### 4.3.8 Improvement of the existing fence

The existing fence which is located along the southern boundary of the Sindhuli Agriculture Farm will be required the improvement works, since the existing fence has been superannuated and has been allowed invasion of strangers. Improved fence will be provided the wetstone masonry footing and wall with barbed wire fence. Total length of improved fence is 209.5 m.

Principal features of the improved fence are as follows:

| | | |
|---|---|---|
| Length | : | 209.5 m |
| Wall | | |
| Foundation width | : | 0.6 m |
| Wall height | : | 1.0 m |
| Barbed wire fence | | |
| Height | : | 1.258 m |
| Interval of poles | : | 3.0 m |

Table 4.1 Calculation Results of Peak Water Requirements

| Description | Grapes | Junar Nursary |
|---|---|---|
| Crop water requirement, CWR (mm/day) | 4.97 | 2.60 |
| Field water requirement, FWR (mm/day) | 5.84 | 4.00 |
| Irrigation water requirement, IWR (mm/day) | 6.50 | 5.00 |
| Application interval (days) | 5 | 5 |
| CWR for once interval (mm) | 24.85 | 13.00 |
| FWR for once interval (mm) | 29.20 | 20.00 |
| IWR for once interval (mm) | 32.50 | 25.00 |

PLATE NO. 2

## AREA OF HORTICULTURAL FARM

| | | |
|---|---|---|
| 1) First Stage Implementation | | 4.29 ha |
| BLOCK | I - 1 | 0.48 ha |
| BLOCK | I - 2 | 0.48 ha |
| BLOCK | II - 1 - (1) | 0.25 ha |
| BLOCK | II - 1 - (2) | 0.21 ha |
| BLOCK | II - 2 | 0.45 ha |
| BLOCK | II - 3 | 0.37 ha |
| BLOCK | II - 4 | 0.46 ha |
| BLOCK | III - 1 - (1) | 0.15 ha |
| BLOCK | III - 1 - (2) | 0.13 ha |
| BLOCK | III - 2 | 0.35 ha |
| BLOCK | III - 3 | 0.44 ha |
| BLOCK | III - 4 | 0.52 ha |
| 2) Second Stage Implementation | | 3.46 ha |
| BLOCK | IV - 1 | 0.52 ha |
| BLOCK | IV - 2 | 0.45 ha |
| BLOCK | IV - 3 | 0.38 ha |
| BLOCK | IV - 4 - (1) | 0.20 ha |
| BLOCK | IV - 4 - (2) | 0.11 ha |
| BLOCK | V - 1 | 0.51 ha |
| BLOCK | V - 2 | 0.41 ha |
| BLOCK | V - 3 | 0.47 ha |
| BLOCK | V - 4 - (1) | 0.28 ha |
| BLOCK | V - 4 - (2) | 0.13 ha |

Trellis Area 2.7 ha

## LIST OF IRRIGATION PIPELINES

| | |
|---|---|
| 1) First Stage Implementation | |
| - Main Irrigation Pipeline (MIP) | 174.50 m |
| - Branch Irrigation Pipeline (BIP) | 531.33 m |
| BIP - 1 | 227.50 m |
| BIP - 2 | 150.00 m |
| BIP - 3 | 153.83 m |
| 2) Second Stage Implementation | |
| - Main Irrigation Pipeline (MIP) | 130.18 m |
| - Branch Irrigation Pipline (BIP) | 313.49 m |
| BIP - 4 | 155.66 m |
| BIP - 5 | 157.83 m |

## LIST OF DRAINAGE CANALS

| | |
|---|---|
| 1) First Stage Implementation | |
| - Main Drain (MD) | 520.03 m |
| - Collector Drain (CD) | 755.02 m |
| CD - 1 | 221.00 m |
| CD - 4 | 213.00 m |
| CD - 5 | 181.02 m |
| CD - 7 | 140.00 m |
| - Field Ditch | 849.00 m |
| 2) Second Stage Implementation | |
| - Collector Drain (CD) | 356.00 m |
| CD - 2 | 119.00 m |
| CD - 3 | 124.00 m |
| CD - 6 | 113.00 m |
| - Field Ditch | 528.00 m |

## LEGEND

- Hydrant on Branch Irrigation Pipeline
- Branch or Bend of Pipeline
- Main Irrigation Pipeline
- Branch Irrigation Pipeline
- Farm Ditch
- Drainage Culvert
- Main Drain
- Collector Drain
- Main Farm Road
- Secondary Farm Road
- Road
- House
- Orchard (Lemon, Litchi & Mango)
- Banana Tree
- Dry Field
- Grass Land
- Bush
- Depression
- Ridge
- Border
- Ditch
- Stream
- Fence
- Transmission or Distribution Line

SCALE 0 50 100 M

Note : L¹ : The construction of Main Drain and improvement of Belhaniya stream and existing farm roads shall be made under the First Stage Implementation.

L² : Sub-surface drains shall be provided in only the block where the vine trellis is provided.

L³ : Elevations and distances in this plate are expressed in meter.

Fig 4.1 (1/3) Layout Map of Nepalgunj Sub-center

HIS MAJESTY'S GOVERNMENT OF NEPAL
HORTICULTURAL DEVELOPMENT PROJECT
NEPALGUNJ SUB-CENTER

TITLE:

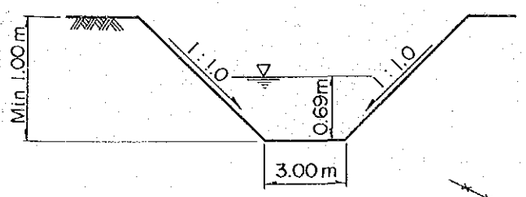
GENERAL LAYOUT (1/3)
HORTICULTURAL FARM

| DATE | MAR. 1986 | D.W.G. NO. | N 100 - 02 |
|---|---|---|---|

JAPAN INTERNATIONAL COOPERATION AGENCY

PLATE NO. 30

| | |
|---|---|
| River Improvement Portion | 120.00 m |
| Short Cut Portion | 143.92 m |
| Total | 263.92 m |




## LEGEND

- Road
- River / Stream
- Grass land
- Depression
- Ditch
- Fence
- Ridge
- 0.5m contour line
- 1.0m contour line
- BL River base elevation

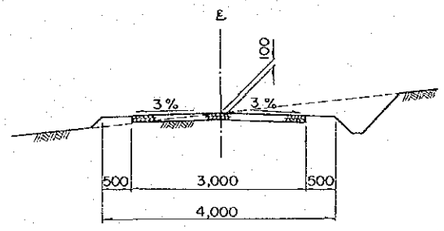
Note : All the elevation and distance in the drawing is expressed in meter.

SCALE 0 50 100 M

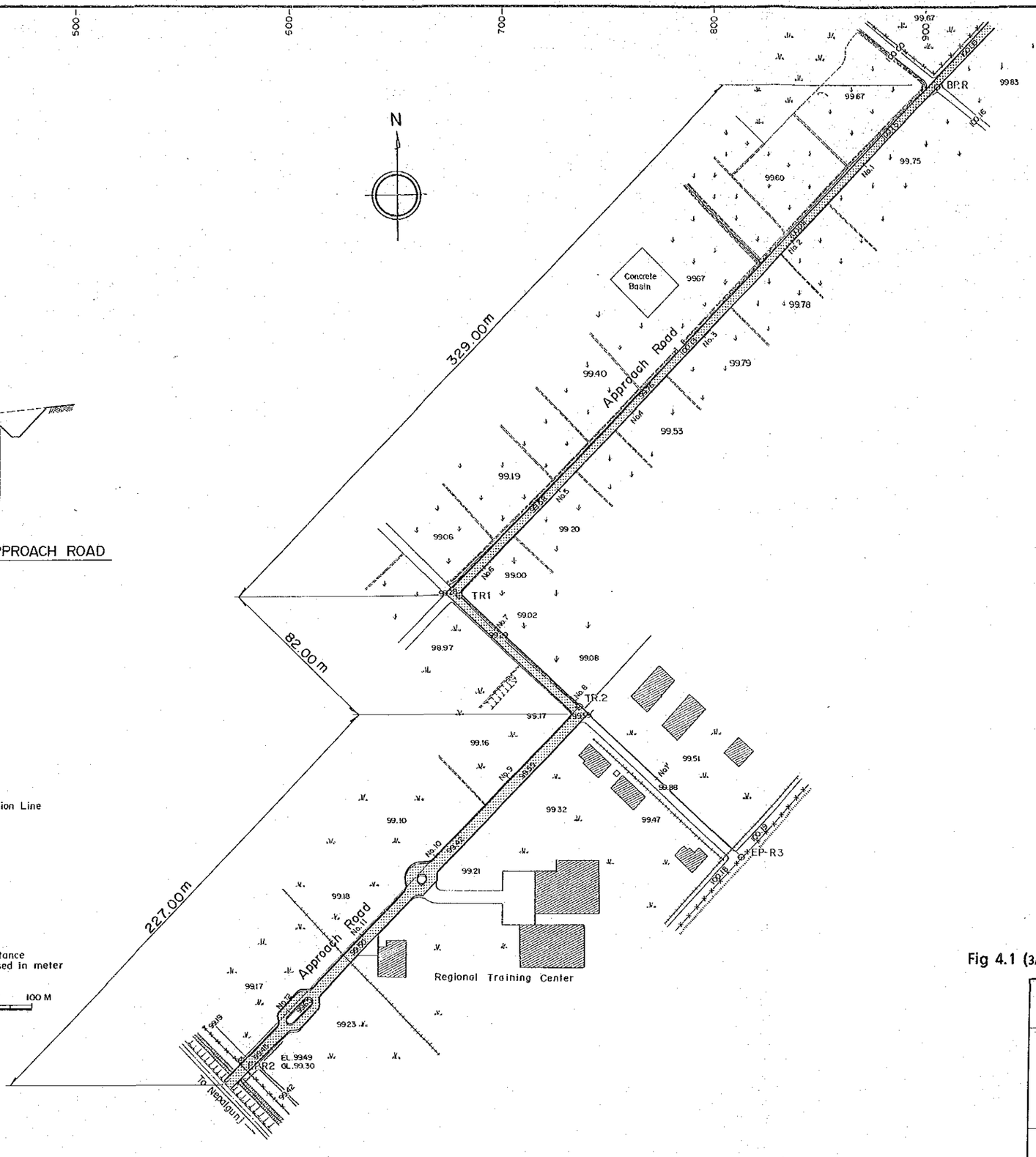
Fig 4.1 (2/3) Layout Map of Nepalgunj Sub-center

| | | | |
|---|---|---|---|
| HIS MAJESTY'S GOVERNMENT OF NEPAL<br>HORTICULTURAL DEVELOPMENT PROJECT<br>NEPALGUNJ SUB-CENTER | | | |
| TITLE: GENERAL LAYOUT (2/3)<br>BELHANIYA STREAM | | | |
| DATE | MAR. 1986 | D.W.G. NO. | N 100 - 03 |
| JAPAN INTERNATIONAL COOPERATION AGENCY | | | |

PLATE NO. 4




TYPICAL CROSS SECTION OF APPROACH ROAD




LEGEND

- Approach Road
- Road
- House
- Border
- Fence
- Transmission or Distribution Line
- Depression
- Ditch
- Stream or Creek
- Bridge
- Grass Land

Note : All the elevation and distance in the drawing is expressed in meter

SCALE 0 50 100 M

Fig 4.1 (3/3) Layout Map of Nepalgunj Sub-center

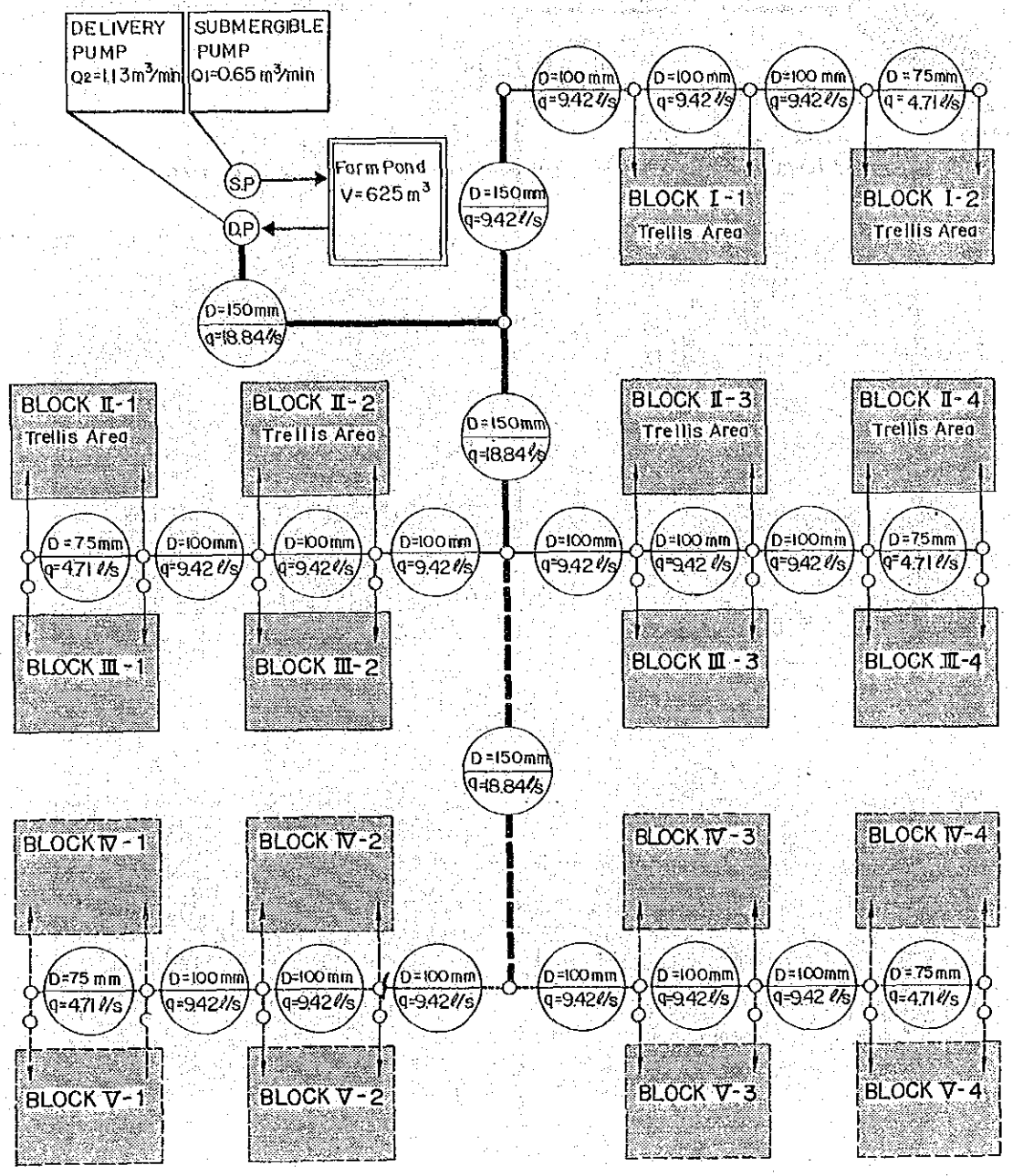
HIS MAJESTY'S GOVERNMENT OF NEPAL
HORTICULTURAL DEVELOPMENT PROJECT
NEPALGUNJ SUB-CENTER

TITLE :

GENERAL LAYOUT (3/3)
APPROACH ROAD

| DATE | MAR. 1986 | D.W.G. NO. | N 100 - 04 |
|---|---|---|---|

JAPAN INTERNATIONAL COOPERATION AGENCY




Note

Irrigation interval is 5-days at peak period.
The farm is divided into five blocks, and
one block is irrigated in a day

LEGEND

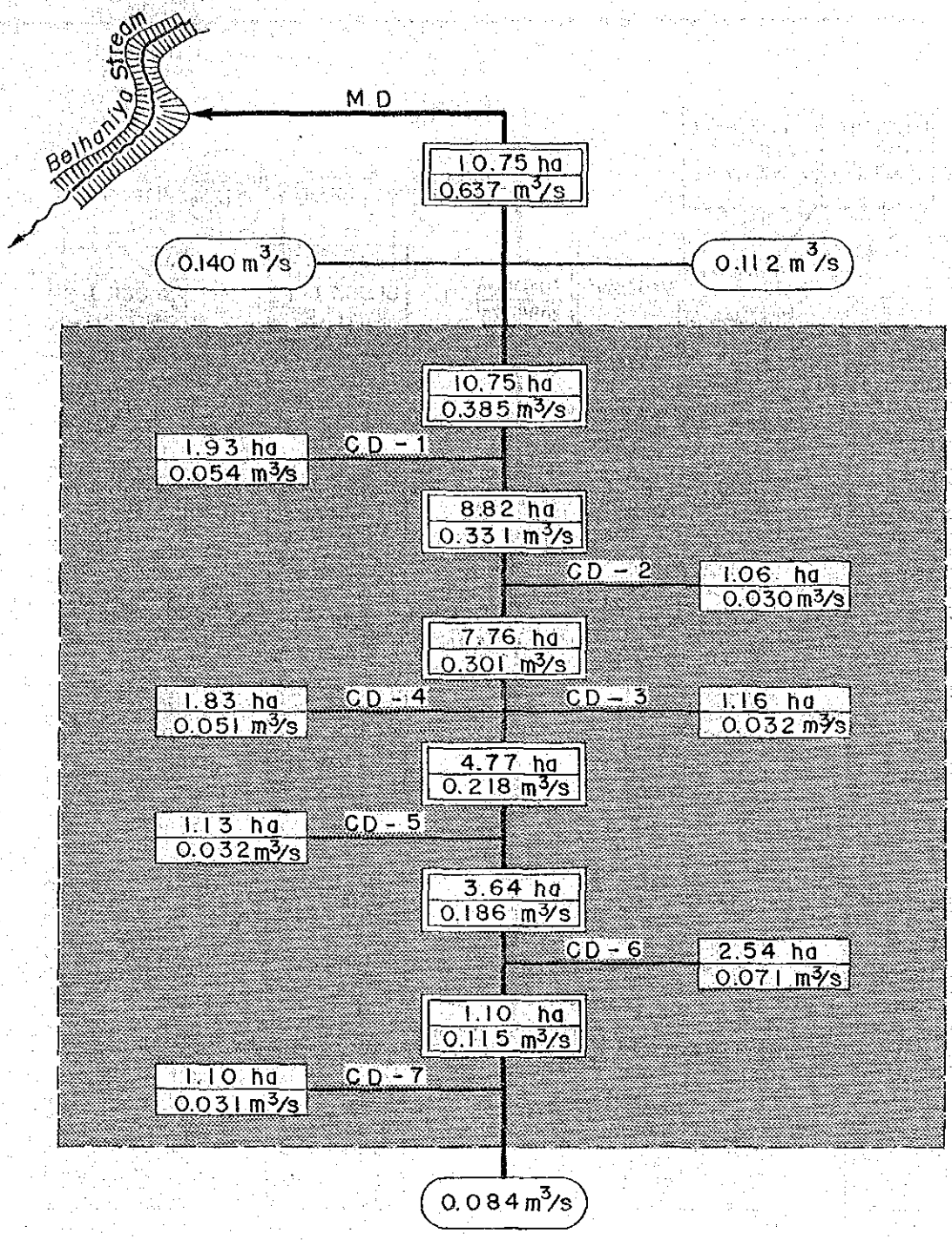
(P) ; Pump Station

——— ; Pipeline

—○ ; Hydrant

▭ ; One Plot Area (0.48 ha)

Fig. 4.2 Irrigation Diagram for Grapes at The Nepalgunj Sub-center




## LEGEND

a / b : Main Drain (MD)

a / b : Collector Drain (CD)

b : Direct Flow-in

a : Catchment Area (ha), b : Design Discharge ( $m^3$/sec)

Fig. 4.3 Drainage Diagram for Nepalgunj Sub-center

PLATE NO. 2

## LIST OF IRRIGATION PIPELINE

| | |
|---|---|
| - Discharge Pipeline | 185.72 m |
| - Main Irrigation Pipeline (MIP) | 136.85 m |
| - Branch Irrigation Pipeline (BIP) | 359.63 m |
| - BIP - 1 | 59.57 m |
| - BIP - 2 | 87.71 m |
| - BIP - 3 | 82.91 m |
| - BIP - 4 | 129.44 m |

## LIST OF DRAINAGE CANAL

| | | | |
|---|---|---|---|
| - Main Drain (MD) | 148.49m | - MD-2-2 | 151.85m |
| - MD - 1 | 121.37m | Catch Drain | 126.64m |
| - MD - 2 | 27.12m | - CD - 1 | 32.27m |
| - Minor Drain (MD) | 420.53m | - CD - 1 - 1 | 29.72m |
| - MD - 1 - 1 | 82.33m | - CD - 1 - 2 | 64.65m |
| - MD - 1 - 2 | 111.97m | | |
| - MD - 2 - 1 | 74.38m | | |

## LEGEND

- Drop
- Branch or Bend on Pipeline
- Hydrant
- Culvert
- Irrigation Pipeline
- Drainage Canal
- Farm Road and Approach Road
- Road
- Orchard (Mango, Litchi etc.)
- Footpath
- Pineapple
- Office & Quarters
- Nursery of Junar etc.
- Irrigation Canal
- Dry Field
- Ditch
- Paddy Field
- Border
- Bush
- Fence

Fig 4.4 Layout Map of Sindhuli Sub-center

HIS MAJESTY'S GOVERNMENT OF NEPAL
HORTICULTURAL DEVELOPMENT PROJECT
SINDHULI SUB-CENTER

TITLE: GENERAL LAYOUT

| DATE | MAR. 1986 | D.W.G. NO. | S 100 - 02 |
|---|---|---|---|

JAPAN INTERNATIONAL COOPERATION AGENCY

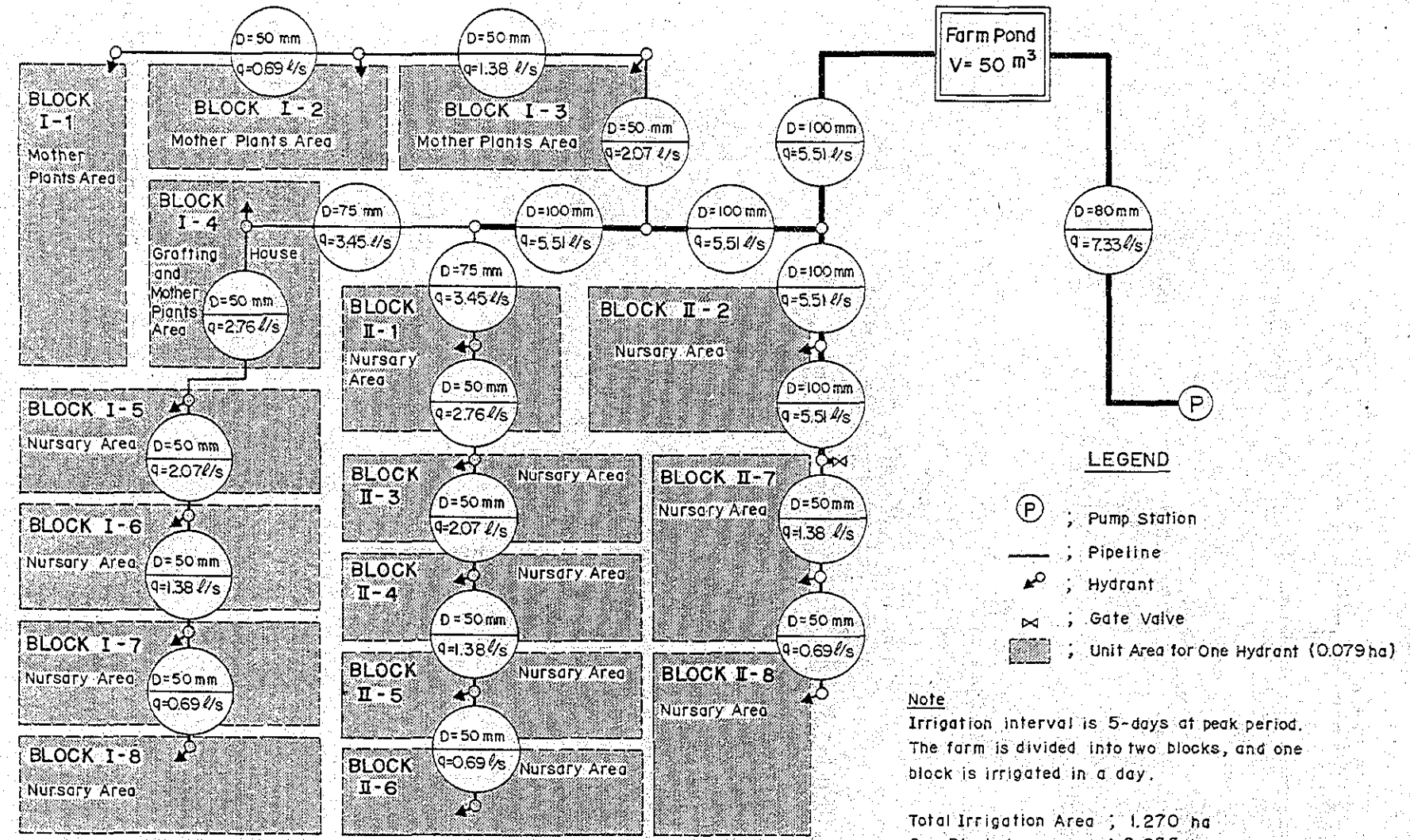



Fig. 4.5 Irrigation Diagram for Junar Nursary at The Sindhuli Sub-center.

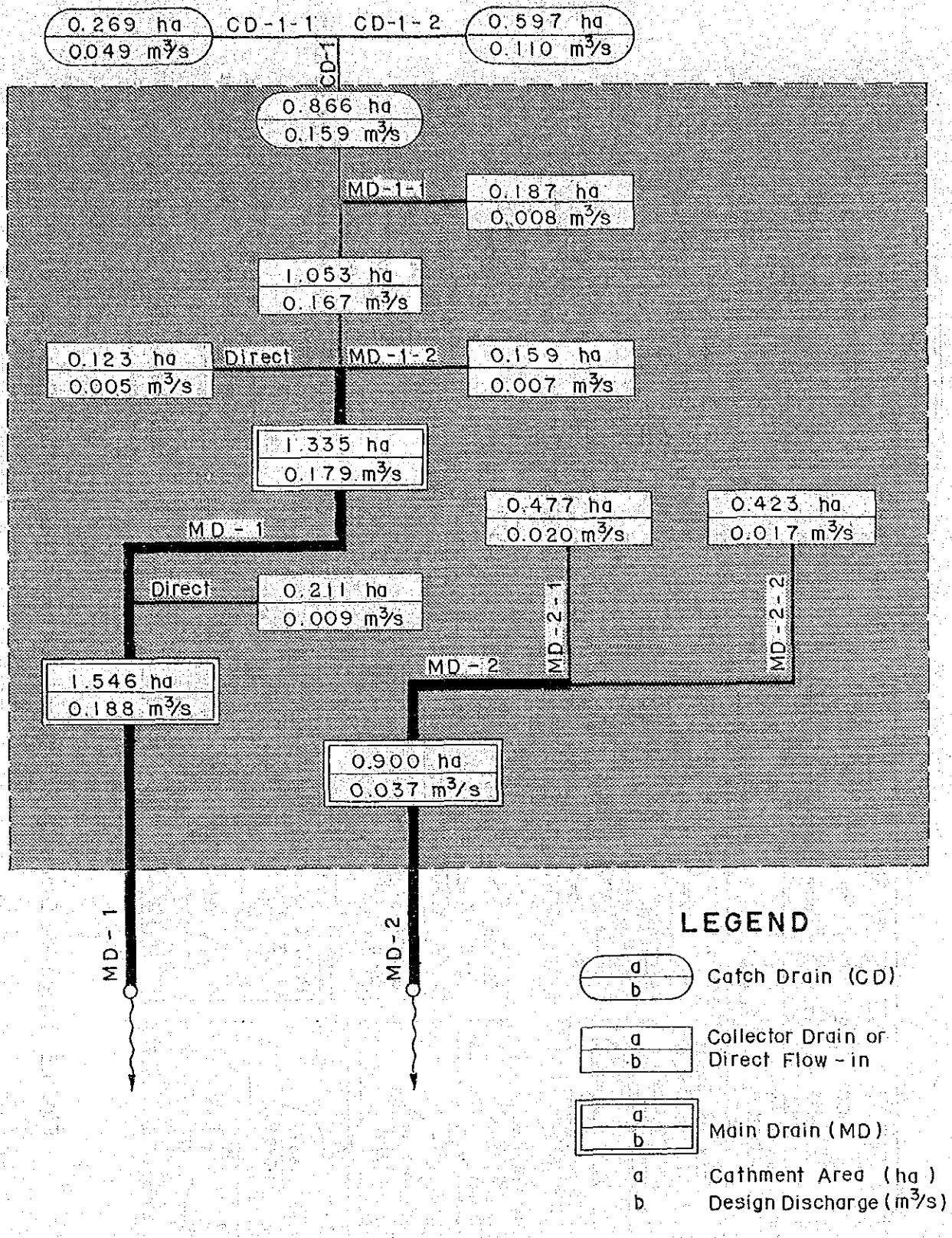



Fig. 4.6 Drainage Diagram for Sindhuli Sub-center

# V. CONSTRUCTION PLAN

# V. CONSTRUCTION PLAN

## 5.1 General

The construction plan is made based on the detail design and also under the following conditions:

- The whole construction works will be performed on the contract basis,
- The construction works will be carried out by local contractor,
- The construction works will be done in one dry season,
- Pump equipments with accessories, P.V.C. pipes with related valves for pipelines, sprinkler sets and some materials of vine trellis, etc. will be supplied from Japan by Japanese Government, and
- Timber pole for vine trellis, cement and concrete pipes, which are procured in local, are supplied by Japanese Government.

## 5.2 Principal Features for Construction Works

### 5.2.1 Nepalgunj Sub-center

The principal features for construction works of the Nepalgunj Sub-center are tabulated below:

| Works | Q'ty | Remarks |
|---|---|---|
| 1. Pumping facilities | | |
| - Submergible pump | 1 unit | Cleaning of the existing deep well and installation of submergible pump<br>Submergible pump:<br>ø80, 0.65 $m^3$/min.<br>H = 19 m, 3.7 kW |
| - Delivery pump | 1 unit | Installationof a delivery pump<br>Delivery pump:<br>ø80 x 65, 1.13 $m^3$/min.<br>H = 36 m, 15 kW |
| - Pump house | 1 no. | Space: 17.5 $m^2$ |

| Works | Q'ty | Remarks |
|---|---|---|
| 2. Farm pond | 1 no. | Effective stage capacity: 625 $m^3$<br>Embankment volume: 1,500 $m^3$<br>Excavation volume: 620 $m^3$ |
| 3. Irrigation facilities | | |
| - Main irrigation pipeline | 170 m | ø150 mm |
| - Branch irrigation pipeline | 530 m | ø150, 100, 75 mm |
| 4. Drainage facilities | | |
| - River improvement | | Excavation: 800 $m^3$ |
| - Main drain | 520 m | Embankment: 4,250 $m^3$<br>Excavation: 650 $m^3$ |
| - Collector drain and farm ditch | 1,600 m | Excavation: 1,800 $m^3$ |
| - Sub-surface drain | 2,700 m | Excavation: 2,600 $m^3$ |
| 5. Farm road | 2,900 m | Gravel : 820 $m^3$<br>Embankment: 1,900 $m^3$<br>Excavation: 700 $m^3$ |
| 6. Land grading | 4.3 ha | |
| 7. Vine trellis | 7 blocks | 2.7 ha |
| 8. Farm house | 1 no. | Space: 48 $m^2$ |

Procurement list of the equipment is shown in Table 5.1.

5.2.2 Sindhuli Sub-center

The principal features for construction works of the Sindhuli Sub-center are tabulated below:

| Works | Q'ty | Remarks |
|---|---|---|
| 1. Pumping facilities | | |
| - Delivery pump | 1 unit | Installation of delivery pump<br>Delivery pump:<br>ø65x50, 0.44 $m^3$/min.<br>H = 36 m, 9 P.S. |
| - Pump house | 1 no. | Space: 4 $m^2$ |
| - Shallow well | 1 no. | ø1.5 m, H = 8 m |
| - Discharge pipeline | 180 m | ø80 mm |

| Works | Q'ty | Remarks |
|---|---|---|
| 2. Farm pond | 1 no. | Effective storage capacity: 50 $m^3$ |
| 3. Irrigation facilities | | |
| - Main irrigation pipeline | 135 m | ø100 |
| - Branch irrigation pipeline | 350 m | ø100, 75, 50 |
| 4. Drainage facilities | | |
| - Collector drain | 800 m | Excavation: 790 $m^3$ |
| 5. Farm road | 980 m | Embankment: 550 $m^3$<br>Excavation: 120 $m^3$ |
| 6. Grafting house | 1 no. | Space: 120 $m^2$ |
| 7. Improvement of fence | 210 m | |

Procurement list of the equipment is shown in Table 5.1.

## 5.3 Construction Time Schedule

The construction works will be carried out by a contractor selected through a competitive bidding. The construction periods of the Nepalgunj Sub-center and the Sindhuli Sub-center are estimated to be 5.5 months and 5 months, respectively. The proposed construction time schedule is shown in Fig. 5.1.

Table 5.1 Procurement List of the Equipments

| Equipment | Q'ty |
|---|---|
| 1. Nepalgunj Sub-center | |
| (1) Submergible pump motor set with accessories | 2 sets |
| (2) Sluice and check valves for submergible pump motor | L.S. |
| (3) Delivery pump motor set with accessories | 1 set |
| (4) Sluice and check valves for delivery pump motor | L.S. |
| (5) Steel pipes with fitting for discharge water from well to pond and from pond to delivery pump | 1 set |
| (6) Generator with accessories | 1 set |
| (7) Control panel and distribution materials | 1 set |
| (8) Chain block | 2 nos. |
| (9) Blow-off valve and steel pipe ø100 mm | 1 set |
| (10) Gate valve and steel pipe ø100 mm | 1 set |
| (11) Spare parts for the pump equipments | L.S. |
| (12) PVC pipe ø150, 100, 75 mm with fittings | 610 m |
| (13) Steel pipe ø50 mm with fittings | 67 m |
| (14) Air valve | 1 no. |
| (15) Hydrants ø50 mm | 20 nos. |
| (16) Fitting materials | L.S. |
| (17) Spare parts for PVC pipes | L.S. |
| (18) Sprinkler sets with spare parts | 2 sets |
| (19) Trellis materials | L.S. |
| 2. Sindhuli Sub-center | |
| (1) Intake engine pump set with accessories | 1 set |
| (2) Valves and pressure gauge | 1 set |
| (3) Chain block | 1 no. |
| (4) Steel pipe with fitting, ø80 mm | 180 m |
| (5) Blow-off valve and steel pipe ø100 mm | 1 set |
| (6) Gate valves and steel pipe, ø100 mm | 1 set |
| (7) Spare parts for pump equipments | L.S. |
| (8) PVC pipe, ø100, 75, 50 mm with fittings | 490 m |
| (9) Steel pipe ø100, 50 mm with fittings | 45 m |
| (10) Hydrants, ø1/2" mm | 16 nos. |
| (11) Air valves | 2 nos. |
| (12) Fitting materials | L.S. |
| (13) Spare parts for PVC pipes | L.S. |

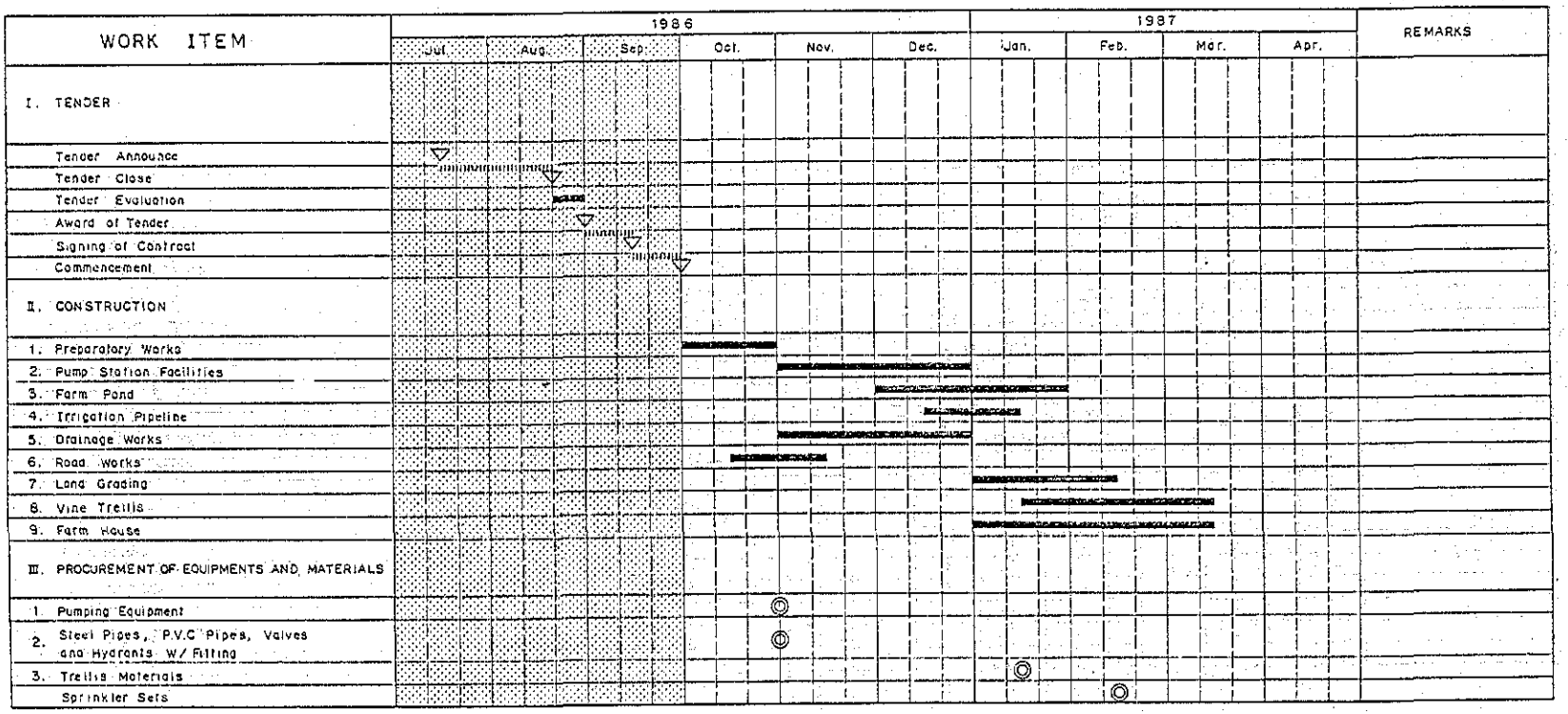



Fig. 5.1 Construction Time Schedule of Nepalgunj Sub-center

HIS MAJESTY'S GOVERNMENT OF NEPAL
HORTICULTURAL DEVELOPMENT PROJECT
NEPALGUNJ SUB-CENTER

TITLE:

CONSTRUCTION TIME SCHEDULE

| DATE | MAR. 1986 | DWG.NO. | N-700 - 01 |
|---|---|---|---|

JAPAN INTERNATIONAL COOPERATION AGENCY

PLATE NO.19

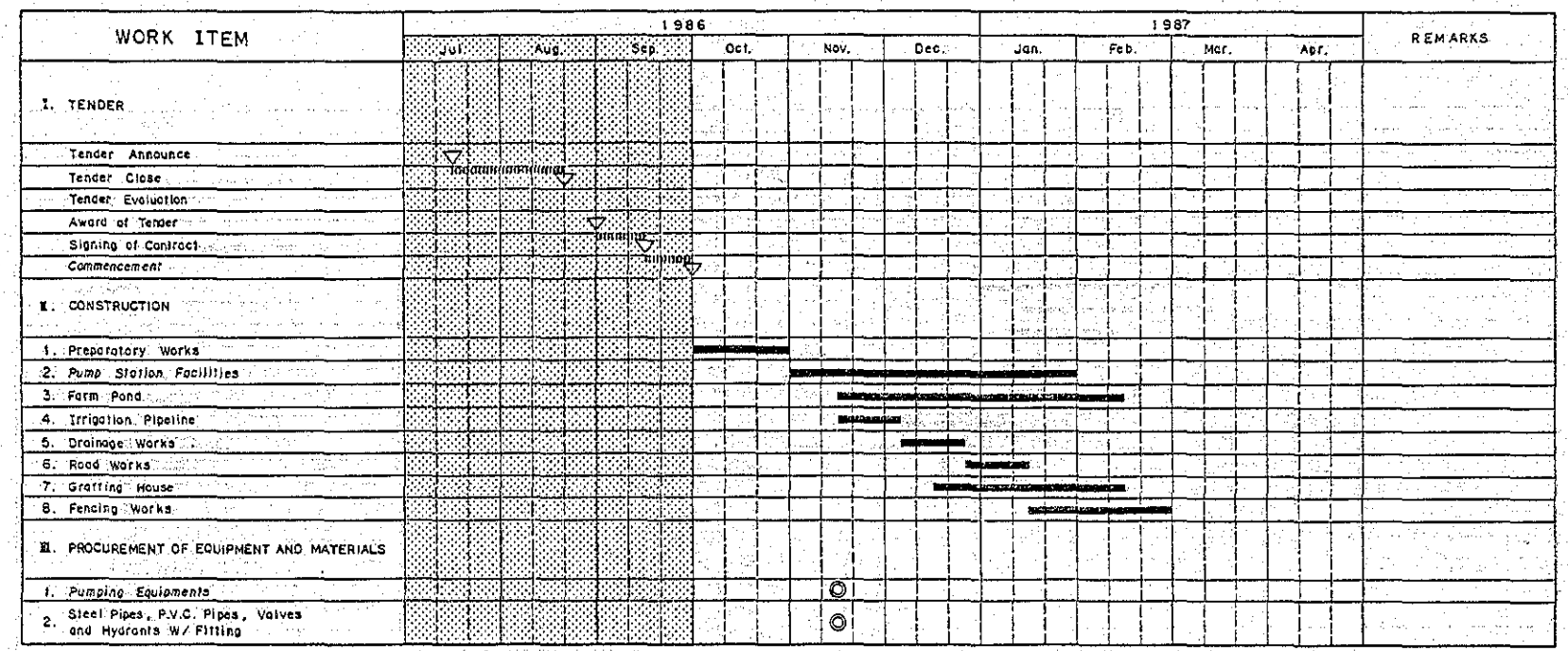



Fig. 5.2 Construction Time Schedule of Sindhuli Sub-center

HIS MAJESTY'S GOVERNMENT OF NEPAL
HORTICULTURAL DEVELOPMENT PROJECT
SINDHULI SUB-CENTER

TITLE :

CONSTRUCTION TIME SCHEDULE

| DATE | MAR. 1986 | DWG. NO. | S 700-01 |
|---|---|---|---|

JAPAN INTERNATIONAL COOPERATION AGENCY