

REVETMENT

TYPE OF WORK

: WET STONE MASONRY

LOCATION

: WF. 97+36.32 ~ WF. 98+31.90

| CALCULATION | | | | | | RESULT |
|-------------------------------------------|----------------------|-----------------|-------------|------------------------|--------------------------|------------------------------|
| WET STONE MASONRY | | | | | | |
| WET STONE MASONRY (1 : 1.5) (t = 250) | | | | | | |
| STATION NO. | PARTIAL DISTANCE (m) | SLOP LENGTH (m) | AVERAGE (m) | AREA (m ²) | VOLUME (m ³) | |
| WF97R+36.320 | | 5.512 | | | | |
| WF97R+41.320 | 7.099 | 5.512 | 5.512 | 39.131 | 9.783 | |
| WF98R+1.400 | 11.745 | 5.523 | 5.518 | 64.804 | 16.201 | |
| WF98R+11.900 | 9.740 | 4.432 | 4.978 | 48.482 | 12.120 | |
| WF98R+21.900 | 9.740 | 3.547 | 3.990 | 38.858 | 9.715 | |
| WF98R+31.900 | 9.740 | 3.561 | 3.554 | 34.617 | 8.654 | |
| | | | | TOTAL | 56.473 | |
| WF98L+31.900 | | 3.561 | | | | |
| WF98L+21.900 | 9.700 | 3.547 | 3.554 | 34.475 | 8.619 | |
| WF98L+11.900 | 9.700 | 4.432 | 3.990 | 38.699 | 9.675 | |
| WF98L+1.400 | 10.200 | 5.523 | 4.978 | 50.772 | 12.693 | |
| WF97L+41.320 | 11.700 | 5.512 | 5.518 | 64.556 | 16.139 | |
| WF97L+36.320 | 5.000 | 5.512 | 5.512 | 27.561 | 6.890 | |
| | | | | TOTAL | 54.016 | |
| <i>TOTAL = 110.489</i> | | | | | | <i>110.489 m³</i> |

REVETMENT

TYPE OF WORK : BACKFILL GRAVEL

LOCATION : WF. 97+36.32 ~ WF. 98+31.90

| CALCULATION | | | | | | RESULT |
|-----------------------------|----------------------|-----------------|-------------|------------------------|--------------------------|------------------------------|
| BACKFILL GRAVEL (t = 300) | | | | | | |
| STATION NO. | PARTIAL DISTANCE (m) | SLOP LENGTH (m) | AVERAGE (m) | AREA (m ²) | VOLUME (m ³) | |
| WF97R+36.320 | | 5.512 | | | | |
| WF97R+41.320 | 5.020 | 5.512 | 5.512 | 27.671 | 8.301 | |
| WF98R+1.400 | 11.745 | 5.523 | 5.518 | 64.804 | 19.441 | |
| WF98R+11.900 | 9.740 | 4.432 | 4.978 | 48.482 | 14.545 | |
| WF98R+21.900 | 9.740 | 3.547 | 3.990 | 38.858 | 11.658 | |
| WF98R+31.900 | 9.740 | 3.561 | 3.554 | 34.617 | 10.385 | |
| | | | | TOTAL | 64.330 | |
| WF98L+31.900 | | 3.561 | | | | |
| WF98L+21.900 | 9.700 | 3.547 | 3.554 | 34.475 | 10.343 | |
| WF98L+11.900 | 9.700 | 4.432 | 3.990 | 38.699 | 11.610 | |
| WF98L+1.400 | 10.200 | 5.523 | 4.978 | 50.772 | 15.232 | |
| WF97L+41.320 | 11.700 | 5.512 | 5.518 | 64.556 | 19.367 | |
| WF97L+36.320 | 5.000 | 5.512 | 5.512 | 27.561 | 8.268 | |
| | | | | TOTAL | 64.819 | |
| TOTAL = 128.149 | | | | | | 128.149 m³ |

TYPE OF WORK : REVETMENT
 LOCATION : TOP CONCRETE
 : WF 97 + 36.32 ~ WF. 98 + 31.90

| CALCULATION | | RESULT |
|------------------------------------------------------|---|-----------------------|
| (RIGHT BANK) | | |
| • CONCRETE (TYPE - CI) | | |
| L = 10.04 + 10.04 + 10.54 + 12.045 + 7.099 | = | 49.764 m |
| V = 0.30 x 0.70 x 49.764 | = | 10.450 |
| | | 10.450 m ³ |
| • GRAVEL BEDDING | | |
| L = 49.764 m | | |
| V = (0.30 + 0.10) x 0.10 x 49.764 | = | 1.991 |
| | | 1.991 m ³ |
| • FORM (H < 4.0 m) | | |
| A ₁ = 0.70 x 49.764 x 2 | = | 69.670 |
| A ₂ = 0.70 x 0.30 x 4 | = | 0.840 |
| Σ A | = | 70.510 |
| | | 70.510 m ² |
| • REINFORCING BAR | | |
| • D13 (W = 1.04 kgf/m) | | |
| W ₁ = 6 Bars x (10.04 - 0.05 x 2) x 1.04 | = | 62.026 |
| W ₂ = 6 Bars x (10.04 - 0.05 x 2) x 1.04 | = | 62.026 |
| W ₃ = 6 Bars x (10.54 - 0.05 x 2) x 1.04 | = | 65.146 |
| W ₄ = 6 Bars x (12.045 - 0.05 x 2) x 1.04 | = | 74.537 |
| W ₅ = 6 Bars x (7.099 - 0.05 x 2) x 1.04 | = | 43.674 |
| • D10 (W = 0.617 kgf/m) | | |
| N ₆ = (10.04 - 0.05 x 2) ÷ 0.30 | = | 33.13 |
| L = 0.20 x 2 + 0.60 x 2 + 15 x 0.01 | = | 1.75 m/Bars |
| W ₆ = 34 Bars x 1.75 x 0.671 | = | 36.712 |
| N ₇ = (10.04 - 0.05 x 2) ÷ 0.30 | = | 33.13 |
| L = 1.75 m/Bars | | |
| W ₇ = 34 Bars x 1.75 x 0.617 | = | 36.712 |
| N ₈ = (10.54 - 0.05 x 2) ÷ 0.30 | = | 34.80 |
| W ₈ = 35 Bars x 1.75 x 0.617 | = | 37.791 |
| N ₉ = (12.045 - 0.05 x 2) ÷ 0.30 | = | 39.82 |
| W ₉ = 40 Bars x 1.75 x 0.617 | = | 43.190 |
| N ₁₀ = (7.099 - 0.05 x 2) ÷ 0.30 | = | 23.33 |
| W ₁₀ = 24 Bars x 1.75 x 0.617 | = | 25.914 |
| Σ W | = | 487.728 kgf |
| | | 0.488 tf |

TYPE OF WORK : REVETMENT
 LOCATION : TOP CONCRETE
 : WF.97 + 36.32 ~ WF.98 + 31.90

| CALCULATION | | RESULT |
|-------------------------|---------------------------------------|---------------|
| (LEFT BANK) | | |
| • CONCRETE (TYPE - C) | | |
| L = | 10.00 + 10.00 + 10.50 + 12.00 + 7.071 | = 49.571 m |
| V = | 0.30 x 0.70 x 49.571 | = 10.410 |
| • GRAVEL BEDDING | | |
| L = | 49.571 m | |
| V = | (0.30 + 0.10) x 0.10 x 49.571 | = 1.983 |
| • FORM (H < 4.0 m) | | |
| A ₁ = | 0.70 x 49.571 x 2 | = 69.399 |
| A ₂ = | 0.70 x 0.30 x 4 | = 0.840 |
| | Σ A | = 70.239 |
| • REINFORCING BAR | | |
| • D 13 (W = 1.04 kgf/m) | | |
| W ₁ = | 6 Bars x (10.00 - 0.05 x 2) x 1.04 | = 61.776 |
| W ₂ = | 6 Bars x (10.00 - 0.05 x 2) x 1.04 | = 61.776 |
| W ₃ = | 6 Bars x (10.50 - 0.05 x 2) x 1.04 | = 64.896 |
| W ₄ = | 6 Bars x (12.00 - 0.05 x 2) x 1.04 | = 74.256 |
| W ₅ = | 6 Bars x (7.07 - 0.05 x 2) x 1.04 | = 43.499 |
| • D10 (W = 0.617 kgf/m) | | |
| N ₆ = | (10.00 - 0.05 x 2) ÷ 0.30 | = 33 Bars |
| L = | 0.20 x 2 + 0.60 x 2 + 15 x 0.0 | = 1.75 m/Bars |
| W ₆ = | 33 Bars x 1.75 x 0.617 | = 35.632 |
| N ₇ = | (10.00 - 0.05 x 2) ÷ 0.30 | = 33 Bars |
| W ₇ = | 33 Bars x 1.75 x 0.617 | = 35.632 |
| N ₈ = | (10.54 - 0.05 x 2) ÷ 0.30 = 34.67 | ≅ 35 Bars |
| W ₈ = | 35 Bars x 1.75 x 0.617 | = 37.791 |
| N ₉ = | (12.00 - 0.05 x 2) ÷ 0.30 = 39.67 | ≅ 40 Bars |
| W ₉ = | 40 Bars x 1.75 x 0.617 | = 43.190 |
| N ₁₀ = | (7.071 - 0.05 x 2) ÷ 0.30 = 23.24 | ≅ 24 Bars |
| W ₁₀ = | 24 Bars x 1.75 x 0.617 | = 25.914 |
| | Σ W | = 485.362 kgf |
| | | 0.484 tf |

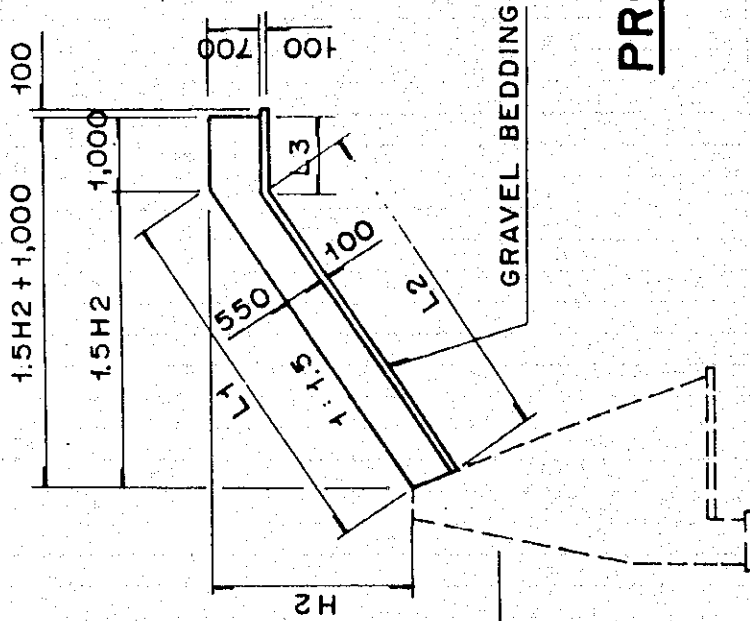
TYPE OF WORK : REVELMENT
 PARTITION WALL

LOCATION : WF.97 +36.32 ~ WF.98 +31.90

EXPLANATORY DRAWING

TABLE OF DIMENSION

| STATION | L1 (m) | L2 (m) | L3 (m) |
|---------------|--------|--------|--------|
| WF. 98+21,900 | 3,796 | 3,515 | 1,058 |
| WF. 98+11,900 | 3,732 | 3,451 | 1,058 |
| WF. 98+1,400 | 4,823 | 4,542 | 1,058 |
| WF. 97+41,320 | 4,812 | 4,531 | 1,058 |



PROFILE OF PARTITION WALL

SCALE A

REVETMENT

TYPE OF WORK

: CEMENT MORTAR POINTING

LOCATION

: WF. 97+36.32 ~ WF. 98+31.90

| CALCULATION | | | | | RESULT |
|------------------------|----------------------|-----------------|-------------|------------------------|------------------------|
| CEMENT MORTAR POINTING | | | | | |
| STATION NO. | PARTIAL DISTANCE (m) | SLOP LENGTH (m) | AVERAGE (m) | AREA (m ²) | |
| WF97R+36.320 | | 5.512 | | | |
| WF97R+41.320 | 7.099 | 5.512 | 5.512 | 39.131 | |
| WF98R+1.400 | 11.745 | 5.523 | 5.518 | 64.804 | |
| WF98R+11.900 | 9.740 | 4.432 | 4.978 | 48.482 | |
| WF98R+21.900 | 9.740 | 3.547 | 3.990 | 38.858 | |
| WF98R+31.900 | 9.740 | 3.561 | 3.554 | 34.617 | |
| | | | TOTAL | 225.893 | |
| WF98L+31.900 | | 3.561 | | | |
| WF98L+21.900 | 9.700 | 3.547 | 3.554 | 34.475 | |
| WF98L+11.900 | 9.700 | 4.432 | 3.990 | 38.699 | |
| WF98L+1.400 | 10.200 | 5.523 | 4.978 | 50.772 | |
| WF97L+41.320 | 11.700 | 5.512 | 5.518 | 64.556 | |
| WF97L+36.320 | 5.000 | 5.512 | 5.512 | 27.561 | |
| | | | TOTAL | 216.063 | |
| TOTAL = 441.956 | | | | | 441.956 m ² |

TYPE OF WORK : REVETMENT
 LOCATION :
 : WF.97 + 36.22 ~ WF.98 + 31.90

| CALCULATION | | | | | | | RESULT | | |
|-------------------------------------------|----------------------|--------------------------------------------------|--------|--------|----------------------|----------------------|------------------------|-----------------------------|-----------------------|
| • FORM (H < 4.0 m) | | | | | | | | | |
| | STATION NO. | L1 (m) | L2 (m) | L3 (m) | A1 (m ²) | A2 (m ²) | AREA (m ²) | FORM AREA (m ²) | |
| | WF. 98+21.900 | 3.796 | 3.515 | 1.058 | 0.720 | 2.011 | 2.731 | 5.462 | |
| | WF. 98+11.900 | 3.732 | 3.451 | 1.058 | 0.720 | 1.975 | 2.696 | 5.391 | |
| | WF. 98+1.400 | 4.823 | 4.542 | 1.058 | 0.720 | 2.575 | 3.296 | 6.591 | |
| | WF. 97+41.320 | 4.812 | 4.531 | 1.058 | 0.720 | 2.569 | 3.290 | 6.579 | |
| | | | | | | | TOTAL | 24.024 | |
| | TOTAL = 24.024 x 2 = | | | | | | 48.048 | | 48.048 m ² |
| • GRAVEL BEDDING (t = 100) | | | | | | | | | |
| | V ₁ | = (0.50 + 0.70) x ½ x 0.10 x (3.515 + 1.058) x 2 | | | | | = | 0.549 | |
| | V ₂ | = (0.50 + 0.70) x ½ x 0.10 x (3.451 + 1.058) x 2 | | | | | = | 0.541 | |
| | V ₃ | = (0.50 + 0.70) x ½ x 0.10 x (4.542 + 1.058) x 2 | | | | | = | 0.672 | |
| | V ₄ | = (0.50 + 0.70) x ½ x 0.10 x (4.531 + 1.058) x 2 | | | | | = | 0.671 | |
| | TOTAL | | | | | | = | 2.433 | 2.433 m ³ |
| • JOINT FILTER (t = 10, ELASTIC MATERIAL) | | | | | | | | | |
| | A ₁ | = 2.731 x 2 | | | | | = | 5.462 | |
| | A ₂ | = 2.696 x 2 | | | | | = | 5.392 | |
| | A ₃ | = 3.296 x 2 | | | | | = | 6.592 | |
| | A ₄ | = 3.290 x 2 | | | | | = | 6.580 | |
| | TOTAL | | | | | | = | 24.026 | 24.026 m ² |
| • FORM (H < 4.0 m) | | | | | | | | | |
| | TOTAL = 24.024 x 2 = | | | | | | 48.048 | | 48.048 m ² |

TYPE OF WORK : REVETMENT FOR SIDE SLOPE OF 1:2.0 (WET STONE MASONRY)
 LOCATION : WF.96L ~ WF.97L + 41.32 m

| CALCULATION | | RESULT |
|--------------------------------------------------------------------------|----------------------------------|------------------------|
| STRUCTURAL EXCAVATION | | |
| $A_1 = (1.10 + 2.50) \times \frac{1}{2} \times 0.60$ | = 1.080 m ² | |
| $A_2 = (4.60 + 6.10) \times \frac{1}{2} \times 0.50$ | = 2.675 m ² | |
| $A_3 = (1.118 \times 7.00 + 1.00) \times 0.50$ | = 4.413 m ² | |
| $A_4 = (0.50 + 1.20) \times \frac{1}{2} \times 0.70$ | = 0.595 m ² | |
| | TOTAL A = 8.763 m ² | |
| $V = 8.763 \times 89.867$ (R = 46.65) | = 787.50 m ³ | 787.50 m ³ |
| BACKFILL WITH SELECTED SOIL | | |
| $A_1 = (0.50 + 1.00) \times \frac{1}{2} \times 0.50 \times 2$ | = 0.750 m ² | |
| $A_2 = (0.50 + 1.10) \times \frac{1}{2} \times 0.60$ | = 0.480 m ² | |
| | TOTAL A = 1.230 m ² | |
| $V = 1.23 \times 89.867$ (R = 46.65) | = 110.54 m ³ | 110.54 m ³ |
| WEEP HOLE | | |
| $n = 6 \text{ places} / 10.0 \text{ m} \times 89.867$ (R = 46.65) | = 54 places | |
| PVC PIPE ϕ 50 (L = 0.80 m/pipe) | | |
| $L = 54 \text{ places} \times 0.8$ | = 43.200 | 43.200 m |
| FILTER CLOTH | | |
| $A = 0.856 \text{ m}^2 / \text{place} \times 54 \text{ places}$ | = 46.224 | 46.224 m ² |
| GRAVEL BEDDING | | |
| $V = (1.118 \times 8.00 + 0.70) \times 0.25 \times 9.70$ | = 23.387 m ³ / 10.00m | |
| $V' = 23.387 \text{ m}^3 / 10.00 \text{ m} \times 89.867$ (R = 46.65) | = 210.172 | 210.172 m ³ |

TYPE OF WORK : REVETMENT FOR SIDE SLOPE OF 1:2.0 (WET STONE MASONRY)
 LOCATION : WF.96L ~ WF.97L + 41.32 m

| CALCULATION | | RESULT |
|---------------------------------------------------------------------------|----------------------------------|------------------------|
| WET STONE MASONRY | | |
| $V = (1.118 \times 8.00 + 0.70) \times 0.25 \times 9.70$ | = 23.387 m ³ / 10.00m | |
| $V^s = 23.387 \text{ m}^3 / 10.00 \text{ m} \times 89.867$ (R = 46.65) | = 210.172 | 210.172 m ³ |
| CEMENT MORTAR POINTING | | |
| $A = (1.118 \times 7.00 + 0.70) \times 0.25 \times 9.70$ | = 82.702 m ² / 10.00m | |
| $A^s = 82.702 \text{ m}^2 / 10.00 \text{ m} \times 89.605$ (R = 46.15) | = 741.051 | 741.051 m ² |
| GABION MATTRESS | | |
| $A = 0.50 \times 3.00$ | = 1.50 m ² | |
| $V = 1.50 \times 97.930$ (R = 52.5) | = 146.895 | 146.895 m ³ |
| RUBBLE STONE FILLING | | |
| $A = \frac{1}{2} \times 0.50 \times 1.00$ | = 0.250 m ² | |
| $V = 0.250 \times 96.883$ (R = 50.5) | = 24.221 | 24.221 m ³ |
| BASE CONCRETE | | |
| CONCRETE (TYPE-C1) | | |
| $V = 2.20 \text{ m}^3 / 10.00 \text{ m} \times 92.276$ (R = 51.25) | = 20.301 | 20.301 m ³ |
| GRAVEL BEDDING | | |
| $V = 0.70 \text{ m}^3 / 10.00 \text{ m} \times 92.276$ | = 6.459 | 6.459 m ³ |
| FORM (H < 4.0 m) | | |
| $A = 10.83 \text{ m}^2 / 10.00 \text{ m} \times 92.276$ | = 99.935 | 99.935 m ² |

TYPE OF WORK : REVETMENT FOR SIDE SLOPE OF 1:2.0 (WET STONE MASONRY)
 LOCATION : WF.96L ~ WF.97L + 41.32 m

| CALCULATION | | RESULT |
|-----------------------------------------------------------------------|------------|-----------------------|
| REINFORCING BAR | | |
| $W = 0.10 \text{ tf} / 10.00 \text{ m} \times 92.276$ | $= 0.923$ | 0.923 tf |
| JOINT FILLER | | |
| $A = 0.22 \text{ m}^2 / 10.00 \text{ m} \times 92.276$ | $= 2.030$ | 2.030 m ² |
| LOG PILE | | |
| $L = 10.00 \text{ m} / 10.00 \text{ m} \times 92.276$ | $= 92.000$ | 92.000 m |
| TOP CONCRETE | | |
| CONCRETE (TYPE-C1) | | |
| $V = 1.80 \text{ m}^3 / 10.00 \text{ m} \times 82.090$ (R = 42.15) | $= 14.776$ | 14.776 m ³ |
| GRAVEL BEDDING | | |
| $V = 0.75 \text{ m}^3 / 10.00 \text{ m} \times 82.090$ | $= 6.157$ | 6.157 m ³ |
| FORM (H < 4.0 m) | | |
| $A = 12.18 \text{ m}^2 / 10.00 \text{ m} \times 82.090$ | $= 99.986$ | 99.986 m ² |
| REINFORCING BAR | | |
| $W = 0.094 \text{ tf} / 10.00 \text{ m} \times 82.090$ | $= 0.772$ | 0.772 tf |
| JOINT FILLER | | |
| $A = 2.605 \text{ m}^2 / 10.00 \text{ m} \times 82.090$ | $= 21.384$ | 21.384 m ² |
| END WALL | | |
| n = 3 places | | |
| CONCRETE (TYPE-C1) | | |
| $V = 1.736 \text{ m}^3 / \text{place} \times 3 \text{ place}$ | $= 5.208$ | 5.208 m ³ |

TYPE OF WORK : REVETMENT FOR SIDE SLOPE OF 1:2.0 (WET STONE MASONRY)

LOCATION : WF.96L ~ WF.97L + 41.32 m

| CALCULATION | | RESULT |
|-----------------------------------------------------------------|------------|----------------------|
| GRAVEL BEDDING | | |
| $V = 0.772 \text{ m}^3 / \text{place} \times 3 \text{ places}$ | $= 2.316$ | 2.316 m^3 |
| FORM (H < 4.0 m) | | |
| $A = 11.573 \text{ m}^2 / \text{place} \times 3 \text{ places}$ | $= 34.719$ | 34.719 m^2 |
| REINFORCING BAR | | |
| $W = 0.091 \text{ tf} / \text{place} \times 3 \text{ places}$ | $= 0.273$ | 0.273 tf |
| JOINT FILLER | | |
| $A = 2.411 \text{ m}^2 / \text{place} \times 3 \text{ places}$ | $= 7.233$ | 7.233 m^2 |
| PARTITION WALL | | |
| $n = 89.867 : 10.00 \quad 8 \text{ places}$ | | |
| CONCRETE (TYPE-C1) | | |
| $V = 1.447 \text{ m}^3 / \text{place} \times 8 \text{ places}$ | $= 11.576$ | 11.576 m^3 |
| GRAVEL BEDDING | | |
| $V = 0.579 \text{ m}^3 / \text{place} \times 8 \text{ places}$ | $= 4.632$ | 4.632 m^3 |
| FORM (H < 4.0 m) | | |
| $A = 9.644 \text{ m}^2 / \text{place} \times 8 \text{ places}$ | $= 77.152$ | 77.152 m^2 |
| REINFORCING BAR | | |
| $W = 0.087 \text{ tf} / \text{place} \times 8 \text{ places}$ | $= 0.696$ | 0.696 tf |
| JOINT FILLER | | |
| $A = 2.411 \text{ m}^2 / \text{place} \times 8 \text{ places}$ | $= 19.288$ | 19.288 m^2 |
| | | |
| | | |
| | | |

TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100R ~ WF.100R+20.0m

| CALCULATION | | RESULT |
|------------------------------------------------------------------|-------------|-----------------------|
| STRUCTURAL EXCAVATION | | |
| $V = 180.390 \text{ m}^3 / 15.0 \text{ m} \times 10.0 \text{ m}$ | $= 120.260$ | 120.260 m^3 |
| BACKFILL WITH SELECTED SOIL | | |
| $V = 20.640 \text{ m}^3 / 15.0 \text{ m} \times 10.0 \text{ m}$ | $= 13.760$ | 13.760 m^3 |
| GRAVEL BEDDING | | |
| 1. BASE CONCRETE | | |
| $V = 0.70 \text{ m}^3 / 10.0 \text{ m} \times 17.0 \text{ m}$ | $= 1.190$ | 1.190 m^3 |
| 2. FOR STANDARD SECTION | | |
| $V = 51.876 \text{ m}^3 / 15.0 \text{ m} \times 10.0 \text{ m}$ | $= 34.584$ | 34.584 m^3 |
| TOTAL | $= 35.774$ | 35.774 m^3 |
| WET STONE MASONRY | | |
| $V = 51.656 \text{ m}^3 / 15.0 \text{ m} \times 10.0 \text{ m}$ | $= 34.437$ | 34.437 m^3 |
| CEMENT MORTAR POINTING | | |
| $A = 174.636 \text{ m}^2 / 15.0 \text{ m} \times 10.0 \text{ m}$ | $= 116.424$ | 116.424 m^2 |
| DEFORMED REINFORCING BAR | | |
| BASE CONCRETE | | |
| $W = 0.1 \text{ tf} / 10.0 \text{ m} \times 17.0 \text{ m}$ | $= 0.17$ | 0.170 tf |
| CONCRETE, FORM | | |
| BASE CONCRETE | | |
| CONCRETE | | |
| $V = 2.20 \text{ m}^3 / 10.0 \text{ m} \times 17.0 \text{ m}$ | $= 3.74$ | 3.740 m^3 |

TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)

LOCATION : WF.100R ~ WF.100R+20.0m

| CALCULATION | | RESULT |
|-----------------------------------------------------------------|-----------------------|----------------------|
| FORM | | |
| $A = 10.830 \text{ m}^2 / 10.0 \text{ m} \times 17.0 \text{ m}$ | $= 18.411$ | 18.411 m^2 |
| JOINT FILLER | | |
| BASE CONCRETE | | |
| $A = 0.22 \text{ m}^2 / 10.0 \text{ m} \times 17.0 \text{ m}$ | $= 0.374$ | 0.374 m^3 |
| GABION MATTRESS | | |
| $t = 500$ | | |
| $V_1 = 17.0 \times 0.5 \times 3.0$ | $= 25.5$ | |
| $V_2 = 17.0 \times 0.5 \times 1.5$ | $= 12.75$ | |
| TOTAL | $= 38.250$ | 38.250 m^3 |
| RUBBLE STONE FILLING | | |
| $A = 1/2 \times 1.0 \times 0.5 \times 2$ | $= 0.500 \text{ m}^2$ | |
| $V = 0.500 \times 17.0 \text{ m}$ | $= 8.500 \text{ m}^3$ | 8.500 m^3 |
| WEEP HOLE | | |
| PVC PIPE ϕ 50 | | |
| $n = 9 / 15.0 \text{ m} \times 10.0 \text{ m}$ | $= 6$ | |
| $l = 6 \times 0.8$ | $= 4.8 \text{ m}$ | 4.800 m |
| JOINT FILLER | | |
| $n = 6$ | | |
| $A = 0.064 \text{ m}^2 / \text{place} \times 6$ | $= 0.384$ | 0.384 m^2 |
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TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100L ~ WF.100L+15.0 m

| CALCULATION | | RESULT |
|-----------------------------------------------------------------|----------|-----------------------|
| STRUCTURAL EXCAVATION | | |
| $V = 180.390 \text{ m}^3 / 15.0 \text{ m} \times 7.0 \text{ m}$ | = 84.182 | 84.182 m ³ |
| BACKFILL WITH SELECTED SOIL | | |
| $V = 20.640 \text{ m}^3 / 15.0 \text{ m} \times 7.0 \text{ m}$ | = 9.632 | 9.632 m ³ |
| GRAVEL BEDDING | | |
| 1. BASE CONCRETE | | |
| $V = 0.70 \text{ m}^3 / 10.0 \text{ m} \times 11.5 \text{ m}$ | = 0.805 | 0.805 m ³ |
| 2. STANDARD SECTION | | |
| $V = 51.876 \text{ m}^3 / 15.0 \text{ m} \times 7.0 \text{ m}$ | = 24.209 | 24.209 m ³ |
| TOTAL | | 25.014 m ³ |
| WET STONE MASONRY | | |
| $V = 51.656 \text{ m}^3 / 15.0 \text{ m} \times 7.0 \text{ m}$ | = 24.106 | 24.106 m ³ |
| CEMENT MORTAR POINTING | | |
| $A = 174.636 \text{ m}^2 / 15.0 \text{ m} \times 7.0 \text{ m}$ | = 81.497 | 81.497 m ² |
| DEFORMED REINFORCING BAR | | |
| 1. BASE CONCRETE | | |
| $W = 0.1 \text{ tf} / 10.0 \text{ m} \times 11.5 \text{ m}$ | = 0.115 | 0.115 tf |
| CONCRETE, FORM | | |
| BASE CONCRETE | | |
| CONCRETE | | |
| $V = 2.20 \text{ m}^3 / 10.0 \text{ m} \times 11.5 \text{ m}$ | = 2.53 | 2.530 m ³ |

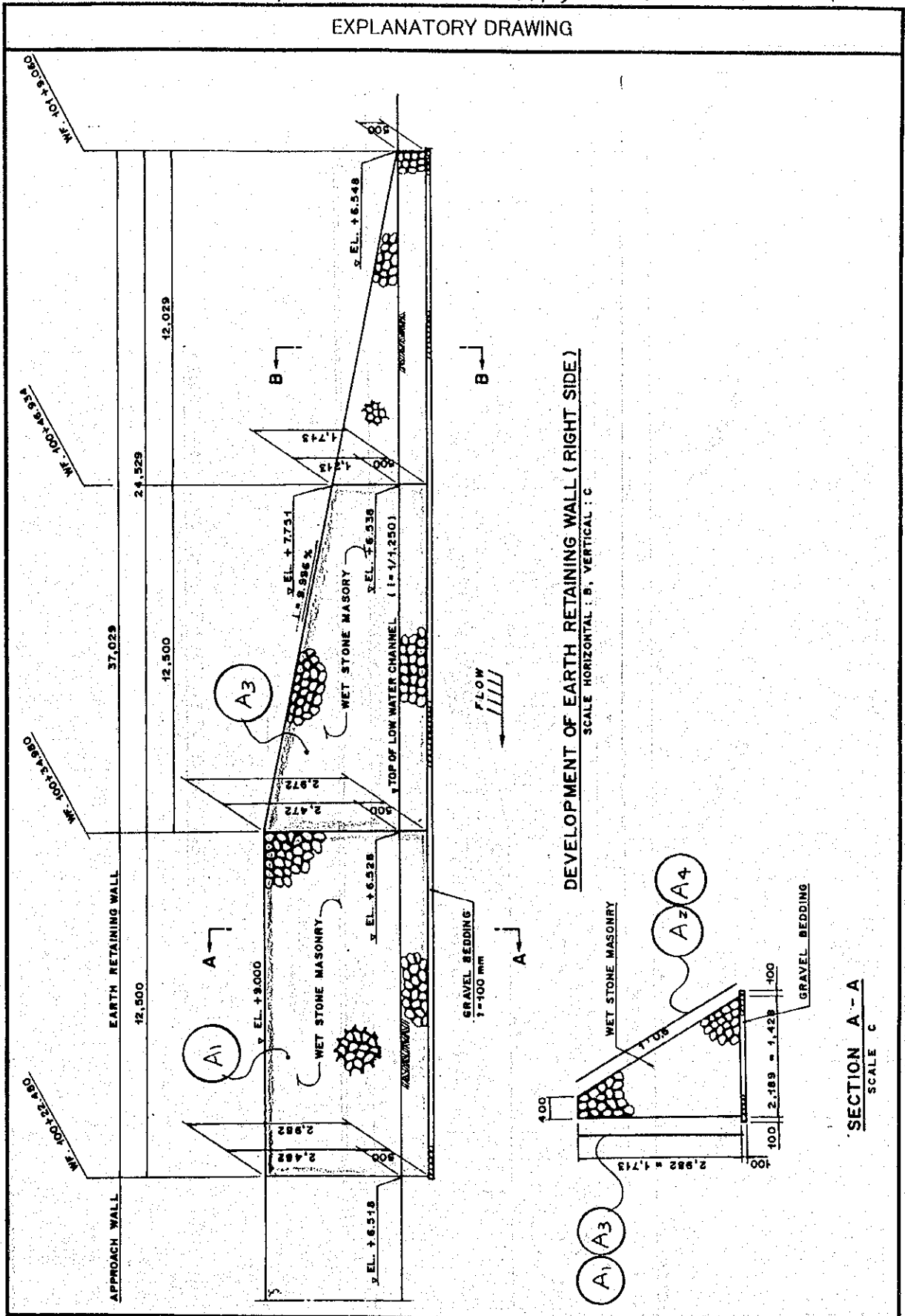
TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100L ~ WF.100L+20.0m

| CALCULATION | | RESULT |
|-----------------------------------------------------------------|-----------------------|----------------------|
| FORM | | |
| $A = 10.830 \text{ m}^2 / 10.0 \text{ m} \times 11.5 \text{ m}$ | $= 12.455$ | 12.455 m^2 |
| JOINT FILLER | | |
| BASE CONCRETE | | |
| $A = 0.22 \text{ m}^2 / 10.0 \text{ m} \times 11.5 \text{ m}$ | $= 0.253$ | 0.253 m^2 |
| GABION MATTRESS | | |
| $t = 500 \text{ mm}$ | | |
| $V_1 = 11.5 \times 0.5 \times 3.0$ | $= 17.250$ | |
| $V_2 = 11.5 \times 0.5 \times 1.5$ | $= 8.625$ | |
| TOTAL | $= 25.875$ | 25.875 m^3 |
| RUBBLE STONE FILLING | | |
| $A = 1/2 \times 1.0 \times 0.5 \times 2$ | $= 0.500 \text{ m}^2$ | |
| $V = 0.500 \times 11.5 \text{ m}$ | $= 5.750 \text{ m}^3$ | 5.750 m^3 |
| WEEP HOLE | | |
| PVC PIPE ϕ 50 | | |
| $n = 9 / 15.0 \text{ m} \times 7.0 \text{ m}$ | $= 4$ | |
| $l = 4 \times 0.8$ | $= 3.2 \text{ m}$ | 3.200 m |
| FILTER CLOTH | | |
| $A = 0.064 \text{ m}^2 / \text{place} \times 4$ | $= 0.256$ | 0.256 m^2 |
| | | |
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TYPE OF WORK : EARTH RETAINING WALL
 LOCATION : WF.100 + 22.48 m ~ WF.101 + 9.06 m (RIGHT BANK)

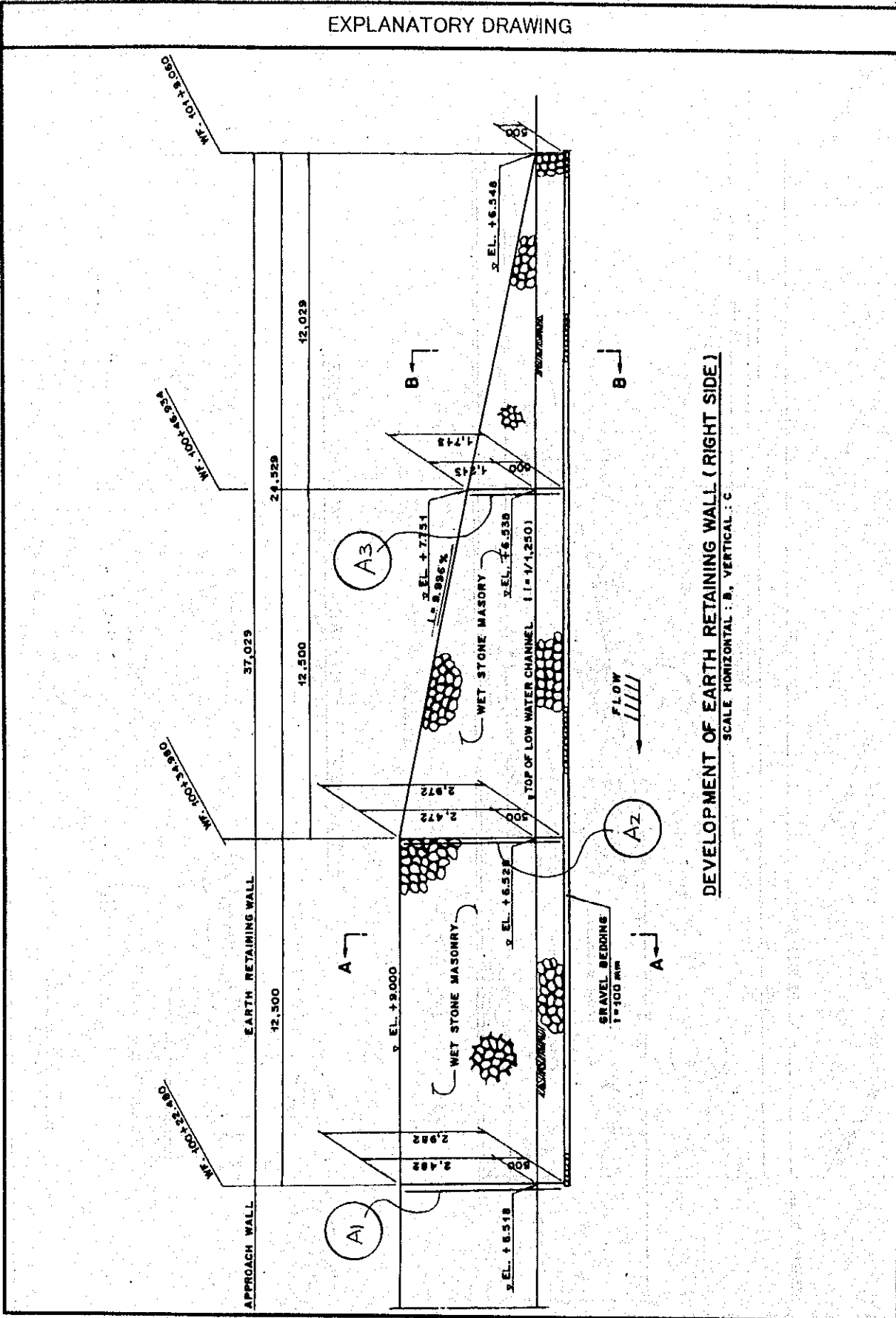
| CALCULATION | | RESULT |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------|
| WET STONE MASONRY | | |
| $V_1 = \{(0.40 + 2.189) \times \frac{1}{2} \times 2.982 + (0.40 + 2.183) \times \frac{1}{2} \times 2.972\} \times \frac{1}{2} \times 12.50$ | = 48.116 | |
| $V_2 = \{(0.40 + 2.183) \times \frac{1}{2} \times 2.972 + (0.40 + 1.428) \times \frac{1}{2} \times 1.713\} \times \frac{1}{2} \times 12.50$ | = 33.775 | |
| $V_3 = \{(0.30 + 1.328) \times \frac{1}{2} \times 1.713 + (0.30 + 0.60) \times \frac{1}{2} \times 0.50\} \times \frac{1}{2} \times 12.029$ | = 9.740 | |
| TOTAL | = 91.631 | 91.631 m ³ |
| GRAVEL BEDDING (t = 100) | | |
| $V_1 = (2.389 + 2.383) \times \frac{1}{2} \times (12.50 + 0.10) \times 0.10$ | = 3.006 | |
| $V_2 = (2.283 + 1.628) \times \frac{1}{2} \times 12.50 \times 0.10$ | = 2.444 | |
| $V_3 = (1.528 + 0.80) \times \frac{1}{2} \times (12.029 + 0.10) \times 0.10$ | = 1.412 | |
| TOTAL | = 6.862 | 6.862 m ³ |
| SCAFFOLDING | | |
| $A_1 = (2.982 + 2.972) \times \frac{1}{2} \times 12.50$ | = 37.213 | |
| $A_2 = (2.982 + 2.972) \times 1.166 \times \frac{1}{2} \times 12.50$ (REVISING COEFFICIENT) | = 43.390 | |
| $A_3 = (2.972 + 1.713) \times \frac{1}{2} \times 12.50$ | = 29.281 | |
| $A_4 = (2.972 + 1.713) \times 1.166 \times \frac{1}{2} \times 12.50$ | = 34.142 | |
| TOTAL | = 144.026 | 144.026 m ² |
| JOINT FILLER t = 10, ELASTIC MATERIAL | | |
| $A_1 = (0.40 + 2.189) \times \frac{1}{2} \times 2.982$ | = 3.860 | |
| $A_2 = (0.40 + 2.183) \times \frac{1}{2} \times 2.972$ | = 3.838 | |
| $A_3 = (0.40 + 1.428) \times \frac{1}{2} \times 1.713$ | = 1.566 | |
| TOTAL | = 9.264 | 9.264 m ² |

TYPE OF WORK : EARTH RETAINING WALL
 : SCAFFOLDING
 LOCATION : WF. 100 + 22.48 ~ WF. 101 + 9.06 (RIGHT BANK)



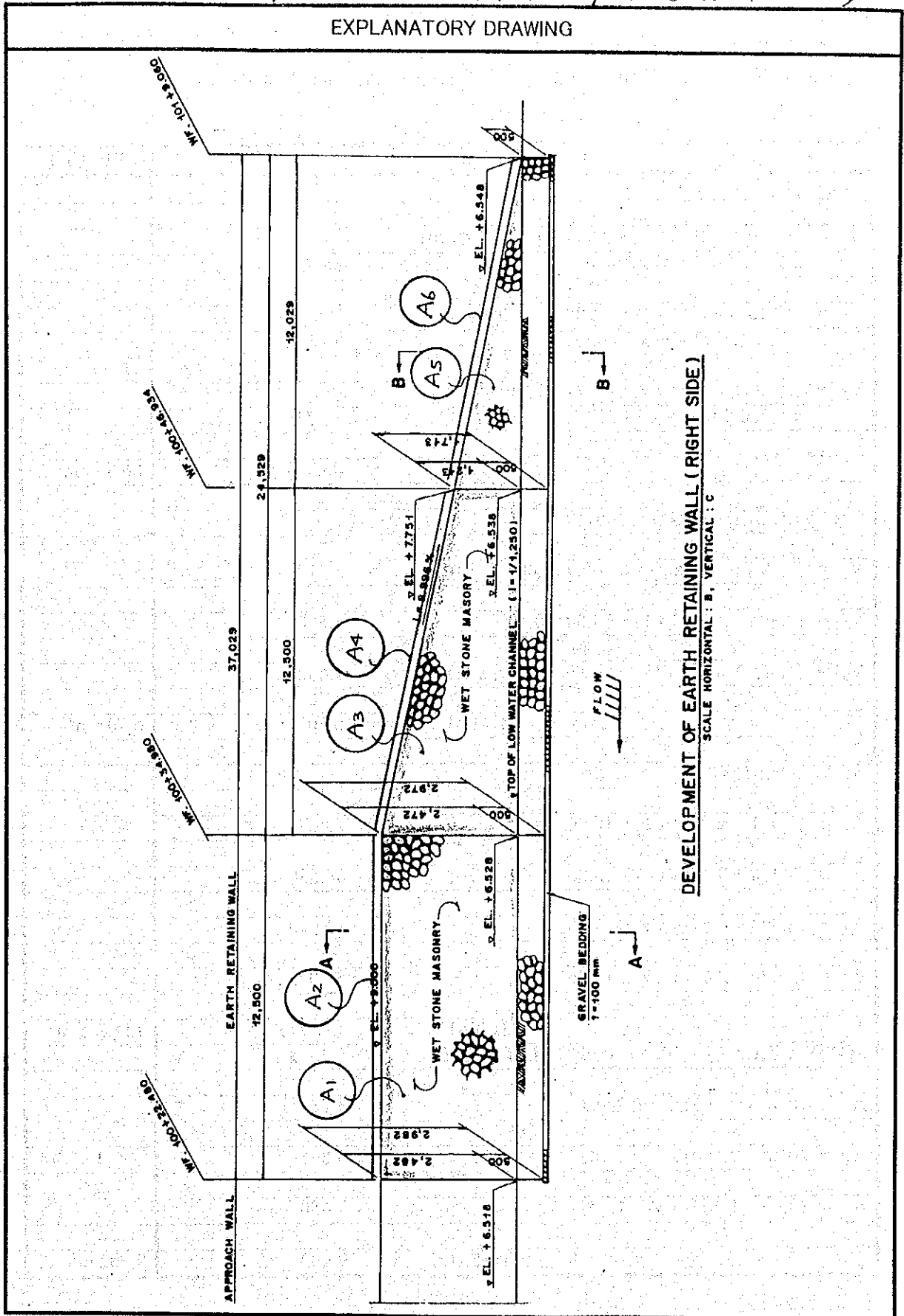
TYPE OF WORK : EARTH RETAINING WALL
 : JOINT FILLER
 LOCATION : WF.100+22.48 ~ WF.101+9.06 (RIGHT BANK)

EXPLANATORY DRAWING



DEVELOPMENT OF EARTH RETAINING WALL (RIGHT SIDE)
 SCALE HORIZONTAL : B, VERTICAL : C

TYPE OF WORK : EARTH RETAINING WALL
 CEMENT MORTAR POINTING
 LOCATION : WF.100+22.48 ~ WF.101+9.06 (RIGHT BANK)



TYPE OF WORK : EARTH RETAINING WALL
 LOCATION : WF.100 + 10.88 m ~ WF.100 + 45.881 m (LEFT BANK)

| CALCULATION | | RESULT |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------|
| WET STONE MASONRY | | |
| $V_1 = \{(0.40 + 2.195) \times \frac{1}{2} \times 2.991 + (0.40 + 2.190) \times \frac{1}{2} \times 2.983\} \times \frac{1}{2} \times 10.00$ | = 38.719 | |
| $V_2 = \{(0.40 + 2.190) \times \frac{1}{2} \times 2.983 + (0.40 + 1.466) \times \frac{1}{2} \times 1.777\} \times \frac{1}{2} \times 13.000$ | = 35.886 | |
| $V_3 = \{(0.30 + 1.366) \times \frac{1}{2} \times 1.777 + (0.30 + 0.60) \times \frac{1}{2} \times 0.50\} \times \frac{1}{2} \times 13.779$ | = 11.748 | |
| TOTAL | = 86.353 | 86.353 m ³ |
| GRAVEL BEDDING (t = 100) | | |
| $V_1 = (2.195 + 0.10 \times 2) \times 0.10 \times (10.00 + 0.10)$ | = 2.419 | |
| $V_2 = (2.395 + 1.666) \times \frac{1}{2} \times 13.00 \times 0.10$ | = 2.640 | |
| $V_3 = (1.566 + 0.80) \times \frac{1}{2} \times (13.779 + 0.10) \times 0.10$ | = 1.642 | |
| TOTAL | = 6.701 | 6.701 m ³ |
| SCAFFOLDING | | |
| $A_1 = (2.991 + 2.983) \times \frac{1}{2} \times 10.00$ | = 29.870 | |
| $A_2 = (3.488 + 3.478) \times \frac{1}{2} \times 10.00$ | = 34.830 | |
| $A_3 = (2.983 + 1.777) \times \frac{1}{2} \times 13.00$ | = 30.940 | |
| $A_4 = (3.478 + 2.072) \times \frac{1}{2} \times 13.00$ | = 36.075 | |
| TOTAL | = 131.715 | 131.715 m ² |
| JOINT FILLER t = 10, ELASTIC MATERIAL | | |
| $A_1 = (0.40 + 2.195) \times \frac{1}{2} \times 2.991$ | = 3.881 | |
| $A_2 = (0.40 + 2.190) \times \frac{1}{2} \times 2.983$ | = 3.863 | |
| $A_3 = (0.40 + 1.466) \times \frac{1}{2} \times 1.777$ | = 1.658 | |
| TOTAL | = 9.402 | 9.402 m ² |

EARTH RETAINING WALL

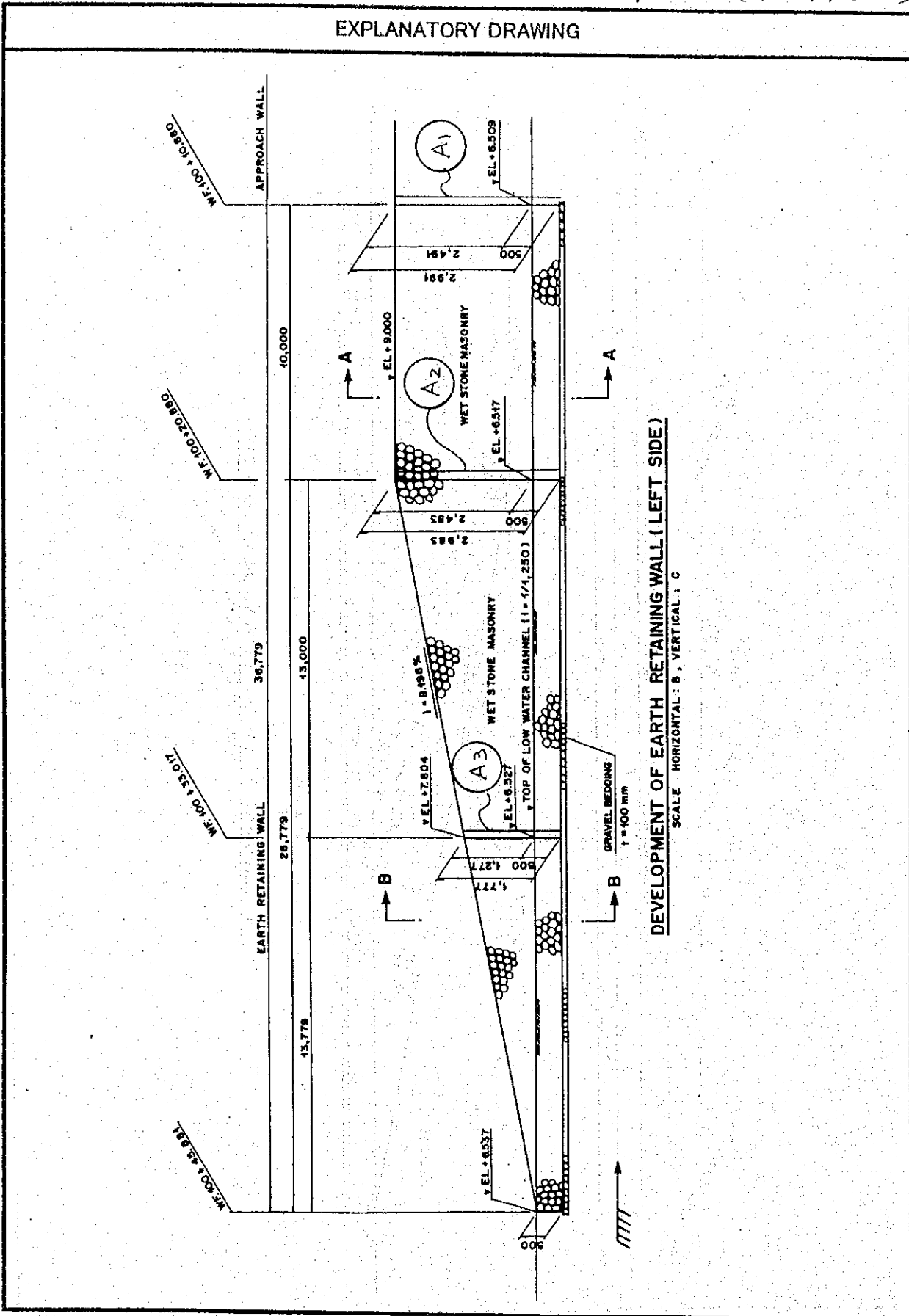
TYPE OF WORK :

JOINT FILLER

LOCATION :

WF. 100 + 10.88 ~ WF. 100 + 45.881 (LEFT BANK)

EXPLANATORY DRAWING



DEVELOPMENT OF EARTH RETAINING WALL (LEFT SIDE)
SCALE HORIZONTAL : 8, VERTICAL : 6

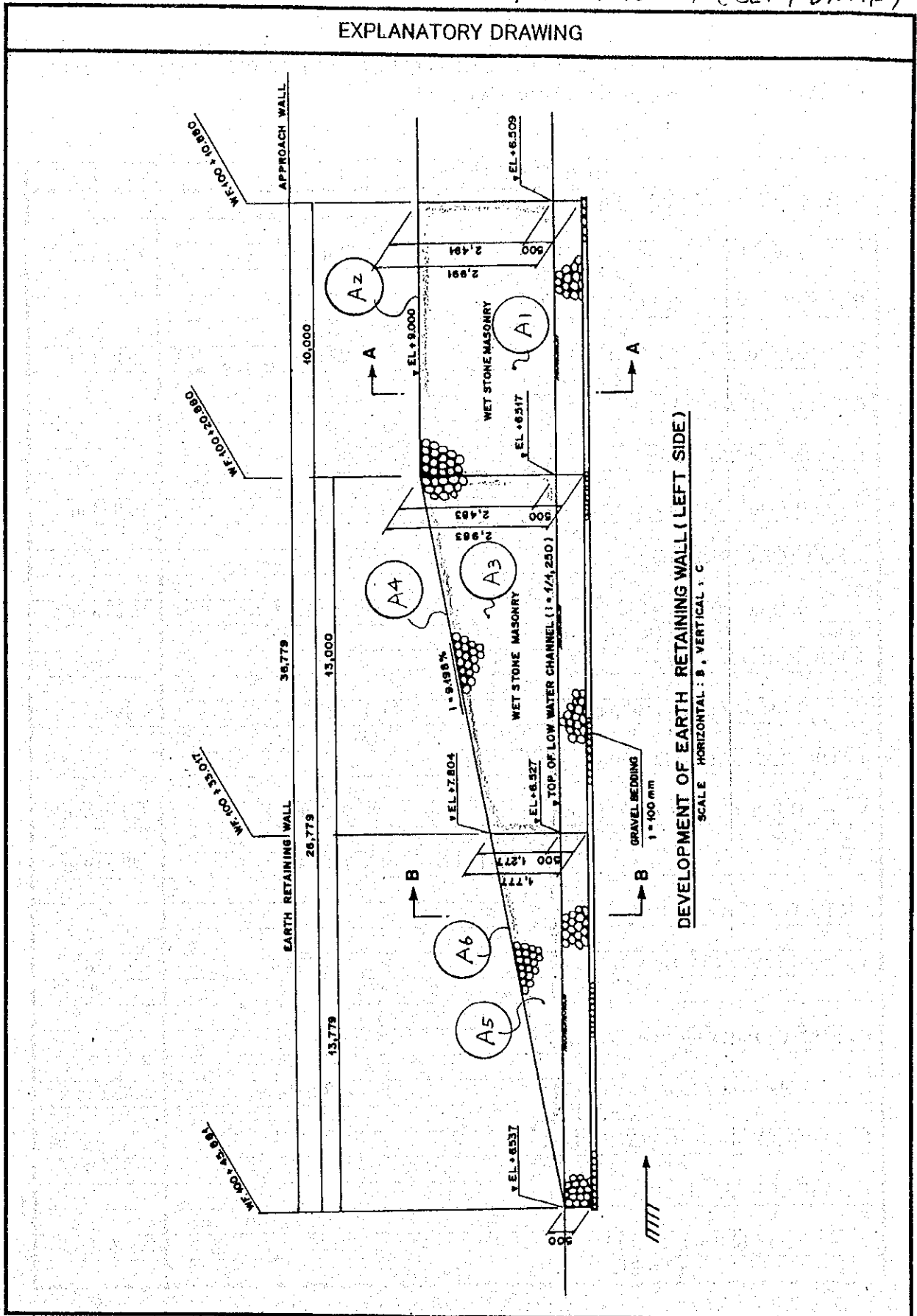
TYPE OF WORK :

EARTH RETAINING WALL
CEMENT MORTAR POINTING

LOCATION :

WF.100+10.88 ~ WF.100+45.881 (LEFT BANK)

EXPLANATORY DRAWING



STYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100R + 20.0 m ~ WF.104R

| CALCULATION | | RESULT |
|--------------------------------------------------------------------------|------------------|------------------------------|
| STRUCTURAL EXCAVATION | | |
| $V = 180.390 \text{ m}^3 / 15.0 \text{ m} \times 213.239$ (R = 221.5) | = 2564.412 | 2564.412 m ³ |
| BACKFILL WITH SELECTED SOIL | | |
| $V = 20.640 \text{ m}^3 / 15.0 \text{ m} \times 213.239$ (R = 221.5) | = 293.417 | 293.417 m ³ |
| GRAVEL BEDDING | | |
| 1. BASE CONCRETE | | |
| $V = 0.70 \text{ m}^3 / 10.0 \text{ m} \times 213.614$ (R = 221.5) | = 14.953 | 14.953 m ³ |
| 2. FOR TOP CONCRETE | | |
| $V = 0.75 \text{ m}^3 / 10.0 \text{ m} \times 213.550$ (R = 221.5) | = 16.016 | 16.016 m ³ |
| 3. FOR PARTITION WALL | | |
| $V = 0.706 \text{ m}^3 / \text{place} \times 14 \text{ places}$ | = 9.884 | 9.884 m ³ |
| 4. FOR STANDARD SECTION | | |
| $V = 51.876 \text{ m}^3 / 15.0 \text{ m} \times 213.239$ (R = 221.5) | = 737.466 | 737.466 m ³ |
| TOTAL | = 778.319 | 778.319 m³ |
| WET STONE MASONRY | | |
| $V = 51.656 \text{ m}^3 / 15.0 \text{ m} \times 213.239$ (R = 221.5) | = 734.338 | 734.338 m ³ |
| CEMENT MORTAR POINTING | | |
| $A = 174.636 \text{ m}^2 / 15.0 \text{ m} \times 213.239$ (R = 221.5) | = 2482.614 | 2482.614 m ² |
| DEFORMED REINFORCING BAR | | |
| 1. BASE CONCRETE | | |
| $W = 0.1 \text{ tf} / 10.0 \text{ m} \times 213.614$ (R = 215.5) | = 2.136 | 2.136 tf |

TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100R + 20.0 m ~ WF.104R

| CALCULATION | | RESULT |
|-----------------------------------------------------------------------|-----------|------------------------|
| 2. TOP CONCRETE | | |
| $W = 0.094 \text{ tf} / 10.0 \text{ m} \times 213.55$ (R = 228.35) | = 2.007 | 2.007 tf |
| 3. PARTITION WALL | | |
| $W = 0.123 \text{ tf} / \text{place} \times 14 \text{ places}$ | = 1.722 | 1.722 tf |
| TOTAL | = 5.865 | 5.865 tf |
| CONCRETE, FORM | | |
| 1. BASE CONCRETE | | |
| CONCRETE | | |
| $V = 2.20 \text{ m}^3 / 10.0 \text{ m} \times 213.614$ (R = 215.5) | = 46.995 | 46.995 m ³ |
| FORM | | |
| $A = 10.830 \text{ m}^2 / 10.0 \text{ m} \times 213.614$ | = 231.344 | 231.344 m ² |
| 2. TOP CONCRETE | | |
| CONCRETE | | |
| $V = 1.80 \text{ m}^3 / 10.0 \text{ m} \times 213.550$ | = 38.439 | 38.439 m ³ |
| FORM | | |
| $A = 12.180 \text{ m}^2 / 10.0 \text{ m} \times 213.550$ | = 260.104 | 260.104 m ² |
| 3. PARTITION WALL | | |
| CONCRETE | | |
| $V = 2.117 \text{ m}^3 / \text{place} \times 14 \text{ places}$ | = 29.638 | 29.638 m ³ |
| FORM | | |
| $A = 14.116 \text{ m}^2 / \text{place} \times 14 \text{ places}$ | = 197.624 | 197.624 m ² |
| TOTAL CONCRETE | = 115.072 | 115.072 m ³ |
| TOTAL FORM | = 689.072 | 689.072 m ² |

TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100R + 20.0 m ~ WF.104R

| CALCULATION | | RESULT |
|-------------------------------------------------------------------------|--------------------------|------------------------------|
| JOINT FILLER | | |
| 1. BASE CONCRETE | | |
| $A = 0.22 \text{ m}^2 / 10.0 \text{ m} \times 213.614$ (R = 215.5) | = 4.700 | 4.700 m ² |
| 2. TOP CONCRETE | | |
| $A = 2.645 \text{ m}^2 / 10.0 \text{ m} \times 213.550$ (R = 228.35) | = 56.484 | 56.484 m ² |
| 3. PARTITION WALL | | |
| $A = 3.529 \text{ m}^3 / \text{place} \times 14 \text{ places}$ | = 49.406 | 49.406 m ³ |
| TOTAL | = 110.590 | 110.590 m³ |
| GABION MATTRESS | | |
| $t = 500$ | | |
| $L_1 = 213.445 \text{ m} (R = 215)$ | | |
| $L_2 = 213.361 \text{ m} (R = 214.75)$ | | |
| $V_1 = 213.445 \times 0.5 \times 3.0$ | = 320.168 | |
| $V_2 = 213.361 \times 0.5 \times 1.5$ | = 160.021 | |
| $V = V_1 + V_2$ | = 480.189 | 480.189 m ³ |
| RUBBLE STONE FILLING | | |
| $A = 1/2 \times 1.0 \times 0.5 \times 2$ | = 0.500 m ² | |
| $V = 0.500 \times 213.451$ (R = 216.5) | = 106.726 m ³ | 106.726 m ³ |
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TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100L+15.0 m ~ WF.104L

| CALCULATION | | RESULT |
|-------------------------------------------------------------------------------|------------|------------------------------|
| STRUCTURAL EXCAVATION | | |
| $V = 180.390 \text{ m}^3 / 15.0 \text{ m} \times 212.229$ (R=178.5) | = 2552.266 | 2552.266 m ³ |
| BACKFILL WITH SELECTED SOIL | | |
| $V = 20.640 \text{ m}^3 / 15.0 \text{ m} \times 212.229$ (R=178.5) | = 292.027 | 292.027 m ³ |
| GRAVEL BEDDING | | |
| 1. BASE CONCRETE | | |
| $V = 0.70 \text{ m}^3 / 10.0 \text{ m} \times 216.754 \text{ m}$ (R=184.5) | = 15.173 | 15.173 m ³ |
| 2. FOR TOP CONCRETE | | |
| $V = 0.75 \text{ m}^3 / 10.0 \text{ m} \times 206.918$ (R=171.65) | = 15.519 | 15.519 m ³ |
| 3. FOR PARTITION WALL | | |
| $V = 0.706 \text{ m}^3 / \text{place} \times 14 \text{ places}$ | = 9.884 | 9.884 m ³ |
| 4. FOR STANDARD SECTION | | |
| $V = 51.876 \text{ m}^3 / 15.0 \text{ m} \times 212.229$ (R=178.5) | = 733.973 | 733.973 m ³ |
| TOTAL | | 774.549 m³ |
| WET STONE MASONRY | | |
| $V = 51.656 \text{ m}^3 / 15.0 \text{ m} \times 212.229$ (R=178.5) | = 730.860 | 730.860 m ³ |
| CEMENT MORTAR POINTING | | |
| $A = 174.636 \text{ m}^2 / 15.0 \text{ m} \times 212.229$ (R=178.5) | = 2470.855 | 2470.855 m ² |
| DEFORMED REINFORCING BAR | | |
| 1. BASE CONCRETE | | |
| $W = 0.1 \text{ tf} / 10.0 \text{ m} \times 216.754$ (R=184.5) | = 2.168 | 2.168 tf |

TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100L+15.0 m ~ WF.104L

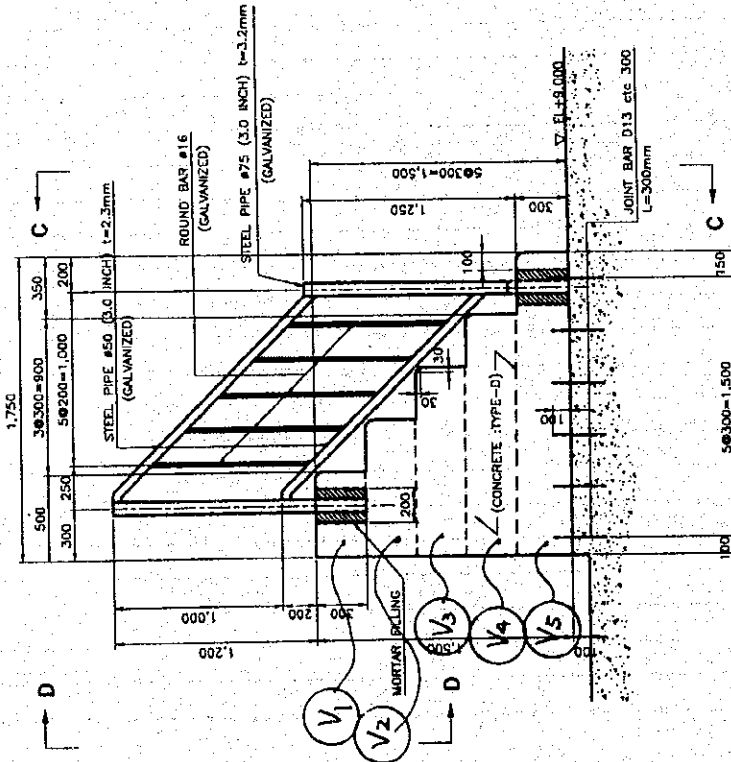
| CALCULATION | | RESULT |
|----------------------------------------------------------|------------------|------------------------------|
| 2. TOP CONCRETE | | |
| W = 0.094 tf / 10.0 m x 206.918 (R=171.65) | = 1.945 | 1.945 tf |
| 3. PARTITION WALL | | |
| W = 0.123 tf / place x 14 places | = 1.722 | 1.722 tf |
| TOTAL | = 5.835 | 5.835 tf |
| CONCRETE, FORM | | |
| 1. BASE CONCRETE | | |
| CONCRETE | | |
| V = 2.20 m ³ / 10.0 m x 216.754 (R=184.5) | = 47.686 | 47.686 m ³ |
| FORM | | |
| A = 10.830 m ² / 10.0 m x 216.754 | = 234.745 | 234.745 m ² |
| 2. TOP CONCRETE | | |
| CONCRETE | | |
| V = 1.80 m ³ / 10.0 m x 206.918 (R=171.65) | = 37.245 | 37.245 m ³ |
| FORM | | |
| A = 12.180 m ² / 10.0 m x 206.918 | = 252.026 | 252.026 m ² |
| 3. PARTITION WALL | | |
| CONCRETE | | |
| V = 2.117 m ³ / place x 14 places | = 29.638 | 29.638 m ³ |
| FORM | | |
| A = 14.116 m ² / place x 14 places | = 197.624 | 197.624 m ² |
| TOTAL CONCRETE | = 114.569 | 114.569 m³ |
| TOTAL FORM | = 684.395 | 684.395 m² |

TYPE OF WORK : REVETMENT FOR SLOPE OF 1:2.0 (WET STONE MASONRY TYPE)
 LOCATION : WF.100L+15.0 m ~ WF.104L

| CALCULATION | | RESULT |
|-----------------------------------------------------------------|--------------------------|------------------------------|
| JOINT FILLER | | |
| 1. BASE CONCRETE | | |
| $A = 0.22 \text{ m}^2 / 10.0 \text{ m} \times 216.754$ | = 4.769 | 4.769 m ² |
| (R=184.5) | | |
| 2. TOP CONCRETE | | |
| $A = 2.645 \text{ m}^2 / 10.0 \text{ m} \times 206.918$ | = 54.730 | 54.730 m ² |
| (R=171.65) | | |
| 3. PARTITION WALL | | |
| $A = 3.529 \text{ m}^3 / \text{place} \times 14 \text{ places}$ | = 49.406 | 49.406 m ³ |
| | | |
| | TOTAL = 108.905 | 108.905 m³ |
| GABION MATTRESS | | |
| $t = 500$ | | |
| $L_1 = 217.007 \text{ m}$ | | |
| $L_2 = 216.923 \text{ m}$ | | |
| $V_1 = 217.007 \times 0.5 \times 3.0$ | = 325.511 | |
| $V_2 = 216.923 \times 0.5 \times 1.5$ | = 162.692 | |
| $V = V_1 + V_2$ | = 488.203 | 488.203 m ³ |
| RUBBLE STONE FILLING | | |
| $A = 1/2 \times 1.0 \times 0.5 \times 2$ | = 0.500 m ² | |
| $V = 0.500 \times 216.417$ | = 108.209 m ³ | 108.209 m ³ |
| (R=183.5) | | |
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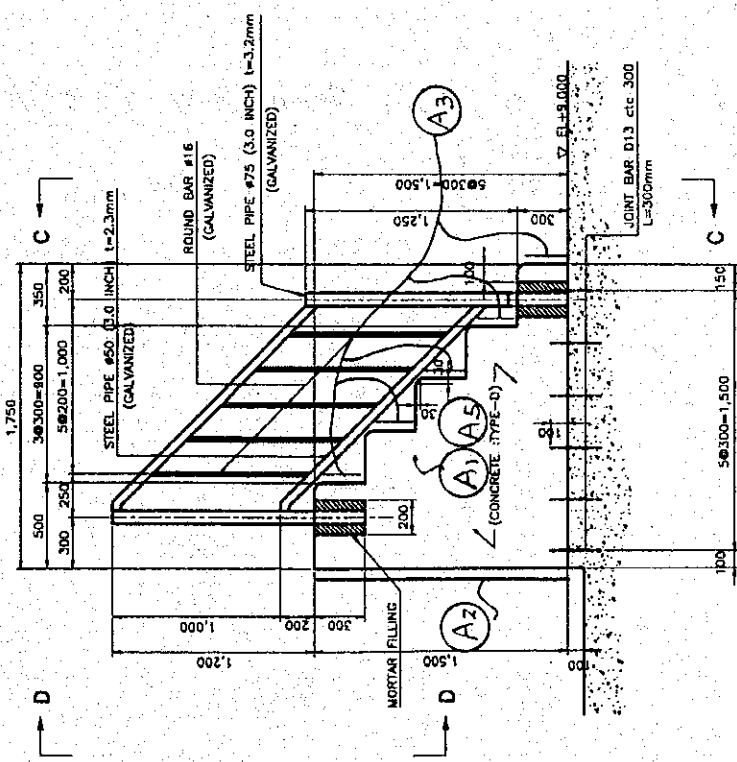
MAINTENANCE STEPS

| TYPE OF WORK : | CALCULATION | | RESULT |
|----------------|----------------------------------------------------------------------------|--|----------------------|
| CONCRETE | CONCRETE (TYPE-D) | | |
| LOCATION : | | | |
| GATE PIER | $V_1 = 0.50 \times 0.30 \times 1.20 = 0.180$ | | |
| | $V_2 = 0.80 \times 0.30 \times 1.20 = 0.288$ | | |
| | $V_3 = 1.10 \times 0.30 \times 1.20 = 0.396$ | | |
| | $V_4 = 1.40 \times 0.30 \times 1.20 = 0.504$ | | |
| | $V_5 = 1.75 \times 0.30 \times 1.20 = 0.630$ | | |
| | (Deduction for Step) | | |
| | $V_6 = -\frac{1}{2} \times 0.03 \times 0.03 \times 1.20 \times 5 = -0.003$ | | |
| | (Deduction for Blockout) | | |
| | $V_7 = -(0.30 \times 0.20 \times 0.30) \times 4 = -0.048$ | | |
| | TOTAL = 1.947 | | 1.947 m ³ |



MAINTENANCE STEPS

| TYPE OF WORK : | FORM | CALCULATION | RESULT |
|----------------|-----------|------------------------------------------------------------------|--------------------------------|
| LOCATION : | GATE PIER | (H < 4.0 m) | |
| | | $A_1 = 1.75 \times 1.50 \times 2$ | $= 5.250$ |
| | | $A_2 = 1.20 \times 1.50$ | $= 1.800$ |
| | | $A_3 = 0.27 \times 1.20 \times 5$ | $= 1.620$ |
| | | $A_4 = \sqrt{2} \times 0.03 \times 1.20 \times 5$ | $= 0.255$ |
| | | $A_5 = -(0.35 \times 1.20 + 0.30 \times 0.90 + 0.30 \times 0.60$ | $+ 0.30 \times 0.30) \times 2$ |
| | | $A_6 = -\frac{1}{2} \times 0.03^2 \times 2 \times 5$ | $= -0.005$ |
| | | $A_7 = (0.3 \times 0.20 \times 4) \times 4$ | $= 0.960$ |
| | | TOTAL = 7.960 | 7.960 m² |

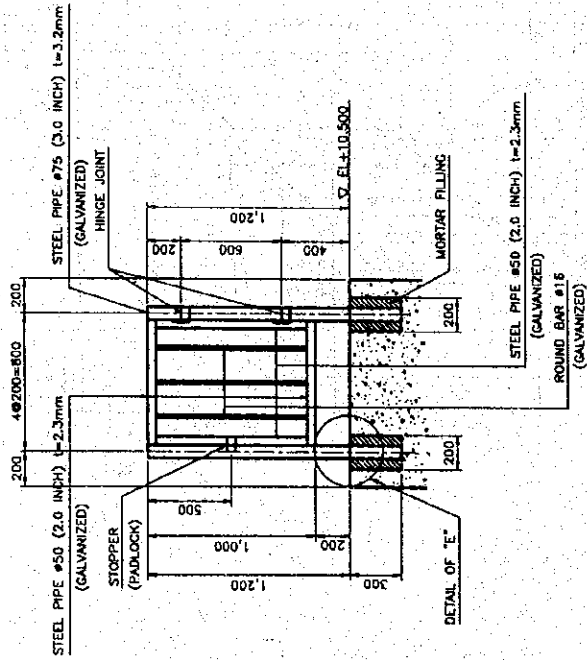


TYPE OF WORK : MAINTENANCE STEPS
 LOCATION : HANDRAIL

| CALCULATION | RESULT |
|-----------------------------------------------------|-----------|
| (GALVANIZED) | |
| • STEEL PIPE $\phi 75$ (3.0 inch) $t = 3.2$ mm | |
| $n = 2, L = 1.50$ m Unit Weight : $w = 5.77$ kg/m | |
| $W_1 = 2 \times 1.50 \times 5.77$ | = 17.310 |
| $n = 2, L = 1.55$ m | |
| $W_2 = 2 \times 1.55 \times 5.77$ | = 17.887 |
| • STEEL PIPE $\phi 50$ (2.0 inch) $t = 2.3$ mm | |
| $n = 4, L = 1.663$ m Unit Weight : $w = 2.63$ kg/m | |
| $W_3 = 4 \times 1.663 \times 2.63$ | = 17.495 |
| • ROUND BAR $\phi 16$ | |
| $n = 10, L = 0.929$ m Unit Weight : $w = 1.58$ kg/m | |
| $W_4 = 10 \times 0.929 \times 1.58$ | = 14.678 |
| TOTAL = 67.370 | |
| | 67.370 kg |
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MAINTENANCE STEPS

| TYPE OF WORK: | CALCULATION | RESULT |
|-------------------|---------------------------------------------------------------|-----------|
| DOOR (GALVANIZED) | STEEL PIPE $\phi 50$ (2.0 inch) $t=2.3\text{mm}$ | |
| GATE PIER | $n = 2, L = 0.90\text{m}$ Unit Weight : $W = 2.63\text{kg/m}$ | |
| | $n = 2, L = 0.725\text{m}$ | |
| | $W_1 = (2 \times 0.90 + 2 \times 0.725) \times 2.63 = 8.548$ | |
| | • ROUND BAR $\phi 16$ | |
| | $n = 3, L = 0.90\text{m}$ Unit Weight : $W = 1.58\text{kg/m}$ | |
| | $W_2 = 3 \times 0.90 \times 1.58 = 4.266$ | |
| | TOTAL = 12.814 | 12.814 kg |
| | • PADLOCK | 1 L.S. |



MAINTENANCE STEPS

TYPE OF WORK :

MORTAR FILLING

LOCATION :

GATE PIER

CALCULATION

$$V = \left\{ (0.20 \times 0.20) - \frac{7}{8} \times 0.075^2 \right\} \times 0.30 \times 4$$

$$= 0.043$$

0.043 m³

RESULT

