

# COMUNE DI CROPALATI

(Provincia di Cosenza)

## PROGETTO DEFINITIVO/ESECUTIVO

**MESSA IN SICUREZZA E CONSOLIDAMENTO DI LUOGHI ESPOSTI  
A RISCHIO IDRAULICO E GEOMORFOLOGICO MOLTO ELEVATO**

### CALCOLI STRUTTURALI

TABULATI DI CALCOLO

### TAVOLA

STR.01.5

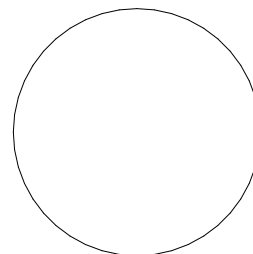
### SCALA

---

COMMITTENTE: Amministrazione Comunale di Cropalati

RESP. UNICO DEL PROCEDIMENTO: Ing. Andrea CALIO'

Timbro e Firma

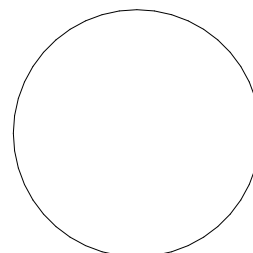
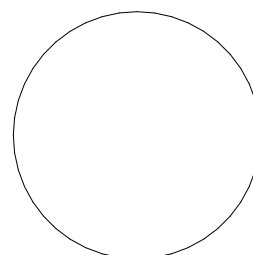


LOCALITA': C.da Circonvallazione

PROGETTISTA - D.L. - CSP - CSE: Ing. Francesco MANGONE

GEOLOGO: Dott. Giuseppe CUFARI

Timbro e Firma



## Tabulati di calcolo

### Spinta e forze

#### Simbologia adottata

|        |                                                                          |
|--------|--------------------------------------------------------------------------|
| Ic     | Indice della combinazione                                                |
| A      | Tipo azione                                                              |
| I      | Inclinazione della spinta, espressa in [°]                               |
| V      | Valore dell'azione, espressa in [kN]                                     |
| Cx, Cy | Componente in direzione X ed Y dell'azione, espressa in [kN]             |
| Px, Py | Coordinata X ed Y del punto di applicazione dell'azione, espressa in [m] |

| Ic | A                            | V<br>[kN] | I<br>[°] | Cx<br>[kN] | Cy<br>[kN]    | Px<br>[m] | Py<br>[m] |
|----|------------------------------|-----------|----------|------------|---------------|-----------|-----------|
| 1  | Spinta statica               | 31.14     | 18.67    | 29.50      | 9.97          | 0.00      | -1.40     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 127.21/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -26.34     |               |           |           |
| 2  | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 9.79     | 9.28       | 3.14          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 19.15      | 127.21/9.57   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -32.31     |               |           |           |
| 3  | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 6.62     | 6.27       | 2.12          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 19.15      | 127.21/-9.57  | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -28.78     |               |           |           |
| 4  | Spinta statica               | 31.14     | 18.67    | 29.50      | 9.97          | 0.00      | -1.40     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 165.38/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -32.20     |               |           |           |
| 5  | Spinta statica               | 31.14     | 18.67    | 29.50      | 9.97          | 0.00      | -1.40     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 127.21/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -26.34     |               |           |           |
| 6  | Spinta statica               | 31.14     | 18.67    | 29.50      | 9.97          | 0.00      | -1.40     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 165.38/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -32.20     |               |           |           |
| 7  | Spinta statica               | 30.35     | 15.13    | 29.30      | 7.92          | 0.00      | -1.39     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 127.21/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -22.35     |               |           |           |
| 8  | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 9.79     | 9.28       | 3.14          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 19.15      | 127.21/9.57   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -32.31     |               |           |           |
| 9  | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 6.62     | 6.27       | 2.12          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 19.15      | 127.21/-9.57  | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -28.78     |               |           |           |
| 10 | Spinta statica               | 31.14     | 18.67    | 29.50      | 9.97          | 0.00      | -1.40     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 127.21/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -26.34     |               |           |           |
| 11 | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 15.82    | 14.99      | 5.07          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 28.72      | 127.21/14.36  | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -36.11     |               |           |           |
| 12 | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 11.79    | 11.17      | 3.77          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 28.72      | 127.21/-14.36 | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -30.95     |               |           |           |
| 13 | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 127.21/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -25.14     |               |           |           |
| 14 | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 127.21/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -25.14     |               |           |           |
| 15 | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Peso/Inerzia muro            |           |          | 0.00       | 127.21/0.00   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -25.14     |               |           |           |
| 16 | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 3.82     | 3.62       | 1.22          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 8.11       | 127.21/4.05   | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -28.12     |               |           |           |
| 17 | Spinta statica               | 22.82     | 18.67    | 21.62      | 7.30          | 0.00      | -1.41     |
|    | Incremento di spinta sismica |           | 2.38     | 2.26       | 0.76          | 0.00      | -1.15     |
|    | Peso/Inerzia muro            |           |          | 8.11       | 127.21/-4.05  | -1.37     | -1.33     |
|    | Resistenza passiva sperone   |           |          | -26.61     |               |           |           |

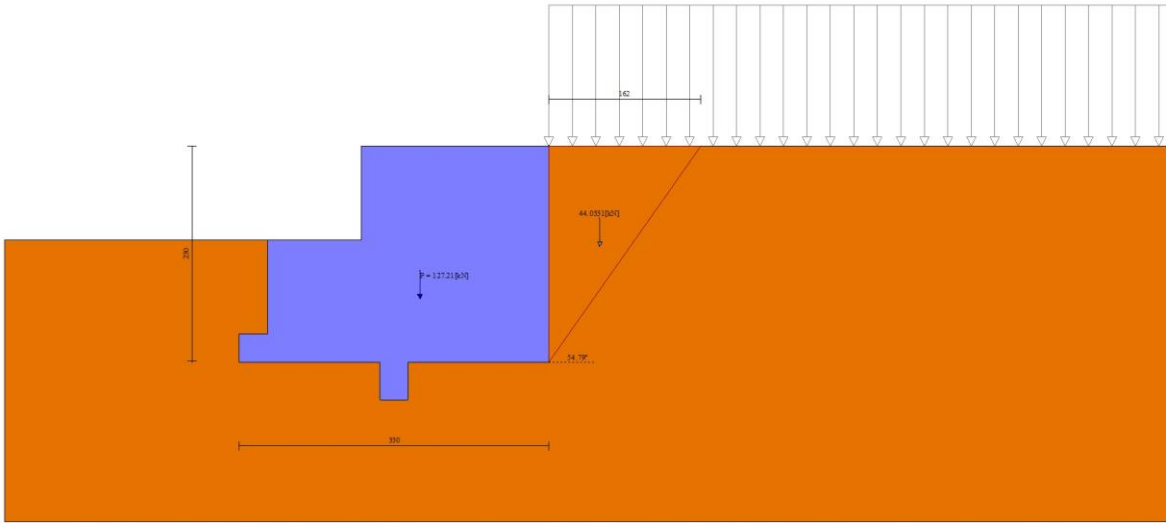


Fig. 1 - Cuneo di spinta (combinazione statica) (Combinazione n° 1)

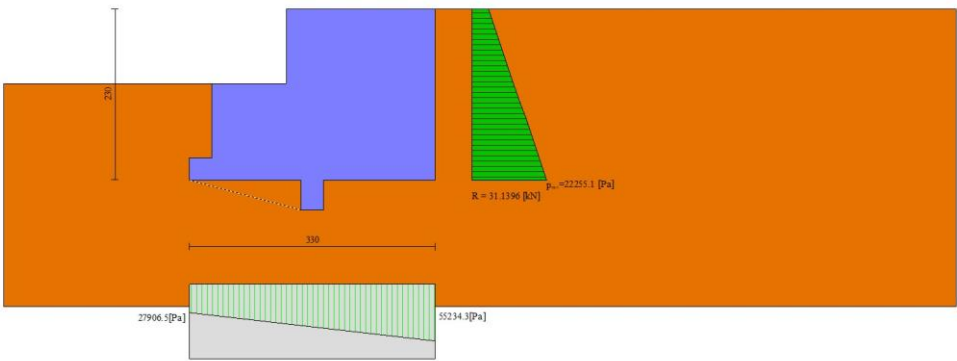


Fig. 2 - Diagramma delle pressioni (combinazione statica) (Combinazione n° 1)

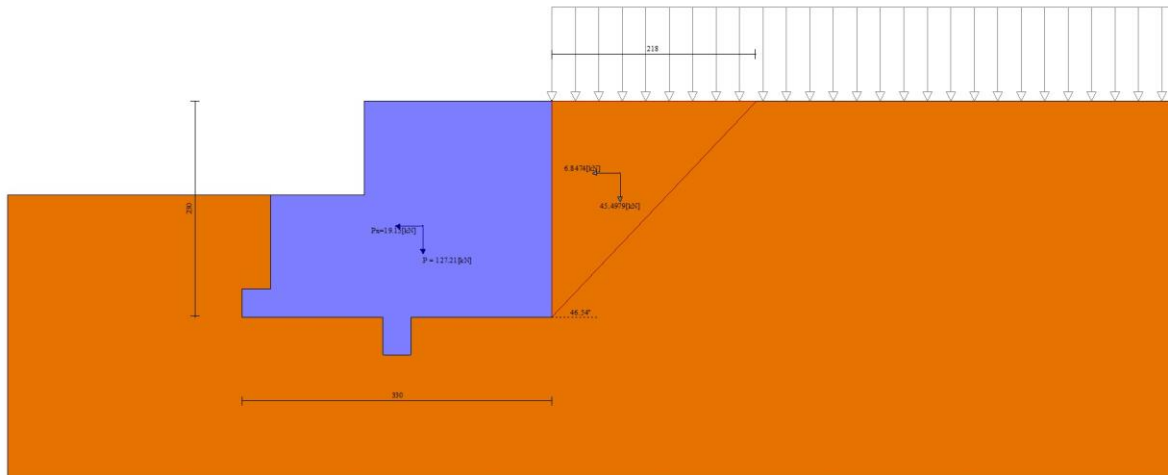


Fig. 3 - Cuneo di spinta (combinazione sismica) (Combinazione n° 2)

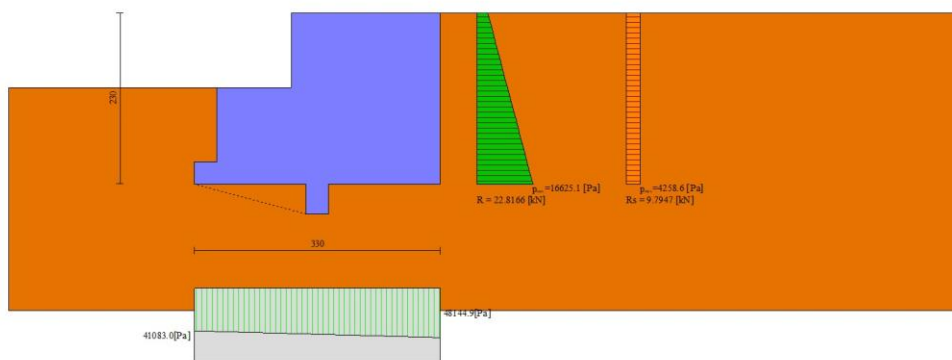


Fig. 4 - Diagramma delle pressioni (combinazione sismica) (Combinazione n° 2)

## Sollecitazioni

### Elementi calcolati a trave

#### Simbologia adottata

- N Sforzo normale, espresso in [kN]. Positivo se di compressione.  
 T Taglio, espresso in [kN]. Positivo se diretto da monte verso valle  
 M Momento, espresso in [kNm]. Positivo se tende le fibre contro terra (a monte)

## Paramento

### Combinazione n° 1 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 4.16      | 0.49      | -0.14      |
| 3  | -0.20    | 8.35      | 1.06      | -0.26      |
| 4  | -0.30    | 12.56     | 1.69      | -0.33      |
| 5  | -0.40    | 16.80     | 2.40      | -0.37      |
| 6  | -0.50    | 21.05     | 3.18      | -0.35      |
| 7  | -0.60    | 25.34     | 4.03      | -0.28      |

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 8  | -0.70    | 29.65     | 4.95      | -0.15      |
| 9  | -0.80    | 33.98     | 5.95      | 0.06       |
| 10 | -0.90    | 38.33     | 7.01      | 0.35       |
| 11 | -1.00    | 42.71     | 8.15      | 0.72       |
| 12 | -1.00    | 42.82     | 8.17      | -20.65     |
| 13 | -1.10    | 49.22     | 9.38      | -20.39     |
| 14 | -1.20    | 55.65     | 10.66     | -20.04     |
| 15 | -1.30    | 62.10     | 12.02     | -19.59     |
| 16 | -1.40    | 68.58     | 13.44     | -19.04     |
| 17 | -1.50    | 75.08     | 14.94     | -18.38     |
| 18 | -1.60    | 81.60     | 16.51     | -17.61     |
| 19 | -1.70    | 88.15     | 18.15     | -16.71     |
| 20 | -1.80    | 94.72     | 19.86     | -15.68     |
| 21 | -1.90    | 101.32    | 21.64     | -14.51     |
| 22 | -2.00    | 107.94    | 23.50     | -13.20     |

Combinazione n° 2 - STR (A1-M1-R3) H + V

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 4.23      | 1.30      | -0.17      |
| 3  | -0.20    | 8.48      | 2.66      | -0.23      |
| 4  | -0.30    | 12.75     | 4.07      | -0.17      |
| 5  | -0.40    | 17.04     | 5.54      | 0.02       |
| 6  | -0.50    | 21.35     | 7.06      | 0.34       |
| 7  | -0.60    | 25.67     | 8.63      | 0.79       |
| 8  | -0.70    | 30.02     | 10.26     | 1.39       |
| 9  | -0.80    | 34.38     | 11.95     | 2.13       |
| 10 | -0.90    | 38.76     | 13.69     | 3.02       |
| 11 | -1.00    | 43.16     | 15.49     | 4.08       |
| 12 | -1.00    | 43.27     | 15.53     | -17.51     |
| 13 | -1.10    | 49.69     | 17.68     | -16.48     |
| 14 | -1.20    | 56.12     | 19.89     | -15.27     |
| 15 | -1.30    | 62.58     | 22.16     | -13.86     |
| 16 | -1.40    | 69.05     | 24.47     | -12.25     |
| 17 | -1.50    | 75.54     | 26.85     | -10.43     |
| 18 | -1.60    | 82.05     | 29.28     | -8.40      |
| 19 | -1.70    | 88.58     | 31.76     | -6.15      |
| 20 | -1.80    | 95.13     | 34.30     | -3.69      |
| 21 | -1.90    | 101.69    | 36.90     | -0.99      |
| 22 | -2.00    | 108.28    | 39.55     | 1.94       |

Combinazione n° 3 - STR (A1-M1-R3) H - V

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 4.19      | 1.18      | -0.14      |
| 3  | -0.20    | 8.40      | 2.42      | -0.17      |
| 4  | -0.30    | 12.63     | 3.71      | -0.10      |
| 5  | -0.40    | 16.88     | 5.06      | 0.08       |
| 6  | -0.50    | 21.15     | 6.46      | 0.39       |
| 7  | -0.60    | 25.43     | 7.92      | 0.82       |
| 8  | -0.70    | 29.74     | 9.43      | 1.38       |
| 9  | -0.80    | 34.06     | 11.00     | 2.07       |
| 10 | -0.90    | 38.40     | 12.62     | 2.90       |
| 11 | -1.00    | 42.76     | 14.30     | 3.88       |
| 12 | -1.00    | 42.87     | 14.33     | -17.50     |
| 13 | -1.10    | 49.24     | 16.37     | -16.54     |
| 14 | -1.20    | 55.64     | 18.46     | -15.40     |
| 15 | -1.30    | 62.05     | 20.60     | -14.08     |
| 16 | -1.40    | 68.48     | 22.80     | -12.57     |
| 17 | -1.50    | 74.94     | 25.06     | -10.87     |
| 18 | -1.60    | 81.41     | 27.37     | -8.96      |
| 19 | -1.70    | 87.89     | 29.73     | -6.85      |
| 20 | -1.80    | 94.40     | 32.15     | -4.53      |
| 21 | -1.90    | 100.93    | 34.63     | -1.99      |
| 22 | -2.00    | 107.47    | 37.16     | 0.77       |

Combinazione n° 4 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 5.36      | 0.49      | -0.14      |
| 3  | -0.20    | 10.75     | 1.06      | -0.26      |
| 4  | -0.30    | 16.16     | 1.69      | -0.33      |
| 5  | -0.40    | 21.59     | 2.40      | -0.37      |
| 6  | -0.50    | 27.05     | 3.18      | -0.35      |
| 7  | -0.60    | 32.53     | 4.03      | -0.28      |
| 8  | -0.70    | 38.04     | 4.95      | -0.15      |
| 9  | -0.80    | 43.57     | 5.95      | 0.06       |
| 10 | -0.90    | 49.12     | 7.01      | 0.35       |
| 11 | -1.00    | 54.70     | 8.15      | 0.72       |
| 12 | -1.00    | 54.84     | 8.17      | -26.65     |
| 13 | -1.10    | 63.04     | 9.38      | -26.39     |
| 14 | -1.20    | 71.27     | 10.66     | -26.04     |
| 15 | -1.30    | 79.52     | 12.02     | -25.59     |
| 16 | -1.40    | 87.79     | 13.44     | -25.04     |

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 17 | -1.50    | 96.09     | 14.94     | -24.38     |
| 18 | -1.60    | 104.41    | 16.51     | -23.61     |
| 19 | -1.70    | 112.76    | 18.15     | -22.71     |
| 20 | -1.80    | 121.13    | 19.86     | -21.68     |
| 21 | -1.90    | 129.52    | 21.64     | -20.51     |
| 22 | -2.00    | 137.94    | 23.50     | -19.20     |

Combinazione n° 5 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 4.16      | 0.49      | -0.14      |
| 3  | -0.20    | 8.35      | 1.06      | -0.26      |
| 4  | -0.30    | 12.56     | 1.69      | -0.33      |
| 5  | -0.40    | 16.80     | 2.40      | -0.37      |
| 6  | -0.50    | 21.05     | 3.18      | -0.35      |
| 7  | -0.60    | 25.34     | 4.03      | -0.28      |
| 8  | -0.70    | 29.65     | 4.95      | -0.15      |
| 9  | -0.80    | 33.98     | 5.95      | 0.06       |
| 10 | -0.90    | 38.33     | 7.01      | 0.35       |
| 11 | -1.00    | 42.71     | 8.15      | 0.72       |
| 12 | -1.00    | 42.82     | 8.17      | -20.65     |
| 13 | -1.10    | 49.22     | 9.38      | -20.39     |
| 14 | -1.20    | 55.65     | 10.66     | -20.04     |
| 15 | -1.30    | 62.10     | 12.02     | -19.59     |
| 16 | -1.40    | 68.58     | 13.44     | -19.04     |
| 17 | -1.50    | 75.08     | 14.94     | -18.38     |
| 18 | -1.60    | 81.60     | 16.51     | -17.61     |
| 19 | -1.70    | 88.15     | 18.15     | -16.71     |
| 20 | -1.80    | 94.72     | 19.86     | -15.68     |
| 21 | -1.90    | 101.32    | 21.64     | -14.51     |
| 22 | -2.00    | 107.94    | 23.50     | -13.20     |

Combinazione n° 6 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 5.36      | 0.49      | -0.14      |
| 3  | -0.20    | 10.75     | 1.06      | -0.26      |
| 4  | -0.30    | 16.16     | 1.69      | -0.33      |
| 5  | -0.40    | 21.59     | 2.40      | -0.37      |
| 6  | -0.50    | 27.05     | 3.18      | -0.35      |
| 7  | -0.60    | 32.53     | 4.03      | -0.28      |
| 8  | -0.70    | 38.04     | 4.95      | -0.15      |
| 9  | -0.80    | 43.57     | 5.95      | 0.06       |
| 10 | -0.90    | 49.12     | 7.01      | 0.35       |
| 11 | -1.00    | 54.70     | 8.15      | 0.72       |
| 12 | -1.00    | 54.84     | 8.17      | -26.65     |
| 13 | -1.10    | 63.04     | 9.38      | -26.39     |
| 14 | -1.20    | 71.27     | 10.66     | -26.04     |
| 15 | -1.30    | 79.52     | 12.02     | -25.59     |
| 16 | -1.40    | 87.79     | 13.44     | -25.04     |
| 17 | -1.50    | 96.09     | 14.94     | -24.38     |
| 18 | -1.60    | 104.41    | 16.51     | -23.61     |
| 19 | -1.70    | 112.76    | 18.15     | -22.71     |
| 20 | -1.80    | 121.13    | 19.86     | -21.68     |
| 21 | -1.90    | 129.52    | 21.64     | -20.51     |
| 22 | -2.00    | 137.94    | 23.50     | -19.20     |

Combinazione n° 13 - SLER

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 4.11      | 0.33      | -0.10      |
| 3  | -0.20    | 8.24      | 0.72      | -0.18      |
| 4  | -0.30    | 12.38     | 1.16      | -0.23      |
| 5  | -0.40    | 16.54     | 1.66      | -0.26      |
| 6  | -0.50    | 20.73     | 2.21      | -0.25      |
| 7  | -0.60    | 24.93     | 2.82      | -0.21      |
| 8  | -0.70    | 29.15     | 3.48      | -0.12      |
| 9  | -0.80    | 33.39     | 4.20      | 0.02       |
| 10 | -0.90    | 37.64     | 4.97      | 0.22       |
| 11 | -1.00    | 41.92     | 5.80      | 0.48       |
| 12 | -1.00    | 42.03     | 5.82      | -20.50     |
| 13 | -1.10    | 48.32     | 6.70      | -20.32     |
| 14 | -1.20    | 54.63     | 7.64      | -20.08     |
| 15 | -1.30    | 60.96     | 8.64      | -19.77     |
| 16 | -1.40    | 67.31     | 9.68      | -19.39     |
| 17 | -1.50    | 73.68     | 10.79     | -18.93     |
| 18 | -1.60    | 80.06     | 11.95     | -18.38     |
| 19 | -1.70    | 86.47     | 13.16     | -17.74     |
| 20 | -1.80    | 92.89     | 14.43     | -17.01     |
| 21 | -1.90    | 99.33     | 15.76     | -16.17     |
| 22 | -2.00    | 105.79    | 17.14     | -15.23     |

Combinazione n° 14 - SLEF

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 4.11      | 0.33      | -0.10      |
| 3  | -0.20    | 8.24      | 0.72      | -0.18      |
| 4  | -0.30    | 12.38     | 1.16      | -0.23      |
| 5  | -0.40    | 16.54     | 1.66      | -0.26      |
| 6  | -0.50    | 20.73     | 2.21      | -0.25      |
| 7  | -0.60    | 24.93     | 2.82      | -0.21      |
| 8  | -0.70    | 29.15     | 3.48      | -0.12      |
| 9  | -0.80    | 33.39     | 4.20      | 0.02       |
| 10 | -0.90    | 37.64     | 4.97      | 0.22       |
| 11 | -1.00    | 41.92     | 5.80      | 0.48       |
| 12 | -1.00    | 42.03     | 5.82      | -20.50     |
| 13 | -1.10    | 48.32     | 6.70      | -20.32     |
| 14 | -1.20    | 54.63     | 7.64      | -20.08     |
| 15 | -1.30    | 60.96     | 8.64      | -19.77     |
| 16 | -1.40    | 67.31     | 9.68      | -19.39     |
| 17 | -1.50    | 73.68     | 10.79     | -18.93     |
| 18 | -1.60    | 80.06     | 11.95     | -18.38     |
| 19 | -1.70    | 86.47     | 13.16     | -17.74     |
| 20 | -1.80    | 92.89     | 14.43     | -17.01     |
| 21 | -1.90    | 99.33     | 15.76     | -16.17     |
| 22 | -2.00    | 105.79    | 17.14     | -15.23     |

#### Combinazione n° 15 - SLEQ

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | 0.00     | 0.00      | 0.00      | 0.00       |
| 2  | -0.10    | 4.11      | 0.33      | -0.10      |
| 3  | -0.20    | 8.24      | 0.72      | -0.18      |
| 4  | -0.30    | 12.38     | 1.16      | -0.23      |
| 5  | -0.40    | 16.54     | 1.66      | -0.26      |
| 6  | -0.50    | 20.73     | 2.21      | -0.25      |
| 7  | -0.60    | 24.93     | 2.82      | -0.21      |
| 8  | -0.70    | 29.15     | 3.48      | -0.12      |
| 9  | -0.80    | 33.39     | 4.20      | 0.02       |
| 10 | -0.90    | 37.64     | 4.97      | 0.22       |
| 11 | -1.00    | 41.92     | 5.80      | 0.48       |
| 12 | -1.00    | 42.03     | 5.82      | -20.50     |
| 13 | -1.10    | 48.32     | 6.70      | -20.32     |
| 14 | -1.20    | 54.63     | 7.64      | -20.08     |
| 15 | -1.30    | 60.96     | 8.64      | -19.77     |
| 16 | -1.40    | 67.31     | 9.68      | -19.39     |
| 17 | -1.50    | 73.68     | 10.79     | -18.93     |
| 18 | -1.60    | 80.06     | 11.95     | -18.38     |
| 19 | -1.70    | 86.47     | 13.16     | -17.74     |
| 20 | -1.80    | 92.89     | 14.43     | -17.01     |
| 21 | -1.90    | 99.33     | 15.76     | -16.17     |
| 22 | -2.00    | 105.79    | 17.14     | -15.23     |

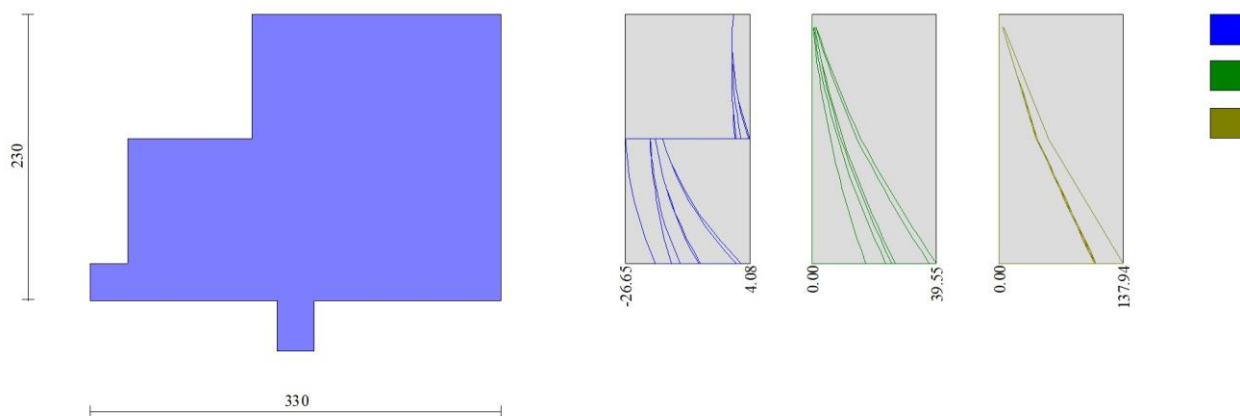


Fig. 5 - Paramento (Involuppo)

#### Fondazione

#### Combinazione n° 1 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 2.10      | 0.10       |
| 3  | -3.10    | 0.00      | 4.28      | 0.42       |
| 4  | -3.00    | 0.00      | 6.54      | 0.96       |

Combinazione n° 2 - STR (A1-M1-R3) H + V

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 3.38      | 0.17       |
| 3  | -3.10    | 0.00      | 6.79      | 0.68       |
| 4  | -3.00    | 0.00      | 10.21     | 1.53       |

Combinazione n° 3 - STR (A1-M1-R3) H - V

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 2.96      | 0.15       |
| 3  | -3.10    | 0.00      | 5.93      | 0.59       |
| 4  | -3.00    | 0.00      | 8.91      | 1.33       |

Combinazione n° 4 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 2.47      | 0.12       |
| 3  | -3.10    | 0.00      | 5.06      | 0.50       |
| 4  | -3.00    | 0.00      | 7.77      | 1.14       |

Combinazione n° 5 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 2.10      | 0.10       |
| 3  | -3.10    | 0.00      | 4.28      | 0.42       |
| 4  | -3.00    | 0.00      | 6.54      | 0.96       |

Combinazione n° 6 - STR (A1-M1-R3)

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 2.47      | 0.12       |
| 3  | -3.10    | 0.00      | 5.06      | 0.50       |
| 4  | -3.00    | 0.00      | 7.77      | 1.14       |

Combinazione n° 13 - SLER

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 1.86      | 0.09       |
| 3  | -3.10    | 0.00      | 3.80      | 0.37       |
| 4  | -3.00    | 0.00      | 5.85      | 0.86       |

Combinazione n° 14 - SLEF

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 1.86      | 0.09       |
| 3  | -3.10    | 0.00      | 3.80      | 0.37       |
| 4  | -3.00    | 0.00      | 5.85      | 0.86       |

Combinazione n° 15 - SLEQ

| n° | X<br>[m] | N<br>[kN] | T<br>[kN] | M<br>[kNm] |
|----|----------|-----------|-----------|------------|
| 1  | -3.30    | 0.00      | 0.00      | 0.00       |
| 2  | -3.20    | 0.00      | 1.86      | 0.09       |
| 3  | -3.10    | 0.00      | 3.80      | 0.37       |
| 4  | -3.00    | 0.00      | 5.85      | 0.86       |



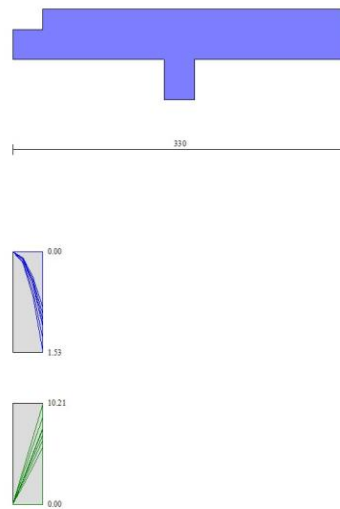


Fig. 6 - Fondazione (Inviluppo)

## Verifiche strutturali

### Paramento in pietrame

#### Simbologia adottata

|          |                                                    |
|----------|----------------------------------------------------|
| n°       | indice sezione                                     |
| Y        | ordinata sezione espressa in [m]                   |
| As       | area sezione reagente espresso in [cmq]            |
| e        | eccentricità espresso in [cm]                      |
| $\sigma$ | tensione espressa in [kPa]                         |
| Rt       | resistenza ai carichi orizzontali espressa in [kN] |
| Et       | Azione orizzontale espressa in [kN]                |
| FSsco    | fattore di sicurezza allo scorrimento (Rt/Et)      |
| Ms       | momento stabilizzante espresso in [kNm]            |
| Mr       | momento ribaltante espresso in [kNm]               |
| FSrib    | fattore di sicurezza a ribaltamento (Ms/Mr)        |

#### Combinazione n° 1 - STR (A1-M1-R3)

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | $\sigma$<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|-------------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0                 | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -3.42     | 2                 | 4.1624     | 0.4924     | 8.454   | 4.3287      | 0.0240      | 180.444 |
| 3  | -0.20    | 20000       | -3.07     | 5                 | 8.3493     | 1.0573     | 7.897   | 8.7065      | 0.1008      | 86.381  |
| 4  | -0.30    | 20000       | -2.67     | 7                 | 12.5604    | 1.6940     | 7.415   | 13.1328     | 0.2376      | 55.266  |
| 5  | -0.40    | 20000       | -2.20     | 9                 | 16.7954    | 2.4014     | 6.994   | 17.6069     | 0.4416      | 39.870  |
| 6  | -0.50    | 20000       | -1.68     | 11                | 21.0545    | 3.1801     | 6.621   | 22.1291     | 0.7198      | 30.743  |
| 7  | -0.60    | 20000       | -1.11     | 13                | 25.3379    | 4.0304     | 6.287   | 26.6997     | 1.0794      | 24.736  |
| 8  | -0.70    | 20000       | -0.49     | 15                | 29.6454    | 4.9524     | 5.986   | 31.3188     | 1.5275      | 20.504  |
| 9  | -0.80    | 20000       | 0.18      | 17                | 33.9772    | 5.9461     | 5.714   | 35.9863     | 2.0712      | 17.374  |
| 10 | -0.90    | 20000       | 0.91      | 20                | 38.3331    | 7.0114     | 5.467   | 40.7023     | 2.7179      | 14.976  |
| 11 | -1.00    | 20000       | 1.69      | 22                | 42.7133    | 8.1485     | 5.242   | 45.4667     | 3.4745      | 13.086  |
| 12 | -1.00    | 30000       | -48.23    | 28                | 42.8213    | 8.1720     | 5.240   | 88.3739     | 3.4908      | 25.316  |
| 13 | -1.10    | 30000       | -41.42    | 30                | 49.2242    | 9.3821     | 5.247   | 98.5916     | 4.3671      | 22.576  |
| 14 | -1.20    | 30000       | -36.00    | 32                | 55.6513    | 10.6639    | 5.219   | 108.8819    | 5.3678      | 20.284  |
| 15 | -1.30    | 30000       | -31.55    | 34                | 62.1027    | 12.0174    | 5.168   | 119.2450    | 6.5001      | 18.345  |
| 16 | -1.40    | 30000       | -27.77    | 36                | 68.5782    | 13.4426    | 5.102   | 129.6806    | 7.7712      | 16.687  |
| 17 | -1.50    | 30000       | -24.49    | 37                | 75.0780    | 14.9394    | 5.026   | 140.1890    | 9.1883      | 15.257  |
| 18 | -1.60    | 30000       | -21.58    | 39                | 81.6020    | 16.5079    | 4.943   | 150.7700    | 10.7585     | 14.014  |
| 19 | -1.70    | 30000       | -18.96    | 41                | 88.1502    | 18.1481    | 4.857   | 161.4236    | 12.4890     | 12.925  |
| 20 | -1.80    | 30000       | -16.55    | 42                | 94.7226    | 19.8600    | 4.770   | 172.1499    | 14.3869     | 11.966  |
| 21 | -1.90    | 30000       | -14.32    | 43                | 101.3193   | 21.6435    | 4.681   | 182.9489    | 16.4594     | 11.115  |
| 22 | -2.00    | 30000       | -12.23    | 45                | 107.9402   | 23.4987    | 4.593   | 193.8205    | 18.7137     | 10.357  |

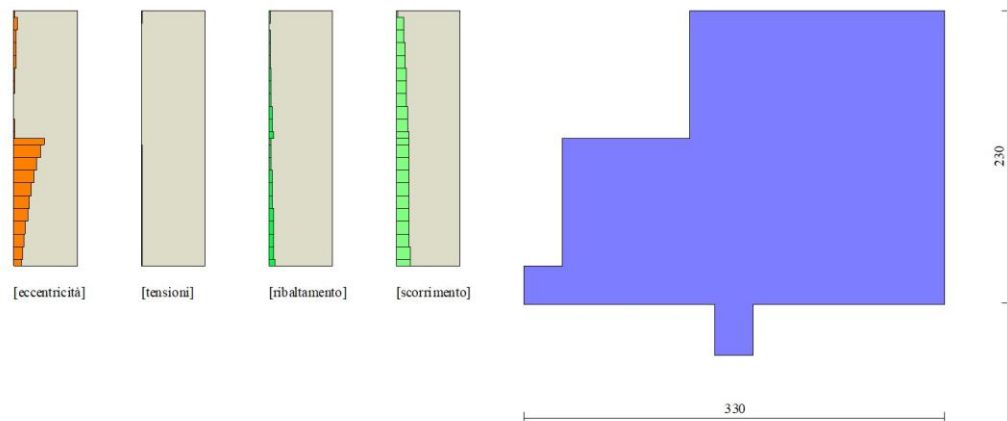


Fig. 7 - Verifiche paramento pietrame (Combinazione n° 1)

Combinazione n° 2 - STR (A1-M1-R3) H + V

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -4.06     | 2          | 4.2324     | 1.3009     | 3.253   | 4.4687      | 0.0645      | 69.268  |
| 3  | -0.20    | 20000       | -2.71     | 5          | 8.4836     | 2.6576     | 3.192   | 8.9751      | 0.2618      | 34.286  |
| 4  | -0.30    | 20000       | -1.32     | 7          | 12.7534    | 4.0694     | 3.134   | 13.5188     | 0.5973      | 22.632  |
| 5  | -0.40    | 20000       | 0.11      | 9          | 17.0417    | 5.5357     | 3.078   | 18.0993     | 1.0767      | 16.811  |
| 6  | -0.50    | 20000       | 1.58      | 11         | 21.3484    | 7.0568     | 3.025   | 22.7169     | 1.7052      | 13.322  |
| 7  | -0.60    | 20000       | 3.08      | 14         | 25.6738    | 8.6330     | 2.974   | 27.3717     | 2.4884      | 10.999  |
| 8  | -0.70    | 20000       | 4.62      | 17         | 30.0178    | 10.2644    | 2.924   | 32.0637     | 3.4319      | 9.343   |
| 9  | -0.80    | 20000       | 6.19      | 20         | 34.3805    | 11.9509    | 2.877   | 36.7930     | 4.5411      | 8.102   |
| 10 | -0.90    | 20000       | 7.80      | 24         | 38.7618    | 13.6925    | 2.831   | 41.5596     | 5.8215      | 7.139   |
| 11 | -1.00    | 20000       | 9.45      | 28         | 43.1617    | 15.4893    | 2.787   | 46.3634     | 7.2787      | 6.370   |
| 12 | -1.00    | 30000       | -40.46    | 26         | 43.2700    | 15.5288    | 2.786   | 89.7199     | 7.3097      | 12.274  |
| 13 | -1.10    | 30000       | -33.17    | 28         | 49.6869    | 17.6825    | 2.810   | 99.9797     | 8.9682      | 11.148  |
| 14 | -1.20    | 30000       | -27.20    | 29         | 56.1224    | 19.8914    | 2.821   | 110.2953    | 10.8445     | 10.171  |
| 15 | -1.30    | 30000       | -22.15    | 30         | 62.5766    | 22.1553    | 2.824   | 120.6668    | 12.9443     | 9.322   |
| 16 | -1.40    | 30000       | -17.74    | 31         | 69.0494    | 24.4744    | 2.821   | 131.0942    | 15.2730     | 8.583   |
| 17 | -1.50    | 30000       | -13.81    | 32         | 75.5408    | 26.8487    | 2.814   | 141.5775    | 17.8361     | 7.938   |
| 18 | -1.60    | 30000       | -10.24    | 33         | 82.0509    | 29.2781    | 2.802   | 152.1167    | 20.6392     | 7.370   |
| 19 | -1.70    | 30000       | -6.95     | 34         | 88.5796    | 31.7626    | 2.789   | 162.7118    | 23.6877     | 6.869   |
| 20 | -1.80    | 30000       | -3.87     | 34         | 95.1269    | 34.3022    | 2.773   | 173.3628    | 26.9872     | 6.424   |
| 21 | -1.90    | 30000       | -0.97     | 35         | 101.6929   | 36.8970    | 2.756   | 184.0697    | 30.5431     | 6.027   |
| 22 | -2.00    | 30000       | 1.80      | 37         | 108.2775   | 39.5469    | 2.738   | 194.8324    | 34.3611     | 5.670   |

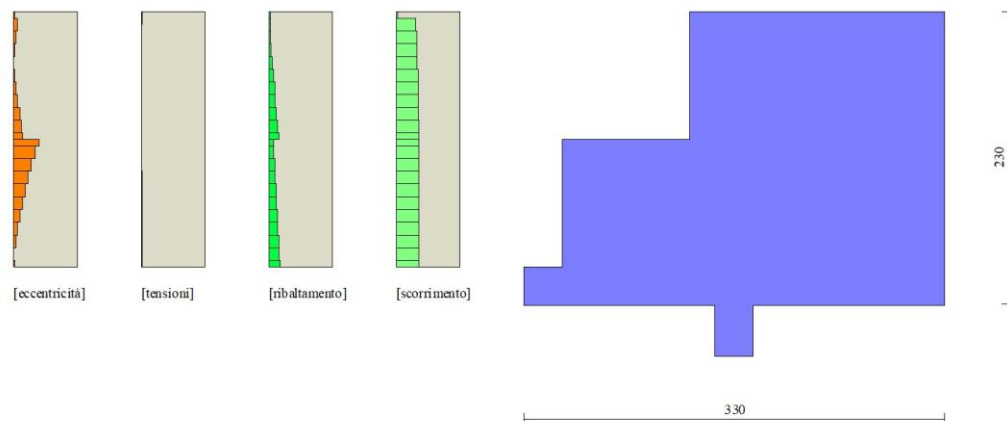


Fig. 8 - Verifiche paramento pietrame (Combinazione n° 2)

Combinazione n° 3 - STR (A1-M1-R3) H - V

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -3.28     | 2          | 4.1921     | 1.1817     | 3.548   | 4.3881      | 0.0586      | 74.936  |
| 3  | -0.20    | 20000       | -2.06     | 4          | 8.4030     | 2.4191     | 3.474   | 8.8140      | 0.2380      | 37.041  |
| 4  | -0.30    | 20000       | -0.80     | 6          | 12.6326    | 3.7118     | 3.403   | 13.2771     | 0.5437      | 24.418  |
| 5  | -0.40    | 20000       | 0.50      | 9          | 16.8805    | 5.0589     | 3.337   | 17.7771     | 0.9814      | 18.114  |
| 6  | -0.50    | 20000       | 1.84      | 11         | 21.1470    | 6.4607     | 3.273   | 22.3140     | 1.5563      | 14.338  |
| 7  | -0.60    | 20000       | 3.22      | 14         | 25.4321    | 7.9178     | 3.212   | 26.8883     | 2.2741      | 11.824  |
| 8  | -0.70    | 20000       | 4.63      | 17         | 29.7359    | 9.4299     | 3.153   | 31.4997     | 3.1401      | 10.031  |
| 9  | -0.80    | 20000       | 6.08      | 20         | 34.0582    | 10.9972    | 3.097   | 36.1485     | 4.1600      | 8.690   |
| 10 | -0.90    | 20000       | 7.56      | 24         | 38.3992    | 12.6196    | 3.043   | 40.8345     | 5.3392      | 7.648   |
| 11 | -1.00    | 20000       | 9.08      | 27         | 42.7589    | 14.2971    | 2.991   | 45.5577     | 6.6832      | 6.817   |
| 12 | -1.00    | 30000       | -40.82    | 26         | 42.8663    | 14.3343    | 2.990   | 88.5090     | 6.7119      | 13.187  |
| 13 | -1.10    | 30000       | -33.59    | 27         | 49.2430    | 16.3688    | 3.008   | 98.6479     | 8.2450      | 11.965  |
| 14 | -1.20    | 30000       | -27.68    | 29         | 55.6382    | 18.4584    | 3.014   | 108.8427    | 9.9842      | 10.902  |
| 15 | -1.30    | 30000       | -22.69    | 30         | 62.0521    | 20.6032    | 3.012   | 119.0934    | 11.9349     | 9.979   |
| 16 | -1.40    | 30000       | -18.36    | 31         | 68.4847    | 22.8030    | 3.003   | 129.4000    | 14.1025     | 9.176   |
| 17 | -1.50    | 30000       | -14.50    | 32         | 74.9358    | 25.0581    | 2.990   | 139.7624    | 16.4927     | 8.474   |
| 18 | -1.60    | 30000       | -11.01    | 33         | 81.4056    | 27.3682    | 2.974   | 150.1808    | 19.1110     | 7.858   |
| 19 | -1.70    | 30000       | -7.79     | 34         | 87.8940    | 29.7335    | 2.956   | 160.6550    | 21.9627     | 7.315   |
| 20 | -1.80    | 30000       | -4.80     | 34         | 94.4010    | 32.1539    | 2.936   | 171.1851    | 25.0536     | 6.833   |
| 21 | -1.90    | 30000       | -1.97     | 35         | 100.9267   | 34.6295    | 2.914   | 181.7711    | 28.3889     | 6.403   |
| 22 | -2.00    | 30000       | 0.71      | 36         | 107.4710   | 37.1602    | 2.892   | 192.4130    | 31.9744     | 6.018   |

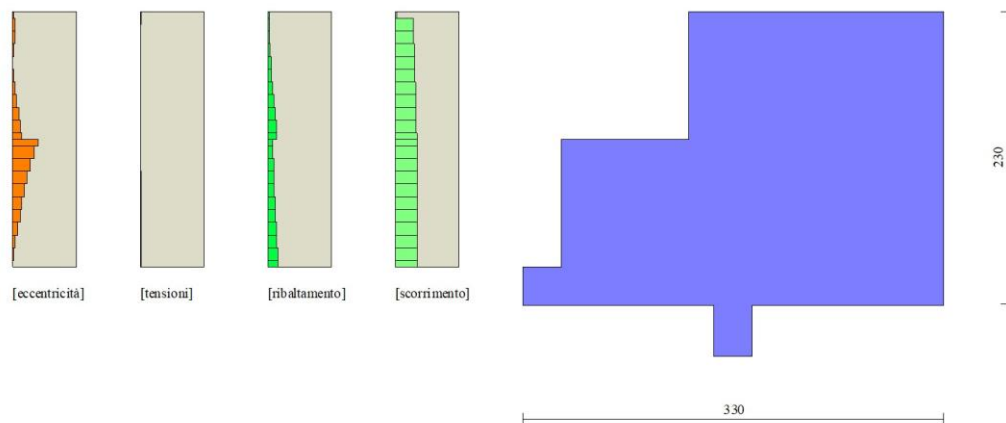


Fig. 9 - Verifiche paramento pietrame (Combinazione n° 3)

Combinazione n° 4 - STR (A1-M1-R3)

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -2.66     | 3          | 5.3612     | 0.4924     | 10.889  | 5.5275      | 0.0240      | 230.416 |
| 3  | -0.20    | 20000       | -2.39     | 6          | 10.7469    | 1.0573     | 10.164  | 11.1041     | 0.1008      | 110.169 |
| 4  | -0.30    | 20000       | -2.07     | 9          | 16.1568    | 1.6940     | 9.538   | 16.7292     | 0.2376      | 70.400  |
| 5  | -0.40    | 20000       | -1.71     | 11         | 21.5906    | 2.4014     | 8.991   | 22.4021     | 0.4416      | 50.729  |
| 6  | -0.50    | 20000       | -1.31     | 14         | 27.0485    | 3.1801     | 8.506   | 28.1231     | 0.7198      | 39.070  |
| 7  | -0.60    | 20000       | -0.87     | 17         | 32.5307    | 4.0304     | 8.071   | 33.8925     | 1.0794      | 31.400  |
| 8  | -0.70    | 20000       | -0.38     | 19         | 38.0370    | 4.9524     | 7.681   | 39.7104     | 1.5275      | 25.998  |
| 9  | -0.80    | 20000       | 0.14      | 22         | 43.5676    | 5.9461     | 7.327   | 45.5767     | 2.0712      | 22.005  |
| 10 | -0.90    | 20000       | 0.71      | 25         | 49.1223    | 7.0114     | 7.006   | 51.4915     | 2.7179      | 18.945  |
| 11 | -1.00    | 20000       | 1.32      | 28         | 54.7013    | 8.1485     | 6.713   | 57.4547     | 3.4745      | 16.536  |
| 12 | -1.00    | 30000       | -48.60    | 36         | 54.8393    | 8.1720     | 6.711   | 112.4009    | 3.4908      | 32.199  |
| 13 | -1.10    | 30000       | -41.86    | 39         | 63.0404    | 9.3821     | 6.719   | 125.3159    | 4.3671      | 28.696  |
| 14 | -1.20    | 30000       | -36.54    | 41         | 71.2657    | 10.6639    | 6.683   | 138.3035    | 5.3678      | 25.766  |
| 15 | -1.30    | 30000       | -32.18    | 44         | 79.5153    | 12.0174    | 6.617   | 151.3639    | 6.5001      | 23.286  |
| 16 | -1.40    | 30000       | -28.53    | 46         | 87.7890    | 13.4426    | 6.531   | 164.4968    | 7.7712      | 21.167  |
| 17 | -1.50    | 30000       | -25.38    | 48         | 96.0870    | 14.9394    | 6.432   | 177.7025    | 9.1883      | 19.340  |
| 18 | -1.60    | 30000       | -22.61    | 51         | 104.4092   | 16.5079    | 6.325   | 190.9808    | 10.7585     | 17.752  |
| 19 | -1.70    | 30000       | -20.14    | 53         | 112.7556   | 18.1481    | 6.213   | 204.3317    | 12.4890     | 16.361  |
| 20 | -1.80    | 30000       | -17.90    | 55         | 121.1262   | 19.8600    | 6.099   | 217.7553    | 14.3869     | 15.136  |
| 21 | -1.90    | 30000       | -15.84    | 57         | 129.5211   | 21.6435    | 5.984   | 231.2516    | 16.4594     | 14.050  |
| 22 | -2.00    | 30000       | -13.92    | 59         | 137.9402   | 23.4987    | 5.870   | 244.8205    | 18.7137     | 13.082  |

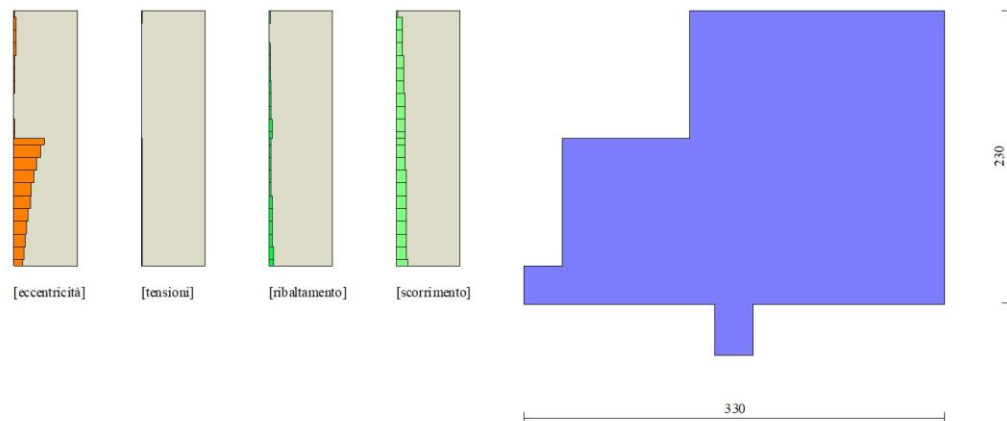


Fig. 10 - Verifiche paramento pietrame (Combinazione n° 4)

Combinazione n° 5 - STR (A1-M1-R3)

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -3.42     | 2          | 4.1624     | 0.4924     | 8.454   | 4.3287      | 0.0240      | 180.444 |
| 3  | -0.20    | 20000       | -3.07     | 5          | 8.3493     | 1.0573     | 7.897   | 8.7065      | 0.1008      | 86.381  |
| 4  | -0.30    | 20000       | -2.67     | 7          | 12.5604    | 1.6940     | 7.415   | 13.1328     | 0.2376      | 55.266  |
| 5  | -0.40    | 20000       | -2.20     | 9          | 16.7954    | 2.4014     | 6.994   | 17.6069     | 0.4416      | 39.870  |
| 6  | -0.50    | 20000       | -1.68     | 11         | 21.0545    | 3.1801     | 6.621   | 22.1291     | 0.7198      | 30.743  |
| 7  | -0.60    | 20000       | -1.11     | 13         | 25.3379    | 4.0304     | 6.287   | 26.6997     | 1.0794      | 24.736  |
| 8  | -0.70    | 20000       | -0.49     | 15         | 29.6454    | 4.9524     | 5.986   | 31.3188     | 1.5275      | 20.504  |
| 9  | -0.80    | 20000       | 0.18      | 17         | 33.9772    | 5.9461     | 5.714   | 35.9863     | 2.0712      | 17.374  |
| 10 | -0.90    | 20000       | 0.91      | 20         | 38.3331    | 7.0114     | 5.467   | 40.7023     | 2.7179      | 14.976  |
| 11 | -1.00    | 20000       | 1.69      | 22         | 42.7133    | 8.1485     | 5.242   | 45.4667     | 3.4745      | 13.086  |
| 12 | -1.00    | 30000       | -48.23    | 28         | 42.8213    | 8.1720     | 5.240   | 88.3739     | 3.4908      | 25.316  |
| 13 | -1.10    | 30000       | -41.42    | 30         | 49.2242    | 9.3821     | 5.247   | 98.5916     | 4.3671      | 22.576  |
| 14 | -1.20    | 30000       | -36.00    | 32         | 55.6513    | 10.6639    | 5.219   | 108.8819    | 5.3678      | 20.284  |
| 15 | -1.30    | 30000       | -31.55    | 34         | 62.1027    | 12.0174    | 5.168   | 119.2450    | 6.5001      | 18.345  |
| 16 | -1.40    | 30000       | -27.77    | 36         | 68.5782    | 13.4426    | 5.102   | 129.6806    | 7.7712      | 16.687  |
| 17 | -1.50    | 30000       | -24.49    | 37         | 75.0780    | 14.9394    | 5.026   | 140.1890    | 9.1883      | 15.257  |
| 18 | -1.60    | 30000       | -21.58    | 39         | 81.6020    | 16.5079    | 4.943   | 150.7700    | 10.7585     | 14.014  |
| 19 | -1.70    | 30000       | -18.96    | 41         | 88.1502    | 18.1481    | 4.857   | 161.4236    | 12.4890     | 12.925  |
| 20 | -1.80    | 30000       | -16.55    | 42         | 94.7226    | 19.8600    | 4.770   | 172.1499    | 14.3869     | 11.966  |
| 21 | -1.90    | 30000       | -14.32    | 43         | 101.3193   | 21.6435    | 4.681   | 182.9489    | 16.4594     | 11.115  |
| 22 | -2.00    | 30000       | -12.23    | 45         | 107.9402   | 23.4987    | 4.593   | 193.8205    | 18.7137     | 10.357  |

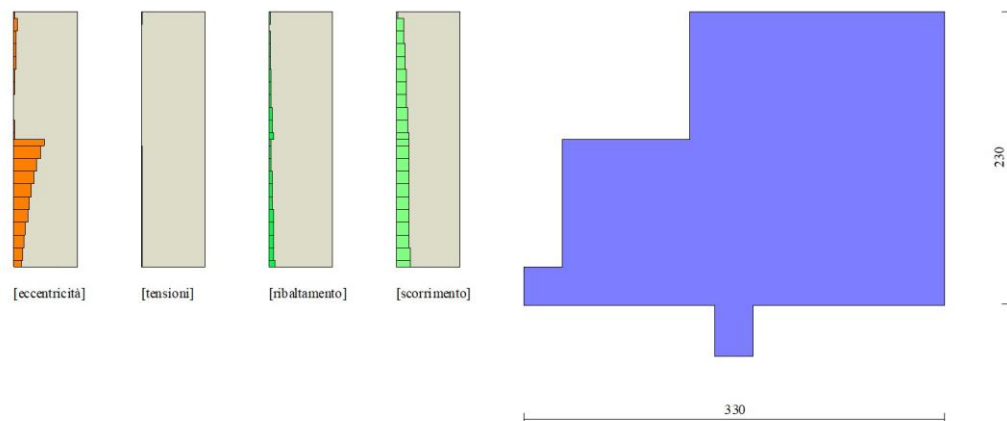


Fig. 11 - Verifiche paramento pietrame (Combinazione n° 5)

Combinazione n° 6 - STR (A1-M1-R3)

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -2.66     | 3          | 5.3612     | 0.4924     | 10.889  | 5.5275      | 0.0240      | 230.416 |
| 3  | -0.20    | 20000       | -2.39     | 6          | 10.7469    | 1.0573     | 10.164  | 11.1041     | 0.1008      | 110.169 |
| 4  | -0.30    | 20000       | -2.07     | 9          | 16.1568    | 1.6940     | 9.538   | 16.7292     | 0.2376      | 70.400  |
| 5  | -0.40    | 20000       | -1.71     | 11         | 21.5906    | 2.4014     | 8.991   | 22.4021     | 0.4416      | 50.729  |
| 6  | -0.50    | 20000       | -1.31     | 14         | 27.0485    | 3.1801     | 8.506   | 28.1231     | 0.7198      | 39.070  |
| 7  | -0.60    | 20000       | -0.87     | 17         | 32.5307    | 4.0304     | 8.071   | 33.8925     | 1.0794      | 31.400  |
| 8  | -0.70    | 20000       | -0.38     | 19         | 38.0370    | 4.9524     | 7.681   | 39.7104     | 1.5275      | 25.998  |
| 9  | -0.80    | 20000       | 0.14      | 22         | 43.5676    | 5.9461     | 7.327   | 45.5767     | 2.0712      | 22.005  |
| 10 | -0.90    | 20000       | 0.71      | 25         | 49.1223    | 7.0114     | 7.006   | 51.4915     | 2.7179      | 18.945  |
| 11 | -1.00    | 20000       | 1.32      | 28         | 54.7013    | 8.1485     | 6.713   | 57.4547     | 3.4745      | 16.536  |
| 12 | -1.00    | 30000       | -48.60    | 36         | 54.8393    | 8.1720     | 6.711   | 112.4009    | 3.4908      | 32.199  |
| 13 | -1.10    | 30000       | -41.86    | 39         | 63.0404    | 9.3821     | 6.719   | 125.3159    | 4.3671      | 28.696  |
| 14 | -1.20    | 30000       | -36.54    | 41         | 71.2657    | 10.6639    | 6.683   | 138.3035    | 5.3678      | 25.766  |
| 15 | -1.30    | 30000       | -32.18    | 44         | 79.5153    | 12.0174    | 6.617   | 151.3639    | 6.5001      | 23.286  |
| 16 | -1.40    | 30000       | -28.53    | 46         | 87.7890    | 13.4426    | 6.531   | 164.4968    | 7.7712      | 21.167  |
| 17 | -1.50    | 30000       | -25.38    | 48         | 96.0870    | 14.9394    | 6.432   | 177.7025    | 9.1883      | 19.340  |
| 18 | -1.60    | 30000       | -22.61    | 51         | 104.4092   | 16.5079    | 6.325   | 190.9808    | 10.7585     | 17.752  |
| 19 | -1.70    | 30000       | -20.14    | 53         | 112.7556   | 18.1481    | 6.213   | 204.3317    | 12.4890     | 16.361  |
| 20 | -1.80    | 30000       | -17.90    | 55         | 121.1262   | 19.8600    | 6.099   | 217.7553    | 14.3869     | 15.136  |
| 21 | -1.90    | 30000       | -15.84    | 57         | 129.5211   | 21.6435    | 5.984   | 231.2516    | 16.4594     | 14.050  |
| 22 | -2.00    | 30000       | -13.92    | 59         | 137.9402   | 23.4987    | 5.870   | 244.8205    | 18.7137     | 13.082  |

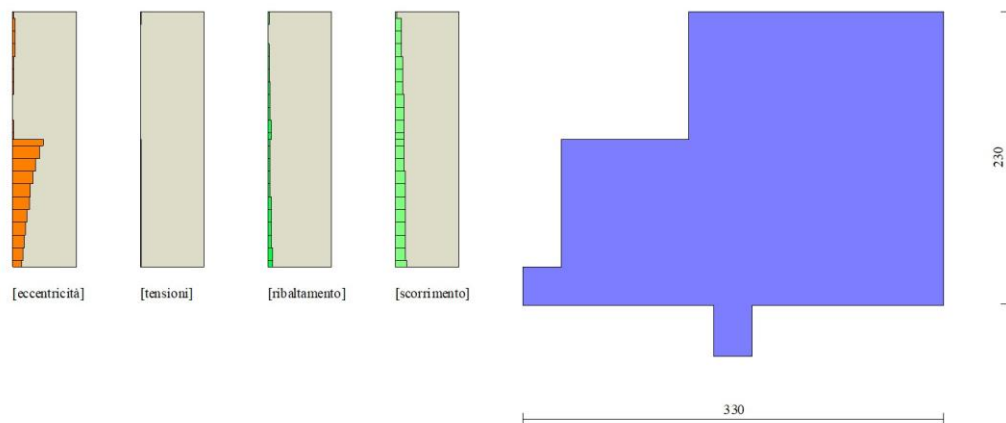


Fig. 12 - Verifiche paramento pietra (Combinazione n° 6)

Combinazione n° 10 - EQU (A1-M1-R3)

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -3.42     | 2          | 4.1624     | 0.4924     | 8.454   | 4.3287      | 0.0240      | 180.444 |
| 3  | -0.20    | 20000       | -3.07     | 5          | 8.3493     | 1.0573     | 7.897   | 8.7065      | 0.1008      | 86.381  |
| 4  | -0.30    | 20000       | -2.67     | 7          | 12.5604    | 1.6940     | 7.415   | 13.1328     | 0.2376      | 55.266  |
| 5  | -0.40    | 20000       | -2.20     | 9          | 16.7954    | 2.4014     | 6.994   | 17.6069     | 0.4416      | 39.870  |
| 6  | -0.50    | 20000       | -1.68     | 11         | 21.0545    | 3.1801     | 6.621   | 22.1291     | 0.7198      | 30.743  |
| 7  | -0.60    | 20000       | -1.11     | 13         | 25.3379    | 4.0304     | 6.287   | 26.6997     | 1.0794      | 24.736  |
| 8  | -0.70    | 20000       | -0.49     | 15         | 29.6454    | 4.9524     | 5.986   | 31.3188     | 1.5275      | 20.504  |
| 9  | -0.80    | 20000       | 0.18      | 17         | 33.9772    | 5.9461     | 5.714   | 35.9863     | 2.0712      | 17.374  |
| 10 | -0.90    | 20000       | 0.91      | 20         | 38.3331    | 7.0114     | 5.467   | 40.7023     | 2.7179      | 14.976  |
| 11 | -1.00    | 20000       | 1.69      | 22         | 42.7133    | 8.1485     | 5.242   | 45.4667     | 3.4745      | 13.086  |
| 12 | -1.00    | 30000       | -48.23    | 28         | 42.8213    | 8.1720     | 5.240   | 88.3739     | 3.4908      | 25.316  |
| 13 | -1.10    | 30000       | -41.42    | 30         | 49.2242    | 9.3821     | 5.247   | 98.5916     | 4.3671      | 22.576  |
| 14 | -1.20    | 30000       | -36.00    | 32         | 55.6513    | 10.6639    | 5.219   | 108.8819    | 5.3678      | 20.284  |
| 15 | -1.30    | 30000       | -31.55    | 34         | 62.1027    | 12.0174    | 5.168   | 119.2450    | 6.5001      | 18.345  |
| 16 | -1.40    | 30000       | -27.77    | 36         | 68.5782    | 13.4426    | 5.102   | 129.6806    | 7.7712      | 16.687  |
| 17 | -1.50    | 30000       | -24.49    | 37         | 75.0780    | 14.9394    | 5.026   | 140.1890    | 9.1883      | 15.257  |
| 18 | -1.60    | 30000       | -21.58    | 39         | 81.6020    | 16.5079    | 4.943   | 150.7700    | 10.7585     | 14.014  |
| 19 | -1.70    | 30000       | -18.96    | 41         | 88.1502    | 18.1481    | 4.857   | 161.4236    | 12.4890     | 12.925  |
| 20 | -1.80    | 30000       | -16.55    | 42         | 94.7226    | 19.8600    | 4.770   | 172.1499    | 14.3869     | 11.966  |
| 21 | -1.90    | 30000       | -14.32    | 43         | 101.3193   | 21.6435    | 4.681   | 182.9489    | 16.4594     | 11.115  |
| 22 | -2.00    | 30000       | -12.23    | 45         | 107.9402   | 23.4987    | 4.593   | 193.8205    | 18.7137     | 10.357  |

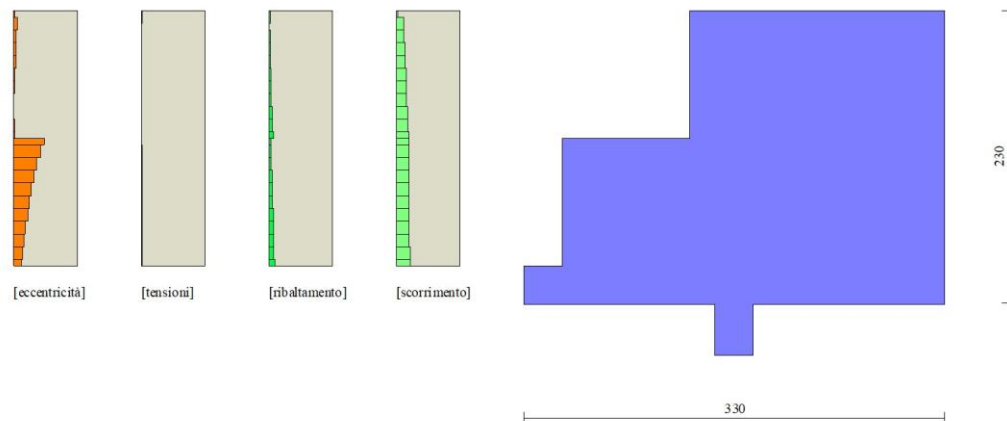


Fig. 13 - Verifiche paramento pietrame (Combinazione n° 10)

Combinazione n° 11 - EQU (A1-M1-R3) H + V

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -5.15     | 2          | 4.3088     | 1.8277     | 2.357   | 4.6215      | 0.0908      | 50.881  |
| 3  | -0.20    | 20000       | -3.21     | 5          | 8.6364     | 3.7113     | 2.327   | 9.2808      | 0.3670      | 25.285  |
| 4  | -0.30    | 20000       | -1.24     | 7          | 12.9827    | 5.6501     | 2.298   | 13.9774     | 0.8342      | 16.756  |
| 5  | -0.40    | 20000       | 0.77      | 9          | 17.3474    | 7.6432     | 2.270   | 18.7107     | 1.4977      | 12.493  |
| 6  | -0.50    | 20000       | 2.82      | 12         | 21.7306    | 9.6912     | 2.242   | 23.4811     | 2.3631      | 9.936   |
| 7  | -0.60    | 20000       | 4.90      | 15         | 26.1324    | 11.7943    | 2.216   | 28.2887     | 3.4359      | 8.233   |
| 8  | -0.70    | 20000       | 7.01      | 18         | 30.5528    | 13.9525    | 2.190   | 33.1336     | 4.7215      | 7.018   |
| 9  | -0.80    | 20000       | 9.15      | 22         | 34.9919    | 16.1659    | 2.165   | 38.0158     | 6.2254      | 6.107   |
| 10 | -0.90    | 20000       | 11.32     | 26         | 39.4496    | 18.4344    | 2.140   | 42.9352     | 7.9532      | 5.398   |
| 11 | -1.00    | 20000       | 13.53     | 31         | 43.9259    | 20.7580    | 2.116   | 47.8919     | 9.9104      | 4.832   |
| 12 | -1.00    | 30000       | -36.36    | 25         | 44.0357    | 20.8096    | 2.116   | 92.0172     | 9.9520      | 9.246   |
| 13 | -1.10    | 30000       | -28.78    | 27         | 50.5291    | 23.6405    | 2.137   | 102.5062    | 12.1718     | 8.422   |
| 14 | -1.20    | 30000       | -22.46    | 28         | 57.0411    | 26.5266    | 2.150   | 113.0512    | 14.6772     | 7.702   |
| 15 | -1.30    | 30000       | -17.02    | 28         | 63.5717    | 29.4678    | 2.157   | 123.6520    | 17.4737     | 7.076   |
| 16 | -1.40    | 30000       | -12.21    | 29         | 70.1209    | 32.4641    | 2.160   | 134.3086    | 20.5667     | 6.530   |
| 17 | -1.50    | 30000       | -7.86     | 30         | 76.6887    | 35.5156    | 2.159   | 145.0212    | 23.9618     | 6.052   |
| 18 | -1.60    | 30000       | -3.86     | 30         | 83.2752    | 38.6222    | 2.156   | 155.7897    | 27.6646     | 5.631   |
| 19 | -1.70    | 30000       | -0.13     | 30         | 89.8803    | 41.7839    | 2.151   | 166.6140    | 31.6804     | 5.259   |
| 20 | -1.80    | 30000       | 3.40      | 34         | 96.5041    | 45.0008    | 2.144   | 177.4943    | 36.0148     | 4.928   |
| 21 | -1.90    | 30000       | 6.75      | 39         | 103.1465   | 48.2728    | 2.137   | 188.4304    | 40.6734     | 4.633   |
| 22 | -2.00    | 30000       | 9.97      | 44         | 109.8075   | 51.5999    | 2.128   | 199.4224    | 45.6616     | 4.367   |

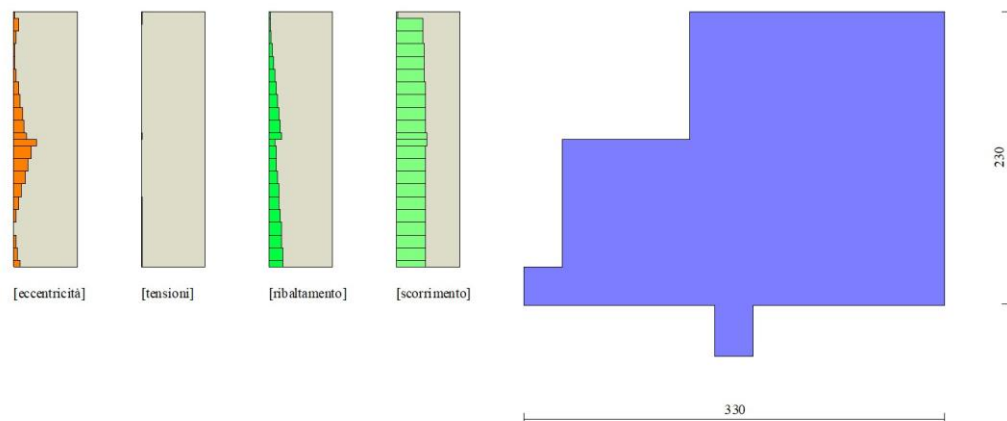


Fig. 14 - Verifiche paramento pietrame (Combinazione n° 11)

Combinazione n° 12 - EQU (A1-M1-R3) H - V

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -4.19     | 2          | 4.2576     | 1.6764     | 2.540   | 4.5193      | 0.0833      | 54.272  |
| 3  | -0.20    | 20000       | -2.41     | 5          | 8.5341     | 3.4087     | 2.504   | 9.0763      | 0.3368      | 26.948  |
| 4  | -0.30    | 20000       | -0.59     | 7          | 12.8293    | 5.1961     | 2.469   | 13.6706     | 0.7662      | 17.843  |
| 5  | -0.40    | 20000       | 1.27      | 9          | 17.1428    | 7.0379     | 2.436   | 18.3017     | 1.3768      | 13.293  |
| 6  | -0.50    | 20000       | 3.16      | 12         | 21.4749    | 8.9345     | 2.404   | 22.9698     | 2.1742      | 10.565  |
| 7  | -0.60    | 20000       | 5.09      | 15         | 25.8256    | 10.8863    | 2.372   | 27.6751     | 3.1637      | 8.748   |
| 8  | -0.70    | 20000       | 7.05      | 18         | 30.1949    | 12.8932    | 2.342   | 32.4177     | 4.3511      | 7.451   |
| 9  | -0.80    | 20000       | 9.04      | 22         | 34.5828    | 14.9552    | 2.312   | 37.1976     | 5.7416      | 6.479   |
| 10 | -0.90    | 20000       | 11.07     | 26         | 38.9894    | 17.0724    | 2.284   | 42.0148     | 7.3410      | 5.723   |
| 11 | -1.00    | 20000       | 13.13     | 30         | 43.4146    | 19.2447    | 2.256   | 46.8692     | 9.1545      | 5.120   |
| 12 | -1.00    | 30000       | -36.77    | 25         | 43.5234    | 19.2932    | 2.256   | 90.4801     | 9.1931      | 9.842   |
| 13 | -1.10    | 30000       | -29.25    | 26         | 49.9656    | 21.9728    | 2.274   | 100.8157    | 11.2539     | 8.958   |
| 14 | -1.20    | 30000       | -23.01    | 27         | 56.4264    | 24.7076    | 2.284   | 111.2072    | 13.5851     | 8.186   |
| 15 | -1.30    | 30000       | -17.65    | 28         | 62.9059    | 27.4974    | 2.288   | 121.6546    | 16.1923     | 7.513   |
| 16 | -1.40    | 30000       | -12.93    | 29         | 69.4040    | 30.3424    | 2.287   | 132.1579    | 19.0809     | 6.926   |
| 17 | -1.50    | 30000       | -8.67     | 30         | 75.9207    | 33.2425    | 2.284   | 142.7171    | 22.2565     | 6.412   |
| 18 | -1.60    | 30000       | -4.76     | 30         | 82.4560    | 36.1978    | 2.278   | 153.3321    | 25.7246     | 5.961   |
| 19 | -1.70    | 30000       | -1.12     | 30         | 89.0100    | 39.2082    | 2.270   | 164.0031    | 29.4907     | 5.561   |
| 20 | -1.80    | 30000       | 2.31      | 33         | 95.5826    | 42.2737    | 2.261   | 174.7299    | 33.5602     | 5.206   |
| 21 | -1.90    | 30000       | 5.57      | 38         | 102.1739   | 45.3944    | 2.251   | 185.5126    | 37.9388     | 4.890   |
| 22 | -2.00    | 30000       | 8.69      | 43         | 108.7837   | 48.5702    | 2.240   | 196.3512    | 42.6319     | 4.606   |

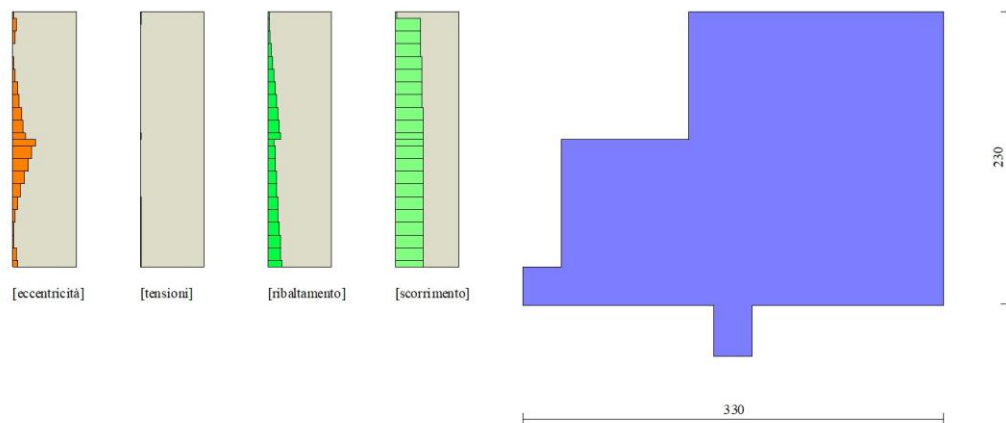


Fig. 15 - Verifiche paramento pietrame (Combinazione n° 12)

Combinazione n° 13 - SLER

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -2.34     | 2          | 4.1082     | 0.3320     | 12.375  | 4.2203      | 0.0161      | 261.862 |
| 3  | -0.20    | 20000       | -2.13     | 4          | 8.2352     | 0.7198     | 11.442  | 8.4784      | 0.0682      | 124.343 |
| 4  | -0.30    | 20000       | -1.87     | 7          | 12.3809    | 1.1627     | 10.648  | 12.7738     | 0.1618      | 78.966  |
| 5  | -0.40    | 20000       | -1.56     | 9          | 16.5449    | 1.6601     | 9.966   | 17.1059     | 0.3023      | 56.584  |
| 6  | -0.50    | 20000       | -1.22     | 11         | 20.7275    | 2.2123     | 9.369   | 21.4751     | 0.4953      | 43.360  |
| 7  | -0.60    | 20000       | -0.83     | 13         | 24.9287    | 2.8196     | 8.841   | 25.8815     | 0.7462      | 34.686  |
| 8  | -0.70    | 20000       | -0.40     | 15         | 29.1486    | 3.4821     | 8.371   | 30.3252     | 1.0605      | 28.596  |
| 9  | -0.80    | 20000       | 0.07      | 17         | 33.3871    | 4.1997     | 7.950   | 34.8061     | 1.4437      | 24.109  |
| 10 | -0.90    | 20000       | 0.59      | 19         | 37.6442    | 4.9724     | 7.571   | 39.3243     | 1.9014      | 20.682  |
| 11 | -1.00    | 20000       | 1.14      | 22         | 41.9199    | 5.8002     | 7.227   | 43.8798     | 2.4390      | 17.991  |
| 12 | -1.00    | 30000       | -48.77    | 28         | 42.0257    | 5.8174     | 7.224   | 85.9870     | 2.4507      | 35.087  |
| 13 | -1.10    | 30000       | -42.06    | 30         | 48.3184    | 6.7015     | 7.210   | 95.8742     | 3.0755      | 31.173  |
| 14 | -1.20    | 30000       | -36.76    | 32         | 54.6298    | 7.6407     | 7.150   | 105.8173    | 3.7914      | 27.910  |
| 15 | -1.30    | 30000       | -32.44    | 34         | 60.9598    | 8.6351     | 7.060   | 115.8163    | 4.6040      | 25.156  |
| 16 | -1.40    | 30000       | -28.81    | 35         | 67.3084    | 9.6846     | 6.950   | 125.8712    | 5.5186      | 22.809  |
| 17 | -1.50    | 30000       | -25.69    | 37         | 73.6756    | 10.7892    | 6.829   | 135.9819    | 6.5408      | 20.790  |
| 18 | -1.60    | 30000       | -22.96    | 39         | 80.0615    | 11.9490    | 6.700   | 146.1486    | 7.6761      | 19.039  |
| 19 | -1.70    | 30000       | -20.52    | 41         | 86.4660    | 13.1639    | 6.568   | 156.3711    | 8.9300      | 17.511  |
| 20 | -1.80    | 30000       | -18.31    | 42         | 92.8892    | 14.4339    | 6.435   | 166.6496    | 10.3081     | 16.167  |
| 21 | -1.90    | 30000       | -16.28    | 44         | 99.3310    | 15.7591    | 6.303   | 176.9839    | 11.8157     | 14.979  |
| 22 | -2.00    | 30000       | -14.39    | 45         | 105.7914   | 17.1394    | 6.172   | 187.3741    | 13.4586     | 13.922  |

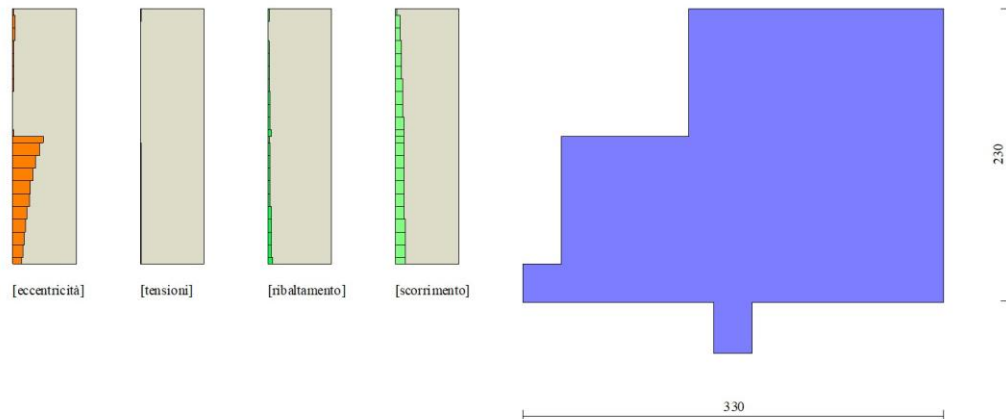


Fig. 16 - Verifiche paramento pietra (Combinazione n° 13)

Combinazione n° 14 - SLEF

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | $\sigma$<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|-------------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0                 | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -2.34     | 2                 | 4.1082     | 0.3320     | 12.375  | 4.2203      | 0.0161      | 261.862 |
| 3  | -0.20    | 20000       | -2.13     | 4                 | 8.2352     | 0.7198     | 11.442  | 8.4784      | 0.0682      | 124.343 |
| 4  | -0.30    | 20000       | -1.87     | 7                 | 12.3809    | 1.1627     | 10.648  | 12.7738     | 0.1618      | 78.966  |
| 5  | -0.40    | 20000       | -1.56     | 9                 | 16.5449    | 1.6601     | 9.966   | 17.1059     | 0.3023      | 56.584  |
| 6  | -0.50    | 20000       | -1.22     | 11                | 20.7275    | 2.2123     | 9.369   | 21.4751     | 0.4953      | 43.360  |
| 7  | -0.60    | 20000       | -0.83     | 13                | 24.9287    | 2.8196     | 8.841   | 25.8815     | 0.7462      | 34.686  |
| 8  | -0.70    | 20000       | -0.40     | 15                | 29.1486    | 3.4821     | 8.371   | 30.3252     | 1.0605      | 28.596  |
| 9  | -0.80    | 20000       | 0.07      | 17                | 33.3871    | 4.1997     | 7.950   | 34.8061     | 1.4437      | 24.109  |
| 10 | -0.90    | 20000       | 0.59      | 19                | 37.6442    | 4.9724     | 7.571   | 39.3243     | 1.9014      | 20.682  |
| 11 | -1.00    | 20000       | 1.14      | 22                | 41.9199    | 5.8002     | 7.227   | 43.8798     | 2.4390      | 17.991  |
| 12 | -1.00    | 30000       | -48.77    | 28                | 42.0257    | 5.8174     | 7.224   | 85.9870     | 2.4507      | 35.087  |
| 13 | -1.10    | 30000       | -42.06    | 30                | 48.3184    | 6.7015     | 7.210   | 95.8742     | 3.0755      | 31.173  |
| 14 | -1.20    | 30000       | -36.76    | 32                | 54.6298    | 7.6407     | 7.150   | 105.8173    | 3.7914      | 27.910  |
| 15 | -1.30    | 30000       | -32.44    | 34                | 60.9598    | 8.6351     | 7.060   | 115.8163    | 4.6040      | 25.156  |
| 16 | -1.40    | 30000       | -28.81    | 35                | 67.3084    | 9.6846     | 6.950   | 125.8712    | 5.5186      | 22.809  |
| 17 | -1.50    | 30000       | -25.69    | 37                | 73.6756    | 10.7892    | 6.829   | 135.9819    | 6.5408      | 20.790  |
| 18 | -1.60    | 30000       | -22.96    | 39                | 80.0615    | 11.9490    | 6.700   | 146.1486    | 7.6761      | 19.039  |
| 19 | -1.70    | 30000       | -20.52    | 41                | 86.4660    | 13.1639    | 6.568   | 156.3711    | 8.9300      | 17.511  |
| 20 | -1.80    | 30000       | -18.31    | 42                | 92.8892    | 14.4339    | 6.435   | 166.6496    | 10.3081     | 16.167  |
| 21 | -1.90    | 30000       | -16.28    | 44                | 99.3310    | 15.7591    | 6.303   | 176.9839    | 11.8157     | 14.979  |
| 22 | -2.00    | 30000       | -14.39    | 45                | 105.7914   | 17.1394    | 6.172   | 187.3741    | 13.4586     | 13.922  |

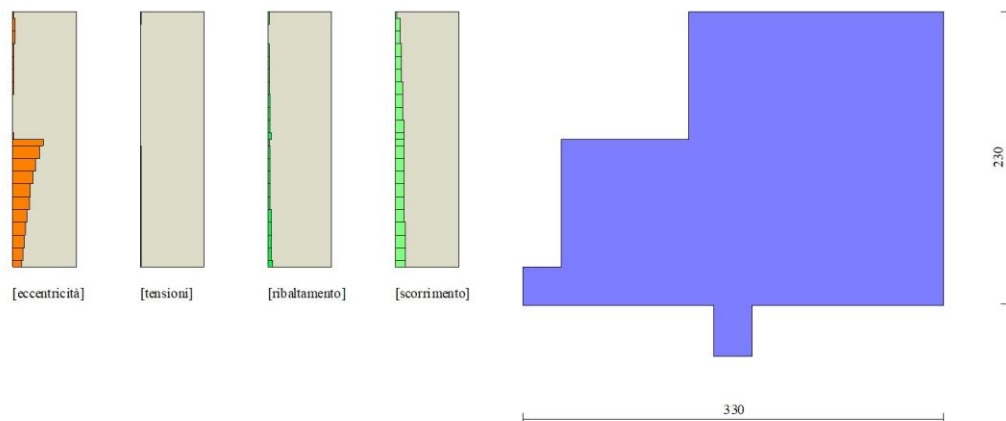


Fig. 17 - Verifiche paramento pietra (Combinazione n° 14)



Combinazione n° 15 - SLEQ

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -2.34     | 2          | 4.1082     | 0.3320     | 12.375  | 4.2203      | 0.0161      | 261.862 |
| 3  | -0.20    | 20000       | -2.13     | 4          | 8.2352     | 0.7198     | 11.442  | 8.4784      | 0.0682      | 124.343 |
| 4  | -0.30    | 20000       | -1.87     | 7          | 12.3809    | 1.1627     | 10.648  | 12.7738     | 0.1618      | 78.966  |
| 5  | -0.40    | 20000       | -1.56     | 9          | 16.5449    | 1.6601     | 9.966   | 17.1059     | 0.3023      | 56.584  |
| 6  | -0.50    | 20000       | -1.22     | 11         | 20.7275    | 2.2123     | 9.369   | 21.4751     | 0.4953      | 43.360  |
| 7  | -0.60    | 20000       | -0.83     | 13         | 24.9287    | 2.8196     | 8.841   | 25.8815     | 0.7462      | 34.686  |
| 8  | -0.70    | 20000       | -0.40     | 15         | 29.1486    | 3.4821     | 8.371   | 30.3252     | 1.0605      | 28.596  |
| 9  | -0.80    | 20000       | 0.07      | 17         | 33.3871    | 4.1997     | 7.950   | 34.8061     | 1.4437      | 24.109  |
| 10 | -0.90    | 20000       | 0.59      | 19         | 37.6442    | 4.9724     | 7.571   | 39.3243     | 1.9014      | 20.682  |
| 11 | -1.00    | 20000       | 1.14      | 22         | 41.9199    | 5.8002     | 7.227   | 43.8798     | 2.4390      | 17.991  |
| 12 | -1.00    | 30000       | -48.77    | 28         | 42.0257    | 5.8174     | 7.224   | 85.9870     | 2.4507      | 35.087  |
| 13 | -1.10    | 30000       | -42.06    | 30         | 48.3184    | 6.7015     | 7.210   | 95.8742     | 3.0755      | 31.173  |
| 14 | -1.20    | 30000       | -36.76    | 32         | 54.6298    | 7.6407     | 7.150   | 105.8173    | 3.7914      | 27.910  |
| 15 | -1.30    | 30000       | -32.44    | 34         | 60.9598    | 8.6351     | 7.060   | 115.8163    | 4.6040      | 25.156  |
| 16 | -1.40    | 30000       | -28.81    | 35         | 67.3084    | 9.6846     | 6.950   | 125.8712    | 5.5186      | 22.809  |
| 17 | -1.50    | 30000       | -25.69    | 37         | 73.6756    | 10.7892    | 6.829   | 135.9819    | 6.5408      | 20.790  |
| 18 | -1.60    | 30000       | -22.96    | 39         | 80.0615    | 11.9490    | 6.700   | 146.1486    | 7.6761      | 19.039  |
| 19 | -1.70    | 30000       | -20.52    | 41         | 86.4660    | 13.1639    | 6.568   | 156.3711    | 8.9300      | 17.511  |
| 20 | -1.80    | 30000       | -18.31    | 42         | 92.8892    | 14.4339    | 6.435   | 166.6496    | 10.3081     | 16.167  |
| 21 | -1.90    | 30000       | -16.28    | 44         | 99.3310    | 15.7591    | 6.303   | 176.9839    | 11.8157     | 14.979  |
| 22 | -2.00    | 30000       | -14.39    | 45         | 105.7914   | 17.1394    | 6.172   | 187.3741    | 13.4586     | 13.922  |

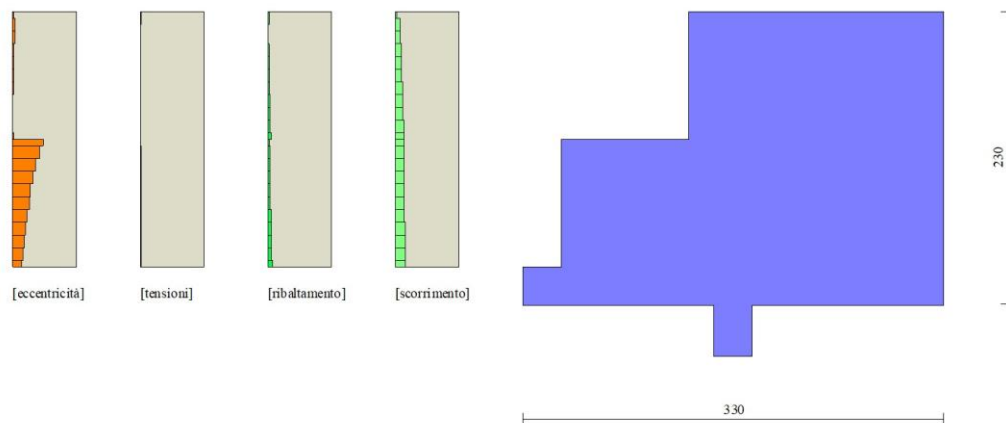


Fig. 18 - Verifiche paramento pietrame (Combinazione n° 15)

Combinazione n° 16 - SLEQ H + V

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -3.00     | 2          | 4.1566     | 0.7302     | 5.693   | 4.3173      | 0.0360      | 119.903 |
| 3  | -0.20    | 20000       | -2.31     | 4          | 8.3322     | 1.5162     | 5.496   | 8.6723      | 0.1477      | 58.698  |
| 4  | -0.30    | 20000       | -1.58     | 7          | 12.5263    | 2.3573     | 5.314   | 13.0646     | 0.3408      | 38.338  |
| 5  | -0.40    | 20000       | -0.80     | 9          | 16.7388    | 3.2529     | 5.146   | 17.4937     | 0.6205      | 28.191  |
| 6  | -0.50    | 20000       | 0.01      | 10         | 20.9699    | 4.2033     | 4.989   | 21.9598     | 0.9925      | 22.125  |
| 7  | -0.60    | 20000       | 0.87      | 13         | 25.2196    | 5.2088     | 4.842   | 26.4632     | 1.4622      | 18.098  |
| 8  | -0.70    | 20000       | 1.76      | 16         | 29.4879    | 6.2694     | 4.703   | 31.0038     | 2.0351      | 15.235  |
| 9  | -0.80    | 20000       | 2.69      | 18         | 33.7748    | 7.3852     | 4.573   | 35.5817     | 2.7167      | 13.098  |
| 10 | -0.90    | 20000       | 3.67      | 21         | 38.0804    | 8.5562     | 4.451   | 40.1968     | 3.5125      | 11.444  |
| 11 | -1.00    | 20000       | 4.68      | 24         | 42.4046    | 9.7822     | 4.335   | 44.8493     | 4.4280      | 10.128  |
| 12 | -1.00    | 30000       | -45.23    | 27         | 42.5114    | 9.8086     | 4.334   | 87.4442     | 4.4476      | 19.661  |
| 13 | -1.10    | 30000       | -38.28    | 29         | 48.8526    | 11.2183    | 4.355   | 97.4768     | 5.4974      | 17.731  |
| 14 | -1.20    | 30000       | -32.70    | 30         | 55.2124    | 12.6831    | 4.353   | 107.5653    | 6.6909      | 16.076  |
| 15 | -1.30    | 30000       | -28.07    | 32         | 61.5909    | 14.2030    | 4.336   | 117.7097    | 8.0334      | 14.653  |
| 16 | -1.40    | 30000       | -24.12    | 34         | 67.9880    | 15.7781    | 4.309   | 127.9100    | 9.5305      | 13.421  |
| 17 | -1.50    | 30000       | -20.66    | 35         | 74.4037    | 17.4083    | 4.274   | 138.1662    | 11.1877     | 12.350  |
| 18 | -1.60    | 30000       | -17.58    | 36         | 80.8381    | 19.0936    | 4.234   | 148.4783    | 13.0105     | 11.412  |
| 19 | -1.70    | 30000       | -14.78    | 38         | 87.2911    | 20.8341    | 4.190   | 158.8462    | 15.0044     | 10.587  |
| 20 | -1.80    | 30000       | -12.21    | 39         | 93.7627    | 22.6297    | 4.143   | 169.2701    | 17.1749     | 9.856   |
| 21 | -1.90    | 30000       | -9.82     | 40         | 100.2529   | 24.4804    | 4.095   | 179.7498    | 19.5276     | 9.205   |
| 22 | -2.00    | 30000       | -7.56     | 41         | 106.7618   | 26.3863    | 4.046   | 190.2855    | 22.0680     | 8.623   |

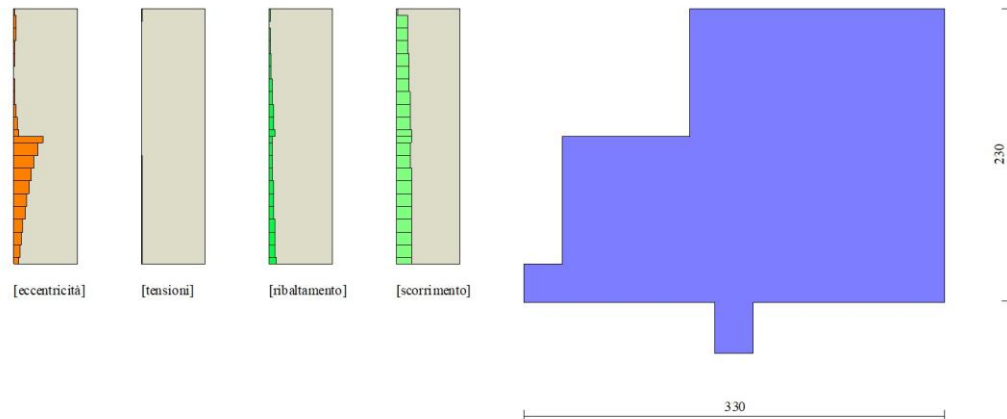


Fig. 19 - Verifiche paramento pietrame (Combinazione n° 16)

Combinazione n° 17 - SLEQ H - V

| n° | Y<br>[m] | As<br>[cmq] | e<br>[cm] | σ<br>[kPa] | Rt<br>[kN] | Et<br>[kN] | FSsco   | Ms<br>[kNm] | Mr<br>[kNm] | FSrib   |
|----|----------|-------------|-----------|------------|------------|------------|---------|-------------|-------------|---------|
| 1  | 0.00     | 20000       | 0.00      | 0          | 0.0000     | 0.0000     | 100.000 | 0.0000      | 0.0000      | 100.000 |
| 2  | -0.10    | 20000       | -2.64     | 2          | 4.1384     | 0.6762     | 6.120   | 4.2808      | 0.0333      | 128.516 |
| 3  | -0.20    | 20000       | -2.01     | 4          | 8.2957     | 1.4082     | 5.891   | 8.5993      | 0.1370      | 62.789  |
| 4  | -0.30    | 20000       | -1.34     | 6          | 12.4716    | 2.1953     | 5.681   | 12.9551     | 0.3165      | 40.933  |
| 5  | -0.40    | 20000       | -0.63     | 8          | 16.6659    | 3.0369     | 5.488   | 17.3477     | 0.5774      | 30.045  |
| 6  | -0.50    | 20000       | 0.13      | 10         | 20.8787    | 3.9333     | 5.308   | 21.7773     | 0.9251      | 23.541  |
| 7  | -0.60    | 20000       | 0.92      | 13         | 25.1101    | 4.8848     | 5.140   | 26.2442     | 1.3651      | 19.225  |
| 8  | -0.70    | 20000       | 1.75      | 15         | 29.3602    | 5.8915     | 4.984   | 30.7484     | 1.9029      | 16.159  |
| 9  | -0.80    | 20000       | 2.63      | 18         | 33.6289    | 6.9532     | 4.836   | 35.2898     | 2.5440      | 13.872  |
| 10 | -0.90    | 20000       | 3.54      | 21         | 37.9162    | 8.0702     | 4.698   | 39.8684     | 3.2940      | 12.103  |
| 11 | -1.00    | 20000       | 4.49      | 24         | 42.2222    | 9.2422     | 4.568   | 44.4843     | 4.1583      | 10.698  |
| 12 | -1.00    | 30000       | -45.42    | 27         | 42.3286    | 9.2675     | 4.567   | 86.8957     | 4.1768      | 20.804  |
| 13 | -1.10    | 30000       | -38.49    | 29         | 48.6515    | 10.6232    | 4.580   | 96.8736     | 5.1699      | 18.738  |
| 14 | -1.20    | 30000       | -32.94    | 30         | 54.9931    | 12.0340    | 4.570   | 106.9073    | 6.3012      | 16.966  |
| 15 | -1.30    | 30000       | -28.35    | 32         | 61.3533    | 13.4999    | 4.545   | 116.9970    | 7.5761      | 15.443  |
| 16 | -1.40    | 30000       | -24.43    | 34         | 67.7322    | 15.0210    | 4.509   | 127.1426    | 9.0003      | 14.127  |
| 17 | -1.50    | 30000       | -21.00    | 35         | 74.1297    | 16.5972    | 4.466   | 137.3440    | 10.5791     | 12.983  |
| 18 | -1.60    | 30000       | -17.96    | 36         | 80.5458    | 18.2285    | 4.419   | 147.6014    | 12.3182     | 11.982  |
| 19 | -1.70    | 30000       | -15.20    | 38         | 86.9805    | 19.9150    | 4.368   | 157.9146    | 14.2230     | 11.103  |
| 20 | -1.80    | 30000       | -12.67    | 39         | 93.4339    | 21.6566    | 4.314   | 168.2837    | 16.2991     | 10.325  |
| 21 | -1.90    | 30000       | -10.31    | 40         | 99.9059    | 23.4533    | 4.260   | 178.7087    | 18.5519     | 9.633   |
| 22 | -2.00    | 30000       | -8.09     | 41         | 106.3965   | 25.3052    | 4.205   | 189.1896    | 20.9869     | 9.015   |

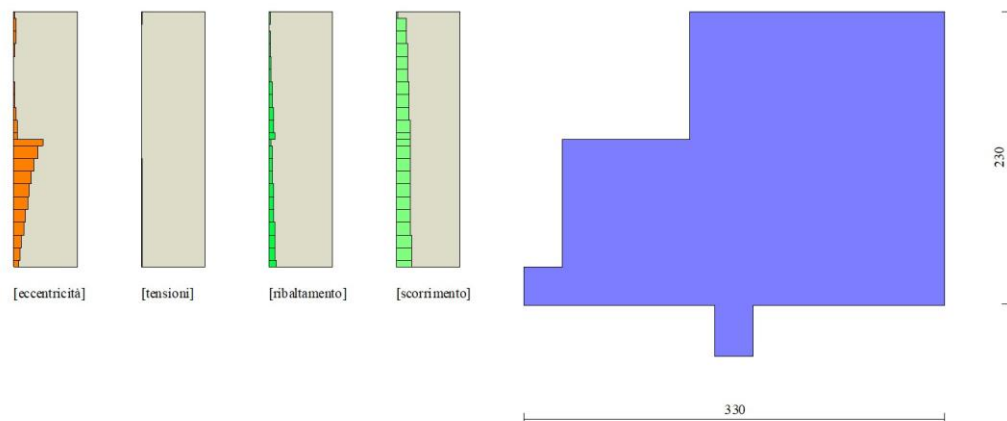


Fig. 20 - Verifiche paramento pietrame (Combinazione n° 17)

*Verifiche a flessione*Elementi calcolati a traveSimbologia adottata

|     |                                                                                   |
|-----|-----------------------------------------------------------------------------------|
| n°  | indice sezione                                                                    |
| Y   | ordinata sezione espressa in [m]                                                  |
| B   | larghezza sezione espressa in [cm]                                                |
| H   | altezza sezione espressa in [cm]                                                  |
| Afi | area ferri inferiori espressa in [cmq]                                            |
| Afs | area ferri superiori espressa in [cmq]                                            |
| M   | momento agente espressa in [kNm]                                                  |
| N   | sforzo normale agente espressa in [kN]                                            |
| Mu  | momento ultimi espresso in [kNm]                                                  |
| Nu  | sforzo normale ultimo espressa in [kN]                                            |
| FS  | fattore di sicurezza (rapporto tra sollecitazione ultima e sollecitazione agente) |

**Fondazione**Combinazione n° 1 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS         |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0.00        | 0.00       | 100000.000 |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.10       | 0.00      | 64.69       | 0.00       | 621.188    |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.42       | 0.00      | 64.69       | 0.00       | 153.266    |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 0.96       | 0.00      | 64.69       | 0.00       | 67.239     |

Combinazione n° 2 - STR (A1-M1-R3) H + V

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS         |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0.00        | 0.00       | 100000.000 |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.17       | 0.00      | 64.69       | 0.00       | 382.782    |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.68       | 0.00      | 64.69       | 0.00       | 95.494     |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 1.53       | 0.00      | 64.69       | 0.00       | 42.353     |

Combinazione n° 3 - STR (A1-M1-R3) H - V

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS         |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0.00        | 0.00       | 100000.000 |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.15       | 0.00      | 64.69       | 0.00       | 437.526    |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.59       | 0.00      | 64.69       | 0.00       | 109.261    |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 1.33       | 0.00      | 64.69       | 0.00       | 48.507     |

Combinazione n° 4 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS         |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0.00        | 0.00       | 100000.000 |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.12       | 0.00      | 64.69       | 0.00       | 527.693    |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.50       | 0.00      | 64.69       | 0.00       | 129.843    |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 1.14       | 0.00      | 64.69       | 0.00       | 56.812     |

Combinazione n° 5 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS         |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0.00        | 0.00       | 100000.000 |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.10       | 0.00      | 64.69       | 0.00       | 621.188    |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.42       | 0.00      | 64.69       | 0.00       | 153.266    |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 0.96       | 0.00      | 64.69       | 0.00       | 67.239     |

Combinazione n° 6 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS         |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0.00        | 0.00       | 100000.000 |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.12       | 0.00      | 64.69       | 0.00       | 527.693    |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.50       | 0.00      | 64.69       | 0.00       | 129.843    |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 1.14       | 0.00      | 64.69       | 0.00       | 56.812     |

**Sperone**Combinazione n° 1 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|-------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 7.87       | 0.00      | 44.52       | 0.00       | 5.656 |

**Combinazione n° 2 - STR (A1-M1-R3) H + V**

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|-------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 13.35      | 0.00      | 44.52       | 0.00       | 3.334 |

**Combinazione n° 3 - STR (A1-M1-R3) H - V**

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|-------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 12.55      | 0.00      | 44.52       | 0.00       | 3.548 |

**Combinazione n° 4 - STR (A1-M1-R3)**

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|-------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 7.87       | 0.00      | 44.52       | 0.00       | 5.656 |

**Combinazione n° 5 - STR (A1-M1-R3)**

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|-------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 7.87       | 0.00      | 44.52       | 0.00       | 5.656 |

**Combinazione n° 6 - STR (A1-M1-R3)**

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | Mu<br>[kNm] | Nu<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|-------------|------------|-------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 7.87       | 0.00      | 44.52       | 0.00       | 5.656 |

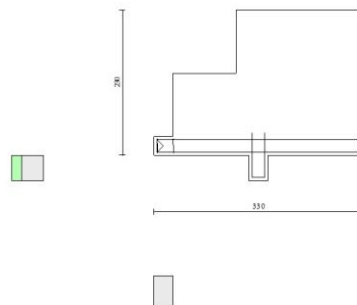


Fig. 21 - Paramento (Inviluppo)

**Verifiche a taglio****Simbologia adottata**

|                  |                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Is               | indice sezione                                                                                                                                                                     |
| Y                | ordinata sezione espressa in [m]                                                                                                                                                   |
| B                | larghezza sezione espressa in [cm]                                                                                                                                                 |
| H                | altezza sezione espressa in [cm]                                                                                                                                                   |
| Asw              | area ferri a taglio espressa in [cmq]                                                                                                                                              |
| cotgθ            | inclinazione delle bielle compresse, θ inclinazione dei puntoni di calcestruzzo                                                                                                    |
| V <sub>Rcd</sub> | resistenza di progetto a 'taglio compressione' espressa in [kN]                                                                                                                    |
| V <sub>Rsd</sub> | resistenza di progetto a 'taglio trazione' espressa in [kN]                                                                                                                        |
| V <sub>Rd</sub>  | resistenza di progetto a taglio espressa in [kN]. Per elementi con armature trasversali resistenti al taglio (Asw>0.0) V <sub>Rd</sub> =min(V <sub>Rcd</sub> , V <sub>Rsd</sub> ). |
| T                | taglio agente espressa in [kN]                                                                                                                                                     |
| FS               | fattore di sicurezza (rapporto tra sollecitazione resistente e sollecitazione agente)                                                                                              |

**Fondazione**

Combinazione n° 1 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS      |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|---------|
| 1  | -3.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | 0.00      | 100.000 |
| 2  | -3.20    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -2.10     | 62.251  |
| 3  | -3.10    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -4.28     | 30.523  |
| 4  | -3.00    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -6.54     | 19.962  |

Combinazione n° 2 - STR (A1-M1-R3) H + V

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS      |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|---------|
| 1  | -3.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | 0.00      | 100.000 |
| 2  | -3.20    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -3.38     | 38.573  |
| 3  | -3.10    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -6.79     | 19.226  |
| 4  | -3.00    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -10.21    | 12.777  |

Combinazione n° 3 - STR (A1-M1-R3) H - V

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS      |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|---------|
| 1  | -3.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | 0.00      | 100.000 |
| 2  | -3.20    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -2.96     | 44.112  |
| 3  | -3.10    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -5.93     | 22.020  |
| 4  | -3.00    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -8.91     | 14.656  |

Combinazione n° 4 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS      |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|---------|
| 1  | -3.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | 0.00      | 100.000 |
| 2  | -3.20    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -2.47     | 52.809  |
| 3  | -3.10    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -5.06     | 25.790  |
| 4  | -3.00    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -7.77     | 16.802  |

Combinazione n° 5 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS      |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|---------|
| 1  | -3.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | 0.00      | 100.000 |
| 2  | -3.20    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -2.10     | 62.251  |
| 3  | -3.10    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -4.28     | 30.523  |
| 4  | -3.00    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -6.54     | 19.962  |

Combinazione n° 6 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS      |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|---------|
| 1  | -3.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | 0.00      | 100.000 |
| 2  | -3.20    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -2.47     | 52.809  |
| 3  | -3.10    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -5.06     | 25.790  |
| 4  | -3.00    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 130.51                  | -7.77     | 16.802  |

**Sperone**Combinazione n° 1 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|-------|
| 1  | -2.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 114.01                  | 29.50     | 3.865 |

Combinazione n° 2 - STR (A1-M1-R3) H + V

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|-------|
| 1  | -2.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 114.01                  | 50.04     | 2.278 |

Combinazione n° 3 - STR (A1-M1-R3) H - V

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|-------|
| 1  | -2.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 114.01                  | 47.03     | 2.424 |

Combinazione n° 4 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|-------|
| 1  | -2.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 114.01                  | 29.50     | 3.865 |

Combinazione n° 5 - STR (A1-M1-R3)

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|-------|
| 1  | -2.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 114.01                  | 29.50     | 3.865 |

**Combinazione n° 6 - STR (A1-M1-R3)**

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>sw</sub><br>[cmq] | s<br>[cm] | cotθ | V <sub>Rcd</sub><br>[kN] | V <sub>Rsd</sub><br>[kN] | V <sub>Rd</sub><br>[kN] | T<br>[kN] | FS    |
|----|----------|-----------|-----------|--------------------------|-----------|------|--------------------------|--------------------------|-------------------------|-----------|-------|
| 1  | -2.30    | 100       | 30        | 0.00                     | 0.00      | --   | 0.00                     | 0.00                     | 114.01                  | 29.50     | 3.865 |

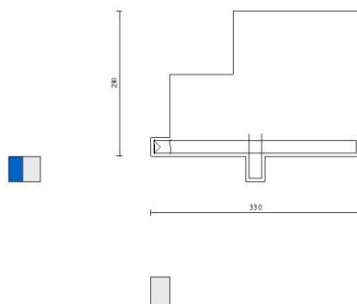


Fig. 22 - Paramento (Inviluppo)

**Verifica delle tensioni****Simbologia adottata**

|                 |                                                     |
|-----------------|-----------------------------------------------------|
| n°              | indice sezione                                      |
| Y               | ordinata sezione, espressa in [m]                   |
| B               | larghezza sezione, espressa in [cm]                 |
| H               | altezza sezione, espressa in [cm]                   |
| A <sub>fi</sub> | area ferri inferiori, espressa in [cmq]             |
| A <sub>fs</sub> | area ferri superiori, espressa in [cmq]             |
| M               | momento agente, espressa in [kNm]                   |
| N               | sforzo normale agente, espressa in [kN]             |
| σ <sub>c</sub>  | tensione di compressione nel cls, espressa in [kPa] |
| σ <sub>fi</sub> | tensione nei ferri inferiori, espressa in [kPa]     |
| σ <sub>fs</sub> | tensione nei ferri superiori, espressa in [kPa]     |

**Combinazioni SLER****Fondazione****Combinazione n° 13 - SLER**

|                                                   |        |       |
|---------------------------------------------------|--------|-------|
| Tensione massima di compressione nel calcestruzzo | 12450  | [kPa] |
| Tensione massima di trazione dell'acciaio         | 360000 | [kPa] |

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | A <sub>fi</sub><br>[cmq] | A <sub>fs</sub><br>[cmq] | M<br>[kNm] | N<br>[kN] | σ <sub>c</sub><br>[kPa] | σ <sub>fi</sub><br>[kPa] | σ <sub>fs</sub><br>[kPa] |
|----|----------|-----------|-----------|--------------------------|--------------------------|------------|-----------|-------------------------|--------------------------|--------------------------|
| 1  | -3.30    | 100       | 30        | 6.79                     | 6.79                     | 0.00       | 0.00      | 0                       | 0                        | 0                        |
| 2  | -3.20    | 100       | 30        | 6.79                     | 6.79                     | 0.09       | 0.00      | 12                      | 585                      | 43                       |
| 3  | -3.10    | 100       | 30        | 6.79                     | 6.79                     | 0.37       | 0.00      | 49                      | 2378                     | 177                      |
| 4  | -3.00    | 100       | 30        | 6.79                     | 6.79                     | 0.86       | 0.00      | 113                     | 5439                     | 405                      |

**Sperone****Combinazione n° 13 - SLER**

|                                                   |       |       |
|---------------------------------------------------|-------|-------|
| Tensione massima di compressione nel calcestruzzo | 12450 | [kPa] |
|---------------------------------------------------|-------|-------|

Tensione massima di trazione dell'acciaio

360000

[kPa]

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | $\sigma_c$<br>[kPa] | $\sigma_{fi}$<br>[kPa] | $\sigma_{fs}$<br>[kPa] |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|---------------------|------------------------|------------------------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 5.77       | 0.00      | 920                 | 54024                  | 1512                   |

**Combinazioni SLEF**FondazioneCombinazione n° 14 - SLEF

Tensione massima di compressione nel calcestruzzo

20750

[kPa]

Tensione massima di trazione dell'acciaio

450000

[kPa]

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | $\sigma_c$<br>[kPa] | $\sigma_{fi}$<br>[kPa] | $\sigma_{fs}$<br>[kPa] |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|---------------------|------------------------|------------------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0                   | 0                      | 0                      |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.09       | 0.00      | 12                  | 585                    | 43                     |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.37       | 0.00      | 49                  | 2378                   | 177                    |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 0.86       | 0.00      | 113                 | 5439                   | 405                    |

SperoneCombinazione n° 14 - SLEF

Tensione massima di compressione nel calcestruzzo

20750

[kPa]

Tensione massima di trazione dell'acciaio

450000

[kPa]

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | $\sigma_c$<br>[kPa] | $\sigma_{fi}$<br>[kPa] | $\sigma_{fs}$<br>[kPa] |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|---------------------|------------------------|------------------------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 5.77       | 0.00      | 920                 | 54024                  | 1512                   |

**Combinazioni SLEQ**FondazioneCombinazione n° 15 - SLEQ

Tensione massima di compressione nel calcestruzzo

9337

[kPa]

Tensione massima di trazione dell'acciaio

450000

[kPa]

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | $\sigma_c$<br>[kPa] | $\sigma_{fi}$<br>[kPa] | $\sigma_{fs}$<br>[kPa] |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|---------------------|------------------------|------------------------|
| 1  | -3.30    | 100       | 30        | 6.79         | 6.79         | 0.00       | 0.00      | 0                   | 0                      | 0                      |
| 2  | -3.20    | 100       | 30        | 6.79         | 6.79         | 0.09       | 0.00      | 12                  | 585                    | 43                     |
| 3  | -3.10    | 100       | 30        | 6.79         | 6.79         | 0.37       | 0.00      | 49                  | 2378                   | 177                    |
| 4  | -3.00    | 100       | 30        | 6.79         | 6.79         | 0.86       | 0.00      | 113                 | 5439                   | 405                    |

SperoneCombinazione n° 15 - SLEQ

Tensione massima di compressione nel calcestruzzo

9337

[kPa]

Tensione massima di trazione dell'acciaio

450000

[kPa]

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Afi<br>[cmq] | Afs<br>[cmq] | M<br>[kNm] | N<br>[kN] | $\sigma_c$<br>[kPa] | $\sigma_{fi}$<br>[kPa] | $\sigma_{fs}$<br>[kPa] |
|----|----------|-----------|-----------|--------------|--------------|------------|-----------|---------------------|------------------------|------------------------|
| 1  | -2.30    | 100       | 30        | 4.52         | 4.52         | 5.77       | 0.00      | 920                 | 54024                  | 1512                   |

**Verifica a fessurazione**

## Simbologia adottata

n°      indice sezione  
 Y      ordinata sezione espressa in [m]  
 B      larghezza sezione espresso in [cm]

|               |                                                 |
|---------------|-------------------------------------------------|
| H             | altezza sezione espressa in [cm]                |
| Af            | area ferri zona tesa espresso in [cmq]          |
| Aeff          | area efficace espressa in [cmq]                 |
| M             | momento agente espressa in [kNm]                |
| Mpf           | momento di prima fessurazione espressa in [kNm] |
| $\varepsilon$ | deformazione espresso in %                      |
| Sm            | spaziatura tra le fessure espressa in [mm]      |
| w             | apertura delle fessure espressa in [mm]         |

## Combinazioni SLER

### Fondazione

#### Combinazione n° 13 - SLER

Apertura limite fessure  $w_{lim}=0.20$

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Af<br>[cmq] | Aeff<br>[cmq] | M<br>[kNm] | Mpf<br>[kNm] | $\varepsilon$<br>[%] | Sm<br>[mm] | w<br>[mm] |
|----|----------|-----------|-----------|-------------|---------------|------------|--------------|----------------------|------------|-----------|
| 1  | -3.30    | 100       | 30        | 0.00        | 0.00          | 0.00       | 0.00         | ---                  | ---        | 0.000     |
| 2  | -3.20    | 100       | 30        | 6.79        | 1150.00       | 0.09       | 44.77        | 0.000000             | 0.00       | 0.000     |
| 3  | -3.10    | 100       | 30        | 6.79        | 1150.00       | 0.37       | 44.77        | 0.000000             | 0.00       | 0.000     |
| 4  | -3.00    | 100       | 30        | 6.79        | 1150.00       | 0.86       | 44.77        | 0.000000             | 0.00       | 0.000     |

### Sperone

#### Combinazione n° 13 - SLER

Apertura limite fessure  $w_{lim}=0.20$

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Af<br>[cmq] | Aeff<br>[cmq] | M<br>[kNm] | Mpf<br>[kNm] | $\varepsilon$<br>[%] | Sm<br>[mm] | w<br>[mm] |
|----|----------|-----------|-----------|-------------|---------------|------------|--------------|----------------------|------------|-----------|
| 1  | -2.30    | 100       | 30        | 4.52        | 1150.00       | 5.77       | 43.44        | 0.000000             | 0.00       | 0.000     |

## Combinazioni SLEF

### Fondazione

#### Combinazione n° 14 - SLEF

Apertura limite fessure  $w_{lim}=0.30$

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Af<br>[cmq] | Aeff<br>[cmq] | M<br>[kNm] | Mpf<br>[kNm] | $\varepsilon$<br>[%] | Sm<br>[mm] | w<br>[mm] |
|----|----------|-----------|-----------|-------------|---------------|------------|--------------|----------------------|------------|-----------|
| 1  | -3.30    | 100       | 30        | 0.00        | 0.00          | 0.00       | 0.00         | ---                  | ---        | 0.000     |
| 2  | -3.20    | 100       | 30        | 6.79        | 1150.00       | 0.09       | 44.77        | 0.000000             | 0.00       | 0.000     |
| 3  | -3.10    | 100       | 30        | 6.79        | 1150.00       | 0.37       | 44.77        | 0.000000             | 0.00       | 0.000     |
| 4  | -3.00    | 100       | 30        | 6.79        | 1150.00       | 0.86       | 44.77        | 0.000000             | 0.00       | 0.000     |

### Sperone

#### Combinazione n° 14 - SLEF

Apertura limite fessure  $w_{lim}=0.30$

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Af<br>[cmq] | Aeff<br>[cmq] | M<br>[kNm] | Mpf<br>[kNm] | $\varepsilon$<br>[%] | Sm<br>[mm] | w<br>[mm] |
|----|----------|-----------|-----------|-------------|---------------|------------|--------------|----------------------|------------|-----------|
| 1  | -2.30    | 100       | 30        | 4.52        | 1150.00       | 5.77       | 43.44        | 0.000000             | 0.00       | 0.000     |

## Combinazioni SLEQ

### Fondazione

#### Combinazione n° 15 - SLEQ

Apertura limite fessure  $w_{lim}=0.20$

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Af<br>[cmq] | Aeff<br>[cmq] | M<br>[kNm] | Mpf<br>[kNm] | $\varepsilon$<br>[%] | Sm<br>[mm] | w<br>[mm] |
|----|----------|-----------|-----------|-------------|---------------|------------|--------------|----------------------|------------|-----------|
| 1  | -3.30    | 100       | 30        | 0.00        | 0.00          | 0.00       | 0.00         | ---                  | ---        | 0.000     |
| 2  | -3.20    | 100       | 30        | 6.79        | 1150.00       | 0.09       | 44.77        | 0.000000             | 0.00       | 0.000     |



| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Af<br>[cmq] | Aeff<br>[cmq] | M<br>[kNm] | Mpf<br>[kNm] | ε<br>[%] | Sm<br>[mm] | w<br>[mm] |
|----|----------|-----------|-----------|-------------|---------------|------------|--------------|----------|------------|-----------|
| 3  | -3.10    | 100       | 30        | 6.79        | 1150.00       | 0.37       | 44.77        | 0.000000 | 0.00       | 0.000     |
| 4  | -3.00    | 100       | 30        | 6.79        | 1150.00       | 0.86       | 44.77        | 0.000000 | 0.00       | 0.000     |

SperoneCombinazione n° 15 - SLEQApertura limite fessure  $w_{lim}=0.20$ 

| n° | Y<br>[m] | B<br>[cm] | H<br>[cm] | Af<br>[cmq] | Aeff<br>[cmq] | M<br>[kNm] | Mpf<br>[kNm] | ε<br>[%] | Sm<br>[mm] | w<br>[mm] |
|----|----------|-----------|-----------|-------------|---------------|------------|--------------|----------|------------|-----------|
| 1  | -2.30    | 100       | 30        | 4.52        | 1150.00       | 5.77       | 43.44        | 0.000000 | 0.00       | 0.000     |

**Indice**

|                         |    |
|-------------------------|----|
| Tabulati di calcolo     | 1  |
| Spinta e forze          | 1  |
| Sollecitazioni          | 3  |
| Paramento               | 3  |
| Fondazione              | 6  |
| Verifiche strutturali   | 8  |
| Paramento in pietrame   | 8  |
| Verifiche a flessione   | 18 |
| Fondazione              | 18 |
| Sperone                 | 18 |
| Verifiche a taglio      | 19 |
| Fondazione              | 19 |
| Sperone                 | 20 |
| Verifica delle tensioni | 21 |
| Combinazioni SLER       | 21 |
| Fondazione              | 21 |
| Sperone                 | 21 |
| Combinazioni SLEF       | 22 |
| Fondazione              | 22 |
| Sperone                 | 22 |
| Combinazioni SLEQ       | 22 |
| Fondazione              | 22 |
| Sperone                 | 22 |
| Verifica a fessurazione | 22 |
| Combinazioni SLER       | 23 |
| Fondazione              | 23 |
| Sperone                 | 23 |
| Combinazioni SLEF       | 23 |
| Fondazione              | 23 |
| Sperone                 | 23 |
| Combinazioni SLEQ       | 23 |

---

|            |    |
|------------|----|
| Fondazione | 23 |
| Sperone    | 24 |