V07

4 × 8.0 + 3.0 = 35.000

# CONCRETE VOLUME

## (1) SLAB

| | | |
|---|---|---|
| $V_a = 18.079^{m^3} \times 1/18.970 \times 34.970$ | = | $33.327^{m^3}$ |
| $V_b = 0.279^{m^3} \times 1$ | = | $0.279^{"}$ |
| $V_c = 0.288^{"} \cdot 3$ | = | $0.864^{"}$ |
| $V_d = 0.127^{"} \times 1$ | = | $0.127^{"}$ |
| $V_e = 10.956^{"} \times 1/18.970 \times 34.970$ | = | $20.197^{"}$ |
| SLAB TOTAL | | $54.794^{m^3}$ |

## (2) BEAM

### 1) LONGITUDINAL BEAM

| | | |
|---|---|---|
| $V_a = 14.212^{m^3} \times 1/18.220 \times 34.220$ | = | $26.692^{m^3}$ |
| $V_b = 0.144^{"} \cdot 9 \times 2$ | = | $2.592^{"}$ |
| SUB TOTAL = | | $29.284^{m^3}$ |

2) AT END OF VIADUCT. TRANSVERSE BEAM

END (1)

$V = 4.908 \times 1$

$4.908\ m^3$

3) AT END OF VIADUCT TRANSVERSE BEAM

END (2)

$V = 0.585\ m^3 \times 1$

$0.585\ m^3$

4) AT INTERMEDIATE OF VIADUCT. TRANSVERSE BEAM

| | | |
|---|---|---|
| $Va = 0.936\ m^3 \times 4$ | = | $3.744\ m^3$ |
| $Vb = 0.006\ m^3 \times 4$ | = | $0.024\ m^3$ |
| SUB TOTAL = | | $3.768\ m^3$ |

5) BASE OF ELECTRIC POLE

$V = 0.684\ m^3 \times 1$

$(0.684\ m^3)$

6) ELECTRIC POLE

$V = 0.358^{m^3} \times 1$

| | |
|---|---|
| | ( $0.358^{m^3}$ ) |
| 5) + 6) ( ELECTRIC TOTAL = | $1.042^{m^3}$ ) |
| (1) BEAM TOTAL | $38.545^{m^3}$ |
| ((2) BEAM TOTAL | $39.587^{m^3}$ ) |

(3) COLUMN

1) AT END OF VIADUCT COLUMN

$Va = 0.360^{m^2} \times (H_2 - 1.700) \times 2$

7.058

| | |
|---|---|
| | $3.858^{m^3}$ |

2) AT INTERMEDIATE OF VIADUCT COLUMN

$Va = 0.360^{m^2} \times (H \text{ (VARIES)} - 0.900) \times 8$

6.910

| | |
|---|---|
| | $17.309^{m^3}$ |
| COLUMN TOTAL | $21.167^{m^3}$ |

(4) FOOTING

| | | |
|---|---|---|
| Va = 10.752 m³ × 5 | = | 53.760 m³ |
| Vb = 2.880 " , 5 | = | 14.400 " |
| FOOTING TOTAL | | 68.160 m³ |

(5) BRACING BEAM

| | | |
|---|---|---|
| Va = 1.572 m³ , 2 | = | 3.144 m³ |
| Vb = 1.680 " × 2 × 3 | = | 10.080 " |
| BRACING BEAM TOTAL | | 13.224 m³ |
| (4) + (5) TOTAL | | 81.384 m³ |

(6) CURB

V = 3.319 m³ × 1/18.970 × 34.970

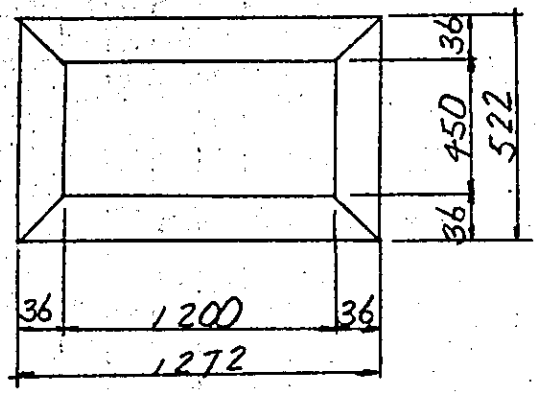
| | |
|---|---|
| CURB TOTAL | 6.118 m³ |

(7) GRADING CONCRETE

V = 6.640 m³ × 1/18.970 × 34.970

| | |
|---|---|
| GRADING CONCRETE. TOTAL | 12.240 m³ |

## (8) FOUNDATION MORTAR




h= 36

$$Va' = \{1.272 \times 0.522 + (1.272 + 1.200)(0.522 + 0.450) + 1.200 \times 0.450\} \times 1/6 \times 0.036 = 0.022$$

$Va = Va' \times 2$ = 0.044 $m^3$

FOUNDATION MORTAR TOTAL = 0.044 $m^3$

(9) LEVELING CONCRETE

| | | |
|---|---|---|
| Va = 1.700 m³ × 5 | = | 8.500 m³ |
| Vb = 0.300 " × 2 | = | 0.600 " |
| Vc = 0.322 " × 2 × 3 | = | 1.932 " |
| LEVELING CONCRETE TOTAL | | 11.032 m³ |

(10) AGGREGATE SUB BASE

| | | |
|---|---|---|
| Va = 3.400 m³ × 5 | = | 17.000 m³ |
| Vb = 0.601 " × 2 | = | 1.202 " |
| Vc = 0.644 " × 2 × 3 | = | 3.864 " |
| AGGREGATE SUB BASE TOTAL | | 22.066 m² |

(11) PILES

φ = 350 ℓ = 11 000 n = 12 × 4 = 48

| | | |
|---|---|---|
| A = ———— | A | —— NUMBER |
| B = 11.0 × 48 | B | 48 |

## (12) EXCAVAION

### 1) FOOTING

$V = 17.000^{m^2} \times 2.100 \times 5$

| | | |
|---|---|---|
| | | $178.500^{m^3}$ |

### 2) BRACING BEAM

| | | |
|---|---|---|
| $V_a = 3.003^{m^2} \times 2.100 \times 2$ | = | $12.613^{m^3}$ |
| $V_b = 3.220^{"} \times 2.100 \times 6$ | = | $40.572^{"}$ |
| SUB TOTAL= | | $53.185^{m^3}$ |

| | |
|---|---|
| EXCAVAION TOTAL | $231.685^{m^3}$ |

# FORM AREA

## (1) SLAB

| | | |
|---|---|---|
| Aa = 12.998 m² × 1 | = | 12.998 m² |
| Ab = 14.800 " × 3 | = | 44.400 " |
| Ac = 2.860 " × 1 | = | 2.860 " |
| Ad = 4.291 " × 1 | = | 4.291 " |
| Ae = 4.487 " × 3 | = | 13.461 " |
| Af = 1.093 " × 1 | = | 1.093 " |
| Ag = 1.454 " × 5 | = | 7.270 " |
| Aa = 0.289 m² × 4 | = | 1.156 m² |
| Ab = 1.269 m × 34.970 × 2 | = | 88.754 " |
| −Ac = 0.952 × 1 | = | ⊖ 0.952 " |
| (POLE) Ad = 1.862 × 1 | = | 1.862 " |
| (1) SLAB TOTAL | | 178.145 m² |
| (2) SLAB TOTAL POLE | | 177.193 " |

## (2) BEAM

### 1) LONGITUDINAL BEAM

| | | | |
|---|---|---|---|
| $Aa'$ = | 7.799 m² | = | 7.799 m² |
| $Ab'$ = | 4.332 " | = | 4.332 " |
| $Ac'$ = | 8.140 " × 3 | = | 24.420 " |
| $Ad'$ = | 4.518 " × 3 | = | 13.554 " |
| $Ae'$ = | 2.608 " | = | 2.608 " |
| $Af'$ = | 1.557 " | = | 1.557 " |
| $Ag'$ = | 0.330 " | = | 0.330 " |
| $Ah'$ = | 0.240 m² × 2 × 9 | = | 4.320 " |
| $A'$ = | | | 58.920 " |

$A = A' \times 2$ = 117.840 m²

117.840 m²

### 2) ATEND OF VIADUCT TRANSVERSE BEAM

AT END (1)

$A'$ = 16.295 m² × 1 = 16.295 m²

$A_{POLE}$ = 16.115 " × 1 ( = 16.115 m² )

| | | |
|---|---|---|
| 3) AT END OF VIADUCT TRANSVERSE BEAM | | |
| END (2) | | |
| Aa = 3.120 × 1 | = | 3.120 $m^2$ |
| | | 3.120 $m^2$ |
| 4) AT INTERMDIATE OF VIADUCT | | |
| TRANSVESE BEAM | | |
| Aa = 2.600 × 4 | = | 10.400 $m^2$ |
| Ab = 0.020 × 4 | = | 0.080 " |
| Ac = 1.609 × 4 | = | 6.436 " |
| SUB TOTAL | = | 16.916 $m^2$ |
| 5) BASE OF ELECTRIC POLE | | |
| A = 3.643 $m^2$ × 1 | | |
| | ( | 3.643 $m^2$ ) |
| 6) ELECTRIC POLE | | |
| A = 4.189 $m^2$ × 1 | | |
| | ( | 4.189 $m^2$ ) |
| 5)+6) (ELECTRIC TOTAL | | 7.832 $m^2$ ) |
| (1) BEAM TOTAL | | 154.171 $m^2$ |
| (2) (BEAM TOTAL | | 162.003 $m^2$ ) |

## (3). COLUMN

### 1). ATEND OF VIADUCT COLUMN

$Aa = 0.600 \times (H_2 \times 4 - 6.900) \times 2$ (7.058) $= 25.598\ m^2$

$25.598\ m^2$

### 2) AT INTER MEDIATE OF VIADUCT COLUMN

$Aa = 0.600 \times (H \times 4 - 3.900) \times 8$ (VARIES, 6.910) $= 113.952\ m^2$

$-A_{b\ POLE} = 0.600 \times 0.550 = -0.330\ m^2$ $(-\ominus\ 0.330)$

$113.952\ m^2$

$(113.622\ m^2)$

COLUMN TOTAL $139.550\ m^2$

(COLUMN TOTAL (POLE) $139.220\ m^2$)

(4) FOOTING

| | | |
|---|---|---|
| Aa = 5.680 m² × 2 | = | 11.360 m² |
| Ab = 6.020 " × 2 | = | 12.040 " |
| Ac = 5.680 " × 3 | = | 17.040 " |
| Ad = 5.320 " × 3 | = | 15.960 " |
| FOOTING TOTAL | | 56.400 m² |

(5) BRACING BEAM

| | | |
|---|---|---|
| Aa = 6.286 m² × 2 | = | 12.572 m² |
| Ab = 6.720 " × 6 | = | 40.320 " |
| BRACING TOTAL | | 52.892 m² |

(6) CURB

A = 34.496 × 1/18.970 × 34.970

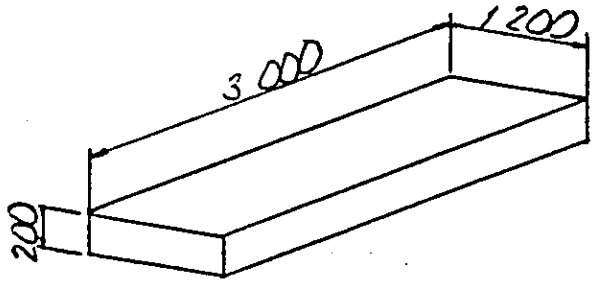
| | |
|---|---|
| CURB TOTAL | 63.591 m² |

# SIGNAL SPACE

$L = 3000$

# CONCRETE VOLUME

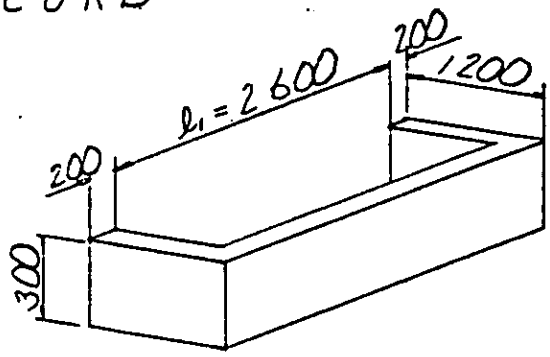
## (1) SLAB




$V = 1.200 \times 0.200 \times 3.000 = 0.720\ m^3$

SLAB TOTAL $0.720\ m^3$

## (2) CURB

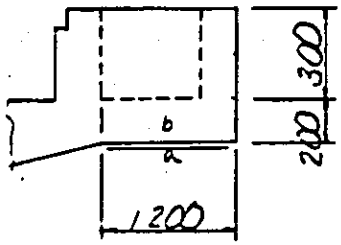



$V = 0.200 \times 0.300 \times (1.200 \times 2 + 2.600) = 0.300\ m^3$ ($\ell_1$)

CURB TOTAL $0.300\ m^3$

# FORM AREA

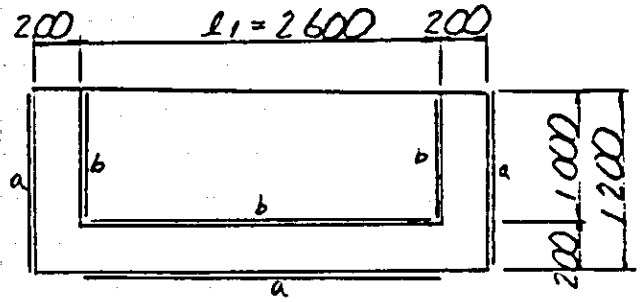
## (1) SLAB




$\ell = 3000$

| | | |
|---|---|---|
| $A_a = 1.200 \times 3.000$ | = | $3.600\ m^2$ |
| $A_b = 0.200 \times 1.200 \times 2$ | = | $0.480\ "$ |
| SLAB TOTAL | | $4.080\ m^2$ |

## (2) CURB




$h = 300$

| | | |
|---|---|---|
| $A_a = 0.300 \times (1.200 \times 2 + 2.600)$ | = | $1.500\ m^2$ |
| $A_b = 0.300 \times (1.000 \times 2 + 2.600)$ | = | $1.380\ "$ |
| CURB TOTAL | | $2.880\ m^2$ |

# REINFORCING BAR

No. 158

| REINF. NO. | DIA. (mm) | U. WEIGHT (kg/m) | LENGTH (mm) | NUMBER | WEIGHT (kg) | REMARKS |
|---|---|---|---|---|---|---|
| | SIGNAL | | | | | |
| | L=3000 | | | | | |
| | SLAB | | | | | |
| S 31 | D13 | 0.995 | 3840 | 25 | 95.5 | ⊃ |
| 32 | 〃 | 〃 | 1590 | 13 | 20.6 | — |
| 33 | 〃 | 〃 | 2930 | 11 | 32.1 | — |
| | | | | D13 | 1482 kg | |
| | | | SLAB | TOTAL | 1482 kg | |
| | CURB | | | | | |
| W 31 | D13 | 0.995 | 2930 | 4 | 11.7 | — |
| 32 | 〃 | 〃 | 1370 | 36 | 49.1 | ⊓ |
| 33 | 〃 | 〃 | 1460 | 8 | 11.6 | ⌋ |
| | | | | D13 | 72.4 kg | |
| | | | CURB | TOTAL | 72.4 kg | |

JICA

# 6. VIADUCT. V002

## 30M000

| | n |
|---|---|
| V002 ~ 003 | 2 |
| V025 ~ 026 | 2 |
| V049 | 1 |
| V080 ~ 084 | 5 |
| V099 ~ 100 | 2 |
| V103 ~ 122 | 20 |

# VIADUCT V 048. L = 30.000 (POLE)
H = 7.820

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (kg) | RATIO ($kg/m^3$) |
|---|---|---|---|---|
| SLAB | 47.0 | 153.1 | 3676.1 | 78.2 |
| BEAM | 31.4 | 132.6 | 9735.1 | 310.0 |
| COLUMN | 19.9 | 131.4 | 5140.9 | 258.3 |
| CURB | 5.2 | 54.3 | 591.7 | 113.8 |
| GRADING CONCRETE | 10.5 | ——— | ——— | ——— |
| TOTAL | 113.0 | 464.5 | 18799.1 | 167.9 |
| FOOTING | 48.8 | 42.6 | 5463.2 | 112.0 |
| BRACING BEAM | 10.1 | 40.3 | 2731.5 | 270.4 |
| TOTAL | 58.9 | 82.9 | 8194.7 | 139.1 |

| | UNIT | QUANTITY | REMARKS |
|---|---|---|---|
| LEVELING CONCRETE | $M^3$ | 8.1 | CLASS F |
| AGGREGATE SUB BASE | $M^3$ | 16.1 | A.S.B.-3 |
| EXCAVATION | $M^3$ | 145.4 | |
| FOUNDATION MORTAR | $M^3$ | ——— | $\sigma_{ck}$ = 400 $kg/cm^2$ |
| PILE | M x NUMBER | A- 8 x 48<br>B- 8 x 48 | Φ350 - A<br>Φ350 - B |

# VIADUCT V048 L=30 000 (H=7.820)
## (ELECTRIC POLE) (AT. INTER)

SD 30 UNIT : Kg.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | —— | —— | —— | —— | —— | —— | 3676.1 | —— | 3676.1 |
| BEAM | —— | —— | 6023.1 | 102.1 | 735.7 | 147.7 | 2726.5 | —— | 9735.1 |
| COLUMN | —— | —— | 4492.0 | —— | —— | —— | 648.9 | —— | 5140.9 |
| CURB | —— | —— | —— | —— | —— | —— | —— | 591.7 | 591.7 |
| TOTAL | —— | —— | 10515.1 | 102.1 | 735.7 | 147.7 | 7051.5 | 591.7 | 19143.8 |
| FOOTING | 2523.2 | 790.2 | —— | —— | 553.6 | 1150.0 | 446.0 | —— | 5463.2 |
| BRACING BEAM | —— | —— | 1784.3 | —— | —— | 342.4 | 604.8 | —— | 2731.5 |
| TOTAL | 2523.2 | 790.2 | 1784.3 | —— | 553.6 | 1492.4 | 1050.8 | —— | 8194.7 |

JICA

No. 131

VIADUCT.

## ELECTRIC POLE (AT INTER)

SD30 UNIT: KG.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | — | — | — | — | — | — | — | — | — |
| BEAM | — | — | 112.2 | 102.1 | — | 21.3 | 109.1 | — | 344.7 |
| COLUMN | — | — | — | — | — | — | — | — | — |
| CURB | — | — | — | — | — | — | — | — | — |
| TOTAL | — | — | 112.2 | 102.1 | — | 21.3 | 109.1 | — | 344.7 |
| FOOTING | — | — | — | — | — | — | — | — | — |
| BRACING BEAM | — | — | — | — | — | — | — | — | — |
| TOTAL | — | — | — | — | — | — | — | — | — |

JICA

No. 142

# VIADUCT L=30.000

REFER TO V048

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (kg) | RATIO (kg/$m^3$) |
|---|---|---|---|---|
| SLAB | 47.0 | 154.0 | 3676.1 | 78.2 |
| BEAM | 30.4 | 124.8 | 9390.4 | 308.9 |
| COLUMN | ※ | ※ | ※ (617.9 kg/m) | |
| CURB | 5.2 | 54.3 | 591.7 | 113.8 |
| GRADING CONCRETE | 10.5 | ——— | ——— | ——— |
| TOTAL | ※+93.1 | ※+333.1 | ※+13658.2 | ※ |
| FOOTING | 48.8 | 42.6 | 5463.2 | 112.0 |
| BRACING BEAM | 10.1 | 40.3 | 2731.5 | 270.4 |
| TOTAL | 58.9 | 82.9 | 8194.7 | 139.1 |

※ REFER TO NO.173

| | UNIT | QUANTITY | REMARKS |
|---|---|---|---|
| LEVELING CONCRETE | $M^3$ | 8.1 | CLASS F |
| AGGREGATE SUB BASE | $M^3$ | 16.1 | A.S.B.-3 |
| EXCAVATION | $M^3$ | ※ | |
| FOUNDATION MORTAR | $M^3$ | ——— | $f_{CK}$ = 400 kg/cm² |
| PILE | M x NUMBER | A- ※<br>B- ※ | Φ350 - A<br>Φ350 - B |

# VIADUCT V048 L=30 000

SD30 UNIT : Kg.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | — | — | — | — | — | — | 3676.1 | — | 3676.1 |
| BEAM | — | — | 3910.9 | — | 735.7 | — | 2617.4 | — | 9390.4 |
| COLUMN | — | — | (539.9 Kg/m × H') | — | — | — | (78.0 Kg/m × H') | — | (617.9 Kg/m × H') |
| CURB | — | — | — | — | — | — | — | 591.7 | 591.7 |
| TOTAL | — | — | 3910.9 + (539.9 Kg/m × H') | 102.1 | 735.7 | — | 6293.5 + (78.0 Kg/m × H') | 591.7 | 13658.2 + (617.9 Kg/m × H') |
| FOOTING | 2523.2 | 790.2 | — | — | 553.6 | 1150.0 | 446.0 | — | 5463.2 |
| BRACING BEAM | — | — | 1784.3 | — | — | 342.4 | 604.8 | — | 2731.5 |
| TOTAL | 2523.2 | 790.2 | 1784.3 | — | 553.6 | 1492.4 | 1050.8 | — | 8194.7 |

NOTE; $H' = H + 0.50$

JICA

No. 164

# VIADUCT V002 L=30 000 (POLE)

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (kg) | RATIO ($kg/m^3$) |
|---|---|---|---|---|
| SLAB | 47.0 | 153.1 | 3676.1 | 78.2 |
| BEAM | 31.4 | 132.6 | 9735.1 | 310.0 |
| COLUMN | ※ | ※ | ※ (617.9 kg/m) | |
| CURB | 5.2 | 54.3 | 591.7 | 113.8 |
| GRADING CONCRETE | 10.5 | ——— | ——— | ——— |
| TOTAL | ※+94.1 | ※+340.0 | ※+14002.9 | ※ |
| FOOTING | 48.8 | 42.6 | 5463.2 | 112.0 |
| BRACING BEAM | 10.1 | 40.3 | 2731.5 | 270.4 |
| TOTAL | 58.9 | 82.9 | 8194.7 | 139.1 |

※ REFER TO NO. 173

| | UNIT | QUANTITY | REMARKS |
|---|---|---|---|
| LEVELING CONCRETE | $M^3$ | 8.1 | CLASS F |
| AGGREGATE SUB BASE | $M^3$ | 16.1 | A.S.B.-3 |
| EXCAVATION | $M^3$ | ※ | |
| FOUNDATION MORTAR | $M^3$ | ——— | $f'_{ck}$ = 400 kg/cm² |
| PILE | M x NUMBER | A-※<br>B-※ | Φ350-A<br>Φ350-B |

# VIADUCT V048 L=30 000
## (ELECTRIC POLE) (AT. INTER)

SD 30 UNIT : Kg.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | —— | —— | —— | —— | —— | —— | 3676.1 | —— | 3676.1 |
| BEAM | —— | —— | 6023.1 | 102.1 | 735.7 | 147.7 | 2726.5 | —— | 9735.1 |
| COLUMN | —— | —— | (539.9 Kg/m × H') | —— | —— | —— | (78.0 Kg/m × H') | —— | (617.9 Kg/m × H') |
| CURB | —— | —— | —— | —— | —— | —— | —— | 591.7 | 591.7 |
| TOTAL | —— | —— | 6023.1 + (539.9 Kg/m × H') | 102.1 | 735.7 | 147.7 | 6402.6 + (78.0 Kg/m × H') | 591.7 | 14002.9 + (617.9 Kg/m × H') |
| FOOTING | 2523.2 | 790.2 | —— | —— | 553.6 | 1150.0 | 446.0 | —— | 5463.2 |
| BRACING BEAM | —— | —— | 1784.3 | —— | —— | 342.4 | 604.8 | —— | 2731.5 |
| TOTAL | 2523.2 | 790.2 | 1784.3 | —— | 553.6 | 1492.4 | 1050.8 | —— | 8194.7 |

NOTE; $H' = H + 0.50$

# SIGNAL SPACE

L= 7000

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (Kg) | RATIO ($Kg/m^3$) |
|---|---|---|---|---|
| SLAB | 1.7 | 8.9 | 339.5 | 199.7 |
| CURB | 0.5 | 5.3 | 123.7 | 247.4 |
| TOTAL | 2.2 | 14.2 | 463.2 | 210.5 |

V025 L-30m 14k 702n 000

VIADUCT. SIGNL L = 7 000

SD 30 UNIT : kg.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | . | . | . | . | . | . | 339.5 | . | 339.5 |
| BEAM | . | . | . | . | . | . | . | . | . |
| COLUMN | . | . | . | . | . | . | . | . | . |
| CURB | . | . | . | . | . | . | 123.7 | . | 123.7 |
| TOTAL | . | . | . | . | . | . | 463.2 | . | 463.2 |
| FOOTING | . | . | . | . | . | . | . | . | . |
| BRACING BEAM | . | . | . | . | . | . | . | . | . |
| TOTAL | . | . | . | . | . | . | . | . | . |

JICA

No. 668

# SIGNAL SPACE

L = 4 000

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (Kg) | RATIO ($Kg/m^3$) |
|---|---|---|---|---|
| SLAB | 1.0 | 5.3 | 196.0 | 196.0 |
| CURB | 0.4 | 3.5 | 84.4 | 211.0 |
| TOTAL | 1.4 | 8.8 | 280.4 | 200.3 |

V081 L = 30 m 16" 925" 000

# VIADUCT. SIGNL L = 4000

SD30 UNIT : KG.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | — | — | — | — | — | — | 196.0 | — | 196.0 |
| BEAM | — | — | — | — | — | — | — | — | — |
| COLUMN | — | — | — | — | — | — | — | — | — |
| CURB | — | — | — | — | — | — | 84.4 | — | 84.4 |
| TOTAL | — | — | — | — | — | — | 280.4 | — | 280.4 |
| FOOTING | — | — | — | — | — | — | — | — | — |
| BRACING BEAM | — | — | — | — | — | — | — | — | — |
| TOTAL | — | — | — | — | — | — | — | — | — |

JICA

No. 120

# SIGNAL SPACE

L = 3000

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (Kg) | RATIO ($Kg/m^3$) |
|---|---|---|---|---|
| SLAB | 0.7 | 4.1 | 148.2 | 211.7 |
| CURB | 0.3 | 2.9 | 72.4 | 241.3 |
| TOTAL | 1.0 | 7.0 | 220.6 | 220.6 |

V115 L=30m 18k 239m 000

# VIADUCT. SIGNL L = 3.000

SD30 UNIT: KG.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | — | — | — | — | — | — | 148.2 | — | 148.2 |
| BEAM | — | — | — | — | — | — | — | — | — |
| COLUMN | — | — | — | — | — | — | — | — | — |
| CURB | — | — | — | — | — | — | 72.4 | — | 72.4 |
| TOTAL | — | — | — | — | — | — | 220.6 | — | 220.6 |
| FOOTING | — | — | — | — | — | — | — | — | — |
| BRACING BEAM | — | — | — | — | — | — | — | — | — |
| TOTAL | — | — | — | — | — | — | — | — | — |

NOTES: L = 30.000

(1) COLUMN.

1) CONCRETE VOLUME. $V = 0.360^{m^2} \times (H - 0.900)^{\text{VARIES}} \times 8$

2) FORM. AREA $A = 0.600 \times (H^{\text{VARIES}} \times 4 - 3.90) \times 8$

3). REINFORCING BAR $W = 617.9^{kg/m} \times (H^{\text{VARIES}} + 0.50)$

(2) EXCAVAION $V = 80.520^{m^2} \times H$

(3) PC PILES $\phi$-350 $A = M. \times 48$ $B = M \times 48$

DIMENSION SCHEDULE NO. 1

| | | COLUMN | | | | EXCAVAION | | PC. PILE |
|---|---|---|---|---|---|---|---|---|
| | | H | CONCRETE | FORM | REINFORCING BAR | H | VOLUME | $\phi$=350 |
| | V002 | 4.084 | 9.170 | 59.693 | 2832.5 | 1.80 | 144.9 | A= B=10.0×48 |
| o | 003 | 4.664 | 10.840 | 70.829 | 3190.8 | " | " | B=10.0×48 |
| o | 024 | 5.153 | 12.249 | 80.218 | 3493.0 | " | " | B=12.0×48 |
| | 025 | 4.692 | 10.921 | 71.366 | 3208.1 | " | " | B=12.0×48 |
| o | 026 | 4.385 | 10.037 | 65.472 | 3018.4 | " | " | B=12.0×48 |
| ※ | 048 | 7.820 | 19.930 | 131.424 | 5140.9 | 1.806 | 145.4 | A=8.00×48 B=8.00×48 |
| o | 049 | " | " | " | " | " | " | " " |
| | 080 | 6.786 | 16.952 | 111.571 | 4502.0 | 1.80 | 144.9 | A=13.0×48 B=8.0×48 |
| o | 081 | 6.966 | 17.470 | 115.027 | 4613.2 | " | " | " " |
| | 082 | 7.146 | 17.988 | 118.483 | 4724.5 | " | " | " " |

# DIMENSION SCHEDULE NO 2

| | | COLUMN | | | | EXCAVAION | | PC PILE |
|---|---|---|---|---|---|---|---|---|
| | | H. | CONCRETE | FORM | REINFORCING BAR | H | VOLUME | φ=350 |
| o | V083 | 7.326 | 18.507 | 121.939 | 4835.7 | 1.80 | 144.9 | A=14.0×48<br>B=8.0×48 |
| | 084 | 7.506 | 19.025 | 125.395 | 4946.9 | 〃 | 〃 | 〃<br>〃 |
| o | 099 | 7.350 | 18.576 | 122.400 | 4850.5 | 1.806 | 145.4 | A=11.0×48<br>B=8.0×48 |
| | 100 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| o | 103 | 6.868 | 17.188 | 113.146 | 4552.7 | 1.80 | 144.9 | A=10.0×48<br>B=8.0×48 |
| o | 104 | 6.434 | 15.938 | 104.813 | 4284.5 | 〃 | 〃 | 〃<br>〃 |
| o | 105 | 5.984 | 14.642 | 96.173 | 4006.5 | 〃 | 〃 | A=9.0×48<br>B=8.0×48 |
| o | 106 | 5.534 | 13.346 | 87.533 | 3728.4 | 〃 | 〃 | 〃<br>〃 |
| | 107 | 5.084 | 11.992 | 78.509 | 3438.0 | 〃 | 〃 | 〃<br>〃 |
| o | 108 | 4.627 | 10.734 | 70.118 | 3168.0 | 〃 | 〃 | 〃<br>〃 |
| o | 109 | 4.400 | 10.080 | 65.760 | 3027.7 | 1.806 | 145.4 | 〃<br>〃 |
| o | 110 | 4.442 | 10.201 | 66.566 | 3053.7 | 1.80 | 144.9 | 〃<br>〃 |
| o | 113 | 4.979 | 11.748 | 76.877 | 3385.5 | 〃 | 〃 | A=8.0×48<br>B=8.0×48 |
| o | 114 | 5.129 | 12.180 | 79.757 | 3478.2 | 〃 | 〃 | 〃<br>〃 |
| o | 115 | 5.279 | 12.612 | 82.637 | 3570.8 | 〃 | 〃 | 〃<br>〃 |
| | 116 | 5.429 | 13.044 | 85.517 | 3663.5 | 〃 | 〃 | 〃<br>〃 |
| o | 117 | 5.579 | 13.476 | 88.397 | 3756.2 | 〃 | 〃 | 〃<br>〃 |
| | 118 | 5.773 | 14.034 | 92.122 | 3876.1 | 〃 | 〃 | 〃<br>〃 |
| o | 119 | 6.082 | 14.924 | 98.054 | 4067.0 | 〃 | 〃 | 〃<br>〃 |

# DIMENSION SCHEDULE NO3

| | COLUMN | | | | EXCAVAION | | PC PILE |
|---|---|---|---|---|---|---|---|
| | H | CONCRETE | FORM | REINFORCING BAR | H | VOLUME | φ=350 |
| V 120 | 6.499 | 16.125 | 106.061 | 4324.7 | 1.80 | 144.9 | A=8.0×48<br>B=8.0×48 |
| 121 | 6.949 | 17.421 | 114.701 | 4602.7 | 〃 | 〃 | A=7.0·48<br>B=8.0·48 |
| 122 | 7.399 | 18.717 | 123.341 | 4880.8 | 〃 | 〃 | 〃<br>〃 |

$L = 30^{m}$

CONCRETE VOLUM (V048)

(1) SLAB

$\Sigma V = 46.996^{m^3}$

(2) BEAM

$\Sigma V = 30.376^{m^3}$

($\Sigma V = 31.418^{"}$) POLE

(3) COLUMN

$\Sigma V$ = ※ REFER TO NO.173

(4) FOOTING

$\Sigma V = 48.848^{m^3}$

(5) BRACING BEAM

$\Sigma V = 10.080^{m^3}$

(6) CURB

$\Sigma V = 5.243\ m^3$

(7) GRADING CONCRETE

$\Sigma V = 10.486\ m^3$

(8) BEARING BASE MORTAR

$\Sigma V = 0.000\ m^3$

(9) LVEVLING CONCRETE

$\Sigma V = 8.052\ m^3$

(10) AGGREGATE SUB BASE

$\Sigma V = 16.104\ m^3$

(11) PILE

A = ※ REFER TO NO.173

B = ※

(12) EXCAVAION

$\Sigma V$ = ※ REFER TO NO. 173

FORM AREA

(1) SLAB

$\Sigma A = 154.031\ m^2$

($\Sigma A = 153.079\ m^2$) POLE

(2) BEAM

$\Sigma A = 124.764\ m^2$

($\Sigma A = 132.596$ ") POLE

(3) COLUMN

$\Sigma A$ = ※ REFER TO NO. 173

(4) FOOTING

$$\Sigma A = 42.600\ m^2$$

(5) BRACING BEAM

$$\Sigma A = 40.320\ m^2$$

(6) C U R B

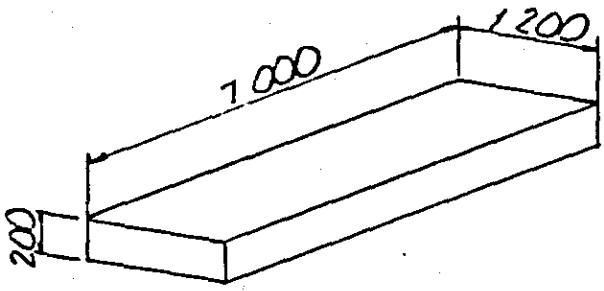
$$\Sigma A = 54.278\ m^2$$

# SIGNAL SPACE

$L = 7000$

# CONCRETE VOLUME

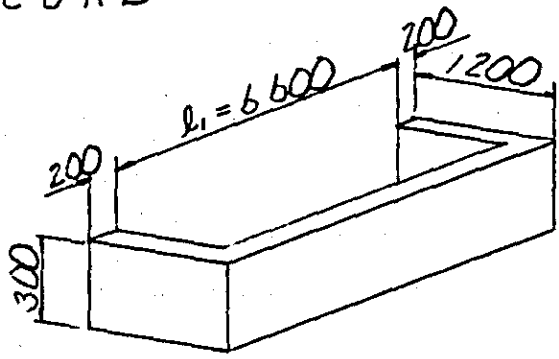
## (1) SLAB




$V = 1.200 \times 0.200 \times 7.000 = 1.680\ m^3$

SLAB TOTAL $1.680\ m^3$

## (2) CURB

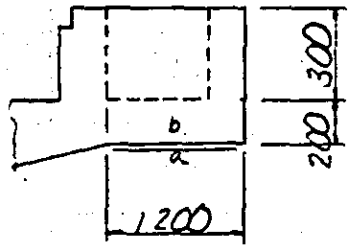



$V = 0.200 \times 0.300 \times (1.200 \times 2 + 6.600) = 0.540\ m^3$ ($\ell_1$)

CURB TOTAL $0.540\ m^3$

# FORM AREA

## (1) SLAB



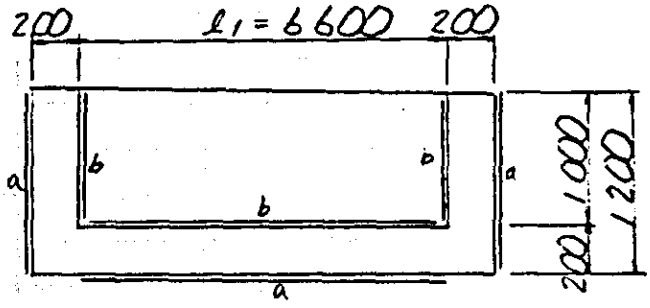

$\ell = 7.000$

$A_a = 1.200 \times 7.000$ = 8.400 m²

$A_b = 0.200 \times 1.200 \times 2$ = 0.480 "

SLAB TOTAL 8.880 m²

## (2) CURB




$h = 300$

$Aa = 0.300 \times (1.200 \times 2 + 6.600)$ = 2.700 m²

$Ab = 0.300 \times (1.000 \times 2 + 6.600)$ = 2.580 "

CURB TOTAL 5.280 m²

# REINFORCING BAR

No. 183

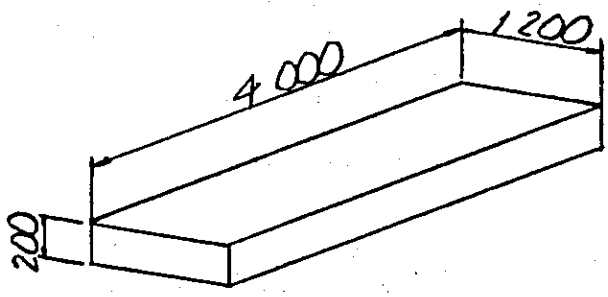
| REINF. NO. | DIA. (mm) | U. WEIGHT (kg/m) | LENGTH (mm) | NUMBER | WEIGHT (kg) | REMARKS |
|---|---|---|---|---|---|---|
| | SIGNAL | | | | | |
| | L=7000 | | | | | |
| | SLAB | | | | | |
| S 31 | D13 | 0.995 | 3840 | 57 | 217.8 | |
| 32 | " | " | 1590 | 29 | 45.9 | |
| 33 | " | " | 6930 | 11 | 75.8 | |
| | | | | D13 | 339.5 KG | |
| | | | SLAB | TOTAL | 339.5 KG | |
| | CURB | | | | | |
| W 31 | D13 | 0.995 | 6930 | 4 | 27.6 | |
| 32 | " | " | 1370 | 62 | 84.5 | |
| 33 | " | " | 1460 | 8 | 11.6 | |
| | | | | D13 | 123.7 KG | |
| | | | CURB | TOTAL | 123.7 KG | |

# SIGNAL SPACE

$L = 4\,000$

# CONCRETE VOLUME

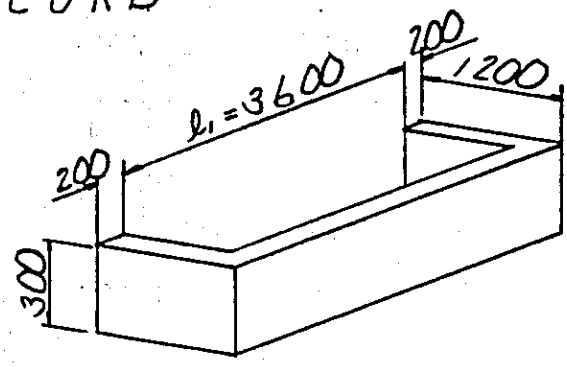
## (1) SLAB




$V = 1.200 \times 0.200 \times 4.000 = 0.960\ m^3$

SLAB TOTAL $0.960\ m^3$

## (2) CURB

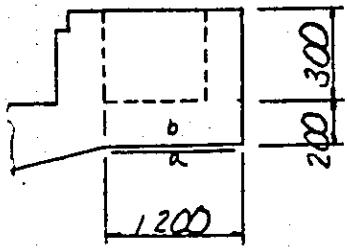



$V = 0.200 \times 0.300 \times (1.200 \times 2 + 3.600) = 0.360\ m^3$

CURB TOTAL $0.360\ m^3$

# FORM AREA

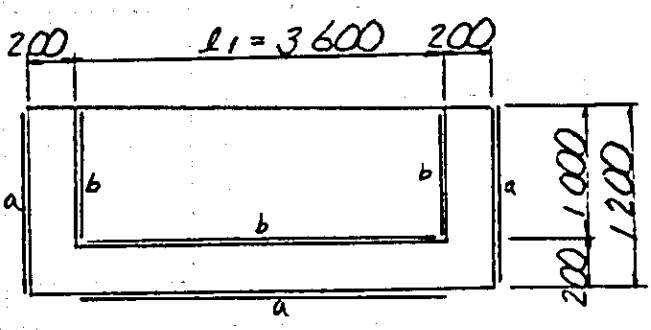
## (1) SLAB




$\ell = 4000$

| | | |
|---|---|---|
| $A_a = 1.200 \times \overset{\ell}{4.000}$ | = | 4.800 $m^2$ |
| $A_b = 0.200 \times 1.200 \times 2$ | = | 0.480 " |
| SLAB TOTAL | | 5.280 $m^2$ |

## (2) CURB




$h = 300$

| | | |
|---|---|---|
| $A_a = 0.300 \times (1.200 \times 2 + \overset{\ell_1}{3.600})$ | = | 1.800 $m^2$ |
| $A_b = 0.300 \times (1.000 \times 2 + \overset{\ell}{3.600})$ | = | 1.680 " |
| CURB TOTAL | | 3.480 $m^2$ |

# REINFORCING BAR

No. 187

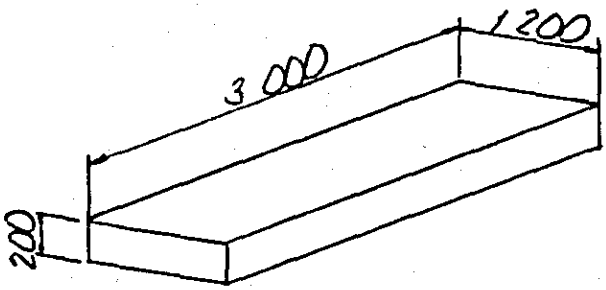
| REINF. NO. | DIA. (mm) | U. WEIGHT (kg/m) | LENGTH (mm) | NUMBER | WEIGHT (kg) | REMARKS |
|---|---|---|---|---|---|---|
| | SIGNAL | | | | | |
| | L=4000 | | | | | |
| | SLAB | | | | | |
| S 31 | D13 | 0.995 | 3840 | 33 | 1261 | ⊃ |
| 32 | " | " | 1590 | 17 | 269 | — |
| 33 | " | " | 3930 | 11 | 430 | ═ |
| | | | | D13 | 1960 kg | |
| | | | SLAB | TOTAL | 1960 kg | |
| | CURB | | | | | |
| W 31 | D13 | 0.995 | 3930 | 4 | 156 | ═ |
| 32 | " | " | 1370 | 42 | 572 | ⊓ |
| 33 | " | " | 1460 | 8 | 116 | ⊔ |
| | | | | D13 | 844 kg | |
| | | | CURB | TOTAL | 844 kg | |

# SIGNAL SPACE

$L = 3000$

# CONCRETE VOLUME

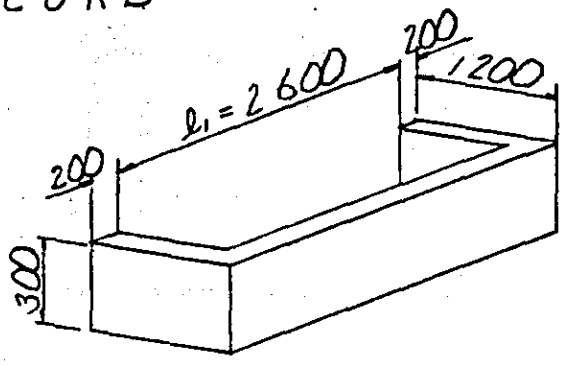
## (1) SLAB




$V = 1.200 \times 0.200 \times 3.000 = 0.720\ m^3$

SLAB TOTAL $0.720\ m^3$

## (2) CURB

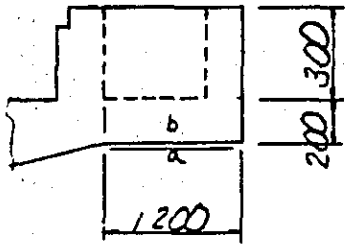



$V = 0.200 \times 0.300 \times (1.200 \times 2 + 2.600) = 0.300\ m^3$ ($\ell_1$)

CURB TOTAL $0.300\ m^3$

# FORM AREA

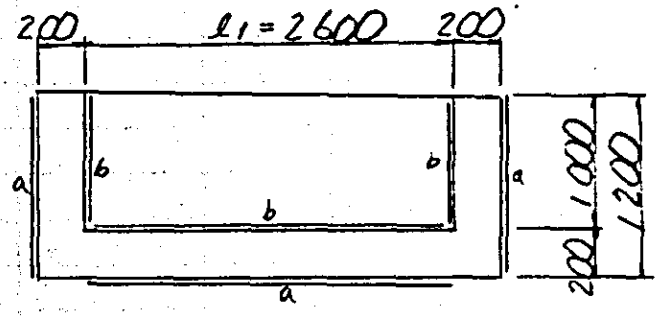
## (1) SLAB




$\ell = 3000$

| | | |
|---|---|---|
| $A_a = 1.200 \times 3.000$ | = | 3.600 $m^2$ |
| $A_b = 0.200 \times 1.200 \times 2$ | = | 0.480 " |
| SLAB TOTAL | | 4.080 $m^2$ |

## (2) CURB




$h = 300$

| | | |
|---|---|---|
| $A_a = 0.300 \times (1.200 \cdot 2 + 2.600)$ | = | 1.500 $m^2$ |
| $A_b = 0.300 \times (1.000 \cdot 2 + 2.600)$ | = | 1.380 " |
| CURB TOTAL | | 2.880 $m^2$ |

# REINFORCING BAR

No. 191

| REINF. NO. | DIA. (mm) | U. WEIGHT (kg/m) | LENGTH (mm) | NUMBER | WEIGHT (kg) | REMARKS |
|---|---|---|---|---|---|---|
| | SIGNAL | | | | | |
| | L = 3000 | | | | | |
| | SLAB | | | | | |
| S 31 | D13 | 0.995 | 3840 | 25 | 95.5 | ⟶ |
| 32 | " | " | 1590 | 13 | 20.6 | — |
| 33 | " | " | 2930 | 11 | 32.1 | —— |
| | | | | D13 | 148.2 kg | |
| | | | SLAB | TOTAL | 148.2 kg | |
| | CURB | | | | | |
| W 31 | D13 | 0.995 | 2930 | 4 | 11.7 | —— |
| 32 | " | " | 1370 | 36 | 49.1 | ⊓ |
| 33 | " | " | 1460 | 8 | 11.6 | ⌋ |
| | | | | D13 | 72.4 kg | |
| | | | CURB | TOTAL. | 72.4 kg | |

JICA

# 7. VIADUCT. V004

## 38M000

V004 V005 V006 V009 V012

V015 V016 V019 ~ V023

V029 ~ V045 V050 ~ V072

V075 ~ V079 V123 ~ V126

# VIADUCT V004 L = 38.000

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (kg) | RATIO (kg/$m^3$) |
|---|---|---|---|---|
| SLAB | 59.5 | 195.1 | 4 618.7 | 77.6 |
| BEAM | 38.1 | 156.2 | 11 783.9 | 309.3 |
| COLUMN | 16.1 | 105.3 | 4 529.3 | 281.3 |
| CURB | 6.6 | 68.8 | 749.1 | 113.5 |
| GRADING CONCRETE | 13.3 | ——— | ——— | ——— |
| TOTAL | 133.6 | 525.4 | 21 681.1 | 162.3 |
| FOOTING | 61.1 | 52.9 | 6 829.0 | 111.8 |
| BRACING BEAM | 13.4 | 53.8 | 3 522.4 | 262.9 |
| TOTAL | 74.5 | 106.7 | 10 351.4 | 138.9 |

| | UNIT | QUANTITY | REMARKS |
|---|---|---|---|
| LEVELING CONCRETE | $M^3$ | 10.2 | CLASS F |
| AGGREGATE SUB BASE | $M^3$ | 20.5 | A.S.B. – 3 |
| EXCAVATION | $M^3$ | 184.1 | |
| FOUNDATION MORTAR | $M^3$ | ——— | $\sigma_{ck} = 400\ kg/cm^2$ |
| PILE | M x NUMBER | A – ———<br>B – 10.0 × 60 | Φ350 – A<br>Φ350 – B |

# VIADUCT V004 L-38.0m (H=5.364)

SD30 UNIT : Kg

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | . | . | . | . | . | . | 4618.7 | . | 4618.7 |
| BEAM | . | . | 7459.9 | . | 879.7 | 151.7 | 3292.6 | . | 11783.9 |
| COLUMN | . | . | 3957.6 | . | . | . | 571.7 | . | 4529.3 |
| CURB | . | . | . | . | . | . | . | 749.1 | 749.1 |
| TOTAL | . | . | 11417.5 | . | 879.7 | 151.7 | 8483.0 | 749.1 | 21681.0 |
| FOOTING | 3154.0 | 988.0 | . | . | 692.0 | 1437.5 | 557.5 | . | 6829.0 |
| BRACING BEAM | . | . | 2293.8 | . | . | 442.3 | 786.3 | . | 3522.4 |
| TOTAL | 3154.0 | 988.0 | 2293.8 | . | 692.0 | 1879.8 | 1343.8 | . | 10351.4 |

NOTE ; 1) COLUMN 772.4 kg/m × (H + 0.50) = TOTAL WEIGHT.

2) H' = H + 0.50

JICA

No. 194

# VIADUCT L = 38.000

REFER TO V004

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (kg) | RATIO ($kg/m^3$) |
|---|---|---|---|---|
| SLAB | 59.5 | 195.1 | 4 618.7 | 77.6 |
| BEAM | 38.1 | 156.2 | 11 783.9 | 309.3 |
| COLUMN | ※ | ※ | ※ (772.4 kg/m) | ※ |
| CURB | 6.6 | 68.8 | 749.1 | 113.5 |
| GRADING CONCRETE | 13.3 | ——— | ——— | ——— |
| TOTAL | ※ + 117.5 | ※ + 420.1 | ※ + 17 151.7 | ※ |
| FOOTING | 61.1 | 52.9 | 6 829.0 | 111.8 |
| BRACING BEAM | 13.4 | 53.8 | 3 522.4 | 262.9 |
| TOTAL | 74.5 | 106.7 | 10 351.4 | 138.9 |

※ REFER TO NO. 202

| | UNIT | QUANTITY | REMARKS |
|---|---|---|---|
| LEVELING CONCRETE | $M^3$ | 10.2 | CLASS F |
| AGGREGATE SUB BASE | $M^3$ | 20.5 | A.S.B.-3 |
| EXCAVATION | $M^3$ | ※ | |
| FOUNDATION MORTAR | $M^3$ | ——— | $\sigma_{CK}$ = 400 $kg/cm^2$ |
| PILE | M x NUMBER | A-※<br>B-※ | Φ350 - A<br>Φ350 - B |

# VIADUCT V004 L-38.000

SD30 UNIT: Kg.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | . | . | . | . | . | . | 4618.7 | . | 4618.7 |
| BEAM | . | . | 7459.9 | . | 879.7 | 151.7 | 3292.6 | . | 11783.9 |
| COLUMN | . | . | (674.9 Kg/m·H) | . | . | . | (97.5 Kg/m) | . | (772.4 Kg/m·H) |
| CURB | . | . | . | . | . | . | . | 749.1 | 749.1 |
| TOTAL | . | . | 7459.9 + 674.9 Kg/m·H | . | 879.7 | 151.7 | 7911.3 + (97.5 Kg/m·H) | 749.1 | 17151.7 + (772.4 Kg/m·H) |
| FOOTING | 3154.0 | 988.0 | . | . | 692.0 | 1437.5 | 557.5 | . | 6829.0 |
| BRACING BEAM | . | . | 2293.8 | . | . | 442.3 | 786.3 | . | 3522.4 |
| TOTAL | 3154.0 | 988.0 | 2293.8 | . | 692.0 | 1879.8 | 1343.8 | . | 10351.4 |

NOTE; COLUMN. 1) 772.4 Kg/m × (H + 0.m50) = TOTAL WEIGHT

2) H' = H + 0.m50

JICA

No. 196

# VIADUCT V005 L=38.000 (POLE)

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (kg) | RATIO ($kg/m^3$) |
|---|---|---|---|---|
| SLAB | 59.5 | 194.1 | 4618.7 | 77.6 |
| BEAM | 39.2 | 164.0 | 12 128.6 | 309.4 |
| COLUMN | ※ | ※ | ※ (772.4 kg/m) | ※ |
| CURB | 6.6 | 68.8 | 749.1 | 113.5 |
| GRADING CONCRETE | 13.3 | ——— | ——— | ——— |
| TOTAL | ※+118.6 | ※+427.0 | ※+17496.4 | ※ |
| FOOTING | 61.1 | 52.9 | 6 829.0 | 111.8 |
| BRACING BEAM | 13.4 | 53.8 | 3 522.4 | 262.9 |
| TOTAL | 74.5 | 106.7 | 10351.4 | 138.9 |

※ REFER TO NO. 202

| | UNIT | QUANTITY | REMARKS |
|---|---|---|---|
| LEVELING CONCRETE | $M^3$ | 10.2 | CLASS F |
| AGGREGATE SUB BASE | $M^3$ | 20.5 | A.S.B.-3 |
| EXCAVATION | $M^3$ | ※ | |
| FOUNDATION MORTAR | $M^3$ | ——— | $\sigma_{ck}$ = 400 $kg/cm^2$ |
| PILE | M x NUMBER | A-※<br>B-※ | Φ350-A<br>Φ350-B |

# VIADUCT V004 L-38.000
(ELECTRIC. POLE)(AT. INTER)

SD30 UNIT : Kg.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | . | . | . | . | . | . | 4618.7 | . | 4618.7 |
| BEAM | . | . | 7572.1 | 102.1 | 879.7 | 173.0 | 3401.7 | . | 12128.6 |
| COLUMN | . | . | (674.9 Kg/m·H) | . | . | . | (97.5 Kg/m) | . | (772.4 Kg/m) |
| CURB | . | . | . | . | . | . | . | 749.1 | 749.1 |
| TOTAL | . | . | 7572.1 +(674.9 Kg/m·H') | 102.1 | 879.7 | 173.0 | 8020.4 +(97.5 Kg/m·H) | 749.1 | 17496.4 +(772.4 Kg/m·H') |
| FOOTING | 3154.0 | 988.0 | . | . | 692.0 | 1437.5 | 557.5 | . | 6829.0 |
| BRACING BEAM | . | . | 2293.8 | . | . | 442.3 | 786.3 | . | 3522.4 |
| TOTAL | 3154.0 | 988.0 | 2293.8 | . | 692.0 | 1879.8 | 1343.8 | . | 10351.4 |

NOTE ; 1) COLUMN. 772.4 Kg/m × (H + 0.50) = TOTAL WEIGHT

2) H' = H + 0.50

JICA

No. 1/28

VIADUCT

# ELECTRIC POLE (AT INTER)

SD30 UNIT : KG.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | — | — | — | — | — | — | — | — | — |
| BEAM | — | — | 112.2 | 102.1 | — | 21.3 | 109.1 | — | 344.7 |
| COLUMN | — | — | — | — | — | — | — | — | — |
| CURB | — | — | — | — | — | — | — | — | — |
| TOTAL | — | — | 112.2 | 102.1 | — | 21.3 | 109.1 | — | 344.7 |
| FOOTING | — | — | — | — | — | — | — | — | — |
| BRACING BEAM | — | — | — | — | — | — | — | — | — |
| TOTAL | — | — | — | — | — | — | — | — | — |

JICA

No. 199

# SIGNAL SPACE

L= 7000

| | CONCRETE VOLUME ($m^3$) | FORM AREA ($m^2$) | REINFORCING BAR (Kg) | RATIO ($Kg/m^3$) |
|---|---|---|---|---|
| SLAB | 1.7 | 8.9 | 339.5 | 199.7 |
| CURB | 0.5 | 5.3 | 123.7 | 247.4 |
| TOTAL | 2.2 | 14.2 | 463.2 | 210.5 |

V042 L = 38m 15K 405~000

V062 L = 38m 16K 199~000

V068 L = 38m 16K 419~000

V126 L = 38m 18K 601~000

VIADUCT. SIGNL L = 7.000

SD30 UNIT : kg.

| | D32 | D29 | D25 | D22 | D19 | D16 | D13 | D10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| SLAB | . | . | . | . | . | . | 339.5 | . | 339.5 |
| BEAM | . | . | . | . | . | . | . | . | . |
| COLUMN | . | . | . | . | . | . | . | . | . |
| CURB | . | . | . | . | . | . | 123.7 | . | 123.7 |
| TOTAL | . | . | . | . | . | . | 463.2 | . | 463.2 |
| FOOTING | . | . | . | . | . | . | . | . | . |
| BRACING BEAM | . | . | . | . | . | . | . | . | . |
| TOTAL | . | . | . | . | . | . | . | . | . |

JICA

No. 201

NOTES: $L = 38.000$

(1) COLUMN.

1) CONCRETE VOLUME. $V = 0.360^{m^2}_{\text{VARIES}} \times (H - 0.900) \times 10$

2) FORM. AREA $A = 0.600 \times (H \times 4 - 3.90)^{\text{VARIES}} \times 10$

3) REINFORCING BAR $W = 772.4^{Kg/m} \times (H + 0.50)^{\text{VARIES}}$

(2) EXCAVAION $V = 102.260^{m^2} \times H$

(3) PC PILES $\phi = 350$ $A = M. \times 60$ $B = M \times 60$

DIMENSION SCHEDULE NO. 1

| | | COLUMN | | | | EXCAVAION | | PC. PILE |
|---|---|---|---|---|---|---|---|---|
| | | H | CONCRETE | FORM | REINFORCING BAR | H | VOLUME | $\phi = 350$ |
| * | V004 | 5.364 | 16.070 | 105.336 | 4529.4 | 1.80 | 184.1 | A = B = 10.0 × 60 |
| ○ | 005 | 6.124 | 18.806 | 123.576 | 5116.4 | " | " | B = 10.0 × 60 |
| ○ | 006 | 6.450 | 19.980 | 131.400 | 5368.2 | " | " | B = 11.0 × 60 |
| ○ | 009 | 7.060 | 22.176 | 146.040 | 5839.3 | " | " | B = 11.0 × 60 |
| ○ | 012 | " | " | " | " | " | " | B = 11.0 × 60 |
| | 015 | 7.322 | 23.119 | 152.328 | 6041.7 | 1.80 | " | B = 11.0 × 60 |
| ○ | 016 | 7.436 | 23.530 | 155.064 | 6129.8 | " | " | B = 11.0 × 60 |
| ○ | 019 | 7.176 | 22.594 | 148.824 | 5928.9 | " | " | B = 12.0 × 60 |
| | 020 | 7.268 | 22.925 | 151.032 | 6000.0 | " | " | B = 12.0 × 60 |
| ○ | 021 | 6.804 | 21.254 | 139.896 | 5641.6 | " | " | B = 12.0 × 60 |

# DIMENSION SCHEDULE NO 2

| | COLUMN | | | | EXCAVAION | | PC PILE |
|---|---|---|---|---|---|---|---|
| | H | CONCRETE | FORM | REINFORCING BAR | H | VOLUME | φ=350 |
| V022 | 6.234 | 19.202 | 126.216 | 5201.3 | 1.80 | 184.1 | A= x B=12 x 60 |
| 023 | 5662 | 17.143 | 112.488 | 4759.5 | 1.80 | 〃 | B=12.0x 60 |
| 029 | 4.720 | 13.752 | 89.880 | 4031.9 | 1.806 | 184.7 | 〃 |
| 030 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | B=13.0 x 60 |
| 031 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 032 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 033 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 034 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | B=14.0 x 60 |
| 035 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 036 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 037 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 038 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 039 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 |
| 040 | 4.712 | 13.723 | 89.688 | 4025.7 | 1.80 | 184.1 | B=14.0 x 60 |
| 041 | 5.006 | 14.782 | 96.744 | 4252.8 | 〃 | 〃 | 〃 |
| 042 | 6.168 | 18.965 | 124.632 | 5150.4 | 〃 | 〃 | 〃 |
| 043 | 6.700 | 20.880 | 137.200 | 5561.3 | 〃 | 〃 | 〃 |
| 044 | 7.232 | 22.795 | 150.168 | 5972.2 | 〃 | 〃 | 〃 |
| 045 | 7.746 | 24.646 | 162.504 | 6369.2 | 〃 | 〃 | 〃 |

# DIMENSION SCHEDULE NO 3

| | COLUMN | | | | EXCAVAION | | PC PILE |
|---|---|---|---|---|---|---|---|
| | H | CONCRETE | FORM | REINFORCING BAR | H | VOLUME | φ=350 |
| V050 | 7.723 | 24.563 | 161.952 | 6351.4 | 1.80 | 184.1 | A=8.0×60<br>B=8.0×60 |
| 051 | 7.499 | 23.756 | 156.576 | 6178.4 | 〃 | 〃 | 〃<br>〃 |
| 052 | 7.233 | 22.799 | 150.192 | 5973.0 | 〃 | 〃 | 〃<br>〃 |
| 053 | 6.967 | 21.841 | 143.808 | 5767.5 | 〃 | 〃 | 〃<br>〃 |
| 054 | 6.701 | 20.884 | 137.424 | 5562.1 | 〃 | 〃 | 〃<br>〃 |
| 055 | 6.644 | 20.678 | 136.056 | 5518.0 | 〃 | 〃 | 〃<br>〃 |
| 056 | 6.532 | 20.275 | 133.368 | 5431.5 | 〃 | 〃 | A=9.0×60<br>B=8.0×60 |
| 057 | 6.550 | 20.340 | 133.800 | 5445.4 | 1.806 | 184.7 | 〃<br>〃 |
| 058 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 059 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 060 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 061 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 062 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | A=10.0×60<br>B=8.0×60 |
| 063 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 064 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 065 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 066 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 067 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 068 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | A=11.0×60<br>B=8.0×60 |

# DIMENSION SCHEDULE NO 4

| | COLUMN | | | | EXCAVAION | | PC PILE |
|---|---|---|---|---|---|---|---|
| | H | CONCRETE | FORM | REINFORCING BAR | H | VOLUME | φ=350 |
| V069 | 6.550 | 20.340 | 133.800 | 5445.4 | 1.806 | 184.7 | A=11.0×60<br>B=8.0×60 |
| 070 | 6.350 | 19.620 | 129.000 | 5290.9 | 〃 | 〃 | 〃<br>〃 |
| 071 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 072 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | A=11.0×60<br>B=8.0×60 |
| 075 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 076 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃 | 〃<br>〃 |
| 077 | 6.150 | 18.900 | 124.200 | 5136.5 | 〃 | 〃 | A=13.0×60<br>B=8.0×60 |
| 078 | 6.306 | 19.462 | 127.944 | 5257.0 | 1.80 | 184.1 | 〃<br>〃 |
| 079 | 6.582 | 20.455 | 134.568 | 5470.1 | 〃 | 〃 | 〃<br>〃 |
| 123 | 7.909 | 25.232 | 166.416 | 6495.1 | 1.80 | 〃 | A=7.0×60<br>B=8.0×60 |
| 124 | 8.469 | 27.248 | 179.856 | 6541.5 | 〃 | 〃 | 〃<br>〃 |
| 125 | 8.844 | 28.598 | 188.856 | 7217.3 | 〃 | 〃 | 〃<br>〃 |
| 126 | 9.150 | 29.700 | 196.500 | 7453.7 | 1.806 | 184.7 | 〃<br>〃 |

V04

3.0 + 4 × 8.0 + 3.0 = 38.000

# CONCRETE VOLUME

## (1) SLAB

| | | |
|---|---|---|
| $Va = 3.800 \times (0.250 \times 37.960 + 0.150 \cdot 0.100 \cdot 2) =$ | | $36.176\ m^3$ |
| $Vb = 17.302\ m^3 \times 1/29.960 \times 37.960$ | = | 21.922 " |
| $Vc = 0.127 \cdot 2$ | = | 0.254 " |
| $Vd = 0.288 \times 4$ | = | 1.152 " |
| SLAB TOTAL | | $59.504\ m^3$ |

## (2) BEAM

### 1) LONGITUDINAL BEAM

| | | |
|---|---|---|
| $Va = 23.134\ m^3 \times 1/29.660 \times 37.660$ | = | $29.374\ m^3$ |
| $Vb = 0.144\ m^3 \cdot 10 \cdot 2$ | = | $2.880\ m^3$ |
| | | $32.254\ m^3$ |

### 2) AT END OF VIADUCT TRANSVERSE BEAM

END (2)

| | | |
|---|---|---|
| $Va = 0.585 \times 2$ | = | $1.170\ m^3$ |
| | | $1.170\ m^3$ |

3) AT INTERMEDIATE OF VIADUCT

TRANSVERSE BEAM

| | | |
|---|---|---|
| $Va = 0.936 \times 5$ | = | $4.680\ m^2$ |
| $Vb = 0.003 \times 2 \times 5$ | = | $0.030\ "$ |
| SUB TOTAL | = | $4.710\ m^3$ |

4) BASE OF ELECTRIC POLE

| | | |
|---|---|---|
| $V = 0.684\ m^3 \times 1$ | = | $0.684\ m^3$ |
| | | $(0.684\ m^3)$ |

5) ELECTRIC POLE

| | | |
|---|---|---|
| $V = 0.358\ m^3 \times 1$ | = | $0.358\ m^3$ |
| | | $(0.358\ m^3)$ |
| 4) + 5) ELECTRIC TOTAL | | $(1.042\ m^3)$ |

| | |
|---|---|
| BEAM TOTAL | $38.134\ m^3$ |
| (BEAM TOTAL (POLE) | $39.176\ m^3)$ |

## (3) COLUMN

### 1) AT END OF VIADUCT COLUMN

$V = 0.360^{m^2} \times (\overset{\text{VARIES}}{5.364} - 0.900) \times 4$ = 6.428 $m^3$

6.428 $m^3$

### 2) AT INTERMEDIATE OF VIADUCT COLUMN

$V = 0.360^{m^2} \times (\overset{\text{VARIES}}{5.364} - 0.900) \times 6$ = 9.642 $m^3$

9.642 $m^3$

COLUMN TOTAL 16.070 $m^3$

## (4) FOOTING

$Va = 9.632^{m^3} \times 5$ = 48.160 $m^3$

$Vb = 2.580 \times 5$ = 12.900 "

FOOTING TOTAL 61.060 $m^3$

## (5) BRACING BEAM

$V = 3.360^{m^3} \times 4$ = 13.440 $m^3$

BRACING TOTAL 13.440 $m^3$

(6) CURB

| | | |
|---|---|---|
| $V = 5.243^{m^3} \times 1/29.960 \times 37.960$ | = | $6.643^{m^3}$ |
| CURB TOTAL | | $6.643^{m^3}$ |

(7) GRADING CONCRETE

| | | |
|---|---|---|
| $V = 0.070 \times 5.000 \times 37.960$ | = | $13.286^{m^3}$ |
| GRADING CONCRETE TOTAL | | $13.286^{m^3}$ |

(9) LEVELING CONCRETE

| | | |
|---|---|---|
| $Va = 1.530^{m^3} \times 5$ | = | $7.650^{m^3}$ |
| $Vb = 0.644^{"} \times 4$ | = | $2.576^{"}$ |
| LEVELING CONCRETE TOTAL | | $10.226^{m^3}$ |

(10) AGGREGATE SUB BASE

| | | |
|---|---|---|
| $Va = 3.060^{m^3} \times 5$ | = | $15.300^{m^3}$ |
| $Vb = 1.288^{"} \times 4$ | = | $5.152^{"}$ |
| AGGREGATE SUB BASE TOTAL | | $20.452^{m^3}$ |

(11) PILE

$\phi = 350$ $\ell = 10.000^{m}$ $n = 60$

$A =$ ———— A ———

$B = 10.00 \times 60$ B 60

(12) EXCAVAION

1) FOOTING

$Va = 15.300^{m^2} \times 1.800^{m} \times 5$ = $137.700^{m^3}$

$137.700^{m^3}$

2) BRACING BEAM

$Va = 6.440^{m^2} \times 1.800^{m} \times 4$ = $46.368^{m^3}$

$46.368^{m^3}$

EXCAVTION TOTAL $184.068^{m^3}$

# FORM AREA

## (1) SLAB

| | | | |
|---|---|---|---|
| SLAB(1) | Aa = 2.860 m × 2 | = | 5.720 m² |
| | Ab = 14.800 " × 4 | = | 59.200 " |
| | Ac = 4.487 " × 4 | = | 17.948 " |
| | Ad = 1.093 " × 2 | = | 2.186 " |
| | Ae = 1.454 " × 6 | = | 8.724 " |
| SLAB(2) | Aa = 0.289 " × 4 | = | 1.156 " |
| | Ab = 1.269 × 37.960 × 2 | = | 96.342 " |
| | $-Ac_{POLE}$ = 0.952 × 1 | = | ⊖ 0.952 " |
| | Ad = 1.900 " × 2 | = | 3.800 " |
| | SLAB TOTAL | | 195.076 m² |
| | (SLAB TOTAL POLE | | 194.124 m²) |

(2) BEAM

1) LONGITUDINAL BEAM

| | | |
|---|---|---|
| Aa = 7.900 × 0.550 × 2 × 4 × 2 | = | 65.120 m² |
| Ab = (1.265 × 2 + 5.000) × 0.600 × 4 × 2 | = | 36.144 " |
| Ac = 5.216 m² × 2 | = | 10.432 " |
| Ad = 3.114 " × 2 | = | 6.228 " |
| Ae = 0.660 " × 2 | = | 1.320 " |
| Af = 1.200 × 0.400 × 1/2 × 2 × 10 × 2 | = | 9.600 " |
| SUB TOTAL | = | 128.844 m² |

2) 0.000 m²

3) AT END OF VIADUCT TRANSVERSE BEAM

END (2)

| | | |
|---|---|---|
| Aa = 6.240 m² | = | 6.240 m² |
| | | 6.240 m² |

4) AT INTERMEDIATE OF VIADUCT

TRANSVERSE BEAM

| | | |
|---|---|---|
| Aa = 2.600 m² × 5 | = | 13.000 m² |
| Ab = 0.020 " × 5 | = | 0.100 " |
| Ac = 1.609 " × 5 | = | 8.045 " |
| SUB TOTAL | = | 21.145 m² |

| | | |
|---|---|---|
| 5) BASE OF ELECTRIC POLE | | |
| $Aa = 3.643\ m^2$ | = | $3.643\ m^2$ |
| | | $(3.643\ m^2)$ |
| 6) ELECTRIC POLE | | |
| $A = 4.189\ m^2 \times 1$ | = | $4.189\ m^2$ |
| | | $(4.189\ m^2)$ |
| (5)+6)-ELECTRIC TOTAL | | $(7.832\ m^2)$ |
| BEAM TOTAL | | $156.229\ m^2$ |
| ( BEAM TOTAL (POLE) | | $164.061\ m^2)$ |

## (3) COLUMN

### 1) AT END OF VIADUCT COLUMN

$$Aa = 0.600 \times \left(\underset{5.364}{H_{2.6\text{-}x}} \times 4 - 3.900\right) \times 4 \quad (\text{VARIES}) \qquad = 42.134\ m^2$$

$42.134\ m^2$

### 2) AT INTERMEDIATE OF VIADUCT COLUMN

$$Aa = 0.600 \times \left(\underset{5.364}{H_4} \times 4 - 3.900\right) \times 6 \qquad = 63.202\ m^2$$

$63.202\ m^2$

COLUMN TOTAL $105.336\ m^2$

## (4) FOOTING

| | | |
|---|---|---|
| $Aa = 5.680\ m^2 \times 2$ | = | $11.360\ m^2$ |
| $Ab = 5.320\ " \times 2$ | = | $10.640\ "$ |
| $Ac = 5.680\ " \times 3$ | = | $17.040\ "$ |
| $Ad = 4.620\ " \times 3$ | = | $13.860\ "$ |

FOOTING TOTAL $52.900\ m^2$

(5) BRACING BEAM

| | | |
|---|---|---|
| Aa = 6.720 m² × 4 | = | 26.880 m² |
| Ab = 6.720 × 4 | = | 26.880 |
| BRACING TOTAL | | 53.760 m² |

(6) CURB

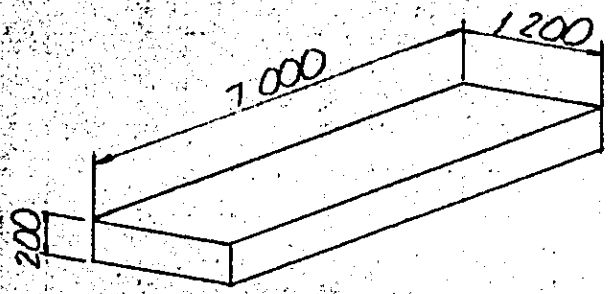
| | | |
|---|---|---|
| A = 54.278 m² × 1/29.960 × 37.960 | = | 68.771 m² |
| CURB TOTAL | | 68.771 m² |

# SIGNAL SPACE

$L = 7000$

# CONCRETE VOLUME

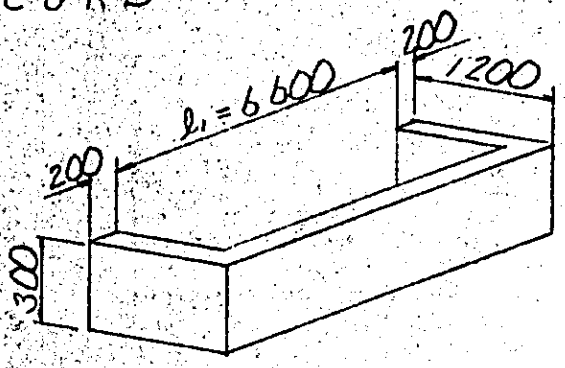
## (1) SLAB




$V = 1.200 \times 0.200 \times 7.000$ = 1.680 $m^3$

SLAB TOTAL 1.680 $m^3$

## (2) CURB

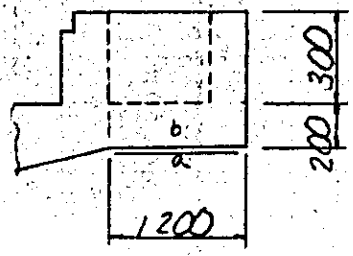



$V = 0.200 \times 0.300 \times (1.200 \times 2 + 6.600)$ = 0.540 $m^3$

CURB TOTAL 0.540 $m^3$

# FORM AREA

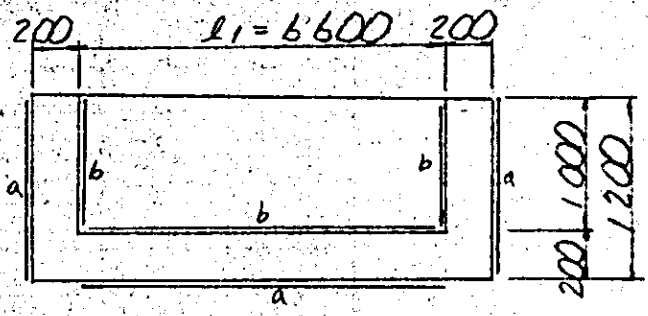
## (1) SLAB




$\ell = 7.000$

| | | |
|---|---|---|
| $A_a = 1.200 \times \overset{\ell}{7.000}$ | = | 8.400 $m^2$ |
| $A_b = 0.200 \times 1.200 \times 2$ | = | 0.480 " |
| SLAB TOTAL | | 8.880 $m^2$ |

## (2) CURB




$h = 300$

| | | |
|---|---|---|
| $A_a = 0.300 \times (1.200 \times 2 + \overset{\ell_1}{6.600})$ | = | 2.700 $m^2$ |
| $A_b = 0.300 \times (1.000 \times 2 + \overset{\ell_2}{6.600})$ | = | 2.580 " |
| CURB TOTAL | | 5.280 $m^2$ |

# REINFORCING BAR

No. 219

| REINF. NO | DIA (mm) | U. WEIGHT (kg/m) | LENGTH (mm) | NUMBER | WEIGHT (kg) | REMARKS |
|---|---|---|---|---|---|---|
| | SIGNAL | | | | | |
| | L=7000 | | | | | |
| | SLAB | | | | | |
| S31 | D13 | 0.995 | 3840 | 57 | 217.8 | |
| 32 | " | " | 1590 | 29 | 45.9 | |
| 33 | " | " | 6930 | 11 | 75.8 | |
| | | | | D13 | 339.5 kg | |
| | | | SLAB | TOTAL | 339.5 kg | |
| | CURB | | | | | |
| W31 | D13 | 0.995 | 6930 | 4 | 27.6 | |
| 32 | " | " | 1370 | 62 | 84.5 | |
| 33 | " | " | 1460 | 8 | 11.6 | |
| | | | | D13 | 123.7 kg | |
| | | | CURB | TOTAL | 123.7 kg | |

JICA