COMMITTENTE:

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DIRETTRICE SUD - PROGETTO ADRIATICA

PROGETTAZIONE:

ITALFERR
GRUPPO FERROVIE DELLO STATO ITALIANE

## DIREZIONE TECNICA
## U.O. OPERE CIVILI E GESTIONE DELLE VARIANTI

# PROGETTO DEFINITIVO

## Nuova linea Ferrandina - Matera La Martella per il collegamento di Matera con la rete ferroviaria nazionale

**MIGLIORAMENTO SISMICO E OPERE DI COMPLETAMENTO DEI VIADOTTI ESISTENTI DELLA LINEA FERRANDINA MATERA**

## GEOTECNICA

***Relazione di calcolo fondazioni dirette su micropali P21 – P22***

SCALA: -

| COMMESSA | LOTTO | FASE | ENTE | TIPO DOC. | OPERA/DISCIPLINA | PROGR. | REV. |
|---|---|---|---|---|---|---|---|
| IA5F | 01 | D | 09 | CL | VI0803 | 003 | A |

| Rev. | Descrizione | Redatto | Data | Verificato | Data | Approvato | Data | Autorizzato Data |
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| A | EMISSIONE ESECUTIVA | S.Gasperoni | Luglio 2019 | M.E.D'Effremo | Luglio 2019 | F. Gernone | Luglio 2019 | A. Vittozzi Luglio 2019 |
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ITALFERR S.p.A. Opere Civili e Gestione delle varianti Dott. Ing. Antonio Vittozzi Ordine degli Ingegneri della Provincia di Roma N° A20795

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|---|---|---|

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# 1. PREMESSA

Nella presente relazione si riporta la verifica delle fondazioni su micropali delle pile P21 e P22 del viadotto Gravina (VI08) per miglioramentosismico nell'ambito della realizzazione della nuova Linea Ferrandina – Matera "La Martella" per il collegamento della città di Matera alla rete ferroviaria nazionale, in particolare con Salerno, per l'accesso al sistema AV/AC, e con Taranto, attraverso la linea Battipaglia-Potenza-Metaponto-Taranto.

In particolare verranno affrontati i seguenti aspetti:

- Descrizione dello stato di fatto delle fondazioni esistenti del viadotto;
- Inquadramento geotecnico: stratigrafia, parametri geotecnici e falda;
- analisi e verifica delle fondazioni esistenti con le nuove azioni sismiche di progetto.

Tutte le analisi svolte nel seguito sono eseguite in conformità alla normativa italiana vigente sulle opere civili (DM 17/01/2018).

# 2. NORMATIVA E DOCUMENTI DI RIFERIMENTO

## 2.1 Normativa di riferimento

[N.1]. Norme Tecniche per le Costruzioni - D.M. 17-01-18 (NTC-2018);

[N.2]. Circolare N.7 del 21-01-2019, C.S.LL.PP. - Istruzioni per l'Applicazione Norme Tecniche Costruzioni di cui al Decreto Ministeriale 17 gennaio 2018.

[N.3]. RFI DTC SI PS MA IFS 001 C - Manuale di Progettazione delle Opere Civili - Parte II – Sezione 2 – Ponti e Strutture

[N.4]. Progetto DOC-Reluis 2005-2008 – linea 3: Valutazione e riduzione del rischio sismico di ponti esistenti – "linee guida e manuale applicativo per la valutazione della sicurezza sismica e il consolidamento dei ponti esistenti in c.a." marzo 2009

## 2.2 Documenti di riferimento

[DC1]. IA5F00D78RHGE0005001 - Nuova Linea Ferrandina – Matera La Martella per il collegamento di Matera con la rete ferroviaria nazionale. Progetto Definitivo. Relazione geotecnica;

[DC2]. IA5F00D78F6GE0005001 - Nuova Linea Ferrandina – Matera La Martella per il collegamento di Matera con la rete ferroviaria nazionale. Progetto Definitivo. Profilo Geotecnico.

[DC3]. E.0.2. - Progetto Esecutivo. Costruzione di un tratto di linea tra Matera e Ferrandina in funzione di collegamento diretto della città di Matera alla rete F.S.. Stazione di Ferrandina – Stazione di Matera la Martella. Relazione calcoli statici 2 a parte. Novembre 1985.

[DC4]. IA5F 01 D 09 RH VI0000 001 A - Nuova Linea Ferrandina – Matera La Martella per il collegamento di Matera con la rete ferroviaria nazionale. Progetto Definitivo. Criteri di calcolo delle fondazioni.

[DC5]. IA5F 01 D 09 RH VI0800 002 A - Nuova Linea Ferrandina – Matera La Martella per il collegamento di Matera con la rete ferroviaria nazionale. Progetto Definitivo. Relazione stabilità di versante.

[DC6]. F.8.1.1. e F.8.1.2 - Linea Ferrandina – Matera Centrale. Pianta e profilo longitudinale Tav.1 e 2. Novembre 1985.

[DC7]. Linea Ferrandina – Matera Centrale. Carpenterie fondazioni e piante. Novembre 1985.

[DC8]. F.8.8.4.P. - Progetto Esecutivo. Costruzione di un tratto di linea tra Matera e Ferrandina in funzione di collegamento diretto della città di Matera alla rete F.S.. Stazione di Ferrandina – Stazione di Matera la Martella. – Viadotto Gravina - Consolidamento del masso roccioso in corrispondenza della pila 21. Novembre 1985.

[DC9]. F.8.8.4.P. - Progetto Esecutivo. Costruzione di un tratto di linea tra Matera e Ferrandina in funzione di collegamento diretto della città di Matera alla rete F.S.. Stazione di Ferrandina – Stazione di Matera la Martella. – Viadotto Gravina - Consolidamento del masso roccioso in corrispondenza della pila 22. Novembre 1985.

[DC10]. Rv.1. Lunghezza pali in opera.

[DC11]. IA5F01D09ROVI0000001A Relazione tecnico-illustrativa: Materiali, Fattore di confidenza e criteri di calcolo

[DC12]. IA5F01D09P9VI0800003A VI08 - Pianta scavi e sezione longitudinale tav.1/6

[DC13]. IA5F01D09P9VI0800004A VI08 - Pianta scavi e sezione longitudinale tav.2/6

[DC14]. IA5F01D09P9VI0800005A VI08 - Pianta scavi e sezione longitudinale tav.3/6

[DC15]. IA5F01D09P9VI0800006A VI08 - Pianta scavi e sezione longitudinale tav.4/6

[DC16]. IA5F01D09P9VI0800007A VI08 - Pianta scavi e sezione longitudinale tav.5/6

[DC17]. IA5F01D09P9VI0800008A VI08 - Pianta scavi e sezione longitudinale tav.6/6

[DC18]. IA5F01D09P9VI0800009A VI08 - Pianta fondazione e sezione longitudinale 1

[DC19]. IA5F01D09P9VI0800010A VI08 - Pianta fondazione e sezione longitudinale 2

[DC20]. IA6F01D09P9VI0800011A VI08 - Pianta fondazione e sezione longitudinale 3

[DC21]. IA6F01D09P9VI0800012A VI08 - Pianta fondazione e sezione longitudinale 4

[DC22]. IA6F01D09P9VI0800013A VI08 - Pianta fondazione e sezione longitudinale 5

[DC23]. IA5F01D09P9VI0800014A VI08 - Pianta fondazione e sezione longitudinale 6

[DC24]. IA5F01D09BZVI0800001A Carpenteria interventi fondazioni pile P1-P3 e P26-P27

[DC25]. IA5F01D09BZVI0800002A Carpenteria interventi fondazioni pile 4-15 e 25

[DC26]. IA5F01D09BZVI0800003A Carpenteria interventi fondazioni pile 16-20

[DC27]. IA5F01D09BZVI0800004A Carpenteria interventi fondazioni pile 21-22

[DC28]. IA5F01D09BZVI0800005A Carpenteria interventi fondazioni pile 23-24

## 2.3 Programmi di calcolo utilizzati

- **APAL** (G. Guiducci, 2006). Studio Sintesi, Rimini (RN), Italia.
  Programma per l'analisi di pali caricati assialmente: curve carico-cediemnto trasferimento sforzo assiale.

- ***MAP Matrix Analysis of Piles (G. Guiducci, 1999). Rimini (RN), Italia.***
  Programma di calcolo per analisi delle sollecitazioni e deformazioni di tipo lineare e non lineare di palificate di fondazione collegate da plinto rigido.

## 3. MATERIALI

Nel presente progetto per le fondazioni esistenti si utilizzaranno i seguenti materiali.

| | |
|---|---|
| Calcestruzzo plinto di fondazione, pali | Rck > 25 MPa C25/30 |
| Calcestruzzo sottoplinto (magrone) | Rck > 15 MPa C16/20 |
| Acciaio in barre per c.a. | FeB 38 K B450C<br>fyk=380 MPa<br>E=210000 MPa |
| Acciaio per armatura micropali | Fe 360 S235<br>fyk=235 MPa<br>E=210000 MPa |

Per i materiali delle opere esistenti si definisce livello di conoscenza LC = 2 e quindi nelle verifiche si assume un fattore di confidenza FC = 1.2.

# 4. DESCRIZIONE DELLE OPERE IN FONDAZIONE

## 4.1 Stato di fatto

Il viadotto è costituito da 27 pile e due spalle.
Le fondazioni delle pile sono costituite da plinti, di dimensioni variabili, fondati su pali (D1200 mm) o su micropali.
Le spalle sono costituite da fondazione su pali D1200 mm.
Inoltre per le pile di scavalco fiume è stato inserito un intervento di consolidamento lungo la scarpata con tiranti attivi (come da schema di figure seguenti).
Di seguito si riportano le tabelle riassuntive con le caratteristiche delle fondazioni esistenti del viadotto in esame:
Nelle figure seguenti sono mostrate le geometrie delle fondazioni.

| | spalla | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | H tot[m] | dim plinto[m] | h plinto[m] | tipo fondaz. | d pali[mm] | num pali | Lunghezza pali[m] | Armatura longitudinale | spirale gabbia superiore | spirale gabbia inferiore |
| A | 8.00 | 11.50x9.20x2.00 | 2.00 | pali | 1200 | 9 | 13.7 | 28 ϕ30 | ϕ8 passo 10 | ϕ8 passo 20 |
| B | 7.50 | 11.50x9.20x2.00 | 2.00 | pali | 1200 | 9 | 24.9÷25.0 | 28 ϕ30 | ϕ8 passo 10 | ϕ8 passo 20 |

| | pila | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | H tot[m] | dim plinto[m] | h plinto[m] | tipo fondaz. | d pali[mm] | num pali /micropali | Lunghezza pali / micropali[m] | Armatura longitudinale | spirale gabbia superiore | spirale gabbia inferiore |
| 1 | 6.00 | 7.40x10.20x2.50 | 2.50 | pali | 1200 | 6 | 11.3 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 2 | 6.35 | 7.40x10.20x2.50 | 2.50 | pali | 1200 | 6 | 10.1÷10.3 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 3 | 6.80 | 7.40x10.20x2.50 | 2.50 | pali | 1200 | 6 | 9.3÷9.5 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 4 | 8.20 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 7.7÷9.5 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 5 | 9.00 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 6.6÷7.4 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 6 | 9.25 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 5.6÷6.8 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 7 | 9.00 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 6.2÷6.9 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 8 | 8.40 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 7.4÷8.1 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 9 | 7.95 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 7.9÷10.2 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 10 | 7.70 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 8.0÷8.7 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 11 | 8.20 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 8.1÷8.9 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 8.95 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 8.4÷8.7 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 13 | 10.45 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 8.3÷9.1 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 14 | 11.70 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 7.8÷12.2 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 15 | 13.30 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 6.9÷12.0 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 16 | 15.80 | 12.50x9.50x2.50 | 2.50 | micropali | 230 | 58 | 15 | - | - | - |
| 17 | 18.15 | 12.50x9.50x2.50 | 2.50 | micropali | 230 | 74 | 15 | - | - | - |
| 18 | 21.50 | 12.50x9.50x2.50 | 2.50 | micropali | 230 | 74 | 15 | - | - | - |
| 19 | 25.00 | 12.50x9.50x2.50 | 2.50 | micropali | 230 | 74 | 15 | - | - | - |
| 20 | 23.10 | 12.50x9.50x2.50 | 2.50 | micropali | 230 | 74 | 15 | - | - | - |
| 21 | 24.30 | 19.7x14.7x2.50 | 2.50 | micropali | 230 | 250 | 28 | - | - | - |
| 22 | 23.60 | 19.7x14.7x2.50 | 2.50 | micropali | 230 | 250 | 28 | - | - | - |
| 23 | 20.20 | 9.60x10.20x2.50 | 2.50 | pali | 1200 | 9 | 10.5÷10.9 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 24 | 16.50 | 9.60x10.20x2.50 | 2.50 | pali | 1200 | 9 | 14.3÷15.7 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 25 | 12.60 | 9.00x10.20x2.50 | 2.50 | pali | 1200 | 8 | 16.2÷17.4 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 26 | 9.30 | 7.40x10.20x2.50 | 2.50 | pali | 1200 | 6 | 19.9÷20.1 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |
| 27 | 6.95 | 7.40x10.20x2.50 | 2.50 | pali | 1200 | 6 | 21.3÷22.1 | 18 ϕ24 | ϕ8 passo 10 | ϕ8 passo 20 |

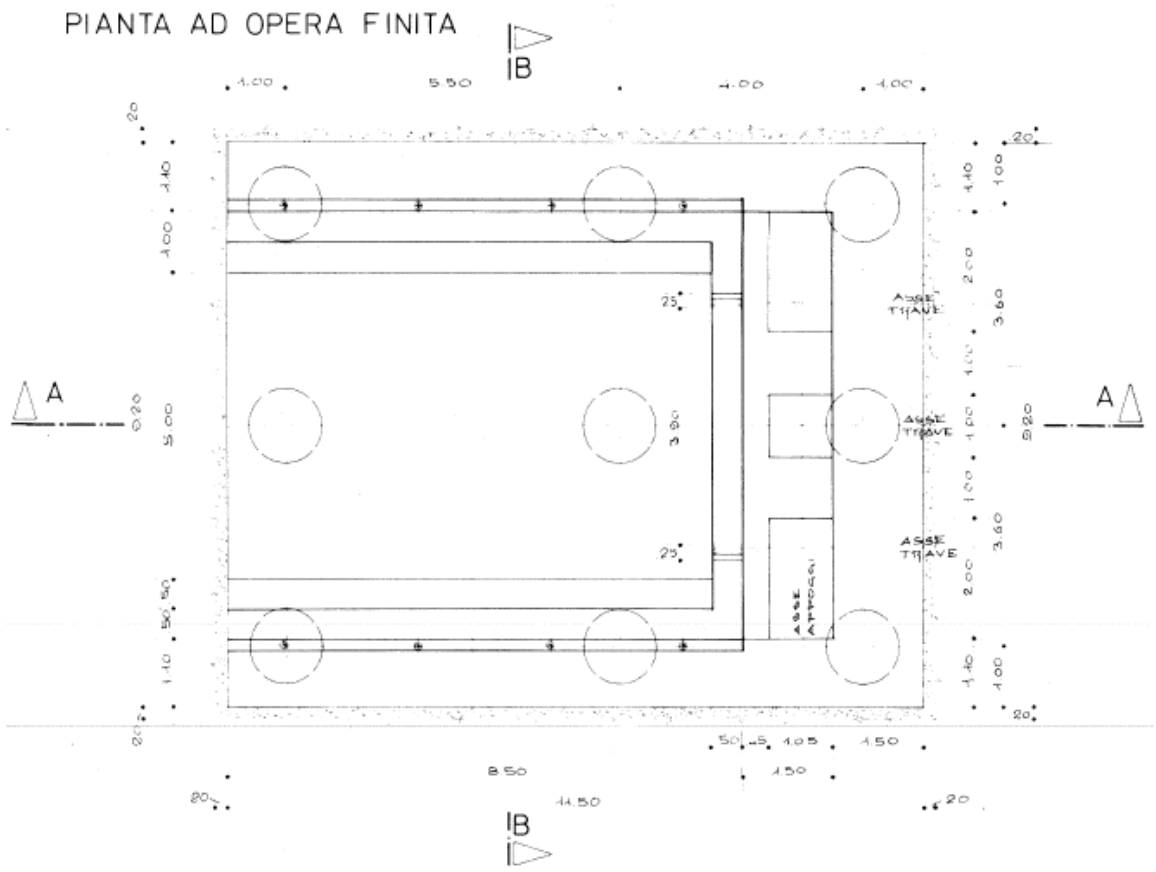



**Figura 1 – Pianta Spalle**

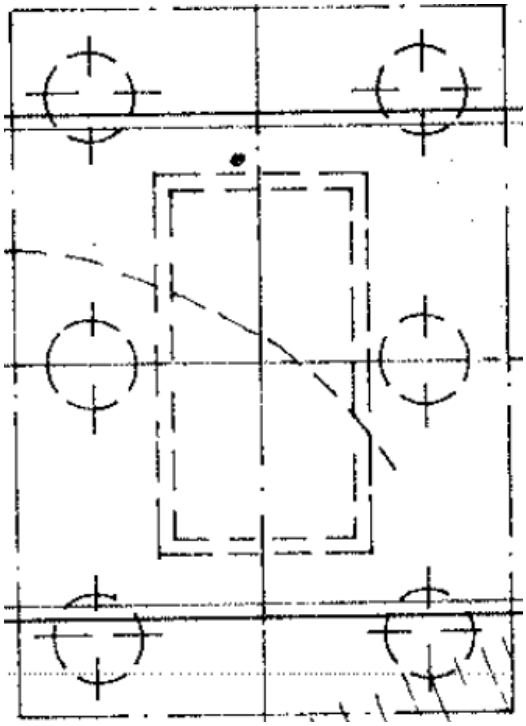


**Figura 2 – Pianta Pile a 6 pali (P1÷P3, P26 e P27)**

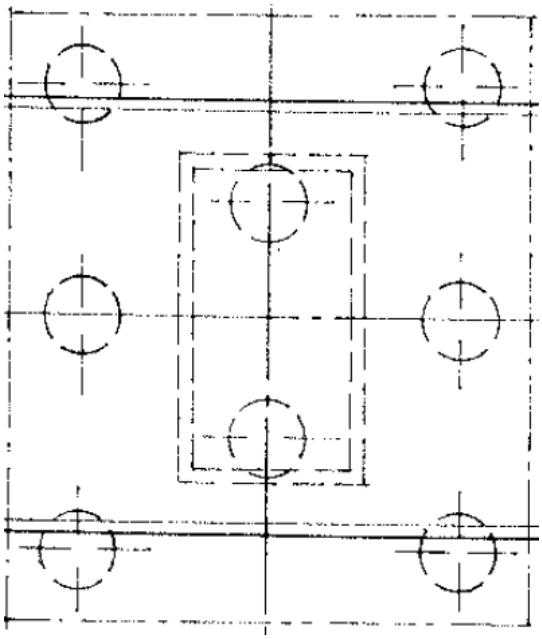


**Figura 3 – Pianta Pile a 8 pali (P4÷P15 e P25)**

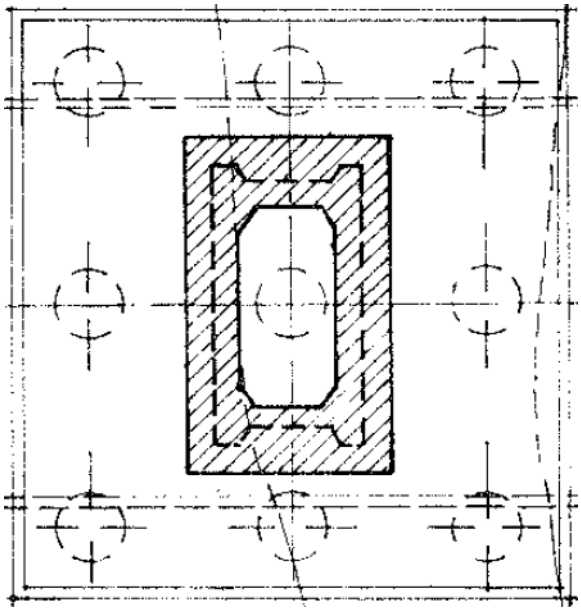


**Figura 4 – Pianta Pile a 9 pali (P23 e P24)**

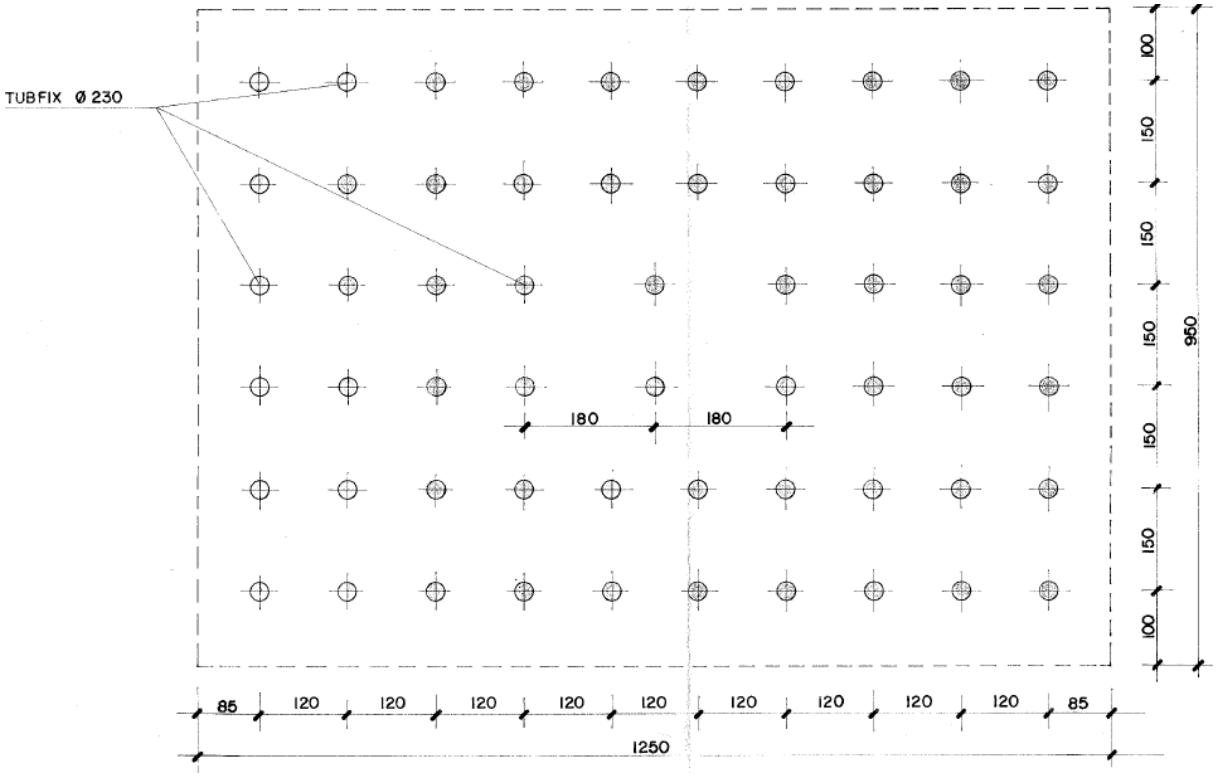



**Figura 5 – Pianta pila P16 su fondazione diretta con n°58 micropali**

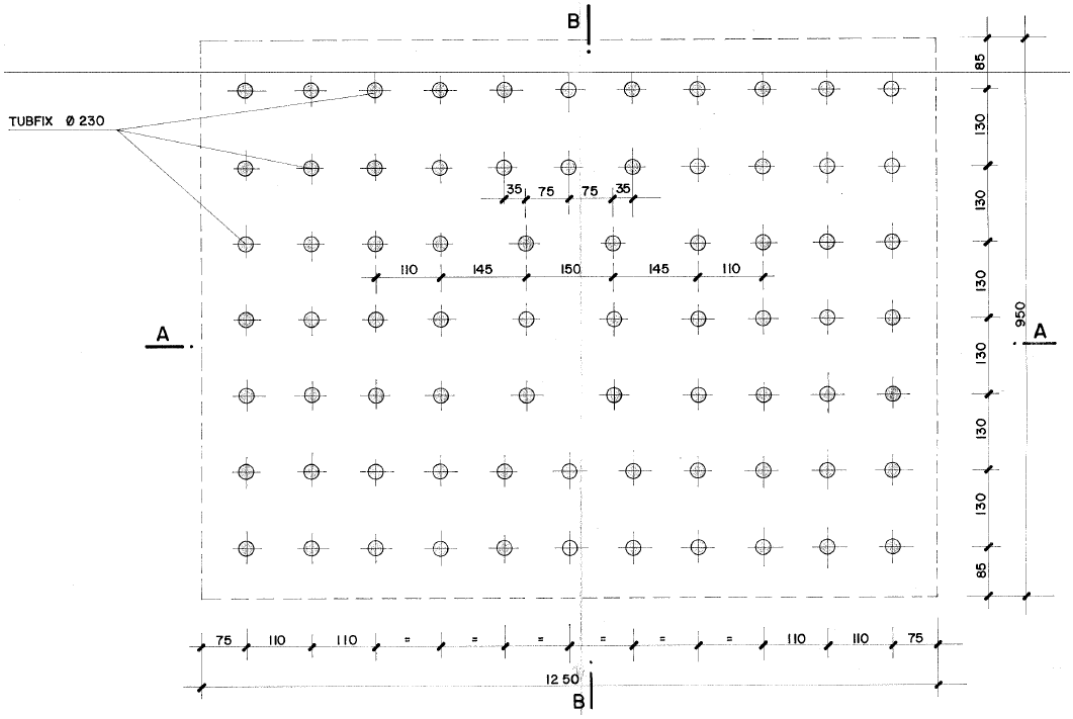



**Figura 6 – Pianta pile P17÷P20 su fondazione diretta con n°74 micropali**

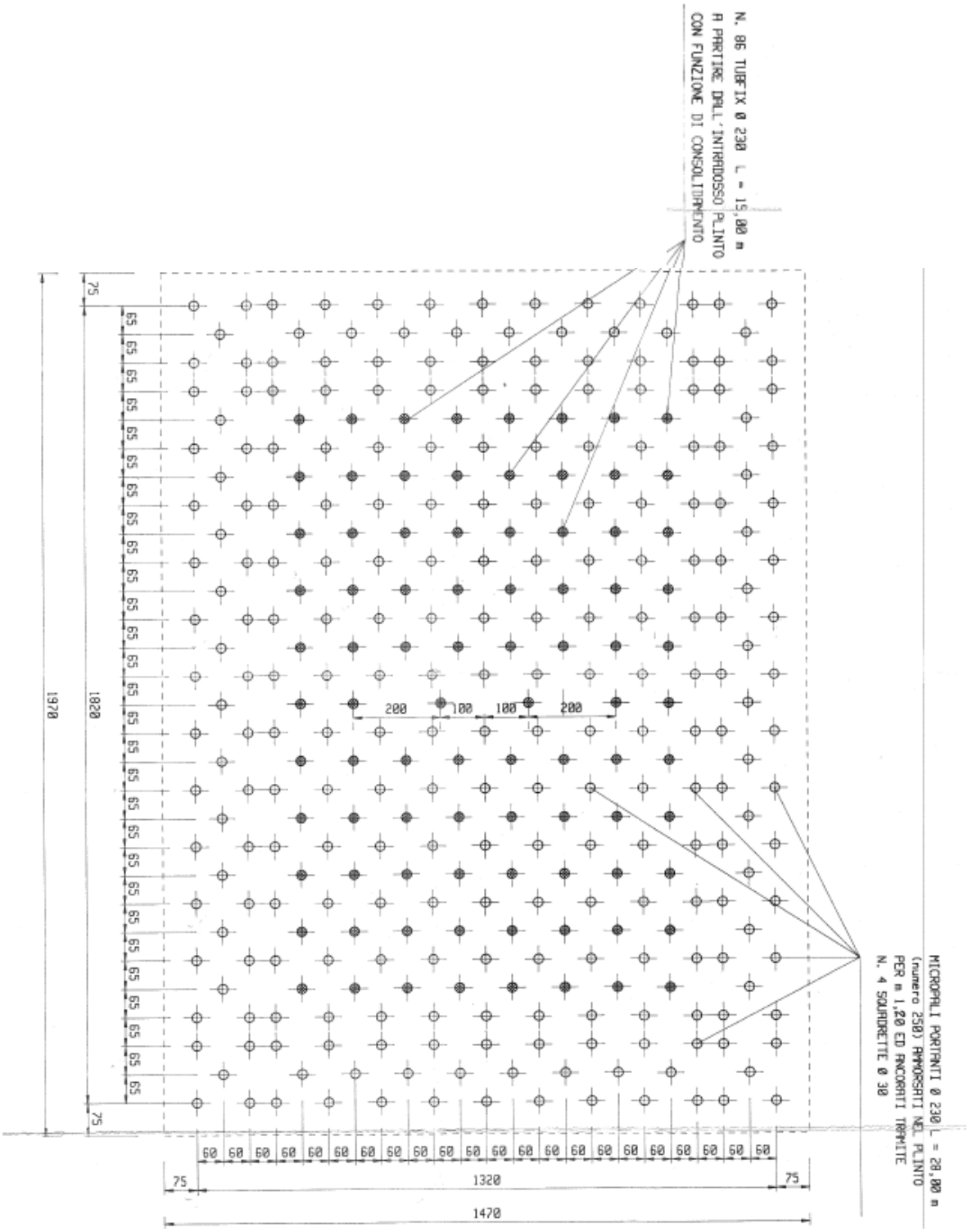



**Figura 7 – Pianta pile P21÷P22 su fondazione diretta con 250 micropali**

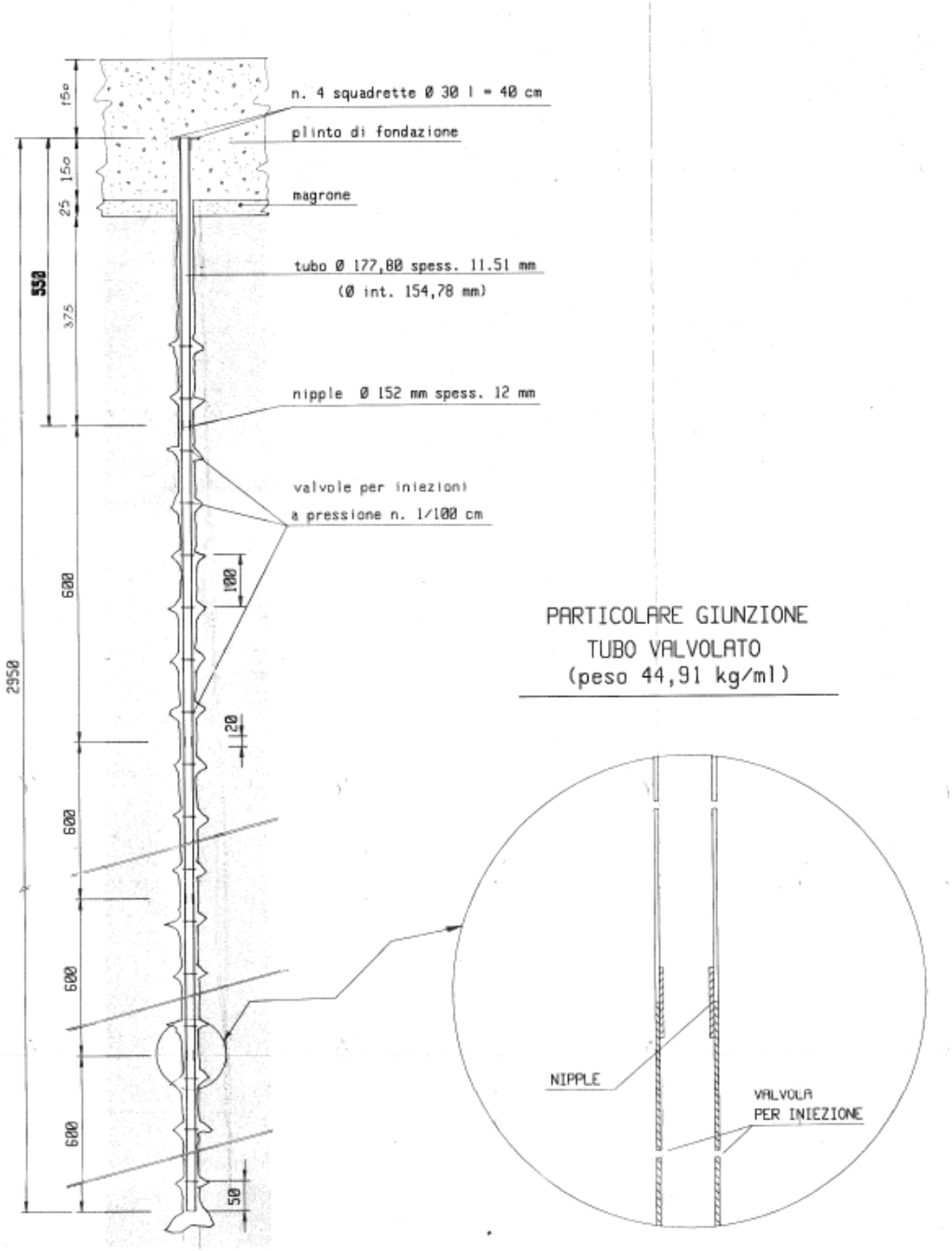



**Figura 8 – Micropali pila P21-P22**

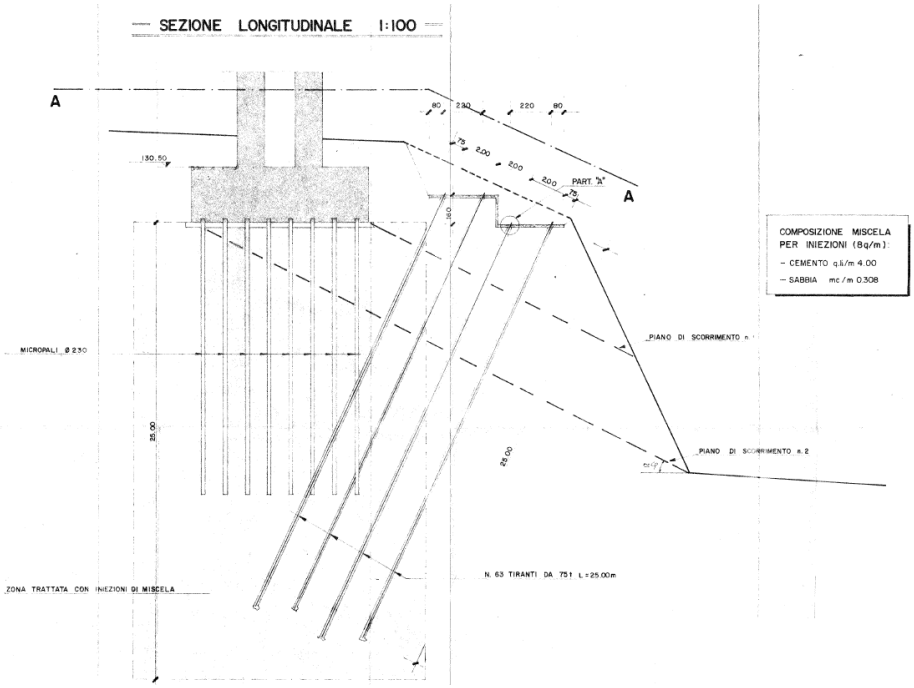



**Figura 9 – Intervento di consolidamento scarpata Pila P21**

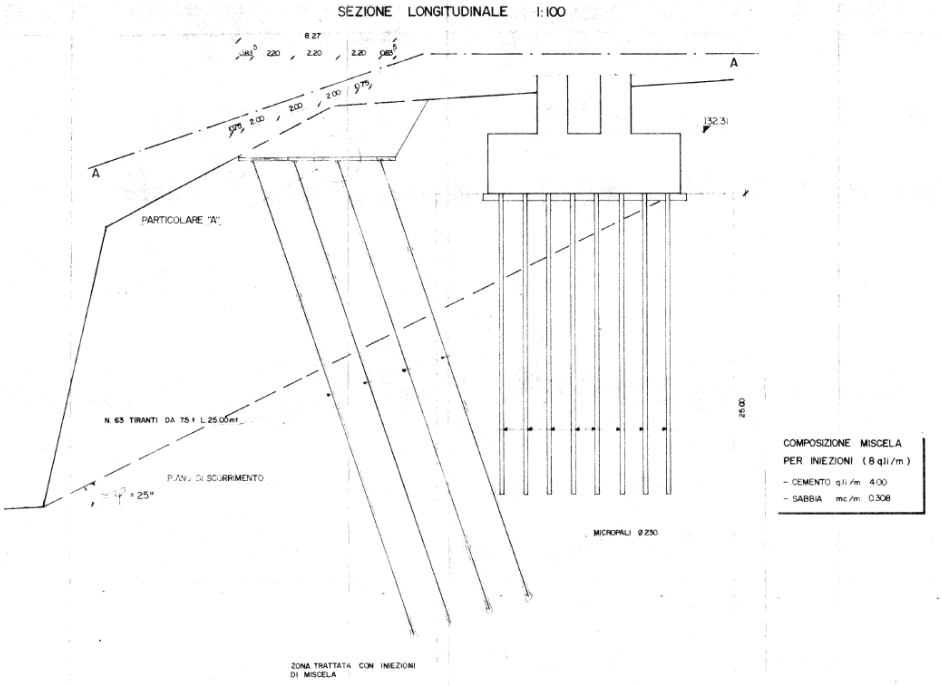



**Figura 10 – Intervento di consolidamento scarpata Pila P22**

Nella relazione di calcolo opere [DC3] per le fondazioni del viadotto si parla di "interventi di consolidamento" delle fondazioni; in particolare si afferma: "per le spalle e le pile con fondazione diretta sulle calcareniti sub-affioranti, sono adottati in rapporto ai problemi geotecnici interventi particolari" (vedasi interventi indicati nella seguente tabella). Come si evince dal documento [DC3], le fondazioni erano state dimensionate come dirette e gli interventi con micropali erano stati inseriti come consolidamento, definendo il numero di elementi in relazione alle pressioni massime in fondazione e definendo una portata massima dei micropali di 80 t (lunghezza micropali 15 m). L'intervento con iniezioni era finalizzato al riempimento di eventuali cavità/fratture presenti nell'ammasso roccioso interagente con l'opera.
Dalle tavole di progetto si osserva che comunque i micropali sono stati opportunamente ancorati entro il plinto di fondazione, quindi i micropali possono essere considerati come elemento di fondazione e non solo consolidamento.

# 5. CARATTERIZZAZIONE GEOTECNICA

Nel presente capitolo si riporta la caratterizzazione geotecnica per il viadotto in esame, valutata sulla base dell'interpretazione delle indagini geotecniche svolte in prossimità dell'opera. In generale lungo la linea Ferrandina – Matera sono disponibili le indagini del progetto del 1984, indagini integrative del 1987 nell'ammasso roccioso in corrispondenza delle pile di scavalco e le nuove indagini integrative eseguite per il presente progetto del 2018/2019 (ancora in fase di completamento).

## 5.1 Indagini pregresse

Lungo il viadotto sono disponibili alcuni sondaggi della vecchia campagna indagine del 1984: M15, M16, M17, M18 e M19, di cui M17 e M18 in corrispondenza delle pile di scavalco P21 e P22 del fiume.

Inoltre, in corrispondenza delle pile P21 e P22 sono stati effettuati sondaggi aggiuntivi per individuare la eventuale presenza di cavità carsiche. Di seguito si riporta una figura con ubicazione dei sondaggi.

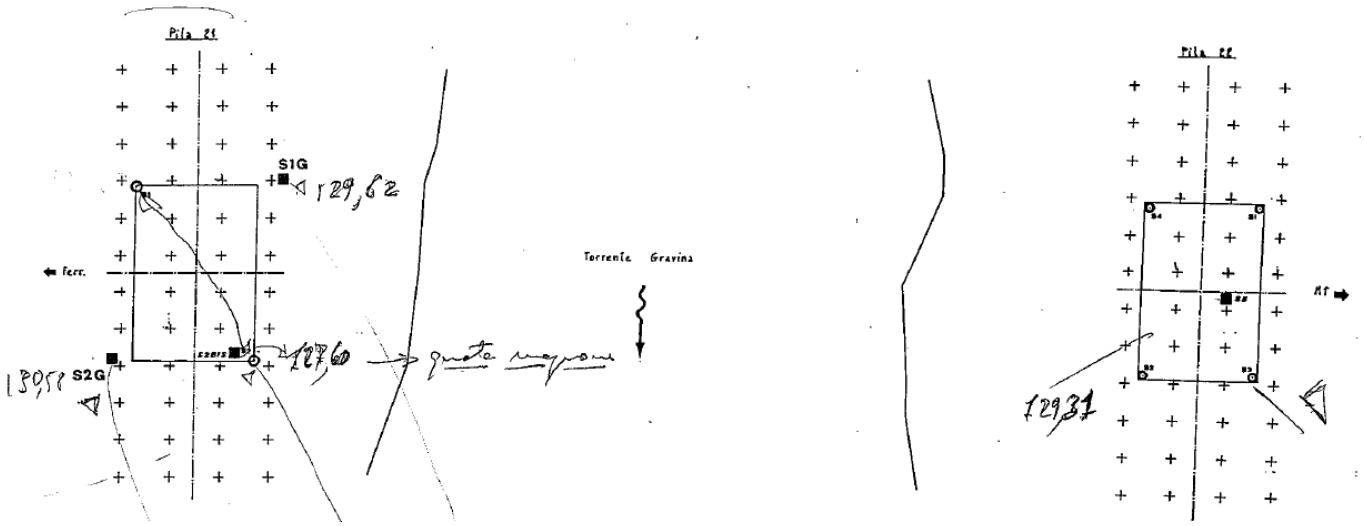



**Figura 11: Sondaggi aggiuntivi per rilievo cavità carsiche**

## 5.2 Indagini geotecniche eseguite nel 2018/2019

L'opera in esame è ubicata tra le progressive km 15+139.40 e km 16+030.31.

Sono disponibili le indagini integrative del 2018/2019 elencate nella seguente tabella. In particolare si osserva che:

- i sondaggi S10_DH_50 e S11_DH_50 sono stati eseguiti in corrispondenza del viadotto;
- il sondaggio S6_10 é ubicato poco prima della spalla A del viadotto.

| Sondaggi / Indagini sismiche | Profondità [m] | Quota boccaforo [m] s.l.m. | n. campioni indisturbati | n. campioni rimaneggiati | N. prove SPT | n. prove Lefranc /Lugeon | n. prove pressiometriche | n. prove dilatometriche | Piezometro TA; CC / Prova DH/CH |
|---|---|---|---|---|---|---|---|---|---|
| S10_DH_50 | 30.0 | 140.949 | 1 | 4 | 3 | 2 | 1 | - | DH [30] |
| S11_DH_50 | 50.0 | 134.580 | - | 7 | 1 | 2 | - | 2 | DH [50] |
| S6_10 | 10.0 | 147.821 | 1 | 1 | 4 | - | - | - | - |
| Masw10 | - | - | - | - | - | - | - | - | - |
| Masw11 | - | - | - | - | - | - | - | - | - |
| DH [m]: prova Down Hole [profondità prova] | | | | | | | | | |

Non sono disponibili misure piezometriche in corrispondenza del viadotto in esame.

Durante la perforazione il sondaggio S10_DH_50 ha rilevato falda a 27 m da p.c., il sondaggio S11_DH_50 ha rilevato falda profonda, non interferente con le opere. Nel sondaggio S6_10 la falda è assente.

Il piezometro S9_PZ_30, installato nelle vicinanze dell'opera, indica falda a 3 m dal p.c..

Il livello di falda è stato assunto come nidicato nel profilo geologico/geotecnico dell'opera.

### 5.3 Stratigrafia

I sondaggi della campagna integrativa del 2018/2019 evidenziano una copertura di depositi alluvionali terrazzati (unità 1e) di circa 1 m, poi le argille limose da molto consistenti a dure dell'unità 2 (ASP-Argille subappennine) fino a 8 m circa (S10_DH_50), poi le calcareniti di Gravina (unità 3) fino a 11.0 m per il sondaggio S10_DH_50 e fino a 18.0 m per il sondaggio S11_DH_50 con alterazione da media ad intensa, da intatta a fratturata (RQD tra 30 e 100%). La presenza di calcareniti è stata confermata anche dai sondaggi della campagna di indagine del 1984 (M17 e M18) che le intercettano fino alla profondità di 14÷16 m circa. A seguire si intercetta calcilutite (unità 4 – Cc11-8c Calcare di Altamura) a struttura compatta con alterazione da media ad elevata fino alla massima profondità investigata (50 m) (RQD tra 20 e 70%).

Di seguito si riporta uno stralcio del profilo geotecnico ricostruito sulla base delle nuove indagini dell'area.

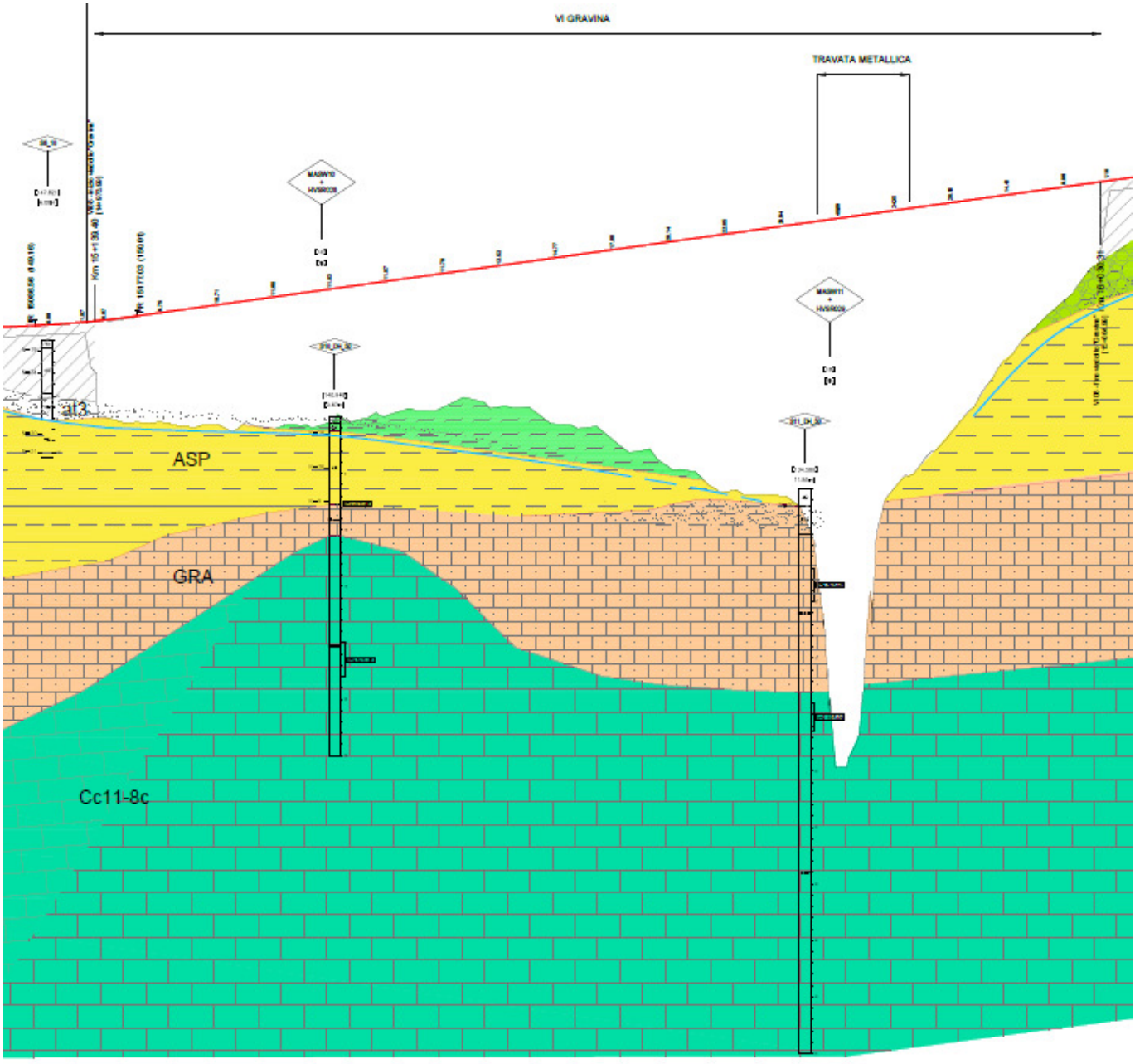



**Figura 12 – Stralcio profilo geotecnico**

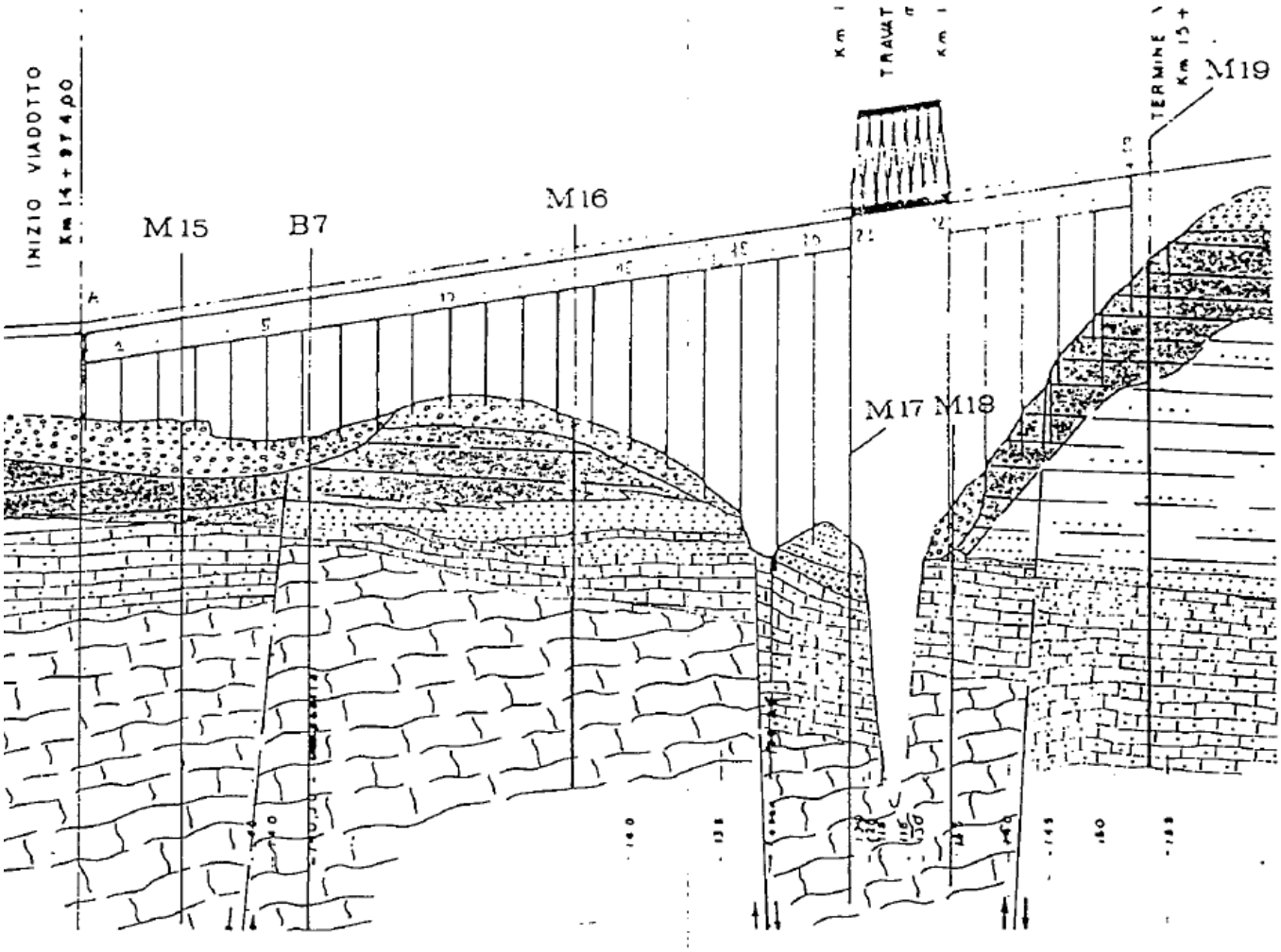



**Figura 13 – Profilo geologico 1984**

## 5.4 Sintesi dei parametri geotecnici di progetto

Nel seguito si riassumono i parametri geotecnici di progetto per le unità intercettate interagenti con le fondazioni.

**Unità 1e – Depositi terrazzati del Fiume Bradano**

| | |
|---|---|
| $\gamma = 19.0$ kN/m$^3$ | peso di volume naturale |
| c' = 0 kPa | coesione drenata |
| $\varphi' = 21 \div 23$ ° | angolo di resistenza al taglio |
| Vs = 130÷400 m/s | velocità delle onde di taglio |
| Eo = 200÷500 MPa | modulo di deformazione elastico iniziale |
| $k = 3.5 \cdot 10^{-5} \div 4.5 \cdot 10^{-4}$ m/s | coefficiente di permeabilità |

**Unità 2 – Argille subappennine**

| | |
|---|---|
| $\gamma$ = 19.0÷21.0 kN/m$^3$ | peso di volume naturale |
| c' = 27÷32 kPa | coesione drenata |
| $\varphi'$ = 22÷24 ° | angolo di resistenza al taglio |
| $c_u$ = 100÷300 kPa | resistenza al taglio in condizioni non drenate |
| Vs = 130÷210 m/s | velocità delle onde di taglio |
| Eo = 120÷200 MPa | modulo di deformazione elastico iniziale |
| k = 9.0 ·10$^{-8}$ ÷ 1.0 ·10$^{-7}$ m/s | coefficiente di permeabilità |

**Unità 3 – Calcareniti di Gravina**

| | |
|---|---|
| $\gamma$ = 19.0÷21.0 kN/m$^3$ | peso di volume naturale |
| GSI = 37 | Geological Strength Index |
| $\sigma$ci = 3 MPa | resistenza a compressione della roccia intatta |
| mi = 9 | costante per la roccia intatta |
| c' = 20 kPa | coesione drenata |
| $\varphi'$ = 32 ° | angolo di resistenza al taglio |
| Vs = 600÷1300 m/s | velocità delle onde di taglio |
| Eo = 4000÷12300 MPa | modulo di deformazione elastico iniziale |
| k = 8.0 ·10$^{-7}$ ÷ 1.0 ·10$^{-7}$ m/s | coefficiente di permeabilità |

**Unità 4 – Calcare di Altamura**

| | |
|---|---|
| $\gamma$ = 24.0÷26.0 kN/m$^3$ | peso di volume naturale |
| GSI = 45 | Geological Strength Index |
| $\sigma$ci = 42 MPa | resistenza a compressione della roccia intatta |
| mi = 9 | costante per la roccia intatta |
| c' = 130 kPa | coesione drenata |
| $\varphi'$ = 40° | angolo di resistenza al taglio |
| Vs = 1400÷1800 m/s | velocità delle onde di taglio |
| Eo = 15600÷21500 MPa | modulo di deformazione elastico iniziale |
| k = 2.0 ·10$^{-7}$÷ 1.0 ·10$^{-5}$ m/s | coefficiente di permeabilità |

I moduli di deformabilità "operativi" (E') da adottare per le opere di sostegno e per le fondazioni, saranno assunti pari a 1/3÷1/5 di quello iniziale (E0).

I parametri di resistenza di progetto per le unità rocciose (calcareniti di Gravina e calcari di Bari) sono stati individuati con il programma "Roclab" a partire dalla caratterizzazione geomeccanica di base indicata nella relazione geotecnica generale valutata sulla base delle nuove indagini eseguite.

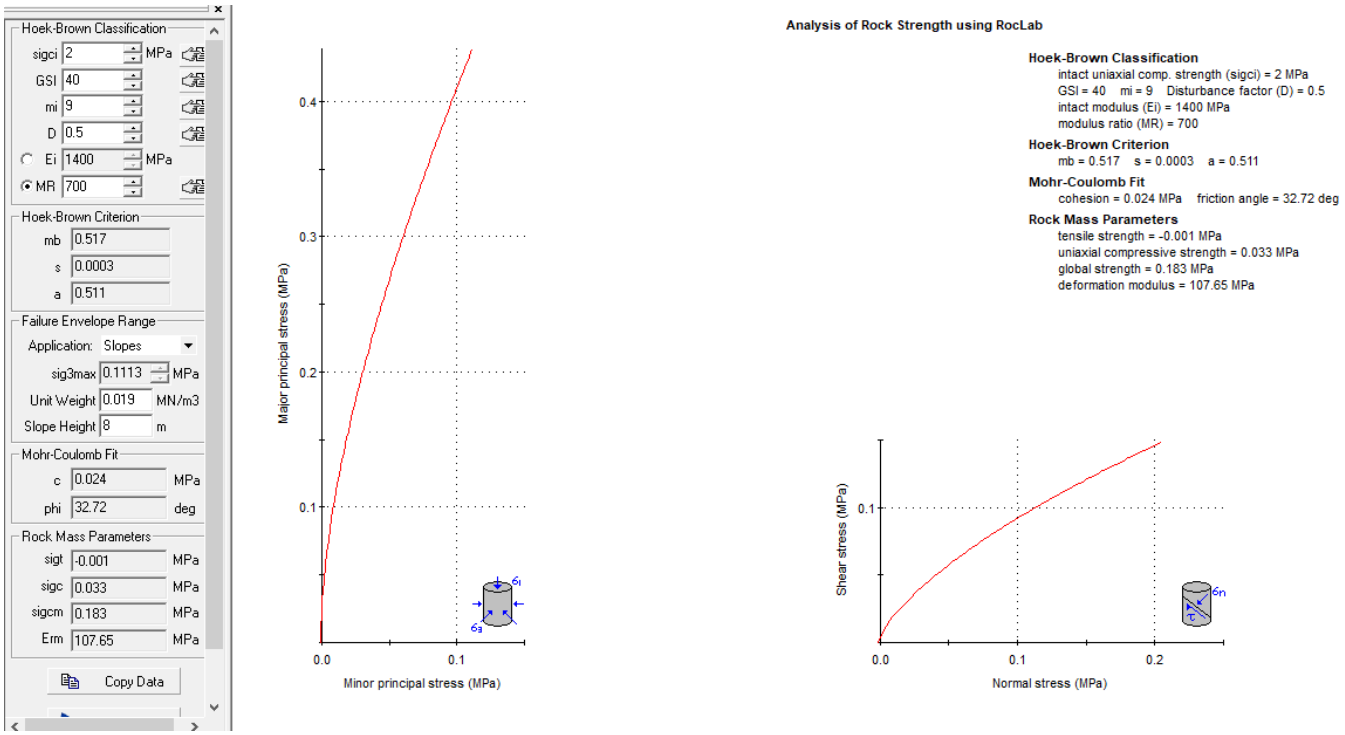



**Figura 14 – Calcareniti di Gravina**

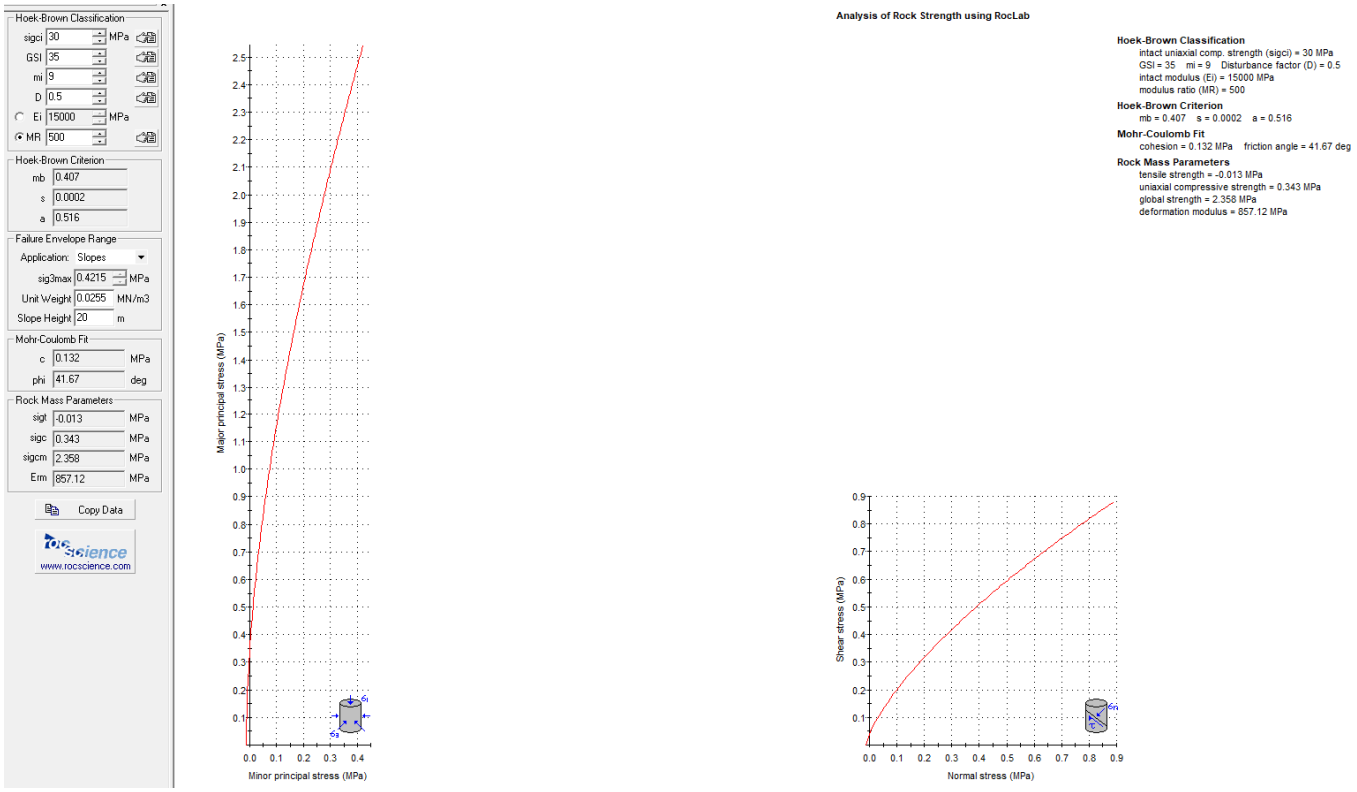



**Figura 15 – Calcare di Bari**

## 5.5 Categoria di sottosuolo

Dalle indagini sismiche Down-Hole (S10_DH_50 e S11_DH_50) e dalle indagini sismiche Masw (Masw10 e Masw11), si definisce una categoria di sottosuolo sismica di tipo E con i seguenti valori di Vs,eq (vedasi tabelle riportate di seguito):

- S10_DH_50: Vs,eq = 208 m/s
- S11_DH_50: Vs,eq = 131 m/s
- Masw10: Vs,eq = 249 m/s
- Masw11: Vs,eq = 228 m/s

**Tabella 1 – S10_DH_50**

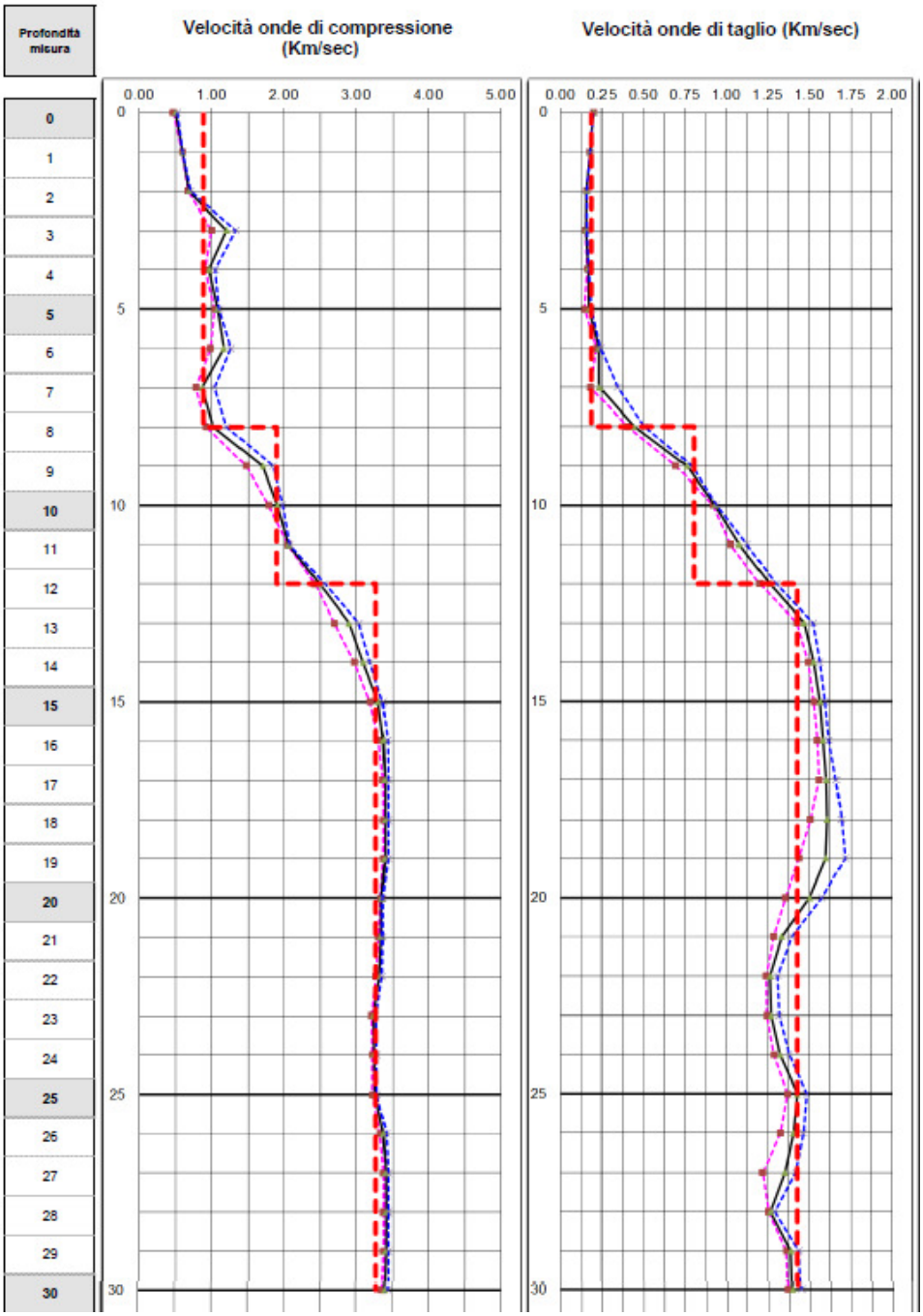


**Tabella 2 – S11_DH_50**

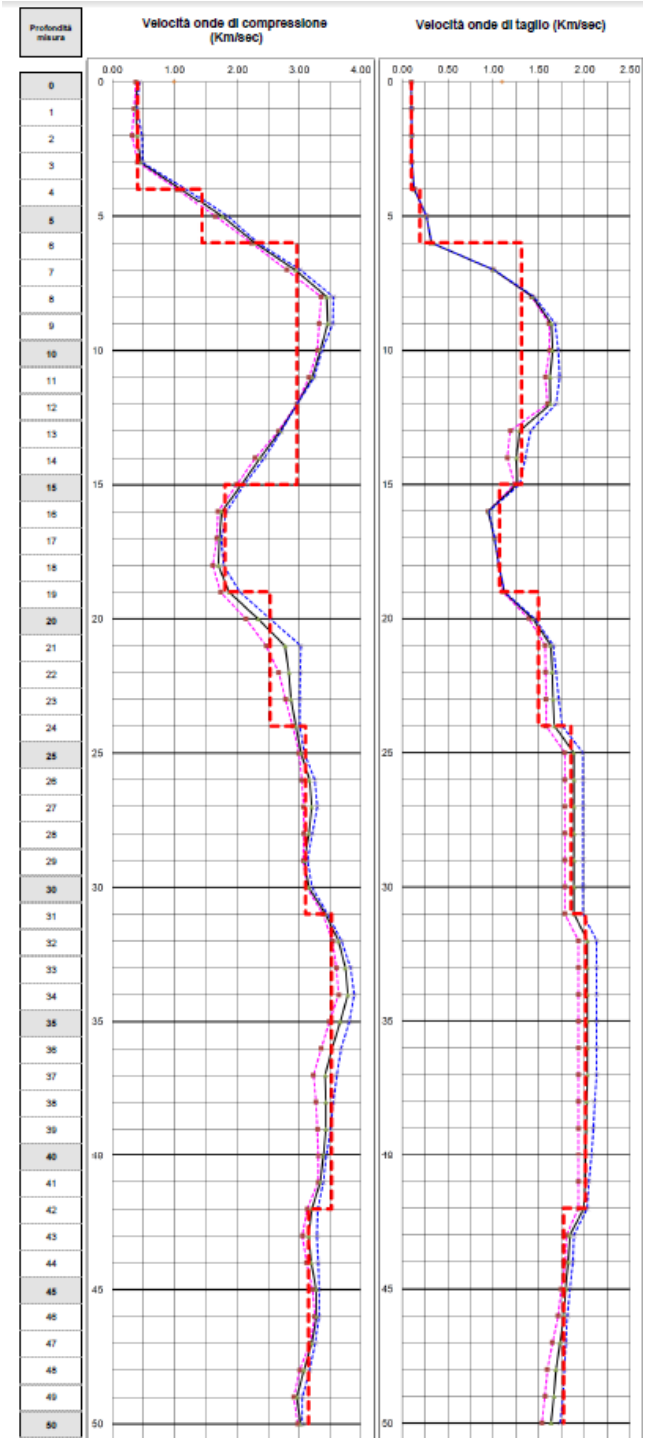
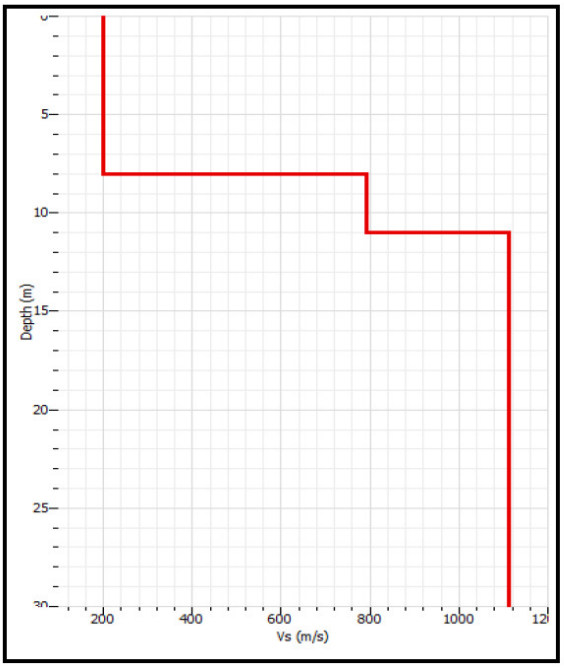


**Tabella 3 – Masw10**

**PROFILO VELOCITA' ONDE DI TAGLIO**




**CALCOLO $VS_{30}$**

| SPESSORE | PROFONDITA' | Vs | SPESSORE/Vs |
|---|---|---|---|
| 8 | 0 | 198 | 0.04040404 |
| 3 | 8 | 790 | 0.003797468 |
| 19 | 11 | 1110 | |
| | 30 | | |

0.044201509

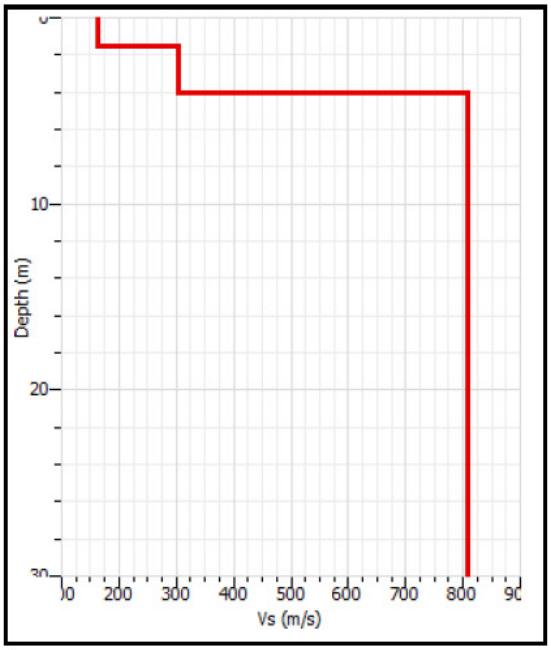
$Vs_{eq11}$ = 249

Seismic classification of soils
(It. D.M. 17/01/2018)

E

**Tabella 4 – Masw11**

**PROFILO VELOCITA' ONDE DI TAGLIO**




**CALCOLO $VS_{30}$**

| SPESSORE | PROFONDITA' | Vs | SPESSORE/Vs |
|---|---|---|---|
| 1.5 | 0 | 160 | 0.009375 |
| 2.6 | 1.5 | 301 | 0.008637874 |
| 25.9 | 4.1 | 810 | |
| | 30 | | |

0.018012874

$Vs_{eq30}$ = 228

Seismic classification of soils
(It. D.M. 17/01/2018)

E

## 6. VALUTAZIONE CAPACITÀ PORTANTE MICROPALI

La verifica di capacità portante per i micropali è stata svolta con la metodologia di Bustamante e Doix, considerando l'Approccio 2 (A1+M1+R3) di normativa e quindi con i seguenti coefficienti parziali sulle resistenze di base e laterale:

- N. 5 verticale di indagine, da cui $\xi_3 = 1.50$,
- $F_{SL}$ = fattore di sicurezza per la portata laterale a compressione ($=\xi_3 \cdot \gamma_s = 1.725$).
- $F_{SL,t}$ = fattore di sicurezza per la portata laterale a trazione ($=\xi_3 \cdot \gamma_s = 1.875$).
- Portata di base nulla.

Quindi per i micropali di fondazione si ha:

La = 24.0 m lunghezza attiva portante (28.0-4.0 = 24.0 m) delle pile P21-P22

Dp = 230 mm diametro di perforazione

Dalle tavole di progetto del 1985 risultano micropali con valvole ogni metro per iniezione a pressione. Comunque ipotizzando una corretta esecuzione dei micropali, secondo le indicazioni di progetto, si ipotizza un valore di resistenza di adesione micropalo-terreno: $\alpha\tau = 200$ kPa (Bustamante e Doix), da cui si stima:

P21-P22:

$Rk = \pi \cdot Dp \cdot \alpha\tau \cdot La = 3466$ kN resistenza caratteristica

$Rd = Rk / F_{SL} = 2009$ kN resistenza di progetto a compressione

$Rdt = Rk / F_{SL,t} = 1848$ kN resistenza di progetto a trazione

# 7. ANALISI PALIFICATE DI FONDAZIONE

## 7.1 Premessa

Nel presente capitolo si riporta l'analisi delle palificate di fondazione, le cui metodologie di calcolo sono dettagliatamente esposte nell'apposito documento [DC4]. Nel seguito si riportano quindi i principali elementi utilizzati per il calcolo, quali geometria palificata, sistema di riferimento globale e dei carichi, carichi, ed infine i risultati.

## 7.2 Metodologia di calcolo

Per l'analisi della fondazione su pali singoli è stato utilizzato il codice di calcolo MAP (G. Guiducci), le cui metodologie sono esposte nel documento [DC4].

Nelle seguenti figure sono riportati i sistemi di riferimento globale e locale con le convenzioni sui segni delle variabili adottate.

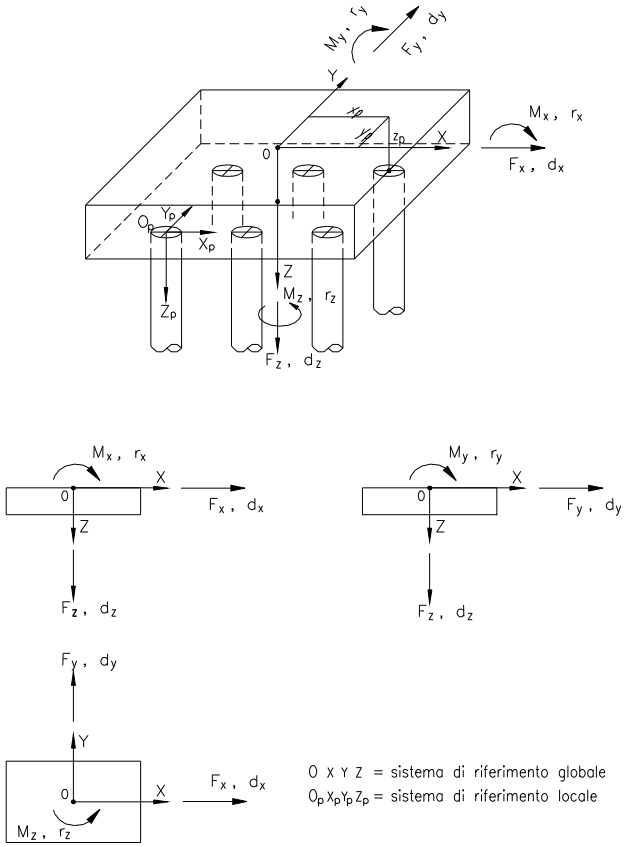



**Figura 16– Definizione dei sistemi di riferimento globali adottati nelle analisi delle palificate**

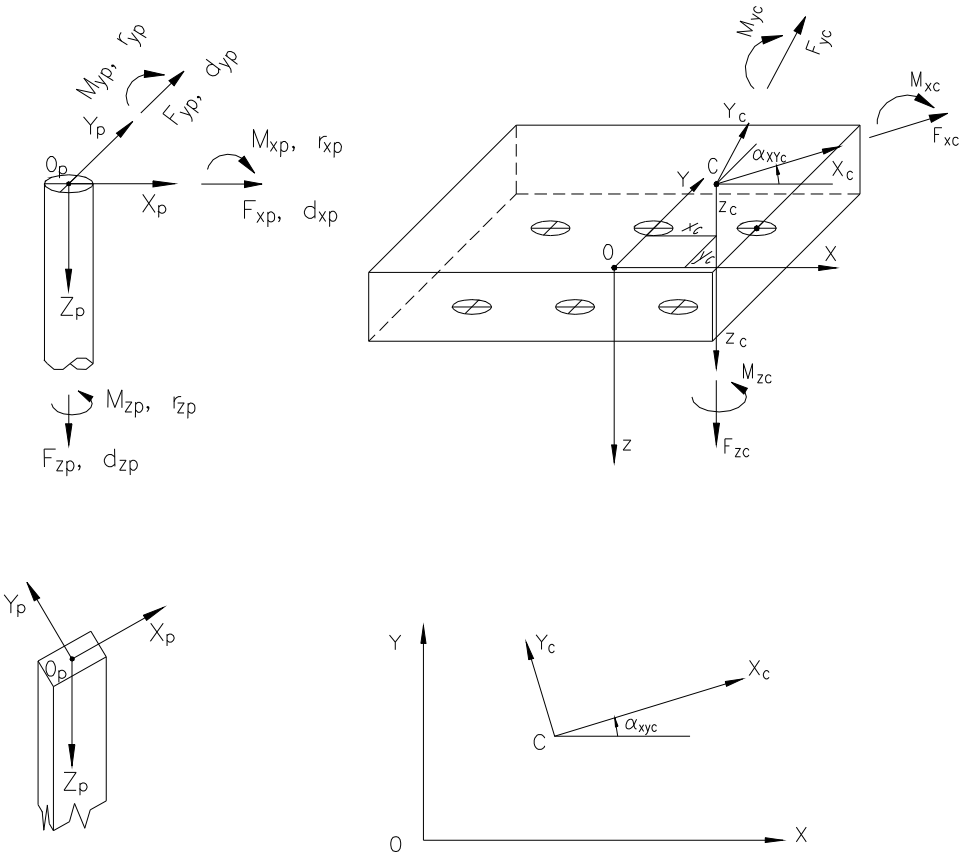



**Figura 17– Definizione dei sistemi di riferimento locali e delle convenzioni sui centri di carico adottati nelle analisi delle palificate**

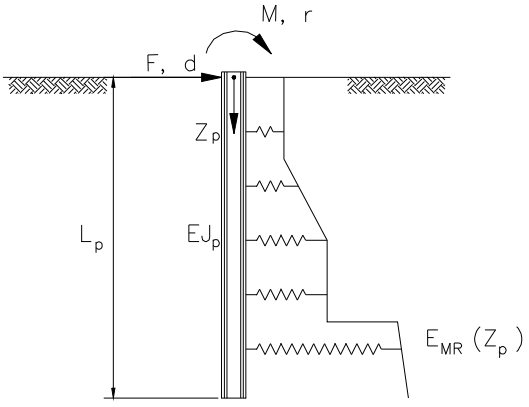



**Figura 18– Pali soggetti a carichi trasversali: moduli di reazione del terreno**

## 7.3 Caratterizzazione della palificata

La struttura della palificata è stata modellata ipotizzando un plinto infinitamente rigido. Per i pali di fondazione, la condizione di vincolo in testa è quella di incastro perfetto con il plinto. Ciascun micropalo di fondazione è stato modellato con una rigidezza flessionale ottenuta considerando la somma dei due contributi: tubo in acciaio e malta di perforazione, da cui si ottiene:

- microapli esistenti e micropali integrativi di progetto (Dp= 230 mm tubo de=177.8mm, sp=11mm):

  EJ = (EJ)tubo + (EJ)malta = 4228 + 2747 = 6975 kN $m^2$.

**Comportamento del palo soggetto a carichi verticali**

La curva carico-cedimento del singolo palo viene caratterizzata attraverso la seguente relazione lineare:

dz = [Fz / Ak]

dove:

dz = spostamento verticale a testa palo/micropalo;

Fz = carico assiale a testa palo/micropalo.

Per le palificate in esame è stata valutata la curva carico-cedimento del singolo palo/micropalo con il programma APAL che utilizza il metodo delle curve di trasferimento riferite al fusto ed alla base dei pali sviluppate da Reese e O'Neill (curve t-s e q-s). Nel caso in esame, si ottiene la curva carico-cedimento mostrata nella figura seguente. In Appendice A sono riportati i tabulati di calcolo completi. Quindi per le palificate in esame si assume la seguente rigidezza assiale per i pali/micropali di fondazione:

Ak =100000 kN/m per micropalo Dp=230 mm

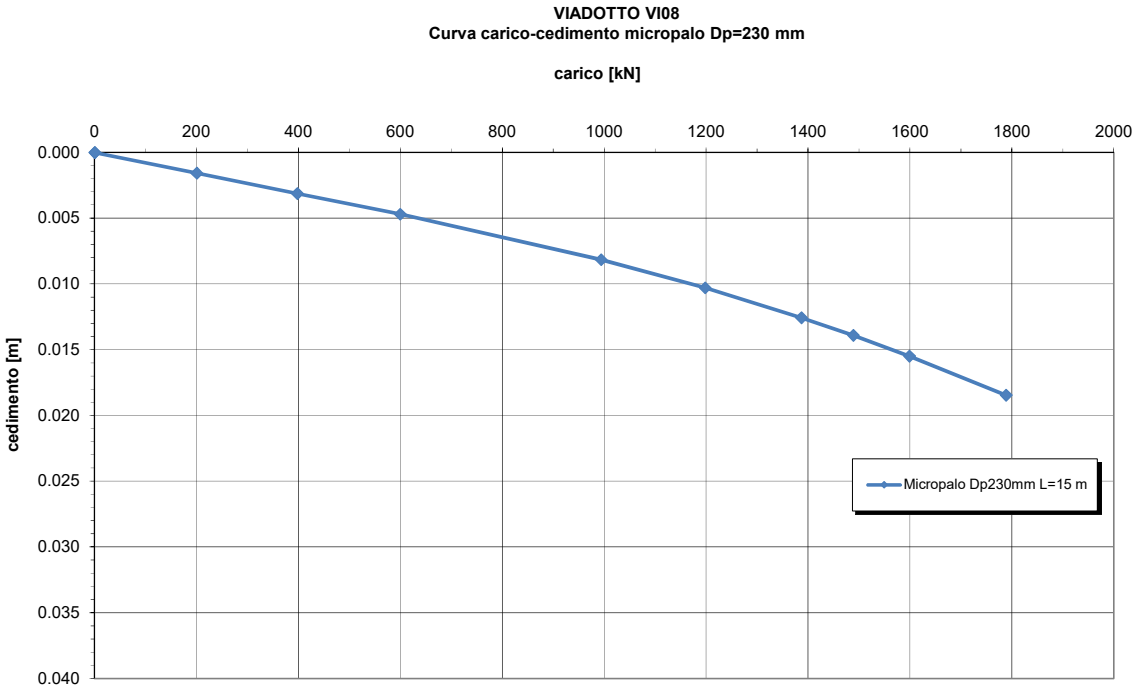



**Figura 19– curva carico – cedimento - micropalo**

## Comportamento del palo soggetto ai carichi orizzontali

Lo studio dell'interazione tra palo soggetto ai carichi orizzontali ed il terreno viene effettuato ricorrendo alla teoria di Matlock e Reese che si basa sul noto modello di suolo alla Winkler (elastico-lineare), caratterizzato da un modulo di reazione orizzontale del terreno ($E_{MR}$) definito come il rapporto fra la reazione del terreno per unità di lunghezza del palo (p) ed il corrispondente spostamento orizzontale (y): $E_{MR} = p / y$. Definito il coefficiente di sottofondo alla Winkler ($K_W$), per un palo di diametro D, si ha questa relazione con il modulo di reazione orizzontale palo-terreno:

$$E_{MR} = K_W \cdot D$$

Nel caso in esame le fondazioni profonde interagiscono con il substrato calcarenitico per il quale si assume un valore massimo del coefficiente di Winkler di 100000 kN/m$^3$.

Quindi si è assunto il seguente andamento per il modulo di reazione micropalo-terreno con la profondità a partire da testa micropalo (diametro di perforazione Dp=230 mm):

| Prof. m | E kN/m2 |
|---|---|
| .00 | 23000.0 |
| 40.00 | 23000.0 |

## 7.4 Carichi

Di seguito si riportano i carichi agenti a quota intradosso plinto, baricentro fondazione, forniti dal progettista strutturale per le palificate in esame.

Per le pile i carichi sono agenti a quota intradosso plinto, a baricentro fondazione, ma non includono il peso del plinto di fondazione, che è stato quindi valutato a parte con la seguente tabella.

| Pila | L | B | h1 | A | V1 | Vtot | PP |
|---|---|---|---|---|---|---|---|
| | [m] | [m] | [m] | [m2] | [m3] | [m3] | [kN] |
| P21-P22 | 19.7 | 14.7 | 2.5 | 289.59 | 723.975 | 724.0 | 18099 |

## Tabella 5 - Carichi pile

| TABLE: Joint Reactions | | | | V long | V trasv | N | M trasv | M long | Mtorc | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Joint | OutputCase | CaseType | StepType | F1 | F2 | F3 | M1 | M2 | M3 | | |
| Text | Text | Text | Text | KN | KN | KN | KN-m | KN-m | KN-m | PILA | comb. | |
| 99 | SLV_x | Combination | Max | 4950 | 1354 | 8977 | 13957 | 46051 | 313 | 1 | SLV 1 | SLV_x Max |
| 99 | SLV_x | Combination | Min | -4950 | -1354 | 7832 | -13957 | -45997 | -313 | | SLV 2 | SLV_x Min |
| 99 | SLV_y | Combination | Max | 1485 | 4512 | 8910 | 46520 | 13837 | 1042 | | SLV 3 | SLV_y Max |
| 99 | SLV_y | Combination | Min | -1485 | -4512 | 7899 | -46520 | -13783 | -1042 | | SLV 4 | SLV_y Min |
| 100 | SLV_x | Combination | Max | 4975 | 1408 | 9014 | 15039 | 48169 | 353 | 2 | SLV 1 | SLV_x Max |
| 100 | SLV_x | Combination | Min | -4975 | -1408 | 7917 | -15039 | -48169 | -353 | | SLV 2 | SLV_x Min |
| 100 | SLV_y | Combination | Max | 1493 | 4694 | 8968 | 50127 | 14453 | 1178 | | SLV 3 | SLV_y Max |
| 100 | SLV_y | Combination | Min | -1493 | -4694 | 7963 | -50127 | -14453 | -1178 | | SLV 4 | SLV_y Min |
| 101 | SLV_x | Combination | Max | 5014 | 1395 | 9138 | 15409 | 50509 | 903 | 3 | SLV 1 | SLV_x Max |
| 101 | SLV_x | Combination | Min | -5014 | -1395 | 8023 | -15409 | -50509 | -903 | | SLV 2 | SLV_x Min |
| 101 | SLV_y | Combination | Max | 1505 | 4649 | 9092 | 51363 | 15156 | 3009 | | SLV 3 | SLV_y Max |
| 101 | SLV_y | Combination | Min | -1505 | -4649 | 8069 | -51363 | -15156 | -3009 | | SLV 4 | SLV_y Min |
| 102 | SLV_x | Combination | Max | 5144 | 1436 | 9626 | 17739 | 58918 | 838 | 4 | SLV 1 | SLV_x Max |
| 102 | SLV_x | Combination | Min | -5144 | -1436 | 8341 | -17739 | -58918 | -838 | | SLV 2 | SLV_x Min |
| 102 | SLV_y | Combination | Max | 1543 | 4788 | 9545 | 59127 | 17678 | 2793 | | SLV 3 | SLV_y Max |
| 102 | SLV_y | Combination | Min | -1543 | -4788 | 8422 | -59127 | -17678 | -2793 | | SLV 4 | SLV_y Min |
| 103 | SLV_x | Combination | Max | 5210 | 1515 | 9852 | 19852 | 63768 | 516 | 5 | SLV 1 | SLV_x Max |
| 103 | SLV_x | Combination | Min | -5210 | -1515 | 8575 | -19852 | -63768 | -516 | | SLV 2 | SLV_x Min |
| 103 | SLV_y | Combination | Max | 1563 | 5050 | 9788 | 66172 | 19132 | 1719 | | SLV 3 | SLV_y Max |
| 103 | SLV_y | Combination | Min | -1563 | -5050 | 8639 | -66172 | -19132 | -1719 | | SLV 4 | SLV_y Min |
| 104 | SLV_x | Combination | Max | 5228 | 1615 | 9898 | 21618 | 65511 | 472 | 6 | SLV 1 | SLV_x Max |
| 104 | SLV_x | Combination | Min | -5228 | -1615 | 8702 | -21618 | -65511 | -472 | | SLV 2 | SLV_x Min |
| 104 | SLV_y | Combination | Max | 1569 | 5383 | 9867 | 72057 | 19655 | 1572 | | SLV 3 | SLV_y Max |
| 104 | SLV_y | Combination | Min | -1569 | -5383 | 8732 | -72057 | -19655 | -1572 | | SLV 4 | SLV_y Min |
| 105 | SLV_x | Combination | Max | 5212 | 1515 | 9804 | 19854 | 63775 | 666 | 7 | SLV 1 | SLV_x Max |
| 105 | SLV_x | Combination | Min | -5212 | -1515 | 8623 | -19854 | -63775 | -666 | | SLV 2 | SLV_x Min |
| 105 | SLV_y | Combination | Max | 1564 | 5050 | 9774 | 66179 | 19134 | 2220 | | SLV 3 | SLV_y Max |
| 105 | SLV_y | Combination | Min | -1564 | -5050 | 8653 | -66179 | -19134 | -2220 | | SLV 4 | SLV_y Min |
| 106 | SLV_x | Combination | Max | 5163 | 1462 | 9650 | 18335 | 60131 | 429 | 8 | SLV 1 | SLV_x Max |
| 106 | SLV_x | Combination | Min | -5163 | -1462 | 8432 | -18335 | -60131 | -429 | | SLV 2 | SLV_x Min |
| 106 | SLV_y | Combination | Max | 1549 | 4873 | 9596 | 61112 | 18041 | 1429 | | SLV 3 | SLV_y Max |
| 106 | SLV_y | Combination | Min | -1549 | -4873 | 8486 | -61112 | -18041 | -1429 | | SLV 4 | SLV_y Min |
| 107 | SLV_x | Combination | Max | 5126 | 1455 | 9507 | 17705 | 57681 | 298 | 9 | SLV 1 | SLV_x Max |
| 107 | SLV_x | Combination | Min | -5126 | -1455 | 8345 | -17705 | -57681 | -298 | | SLV 2 | SLV_x Min |
| 107 | SLV_y | Combination | Max | 1538 | 4851 | 9466 | 59015 | 17306 | 994 | | SLV 3 | SLV_y Max |
| 107 | SLV_y | Combination | Min | -1538 | -4851 | 8386 | -59015 | -17306 | -994 | | SLV 4 | SLV_y Min |
| 108 | SLV_x | Combination | Max | 5119 | 1383 | 9402 | 16440 | 56087 | 445 | 10 | SLV 1 | SLV_x Max |
| 108 | SLV_x | Combination | Min | -5119 | -1383 | 8277 | -16440 | -56087 | -445 | | SLV 2 | SLV_x Min |
| 108 | SLV_y | Combination | Max | 1536 | 4611 | 9369 | 54798 | 16829 | 1483 | | SLV 3 | SLV_y Max |
| 108 | SLV_y | Combination | Min | -1536 | -4611 | 8310 | -54798 | -16829 | -1483 | | SLV 4 | SLV_y Min |
| 109 | SLV_x | Combination | Max | 5144 | 1448 | 9582 | 17880 | 58900 | 737 | 11 | SLV 1 | SLV_x Max |
| 109 | SLV_x | Combination | Min | -5144 | -1448 | 8385 | -17880 | -58900 | -737 | | SLV 2 | SLV_x Min |
| 109 | SLV_y | Combination | Max | 1543 | 4825 | 9532 | 59598 | 17672 | 2458 | | SLV 3 | SLV_y Max |
| 109 | SLV_y | Combination | Min | -1543 | -4825 | 8435 | -59598 | -17672 | -2458 | | SLV 4 | SLV_y Min |
| 110 | SLV_x | Combination | Max | 5210 | 1466 | 9833 | 19135 | 63502 | 1268 | 12 | SLV 1 | SLV_x Max |
| 110 | SLV_x | Combination | Min | -5210 | -1466 | 8565 | -19135 | -63502 | -1268 | | SLV 2 | SLV_x Min |
| 110 | SLV_y | Combination | Max | 1563 | 4886 | 9772 | 63781 | 19055 | 4226 | | SLV 3 | SLV_y Max |
| 110 | SLV_y | Combination | Min | -1563 | -4886 | 8627 | -63781 | -19055 | -4226 | | SLV 4 | SLV_y Min |
| 111 | SLV_x | Combination | Max | 5352 | 1491 | 10325 | 21643 | 73419 | 1323 | 13 | SLV 1 | SLV_x Max |
| 111 | SLV_x | Combination | Min | -5352 | -1491 | 8966 | -21643 | -73419 | -1323 | | SLV 2 | SLV_x Min |
| 111 | SLV_y | Combination | Max | 1606 | 4970 | 10246 | 72143 | 22028 | 4409 | | SLV 3 | SLV_y Max |
| 111 | SLV_y | Combination | Min | -1606 | -4970 | 9045 | -72143 | -22028 | -4409 | | SLV 4 | SLV_y Min |
| 112 | SLV_x | Combination | Max | 5458 | 1530 | 10670 | 23950 | 81328 | 1746 | 14 | SLV 1 | SLV_x Max |
| 112 | SLV_x | Combination | Min | -5458 | -1530 | 9311 | -23950 | -81328 | -1746 | | SLV 2 | SLV_x Min |
| 112 | SLV_y | Combination | Max | 1638 | 5098 | 10599 | 79829 | 24401 | 5818 | | SLV 3 | SLV_y Max |
| 112 | SLV_y | Combination | Min | -1638 | -5098 | 9382 | -79829 | -24401 | -5818 | | SLV 4 | SLV_y Min |
| 113 | SLV_x | Combination | Max | 5602 | 1549 | 11152 | 26626 | 92319 | 2104 | 15 | SLV 1 | SLV_x Max |
| 113 | SLV_x | Combination | Min | -5602 | -1549 | 9750 | -26626 | -92319 | -2104 | | SLV 2 | SLV_x Min |
| 113 | SLV_y | Combination | Max | 1681 | 5165 | 11077 | 88754 | 27697 | 7012 | | SLV 3 | SLV_y Max |
| 113 | SLV_y | Combination | Min | -1681 | -5165 | 9825 | -88754 | -27697 | -7012 | | SLV 4 | SLV_y Min |
| 119 | SLV_x | Combination | Max | 5931 | 1661 | 12944 | 32037 | 111452 | 2452 | 16 | SLV 1 | SLV_x Max |
| 119 | SLV_x | Combination | Min | -5931 | -1661 | 11479 | -32037 | -111452 | -2452 | | SLV 2 | SLV_x Min |
| 119 | SLV_y | Combination | Max | 1780 | 5535 | 12886 | 106790 | 33441 | 8172 | | SLV 3 | SLV_y Max |
| 119 | SLV_y | Combination | Min | -1780 | -5535 | 11536 | -106790 | -33441 | -8172 | | SLV 4 | SLV_y Min |
| 120 | SLV_x | Combination | Max | 5759 | 1760 | 14222 | 36997 | 118581 | 3541 | 17 | SLV 1 | SLV_x Max |
| 120 | SLV_x | Combination | Min | -5759 | -1760 | 12612 | -36997 | -118581 | -3541 | | SLV 2 | SLV_x Min |
| 120 | SLV_y | Combination | Max | 1731 | 5866 | 14150 | 123321 | 35589 | 11804 | | SLV 3 | SLV_y Max |
| 120 | SLV_y | Combination | Min | -1731 | -5866 | 12684 | -123321 | -35589 | -11804 | | SLV 4 | SLV_y Min |
| 121 | SLV_x | Combination | Max | 5372 | 1870 | 16014 | 43805 | 123910 | 5476 | 18 | SLV 1 | SLV_x Max |
| 121 | SLV_x | Combination | Min | -5372 | -1870 | 14258 | -43805 | -123910 | -5476 | | SLV 2 | SLV_x Min |
| 121 | SLV_y | Combination | Max | 1612 | 6232 | 15939 | 146018 | 37177 | 18253 | | SLV 3 | SLV_y Max |
| 121 | SLV_y | Combination | Min | -1612 | -6232 | 14333 | -146018 | -37177 | -18253 | | SLV 4 | SLV_y Min |
| 122 | SLV_x | Combination | Max | 5085 | 2404 | 17868 | 62259 | 128135 | 3377 | 19 | SLV 1 | SLV_x Max |
| 122 | SLV_x | Combination | Min | -5085 | -2404 | 15996 | -62259 | -128135 | -3377 | | SLV 2 | SLV_x Min |
| 122 | SLV_y | Combination | Max | 1526 | 8013 | 17805 | 207529 | 38442 | 11257 | | SLV 3 | SLV_y Max |
| 122 | SLV_y | Combination | Min | -1526 | -8013 | 16058 | -207529 | -38442 | -11257 | | SLV 4 | SLV_y Min |
| 123 | SLV_x | Combination | Max | 5255 | 1984 | 16830 | 48847 | 125998 | 3403 | 20 | SLV 1 | SLV_x Max |
| 123 | SLV_x | Combination | Min | -5255 | -1984 | 15084 | -48847 | -125998 | -3403 | | SLV 2 | SLV_x Min |
| 123 | SLV_y | Combination | Max | 1577 | 6613 | 16783 | 162821 | 37802 | 11343 | | SLV 3 | SLV_y Max |
| 123 | SLV_y | Combination | Min | -1577 | -6613 | 15131 | -162821 | -37802 | -11343 | | SLV 4 | SLV_y Min |
| 124 | SLV_x_T4 | Combination | Max | 11210 | 4140 | 25596 | 97520 | 261290 | 1190 | 21 | SLV 1 (T4) | SLV_x_T4 Max |
| 124 | SLV_x_T4 | Combination | Min | -11210 | -4140 | 22202 | -97520 | -260798 | -1190 | | SLV 2 (T4) | SLV_x_T4 Min |
| 124 | SLV_y_T4 | Combination | Max | 3365 | 13799 | 25521 | 325064 | 78572 | 3965 | | SLV 3 (T4) | SLV_y_T4 Max |
| 124 | SLV_y_T4 | Combination | Min | -3365 | -13799 | 22277 | -325064 | -78080 | -3965 | | SLV 4 (T4) | SLV_y_T4 Min |
| 125 | SLV_x_T4 | Combination | Max | 11691 | 4206 | 24776 | 97230 | 267577 | 4930 | 22 | SLV 1 (T4) | SLV_x_T4 Max |
| 125 | SLV_x_T4 | Combination | Min | -11691 | -4206 | 21577 | -97230 | -268069 | -4930 | | SLV 2 (T4) | SLV_x_T4 Min |
| 125 | SLV_y_T4 | Combination | Max | 3510 | 14021 | 24738 | 324099 | 80116 | 16434 | | SLV 3 (T4) | SLV_y_T4 Max |
| 125 | SLV_y_T4 | Combination | Min | -3510 | -14021 | 21615 | -324099 | -80608 | -16434 | | SLV 4 (T4) | SLV_y_T4 Min |
| 114 | SLV_x | Combination | Max | 5640 | 1759 | 15123 | 39043 | 122802 | 2854 | 23 | SLV 1 | SLV_x Max |
| 114 | SLV_x | Combination | Min | -5640 | -1759 | 13558 | -39043 | -122802 | -2854 | | SLV 2 | SLV_x Min |
| 114 | SLV_y | Combination | Max | 1693 | 5863 | 15087 | 130143 | 36845 | 9514 | | SLV 3 | SLV_y Max |
| 114 | SLV_y | Combination | Min | -1693 | -5863 | 13594 | -130143 | -36845 | -9514 | | SLV 4 | SLV_y Min |
| 115 | SLV_x | Combination | Max | 5952 | 1647 | 13208 | 32031 | 112828 | 2053 | 24 | SLV 1 | SLV_x Max |
| 115 | SLV_x | Combination | Min | -5952 | -1647 | 11676 | -32031 | -112828 | -2053 | | SLV 2 | SLV_x Min |
| 115 | SLV_y | Combination | Max | 1788 | 5489 | 13129 | 106768 | 33858 | 6844 | | SLV 3 | SLV_y Max |
| 115 | SLV_y | Combination | Min | -1788 | -5489 | 11755 | -106768 | -33858 | -6844 | | SLV 4 | SLV_y Min |
| 116 | SLV_x | Combination | Max | 5545 | 1478 | 10945 | 24412 | 87537 | 1593 | 25 | SLV 1 | SLV_x Max |
| 116 | SLV_x | Combination | Min | -5545 | -1478 | 9554 | -24412 | -87537 | -1593 | | SLV 2 | SLV_x Min |
| 116 | SLV_y | Combination | Max | 1664 | 4928 | 10869 | 81371 | 26265 | 5310 | | SLV 3 | SLV_y Max |
| 116 | SLV_y | Combination | Min | -1664 | -4928 | 9630 | -81371 | -26265 | -5310 | | SLV 4 | SLV_y Min |
| 117 | SLV_x | Combination | Max | 5242 | 1458 | 9978 | 19512 | 65717 | 1038 | 26 | SLV 1 | SLV_x Max |
| 117 | SLV_x | Combination | Min | -5242 | -1458 | 8622 | -19512 | -65717 | -1038 | | SLV 2 | SLV_x Min |
| 117 | SLV_y | Combination | Max | 1573 | 4861 | 9892 | 65038 | 19721 | 3459 | | SLV 3 | SLV_y Max |
| 117 | SLV_y | Combination | Min | -1573 | -4861 | 8708 | -65038 | -19721 | -3459 | | SLV 4 | SLV_y Min |
| 118 | SLV_x | Combination | Max | 5105 | 1368 | 9315 | 15364 | 52451 | 638 | 27 | SLV 1 | SLV_x Max |
| 118 | SLV_x | Combination | Min | -5105 | -1368 | 8069 | -15364 | -52505 | -638 | | SLV 2 | SLV_x Min |
| 118 | SLV_y | Combination | Max | 1532 | 4559 | 9230 | 51212 | 15721 | 2127 | | SLV 3 | SLV_y Max |
| 118 | SLV_y | Combination | Min | -1532 | -4559 | 8154 | -51212 | -15775 | -2127 | | SLV 4 | SLV_y Min |

## 7.5 Risultati P21-P22

Nella seguente tabella si sintetizzano le massime sollecitazioni a testa palo/micropalo per le condizioni di carico analizzate. Inoltre si riportano anche le deformazioni massime del plinto. In **Appendice B** si riportano i tabulati di calcolo completi.

**Tabella 6 – pile P21÷P22 su micropali – Analisi SLV**

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

250 pali D = 230 mm

Sollecitazioni massime in sommita' ai pali

| | Fz kN | M kN*m | T kN | palo | c.d.c. |
|---|---|---|---|---|---|
| S.1 | 653.2 | 20.9 | 47.5 | 1 | 5 |
| S.2 | -323.6 | 20.9 | 47.5 | 1 | 6 |
| S.3 | -62.5 | 33.0 | 68.9 | 16 | 7 |
| S.4 | -62.5 | 33.0 | 68.9 | 16 | 7 |
| T.1 | 631.3 | 30.8 | 64.2 | 1 | 7 |
| T.2 | -301.8 | 30.8 | 64.2 | 1 | 8 |

S.1: cond. di carico con Sforzo Normale Massimo
VI08 - P22 - SLV_x
S.2: cond. di carico con Sforzo Normale Minimo
VI08 - P22 - SLV_x
S.3: cond. di carico con Momento Massimo
VI08 - P22 - SLV_y
S.4: cond. di carico con Taglio Massimo
VI08 - P22 - SLV_y
T.1: cond. di carico con Tensione Massima (sez. interamente reagente)
VI08 - P22 - SLV_y
T.2: cond. di carico con Tensione Minima (sez. interamente reagente)
VI08 - P22 - SLV_y

Deformazioni massime del plinto

| | dz mm | dx mm | rx mRad | dy mm | ry mRad | c.d.c. |
|---|---|---|---|---|---|---|
| D.1 | 1.748 | 2.148 | .558 | .746 | .115 | 1 |
| D.2 | 1.587 | -2.236 | -.573 | -.757 | -.114 | 6 |
| D.3 | 1.587 | -2.236 | -.573 | -.757 | -.114 | 6 |
| D.4 | 1.713 | .671 | .171 | 2.522 | .381 | 7 |
| D.5 | 1.745 | .645 | .168 | 2.485 | .382 | 3 |

D.1: cond. di carico con dz massimo
VI08 - P21 - SLV_x
D.2: cond. di carico con dx massimo
VI08 - P22 - SLV_x
D.3: cond. di carico con rx massimo
VI08 - P22 - SLV_x
D.4: cond. di carico con dy massimo
VI08 - P22 - SLV_y
D.5: cond. di carico con ry massimo
VI08 - P21 - SLV_y

# 8. VERIFICHE GEOTECNICHE

## 8.1 Verifica capacità portante fondazioni su pali

Le verifiche di capacità portante dei pali sono condotte in accordo alla normativa vigente (NTC 2018), in particolare si è fatto riferimento alla combinazione (A1+M1+R3). Nelle seguenti tabelle si sintetizzano le massime sollecitazioni in testa ai pali (Nmax) per le analisi eseguite, le lunghezze dei pali e le relative portate di progetto a compressione (Qd).

Le curve di capacità portante sono riportate al capitolo 6.

Le verifiche di portanza dei micropali sono riportate nella seguente tabella, da cui si osserva che le verifiche di portanza sono soddisfatte in quanto la resistenza di progetto è sempre maggiore della massima sollecitazione assiale di progetto sia a compressione che a trazione.

**Tabella 7 – Verifica capacità portante micropali esistenti Dp=230 mm**

| Pila | Nmax [kN] compressione | Rd [kN] compressione | Nmax,t [kN] trazione | Rd,t [kN] trazione | Lmicropalo [m] |
|---|---|---|---|---|---|
| P21, P22 | 653 | 2009 | 324 | 1848 | 28.0 |

## 8.2 Verifica carico limite orizzontale

Per la verifica del carico limite orizzontale si fa generalmente riferimento alla teoria di Broms per il caso di pali con rotazione in testa impedita. Le metodologie di calcolo sono riportate nel documento [DC4].

Il valore della azione resistente di progetto (Hd) è valutato dal valore caratteristico della resistenza (Hk) con il fattore di correlazione $\xi_3 = 1.5$ (cinque verticali di indagine), il coefficiente parziale $\gamma_T = 1.3$ ed un fattore di effetto gruppo orizzontale assunto cautelativamente pari a 0.80.

Per la resistenza del terreno si considerano i valori medi di resistenza laterale lungo il palo, valutati in tensioni totali in quanto le condizioni di acrico massime sono sismiche. Inoltre le fondazioni sono in roccia e quindi la resistenza verrà dedotta dalla resistenza a compressione monoassiale minima indicata per la roccia ($\sigma c$=3MPa)

Nella seguente tabella si riassumono i risultati delle verifiche. La verifica a carico limite orizzontale è sempre soddisfatta, in quanto la massima azione di taglio di progetto, valutata con effetto gruppo orizzontale, risulta sempre inferiore all'azione di taglio resistente ($H_{max,EG} = H_{max}/0.8 < H_d = H_k/(\xi_3 \cdot \gamma_T)$).

| OPERA | D [mm] | L [m] | My [kNm] | φ [°] | cu [kPa] | Hmax [kN] | Hk [kN] | Hd [kN] |
|---|---|---|---|---|---|---|---|---|
| P21-P22 | 230 | 28.0 | 67.4 (de=177.8mm sp=11mm) | - | 1500 (σc/2) | 337.55 | 173.1 | 69 (associato a trazione massima N=-63 kN) |

My = momento di plasticizzazzione.
Hmax = azione massima orizzontale di progetto.
Hd = Hk / ($\gamma_R \cdot \xi_3$) = resistenza orizzontale di progetto.
D = diametro palo.
L = lunghezza palo.

## *9. VERIFICHE STRUTTURALI*

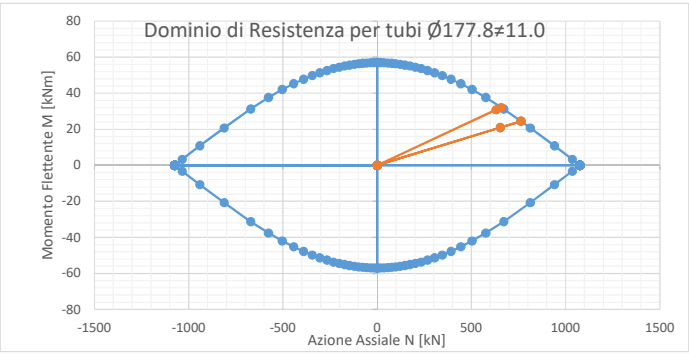
### 9.1 Verifica dell'armatura tubolare in acciaio dei micropali

La verifica è svolta in accordo alle normative vigenti NTC 2018 con riferimento alle massime sollecitazioni individuate dall'analisi eseguita.

Tutti i micropali esistenti sono armati con tubo de= 177.8 mm sp=11 mm acciaio ex. Fe360 (S235).
Per i materiali delle opere esistenti si definisce livello di conoscenza LC = 2 e quindi nelle verifiche si assume un fattore di confidenza FC = 1.2.

Come si evince dalla seguente tabella la verifica di resistenza dell'armatura tubolare è soddisfatta per i micropali esistenti della fondazione delle pile P21-P22.

| | AZIONI DI PROGETTO ($F_{Ed}$) | | | RESISTENZE DI PROGETTO ($R_d$) | | | | | | VERIFICA (>1) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sezione | $N_{Ed}$ | $M_{Ed}$ | $V_{Ed}$ | $N_{pl,Rd}$ | $M_{c,Rd}$ | $V_{c,Rd}$ | $M_{y,V,Rd}$ | $M_{N,y,Rd}$ | $M_{y,V,Rd}$ | $(R_d/F_{Ed})_{min}$ | |
| - | kN | kNm | kN | kN | kNm | kN | kNm | kNm | kNm | -- | |
| P22 - cdc SLV-x | 653 | 21 | 48 | 1075 | 57 | 395 | 57 | 24 | 24 | 1.17 | OK |
| P22 - cdc SLV-y | 631 | 31 | 64 | 1075 | 57 | 395 | 57 | 32 | 32 | 1.04 | OK |



# 10. APPENDICE A: ANALISI CURVA CARICO-CEDIMENTO. TABULATI DI CALCOLO APAL

## 10.1 Micropalo esistente DP230mm

```
GRAVINA D230mm


Caratteristiche palo

Lunghezza                  =       15.00  m
Diametro                   =         .23  m
Modulo elastico            = 20000000.00  kPa
Peso di volume immerso     =        5.00  kN/m3


Carico in sommita al palo  =         .00  kN


Caratteristiche alla base del palo

Pressione limite specifica    =  5000.000  kPa
Parametro deformazione limite =      .200
   cedimento per press. lim.  =  .200 x D =   46. mm
Parametro forma curva         =      .090


Caratteristiche di adesione laterale

-----------------------------------
prof.    ades. limite      s. lim.
   m          kPa             mm
-----------------------------------
  .00         100.0           5.0
 3.00         100.0           5.0
 3.10         220.0           5.0
20.00         220.0           5.0
-----------------------------------


Definizione cedimenti del terreno

----------------------
prof.        cedimento
   m            mm
----------------------
----------------------



STAMPA DEI RISULTATI

---------------------------------------
prof.      sforzo normale    cedimento
  m               kN              mm
---------------------------------------
   .00             .7             .01
   .50             .7             .01
  1.00             .7             .01
  1.50             .7             .01
  2.00             .8             .01
  2.50             .8             .01
  3.00             .8             .01
  3.50             .7             .01
  4.00             .7             .01
  4.50             .6             .01
  5.00             .6             .01
  5.50             .5             .01
  6.00             .5             .01
  6.50             .4             .01
  7.00             .4             .01
  7.50             .4             .01
  8.00             .4             .01
  8.50             .3             .01
  9.00             .3             .01
  9.50             .3             .01
 10.00             .3             .01
 10.50             .3             .01
 11.00             .3             .01
```

| | | |
|---|---|---|
| 11.50 | .3 | .01 |
| 12.00 | .3 | .01 |
| 12.50 | .3 | .01 |
| 13.00 | .3 | .01 |
| 13.50 | .3 | .01 |
| 14.00 | .3 | .01 |
| 14.50 | .3 | .01 |
| 15.00 | .3 | .01 |

Carico in sommita al palo = 1.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | .7 | .01 |
| .50 | .7 | .01 |
| 1.00 | .7 | .01 |
| 1.50 | .7 | .01 |
| 2.00 | .8 | .01 |
| 2.50 | .8 | .01 |
| 3.00 | .8 | .01 |
| 3.50 | .7 | .01 |
| 4.00 | .7 | .01 |
| 4.50 | .6 | .01 |
| 5.00 | .6 | .01 |
| 5.50 | .5 | .01 |
| 6.00 | .5 | .01 |
| 6.50 | .4 | .01 |
| 7.00 | .4 | .01 |
| 7.50 | .4 | .01 |
| 8.00 | .4 | .01 |
| 8.50 | .3 | .01 |
| 9.00 | .3 | .01 |
| 9.50 | .3 | .01 |
| 10.00 | .3 | .01 |
| 10.50 | .3 | .01 |
| 11.00 | .3 | .01 |
| 11.50 | .3 | .01 |
| 12.00 | .3 | .01 |
| 12.50 | .3 | .01 |
| 13.00 | .3 | .01 |
| 13.50 | .3 | .01 |
| 14.00 | .3 | .01 |
| 14.50 | .3 | .01 |
| 15.00 | .3 | .01 |

Carico in sommita al palo = 200.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 200.9 | 1.58 |
| .50 | 190.5 | 1.46 |
| 1.00 | 180.8 | 1.35 |
| 1.50 | 171.9 | 1.25 |
| 2.00 | 163.7 | 1.15 |
| 2.50 | 156.3 | 1.05 |
| 3.00 | 149.4 | .96 |
| 3.50 | 135.7 | .87 |
| 4.00 | 123.2 | .79 |
| 4.50 | 111.8 | .72 |
| 5.00 | 101.5 | .66 |
| 5.50 | 92.0 | .60 |

| | | |
|---|---|---|
| 6.00 | 83.4 | .55 |
| 6.50 | 75.6 | .50 |
| 7.00 | 68.4 | .46 |
| 7.50 | 61.9 | .42 |
| 8.00 | 56.0 | .38 |
| 8.50 | 50.5 | .35 |
| 9.00 | 45.5 | .32 |
| 9.50 | 40.9 | .29 |
| 10.00 | 36.7 | .27 |
| 10.50 | 32.9 | .25 |
| 11.00 | 29.3 | .23 |
| 11.50 | 26.0 | .21 |
| 12.00 | 22.9 | .20 |
| 12.50 | 20.0 | .19 |
| 13.00 | 17.3 | .18 |
| 13.50 | 14.8 | .17 |
| 14.00 | 12.4 | .16 |
| 14.50 | 10.1 | .15 |
| 15.00 | 7.9 | .15 |

Carico in sommita al palo = 400.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 398.1 | 3.13 |
| .50 | 377.3 | 2.89 |
| 1.00 | 358.1 | 2.67 |
| 1.50 | 340.4 | 2.46 |
| 2.00 | 324.2 | 2.26 |
| 2.50 | 309.3 | 2.07 |
| 3.00 | 295.8 | 1.89 |
| 3.50 | 268.6 | 1.72 |
| 4.00 | 243.8 | 1.56 |
| 4.50 | 221.3 | 1.42 |
| 5.00 | 200.7 | 1.30 |
| 5.50 | 182.1 | 1.18 |
| 6.00 | 165.0 | 1.08 |
| 6.50 | 149.5 | .98 |
| 7.00 | 135.4 | .90 |
| 7.50 | 122.4 | .82 |
| 8.00 | 110.6 | .75 |
| 8.50 | 99.8 | .69 |
| 9.00 | 89.9 | .63 |
| 9.50 | 80.8 | .58 |
| 10.00 | 72.5 | .53 |
| 10.50 | 64.8 | .49 |
| 11.00 | 57.7 | .45 |
| 11.50 | 51.1 | .42 |
| 12.00 | 45.0 | .39 |
| 12.50 | 39.3 | .37 |
| 13.00 | 33.9 | .34 |
| 13.50 | 28.8 | .33 |
| 14.00 | 24.0 | .31 |
| 14.50 | 19.4 | .30 |
| 15.00 | 14.9 | .29 |

Carico in sommita al palo = 600.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 600.0 | 4.71 |

| | | |
|---|---|---|
| .50 | 568.7 | 4.36 |
| 1.00 | 539.7 | 4.02 |
| 1.50 | 513.0 | 3.71 |
| 2.00 | 488.5 | 3.40 |
| 2.50 | 466.1 | 3.12 |
| 3.00 | 445.7 | 2.84 |
| 3.50 | 404.7 | 2.59 |
| 4.00 | 367.4 | 2.35 |
| 4.50 | 333.4 | 2.14 |
| 5.00 | 302.5 | 1.95 |
| 5.50 | 274.3 | 1.78 |
| 6.00 | 248.6 | 1.62 |
| 6.50 | 225.2 | 1.48 |
| 7.00 | 203.9 | 1.35 |
| 7.50 | 184.4 | 1.23 |
| 8.00 | 166.5 | 1.13 |
| 8.50 | 150.2 | 1.03 |
| 9.00 | 135.3 | .95 |
| 9.50 | 121.6 | .87 |
| 10.00 | 109.0 | .80 |
| 10.50 | 97.4 | .74 |
| 11.00 | 86.6 | .68 |
| 11.50 | 76.7 | .63 |
| 12.00 | 67.4 | .59 |
| 12.50 | 58.8 | .55 |
| 13.00 | 50.6 | .52 |
| 13.50 | 42.9 | .49 |
| 14.00 | 35.6 | .47 |
| 14.50 | 28.6 | .45 |
| 15.00 | 21.8 | .43 |

Carico in sommita al palo = 1000.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 994.4 | 8.16 |
| .50 | 958.4 | 7.57 |
| 1.00 | 922.3 | 7.01 |
| 1.50 | 886.3 | 6.46 |
| 2.00 | 850.3 | 5.94 |
| 2.50 | 814.3 | 5.44 |
| 3.00 | 778.5 | 4.96 |
| 3.50 | 706.8 | 4.52 |
| 4.00 | 641.6 | 4.11 |
| 4.50 | 582.2 | 3.74 |
| 5.00 | 528.1 | 3.41 |
| 5.50 | 478.9 | 3.10 |
| 6.00 | 434.0 | 2.83 |
| 6.50 | 393.1 | 2.58 |
| 7.00 | 355.7 | 2.36 |
| 7.50 | 321.6 | 2.15 |
| 8.00 | 290.4 | 1.97 |
| 8.50 | 261.9 | 1.80 |
| 9.00 | 235.8 | 1.65 |
| 9.50 | 211.7 | 1.52 |
| 10.00 | 189.6 | 1.40 |
| 10.50 | 169.3 | 1.29 |
| 11.00 | 150.4 | 1.19 |
| 11.50 | 132.9 | 1.11 |
| 12.00 | 116.6 | 1.03 |
| 12.50 | 101.3 | .97 |
| 13.00 | 87.0 | .91 |
| 13.50 | 73.4 | .86 |
| 14.00 | 60.4 | .82 |
| 14.50 | 48.0 | .79 |
| 15.00 | 35.9 | .76 |

Carico in sommita al palo = 1200.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 1198.2 | 10.30 |
| .50 | 1162.2 | 9.59 |
| 1.00 | 1126.2 | 8.90 |
| 1.50 | 1090.1 | 8.23 |
| 2.00 | 1054.1 | 7.59 |
| 2.50 | 1018.1 | 6.96 |
| 3.00 | 982.1 | 6.36 |
| 3.50 | 902.7 | 5.79 |
| 4.00 | 823.3 | 5.27 |
| 4.50 | 747.1 | 4.80 |
| 5.00 | 677.7 | 4.37 |
| 5.50 | 614.4 | 3.98 |
| 6.00 | 556.8 | 3.63 |
| 6.50 | 504.2 | 3.31 |
| 7.00 | 456.3 | 3.02 |
| 7.50 | 412.5 | 2.76 |
| 8.00 | 372.4 | 2.53 |
| 8.50 | 335.7 | 2.31 |
| 9.00 | 302.1 | 2.12 |
| 9.50 | 271.2 | 1.95 |
| 10.00 | 242.8 | 1.79 |
| 10.50 | 216.6 | 1.66 |
| 11.00 | 192.3 | 1.53 |
| 11.50 | 169.8 | 1.42 |
| 12.00 | 148.7 | 1.33 |
| 12.50 | 129.1 | 1.24 |
| 13.00 | 110.5 | 1.17 |
| 13.50 | 93.0 | 1.11 |
| 14.00 | 76.2 | 1.06 |
| 14.50 | 60.1 | 1.02 |
| 15.00 | 44.5 | .99 |

Carico in sommita al palo = 1400.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 1387.2 | 12.57 |
| .50 | 1351.2 | 11.74 |
| 1.00 | 1315.2 | 10.94 |
| 1.50 | 1279.2 | 10.16 |
| 2.00 | 1243.1 | 9.40 |
| 2.50 | 1207.1 | 8.66 |
| 3.00 | 1171.1 | 7.95 |
| 3.50 | 1091.7 | 7.27 |
| 4.00 | 1012.3 | 6.64 |
| 4.50 | 932.9 | 6.05 |
| 5.00 | 853.6 | 5.51 |
| 5.50 | 774.2 | 5.02 |
| 6.00 | 701.5 | 4.58 |
| 6.50 | 635.2 | 4.18 |
| 7.00 | 574.7 | 3.81 |
| 7.50 | 519.4 | 3.48 |
| 8.00 | 468.9 | 3.19 |
| 8.50 | 422.6 | 2.92 |
| 9.00 | 380.1 | 2.68 |
| 9.50 | 341.1 | 2.46 |
| 10.00 | 305.2 | 2.27 |
| 10.50 | 272.1 | 2.09 |
| 11.00 | 241.4 | 1.94 |
| 11.50 | 212.9 | 1.80 |
| 12.00 | 186.3 | 1.68 |
| 12.50 | 161.3 | 1.58 |
| 13.00 | 137.8 | 1.49 |
| 13.50 | 115.5 | 1.41 |
| 14.00 | 94.2 | 1.35 |
| 14.50 | 73.7 | 1.30 |

| | | |
|---|---|---|
| 15.00 | 53.8 | 1.26 |

Carico in sommita al palo = 1500.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 1489.0 | 13.92 |
| .50 | 1453.0 | 13.04 |
| 1.00 | 1416.9 | 12.17 |
| 1.50 | 1380.9 | 11.33 |
| 2.00 | 1344.9 | 10.51 |
| 2.50 | 1308.9 | 9.71 |
| 3.00 | 1272.8 | 8.94 |
| 3.50 | 1193.5 | 8.20 |
| 4.00 | 1114.1 | 7.50 |
| 4.50 | 1034.7 | 6.86 |
| 5.00 | 955.3 | 6.26 |
| 5.50 | 875.9 | 5.71 |
| 6.00 | 796.6 | 5.20 |
| 6.50 | 721.2 | 4.75 |
| 7.00 | 652.5 | 4.33 |
| 7.50 | 589.6 | 3.96 |
| 8.00 | 532.2 | 3.62 |
| 8.50 | 479.6 | 3.32 |
| 9.00 | 431.3 | 3.04 |
| 9.50 | 387.0 | 2.80 |
| 10.00 | 346.1 | 2.58 |
| 10.50 | 308.4 | 2.38 |
| 11.00 | 273.5 | 2.20 |
| 11.50 | 241.0 | 2.05 |
| 12.00 | 210.7 | 1.91 |
| 12.50 | 182.3 | 1.80 |
| 13.00 | 155.4 | 1.69 |
| 13.50 | 130.0 | 1.61 |
| 14.00 | 105.7 | 1.54 |
| 14.50 | 82.2 | 1.48 |
| 15.00 | 59.5 | 1.44 |

Carico in sommita al palo = 1600.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 1599.3 | 15.49 |
| .50 | 1563.3 | 14.54 |
| 1.00 | 1527.2 | 13.61 |
| 1.50 | 1491.2 | 12.70 |
| 2.00 | 1455.2 | 11.81 |
| 2.50 | 1419.2 | 10.95 |
| 3.00 | 1383.1 | 10.10 |
| 3.50 | 1303.8 | 9.30 |
| 4.00 | 1224.4 | 8.54 |
| 4.50 | 1145.0 | 7.82 |
| 5.00 | 1065.6 | 7.16 |
| 5.50 | 986.2 | 6.54 |
| 6.00 | 906.9 | 5.97 |
| 6.50 | 827.5 | 5.45 |
| 7.00 | 748.5 | 4.97 |
| 7.50 | 676.4 | 4.55 |
| 8.00 | 610.4 | 4.16 |
| 8.50 | 549.9 | 3.81 |
| 9.00 | 494.4 | 3.50 |

| | | |
|---|---|---|
| 9.50 | 443.5 | 3.21 |
| 10.00 | 396.5 | 2.96 |
| 10.50 | 353.1 | 2.74 |
| 11.00 | 312.9 | 2.53 |
| 11.50 | 275.6 | 2.36 |
| 12.00 | 240.7 | 2.20 |
| 12.50 | 207.9 | 2.07 |
| 13.00 | 177.0 | 1.95 |
| 13.50 | 147.6 | 1.85 |
| 14.00 | 119.5 | 1.77 |
| 14.50 | 92.4 | 1.71 |
| 15.00 | 66.1 | 1.66 |

Carico in sommita al palo = 1800.00 kN

STAMPA DEI RISULTATI

| prof. m | sforzo normale kN | cedimento mm |
|---|---|---|
| .00 | 1788.9 | 18.47 |
| .50 | 1752.9 | 17.40 |
| 1.00 | 1716.9 | 16.36 |
| 1.50 | 1680.9 | 15.34 |
| 2.00 | 1644.9 | 14.34 |
| 2.50 | 1608.8 | 13.36 |
| 3.00 | 1572.8 | 12.40 |
| 3.50 | 1493.4 | 11.48 |
| 4.00 | 1414.0 | 10.60 |
| 4.50 | 1334.7 | 9.77 |
| 5.00 | 1255.3 | 9.00 |
| 5.50 | 1175.9 | 8.26 |
| 6.00 | 1096.5 | 7.58 |
| 6.50 | 1017.2 | 6.94 |
| 7.00 | 937.8 | 6.36 |
| 7.50 | 858.4 | 5.82 |
| 8.00 | 779.0 | 5.32 |
| 8.50 | 701.6 | 4.88 |
| 9.00 | 630.5 | 4.48 |
| 9.50 | 565.2 | 4.12 |
| 10.00 | 504.9 | 3.80 |
| 10.50 | 449.3 | 3.51 |
| 11.00 | 397.6 | 3.25 |
| 11.50 | 349.6 | 3.03 |
| 12.00 | 304.7 | 2.83 |
| 12.50 | 262.5 | 2.66 |
| 13.00 | 222.6 | 2.52 |
| 13.50 | 184.7 | 2.39 |
| 14.00 | 148.3 | 2.29 |
| 14.50 | 113.2 | 2.21 |
| 15.00 | 79.0 | 2.16 |

STAMPA tabella carichi-cedimenti a testa palo

| carico kN | cedimento mm |
|---|---|
| .7 | .01 |
| .7 | .01 |
| 200.9 | 1.58 |
| 398.1 | 3.13 |
| 600.0 | 4.71 |
| 994.4 | 8.16 |
| 1198.2 | 10.30 |
| 1387.2 | 12.57 |
| 1489.0 | 13.92 |
| 1599.3 | 15.49 |
| 1788.9 | 18.47 |

STAMPA tabella carichi a testa palo-sforzi normali massimi

| carico a testa palo kN | sforzo normale massimo kN | profondita' sf. massimo m |
|---|---|---|
| .7 | .8 | 3.00 |
| .7 | .8 | 3.00 |
| 200.9 | 200.9 | .00 |
| 398.1 | 398.1 | .00 |
| 600.0 | 600.0 | .00 |
| 994.4 | 994.4 | .00 |
| 1198.2 | 1198.2 | .00 |
| 1387.2 | 1387.2 | .00 |
| 1489.0 | 1489.0 | .00 |
| 1599.3 | 1599.3 | .00 |
| 1788.9 | 1788.9 | .00 |

# 11. APPENDICE B: ANALISI DELLE PALIFICATE DI FONDAZIONE. TABULATI DI CALCOLO MAP

## 11.1 Pile P20, P21 – Analisi SLV

M A P - Matrix Analysis of Piles
Programma per l'analisi di palificate collegate da un plinto rigido

(C) G.Guiducci, S.G.I. - luglio 1994

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LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

Geometria Palificata

| palo | vin | X m | Y m | Z m | axz deg | ayz deg | axy deg | Box m | Boy m |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 6.600 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 2 | 0 | 6.600 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 3 | 0 | 6.600 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 4 | 0 | 6.600 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 5 | 0 | 6.600 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 6 | 0 | 6.600 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 7 | 0 | 6.600 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 8 | 0 | 6.600 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 9 | 0 | 6.600 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 10 | 0 | 6.600 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 11 | 0 | 6.600 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 12 | 0 | 6.600 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 13 | 0 | 6.600 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 14 | 0 | 6.600 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 15 | 0 | 6.600 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 16 | 0 | 6.600 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 17 | 0 | 6.000 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 18 | 0 | 6.000 | 6.500 | .000 | .00 | .00 | .00 | .23 | .00 |
| 19 | 0 | 6.000 | 5.200 | .000 | .00 | .00 | .00 | .23 | .00 |
| 20 | 0 | 6.000 | 3.900 | .000 | .00 | .00 | .00 | .23 | .00 |
| 21 | 0 | 6.000 | 2.600 | .000 | .00 | .00 | .00 | .23 | .00 |
| 22 | 0 | 6.000 | 1.300 | .000 | .00 | .00 | .00 | .23 | .00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23 | 0 | 6.000 | .000 | .000 | .00 | .00 | .00 | .23 | .00 |
| 24 | 0 | 6.000 | -1.300 | .000 | .00 | .00 | .00 | .23 | .00 |
| 25 | 0 | 6.000 | -2.600 | .000 | .00 | .00 | .00 | .23 | .00 |
| 26 | 0 | 6.000 | -3.900 | .000 | .00 | .00 | .00 | .23 | .00 |
| 27 | 0 | 6.000 | -5.200 | .000 | .00 | .00 | .00 | .23 | .00 |
| 28 | 0 | 6.000 | -6.500 | .000 | .00 | .00 | .00 | .23 | .00 |
| 29 | 0 | 6.000 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 30 | 0 | 5.400 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 31 | 0 | 5.400 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 32 | 0 | 5.400 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 33 | 0 | 5.400 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 34 | 0 | 5.400 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 35 | 0 | 5.400 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 36 | 0 | 5.400 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 37 | 0 | 5.400 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 38 | 0 | 5.400 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 39 | 0 | 5.400 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 40 | 0 | 5.400 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 41 | 0 | 5.400 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 42 | 0 | 5.400 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 43 | 0 | 5.400 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 44 | 0 | 5.400 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 45 | 0 | 5.400 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 46 | 0 | 4.800 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 47 | 0 | 4.800 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 48 | 0 | 4.800 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 49 | 0 | 4.800 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 50 | 0 | 4.800 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 51 | 0 | 4.800 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 52 | 0 | 4.800 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 53 | 0 | 4.800 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 54 | 0 | 4.800 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 55 | 0 | 4.800 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 56 | 0 | 4.800 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 57 | 0 | 4.800 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 58 | 0 | 4.800 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 59 | 0 | 4.800 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 60 | 0 | 4.800 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 61 | 0 | 4.800 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 62 | 0 | 4.200 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 63 | 0 | 4.200 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 64 | 0 | 3.600 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 65 | 0 | 3.600 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 66 | 0 | 3.600 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 67 | 0 | 3.600 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 68 | 0 | 3.600 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 69 | 0 | 3.600 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 70 | 0 | 3.600 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 71 | 0 | 3.600 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 72 | 0 | 3.600 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 73 | 0 | 3.600 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 74 | 0 | 3.600 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 75 | 0 | 3.600 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 76 | 0 | 3.600 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 77 | 0 | 3.600 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 78 | 0 | 3.600 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 79 | 0 | 3.600 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 80 | 0 | 3.000 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 81 | 0 | 3.000 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 82 | 0 | 2.400 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 83 | 0 | 2.400 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 84 | 0 | 2.400 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 85 | 0 | 2.400 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 86 | 0 | 2.400 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 87 | 0 | 2.400 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 88 | 0 | 2.400 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 89 | 0 | 2.400 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 90 | 0 | 2.400 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 91 | 0 | 2.400 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 92 | 0 | 2.400 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 93 | 0 | 2.400 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 94 | 0 | 2.400 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 95 | 0 | 2.400 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 96 | 0 | 2.400 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 97 | 0 | 2.400 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 98 | 0 | 1.800 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 99 | 0 | 1.800 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 100 | 0 | 1.200 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 101 | 0 | 1.200 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 102 | 0 | 1.200 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 103 | 0 | 1.200 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 104 | 0 | 1.200 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 105 | 0 | 1.200 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 106 | 0 | 1.200 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 107 | 0 | 1.200 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 108 | 0 | 1.200 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 109 | 0 | 1.200 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 110 | 0 | 1.200 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 111 | 0 | 1.200 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 112 | 0 | 1.200 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 113 | 0 | 1.200 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 114 | 0 | 1.200 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 115 | 0 | 1.200 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 116 | 0 | .600 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 117 | 0 | .600 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 118 | 0 | .000 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 119 | 0 | .000 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 120 | 0 | .000 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 121 | 0 | .000 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 122 | 0 | .000 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 123 | 0 | .000 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 124 | 0 | .000 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 125 | 0 | .000 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 126 | 0 | .000 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 127 | 0 | .000 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 128 | 0 | .000 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 129 | 0 | .000 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 130 | 0 | .000 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 131 | 0 | .000 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 132 | 0 | .000 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 133 | 0 | .000 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 134 | 0 | -.600 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 135 | 0 | -.600 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 136 | 0 | -1.200 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 137 | 0 | -1.200 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 138 | 0 | -1.200 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 139 | 0 | -1.200 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 140 | 0 | -1.200 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 141 | 0 | -1.200 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 142 | 0 | -1.200 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 143 | 0 | -1.200 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 144 | 0 | -1.200 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 145 | 0 | -1.200 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 146 | 0 | -1.200 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 147 | 0 | -1.200 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 148 | 0 | -1.200 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 149 | 0 | -1.200 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 150 | 0 | -1.200 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 151 | 0 | -1.200 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 152 | 0 | -1.800 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 153 | 0 | -1.800 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 154 | 0 | -2.400 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 155 | 0 | -2.400 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 156 | 0 | -2.400 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 157 | 0 | -2.400 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 158 | 0 | -2.400 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 159 | 0 | -2.400 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 160 | 0 | -2.400 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 161 | 0 | -2.400 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 162 | 0 | -2.400 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 163 | 0 | -2.400 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 164 | 0 | -2.400 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 165 | 0 | -2.400 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 166 | 0 | -2.400 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 167 | 0 | -2.400 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 168 | 0 | -2.400 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 169 | 0 | -2.400 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 170 | 0 | -3.000 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 171 | 0 | -3.000 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 172 | 0 | -3.600 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 173 | 0 | -3.600 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 174 | 0 | -3.600 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 175 | 0 | -3.600 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 176 | 0 | -3.600 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 177 | 0 | -3.600 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 178 | 0 | -3.600 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 179 | 0 | -3.600 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 180 | 0 | -3.600 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 181 | 0 | -3.600 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 182 | 0 | -3.600 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 183 | 0 | -3.600 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 184 | 0 | -3.600 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 185 | 0 | -3.600 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 186 | 0 | -3.600 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 187 | 0 | -3.600 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 188 | 0 | -4.200 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 189 | 0 | -4.200 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 190 | 0 | -4.800 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 191 | 0 | -4.800 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 192 | 0 | -4.800 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 193 | 0 | -4.800 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 194 | 0 | -4.800 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 195 | 0 | -4.800 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 196 | 0 | -4.800 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 197 | 0 | -4.800 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 198 | 0 | -4.800 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 199 | 0 | -4.800 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 200 | 0 | -4.800 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 201 | 0 | -4.800 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 202 | 0 | -4.800 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 203 | 0 | -4.800 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 204 | 0 | -4.800 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 205 | 0 | -4.800 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 206 | 0 | -5.400 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 207 | 0 | -5.400 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 208 | 0 | -5.400 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 209 | 0 | -5.400 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 210 | 0 | -5.400 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 211 | 0 | -5.400 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 212 | 0 | -5.400 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 213 | 0 | -5.400 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 214 | 0 | -5.400 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 215 | 0 | -5.400 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 216 | 0 | -5.400 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 217 | 0 | -5.400 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 218 | 0 | -5.400 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 219 | 0 | -5.400 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 220 | 0 | -5.400 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 221 | 0 | -5.400 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 222 | 0 | -6.000 | 8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 223 | 0 | -6.000 | 6.500 | .000 | .00 | .00 | .00 | .23 | .00 |
| 224 | 0 | -6.000 | 5.200 | .000 | .00 | .00 | .00 | .23 | .00 |
| 225 | 0 | -6.000 | 3.900 | .000 | .00 | .00 | .00 | .23 | .00 |
| 226 | 0 | -6.000 | 2.600 | .000 | .00 | .00 | .00 | .23 | .00 |
| 227 | 0 | -6.000 | 1.300 | .000 | .00 | .00 | .00 | .23 | .00 |
| 228 | 0 | -6.000 | .000 | .000 | .00 | .00 | .00 | .23 | .00 |
| 229 | 0 | -6.000 | -1.300 | .000 | .00 | .00 | .00 | .23 | .00 |
| 230 | 0 | -6.000 | -2.600 | .000 | .00 | .00 | .00 | .23 | .00 |
| 231 | 0 | -6.000 | -3.900 | .000 | .00 | .00 | .00 | .23 | .00 |
| 232 | 0 | -6.000 | -5.200 | .000 | .00 | .00 | .00 | .23 | .00 |
| 233 | 0 | -6.000 | -6.500 | .000 | .00 | .00 | .00 | .23 | .00 |
| 234 | 0 | -6.000 | -8.450 | .000 | .00 | .00 | .00 | .23 | .00 |
| 235 | 0 | -6.600 | 9.100 | .000 | .00 | .00 | .00 | .23 | .00 |
| 236 | 0 | -6.600 | 7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 237 | 0 | -6.600 | 7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 238 | 0 | -6.600 | 5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 239 | 0 | -6.600 | 4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 240 | 0 | -6.600 | 3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 241 | 0 | -6.600 | 1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 242 | 0 | -6.600 | .650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 243 | 0 | -6.600 | -.650 | .000 | .00 | .00 | .00 | .23 | .00 |
| 244 | 0 | -6.600 | -1.950 | .000 | .00 | .00 | .00 | .23 | .00 |
| 245 | 0 | -6.600 | -3.250 | .000 | .00 | .00 | .00 | .23 | .00 |
| 246 | 0 | -6.600 | -4.550 | .000 | .00 | .00 | .00 | .23 | .00 |
| 247 | 0 | -6.600 | -5.850 | .000 | .00 | .00 | .00 | .23 | .00 |
| 248 | 0 | -6.600 | -7.150 | .000 | .00 | .00 | .00 | .23 | .00 |
| 249 | 0 | -6.600 | -7.800 | .000 | .00 | .00 | .00 | .23 | .00 |
| 250 | 0 | -6.600 | -9.100 | .000 | .00 | .00 | .00 | .23 | .00 |

```
---------------------------------------------------------------------

vin     = 0 - incastro;   1 - cerniera;   2 - appoggio
X, Y, Z = Coordinate testa pali
axz     = Inclinazione palo nel piano  Xp Z  rispetto alla verticale
             (positiva se verso  Xp positivo)
ayz     = Inclinazione palo nel piano  Yp Z  rispetto alla verticale
             (positiva se verso  Yp  positivo)
axy     = Rotazione assi  Xp Yp     (positiva se antioraria)
Box     = Lato dell'elemento parallelo all'asse  Xp
Boy     = Lato dell'elemento parallelo all'asse  Yp
          se  Boy = 0   D = Box:  diametro
          altrimenti    D = sqr (Box * Boy * 1.273): diametro equivalente
```

Caratterizzazione dei pali soggetti a carichi assiali e torsionali
(uguali per tutti i pali)

| palo | AK kN/m | TK kN*m/rad |
|---|---|---|
| 1 | 100000. | .0 |

AK = Rigidezza assiale palo-terreno
TK = Rigidezza torsionale palo-terreno

Baricentro palificata: Xg = .000 m Yg = .000 m
Rotazione direzioni princip. di inerzia: .00 deg

Caratterizzazione del terreno per pali soggetti a carichi trasversali

Terreno tipo 1

| Prof. m | E kN/m2 |
|---|---|
| .00 | 23000.0 |
| 40.00 | 23000.0 |

Caratterizzazione dei pali soggetti a carichi trasversali
(uguali per tutti i pali)

| palo | Lp m | EJx kN*m2 | Itx | Ridx | EJy kN*m2 | Ity | Ridy |
|---|---|---|---|---|---|---|---|
| 1 | 15.00 | 6975. | 1 | 1.000 | 6975. | 1 | 1.000 |

Lp = Lunghezza palo (compreso eventuale tratto fuori terra)
EJ = Rigidezza flessionale del palo
It = Tipo di terreno
Rid = Moltiplicatore del modulo di reazione orizzontale

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 1
VI08 - P21 - SLV_x

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 25596.4 | 11209.9 | 261289.6 | 4139.8 | 97519.9 | 1189.6 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 43695.4 | 11209.9 | 261289.6 | 4139.8 | 97519.9 | 1189.6 |

Punto di applic. carico verticale: Xv = 5.980 m Yv = 2.232 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.748 | 2.148 | .558 | .746 | .115 | .004 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | 647.7 | 44.0 | -19.1 | 17.1 | -8.1 | .0 | 20.8 |
| 2 | 632.8 | 44.1 | -19.2 | 17.1 | -8.1 | .0 | 20.9 |
| 3 | 625.3 | 44.2 | -19.2 | 17.1 | -8.1 | .0 | 20.9 |
| 4 | 610.4 | 44.3 | -19.3 | 17.1 | -8.1 | .0 | 20.9 |
| 5 | 595.5 | 44.4 | -19.3 | 17.1 | -8.1 | .0 | 21.0 |
| 6 | 580.6 | 44.6 | -19.4 | 17.1 | -8.1 | .0 | 21.0 |
| 7 | 565.7 | 44.7 | -19.5 | 17.1 | -8.1 | .0 | 21.1 |
| 8 | 550.8 | 44.8 | -19.5 | 17.1 | -8.1 | .0 | 21.2 |
| 9 | 535.9 | 44.9 | -19.6 | 17.1 | -8.1 | .0 | 21.2 |
| 10 | 521.0 | 45.0 | -19.6 | 17.1 | -8.1 | .0 | 21.3 |
| 11 | 506.1 | 45.1 | -19.7 | 17.1 | -8.1 | .0 | 21.3 |
| 12 | 491.2 | 45.2 | -19.8 | 17.1 | -8.1 | .0 | 21.4 |
| 13 | 476.3 | 45.4 | -19.8 | 17.1 | -8.1 | .0 | 21.4 |
| 14 | 461.4 | 45.5 | -19.9 | 17.1 | -8.1 | .0 | 21.5 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | 453.9 | 45.5 | -19.9 | 17.1 | -8.1 | .0 | 21.5 |
| 16 | 439.0 | 45.6 | -20.0 | 17.1 | -8.1 | .0 | 21.6 |
| 17 | 606.7 | 44.1 | -19.2 | 17.1 | -8.1 | .0 | 20.8 |
| 18 | 584.4 | 44.3 | -19.3 | 17.1 | -8.1 | .0 | 20.9 |
| 19 | 569.5 | 44.4 | -19.3 | 17.1 | -8.1 | .0 | 21.0 |
| 20 | 554.6 | 44.5 | -19.4 | 17.1 | -8.1 | .0 | 21.0 |
| 21 | 539.7 | 44.6 | -19.4 | 17.1 | -8.1 | .0 | 21.1 |
| 22 | 524.8 | 44.7 | -19.5 | 17.1 | -8.1 | .0 | 21.1 |
| 23 | 509.9 | 44.8 | -19.6 | 17.1 | -8.1 | .0 | 21.2 |
| 24 | 494.9 | 45.0 | -19.6 | 17.1 | -8.1 | .0 | 21.2 |
| 25 | 480.0 | 45.1 | -19.7 | 17.1 | -8.1 | .0 | 21.3 |
| 26 | 465.1 | 45.2 | -19.7 | 17.1 | -8.1 | .0 | 21.3 |
| 27 | 450.2 | 45.3 | -19.8 | 17.1 | -8.1 | .0 | 21.4 |
| 28 | 435.3 | 45.4 | -19.9 | 17.1 | -8.1 | .0 | 21.5 |
| 29 | 413.0 | 45.6 | -19.9 | 17.1 | -8.1 | .0 | 21.5 |
| 30 | 580.7 | 44.0 | -19.1 | 17.0 | -8.1 | .0 | 20.8 |
| 31 | 565.8 | 44.1 | -19.2 | 17.0 | -8.1 | .0 | 20.8 |
| 32 | 558.3 | 44.2 | -19.2 | 17.0 | -8.1 | .0 | 20.9 |
| 33 | 543.4 | 44.3 | -19.3 | 17.0 | -8.1 | .0 | 20.9 |
| 34 | 528.5 | 44.4 | -19.3 | 17.0 | -8.1 | .0 | 21.0 |
| 35 | 513.6 | 44.6 | -19.4 | 17.0 | -8.1 | .0 | 21.0 |
| 36 | 498.7 | 44.7 | -19.5 | 17.0 | -8.1 | .0 | 21.1 |
| 37 | 483.8 | 44.8 | -19.5 | 17.0 | -8.1 | .0 | 21.1 |
| 38 | 468.9 | 44.9 | -19.6 | 17.0 | -8.1 | .0 | 21.2 |
| 39 | 454.0 | 45.0 | -19.6 | 17.0 | -8.1 | .0 | 21.2 |
| 40 | 439.1 | 45.1 | -19.7 | 17.0 | -8.1 | .0 | 21.3 |
| 41 | 424.2 | 45.2 | -19.8 | 17.0 | -8.1 | .0 | 21.4 |
| 42 | 409.3 | 45.4 | -19.8 | 17.0 | -8.1 | .0 | 21.4 |
| 43 | 394.4 | 45.5 | -19.9 | 17.0 | -8.1 | .0 | 21.5 |
| 44 | 386.9 | 45.5 | -19.9 | 17.0 | -8.1 | .0 | 21.5 |
| 45 | 372.0 | 45.6 | -20.0 | 17.0 | -8.1 | .0 | 21.6 |
| 46 | 547.2 | 44.0 | -19.1 | 17.0 | -8.1 | .0 | 20.8 |
| 47 | 532.3 | 44.1 | -19.2 | 17.0 | -8.1 | .0 | 20.8 |
| 48 | 524.8 | 44.2 | -19.2 | 17.0 | -8.1 | .0 | 20.9 |
| 49 | 509.9 | 44.3 | -19.3 | 17.0 | -8.1 | .0 | 20.9 |
| 50 | 495.0 | 44.4 | -19.3 | 17.0 | -8.1 | .0 | 21.0 |
| 51 | 480.1 | 44.6 | -19.4 | 17.0 | -8.1 | .0 | 21.0 |
| 52 | 465.2 | 44.7 | -19.5 | 17.0 | -8.1 | .0 | 21.1 |
| 53 | 450.3 | 44.8 | -19.5 | 17.0 | -8.1 | .0 | 21.1 |
| 54 | 435.4 | 44.9 | -19.6 | 17.0 | -8.1 | .0 | 21.2 |
| 55 | 420.5 | 45.0 | -19.6 | 17.0 | -8.1 | .0 | 21.2 |
| 56 | 405.6 | 45.1 | -19.7 | 17.0 | -8.1 | .0 | 21.3 |
| 57 | 390.7 | 45.2 | -19.8 | 17.0 | -8.1 | .0 | 21.3 |
| 58 | 375.8 | 45.4 | -19.8 | 17.0 | -8.1 | .0 | 21.4 |
| 59 | 360.9 | 45.5 | -19.9 | 17.0 | -8.1 | .0 | 21.5 |
| 60 | 353.4 | 45.5 | -19.9 | 17.0 | -8.1 | .0 | 21.5 |
| 61 | 338.5 | 45.6 | -20.0 | 17.0 | -8.1 | .0 | 21.5 |
| 62 | 506.2 | 44.1 | -19.2 | 16.9 | -8.0 | .0 | 20.8 |
| 63 | 312.4 | 45.6 | -19.9 | 16.9 | -8.0 | .0 | 21.5 |
| 64 | 480.2 | 44.0 | -19.1 | 16.9 | -8.0 | .0 | 20.7 |
| 65 | 465.3 | 44.1 | -19.2 | 16.9 | -8.0 | .0 | 20.8 |
| 66 | 457.8 | 44.2 | -19.2 | 16.9 | -8.0 | .0 | 20.8 |
| 67 | 442.9 | 44.3 | -19.3 | 16.9 | -8.0 | .0 | 20.9 |
| 68 | 428.0 | 44.4 | -19.3 | 16.9 | -8.0 | .0 | 20.9 |
| 69 | 413.1 | 44.6 | -19.4 | 16.9 | -8.0 | .0 | 21.0 |
| 70 | 398.2 | 44.7 | -19.5 | 16.9 | -8.0 | .0 | 21.1 |
| 71 | 383.3 | 44.8 | -19.5 | 16.9 | -8.0 | .0 | 21.1 |
| 72 | 368.4 | 44.9 | -19.6 | 16.9 | -8.0 | .0 | 21.2 |
| 73 | 353.5 | 45.0 | -19.6 | 16.9 | -8.0 | .0 | 21.2 |
| 74 | 338.6 | 45.1 | -19.7 | 16.9 | -8.0 | .0 | 21.3 |
| 75 | 323.7 | 45.2 | -19.8 | 16.9 | -8.0 | .0 | 21.3 |
| 76 | 308.8 | 45.4 | -19.8 | 16.9 | -8.0 | .0 | 21.4 |
| 77 | 293.8 | 45.5 | -19.9 | 16.9 | -8.0 | .0 | 21.4 |
| 78 | 286.4 | 45.5 | -19.9 | 16.9 | -8.0 | .0 | 21.5 |
| 79 | 271.5 | 45.6 | -20.0 | 16.9 | -8.0 | .0 | 21.5 |
| 80 | 439.2 | 44.1 | -19.2 | 16.8 | -8.0 | .0 | 20.8 |
| 81 | 245.4 | 45.6 | -19.9 | 16.8 | -8.0 | .0 | 21.5 |
| 82 | 413.1 | 44.0 | -19.1 | 16.8 | -8.0 | .0 | 20.7 |
| 83 | 398.2 | 44.1 | -19.2 | 16.8 | -8.0 | .0 | 20.8 |
| 84 | 390.8 | 44.2 | -19.2 | 16.8 | -8.0 | .0 | 20.8 |
| 85 | 375.9 | 44.3 | -19.3 | 16.8 | -8.0 | .0 | 20.9 |
| 86 | 361.0 | 44.4 | -19.3 | 16.8 | -8.0 | .0 | 20.9 |
| 87 | 346.1 | 44.6 | -19.4 | 16.8 | -8.0 | .0 | 21.0 |
| 88 | 331.2 | 44.7 | -19.5 | 16.8 | -8.0 | .0 | 21.0 |
| 89 | 316.3 | 44.8 | -19.5 | 16.8 | -8.0 | .0 | 21.1 |
| 90 | 301.4 | 44.9 | -19.6 | 16.8 | -8.0 | .0 | 21.1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 91 | 286.5 | 45.0 | -19.6 | 16.8 | -8.0 | .0 | 21.2 |
| 92 | 271.5 | 45.1 | -19.7 | 16.8 | -8.0 | .0 | 21.3 |
| 93 | 256.6 | 45.2 | -19.8 | 16.8 | -8.0 | .0 | 21.3 |
| 94 | 241.7 | 45.4 | -19.8 | 16.8 | -8.0 | .0 | 21.4 |
| 95 | 226.8 | 45.5 | -19.9 | 16.8 | -8.0 | .0 | 21.4 |
| 96 | 219.4 | 45.5 | -19.9 | 16.8 | -8.0 | .0 | 21.4 |
| 97 | 204.5 | 45.6 | -20.0 | 16.8 | -8.0 | .0 | 21.5 |
| 98 | 372.2 | 44.1 | -19.2 | 16.7 | -7.9 | .0 | 20.7 |
| 99 | 178.4 | 45.6 | -19.9 | 16.7 | -7.9 | .0 | 21.5 |
| 100 | 346.1 | 44.0 | -19.1 | 16.7 | -7.9 | .0 | 20.7 |
| 101 | 331.2 | 44.1 | -19.2 | 16.7 | -7.9 | .0 | 20.8 |
| 102 | 323.8 | 44.2 | -19.2 | 16.7 | -7.9 | .0 | 20.8 |
| 103 | 308.9 | 44.3 | -19.3 | 16.7 | -7.9 | .0 | 20.8 |
| 104 | 294.0 | 44.4 | -19.3 | 16.7 | -7.9 | .0 | 20.9 |
| 105 | 279.1 | 44.6 | -19.4 | 16.7 | -7.9 | .0 | 21.0 |
| 106 | 264.2 | 44.7 | -19.5 | 16.7 | -7.9 | .0 | 21.0 |
| 107 | 249.2 | 44.8 | -19.5 | 16.7 | -7.9 | .0 | 21.1 |
| 108 | 234.3 | 44.9 | -19.6 | 16.7 | -7.9 | .0 | 21.1 |
| 109 | 219.4 | 45.0 | -19.6 | 16.7 | -7.9 | .0 | 21.2 |
| 110 | 204.5 | 45.1 | -19.7 | 16.7 | -7.9 | .0 | 21.2 |
| 111 | 189.6 | 45.2 | -19.8 | 16.7 | -7.9 | .0 | 21.3 |
| 112 | 174.7 | 45.4 | -19.8 | 16.7 | -7.9 | .0 | 21.3 |
| 113 | 159.8 | 45.5 | -19.9 | 16.7 | -7.9 | .0 | 21.4 |
| 114 | 152.4 | 45.5 | -19.9 | 16.7 | -7.9 | .0 | 21.4 |
| 115 | 137.5 | 45.6 | -20.0 | 16.7 | -7.9 | .0 | 21.5 |
| 116 | 305.2 | 44.1 | -19.2 | 16.6 | -7.9 | .0 | 20.7 |
| 117 | 111.4 | 45.6 | -19.9 | 16.6 | -7.9 | .0 | 21.4 |
| 118 | 279.1 | 44.0 | -19.1 | 16.6 | -7.8 | .0 | 20.7 |
| 119 | 264.2 | 44.1 | -19.2 | 16.6 | -7.8 | .0 | 20.7 |
| 120 | 256.8 | 44.2 | -19.2 | 16.6 | -7.8 | .0 | 20.8 |
| 121 | 241.9 | 44.3 | -19.3 | 16.6 | -7.8 | .0 | 20.8 |
| 122 | 226.9 | 44.4 | -19.3 | 16.6 | -7.8 | .0 | 20.9 |
| 123 | 212.0 | 44.6 | -19.4 | 16.6 | -7.8 | .0 | 20.9 |
| 124 | 197.1 | 44.7 | -19.5 | 16.6 | -7.8 | .0 | 21.0 |
| 125 | 182.2 | 44.8 | -19.5 | 16.6 | -7.8 | .0 | 21.0 |
| 126 | 167.3 | 44.9 | -19.6 | 16.6 | -7.8 | .0 | 21.1 |
| 127 | 152.4 | 45.0 | -19.6 | 16.6 | -7.8 | .0 | 21.2 |
| 128 | 137.5 | 45.1 | -19.7 | 16.6 | -7.8 | .0 | 21.2 |
| 129 | 122.6 | 45.2 | -19.8 | 16.6 | -7.8 | .0 | 21.3 |
| 130 | 107.7 | 45.4 | -19.8 | 16.6 | -7.8 | .0 | 21.3 |
| 131 | 92.8 | 45.5 | -19.9 | 16.6 | -7.8 | .0 | 21.4 |
| 132 | 85.4 | 45.5 | -19.9 | 16.6 | -7.8 | .0 | 21.4 |
| 133 | 70.4 | 45.6 | -20.0 | 16.6 | -7.8 | .0 | 21.5 |
| 134 | 238.2 | 44.1 | -19.2 | 16.5 | -7.8 | .0 | 20.7 |
| 135 | 44.4 | 45.6 | -19.9 | 16.5 | -7.8 | .0 | 21.4 |
| 136 | 212.1 | 44.0 | -19.1 | 16.5 | -7.8 | .0 | 20.7 |
| 137 | 197.2 | 44.1 | -19.2 | 16.5 | -7.8 | .0 | 20.7 |
| 138 | 189.7 | 44.2 | -19.2 | 16.5 | -7.8 | .0 | 20.7 |
| 139 | 174.8 | 44.3 | -19.3 | 16.5 | -7.8 | .0 | 20.8 |
| 140 | 159.9 | 44.4 | -19.3 | 16.5 | -7.8 | .0 | 20.9 |
| 141 | 145.0 | 44.6 | -19.4 | 16.5 | -7.8 | .0 | 20.9 |
| 142 | 130.1 | 44.7 | -19.5 | 16.5 | -7.8 | .0 | 21.0 |
| 143 | 115.2 | 44.8 | -19.5 | 16.5 | -7.8 | .0 | 21.0 |
| 144 | 100.3 | 44.9 | -19.6 | 16.5 | -7.8 | .0 | 21.1 |
| 145 | 85.4 | 45.0 | -19.6 | 16.5 | -7.8 | .0 | 21.1 |
| 146 | 70.5 | 45.1 | -19.7 | 16.5 | -7.8 | .0 | 21.2 |
| 147 | 55.6 | 45.2 | -19.8 | 16.5 | -7.8 | .0 | 21.2 |
| 148 | 40.7 | 45.4 | -19.8 | 16.5 | -7.8 | .0 | 21.3 |
| 149 | 25.8 | 45.5 | -19.9 | 16.5 | -7.8 | .0 | 21.4 |
| 150 | 18.3 | 45.5 | -19.9 | 16.5 | -7.8 | .0 | 21.4 |
| 151 | 3.4 | 45.6 | -20.0 | 16.5 | -7.8 | .0 | 21.4 |
| 152 | 171.1 | 44.1 | -19.2 | 16.4 | -7.8 | .0 | 20.7 |
| 153 | -22.6 | 45.6 | -19.9 | 16.4 | -7.8 | .0 | 21.4 |
| 154 | 145.1 | 44.0 | -19.1 | 16.3 | -7.7 | .0 | 20.6 |
| 155 | 130.2 | 44.1 | -19.2 | 16.3 | -7.7 | .0 | 20.7 |
| 156 | 122.7 | 44.2 | -19.2 | 16.3 | -7.7 | .0 | 20.7 |
| 157 | 107.8 | 44.3 | -19.3 | 16.3 | -7.7 | .0 | 20.8 |
| 158 | 92.9 | 44.4 | -19.3 | 16.3 | -7.7 | .0 | 20.8 |
| 159 | 78.0 | 44.6 | -19.4 | 16.3 | -7.7 | .0 | 20.9 |
| 160 | 63.1 | 44.7 | -19.5 | 16.3 | -7.7 | .0 | 20.9 |
| 161 | 48.2 | 44.8 | -19.5 | 16.3 | -7.7 | .0 | 21.0 |
| 162 | 33.3 | 44.9 | -19.6 | 16.3 | -7.7 | .0 | 21.1 |
| 163 | 18.4 | 45.0 | -19.6 | 16.3 | -7.7 | .0 | 21.1 |
| 164 | 3.5 | 45.1 | -19.7 | 16.3 | -7.7 | .0 | 21.2 |
| 165 | -11.4 | 45.2 | -19.8 | 16.3 | -7.7 | .0 | 21.2 |
| 166 | -26.3 | 45.4 | -19.8 | 16.3 | -7.7 | .0 | 21.3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 167 | -41.2 | 45.5 | -19.9 | 16.3 | -7.7 | .0 | 21.3 |
| 168 | -48.7 | 45.5 | -19.9 | 16.3 | -7.7 | .0 | 21.4 |
| 169 | -63.6 | 45.6 | -20.0 | 16.3 | -7.7 | .0 | 21.4 |
| 170 | 104.1 | 44.1 | -19.2 | 16.3 | -7.7 | .0 | 20.7 |
| 171 | -89.6 | 45.6 | -19.9 | 16.3 | -7.7 | .0 | 21.4 |
| 172 | 78.1 | 44.0 | -19.1 | 16.2 | -7.7 | .0 | 20.6 |
| 173 | 63.2 | 44.1 | -19.2 | 16.2 | -7.7 | .0 | 20.7 |
| 174 | 55.7 | 44.2 | -19.2 | 16.2 | -7.7 | .0 | 20.7 |
| 175 | 40.8 | 44.3 | -19.3 | 16.2 | -7.7 | .0 | 20.8 |
| 176 | 25.9 | 44.4 | -19.3 | 16.2 | -7.7 | .0 | 20.8 |
| 177 | 11.0 | 44.6 | -19.4 | 16.2 | -7.7 | .0 | 20.9 |
| 178 | -3.9 | 44.7 | -19.5 | 16.2 | -7.7 | .0 | 20.9 |
| 179 | -18.8 | 44.8 | -19.5 | 16.2 | -7.7 | .0 | 21.0 |
| 180 | -33.7 | 44.9 | -19.6 | 16.2 | -7.7 | .0 | 21.0 |
| 181 | -48.6 | 45.0 | -19.6 | 16.2 | -7.7 | .0 | 21.1 |
| 182 | -63.5 | 45.1 | -19.7 | 16.2 | -7.7 | .0 | 21.2 |
| 183 | -78.4 | 45.2 | -19.8 | 16.2 | -7.7 | .0 | 21.2 |
| 184 | -93.3 | 45.4 | -19.8 | 16.2 | -7.7 | .0 | 21.3 |
| 185 | -108.2 | 45.5 | -19.9 | 16.2 | -7.7 | .0 | 21.3 |
| 186 | -115.7 | 45.5 | -19.9 | 16.2 | -7.7 | .0 | 21.3 |
| 187 | -130.6 | 45.6 | -20.0 | 16.2 | -7.7 | .0 | 21.4 |
| 188 | 37.1 | 44.1 | -19.2 | 16.2 | -7.6 | .0 | 20.6 |
| 189 | -156.7 | 45.6 | -19.9 | 16.2 | -7.6 | .0 | 21.4 |
| 190 | 11.1 | 44.0 | -19.1 | 16.1 | -7.6 | .0 | 20.6 |
| 191 | -3.8 | 44.1 | -19.2 | 16.1 | -7.6 | .0 | 20.7 |
| 192 | -11.3 | 44.2 | -19.2 | 16.1 | -7.6 | .0 | 20.7 |
| 193 | -26.2 | 44.3 | -19.3 | 16.1 | -7.6 | .0 | 20.7 |
| 194 | -41.1 | 44.4 | -19.3 | 16.1 | -7.6 | .0 | 20.8 |
| 195 | -56.0 | 44.6 | -19.4 | 16.1 | -7.6 | .0 | 20.9 |
| 196 | -70.9 | 44.7 | -19.5 | 16.1 | -7.6 | .0 | 20.9 |
| 197 | -85.8 | 44.8 | -19.5 | 16.1 | -7.6 | .0 | 21.0 |
| 198 | -100.7 | 44.9 | -19.6 | 16.1 | -7.6 | .0 | 21.0 |
| 199 | -115.6 | 45.0 | -19.6 | 16.1 | -7.6 | .0 | 21.1 |
| 200 | -130.5 | 45.1 | -19.7 | 16.1 | -7.6 | .0 | 21.1 |
| 201 | -145.4 | 45.2 | -19.8 | 16.1 | -7.6 | .0 | 21.2 |
| 202 | -160.3 | 45.4 | -19.8 | 16.1 | -7.6 | .0 | 21.2 |
| 203 | -175.3 | 45.5 | -19.9 | 16.1 | -7.6 | .0 | 21.3 |
| 204 | -182.7 | 45.5 | -19.9 | 16.1 | -7.6 | .0 | 21.3 |
| 205 | -197.6 | 45.6 | -20.0 | 16.1 | -7.6 | .0 | 21.4 |
| 206 | -22.4 | 44.0 | -19.1 | 16.1 | -7.6 | .0 | 20.6 |
| 207 | -37.4 | 44.1 | -19.2 | 16.1 | -7.6 | .0 | 20.6 |
| 208 | -44.8 | 44.2 | -19.2 | 16.1 | -7.6 | .0 | 20.7 |
| 209 | -59.7 | 44.3 | -19.3 | 16.1 | -7.6 | .0 | 20.7 |
| 210 | -74.6 | 44.4 | -19.3 | 16.1 | -7.6 | .0 | 20.8 |
| 211 | -89.5 | 44.6 | -19.4 | 16.1 | -7.6 | .0 | 20.8 |
| 212 | -104.4 | 44.7 | -19.5 | 16.1 | -7.6 | .0 | 20.9 |
| 213 | -119.3 | 44.8 | -19.5 | 16.1 | -7.6 | .0 | 21.0 |
| 214 | -134.2 | 44.9 | -19.6 | 16.1 | -7.6 | .0 | 21.0 |
| 215 | -149.1 | 45.0 | -19.6 | 16.1 | -7.6 | .0 | 21.1 |
| 216 | -164.0 | 45.1 | -19.7 | 16.1 | -7.6 | .0 | 21.1 |
| 217 | -178.9 | 45.2 | -19.8 | 16.1 | -7.6 | .0 | 21.2 |
| 218 | -193.9 | 45.4 | -19.8 | 16.1 | -7.6 | .0 | 21.2 |
| 219 | -208.8 | 45.5 | -19.9 | 16.1 | -7.6 | .0 | 21.3 |
| 220 | -216.2 | 45.5 | -19.9 | 16.1 | -7.6 | .0 | 21.3 |
| 221 | -231.1 | 45.6 | -20.0 | 16.1 | -7.6 | .0 | 21.4 |
| 222 | -63.4 | 44.1 | -19.2 | 16.0 | -7.6 | .0 | 20.6 |
| 223 | -85.8 | 44.3 | -19.3 | 16.0 | -7.6 | .0 | 20.7 |
| 224 | -100.7 | 44.4 | -19.3 | 16.0 | -7.6 | .0 | 20.7 |
| 225 | -115.6 | 44.5 | -19.4 | 16.0 | -7.6 | .0 | 20.8 |
| 226 | -130.5 | 44.6 | -19.4 | 16.0 | -7.6 | .0 | 20.9 |
| 227 | -145.4 | 44.7 | -19.5 | 16.0 | -7.6 | .0 | 20.9 |
| 228 | -160.3 | 44.8 | -19.6 | 16.0 | -7.6 | .0 | 21.0 |
| 229 | -175.2 | 45.0 | -19.6 | 16.0 | -7.6 | .0 | 21.0 |
| 230 | -190.1 | 45.1 | -19.7 | 16.0 | -7.6 | .0 | 21.1 |
| 231 | -205.0 | 45.2 | -19.7 | 16.0 | -7.6 | .0 | 21.1 |
| 232 | -219.9 | 45.3 | -19.8 | 16.0 | -7.6 | .0 | 21.2 |
| 233 | -234.8 | 45.4 | -19.9 | 16.0 | -7.6 | .0 | 21.3 |
| 234 | -257.2 | 45.6 | -19.9 | 16.0 | -7.6 | .0 | 21.3 |
| 235 | -89.5 | 44.0 | -19.1 | 16.0 | -7.5 | .0 | 20.6 |
| 236 | -104.4 | 44.1 | -19.2 | 16.0 | -7.5 | .0 | 20.6 |
| 237 | -111.8 | 44.2 | -19.2 | 16.0 | -7.5 | .0 | 20.7 |
| 238 | -126.7 | 44.3 | -19.3 | 16.0 | -7.5 | .0 | 20.7 |
| 239 | -141.6 | 44.4 | -19.3 | 16.0 | -7.5 | .0 | 20.8 |
| 240 | -156.5 | 44.6 | -19.4 | 16.0 | -7.5 | .0 | 20.8 |
| 241 | -171.4 | 44.7 | -19.5 | 16.0 | -7.5 | .0 | 20.9 |
| 242 | -186.3 | 44.8 | -19.5 | 16.0 | -7.5 | .0 | 20.9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 243 | -201.2 | 44.9 | -19.6 | 16.0 | -7.5 | .0 | 21.0 |
| 244 | -216.2 | 45.0 | -19.6 | 16.0 | -7.5 | .0 | 21.0 |
| 245 | -231.1 | 45.1 | -19.7 | 16.0 | -7.5 | .0 | 21.1 |
| 246 | -246.0 | 45.2 | -19.8 | 16.0 | -7.5 | .0 | 21.2 |
| 247 | -260.9 | 45.4 | -19.8 | 16.0 | -7.5 | .0 | 21.2 |
| 248 | -275.8 | 45.5 | -19.9 | 16.0 | -7.5 | .0 | 21.3 |
| 249 | -283.2 | 45.5 | -19.9 | 16.0 | -7.5 | .0 | 21.3 |
| 250 | -298.1 | 45.6 | -20.0 | 16.0 | -7.5 | .0 | 21.4 |

Mris = (Mxp^2 + Myp^2)^0.5

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 2
VI08 - P21 - SLV_x

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 22201.9 | -11209.9 | -260797.6 | -4139.8 | -97519.9 | -1189.6 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 40300.9 | -11209.9 | -260797.6 | -4139.8 | -97519.9 | -1189.6 |

Punto di applic. carico verticale: Xv = -6.471 m Yv = -2.420 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.612 | -2.148 | -.557 | -.746 | -.115 | -.004 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | -311.0 | -44.0 | 19.1 | -17.1 | 8.1 | .0 | 20.8 |
| 2 | -296.1 | -44.1 | 19.2 | -17.1 | 8.1 | .0 | 20.9 |
| 3 | -288.7 | -44.2 | 19.2 | -17.1 | 8.1 | .0 | 20.9 |
| 4 | -273.8 | -44.3 | 19.3 | -17.1 | 8.1 | .0 | 20.9 |
| 5 | -258.9 | -44.4 | 19.4 | -17.1 | 8.1 | .0 | 21.0 |
| 6 | -244.0 | -44.6 | 19.4 | -17.1 | 8.1 | .0 | 21.1 |
| 7 | -229.1 | -44.7 | 19.5 | -17.1 | 8.1 | .0 | 21.1 |
| 8 | -214.1 | -44.8 | 19.5 | -17.1 | 8.1 | .0 | 21.2 |
| 9 | -199.2 | -44.9 | 19.6 | -17.1 | 8.1 | .0 | 21.2 |
| 10 | -184.3 | -45.0 | 19.7 | -17.1 | 8.1 | .0 | 21.3 |
| 11 | -169.4 | -45.1 | 19.7 | -17.1 | 8.1 | .0 | 21.3 |
| 12 | -154.5 | -45.2 | 19.8 | -17.1 | 8.1 | .0 | 21.4 |
| 13 | -139.6 | -45.4 | 19.8 | -17.1 | 8.1 | .0 | 21.4 |
| 14 | -124.7 | -45.5 | 19.9 | -17.1 | 8.1 | .0 | 21.5 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | -117.3 | -45.5 | 19.9 | -17.1 | 8.1 | .0 | 21.5 |
| 16 | -102.4 | -45.6 | 20.0 | -17.1 | 8.1 | .0 | 21.6 |
| 17 | -270.1 | -44.1 | 19.2 | -17.1 | 8.1 | .0 | 20.8 |
| 18 | -247.8 | -44.3 | 19.3 | -17.1 | 8.1 | .0 | 20.9 |
| 19 | -232.9 | -44.4 | 19.3 | -17.1 | 8.1 | .0 | 21.0 |
| 20 | -218.0 | -44.5 | 19.4 | -17.1 | 8.1 | .0 | 21.0 |
| 21 | -203.1 | -44.6 | 19.4 | -17.1 | 8.1 | .0 | 21.1 |
| 22 | -188.2 | -44.7 | 19.5 | -17.1 | 8.1 | .0 | 21.1 |
| 23 | -173.2 | -44.8 | 19.6 | -17.1 | 8.1 | .0 | 21.2 |
| 24 | -158.3 | -45.0 | 19.6 | -17.1 | 8.1 | .0 | 21.2 |
| 25 | -143.4 | -45.1 | 19.7 | -17.1 | 8.1 | .0 | 21.3 |
| 26 | -128.5 | -45.2 | 19.7 | -17.1 | 8.1 | .0 | 21.3 |
| 27 | -113.6 | -45.3 | 19.8 | -17.1 | 8.1 | .0 | 21.4 |
| 28 | -98.7 | -45.4 | 19.9 | -17.1 | 8.1 | .0 | 21.5 |
| 29 | -76.4 | -45.6 | 20.0 | -17.1 | 8.1 | .0 | 21.5 |
| 30 | -244.1 | -44.0 | 19.1 | -17.0 | 8.1 | .0 | 20.8 |
| 31 | -229.2 | -44.1 | 19.2 | -17.0 | 8.1 | .0 | 20.8 |
| 32 | -221.8 | -44.2 | 19.2 | -17.0 | 8.1 | .0 | 20.9 |
| 33 | -206.9 | -44.3 | 19.3 | -17.0 | 8.1 | .0 | 20.9 |
| 34 | -192.0 | -44.4 | 19.4 | -17.0 | 8.1 | .0 | 21.0 |
| 35 | -177.1 | -44.6 | 19.4 | -17.0 | 8.1 | .0 | 21.0 |
| 36 | -162.2 | -44.7 | 19.5 | -17.0 | 8.1 | .0 | 21.1 |
| 37 | -147.3 | -44.8 | 19.5 | -17.0 | 8.1 | .0 | 21.1 |
| 38 | -132.4 | -44.9 | 19.6 | -17.0 | 8.1 | .0 | 21.2 |
| 39 | -117.4 | -45.0 | 19.7 | -17.0 | 8.1 | .0 | 21.3 |
| 40 | -102.5 | -45.1 | 19.7 | -17.0 | 8.1 | .0 | 21.3 |
| 41 | -87.6 | -45.2 | 19.8 | -17.0 | 8.1 | .0 | 21.4 |
| 42 | -72.7 | -45.4 | 19.8 | -17.0 | 8.1 | .0 | 21.4 |
| 43 | -57.8 | -45.5 | 19.9 | -17.0 | 8.1 | .0 | 21.5 |
| 44 | -50.4 | -45.5 | 19.9 | -17.0 | 8.1 | .0 | 21.5 |
| 45 | -35.5 | -45.6 | 20.0 | -17.0 | 8.1 | .0 | 21.6 |
| 46 | -210.7 | -44.0 | 19.1 | -17.0 | 8.1 | .0 | 20.8 |
| 47 | -195.8 | -44.1 | 19.2 | -17.0 | 8.1 | .0 | 20.8 |
| 48 | -188.3 | -44.2 | 19.2 | -17.0 | 8.1 | .0 | 20.9 |
| 49 | -173.4 | -44.3 | 19.3 | -17.0 | 8.1 | .0 | 20.9 |
| 50 | -158.5 | -44.4 | 19.4 | -17.0 | 8.1 | .0 | 21.0 |
| 51 | -143.6 | -44.6 | 19.4 | -17.0 | 8.1 | .0 | 21.0 |
| 52 | -128.7 | -44.7 | 19.5 | -17.0 | 8.1 | .0 | 21.1 |
| 53 | -113.8 | -44.8 | 19.5 | -17.0 | 8.1 | .0 | 21.1 |
| 54 | -98.9 | -44.9 | 19.6 | -17.0 | 8.1 | .0 | 21.2 |
| 55 | -84.0 | -45.0 | 19.7 | -17.0 | 8.1 | .0 | 21.2 |
| 56 | -69.1 | -45.1 | 19.7 | -17.0 | 8.1 | .0 | 21.3 |
| 57 | -54.2 | -45.2 | 19.8 | -17.0 | 8.1 | .0 | 21.4 |
| 58 | -39.3 | -45.4 | 19.8 | -17.0 | 8.1 | .0 | 21.4 |
| 59 | -24.4 | -45.5 | 19.9 | -17.0 | 8.1 | .0 | 21.5 |
| 60 | -16.9 | -45.5 | 19.9 | -17.0 | 8.1 | .0 | 21.5 |
| 61 | -2.0 | -45.6 | 20.0 | -17.0 | 8.1 | .0 | 21.5 |
| 62 | -169.8 | -44.1 | 19.2 | -16.9 | 8.0 | .0 | 20.8 |
| 63 | 24.0 | -45.6 | 20.0 | -16.9 | 8.0 | .0 | 21.5 |
| 64 | -143.8 | -44.0 | 19.1 | -16.9 | 8.0 | .0 | 20.8 |
| 65 | -128.9 | -44.1 | 19.2 | -16.9 | 8.0 | .0 | 20.8 |
| 66 | -121.4 | -44.2 | 19.2 | -16.9 | 8.0 | .0 | 20.8 |
| 67 | -106.5 | -44.3 | 19.3 | -16.9 | 8.0 | .0 | 20.9 |
| 68 | -91.6 | -44.4 | 19.4 | -16.9 | 8.0 | .0 | 20.9 |
| 69 | -76.7 | -44.6 | 19.4 | -16.9 | 8.0 | .0 | 21.0 |
| 70 | -61.8 | -44.7 | 19.5 | -16.9 | 8.0 | .0 | 21.1 |
| 71 | -46.9 | -44.8 | 19.5 | -16.9 | 8.0 | .0 | 21.1 |
| 72 | -32.0 | -44.9 | 19.6 | -16.9 | 8.0 | .0 | 21.2 |
| 73 | -17.1 | -45.0 | 19.7 | -16.9 | 8.0 | .0 | 21.2 |
| 74 | -2.2 | -45.1 | 19.7 | -16.9 | 8.0 | .0 | 21.3 |
| 75 | 12.7 | -45.2 | 19.8 | -16.9 | 8.0 | .0 | 21.3 |
| 76 | 27.6 | -45.4 | 19.8 | -16.9 | 8.0 | .0 | 21.4 |
| 77 | 42.5 | -45.5 | 19.9 | -16.9 | 8.0 | .0 | 21.4 |
| 78 | 50.0 | -45.5 | 19.9 | -16.9 | 8.0 | .0 | 21.5 |
| 79 | 64.9 | -45.6 | 20.0 | -16.9 | 8.0 | .0 | 21.5 |
| 80 | -102.9 | -44.1 | 19.2 | -16.8 | 8.0 | .0 | 20.8 |
| 81 | 90.9 | -45.6 | 20.0 | -16.8 | 8.0 | .0 | 21.5 |
| 82 | -76.9 | -44.0 | 19.1 | -16.8 | 8.0 | .0 | 20.7 |
| 83 | -62.0 | -44.1 | 19.2 | -16.8 | 8.0 | .0 | 20.8 |
| 84 | -54.6 | -44.2 | 19.2 | -16.8 | 8.0 | .0 | 20.8 |
| 85 | -39.7 | -44.3 | 19.3 | -16.8 | 8.0 | .0 | 20.9 |
| 86 | -24.7 | -44.4 | 19.4 | -16.8 | 8.0 | .0 | 20.9 |
| 87 | -9.8 | -44.6 | 19.4 | -16.8 | 8.0 | .0 | 21.0 |
| 88 | 5.1 | -44.7 | 19.5 | -16.8 | 8.0 | .0 | 21.0 |
| 89 | 20.0 | -44.8 | 19.5 | -16.8 | 8.0 | .0 | 21.1 |
| 90 | 34.9 | -44.9 | 19.6 | -16.8 | 8.0 | .0 | 21.1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 91 | 49.8 | -45.0 | 19.7 | -16.8 | 8.0 | .0 | 21.2 |
| 92 | 64.7 | -45.1 | 19.7 | -16.8 | 8.0 | .0 | 21.3 |
| 93 | 79.6 | -45.2 | 19.8 | -16.8 | 8.0 | .0 | 21.3 |
| 94 | 94.5 | -45.4 | 19.8 | -16.8 | 8.0 | .0 | 21.4 |
| 95 | 109.4 | -45.5 | 19.9 | -16.8 | 8.0 | .0 | 21.4 |
| 96 | 116.9 | -45.5 | 19.9 | -16.8 | 8.0 | .0 | 21.5 |
| 97 | 131.8 | -45.6 | 20.0 | -16.8 | 8.0 | .0 | 21.5 |
| 98 | -36.0 | -44.1 | 19.2 | -16.7 | 7.9 | .0 | 20.7 |
| 99 | 157.8 | -45.6 | 20.0 | -16.7 | 7.9 | .0 | 21.5 |
| 100 | -10.0 | -44.0 | 19.1 | -16.7 | 7.9 | .0 | 20.7 |
| 101 | 4.9 | -44.1 | 19.2 | -16.7 | 7.9 | .0 | 20.8 |
| 102 | 12.3 | -44.2 | 19.2 | -16.7 | 7.9 | .0 | 20.8 |
| 103 | 27.2 | -44.3 | 19.3 | -16.7 | 7.9 | .0 | 20.8 |
| 104 | 42.1 | -44.4 | 19.4 | -16.7 | 7.9 | .0 | 20.9 |
| 105 | 57.1 | -44.6 | 19.4 | -16.7 | 7.9 | .0 | 21.0 |
| 106 | 72.0 | -44.7 | 19.5 | -16.7 | 7.9 | .0 | 21.0 |
| 107 | 86.9 | -44.8 | 19.5 | -16.7 | 7.9 | .0 | 21.1 |
| 108 | 101.8 | -44.9 | 19.6 | -16.7 | 7.9 | .0 | 21.1 |
| 109 | 116.7 | -45.0 | 19.7 | -16.7 | 7.9 | .0 | 21.2 |
| 110 | 131.6 | -45.1 | 19.7 | -16.7 | 7.9 | .0 | 21.2 |
| 111 | 146.5 | -45.2 | 19.8 | -16.7 | 7.9 | .0 | 21.3 |
| 112 | 161.4 | -45.4 | 19.8 | -16.7 | 7.9 | .0 | 21.3 |
| 113 | 176.3 | -45.5 | 19.9 | -16.7 | 7.9 | .0 | 21.4 |
| 114 | 183.7 | -45.5 | 19.9 | -16.7 | 7.9 | .0 | 21.4 |
| 115 | 198.6 | -45.6 | 20.0 | -16.7 | 7.9 | .0 | 21.5 |
| 116 | 30.9 | -44.1 | 19.2 | -16.6 | 7.9 | .0 | 20.7 |
| 117 | 224.6 | -45.6 | 20.0 | -16.6 | 7.9 | .0 | 21.5 |
| 118 | 56.9 | -44.0 | 19.1 | -16.6 | 7.8 | .0 | 20.7 |
| 119 | 71.8 | -44.1 | 19.2 | -16.6 | 7.8 | .0 | 20.7 |
| 120 | 79.2 | -44.2 | 19.2 | -16.6 | 7.8 | .0 | 20.8 |
| 121 | 94.1 | -44.3 | 19.3 | -16.6 | 7.8 | .0 | 20.8 |
| 122 | 109.0 | -44.4 | 19.4 | -16.6 | 7.8 | .0 | 20.9 |
| 123 | 123.9 | -44.6 | 19.4 | -16.6 | 7.8 | .0 | 20.9 |
| 124 | 138.8 | -44.7 | 19.5 | -16.6 | 7.8 | .0 | 21.0 |
| 125 | 153.8 | -44.8 | 19.5 | -16.6 | 7.8 | .0 | 21.1 |
| 126 | 168.7 | -44.9 | 19.6 | -16.6 | 7.8 | .0 | 21.1 |
| 127 | 183.6 | -45.0 | 19.7 | -16.6 | 7.8 | .0 | 21.2 |
| 128 | 198.5 | -45.1 | 19.7 | -16.6 | 7.8 | .0 | 21.2 |
| 129 | 213.4 | -45.2 | 19.8 | -16.6 | 7.8 | .0 | 21.3 |
| 130 | 228.3 | -45.4 | 19.8 | -16.6 | 7.8 | .0 | 21.3 |
| 131 | 243.2 | -45.5 | 19.9 | -16.6 | 7.8 | .0 | 21.4 |
| 132 | 250.6 | -45.5 | 19.9 | -16.6 | 7.8 | .0 | 21.4 |
| 133 | 265.5 | -45.6 | 20.0 | -16.6 | 7.8 | .0 | 21.5 |
| 134 | 97.8 | -44.1 | 19.2 | -16.5 | 7.8 | .0 | 20.7 |
| 135 | 291.5 | -45.6 | 20.0 | -16.5 | 7.8 | .0 | 21.4 |
| 136 | 123.8 | -44.0 | 19.1 | -16.5 | 7.8 | .0 | 20.7 |
| 137 | 138.7 | -44.1 | 19.2 | -16.5 | 7.8 | .0 | 20.7 |
| 138 | 146.1 | -44.2 | 19.2 | -16.5 | 7.8 | .0 | 20.8 |
| 139 | 161.0 | -44.3 | 19.3 | -16.5 | 7.8 | .0 | 20.8 |
| 140 | 175.9 | -44.4 | 19.4 | -16.5 | 7.8 | .0 | 20.9 |
| 141 | 190.8 | -44.6 | 19.4 | -16.5 | 7.8 | .0 | 20.9 |
| 142 | 205.7 | -44.7 | 19.5 | -16.5 | 7.8 | .0 | 21.0 |
| 143 | 220.6 | -44.8 | 19.5 | -16.5 | 7.8 | .0 | 21.0 |
| 144 | 235.5 | -44.9 | 19.6 | -16.5 | 7.8 | .0 | 21.1 |
| 145 | 250.5 | -45.0 | 19.7 | -16.5 | 7.8 | .0 | 21.1 |
| 146 | 265.4 | -45.1 | 19.7 | -16.5 | 7.8 | .0 | 21.2 |
| 147 | 280.3 | -45.2 | 19.8 | -16.5 | 7.8 | .0 | 21.3 |
| 148 | 295.2 | -45.4 | 19.8 | -16.5 | 7.8 | .0 | 21.3 |
| 149 | 310.1 | -45.5 | 19.9 | -16.5 | 7.8 | .0 | 21.4 |
| 150 | 317.5 | -45.5 | 19.9 | -16.5 | 7.8 | .0 | 21.4 |
| 151 | 332.4 | -45.6 | 20.0 | -16.5 | 7.8 | .0 | 21.4 |
| 152 | 164.7 | -44.1 | 19.2 | -16.4 | 7.8 | .0 | 20.7 |
| 153 | 358.4 | -45.6 | 20.0 | -16.4 | 7.8 | .0 | 21.4 |
| 154 | 190.6 | -44.0 | 19.1 | -16.3 | 7.7 | .0 | 20.6 |
| 155 | 205.6 | -44.1 | 19.2 | -16.3 | 7.7 | .0 | 20.7 |
| 156 | 213.0 | -44.2 | 19.2 | -16.3 | 7.7 | .0 | 20.7 |
| 157 | 227.9 | -44.3 | 19.3 | -16.3 | 7.7 | .0 | 20.8 |
| 158 | 242.8 | -44.4 | 19.4 | -16.3 | 7.7 | .0 | 20.8 |
| 159 | 257.7 | -44.6 | 19.4 | -16.3 | 7.7 | .0 | 20.9 |
| 160 | 272.6 | -44.7 | 19.5 | -16.3 | 7.7 | .0 | 21.0 |
| 161 | 287.5 | -44.8 | 19.5 | -16.3 | 7.7 | .0 | 21.0 |
| 162 | 302.4 | -44.9 | 19.6 | -16.3 | 7.7 | .0 | 21.1 |
| 163 | 317.3 | -45.0 | 19.7 | -16.3 | 7.7 | .0 | 21.1 |
| 164 | 332.2 | -45.1 | 19.7 | -16.3 | 7.7 | .0 | 21.2 |
| 165 | 347.2 | -45.2 | 19.8 | -16.3 | 7.7 | .0 | 21.2 |
| 166 | 362.1 | -45.4 | 19.8 | -16.3 | 7.7 | .0 | 21.3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 167 | 377.0 | -45.5 | 19.9 | -16.3 | 7.7 | .0 | 21.3 |
| 168 | 384.4 | -45.5 | 19.9 | -16.3 | 7.7 | .0 | 21.4 |
| 169 | 399.3 | -45.6 | 20.0 | -16.3 | 7.7 | .0 | 21.4 |
| 170 | 231.5 | -44.1 | 19.2 | -16.3 | 7.7 | .0 | 20.7 |
| 171 | 425.3 | -45.6 | 20.0 | -16.3 | 7.7 | .0 | 21.4 |
| 172 | 257.5 | -44.0 | 19.1 | -16.2 | 7.7 | .0 | 20.6 |
| 173 | 272.4 | -44.1 | 19.2 | -16.2 | 7.7 | .0 | 20.7 |
| 174 | 279.9 | -44.2 | 19.2 | -16.2 | 7.7 | .0 | 20.7 |
| 175 | 294.8 | -44.3 | 19.3 | -16.2 | 7.7 | .0 | 20.8 |
| 176 | 309.7 | -44.4 | 19.4 | -16.2 | 7.7 | .0 | 20.8 |
| 177 | 324.6 | -44.6 | 19.4 | -16.2 | 7.7 | .0 | 20.9 |
| 178 | 339.5 | -44.7 | 19.5 | -16.2 | 7.7 | .0 | 20.9 |
| 179 | 354.4 | -44.8 | 19.5 | -16.2 | 7.7 | .0 | 21.0 |
| 180 | 369.3 | -44.9 | 19.6 | -16.2 | 7.7 | .0 | 21.0 |
| 181 | 384.2 | -45.0 | 19.7 | -16.2 | 7.7 | .0 | 21.1 |
| 182 | 399.1 | -45.1 | 19.7 | -16.2 | 7.7 | .0 | 21.2 |
| 183 | 414.0 | -45.2 | 19.8 | -16.2 | 7.7 | .0 | 21.2 |
| 184 | 428.9 | -45.4 | 19.8 | -16.2 | 7.7 | .0 | 21.3 |
| 185 | 443.9 | -45.5 | 19.9 | -16.2 | 7.7 | .0 | 21.3 |
| 186 | 451.3 | -45.5 | 19.9 | -16.2 | 7.7 | .0 | 21.4 |
| 187 | 466.2 | -45.6 | 20.0 | -16.2 | 7.7 | .0 | 21.4 |
| 188 | 298.4 | -44.1 | 19.2 | -16.2 | 7.6 | .0 | 20.6 |
| 189 | 492.2 | -45.6 | 20.0 | -16.2 | 7.6 | .0 | 21.4 |
| 190 | 324.4 | -44.0 | 19.1 | -16.1 | 7.6 | .0 | 20.6 |
| 191 | 339.3 | -44.1 | 19.2 | -16.1 | 7.6 | .0 | 20.7 |
| 192 | 346.8 | -44.2 | 19.2 | -16.1 | 7.6 | .0 | 20.7 |
| 193 | 361.7 | -44.3 | 19.3 | -16.1 | 7.6 | .0 | 20.7 |
| 194 | 376.6 | -44.4 | 19.4 | -16.1 | 7.6 | .0 | 20.8 |
| 195 | 391.5 | -44.6 | 19.4 | -16.1 | 7.6 | .0 | 20.9 |
| 196 | 406.4 | -44.7 | 19.5 | -16.1 | 7.6 | .0 | 20.9 |
| 197 | 421.3 | -44.8 | 19.5 | -16.1 | 7.6 | .0 | 21.0 |
| 198 | 436.2 | -44.9 | 19.6 | -16.1 | 7.6 | .0 | 21.0 |
| 199 | 451.1 | -45.0 | 19.7 | -16.1 | 7.6 | .0 | 21.1 |
| 200 | 466.0 | -45.1 | 19.7 | -16.1 | 7.6 | .0 | 21.1 |
| 201 | 480.9 | -45.2 | 19.8 | -16.1 | 7.6 | .0 | 21.2 |
| 202 | 495.8 | -45.4 | 19.8 | -16.1 | 7.6 | .0 | 21.2 |
| 203 | 510.7 | -45.5 | 19.9 | -16.1 | 7.6 | .0 | 21.3 |
| 204 | 518.2 | -45.5 | 19.9 | -16.1 | 7.6 | .0 | 21.3 |
| 205 | 533.1 | -45.6 | 20.0 | -16.1 | 7.6 | .0 | 21.4 |
| 206 | 357.9 | -44.0 | 19.1 | -16.1 | 7.6 | .0 | 20.6 |
| 207 | 372.8 | -44.1 | 19.2 | -16.1 | 7.6 | .0 | 20.7 |
| 208 | 380.2 | -44.2 | 19.2 | -16.1 | 7.6 | .0 | 20.7 |
| 209 | 395.1 | -44.3 | 19.3 | -16.1 | 7.6 | .0 | 20.7 |
| 210 | 410.0 | -44.4 | 19.4 | -16.1 | 7.6 | .0 | 20.8 |
| 211 | 424.9 | -44.6 | 19.4 | -16.1 | 7.6 | .0 | 20.8 |
| 212 | 439.9 | -44.7 | 19.5 | -16.1 | 7.6 | .0 | 20.9 |
| 213 | 454.8 | -44.8 | 19.5 | -16.1 | 7.6 | .0 | 21.0 |
| 214 | 469.7 | -44.9 | 19.6 | -16.1 | 7.6 | .0 | 21.0 |
| 215 | 484.6 | -45.0 | 19.7 | -16.1 | 7.6 | .0 | 21.1 |
| 216 | 499.5 | -45.1 | 19.7 | -16.1 | 7.6 | .0 | 21.1 |
| 217 | 514.4 | -45.2 | 19.8 | -16.1 | 7.6 | .0 | 21.2 |
| 218 | 529.3 | -45.4 | 19.8 | -16.1 | 7.6 | .0 | 21.2 |
| 219 | 544.2 | -45.5 | 19.9 | -16.1 | 7.6 | .0 | 21.3 |
| 220 | 551.6 | -45.5 | 19.9 | -16.1 | 7.6 | .0 | 21.3 |
| 221 | 566.5 | -45.6 | 20.0 | -16.1 | 7.6 | .0 | 21.4 |
| 222 | 398.8 | -44.1 | 19.2 | -16.0 | 7.6 | .0 | 20.6 |
| 223 | 421.1 | -44.3 | 19.3 | -16.0 | 7.6 | .0 | 20.7 |
| 224 | 436.0 | -44.4 | 19.3 | -16.0 | 7.6 | .0 | 20.8 |
| 225 | 450.9 | -44.5 | 19.4 | -16.0 | 7.6 | .0 | 20.8 |
| 226 | 465.8 | -44.6 | 19.4 | -16.0 | 7.6 | .0 | 20.9 |
| 227 | 480.8 | -44.7 | 19.5 | -16.0 | 7.6 | .0 | 20.9 |
| 228 | 495.7 | -44.8 | 19.6 | -16.0 | 7.6 | .0 | 21.0 |
| 229 | 510.6 | -45.0 | 19.6 | -16.0 | 7.6 | .0 | 21.0 |
| 230 | 525.5 | -45.1 | 19.7 | -16.0 | 7.6 | .0 | 21.1 |
| 231 | 540.4 | -45.2 | 19.7 | -16.0 | 7.6 | .0 | 21.1 |
| 232 | 555.3 | -45.3 | 19.8 | -16.0 | 7.6 | .0 | 21.2 |
| 233 | 570.2 | -45.4 | 19.9 | -16.0 | 7.6 | .0 | 21.3 |
| 234 | 592.5 | -45.6 | 20.0 | -16.0 | 7.6 | .0 | 21.3 |
| 235 | 424.8 | -44.0 | 19.1 | -16.0 | 7.5 | .0 | 20.6 |
| 236 | 439.7 | -44.1 | 19.2 | -16.0 | 7.5 | .0 | 20.6 |
| 237 | 447.1 | -44.2 | 19.2 | -16.0 | 7.5 | .0 | 20.7 |
| 238 | 462.0 | -44.3 | 19.3 | -16.0 | 7.5 | .0 | 20.7 |
| 239 | 476.9 | -44.4 | 19.4 | -16.0 | 7.5 | .0 | 20.8 |
| 240 | 491.8 | -44.6 | 19.4 | -16.0 | 7.5 | .0 | 20.8 |
| 241 | 506.7 | -44.7 | 19.5 | -16.0 | 7.5 | .0 | 20.9 |
| 242 | 521.6 | -44.8 | 19.5 | -16.0 | 7.5 | .0 | 20.9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 243 | 536.6 | -44.9 | 19.6 | -16.0 | 7.5 | .0 | 21.0 |
| 244 | 551.5 | -45.0 | 19.7 | -16.0 | 7.5 | .0 | 21.1 |
| 245 | 566.4 | -45.1 | 19.7 | -16.0 | 7.5 | .0 | 21.1 |
| 246 | 581.3 | -45.2 | 19.8 | -16.0 | 7.5 | .0 | 21.2 |
| 247 | 596.2 | -45.4 | 19.8 | -16.0 | 7.5 | .0 | 21.2 |
| 248 | 611.1 | -45.5 | 19.9 | -16.0 | 7.5 | .0 | 21.3 |
| 249 | 618.5 | -45.5 | 19.9 | -16.0 | 7.5 | .0 | 21.3 |
| 250 | 633.4 | -45.6 | 20.0 | -16.0 | 7.5 | .0 | 21.4 |

Mris = (Mxp^2 + Myp^2)^0.5

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 3
VI08 - P21 - SLV_y

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 25521.3 | 3365.0 | 78572.0 | 13799.3 | 325064.4 | 3965.2 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 43620.3 | 3365.0 | 78572.0 | 13799.3 | 325064.4 | 3965.2 |

Punto di applic. carico verticale: Xv = 1.801 m Yv = 7.452 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.745 | .645 | .168 | 2.485 | .382 | .012 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | 633.1 | 10.8 | -4.5 | 57.1 | -27.2 | .0 | 27.5 |
| 2 | 583.4 | 11.2 | -4.7 | 57.1 | -27.2 | .0 | 27.6 |
| 3 | 558.6 | 11.4 | -4.8 | 57.1 | -27.2 | .0 | 27.6 |
| 4 | 508.9 | 11.7 | -5.0 | 57.1 | -27.2 | .0 | 27.6 |
| 5 | 459.2 | 12.1 | -5.2 | 57.1 | -27.2 | .0 | 27.6 |
| 6 | 409.5 | 12.5 | -5.4 | 57.1 | -27.2 | .0 | 27.7 |
| 7 | 359.8 | 12.9 | -5.6 | 57.1 | -27.2 | .0 | 27.7 |
| 8 | 310.2 | 13.3 | -5.8 | 57.1 | -27.2 | .0 | 27.8 |
| 9 | 260.5 | 13.7 | -6.0 | 57.1 | -27.2 | .0 | 27.8 |
| 10 | 210.8 | 14.0 | -6.2 | 57.1 | -27.2 | .0 | 27.8 |
| 11 | 161.1 | 14.4 | -6.4 | 57.1 | -27.2 | .0 | 27.9 |
| 12 | 111.4 | 14.8 | -6.6 | 57.1 | -27.2 | .0 | 27.9 |
| 13 | 61.7 | 15.2 | -6.8 | 57.1 | -27.2 | .0 | 28.0 |
| 14 | 12.1 | 15.6 | -7.0 | 57.1 | -27.2 | .0 | 28.0 |

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|---|---|---|---|---|---|---|---|
| 15 | -12.8 | 15.8 | -7.1 | 57.1 | -27.2 | .0 | 28.1 |
| 16 | -62.5 | 16.1 | -7.3 | 57.1 | -27.2 | .0 | 28.1 |
| 17 | 598.2 | 11.0 | -4.6 | 57.0 | -27.1 | .0 | 27.4 |
| 18 | 523.7 | 11.5 | -4.9 | 57.0 | -27.1 | .0 | 27.5 |
| 19 | 474.0 | 11.9 | -5.1 | 57.0 | -27.1 | .0 | 27.5 |
| 20 | 424.3 | 12.3 | -5.3 | 57.0 | -27.1 | .0 | 27.6 |
| 21 | 374.6 | 12.7 | -5.5 | 57.0 | -27.1 | .0 | 27.6 |
| 22 | 324.9 | 13.1 | -5.7 | 57.0 | -27.1 | .0 | 27.6 |
| 23 | 275.2 | 13.5 | -5.9 | 57.0 | -27.1 | .0 | 27.7 |
| 24 | 225.6 | 13.8 | -6.1 | 57.0 | -27.1 | .0 | 27.7 |
| 25 | 175.9 | 14.2 | -6.3 | 57.0 | -27.1 | .0 | 27.8 |
| 26 | 126.2 | 14.6 | -6.5 | 57.0 | -27.1 | .0 | 27.8 |
| 27 | 76.5 | 15.0 | -6.7 | 57.0 | -27.1 | .0 | 27.9 |
| 28 | 26.8 | 15.4 | -6.9 | 57.0 | -27.1 | .0 | 27.9 |
| 29 | -47.7 | 16.0 | -7.2 | 57.0 | -27.1 | .0 | 28.0 |
| 30 | 612.9 | 10.8 | -4.5 | 56.8 | -27.0 | .0 | 27.3 |
| 31 | 563.3 | 11.2 | -4.7 | 56.8 | -27.0 | .0 | 27.4 |
| 32 | 538.4 | 11.4 | -4.8 | 56.8 | -27.0 | .0 | 27.4 |
| 33 | 488.7 | 11.7 | -5.0 | 56.8 | -27.0 | .0 | 27.4 |
| 34 | 439.1 | 12.1 | -5.2 | 56.8 | -27.0 | .0 | 27.5 |
| 35 | 389.4 | 12.5 | -5.4 | 56.8 | -27.0 | .0 | 27.5 |
| 36 | 339.7 | 12.9 | -5.6 | 56.8 | -27.0 | .0 | 27.5 |
| 37 | 290.0 | 13.3 | -5.8 | 56.8 | -27.0 | .0 | 27.6 |
| 38 | 240.3 | 13.7 | -6.0 | 56.8 | -27.0 | .0 | 27.6 |
| 39 | 190.6 | 14.0 | -6.2 | 56.8 | -27.0 | .0 | 27.7 |
| 40 | 141.0 | 14.4 | -6.4 | 56.8 | -27.0 | .0 | 27.7 |
| 41 | 91.3 | 14.8 | -6.6 | 56.8 | -27.0 | .0 | 27.8 |
| 42 | 41.6 | 15.2 | -6.8 | 56.8 | -27.0 | .0 | 27.8 |
| 43 | -8.1 | 15.6 | -7.0 | 56.8 | -27.0 | .0 | 27.9 |
| 44 | -32.9 | 15.8 | -7.1 | 56.8 | -27.0 | .0 | 27.9 |
| 45 | -82.6 | 16.1 | -7.3 | 56.8 | -27.0 | .0 | 27.9 |
| 46 | 602.9 | 10.8 | -4.5 | 56.6 | -26.9 | .0 | 27.2 |
| 47 | 553.2 | 11.2 | -4.7 | 56.6 | -26.9 | .0 | 27.3 |
| 48 | 528.3 | 11.4 | -4.8 | 56.6 | -26.9 | .0 | 27.3 |
| 49 | 478.7 | 11.7 | -5.0 | 56.6 | -26.9 | .0 | 27.3 |
| 50 | 429.0 | 12.1 | -5.2 | 56.6 | -26.9 | .0 | 27.4 |
| 51 | 379.3 | 12.5 | -5.4 | 56.6 | -26.9 | .0 | 27.4 |
| 52 | 329.6 | 12.9 | -5.6 | 56.6 | -26.9 | .0 | 27.4 |
| 53 | 279.9 | 13.3 | -5.8 | 56.6 | -26.9 | .0 | 27.5 |
| 54 | 230.2 | 13.7 | -6.0 | 56.6 | -26.9 | .0 | 27.5 |
| 55 | 180.6 | 14.0 | -6.2 | 56.6 | -26.9 | .0 | 27.6 |
| 56 | 130.9 | 14.4 | -6.4 | 56.6 | -26.9 | .0 | 27.6 |
| 57 | 81.2 | 14.8 | -6.6 | 56.6 | -26.9 | .0 | 27.7 |
| 58 | 31.5 | 15.2 | -6.8 | 56.6 | -26.9 | .0 | 27.7 |
| 59 | -18.2 | 15.6 | -7.0 | 56.6 | -26.9 | .0 | 27.8 |
| 60 | -43.0 | 15.8 | -7.1 | 56.6 | -26.9 | .0 | 27.8 |
| 61 | -92.7 | 16.1 | -7.3 | 56.6 | -26.9 | .0 | 27.8 |
| 62 | 568.0 | 11.0 | -4.6 | 56.4 | -26.8 | .0 | 27.2 |
| 63 | -77.9 | 16.0 | -7.2 | 56.4 | -26.8 | .0 | 27.7 |
| 64 | 582.7 | 10.8 | -4.5 | 56.3 | -26.7 | .0 | 27.1 |
| 65 | 533.0 | 11.2 | -4.7 | 56.3 | -26.7 | .0 | 27.1 |
| 66 | 508.2 | 11.4 | -4.8 | 56.3 | -26.7 | .0 | 27.1 |
| 67 | 458.5 | 11.7 | -5.0 | 56.3 | -26.7 | .0 | 27.2 |
| 68 | 408.8 | 12.1 | -5.2 | 56.3 | -26.7 | .0 | 27.2 |
| 69 | 359.1 | 12.5 | -5.4 | 56.3 | -26.7 | .0 | 27.2 |
| 70 | 309.5 | 12.9 | -5.6 | 56.3 | -26.7 | .0 | 27.3 |
| 71 | 259.8 | 13.3 | -5.8 | 56.3 | -26.7 | .0 | 27.3 |
| 72 | 210.1 | 13.7 | -6.0 | 56.3 | -26.7 | .0 | 27.4 |
| 73 | 160.4 | 14.0 | -6.2 | 56.3 | -26.7 | .0 | 27.4 |
| 74 | 110.7 | 14.4 | -6.4 | 56.3 | -26.7 | .0 | 27.4 |
| 75 | 61.0 | 14.8 | -6.6 | 56.3 | -26.7 | .0 | 27.5 |
| 76 | 11.4 | 15.2 | -6.8 | 56.3 | -26.7 | .0 | 27.5 |
| 77 | -38.3 | 15.6 | -7.0 | 56.3 | -26.7 | .0 | 27.6 |
| 78 | -63.2 | 15.8 | -7.1 | 56.3 | -26.7 | .0 | 27.6 |
| 79 | -112.9 | 16.1 | -7.3 | 56.3 | -26.7 | .0 | 27.7 |
| 80 | 547.8 | 11.0 | -4.6 | 56.1 | -26.6 | .0 | 27.0 |
| 81 | -98.1 | 16.0 | -7.2 | 56.1 | -26.6 | .0 | 27.5 |
| 82 | 562.6 | 10.8 | -4.5 | 55.9 | -26.5 | .0 | 26.9 |
| 83 | 512.9 | 11.2 | -4.7 | 55.9 | -26.5 | .0 | 26.9 |
| 84 | 488.0 | 11.4 | -4.8 | 55.9 | -26.5 | .0 | 26.9 |
| 85 | 438.4 | 11.7 | -5.0 | 55.9 | -26.5 | .0 | 27.0 |
| 86 | 388.7 | 12.1 | -5.2 | 55.9 | -26.5 | .0 | 27.0 |
| 87 | 339.0 | 12.5 | -5.4 | 55.9 | -26.5 | .0 | 27.0 |
| 88 | 289.3 | 12.9 | -5.6 | 55.9 | -26.5 | .0 | 27.1 |
| 89 | 239.6 | 13.3 | -5.8 | 55.9 | -26.5 | .0 | 27.1 |
| 90 | 189.9 | 13.7 | -6.0 | 55.9 | -26.5 | .0 | 27.2 |

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|---|---|---|---|---|---|---|---|
| 91 | 140.3 | 14.0 | -6.2 | 55.9 | -26.5 | .0 | 27.2 |
| 92 | 90.6 | 14.4 | -6.4 | 55.9 | -26.5 | .0 | 27.3 |
| 93 | 40.9 | 14.8 | -6.6 | 55.9 | -26.5 | .0 | 27.3 |
| 94 | -8.8 | 15.2 | -6.8 | 55.9 | -26.5 | .0 | 27.4 |
| 95 | -58.5 | 15.6 | -7.0 | 55.9 | -26.5 | .0 | 27.4 |
| 96 | -83.3 | 15.8 | -7.1 | 55.9 | -26.5 | .0 | 27.4 |
| 97 | -133.0 | 16.1 | -7.3 | 55.9 | -26.5 | .0 | 27.5 |
| 98 | 527.7 | 11.0 | -4.6 | 55.7 | -26.4 | .0 | 26.8 |
| 99 | -118.2 | 16.0 | -7.2 | 55.7 | -26.4 | .0 | 27.4 |
| 100 | 542.4 | 10.8 | -4.5 | 55.6 | -26.3 | .0 | 26.7 |
| 101 | 492.7 | 11.2 | -4.7 | 55.6 | -26.3 | .0 | 26.7 |
| 102 | 467.9 | 11.4 | -4.8 | 55.6 | -26.3 | .0 | 26.8 |
| 103 | 418.2 | 11.7 | -5.0 | 55.6 | -26.3 | .0 | 26.8 |
| 104 | 368.5 | 12.1 | -5.2 | 55.6 | -26.3 | .0 | 26.8 |
| 105 | 318.8 | 12.5 | -5.4 | 55.6 | -26.3 | .0 | 26.9 |
| 106 | 269.2 | 12.9 | -5.6 | 55.6 | -26.3 | .0 | 26.9 |
| 107 | 219.5 | 13.3 | -5.8 | 55.6 | -26.3 | .0 | 26.9 |
| 108 | 169.8 | 13.7 | -6.0 | 55.6 | -26.3 | .0 | 27.0 |
| 109 | 120.1 | 14.0 | -6.2 | 55.6 | -26.3 | .0 | 27.0 |
| 110 | 70.4 | 14.4 | -6.4 | 55.6 | -26.3 | .0 | 27.1 |
| 111 | 20.7 | 14.8 | -6.6 | 55.6 | -26.3 | .0 | 27.1 |
| 112 | -28.9 | 15.2 | -6.8 | 55.6 | -26.3 | .0 | 27.2 |
| 113 | -78.6 | 15.6 | -7.0 | 55.6 | -26.3 | .0 | 27.2 |
| 114 | -103.5 | 15.8 | -7.1 | 55.6 | -26.3 | .0 | 27.3 |
| 115 | -153.2 | 16.1 | -7.3 | 55.6 | -26.3 | .0 | 27.3 |
| 116 | 507.5 | 11.0 | -4.6 | 55.4 | -26.2 | .0 | 26.6 |
| 117 | -138.4 | 16.0 | -7.2 | 55.4 | -26.2 | .0 | 27.2 |
| 118 | 522.3 | 10.8 | -4.5 | 55.2 | -26.1 | .0 | 26.5 |
| 119 | 472.6 | 11.2 | -4.7 | 55.2 | -26.1 | .0 | 26.6 |
| 120 | 447.7 | 11.4 | -4.8 | 55.2 | -26.1 | .0 | 26.6 |
| 121 | 398.1 | 11.7 | -5.0 | 55.2 | -26.1 | .0 | 26.6 |
| 122 | 348.4 | 12.1 | -5.2 | 55.2 | -26.1 | .0 | 26.6 |
| 123 | 298.7 | 12.5 | -5.4 | 55.2 | -26.1 | .0 | 26.7 |
| 124 | 249.0 | 12.9 | -5.6 | 55.2 | -26.1 | .0 | 26.7 |
| 125 | 199.3 | 13.3 | -5.8 | 55.2 | -26.1 | .0 | 26.8 |
| 126 | 149.6 | 13.7 | -6.0 | 55.2 | -26.1 | .0 | 26.8 |
| 127 | 100.0 | 14.0 | -6.2 | 55.2 | -26.1 | .0 | 26.9 |
| 128 | 50.3 | 14.4 | -6.4 | 55.2 | -26.1 | .0 | 26.9 |
| 129 | .6 | 14.8 | -6.6 | 55.2 | -26.1 | .0 | 27.0 |
| 130 | -49.1 | 15.2 | -6.8 | 55.2 | -26.1 | .0 | 27.0 |
| 131 | -98.8 | 15.6 | -7.0 | 55.2 | -26.1 | .0 | 27.1 |
| 132 | -123.6 | 15.8 | -7.1 | 55.2 | -26.1 | .0 | 27.1 |
| 133 | -173.3 | 16.1 | -7.3 | 55.2 | -26.1 | .0 | 27.1 |
| 134 | 487.3 | 11.0 | -4.6 | 55.0 | -26.0 | .0 | 26.4 |
| 135 | -158.5 | 16.0 | -7.2 | 55.0 | -26.0 | .0 | 27.0 |
| 136 | 502.1 | 10.8 | -4.5 | 54.8 | -26.0 | .0 | 26.3 |
| 137 | 452.4 | 11.2 | -4.7 | 54.8 | -26.0 | .0 | 26.4 |
| 138 | 427.6 | 11.4 | -4.8 | 54.8 | -26.0 | .0 | 26.4 |
| 139 | 377.9 | 11.7 | -5.0 | 54.8 | -26.0 | .0 | 26.4 |
| 140 | 328.2 | 12.1 | -5.2 | 54.8 | -26.0 | .0 | 26.5 |
| 141 | 278.5 | 12.5 | -5.4 | 54.8 | -26.0 | .0 | 26.5 |
| 142 | 228.9 | 12.9 | -5.6 | 54.8 | -26.0 | .0 | 26.5 |
| 143 | 179.2 | 13.3 | -5.8 | 54.8 | -26.0 | .0 | 26.6 |
| 144 | 129.5 | 13.7 | -6.0 | 54.8 | -26.0 | .0 | 26.6 |
| 145 | 79.8 | 14.0 | -6.2 | 54.8 | -26.0 | .0 | 26.7 |
| 146 | 30.1 | 14.4 | -6.4 | 54.8 | -26.0 | .0 | 26.7 |
| 147 | -19.6 | 14.8 | -6.6 | 54.8 | -26.0 | .0 | 26.8 |
| 148 | -69.2 | 15.2 | -6.8 | 54.8 | -26.0 | .0 | 26.8 |
| 149 | -118.9 | 15.6 | -7.0 | 54.8 | -26.0 | .0 | 26.9 |
| 150 | -143.8 | 15.8 | -7.1 | 54.8 | -26.0 | .0 | 26.9 |
| 151 | -193.5 | 16.1 | -7.3 | 54.8 | -26.0 | .0 | 27.0 |
| 152 | 467.2 | 11.0 | -4.6 | 54.7 | -25.9 | .0 | 26.3 |
| 153 | -178.7 | 16.0 | -7.2 | 54.7 | -25.9 | .0 | 26.8 |
| 154 | 482.0 | 10.8 | -4.5 | 54.5 | -25.8 | .0 | 26.2 |
| 155 | 432.3 | 11.2 | -4.7 | 54.5 | -25.8 | .0 | 26.2 |
| 156 | 407.4 | 11.4 | -4.8 | 54.5 | -25.8 | .0 | 26.2 |
| 157 | 357.8 | 11.7 | -5.0 | 54.5 | -25.8 | .0 | 26.2 |
| 158 | 308.1 | 12.1 | -5.2 | 54.5 | -25.8 | .0 | 26.3 |
| 159 | 258.4 | 12.5 | -5.4 | 54.5 | -25.8 | .0 | 26.3 |
| 160 | 208.7 | 12.9 | -5.6 | 54.5 | -25.8 | .0 | 26.4 |
| 161 | 159.0 | 13.3 | -5.8 | 54.5 | -25.8 | .0 | 26.4 |
| 162 | 109.3 | 13.7 | -6.0 | 54.5 | -25.8 | .0 | 26.5 |
| 163 | 59.7 | 14.0 | -6.2 | 54.5 | -25.8 | .0 | 26.5 |
| 164 | 10.0 | 14.4 | -6.4 | 54.5 | -25.8 | .0 | 26.5 |
| 165 | -39.7 | 14.8 | -6.6 | 54.5 | -25.8 | .0 | 26.6 |
| 166 | -89.4 | 15.2 | -6.8 | 54.5 | -25.8 | .0 | 26.6 |

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|---|---|---|---|---|---|---|---|
| 167 | -139.1 | 15.6 | -7.0 | 54.5 | -25.8 | .0 | 26.7 |
| 168 | -163.9 | 15.8 | -7.1 | 54.5 | -25.8 | .0 | 26.7 |
| 169 | -213.6 | 16.1 | -7.3 | 54.5 | -25.8 | .0 | 26.8 |
| 170 | 447.0 | 11.0 | -4.6 | 54.3 | -25.7 | .0 | 26.1 |
| 171 | -198.8 | 16.0 | -7.2 | 54.3 | -25.7 | .0 | 26.7 |
| 172 | 461.8 | 10.8 | -4.5 | 54.1 | -25.6 | .0 | 26.0 |
| 173 | 412.1 | 11.2 | -4.7 | 54.1 | -25.6 | .0 | 26.0 |
| 174 | 387.3 | 11.4 | -4.8 | 54.1 | -25.6 | .0 | 26.0 |
| 175 | 337.6 | 11.7 | -5.0 | 54.1 | -25.6 | .0 | 26.1 |
| 176 | 287.9 | 12.1 | -5.2 | 54.1 | -25.6 | .0 | 26.1 |
| 177 | 238.2 | 12.5 | -5.4 | 54.1 | -25.6 | .0 | 26.1 |
| 178 | 188.6 | 12.9 | -5.6 | 54.1 | -25.6 | .0 | 26.2 |
| 179 | 138.9 | 13.3 | -5.8 | 54.1 | -25.6 | .0 | 26.2 |
| 180 | 89.2 | 13.7 | -6.0 | 54.1 | -25.6 | .0 | 26.3 |
| 181 | 39.5 | 14.0 | -6.2 | 54.1 | -25.6 | .0 | 26.3 |
| 182 | -10.2 | 14.4 | -6.4 | 54.1 | -25.6 | .0 | 26.4 |
| 183 | -59.9 | 14.8 | -6.6 | 54.1 | -25.6 | .0 | 26.4 |
| 184 | -109.5 | 15.2 | -6.8 | 54.1 | -25.6 | .0 | 26.5 |
| 185 | -159.2 | 15.6 | -7.0 | 54.1 | -25.6 | .0 | 26.5 |
| 186 | -184.1 | 15.8 | -7.1 | 54.1 | -25.6 | .0 | 26.5 |
| 187 | -233.8 | 16.1 | -7.3 | 54.1 | -25.6 | .0 | 26.6 |
| 188 | 426.9 | 11.0 | -4.6 | 54.0 | -25.5 | .0 | 25.9 |
| 189 | -219.0 | 16.0 | -7.2 | 54.0 | -25.5 | .0 | 26.5 |
| 190 | 441.7 | 10.8 | -4.5 | 53.8 | -25.4 | .0 | 25.8 |
| 191 | 392.0 | 11.2 | -4.7 | 53.8 | -25.4 | .0 | 25.8 |
| 192 | 367.1 | 11.4 | -4.8 | 53.8 | -25.4 | .0 | 25.8 |
| 193 | 317.5 | 11.7 | -5.0 | 53.8 | -25.4 | .0 | 25.9 |
| 194 | 267.8 | 12.1 | -5.2 | 53.8 | -25.4 | .0 | 25.9 |
| 195 | 218.1 | 12.5 | -5.4 | 53.8 | -25.4 | .0 | 26.0 |
| 196 | 168.4 | 12.9 | -5.6 | 53.8 | -25.4 | .0 | 26.0 |
| 197 | 118.7 | 13.3 | -5.8 | 53.8 | -25.4 | .0 | 26.0 |
| 198 | 69.0 | 13.7 | -6.0 | 53.8 | -25.4 | .0 | 26.1 |
| 199 | 19.4 | 14.0 | -6.2 | 53.8 | -25.4 | .0 | 26.1 |
| 200 | -30.3 | 14.4 | -6.4 | 53.8 | -25.4 | .0 | 26.2 |
| 201 | -80.0 | 14.8 | -6.6 | 53.8 | -25.4 | .0 | 26.2 |
| 202 | -129.7 | 15.2 | -6.8 | 53.8 | -25.4 | .0 | 26.3 |
| 203 | -179.4 | 15.6 | -7.0 | 53.8 | -25.4 | .0 | 26.3 |
| 204 | -204.2 | 15.8 | -7.1 | 53.8 | -25.4 | .0 | 26.4 |
| 205 | -253.9 | 16.1 | -7.3 | 53.8 | -25.4 | .0 | 26.4 |
| 206 | 431.6 | 10.8 | -4.5 | 53.6 | -25.3 | .0 | 25.7 |
| 207 | 381.9 | 11.2 | -4.7 | 53.6 | -25.3 | .0 | 25.7 |
| 208 | 357.1 | 11.4 | -4.8 | 53.6 | -25.3 | .0 | 25.8 |
| 209 | 307.4 | 11.7 | -5.0 | 53.6 | -25.3 | .0 | 25.8 |
| 210 | 257.7 | 12.1 | -5.2 | 53.6 | -25.3 | .0 | 25.8 |
| 211 | 208.0 | 12.5 | -5.4 | 53.6 | -25.3 | .0 | 25.9 |
| 212 | 158.3 | 12.9 | -5.6 | 53.6 | -25.3 | .0 | 25.9 |
| 213 | 108.6 | 13.3 | -5.8 | 53.6 | -25.3 | .0 | 26.0 |
| 214 | 59.0 | 13.7 | -6.0 | 53.6 | -25.3 | .0 | 26.0 |
| 215 | 9.3 | 14.0 | -6.2 | 53.6 | -25.3 | .0 | 26.1 |
| 216 | -40.4 | 14.4 | -6.4 | 53.6 | -25.3 | .0 | 26.1 |
| 217 | -90.1 | 14.8 | -6.6 | 53.6 | -25.3 | .0 | 26.1 |
| 218 | -139.8 | 15.2 | -6.8 | 53.6 | -25.3 | .0 | 26.2 |
| 219 | -189.5 | 15.6 | -7.0 | 53.6 | -25.3 | .0 | 26.3 |
| 220 | -214.3 | 15.8 | -7.1 | 53.6 | -25.3 | .0 | 26.3 |
| 221 | -264.0 | 16.1 | -7.3 | 53.6 | -25.3 | .0 | 26.3 |
| 222 | 396.7 | 11.0 | -4.6 | 53.4 | -25.2 | .0 | 25.6 |
| 223 | 322.1 | 11.5 | -4.9 | 53.4 | -25.2 | .0 | 25.7 |
| 224 | 272.5 | 11.9 | -5.1 | 53.4 | -25.2 | .0 | 25.7 |
| 225 | 222.8 | 12.3 | -5.3 | 53.4 | -25.2 | .0 | 25.8 |
| 226 | 173.1 | 12.7 | -5.5 | 53.4 | -25.2 | .0 | 25.8 |
| 227 | 123.4 | 13.1 | -5.7 | 53.4 | -25.2 | .0 | 25.8 |
| 228 | 73.7 | 13.5 | -5.9 | 53.4 | -25.2 | .0 | 25.9 |
| 229 | 24.0 | 13.8 | -6.1 | 53.4 | -25.2 | .0 | 25.9 |
| 230 | -25.6 | 14.2 | -6.3 | 53.4 | -25.2 | .0 | 26.0 |
| 231 | -75.3 | 14.6 | -6.5 | 53.4 | -25.2 | .0 | 26.0 |
| 232 | -125.0 | 15.0 | -6.7 | 53.4 | -25.2 | .0 | 26.1 |
| 233 | -174.7 | 15.4 | -6.9 | 53.4 | -25.2 | .0 | 26.1 |
| 234 | -249.2 | 16.0 | -7.2 | 53.4 | -25.2 | .0 | 26.2 |
| 235 | 411.4 | 10.8 | -4.5 | 53.3 | -25.1 | .0 | 25.5 |
| 236 | 361.8 | 11.2 | -4.7 | 53.3 | -25.1 | .0 | 25.6 |
| 237 | 336.9 | 11.4 | -4.8 | 53.3 | -25.1 | .0 | 25.6 |
| 238 | 287.2 | 11.7 | -5.0 | 53.3 | -25.1 | .0 | 25.6 |
| 239 | 237.5 | 12.1 | -5.2 | 53.3 | -25.1 | .0 | 25.7 |
| 240 | 187.9 | 12.5 | -5.4 | 53.3 | -25.1 | .0 | 25.7 |
| 241 | 138.2 | 12.9 | -5.6 | 53.3 | -25.1 | .0 | 25.7 |
| 242 | 88.5 | 13.3 | -5.8 | 53.3 | -25.1 | .0 | 25.8 |

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|---|---|---|---|---|---|---|---|
| 243 | 38.8 | 13.7 | -6.0 | 53.3 | -25.1 | .0 | 25.8 |
| 244 | -10.9 | 14.0 | -6.2 | 53.3 | -25.1 | .0 | 25.9 |
| 245 | -60.6 | 14.4 | -6.4 | 53.3 | -25.1 | .0 | 25.9 |
| 246 | -110.2 | 14.8 | -6.6 | 53.3 | -25.1 | .0 | 26.0 |
| 247 | -159.9 | 15.2 | -6.8 | 53.3 | -25.1 | .0 | 26.0 |
| 248 | -209.6 | 15.6 | -7.0 | 53.3 | -25.1 | .0 | 26.1 |
| 249 | -234.5 | 15.8 | -7.1 | 53.3 | -25.1 | .0 | 26.1 |
| 250 | -284.1 | 16.1 | -7.3 | 53.3 | -25.1 | .0 | 26.2 |

Mris = (Mxp^2 + Myp^2)^0.5

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 4
VI08 - P21 - SLV_y

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 22277.0 | -3365.0 | -78080.0 | -13799.3 | -325064.4 | -3965.2 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 40376.0 | -3365.0 | -78080.0 | -13799.3 | -325064.4 | -3965.2 |

Punto di applic. carico verticale: Xv = -1.934 m Yv = -8.051 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.615 | -.644 | -.167 | -2.485 | -.382 | -.012 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | -296.4 | -10.8 | 4.5 | -57.1 | 27.2 | .0 | 27.5 |
| 2 | -246.7 | -11.2 | 4.7 | -57.1 | 27.2 | .0 | 27.6 |
| 3 | -221.9 | -11.4 | 4.8 | -57.1 | 27.2 | .0 | 27.6 |
| 4 | -172.2 | -11.7 | 5.0 | -57.1 | 27.2 | .0 | 27.6 |
| 5 | -122.5 | -12.1 | 5.2 | -57.1 | 27.2 | .0 | 27.6 |
| 6 | -72.9 | -12.5 | 5.4 | -57.1 | 27.2 | .0 | 27.7 |
| 7 | -23.2 | -12.9 | 5.6 | -57.1 | 27.2 | .0 | 27.7 |
| 8 | 26.5 | -13.3 | 5.8 | -57.1 | 27.2 | .0 | 27.8 |
| 9 | 76.2 | -13.7 | 6.0 | -57.1 | 27.2 | .0 | 27.8 |
| 10 | 125.9 | -14.0 | 6.2 | -57.1 | 27.2 | .0 | 27.8 |
| 11 | 175.6 | -14.4 | 6.4 | -57.1 | 27.2 | .0 | 27.9 |
| 12 | 225.2 | -14.8 | 6.6 | -57.1 | 27.2 | .0 | 27.9 |
| 13 | 274.9 | -15.2 | 6.8 | -57.1 | 27.2 | .0 | 28.0 |
| 14 | 324.6 | -15.6 | 7.0 | -57.1 | 27.2 | .0 | 28.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | 349.5 | -15.8 | 7.1 | -57.1 | 27.2 | .0 | 28.1 |
| 16 | 399.1 | -16.1 | 7.3 | -57.1 | 27.2 | .0 | 28.1 |
| 17 | -261.6 | -11.0 | 4.6 | -57.0 | 27.1 | .0 | 27.4 |
| 18 | -187.1 | -11.5 | 4.9 | -57.0 | 27.1 | .0 | 27.5 |
| 19 | -137.4 | -11.9 | 5.1 | -57.0 | 27.1 | .0 | 27.5 |
| 20 | -87.7 | -12.3 | 5.3 | -57.0 | 27.1 | .0 | 27.6 |
| 21 | -38.0 | -12.7 | 5.5 | -57.0 | 27.1 | .0 | 27.6 |
| 22 | 11.7 | -13.1 | 5.7 | -57.0 | 27.1 | .0 | 27.6 |
| 23 | 61.4 | -13.5 | 5.9 | -57.0 | 27.1 | .0 | 27.7 |
| 24 | 111.1 | -13.8 | 6.1 | -57.0 | 27.1 | .0 | 27.7 |
| 25 | 160.7 | -14.2 | 6.3 | -57.0 | 27.1 | .0 | 27.8 |
| 26 | 210.4 | -14.6 | 6.5 | -57.0 | 27.1 | .0 | 27.8 |
| 27 | 260.1 | -15.0 | 6.7 | -57.0 | 27.1 | .0 | 27.9 |
| 28 | 309.8 | -15.4 | 6.9 | -57.0 | 27.1 | .0 | 27.9 |
| 29 | 384.3 | -16.0 | 7.2 | -57.0 | 27.1 | .0 | 28.0 |
| 30 | -276.4 | -10.8 | 4.5 | -56.8 | 27.0 | .0 | 27.3 |
| 31 | -226.7 | -11.2 | 4.7 | -56.8 | 27.0 | .0 | 27.4 |
| 32 | -201.9 | -11.4 | 4.8 | -56.8 | 27.0 | .0 | 27.4 |
| 33 | -152.2 | -11.7 | 5.0 | -56.8 | 27.0 | .0 | 27.4 |
| 34 | -102.5 | -12.1 | 5.2 | -56.8 | 27.0 | .0 | 27.5 |
| 35 | -52.8 | -12.5 | 5.4 | -56.8 | 27.0 | .0 | 27.5 |
| 36 | -3.1 | -12.9 | 5.6 | -56.8 | 27.0 | .0 | 27.5 |
| 37 | 46.5 | -13.3 | 5.8 | -56.8 | 27.0 | .0 | 27.6 |
| 38 | 96.2 | -13.7 | 6.0 | -56.8 | 27.0 | .0 | 27.6 |
| 39 | 145.9 | -14.0 | 6.2 | -56.8 | 27.0 | .0 | 27.7 |
| 40 | 195.6 | -14.4 | 6.4 | -56.8 | 27.0 | .0 | 27.7 |
| 41 | 245.3 | -14.8 | 6.6 | -56.8 | 27.0 | .0 | 27.8 |
| 42 | 295.0 | -15.2 | 6.8 | -56.8 | 27.0 | .0 | 27.8 |
| 43 | 344.6 | -15.6 | 7.0 | -56.8 | 27.0 | .0 | 27.9 |
| 44 | 369.5 | -15.8 | 7.1 | -56.8 | 27.0 | .0 | 27.9 |
| 45 | 419.2 | -16.1 | 7.3 | -56.8 | 27.0 | .0 | 27.9 |
| 46 | -266.4 | -10.8 | 4.5 | -56.6 | 26.9 | .0 | 27.2 |
| 47 | -216.7 | -11.2 | 4.7 | -56.6 | 26.9 | .0 | 27.3 |
| 48 | -191.9 | -11.4 | 4.8 | -56.6 | 26.9 | .0 | 27.3 |
| 49 | -142.2 | -11.7 | 5.0 | -56.6 | 26.9 | .0 | 27.3 |
| 50 | -92.5 | -12.1 | 5.2 | -56.6 | 26.9 | .0 | 27.4 |
| 51 | -42.8 | -12.5 | 5.4 | -56.6 | 26.9 | .0 | 27.4 |
| 52 | 6.9 | -12.9 | 5.6 | -56.6 | 26.9 | .0 | 27.4 |
| 53 | 56.6 | -13.3 | 5.8 | -56.6 | 26.9 | .0 | 27.5 |
| 54 | 106.2 | -13.7 | 6.0 | -56.6 | 26.9 | .0 | 27.5 |
| 55 | 155.9 | -14.0 | 6.2 | -56.6 | 26.9 | .0 | 27.6 |
| 56 | 205.6 | -14.4 | 6.4 | -56.6 | 26.9 | .0 | 27.6 |
| 57 | 255.3 | -14.8 | 6.6 | -56.6 | 26.9 | .0 | 27.7 |
| 58 | 305.0 | -15.2 | 6.8 | -56.6 | 26.9 | .0 | 27.7 |
| 59 | 354.7 | -15.6 | 7.0 | -56.6 | 26.9 | .0 | 27.8 |
| 60 | 379.5 | -15.8 | 7.1 | -56.6 | 26.9 | .0 | 27.8 |
| 61 | 429.2 | -16.1 | 7.3 | -56.6 | 26.9 | .0 | 27.8 |
| 62 | -231.5 | -11.0 | 4.6 | -56.4 | 26.8 | .0 | 27.2 |
| 63 | 414.4 | -16.0 | 7.2 | -56.4 | 26.8 | .0 | 27.7 |
| 64 | -246.4 | -10.8 | 4.5 | -56.3 | 26.7 | .0 | 27.1 |
| 65 | -196.7 | -11.2 | 4.7 | -56.3 | 26.7 | .0 | 27.1 |
| 66 | -171.8 | -11.4 | 4.8 | -56.3 | 26.7 | .0 | 27.1 |
| 67 | -122.2 | -11.7 | 5.0 | -56.3 | 26.7 | .0 | 27.2 |
| 68 | -72.5 | -12.1 | 5.2 | -56.3 | 26.7 | .0 | 27.2 |
| 69 | -22.8 | -12.5 | 5.4 | -56.3 | 26.7 | .0 | 27.2 |
| 70 | 26.9 | -12.9 | 5.6 | -56.3 | 26.7 | .0 | 27.3 |
| 71 | 76.6 | -13.3 | 5.8 | -56.3 | 26.7 | .0 | 27.3 |
| 72 | 126.3 | -13.7 | 6.0 | -56.3 | 26.7 | .0 | 27.4 |
| 73 | 175.9 | -14.0 | 6.2 | -56.3 | 26.7 | .0 | 27.4 |
| 74 | 225.6 | -14.4 | 6.4 | -56.3 | 26.7 | .0 | 27.4 |
| 75 | 275.3 | -14.8 | 6.6 | -56.3 | 26.7 | .0 | 27.5 |
| 76 | 325.0 | -15.2 | 6.8 | -56.3 | 26.7 | .0 | 27.5 |
| 77 | 374.7 | -15.6 | 7.0 | -56.3 | 26.7 | .0 | 27.6 |
| 78 | 399.5 | -15.8 | 7.1 | -56.3 | 26.7 | .0 | 27.6 |
| 79 | 449.2 | -16.1 | 7.3 | -56.3 | 26.7 | .0 | 27.7 |
| 80 | -211.5 | -11.0 | 4.6 | -56.1 | 26.6 | .0 | 27.0 |
| 81 | 434.4 | -16.0 | 7.2 | -56.1 | 26.6 | .0 | 27.5 |
| 82 | -226.3 | -10.8 | 4.5 | -55.9 | 26.5 | .0 | 26.9 |
| 83 | -176.7 | -11.2 | 4.7 | -55.9 | 26.5 | .0 | 26.9 |
| 84 | -151.8 | -11.4 | 4.8 | -55.9 | 26.5 | .0 | 26.9 |
| 85 | -102.1 | -11.7 | 5.0 | -55.9 | 26.5 | .0 | 27.0 |
| 86 | -52.4 | -12.1 | 5.2 | -55.9 | 26.5 | .0 | 27.0 |
| 87 | -2.8 | -12.5 | 5.4 | -55.9 | 26.5 | .0 | 27.0 |
| 88 | 46.9 | -12.9 | 5.6 | -55.9 | 26.5 | .0 | 27.1 |
| 89 | 96.6 | -13.3 | 5.8 | -55.9 | 26.5 | .0 | 27.1 |
| 90 | 146.3 | -13.7 | 6.0 | -55.9 | 26.5 | .0 | 27.2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 91 | 196.0 | -14.0 | 6.2 | -55.9 | 26.5 | .0 | 27.2 |
| 92 | 245.7 | -14.4 | 6.4 | -55.9 | 26.5 | .0 | 27.3 |
| 93 | 295.3 | -14.8 | 6.6 | -55.9 | 26.5 | .0 | 27.3 |
| 94 | 345.0 | -15.2 | 6.8 | -55.9 | 26.5 | .0 | 27.4 |
| 95 | 394.7 | -15.6 | 7.0 | -55.9 | 26.5 | .0 | 27.4 |
| 96 | 419.6 | -15.8 | 7.1 | -55.9 | 26.5 | .0 | 27.4 |
| 97 | 469.2 | -16.1 | 7.3 | -55.9 | 26.5 | .0 | 27.5 |
| 98 | -191.5 | -11.0 | 4.6 | -55.7 | 26.4 | .0 | 26.8 |
| 99 | 454.4 | -16.0 | 7.2 | -55.7 | 26.4 | .0 | 27.4 |
| 100 | -206.3 | -10.8 | 4.5 | -55.6 | 26.3 | .0 | 26.7 |
| 101 | -156.6 | -11.2 | 4.7 | -55.6 | 26.3 | .0 | 26.7 |
| 102 | -131.8 | -11.4 | 4.8 | -55.6 | 26.3 | .0 | 26.8 |
| 103 | -82.1 | -11.7 | 5.0 | -55.6 | 26.3 | .0 | 26.8 |
| 104 | -32.4 | -12.1 | 5.2 | -55.6 | 26.3 | .0 | 26.8 |
| 105 | 17.3 | -12.5 | 5.4 | -55.6 | 26.3 | .0 | 26.9 |
| 106 | 67.0 | -12.9 | 5.6 | -55.6 | 26.3 | .0 | 26.9 |
| 107 | 116.6 | -13.3 | 5.8 | -55.6 | 26.3 | .0 | 26.9 |
| 108 | 166.3 | -13.7 | 6.0 | -55.6 | 26.3 | .0 | 27.0 |
| 109 | 216.0 | -14.0 | 6.2 | -55.6 | 26.3 | .0 | 27.0 |
| 110 | 265.7 | -14.4 | 6.4 | -55.6 | 26.3 | .0 | 27.1 |
| 111 | 315.4 | -14.8 | 6.6 | -55.6 | 26.3 | .0 | 27.1 |
| 112 | 365.1 | -15.2 | 6.8 | -55.6 | 26.3 | .0 | 27.2 |
| 113 | 414.7 | -15.6 | 7.0 | -55.6 | 26.3 | .0 | 27.2 |
| 114 | 439.6 | -15.8 | 7.1 | -55.6 | 26.3 | .0 | 27.3 |
| 115 | 489.3 | -16.1 | 7.3 | -55.6 | 26.3 | .0 | 27.3 |
| 116 | -171.5 | -11.0 | 4.6 | -55.4 | 26.2 | .0 | 26.6 |
| 117 | 474.4 | -16.0 | 7.2 | -55.4 | 26.2 | .0 | 27.2 |
| 118 | -186.3 | -10.8 | 4.5 | -55.2 | 26.1 | .0 | 26.5 |
| 119 | -136.6 | -11.2 | 4.7 | -55.2 | 26.1 | .0 | 26.6 |
| 120 | -111.8 | -11.4 | 4.8 | -55.2 | 26.1 | .0 | 26.6 |
| 121 | -62.1 | -11.7 | 5.0 | -55.2 | 26.1 | .0 | 26.6 |
| 122 | -12.4 | -12.1 | 5.2 | -55.2 | 26.1 | .0 | 26.6 |
| 123 | 37.3 | -12.5 | 5.4 | -55.2 | 26.1 | .0 | 26.7 |
| 124 | 87.0 | -12.9 | 5.6 | -55.2 | 26.1 | .0 | 26.7 |
| 125 | 136.7 | -13.3 | 5.8 | -55.2 | 26.1 | .0 | 26.8 |
| 126 | 186.3 | -13.7 | 6.0 | -55.2 | 26.1 | .0 | 26.8 |
| 127 | 236.0 | -14.0 | 6.2 | -55.2 | 26.1 | .0 | 26.9 |
| 128 | 285.7 | -14.4 | 6.4 | -55.2 | 26.1 | .0 | 26.9 |
| 129 | 335.4 | -14.8 | 6.6 | -55.2 | 26.1 | .0 | 27.0 |
| 130 | 385.1 | -15.2 | 6.8 | -55.2 | 26.1 | .0 | 27.0 |
| 131 | 434.8 | -15.6 | 7.0 | -55.2 | 26.1 | .0 | 27.1 |
| 132 | 459.6 | -15.8 | 7.1 | -55.2 | 26.1 | .0 | 27.1 |
| 133 | 509.3 | -16.1 | 7.3 | -55.2 | 26.1 | .0 | 27.1 |
| 134 | -151.4 | -11.0 | 4.6 | -55.0 | 26.0 | .0 | 26.4 |
| 135 | 494.5 | -16.0 | 7.2 | -55.0 | 26.0 | .0 | 27.0 |
| 136 | -166.3 | -10.8 | 4.5 | -54.8 | 26.0 | .0 | 26.3 |
| 137 | -116.6 | -11.2 | 4.7 | -54.8 | 26.0 | .0 | 26.4 |
| 138 | -91.7 | -11.4 | 4.8 | -54.8 | 26.0 | .0 | 26.4 |
| 139 | -42.0 | -11.7 | 5.0 | -54.8 | 26.0 | .0 | 26.4 |
| 140 | 7.6 | -12.1 | 5.2 | -54.8 | 26.0 | .0 | 26.5 |
| 141 | 57.3 | -12.5 | 5.4 | -54.8 | 26.0 | .0 | 26.5 |
| 142 | 107.0 | -12.9 | 5.6 | -54.8 | 26.0 | .0 | 26.5 |
| 143 | 156.7 | -13.3 | 5.8 | -54.8 | 26.0 | .0 | 26.6 |
| 144 | 206.4 | -13.7 | 6.0 | -54.8 | 26.0 | .0 | 26.6 |
| 145 | 256.1 | -14.0 | 6.2 | -54.8 | 26.0 | .0 | 26.7 |
| 146 | 305.7 | -14.4 | 6.4 | -54.8 | 26.0 | .0 | 26.7 |
| 147 | 355.4 | -14.8 | 6.6 | -54.8 | 26.0 | .0 | 26.8 |
| 148 | 405.1 | -15.2 | 6.8 | -54.8 | 26.0 | .0 | 26.8 |
| 149 | 454.8 | -15.6 | 7.0 | -54.8 | 26.0 | .0 | 26.9 |
| 150 | 479.6 | -15.8 | 7.1 | -54.8 | 26.0 | .0 | 26.9 |
| 151 | 529.3 | -16.1 | 7.3 | -54.8 | 26.0 | .0 | 27.0 |
| 152 | -131.4 | -11.0 | 4.6 | -54.7 | 25.9 | .0 | 26.3 |
| 153 | 514.5 | -16.0 | 7.2 | -54.7 | 25.9 | .0 | 26.8 |
| 154 | -146.2 | -10.8 | 4.5 | -54.5 | 25.8 | .0 | 26.2 |
| 155 | -96.5 | -11.2 | 4.7 | -54.5 | 25.8 | .0 | 26.2 |
| 156 | -71.7 | -11.4 | 4.8 | -54.5 | 25.8 | .0 | 26.2 |
| 157 | -22.0 | -11.7 | 5.0 | -54.5 | 25.8 | .0 | 26.2 |
| 158 | 27.7 | -12.1 | 5.2 | -54.5 | 25.8 | .0 | 26.3 |
| 159 | 77.3 | -12.5 | 5.4 | -54.5 | 25.8 | .0 | 26.3 |
| 160 | 127.0 | -12.9 | 5.6 | -54.5 | 25.8 | .0 | 26.4 |
| 161 | 176.7 | -13.3 | 5.8 | -54.5 | 25.8 | .0 | 26.4 |
| 162 | 226.4 | -13.7 | 6.0 | -54.5 | 25.8 | .0 | 26.5 |
| 163 | 276.1 | -14.0 | 6.2 | -54.5 | 25.8 | .0 | 26.5 |
| 164 | 325.8 | -14.4 | 6.4 | -54.5 | 25.8 | .0 | 26.5 |
| 165 | 375.5 | -14.8 | 6.6 | -54.5 | 25.8 | .0 | 26.6 |
| 166 | 425.1 | -15.2 | 6.8 | -54.5 | 25.8 | .0 | 26.6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 167 | 474.8 | -15.6 | 7.0 | -54.5 | 25.8 | .0 | 26.7 |
| 168 | 499.7 | -15.8 | 7.1 | -54.5 | 25.8 | .0 | 26.7 |
| 169 | 549.3 | -16.1 | 7.3 | -54.5 | 25.8 | .0 | 26.8 |
| 170 | -111.4 | -11.0 | 4.6 | -54.3 | 25.7 | .0 | 26.1 |
| 171 | 534.5 | -16.0 | 7.2 | -54.3 | 25.7 | .0 | 26.7 |
| 172 | -126.2 | -10.8 | 4.5 | -54.1 | 25.6 | .0 | 26.0 |
| 173 | -76.5 | -11.2 | 4.7 | -54.1 | 25.6 | .0 | 26.0 |
| 174 | -51.7 | -11.4 | 4.8 | -54.1 | 25.6 | .0 | 26.0 |
| 175 | -2.0 | -11.7 | 5.0 | -54.1 | 25.6 | .0 | 26.1 |
| 176 | 47.7 | -12.1 | 5.2 | -54.1 | 25.6 | .0 | 26.1 |
| 177 | 97.4 | -12.5 | 5.4 | -54.1 | 25.6 | .0 | 26.1 |
| 178 | 147.1 | -12.9 | 5.6 | -54.1 | 25.6 | .0 | 26.2 |
| 179 | 196.7 | -13.3 | 5.8 | -54.1 | 25.6 | .0 | 26.2 |
| 180 | 246.4 | -13.7 | 6.0 | -54.1 | 25.6 | .0 | 26.3 |
| 181 | 296.1 | -14.0 | 6.2 | -54.1 | 25.6 | .0 | 26.3 |
| 182 | 345.8 | -14.4 | 6.4 | -54.1 | 25.6 | .0 | 26.4 |
| 183 | 395.5 | -14.8 | 6.6 | -54.1 | 25.6 | .0 | 26.4 |
| 184 | 445.2 | -15.2 | 6.8 | -54.1 | 25.6 | .0 | 26.5 |
| 185 | 494.8 | -15.6 | 7.0 | -54.1 | 25.6 | .0 | 26.5 |
| 186 | 519.7 | -15.8 | 7.1 | -54.1 | 25.6 | .0 | 26.5 |
| 187 | 569.4 | -16.1 | 7.3 | -54.1 | 25.6 | .0 | 26.6 |
| 188 | -91.3 | -11.0 | 4.6 | -54.0 | 25.5 | .0 | 25.9 |
| 189 | 554.5 | -16.0 | 7.2 | -54.0 | 25.5 | .0 | 26.5 |
| 190 | -106.2 | -10.8 | 4.5 | -53.8 | 25.4 | .0 | 25.8 |
| 191 | -56.5 | -11.2 | 4.7 | -53.8 | 25.4 | .0 | 25.8 |
| 192 | -31.6 | -11.4 | 4.8 | -53.8 | 25.4 | .0 | 25.8 |
| 193 | 18.0 | -11.7 | 5.0 | -53.8 | 25.4 | .0 | 25.9 |
| 194 | 67.7 | -12.1 | 5.2 | -53.8 | 25.4 | .0 | 25.9 |
| 195 | 117.4 | -12.5 | 5.4 | -53.8 | 25.4 | .0 | 26.0 |
| 196 | 167.1 | -12.9 | 5.6 | -53.8 | 25.4 | .0 | 26.0 |
| 197 | 216.8 | -13.3 | 5.8 | -53.8 | 25.4 | .0 | 26.1 |
| 198 | 266.5 | -13.7 | 6.0 | -53.8 | 25.4 | .0 | 26.1 |
| 199 | 316.1 | -14.0 | 6.2 | -53.8 | 25.4 | .0 | 26.1 |
| 200 | 365.8 | -14.4 | 6.4 | -53.8 | 25.4 | .0 | 26.2 |
| 201 | 415.5 | -14.8 | 6.6 | -53.8 | 25.4 | .0 | 26.2 |
| 202 | 465.2 | -15.2 | 6.8 | -53.8 | 25.4 | .0 | 26.3 |
| 203 | 514.9 | -15.6 | 7.0 | -53.8 | 25.4 | .0 | 26.3 |
| 204 | 539.7 | -15.8 | 7.1 | -53.8 | 25.4 | .0 | 26.4 |
| 205 | 589.4 | -16.1 | 7.3 | -53.8 | 25.4 | .0 | 26.4 |
| 206 | -96.2 | -10.8 | 4.5 | -53.6 | 25.3 | .0 | 25.7 |
| 207 | -46.5 | -11.2 | 4.7 | -53.6 | 25.3 | .0 | 25.7 |
| 208 | -21.6 | -11.4 | 4.8 | -53.6 | 25.3 | .0 | 25.8 |
| 209 | 28.1 | -11.7 | 5.0 | -53.6 | 25.3 | .0 | 25.8 |
| 210 | 77.7 | -12.1 | 5.2 | -53.6 | 25.3 | .0 | 25.8 |
| 211 | 127.4 | -12.5 | 5.4 | -53.6 | 25.3 | .0 | 25.9 |
| 212 | 177.1 | -12.9 | 5.6 | -53.6 | 25.3 | .0 | 25.9 |
| 213 | 226.8 | -13.3 | 5.8 | -53.6 | 25.3 | .0 | 26.0 |
| 214 | 276.5 | -13.7 | 6.0 | -53.6 | 25.3 | .0 | 26.0 |
| 215 | 326.2 | -14.0 | 6.2 | -53.6 | 25.3 | .0 | 26.1 |
| 216 | 375.8 | -14.4 | 6.4 | -53.6 | 25.3 | .0 | 26.1 |
| 217 | 425.5 | -14.8 | 6.6 | -53.6 | 25.3 | .0 | 26.2 |
| 218 | 475.2 | -15.2 | 6.8 | -53.6 | 25.3 | .0 | 26.2 |
| 219 | 524.9 | -15.6 | 7.0 | -53.6 | 25.3 | .0 | 26.3 |
| 220 | 549.7 | -15.8 | 7.1 | -53.6 | 25.3 | .0 | 26.3 |
| 221 | 599.4 | -16.1 | 7.3 | -53.6 | 25.3 | .0 | 26.3 |
| 222 | -61.3 | -11.0 | 4.6 | -53.4 | 25.2 | .0 | 25.6 |
| 223 | 13.2 | -11.5 | 4.9 | -53.4 | 25.2 | .0 | 25.7 |
| 224 | 62.9 | -11.9 | 5.1 | -53.4 | 25.2 | .0 | 25.7 |
| 225 | 112.6 | -12.3 | 5.3 | -53.4 | 25.2 | .0 | 25.8 |
| 226 | 162.3 | -12.7 | 5.5 | -53.4 | 25.2 | .0 | 25.8 |
| 227 | 212.0 | -13.1 | 5.7 | -53.4 | 25.2 | .0 | 25.8 |
| 228 | 261.6 | -13.5 | 5.9 | -53.4 | 25.2 | .0 | 25.9 |
| 229 | 311.3 | -13.8 | 6.1 | -53.4 | 25.2 | .0 | 25.9 |
| 230 | 361.0 | -14.2 | 6.3 | -53.4 | 25.2 | .0 | 26.0 |
| 231 | 410.7 | -14.6 | 6.5 | -53.4 | 25.2 | .0 | 26.0 |
| 232 | 460.4 | -15.0 | 6.7 | -53.4 | 25.2 | .0 | 26.1 |
| 233 | 510.1 | -15.4 | 6.9 | -53.4 | 25.2 | .0 | 26.1 |
| 234 | 584.6 | -16.0 | 7.2 | -53.4 | 25.2 | .0 | 26.2 |
| 235 | -76.1 | -10.8 | 4.5 | -53.3 | 25.1 | .0 | 25.5 |
| 236 | -26.4 | -11.2 | 4.7 | -53.3 | 25.1 | .0 | 25.6 |
| 237 | -1.6 | -11.4 | 4.8 | -53.3 | 25.1 | .0 | 25.6 |
| 238 | 48.1 | -11.7 | 5.0 | -53.3 | 25.1 | .0 | 25.6 |
| 239 | 97.8 | -12.1 | 5.2 | -53.3 | 25.1 | .0 | 25.7 |
| 240 | 147.4 | -12.5 | 5.4 | -53.3 | 25.1 | .0 | 25.7 |
| 241 | 197.1 | -12.9 | 5.6 | -53.3 | 25.1 | .0 | 25.7 |
| 242 | 246.8 | -13.3 | 5.8 | -53.3 | 25.1 | .0 | 25.8 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 243 | 296.5 | -13.7 | 6.0 | -53.3 | 25.1 | .0 | 25.8 |
| 244 | 346.2 | -14.0 | 6.2 | -53.3 | 25.1 | .0 | 25.9 |
| 245 | 395.9 | -14.4 | 6.4 | -53.3 | 25.1 | .0 | 25.9 |
| 246 | 445.5 | -14.8 | 6.6 | -53.3 | 25.1 | .0 | 26.0 |
| 247 | 495.2 | -15.2 | 6.8 | -53.3 | 25.1 | .0 | 26.0 |
| 248 | 544.9 | -15.6 | 7.0 | -53.3 | 25.1 | .0 | 26.1 |
| 249 | 569.8 | -15.8 | 7.1 | -53.3 | 25.1 | .0 | 26.1 |
| 250 | 619.4 | -16.1 | 7.3 | -53.3 | 25.1 | .0 | 26.2 |

Mris = (Mxp^2 + Myp^2)^0.5

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 5
VI08 - P22 - SLV_x

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 24776.0 | 11691.4 | 267577.3 | 4206.3 | 97230.1 | 4930.2 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 42875.0 | 11691.4 | 267577.3 | 4206.3 | 97230.1 | 4930.2 |

Punto di applic. carico verticale: Xv = 6.241 m Yv = 2.268 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.715 | 2.235 | .572 | .757 | .114 | .015 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | 653.2 | 43.4 | -18.7 | 19.2 | -9.2 | .0 | 20.9 |
| 2 | 638.3 | 43.9 | -19.0 | 19.2 | -9.2 | .0 | 21.1 |
| 3 | 630.9 | 44.1 | -19.1 | 19.2 | -9.2 | .0 | 21.2 |
| 4 | 616.0 | 44.6 | -19.4 | 19.2 | -9.2 | .0 | 21.4 |
| 5 | 601.1 | 45.1 | -19.6 | 19.2 | -9.2 | .0 | 21.7 |
| 6 | 586.3 | 45.6 | -19.8 | 19.2 | -9.2 | .0 | 21.9 |
| 7 | 571.4 | 46.1 | -20.1 | 19.2 | -9.2 | .0 | 22.1 |
| 8 | 556.5 | 46.5 | -20.3 | 19.2 | -9.2 | .0 | 22.3 |
| 9 | 541.7 | 47.0 | -20.6 | 19.2 | -9.2 | .0 | 22.6 |
| 10 | 526.8 | 47.5 | -20.8 | 19.2 | -9.2 | .0 | 22.8 |
| 11 | 511.9 | 48.0 | -21.1 | 19.2 | -9.2 | .0 | 23.0 |
| 12 | 497.1 | 48.4 | -21.3 | 19.2 | -9.2 | .0 | 23.3 |
| 13 | 482.2 | 48.9 | -21.6 | 19.2 | -9.2 | .0 | 23.5 |
| 14 | 467.3 | 49.4 | -21.8 | 19.2 | -9.2 | .0 | 23.7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | 459.9 | 49.6 | -22.0 | 19.2 | -9.2 | .0 | 23.8 |
| 16 | 445.0 | 50.1 | -22.2 | 19.2 | -9.2 | .0 | 24.1 |
| 17 | 611.4 | 43.7 | -18.9 | 19.0 | -9.1 | .0 | 20.9 |
| 18 | 589.1 | 44.4 | -19.2 | 19.0 | -9.1 | .0 | 21.3 |
| 19 | 574.2 | 44.9 | -19.5 | 19.0 | -9.1 | .0 | 21.5 |
| 20 | 559.4 | 45.3 | -19.7 | 19.0 | -9.1 | .0 | 21.7 |
| 21 | 544.5 | 45.8 | -20.0 | 19.0 | -9.1 | .0 | 22.0 |
| 22 | 529.6 | 46.3 | -20.2 | 19.0 | -9.1 | .0 | 22.2 |
| 23 | 514.8 | 46.8 | -20.5 | 19.0 | -9.1 | .0 | 22.4 |
| 24 | 499.9 | 47.2 | -20.7 | 19.0 | -9.1 | .0 | 22.6 |
| 25 | 485.0 | 47.7 | -21.0 | 19.0 | -9.1 | .0 | 22.9 |
| 26 | 470.2 | 48.2 | -21.2 | 19.0 | -9.1 | .0 | 23.1 |
| 27 | 455.3 | 48.7 | -21.5 | 19.0 | -9.1 | .0 | 23.3 |
| 28 | 440.4 | 49.1 | -21.7 | 19.0 | -9.1 | .0 | 23.5 |
| 29 | 418.1 | 49.9 | -22.1 | 19.0 | -9.1 | .0 | 23.9 |
| 30 | 584.5 | 43.4 | -18.7 | 18.8 | -9.0 | .0 | 20.8 |
| 31 | 569.6 | 43.9 | -19.0 | 18.8 | -9.0 | .0 | 21.0 |
| 32 | 562.2 | 44.1 | -19.1 | 18.8 | -9.0 | .0 | 21.1 |
| 33 | 547.3 | 44.6 | -19.4 | 18.8 | -9.0 | .0 | 21.3 |
| 34 | 532.5 | 45.1 | -19.6 | 18.8 | -9.0 | .0 | 21.6 |
| 35 | 517.6 | 45.6 | -19.8 | 18.8 | -9.0 | .0 | 21.8 |
| 36 | 502.7 | 46.1 | -20.1 | 18.8 | -9.0 | .0 | 22.0 |
| 37 | 487.9 | 46.5 | -20.3 | 18.8 | -9.0 | .0 | 22.3 |
| 38 | 473.0 | 47.0 | -20.6 | 18.8 | -9.0 | .0 | 22.5 |
| 39 | 458.1 | 47.5 | -20.8 | 18.8 | -9.0 | .0 | 22.7 |
| 40 | 443.3 | 48.0 | -21.1 | 18.8 | -9.0 | .0 | 22.9 |
| 41 | 428.4 | 48.4 | -21.3 | 18.8 | -9.0 | .0 | 23.2 |
| 42 | 413.5 | 48.9 | -21.6 | 18.8 | -9.0 | .0 | 23.4 |
| 43 | 398.7 | 49.4 | -21.8 | 18.8 | -9.0 | .0 | 23.6 |
| 44 | 391.2 | 49.6 | -22.0 | 18.8 | -9.0 | .0 | 23.7 |
| 45 | 376.4 | 50.1 | -22.2 | 18.8 | -9.0 | .0 | 24.0 |
| 46 | 550.2 | 43.4 | -18.7 | 18.6 | -8.9 | .0 | 20.7 |
| 47 | 535.3 | 43.9 | -19.0 | 18.6 | -8.9 | .0 | 21.0 |
| 48 | 527.9 | 44.1 | -19.1 | 18.6 | -8.9 | .0 | 21.1 |
| 49 | 513.0 | 44.6 | -19.4 | 18.6 | -8.9 | .0 | 21.3 |
| 50 | 498.2 | 45.1 | -19.6 | 18.6 | -8.9 | .0 | 21.5 |
| 51 | 483.3 | 45.6 | -19.8 | 18.6 | -8.9 | .0 | 21.8 |
| 52 | 468.4 | 46.1 | -20.1 | 18.6 | -8.9 | .0 | 22.0 |
| 53 | 453.6 | 46.5 | -20.3 | 18.6 | -8.9 | .0 | 22.2 |
| 54 | 438.7 | 47.0 | -20.6 | 18.6 | -8.9 | .0 | 22.4 |
| 55 | 423.8 | 47.5 | -20.8 | 18.6 | -8.9 | .0 | 22.7 |
| 56 | 408.9 | 48.0 | -21.1 | 18.6 | -8.9 | .0 | 22.9 |
| 57 | 394.1 | 48.4 | -21.3 | 18.6 | -8.9 | .0 | 23.1 |
| 58 | 379.2 | 48.9 | -21.6 | 18.6 | -8.9 | .0 | 23.3 |
| 59 | 364.3 | 49.4 | -21.8 | 18.6 | -8.9 | .0 | 23.6 |
| 60 | 356.9 | 49.6 | -22.0 | 18.6 | -8.9 | .0 | 23.7 |
| 61 | 342.0 | 50.1 | -22.2 | 18.6 | -8.9 | .0 | 23.9 |
| 62 | 508.4 | 43.7 | -18.9 | 18.4 | -8.8 | .0 | 20.8 |
| 63 | 315.2 | 49.9 | -22.1 | 18.4 | -8.8 | .0 | 23.8 |
| 64 | 481.5 | 43.4 | -18.7 | 18.1 | -8.7 | .0 | 20.6 |
| 65 | 466.7 | 43.9 | -19.0 | 18.1 | -8.7 | .0 | 20.9 |
| 66 | 459.2 | 44.1 | -19.1 | 18.1 | -8.7 | .0 | 21.0 |
| 67 | 444.4 | 44.6 | -19.4 | 18.1 | -8.7 | .0 | 21.2 |
| 68 | 429.5 | 45.1 | -19.6 | 18.1 | -8.7 | .0 | 21.4 |
| 69 | 414.6 | 45.6 | -19.8 | 18.1 | -8.7 | .0 | 21.7 |
| 70 | 399.8 | 46.1 | -20.1 | 18.1 | -8.7 | .0 | 21.9 |
| 71 | 384.9 | 46.5 | -20.3 | 18.1 | -8.7 | .0 | 22.1 |
| 72 | 370.0 | 47.0 | -20.6 | 18.1 | -8.7 | .0 | 22.3 |
| 73 | 355.2 | 47.5 | -20.8 | 18.1 | -8.7 | .0 | 22.6 |
| 74 | 340.3 | 48.0 | -21.1 | 18.1 | -8.7 | .0 | 22.8 |
| 75 | 325.4 | 48.4 | -21.3 | 18.1 | -8.7 | .0 | 23.0 |
| 76 | 310.6 | 48.9 | -21.6 | 18.1 | -8.7 | .0 | 23.3 |
| 77 | 295.7 | 49.4 | -21.8 | 18.1 | -8.7 | .0 | 23.5 |
| 78 | 288.3 | 49.6 | -22.0 | 18.1 | -8.7 | .0 | 23.6 |
| 79 | 273.4 | 50.1 | -22.2 | 18.1 | -8.7 | .0 | 23.8 |
| 80 | 439.8 | 43.7 | -18.9 | 17.9 | -8.6 | .0 | 20.7 |
| 81 | 246.5 | 49.9 | -22.1 | 17.9 | -8.6 | .0 | 23.7 |
| 82 | 412.9 | 43.4 | -18.7 | 17.7 | -8.4 | .0 | 20.5 |
| 83 | 398.0 | 43.9 | -19.0 | 17.7 | -8.4 | .0 | 20.8 |
| 84 | 390.6 | 44.1 | -19.1 | 17.7 | -8.4 | .0 | 20.9 |
| 85 | 375.7 | 44.6 | -19.4 | 17.7 | -8.4 | .0 | 21.1 |
| 86 | 360.8 | 45.1 | -19.6 | 17.7 | -8.4 | .0 | 21.3 |
| 87 | 346.0 | 45.6 | -19.8 | 17.7 | -8.4 | .0 | 21.6 |
| 88 | 331.1 | 46.1 | -20.1 | 17.7 | -8.4 | .0 | 21.8 |
| 89 | 316.2 | 46.5 | -20.3 | 17.7 | -8.4 | .0 | 22.0 |
| 90 | 301.4 | 47.0 | -20.6 | 17.7 | -8.4 | .0 | 22.3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 91 | 286.5 | 47.5 | -20.8 | 17.7 | -8.4 | .0 | 22.5 |
| 92 | 271.6 | 48.0 | -21.1 | 17.7 | -8.4 | .0 | 22.7 |
| 93 | 256.8 | 48.4 | -21.3 | 17.7 | -8.4 | .0 | 22.9 |
| 94 | 241.9 | 48.9 | -21.6 | 17.7 | -8.4 | .0 | 23.2 |
| 95 | 227.0 | 49.4 | -21.8 | 17.7 | -8.4 | .0 | 23.4 |
| 96 | 219.6 | 49.6 | -22.0 | 17.7 | -8.4 | .0 | 23.5 |
| 97 | 204.7 | 50.1 | -22.2 | 17.7 | -8.4 | .0 | 23.8 |
| 98 | 371.1 | 43.7 | -18.9 | 17.5 | -8.3 | .0 | 20.6 |
| 99 | 177.8 | 49.9 | -22.1 | 17.5 | -8.3 | .0 | 23.6 |
| 100 | 344.2 | 43.4 | -18.7 | 17.3 | -8.2 | .0 | 20.5 |
| 101 | 329.4 | 43.9 | -19.0 | 17.3 | -8.2 | .0 | 20.7 |
| 102 | 321.9 | 44.1 | -19.1 | 17.3 | -8.2 | .0 | 20.8 |
| 103 | 307.1 | 44.6 | -19.4 | 17.3 | -8.2 | .0 | 21.0 |
| 104 | 292.2 | 45.1 | -19.6 | 17.3 | -8.2 | .0 | 21.3 |
| 105 | 277.3 | 45.6 | -19.8 | 17.3 | -8.2 | .0 | 21.5 |
| 106 | 262.5 | 46.1 | -20.1 | 17.3 | -8.2 | .0 | 21.7 |
| 107 | 247.6 | 46.5 | -20.3 | 17.3 | -8.2 | .0 | 21.9 |
| 108 | 232.7 | 47.0 | -20.6 | 17.3 | -8.2 | .0 | 22.2 |
| 109 | 217.9 | 47.5 | -20.8 | 17.3 | -8.2 | .0 | 22.4 |
| 110 | 203.0 | 48.0 | -21.1 | 17.3 | -8.2 | .0 | 22.6 |
| 111 | 188.1 | 48.4 | -21.3 | 17.3 | -8.2 | .0 | 22.9 |
| 112 | 173.3 | 48.9 | -21.6 | 17.3 | -8.2 | .0 | 23.1 |
| 113 | 158.4 | 49.4 | -21.8 | 17.3 | -8.2 | .0 | 23.3 |
| 114 | 151.0 | 49.6 | -22.0 | 17.3 | -8.2 | .0 | 23.4 |
| 115 | 136.1 | 50.1 | -22.2 | 17.3 | -8.2 | .0 | 23.7 |
| 116 | 302.5 | 43.7 | -18.9 | 17.0 | -8.1 | .0 | 20.5 |
| 117 | 109.2 | 49.9 | -22.1 | 17.0 | -8.1 | .0 | 23.5 |
| 118 | 275.6 | 43.4 | -18.7 | 16.8 | -8.0 | .0 | 20.4 |
| 119 | 260.7 | 43.9 | -19.0 | 16.8 | -8.0 | .0 | 20.6 |
| 120 | 253.3 | 44.1 | -19.1 | 16.8 | -8.0 | .0 | 20.7 |
| 121 | 238.4 | 44.6 | -19.4 | 16.8 | -8.0 | .0 | 20.9 |
| 122 | 223.5 | 45.1 | -19.6 | 16.8 | -8.0 | .0 | 21.2 |
| 123 | 208.7 | 45.6 | -19.8 | 16.8 | -8.0 | .0 | 21.4 |
| 124 | 193.8 | 46.1 | -20.1 | 16.8 | -8.0 | .0 | 21.6 |
| 125 | 178.9 | 46.5 | -20.3 | 16.8 | -8.0 | .0 | 21.9 |
| 126 | 164.1 | 47.0 | -20.6 | 16.8 | -8.0 | .0 | 22.1 |
| 127 | 149.2 | 47.5 | -20.8 | 16.8 | -8.0 | .0 | 22.3 |
| 128 | 134.3 | 48.0 | -21.1 | 16.8 | -8.0 | .0 | 22.5 |
| 129 | 119.5 | 48.4 | -21.3 | 16.8 | -8.0 | .0 | 22.8 |
| 130 | 104.6 | 48.9 | -21.6 | 16.8 | -8.0 | .0 | 23.0 |
| 131 | 89.7 | 49.4 | -21.8 | 16.8 | -8.0 | .0 | 23.2 |
| 132 | 82.3 | 49.6 | -22.0 | 16.8 | -8.0 | .0 | 23.4 |
| 133 | 67.4 | 50.1 | -22.2 | 16.8 | -8.0 | .0 | 23.6 |
| 134 | 233.8 | 43.7 | -18.9 | 16.6 | -7.9 | .0 | 20.4 |
| 135 | 40.5 | 49.9 | -22.1 | 16.6 | -7.9 | .0 | 23.4 |
| 136 | 206.9 | 43.4 | -18.7 | 16.4 | -7.8 | .0 | 20.3 |
| 137 | 192.0 | 43.9 | -19.0 | 16.4 | -7.8 | .0 | 20.5 |
| 138 | 184.6 | 44.1 | -19.1 | 16.4 | -7.8 | .0 | 20.6 |
| 139 | 169.7 | 44.6 | -19.4 | 16.4 | -7.8 | .0 | 20.8 |
| 140 | 154.9 | 45.1 | -19.6 | 16.4 | -7.8 | .0 | 21.1 |
| 141 | 140.0 | 45.6 | -19.8 | 16.4 | -7.8 | .0 | 21.3 |
| 142 | 125.1 | 46.1 | -20.1 | 16.4 | -7.8 | .0 | 21.5 |
| 143 | 110.3 | 46.5 | -20.3 | 16.4 | -7.8 | .0 | 21.8 |
| 144 | 95.4 | 47.0 | -20.6 | 16.4 | -7.8 | .0 | 22.0 |
| 145 | 80.5 | 47.5 | -20.8 | 16.4 | -7.8 | .0 | 22.2 |
| 146 | 65.7 | 48.0 | -21.1 | 16.4 | -7.8 | .0 | 22.5 |
| 147 | 50.8 | 48.4 | -21.3 | 16.4 | -7.8 | .0 | 22.7 |
| 148 | 35.9 | 48.9 | -21.6 | 16.4 | -7.8 | .0 | 22.9 |
| 149 | 21.1 | 49.4 | -21.8 | 16.4 | -7.8 | .0 | 23.2 |
| 150 | 13.6 | 49.6 | -22.0 | 16.4 | -7.8 | .0 | 23.3 |
| 151 | -1.2 | 50.1 | -22.2 | 16.4 | -7.8 | .0 | 23.5 |
| 152 | 165.2 | 43.7 | -18.9 | 16.2 | -7.6 | .0 | 20.3 |
| 153 | -28.1 | 49.9 | -22.1 | 16.2 | -7.6 | .0 | 23.4 |
| 154 | 138.3 | 43.4 | -18.7 | 15.9 | -7.5 | .0 | 20.2 |
| 155 | 123.4 | 43.9 | -19.0 | 15.9 | -7.5 | .0 | 20.4 |
| 156 | 116.0 | 44.1 | -19.1 | 15.9 | -7.5 | .0 | 20.5 |
| 157 | 101.1 | 44.6 | -19.4 | 15.9 | -7.5 | .0 | 20.8 |
| 158 | 86.2 | 45.1 | -19.6 | 15.9 | -7.5 | .0 | 21.0 |
| 159 | 71.4 | 45.6 | -19.8 | 15.9 | -7.5 | .0 | 21.2 |
| 160 | 56.5 | 46.1 | -20.1 | 15.9 | -7.5 | .0 | 21.5 |
| 161 | 41.6 | 46.5 | -20.3 | 15.9 | -7.5 | .0 | 21.7 |
| 162 | 26.8 | 47.0 | -20.6 | 15.9 | -7.5 | .0 | 21.9 |
| 163 | 11.9 | 47.5 | -20.8 | 15.9 | -7.5 | .0 | 22.2 |
| 164 | -3.0 | 48.0 | -21.1 | 15.9 | -7.5 | .0 | 22.4 |
| 165 | -17.8 | 48.4 | -21.3 | 15.9 | -7.5 | .0 | 22.6 |
| 166 | -32.7 | 48.9 | -21.6 | 15.9 | -7.5 | .0 | 22.9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 167 | -47.6 | 49.4 | -21.8 | 15.9 | -7.5 | .0 | 23.1 |
| 168 | -55.0 | 49.6 | -22.0 | 15.9 | -7.5 | .0 | 23.2 |
| 169 | -69.9 | 50.1 | -22.2 | 15.9 | -7.5 | .0 | 23.4 |
| 170 | 96.5 | 43.7 | -18.9 | 15.7 | -7.4 | .0 | 20.3 |
| 171 | -96.8 | 49.9 | -22.1 | 15.7 | -7.4 | .0 | 23.3 |
| 172 | 69.6 | 43.4 | -18.7 | 15.5 | -7.3 | .0 | 20.1 |
| 173 | 54.7 | 43.9 | -19.0 | 15.5 | -7.3 | .0 | 20.3 |
| 174 | 47.3 | 44.1 | -19.1 | 15.5 | -7.3 | .0 | 20.4 |
| 175 | 32.4 | 44.6 | -19.4 | 15.5 | -7.3 | .0 | 20.7 |
| 176 | 17.6 | 45.1 | -19.6 | 15.5 | -7.3 | .0 | 20.9 |
| 177 | 2.7 | 45.6 | -19.8 | 15.5 | -7.3 | .0 | 21.1 |
| 178 | -12.2 | 46.1 | -20.1 | 15.5 | -7.3 | .0 | 21.4 |
| 179 | -27.0 | 46.5 | -20.3 | 15.5 | -7.3 | .0 | 21.6 |
| 180 | -41.9 | 47.0 | -20.6 | 15.5 | -7.3 | .0 | 21.8 |
| 181 | -56.8 | 47.5 | -20.8 | 15.5 | -7.3 | .0 | 22.1 |
| 182 | -71.6 | 48.0 | -21.1 | 15.5 | -7.3 | .0 | 22.3 |
| 183 | -86.5 | 48.4 | -21.3 | 15.5 | -7.3 | .0 | 22.5 |
| 184 | -101.4 | 48.9 | -21.6 | 15.5 | -7.3 | .0 | 22.8 |
| 185 | -116.2 | 49.4 | -21.8 | 15.5 | -7.3 | .0 | 23.0 |
| 186 | -123.7 | 49.6 | -22.0 | 15.5 | -7.3 | .0 | 23.1 |
| 187 | -138.5 | 50.1 | -22.2 | 15.5 | -7.3 | .0 | 23.4 |
| 188 | 27.8 | 43.7 | -18.9 | 15.3 | -7.2 | .0 | 20.2 |
| 189 | -165.4 | 49.9 | -22.1 | 15.3 | -7.2 | .0 | 23.2 |
| 190 | 1.0 | 43.4 | -18.7 | 15.1 | -7.1 | .0 | 20.0 |
| 191 | -13.9 | 43.9 | -19.0 | 15.1 | -7.1 | .0 | 20.3 |
| 192 | -21.3 | 44.1 | -19.1 | 15.1 | -7.1 | .0 | 20.4 |
| 193 | -36.2 | 44.6 | -19.4 | 15.1 | -7.1 | .0 | 20.6 |
| 194 | -51.1 | 45.1 | -19.6 | 15.1 | -7.1 | .0 | 20.8 |
| 195 | -65.9 | 45.6 | -19.8 | 15.1 | -7.1 | .0 | 21.1 |
| 196 | -80.8 | 46.1 | -20.1 | 15.1 | -7.1 | .0 | 21.3 |
| 197 | -95.7 | 46.5 | -20.3 | 15.1 | -7.1 | .0 | 21.5 |
| 198 | -110.6 | 47.0 | -20.6 | 15.1 | -7.1 | .0 | 21.8 |
| 199 | -125.4 | 47.5 | -20.8 | 15.1 | -7.1 | .0 | 22.0 |
| 200 | -140.3 | 48.0 | -21.1 | 15.1 | -7.1 | .0 | 22.2 |
| 201 | -155.2 | 48.4 | -21.3 | 15.1 | -7.1 | .0 | 22.5 |
| 202 | -170.0 | 48.9 | -21.6 | 15.1 | -7.1 | .0 | 22.7 |
| 203 | -184.9 | 49.4 | -21.8 | 15.1 | -7.1 | .0 | 22.9 |
| 204 | -192.3 | 49.6 | -22.0 | 15.1 | -7.1 | .0 | 23.1 |
| 205 | -207.2 | 50.1 | -22.2 | 15.1 | -7.1 | .0 | 23.3 |
| 206 | -33.4 | 43.4 | -18.7 | 14.8 | -7.0 | .0 | 20.0 |
| 207 | -48.2 | 43.9 | -19.0 | 14.8 | -7.0 | .0 | 20.2 |
| 208 | -55.7 | 44.1 | -19.1 | 14.8 | -7.0 | .0 | 20.3 |
| 209 | -70.5 | 44.6 | -19.4 | 14.8 | -7.0 | .0 | 20.6 |
| 210 | -85.4 | 45.1 | -19.6 | 14.8 | -7.0 | .0 | 20.8 |
| 211 | -100.3 | 45.6 | -19.8 | 14.8 | -7.0 | .0 | 21.0 |
| 212 | -115.1 | 46.1 | -20.1 | 14.8 | -7.0 | .0 | 21.3 |
| 213 | -130.0 | 46.5 | -20.3 | 14.8 | -7.0 | .0 | 21.5 |
| 214 | -144.9 | 47.0 | -20.6 | 14.8 | -7.0 | .0 | 21.7 |
| 215 | -159.7 | 47.5 | -20.8 | 14.8 | -7.0 | .0 | 22.0 |
| 216 | -174.6 | 48.0 | -21.1 | 14.8 | -7.0 | .0 | 22.2 |
| 217 | -189.5 | 48.4 | -21.3 | 14.8 | -7.0 | .0 | 22.4 |
| 218 | -204.3 | 48.9 | -21.6 | 14.8 | -7.0 | .0 | 22.7 |
| 219 | -219.2 | 49.4 | -21.8 | 14.8 | -7.0 | .0 | 22.9 |
| 220 | -226.6 | 49.6 | -22.0 | 14.8 | -7.0 | .0 | 23.0 |
| 221 | -241.5 | 50.1 | -22.2 | 14.8 | -7.0 | .0 | 23.3 |
| 222 | -75.1 | 43.7 | -18.9 | 14.6 | -6.8 | .0 | 20.1 |
| 223 | -97.4 | 44.4 | -19.2 | 14.6 | -6.8 | .0 | 20.4 |
| 224 | -112.3 | 44.9 | -19.5 | 14.6 | -6.8 | .0 | 20.6 |
| 225 | -127.2 | 45.3 | -19.7 | 14.6 | -6.8 | .0 | 20.9 |
| 226 | -142.0 | 45.8 | -20.0 | 14.6 | -6.8 | .0 | 21.1 |
| 227 | -156.9 | 46.3 | -20.2 | 14.6 | -6.8 | .0 | 21.3 |
| 228 | -171.8 | 46.8 | -20.5 | 14.6 | -6.8 | .0 | 21.6 |
| 229 | -186.6 | 47.2 | -20.7 | 14.6 | -6.8 | .0 | 21.8 |
| 230 | -201.5 | 47.7 | -21.0 | 14.6 | -6.8 | .0 | 22.1 |
| 231 | -216.4 | 48.2 | -21.2 | 14.6 | -6.8 | .0 | 22.3 |
| 232 | -231.2 | 48.7 | -21.5 | 14.6 | -6.8 | .0 | 22.5 |
| 233 | -246.1 | 49.1 | -21.7 | 14.6 | -6.8 | .0 | 22.8 |
| 234 | -268.4 | 49.9 | -22.1 | 14.6 | -6.8 | .0 | 23.1 |
| 235 | -102.0 | 43.4 | -18.7 | 14.4 | -6.7 | .0 | 19.9 |
| 236 | -116.9 | 43.9 | -19.0 | 14.4 | -6.7 | .0 | 20.1 |
| 237 | -124.3 | 44.1 | -19.1 | 14.4 | -6.7 | .0 | 20.3 |
| 238 | -139.2 | 44.6 | -19.4 | 14.4 | -6.7 | .0 | 20.5 |
| 239 | -154.1 | 45.1 | -19.6 | 14.4 | -6.7 | .0 | 20.7 |
| 240 | -168.9 | 45.6 | -19.8 | 14.4 | -6.7 | .0 | 21.0 |
| 241 | -183.8 | 46.1 | -20.1 | 14.4 | -6.7 | .0 | 21.2 |
| 242 | -198.7 | 46.5 | -20.3 | 14.4 | -6.7 | .0 | 21.4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 243 | -213.5 | 47.0 | -20.6 | 14.4 | -6.7 | .0 | 21.7 |
| 244 | -228.4 | 47.5 | -20.8 | 14.4 | -6.7 | .0 | 21.9 |
| 245 | -243.3 | 48.0 | -21.1 | 14.4 | -6.7 | .0 | 22.1 |
| 246 | -258.1 | 48.4 | -21.3 | 14.4 | -6.7 | .0 | 22.4 |
| 247 | -273.0 | 48.9 | -21.6 | 14.4 | -6.7 | .0 | 22.6 |
| 248 | -287.9 | 49.4 | -21.8 | 14.4 | -6.7 | .0 | 22.8 |
| 249 | -295.3 | 49.6 | -22.0 | 14.4 | -6.7 | .0 | 23.0 |
| 250 | -310.2 | 50.1 | -22.2 | 14.4 | -6.7 | .0 | 23.2 |

Mris = (Mxp^2 + Myp^2)^0.5

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 6
VI08 - P22 - SLV_x

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 21576.8 | -11691.4 | -268069.3 | -4206.3 | -97230.1 | -4930.2 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 39675.8 | -11691.4 | -268069.3 | -4206.3 | -97230.1 | -4930.2 |

Punto di applic. carico verticale: Xv = -6.756 m Yv = -2.451 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.587 | -2.236 | -.573 | -.757 | -.114 | -.015 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | -323.6 | -43.4 | 18.7 | -19.2 | 9.2 | .0 | 20.9 |
| 2 | -308.8 | -43.9 | 19.0 | -19.2 | 9.2 | .0 | 21.1 |
| 3 | -301.3 | -44.1 | 19.1 | -19.2 | 9.2 | .0 | 21.2 |
| 4 | -286.5 | -44.6 | 19.3 | -19.2 | 9.2 | .0 | 21.4 |
| 5 | -271.6 | -45.1 | 19.6 | -19.2 | 9.2 | .0 | 21.7 |
| 6 | -256.7 | -45.6 | 19.8 | -19.2 | 9.2 | .0 | 21.9 |
| 7 | -241.9 | -46.1 | 20.1 | -19.2 | 9.2 | .0 | 22.1 |
| 8 | -227.0 | -46.5 | 20.3 | -19.2 | 9.2 | .0 | 22.3 |
| 9 | -212.1 | -47.0 | 20.6 | -19.2 | 9.2 | .0 | 22.6 |
| 10 | -197.3 | -47.5 | 20.8 | -19.2 | 9.2 | .0 | 22.8 |
| 11 | -182.4 | -48.0 | 21.1 | -19.2 | 9.2 | .0 | 23.0 |
| 12 | -167.5 | -48.4 | 21.3 | -19.2 | 9.2 | .0 | 23.2 |
| 13 | -152.7 | -48.9 | 21.6 | -19.2 | 9.2 | .0 | 23.5 |
| 14 | -137.8 | -49.4 | 21.8 | -19.2 | 9.2 | .0 | 23.7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | -130.4 | -49.6 | 22.0 | -19.2 | 9.2 | .0 | 23.8 |
| 16 | -115.5 | -50.1 | 22.2 | -19.2 | 9.2 | .0 | 24.0 |
| 17 | -281.8 | -43.7 | 18.8 | -19.0 | 9.1 | .0 | 20.9 |
| 18 | -259.5 | -44.4 | 19.2 | -19.0 | 9.1 | .0 | 21.3 |
| 19 | -244.7 | -44.9 | 19.5 | -19.0 | 9.1 | .0 | 21.5 |
| 20 | -229.8 | -45.3 | 19.7 | -19.0 | 9.1 | .0 | 21.7 |
| 21 | -214.9 | -45.8 | 20.0 | -19.0 | 9.1 | .0 | 22.0 |
| 22 | -200.1 | -46.3 | 20.2 | -19.0 | 9.1 | .0 | 22.2 |
| 23 | -185.2 | -46.8 | 20.5 | -19.0 | 9.1 | .0 | 22.4 |
| 24 | -170.3 | -47.2 | 20.7 | -19.0 | 9.1 | .0 | 22.6 |
| 25 | -155.5 | -47.7 | 21.0 | -19.0 | 9.1 | .0 | 22.9 |
| 26 | -140.6 | -48.2 | 21.2 | -19.0 | 9.1 | .0 | 23.1 |
| 27 | -125.7 | -48.7 | 21.5 | -19.0 | 9.1 | .0 | 23.3 |
| 28 | -110.9 | -49.1 | 21.7 | -19.0 | 9.1 | .0 | 23.5 |
| 29 | -88.5 | -49.9 | 22.1 | -19.0 | 9.1 | .0 | 23.9 |
| 30 | -254.9 | -43.4 | 18.7 | -18.8 | 9.0 | .0 | 20.8 |
| 31 | -240.0 | -43.9 | 19.0 | -18.8 | 9.0 | .0 | 21.0 |
| 32 | -232.6 | -44.1 | 19.1 | -18.8 | 9.0 | .0 | 21.1 |
| 33 | -217.7 | -44.6 | 19.3 | -18.8 | 9.0 | .0 | 21.3 |
| 34 | -202.8 | -45.1 | 19.6 | -18.8 | 9.0 | .0 | 21.6 |
| 35 | -188.0 | -45.6 | 19.8 | -18.8 | 9.0 | .0 | 21.8 |
| 36 | -173.1 | -46.1 | 20.1 | -18.8 | 9.0 | .0 | 22.0 |
| 37 | -158.2 | -46.5 | 20.3 | -18.8 | 9.0 | .0 | 22.2 |
| 38 | -143.4 | -47.0 | 20.6 | -18.8 | 9.0 | .0 | 22.5 |
| 39 | -128.5 | -47.5 | 20.8 | -18.8 | 9.0 | .0 | 22.7 |
| 40 | -113.6 | -48.0 | 21.1 | -18.8 | 9.0 | .0 | 22.9 |
| 41 | -98.8 | -48.4 | 21.3 | -18.8 | 9.0 | .0 | 23.2 |
| 42 | -83.9 | -48.9 | 21.6 | -18.8 | 9.0 | .0 | 23.4 |
| 43 | -69.0 | -49.4 | 21.8 | -18.8 | 9.0 | .0 | 23.6 |
| 44 | -61.6 | -49.6 | 22.0 | -18.8 | 9.0 | .0 | 23.7 |
| 45 | -46.7 | -50.1 | 22.2 | -18.8 | 9.0 | .0 | 24.0 |
| 46 | -220.5 | -43.4 | 18.7 | -18.6 | 8.9 | .0 | 20.7 |
| 47 | -205.6 | -43.9 | 19.0 | -18.6 | 8.9 | .0 | 21.0 |
| 48 | -198.2 | -44.1 | 19.1 | -18.6 | 8.9 | .0 | 21.1 |
| 49 | -183.3 | -44.6 | 19.3 | -18.6 | 8.9 | .0 | 21.3 |
| 50 | -168.4 | -45.1 | 19.6 | -18.6 | 8.9 | .0 | 21.5 |
| 51 | -153.6 | -45.6 | 19.8 | -18.6 | 8.9 | .0 | 21.7 |
| 52 | -138.7 | -46.1 | 20.1 | -18.6 | 8.9 | .0 | 22.0 |
| 53 | -123.8 | -46.5 | 20.3 | -18.6 | 8.9 | .0 | 22.2 |
| 54 | -109.0 | -47.0 | 20.6 | -18.6 | 8.9 | .0 | 22.4 |
| 55 | -94.1 | -47.5 | 20.8 | -18.6 | 8.9 | .0 | 22.7 |
| 56 | -79.2 | -48.0 | 21.1 | -18.6 | 8.9 | .0 | 22.9 |
| 57 | -64.4 | -48.4 | 21.3 | -18.6 | 8.9 | .0 | 23.1 |
| 58 | -49.5 | -48.9 | 21.6 | -18.6 | 8.9 | .0 | 23.3 |
| 59 | -34.6 | -49.4 | 21.8 | -18.6 | 8.9 | .0 | 23.6 |
| 60 | -27.2 | -49.6 | 22.0 | -18.6 | 8.9 | .0 | 23.7 |
| 61 | -12.3 | -50.1 | 22.2 | -18.6 | 8.9 | .0 | 23.9 |
| 62 | -178.7 | -43.7 | 18.8 | -18.4 | 8.8 | .0 | 20.8 |
| 63 | 14.6 | -49.9 | 22.1 | -18.4 | 8.8 | .0 | 23.8 |
| 64 | -151.7 | -43.4 | 18.7 | -18.1 | 8.7 | .0 | 20.6 |
| 65 | -136.8 | -43.9 | 19.0 | -18.1 | 8.7 | .0 | 20.9 |
| 66 | -129.4 | -44.1 | 19.1 | -18.1 | 8.7 | .0 | 21.0 |
| 67 | -114.5 | -44.6 | 19.3 | -18.1 | 8.7 | .0 | 21.2 |
| 68 | -99.7 | -45.1 | 19.6 | -18.1 | 8.7 | .0 | 21.4 |
| 69 | -84.8 | -45.6 | 19.8 | -18.1 | 8.7 | .0 | 21.7 |
| 70 | -69.9 | -46.1 | 20.1 | -18.1 | 8.7 | .0 | 21.9 |
| 71 | -55.1 | -46.5 | 20.3 | -18.1 | 8.7 | .0 | 22.1 |
| 72 | -40.2 | -47.0 | 20.6 | -18.1 | 8.7 | .0 | 22.3 |
| 73 | -25.3 | -47.5 | 20.8 | -18.1 | 8.7 | .0 | 22.6 |
| 74 | -10.5 | -48.0 | 21.1 | -18.1 | 8.7 | .0 | 22.8 |
| 75 | 4.4 | -48.4 | 21.3 | -18.1 | 8.7 | .0 | 23.0 |
| 76 | 19.3 | -48.9 | 21.6 | -18.1 | 8.7 | .0 | 23.3 |
| 77 | 34.1 | -49.4 | 21.8 | -18.1 | 8.7 | .0 | 23.5 |
| 78 | 41.6 | -49.6 | 22.0 | -18.1 | 8.7 | .0 | 23.6 |
| 79 | 56.4 | -50.1 | 22.2 | -18.1 | 8.7 | .0 | 23.8 |
| 80 | -109.9 | -43.7 | 18.8 | -17.9 | 8.6 | .0 | 20.7 |
| 81 | 83.4 | -49.9 | 22.1 | -17.9 | 8.6 | .0 | 23.7 |
| 82 | -82.9 | -43.4 | 18.7 | -17.7 | 8.4 | .0 | 20.5 |
| 83 | -68.1 | -43.9 | 19.0 | -17.7 | 8.4 | .0 | 20.8 |
| 84 | -60.6 | -44.1 | 19.1 | -17.7 | 8.4 | .0 | 20.9 |
| 85 | -45.8 | -44.6 | 19.3 | -17.7 | 8.4 | .0 | 21.1 |
| 86 | -30.9 | -45.1 | 19.6 | -17.7 | 8.4 | .0 | 21.3 |
| 87 | -16.0 | -45.6 | 19.8 | -17.7 | 8.4 | .0 | 21.6 |
| 88 | -1.2 | -46.1 | 20.1 | -17.7 | 8.4 | .0 | 21.8 |
| 89 | 13.7 | -46.5 | 20.3 | -17.7 | 8.4 | .0 | 22.0 |
| 90 | 28.6 | -47.0 | 20.6 | -17.7 | 8.4 | .0 | 22.2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 91 | 43.4 | -47.5 | 20.8 | -17.7 | 8.4 | .0 | 22.5 |
| 92 | 58.3 | -48.0 | 21.1 | -17.7 | 8.4 | .0 | 22.7 |
| 93 | 73.2 | -48.4 | 21.3 | -17.7 | 8.4 | .0 | 22.9 |
| 94 | 88.0 | -48.9 | 21.6 | -17.7 | 8.4 | .0 | 23.2 |
| 95 | 102.9 | -49.4 | 21.8 | -17.7 | 8.4 | .0 | 23.4 |
| 96 | 110.3 | -49.6 | 22.0 | -17.7 | 8.4 | .0 | 23.5 |
| 97 | 125.2 | -50.1 | 22.2 | -17.7 | 8.4 | .0 | 23.7 |
| 98 | -41.1 | -43.7 | 18.8 | -17.5 | 8.3 | .0 | 20.6 |
| 99 | 152.2 | -49.9 | 22.1 | -17.5 | 8.3 | .0 | 23.6 |
| 100 | -14.1 | -43.4 | 18.7 | -17.3 | 8.2 | .0 | 20.4 |
| 101 | .7 | -43.9 | 19.0 | -17.3 | 8.2 | .0 | 20.7 |
| 102 | 8.2 | -44.1 | 19.1 | -17.3 | 8.2 | .0 | 20.8 |
| 103 | 23.0 | -44.6 | 19.3 | -17.3 | 8.2 | .0 | 21.0 |
| 104 | 37.9 | -45.1 | 19.6 | -17.3 | 8.2 | .0 | 21.2 |
| 105 | 52.8 | -45.6 | 19.8 | -17.3 | 8.2 | .0 | 21.5 |
| 106 | 67.6 | -46.1 | 20.1 | -17.3 | 8.2 | .0 | 21.7 |
| 107 | 82.5 | -46.5 | 20.3 | -17.3 | 8.2 | .0 | 21.9 |
| 108 | 97.4 | -47.0 | 20.6 | -17.3 | 8.2 | .0 | 22.2 |
| 109 | 112.2 | -47.5 | 20.8 | -17.3 | 8.2 | .0 | 22.4 |
| 110 | 127.1 | -48.0 | 21.1 | -17.3 | 8.2 | .0 | 22.6 |
| 111 | 142.0 | -48.4 | 21.3 | -17.3 | 8.2 | .0 | 22.9 |
| 112 | 156.8 | -48.9 | 21.6 | -17.3 | 8.2 | .0 | 23.1 |
| 113 | 171.7 | -49.4 | 21.8 | -17.3 | 8.2 | .0 | 23.3 |
| 114 | 179.1 | -49.6 | 22.0 | -17.3 | 8.2 | .0 | 23.4 |
| 115 | 194.0 | -50.1 | 22.2 | -17.3 | 8.2 | .0 | 23.7 |
| 116 | 27.7 | -43.7 | 18.8 | -17.0 | 8.1 | .0 | 20.5 |
| 117 | 220.9 | -49.9 | 22.1 | -17.0 | 8.1 | .0 | 23.5 |
| 118 | 54.6 | -43.4 | 18.7 | -16.8 | 8.0 | .0 | 20.4 |
| 119 | 69.5 | -43.9 | 19.0 | -16.8 | 8.0 | .0 | 20.6 |
| 120 | 76.9 | -44.1 | 19.1 | -16.8 | 8.0 | .0 | 20.7 |
| 121 | 91.8 | -44.6 | 19.3 | -16.8 | 8.0 | .0 | 20.9 |
| 122 | 106.7 | -45.1 | 19.6 | -16.8 | 8.0 | .0 | 21.2 |
| 123 | 121.5 | -45.6 | 19.8 | -16.8 | 8.0 | .0 | 21.4 |
| 124 | 136.4 | -46.1 | 20.1 | -16.8 | 8.0 | .0 | 21.6 |
| 125 | 151.3 | -46.5 | 20.3 | -16.8 | 8.0 | .0 | 21.8 |
| 126 | 166.1 | -47.0 | 20.6 | -16.8 | 8.0 | .0 | 22.1 |
| 127 | 181.0 | -47.5 | 20.8 | -16.8 | 8.0 | .0 | 22.3 |
| 128 | 195.9 | -48.0 | 21.1 | -16.8 | 8.0 | .0 | 22.5 |
| 129 | 210.7 | -48.4 | 21.3 | -16.8 | 8.0 | .0 | 22.8 |
| 130 | 225.6 | -48.9 | 21.6 | -16.8 | 8.0 | .0 | 23.0 |
| 131 | 240.5 | -49.4 | 21.8 | -16.8 | 8.0 | .0 | 23.2 |
| 132 | 247.9 | -49.6 | 22.0 | -16.8 | 8.0 | .0 | 23.4 |
| 133 | 262.8 | -50.1 | 22.2 | -16.8 | 8.0 | .0 | 23.6 |
| 134 | 96.5 | -43.7 | 18.8 | -16.6 | 7.9 | .0 | 20.4 |
| 135 | 289.7 | -49.9 | 22.1 | -16.6 | 7.9 | .0 | 23.4 |
| 136 | 123.4 | -43.4 | 18.7 | -16.4 | 7.8 | .0 | 20.3 |
| 137 | 138.3 | -43.9 | 19.0 | -16.4 | 7.8 | .0 | 20.5 |
| 138 | 145.7 | -44.1 | 19.1 | -16.4 | 7.8 | .0 | 20.6 |
| 139 | 160.6 | -44.6 | 19.3 | -16.4 | 7.8 | .0 | 20.8 |
| 140 | 175.4 | -45.1 | 19.6 | -16.4 | 7.8 | .0 | 21.1 |
| 141 | 190.3 | -45.6 | 19.8 | -16.4 | 7.8 | .0 | 21.3 |
| 142 | 205.2 | -46.1 | 20.1 | -16.4 | 7.8 | .0 | 21.5 |
| 143 | 220.0 | -46.5 | 20.3 | -16.4 | 7.8 | .0 | 21.8 |
| 144 | 234.9 | -47.0 | 20.6 | -16.4 | 7.8 | .0 | 22.0 |
| 145 | 249.8 | -47.5 | 20.8 | -16.4 | 7.8 | .0 | 22.2 |
| 146 | 264.6 | -48.0 | 21.1 | -16.4 | 7.8 | .0 | 22.5 |
| 147 | 279.5 | -48.4 | 21.3 | -16.4 | 7.8 | .0 | 22.7 |
| 148 | 294.4 | -48.9 | 21.6 | -16.4 | 7.8 | .0 | 22.9 |
| 149 | 309.2 | -49.4 | 21.8 | -16.4 | 7.8 | .0 | 23.2 |
| 150 | 316.7 | -49.6 | 22.0 | -16.4 | 7.8 | .0 | 23.3 |
| 151 | 331.5 | -50.1 | 22.2 | -16.4 | 7.8 | .0 | 23.5 |
| 152 | 165.2 | -43.7 | 18.8 | -16.2 | 7.6 | .0 | 20.3 |
| 153 | 358.5 | -49.9 | 22.1 | -16.2 | 7.6 | .0 | 23.4 |
| 154 | 192.2 | -43.4 | 18.7 | -15.9 | 7.5 | .0 | 20.2 |
| 155 | 207.1 | -43.9 | 19.0 | -15.9 | 7.5 | .0 | 20.4 |
| 156 | 214.5 | -44.1 | 19.1 | -15.9 | 7.5 | .0 | 20.5 |
| 157 | 229.4 | -44.6 | 19.3 | -15.9 | 7.5 | .0 | 20.8 |
| 158 | 244.2 | -45.1 | 19.6 | -15.9 | 7.5 | .0 | 21.0 |
| 159 | 259.1 | -45.6 | 19.8 | -15.9 | 7.5 | .0 | 21.2 |
| 160 | 274.0 | -46.1 | 20.1 | -15.9 | 7.5 | .0 | 21.5 |
| 161 | 288.8 | -46.5 | 20.3 | -15.9 | 7.5 | .0 | 21.7 |
| 162 | 303.7 | -47.0 | 20.6 | -15.9 | 7.5 | .0 | 21.9 |
| 163 | 318.6 | -47.5 | 20.8 | -15.9 | 7.5 | .0 | 22.2 |
| 164 | 333.4 | -48.0 | 21.1 | -15.9 | 7.5 | .0 | 22.4 |
| 165 | 348.3 | -48.4 | 21.3 | -15.9 | 7.5 | .0 | 22.6 |
| 166 | 363.2 | -48.9 | 21.6 | -15.9 | 7.5 | .0 | 22.9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 167 | 378.0 | -49.4 | 21.8 | -15.9 | 7.5 | .0 | 23.1 |
| 168 | 385.5 | -49.6 | 22.0 | -15.9 | 7.5 | .0 | 23.2 |
| 169 | 400.3 | -50.1 | 22.2 | -15.9 | 7.5 | .0 | 23.4 |
| 170 | 234.0 | -43.7 | 18.8 | -15.7 | 7.4 | .0 | 20.3 |
| 171 | 427.3 | -49.9 | 22.1 | -15.7 | 7.4 | .0 | 23.3 |
| 172 | 261.0 | -43.4 | 18.7 | -15.5 | 7.3 | .0 | 20.1 |
| 173 | 275.8 | -43.9 | 19.0 | -15.5 | 7.3 | .0 | 20.3 |
| 174 | 283.3 | -44.1 | 19.1 | -15.5 | 7.3 | .0 | 20.4 |
| 175 | 298.1 | -44.6 | 19.3 | -15.5 | 7.3 | .0 | 20.7 |
| 176 | 313.0 | -45.1 | 19.6 | -15.5 | 7.3 | .0 | 20.9 |
| 177 | 327.9 | -45.6 | 19.8 | -15.5 | 7.3 | .0 | 21.1 |
| 178 | 342.7 | -46.1 | 20.1 | -15.5 | 7.3 | .0 | 21.4 |
| 179 | 357.6 | -46.5 | 20.3 | -15.5 | 7.3 | .0 | 21.6 |
| 180 | 372.5 | -47.0 | 20.6 | -15.5 | 7.3 | .0 | 21.8 |
| 181 | 387.3 | -47.5 | 20.8 | -15.5 | 7.3 | .0 | 22.1 |
| 182 | 402.2 | -48.0 | 21.1 | -15.5 | 7.3 | .0 | 22.3 |
| 183 | 417.1 | -48.4 | 21.3 | -15.5 | 7.3 | .0 | 22.5 |
| 184 | 431.9 | -48.9 | 21.6 | -15.5 | 7.3 | .0 | 22.8 |
| 185 | 446.8 | -49.4 | 21.8 | -15.5 | 7.3 | .0 | 23.0 |
| 186 | 454.2 | -49.6 | 22.0 | -15.5 | 7.3 | .0 | 23.1 |
| 187 | 469.1 | -50.1 | 22.2 | -15.5 | 7.3 | .0 | 23.4 |
| 188 | 302.8 | -43.7 | 18.8 | -15.3 | 7.2 | .0 | 20.2 |
| 189 | 496.1 | -49.9 | 22.1 | -15.3 | 7.2 | .0 | 23.2 |
| 190 | 329.7 | -43.4 | 18.7 | -15.1 | 7.1 | .0 | 20.0 |
| 191 | 344.6 | -43.9 | 19.0 | -15.1 | 7.1 | .0 | 20.2 |
| 192 | 352.0 | -44.1 | 19.1 | -15.1 | 7.1 | .0 | 20.4 |
| 193 | 366.9 | -44.6 | 19.3 | -15.1 | 7.1 | .0 | 20.6 |
| 194 | 381.8 | -45.1 | 19.6 | -15.1 | 7.1 | .0 | 20.8 |
| 195 | 396.6 | -45.6 | 19.8 | -15.1 | 7.1 | .0 | 21.1 |
| 196 | 411.5 | -46.1 | 20.1 | -15.1 | 7.1 | .0 | 21.3 |
| 197 | 426.4 | -46.5 | 20.3 | -15.1 | 7.1 | .0 | 21.5 |
| 198 | 441.2 | -47.0 | 20.6 | -15.1 | 7.1 | .0 | 21.8 |
| 199 | 456.1 | -47.5 | 20.8 | -15.1 | 7.1 | .0 | 22.0 |
| 200 | 471.0 | -48.0 | 21.1 | -15.1 | 7.1 | .0 | 22.2 |
| 201 | 485.8 | -48.4 | 21.3 | -15.1 | 7.1 | .0 | 22.5 |
| 202 | 500.7 | -48.9 | 21.6 | -15.1 | 7.1 | .0 | 22.7 |
| 203 | 515.6 | -49.4 | 21.8 | -15.1 | 7.1 | .0 | 22.9 |
| 204 | 523.0 | -49.6 | 22.0 | -15.1 | 7.1 | .0 | 23.1 |
| 205 | 537.9 | -50.1 | 22.2 | -15.1 | 7.1 | .0 | 23.3 |
| 206 | 364.1 | -43.4 | 18.7 | -14.8 | 7.0 | .0 | 20.0 |
| 207 | 379.0 | -43.9 | 19.0 | -14.8 | 7.0 | .0 | 20.2 |
| 208 | 386.4 | -44.1 | 19.1 | -14.8 | 7.0 | .0 | 20.3 |
| 209 | 401.3 | -44.6 | 19.3 | -14.8 | 7.0 | .0 | 20.6 |
| 210 | 416.2 | -45.1 | 19.6 | -14.8 | 7.0 | .0 | 20.8 |
| 211 | 431.0 | -45.6 | 19.8 | -14.8 | 7.0 | .0 | 21.0 |
| 212 | 445.9 | -46.1 | 20.1 | -14.8 | 7.0 | .0 | 21.3 |
| 213 | 460.8 | -46.5 | 20.3 | -14.8 | 7.0 | .0 | 21.5 |
| 214 | 475.6 | -47.0 | 20.6 | -14.8 | 7.0 | .0 | 21.7 |
| 215 | 490.5 | -47.5 | 20.8 | -14.8 | 7.0 | .0 | 22.0 |
| 216 | 505.4 | -48.0 | 21.1 | -14.8 | 7.0 | .0 | 22.2 |
| 217 | 520.2 | -48.4 | 21.3 | -14.8 | 7.0 | .0 | 22.4 |
| 218 | 535.1 | -48.9 | 21.6 | -14.8 | 7.0 | .0 | 22.7 |
| 219 | 550.0 | -49.4 | 21.8 | -14.8 | 7.0 | .0 | 22.9 |
| 220 | 557.4 | -49.6 | 22.0 | -14.8 | 7.0 | .0 | 23.0 |
| 221 | 572.3 | -50.1 | 22.2 | -14.8 | 7.0 | .0 | 23.3 |
| 222 | 406.0 | -43.7 | 18.8 | -14.6 | 6.8 | .0 | 20.1 |
| 223 | 428.3 | -44.4 | 19.2 | -14.6 | 6.8 | .0 | 20.4 |
| 224 | 443.1 | -44.9 | 19.5 | -14.6 | 6.8 | .0 | 20.6 |
| 225 | 458.0 | -45.3 | 19.7 | -14.6 | 6.8 | .0 | 20.9 |
| 226 | 472.9 | -45.8 | 20.0 | -14.6 | 6.8 | .0 | 21.1 |
| 227 | 487.7 | -46.3 | 20.2 | -14.6 | 6.8 | .0 | 21.3 |
| 228 | 502.6 | -46.8 | 20.5 | -14.6 | 6.8 | .0 | 21.6 |
| 229 | 517.5 | -47.2 | 20.7 | -14.6 | 6.8 | .0 | 21.8 |
| 230 | 532.3 | -47.7 | 21.0 | -14.6 | 6.8 | .0 | 22.0 |
| 231 | 547.2 | -48.2 | 21.2 | -14.6 | 6.8 | .0 | 22.3 |
| 232 | 562.1 | -48.7 | 21.5 | -14.6 | 6.8 | .0 | 22.5 |
| 233 | 576.9 | -49.1 | 21.7 | -14.6 | 6.8 | .0 | 22.8 |
| 234 | 599.2 | -49.9 | 22.1 | -14.6 | 6.8 | .0 | 23.1 |
| 235 | 432.9 | -43.4 | 18.7 | -14.4 | 6.7 | .0 | 19.9 |
| 236 | 447.8 | -43.9 | 19.0 | -14.4 | 6.7 | .0 | 20.1 |
| 237 | 455.2 | -44.1 | 19.1 | -14.4 | 6.7 | .0 | 20.2 |
| 238 | 470.1 | -44.6 | 19.3 | -14.4 | 6.7 | .0 | 20.5 |
| 239 | 484.9 | -45.1 | 19.6 | -14.4 | 6.7 | .0 | 20.7 |
| 240 | 499.8 | -45.6 | 19.8 | -14.4 | 6.7 | .0 | 20.9 |
| 241 | 514.7 | -46.1 | 20.1 | -14.4 | 6.7 | .0 | 21.2 |
| 242 | 529.5 | -46.5 | 20.3 | -14.4 | 6.7 | .0 | 21.4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 243 | 544.4 | -47.0 | 20.6 | -14.4 | 6.7 | .0 | 21.7 |
| 244 | 559.3 | -47.5 | 20.8 | -14.4 | 6.7 | .0 | 21.9 |
| 245 | 574.1 | -48.0 | 21.1 | -14.4 | 6.7 | .0 | 22.1 |
| 246 | 589.0 | -48.4 | 21.3 | -14.4 | 6.7 | .0 | 22.4 |
| 247 | 603.9 | -48.9 | 21.6 | -14.4 | 6.7 | .0 | 22.6 |
| 248 | 618.7 | -49.4 | 21.8 | -14.4 | 6.7 | .0 | 22.8 |
| 249 | 626.2 | -49.6 | 22.0 | -14.4 | 6.7 | .0 | 23.0 |
| 250 | 641.0 | -50.1 | 22.2 | -14.4 | 6.7 | .0 | 23.2 |

Mris = (Mxp^2 + Myp^2)^0.5

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 7
VI08 - P22 - SLV_y

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 24737.8 | 3509.7 | 80115.6 | 14020.8 | 324099.0 | 16433.8 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 42836.8 | 3509.7 | 80115.6 | 14020.8 | 324099.0 | 16433.8 |

Punto di applic. carico verticale: Xv = 1.870 m Yv = 7.566 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.713 | .671 | .171 | 2.522 | .381 | .051 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | 631.3 | 2.9 | -.4 | 64.2 | -30.8 | .0 | 30.8 |
| 2 | 581.7 | 4.5 | -1.2 | 64.2 | -30.8 | .0 | 30.8 |
| 3 | 557.0 | 5.3 | -1.6 | 64.2 | -30.8 | .0 | 30.8 |
| 4 | 507.4 | 6.9 | -2.4 | 64.2 | -30.8 | .0 | 30.9 |
| 5 | 457.9 | 8.5 | -3.3 | 64.2 | -30.8 | .0 | 31.0 |
| 6 | 408.3 | 10.1 | -4.1 | 64.2 | -30.8 | .0 | 31.1 |
| 7 | 358.7 | 11.7 | -4.9 | 64.2 | -30.8 | .0 | 31.2 |
| 8 | 309.2 | 13.2 | -5.7 | 64.2 | -30.8 | .0 | 31.3 |
| 9 | 259.6 | 14.8 | -6.6 | 64.2 | -30.8 | .0 | 31.5 |
| 10 | 210.1 | 16.4 | -7.4 | 64.2 | -30.8 | .0 | 31.7 |
| 11 | 160.5 | 18.0 | -8.2 | 64.2 | -30.8 | .0 | 31.9 |
| 12 | 111.0 | 19.6 | -9.0 | 64.2 | -30.8 | .0 | 32.1 |
| 13 | 61.4 | 21.2 | -9.9 | 64.2 | -30.8 | .0 | 32.3 |
| 14 | 11.9 | 22.8 | -10.7 | 64.2 | -30.8 | .0 | 32.6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | -12.9 | 23.6 | -11.1 | 64.2 | -30.8 | .0 | 32.7 |
| 16 | -62.5 | 25.2 | -11.9 | 64.2 | -30.8 | .0 | 33.0 |
| 17 | 596.2 | 3.7 | -.8 | 63.4 | -30.4 | .0 | 30.4 |
| 18 | 521.9 | 6.1 | -2.0 | 63.4 | -30.4 | .0 | 30.5 |
| 19 | 472.4 | 7.7 | -2.8 | 63.4 | -30.4 | .0 | 30.6 |
| 20 | 422.8 | 9.3 | -3.7 | 63.4 | -30.4 | .0 | 30.6 |
| 21 | 373.2 | 10.9 | -4.5 | 63.4 | -30.4 | .0 | 30.8 |
| 22 | 323.7 | 12.4 | -5.3 | 63.4 | -30.4 | .0 | 30.9 |
| 23 | 274.1 | 14.0 | -6.1 | 63.4 | -30.4 | .0 | 31.0 |
| 24 | 224.6 | 15.6 | -7.0 | 63.4 | -30.4 | .0 | 31.2 |
| 25 | 175.0 | 17.2 | -7.8 | 63.4 | -30.4 | .0 | 31.4 |
| 26 | 125.5 | 18.8 | -8.6 | 63.4 | -30.4 | .0 | 31.6 |
| 27 | 75.9 | 20.4 | -9.5 | 63.4 | -30.4 | .0 | 31.9 |
| 28 | 26.3 | 22.0 | -10.3 | 63.4 | -30.4 | .0 | 32.1 |
| 29 | -48.0 | 24.4 | -11.5 | 63.4 | -30.4 | .0 | 32.5 |
| 30 | 610.7 | 2.9 | -.4 | 62.7 | -30.0 | .0 | 30.0 |
| 31 | 561.2 | 4.5 | -1.2 | 62.7 | -30.0 | .0 | 30.1 |
| 32 | 536.4 | 5.3 | -1.6 | 62.7 | -30.0 | .0 | 30.1 |
| 33 | 486.9 | 6.9 | -2.4 | 62.7 | -30.0 | .0 | 30.1 |
| 34 | 437.3 | 8.5 | -3.3 | 62.7 | -30.0 | .0 | 30.2 |
| 35 | 387.7 | 10.1 | -4.1 | 62.7 | -30.0 | .0 | 30.3 |
| 36 | 338.2 | 11.7 | -4.9 | 62.7 | -30.0 | .0 | 30.4 |
| 37 | 288.6 | 13.2 | -5.7 | 62.7 | -30.0 | .0 | 30.6 |
| 38 | 239.1 | 14.8 | -6.6 | 62.7 | -30.0 | .0 | 30.7 |
| 39 | 189.5 | 16.4 | -7.4 | 62.7 | -30.0 | .0 | 30.9 |
| 40 | 140.0 | 18.0 | -8.2 | 62.7 | -30.0 | .0 | 31.1 |
| 41 | 90.4 | 19.6 | -9.0 | 62.7 | -30.0 | .0 | 31.4 |
| 42 | 40.8 | 21.2 | -9.9 | 62.7 | -30.0 | .0 | 31.6 |
| 43 | -8.7 | 22.8 | -10.7 | 62.7 | -30.0 | .0 | 31.9 |
| 44 | -33.5 | 23.6 | -11.1 | 62.7 | -30.0 | .0 | 32.0 |
| 45 | -83.0 | 25.2 | -11.9 | 62.7 | -30.0 | .0 | 32.3 |
| 46 | 600.5 | 2.9 | -.4 | 62.0 | -29.7 | .0 | 29.7 |
| 47 | 550.9 | 4.5 | -1.2 | 62.0 | -29.7 | .0 | 29.7 |
| 48 | 526.1 | 5.3 | -1.6 | 62.0 | -29.7 | .0 | 29.7 |
| 49 | 476.6 | 6.9 | -2.4 | 62.0 | -29.7 | .0 | 29.8 |
| 50 | 427.0 | 8.5 | -3.3 | 62.0 | -29.7 | .0 | 29.8 |
| 51 | 377.5 | 10.1 | -4.1 | 62.0 | -29.7 | .0 | 29.9 |
| 52 | 327.9 | 11.7 | -4.9 | 62.0 | -29.7 | .0 | 30.1 |
| 53 | 278.4 | 13.2 | -5.7 | 62.0 | -29.7 | .0 | 30.2 |
| 54 | 228.8 | 14.8 | -6.6 | 62.0 | -29.7 | .0 | 30.4 |
| 55 | 179.2 | 16.4 | -7.4 | 62.0 | -29.7 | .0 | 30.6 |
| 56 | 129.7 | 18.0 | -8.2 | 62.0 | -29.7 | .0 | 30.8 |
| 57 | 80.1 | 19.6 | -9.0 | 62.0 | -29.7 | .0 | 31.0 |
| 58 | 30.6 | 21.2 | -9.9 | 62.0 | -29.7 | .0 | 31.3 |
| 59 | -19.0 | 22.8 | -10.7 | 62.0 | -29.7 | .0 | 31.5 |
| 60 | -43.8 | 23.6 | -11.1 | 62.0 | -29.7 | .0 | 31.7 |
| 61 | -93.3 | 25.2 | -11.9 | 62.0 | -29.7 | .0 | 32.0 |
| 62 | 565.4 | 3.7 | -.8 | 61.2 | -29.3 | .0 | 29.3 |
| 63 | -78.8 | 24.4 | -11.5 | 61.2 | -29.3 | .0 | 31.5 |
| 64 | 579.9 | 2.9 | -.4 | 60.5 | -28.9 | .0 | 28.9 |
| 65 | 530.4 | 4.5 | -1.2 | 60.5 | -28.9 | .0 | 28.9 |
| 66 | 505.6 | 5.3 | -1.6 | 60.5 | -28.9 | .0 | 28.9 |
| 67 | 456.0 | 6.9 | -2.4 | 60.5 | -28.9 | .0 | 29.0 |
| 68 | 406.5 | 8.5 | -3.3 | 60.5 | -28.9 | .0 | 29.1 |
| 69 | 356.9 | 10.1 | -4.1 | 60.5 | -28.9 | .0 | 29.2 |
| 70 | 307.4 | 11.7 | -4.9 | 60.5 | -28.9 | .0 | 29.3 |
| 71 | 257.8 | 13.2 | -5.7 | 60.5 | -28.9 | .0 | 29.5 |
| 72 | 208.2 | 14.8 | -6.6 | 60.5 | -28.9 | .0 | 29.6 |
| 73 | 158.7 | 16.4 | -7.4 | 60.5 | -28.9 | .0 | 29.8 |
| 74 | 109.1 | 18.0 | -8.2 | 60.5 | -28.9 | .0 | 30.0 |
| 75 | 59.6 | 19.6 | -9.0 | 60.5 | -28.9 | .0 | 30.3 |
| 76 | 10.0 | 21.2 | -9.9 | 60.5 | -28.9 | .0 | 30.5 |
| 77 | -39.5 | 22.8 | -10.7 | 60.5 | -28.9 | .0 | 30.8 |
| 78 | -64.3 | 23.6 | -11.1 | 60.5 | -28.9 | .0 | 31.0 |
| 79 | -113.9 | 25.2 | -11.9 | 60.5 | -28.9 | .0 | 31.3 |
| 80 | 544.9 | 3.7 | -.8 | 59.8 | -28.5 | .0 | 28.5 |
| 81 | -99.4 | 24.4 | -11.5 | 59.8 | -28.5 | .0 | 30.8 |
| 82 | 559.4 | 2.9 | -.4 | 59.0 | -28.1 | .0 | 28.1 |
| 83 | 509.8 | 4.5 | -1.2 | 59.0 | -28.1 | .0 | 28.2 |
| 84 | 485.0 | 5.3 | -1.6 | 59.0 | -28.1 | .0 | 28.2 |
| 85 | 435.5 | 6.9 | -2.4 | 59.0 | -28.1 | .0 | 28.2 |
| 86 | 385.9 | 8.5 | -3.3 | 59.0 | -28.1 | .0 | 28.3 |
| 87 | 336.4 | 10.1 | -4.1 | 59.0 | -28.1 | .0 | 28.4 |
| 88 | 286.8 | 11.7 | -4.9 | 59.0 | -28.1 | .0 | 28.6 |
| 89 | 237.2 | 13.2 | -5.7 | 59.0 | -28.1 | .0 | 28.7 |
| 90 | 187.7 | 14.8 | -6.6 | 59.0 | -28.1 | .0 | 28.9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 91 | 138.1 | 16.4 | -7.4 | 59.0 | -28.1 | .0 | 29.1 |
| 92 | 88.6 | 18.0 | -8.2 | 59.0 | -28.1 | .0 | 29.3 |
| 93 | 39.0 | 19.6 | -9.0 | 59.0 | -28.1 | .0 | 29.6 |
| 94 | -10.5 | 21.2 | -9.9 | 59.0 | -28.1 | .0 | 29.8 |
| 95 | -60.1 | 22.8 | -10.7 | 59.0 | -28.1 | .0 | 30.1 |
| 96 | -84.9 | 23.6 | -11.1 | 59.0 | -28.1 | .0 | 30.2 |
| 97 | -134.4 | 25.2 | -11.9 | 59.0 | -28.1 | .0 | 30.6 |
| 98 | 524.3 | 3.7 | -.8 | 58.3 | -27.8 | .0 | 27.8 |
| 99 | -119.9 | 24.4 | -11.5 | 58.3 | -27.8 | .0 | 30.0 |
| 100 | 538.8 | 2.9 | -.4 | 57.6 | -27.4 | .0 | 27.4 |
| 101 | 489.2 | 4.5 | -1.2 | 57.6 | -27.4 | .0 | 27.4 |
| 102 | 464.5 | 5.3 | -1.6 | 57.6 | -27.4 | .0 | 27.4 |
| 103 | 414.9 | 6.9 | -2.4 | 57.6 | -27.4 | .0 | 27.5 |
| 104 | 365.4 | 8.5 | -3.3 | 57.6 | -27.4 | .0 | 27.6 |
| 105 | 315.8 | 10.1 | -4.1 | 57.6 | -27.4 | .0 | 27.7 |
| 106 | 266.2 | 11.7 | -4.9 | 57.6 | -27.4 | .0 | 27.8 |
| 107 | 216.7 | 13.2 | -5.7 | 57.6 | -27.4 | .0 | 28.0 |
| 108 | 167.1 | 14.8 | -6.6 | 57.6 | -27.4 | .0 | 28.1 |
| 109 | 117.6 | 16.4 | -7.4 | 57.6 | -27.4 | .0 | 28.3 |
| 110 | 68.0 | 18.0 | -8.2 | 57.6 | -27.4 | .0 | 28.6 |
| 111 | 18.5 | 19.6 | -9.0 | 57.6 | -27.4 | .0 | 28.8 |
| 112 | -31.1 | 21.2 | -9.9 | 57.6 | -27.4 | .0 | 29.1 |
| 113 | -80.7 | 22.8 | -10.7 | 57.6 | -27.4 | .0 | 29.4 |
| 114 | -105.4 | 23.6 | -11.1 | 57.6 | -27.4 | .0 | 29.5 |
| 115 | -155.0 | 25.2 | -11.9 | 57.6 | -27.4 | .0 | 29.9 |
| 116 | 503.7 | 3.7 | -.8 | 56.8 | -27.0 | .0 | 27.0 |
| 117 | -140.5 | 24.4 | -11.5 | 56.8 | -27.0 | .0 | 29.3 |
| 118 | 518.2 | 2.9 | -.4 | 56.1 | -26.6 | .0 | 26.6 |
| 119 | 468.7 | 4.5 | -1.2 | 56.1 | -26.6 | .0 | 26.6 |
| 120 | 443.9 | 5.3 | -1.6 | 56.1 | -26.6 | .0 | 26.7 |
| 121 | 394.4 | 6.9 | -2.4 | 56.1 | -26.6 | .0 | 26.7 |
| 122 | 344.8 | 8.5 | -3.3 | 56.1 | -26.6 | .0 | 26.8 |
| 123 | 295.2 | 10.1 | -4.1 | 56.1 | -26.6 | .0 | 26.9 |
| 124 | 245.7 | 11.7 | -4.9 | 56.1 | -26.6 | .0 | 27.1 |
| 125 | 196.1 | 13.2 | -5.7 | 56.1 | -26.6 | .0 | 27.2 |
| 126 | 146.6 | 14.8 | -6.6 | 56.1 | -26.6 | .0 | 27.4 |
| 127 | 97.0 | 16.4 | -7.4 | 56.1 | -26.6 | .0 | 27.6 |
| 128 | 47.5 | 18.0 | -8.2 | 56.1 | -26.6 | .0 | 27.8 |
| 129 | -2.1 | 19.6 | -9.0 | 56.1 | -26.6 | .0 | 28.1 |
| 130 | -51.7 | 21.2 | -9.9 | 56.1 | -26.6 | .0 | 28.4 |
| 131 | -101.2 | 22.8 | -10.7 | 56.1 | -26.6 | .0 | 28.7 |
| 132 | -126.0 | 23.6 | -11.1 | 56.1 | -26.6 | .0 | 28.8 |
| 133 | -175.5 | 25.2 | -11.9 | 56.1 | -26.6 | .0 | 29.2 |
| 134 | 483.2 | 3.7 | -.8 | 55.3 | -26.2 | .0 | 26.2 |
| 135 | -161.0 | 24.4 | -11.5 | 55.3 | -26.2 | .0 | 28.6 |
| 136 | 497.7 | 2.9 | -.4 | 54.6 | -25.8 | .0 | 25.8 |
| 137 | 448.1 | 4.5 | -1.2 | 54.6 | -25.8 | .0 | 25.9 |
| 138 | 423.4 | 5.3 | -1.6 | 54.6 | -25.8 | .0 | 25.9 |
| 139 | 373.8 | 6.9 | -2.4 | 54.6 | -25.8 | .0 | 26.0 |
| 140 | 324.2 | 8.5 | -3.3 | 54.6 | -25.8 | .0 | 26.0 |
| 141 | 274.7 | 10.1 | -4.1 | 54.6 | -25.8 | .0 | 26.2 |
| 142 | 225.1 | 11.7 | -4.9 | 54.6 | -25.8 | .0 | 26.3 |
| 143 | 175.6 | 13.2 | -5.7 | 54.6 | -25.8 | .0 | 26.5 |
| 144 | 126.0 | 14.8 | -6.6 | 54.6 | -25.8 | .0 | 26.7 |
| 145 | 76.5 | 16.4 | -7.4 | 54.6 | -25.8 | .0 | 26.9 |
| 146 | 26.9 | 18.0 | -8.2 | 54.6 | -25.8 | .0 | 27.1 |
| 147 | -22.7 | 19.6 | -9.0 | 54.6 | -25.8 | .0 | 27.4 |
| 148 | -72.2 | 21.2 | -9.9 | 54.6 | -25.8 | .0 | 27.7 |
| 149 | -121.8 | 22.8 | -10.7 | 54.6 | -25.8 | .0 | 28.0 |
| 150 | -146.5 | 23.6 | -11.1 | 54.6 | -25.8 | .0 | 28.1 |
| 151 | -196.1 | 25.2 | -11.9 | 54.6 | -25.8 | .0 | 28.5 |
| 152 | 462.6 | 3.7 | -.8 | 53.9 | -25.5 | .0 | 25.5 |
| 153 | -181.6 | 24.4 | -11.5 | 53.9 | -25.5 | .0 | 27.9 |
| 154 | 477.1 | 2.9 | -.4 | 53.1 | -25.1 | .0 | 25.1 |
| 155 | 427.6 | 4.5 | -1.2 | 53.1 | -25.1 | .0 | 25.1 |
| 156 | 402.8 | 5.3 | -1.6 | 53.1 | -25.1 | .0 | 25.1 |
| 157 | 353.2 | 6.9 | -2.4 | 53.1 | -25.1 | .0 | 25.2 |
| 158 | 303.7 | 8.5 | -3.3 | 53.1 | -25.1 | .0 | 25.3 |
| 159 | 254.1 | 10.1 | -4.1 | 53.1 | -25.1 | .0 | 25.4 |
| 160 | 204.6 | 11.7 | -4.9 | 53.1 | -25.1 | .0 | 25.6 |
| 161 | 155.0 | 13.2 | -5.7 | 53.1 | -25.1 | .0 | 25.7 |
| 162 | 105.5 | 14.8 | -6.6 | 53.1 | -25.1 | .0 | 25.9 |
| 163 | 55.9 | 16.4 | -7.4 | 53.1 | -25.1 | .0 | 26.1 |
| 164 | 6.3 | 18.0 | -8.2 | 53.1 | -25.1 | .0 | 26.4 |
| 165 | -43.2 | 19.6 | -9.0 | 53.1 | -25.1 | .0 | 26.7 |
| 166 | -92.8 | 21.2 | -9.9 | 53.1 | -25.1 | .0 | 27.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 167 | -142.3 | 22.8 | -10.7 | 53.1 | -25.1 | .0 | 27.3 |
| 168 | -167.1 | 23.6 | -11.1 | 53.1 | -25.1 | .0 | 27.4 |
| 169 | -216.7 | 25.2 | -11.9 | 53.1 | -25.1 | .0 | 27.8 |
| 170 | 442.1 | 3.7 | -.8 | 52.4 | -24.7 | .0 | 24.7 |
| 171 | -202.2 | 24.4 | -11.5 | 52.4 | -24.7 | .0 | 27.3 |
| 172 | 456.6 | 2.9 | -.4 | 51.7 | -24.3 | .0 | 24.3 |
| 173 | 407.0 | 4.5 | -1.2 | 51.7 | -24.3 | .0 | 24.3 |
| 174 | 382.2 | 5.3 | -1.6 | 51.7 | -24.3 | .0 | 24.4 |
| 175 | 332.7 | 6.9 | -2.4 | 51.7 | -24.3 | .0 | 24.4 |
| 176 | 283.1 | 8.5 | -3.3 | 51.7 | -24.3 | .0 | 24.5 |
| 177 | 233.6 | 10.1 | -4.1 | 51.7 | -24.3 | .0 | 24.7 |
| 178 | 184.0 | 11.7 | -4.9 | 51.7 | -24.3 | .0 | 24.8 |
| 179 | 134.5 | 13.2 | -5.7 | 51.7 | -24.3 | .0 | 25.0 |
| 180 | 84.9 | 14.8 | -6.6 | 51.7 | -24.3 | .0 | 25.2 |
| 181 | 35.3 | 16.4 | -7.4 | 51.7 | -24.3 | .0 | 25.4 |
| 182 | -14.2 | 18.0 | -8.2 | 51.7 | -24.3 | .0 | 25.7 |
| 183 | -63.8 | 19.6 | -9.0 | 51.7 | -24.3 | .0 | 25.9 |
| 184 | -113.3 | 21.2 | -9.9 | 51.7 | -24.3 | .0 | 26.2 |
| 185 | -162.9 | 22.8 | -10.7 | 51.7 | -24.3 | .0 | 26.6 |
| 186 | -187.7 | 23.6 | -11.1 | 51.7 | -24.3 | .0 | 26.7 |
| 187 | -237.2 | 25.2 | -11.9 | 51.7 | -24.3 | .0 | 27.1 |
| 188 | 421.5 | 3.7 | -.8 | 50.9 | -23.9 | .0 | 23.9 |
| 189 | -222.7 | 24.4 | -11.5 | 50.9 | -23.9 | .0 | 26.6 |
| 190 | 436.0 | 2.9 | -.4 | 50.2 | -23.6 | .0 | 23.6 |
| 191 | 386.5 | 4.5 | -1.2 | 50.2 | -23.6 | .0 | 23.6 |
| 192 | 361.7 | 5.3 | -1.6 | 50.2 | -23.6 | .0 | 23.6 |
| 193 | 312.1 | 6.9 | -2.4 | 50.2 | -23.6 | .0 | 23.7 |
| 194 | 262.6 | 8.5 | -3.3 | 50.2 | -23.6 | .0 | 23.8 |
| 195 | 213.0 | 10.1 | -4.1 | 50.2 | -23.6 | .0 | 23.9 |
| 196 | 163.5 | 11.7 | -4.9 | 50.2 | -23.6 | .0 | 24.1 |
| 197 | 113.9 | 13.2 | -5.7 | 50.2 | -23.6 | .0 | 24.2 |
| 198 | 64.3 | 14.8 | -6.6 | 50.2 | -23.6 | .0 | 24.5 |
| 199 | 14.8 | 16.4 | -7.4 | 50.2 | -23.6 | .0 | 24.7 |
| 200 | -34.8 | 18.0 | -8.2 | 50.2 | -23.6 | .0 | 24.9 |
| 201 | -84.3 | 19.6 | -9.0 | 50.2 | -23.6 | .0 | 25.2 |
| 202 | -133.9 | 21.2 | -9.9 | 50.2 | -23.6 | .0 | 25.5 |
| 203 | -183.4 | 22.8 | -10.7 | 50.2 | -23.6 | .0 | 25.9 |
| 204 | -208.2 | 23.6 | -11.1 | 50.2 | -23.6 | .0 | 26.0 |
| 205 | -257.8 | 25.2 | -11.9 | 50.2 | -23.6 | .0 | 26.4 |
| 206 | 425.7 | 2.9 | -.4 | 49.5 | -23.2 | .0 | 23.2 |
| 207 | 376.2 | 4.5 | -1.2 | 49.5 | -23.2 | .0 | 23.2 |
| 208 | 351.4 | 5.3 | -1.6 | 49.5 | -23.2 | .0 | 23.2 |
| 209 | 301.8 | 6.9 | -2.4 | 49.5 | -23.2 | .0 | 23.3 |
| 210 | 252.3 | 8.5 | -3.3 | 49.5 | -23.2 | .0 | 23.4 |
| 211 | 202.7 | 10.1 | -4.1 | 49.5 | -23.2 | .0 | 23.5 |
| 212 | 153.2 | 11.7 | -4.9 | 49.5 | -23.2 | .0 | 23.7 |
| 213 | 103.6 | 13.2 | -5.7 | 49.5 | -23.2 | .0 | 23.9 |
| 214 | 54.1 | 14.8 | -6.6 | 49.5 | -23.2 | .0 | 24.1 |
| 215 | 4.5 | 16.4 | -7.4 | 49.5 | -23.2 | .0 | 24.3 |
| 216 | -45.1 | 18.0 | -8.2 | 49.5 | -23.2 | .0 | 24.6 |
| 217 | -94.6 | 19.6 | -9.0 | 49.5 | -23.2 | .0 | 24.9 |
| 218 | -144.2 | 21.2 | -9.9 | 49.5 | -23.2 | .0 | 25.2 |
| 219 | -193.7 | 22.8 | -10.7 | 49.5 | -23.2 | .0 | 25.5 |
| 220 | -218.5 | 23.6 | -11.1 | 49.5 | -23.2 | .0 | 25.7 |
| 221 | -268.1 | 25.2 | -11.9 | 49.5 | -23.2 | .0 | 26.1 |
| 222 | 390.7 | 3.7 | -.8 | 48.7 | -22.8 | .0 | 22.8 |
| 223 | 316.3 | 6.1 | -2.0 | 48.7 | -22.8 | .0 | 22.9 |
| 224 | 266.8 | 7.7 | -2.8 | 48.7 | -22.8 | .0 | 23.0 |
| 225 | 217.2 | 9.3 | -3.7 | 48.7 | -22.8 | .0 | 23.1 |
| 226 | 167.7 | 10.9 | -4.5 | 48.7 | -22.8 | .0 | 23.2 |
| 227 | 118.1 | 12.4 | -5.3 | 48.7 | -22.8 | .0 | 23.4 |
| 228 | 68.6 | 14.0 | -6.1 | 48.7 | -22.8 | .0 | 23.6 |
| 229 | 19.0 | 15.6 | -7.0 | 48.7 | -22.8 | .0 | 23.8 |
| 230 | -30.6 | 17.2 | -7.8 | 48.7 | -22.8 | .0 | 24.1 |
| 231 | -80.1 | 18.8 | -8.6 | 48.7 | -22.8 | .0 | 24.4 |
| 232 | -129.7 | 20.4 | -9.5 | 48.7 | -22.8 | .0 | 24.7 |
| 233 | -179.2 | 22.0 | -10.3 | 48.7 | -22.8 | .0 | 25.0 |
| 234 | -253.6 | 24.4 | -11.5 | 48.7 | -22.8 | .0 | 25.5 |
| 235 | 405.2 | 2.9 | -.4 | 48.0 | -22.4 | .0 | 22.4 |
| 236 | 355.6 | 4.5 | -1.2 | 48.0 | -22.4 | .0 | 22.4 |
| 237 | 330.8 | 5.3 | -1.6 | 48.0 | -22.4 | .0 | 22.5 |
| 238 | 281.3 | 6.9 | -2.4 | 48.0 | -22.4 | .0 | 22.5 |
| 239 | 231.7 | 8.5 | -3.3 | 48.0 | -22.4 | .0 | 22.6 |
| 240 | 182.2 | 10.1 | -4.1 | 48.0 | -22.4 | .0 | 22.8 |
| 241 | 132.6 | 11.7 | -4.9 | 48.0 | -22.4 | .0 | 22.9 |
| 242 | 83.1 | 13.2 | -5.7 | 48.0 | -22.4 | .0 | 23.1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 243 | 33.5 | 14.8 | -6.6 | 48.0 | -22.4 | .0 | 23.3 |
| 244 | -16.1 | 16.4 | -7.4 | 48.0 | -22.4 | .0 | 23.6 |
| 245 | -65.6 | 18.0 | -8.2 | 48.0 | -22.4 | .0 | 23.9 |
| 246 | -115.2 | 19.6 | -9.0 | 48.0 | -22.4 | .0 | 24.2 |
| 247 | -164.7 | 21.2 | -9.9 | 48.0 | -22.4 | .0 | 24.5 |
| 248 | -214.3 | 22.8 | -10.7 | 48.0 | -22.4 | .0 | 24.8 |
| 249 | -239.1 | 23.6 | -11.1 | 48.0 | -22.4 | .0 | 25.0 |
| 250 | -288.6 | 25.2 | -11.9 | 48.0 | -22.4 | .0 | 25.4 |

Mris = (Mxp^2 + Myp^2)^0.5

LINEA FS FERRANDINA MATERA
VI08 Pile P21 e P22 - Analisi SLV

CONDIZIONE DI CARICO 8
VI08 - P22 - SLV_y

Coordinate Centri di Carico (c.c.)

| c.c. | Xc m | Yc m | Zc m | Alfc deg |
|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .00 |
| 2 | .000 | .000 | .000 | .00 |

Componenti di Azioni Esterne riferite ai Centri di Carico

| c.c. | Fzc kN | Fxc kN | Mxc kN*m | Fyc kN | Myc kN*m | Mzc kN*m |
|---|---|---|---|---|---|---|
| 1 | 21615.0 | -3509.7 | -80607.6 | -14020.8 | -324099.0 | -16433.8 |
| 2 | 18099.0 | .0 | .0 | .0 | .0 | .0 |

Componenti di Carico Risultanti (riferimento globale)

| Fz kN | Fx kN | Mx kN*m | Fy kN | My kN*m | Mz kN*m |
|---|---|---|---|---|---|
| 39714.0 | -3509.7 | -80607.6 | -14020.8 | -324099.0 | -16433.8 |

Punto di applic. carico verticale: Xv = -2.030 m Yv = -8.161 m

Componenti di Spostamento del Plinto (riferimento globale)

| dz mm | dx mm | rx mRad | dy mm | ry mRad | rz mRad |
|---|---|---|---|---|---|
| 1.589 | -.671 | -.172 | -2.522 | -.381 | -.051 |

Sollecitazioni in Sommita' ai Singoli Pali (riferimento locale)

| palo | Fzp kN | Fxp kN | Mxp kN*m | Fyp kN | Myp kN*m | Mzp kN*m | Mris kN*m |
|---|---|---|---|---|---|---|---|
| 1 | -301.8 | -2.9 | .4 | -64.2 | 30.8 | .0 | 30.8 |
| 2 | -252.2 | -4.5 | 1.2 | -64.2 | 30.8 | .0 | 30.8 |
| 3 | -227.4 | -5.3 | 1.6 | -64.2 | 30.8 | .0 | 30.8 |
| 4 | -177.9 | -6.9 | 2.4 | -64.2 | 30.8 | .0 | 30.9 |
| 5 | -128.3 | -8.5 | 3.2 | -64.2 | 30.8 | .0 | 31.0 |
| 6 | -78.8 | -10.1 | 4.1 | -64.2 | 30.8 | .0 | 31.1 |
| 7 | -29.2 | -11.7 | 4.9 | -64.2 | 30.8 | .0 | 31.2 |
| 8 | 20.3 | -13.2 | 5.7 | -64.2 | 30.8 | .0 | 31.3 |
| 9 | 69.9 | -14.8 | 6.6 | -64.2 | 30.8 | .0 | 31.5 |
| 10 | 119.4 | -16.4 | 7.4 | -64.2 | 30.8 | .0 | 31.7 |
| 11 | 169.0 | -18.0 | 8.2 | -64.2 | 30.8 | .0 | 31.9 |
| 12 | 218.6 | -19.6 | 9.0 | -64.2 | 30.8 | .0 | 32.1 |
| 13 | 268.1 | -21.2 | 9.9 | -64.2 | 30.8 | .0 | 32.3 |
| 14 | 317.7 | -22.8 | 10.7 | -64.2 | 30.8 | .0 | 32.6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | 342.5 | -23.6 | 11.1 | -64.2 | 30.8 | .0 | 32.7 |
| 16 | 392.0 | -25.2 | 11.9 | -64.2 | 30.8 | .0 | 33.0 |
| 17 | -266.7 | -3.7 | .8 | -63.4 | 30.4 | .0 | 30.4 |
| 18 | -192.3 | -6.1 | 2.0 | -63.4 | 30.4 | .0 | 30.5 |
| 19 | -142.8 | -7.7 | 2.8 | -63.4 | 30.4 | .0 | 30.6 |
| 20 | -93.2 | -9.3 | 3.7 | -63.4 | 30.4 | .0 | 30.6 |
| 21 | -43.7 | -10.9 | 4.5 | -63.4 | 30.4 | .0 | 30.8 |
| 22 | 5.9 | -12.4 | 5.3 | -63.4 | 30.4 | .0 | 30.9 |
| 23 | 55.5 | -14.0 | 6.1 | -63.4 | 30.4 | .0 | 31.0 |
| 24 | 105.0 | -15.6 | 7.0 | -63.4 | 30.4 | .0 | 31.2 |
| 25 | 154.6 | -17.2 | 7.8 | -63.4 | 30.4 | .0 | 31.4 |
| 26 | 204.1 | -18.8 | 8.6 | -63.4 | 30.4 | .0 | 31.6 |
| 27 | 253.7 | -20.4 | 9.4 | -63.4 | 30.4 | .0 | 31.9 |
| 28 | 303.2 | -22.0 | 10.3 | -63.4 | 30.4 | .0 | 32.1 |
| 29 | 377.6 | -24.4 | 11.5 | -63.4 | 30.4 | .0 | 32.5 |
| 30 | -281.1 | -2.9 | .4 | -62.7 | 30.0 | .0 | 30.0 |
| 31 | -231.5 | -4.5 | 1.2 | -62.7 | 30.0 | .0 | 30.1 |
| 32 | -206.8 | -5.3 | 1.6 | -62.7 | 30.0 | .0 | 30.1 |
| 33 | -157.2 | -6.9 | 2.4 | -62.7 | 30.0 | .0 | 30.1 |
| 34 | -107.7 | -8.5 | 3.2 | -62.7 | 30.0 | .0 | 30.2 |
| 35 | -58.1 | -10.1 | 4.1 | -62.7 | 30.0 | .0 | 30.3 |
| 36 | -8.5 | -11.7 | 4.9 | -62.7 | 30.0 | .0 | 30.4 |
| 37 | 41.0 | -13.2 | 5.7 | -62.7 | 30.0 | .0 | 30.6 |
| 38 | 90.6 | -14.8 | 6.6 | -62.7 | 30.0 | .0 | 30.7 |
| 39 | 140.1 | -16.4 | 7.4 | -62.7 | 30.0 | .0 | 30.9 |
| 40 | 189.7 | -18.0 | 8.2 | -62.7 | 30.0 | .0 | 31.1 |
| 41 | 239.2 | -19.6 | 9.0 | -62.7 | 30.0 | .0 | 31.4 |
| 42 | 288.8 | -21.2 | 9.9 | -62.7 | 30.0 | .0 | 31.6 |
| 43 | 338.4 | -22.8 | 10.7 | -62.7 | 30.0 | .0 | 31.9 |
| 44 | 363.1 | -23.6 | 11.1 | -62.7 | 30.0 | .0 | 32.0 |
| 45 | 412.7 | -25.2 | 11.9 | -62.7 | 30.0 | .0 | 32.3 |
| 46 | -270.8 | -2.9 | .4 | -62.0 | 29.7 | .0 | 29.7 |
| 47 | -221.2 | -4.5 | 1.2 | -62.0 | 29.7 | .0 | 29.7 |
| 48 | -196.4 | -5.3 | 1.6 | -62.0 | 29.7 | .0 | 29.7 |
| 49 | -146.9 | -6.9 | 2.4 | -62.0 | 29.7 | .0 | 29.8 |
| 50 | -97.3 | -8.5 | 3.2 | -62.0 | 29.7 | .0 | 29.8 |
| 51 | -47.8 | -10.1 | 4.1 | -62.0 | 29.7 | .0 | 29.9 |
| 52 | 1.8 | -11.7 | 4.9 | -62.0 | 29.7 | .0 | 30.1 |
| 53 | 51.4 | -13.2 | 5.7 | -62.0 | 29.7 | .0 | 30.2 |
| 54 | 100.9 | -14.8 | 6.6 | -62.0 | 29.7 | .0 | 30.4 |
| 55 | 150.5 | -16.4 | 7.4 | -62.0 | 29.7 | .0 | 30.6 |
| 56 | 200.0 | -18.0 | 8.2 | -62.0 | 29.7 | .0 | 30.8 |
| 57 | 249.6 | -19.6 | 9.0 | -62.0 | 29.7 | .0 | 31.0 |
| 58 | 299.1 | -21.2 | 9.9 | -62.0 | 29.7 | .0 | 31.3 |
| 59 | 348.7 | -22.8 | 10.7 | -62.0 | 29.7 | .0 | 31.5 |
| 60 | 373.5 | -23.6 | 11.1 | -62.0 | 29.7 | .0 | 31.7 |
| 61 | 423.0 | -25.2 | 11.9 | -62.0 | 29.7 | .0 | 32.0 |
| 62 | -235.6 | -3.7 | .8 | -61.2 | 29.3 | .0 | 29.3 |
| 63 | 408.6 | -24.4 | 11.5 | -61.2 | 29.3 | .0 | 31.5 |
| 64 | -250.1 | -2.9 | .4 | -60.5 | 28.9 | .0 | 28.9 |
| 65 | -200.5 | -4.5 | 1.2 | -60.5 | 28.9 | .0 | 28.9 |
| 66 | -175.7 | -5.3 | 1.6 | -60.5 | 28.9 | .0 | 28.9 |
| 67 | -126.2 | -6.9 | 2.4 | -60.5 | 28.9 | .0 | 29.0 |
| 68 | -76.6 | -8.5 | 3.2 | -60.5 | 28.9 | .0 | 29.1 |
| 69 | -27.1 | -10.1 | 4.1 | -60.5 | 28.9 | .0 | 29.2 |
| 70 | 22.5 | -11.7 | 4.9 | -60.5 | 28.9 | .0 | 29.3 |
| 71 | 72.0 | -13.2 | 5.7 | -60.5 | 28.9 | .0 | 29.5 |
| 72 | 121.6 | -14.8 | 6.6 | -60.5 | 28.9 | .0 | 29.6 |
| 73 | 171.1 | -16.4 | 7.4 | -60.5 | 28.9 | .0 | 29.8 |
| 74 | 220.7 | -18.0 | 8.2 | -60.5 | 28.9 | .0 | 30.0 |
| 75 | 270.3 | -19.6 | 9.0 | -60.5 | 28.9 | .0 | 30.3 |
| 76 | 319.8 | -21.2 | 9.9 | -60.5 | 28.9 | .0 | 30.5 |
| 77 | 369.4 | -22.8 | 10.7 | -60.5 | 28.9 | .0 | 30.8 |
| 78 | 394.2 | -23.6 | 11.1 | -60.5 | 28.9 | .0 | 31.0 |
| 79 | 443.7 | -25.2 | 11.9 | -60.5 | 28.9 | .0 | 31.3 |
| 80 | -215.0 | -3.7 | .8 | -59.8 | 28.5 | .0 | 28.5 |
| 81 | 429.3 | -24.4 | 11.5 | -59.8 | 28.5 | .0 | 30.8 |
| 82 | -229.4 | -2.9 | .4 | -59.0 | 28.1 | .0 | 28.1 |
| 83 | -179.8 | -4.5 | 1.2 | -59.0 | 28.1 | .0 | 28.2 |
| 84 | -155.1 | -5.3 | 1.6 | -59.0 | 28.1 | .0 | 28.2 |
| 85 | -105.5 | -6.9 | 2.4 | -59.0 | 28.1 | .0 | 28.2 |
| 86 | -56.0 | -8.5 | 3.2 | -59.0 | 28.1 | .0 | 28.3 |
| 87 | -6.4 | -10.1 | 4.1 | -59.0 | 28.1 | .0 | 28.4 |
| 88 | 43.2 | -11.7 | 4.9 | -59.0 | 28.1 | .0 | 28.6 |
| 89 | 92.7 | -13.2 | 5.7 | -59.0 | 28.1 | .0 | 28.7 |
| 90 | 142.3 | -14.8 | 6.6 | -59.0 | 28.1 | .0 | 28.9 |

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|---|---|---|---|---|---|---|---|
| 91 | 191.8 | -16.4 | 7.4 | -59.0 | 28.1 | .0 | 29.1 |
| 92 | 241.4 | -18.0 | 8.2 | -59.0 | 28.1 | .0 | 29.3 |
| 93 | 290.9 | -19.6 | 9.0 | -59.0 | 28.1 | .0 | 29.5 |
| 94 | 340.5 | -21.2 | 9.9 | -59.0 | 28.1 | .0 | 29.8 |
| 95 | 390.1 | -22.8 | 10.7 | -59.0 | 28.1 | .0 | 30.1 |
| 96 | 414.8 | -23.6 | 11.1 | -59.0 | 28.1 | .0 | 30.2 |
| 97 | 464.4 | -25.2 | 11.9 | -59.0 | 28.1 | .0 | 30.6 |
| 98 | -194.3 | -3.7 | .8 | -58.3 | 27.8 | .0 | 27.8 |
| 99 | 450.0 | -24.4 | 11.5 | -58.3 | 27.8 | .0 | 30.0 |
| 100 | -208.7 | -2.9 | .4 | -57.6 | 27.4 | .0 | 27.4 |
| 101 | -159.2 | -4.5 | 1.2 | -57.6 | 27.4 | .0 | 27.4 |
| 102 | -134.4 | -5.3 | 1.6 | -57.6 | 27.4 | .0 | 27.4 |
| 103 | -84.8 | -6.9 | 2.4 | -57.6 | 27.4 | .0 | 27.5 |
| 104 | -35.3 | -8.5 | 3.2 | -57.6 | 27.4 | .0 | 27.6 |
| 105 | 14.3 | -10.1 | 4.1 | -57.6 | 27.4 | .0 | 27.7 |
| 106 | 63.8 | -11.7 | 4.9 | -57.6 | 27.4 | .0 | 27.8 |
| 107 | 113.4 | -13.2 | 5.7 | -57.6 | 27.4 | .0 | 28.0 |
| 108 | 163.0 | -14.8 | 6.6 | -57.6 | 27.4 | .0 | 28.1 |
| 109 | 212.5 | -16.4 | 7.4 | -57.6 | 27.4 | .0 | 28.3 |
| 110 | 262.1 | -18.0 | 8.2 | -57.6 | 27.4 | .0 | 28.6 |
| 111 | 311.6 | -19.6 | 9.0 | -57.6 | 27.4 | .0 | 28.8 |
| 112 | 361.2 | -21.2 | 9.9 | -57.6 | 27.4 | .0 | 29.1 |
| 113 | 410.7 | -22.8 | 10.7 | -57.6 | 27.4 | .0 | 29.4 |
| 114 | 435.5 | -23.6 | 11.1 | -57.6 | 27.4 | .0 | 29.5 |
| 115 | 485.1 | -25.2 | 11.9 | -57.6 | 27.4 | .0 | 29.9 |
| 116 | -173.6 | -3.7 | .8 | -56.8 | 27.0 | .0 | 27.0 |
| 117 | 470.6 | -24.4 | 11.5 | -56.8 | 27.0 | .0 | 29.3 |
| 118 | -188.0 | -2.9 | .4 | -56.1 | 26.6 | .0 | 26.6 |
| 119 | -138.5 | -4.5 | 1.2 | -56.1 | 26.6 | .0 | 26.6 |
| 120 | -113.7 | -5.3 | 1.6 | -56.1 | 26.6 | .0 | 26.7 |
| 121 | -64.1 | -6.9 | 2.4 | -56.1 | 26.6 | .0 | 26.7 |
| 122 | -14.6 | -8.5 | 3.2 | -56.1 | 26.6 | .0 | 26.8 |
| 123 | 35.0 | -10.1 | 4.1 | -56.1 | 26.6 | .0 | 26.9 |
| 124 | 84.5 | -11.7 | 4.9 | -56.1 | 26.6 | .0 | 27.1 |
| 125 | 134.1 | -13.2 | 5.7 | -56.1 | 26.6 | .0 | 27.2 |
| 126 | 183.6 | -14.8 | 6.6 | -56.1 | 26.6 | .0 | 27.4 |
| 127 | 233.2 | -16.4 | 7.4 | -56.1 | 26.6 | .0 | 27.6 |
| 128 | 282.7 | -18.0 | 8.2 | -56.1 | 26.6 | .0 | 27.8 |
| 129 | 332.3 | -19.6 | 9.0 | -56.1 | 26.6 | .0 | 28.1 |
| 130 | 381.9 | -21.2 | 9.9 | -56.1 | 26.6 | .0 | 28.4 |
| 131 | 431.4 | -22.8 | 10.7 | -56.1 | 26.6 | .0 | 28.7 |
| 132 | 456.2 | -23.6 | 11.1 | -56.1 | 26.6 | .0 | 28.8 |
| 133 | 505.8 | -25.2 | 11.9 | -56.1 | 26.6 | .0 | 29.2 |
| 134 | -152.9 | -3.7 | .8 | -55.3 | 26.2 | .0 | 26.2 |
| 135 | 491.3 | -24.4 | 11.5 | -55.3 | 26.2 | .0 | 28.6 |
| 136 | -167.4 | -2.9 | .4 | -54.6 | 25.8 | .0 | 25.8 |
| 137 | -117.8 | -4.5 | 1.2 | -54.6 | 25.8 | .0 | 25.9 |
| 138 | -93.0 | -5.3 | 1.6 | -54.6 | 25.8 | .0 | 25.9 |
| 139 | -43.5 | -6.9 | 2.4 | -54.6 | 25.8 | .0 | 26.0 |
| 140 | 6.1 | -8.5 | 3.2 | -54.6 | 25.8 | .0 | 26.0 |
| 141 | 55.6 | -10.1 | 4.1 | -54.6 | 25.8 | .0 | 26.2 |
| 142 | 105.2 | -11.7 | 4.9 | -54.6 | 25.8 | .0 | 26.3 |
| 143 | 154.8 | -13.2 | 5.7 | -54.6 | 25.8 | .0 | 26.5 |
| 144 | 204.3 | -14.8 | 6.6 | -54.6 | 25.8 | .0 | 26.7 |
| 145 | 253.9 | -16.4 | 7.4 | -54.6 | 25.8 | .0 | 26.9 |
| 146 | 303.4 | -18.0 | 8.2 | -54.6 | 25.8 | .0 | 27.1 |
| 147 | 353.0 | -19.6 | 9.0 | -54.6 | 25.8 | .0 | 27.4 |
| 148 | 402.5 | -21.2 | 9.9 | -54.6 | 25.8 | .0 | 27.7 |
| 149 | 452.1 | -22.8 | 10.7 | -54.6 | 25.8 | .0 | 28.0 |
| 150 | 476.9 | -23.6 | 11.1 | -54.6 | 25.8 | .0 | 28.1 |
| 151 | 526.4 | -25.2 | 11.9 | -54.6 | 25.8 | .0 | 28.5 |
| 152 | -132.2 | -3.7 | .8 | -53.9 | 25.5 | .0 | 25.5 |
| 153 | 512.0 | -24.4 | 11.5 | -53.9 | 25.5 | .0 | 27.9 |
| 154 | -146.7 | -2.9 | .4 | -53.1 | 25.1 | .0 | 25.1 |
| 155 | -97.1 | -4.5 | 1.2 | -53.1 | 25.1 | .0 | 25.1 |
| 156 | -72.3 | -5.3 | 1.6 | -53.1 | 25.1 | .0 | 25.1 |
| 157 | -22.8 | -6.9 | 2.4 | -53.1 | 25.1 | .0 | 25.2 |
| 158 | 26.8 | -8.5 | 3.2 | -53.1 | 25.1 | .0 | 25.3 |
| 159 | 76.3 | -10.1 | 4.1 | -53.1 | 25.1 | .0 | 25.4 |
| 160 | 125.9 | -11.7 | 4.9 | -53.1 | 25.1 | .0 | 25.6 |
| 161 | 175.4 | -13.2 | 5.7 | -53.1 | 25.1 | .0 | 25.7 |
| 162 | 225.0 | -14.8 | 6.6 | -53.1 | 25.1 | .0 | 25.9 |
| 163 | 274.6 | -16.4 | 7.4 | -53.1 | 25.1 | .0 | 26.1 |
| 164 | 324.1 | -18.0 | 8.2 | -53.1 | 25.1 | .0 | 26.4 |
| 165 | 373.7 | -19.6 | 9.0 | -53.1 | 25.1 | .0 | 26.7 |
| 166 | 423.2 | -21.2 | 9.9 | -53.1 | 25.1 | .0 | 26.9 |

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|---|---|---|---|---|---|---|---|
| 167 | 472.8 | -22.8 | 10.7 | -53.1 | 25.1 | .0 | 27.3 |
| 168 | 497.6 | -23.6 | 11.1 | -53.1 | 25.1 | .0 | 27.4 |
| 169 | 547.1 | -25.2 | 11.9 | -53.1 | 25.1 | .0 | 27.8 |
| 170 | -111.6 | -3.7 | .8 | -52.4 | 24.7 | .0 | 24.7 |
| 171 | 532.7 | -24.4 | 11.5 | -52.4 | 24.7 | .0 | 27.3 |
| 172 | -126.0 | -2.9 | .4 | -51.7 | 24.3 | .0 | 24.3 |
| 173 | -76.4 | -4.5 | 1.2 | -51.7 | 24.3 | .0 | 24.3 |
| 174 | -51.7 | -5.3 | 1.6 | -51.7 | 24.3 | .0 | 24.4 |
| 175 | -2.1 | -6.9 | 2.4 | -51.7 | 24.3 | .0 | 24.4 |
| 176 | 47.4 | -8.5 | 3.2 | -51.7 | 24.3 | .0 | 24.5 |
| 177 | 97.0 | -10.1 | 4.1 | -51.7 | 24.3 | .0 | 24.7 |
| 178 | 146.6 | -11.7 | 4.9 | -51.7 | 24.3 | .0 | 24.8 |
| 179 | 196.1 | -13.2 | 5.7 | -51.7 | 24.3 | .0 | 25.0 |
| 180 | 245.7 | -14.8 | 6.6 | -51.7 | 24.3 | .0 | 25.2 |
| 181 | 295.2 | -16.4 | 7.4 | -51.7 | 24.3 | .0 | 25.4 |
| 182 | 344.8 | -18.0 | 8.2 | -51.7 | 24.3 | .0 | 25.7 |
| 183 | 394.3 | -19.6 | 9.0 | -51.7 | 24.3 | .0 | 25.9 |
| 184 | 443.9 | -21.2 | 9.9 | -51.7 | 24.3 | .0 | 26.2 |
| 185 | 493.5 | -22.8 | 10.7 | -51.7 | 24.3 | .0 | 26.6 |
| 186 | 518.2 | -23.6 | 11.1 | -51.7 | 24.3 | .0 | 26.7 |
| 187 | 567.8 | -25.2 | 11.9 | -51.7 | 24.3 | .0 | 27.1 |
| 188 | -90.9 | -3.7 | .8 | -50.9 | 23.9 | .0 | 23.9 |
| 189 | 553.4 | -24.4 | 11.5 | -50.9 | 23.9 | .0 | 26.6 |
| 190 | -105.3 | -2.9 | .4 | -50.2 | 23.6 | .0 | 23.6 |
| 191 | -55.8 | -4.5 | 1.2 | -50.2 | 23.6 | .0 | 23.6 |
| 192 | -31.0 | -5.3 | 1.6 | -50.2 | 23.6 | .0 | 23.6 |
| 193 | 18.6 | -6.9 | 2.4 | -50.2 | 23.6 | .0 | 23.7 |
| 194 | 68.1 | -8.5 | 3.2 | -50.2 | 23.6 | .0 | 23.8 |
| 195 | 117.7 | -10.1 | 4.1 | -50.2 | 23.6 | .0 | 23.9 |
| 196 | 167.2 | -11.7 | 4.9 | -50.2 | 23.6 | .0 | 24.1 |
| 197 | 216.8 | -13.2 | 5.7 | -50.2 | 23.6 | .0 | 24.2 |
| 198 | 266.4 | -14.8 | 6.6 | -50.2 | 23.6 | .0 | 24.4 |
| 199 | 315.9 | -16.4 | 7.4 | -50.2 | 23.6 | .0 | 24.7 |
| 200 | 365.5 | -18.0 | 8.2 | -50.2 | 23.6 | .0 | 24.9 |
| 201 | 415.0 | -19.6 | 9.0 | -50.2 | 23.6 | .0 | 25.2 |
| 202 | 464.6 | -21.2 | 9.9 | -50.2 | 23.6 | .0 | 25.5 |
| 203 | 514.1 | -22.8 | 10.7 | -50.2 | 23.6 | .0 | 25.9 |
| 204 | 538.9 | -23.6 | 11.1 | -50.2 | 23.6 | .0 | 26.0 |
| 205 | 588.5 | -25.2 | 11.9 | -50.2 | 23.6 | .0 | 26.4 |
| 206 | -95.0 | -2.9 | .4 | -49.5 | 23.2 | .0 | 23.2 |
| 207 | -45.4 | -4.5 | 1.2 | -49.5 | 23.2 | .0 | 23.2 |
| 208 | -20.6 | -5.3 | 1.6 | -49.5 | 23.2 | .0 | 23.2 |
| 209 | 28.9 | -6.9 | 2.4 | -49.5 | 23.2 | .0 | 23.3 |
| 210 | 78.5 | -8.5 | 3.2 | -49.5 | 23.2 | .0 | 23.4 |
| 211 | 128.0 | -10.1 | 4.1 | -49.5 | 23.2 | .0 | 23.5 |
| 212 | 177.6 | -11.7 | 4.9 | -49.5 | 23.2 | .0 | 23.7 |
| 213 | 227.1 | -13.2 | 5.7 | -49.5 | 23.2 | .0 | 23.9 |
| 214 | 276.7 | -14.8 | 6.6 | -49.5 | 23.2 | .0 | 24.1 |
| 215 | 326.3 | -16.4 | 7.4 | -49.5 | 23.2 | .0 | 24.3 |
| 216 | 375.8 | -18.0 | 8.2 | -49.5 | 23.2 | .0 | 24.6 |
| 217 | 425.4 | -19.6 | 9.0 | -49.5 | 23.2 | .0 | 24.9 |
| 218 | 474.9 | -21.2 | 9.9 | -49.5 | 23.2 | .0 | 25.2 |
| 219 | 524.5 | -22.8 | 10.7 | -49.5 | 23.2 | .0 | 25.5 |
| 220 | 549.3 | -23.6 | 11.1 | -49.5 | 23.2 | .0 | 25.7 |
| 221 | 598.8 | -25.2 | 11.9 | -49.5 | 23.2 | .0 | 26.1 |
| 222 | -59.9 | -3.7 | .8 | -48.7 | 22.8 | .0 | 22.8 |
| 223 | 14.5 | -6.1 | 2.0 | -48.7 | 22.8 | .0 | 22.9 |
| 224 | 64.0 | -7.7 | 2.8 | -48.7 | 22.8 | .0 | 23.0 |
| 225 | 113.6 | -9.3 | 3.7 | -48.7 | 22.8 | .0 | 23.1 |
| 226 | 163.1 | -10.9 | 4.5 | -48.7 | 22.8 | .0 | 23.2 |
| 227 | 212.7 | -12.4 | 5.3 | -48.7 | 22.8 | .0 | 23.4 |
| 228 | 262.3 | -14.0 | 6.1 | -48.7 | 22.8 | .0 | 23.6 |
| 229 | 311.8 | -15.6 | 7.0 | -48.7 | 22.8 | .0 | 23.8 |
| 230 | 361.4 | -17.2 | 7.8 | -48.7 | 22.8 | .0 | 24.1 |
| 231 | 410.9 | -18.8 | 8.6 | -48.7 | 22.8 | .0 | 24.4 |
| 232 | 460.5 | -20.4 | 9.4 | -48.7 | 22.8 | .0 | 24.7 |
| 233 | 510.0 | -22.0 | 10.3 | -48.7 | 22.8 | .0 | 25.0 |
| 234 | 584.4 | -24.4 | 11.5 | -48.7 | 22.8 | .0 | 25.5 |
| 235 | -74.3 | -2.9 | .4 | -48.0 | 22.4 | .0 | 22.4 |
| 236 | -24.7 | -4.5 | 1.2 | -48.0 | 22.4 | .0 | 22.4 |
| 237 | .0 | -5.3 | 1.6 | -48.0 | 22.4 | .0 | 22.5 |
| 238 | 49.6 | -6.9 | 2.4 | -48.0 | 22.4 | .0 | 22.5 |
| 239 | 99.2 | -8.5 | 3.2 | -48.0 | 22.4 | .0 | 22.6 |
| 240 | 148.7 | -10.1 | 4.1 | -48.0 | 22.4 | .0 | 22.8 |
| 241 | 198.3 | -11.7 | 4.9 | -48.0 | 22.4 | .0 | 22.9 |
| 242 | 247.8 | -13.2 | 5.7 | -48.0 | 22.4 | .0 | 23.1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 243 | 297.4 | -14.8 | 6.6 | -48.0 | 22.4 | .0 | 23.3 |
| 244 | 346.9 | -16.4 | 7.4 | -48.0 | 22.4 | .0 | 23.6 |
| 245 | 396.5 | -18.0 | 8.2 | -48.0 | 22.4 | .0 | 23.9 |
| 246 | 446.0 | -19.6 | 9.0 | -48.0 | 22.4 | .0 | 24.2 |
| 247 | 495.6 | -21.2 | 9.9 | -48.0 | 22.4 | .0 | 24.5 |
| 248 | 545.2 | -22.8 | 10.7 | -48.0 | 22.4 | .0 | 24.8 |
| 249 | 569.9 | -23.6 | 11.1 | -48.0 | 22.4 | .0 | 25.0 |
| 250 | 619.5 | -25.2 | 11.9 | -48.0 | 22.4 | .0 | 25.4 |

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Mris = (Mxp^2 + Myp^2)^0.5