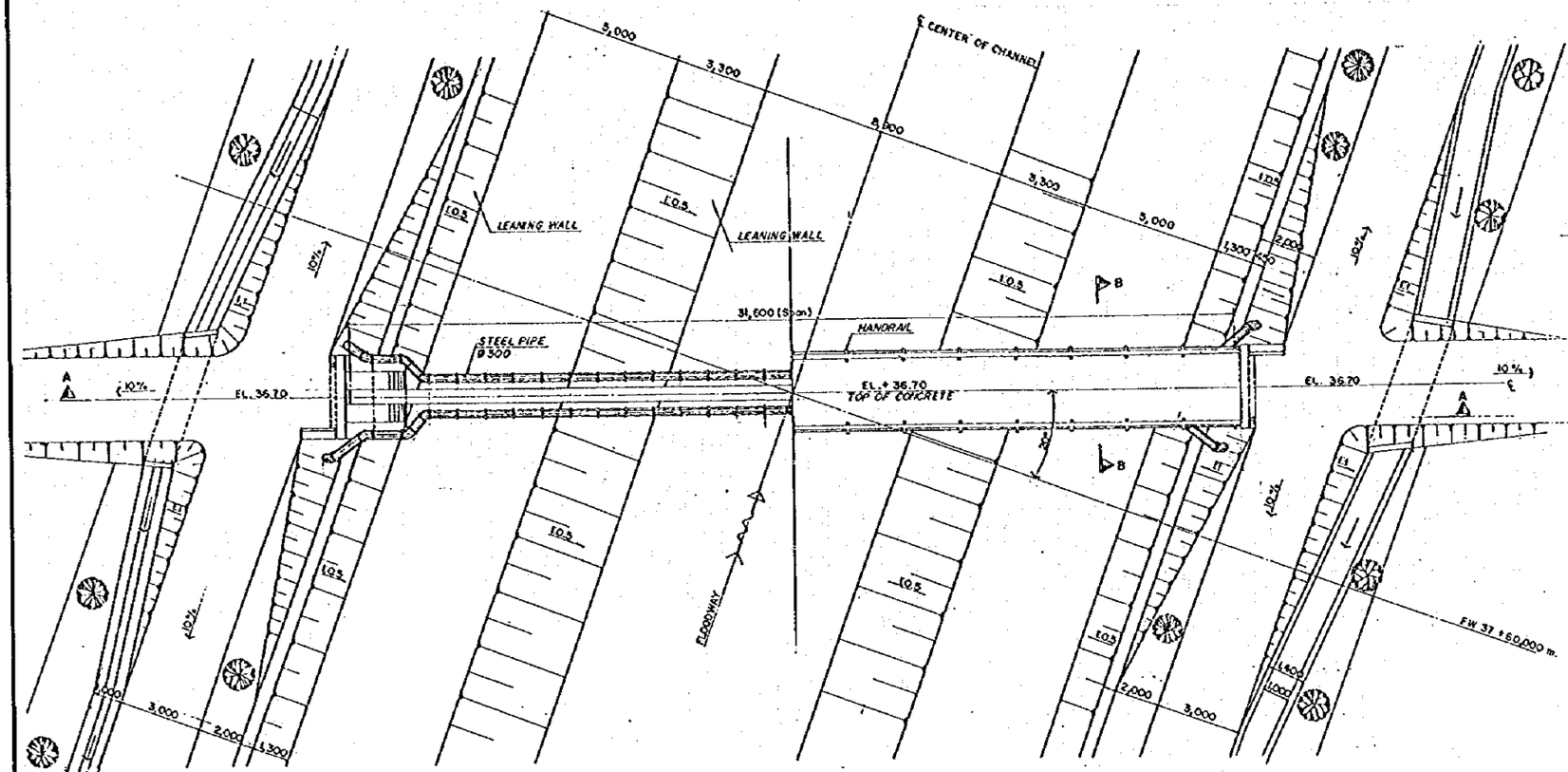



KEY PLAN
NOT TO SCALE

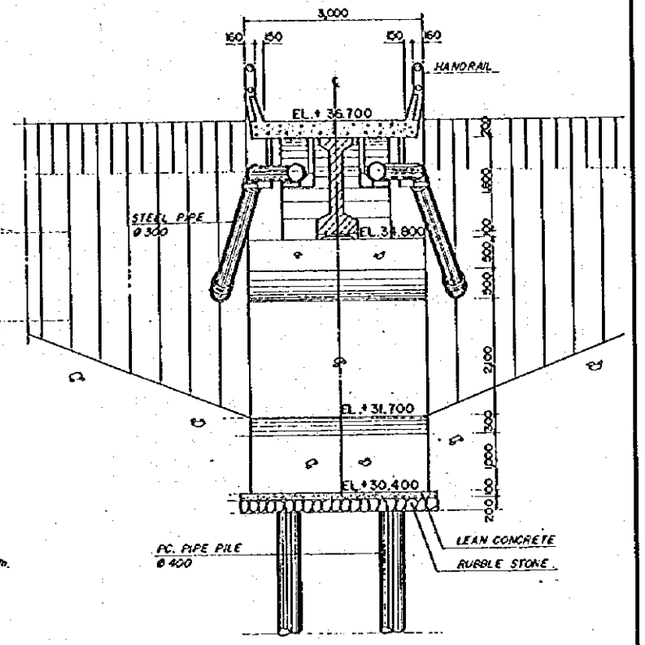
SCALE. A (1:200)

SCALE. B (1:50)

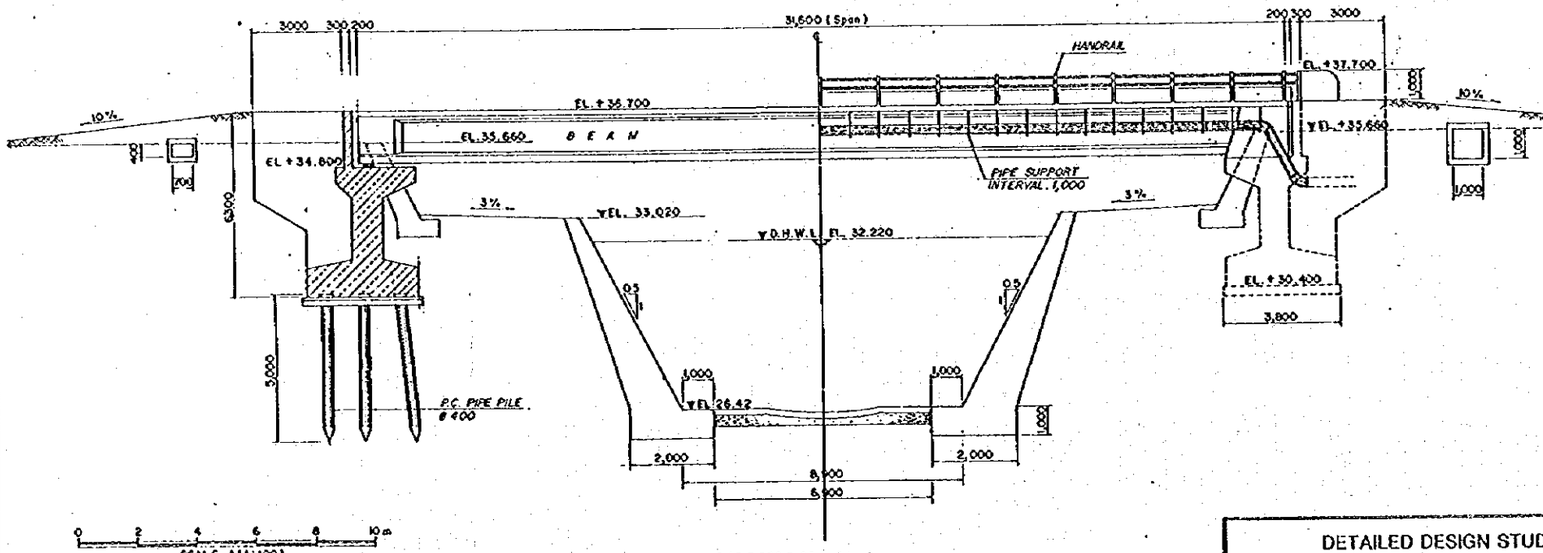
| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT<br>JAPAN INTERNATIONAL COOPERATION AGENCY | DWG. 6.3.20<br>GENERAL PLAN OF DUSUN ANGGEREK BRIDGE (P6, PEDESTRIAN BR.) |



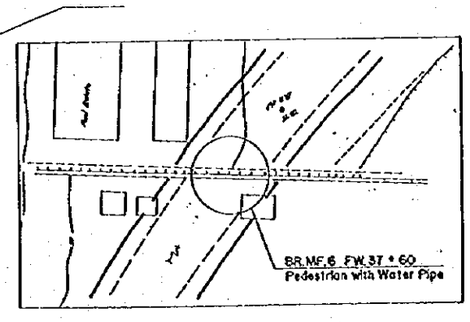

PLAN
SCALE. A




SECTION. B-B
SCALE. B

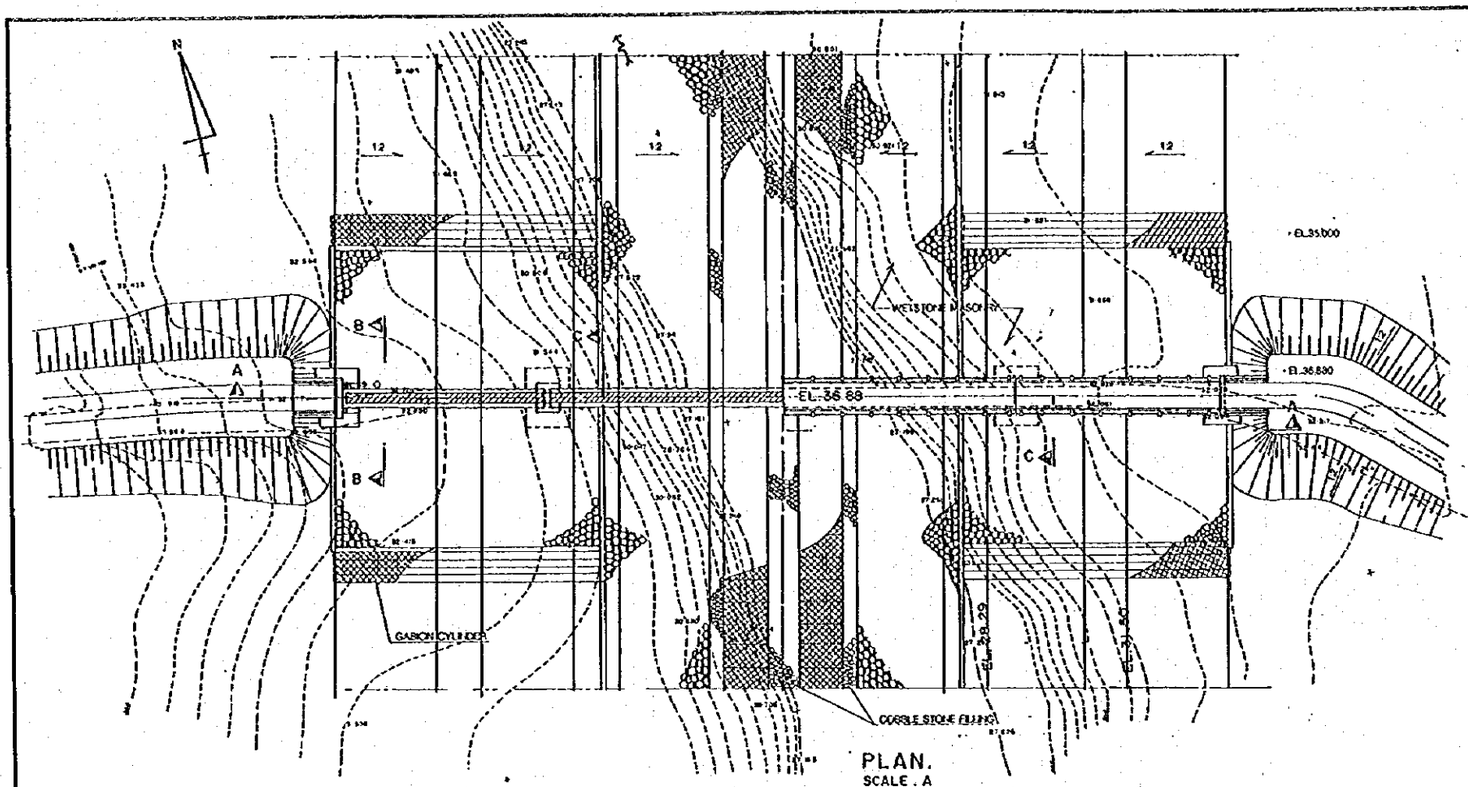



SECTION. A-A
SCALE. A

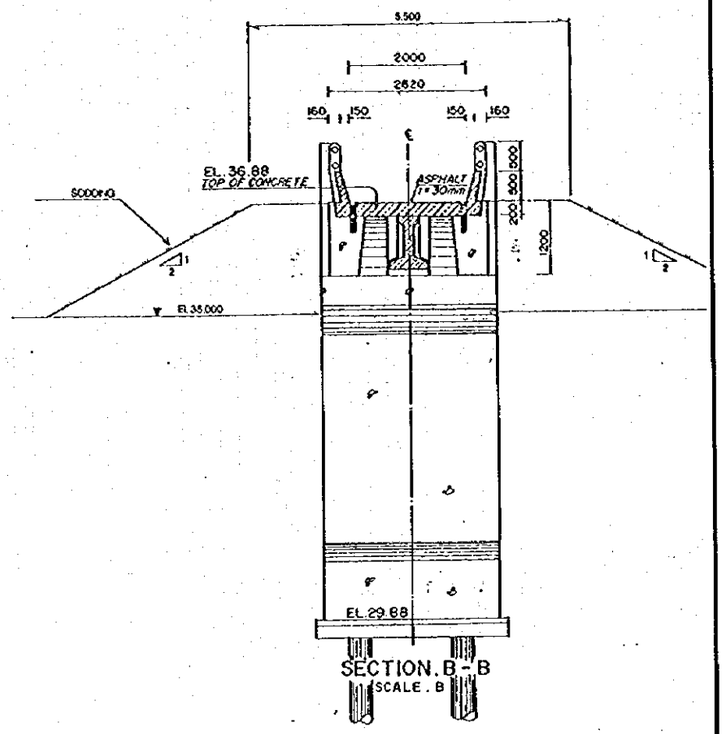



KEY PLAN
NOT TO SCALE

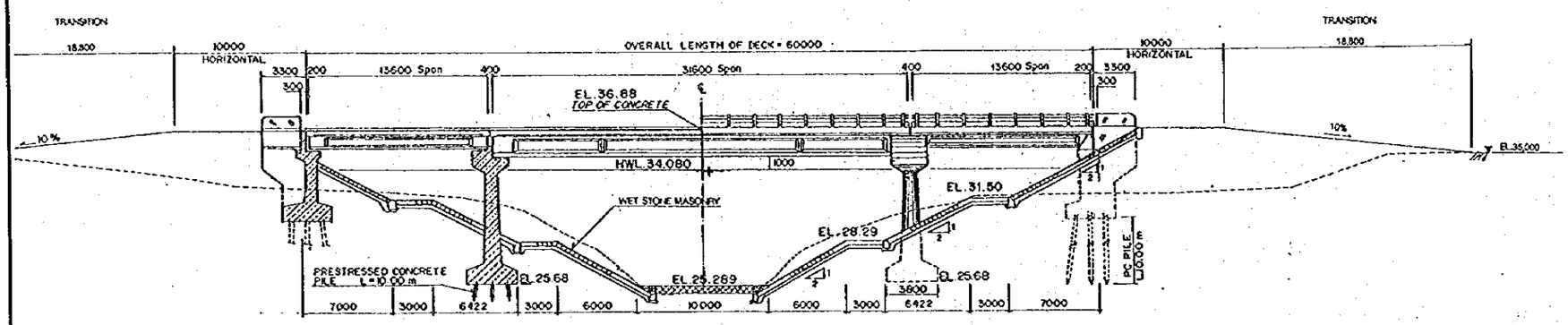
| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.21 GENERAL PLAN OF PEDESTRIAN BRIDGE (F6) |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |



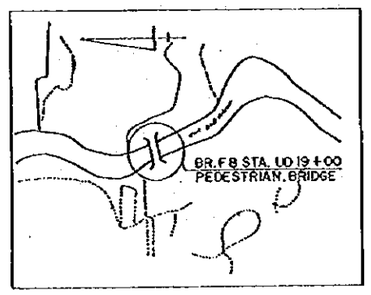

PLAN.
SCALE . A




SECTION. B – B
SCALE . B




SECTION. A – A
SCALE . A



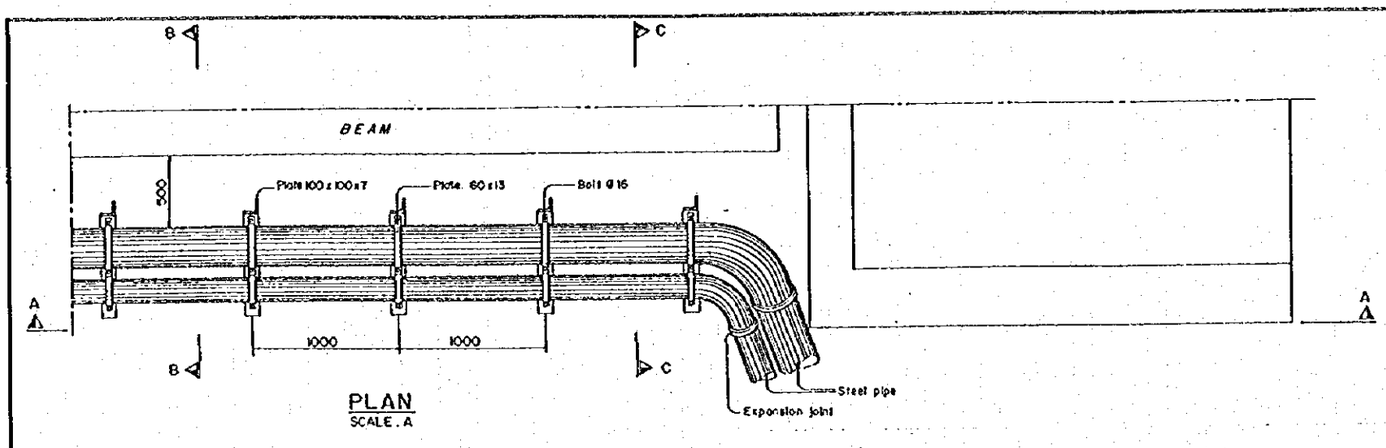

KEY PLAN
NOT TO SCALE

0 5 10 15 20m
SCALE. A (1:200)

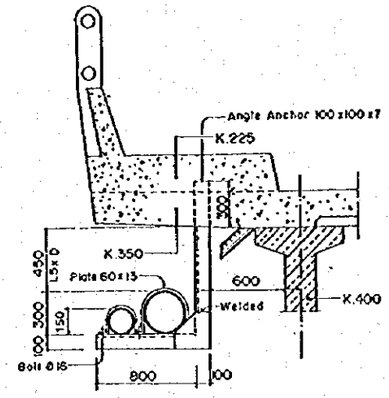
0 1 2 3 4 5m
SCALE. B (1:50)

| | |
|---|---|
| DETAILED DESIGN STUDY ON<br>MEDAN FLOOD CONTROL PROJECT<br>JAPAN INTERNATIONAL COOPERATION AGENCY | DWG. 6.3.22<br>GENERAL PLAN OF GG. SEKSAMA BRIDGE<br>(F8, PEDESTRIAN BR.) |

6-67




PLAN
SCALE. A




SECTION. B – B
SCALE. A

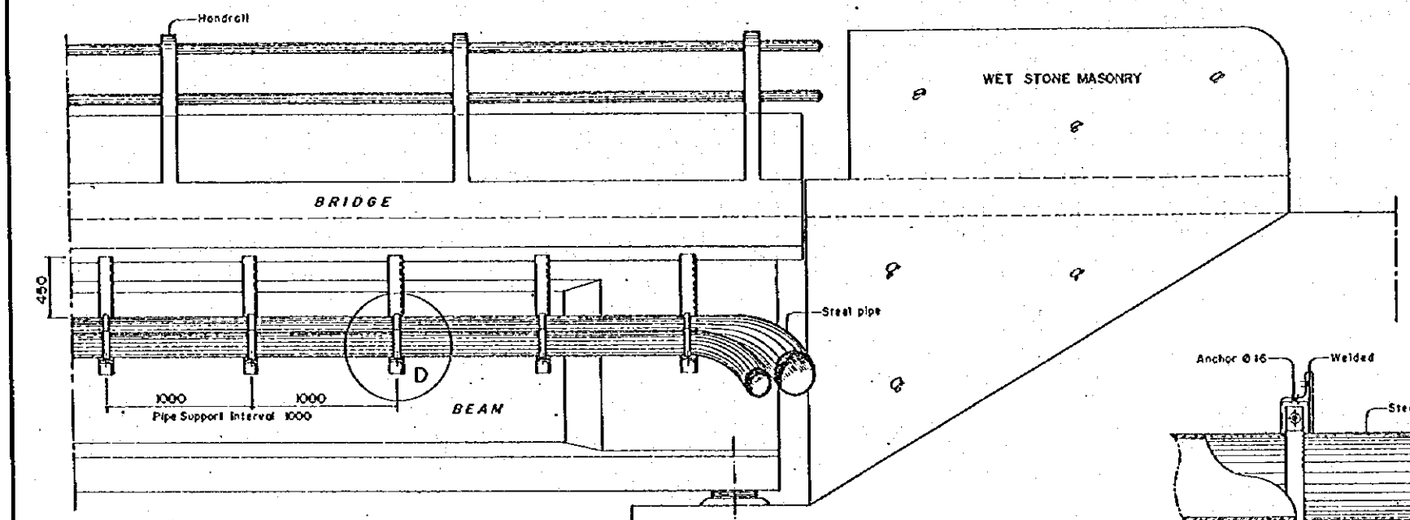
DIMENSIONS OF PIPE AND HANG SUPPORT

| NAME OF BRIDGE | DIAMETER OF PIPE (mm) | | HANG SUPPORT (mm) | |
|---|---|---|---|---|
| | D1 | D2 | L | B |
| MEDAN TEMBUNG (P7) | 100 | - | 350 | 400 |
| MEDAN DENAI (P9) | 150 | 100 | 500 | 650 |
| BINJAI (P11) | 400 | 150 | 1,100 | 1,000 |
| AMPLAS (P13) | 300 | 150 | 850 | 900 |
| | 125 x 4 | - | 600 | 450 |
| DELI TUA (P5) | 350 | - | 1,000 | 950 |

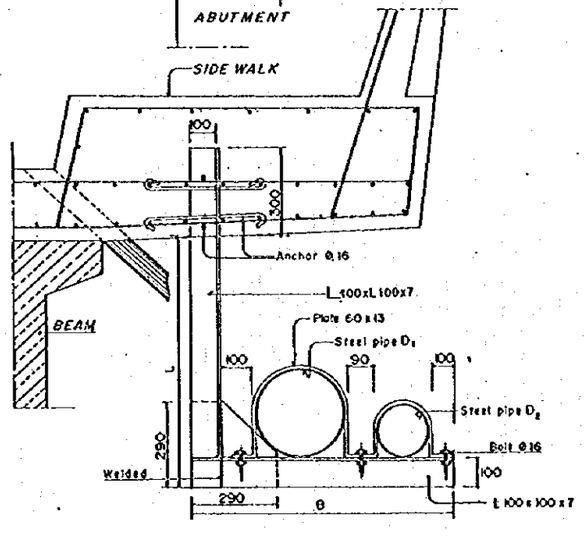
NOTE :

VARUES ARE PROVIDED AS FOLLOWS :

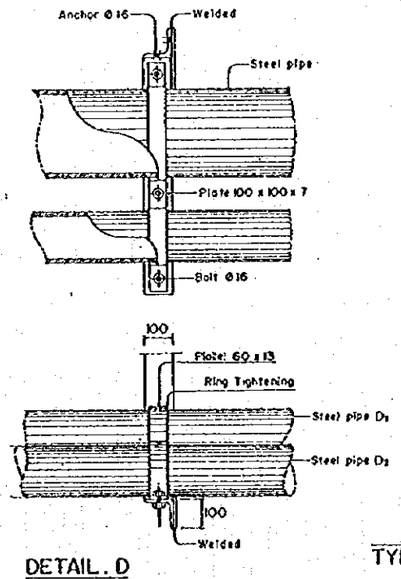
| PIPE | | VALVE |
|---|---|---|
| ϕ 300 | ..... | ϕ 25 |
| ϕ 350 | ..... | ϕ 25 |
| ϕ 400 | ..... | ϕ 50 |



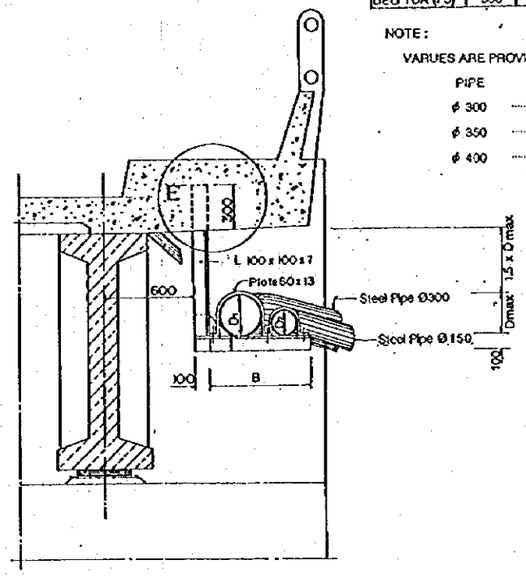

SECTION. A -- A
SCALE. A




DETAIL. E
SCALE. B




DETAIL. D
SCALE. B



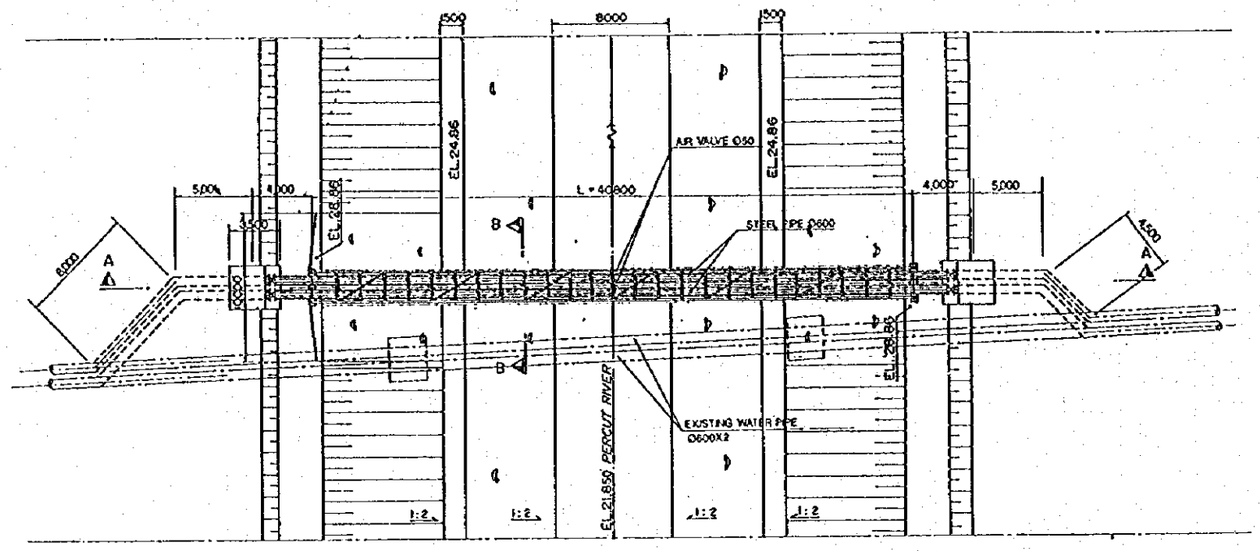

SECTION. C – C
SCALE. A

BRIDGE
TYPICAL SERVICE PIPE HANGER

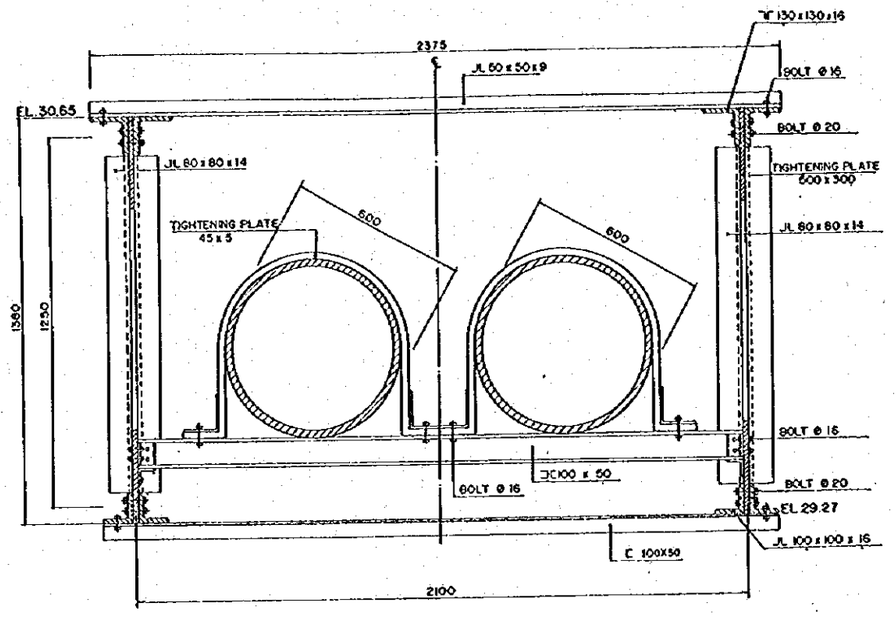
0 0.5 1.0 1.5 2.0m
SCALE. A (1 : 20)

0 2 4 6 8 10m
SCALE. B (1 : 10)

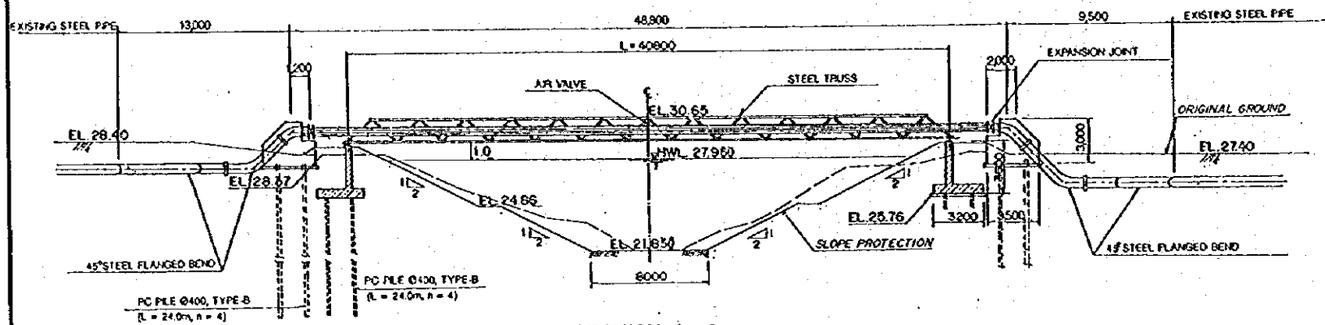
| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.23 DETAILS OF PIPE HANGER UNDER BRIDGE |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |



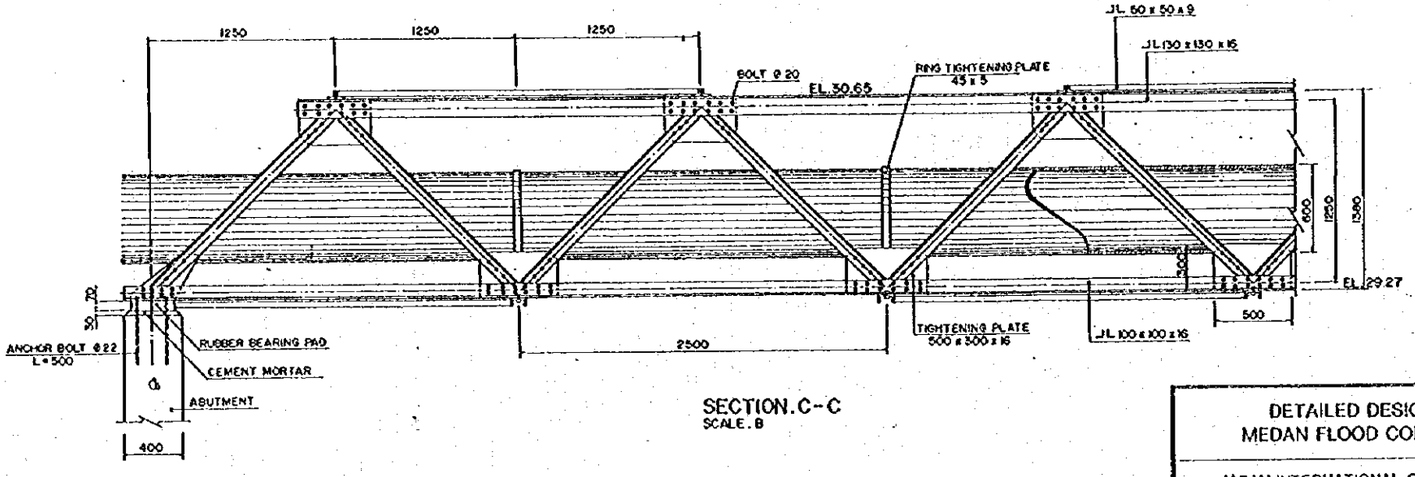

PLAN
SCALE.A



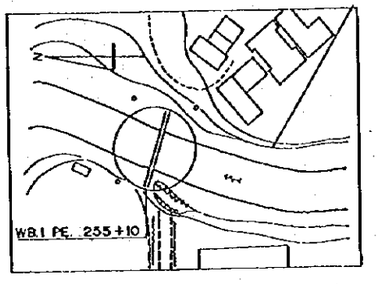

SECTION. B - B
SCALE.C




SECTION. A - A
SCALE. A




SECTION. C - C
SCALE. B




KEY PLAN
NOT TO SCALE

0 5 10 15 20 m
SCALE.A(1:200)

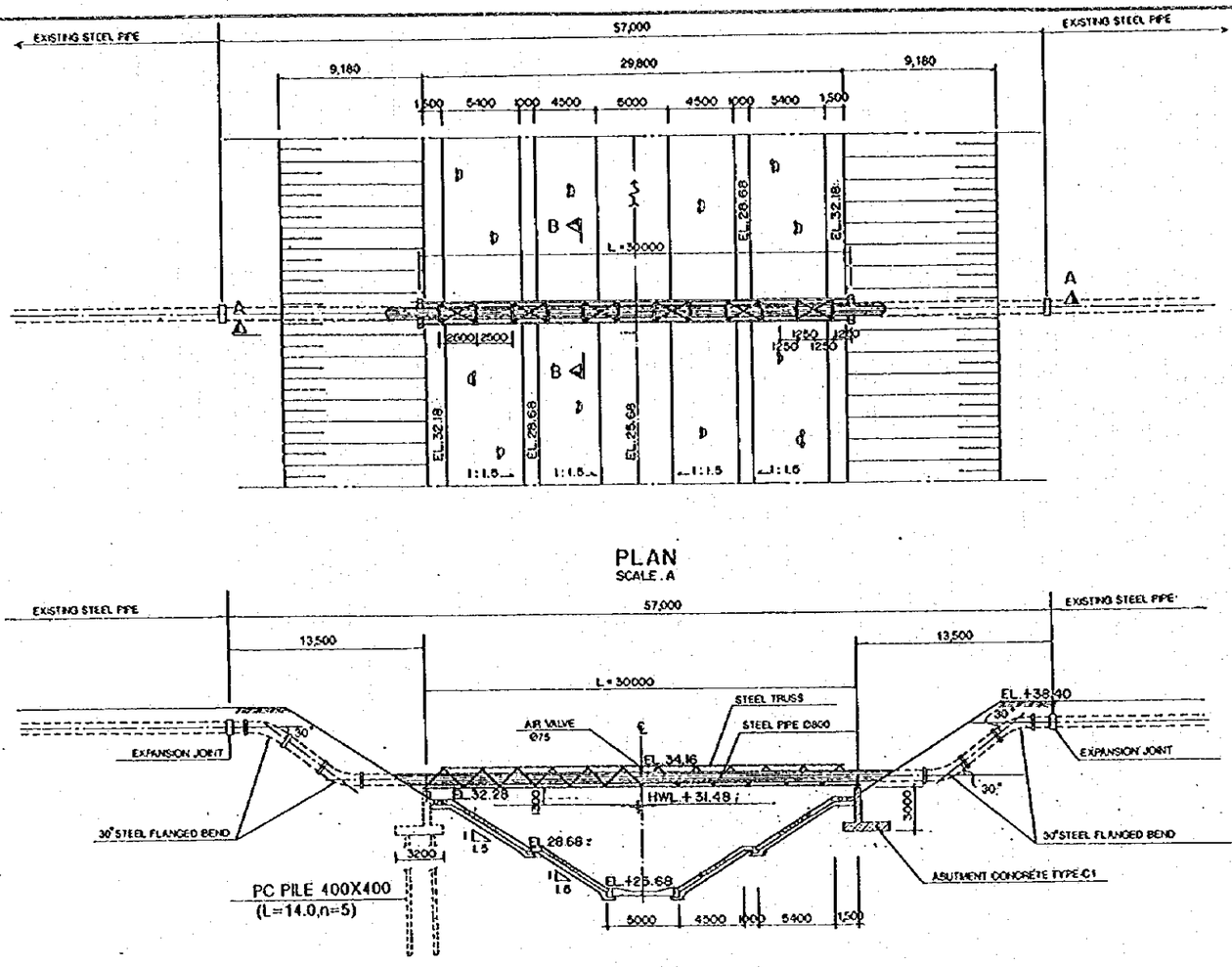
0 0.5 1.0 1.5 2.0m
SCALE.B(1:20)

0 0.2 0.4 0.6 0.8 1.0 m
SCALE.C(1:10)

| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.24 GENERAL PLAN OF WATER PIPE BRIDGE (WB 1) |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |

6-69

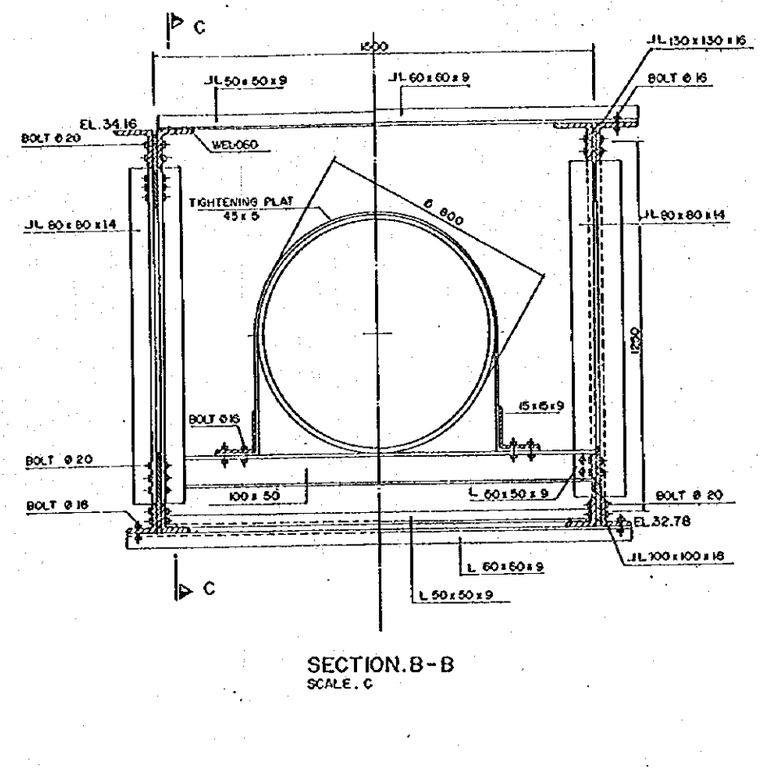
D - 6 - 69



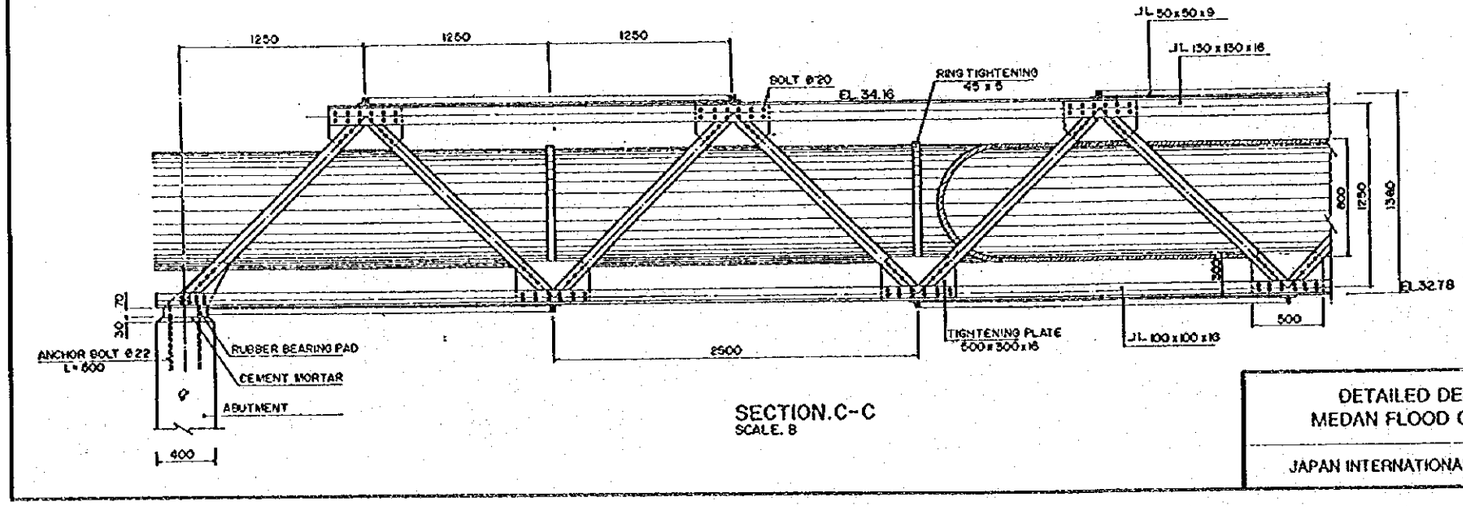

PLAN
SCALE. A



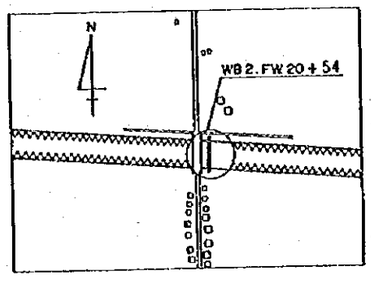

SECTION. A-A
SCALE. A



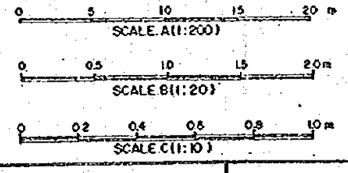

SECTION. B-B
SCALE. C



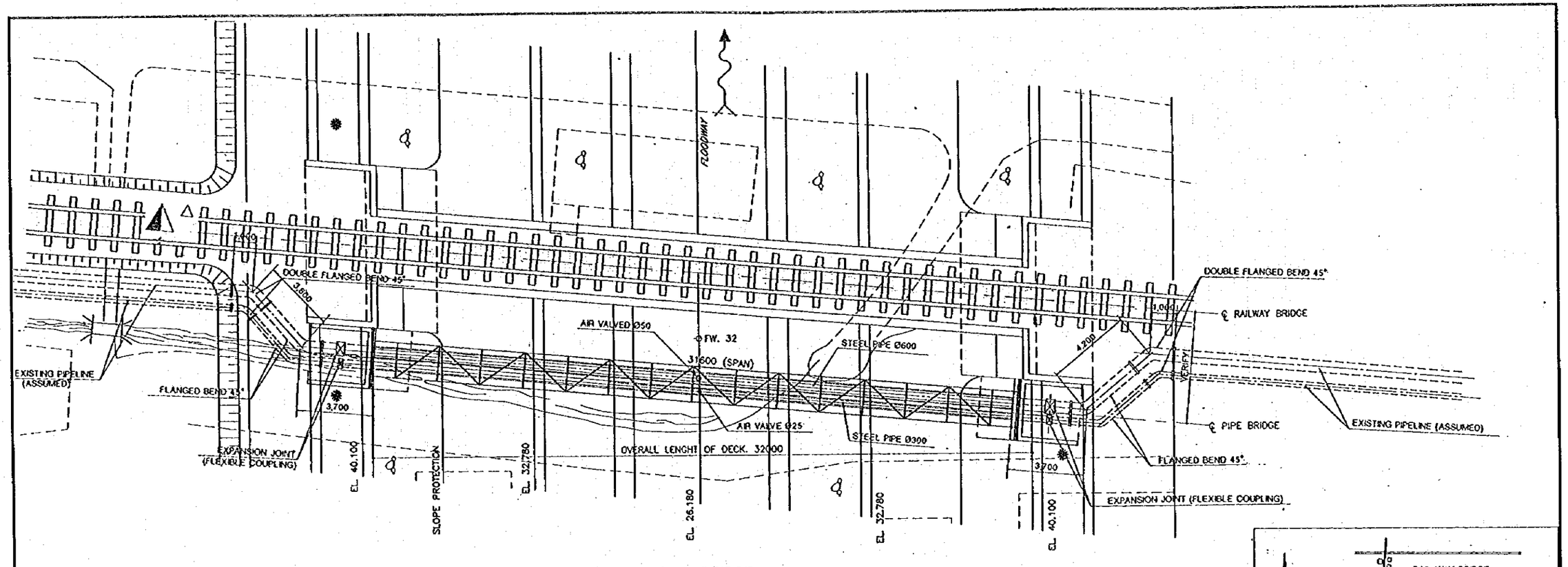

SECTION. C-C
SCALE. B




KEY PLAN
NOT TO SCALE

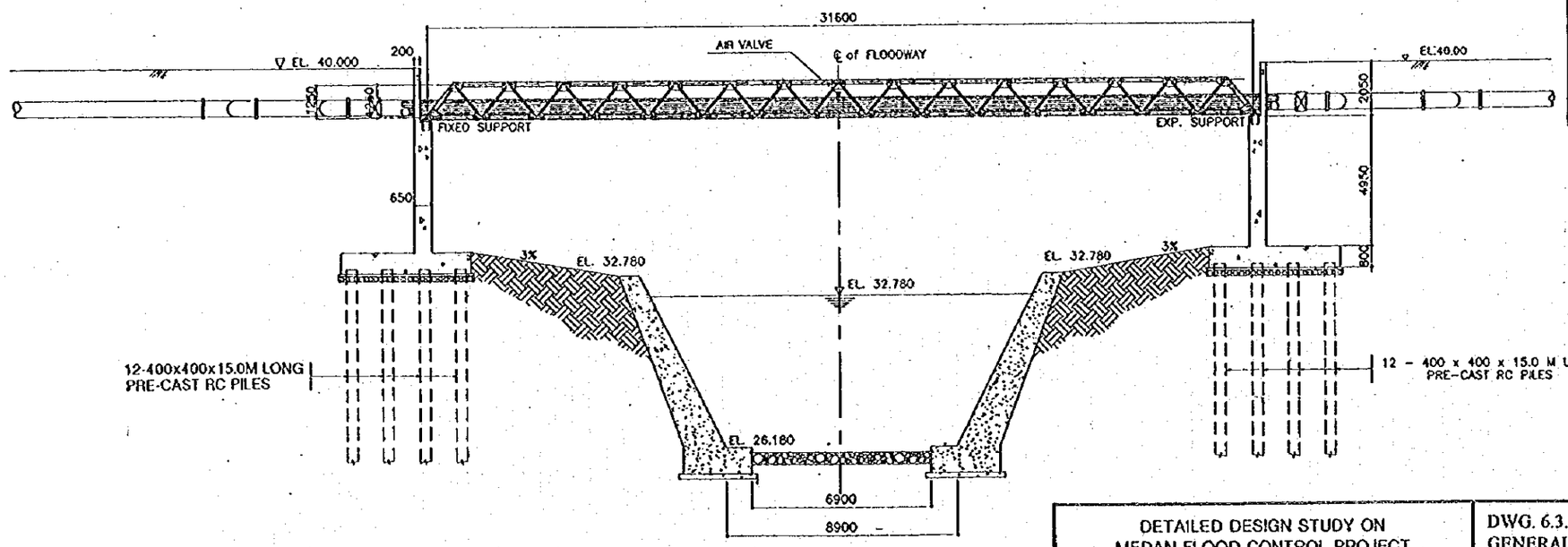



| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.25 GENERAL PLAN OF WATER PIPE BRIDGE (WB 2) |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |



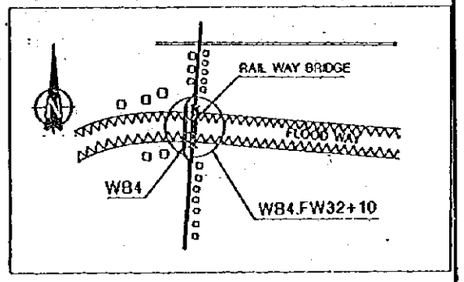

PLAN OF PIPE BRIDGE

SCALE 1:100




ELEVATION

SCALE 1:100




SCALE

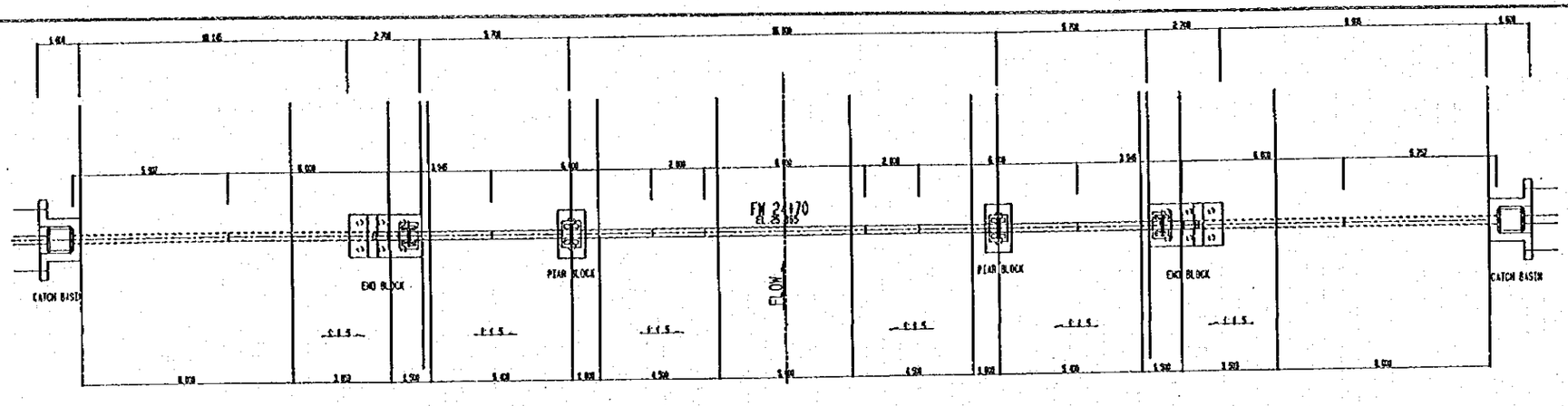
0 5 10 15 20 25m

SCALE 1 : 100

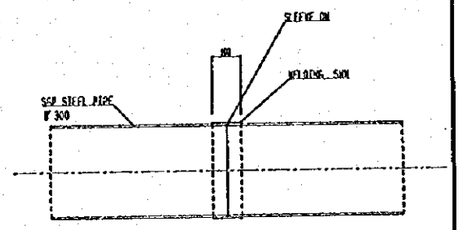
GENERAL PLAN AND ELEVATION

| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.26 GENERAL PLAN OF WATER PIPE BRIDGE (WB 4) |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |

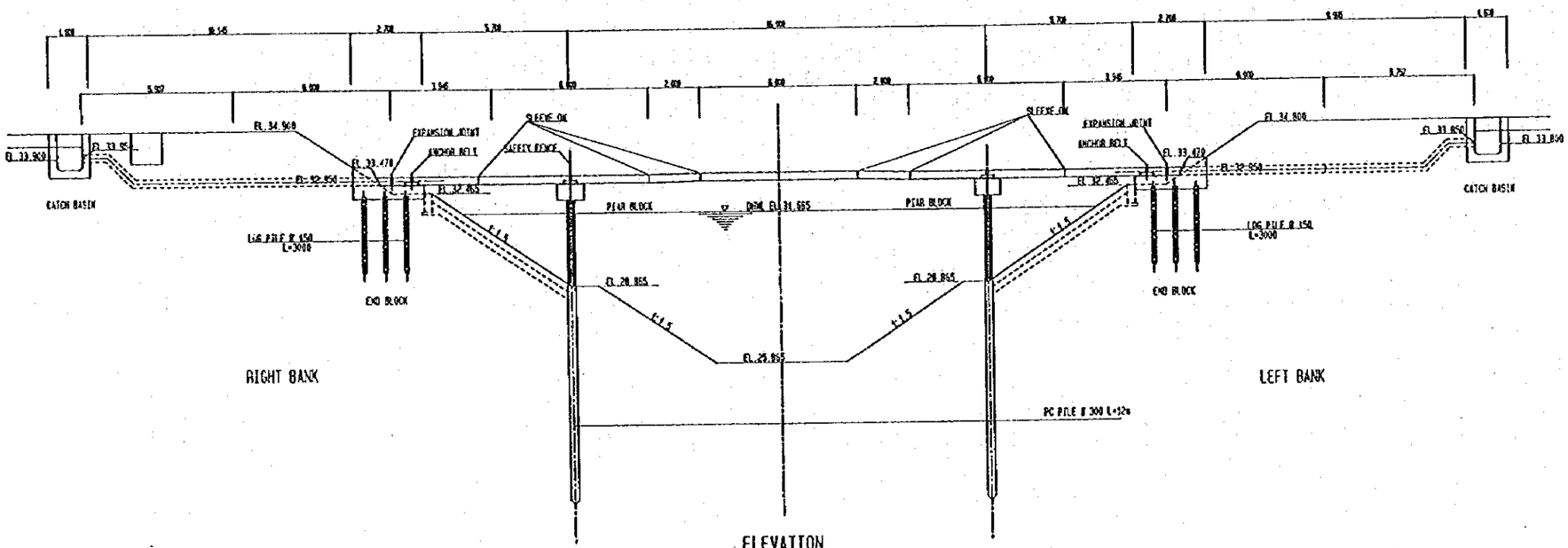
6-71



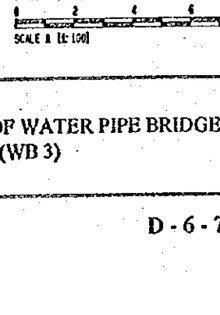

PLAN
SCALE A



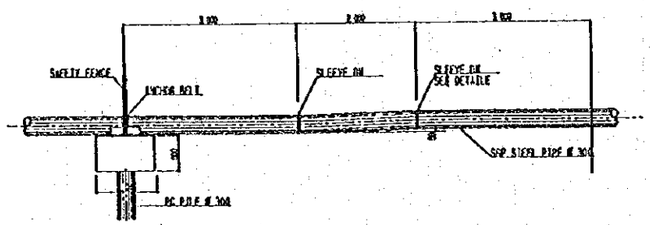

DETAIL OF SLEEVE ON
SCALE C



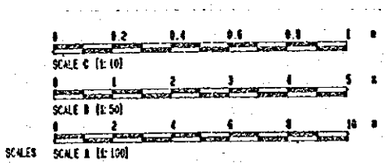

ELEVATION
SCALE A




DETAIL OF PILE
SCALE C




DETAIL OF PIPE JOINT
SCALE B




| | |
|---|---|
| DETAILED DESIGN STUDY ON MEDAN FLOOD CONTROL PROJECT | DWG. 6.3.27 GENERAL PLAN OF WATER PIPE BRIDGE FOR IRRIGATION (WB 3) |
| JAPAN INTERNATIONAL COOPERATION AGENCY | |

# CHAPTER 7

# CONSTRUCTION PLAN AND COST ESTIMATE

# CHAPTER 7. CONSTRUCTION PLAN AND COST ESTIMATE

## 7.1 Construction Plan

### 7.1.1 Planning Condition

**Condition for Construction Works**

For construction planning and scheduling, the following basic concepts were taken into consideration:

(1) Working Days

The estimation of working days in Indonesia is based on the daily rainfall data at Balai Penetilian Station for the last ten years from 1984 to 1993, as well as the number of Sundays and holidays. Daily rainfall is classified into three ranges; namely, less than 3 mm/day, 3 to 10 mm/day, and more than 10 mm/day. The average number of days in each rainfall is as estimated below:

| | |
|---|---|
| Less than 3 mm/day | 261 days |
| Less than 10 mm/day | 298 days |
| More than 10 mm/day | 67 days |

Embankment work can be executed only under the weather condition having rainfall of less than 3 mm/day. Furthermore, embankment work shall not commence at least half a day after a rainfall of more than 10 mm/day to assure dry-up of embankment materials. Dredging may be executed under any weather condition.

Construction works that are affected by river flow such as river channel excavation, groundsill, bridge foundation/substructure and revetment can be executed under rainfall of less than 3 mm/day. On the other hand, other works that are not affected by river flow such as common excavation, bridge superstructure and concreting of structures outside of river channel can be executed under rainfall of less than 10 mm/day.

The non-working national holidays and Sundays are estimated at 65 days per year in total. Therefore, by deducting the non-working holidays and Sundays from the number of days of the respective rainfall conditions, the annual workable days for each work item are estimated as follows:

| Civil Works Item | Workable Days |
|---|---|
| Embankment | 187 days |
| River Channel Excavation, Groundsill and Revetment | 215 days |
| Bridge Substructure/Foundation and Protection Works | 215 days |
| Common Excavation | 245 days |
| Bridge Superstructure and Drainage Outlet | 245 days |
| Dredging | 300 days |

(2) Construction Materials, Labor and Equipment

Major construction materials are aggregate and stone, cement and asphalt, lumber/timber, steel bar and pile, prestressed concrete pile, girder and oil. These construction materials can be obtained mostly in the domestic market in Indonesia. The promising supply sources of construction materials are shown below.

| Material | Source |
|---|---|
| Aggregate/Stone | Rivers in Medan and Binjei City |
| Cement/Asphalt | Medan City |
| Ready-Mixed Concrete | Medan City |
| Lumber/Timber | Medan City |
| Steel Bar | Medan City |
| Steel Sheet Pile | Jakarta or Surabaya City |
| PC Pile/Girder | Medan City |
| Combustibles (Oil, Grease, etc.) | Medan City |

Common labor is easily recruited in and around the construction sites, and skilled labor is abundant in Medan City. Major equipment with the standard or average capacity required for construction works are mostly earth-moving, piling, concreting and loading equipment. Most of these construction equipment are available in the domestic market, usually used in similar construction projects in and around the project area.

(3) Access to the Site

There is one main national road in the project area, which is a trunk route linking Belawan to Tebing Tinggi crossing Deli River and Percut River at PE206+20. The seaport is located at Belawan, and this is the biggest port in North Sumatra for export-import, as well as domestic trade. A tollway, 25 km long, connects the project area to the Belawan Port.

(4) Power Supply

In the project area, PLN supplies electric power which is available for the construction works of the Project. Diesel engine generator can be provided at the construction site, where connection to the PLN power line may be costly.

(5) Construction Method and Type of Construction Equipment

The construction of river improvement works employ conventional and effective styles. Construction equipment utilizes the standard and common equipment at the site.

(6) Earth Volume Change Factor

Volume change factors are used for the calculation of production rate of equipment for earthwork. The conversion factor for loose and compacted conditions are assumed as 1.10 and 0.91, based on the geological survey results.

## Main Construction Works

(1) Construction Schedule

The Project consists mainly of the Percut River Improvement Works (28.23 km) and the construction of the Floodway (3.92 km) including the improvement of Upper Deli River (0.95 km). For implementation, the construction works are divided into seven (7) portions, as tabulated below and delineated in Fig. 7.1.1. The apportioning of construction works is made in consideration of the suitable and practical volume of civil works contracts as practiced and experienced in similar projects in Indonesia.

| Work Portion | Station No. | Object Distance |
|---|---|---|
| MFC-1 | PE0-200 ~ PE46 | 5,040 m |
| MFC-2 | PE46 ~ PE129 | 8,270 m |
| MFC-3 | PE129 ~ PE210 | 8,100 m |
| MFC-4 | PE210 ~ PE274 | 6,500 m |
| MFC-5 | FW0 ~ FW24 & PE274 ~ PE274+320 | 2,680 m |
| MFC-6 | FW24 ~ FW34 | 1,010 m |
| MFC-7 | FW34 ~ FW39+50 & UD12-85.0 ~ UD23 | 1,500 m |

(2) Arrangement of Spoil Bank

As shown in Fig. 7.1.2, some spoil banks for excavation material are mainly situated in swamp and lowland areas. The capacities of the spoil areas are as shown below.

| Spoil Bank | Area (in ha) | Embankment Height (m) | Spoil Volume ($m^3$) |
|---|---|---|---|
| 1 | 300m x 400m = 12.0 ha | 1.5 | 180,000 |
| 2 | 150m x 1,800m = 27.0 ha | 2.0 | 540,000 |
| 3 | 200m x 600m = 12.0 ha | 2.0 | 240,000 |
| 4 | 150m x 500m = 7.5 ha | 3.0 | 225,000 |
| 5 | 300m x 500m = 15.0 ha | 3.0 | 450,000 |
| 6 | 200m x 1,000m = 20.0 ha | 2.0~4.0 | 800,000 |
| Total | 93.5 ha | - | 2,435,000 |

The hauling distance from each portion of construction work to the spoil area is calculated by the spoil volume to each area and the distance, and the average distance is as shown below. The spoil volume is considered as the surplus of excavated and embankment soil.

| Portion | Spoil Area | Average Distance | Spoil Area | Average Distance | Spoil Area | Average Distance | Estimated Distance |
|---|---|---|---|---|---|---|---|
| MFC-1 | 1 | 2 km | 2 | 2 km | | | 2 km |
| MFC-2 | 1 | 5 km | 2 | 5 km | | | 5 km |
| MFC-3 | 2 | 11 km | 3 | 2 km | 4 | 2 km | 6.5 km |
| MFC-4 | 4 | 6.5 km | 4 | 4 km | | | 5 km |
| MFC-5 | 5 | 1 km | 6 | 6 km | | | 5 km |
| MFC-6 | 5 | 5 km | | | | | 5 km |
| MFC-7 | 6 | 4 km | | | | | 4 km |

## Construction Method of Major Work Items

The construction method of major work items are as described below.

(1) Excavation

A common excavation is defined as the execution of excavation works on ground higher than the elevation of 4 m below the design high water level, while a river channel excavation is the excavation on ground lower than the said elevation. The common excavation is assumed to use 0.6 $m^3$ backhoe, 12 ton bulldozer, 1.2 $m^3$ wheel loader and 8-ton dump truck.

The common excavation in the Floodway can be performed with a larger capacity of equipment than those in Percut River. River channel excavation is mainly carried out by using backhoe and clamshell for dumping the excavated materials in the inland side, and a dump truck for hauling them to the spoil area.

Dredging work is employed only for the stretch from the river mouth (PE0-200) to PE14 of Percut River. Spoil areas for dredging materials are provided with a sedimentation pond with dike coffering to prevent the outflow of sand and silt into the river. Besides, excavated material from PE0-200 to PE1.0 is highly silty soil which is planned to be spoiled to the right side at around PE0.0 with coffering dike. (refer to Fig. 7.1.3)

(2) Embankment

Embankment of dike is carried out mainly with suitable material from the excavated soil. The embankment works are performed by 12 ton bulldozer, 0.4 $m^3$ backhoe and compactors. The thickness of each layer of embankment is preferably less than 30 cm.

The materials for embankment will depend on the results of survey and soil test. The ratio of embankment suitable volume to the total volume of excavated materials is estimated for each portion as below.

| Portion | Common | River Channel | Dredging |
|---|---|---|---|
| MFC-1 | 40% | 10% | 0% |
| MFC-2 to MFC-4, MFC-7 | 90% | 20% | - |
| MFC-5 to MFC-6 | 90% | - | - |

(3) Concrete Works

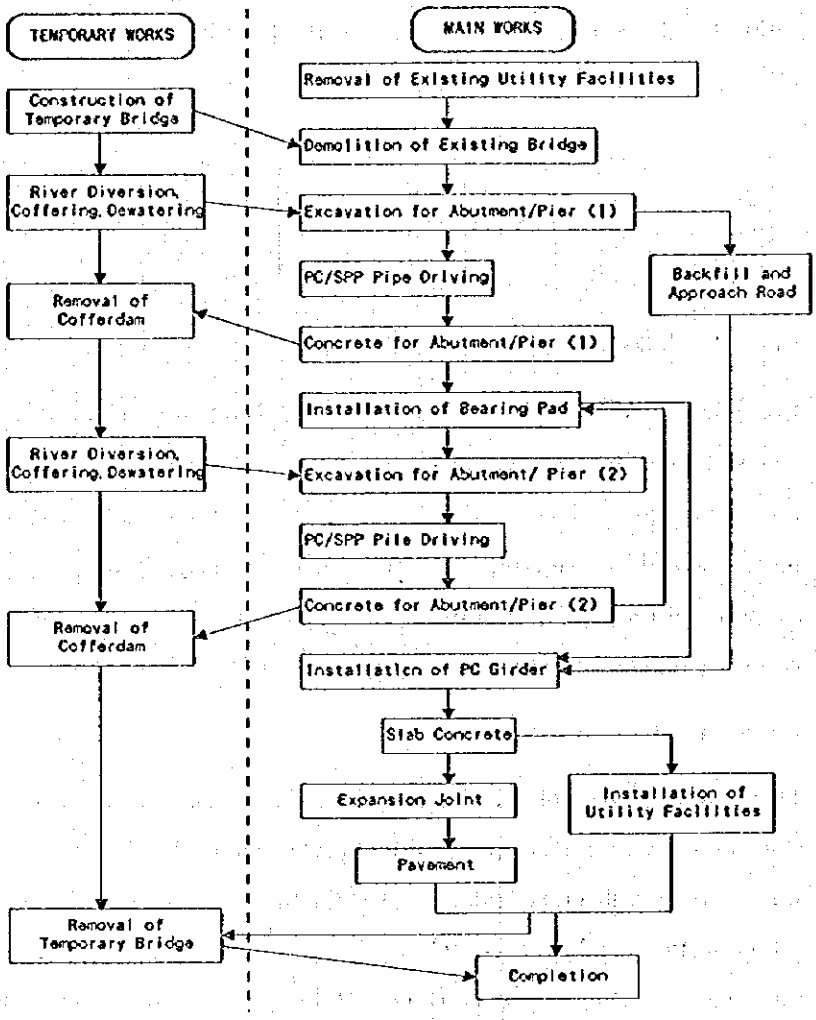
Concrete works are applied to the reinforced concrete for weirs and piles, bridge slab and structures where ready-mixed concrete is to be procured from suppliers. A portable concrete mixer is used for small concrete structures such as partition wall of revetment and drainage ditch. Formwork for concrete is of two types, form with support and form only, each of which is made up of 2.5 m in height. Formwork is necessary for concrete structures having a slope of 1 : 1.5 and above.

(4) Revetment

There are two types of revetment, wet stone masonry type and concrete type. Wet stone masonry type is composed of foot protection, cobblestone filling, base concrete, wet masonry with gravel filling, and palm filter. Foot protection is provided with gabion mattress and cylinder. The coffering of the work site is made of log piles and sandbags. Concrete type is composed of rubble stone bedding, base concrete, backfilling with soil and gravel, main concrete and weep hole. Weep hole is made of PVC pipe and filter cloth.

(5) Bridge Works

Bridge works are composed of excavation, piling, reinforced bar, concrete, girder stressing and loading, pipe and pavement works. Designed bridges are of five types, pedestrian, water pipe, railway, road and maintenance, depending on purpose. Precast prestressed concrete girder for the bridges is commonly designed as a main and cross beam. Loading work for bridge girder is executed by portal crane which is a common method in Indonesia (refer to Fig. 7.1.4). A typical work sequence of bridge construction is as illustrated below.




(6) Intake Weir (Inflatable Rubber-Made Dam)

The major works of new intake weir construction are composed of inflatable rubber-made dam, irrigation channel, revetment, box culvert and intake gate. After diverting river flow from the existing low water channel to the newly excavated low water channel connected to the new intake weir, the existing weir will be demolished. Work schedules for the main body are the installation of anchor bolt, embedded plate and piping, and the construction of control house and installation of operating equipment. Testing will be the last work after placing the inflatable rubber main body on foundation and clamps.

(7) Preparatory Works

The preparatory works consist of mobilization and demobilization of construction equipment as well as labor force, preparation and demolition of temporary building and

yards, clearing and grubbing of spoil area, installation and removal of water, fuel, electric power supply system, survey works for the preparation of working drawings and so on. These works are to be carried out in the beginning and the end of the construction period. Preparatory works include improvement and maintenance of existing road, construction, maintenance and subsequent demolition of the temporary access road.

Immediately after the receipt of Notice to Proceed, the Contractor will commence with the mobilization of work force, construction equipment and preparation of temporary facilities such as site office, workshop, laboratory, etc., including water, telecommunication and power supply system. Other requirements for the construction works such as survey, soil investigation, submittal of construction program for approval, working drawings and other necessary documentation have to be carried out smoothly based on the stipulation of the contract. The preparatory works mentioned above are common for each portion of the project.

(8) Temporary Works

Temporary works include temporary bridges, temporary channels, and coffering and dewatering. The reconstruction of bridges require temporary bridge to minimize inconvenience to the usual activities of people around the construction site during the construction period. A temporary channel for river diversion work is also necessary for the construction of the Deli Diversion Weir. Dewatering and coffering works are required for the construction works of groundsill, bridge protection, dredging, jetty parapet, riverbed protection and excavation.

(a) Coffering and Dewatering

Cofferdam will be provided in riverside construction works using sandbags with excavated materials and one or two lines of log piles. The cofferdam is designed with a crest width of 1.0 m and a height of 2.0 m. The materials for a cofferdam can be reused for the next cofferdam. In the dry season, a small sized cofferdam may be constructed considering water level and rainfall. However, at the end of the dry season, October and November, the size of cofferdam should be reinforced to the same dimension mentioned above in preparation for the coming rainy season.

Thoughout the construction period, dewatering work is indispensable to construct all structures in dry condition, especially during the construction of revetment,

bridge protection, groundsill, weir and excavation of floodway. Excavation works at the floodway may percolate groundwater to the construction site The contractor has to employ enough number of submersible pumps and engine generators to cope with dewatering.

(b) Temporary Bridge

The temporary bridge for detouring is constructed of coconut piles with steel beam and wooden board (refer to Fig. 7.1.5). Equipment for loading and materials for temporary bridge are assumed to be reused from one bridge construction to another. The width of the temporary bridge is 3.0 m to 7.0 m based on traffic condition. The dimensions of temporary bridge are as shown below.

| Name of Bridge | Width (m) | Length (m) | Area ($m^2$) |
|---|---|---|---|
| Br. P-1, Titi Besi Bridge | 6.0 | 80.0 | 480.0 |
| Br. P-7, Medan Tembung Bridge | 7.0 | 30.0 | 210.0 |
| Br. P-9, Medan Denai Bridge | 4.0 | 60.0 | 240.0 |
| Br. P-11, Binjai Bridge | 7.0 | 30.0 | 210.0 |
| Br. P-13, Amplas Bridge | 6.0 | 50.0 | 300.0 |
| Br. F-8, Gg. Sekasama Bridge | 3.0 | 50.0 | 150.0 |
| MFC-7, Hauling Bridge | 3.0 | 50.0 | 150.0 |

(c) Temporary Channel

A temporary channel is proposed to divert the river discharge during the construction of Deli Diversion Weir. The channel can be either one of two alternative types: (1) temporary diversion channel by open-cut method with protection work, and (2) river channel with coffering of steel structure. The comparison of these two types was made as to construction period, workability of site, execution and safety, as tabulated below.

| Alternative 1 (Diversion Channel) | | Alternative 2 (Coffering) | |
|---|---|---|---|
| Dimension | | Dimension | |
| - Riverbed Width | 15.0 m | - Coffering Length | 80.0 m |
| - Channel Length | 225.0 m | - Piling Length (two sides) | 10 m |
| Work Volume | | Work Volume | |
| - Excavation | 23,241 $m^3$ | - Steel Structure | 40,000 kg |
| - Gabion Mattress | 1,353 $m^3$ | - Dewatering | 300 set/day |
| - Coffering | 330 m | - Coffering | 380 m |
| - Embankment | 25,566 $m^3$ | - Excavation | 3,960 $m^3$ |
| | | - Embankment | 4,356 $m^3$ |
| Construction Period | 11 months | Construction Period | 13 months |
| Construction Cost | Rp 475,000,000 | Construction Cost | Rp 604,000,000 |

Based on the above comparison, Alternative 1 is more advantageous than Alternative 2. Especially, Alternative 2 is required to shift coffering to the opposite side in the rainy season since the construction period of Deli River Weir is estimated to be one year. The coffering work is difficult and dangerous in the rainy season because the left side bank of the construction site has a cliff profile and a small working area.

## Work Capacity

The quantity of work for major work items is calculated in consideration of construction method suitable to the work. Daily work volume is estimated on the basis of "set" estimated on workability of major equipment required for each item of work. The daily work volume per set of main work item is estimated as follows:

| Work Item | Unit | Daily Work Volume/Set |
|---|---|---|
| Excavation (Common) | $m^3$ | 1,120 |
| Excavation (Riverbed) | $m^3$ | 480 |
| Excavation (Floodway) | $m^3$ | 1,440 |
| Embankment | $m^3$ | 800 |
| Revetment (Wet Stone Masonry) | $m^3$ | 17.5 |
| Revetment (Concrete) | $m^3$ | 15 |
| Bridge | $m^2$ | 5 |
| Sodding | $m^2$ | 400 |
| Clearing/Grubbing | $m^2$ | 960 |
| Stripping | $m^3$ | 1,150 |
| Dredging | $m^3$ | 400 |

A set of equipment for each work item is composed as follows:

| Work Item | Equipment | Number of Units |
|---|---|---|
| Excavation (Common) | Bulldozer, 12 ton | 1 |
| | Backhoe, 0.6 $m^3$ | 1 |
| | Wheel-Loader, 1.2 $m^3$ | 1 |
| | Dump Truck, 8-ton | 14 |
| Excavation (River Channel) | Backhoe, 0.6 $m^3$ | 2 |
| | Dump Truck, 8-ton | 6 |
| Excavation (Floodway) | Bulldozer, 15-ton | 1 |
| | Backhoe, 0.6 $m^3$ | 1 |
| | Wheel-Loader, 1.2 $m^3$ | 1 |
| | Dump Truck, 8-ton | 18 |
| Dredging | Dredger, 200 ps | 1 |
| Embankment | Bulldozer, 12-ton | 1 |
| | Backhoe, 0.4 $m^3$ | 1 |
| | Tire Roller | 1 |
| Clearing and Grubbing | Bulldozer, 12-ton | 1 |
| | Wheel-Loader, 1.2 $m^3$ | 1 |
| | Dump Truck, 8-ton | 12 |
| Stripping | Bulldozer, 15-ton | 2 |
| | Wheel-Loader, 1.2 $m^3$ | 1 |
| | Dump Truck, 8-ton | 6 |

### 7.1.2 Construction Plan of Work Portions

The construction works of portion MFC-1 to MFC-7 are scheduled to commence within three years. River improvement is generally executed from the downstream to upstream, but some embankment works upstream may be conducted before excavation works of the downstream on condition that the work shall not bring an imbalance of the flow capacities between the up and downstream stretches.

**MFC-1**

MFC-1 is the portion nearest to the river mouth and the improvement stretch is 5,040 m long from PE0-200 to PE46.

(1) Work Quantity

Based on the design of river improvement, the work volumes for MFC-1 are as calculated below.

| Work Item | Unit | Quantity |
|---|---|---|
| River Works | | |
| - Clearing and Grubbing | $m^2$ | 290,600 |
| - Stripping | $m^3$ | 36,500 |
| - Dredging | $m^3$ | 82,600 |
| - Excavation (Common) | $m^3$ | 139,600 |
| - Excavation (River Channel) | $m^3$ | 164,600 |
| - Embankment | $m^3$ | 263,800 |
| - Parapet Wall | $m^3$ | 1,560 |
| - Revetment (Wet Stone Masonry) | $m^3$ | 2,560 |
| - Sodding | $m^2$ | 86,100 |
| Other Works | | |
| - Jetty (Landing Stage) | L.S. | 1 |
| - Channel Excavation for Sungai Latang (PE0-60 ~ PE8+50) | m | 910 |
| - Relocation of Kabupaten Road (PE14+80 ~ PE33+100) | m | 1,920 |
| - Intake Sluice Gate for Fishpond | nos. | 2 |

(2) Site Condition

In the construction stage, the following matters shall be considered:

(a) Dredged materials are hauled to the spoil area where dike and sedimentation pond for sand and silt are provided, and two locations of spoil area for dredged materials are proposed, the right side area at PE0.0 and Spoil Area No. 2 (refer to Fig. 7.1.2). Since the right side area has a length of 200 m and a width of about 150 m, the dredged volume from PE0.0-200 to PE1.0 is estimated to have a depth of 0.5 m. It is not necessary to build a sedimentation pond because the materials

dredged from the estuary are of the same quality as the materials in the spoil area. On the other hand, the dredged materials from PE1.0 to PE14.0 are less silty and easier to settle. The excavated soils shall be dried up in the sedimentation pond for a few days and then mixed with other soils to obtain a stiffer material.

(b) A temporary jetty is required during the construction of a new jetty. It is necessary for the coffering and dewatering of piling works, wet stone masonry and concrete works, because the left side of Percut River downstream is always inundated by tide. The construction period is estimated to be 4.5 months during the dry season. The height of coffering shall conform with the tidal and water levels. The concrete sheet pile work shall be finished before the onset of the rainy season.

(c) The excavated materials in work portion MFC-1 does not meet the required volume of embankment material. The materials for embankment shall be supplied directly from the other work portions (MFC-2 or MFC-3) or from the stockyard. (refer to Fig. 7.1.6). The right-of-way will be utilized as transportation road.

(d) Since Spoil Area No. 1 and No. 2 are located near the estuary and earth works are to be started from the beginning of each portion especially MFC-1 and MFC-2, the transportation road to the spoil area shall be executed first from the beginning of the construction period in both sides of the river.

(e) Channel excavation for Sungai Lalang is also planned to start early in order to complete diking work on the right side bank from PE9.0 to PE0.0 before the rainy season. Besides, the right side dike will be used as the transportation road for rubble mound construction.

(3) Number of Working Sets and Period

The number of sets of major civil works are as estimated below, and the construction schedule is shown in Fig. 7.1.7:

| Work Item | No. of Sets | Period (month) |
|---|---|---|
| Clearing and Grubbing | 3 | 5.0 |
| Stripping | 2 | 1.0 |
| Excavation (Common) | 2 | 3.5 |
| Excavation (River Channel) | 3 | 6.0 |
| Dredging | 1 | 9.5 |
| Embankment | 1 | 11.0 |
| Parapet | 1 | 2.0 |
| Revetment (Wet Stone Masonry) | 1 | 7.5 |
| Sodding | 2 | 4.5 |

**MFC-2**

MFC-2 is located upstream of MFC-1 with a stretch of 8,270 m from PE46 to PE129.

(1) Work Quantity

The work volumes for MFC-2 are as calculated below.

| Work Item | Unit | Quantity |
|---|---|---|
| River Works | | |
| - Clearing and Grubbing | $m^2$ | 528,000 |
| - Stripping | $m^3$ | 61,000 |
| - Excavation (Common) | $m^3$ | 340,900 |
| - Excavation (River Channel) | $m^3$ | 166,200 |
| - Embankment | $m^3$ | 338,000 |
| - Bandar Sidoras Intake Weir | L.S. | 1 |
| - Groundsill | L.S. | 1 |
| - Revetment (Wet Stone Masonry) | $m^3$ | 2,680 |
| - Sodding | $m^2$ | 175,400 |
| Bridge Works | | |
| - Titi Besi Bridge, W=7.0 m, L=82.8 m | L.S. | 1 |
| - Perkebunan Bridge, W=7.0 m, L=104.0 m | L.S. | 1 |
| - Titi Gantung Bridge, W=7.0 m, L=57.4 m | L.S. | 1 |
| Drainage Works | | |
| - Drainage Gate, Flap Dia 600 mm | L.S. | 1 |
| - Drainage Gate, 2.0 m x 1.5 m x 2 | L.S. | 1 |
| Other Works | | |
| - Relocation of Existing Road (PE82 ~ PE97) | m | 1,500 |
| - Relocation of Irrigation Channel for SL2 (PE95+35 ~ PE103+10) | m | 710 |

(2) Site Condition

(a) The irrigation intake gate at Bandar Sidoras Intake Weir is fully opened twice a year, April to May and October to November. River diversion work is accordingly executed at those times (refer to Fig. 7.1.8). There is a large hole dugged in front of the existing gate and in order to maintain the smooth flow, the demolished concrete block of the existing weir will be used to backfill this place.

(b) The construction of Titi Besi Bridge (P1) requires a temporary bridge as well as coffering and dewatering for foundation works. The electric pole on the bridge is also required to be relocated. The temporary bridge is 6.0 m wide and 80.0 m long, and it is wider than the existing bridge for construction use. Coffering is necessary during the foundation work on piers but not so much. Perkebunan Bridge (P2) and Titi Gantung Bridge (P3) are planned to be constructed upstream

of the existing bridges. The existing bridges will be used during the construction period.

(c) Groundsill work shall be executed with exact construction timing together with the temporary works. Coffering and dewatering is carried out by diking with log piles and sandbags. Construction may be started from one side, diverting river flow to the other side and vice versa.. Therefore, construction of the grounsill shall be executed in the dry season.

(d) A specified skill and technique is required to install and adjust the control equipment of the inflatable rubber-made dam. Electric power is required for the adjustment and test after installation.

(3) Number of Working Sets and Period

The number of sets for major civil works are as estimated below, and the construction schedule is shown in Fig. 7.1.9.

| Work Item | No. of Sets | Period (month) |
|---|---|---|
| Clearing and Grubbing | 3 | 9.0 |
| Stripping | 3 | 1.0 |
| Excavation (Common) | 2 | 7.5 |
| Excavation (River Channel) | 2 | 8.5 |
| Embankment | 3 | 9.0 |
| Bandar Sidoras Intake Weir | 1 | 10.0 |
| Revetment (Wet Stone Masonry) | 1 | 7.5 |
| Sodding | 4 | 5.5 |

## MFC-3

MFC-3 is located upstream of MFC-2, with a length of 8,100 m covering the stretch from PE129 to PE210.

(1) Work Quantity

Based on the design of the river improvement, the work volumes for MFC-3 are as calculated below.

| Work Item | Unit | Quantity |
|---|---|---|
| River Works | | |
| - Clearing and Grubbing | $m^2$ | 332,400 |
| - Stripping | $m^3$ | 16,300 |
| - Excavation (Common) | $m^3$ | 626,300 |
| - Excavation (River Channel) | $m^3$ | 161,900 |
| - Embankment | $m^3$ | 95,200 |
| - Revetment (Wet Stone Masonry) | $m^3$ | 10,200 |
| - Sodding | $m^2$ | 88,500 |

| | | |
|---|---|---|
| Protection Works | | |
| - Titi Runtuh Bridge | L.S. | 1 |
| - Railway Bridge | L.S. | 1 |
| Bridge Works | | |
| - Payung Bridge, W=7.0 m, L=40.8 m | L.S. | 1 |
| - Pedestrian Bridge, W=2.0 m, L=40.8 m | L.S. | 1 |
| - Medan Tembung Bridge, W=9.0 m, L=40.8 m | L.S. | 1 |
| - Medan Denai Bridge, W=16.0 m, L=40.8 m | L.S. | 1 |
| Drainage Works | | |
| - Drainage Gate, 1.5 m x 1.5 m | site | 2 |
| - Drainage Gate, 2.0 m x 1.5 m | site | 1 |
| - Drainage Box Culvert, 2.0 m x 1.5 m | site | 1 |
| - Drainage Pipe, Dia 1,000 mm x 2 | site | 1 |
| - Drainage Pipe, Dia 1,000 mm | site | 1 |
| - Drainage Pipe, Dia 800 mm x 2 | site | 2 |
| - Drainage Pipe, Dia 800 mm | site | 1 |
| - Drainage Pipe, Dia 600 mm | site | 3 |
| - Drainage Ditch, W=1,000 mm | site | 1 |
| - Drainage Ditch, W=600 mm | site | 1 |

(2) Site Condition

(a) Protection works for bridge pier require coffering and dewatering during the construction period. Riverbed protection is made by concrete lining and placing of concrete block and gabion mattress, or a combination of the above. Construction period shall be within the dry season.

(b) Excavated materials are classified as embankment materials and others. Embankment materials are temporarily stored in a spoil area near the construction site, and the materials for embankment of MFC-1 portions are hauled to Spoil Area No. 1 and No. 2, because the volume of excavation exceeds the embankment volume.

(c) Relocation of water level gauging station shall consist only of the construction of gauging well and observation house. The existing gauging equipment is transferred to the new station. The new well of the water level station will be made of steel pipe with a diameter of 600 mm and with two inlet pipes of 400 mm. Leveling and protection works shall be executed.

(d) The construction of Medan Tembung Bridge (P7) and Medan Denai Bridge (P9) requires temporary bridges during the construction period. Medan Denai Bridge (P9) is planned to be constructed prior to Medan Tembung Bridge (P7) which is started after completion of Medan Denai Bridge (P9), so that materials for the temporary bridge could be reused. The locations of bridge abutments in MFC-3 are on the land-side so that coffering work is expected to be not so much.

(3) Number of Working Sets and Period

The number of sets of major civil works are as estimated below, and the construction plan is shown in Fig. 7.1.10.

| Work Item | No. of Sets | Period (month) |
|---|---|---|
| Clearing and Grubbing | 3 | 6.0 |
| Stripping | 1 | 1.0 |
| Excavation (Common) | 3 | 9.5 |
| Excavation (River Channel) | 2 | 8.5 |
| Embankment | 1 | 8.0 |
| Revetment (Wet Stone Masonry) | 4 | 7.5 |
| Sodding | 2 | 5.5 |

**MFC-4**

MFC-4 is located upstream of MFC-3, with a length of 6,500 m from PE210 to PE274.

(1) Work Quantity

Based on the design of river improvement, the work volumes for MFC-4 are as calculated below.

| Work Item | Unit | Quantity |
|---|---|---|
| River Works | | |
| - Clearing and Grubbing | $m^2$ | 228,700 |
| - Stripping | $m^3$ | 8,750 |
| - Excavation (Common) | $m^3$ | 342,900 |
| - Excavation (River Channel) | $m^3$ | 99,500 |
| - Embankment | $m^3$ | 59,200 |
| - Revetment (Wet Stone Masonry) | $m^3$ | 5,880 |
| - Sodding | $m^2$ | 65,500 |
| Protection Works | | |
| - National Road Bridge | L.S. | 1 |
| Bridge Works | | |
| - Binjai Bridge, W=16.0 m, L=40.8 m | L.S. | 1 |
| - Amplas Bridge, W=16.0 m, L=40.8 m | L.S. | 1 |
| Drainage Works | | |
| - Drainage Box Culvert, 1.5 m x 1.5 m x 2 | site | 1 |
| - Drainage Box Culvert, 2.0 m x 2.0 m | site | 1 |
| - Drainage Box Culvert, 2.0 m x 2.0 m x 2 | site | 1 |
| - Drainage Box Culvert, 2.1 m x 2.4 m x 2 | site | 1 |
| - Drainage Pipe, Dia 1,000 mm x 2 | site | 1 |
| - Drainage Pipe, Dia 1,000 mm | site | 2 |
| - Drainage Pipe, Dia 800 mm | site | 4 |
| - Drainage Pipe, Dia 600 mm | site | 6 |
| - Drainage Ditch, W=600 mm | site | 3 |

(2) Site Condition

(a) The construction of drainage outlets, which are located beside the bridge, is carried out after the bridge work.

(b) Denai Bridge and Amplas Bridge require temporary bridges at the downstream sections of the existing bridge sites. Coffering length for bridge abutment could be reduced by pushing soil to the riverside.

(c) Protection works of the National Road Bridge requires coffering and dewatering works. Concrete blocks, 1.0 × 1.0 × 0.5 m, are planned for riverbed protection. The placement of concrete blocks requires a crane pontoon at the middle of the river channel, and placement on either side of the river could be handled by a crawler crane. Coffering and dewatering is required for revetment work; cofferdam should be higher than the normal water level and execution is in the dry season.

(3) Number of Working Sets and Period

The number of sets of major civil works are as estimated below, and the construction schedule is shown in Fig. 7.1.11.

| Work Item | No. of Sets | Period (month) |
|---|---|---|
| Clearing and Grubbing | 3 | 4.0 |
| Stripping | 1 | 0.5 |
| Excavation (Common) | 2 | 7.5 |
| Excavation (River Channel) | 1 | 10.5 |
| Embankment | 1 | 5.0 |
| Revetment (Wet Stone Masonry) | 3 | 5.5 |
| Sodding | 2 | 4.0 |

**MFC-5**

MFC-5 covers the stretch of 2,680 m from PE274 to PE274+320 and from FW0 to FW24.

(1) Work Quantity

Based on the design of river improvement, the work volumes for MFC-5 are as calculated below.

| Work Item | Unit | Quantity |
|---|---|---|
| River Works | | |
| - Clearing and Grubbing | $m^2$ | 152,900 |
| - Stripping | $m^3$ | 4,210 |
| - Excavation (Floodway) | $m^3$ | 646,300 |
| - Embankment | $m^3$ | 15,800 |
| - Floodway Groundsill | L.S. | 1 |
| - Revetment (Wet Stone Masonry) | $m^3$ | 19,100 |
| - Sodding | $m^2$ | 35,200 |
| Bridge Works | | |
| - Jalan Bajak Bridge, W=7.0 m, L=31.6 m | L.S. | 1 |
| - PIP-IX Bridge, W=9.0 m, L=31.6 m | L.S. | 1 |
| - Pipe Bridge, Dia 800 mm | L.S. | 1 |

| | | |
|---|---|---|
| Drainage Works | | |
| - Drainage Box Culvert, 2.0 m x 2.0 m | site | 1 |
| - Drainage Pipe, Dia 1,000 mm | site | 3 |
| - Drainage Pipe, Dia 800 mm | site | 1 |

(2) Site Condition

(a) Loading equipment (patrol crane) for bridge work can be reused for another bridge construction.

(b) Dewatering work is executed before the rainy season and all local excavation for bridge foundation is provided with dewatering channel or pumping system.

(c) Hauling road for excavation materials is temporarily placed inside the Floodway area to avoid disturbance to the local traffic system.

(d) Bridge work requires a site yard for erection and tensioning of PC beam girder segments. The site yard may be used as a stockyard for materials such as concrete beams, cables, and anchors. Since the main beam is 31.6 m long, the site yard shall at least be 60.0 m long by 30.0 m wide.

(e) Excavation of the Floodway is executed adopting a bench-cut method, and the progress of excavation is adjusted with the related works such as bridge foundation works. Excavation work will be executed from the downstream to upstream, and left side ditch excavation for dewatering fishpond is planned in the beginning of the construction period.

(f) Fishponds at the left side of the Floodway are promising spoil areas. Dewatering of fishponds shall discharge into the floodway channel. The surface layer of the bottom of fishponds which may be muddy and silty is required to dry-up and be separated from backfill soil.

(3) Number of Working Sets and Period

The number of sets of major civil works are as estimated below, and the construction schedule is shown in Fig. 7.1.12.

| Work Item | No. of Set | Period (month) |
|---|---|---|
| Clearing and Grubbing | 3 | 3.0 |
| Stripping | 0.5 | 0.5 |
| Excavation (Floodway) | 3 | 7.5 |
| Embankment | 1 | 1.5 |
| Revetment (Wet Stone Masonry) | 6 | 9.0 |
| Sodding | 1 | 4.5 |

## MFC-6

MFC-6 is the stretch of 1,010 m from FW24 to FW34.

(1) Work Quantity

Based on the design of river improvement, the work volumes for MFC-6 are as calculated below.

| Work Item | Unit | Quantity |
|---|---|---|
| River Works | | |
| - Clearing and Grubbing | $m^2$ | 63,200 |
| - Stripping | $m^3$ | 2,270 |
| - Excavation (Floodway) | $m^3$ | 290,200 |
| - Embankment | $m^3$ | 4,620 |
| - Revetment (Concrete) | $m^3$ | 29,800 |
| - Revetment (Wet Stone Masonry) | $m^3$ | 3,140 |
| - Sodding | $m^2$ | 5,680 |
| Bridge Works | | |
| - STM Ujung Bridge, W=9.0 m, L=31.6 m | L.S. | 1 |
| - Railway Bridge, W=3.0 m, L=31.6 m | L.S. | 1 |
| - Deli Dua Bridge, W=16.0 m, L=31.6 m | L.S. | 1 |
| - Pipe Bridge, Dia 300 mm | L.S. | 1 |
| - Pipe Bridge, Dia 600, 300 mm | L.S. | 1 |
| Drainage Works | | |
| - Batuan River Box Culvert, 2.0 m x 2.0 m x 2 | site | 1 |
| - Drainage Pipe, Dia 1,000 mm | site | 1 |

(2) Site Condition

(a) Dewatering work is executed before the rainy season and all local excavation for bridge foundations is provided with a dewatering ditch or pumping system. Since Batuan River will be the dewatering channel for MFC-6, dewatering ditches shall be constructed along both sides of the floodway.

(b) Jalan Deli Tua is one of the main roads in Titi Kuning. STM Ujung Bridge will be constructed before detouring Jalan Deli Tua.

(c) Loading equipment for bridge works can be sequentially used for another bridge construction.

(d) Hauling road for excavation materials can be located in the area of the floodway to avoid disturbance to the local traffic system.

(e) Bridge work requires a site yard for erection and tensioning of the PC girder segment.

(f) Excavation of the floodway is executed adopting a bench-cut method, and the progress of excavation is adjusted with the related works such as bridge foundation works.

(g) Revetment work in MFC-6 has two types, wet stone masonry type and concrete type. Leaning wall of concrete type revetment shall be constructed by the optimum

working procedure of concreting, because wall height is from 2.0 m to 7.0 m and the concreting height for one placement is 1.5 m to 2.0 m on account of the daily work volume.

(3) Number of Working Sets and Period

The number of sets of major civil works are as estimated below, and the construction schedule is shown in Fig. 7.1.13.

| Work Item | No. of Sets | Period (month) |
|---|---|---|
| Clearing and Grubbing | 1.5 | 2.5 |
| Stripping | 0.5 | 0.5 |
| Excavation (Floodway) | 1 | 10.0 |
| Embankment | 0.5 | 1.0 |
| Revetment (Concrete) | 6 | 16.5 |
| Revetment (Wet Stone Masonry) | 2 | 4.5 |
| Sodding | 1 | 1.0 |

**MFC-7**

MFC-7 is the stretch of FW34 to FW39+50 in the Floodway and DU10+46.5 to DU23.0 in the Upper Deli River, with a total length of 1,500 m.

(1) Work Quantity

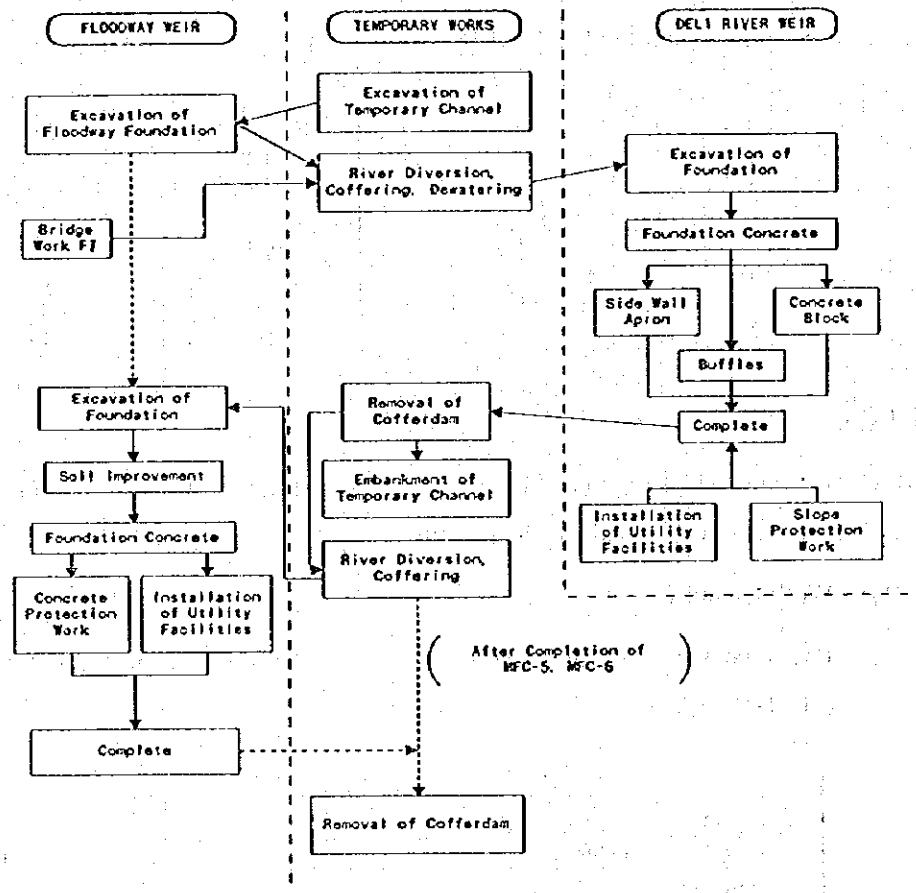
Based on the design of river improvement, the work volumes for MFC-7 are as calculated below.

| Work Item | Unit | Quantity |
|---|---|---|
| River Works | | |
| - Clearing and Grubbing | $m^2$ | 143,700 |
| - Stripping | $m^3$ | 24,800 |
| - Excavation (Common) | $m^3$ | 40,500 |
| - Excavation (Floodway) | $m^3$ | 137,000 |
| - Excavation (River Channel) | $m^3$ | 13,000 |
| - Embankment | $m^3$ | 267,700 |
| - Floodway Weir | L.S. | 1 |
| - Deli River Weir | L.S. | 1 |
| - Revetment (Concrete) | $m^3$ | 22,600 |
| - Revetment (Wet Stone Masonry) | $m^3$ | 5,120 |
| - Sodding | $m^2$ | 31,700 |
| Bridge Works | | |
| - Pipe & Pedestrian Bridge, W=3.0 m, L=31.6 m | L.S. | 1 |
| - Jalan SMA Bridge, W=4.5 m, L=16.6 m | L.S. | 1 |
| - Gg. Seksama Bridge, W=2.0 m, L=58.8 m | L.S. | 1 |
| Drainage Works | | |
| - Drainage Pipe, Dia 1,000 mm | site | 1 |

(2) Site Condition

(a) Deli River Weir is located in the narrow valley-shaped section, therefore, it is difficult to execute coffering in the river channel and, further, costly to carry out

coffering within the river channel. A temporary diversion channel is proposed from the Floodway Weir to the section downstream of Deli River Weir (refer to Fig. 7.1.14). The sequence of construction work on the Floodway Weir and the Deli River Weir is as illustrated below.




(b) The embankment work at the left side of retarding channel requires a temporary bridge for crossing Deli River. This temporary bridge can be combined with the detour bridge for Gg. Seksama Bridge (F8).

(c) Miscellaneous works consist of tree planting along the Floodway, installation of roofed bench with related facilities, and installation of guard fence, information board and inspection road.

(3) Number of Working Sets and Period

The number of sets for major civil works are as estimated below, and the construction schedule is shown in Fig. 7.1.15.

| Work Item | No. of Sets | Period (month) |
|---|---|---|
| Clearing and Grubbing | 1.5 | 5.0 |
| Stripping | 1 | 1.5 |
| Excavation (Common) | 1 | 2.0 |
| Excavation (Floodway) | 1 | 5.0 |
| Excavation (River Channel) | 1 | 1.5 |
| Embankment | 2 | 11.0 |
| Revetment (Concrete) | 7 | 11.0 |
| Revetment (Wet Stone Masonry) | 3 | 5.0 |
| Sodding | 2 | 2.0 |

### 7.1.3 Overall Construction Plan

The overall construction plan of the Medan Flood Control Project is prepared by integrating all of the construction plans of the respective portions in consideration of the following items:

(1) The river improvement works are generally executed from the downstream to upstream.

(2) To assure the smooth and enough supply of construction materials as well as procurement of construction equipment and labor, the same type of civil works shall be sequentially arranged.

(3) The embankment works shall be carried out in the dry season for higher work efficiency. Further, the embankment works shall be well arranged with the excavation works so as to minimize hauling cost and storage cost of the materials.

(4) Reconstruction or new construction of bridges shall be carefully examined whether or not the work may disturb or deteriorate the local traffic system. The necessity of temporary bridge and detouring shall also be examined to find the best arrangement or coordination of the work.

Based on the examination of the aforementioned conditions, the overall construction schedule is prepared, as shown in Fig. 7.1.16. The monthly number of construction equipment and labor for each portion of work are shown in Tables 7.1.1 to 7.1.7.

### 7.1.4 Soil Balance

#### Embankment Materials

Embankment materials are mainly supplied from the excavated soils of construction works through the selection of suitable soils for embankment. Based on the results of the geological investigation and soil mechanics tests, it has been identified that the lower reaches of Percut River is covered by thin clay layer and thick, poor grade sand layer, and that silty and sandy

clay layer increases in thickness at the upper reaches from PE50. The silty sand around Bandar Sidoras Intake Weir should then be suitable for embankment materials.

The estimation of available volume for embankment is made for each portion of the Project. Based on the above study, MFC-1 and MFC-7 do not have enough volume for embankment works (refer to Table 7.1.8). Embankment materials for MFC-1 are brought from MFC-2 and MFC-3 and their quantities are estimated at 2,050 $m^3$ and 189,450$m^3$, respectively. The embankment materials for MFC-7 is provided by 94,830 $m^3$ from MFC-6.

**Volume for Spoil Area**

In the balance calculation of embankment volume among portions, the surplus soil volume will be hauled to the spoil area. The surplus soil is mostly brought by dredging, stripping and excess soil from embankment. The materials produced by clearing and grubbing works will be arranged at the site. The surplus soil volume for each portion is calculated as shown in Table 7.1.9. Consequently, the total volume for the spoil area is estimated at 2,373,600 $m^3$.

## 7.2 Cost Estimate

### 7.2.1 Cost Estimation Conditions

Project cost is estimated on the basis of the design, the construction plan, and the following assumptions and conditions.

(1) Price Level

Price level is as of November 1995.

(2) Currency Conversion Rate

Currency conversion rates among U.S. Dollar (US$), Indonesian Rupiah (Rp.) and Japanese Yen (¥) are: US$1.00 = Rp 2,285 = ¥103.6.

(3) Currency of Cost Estimate

Construction cost is estimated in foreign and local currencies. Both of the estimated costs are expressed in Indonesian Rupiah using the currency conversion rates stated above.

### 7.2.2 Cost Estimation Method

Costs for civil works are estimated on the unit price basis. The unit prices are composed of the unit costs of labor, material, equipment, miscellaneous and contractor's indirect cost.

(1) Unit Price

(a) Labor Cost

The unit costs of labor are estimated using the local basic wage in Medan for 1995-1996 and are calculated based on the regulations for employment (HIMPUNAN PERATURAN, 1988) in Indonesia. The estimated costs of labor per day are shown in Table 7.2.1.

(b) Material Cost

The unit costs of construction materials are estimated based on the data collected at the project site at November 1995 prices. The cost of material which has to be supplied from outside of Medan area shall include transportation and insurance costs to the site. The materials which have to be imported shall consider insurance, freight to port of destination, transport to port and transport to the site. The estimated costs of materials are shown in Table 7.2.2.

(c) Equipment Cost

The unit costs of construction equipment are estimated based on the local government prices of 1991 and consider the price escalation of 4% for each year. The price of equipment is calculated on rental basis per hour. The estimated costs of equipment per hour are shown in Table 7.2.3.

(d) Indirect Cost

The Contractor's indirect cost is computed in percentage of each unit cost. Indirect cost is estimated at 7% for contractor's profit and 8% for overhead and other incidentals.

(2) Value Added Tax

Value Added Tax is estimated at 10% and included in the construction cost, except for the direct foreign currency.

### 7.2.3 Bill of Quantities

Based on the structural design, a draft Bill of Quantities for items of civil works is prepared as hereto attached (see ANNEX).

*TABLES*

*CHAPTER 7*

*CONSTRUCTION PLAN AND COST ESTIMATE*

# Table 7.1.1 MONTHLY CONSTRUCTION EQUIPMENT AND LABOUR SCHEDULE AT MFC-1

| Code No. | Construction Equipment / Labour | Capacity/ Specification | 1st year | | | | | | | | | | | | 2nd year | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| | EQUIPMENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQ1 | Bulldozer A | 15 ton | | | | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 4 |
| EQ2 | Bulldozer B | 12 ton | | | | 3 | 3 | 3 | 3 | 3 | - | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | 41 |
| EQ3 | Bulldozer C | 6 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ4 | Bulldozer with Ripper | 21 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ5 | Back hoe / Excavator A | 0.60 m3 | | | | - | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | | | | | 44 |
| EQ6 | Back hoe / Excavator B | 0.40 m3 | | | | 3 | 3 | 3 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | 41 |
| EQ7 | Crawler-Type Loader | 1.20 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ8 | Wheel-type Loader | 1.20 m3 | | | | 2 | - | - | - | - | - | - | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | - | | | | | 14 |
| EQ9 | Dump Truck A | 8 ton | | | | 48 | 54 | 54 | 54 | 54 | 18 | 18 | 20 | 20 | 20 | 20 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 416 |
| EQ10 | Dump Truck B | 6 ton | | | | - | - | - | - | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 6 |
| EQ11 | Ordinary Truck | 4 ton | | | | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 16 |
| EQ12 | Wheel Crane A | 10 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ13 | Wheel Crane B | 4.9 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ14 | Truck with Crane | 6 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ15 | Truck with Crane | 4 ton | | | | - | - | - | - | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 8 |
| EQ16 | Trailer A | 35 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ17 | Trailer B | 20 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ18 | Truck Mixer | 4.5 ton | | | | - | - | - | - | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 8 |
| EQ19 | Concrete Pump Truck | 55 m3/hr | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ20 | Water Tanker | 4 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 6 |
| EQ21 | Tamper | 80/100 kg | | | | - | - | - | - | - | - | - | - | - | - | - | 5 | 5 | 5 | 5 | 5 | 5 | | | | | 30 |
| EQ22 | Vibrator Roller A | 1 ton | | | | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 6 |
| EQ23 | Vibrator Roller B | 4 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ24 | Vibrator Roller C | 12 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ25 | Tire Roller | 8/12 ton | | | | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 28 |
| EQ26 | Tandem Roller | 8/12 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ27 | Motor Grader | 2.8 m | | | | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 22 |
| EQ28 | Crawler Crane A | 50 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ29 | Crawler Crane B | 35 ton | | | | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 6 |
| EQ30 | Crawler Crane C | 15 ton | | | | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 6 |
| EQ31 | Portable Engine Compressor | 3.5m3/min | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ32 | Diesel Engine Generator A | 100KVA | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ33 | Diesel Engine Generator B | 35KVA | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 27 |
| EQ34 | Diesel Engine Generator C | 15KVA | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 23 |
| EQ35 | Diesel Pile Hammer | 2.5 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ36 | Vibro Hammer | 23/24 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ37 | Drop Hammer | 0.5 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ38 | Concrete Vibrator | | | | | - | - | - | - | - | - | 2 | 2 | | - | - | - | - | - | - | - | - | | | | | 4 |
| EQ39 | Portable Concrete Mixer | 0.5 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ40 | Portable Concrete Mixer | 0.2 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ41 | Asphalt Plant | 30 ton/hr | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ42 | Asphalt Finisher | 2.4 m | | | | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 6 |
| EQ43 | Asphalt Sprayer | 30 Lit/min. | | | | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 6 |
| EQ44 | Concrete Breaker A | 600 kg | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ45 | Pneumatic Hand Breaker | 20 kg | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ46 | Submergible Pump A | D 150mm | | | | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 12 |
| EQ47 | Submergible Pump B | D 50 mm | | | | - | - | - | - | - | - | - | - | - | - | - | 5 | 5 | 5 | 5 | 5 | 5 | | | | | 30 |
| EQ48 | Engine Welder | 250 AMP | | | | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 12 |
| EQ49 | Chain Saw | | | | | 9 | 9 | 9 | 9 | 9 | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 57 |
| EQ50 | Drag Line | 0.8 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ51 | Bar Cutting Machine | - | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ52 | Bar Bending Machine | - | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ53 | Portal Crane | 25 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ54 | Dredger | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | | | | | 11 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LABOUR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LA1 | Foreman | | | | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | 50 |
| LA2 | Operator | | | | | 14 | 14 | 14 | 14 | 14 | 8 | 20 | 21 | 21 | 20 | 20 | 13 | 13 | 13 | 13 | 13 | 13 | | | | | 258 |
| LA3 | Electrician | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | | | | | 11 |
| LA4 | Mechanic | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | | | | | 11 |
| LA5 | Welder | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA6 | Driver | | | | | 48 | 54 | 54 | 54 | 54 | 18 | 18 | 20 | 29 | 29 | 29 | 3 | 3 | 3 | 3 | 3 | 4 | | | | | 464 |
| LA7 | Mason | | | | | - | - | - | - | - | - | - | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 16 |
| LA8 | Carpenter | | | | | - | - | - | - | - | - | - | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 16 |
| LA9 | Scaffolding Man | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA10 | Plumber | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA11 | Steel Worker | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA12 | Concrete Worker | | | | | - | - | - | - | - | - | - | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 2 | 2 | | | | | 16 |
| LA13 | Painter | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA14 | Plasterer | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA15 | Asphalt Worker | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA16 | Skilled Labour | | | | | 33 | 33 | 33 | 33 | 33 | 16 | 33 | 36 | 38 | 36 | 36 | 16 | 16 | 16 | 16 | 16 | 16 | | | | | 523 |
| LA17 | Common Labour | | | | | 96 | 53 | 33 | 92 | 53 | 23 | 33 | 40 | 58 | 42 | 42 | 70 | 70 | 70 | 70 | 70 | 60 | | | | | 952 |
| LA18 | Watchman | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | | | | | 32 |

## Table 7.1.2 MONTHLY CONSTRUCTION EQUIPMENT AND LABOUR SCHEDULE AT MFC-2

| Code No. | Construction Equipment / Labour | Capacity/ Specification | 1st year | | | | | | | | | | | | 2nd year | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| | EQUIPMENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQ1 | Bulldozer A | 15 ton | | | | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 6 |
| EQ2 | Bulldozer B | 12 ton | | | | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | - | | | | | 52 |
| EQ3 | Bulldozer C | 6 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ4 | Bulldozer with Ripper | 21 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ5 | Back hoe / Excavator A | 0.60 m3 | | | | 3 | 6 | 7 | 6 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 2 | 2 | 6 | 6 | 4 | - | | | | | 69 |
| EQ6 | Back hoe / Excavator B | 0.40 m3 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 1 | | | | | 47 |
| EQ7 | Crawler-Type Loader | 1.20 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ8 | Wheel-type Loader | 1.20 m3 | | | | 3 | - | - | - | - | - | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | - | | | | | 23 |
| EQ9 | Dump Truck A | 8 ton | | | | 33 | 27 | 30 | 27 | 24 | 24 | 26 | 45 | 44 | 38 | 28 | 28 | 29 | 42 | 42 | 33 | 1 | | | | | 494 |
| EQ10 | Dump Truck B | 6 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | | | | | 4 |
| EQ11 | Ordinary Truck | 4 ton | | | | 3 | 2 | 2 | 3 | 4 | 4 | 2 | 4 | 5 | 4 | 3 | 7 | 8 | 7 | 7 | 5 | 4 | | | | | 73 |
| EQ12 | Wheel Crane A | 10 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ13 | Wheel Crane B | 4.9 ton | | | | 1 | 1 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | - | - | - | - | - | - | | | | | 8 |
| EQ14 | Truck with Crane | 6 ton | | | | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | | | | | 7 |
| EQ15 | Truck with Crane | 4 ton | | | | 1 | 1 | 2 | 1 | - | - | 2 | 3 | 2 | 1 | - | - | 1 | 2 | 2 | 1 | 1 | | | | | 20 |
| EQ16 | Trailer A | 35 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ17 | Trailer B | 20 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ18 | Truck Mixer | 4.5 ton | | | | - | - | - | 1 | 3 | 3 | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 12 |
| EQ19 | Concrete Pump Truck | 55 m3/hr | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ20 | Water Tanker | 4 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | | | | | 4 |
| EQ21 | Tamper | 80/100 kg | | | | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 5 | 5 | 9 | 9 | 7 | 7 | | | | | 43 |
| EQ22 | Vibrator Roller A | 1 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | | | | | 4 |
| EQ23 | Vibrator Roller B | 4 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ24 | Vibrator Roller C | 12 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ25 | Tire Roller | 8/12 ton | | | | - | - | - | - | - | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 1 | | | | | 31 |
| EQ26 | Tandem Roller | 8/12 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ27 | Motor Grader | 2.8 m | | | | - | - | - | - | - | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | | | | | 27 |
| EQ28 | Crawler Crane A | 50 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ29 | Crawler Crane B | 35 ton | | | | 1 | 1 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | - | - | 1 | 1 | 1 | 1 | | | | | 12 |
| EQ30 | Crawler Crane C | 15 ton | | | | 2 | 2 | 2 | 3 | 4 | 4 | - | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 30 |
| EQ31 | Portable Engine Compressor | 3.5m3/min | | | | - | - | - | 1 | 2 | 2 | - | - | - | - | 1 | 1 | 1 | - | - | - | - | | | | | 8 |
| EQ32 | Diesel Engine Generator A | 100KVA | | | | 1 | 1 | 2 | 1 | - | - | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | | | | | 8 |
| EQ33 | Diesel Engine Generator B | 35KVA | | | | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 4 | 3 | 2 | - | - | 1 | 2 | 2 | 1 | 1 | | | | | 29 |
| EQ34 | Diesel Engine Generator C | 15KVA | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | | | | | 8 |
| EQ35 | Diesel Pile Hammer | 2.5 ton | | | | 1 | 1 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | - | - | - | - | - | - | | | | | 8 |
| EQ36 | Vibro Hammer | 23/24 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ37 | Drop Hammer | 0.5 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ38 | Concrete Vibrator | | | | | 2 | 2 | 2 | 4 | 6 | 6 | 2 | 4 | 4 | 3 | 3 | 3 | 4 | 2 | 2 | - | - | | | | | 49 |
| EQ39 | Portable Concrete Mixer | 0.5 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ40 | Portable Concrete Mixer | 0.2 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ41 | Asphalt Plant | 30 ton/hr | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ42 | Asphalt Finisher | 2.4 m | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | | | | | 4 |
| EQ43 | Asphalt Sprayer | 30 Lit/min | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | | | | | 4 |
| EQ44 | Concrete Breaker A | 600 kg | | | | 1 | 1 | 1 | 1 | 1 | 1 | - | 1 | 1 | 1 | - | - | - | - | - | - | - | | | | | 9 |
| EQ45 | Pneumatic Hand Breaker | 20 kg | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ46 | Submergible Pump A | D 150mm | | | | 1 | 1 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | - | - | 2 | 2 | 2 | 2 | | | | | 16 |
| EQ47 | Submergible Pump B | D 50 mm | | | | 1 | 1 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | - | - | 5 | 5 | 5 | 5 | | | | | 28 |
| EQ48 | Engine Welder | 250 AMP | | | | 3 | 1 | 2 | 1 | - | - | 2 | 3 | 2 | 1 | - | - | 1 | 3 | 3 | 2 | 2 | | | | | 24 |
| EQ49 | Chain Saw | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | 2 | 2 | 2 | 2 | | | | | 35 |
| EQ50 | Drag Line | 0.8 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| EQ51 | Bar Cutting Machine | - | | | | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 4 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | - | - | | | | | 33 |
| EQ52 | Bar Bending Machine | - | | | | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | - | - | | | | | 24 |
| EQ53 | Portal Crane | 25 ton | | | | - | - | - | - | - | - | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | - | | | | | 8 |
| EQ54 | Dredger | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| | LABOUR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LA1 | Foreman | | | | | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 7 | 7 | 6 | 5 | 6 | 7 | 8 | 8 | 5 | 2 | | | | | 86 |
| LA2 | Operator | | | | | 15 | 10 | 12 | 13 | 12 | 13 | 10 | 34 | 33 | 29 | 27 | 27 | 29 | 32 | 33 | 23 | 1 | | | | | 350 |
| LA3 | Electrician | | | | | 1 | 1 | 1 | 1 | 1 | 1 | - | 1 | 1 | 1 | - | - | - | - | - | - | - | | | | | 9 |
| LA4 | Mechanic | | | | | 1 | 1 | 1 | 1 | 1 | 1 | - | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | | | | | 16 |
| LA5 | Welder | | | | | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | - | - | | | | | 25 |
| LA6 | Driver | | | | | 32 | 26 | 27 | 27 | 27 | 27 | 26 | 43 | 44 | 34 | 30 | 38 | 39 | 50 | 50 | 23 | 8 | | | | | 347 |
| LA7 | Mason | | | | | 2 | 2 | 2 | 3 | 3 | 2 | - | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | | | | | 30 |
| LA8 | Carpenter | | | | | 2 | 2 | 2 | 4 | 6 | 6 | 4 | 6 | 4 | 2 | 2 | 2 | 4 | 4 | 4 | 2 | 2 | | | | | 58 |
| LA9 | Scaffolding Man | | | | | 1 | 1 | 1 | 1 | 1 | 2 | - | 1 | 1 | 1 | - | - | - | - | - | - | - | | | | | 9 |
| LA10 | Plumber | | | | | - | - | - | - | - | - | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | - | | | | | 8 |
| LA11 | Steel Worker | | | | | 4 | 4 | 6 | 6 | 6 | 6 | 4 | 8 | 6 | 4 | 2 | 2 | 4 | 2 | 2 | - | - | | | | | 66 |
| LA12 | Concrete Worker | | | | | 8 | 8 | 11 | 11 | 11 | 11 | 8 | 14 | 12 | 8 | 3 | 3 | 7 | 6 | 6 | 2 | 2 | | | | | 133 |
| LA13 | Painter | | | | | - | - | - | - | - | - | 2 | 2 | 2 | - | - | - | 3 | 3 | 3 | - | - | | | | | 8 |
| LA14 | Plasterer | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |
| LA15 | Asphalt Worker | | | | | - | - | - | - | - | - | 4 | 4 | 2 | - | - | - | 2 | 2 | 2 | - | - | | | | | 16 |
| LA16 | Skilled Labour | | | | | 33 | 16 | 18 | 18 | 18 | 18 | 25 | 25 | 27 | 22 | 19 | 31 | 33 | 41 | 41 | 33 | 14 | | | | | 402 |
| LA17 | Common Labour | | | | | 111 | 51 | 56 | 61 | 46 | 46 | 40 | 71 | 75 | 53 | 34 | 134 | 148 | 152 | 152 | 126 | 88 | | | | | 1,402 |
| LA18 | Watchman | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | 0 |

# Table 7.1.3 MONTHLY CONSTRUCTION EQUIPMENT AND LABOUR SCHEDULE AT MFC-3

| Code No. | Construction Equipment / Labour | Capacity/ Specification | 1st year | | | 2nd year | | | | | | | | | | | | 3nd year | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| | | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | |
| | EQUIPMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQ1 | Bulldozer A | 15 ton | | | | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 |
| EQ2 | Bulldozer B | 12 ton | | | | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 65 |
| EQ3 | Bulldozer C | 6 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ4 | Bulldozer with Ripper | 21 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ5 | Back hoe / Excavator A | 0 60 m3 | | | | 2 | 4 | 3 | 4 | 6 | 2 | 3 | 3 | 2 | 3 | 1 | 1 | 9 | 8 | 8 | 3 | 3 | 1 | - | - | - | - | - | - | 85 |
| EQ6 | Back hoe / Excavator B | 0 40 m3 | | | | 3 | 3 | 6 | 6 | 6 | 1 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 79 |
| EQ7 | Crawler-Type Loader | 1 20 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ8 | Wheel-type Loader | 1 20 m3 | | | | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | 33 |
| EQ9 | Dump Truck A | 8 ton | | | | 48 | 70 | 67 | 76 | 77 | 65 | 32 | 32 | 30 | 30 | 43 | 43 | 43 | 48 | 49 | 13 | 13 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 769 |
| EQ10 | Dump Truck B | 6 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ11 | Ordinary Truck | 4 ton | | | | - | - | 4 | 5 | 5 | 7 | 4 | 5 | 7 | 9 | 3 | 3 | 3 | 4 | 5 | 4 | 4 | 1 | 3 | 3 | 3 | - | - | - | 85 |
| EQ12 | Wheel Crane A | 10 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ13 | Wheel Crane B | 4 9 ton | | | | 2 | 2 | 1 | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EQ14 | Truck with Crane | 6 ton | | | | - | - | 3 | 3 | 3 | 5 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 46 |
| EQ15 | Truck with Crane | 4 ton | | | | 2 | 2 | 1 | - | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 38 |
| EQ16 | Trailer A | 35 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ17 | Trailer B | 20 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ18 | Truck Mixer | 4 5 ton | | | | - | - | 1 | 2 | 1 | 1 | - | 1 | 1 | 1 | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 16 |
| EQ19 | Concrete Pump Truck | 55 m3/hr | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ20 | Water Tanker | 4 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ21 | Tamper | 80/100 kg | | | | - | - | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 79 |
| EQ22 | Vibrator Roller A | 1 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ23 | Vibrator Roller B | 4 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ24 | Vibrator Roller C | 12 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ25 | Tire Roller | 8/12 ton | | | | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 35 |
| EQ26 | Tandem Roller | 8/12 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ27 | Motor Grader | 2 8 m | | | | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 8 |
| EQ28 | Crawler Crane A | 50 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ29 | Crawler Crane B | 35 ton | | | | 2 | 2 | 1 | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 17 |
| EQ30 | Crawler Crane C | 15 ton | | | | - | - | 1 | 2 | 1 | 1 | - | 1 | 1 | - | 1 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 27 |
| EQ31 | Portable Engine Compresser | 3 5m3/min | | | | - | - | 1 | 2 | 1 | 1 | - | 1 | 1 | - | 1 | 1 | 2 | 3 | 3 | 1 | 1 | 1 | - | - | - | - | - | - | 20 |
| EQ32 | Diesel Engine Generator A | 100KVA | | | | 2 | 2 | 1 | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EQ33 | Diesel Engine Generator B | 35KVA | | | | 2 | 2 | 1 | - | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 38 |
| EQ34 | Diesel Engine Generator C | 15KVA | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 14 |
| EQ35 | Diesel Pile Hammer | 2 5 ton | | | | 2 | 2 | 1 | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EQ36 | Vibro Hammer | 13/24 ton | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ37 | Drop Hammer | 0 5 ton | | | | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | 11 |
| EQ38 | Concrete Vibrator | | | | | - | - | 5 | 7 | 6 | 8 | 4 | 6 | 8 | 5 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | - | - | - | - | - | - | - | 74 |
| EQ39 | Portable Concrete Mixer | 0 5 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ40 | Portable Concrete Mixer | 0 2 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ41 | Asphalt Plant | 30 ton/hr | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ42 | Asphalt Finisher | 2.4 m | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ43 | Asphalt Sprayer | 30 Lit/min | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ44 | Concrete Breaker A | 600 kg | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ45 | Pneumatic Hand Breaker | 20 kg | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ46 | Submergible Pump A | D 150mm | | | | 2 | 2 | 1 | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | - | - | - | - | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 46 |
| EQ47 | Submergible Pump B | D 50 mm | | | | 2 | 2 | 1 | - | - | - | 1 | 1 | - | - | 1 | 1 | 1 | - | - | - | - | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 45 |
| EQ48 | Engine Welder | 250 AMP | | | | 2 | 2 | 1 | - | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | - | - | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 34 |
| EQ49 | Chain Saw | | | | | 9 | 9 | 9 | 9 | 9 | 9 | - | - | - | - | 1 | 1 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 79 |
| EQ50 | Drag Line | 0 8 m3 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| EQ51 | Bar Cutting Machine | - | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 29 |
| EQ52 | Bar Bending Machine | - | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 29 |
| EQ53 | Postal Crane | 25 ton | | | | - | - | - | - | - | 1 | 1 | 1 | 1 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 10 |
| EQ54 | Dredger | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LABOUR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LA1 | Foreman | | | | | 3 | 4 | 5 | 6 | 6 | 6 | 5 | 6 | 6 | 5 | 6 | 6 | 7 | 7 | 8 | 5 | 5 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 110 |
| LA2 | Operator | | | | | 13 | 16 | 19 | 23 | 23 | 21 | 13 | 15 | 16 | 13 | 23 | 23 | 25 | 25 | 25 | 16 | 16 | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 340 |
| LA3 | Electrician | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| LA4 | Mechanic | | | | | - | - | 3 | 3 | 3 | 5 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 46 |
| LA5 | Welder | | | | | - | - | 1 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | - | - | - | - | 1 | 1 | 1 | - | - | - | - | - | - | - | 19 |
| LA6 | Driver | | | | | 44 | 66 | 66 | 78 | 78 | 66 | 30 | 31 | 33 | 30 | 42 | 42 | 43 | 43 | 44 | 15 | 15 | 3 | 5 | 5 | 5 | 5 | 6 | 4 | 791 |
| LA7 | Mason | | | | | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 26 |
| LA8 | Carpenter | | | | | - | - | 2 | 4 | 4 | 4 | 2 | 4 | 6 | 4 | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 52 |
| LA9 | Scaffolding Man | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| LA10 | Plumber | | | | | - | - | - | - | 1 | 1 | 1 | 1 | 2 | 2 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | 10 |
| LA11 | Steel Worker | | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 58 |
| LA12 | Concrete Worker | | | | | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 10 | 11 | 8 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 111 |
| LA13 | Painter | | | | | - | - | - | - | 1 | 1 | 1 | 1 | 2 | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | 10 |
| LA14 | Plasterer | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| LA15 | Asphalt Worker | | | | | - | - | - | - | 2 | 2 | 2 | 2 | 4 | 4 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | - | - | 20 |
| LA16 | Skilled Labour | | | | | 18 | 17 | 23 | 31 | 31 | 23 | 14 | 16 | 18 | 14 | 25 | 25 | 27 | 27 | 29 | 21 | 21 | 9 | 10 | 10 | 10 | 10 | 8 | 8 | 449 |
| LA17 | Common Labour | | | | | 70 | 53 | 69 | 81 | 84 | 91 | 39 | 49 | 58 | 44 | 55 | 53 | 65 | 70 | 80 | 54 | 54 | 34 | 58 | 58 | 58 | 58 | 48 | 48 | 1,426 |
| LA18 | Watchman | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |

# Table 7.1.4 MONTHLY CONSTRUCTION EQUIPMENT AND LABOUR SCHEDULE AT MFC-4

| Code No. | Construction Equipment / Labour | Capacity/ Specification | 1st year | | | 2nd year | | | | | | | | | | | | 3nd year | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| | | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | |
| | EQUIPMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQ1 | Bulldozer A | 15 ton | | | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| EQ2 | Bulldozer B | 12 ton | | | | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 35 |
| EQ3 | Bulldozer C | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ4 | Bulldozer with Ripper | 21 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ5 | Back hoe / Excavator A | 0 60 m3 | | | | 0 | 1 | 3 | 3 | 5 | 2 | 2 | 2 | 2 | 2 | 4 | 5 | 6 | 4 | 4 | 3 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| EQ6 | Back hoe / Excavator B | 0.40 m3 | | | | 6 | 6 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 1 | 1 | 84 |
| EQ7 | Crawler-Type Loader | 1 20 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ8 | Wheel-type Loader | 1 20 m3 | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 20 |
| EQ9 | Dump Truck A | 8 ton | | | | 42 | 39 | 45 | 9 | 9 | 6 | 6 | 9 | 8 | 8 | 36 | 37 | 37 | 31 | 31 | 26 | 28 | 30 | 2 | 2 | 2 | 1 | 1 | 1 | 447 |
| EQ10 | Dump Truck B | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ11 | Ordinary Truck | 4 ton | | | | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 4 | 5 | 5 | 5 | 7 | 7 | 5 | 3 | 0 | 0 | 94 |
| EQ12 | Wheel Crane A | 10 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ13 | Wheel Crane B | 4.9 ton | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| EQ14 | Truck with Crane | 6 ton | | | | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 0 | 0 | 63 |
| EQ15 | Truck with Crane | 4 ton | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 32 |
| EQ16 | Trailer A | 35 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ17 | Trailer B | 20 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ18 | Truck Mixer | 4.5 ton | | | | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 13 |
| EQ19 | Concrete Pump Truck | 55 m3/hr | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ20 | Water Tanker | 4 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ21 | Tamper | 80/100 kg | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 8 | 8 | 7 | 6 | 3 | 3 | 92 |
| EQ22 | Vibrator Roller A | 1 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ23 | Vibrator Roller B | 4 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ24 | Vibrator Roller C | 12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ25 | Tire Roller | 8/12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 |
| EQ26 | Tandem Roller | 8/12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ27 | Motor Grader | 2.8 m | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| EQ28 | Crawler Crane A | 50 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ29 | Crawler Crane B | 35 ton | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 13 |
| EQ30 | Crawler Crane C | 15 ton | | | | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 18 |
| EQ31 | Portable Engine Compressor | 3.5m3/min | | | | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| EQ32 | Diesel Engine Generator A | 100KVA | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| EQ33 | Diesel Engine Generator B | 35KVA | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 32 |
| EQ34 | Diesel Engine Generator C | 15KVA | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 14 |
| EQ35 | Diesel Pile Hammer | 2.5 ton | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| EQ36 | Vibro Hammer | 23-24 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ37 | Drop Hammer | 0 5 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| EQ38 | Concrete Vibrator | | | | | 3 | 3 | 3 | 3 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 3 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 1 | 0 | 0 | 87 |
| EQ39 | Portable Concrete Mixer | 0 5 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ40 | Portable Concrete Mixer | 0 2 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ41 | Asphalt Plant | 30 ton/hr | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ42 | Asphalt Finisher | 2 4 m | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ43 | Asphalt Sprayer | 30 Lit/min | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ44 | Concrete Breaker A | 600 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ45 | Pneumatic Hand Breaker | 20 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ46 | Submergible Pump A | D 150mm | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 32 |
| EQ47 | Submergible Pump B | D 50 mm | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 43 |
| EQ48 | Engine Welder | 250 AMP | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 34 |
| EQ49 | Chain Saw | | | | | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 46 |
| EQ50 | Drag Line | 0 8 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ51 | Bar Cutting Machine | - | | | | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 26 |
| EQ52 | Bar Bending Machine | - | | | | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 26 |
| EQ53 | Portal Crane | 25 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 12 |
| EQ54 | Dredger | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LABOUR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LA1 | Foreman | | | | | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 6 | 5 | 6 | 6 | 6 | 5 | 5 | 5 | 4 | 2 | 1 | 1 | 93 |
| LA2 | Operator | | | | | 12 | 11 | 13 | 7 | 9 | 7 | 7 | 9 | 9 | 9 | 13 | 13 | 21 | 19 | 21 | 19 | 19 | 12 | 6 | 6 | 3 | 2 | 1 | 1 | 253 |
| LA3 | Electrician | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA4 | Mechanic | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 0 | 0 | 63 |
| LA5 | Welder | | | | | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 18 |
| LA6 | Driver | | | | | 42 | 37 | 43 | 7 | 9 | 7 | 7 | 9 | 8 | 8 | 35 | 35 | 36 | 30 | 31 | 31 | 31 | 30 | 6 | 6 | 5 | 4 | 0 | 0 | 456 |
| LA7 | Mason | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 17 |
| LA8 | Carpenter | | | | | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 50 |
| LA9 | Scaffolding Man | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA10 | Plumber | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 12 |
| LA11 | Steel Worker | | | | | 0 | 2 | 2 | 2 | 4 | 2 | 2 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 52 |
| LA12 | Concrete Worker | | | | | 0 | 3 | 3 | 3 | 6 | 3 | 3 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 6 | 3 | 3 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 104 |
| LA13 | Painter | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 12 |
| LA14 | Plasterer | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA15 | Asphalt Worker | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 24 |
| LA16 | Skilled Labour | | | | | 20 | 17 | 21 | 12 | 14 | 12 | 12 | 18 | 14 | 14 | 18 | 16 | 21 | 17 | 19 | 19 | 19 | 16 | 18 | 18 | 14 | 10 | 2 | 2 | 359 |
| LA17 | Common Labour | | | | | 72 | 47 | 52 | 22 | 32 | 27 | 27 | 37 | 37 | 37 | 49 | 34 | 50 | 45 | 55 | 60 | 60 | 52 | 80 | 80 | 66 | 52 | 8 | 8 | 1,089 |
| LA18 | Watchman | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# Table 7.1.5 MONTHLY CONSTRUCTION EQUIPMENT AND LABOUR SCHEDULE AT MFC-5

| Code No. | Construction Equipment / Labour | Capacity/ Specification | 1st year | | | | | | | | | | | | 2nd year | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| | EQUIPMENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQ1 | Bulldozer A | 15 ton | | | | 2 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | | | | | 26 |
| EQ2 | Bulldozer B | 12 ton | | | | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 11 |
| EQ3 | Bulldozer C | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ4 | Bulldozer with Ripper | 21 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ5 | Back hoe / Excavator A | 0 60 m3 | | | | 0 | 1 | 1 | 0 | 0 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | | | | | 29 |
| EQ6 | Back hoe / Excavator B | 0 40 m3 | | | | 4 | 3 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | | | | | 31 |
| EQ7 | Crawler-Type Loader | 1 20 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ8 | Wheel-type Loader | 1 20 m3 | | | | 1 | 0 | 0 | 0 | 0 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 1 | 1 | 0 | | | | | 36 |
| EQ9 | Dump Truck A | 8 ton | | | | 42 | 40 | 39 | 0 | 0 | 55 | 55 | 58 | 57 | 58 | 54 | 53 | 56 | 2 | 1 | 1 | 1 | | | | | 574 |
| EQ10 | Dump Truck B | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | | | | | 5 |
| EQ11 | Ordinary Truck | 4 ton | | | | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 3 | 2 | 3 | 3 | 4 | 5 | 3 | 2 | 2 | 0 | | | | | 38 |
| EQ12 | Wheel Crane A | 10 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ13 | Wheel Crane B | 4 9 ton | | | | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 5 |
| EQ14 | Truck with Crane | 5 ton | | | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | | | | | 15 |
| EQ15 | Truck with Crane | 4 ton | | | | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | | | | | 18 |
| EQ16 | Trailer A | 35 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ17 | Trailer B | 20 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ18 | Truck Mixer | 4 5 ton | | | | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | 10 |
| EQ19 | Concrete Pump Truck | 55 m3/hr | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ20 | Water Tanker | 4 m3 | | | | 0 | 1 | 0 | 0 | 0 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 4 | 1 | 1 | 1 | 1 | | | | | 31 |
| EQ21 | Tamper | 80/100 kg | | | | 3 | 4 | 3 | 3 | 3 | 0 | 0 | 1 | 3 | 4 | 3 | 3 | 6 | 4 | 4 | 4 | 4 | | | | | 61 |
| EQ22 | Vibrator Roller A | 1 ton | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | 7 |
| EQ23 | Vibrator Roller B | 4 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ24 | Vibrator Roller C | 12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ25 | Tire Roller | 8/12 ton | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | 9 |
| EQ26 | Tandem Roller | 8/12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ27 | Motor Grader | 2 8 m | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 2 |
| EQ28 | Crawler Crane A | 50 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ29 | Crawler Crane B | 35 ton | | | | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | 12 |
| EQ30 | Crawler Crane C | 15 ton | | | | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | 10 |
| EQ31 | Portable Engine Compressor | 3 5m3/min | | | | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 3 |
| EQ32 | Diesel Engine Generator A | 100KVA | | | | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 5 |
| EQ33 | Diesel Engine Generator B | 35KVA | | | | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | | | | | 18 |
| EQ34 | Diesel Engine Generator C | 15KVA | | | | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | | | | | 14 |
| EQ35 | Diesel Pile Hammer | 2 5 ton | | | | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 5 |
| EQ36 | Vibro Hammer | 23/24 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ37 | Drop Hammer | 0 5 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ38 | Concrete Vibrator | - | | | | 1 | 1 | 1 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | 1 | 0 | 0 | 0 | | | | | 27 |
| EQ39 | Portable Concrete Mixer | 0 5 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ40 | Portable Concrete Mixer | 0 2 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ41 | Asphalt Plant | 30 ton/hr | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ42 | Asphalt Finisher | 2 4 m | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | 7 |
| EQ43 | Asphalt Sprayer | 30 Lit/min | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | 7 |
| EQ44 | Concrete Breaker A | 600 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ45 | Pneumatic Hand Breaker | 20 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ46 | Submergible Pump A | D 150mm | | | | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | | | | | 29 |
| EQ47 | Submergible Pump B | D 50 mm | | | | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 0 | 0 | 5 | 5 | 5 | 5 | 5 | | | | | 40 |
| EQ48 | Engine Welder | 250 AMP | | | | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 3 | 0 | 1 | 3 | 2 | 2 | 2 | 2 | | | | | 25 |
| EQ49 | Chain Saw | | | | | 9 | 11 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | | | | | 41 |
| EQ50 | Drag Line | 0 8 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| EQ51 | Bar Cutting Machine | - | | | | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | | | | | 14 |
| EQ52 | Bar Bending Machine | - | | | | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | | | | | 14 |
| EQ53 | Portal Crane | 25 ton | | | | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | | | | | 6 |
| EQ54 | Dredger | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LABOUR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LA1 | Foreman | | | | | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 5 | 4 | 4 | 5 | 3 | 2 | 2 | 1 | | | | | 53 |
| LA2 | Operator | | | | | 10 | 10 | 9 | 3 | 3 | 12 | 11 | 14 | 12 | 11 | 17 | 13 | 14 | 3 | 1 | 1 | 1 | | | | | 153 |
| LA3 | Electrician | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| LA4 | Mechanic | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | | | | | 19 |
| LA5 | Welder | | | | | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | | | | | 9 |
| LA6 | Driver | | | | | 42 | 37 | 37 | 1 | 1 | 53 | 55 | 57 | 56 | 57 | 53 | 56 | 56 | 4 | 3 | 3 | 2 | | | | | 575 |
| LA7 | Mason | | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | | | | | 16 |
| LA8 | Carpenter | | | | | 0 | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 4 | 0 | 2 | 4 | 4 | 2 | 2 | 2 | | | | | 32 |
| LA9 | Scaffolding Man | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| LA10 | Plumber | | | | | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | | | | | 6 |
| LA11 | Steel Worker | | | | | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 4 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | | | | | 28 |
| LA12 | Concrete Worker | | | | | 0 | 5 | 3 | 3 | 3 | 4 | 4 | 7 | 3 | 8 | 0 | 4 | 6 | 6 | 2 | 2 | 2 | | | | | 62 |
| LA13 | Painter | | | | | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | | | | | 6 |
| LA14 | Plasterer | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| LA15 | Asphalt Worker | | | | | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | | | | | 12 |
| LA16 | Skilled Labour | | | | | 16 | 15 | 13 | 4 | 4 | 20 | 9 | 14 | 12 | 19 | 13 | 14 | 19 | 5 | 7 | 7 | 3 | | | | | 191 |
| LA17 | Common Labour | | | | | 64 | 47 | 39 | 14 | 14 | 29 | 25 | 43 | 34 | 58 | 39 | 43 | 78 | 48 | 36 | 38 | 28 | | | | | 672 |
| LA18 | Watchman | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |

## Table 7.1.6 MONTHLY CONSTRUCTION EQUIPMENT AND LABOUR SCHEDULE AT MFC-6

| Code No. | Construction Equipment / Labour | Capacity/ Specification | 1st year | | | 2nd year | | | | | | | | | | | | 3nd year | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| | | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | |
| | EQUIPMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQ1 | Bulldozer A | 15 ton | | | | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| EQ2 | Bulldozer B | 12 ton | | | | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| EQ3 | Bulldozer C | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ4 | Bulldozer with Ripper | 21 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ5 | Back hoe / Excavator A | 0.60 m3 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| EQ6 | Back hoe / Excavator B | 0.40 m3 | | | | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 19 |
| EQ7 | Crawler-Type Loader | 1.20 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ8 | Wheel-type Loader | 1.20 m3 | | | | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 13 |
| EQ9 | Dump Truck A | 8 ton | | | | 21 | 21 | 24 | 19 | 20 | 19 | 21 | 21 | 19 | 19 | 21 | 22 | 19 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 280 |
| EQ10 | Dump Truck B | 6 ton | | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ11 | Ordinary Truck | 4 ton | | | | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 2 | 3 | 4 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 0 | 33 |
| EQ12 | Wheel Crane A | 10 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ13 | Wheel Crane B | 4.9 ton | | | | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| EQ14 | Truck with Crane | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 7 |
| EQ15 | Truck with Crane | 4 ton | | | | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 46 |
| EQ16 | Trailer A | 35 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ17 | Trailer B | 20 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ18 | Truck Mixer | 4.5 ton | | | | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 11 |
| EQ19 | Concrete Pump Truck | 55 m3/hr | | | | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 17 |
| EQ20 | Water Tanker | 4 m3 | | | | 0 | 0 | 0 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 34 |
| EQ21 | Tamper | 80/100 kg | | | | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 3 | 3 | 4 | 3 | 29 |
| EQ22 | Vibrator Roller A | 1 ton | | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ23 | Vibrator Roller B | 4 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ24 | Vibrator Roller C | 12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ25 | Tire Roller | 8-12 ton | | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| EQ26 | Tandem Roller | 8-12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ27 | Motor Grader | 2.8 m | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| EQ28 | Crawler Crane A | 50 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ29 | Crawler Crane B | 35 ton | | | | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 14 |
| EQ30 | Crawler Crane C | 15 ton | | | | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 13 |
| EQ31 | Portable Engine Compressor | 3.5m3/min. | | | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| EQ32 | Diesel Engine Generator A | 100KVA | | | | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| EQ33 | Diesel Engine Generator B | 35KVA | | | | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 46 |
| EQ34 | Diesel Engine Generator C | 15KVA | | | | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 14 |
| EQ35 | Diesel Pile Hammer | 2.5 ton | | | | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| EQ36 | Vibro Hammer | 23/24 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ37 | Drop Hammer | 0.5 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ38 | Concrete Vibrator | | | | | 0 | 0 | 0 | 8 | 6 | 6 | 5 | 7 | 8 | 6 | 3 | 6 | 8 | 9 | 10 | 8 | 8 | 7 | 6 | 6 | 0 | 0 | 0 | 0 | 119 |
| EQ39 | Portable Concrete Mixer | 0.5 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ40 | Portable Concrete Mixer | 0.2 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ41 | Asphalt Plant | 30 ton/hr | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ42 | Asphalt Finisher | 2.4 m | | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ43 | Asphalt Sprayer | 30 Lit/min. | | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| EQ44 | Concrete Breaker A | 600 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ45 | Pneumatic Hand Breaker | 20 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ46 | Submergible Pump A | D 150mm | | | | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 21 |
| EQ47 | Submergible Pump B | D 50 mm | | | | 1 | 1 | 1 | 0 | 5 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 42 |
| EQ48 | Engine Welder | 250 AMP | | | | 1 | 1 | 1 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 53 |
| EQ49 | Chain Saw | | | | | 5 | 5 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 28 |
| EQ50 | Drag Line | 0.8 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ51 | Bar Cutting Machine | - | | | | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 4 | 3 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 45 |
| EQ52 | Bar Bending Machine | - | | | | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 4 | 3 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 45 |
| EQ53 | Portal Crane | 25 ton | | | | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| EQ54 | Dredger | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LABOUR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LA1 | Foreman | | | | | 1 | 1 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 4 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 56 |
| LA2 | Operator | | | | | 5 | 5 | 7 | 8 | 7 | 6 | 6 | 8 | 8 | 6 | 6 | 8 | 11 | 6 | 8 | 6 | 6 | 4 | 3 | 3 | 1 | 1 | 1 | 1 | 133 |
| LA3 | Electrician | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA4 | Mechanic | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 7 |
| LA5 | Welder | | | | | 0 | 0 | 0 | 3 | 2 | 2 | 1 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 4 | 3 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 38 |
| LA6 | Driver | | | | | 19 | 19 | 22 | 21 | 20 | 20 | 20 | 21 | 21 | 20 | 20 | 21 | 21 | 3 | 4 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 3 | 0 | 288 |
| LA7 | Mason | | | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 1 | 11 |
| LA8 | Carpenter | | | | | 0 | 0 | 0 | 6 | 6 | 4 | 2 | 4 | 6 | 4 | 2 | 4 | 6 | 6 | 8 | 6 | 6 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 90 |
| LA9 | Scaffolding Man | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA10 | Plumber | | | | | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| LA11 | Steel Worker | | | | | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 4 | 4 | 2 | 2 | 4 | 4 | 4 | 6 | 4 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 56 |
| LA12 | Concrete Worker | | | | | 3 | 3 | 3 | 11 | 10 | 8 | 7 | 10 | 11 | 8 | 7 | 11 | 11 | 11 | 15 | 12 | 12 | 8 | 6 | 6 | 2 | 2 | 2 | 2 | 191 |
| LA13 | Painter | | | | | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| LA14 | Plasterer | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA15 | Asphalt Worker | | | | | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 2 | 2 | 2 | 4 | 4 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| LA16 | Skilled Labour | | | | | 7 | 7 | 9 | 9 | 9 | 7 | 7 | 9 | 9 | 7 | 7 | 9 | 11 | 9 | 11 | 9 | 9 | 7 | 7 | 9 | 4 | 4 | 7 | 2 | 184 |
| LA17 | Common Labour | | | | | 20 | 20 | 33 | 40 | 38 | 30 | 25 | 35 | 40 | 30 | 25 | 35 | 43 | 39 | 49 | 39 | 39 | 29 | 27 | 37 | 18 | 19 | 38 | 9 | 735 |
| LA18 | Watchman | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# Table 7.1.7 MONTHLY CONSTRUCTION EQUIPMENT AND LABOUR SCHEDULE AT MFC-7

| Code No. | Construction Equipment / Labour | Capacity/ Specification | 1st year | | | 2nd year | | | | | | | | | | | | 3nd year | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | |
| | | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | |
| | EQUIPMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQ1 | Bulldozer A | 15 ton | | | | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 4 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 35 |
| EQ2 | Bulldozer B | 12 ton | | | | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| EQ3 | Bulldozer C | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ4 | Bulldozer with Ripper | 21 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ5 | Back hoe / Excavator A | 0 60 m3 | | | | 2 | 4 | 2 | 1 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 41 |
| EQ6 | Back hoe / Excavator B | 0 40 m3 | | | | 3 | 4 | 3 | 3 | 5 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 63 |
| EQ7 | Crawler-Type Loader | 1 20 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ8 | Wheel-type Loader | 1 20 m3 | | | | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 10 |
| EQ9 | Dump Truck A | 8 ton | | | | 39 | 51 | 24 | 22 | 28 | 12 | 4 | 4 | 3 | 3 | 3 | 6 | 30 | 24 | 23 | 18 | 17 | 3 | 3 | 3 | 4 | 4 | 4 | 1 | 332 |
| EQ10 | Dump Truck B | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 |
| EQ11 | Ordinary Truck | 4 ton | | | | 0 | 0 | 1 | 2 | 1 | 0 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 20 |
| EQ12 | Wheel Crane A | 10 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ13 | Wheel Crane B | 4 9 ton | | | | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| EQ14 | Truck with Crane | 6 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| EQ15 | Truck with Crane | 4 ton | | | | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 27 |
| EQ16 | Trailer A | 35 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ17 | Trailer B | 20 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ18 | Truck Mixer | 4 5 ton | | | | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 9 |
| EQ19 | Concrete Pump Truck | 55 m3/hr | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 12 |
| EQ20 | Water Tanker | 4 m3 | | | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 21 |
| EQ21 | Tamper | 80-100 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 5 | 3 | 20 |
| EQ22 | Vibrator Roller A | 1 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 |
| EQ23 | Vibrator Roller B | 4 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ24 | Vibrator Roller C | 12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ25 | Tire Roller | 8/12 ton | | | | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 26 |
| EQ26 | Tandem Roller | 8-12 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ27 | Motor Grader | 2 8 m | | | | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| EQ28 | Crawler Crane A | 50 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ29 | Crawler Crane B | 35 ton | | | | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 34 |
| EQ30 | Crawler Crane C | 15 ton | | | | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 9 |
| EQ31 | Portable Engine Compressor | 3 5m3/min | | | | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| EQ32 | Diesel Engine Generator A | 100KVA | | | | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| EQ33 | Diesel Engine Generator B | 35KVA | | | | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 52 |
| EQ34 | Diesel Engine Generator C | 15KVA | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 8 |
| EQ35 | Diesel Pile Hammer | 2 5 ton | | | | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| EQ36 | Vibro Hammer | 20/24 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ37 | Drop Hammer | 0 5 ton | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ38 | Concrete Vibrator | | | | | 3 | 6 | 5 | 6 | 4 | 3 | 6 | 5 | 4 | 4 | 4 | 11 | 8 | 10 | 11 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 0 | 155 |
| EQ39 | Portable Concrete Mixer | 0 5 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ40 | Portable Concrete Mixer | 0 2 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ41 | Asphalt Plant | 30 ton/hr | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 |
| EQ42 | Asphalt Finisher | 2 4 m | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 |
| EQ43 | Asphalt Sprayer | 30 Lit/min | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ44 | Concrete Breaker A | 600 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EQ45 | Pneumatic Hand Breaker | 20 kg | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 13 |
| EQ46 | Submergible Pump A | D 150mm | | | | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 13 |
| EQ47 | Submergible Pump B | D 50 mm | | | | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 5 | 75 |
| EQ48 | Engine Welder | 250 AMP | | | | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 2 | 56 |
| EQ49 | Chain Saw | | | | | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 31 |
| EQ50 | Drag Line | 0 8 m3 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| EQ51 | Bar Cutting Machine | - | | | | 1 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | 3 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 53 |
| EQ52 | Bar Bending Machine | - | | | | 1 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | 3 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 53 |
| EQ53 | Portal Crane | 25 ton | | | | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| EQ54 | Dredger | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LABOUR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LA1 | Foreman | | | | | 2 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 73 |
| LA2 | Operator | | | | | 9 | 17 | 10 | 10 | 22 | 19 | 19 | 18 | 16 | 16 | 16 | 19 | 24 | 23 | 23 | 9 | 7 | 4 | 4 | 4 | 5 | 5 | 5 | 1 | 305 |
| LA3 | Electrician | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA4 | Mechanic | | | | | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 29 |
| LA5 | Welder | | | | | 1 | 2 | 2 | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 48 |
| LA6 | Driver | | | | | 36 | 43 | 20 | 20 | 25 | 7 | 2 | 1 | 0 | 0 | 0 | 1 | 26 | 21 | 21 | 16 | 15 | 1 | 1 | 1 | 2 | 5 | 5 | 0 | 269 |
| LA7 | Mason | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 5 |
| LA8 | Carpenter | | | | | 2 | 4 | 4 | 6 | 4 | 2 | 6 | 4 | 2 | 2 | 2 | 6 | 4 | 6 | 8 | 6 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 2 | 104 |
| LA9 | Scaffolding Man | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA10 | Plumber | | | | | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| LA11 | Steel Worker | | | | | 2 | 6 | 6 | 6 | 4 | 4 | 6 | 4 | 2 | 2 | 2 | 4 | 5 | 6 | 6 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 82 |
| LA12 | Concrete Worker | | | | | 0 | 3 | 6 | 7 | 4 | 3 | 3 | 4 | 0 | 0 | 0 | 4 | 7 | 10 | 11 | 8 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 2 | 110 |
| LA13 | Painter | | | | | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| LA14 | Plasterer | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LA15 | Asphalt Worker | | | | | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| LA16 | Skilled Labour | | | | | 11 | 22 | 13 | 13 | 21 | 16 | 14 | 14 | 12 | 12 | 12 | 17 | 22 | 19 | 19 | 11 | 9 | 7 | 7 | 7 | 11 | 13 | 13 | 2 | 319 |
| LA17 | Common Labour | | | | | 30 | 25 | 30 | 45 | 52 | 32 | 42 | 36 | 26 | 26 | 26 | 47 | 77 | 57 | 62 | 41 | 31 | 25 | 25 | 25 | 43 | 73 | 25 | 8 | 1,043 |
| LA18 | Watchman | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 7.1.8 BALANCE OF SOIL VOLUME FOR EACH WORK PORTION (FOR EMBANKMENT)

(UNIT : $m^3$)

| WORK ITEM | MFC-1 | MFC-2 | MFC-3 | MFC-4 | MFC-5 | MFC-6 | MFC-7 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 1. Excavation (Common) | 139,600 | 340,900 | 626,300 | 342,900 | 654,000 | 290,200 | 189,300 | 2,543,000 |
| 2. Excavation (Riverbed) | 164,600 | 166,200 | 161,900 | 99,500 | 0 | 0 | 13,000 | 608,000 |
| I. Volume can be used for Embankment | 72,300 | 340,050 | 596,050 | 328,510 | 588,600 | 261,180 | 172,970 | 2,359,660 |
| 3. Embankment | 263,800 | 338,000 | 95,200 | 59,200 | 15,800 | 4,600 | 267,800 | 912,000 |
| II. Remained Volume after Embankment | 231,900 | 167,050 | 503,550 | 383,200 | 638,200 | 190,770 | 29,330 | 2,144,000 |
| 4. Dredging | 82,600 | 0 | 0 | 0 | 0 | 0 | 0 | 84,000 |
| 5. Clearing and Grubbing ($m^2$) | 273,700 | 528,000 | 332,400 | 228,700 | 159,100 | 63,200 | 143,700 | 1,764,000 |
| 6. Stripping | 32,500 | 61,100 | 16,300 | 8,700 | 4,200 | 2,300 | 21,900 | 148,000 |
| Total of Remained Volume (II. + 4. +6.) | 347,000 | 228,150 | 519,850 | 391,900 | 642,400 | 193,070 | 51,230 | 2,373,600 |

Note : Clearing and Grubbing Volume will is not counted in the remained volume.

Table 7.1.9 BALANCE OF SOIL VOLUME FOR EACH WORK PORTION (FOR SPOIL AREA)

UNIT : $m^3$

| WORK ITEM | | MFC-1 | MFC-2 | MFC-3 | MFC-4 | MFC-5 | MFC-6 | MFC-7 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| 1. Excavation (Common) | Right | 105,100 | 153,100 | 345,900 | 159,000 | 654,000 | 290,200 | 170,900 | 1,878,200 |
| | Left | 34,500 | 187,800 | 280,400 | 183,900 | 0 | 0 | 18,400 | 705,000 |
| | Sub-Total | 139,600 | 340,900 | 626,300 | 342,900 | 654,000 | 290,200 | 189,300 | 2,583,200 |
| Satisfied Volume for Embankment | Right | 42,040 | 137,790 | 311,310 | 143,100 | 588,600 | 261,180 | 153,810 | 1,637,830 |
| | Left | 13,800 | 169,020 | 252,360 | 165,510 | 0 | 0 | 16,560 | 617,250 |
| | Sub-Total | 55,840 | 306,810 | 563,670 | 308,610 | 588,600 | 261,180 | 170,370 | 2,255,080 |
| 2. Excavation (Riverbed) | Right | 129,100 | 63,400 | 91,800 | 43,400 | 0 | 0 | 8,200 | 335,900 |
| | Left | 35,500 | 102,800 | 70,100 | 56,100 | 0 | 0 | 4,800 | 269,300 |
| | Sub-Total | 164,600 | 166,200 | 161,900 | 99,500 | 0 | 0 | 13,000 | 605,200 |
| Satisfied Volume for Embankment | Right | 12,910 | 12,680 | 18,360 | 8,680 | 0 | 0 | 1,640 | 54,270 |
| | Left | 3,550 | 20,560 | 14,020 | 11,220 | 0 | 0 | 960 | 50,310 |
| | Sub-Total | 16,460 | 33,240 | 32,380 | 19,900 | 0 | 0 | 2,600 | 104,580 |
| 3. Embankment | Right | 179,500 | 184,400 | 45,000 | 30,800 | 15,800 | 4,600 | 161,700 | 621,800 |
| | Left | 84,300 | 153,600 | 50,200 | 28,400 | 0 | 0 | 106,100 | 422,600 |
| | Sub-Total | 263,800 | 338,000 | 95,200 | 59,200 | 15,800 | 4,600 | 267,800 | 1,044,400 |
| Volume Balance after Embankment | Right | -124,550 | -33,930 | 284,670 | 120,980 | 572,800 | 256,580 | -6,250 | 1,070,300 |
| | Left | -66,950 | 35,980 | 216,180 | 148,330 | 0 | 0 | -88,580 | 244,960 |
| | Sub-Total | -191,500 | 2,050 | 500,850 | 269,310 | 572,800 | 256,580 | -94,830 | 1,315,260 |
| Remained Volume | | 0 | 0 | 311,400 | 269,310 | 572,800 | 161,750 | 0 | 1,315,260 |
| Embankment Material | MFC-1 | 0 | 2,050 | 189,450 | 0 | 0 | 0 | 0 | |
| from other Package | MFC-2 | -2,050 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | MFC-3 | -189,450 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Legend : | MFC-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| - minus get from other Package | MFC-5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| - plus produce to other Package | MFC-6 | 0 | 0 | 0 | 0 | 0 | 0 | -94,830 | |
| | MFC-7 | 0 | 0 | 0 | 0 | 0 | 94,830 | 0 | |

Table 7.2.1 BASIC UNIT COSTS OF LABOUR AND COMPUTATION OF LABOUR COSTS IN KAB. DELI SERDANG 1995-1996

(Unit : Rupiah)

| Qualification | Basic Wage | Additional Cost (Monthly Base) | | | | COST | Rounded |
|---|---|---|---|---|---|---|---|
| | (1) Daily | (2) Overtime | (3) Leave | (4) Bonus | (5) Others | PER DAY | |
| 1 Foreman | 10,000 | 5,000 | 833 | 833 | 2,500 | 19,167 | 19,200 |
| 2 Operator | 10,000 | 5,000 | 833 | 833 | 2,500 | 19,167 | 19,200 |
| 3 Electrician | 9,000 | 4,500 | 750 | 750 | 2,250 | 17,250 | 17,300 |
| 4 Mechanic | 9,000 | 4,500 | 750 | 750 | 2,250 | 17,250 | 17,300 |
| 5 Welder | 9,000 | 4,500 | 750 | 750 | 2,250 | 17,250 | 17,300 |
| 6 Driver | 7,500 | 3,750 | 625 | 625 | 1,875 | 14,375 | 14,400 |
| 7 Mason | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 8 Carpenter | 9,000 | 4,500 | 750 | 750 | 2,250 | 17,250 | 17,300 |
| 9 Scaffolding Man | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 10 Plumber | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 11 Steel Worker | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 12 Concrete Worker | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 13 Painter | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 14 Plasterer | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 15 Asphalt Worker | 8,000 | 4,000 | 667 | 667 | 2,000 | 15,333 | 15,300 |
| 16 Skilled Labour | 6,000 | 3,000 | 500 | 500 | 1,500 | 11,500 | 11,500 |
| 17 Common Labour | 5,000 | 2,500 | 417 | 417 | 1,250 | 9,583 | 9,600 |
| 18 Watchman | 5,500 | 2,750 | 458 | 458 | 1,375 | 10,542 | 10,500 |

(1) : SOURCE; DAFTAR HARGA SATUAN BAHAN - UPAH KERJA TAHUN ANGGARAN 1995-1996

(2) : 7 Basic Working Hours + 2 Hours Overtime + 1 Hour Rest Time

- Overtime, 1st Hour; Basic Wage / 7 * 1.5
- Overtime, 2nd Hour; Basic Wage / 7 * 2.0

(3) : Vacation and Sick Leave;

Basic Wage / 12

(4) : Bonus or 13th Month Pay;

Basic Wage / 12

(5) : Food, Transportation and other Allowances + Taxes and Insurance

((1) + (2) + (3) + (4)) * 0.15

## Table 7.2.2 (1/3) BASIC UNIT COSTS OF CONSTRUCTION MATERIALS IN MEDAN CITY

(Unit: Rp.)

| No. | Materials | Unit | Local Currency (Rp.) | Foreign Currency (Rp.) | Total (Rp.) |
|---|---|---|---|---|---|
| A. | Combustibles | | | | |
| 1 | Gasoline | lit. | 560 | 140 | 700 |
| 2 | Light Oil (Diesel Oil) | lit. | 304 | 76 | 380 |
| 3 | Kerosene | lit. | 210 | 140 | 350 |
| 4 | Propane Gas | kg | 600 | 150 | 750 |
| 5 | Oxygen (big tube) | 7m³ | 45,000 | 5,000 | 50,000 |
| 6 | Grease | kg | 3,600 | 400 | 4,000 |
| B. | Sand and Stones | | | | |
| 1 | Fine Aggregate ( Washed Sand ) (10km) | m³ | 11,880 | 1,320 | 13,200 |
| 2 | Sand for Filling and Base Course (10 km) | m³ | 9,900 | 1,100 | 11,000 |
| 3 | Cobble Stone (Average Delivery Dis. 20km) | m³ | 13,500 | 1,500 | 15,000 |
| 4 | Crasher Run (Average Delivery Dis. 20 km) | m³ | 31,500 | 3,500 | 35,000 |
| 5 | River Gravel (Average Delivery Dis. 25 km) | m³ | 18,000 | 2,000 | 20,000 |
| 6 | Boulder (Average Delivery Dis. 25km) | m³ | 19,800 | 2,200 | 22,000 |
| C. | Concrete and Asphalt | | | | |
| 1 | Portland Cement | bag | 5,100 | 3,400 | 8,500 |
| 2 | Cut-back Asphalt | kg | 480 | 320 | 800 |
| 3 | Asphalt Concrete ( Hot Mix) | ton | 66,000 | 44,000 | 110,000 |
| 4 | Asphalt Tack Coat | lit | 720 | 480 | 1,200 |
| 5 | Asphalt Prime Coat | lit | 600 | 400 | 1,000 |
| 6 | Ready Mixed Concrete; 400 kg/cm², 25 mm (A) | m³ | 109,560 | 73,040 | 182,600 |
| 7 | Ready Mixed Concrete; 350 kg/cm², 25 mm (B) | m³ | 104,940 | 69,960 | 174,900 |
| 8 | Ready Mixed Concrete; 225 kg/cm², 25 mm (C1) | m³ | 95,040 | 63,360 | 158,400 |
| 9 | Ready Mixed Concrete; 225 kg/cm², 10 mm (C2) | m³ | 90,720 | 60,480 | 151,200 |
| 10 | Ready Mixed Concrete; 175 kg/cm², 40 mm (D) | m³ | 87,420 | 58,280 | 145,700 |
| 11 | Ready Mixed Concrete; 120 kg/cm², 25 mm (E) | m³ | 80,160 | 53,440 | 133,600 |
| 12 | Prestressed Concrete Pile Dia. 300 mm A | m | 23,800 | 10,200 | 34,000 |
| 13 | Prestressed Concrete Pile Dia. 300 mm AB | m | 28,700 | 12,300 | 41,000 |
| 14 | Prestressed Concrete Pile Dia. 400 mm B | m | 52,500 | 22,500 | 75,000 |
| 15 | Prestressed Concrete Pile Dia. 400 mm AB | m | 48,300 | 20,700 | 69,000 |
| 16 | Prestressed Concrete Pile Dia. 500 mm AB | m | 73,500 | 31,500 | 105,000 |
| 17 | Prestressed Concrete Pile Dia. 600 mm AB | m | 99,400 | 42,600 | 142,000 |
| 18 | Concrete Pipe (Without Re-bar) Dia. 600 mm | m | 18,200 | 7,800 | 26,000 |
| 19 | Concrete Pipe (Without Re-bar) Dia. 400 mm | m | 8,400 | 3,600 | 12,000 |
| 20 | Reinforced Concrete Pipe, Dia. 300 mm | m | 17,400 | 11,600 | 29,000 |
| 21 | Reinforced Concrete Pipe, Dia. 400 mm | m | 27,000 | 18,000 | 45,000 |
| 22 | Reinforced Concrete Pipe, Dia. 500 mm | m | 43,200 | 28,800 | 72,000 |
| 23 | Reinforced Concrete Pipe, Dia. 600 mm | m | 58,800 | 39,200 | 98,000 |
| 24 | Reinforced Concrete Pipe, Dia. 800 mm | m | 104,400 | 69,600 | 174,000 |
| 25 | Reinforced Concrete Pipe, Dia. 1000 mm | m | 162,600 | 108,400 | 271,000 |
| 26 | Concrete Block for Pavement : 21 x 10.5 x 8 cm | pcs | 440 | 110 | 550 |
| 27 | Concrete Hollow Block : 40 x 20 x 10 cm | pcs | 496 | 124 | 620 |
| 28 | Form Tie | pcs | 3,000 | 2,000 | 5,000 |
| 29 | Non Shrinkage Mortar | m³ | 41,500 | 41,500 | 83,000 |
| 30 | Sealant | m³ | 40,000 | 40,000 | 80,000 |
| 31 | Prestressed Concrete Sheet Pile | m | 86,064 | 57,376 | 143,440 |
| 32 | Precast Prestressed Concrete Main Beam | m³ | 1,010,400 | 673,600 | 1,684,000 |
| 33 | Precast Prestressed Panel | m³ | 280,000 | 280,000 | 560,000 |
| 34 | Precast Prestressed Concrete Diaphragm | m³ | 339,200 | 339,200 | 678,400 |
| D. | Log and Timber | | | | |
| 1 | Log Pile, Dia. 15 cm | m | 1,980 | 220 | 2,200 |
| 2 | Log Pile, Dia. 10 cm | m | 990 | 110 | 1,100 |
| 3 | Timber | m³ | 337,500 | 37,500 | 375,000 |
| 4 | Plywood, t = 12 mm | m² | 12,600 | 1,400 | 14,000 |
| 5 | Door incl. Frame Accessories, 2.0 x 0.8 m | nos | 110,880 | 12,320 | 123,200 |
| 6 | Form Timber | m³ | 405,000 | 45,000 | 450,000 |
| 7 | Coconut Pile, Dia. 25 cm, 10-12 m | nos. | 45,000 | 5,000 | 50,000 |

## Table 7.2.2 (2/3) BASIC UNIT COSTS OF CONSTRUCTION MATERIALS IN MEDAN CITY

(Unit : Rp.)

| No. | Materials | Unit | Local Currency (Rp.) | Foreign Currency (Rp.) | Total (Rp.) |
|---|---|---|---|---|---|
| E. | Iron | | | | |
| 1 | Reinforcing Bars, Round | kg | 165 | 1,485 | 1,650 |
| 2 | Reinforcing Bars, Deformed | kg | 165 | 1,485 | 1,650 |
| 3 | Structural Steel | kg | 315 | 2,835 | 3,150 |
| 4 | Steel Plate | kg | 225 | 2,025 | 2,250 |
| 5 | Steel Pipe, Dia. 800 mm incl. Coating & Lining | m | 79,940 | 719,460 | 799,400 |
| 6 | Steel Pipe, Dia. 600 mm incl. Coating & Lining | m | 69,750 | 627,750 | 697,500 |
| 7 | Steel Pipe, Dia. 400 mm incl. Coating & Lining | m | 46,500 | 418,500 | 465,000 |
| 8 | Steel Pipe, Dia. 300 mm incl. Coating & Lining | m | 41,000 | 369,000 | 410,000 |
| 9 | Steel Pipe, Dia. 150 mm incl. Coating & Lining | m | 18,500 | 166,500 | 185,000 |
| 10 | Steel Pipe, Dia. 125 mm incl. Coating & Lining | m | 15,500 | 139,500 | 155,000 |
| 11 | Steel Pipe, Dia. 100 mm incl. Coating & Lining | m | 9,300 | 83,700 | 93,000 |
| 12 | Steel Pipe, Dia. 38 mm (1.5 inch) | m | 2,025 | 18,225 | 20,250 |
| 13 | Steel Pipe Pile, Dia. 600 mm (spiral welded) | m | 36,000 | 324,000 | 360,000 |
| 14 | Steel Pipe Pile, Dia. 400 mm (spiral welded) | m | 23,800 | 214,200 | 238,000 |
| 15 | Galvanized Steel Pipe, Dia. 40 mm | m | 2,213 | 19,912 | 22,125 |
| 16 | Galvanized Steel Pipe, Dia. 50 mm | m | 2,775 | 24,975 | 27,750 |
| 17 | Galvanized Steel Pipe, Dia. 75 mm | m | 4,500 | 40,500 | 45,000 |
| 18 | Galvanized Steel Pipe, Dia. 100 mm | m | 6,000 | 54,000 | 60,000 |
| 19 | Steel Door, 40 mm thick, 2.10 x 1.70 m | pcs | 285,000 | 2,565,000 | 2,850,000 |
| 20 | Steel Sheet Pile | ton | 247,500 | 2,227,500 | 2,475,000 |
| 21 | Expansion Joint, Steel Profile L-75 x 6 mm | m | 705 | 6,345 | 7,050 |
| 22 | Anchor, Steel Bar (Dia.32 & 22) incl. PVC Pipe | nos | 3,000 | 27,000 | 30,000 |
| 23 | Galvanized Steel Wire | kg | 500 | 2,000 | 2,500 |
| 24 | Bolt and Nut | kg | 3,750 | 33,750 | 37,500 |
| 25 | Welding Rod | kg | 1,950 | 7,800 | 9,750 |
| 26 | Galvanized Steel Fence, H = 1.75 m | m | 20,580 | 82,320 | 102,900 |
| 27 | Gabion Mattress; 4 mm, 1.5 x 3.0 x 0.5 m | pcs | 34,000 | 136,000 | 170,000 |
| 28 | Gabion Cylinder; 4 mm, Dia. = 50 cm | m | 5,000 | 20,000 | 25,000 |
| 29 | Zinc Roof | $m^2$ | 1,800 | 7,200 | 9,000 |
| 30 | Checkered Steel Plate, 6 mm thick | kg | 450 | 1,800 | 2,250 |
| 31 | Live and Anchorage | set | 189,000 | 441,000 | 630,000 |
| 32 | Steel Pipe, Dia. 350 mm incl. Coating & Lining | m | 43,750 | 393,750 | 437,500 |
| 33 | Steel Pipe, Dia. 200 mm incl. Coating & Lining | m | 25,150 | 226,350 | 251,500 |
| F. | Valves | | | | |
| 1 | Air Valve, Dia 25 mm | set | 124,200 | 496,800 | 621,000 |
| 2 | Sluice Valve for 400 mm Dia. Pipe | set | 1,725,000 | 6,900,000 | 8,625,000 |
| 3 | Counterflow Prevention Valve for 100 mm Dia. Pipe | set | 0 | 45,423 | 45,423 |
| 4 | Butterfly Valve for 600 mm Dia. Pipe | set | 2,250,000 | 9,000,000 | 11,250,000 |
| 5 | Butterfly Valve for 400 mm Dia. Pipe | set | 1,500,000 | 6,000,000 | 7,500,000 |
| 6 | Flap Gate 1000 mm Dia | set | 4,684,800 | 3,123,200 | 7,808,000 |
| 7 | Flap Gate 600 mm Dia | set | 2,812,800 | 1,875,200 | 4,688,000 |
| 8 | Air Valve Dia. 75 mm | set | 903,600 | 602,400 | 1,506,000 |
| 9 | Air Valve, Dia. 50 mm | set | 638,400 | 425,600 | 1,064,000 |
| 10 | Steel Gate 2.0 * 2.0 m (Slide Gate Type) | set | 9,000,000 | 6,000,000 | 15,000,000 |
| 11 | Steel Gate 2.0 * 1.5 m (Slide Gate Type) | set | 6,969,600 | 4,646,400 | 11,616,000 |
| 12 | Steel Gate 1.5 * 1.5 m (Slide Gate Type) | set | 5,270,400 | 3,513,600 | 8,784,000 |
| 13 | Steel Gate 1.0 * 1.25 m (Slide Gate Type) | set | 4,128,000 | 2,752,000 | 6,880,000 |
| 14 | Steel Gate 1.0 * 1.0 m (Slide Gate Type) | set | 3,600,000 | 2,400,000 | 6,000,000 |
| 15 | Expansion Joint for Pipe, Dia. 100 mm | nos. | 852,000 | 1,988,000 | 2,840,000 |
| 16 | Expansion Joint for Pipe, Dia. 125 mm | nos. | 952,500 | 2,222,500 | 3,175,000 |
| 17 | Expansion Joint for Pipe, Dia. 150 mm | nos. | 1,047,900 | 2,445,100 | 3,493,000 |
| 18 | Expansion Joint for Pipe, Dia. 300 mm | nos. | 1,092,900 | 2,550,100 | 3,643,000 |
| 19 | Expansion Joint for Pipe, Dia. 350 mm | nos. | 1,293,900 | 3,019,100 | 4,313,000 |
| 20 | Expansion Joint for Pipe, Dia. 400 mm | nos. | 2,119,500 | 4,945,500 | 7,065,000 |
| 21 | Expansion Joint for Pipe, Dia. 600 mm | nos. | 2,338,500 | 5,456,500 | 7,795,000 |
| 22 | Expansion Joint for Pipe, Dia. 800 mm | nos. | 5,268,300 | 12,292,700 | 17,561,000 |

## Table 7.2.2 ( 3/3) BASIC UNIT COSTS OF CONSTRUCTION MATERIALS IN MEDAN CITY

(unit : Rp.)

| No. | Materials | Unit | Local Currency (Rp.) | Foreign Currency (Rp.) | Total Nov.1.95 |
|---|---|---|---|---|---|
| G. | Chemicals | | | | |
| 1 | PVC Pipe, Dia. 150 mm | m | 29,925 | 12,825 | 42,750 |
| 2 | PVC Pipe, Dia. 100 mm | m | 14,490 | 6,210 | 20,700 |
| 3 | PVC Pipe, Dia. 75 mm | m | 7,350 | 3,150 | 10,500 |
| 4 | PVC Pipe, Dia. 50 mm | m | 5,250 | 2,250 | 7,500 |
| 5 | PVC Air Vent Pipe, Dia. 75 mm, 80 cm Long | pcs | 24,500 | 10,500 | 35,000 |
| 6 | Elastic Joint Filler 10 mm thick | $m^2$ | 17,500 | 7,500 | 25,000 |
| 7 | Geotextile | $m^2$ | 5,250 | 2,250 | 7,500 |
| 8 | Waterstop, B = 300 mm | m | 31,500 | 13,500 | 45,000 |
| 9 | Elastomeric Bearing, 300 x 300 x 60 mm | pcs | 175,000 | 75,000 | 250,000 |
| 10 | Elastomeric Bearing, 406 x 280 x 67 mm | pcs | 218,750 | 93,750 | 312,500 |
| 11 | Elastomeric Bearing, 480 x 300 x 67 mm | pcs | 280,000 | 120,000 | 400,000 |
| 12 | PVC Pipe, Dia. 200 mm | m | 48,825 | 20,925 | 69,750 |
| H. | Rubber Dam | | | | |
| 1 | Rubber Body (6.315*32.33 m) | L.S | 0 | 595,350,000 | 595,350,000 |
| 2 | Fixing Materials ( Anchor Bolts, Plate, etc.) | L.S | 0 | 529,200,000 | 529,200,000 |
| 3 | Spacer Parts and Pipelines | L.S | 0 | 66,150,000 | 66,150,000 |
| 4 | Operation Equipment | L.S | 0 | 132,300,000 | 132,300,000 |
| I. | Plants and Grass | | | | |
| 1 | Acasia Petandra | tree | 7,000 | 0 | 7,000 |
| 2 | Fillisium | tree | 10,500 | 0 | 10,500 |
| 3 | Bougainvillea | tree | 5,000 | 0 | 5,000 |
| 4 | Cemara Kipas | tree | 35,000 | 0 | 35,000 |
| 5 | Cemara Lilin | tree | 35,000 | 0 | 35,000 |
| 6 | Palem Hijau | tree | 15,000 | 0 | 15,000 |
| 7 | Tanjung | tree | 10,500 | 0 | 10,500 |
| 8 | Cendrawasih/Taiwan Lila | tree | 105 | 0 | 105 |
| 9 | Soka | tree | 250 | 0 | 250 |
| 10 | Filling of Fertilized Soil | kg | 1,200 | 0 | 1,200 |
| J. | Others | | | | |
| 1 | Palm Fiber, 20 mm thick | $m^2$ | 18,000 | 2,000 | 20,000 |
| 2 | Brick ; 23 x 11.5 x 5.5 cm | pcs | 90 | 10 | 100 |
| 3 | Floor Tile | $m^2$ | 16,650 | 1,850 | 18,500 |
| 4 | Wall Tile | $m^2$ | 15,750 | 1,750 | 17,500 |
| 5 | Mozaic Tile | $m^2$ | 20,790 | 2,310 | 23,100 |
| 6 | Roof Tile | $m^2$ | 16,650 | 1,850 | 18,500 |
| 7 | Wall Paint | $m^2$ | 6,750 | 750 | 7,500 |
| 8 | Window with Accessory, 0.6 x 1.20 m | $m^2$ | 36,000 | 4,000 | 40,000 |
| 9 | Synthetic Shell (5 $m^2$ / kg) | kg | 3,125 | 3,125 | 6,250 |
| 10 | Water Proofing Coat | $m^2$ | 10,200 | 10,200 | 20,400 |
| 11 | Staff Gauge (5.0 m) | nos | 140,000 | 60,000 | 200,000 |
| 12 | Asbestos Cemet, 6 mm thick | $m^2$ | 875 | 875 | 1,750 |
| 13 | Aluminium Frame | $m^2$ | 125,000 | 125,000 | 250,000 |
| 14 | Cast-iron Cover, Dia.60 cm | pcs | 400,000 | 400,000 | 800,000 |
| 15 | Nails | kg | 1,200 | 800 | 2,000 |
| 16 | Handy Talky | set | 240,000 | 160,000 | 400,000 |
| 17 | Trash Can | nos | 28,000 | 7,000 | 35,000 |
| 18 | Trash Carrier | nos | 128,000 | 32,000 | 160,000 |
| 19 | Water Tank, 5.0 $m^3$ | nos | 2,500,000 | 625,000 | 3,125,000 |
| 20 | Maintenance Post Marker | nos | 39,000 | 26,000 | 65,000 |
| 21 | Submerged Motor Pump, 0.1 $m^3$/min. 2.2 kw | nos | 3,525,000 | 2,350,000 | 5,875,000 |
| 22 | Submerged Motor Pump, 0.1 $m^3$/min. 1.5 kw | nos | 2,550,000 | 1,700,000 | 4,250,000 |
| 23 | Name Plate ( marble) | $m^2$ | 360,000 | 40,000 | 400,000 |
| 24 | Bench (woodea) | nos. | 165,000 | 110,000 | 275,000 |
| 25 | Bench (steel) | nos. | 200,000 | 0 | 200,000 |
| 26 | Sodding Grass | $m^2$ | 500 | 0 | 500 |

Source:

1 DAFTAR HARGA SATUAN BAHAN - UPAHKERJA, TAHUN ANGGARAN 1995-1996 DI DATI II KABUPATEN DELI SERDANG.

2 JURUAL HARGA SATUAN BAHAN BANGUNAN DAN KONSTRUKSI, EDISI III September 1995

## Table 7.2.3 BASIC UNIT COSTS OF CONSTRUCTION EQUIPMENT

| | Construction Equipment | Capacity/ Specification | Power | Type | Economic Life (Year) | Yearly Working (hour) | Basic Price (Rp/hour) |
|---|---|---|---|---|---|---|---|
| 1. | Bulldozer A | 15 ton | 145 PS | D58E-1 | 5 | 2,000 | 74,900 |
| 2. | Bulldozer B | 12 ton | 100 PS | | 5 | 2,000 | 60,200 |
| 3. | Bulldozer C | 6 ton | 71 PS | | 5 | 2,000 | 37,700 |
| 4. | Bulldozer with Ripper | 21 ton | 225 PS | D53A-17 | 5 | 2,000 | 119,400 |
| 5. | Back hoe / Excavator A | 0.60 m3 | 120 PS | PC200-5 | 4 | 2,000 | 65,700 |
| 6. | Back hoe / Excavator B | 0.40 m3 | 88 PS | PC100-5 | 4 | 2,000 | 43,000 |
| 7. | Crawler-Type Loader | 1.20 m3 | 93 PS | 951C | 5 | 2,000 | 49,500 |
| 8. | Wheel-type Loader | 1.20 m3 | 81 PS | 920 | 5 | 2,000 | 55,600 |
| 9. | Dump Truck A | 8 ton | 253 PS | TDZ-60 | 5 | 2,000 | 33,000 |
| 10. | Dump Truck B | 6 ton | 188 PS | TSD-6 | 5 | 2,000 | 16,500 |
| 11. | Ordinary Truck | 4 ton | 180 PS | TE-100 | 5 | 2,000 | 12,300 |
| 12 | Wheel Crane A | 10 ton | 100 PS | KB-122 | 5 | 2,000 | 38,200 |
| 13 | Wheel Crane B | 4.9 ton | 50 PS | TSO45 | 5 | 2,000 | 33,400 |
| 14 | Truck with Crane | 6 ton | 190 PS | TXO-60 | 5 | 2,000 | 19,400 |
| 15. | Truck with Crane | 4 ton | 162 PS | TS-3 | 5 | 2,000 | 12,900 |
| 16. | Trailer A | 35 ton | 320 PS | VOZ-441 | 5 | 2,000 | 61,700 |
| 17 | Trailer B | 20 ton | 320 PS | F-2100 | 5 | 2,000 | 43,500 |
| 18. | Truck Mixer | 4.5 ton | 290 PS | TDJ-50 | 5 | 2,000 | 49,700 |
| 19. | Concrete Pump Truck | 55 m3/hr | 164 PS | NCP-900 | 4 | 2,000 | 62,400 |
| 20. | Water Tanker | 4 m3 | | 4862-WD | 5 | 2,000 | 14,100 |
| 21. | Tamper | 80/100 kg | 4 PS | BS-60Y | 3 | 1,600 | 5,500 |
| 22 | Vibrator Roller A | 1 ton | 8 PS | SV-10 | 5 | 1,600 | 13,100 |
| 23. | Vibrator Roller B | 4 ton | 27.3 PS | SV-25 | 5 | 1,600 | 26,700 |
| 24. | Vibrator Roller C | 12 ton | 91 PS | SV-900 | 6 | 2,000 | 66,500 |
| 25. | Tire Roller | 8/12 ton | 99 PS | TS-150 | 7 | 1,600 | 36,500 |
| 26. | Tandem Roller | 8/12 ton | 99 PS | | 5 | 2,000 | 39,200 |
| 27. | Motor Grader | 2.8 m | 94 PS | GD510R-1 | 6 | 2,000 | 49,500 |
| 28 | Crawler Crane A | 50 ton | 156 PS | TG-500 | 6 | 1,400 | 146,600 |
| 29. | Crawler Crane B | 35 ton | 117 PS | DH-350 | 6 | 1,400 | 115,500 |
| 30. | Crawler Crane C | 15 ton | 96 PS | 421D | 6 | 1,400 | 64,600 |
| 31. | Portable Engine Compressor | 3.5m3/min. | 36 PS | EC-50Hz | 6 | 1,200 | 16,300 |
| 32. | Diesel Engine Generator A | 100KVA | 120 PS | 3304 | 6 | 1,600 | 40,400 |
| 33. | Diesel Engine Generator B | 35KVA | 42 PS | DCA-35 | 6 | 1,600 | 15,100 |
| 34. | Diesel Engine Generator C | 15KVA | 20 PS | DCA-21 | 6 | 1,600 | 8,400 |
| 35. | Diesel Pile Hammer | 2.5 ton | 102 PS | 335-A | 4 | 1,400 | 28,500 |
| 36. | Vibro Hammer | 23/24 ton | 30 KW | | 4 | 1,400 | 11,200 |
| 37. | Drop Hammer | 0.5 ton | 9 PS | | 4 | 1,400 | 5,000 |
| 38. | Concrete Vibrator | | 1 KW | Dia.0-13 | 3 | 1,600 | 1,300 |
| 39. | Portable Concrete Mixer | 0.5 m3 | | SM-500 | 3 | 1,600 | 28,900 |
| 40 | Portable Concrete Mixer | 0.2 m3 | | KNP-7US | 3 | 1,600 | 9,200 |
| 41. | Asphalt Plant | 30 ton/hr | 110 KW | BDM-50 | 5 | 1,400 | 192,500 |
| 42. | Asphalt Finisher | 2.4 m | 33 PS | MP-30-2 | 5 | 1,600 | 41,400 |
| 43. | Asphalt Sprayer | 30 Lit./min. | 5.5 PS | BAD-200L | 5 | 2,000 | 26,300 |
| 44. | Concrete Breaker A | 600 kg | 108 PS | HB-700 | 3 | 1,200 | 29,100 |
| 45. | Peneumatic Hand Breaker | 20 kg | 8/10 PS | CB-21 | 3 | 1,200 | 2,000 |
| 46. | Submergible Pump A | D 150mm | 7.5 KW | | 5 | 1,200 | 3,500 |
| 47. | Submergible Pump B | D 50 mm | 0.75 KW | | 5 | 1,200 | 2,000 |
| 48. | Engine Welder | 250 AMP | 19.1 PS | 250 MK | 6 | 1,200 | 7,500 |
| 49. | Chain Saw | | 0.7 PS | | 6 | 1,200 | 2,400 |
| 50. | Drag Line | 0.8 m3 | | | 5 | 2,000 | 51,400 |
| 51. | Bar Cutting Machine | - | - | - | 6 | | 1,100 |
| 52. | Bar Bending Machine | - | - | - | 6 | | 3,000 |
| 53. | Portal Crane | 25 ton | | | 5 | 2,000 | 56,700 |
| 54. | Dredger | | 200 PS | | 5 | 2,000 | 71,600 |

Note :

1. Hourly costs of equipment are estimated based on owning, operation and maintenance cost system in Indonesia
2. Operator and labour cost are excluded.
3. Mobilization and demobilization cost is not included.
4. Price Escalation is considered 4 % for every year.

Source of Data :

1. Keputusan Menteri Pekerjaan Umum Nomor : 167/KPTS/1991