

Technical drawing of a rock stabilization system. The drawing shows a cable anchor (44-11) and a mortar container (44-20) with dimensions and labels.

Labels and dimensions include:

- $H_1 =$  (height)
- Minimum 1.50m (cable length)
- $\alpha =$  (angle)
- $\beta =$  (angle)
- 60 (dimension)
- 20 (dimension)
- 1.68 (dimension)
- 2.30 (dimension)
- 1.37 (dimension)
- $X =$  (dimension)
- 1.0 (dimension)
- 2 (dimension)
- Mortar container (2 units per anchor bar) 44-20
- Anchor bar  $L' =$  m 44-19
- $\phi$  25 mm
- 2 x nos
- 1.25 (dimension)
- $B =$  (dimension)
- Minimum 1.50m (dimension)
- $H_2 =$  (height)
- $h_1 =$  (height)
- Cable elevation
- 44-11 (cable anchor)

\* Refer to General Arrangement for correct direction of anchor bars (44-19) and probable additional bars to stabilize the rock.

Technical drawing of a cable anchorage block. The drawing shows a cross-section of the block with internal components and dimensions.

**Dimensions and Labels:**

- L =**: Total length of the block.
- L/2**: Half the total length.
- 35**: Distance from the end of the block to the center of the inner rods.
- c/c =**: Center-to-center distance of the inner rods.
- Equally distributed (if any)**: Indicates the distribution of the inner rods.
- 0.46**: Distance from the center of the inner rods to the center line of the block.
- Centre line of the block**: The central axis of the block.
- Hole in the flange to mark centre line of block**: A hole used for alignment.
- Thimble for cable  $\phi$  32 mm**: A component used for cable connection.
- 44-15**: Reference number for the thimble.
- 2 Windguy cables  $\phi$  32 mm**: Two cables used for windguying.
- 10, 151**: Dimensions for the windguy cables.
- 190, 190**: Dimensions for the windguy cables.
- Hook for cable erection**: A component used for cable erection.
- 44-11**: Reference number for the hook.
- 6 Bulldog grips**: Six grips used for cable connection.
- 44-16**: Reference number for the bulldog grips.
- Binding wire or weld at the cable end**: A component used for cable connection.
- Fix windguy cable clamp (Drawing no. 17) 3.40m in front of anchorage block**: A component used for cable connection.
- A**: A point or location marked on the right side of the drawing.
- B =**: A dimension or label at the bottom of the drawing.

**INDEX :**

**Cement**

|                                                                                       |                                                              |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------|
|  | Cement plaster 1:4 , 2 cm thick                              |
|  | Plumb concrete 1:3:6 + 40 % boulders                         |
|  | Make proper supports on correct level with cement mortar 1:4 |
|  | Data to be taken from General Arrangement                    |
|  | Part number<br>Working drawing number                        |

| $B = \dots\dots\dots m.$<br>$H_1 = \dots\dots\dots m.$                           | $L = \dots\dots\dots m.$<br>$H_2 = \dots\dots\dots m.$ | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%; padding: 5px;">Vo Quantity (m<sup>3</sup>)</th> <th style="width: 50%; padding: 5px;">Cement Bags/m<sup>3</sup></th> </tr> <tr> <td style="padding: 5px;">Cement plaster 1:4 , 2 cm thick<br/>Vo = 0.02 BL</td> <td style="padding: 5px; text-align: center;">9.12</td> </tr> <tr> <td style="padding: 5px;">Plumb concrete 1:3 : 6 + 40 % boulders<br/>Vo = <math>\frac{BL}{2} (H_1 + H_2 - 0.04)</math></td> <td style="padding: 5px; text-align: center;">2.64</td> </tr> <tr> <td style="padding: 5px;">TOTAL VOLUME :-<br/>Vtotal = <math>\frac{BL}{2} (H_1 + H_2)</math></td> <td style="padding: 5px;"></td> </tr> </table> | Vo Quantity (m <sup>3</sup> ) | Cement Bags/m <sup>3</sup> | Cement plaster 1:4 , 2 cm thick<br>Vo = 0.02 BL | 9.12 | Plumb concrete 1:3 : 6 + 40 % boulders<br>Vo = $\frac{BL}{2} (H_1 + H_2 - 0.04)$ | 2.64 | TOTAL VOLUME :-<br>Vtotal = $\frac{BL}{2} (H_1 + H_2)$ |  |
|----------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------|-------------------------------------------------|------|----------------------------------------------------------------------------------|------|--------------------------------------------------------|--|
| Vo Quantity (m <sup>3</sup> )                                                    | Cement Bags/m <sup>3</sup>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                            |                                                 |      |                                                                                  |      |                                                        |  |
| Cement plaster 1:4 , 2 cm thick<br>Vo = 0.02 BL                                  | 9.12                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                            |                                                 |      |                                                                                  |      |                                                        |  |
| Plumb concrete 1:3 : 6 + 40 % boulders<br>Vo = $\frac{BL}{2} (H_1 + H_2 - 0.04)$ | 2.64                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                            |                                                 |      |                                                                                  |      |                                                        |  |
| TOTAL VOLUME :-<br>Vtotal = $\frac{BL}{2} (H_1 + H_2)$                           |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                            |                                                 |      |                                                                                  |      |                                                        |  |
|                                                                                  |                                                        | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">No. of cement bags</td> <td style="width: 50%; padding: 5px;"></td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No. of cement bags            |                            |                                                 |      |                                                                                  |      |                                                        |  |
| No. of cement bags                                                               |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                            |                                                 |      |                                                                                  |      |                                                        |  |

|                                     |                                              |
|-------------------------------------|----------------------------------------------|
| Formwork                            | F <sub>o</sub><br>Quantity (m <sup>2</sup> ) |
| F <sub>o</sub> = H <sub>2</sub> x L |                                              |

|                        |    |      |     |     |     |     |     |     |     |      |     |
|------------------------|----|------|-----|-----|-----|-----|-----|-----|-----|------|-----|
| $\beta$ ( $^{\circ}$ ) | -3 | -1.5 | 0   | 1.5 | 3   | 4.5 | 6   | 7.5 | 9   | 10.5 | 12  |
| X (cm)                 | 57 | 101  | 145 | 189 | 233 | 277 | 321 | 365 | 409 | 453  | 497 |
| h (cm)                 | 6  | 12   | 19  | 25  | 31  | 37  | 43  | 49  | 55  | 61   | 67  |

For the intermediate values of  $\beta$  select the data for the next bigger value.

|            |                        | Minimum      | Maximum |
|------------|------------------------|--------------|---------|
| B          |                        | 3.00         | 3.80    |
| L          |                        | 1.80         | 4.20    |
| $h_T$      | $\beta \leq 4.5^\circ$ | 0.60         | 2.80    |
|            | $\beta > 4.5^\circ$    | 0.90         |         |
| $H_1, H_2$ | $\beta \leq 4.5^\circ$ | $h_T + 0.80$ | Open    |
|            | $\beta > 4.5^\circ$    | $h_T + 0.45$ |         |

|                                                                                                      |                         |
|------------------------------------------------------------------------------------------------------|-------------------------|
| Bridge No:                                                                                           | Name:                   |
| Span:                                                                                                |                         |
| Structural                                                                                           | Drawing :               |
| <p><b>Windguy Cable Foundation</b></p> <p>On Rock</p> <p>2 Cables <math>\varnothing</math> 32 mm</p> |                         |
| <b>Date:</b> August 2004                                                                             | <b>Drawing No. 44/2</b> |