

## Foundation of Transmission Lines. (for 1 Tower)

1) Surface Excavation in Common

$$65.63 \times 11.00 = 721.93 \text{ m}^3$$

2) Backfill

$$9.0 \times 11.00 \times 0.7 = 69.30 \text{ m}^3$$

3) Cobble Stones

$$7.4 \times 7.4 \times 0.2 = 10.95 \text{ m}^3$$

4) Fence

$$2 \times 10.5 + 10.0 = 31.0 \text{ m}$$

5) steel cover

$$0.7 \times 9.5 \times 4 = 26.6 \text{ m}^2$$

6). Concrete.

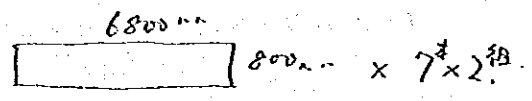
①  $7.0\text{ m} \times 7.0\text{ m} \times 1.0\text{ m} = 49.0\text{ m}^3$

②  $\{0.6\text{ m} \times 0.6\text{ m} \times 0.95\text{ m} - \frac{1}{2} \times 0.2\text{ m} \times 0.95\text{ m} \times (0.6\text{ m} + 0.6\text{ m})\} \times 4\text{ 组}$   
 $= 0.912\text{ m}^3$

① + ② =  $49.0 + 0.912 = 49.912\text{ m}^3$

7). Rain farce. (one Tower)

① D-25  $l = 15200\text{ mm}$



② D-19  $l = 15200\text{ mm}$



③ D-19  $l = 6800\text{ mm}$



④ D-16  $l = 6800\text{ mm}$



⑤ St D-16  $l = 2.420\text{ mm}$



脚部.

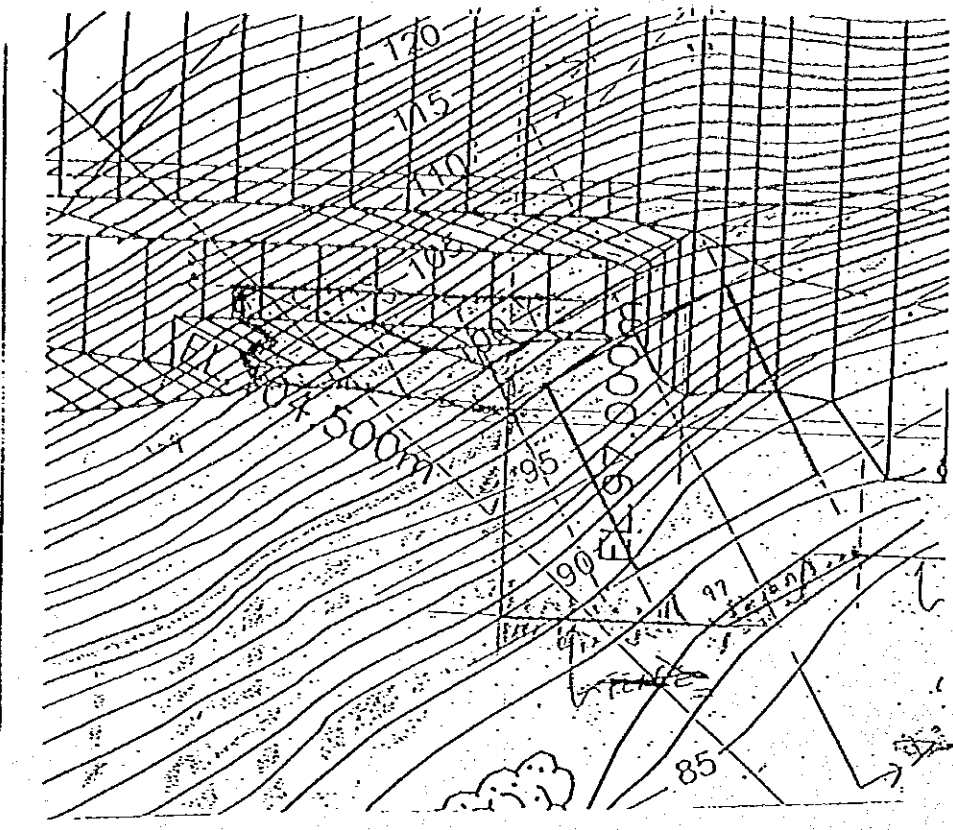
⑥ D-25  $l = 3761\text{ mm}$



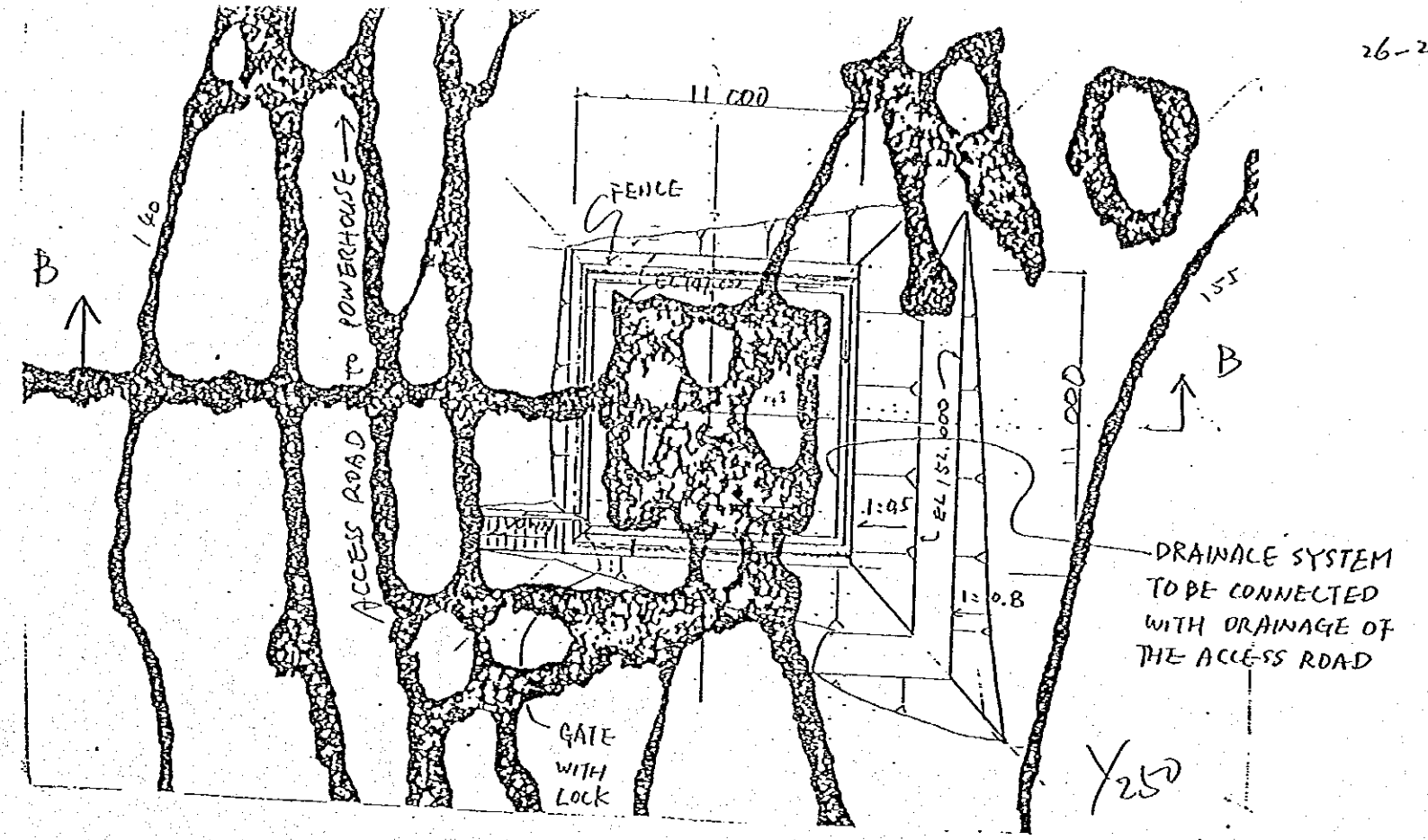
⑦ D-13  $l = 240, 280, 320, 360, 400, 440$

$\times 4\text{ 组}$

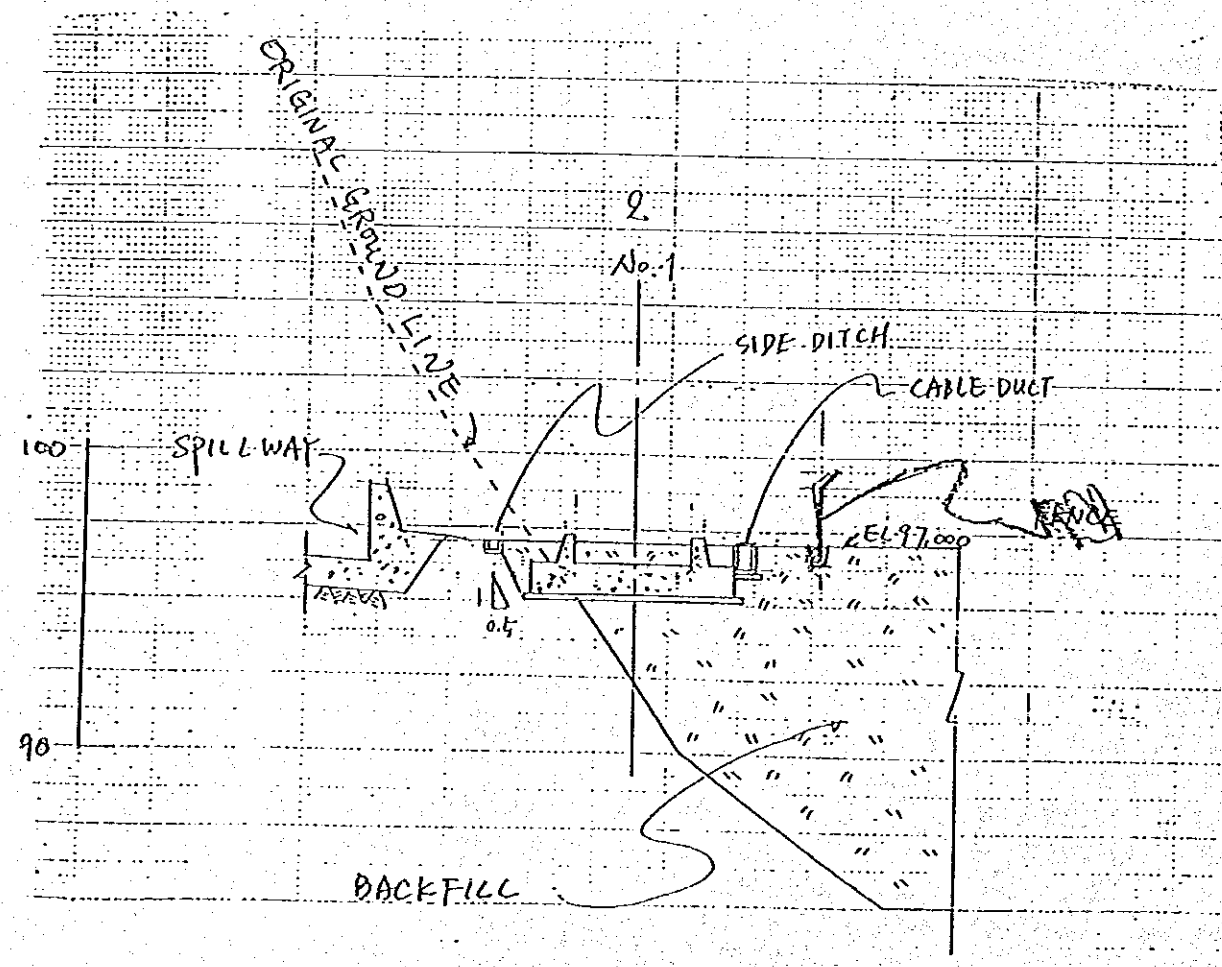
Weight =  $819.3 + 881.3 + 121.3 + 86.0 + 336.5 + 57.9 + 8.5$   
 $= 2310.8\text{ Kg}$



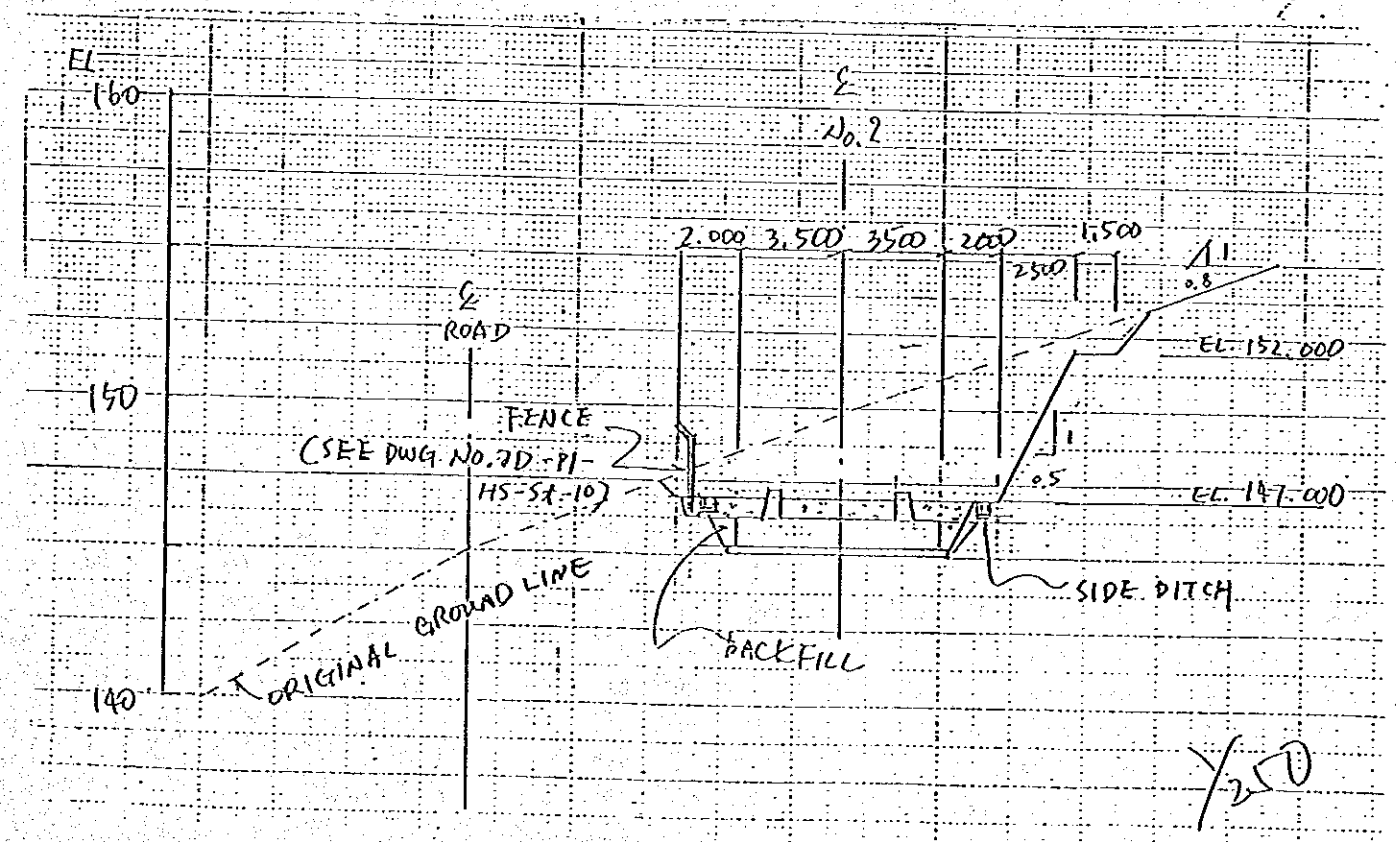
PLAN



PLAN



SECTION A-A



SECTION B-B





## FOUNDATION OF MAIN TRANSFORMER YARD

## 1. Concrete

$$V_1 = 5.50 \times 5.20 \times 1.20 - 0.40 \times 0.50 \times (5.05 + 4.15 + 4.50 + 0.95 + 0.95) - 0.40 \times 0.40 \times 0.80 \times 6 = 30.43 \text{ m}^3$$

$$V_2 = 3.00 \times 3.00 \times 1.20 = 10.80 \text{ m}^3$$

Cable Duct

$$V_3 = 0.70 \times 0.95 \times (10.60 + 11.20 + 1.00 \times 4 + 4.95)$$

$$+ 1.25 \times 0.95 \times 7.20 - 0.40 \times 0.80 \times (10.95 + 11.05$$

$$+ 1.15 \times 3 + 1.00 + 5.25 + 7.20 \times 2) = 14.41 \text{ m}^3$$

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$$\text{計} \quad 55.64 \text{ m}^3$$

## 2. Cobble stones

## ① Cobble stones for leveling

$$V_1 = 5.50 \times 5.20 \times 0.10 = 2.86 \text{ m}^3$$

$$V_2 = 3.00 \times 3.00 \times 0.10 = 0.90 \text{ m}^3$$

$$V_3 = 0.70 \times 0.10 \times (10.60 + 11.20 + 1.00 \times 4 + 4.95)$$

$$+ 1.25 \times 0.10 \times 7.20 = 3.05 \text{ m}^3$$

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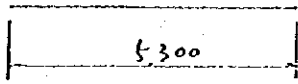

$$\text{計} \quad 6.81 \text{ m}^3$$

## ② Cobble stones in common

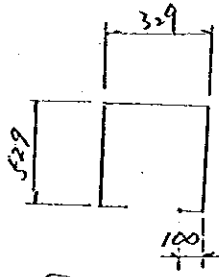
$$2 \times (2 \times 1.0 \times 1.0 + 5.8 \times 1.0) \times 1.0 = 15.6 \text{ m}^3$$

$$\text{Total} = \text{①} + \text{②} = 22.41 \text{ m}^3$$

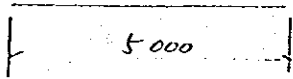




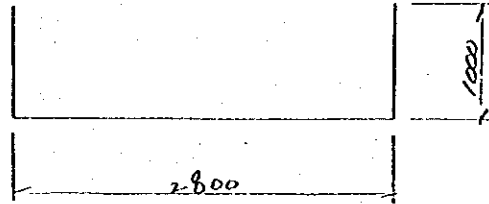
(B1) D16 - 36 x 5300



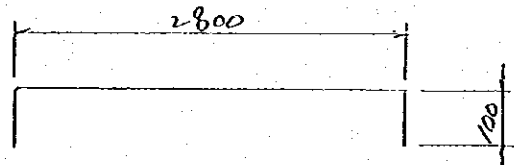
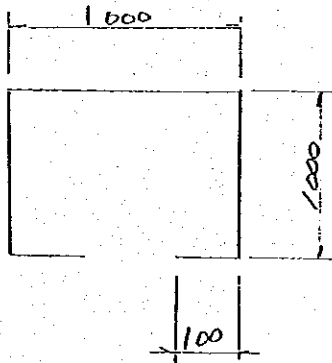
(B5) D13 - 64 x 1590



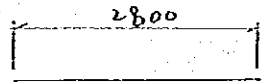
(B2) D16 - 48 x 5000



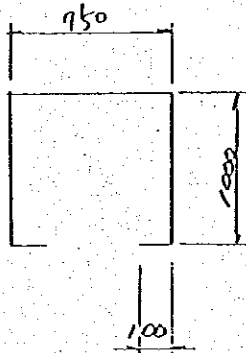
(B6) D16 - 10 x 4800



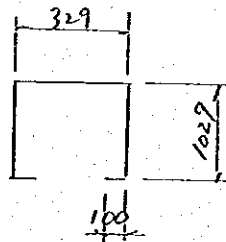
(B7) D16 - 10 x 3000



(B3) D16 - 18 x 3200

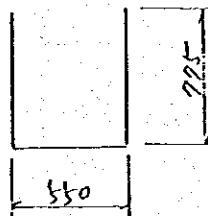


(B8) D16 - 24 x 2800



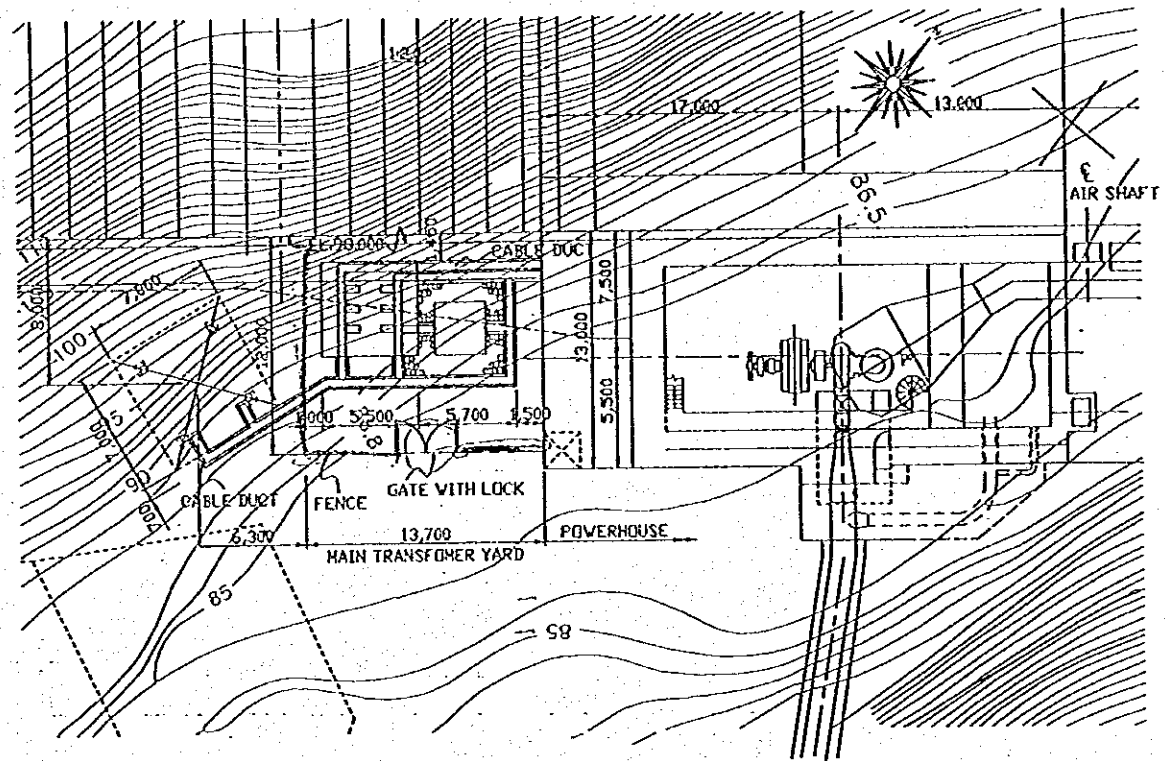
(B9) D13 - 32 x 2590

(B4) D16 - 36 x 2950

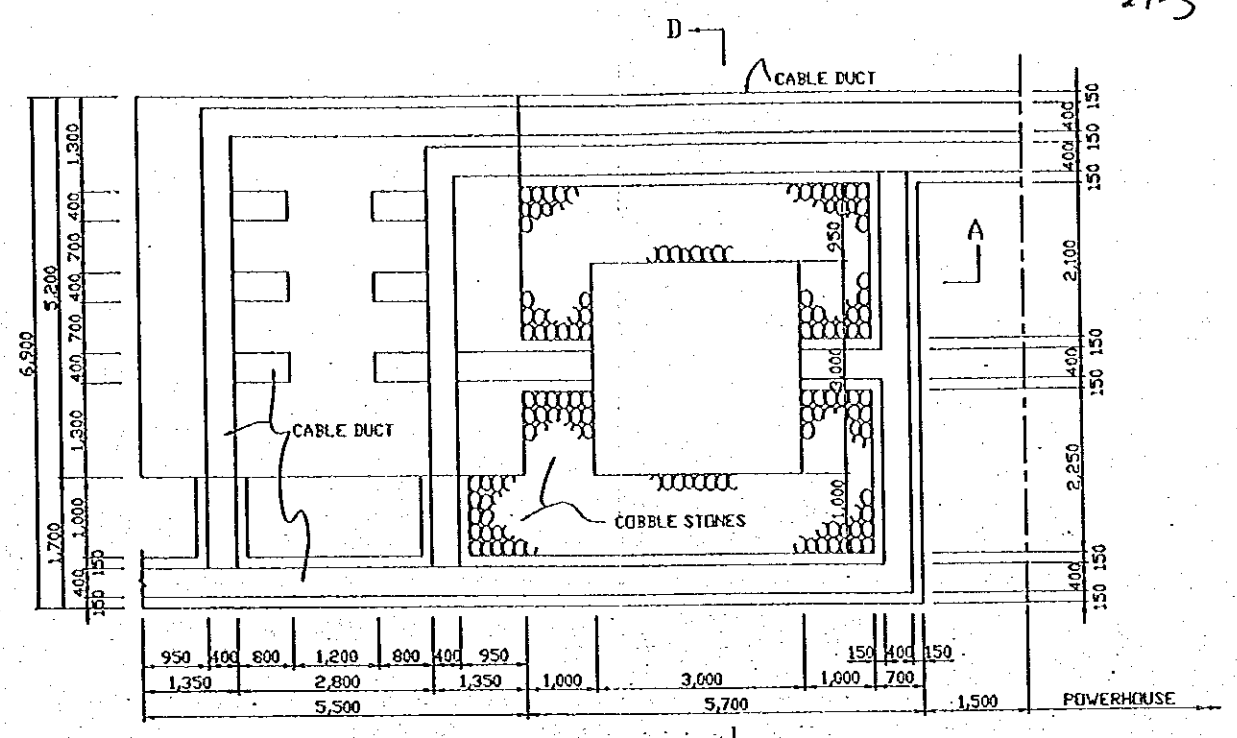


(D1) D13 - 150 x 2,100  
3-102

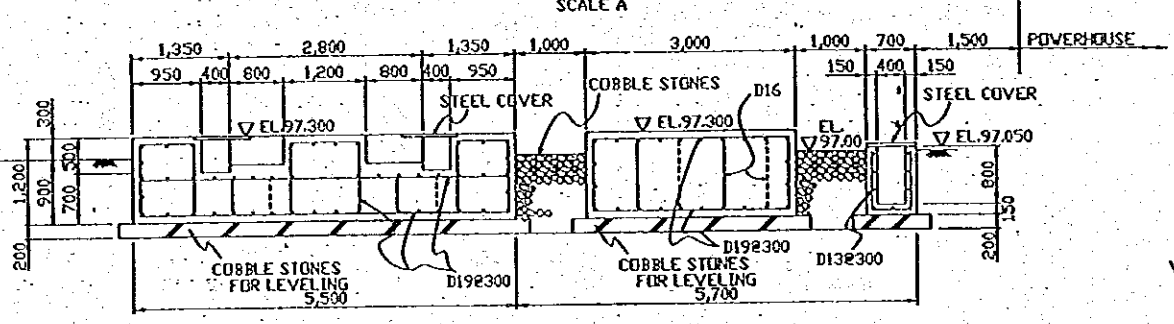




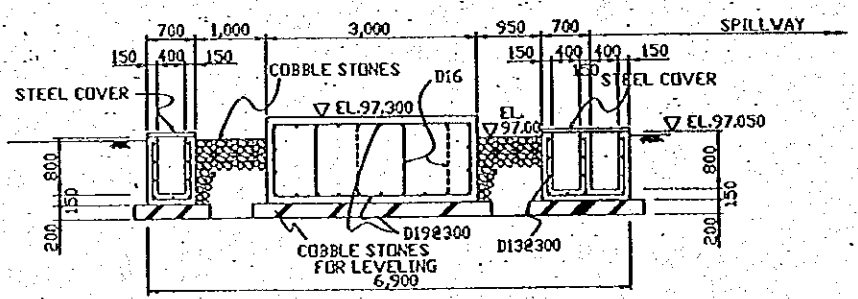
GENERAL PLAN  
SCALE A



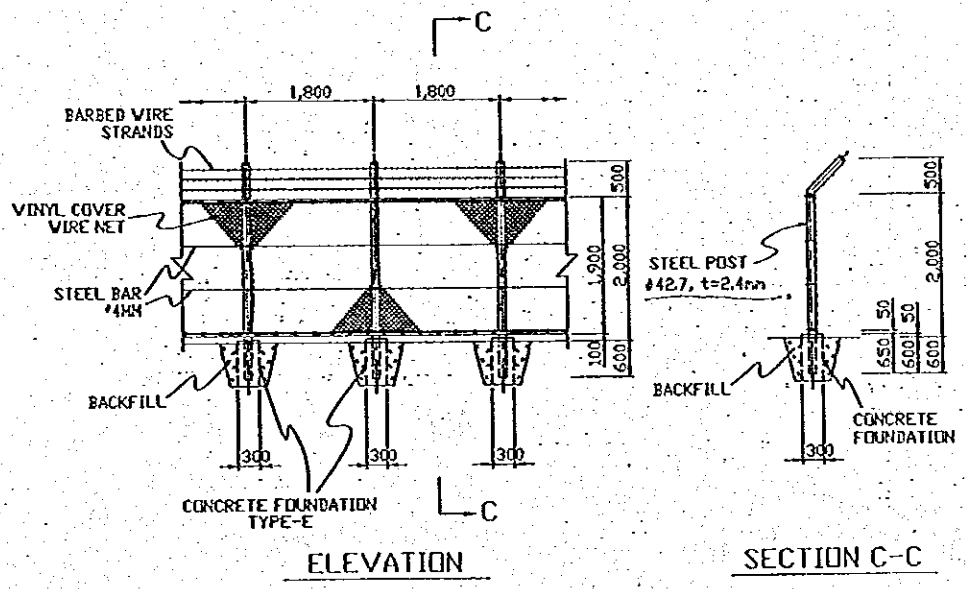
PLAN  
SCALE B



SECTION A-A  
SCALE B



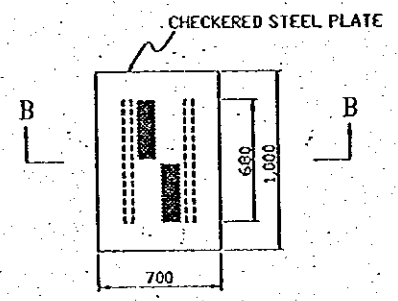
SECTION D-D  
SCALE B



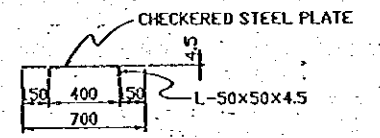
ELEVATION

SECTION C-C

WIRE NET FENCE  
SCALE B



PLAN



SECTION B-B  
STEEL COVER

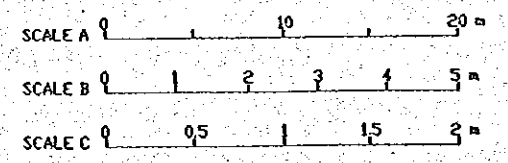
CABLE DUCT  
SCALE C

NOTES

1. ALL CABLE DUCTS SHALL BE COVERED WITH STEEL COVERS EXCEPT THE PART UNDER THE CUBICLES.
2. THE CABLE DUCT SHALL HAVE SLOPES FOR DRAINAGE TOWARD THE DRAINAGE SYSTEM IN THE POWERHOUSE AREA.
3. STEEL FOUNDATIONS AND OTHER MATERIALS FOR INSTALLATION OF THE TRANSFORMER AND THE CUBICLES ARE NOT SHOWN IN THIS DRAWING. THE STEEL FOUNDATIONS AND OTHER MATERIALS ARE SUPPLIED BY OTHER CONTRACTOR AND SHALL BE INSTALLED BY THE CIVIL CONTRACTOR.
4. THE AREA IN THE FENCE SHALL BE PAVED WITH GRAVEL OR CRUSHED AGGREGATES. (THICKNESS = 0.10 m)

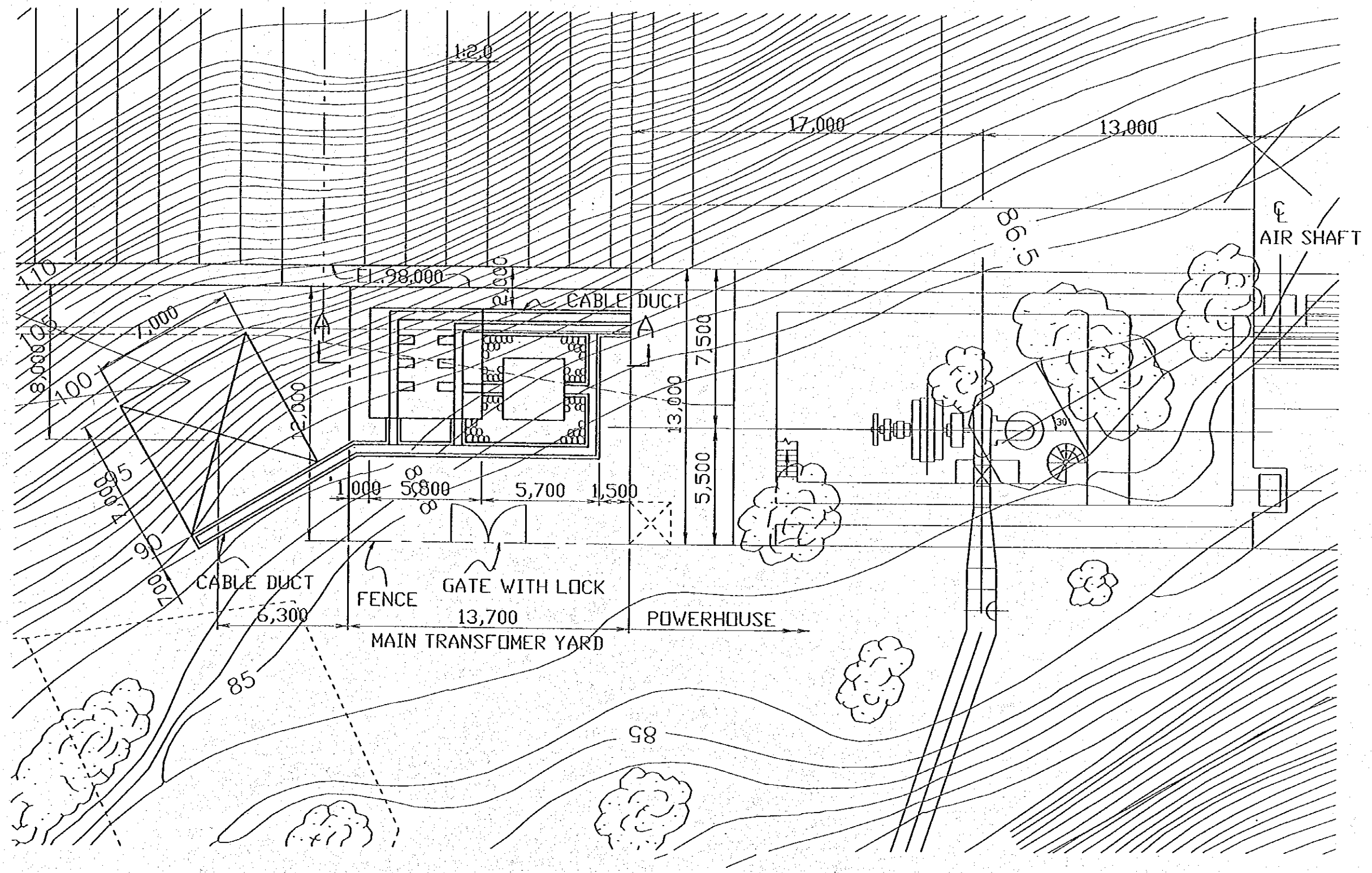
REFERENCE DRAWINGS

- JD-PI-HS-PI-1 GENERAL PLAN OF POWERHOUSE AREA
- JD-PI-HS-St-11 TRANSMISSION LINE TOWER FOUNDATION

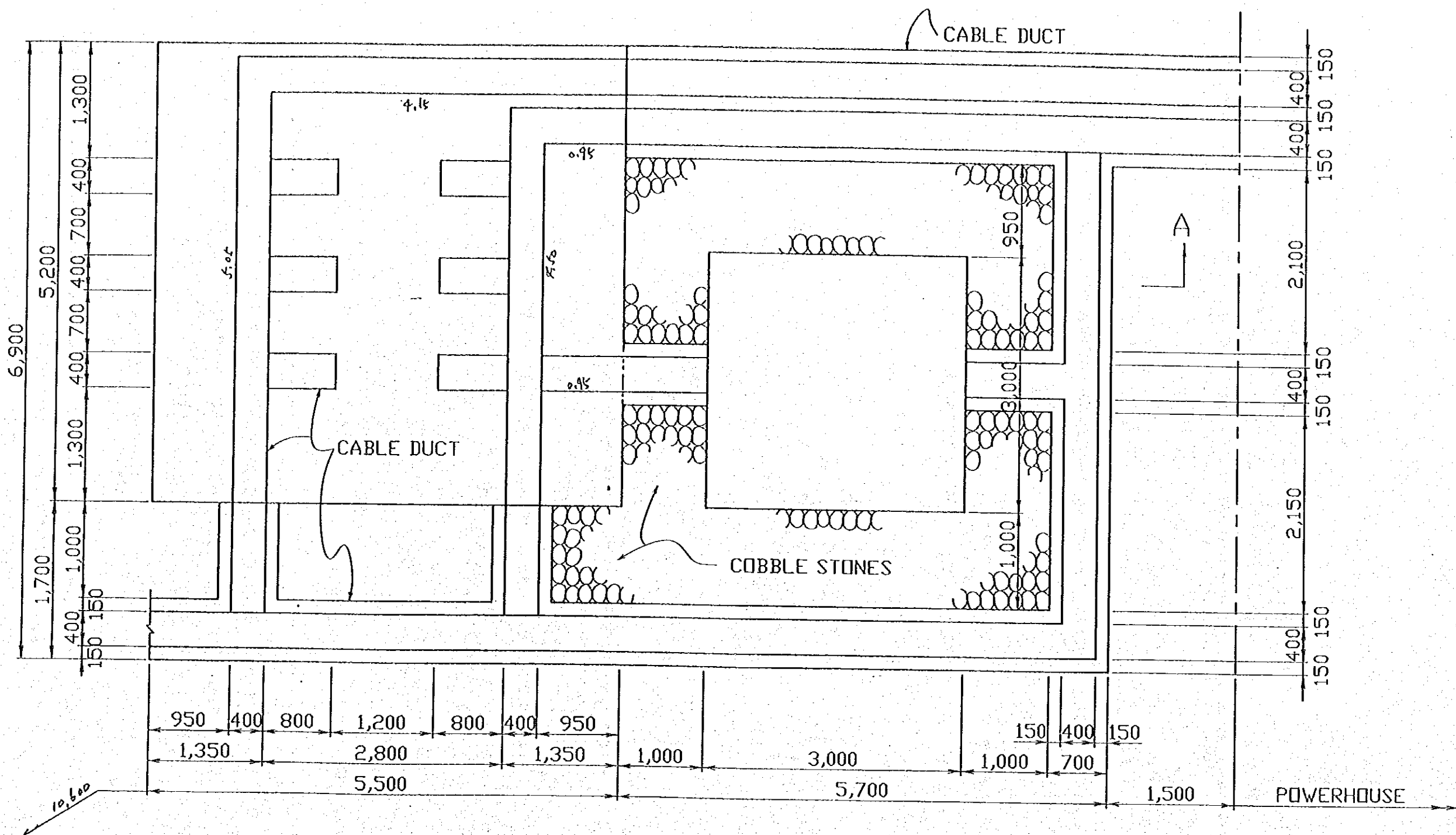


NO.	DATE	REVISIONS	ORIGINATED	DESIGNED	APPROVED	APPROVED

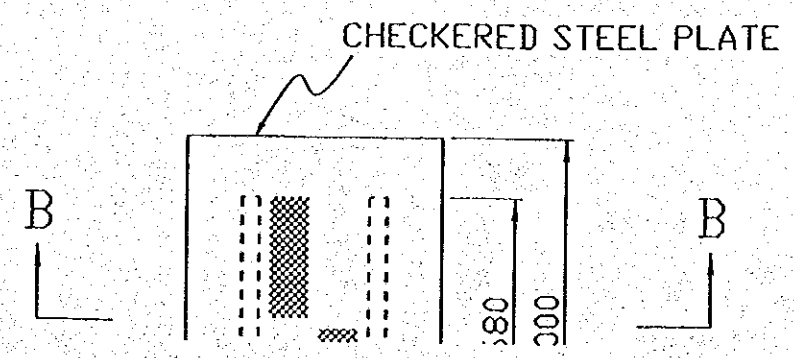
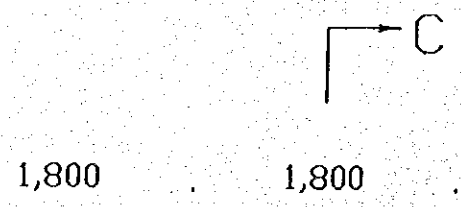
THE REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT AND DIRECTORATE GENERAL OF HUMAN SETTLEMENT		PROVINCE CENTRAL JAWA
TRATUNSELUNA FLOOD CONTROL PROJECT COMPONENT: JATIBARANG DAM CONSTRUCTION JATIBARANG DAM MANAGEMENT COMPLEX MAIN TRANSFORMER YARD FOUNDATION PLAN AND DETAILS		PROJECT NAME FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG BY THE REPUBLIC OF INDONESIA
BAHU INTERNATIONAL CONSULTING AGENCY CIVIL ENGINEERING COLLEGE, BAHU INTERNATIONAL PAKING, GORONTALO, INDONESIA		DISTRICT SEMARANG CITY
DESIGNED CHECKED		DRAWING NO. JD-PI-HS-14-10 SHEET NO.
CHIEF OF PLANNING AND DESIGN PROJECT MANAGER		DATE CONTRACT NO. 3-103



GENERAL PLAN  
SCALE A



PLAN  
SCALE B





## • Anchor Block.

### 1) Lean Concrete - TYPE-E

$$\textcircled{1} \frac{1}{2} (1.0 + 4.1) \times 3.9 \times 2.8 = 27.846 \text{ m}^3$$

$$\textcircled{2} (10.21 - 6.1) \times 4.1 \times 2.8 = 47.1828 \text{ m}^3$$

$$\textcircled{3} 3.1 \times 6.1 \times 2.4 = 45.384 \text{ m}^3$$

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$$120.4128 \text{ m}^3$$

### 2) Concrete.

$$\textcircled{1} \frac{1}{2} (1.0 + 4.1) \times 3.9 \times 3.925 = 39.034$$

$$\textcircled{2} (10.21 - 6.1) \times 4.1 \times 3.925 = 66.140$$

$$\textcircled{3} 3.1 \times 6.1 \times 4.6 = 86.986$$

$$\textcircled{4} -1.1 \times 2.6 \times (3.2 + 0.9) = -11.726$$

$$\textcircled{5} -\frac{1}{4}\pi \times 1.4^2 \times 2 \text{ m} = -3.079$$

$$\textcircled{6} -\frac{1}{4}\pi \times 0.65^2 \times 9.45 \text{ m} = -3.136$$

$$\textcircled{7} -\frac{1}{4}\pi \times 0.25^2 \times 3.10 \text{ m} = -0.152$$

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$$174.067 \text{ m}^3$$

### 3) Reinforcement Bars

$$\text{Total} = 5046.4 \text{ kg} \quad (\text{see P. 28-1})$$



Penstock (only 5m).

The following formula is used for computing the weights of the penstock and drainage pipes.

$$W = 0.02466 t (D - t) \times L$$

W : Weight of Pipe (kg)

t : Thickness of Pipe (mm)

D : Diameter of Outside (mm)

L : Length (m)

1).  $\phi 1400$  Pipe (  $l = 1.0$  m )

$$W = 0.02466 \times 9 \times (1400 + 2 \times 9 - 9) \times 1.0 = 312.71 \text{ kg.}$$

2)  $\phi 1400 \sim 300$  <sup>Pipe</sup> (  $l = 2.0$  m )

$$W = 0.02466 \times 9 \times [ ( 300 + 2 \times 9 - 9 )$$

$$+ ( 1400 + 2 \times 9 - 9 ) ] \times 0.5 \times 2.0 = 492.26 \text{ kg}$$

3).  $\phi 800$  Pipe (  $l = 2.0$  m )

$$W = 0.02466 \times 9 \times ( 800 + 2 \times 9 - 9 ) \times 2 = 359.10 \text{ kg.}$$

4)  $\phi 150$  Pipe (  $l = 11.0$  m )

$$W = 0.02466 \times 9 \times ( 150 + 2 \times 9 - 9 ) \times 11 = 388.17 \text{ kg}$$

## Grounding

17 EL. 97.500 Floor and GL (P. 33)

$$\text{Side: } 75.625 \times 3 + 14.077 + 12.083 + 16.308 + 4.022 + 2.306 = 275.67 \text{ m}$$

$$\begin{aligned} \text{Vertical: } & 2 \times 16.549 + 4 \times 16.513 + 18.480 \\ & + 0.908 + 2 \times 3.345 + 5.525 + 2.500 \\ & + 31.557 + 1.956 = 166.77 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Inclined: } & 21.781 + 15.287 + 7.857 + 8.403 \\ & + 14.979 + 18.523 = 86.83 \text{ m} \end{aligned}$$

$$\textcircled{x} \quad 41 \times 1.0 = 41.00 \text{ m}$$

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 Total 570.27 m

22. EL. 93.000 Floor. (P. 34)

$$\text{Side: } 2 \times 30 + 2.0 + 0.984 = 62.98 \text{ m}$$

$$\begin{aligned} \text{Vertical: } & 10.484 \times 3 + 1.587 + 1.35 + 1.516 \\ & + 0.803 + 8.218 = 44.93 \text{ m} \end{aligned}$$

$$\text{Inclined: } 0.467 + 1.86 = 2.33 \text{ m}$$

$$\textcircled{x} \quad 13 \times 1.0 = 13.00 \text{ m}$$

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 Total 123.24 m



3> EL. 84.900 Floor. (Page. 34)

$$\text{Side: } 2 \times 30.0 + 3.467 + 2.642 = 66.12 \text{ m}$$

$$\begin{aligned} \text{Vertical: } & 3 \times 10.484 + 2.35 + 1.0 + 2.547 \\ & + 1.9 + 2.5 + 3.056 = 44.81 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Inclined: } & 4.546 + 1.5 + 2.352 + 2.81 \\ & + 3.503 + 1.306 + 1.872 + 2.361 \\ & + 0.608 + 1.944 = 22.80 \text{ m} \end{aligned}$$

$$\textcircled{x} \quad 20 \times 1.0 = 20.0 \text{ m}$$

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$$\text{Total: } 153.73 \text{ m}$$

4> Section B-B (Page 34)

$$\text{Side: } 4 \times 28.5 + 2 \times 41.0 = 196.00 \text{ m}$$

$$\text{Vertical: } 3 \times 23.0 + 4 \times 10.5 + 3 \times 4.0 = 123.00 \text{ m}$$

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$$\text{Total: } 319.00 \text{ m}$$

$$\begin{aligned} \text{5> Tower: } & 7.083 + 31.667 + 2.514 \times 2 \\ & + 6.578 + 3.684 + 6.95 = 60.99 \text{ m} \end{aligned}$$

6> Powerhouse (Architecture work)

(Page 35)

$$3 \times (5.615 \times 2^2 + 3.096 \times 2^2) \\ + 2 \times 30.0 = 164.53 \text{ m}$$

7> Powerhouse (Civil Work)

① Section

$$(2 \times [10.277 + 5.821 + 1.201] + 23.0) \\ + 3 \times (17.5 \times 3 + 2 \times 12.5 + 1.0 + 23.0) = 382.65 \text{ m}$$

② Longitudinal

$$3 \times 30 + 32.0 = 121.67 \text{ m}$$

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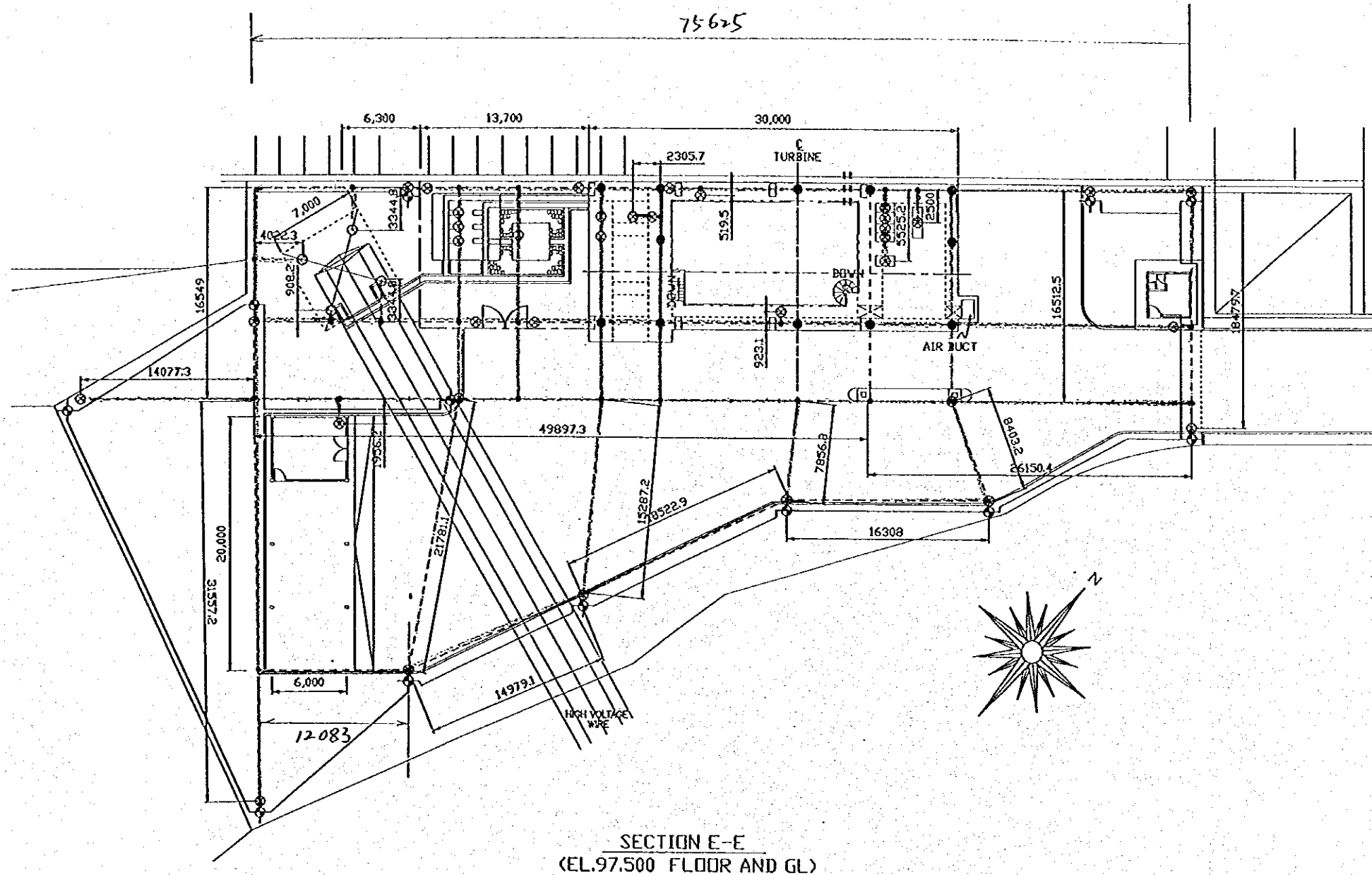
Total 504.32 m

8> Tailrace + Gate

$$41.667 + 16.667 = 58.33 \text{ m}$$

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$$\text{Total. } 1) + 2) + \dots + 8) = 1789.25 \text{ m}$$



SECTION E-E  
(EL.97.500 FLOOR AND GL)

**NOTES**

1. ALL GROUNDING CONDUCTORS AND CONNECTIONS SHALL BE EMBEDDED IN OR COVERED BY CONCRETE. GROUNDING FOR BUS HOUSING SHALL BE SUPPLIED AND INSTALLED BY CIVIL CONTRACTOR ACCORDING TO BUS DESIGN REQUIREMENTS.
2. JOINTS SHALL BE BRAZED USING ALLOY CPI TO BS 1845-1966 (15 % Ag + 5 % P + CU)
3. CURRENT AND VOLTAGE TRANSFORMERS, CAPACITORS, MOTOR STATOR CUBICLES AND CONTROL PANELS TO BE CONNECTED TO THE NEAREST EARTHING BUSBAR WITH NOT LESS THAN 70 mm<sup>2</sup> COPPER CONDUCTOR. OTHER SEPARATELY MOUNTED EQUIPMENT SHALL BE EARTHED BY COPPER CONDUCTOR AS REQUIRED BY TABLE 27 OF AS 3000 PART 1-1976 EXCEPT THAT WHERE A WIRE IS USED IT SHALL CONSIST OF AT LEAST 7 STRANDS.
4. ALL METAL SUCH AS PIPES, DOOR FRAMES AND HANDRAILS, WHICH ARE READILY ACCESSIBLE TO HAND CONTACT SHALL BE CONNECTED TO THE EARTH GRID. ITEMS EMBEDDED BY THE CIVIL CONTRACTOR, SUCH AS DOOR FRAMES, SHALL BE CONNECTED DIRECTLY TO THE EMBEDDED EARTHING GRID BY THE CIVIL CONTRACTOR. TO ENSURE ADEQUATE MECHANICAL STRENGTH, THE CONNECTIONS BETWEEN METAL WORK AND THE COPPER EARTHING BUSBARS SHALL BE LOCATED IN POSITIONS WHERE THEY ARE PROTECTED FROM DAMAGE AND SHALL BE MADE USING COPPER WIRE OF NOT LESS THAN 4 mm<sup>2</sup> AND NOT LESS THAN 7 STRANDS OR COPPER STRIP NOT LESS THAN 25 mm X 3 mm.
5. ITEMS NOT MARKED \* ARE SUPPLIED AND INSTALLED BY THE CIVIL CONTRACTOR.

**LEGEND**


- GROUND CABLE EMBEDDED (HCCC 60 mm<sup>2</sup>)
- GROUND CABLE RISER (UP)
- GROUND CABLE RISER (DOWN)
- |--- CRAMP-STYLE CONNECTION
- ⊗ GROUND CABLE TO BE CONNECTED TO GROUND SYSTEM IN ARCHITECTURAL WORK OR/AND E/H WORK

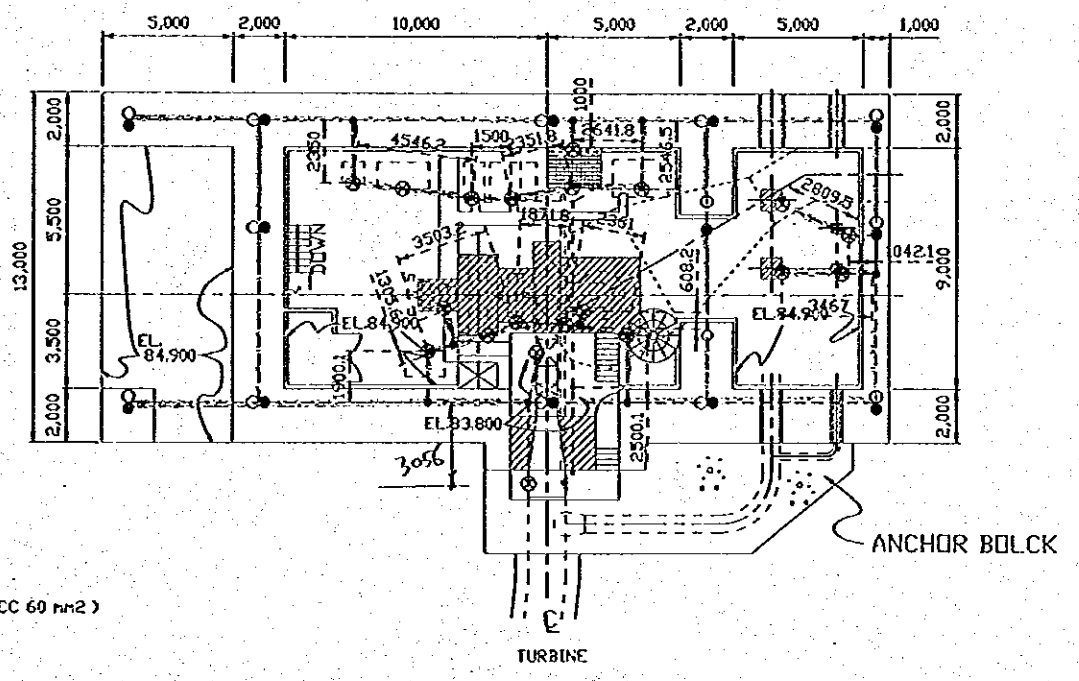
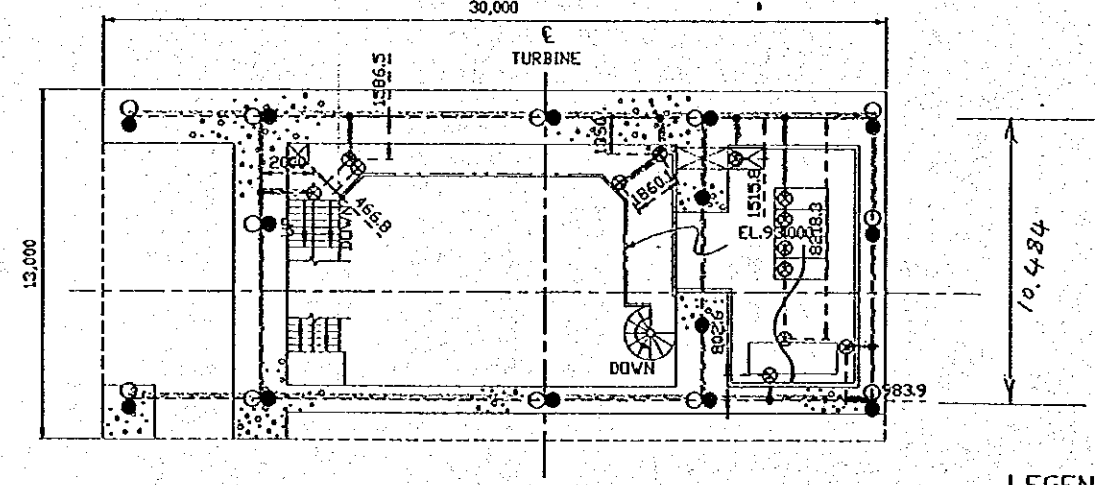
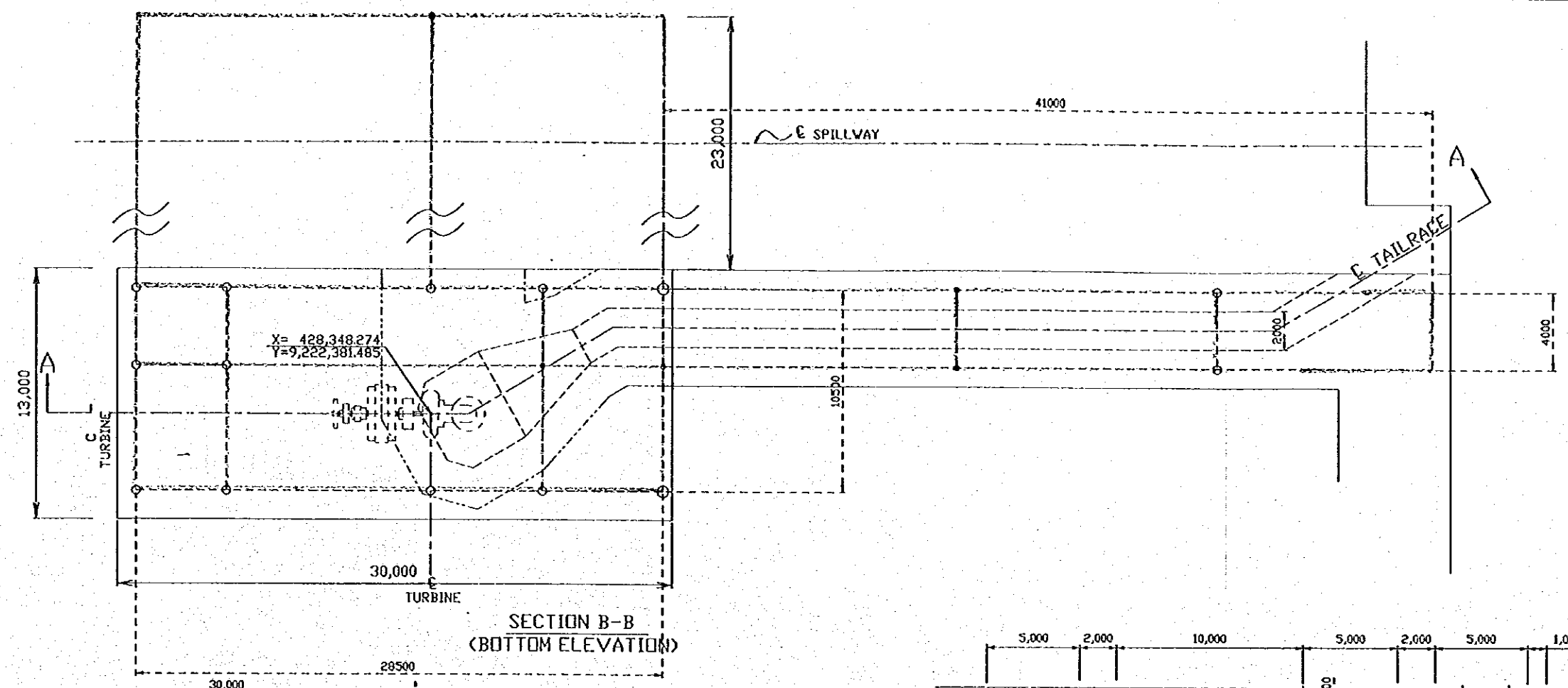
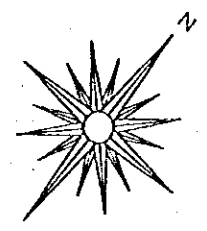
**REFERENCE DRAWINGS**

- JD-P1-HS-St-12 POWERHOUSE AREA GROUNDING WORK (SHEET 1 OF 2)
- EL-500 JATIBARANG DAM HYDROPOWER STATION COMPLEX LIGHTING CONDUCTOR PLAN AND DETAIL HYDROPOWER STATION

SCALE A 0 5 10 m

NO.	DATE	REVISION	ORIGINATED	DESIGNED	APPROVED

 <p>THE REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT AND DIRECTORATE GENERAL OF HUMAN SETTLEMENT</p>	PROVINCE	CENTRAL JAVA
	PROJECT NAME	FLOOD CONTROL, SLEUTH DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
	DISTRICT	SEMARANG CITY
	DRAWING NO.	JD-P1-HS-11-14
<p>JRATUNSELUMA FLOOD CONTROL PROJECT COMPONENT - JATIBARANG DAM CONSTRUCTION JATIBARANG DAM MANAGEMENT COMPLEX POWERHOUSE AREA GROUNDING WORK (SHEET 3 OF 3)</p>	DATE	CONTRACT NO.
<p>DESIGNED CHECKED</p>	<p>DATE</p>	3-113
<p>CHIEF OF PLANNING AND DESIGN PROJECT MANAGER</p>		



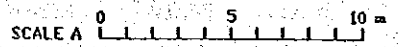
- LEGEND**
- GROUND CABLE EMBEDDED (HDCC 60 mm<sup>2</sup>)
  - GROUND CABLE RISER (UP)
  - GROUND CABLE RISER (DOWN)
  - CRAMP-STYLE CONNECTION
  - ⊗ GROUND CABLE TO BE CONNECTED TO GROUND SYSTEM IN ARCHITECTURAL WORK OR/AND E/H WORK

**NOTES**

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2. JOINTS SHALL BE BRAZED USING ALLOY CPI TO BS 1845-1966 (15% Ag + 5% P + CU)
3. CURRENT AND VOLTAGE TRANSFORMERS, CAPACITORS, MOTOR STATER CUBICLES AND CONTROL PANELS TO BE CONNECTED TO THE NEAREST EARTHING BUSBAR WITH NOT LESS THAN 70 mm<sup>2</sup> COPPER CONDUCTOR. OTHER SEPARATELY MOUNTED EQUIPMENT SHALL BE EARTHED BY COPPER CONDUCTOR AS REQUIRED BY TABLE 27 OF AS 3000 PART 1-1976 EXCEPT THAT WHERE A WIRE IS USED IT SHALL CONSIST OF AT LEAST 7 STRANDS.
4. ALL METAL SUCH AS PIPES, DOOR FRAMES AND HANDRAILS, WHICH ARE READILY ACCESSIBLE TO HAND CONTACT SHALL BE CONNECTED TO THE EARTH GRID. ITEMS EMBEDDED BY THE CIVIL CONTRACTOR, SUCH AS DOOR FRAMES, SHALL BE CONNECTED DIRECTLY TO THE EMBEDDED EATHING GRID BY THE CIVIL CONTRACTOR. TO ENSURE ADEQUATE MECHANICAL STRENGTH, THE CONNECTIONS BETWEEN METALWORK AND THE COPPER EARTHING BUSBARS SHALL BE LOCATED IN POSITIONS WHERE THEY ARE PROTECTED FROM DAMAGE AND SHALL BE MADE USING COPPER WIRE OF NOT LESS THAN 4 mm<sup>2</sup> AND NOT LESS THAN 7 STRANDS OR COPPER STRIP NOT LESS THAN 25 mm X 3 mm.
5. ITEMS NOT MARKED \* ARE SUPPLIED AND INSTALLED BY THE CIVIL CONTRACTOR.

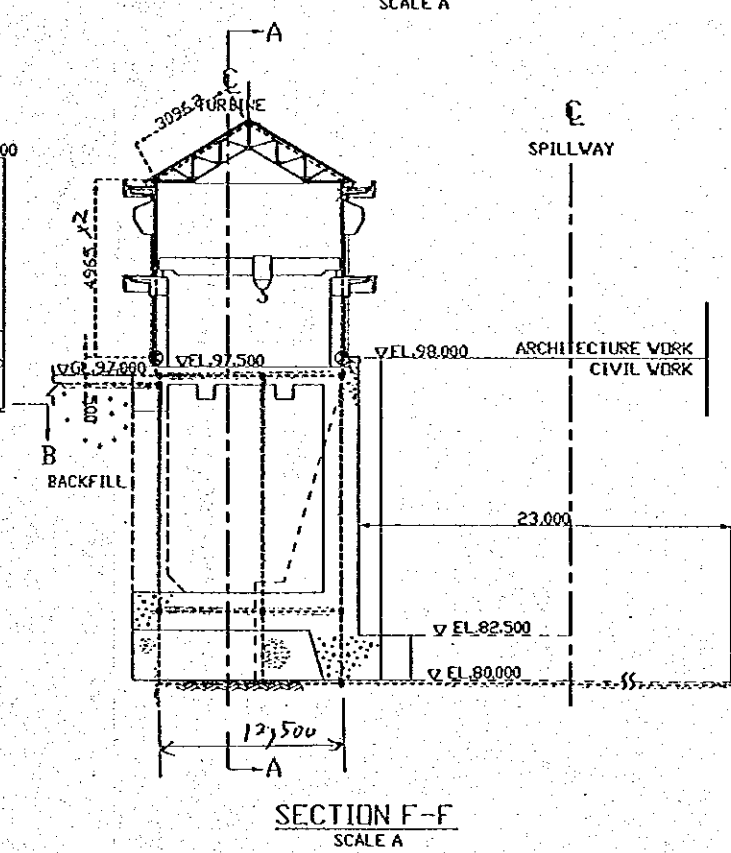
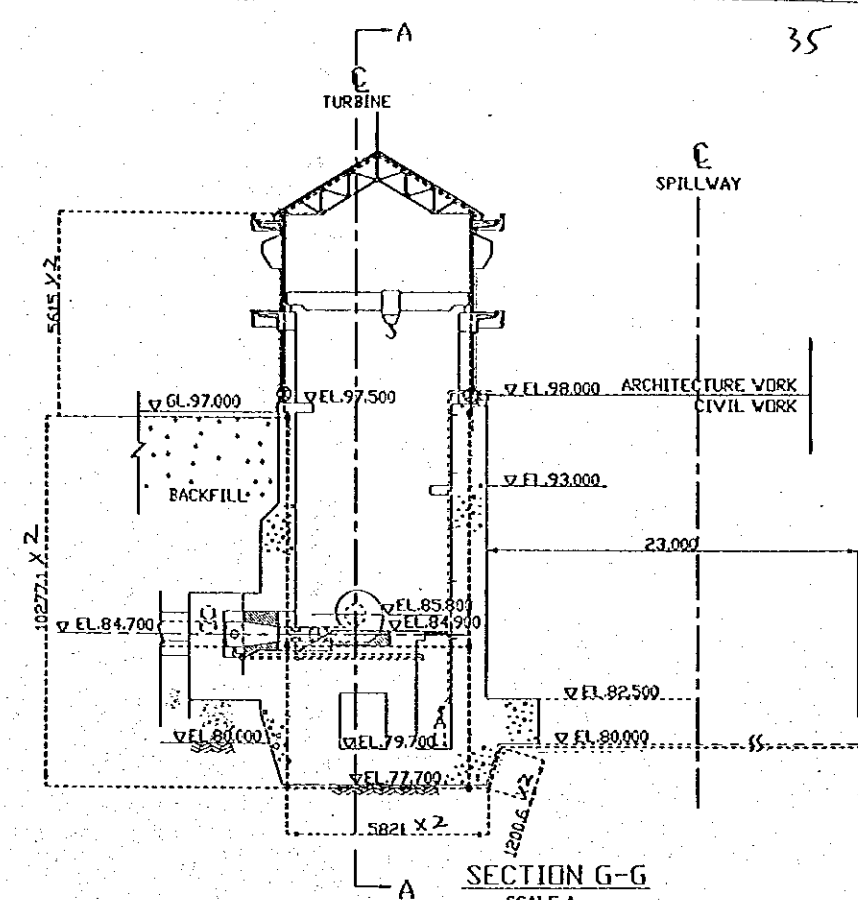
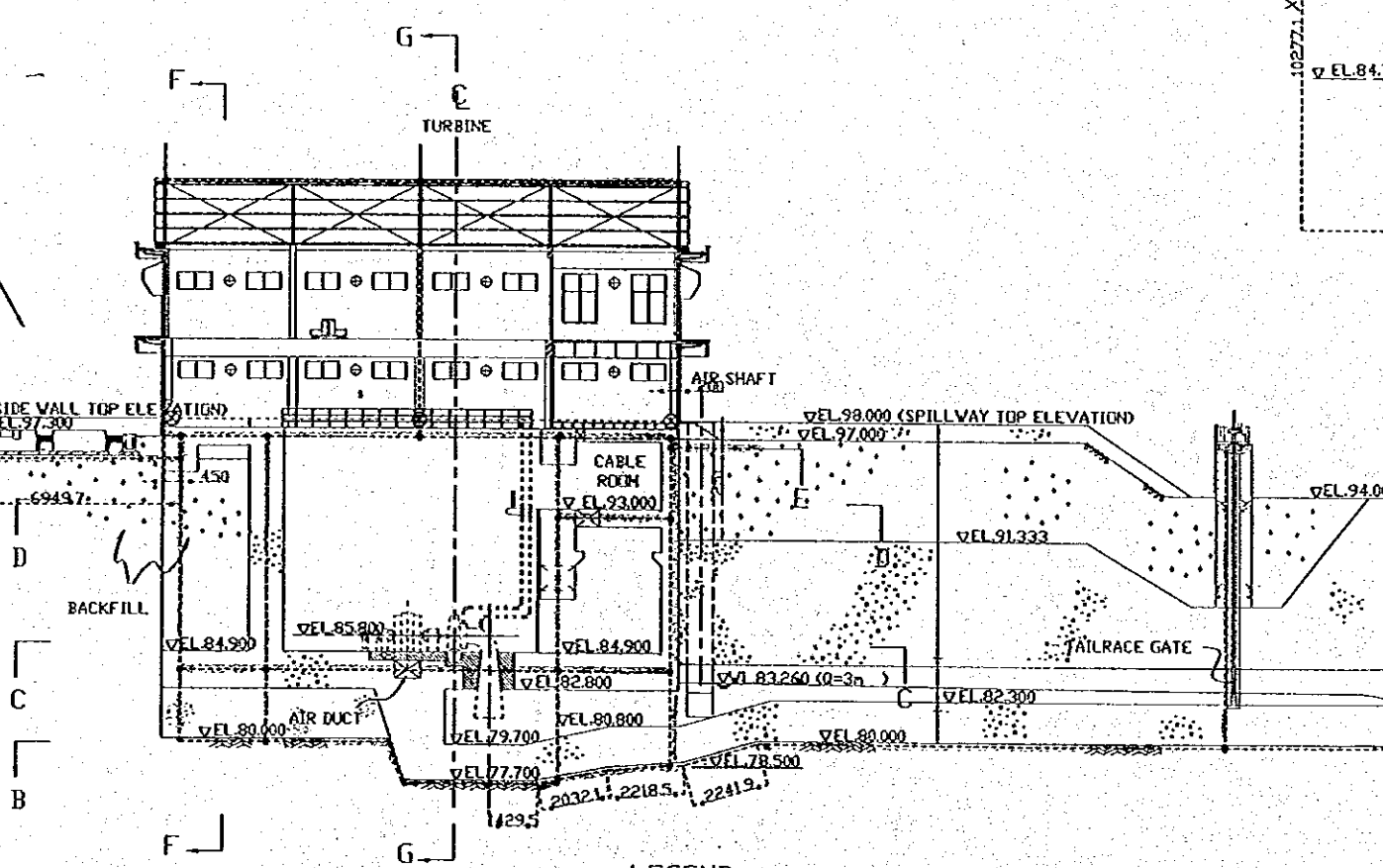
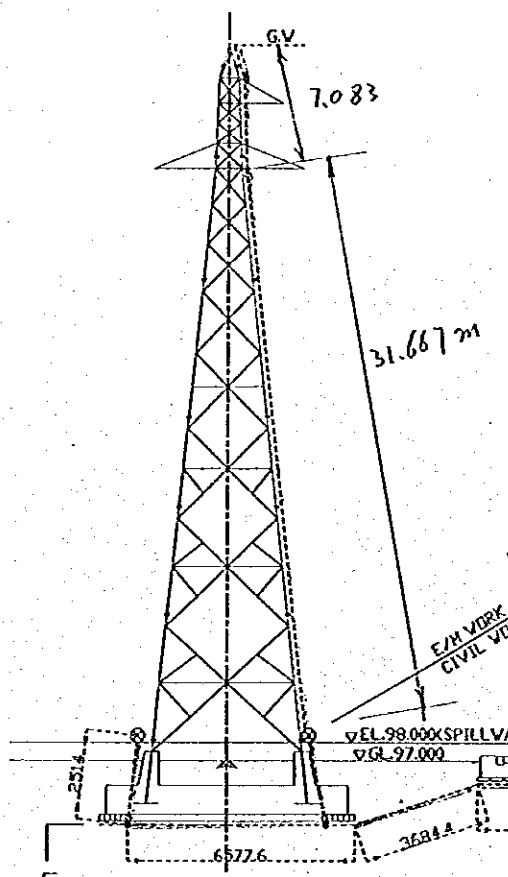
**REFERENCE DRAWINGS**

- JD-P1-HS-S4-12 POWERHOUSE AREA GROUNDING WORK (SHEET 1 OF 2)
- E1-500 JATIBARANG DAM HYDROPOWER STATION COMPLEX LIGHTING CONDUCTOR PLAN AND DETAIL HYDROPOWER STATION



NO.	DATE	REVISIONS	ORGANIZED	DESIGNED	APPROVED	APPROVED

THE REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT AND DIRECTORATE GENERAL OF HUMAN SETTLEMENT		PROVINCE CENTRAL JAVA
IRATUNSELUNA FLOOD CONTROL PROJECT COMPONENT - JATIBARANG DAM CONSTRUCTION JATIBARANG DAM MANAGEMENT COMPLEX POWERHOUSE AREA GROUNDING WORK (SHEET 2 OF 3)		PROJECT NAME FLOOD CONTROL, CREAM DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG IN THE REPUBLIC OF INDONESIA
DPM INTERNATIONAL CONSULTING SERVICE PT. BANGUNAN COLTIPO & ASSOCIATES PABLO CONSULTANTS INTERNATIONAL, INC. PABLO INTERNATIONAL INC.		DISTRICT SEMARANG CITY
DESIGNED CHECKED CHIEF OF PLANNING AND DESIGN PROJECT MANAGER		DRAWING NO. JD-P1-HS-S4-13 SHEET NO. 3-114



**NOTES**

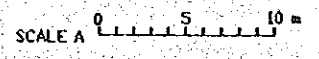
1. ALL GROUNDING CONDUCTORS AND CONNECTIONS SHALL BE EMBEDDED IN OR COVERED BY CONCRETE. GROUNDING FOR BUS HOUSING SHALL BE SUPPLIED AND INSTALLED BY CIVIL CONTRACTOR ACCORDING TO BUS DESIGN REQUIREMENTS.
2. JOINTS SHALL BE BRAZED USING ALLOY CPI TO BS 1845-1966 (15% Ag + 5% P + Cu)
3. CURRENT AND VOLTAGE TRANSFORMERS, CAPACITORS, MOTOR STATOR CUBICLES AND CONTROL PANELS TO BE CONNECTED TO THE NEAREST EARTHING BUSBAR WITH NOT LESS THAN 70 mm<sup>2</sup> COPPER CONDUCTOR. OTHER SEPARATELY MOUNTED EQUIPMENT SHALL BE EARTHED BY COPPER CONDUCTOR AS REQUIRED BY TABLE 27 OF AS 3000 PART 1-1976 EXCEPT THAT WHERE A WIRE IS USED IT SHALL CONSIST OF AT LEAST 7 STRANDS.
4. ALL METAL SUCH AS PIPES, DOOR FRAMES AND HANDRAILS, WHICH ARE READILY ACCESSIBLE TO HAND CONTACT SHALL BE CONNECTED TO THE EARTH GRID. ITEMS EMBEDDED BY THE CIVIL CONTRACTOR, SUCH AS DOOR FRAMES, SHALL BE CONNECTED DIRECTLY TO THE EMBEDDED EARTHING GRID BY THE CIVIL CONTRACTOR. TO ENSURE ADEQUATE MECHANICAL STRENGTH, THE CONNECTIONS BETWEEN METALWORK AND THE COPPER EARTHING BUSBARS SHALL BE LOCATED IN POSITIONS WHERE THEY ARE PROTECTED FROM DAMAGE AND SHALL BE MADE USING COPPER WIRE OF NOT LESS THAN 4 mm<sup>2</sup> AND NOT LESS THAN 7 STRANDS OR COPPER STRIP NOT LESS THAN 25 mm X 3 mm.
5. ITEMS NOT MARKED \* ARE SUPPLIED AND INSTALLED BY THE CIVIL CONTRACTOR.

**LEGEND**

- GROUND CABLE EMBEDDED (HDCC 60 mm<sup>2</sup>)
- GROUND CABLE RISER (UP)
- GROUND CABLE RISER (DOWN)
- ⊙ CRAMP-STYLE CONNECTION
- ⊙ GROUND CABLE TO BE CONNECTED TO GROUND SYSTEM IN ARCHITECTURAL WORK OR/AND E/M WORK

**REFERENCE DRAWINGS**

- JD-P1-HS-St-13 POWERHOUSE AREA GROUNDING WORK (SHEET 2 OF 2)
- E1-500 JATIBARANG DAM HYDROPOWER STATION COMPLEX LIGHTING CONDUCTOR PLAN AND DETAIL HYDROPOWER STATION



NO.	DATE	REVISIONS	ORIGINATED	DESIGNED	APPROVED	APPROVED	DESIGNED	CHECKED

THE REPUBLIC OF INDONESIA MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT AND DIRECTORATE GENERAL OF HUMAN SETTLEMENT		PROVINCE CENTRAL JAVA
PRATUNSELUNA FLOOD CONTROL PROJECT COMPONENT: JATIBARANG DAM CONSTRUCTION JATIBARANG DAM MANAGEMENT COMPLEX POWERHOUSE AREA GROUNDING WORK (SHEET 1 OF 3)		PROJECT NAME FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT OF SEMARANG IN THE REPUBLIC OF INDONESIA
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) THROUGH ODA TO FINANCE THE PACIFIC CONSULTANTS INTERNATIONAL, INC. (PCI) THROUGH ODA TO FINANCE THE JATIBARANG DAM PROJECT		DISTRICT SEMARANG CITY
DATE _____		DRAWING NO. JB-P1-HS-11-12
CONTRACT NO. _____		SHEET NO. 3-115
CHIEF OF PLANNING AND DESIGN PROJECT MANAGER		