

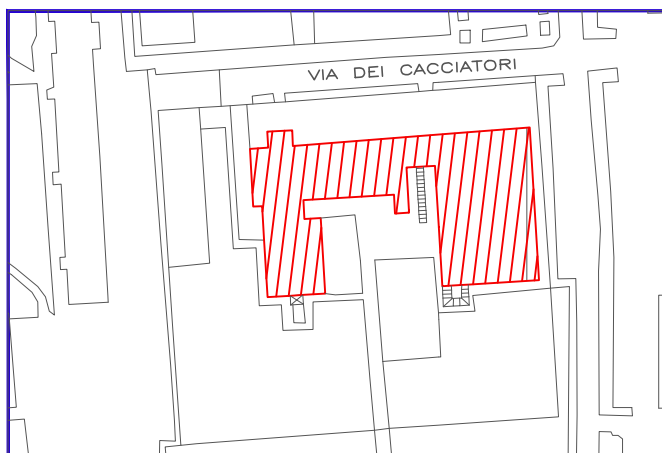


COMUNE DI NICHELINO

CITTA' METROPOLITANA DI TORINO

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE
COMUNALE - EDILIZIA SCOLASTICA II LOTTO

Scuola Primaria "A. Gramsci" - via Cacciatori, 21/12
COD. ED. 08



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PROGETTO ESECUTIVO

RELAZIONE TECNICA STRUTTURALE

scala

-

REV	MODIFICHE	DATA	DATA ultimo aggiornamento	08_PE.ST.RTS_01
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1	REVISIONE	aprile 2018		
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RELAZIONE GEOTECNICA E SULLE FONDAZIONI

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PREMESSA

La presente relazione è redatta a corredo del Progetto Esecutivo relativo ad Interventi di manutenzione straordinaria su edifici scolastici nel Comune di Nichelino. Nello specifico sono illustrati gli interventi di carattere strutturale sulla Scuola "A. Gramsci".

Come richiesto dall'art. **33 del d.P.R. n. 207/2010** (in vigore fino all'emanazione delle linee - guida e dei decreti attuativi del d.lgs. n. 50/2016) verranno di seguito illustrate nel dettaglio le verifiche condotte sulle fondazioni.

Riferimento Normativo di carattere Tecnico è il **D.M. 14.01.2008 – Norme Tecniche per le Costruzioni** (di seguito indicate **NTC08**) e la relativa **Circolare Esplicativa** (di seguito indicata **C08**) (ove necessario si farà anche riferimento agli Eurocodici ed alle direttive CNR).

Elenco completo di tutti i riferimenti normativi è riportato in calce alla presente relazione insieme alle note di dettaglio sul codice di calcolo.

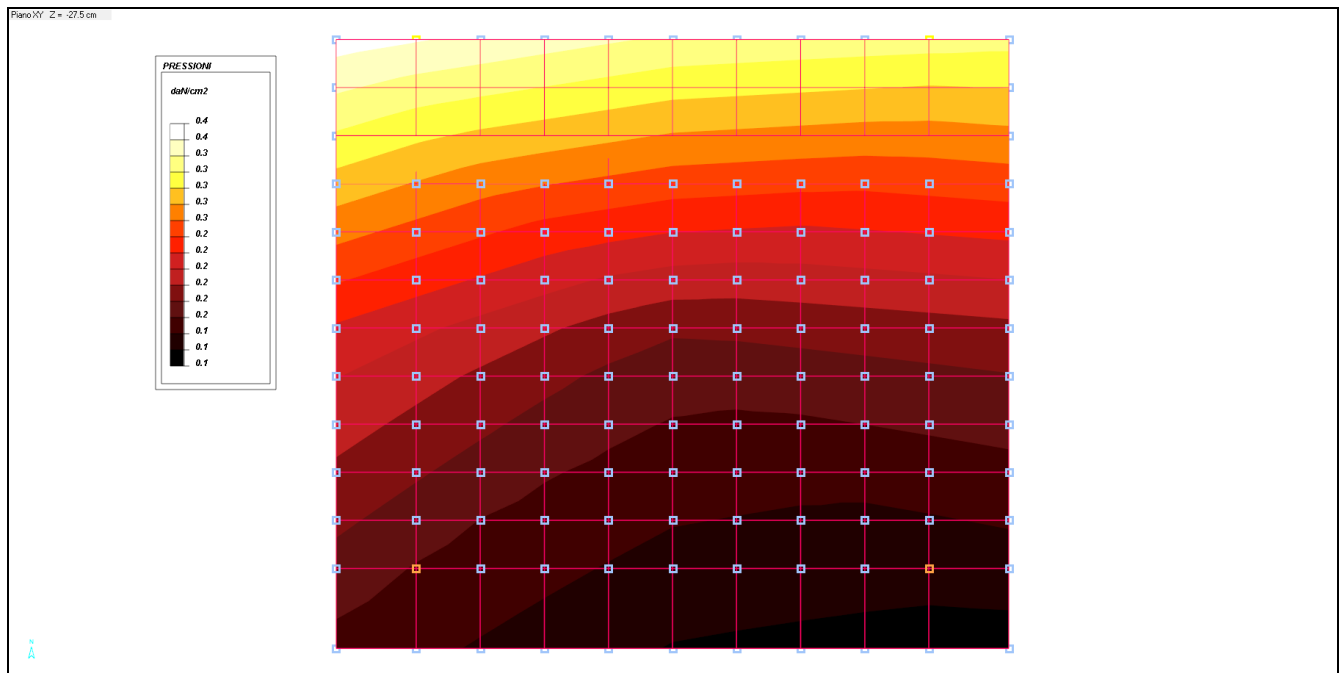
I carichi utilizzati per le verifiche sono quelli che risultano dal modello tridimensionale agli elementi finiti realizzato per le verifiche strutturali in cui è stato utilizzato, congruentemente con quanto riportato nelle relazioni specialistiche del progetto definitivo (geologica e geotecnica), **un modulo di reazione verticale del terreno "Winkler"** pari a 3.0 (vedasi Tabella dei moduli di Winkler secondo Pozzati).

Il programma di calcolo utilizzato per il dimensionamento e la verifica degli elementi **DOLMEN 16** che è stato utilizzato per realizzare una **modellazione strutturale agli elementi finiti**, applicato a sistemi tridimensionali.

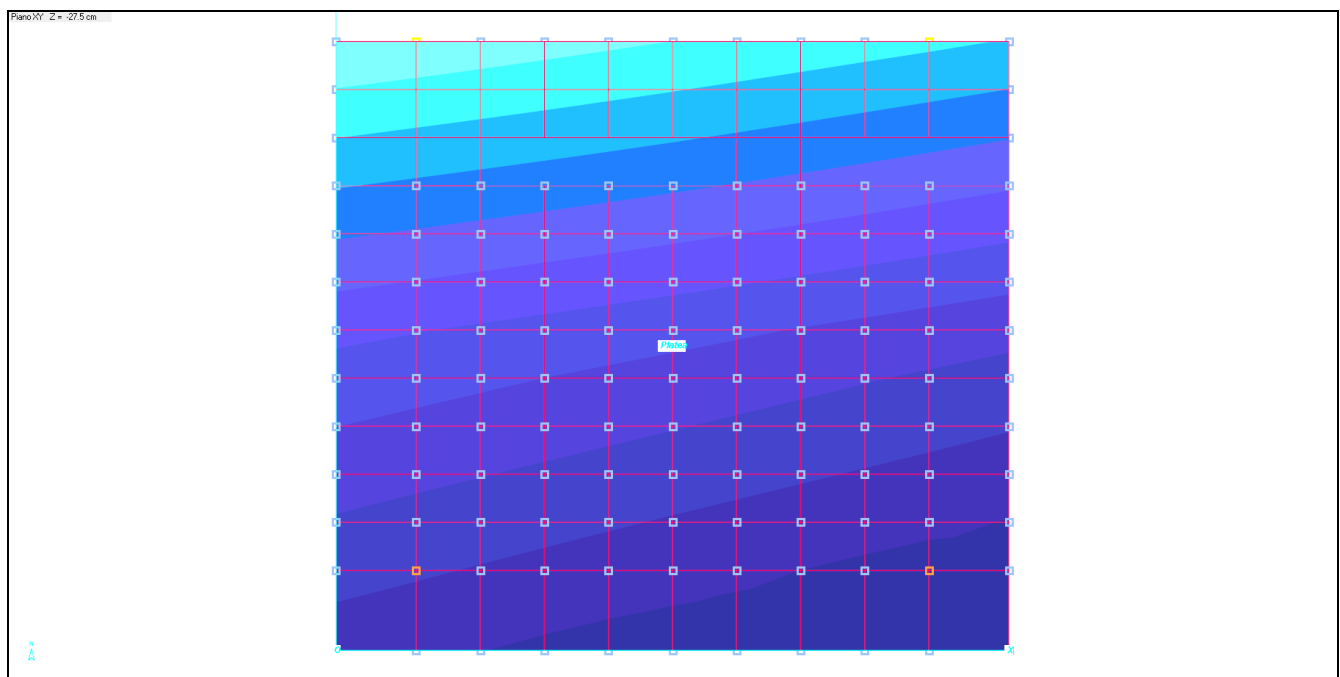
Le verifiche numeriche sono state condotte utilizzando i valori riportati nella Relazione Geologica fornita dalla stazione appaltante e relativa al progetto del "Nuovo Centro d'incontro "quartiere

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boscehtto''' redatta dal Dott. Geol. Massimo Trossero nell'Ottobre 2008 (è stata utilizzata tale relazione in quanto il Comune non ha realizzato indagini specifiche per il lavoro in oggetto).

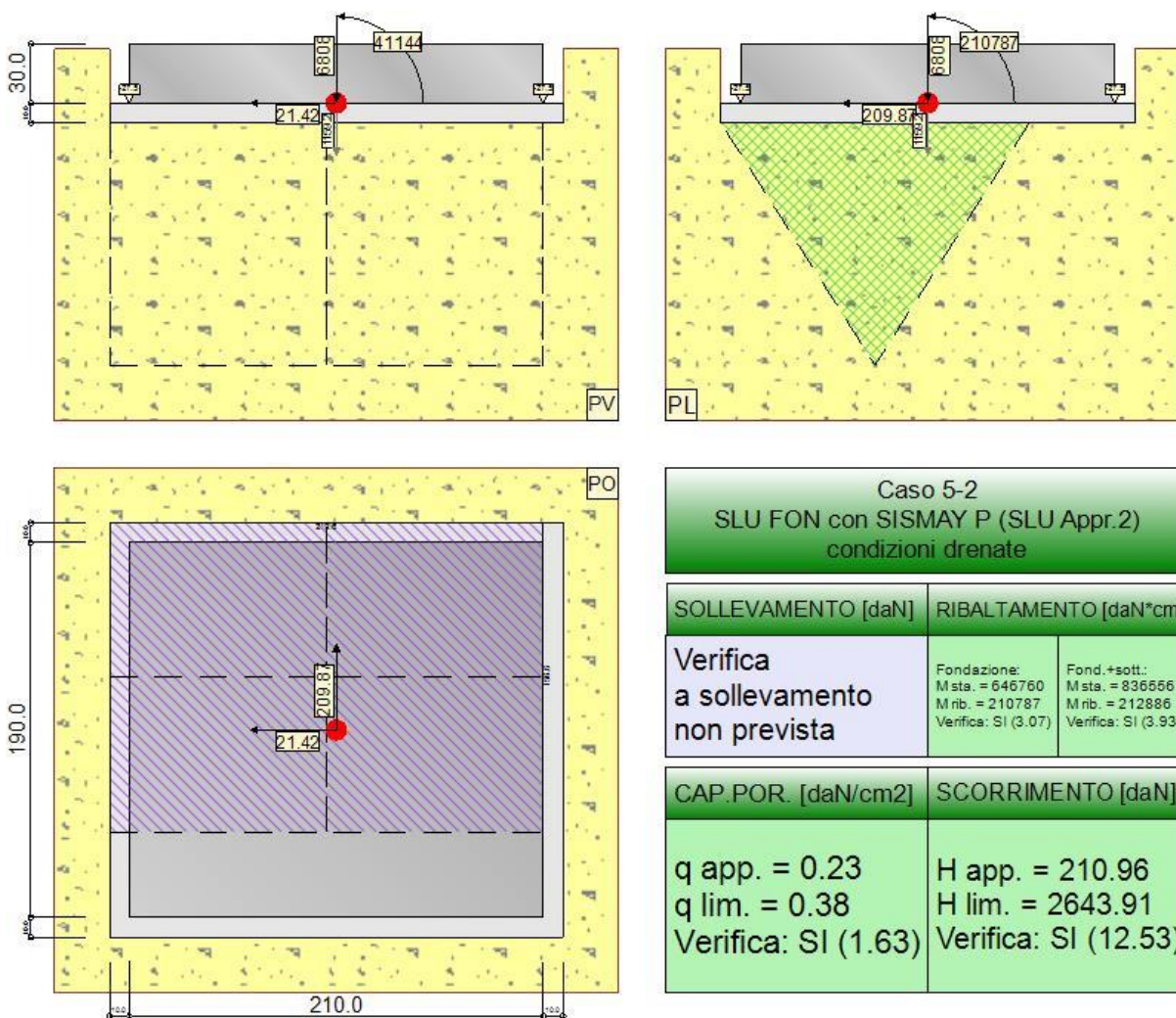


Mapa delle pressioni sul terreno caso SLU fondazioni (valori 0.1-0.4 daN/cm²)



Mapa dei cedimenti sul terreno caso SLU fondazioni (valori -0.07 - + 0.02 cm)

VALUTAZIONE DELLA STABILITÀ, CAPACITÀ PORTANTE E RESISTENZA A SCORRIMENTO DI UNA FONDAZIONE SUPERFICIALE (FONDAZIONE PLATEA)



Rappresentazione della fondazione.

Descrizione dei Casi di calcolo e riassunto dei risultati.

Segue il riassunto dei Casi di calcolo analizzati. I dettagli di ciascun Caso (sollecitazioni, verifiche, ecc.) sono specificati nei paragrafi successivi.

Indici e nomi dei casi di carico			Elenco delle verifiche eseguite per ciascun caso				Sisma
Caso	Nome	Sestetti	Ver. dren.	Ver. non dren.	Ver. equ.	Ver. upl.	Coef. sism.
1	SLU SENZA SISMA (SLU Appr.2)	da 1-1 a 1-2	Si	No	Si	No	Non sismico
1-1 Caso 1-1; 1-2 Caso 1-2							
2	SLU con SISMAX PRINC (SLU Appr.2)	da 2-1 a 2-8	Si	No	Si	No	$k_{h,x} = 0.25$, $k_{h,y} = 0.00$
2-1 Caso 4-1; 2-2 Caso 4-2; 2-3 Caso 4-3; 2-4 Caso 4-4; 2-5 Caso 4-5; 2-6 Caso 4-6; 2-7 Caso 4-7; 2-8 Caso 4-8							
3	SLU conda	da 3-1	Si	No	Si	No	$k_{h,x} = 0.00$, $k_{h,y} =$

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	SISMAY PRINC (SLU Appr.2)	a 3-8					0.25
3-1 Caso 5-1; 3-2 Caso 5-2; 3-3 Caso 5-3; 3-4 Caso 5-4; 3-5 Caso 5-5; 3-6 Caso 5-6; 3-7 Caso 5-7; 3-8 Caso 5-8							
4	SLU FON con SISMAY P (SLU Appr.2)	da 4-1 a 4-8	Si	No	Si	No	$k_{h,x} = 0.25$, $k_{h,y} = 0.00$
4-1 Caso 8-1; 4-2 Caso 8-2; 4-3 Caso 8-3; 4-4 Caso 8-4; 4-5 Caso 8-5; 4-6 Caso 8-6; 4-7 Caso 8-7; 4-8 Caso 8-8							
5	SLU FON con SISMAY P (SLU Appr.2)	da 5-1 a 5-8	Si	No	Si	No	$k_{h,x} = 0.00$, $k_{h,y} = 0.25$
5-1 Caso 9-1; 5-2 Caso 9-2; 5-3 Caso 9-3; 5-4 Caso 9-4; 5-5 Caso 9-5; 5-6 Caso 9-6; 5-7 Caso 9-7; 5-8 Caso 9-8							

La seguente tabella elenca i coefficienti di sicurezza parziali, applicati alle caratteristiche meccaniche del terreno, alla capacità portante, alla resistenza a scorrimento e del terreno, per ciascun Caso di calcolo.

Caso	$\gamma_{G1,fav}$	$\gamma_{G1,sfa}$	$\gamma_{G2,fav}$	$\gamma_{G2,sfa}$	$\gamma_{Q1,fav}$	$\gamma_{Q1,sfa}$	γ_r	γ_e	$\gamma_{c'}$	$\gamma_{R,v}$	$\gamma_{R,h}$	$\gamma_{R,e}$	$\gamma_{R,eq}$	$\gamma_{R,upl}$
1	1.00	1.30	0.00	1.50	0.00	1.50	1.00	1.00	1.00	2.30	1.10	1.00	-	-
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.30	1.10	1.00	-	-
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.30	1.10	1.00	-	-
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.30	1.10	1.00	-	-
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.30	1.10	1.00	-	-

Segue la tabella riassuntiva di tutte le verifiche a **ribaltamento**.

Caso	Fondazione			Fondazione e Sottofondo		
	R_d [daN*cm]	E_d [daN*cm]	Verifica	R_d [daN*cm]	E_d [daN*cm]	Verifica
1-1	1185410	413680	SI (1185410/413680 = 2.87 >= 1.0)	1468420	417260	SI (1468420/417260 = 3.52 >= 1.0)
1-2	1185120	262170	SI (1185120/262170 = 4.52 >= 1.0)	1472240	262170	SI (1472240/262170 = 5.62 >= 1.0)
2-1	646480	181240	SI (646480/181240 = 3.57 >= 1.0)	836240	182850	SI (836240/182850 = 4.57 >= 1.0)
2-2	646480	158860	SI (646480/158860 = 4.07 >= 1.0)	836240	160110	SI (836240/160110 = 5.22 >= 1.0)
2-3	646480	181240	SI (646480/181240 = 3.57 >= 1.0)	836240	182850	SI (836240/182850 = 4.57 >= 1.0)
2-4	646570	158810	SI (646570/158810 = 4.07 >= 1.0)	836350	160060	SI (836350/160060 = 5.23 >= 1.0)
2-5	646480	120520	SI (646480/120520 = 5.36 >= 1.0)	837720	120520	SI (837720/120520 = 6.95 >= 1.0)
2-6	646480	98140	SI (646480/98140 = 6.59 >= 1.0)	838080	98140	SI (838080/98140 = 8.54 >= 1.0)
2-7	646480	120520	SI (646480/120520 = 5.36 >= 1.0)	837720	120520	SI (837720/120520 = 6.95 >= 1.0)
2-8	646480	98140	SI (646480/98140 = 6.59 >= 1.0)	838080	98140	SI (838080/98140 = 8.54 >= 1.0)
3-1	646570	207290	SI (646570/207290 = 3.12 >= 1.0)	836350	209320	SI (836350/209320 = 4.00 >= 1.0)
3-2	647140	206780	SI (647140/206780 = 3.13 >= 1.0)	836980	208820	SI (836980/208820 = 4.01 >= 1.0)
3-3	646480	132750	SI (646480/132750 = 4.87 >= 1.0)	836240	133570	SI (836240/133570 = 6.26 >= 1.0)
3-4	646480	132750	SI (646480/132750 = 4.87 >= 1.0)	836240	133570	SI (836240/133570 = 6.26 >= 1.0)
3-5	646480	146620	SI (646480/146620 = 4.41 >= 1.0)	837290	146620	SI (837290/146620 = 5.71 >= 1.0)
3-6	646480	146620	SI (646480/146620 = 4.41 >= 1.0)	837290	146620	SI (837290/146620 = 5.71 >= 1.0)
3-7	646480	72030	SI (646480/72030 = 8.97 >= 1.0)	838510	72030	SI (838510/72030 = 11.64 >= 1.0)
3-8	646480	72030	SI (646480/72030 = 8.97 >= 1.0)	838510	72030	SI (838510/72030 = 11.64 >= 1.0)
4-1	646480	182360	SI (646480/182360 = 3.55 >= 1.0)	836240	183990	SI (836240/183990 = 4.55 >= 1.0)
4-2	646480	157740	SI (646480/157740 = 4.10 >= 1.0)	836240	158970	SI (836240/158970 = 5.26 >= 1.0)
4-3	646480	182330	SI (646480/182330 = 3.55 >= 1.0)	836240	183960	SI (836240/183960 = 4.55 >= 1.0)

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4-4	646570	157650	SI (646570/157650 = 4.10 >= 1.0)	836350	158880	SI (836350/158880 = 5.26 >= 1.0)
4-5	646480	121640	SI (646480/121640 = 5.31 >= 1.0)	837700	121640	SI (837700/121640 = 6.89 >= 1.0)
4-6	646480	97020	SI (646480/97020 = 6.66 >= 1.0)	838100	97020	SI (838100/97020 = 8.64 >= 1.0)
4-7	646480	121640	SI (646480/121640 = 5.31 >= 1.0)	837700	121640	SI (837700/121640 = 6.89 >= 1.0)
4-8	646480	97020	SI (646480/97020 = 6.66 >= 1.0)	838100	97020	SI (838100/97020 = 8.64 >= 1.0)
5-1	646660	210880	SI (646660/210880 = 3.07 >= 1.0)	836450	212980	SI (836450/212980 = 3.93 >= 1.0)
5-2	646760	210790	SI (646760/210790 = 3.07 >= 1.0)	836560	212890	SI (836560/212890 = 3.93 >= 1.0)
5-3	646480	129020	SI (646480/129020 = 5.01 >= 1.0)	836240	129780	SI (836240/129780 = 6.44 >= 1.0)
5-4	646480	129020	SI (646480/129020 = 5.01 >= 1.0)	836240	129780	SI (836240/129780 = 6.44 >= 1.0)
5-5	646480	150350	SI (646480/150350 = 4.30 >= 1.0)	837230	150350	SI (837230/150350 = 5.57 >= 1.0)
5-6	646480	150350	SI (646480/150350 = 4.30 >= 1.0)	837230	150350	SI (837230/150350 = 5.57 >= 1.0)
5-7	646480	68300	SI (646480/68300 = 9.46 >= 1.0)	838570	68300	SI (838570/68300 = 12.28 >= 1.0)
5-8	646480	68300	SI (646480/68300 = 9.46 >= 1.0)	838570	68300	SI (838570/68300 = 12.28 >= 1.0)

Segue la tabella riassuntiva di tutte le verifiche di **capacità portante**, i dettagli sono riportati nei paragrafi successivi.

Caso	Cond. drenate			Cond. non drenate		
	E_d [daN]	R_d [daN]	Verifica	E_d [daN]	R_d [daN]	Verifica
1-1	13985	37719.4	SI (37719.4/13985 = 2.70 >= 1.0)	Verifica non richiesta.		
1-2	13982	48039.3	SI (48039.3/13982 = 3.44 >= 1.0)	Verifica non richiesta.		
2-1	7964.2	14333.7	SI (14333.7/7964.2 = 1.80 >= 1.0)	Verifica non richiesta.		
2-2	7964.2	15215.1	SI (15215.1/7964.2 = 1.91 >= 1.0)	Verifica non richiesta.		
2-3	7964.2	13588.3	SI (13588.3/7964.2 = 1.71 >= 1.0)	Verifica non richiesta.		
2-4	7965.2	14431.4	SI (14431.4/7965.2 = 1.81 >= 1.0)	Verifica non richiesta.		
2-5	7964.2	16551	SI (16551/7964.2 = 2.08 >= 1.0)	Verifica non richiesta.		
2-6	7964.2	17217.2	SI (17217.2/7964.2 = 2.16 >= 1.0)	Verifica non richiesta.		
2-7	7964.2	15703.7	SI (15703.7/7964.2 = 1.97 >= 1.0)	Verifica non richiesta.		
2-8	7964.2	16341.3	SI (16341.3/7964.2 = 2.05 >= 1.0)	Verifica non richiesta.		
3-1	7965.2	13483	SI (13483/7965.2 = 1.69 >= 1.0)	Verifica non richiesta.		
3-2	7971.2	13194.8	SI (13194.8/7971.2 = 1.66 >= 1.0)	Verifica non richiesta.		
3-3	7964.2	16455.3	SI (16455.3/7964.2 = 2.07 >= 1.0)	Verifica non richiesta.		
3-4	7964.2	16076.5	SI (16076.5/7964.2 = 2.02 >= 1.0)	Verifica non richiesta.		
3-5	7964.2	15944.6	SI (15944.6/7964.2 = 2.00 >= 1.0)	Verifica non richiesta.		
3-6	7964.2	15576.7	SI (15576.7/7964.2 = 1.96 >= 1.0)	Verifica non richiesta.		
3-7	7964.2	18193.6	SI (18193.6/7964.2 = 2.28 >= 1.0)	Verifica non richiesta.		
3-8	7964.2	17782.9	SI (17782.9/7964.2 = 2.23 >= 1.0)	Verifica non richiesta.		
4-1	7964.2	14211.7	SI (14211.7/7964.2 = 1.77 >= 1.0)	Verifica non richiesta.		

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			$= 1.78 \geq 1.0$	
4-2	7964.2	15175.9	SI (15175.9/7964.2 = 1.91 ≥ 1.0)	Verifica non richiesta.
4-3	7964.2	13470.9	SI (13470.9/7964.2 = 1.69 ≥ 1.0)	Verifica non richiesta.
4-4	7965.2	14392.9	SI (14392.9/7965.2 = 1.81 ≥ 1.0)	Verifica non richiesta.
4-5	7964.2	16426.9	SI (16426.9/7964.2 = 2.06 ≥ 1.0)	Verifica non richiesta.
4-6	7964.2	17155.9	SI (17155.9/7964.2 = 2.15 ≥ 1.0)	Verifica non richiesta.
4-7	7964.2	15582	SI (15582/7964.2 = 1.96 ≥ 1.0)	Verifica non richiesta.
4-8	7964.2	16279.6	SI (16279.6/7964.2 = 2.04 ≥ 1.0)	Verifica non richiesta.
5-1	7966.2	13361.4	SI (13361.4/7966.2 = 1.68 ≥ 1.0)	Verifica non richiesta.
5-2	7967.2	13020.1	SI (13020.1/7967.2 = 1.63 ≥ 1.0)	Verifica non richiesta.
5-3	7964.2	16626.6	SI (16626.6/7964.2 = 2.09 ≥ 1.0)	Verifica non richiesta.
5-4	7964.2	16204.9	SI (16204.9/7964.2 = 2.03 ≥ 1.0)	Verifica non richiesta.
5-5	7964.2	15846.1	SI (15846.1/7964.2 = 1.99 ≥ 1.0)	Verifica non richiesta.
5-6	7964.2	15442.5	SI (15442.5/7964.2 = 1.94 ≥ 1.0)	Verifica non richiesta.
5-7	7964.2	18320.9	SI (18320.9/7964.2 = 2.30 ≥ 1.0)	Verifica non richiesta.
5-8	7964.2	17865.4	SI (17865.4/7964.2 = 2.24 ≥ 1.0)	Verifica non richiesta.

Segue la tabella riassuntiva di tutte le verifiche di **resistenza a scorrimento**, i dettagli sono riportati nei paragrafi successivi.

Caso	Cond. drenate			Cond. non drenate		
	E_d [daN]	R_d [daN]	Verifica	E_d [daN]	R_d [daN]	Verifica
1-1	358.3	4488.5	SI (4488.5/358.3 = 12.53 ≥ 1.0)			Verifica non richiesta.
1-2	413.9	4487.3	SI (4487.3/413.9 = 10.84 ≥ 1.0)			Verifica non richiesta.
2-1	177	2677.1	SI (2677.1/177 = 15.12 ≥ 1.0)			Verifica non richiesta.
2-2	144.6	2683.4	SI (2683.4/144.6 = 18.56 ≥ 1.0)			Verifica non richiesta.
2-3	175.4	2675.6	SI (2675.6/175.4 = 15.26 ≥ 1.0)			Verifica non richiesta.
2-4	142.5	2682.4	SI (2682.4/142.5 = 18.82 ≥ 1.0)			Verifica non richiesta.
2-5	164.8	2679.4	SI (2679.4/164.8 = 16.26 ≥ 1.0)			Verifica non richiesta.
2-6	198.2	2673.5	SI (2673.5/198.2 = 13.49 ≥ 1.0)			Verifica non richiesta.
2-7	163	2677.9	SI (2677.9/163 = 16.43 ≥ 1.0)			Verifica non richiesta.
2-8	196.7	2671.8	SI (2671.8/196.7 = 13.58 ≥ 1.0)			Verifica non richiesta.
3-1	205.1	2645	SI (2645/205.1 = 12.90 ≥ 1.0)			Verifica non richiesta.
3-2	204.7	2644.1	SI (2644.1/204.7 = 12.92 ≥ 1.0)			Verifica non richiesta.
3-3	85.3	2664.2	SI (2664.2/85.3 = 31.22 ≥ 1.0)			Verifica non richiesta.
3-4	84.3	2659.1	SI (2659.1/84.3 = 31.54 ≥ 1.0)			Verifica non richiesta.
3-5	107.6	2657.8	SI (2657.8/107.6 = 24.69 ≥ 1.0)			Verifica non richiesta.
3-6	106.8	2653.4	SI (2653.4/106.8 = 24.84 ≥ 1.0)			Verifica non richiesta.

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3-7	228	2643.1	SI (2643.1/228 = 11.59 >= 1.0)	Verifica non richiesta.
3-8	227.6	2640.6	SI (2640.6/227.6 = 11.60 >= 1.0)	Verifica non richiesta.
4-1	181.7	2679.3	SI (2679.3/181.7 = 14.74 >= 1.0)	Verifica non richiesta.
4-2	146.8	2685.4	SI (2685.4/146.8 = 18.30 >= 1.0)	Verifica non richiesta.
4-3	179.9	2677.9	SI (2677.9/179.9 = 14.88 >= 1.0)	Verifica non richiesta.
4-4	144.5	2684.8	SI (2684.8/144.5 = 18.57 >= 1.0)	Verifica non richiesta.
4-5	166.5	2682	SI (2682/166.5 = 16.11 >= 1.0)	Verifica non richiesta.
4-6	202.6	2675.8	SI (2675.8/202.6 = 13.21 >= 1.0)	Verifica non richiesta.
4-7	164.5	2680.7	SI (2680.7/164.5 = 16.29 >= 1.0)	Verifica non richiesta.
4-8	201	2674.3	SI (2674.3/201 = 13.30 >= 1.0)	Verifica non richiesta.
5-1	211.4	2646.2	SI (2646.2/211.4 = 12.52 >= 1.0)	Verifica non richiesta.
5-2	211	2643.9	SI (2643.9/211 = 12.53 >= 1.0)	Verifica non richiesta.
5-3	80.2	2668.7	SI (2668.7/80.2 = 33.30 >= 1.0)	Verifica non richiesta.
5-4	78.9	2663.9	SI (2663.9/78.9 = 33.75 >= 1.0)	Verifica non richiesta.
5-5	102.2	2661.5	SI (2661.5/102.2 = 26.04 >= 1.0)	Verifica non richiesta.
5-6	101.3	2657.1	SI (2657.1/101.3 = 26.24 >= 1.0)	Verifica non richiesta.
5-7	234.3	2644	SI (2644/234.3 = 11.29 >= 1.0)	Verifica non richiesta.
5-8	233.9	2641.6	SI (2641.6/233.9 = 11.30 >= 1.0)	Verifica non richiesta.

Descrizione del metodo di calcolo.

Il calcolo della capacità portante viene eseguito secondo la formula trinomia, considerando separatamente i contributi dovuti alla coesione, al sovraccarico laterale ed al peso del terreno. Per le verifiche in condizioni drenate, si utilizzano i coefficienti di capacità portante N_q (Prandtl, 1921), N_c (Reissner, 1924), N_γ (Vesic, 1973), i coefficienti correttivi dovuti alla forma della fondazione (s , Meyerhof, 1951 e 1963), all'approfondimento (d , Brinch Hansen, 1970), all'inclinazione del carico (i , Vesic, 1973), all'inclinazione del piano di posa (b , Vesic, 1973), all'inclinazione del piano campagna (g , Vesic, 1973), e all'azione sismica (h - Maugeri e Novità, 2004). Nel caso di terreno eterogeneo (litologie differenti, presenza di falda), i parametri meccanici utilizzati nel calcolo sono ottenuti come media ponderata dei valori rinvenuti all'interno del cuneo di rottura. La resistenza a scorrimento, viene ottenuta sommando i contributi del carico normale al piano di posa moltiplicato per il coefficiente d'attrito, e dell'area del piano di posa (eventualmente ridotta per carico verticale eccentrico) per l'adesione fondazione-terreno. In condizioni drenate, l'attrito fondazione terreno è assunto pari all'angolo di resistenza al taglio del terreno moltiplicato per il coefficiente 0.75, l'adesione fondazione terreno è trascurata (assunta pari a 0). Si considera il contributo della pressione del terreno a lato della fondazione. La resistenza laterale del terreno è assunta pari alla resistenza passiva disponibile moltiplicata per 0.50.

Descrizione della fondazione.

La fondazione ha piano di posa rettangolare, con lato X di 230 [cm], lato Y di 210 [cm], e centro alla quota $z = -37.5$ [cm]. Il piano di posa è orizzontale.

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Descrizione del terreno.

La stratigrafia è omogenea, presenta un solo strato							
n.	nome	z _i [cm]	z _f [cm]	γ _d [daN/cm ³]	γ _t [daN/cm ³]	c' [daN/cm ²]	φ' [°]
1	Sabbia	0	-1000	0.00185	0.00215	0	25
La stratigrafia non contiene una falda							

Verifiche in condizioni drenate.

Sollecitazioni al piano di posa.

Si riportano di seguito le componenti della sollecitazione applicata e la distanza del punto di applicazione dal centro del piano di posa della fondazione.

Rispetto al sistema di rif. globale:								
Caso	F _x [daN]	F _y [daN]	F _z [daN]	M _x [daN*cm]	M _y [daN*cm]	dx [cm]	dy [cm]	dz [cm]
1-1	5.71	358.29	-13984.96	-413675	-77033	0	0	10
1-2	5.71	-413.83	-13981.96	-262167	-76737	0	0	10
2-1	73.19	161.18	-7964.2	-181236	13737	0	0	10
2-2	73.19	124.67	-7964.2	-158859	13737	0	0	10
2-3	-69.07	161.18	-7964.2	-181236	-69058	0	0	10
2-4	-69.07	124.67	-7965.2	-158812	-68937	0	0	10
2-5	73.19	-147.66	-7964.2	-120516	13737	0	0	10
2-6	73.19	-184.18	-7964.2	-98139	13737	0	0	10
2-7	-69.07	-147.66	-7964.2	-120516	-68990	0	0	10
2-8	-69.07	-184.18	-7964.2	-98139	-68990	0	0	10
3-1	23.4	203.78	-7965.2	-207287	-15158	0	0	10
3-2	-19.28	203.78	-7971.2	-206785	-39552	0	0	10
3-3	23.4	82.07	-7964.2	-132754	-15217	0	0	10
3-4	-19.28	82.07	-7964.2	-132754	-40035	0	0	10
3-5	23.4	-105.06	-7964.2	-146622	-15217	0	0	10
3-6	-19.28	-105.06	-7964.2	-146622	-40035	0	0	10
3-7	23.4	-226.78	-7964.2	-72034	-15217	0	0	10
3-8	-19.28	-226.78	-7964.2	-72034	-40035	0	0	10
4-1	80.3	163.01	-7964.2	-182355	17873	0	0	10
4-2	80.3	122.84	-7964.2	-157741	17873	0	0	10
4-3	-76.19	163.01	-7964.2	-182330	-73137	0	0	10
4-4	-76.19	122.84	-7965.2	-157654	-73030	0	0	10
4-5	80.3	-145.84	-7964.2	-121635	17873	0	0	10
4-6	80.3	-186.01	-7964.2	-97021	17873	0	0	10
4-7	-76.19	-145.84	-7964.2	-121635	-73126	0	0	10
4-8	-76.19	-186.01	-7964.2	-97021	-73126	0	0	10
5-1	25.53	209.87	-7966.2	-210879	-13789	0	0	10
5-2	-21.42	209.87	-7967.2	-210787	-41144	0	0	10
5-3	25.53	75.98	-7964.2	-129024	-13976	0	0	10
5-4	-21.42	75.98	-7964.2	-129024	-41276	0	0	10
5-5	25.53	-98.98	-7964.2	-150351	-13976	0	0	10
5-6	-21.42	-98.98	-7964.2	-150351	-41276	0	0	10
5-7	25.53	-232.87	-7964.2	-68304	-13976	0	0	10
5-8	-21.42	-232.87	-7964.2	-68304	-41276	0	0	10
Rispetto al sistema di rif. locale (centro piano di posa):								
Caso	H _x [daN]	H _y [daN]	V _z [daN]	M _x [daN*cm]	M _y [daN*cm]	dx [cm]	dy [cm]	dz [cm]
1-1	5.71	358.29	-13984.96	-417258	-76976	-	-	-
1-2	5.71	-413.83	-13981.96	-258029	-76680	-	-	-
2-1	73.19	161.18	-7964.2	-182848	14469	-	-	-
2-2	73.19	124.67	-7964.2	-160106	14469	-	-	-
2-3	-69.07	161.18	-7964.2	-182848	-69749	-	-	-
2-4	-69.07	124.67	-7965.2	-160059	-69628	-	-	-
2-5	73.19	-147.66	-7964.2	-119039	14469	-	-	-
2-6	73.19	-184.18	-7964.2	-96297	14469	-	-	-
2-7	-69.07	-147.66	-7964.2	-119039	-69681	-	-	-
2-8	-69.07	-184.18	-7964.2	-96297	-69681	-	-	-
3-1	23.4	203.78	-7965.2	-209325	-14924	-	-	-
3-2	-19.28	203.78	-7971.2	-208823	-39745	-	-	-
3-3	23.4	82.07	-7964.2	-133575	-14983	-	-	-

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3-4	-19.28	82.07	-7964.2	-133575	-40228	-	-	-
3-5	23.4	-105.06	-7964.2	-145571	-14983	-	-	-
3-6	-19.28	-105.06	-7964.2	-145571	-40228	-	-	-
3-7	23.4	-226.78	-7964.2	-69766	-14983	-	-	-
3-8	-19.28	-226.78	-7964.2	-69766	-40228	-	-	-
4-1	80.3	163.01	-7964.2	-183985	18676	-	-	-
4-2	80.3	122.84	-7964.2	-158969	18676	-	-	-
4-3	-76.19	163.01	-7964.2	-183960	-73899	-	-	-
4-4	-76.19	122.84	-7965.2	-158882	-73792	-	-	-
4-5	80.3	-145.84	-7964.2	-120177	18676	-	-	-
4-6	80.3	-186.01	-7964.2	-95161	18676	-	-	-
4-7	-76.19	-145.84	-7964.2	-120177	-73888	-	-	-
4-8	-76.19	-186.01	-7964.2	-95161	-73888	-	-	-
5-1	25.53	209.87	-7966.2	-212978	-13534	-	-	-
5-2	-21.42	209.87	-7967.2	-212886	-41358	-	-	-
5-3	25.53	75.98	-7964.2	-129784	-13721	-	-	-
5-4	-21.42	75.98	-7964.2	-129784	-41490	-	-	-
5-5	25.53	-98.98	-7964.2	-149361	-13721	-	-	-
5-6	-21.42	-98.98	-7964.2	-149361	-41490	-	-	-
5-7	25.53	-232.87	-7964.2	-65975	-13721	-	-	-
5-8	-21.42	-232.87	-7964.2	-65975	-41490	-	-	-

Le sollecitazioni applicate provocano un' eccentricità lungo X (max = 9.28 [cm]) e lungo Y (max = 29.84 [cm]), perciò le verifiche vengono eseguite sulla fondazione ridotta rettangolare.

Caso	ecc. X [cm]	ecc. Y [cm]	Asse B	Asse L
1-1	5.5	29.84	asse Y	asse X
1-2	5.48	18.45	asse Y	asse X
2-1	1.82	22.96	asse Y	asse X
2-2	1.82	20.1	asse Y	asse X
2-3	8.76	22.96	asse Y	asse X
2-4	8.74	20.09	asse Y	asse X
2-5	1.82	14.95	asse Y	asse X
2-6	1.82	12.09	asse Y	asse X
2-7	8.75	14.95	asse Y	asse X
2-8	8.75	12.09	asse Y	asse X
3-1	1.87	26.28	asse Y	asse X
3-2	4.99	26.2	asse Y	asse X
3-3	1.88	16.77	asse Y	asse X
3-4	5.05	16.77	asse Y	asse X
3-5	1.88	18.28	asse Y	asse X
3-6	5.05	18.28	asse Y	asse X
3-7	1.88	8.76	asse Y	asse X
3-8	5.05	8.76	asse Y	asse X
4-1	2.34	23.1	asse Y	asse X
4-2	2.34	19.96	asse Y	asse X
4-3	9.28	23.1	asse Y	asse X
4-4	9.26	19.95	asse Y	asse X
4-5	2.34	15.09	asse Y	asse X
4-6	2.34	11.95	asse Y	asse X
4-7	9.28	15.09	asse Y	asse X
4-8	9.28	11.95	asse Y	asse X
5-1	1.7	26.74	asse Y	asse X
5-2	5.19	26.72	asse Y	asse X
5-3	1.72	16.3	asse Y	asse X
5-4	5.21	16.3	asse Y	asse X
5-5	1.72	18.75	asse Y	asse X
5-6	5.21	18.75	asse Y	asse X
5-7	1.72	8.28	asse Y	asse X
5-8	5.21	8.28	asse Y	asse X

Capacità portante.

Le seguenti tabelle elencano il valore dell'angolo di resistenza al taglio, del peso di volume alleggerito, della coesione efficace, del sovraccarico alleggerito, e dei fattori e coefficienti introdotti nel calcolo della capacità portante.

Caso	γ_{cp}	γ_{cy}	φ [°]	γ'	N_{γ}	S_{γ}	d_{γ}	i_{by}	i_{by}	b_{γ}	g_{γ}	h_{γ}	$q'_{lim,\gamma}$
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				[daN/cm³]									[daN/cm²]
1-1	1.00	1.00	25	0.00185	10.88	1.17	1.00	0.93	1.00	1.00	1.00	-	1.65
1-2	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.93	1.00	1.00	1.00	-	1.92
2-1	1.00	1.00	25	0.00185	10.88	1.18	1.00	0.95	0.98	1.00	1.00	0.19	0.34
2-2	1.00	1.00	25	0.00185	10.88	1.18	1.00	0.96	0.98	1.00	1.00	0.19	0.36
2-3	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.95	0.98	1.00	1.00	0.19	0.35
2-4	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.96	0.98	1.00	1.00	0.19	0.36
2-5	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.95	0.98	1.00	1.00	0.19	0.38
2-6	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.94	0.98	1.00	1.00	0.19	0.39
2-7	1.00	1.00	25	0.00185	10.88	1.21	1.00	0.95	0.98	1.00	1.00	0.19	0.39
2-8	1.00	1.00	25	0.00185	10.88	1.22	1.00	0.94	0.98	1.00	1.00	0.19	0.4
3-1	1.00	1.00	25	0.00185	10.88	1.17	1.00	0.94	0.99	1.00	1.00	0.19	0.33
3-2	1.00	1.00	25	0.00185	10.88	1.18	1.00	0.94	0.99	1.00	1.00	0.19	0.33
3-3	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.97	0.99	1.00	1.00	0.19	0.39
3-4	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.97	0.99	1.00	1.00	0.19	0.39
3-5	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.97	0.99	1.00	1.00	0.19	0.38
3-6	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.97	0.99	1.00	1.00	0.19	0.38
3-7	1.00	1.00	25	0.00185	10.88	1.21	1.00	0.93	0.99	1.00	1.00	0.19	0.41
3-8	1.00	1.00	25	0.00185	10.88	1.22	1.00	0.93	0.99	1.00	1.00	0.19	0.41
4-1	1.00	1.00	25	0.00185	10.88	1.18	1.00	0.95	0.98	1.00	1.00	0.19	0.34
4-2	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.96	0.98	1.00	1.00	0.19	0.36
4-3	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.95	0.98	1.00	1.00	0.19	0.34
4-4	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.96	0.98	1.00	1.00	0.19	0.36
4-5	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.95	0.98	1.00	1.00	0.19	0.38
4-6	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.94	0.98	1.00	1.00	0.19	0.39
4-7	1.00	1.00	25	0.00185	10.88	1.21	1.00	0.95	0.98	1.00	1.00	0.19	0.39
4-8	1.00	1.00	25	0.00185	10.88	1.22	1.00	0.94	0.98	1.00	1.00	0.19	0.4
5-1	1.00	1.00	25	0.00185	10.88	1.17	1.00	0.93	0.99	1.00	1.00	0.19	0.32
5-2	1.00	1.00	25	0.00185	10.88	1.18	1.00	0.93	0.99	1.00	1.00	0.19	0.33
5-3	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.98	0.99	1.00	1.00	0.19	0.39
5-4	1.00	1.00	25	0.00185	10.88	1.20	1.00	0.98	0.99	1.00	1.00	0.19	0.39
5-5	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.97	0.99	1.00	1.00	0.19	0.38
5-6	1.00	1.00	25	0.00185	10.88	1.19	1.00	0.97	0.99	1.00	1.00	0.19	0.38
5-7	1.00	1.00	25	0.00185	10.88	1.21	1.00	0.93	0.99	1.00	1.00	0.19	0.41
5-8	1.00	1.00	25	0.00185	10.88	1.22	1.00	0.93	0.99	1.00	1.00	0.19	0.41
Caso	γ_c	c' [daN/cm²]	N_c	s_c	d_c	i_{bc}	i_{ic}	b_c	g_c	h_c	$q'_{lim,c}$ [daN/cm²]		
1-1	1.00	0	20.72	1.34	1.09	0.96	1.00	1.00	1.00	-	0		
1-2	1.00	0	20.72	1.39	1.07	0.95	1.00	1.00	1.00	-	0		
2-1	1.00	0	20.72	1.36	1.08	0.96	0.99	1.00	1.00	0.64	0		
2-2	1.00	0	20.72	1.37	1.08	0.97	0.99	1.00	1.00	0.64	0		
2-3	1.00	0	20.72	1.38	1.08	0.97	0.99	1.00	1.00	0.64	0		
2-4	1.00	0	20.72	1.39	1.08	0.97	0.99	1.00	1.00	0.64	0		
2-5	1.00	0	20.72	1.39	1.07	0.97	0.99	1.00	1.00	0.64	0		
2-6	1.00	0	20.72	1.40	1.07	0.96	0.99	1.00	1.00	0.64	0		
2-7	1.00	0	20.72	1.42	1.07	0.97	0.99	1.00	1.00	0.64	0		
2-8	1.00	0	20.72	1.43	1.07	0.96	0.99	1.00	1.00	0.64	0		
3-1	1.00	0	20.72	1.34	1.08	0.96	1.00	1.00	1.00	0.64	0		
3-2	1.00	0	20.72	1.35	1.08	0.96	1.00	1.00	1.00	0.64	0		
3-3	1.00	0	20.72	1.38	1.07	0.98	1.00	1.00	1.00	0.64	0		
3-4	1.00	0	20.72	1.40	1.07	0.98	1.00	1.00	1.00	0.64	0		
3-5	1.00	0	20.72	1.38	1.07	0.98	1.00	1.00	1.00	0.64	0		
3-6	1.00	0	20.72	1.39	1.07	0.98	1.00	1.00	1.00	0.64	0		
3-7	1.00	0	20.72	1.42	1.07	0.95	1.00	1.00	1.00	0.64	0		
3-8	1.00	0	20.72	1.43	1.07	0.95	1.00	1.00	1.00	0.64	0		
4-1	1.00	0	20.72	1.36	1.08	0.96	0.98	1.00	1.00	0.64	0		
4-2	1.00	0	20.72	1.37	1.08	0.97	0.98	1.00	1.00	0.64	0		
4-3	1.00	0	20.72	1.38	1.08	0.96	0.98	1.00	1.00	0.64	0		
4-4	1.00	0	20.72	1.40	1.08	0.97	0.98	1.00	1.00	0.64	0		
4-5	1.00	0	20.72	1.39	1.07	0.97	0.98	1.00	1.00	0.64	0		
4-6	1.00	0	20.72	1.41	1.07	0.96	0.98	1.00	1.00	0.64	0		
4-7	1.00	0	20.72	1.42	1.07	0.97	0.98	1.00	1.00	0.64	0		
4-8	1.00	0	20.72	1.43	1.07	0.96	0.98	1.00	1.00	0.64	0		
5-1	1.00	0	20.72	1.34	1.08	0.95	1.00	1.00	1.00	0.64	0		
5-2	1.00	0	20.72	1.35	1.08	0.95	1.00	1.00	1.00	0.64	0		
5-3	1.00	0	20.72	1.39	1.07	0.98	0.99	1.00	1.00	0.64	0		

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5-4	1.00	0	20.72	1.40	1.07	0.98	1.00	1.00	1.00	0.64	0
5-5	1.00	0	20.72	1.38	1.07	0.98	0.99	1.00	1.00	0.64	0
5-6	1.00	0	20.72	1.39	1.07	0.98	1.00	1.00	1.00	0.64	0
5-7	1.00	0	20.72	1.42	1.07	0.95	0.99	1.00	1.00	0.64	0
5-8	1.00	0	20.72	1.43	1.07	0.95	1.00	1.00	1.00	0.64	0
Caso	q' [daN/cm ²]	N _q	S _q	d _q	i _{bq}	i _{iq}	b _q	g _q	h _q	q' _{lim,q} [daN/cm ²]	
1-1	0.07	10.66	1.17	1.08	0.96	1.00	1.00	1.00	-	0.89	
1-2	0.07	10.66	1.19	1.07	0.95	1.00	1.00	1.00	-	0.9	
2-1	0.07	10.66	1.18	1.07	0.97	0.99	1.00	1.00	0.51	0.46	
2-2	0.07	10.66	1.18	1.07	0.98	0.99	1.00	1.00	0.51	0.46	
2-3	0.07	10.66	1.19	1.07	0.97	0.99	1.00	1.00	0.51	0.46	
2-4	0.07	10.66	1.20	1.07	0.98	0.99	1.00	1.00	0.51	0.47	
2-5	0.07	10.66	1.20	1.06	0.97	0.99	1.00	1.00	0.51	0.46	
2-6	0.07	10.66	1.20	1.06	0.96	0.99	1.00	1.00	0.51	0.46	
2-7	0.07	10.66	1.21	1.06	0.97	0.99	1.00	1.00	0.51	0.47	
2-8	0.07	10.66	1.22	1.06	0.96	0.99	1.00	1.00	0.51	0.46	
3-1	0.07	10.66	1.17	1.07	0.96	1.00	1.00	1.00	0.51	0.45	
3-2	0.07	10.66	1.18	1.07	0.96	1.00	1.00	1.00	0.51	0.46	
3-3	0.07	10.66	1.19	1.07	0.98	1.00	1.00	1.00	0.51	0.47	
3-4	0.07	10.66	1.20	1.07	0.98	1.00	1.00	1.00	0.51	0.47	
3-5	0.07	10.66	1.19	1.07	0.98	1.00	1.00	1.00	0.51	0.47	
3-6	0.07	10.66	1.19	1.07	0.98	1.00	1.00	1.00	0.51	0.47	
3-7	0.07	10.66	1.21	1.06	0.96	1.00	1.00	1.00	0.51	0.46	
3-8	0.07	10.66	1.22	1.06	0.96	1.00	1.00	1.00	0.51	0.46	
4-1	0.07	10.66	1.18	1.07	0.97	0.99	1.00	1.00	0.51	0.45	
4-2	0.07	10.66	1.19	1.07	0.98	0.99	1.00	1.00	0.51	0.46	
4-3	0.07	10.66	1.19	1.07	0.97	0.99	1.00	1.00	0.51	0.46	
4-4	0.07	10.66	1.20	1.07	0.98	0.99	1.00	1.00	0.51	0.47	
4-5	0.07	10.66	1.20	1.06	0.97	0.99	1.00	1.00	0.51	0.46	
4-6	0.07	10.66	1.20	1.06	0.96	0.99	1.00	1.00	0.51	0.46	
4-7	0.07	10.66	1.21	1.06	0.97	0.99	1.00	1.00	0.51	0.47	
4-8	0.07	10.66	1.22	1.06	0.96	0.99	1.00	1.00	0.51	0.46	
5-1	0.07	10.66	1.17	1.07	0.96	1.00	1.00	1.00	0.51	0.45	
5-2	0.07	10.66	1.18	1.07	0.96	1.00	1.00	1.00	0.51	0.46	
5-3	0.07	10.66	1.19	1.07	0.99	1.00	1.00	1.00	0.51	0.47	
5-4	0.07	10.66	1.20	1.07	0.99	1.00	1.00	1.00	0.51	0.47	
5-5	0.07	10.66	1.19	1.07	0.98	1.00	1.00	1.00	0.51	0.47	
5-6	0.07	10.66	1.19	1.07	0.98	1.00	1.00	1.00	0.51	0.47	
5-7	0.07	10.66	1.21	1.06	0.96	1.00	1.00	1.00	0.51	0.46	
5-8	0.07	10.66	1.22	1.06	0.96	1.00	1.00	1.00	0.51	0.46	

Segue il confronto fra la pressione limite ed applicata.

Caso	$\gamma_{R,v}$	q' _{lim} [daN/cm ²]	A [cm ²]	R _f [daN]	E _f [daN]	Verifica
1-1	2.30	1.15	32920.49	37719.4	13985	SI (37719.4/13985 = 2.70 >= 1.0)
1-2	2.30	1.27	37912.44	48039.3	13982	SI (48039.3/13982 = 3.44 >= 1.0)
2-1	2.30	0.39	37142.8	14333.7	7964.2	SI (14333.7/7964.2 = 1.80 >= 1.0)
2-2	2.30	0.4	38435.6	15215.1	7964.2	SI (15215.1/7964.2 = 1.91 >= 1.0)
2-3	2.30	0.39	34864.99	13588.3	7964.2	SI (13588.3/7964.2 = 1.71 >= 1.0)
2-4	2.30	0.4	36087.62	14431.4	7965.2	SI (14431.4/7965.2 = 1.81 >= 1.0)
2-5	2.30	0.41	40770.05	16551	7964.2	SI (16551/7964.2 = 2.08 >= 1.0)
2-6	2.30	0.41	42062.86	17217.2	7964.2	SI (17217.2/7964.2 = 2.16 >= 1.0)
2-7	2.30	0.41	38272.88	15703.7	7964.2	SI (15703.7/7964.2 = 1.97 >= 1.0)
2-8	2.30	0.41	39486.5	16341.3	7964.2	SI (16341.3/7964.2 = 2.05 >= 1.0)
3-1	2.30	0.38	35621.26	13483	7965.2	SI (13483/7965.2 = 1.69 >= 1.0)
3-2	2.30	0.38	34677.65	13194.8	7971.2	SI (13194.8/7971.2 = 1.66 >= 1.0)

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

3-3	2.30	0.41	39921	16455.3	7964.2	SI (16455.3/7964.2 = 2.07 >= 1.0)
3-4	2.30	0.41	38802.34	16076.5	7964.2	SI (16076.5/7964.2 = 2.02 >= 1.0)
3-5	2.30	0.41	39239.42	15944.6	7964.2	SI (15944.6/7964.2 = 2.00 >= 1.0)
3-6	2.30	0.41	38139.86	15576.7	7964.2	SI (15576.7/7964.2 = 1.96 >= 1.0)
3-7	2.30	0.42	43546.19	18193.6	7964.2	SI (18193.6/7964.2 = 2.28 >= 1.0)
3-8	2.30	0.42	42325.95	17782.9	7964.2	SI (17782.9/7964.2 = 2.23 >= 1.0)
4-1	2.30	0.39	36905.1	14211.7	7964.2	SI (14211.7/7964.2 = 1.78 >= 1.0)
4-2	2.30	0.4	38320.5	15175.9	7964.2	SI (15175.9/7964.2 = 1.91 >= 1.0)
4-3	2.30	0.39	34634.92	13470.9	7964.2	SI (13470.9/7964.2 = 1.69 >= 1.0)
4-4	2.30	0.4	35972.53	14392.9	7965.2	SI (14392.9/7965.2 = 1.81 >= 1.0)
4-5	2.30	0.41	40515.43	16426.9	7964.2	SI (16426.9/7964.2 = 2.06 >= 1.0)
4-6	2.30	0.41	41930.83	17155.9	7964.2	SI (17155.9/7964.2 = 2.15 >= 1.0)
4-7	2.30	0.41	38022.21	15582	7964.2	SI (15582/7964.2 = 1.96 >= 1.0)
4-8	2.30	0.41	39350.51	16279.6	7964.2	SI (16279.6/7964.2 = 2.04 >= 1.0)
5-1	2.30	0.38	35469.97	13361.4	7966.2	SI (13361.4/7966.2 = 1.68 >= 1.0)
5-2	2.30	0.38	34383.26	13020.1	7967.2	SI (13020.1/7967.2 = 1.63 >= 1.0)
5-3	2.30	0.41	40192.61	16626.6	7964.2	SI (16626.6/7964.2 = 2.09 >= 1.0)
5-4	2.30	0.42	38955.44	16204.9	7964.2	SI (16204.9/7964.2 = 2.03 >= 1.0)
5-5	2.30	0.41	39078.79	15846.1	7964.2	SI (15846.1/7964.2 = 1.99 >= 1.0)
5-6	2.30	0.41	37875.9	15442.5	7964.2	SI (15442.5/7964.2 = 1.94 >= 1.0)
5-7	2.30	0.42	43822.88	18320.9	7964.2	SI (18320.9/7964.2 = 2.30 >= 1.0)
5-8	2.30	0.42	42473.97	17865.4	7964.2	SI (17865.4/7964.2 = 2.24 >= 1.0)

Scorrimento.

Le seguenti tabelle elencano il valore dell'angolo di resistenza al taglio, della coesione efficace, dell'attrito e dell'aderenza fondazione-terreno, e della resistenza disponibile sul piano di posa e sulle pareti laterali.

Caso	γ_a	γ_c'	ϕ [°]	c' [daN/cm ²]	δ [°]	a [daN/cm ²]	$\gamma_{R,h}$	$\gamma_{R,g}$	R_h [daN]	R_c [daN]
1-1	1.00	1.00	25	0	18.7	0	1.10	1.00	4315.69	172.82
1-2	1.00	1.00	25	0	18.7	0	1.10	1.00	4314.76	172.49
2-1	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	219.43
2-2	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	225.67
2-3	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	217.86
2-4	1.00	1.00	25	0	18.7	0	1.10	1.00	2458.02	224.4
2-5	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	221.72
2-6	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	215.77
2-7	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	220.22
2-8	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	214.14
3-1	1.00	1.00	25	0	18.7	0	1.10	1.00	2458.02	187
3-2	1.00	1.00	25	0	18.7	0	1.10	1.00	2459.87	184.26
3-3	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	206.49
3-4	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	201.42
3-5	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	200.11
3-6	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	195.64

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

3-7	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	185.43
3-8	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	182.93
4-1	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	221.57
4-2	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	227.71
4-3	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	220.2
4-4	1.00	1.00	25	0	18.7	0	1.10	1.00	2458.02	226.77
4-5	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	224.26
4-6	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	218.06
4-7	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	223.03
4-8	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	216.61
5-1	1.00	1.00	25	0	18.7	0	1.10	1.00	2458.33	187.9
5-2	1.00	1.00	25	0	18.7	0	1.10	1.00	2458.64	185.28
5-3	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	211.04
5-4	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	206.18
5-5	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	203.81
5-6	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	199.41
5-7	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	186.3
5-8	1.00	1.00	25	0	18.7	0	1.10	1.00	2457.71	183.9

Segue il confronto fra la resistenza a scorrimento e l'azione applicata.

Caso	R_d [daN]	E_d [daN]	Verifica
1-1	4488.5	358.3	SI (4488.5/358.3 = 12.53 >= 1.0)
1-2	4487.3	413.9	SI (4487.3/413.9 = 10.84 >= 1.0)
2-1	2677.1	177	SI (2677.1/177 = 15.12 >= 1.0)
2-2	2683.4	144.6	SI (2683.4/144.6 = 18.56 >= 1.0)
2-3	2675.6	175.4	SI (2675.6/175.4 = 15.26 >= 1.0)
2-4	2682.4	142.5	SI (2682.4/142.5 = 18.82 >= 1.0)
2-5	2679.4	164.8	SI (2679.4/164.8 = 16.26 >= 1.0)
2-6	2673.5	198.2	SI (2673.5/198.2 = 13.49 >= 1.0)
2-7	2677.9	163	SI (2677.9/163 = 16.43 >= 1.0)
2-8	2671.8	196.7	SI (2671.8/196.7 = 13.58 >= 1.0)
3-1	2645	205.1	SI (2645/205.1 = 12.90 >= 1.0)
3-2	2644.1	204.7	SI (2644.1/204.7 = 12.92 >= 1.0)
3-3	2664.2	85.3	SI (2664.2/85.3 = 31.22 >= 1.0)
3-4	2659.1	84.3	SI (2659.1/84.3 = 31.54 >= 1.0)
3-5	2657.8	107.6	SI (2657.8/107.6 = 24.69 >= 1.0)
3-6	2653.4	106.8	SI (2653.4/106.8 = 24.84 >= 1.0)
3-7	2643.1	228	SI (2643.1/228 = 11.59 >= 1.0)
3-8	2640.6	227.6	SI (2640.6/227.6 = 11.60 >= 1.0)
4-1	2679.3	181.7	SI (2679.3/181.7 = 14.74 >= 1.0)
4-2	2685.4	146.8	SI (2685.4/146.8 = 18.30 >= 1.0)
4-3	2677.9	179.9	SI (2677.9/179.9 = 14.88 >= 1.0)
4-4	2684.8	144.5	SI (2684.8/144.5 = 18.57 >= 1.0)
4-5	2682	166.5	SI (2682/166.5 = 16.11 >= 1.0)
4-6	2675.8	202.6	SI (2675.8/202.6 = 13.21 >= 1.0)
4-7	2680.7	164.5	SI (2680.7/164.5 = 16.29 >= 1.0)
4-8	2674.3	201	SI (2674.3/201 = 13.30 >= 1.0)
5-1	2646.2	211.4	SI (2646.2/211.4 = 12.52 >= 1.0)
5-2	2643.9	211	SI (2643.9/211 = 12.53 >= 1.0)
5-3	2668.7	80.2	SI (2668.7/80.2 = 33.30 >= 1.0)
5-4	2663.9	78.9	SI (2663.9/78.9 = 33.75 >= 1.0)
5-5	2661.5	102.2	SI (2661.5/102.2 = 26.04 >= 1.0)
5-6	2657.1	101.3	SI (2657.1/101.3 = 26.24 >= 1.0)
5-7	2644	234.3	SI (2644/234.3 = 11.29 >= 1.0)
5-8	2641.6	233.9	SI (2641.6/233.9 = 11.30 >= 1.0)

VERIFICA STRUTTURALE FONDAZIONE PENSILINA

MACROGUSCIO Platea

VERIFICA ARMATURE EFFETTIVE (EFFETTO MEMBRANA + PIASTRA)

CASI DI CARICO:

Nome	Descrizione
1	SLU SENZA SISMA
4	SLU con SISMAX PRINC
5	SLU con SISMAX PRINC
8	SLU FON con SISMAX P
9	SLU FON con SISMAX P

DATI:

tensione di snervamento acciaio (fyk):	4500	daN/cm2
coefficiente sicurezza acciaio	: 1.15	
deformazione ultima acciaio	: 1.97	per mille
deformazione ultima cls	: 3.5	per mille
rapporto rottura/snervamento (k):	1	
resistenza cilindrica cls (fck):	249	daN/cm2
coefficiente sicurezza cls	: 1.5	
coefficiente riduttivo (alfa):	0.85	
copriferro inferiore (asse armatura):	3.9	cm
copriferro superiore (asse armatura):	3.9	cm
moltiplicatore sollecitazioni	: 1	

LEGENDA:

spess	= spessore guscio. Verifica effettuata su sezione BxH, con B=1 cm e H="spess" cm
Af	= area disposta al lembo teso, in cm2 al metro
Afc	= area disposta al lembo compresso, in cm2 al metro
Mom	= momento flettente [daNcm/cm]
Nor	= sforzo normale [daN]
epsC	= deformazione cls [per mille]
epsF	= deformazione acciaio [per mille]

L'armatura è sufficiente se le deformazioni dei materiali sono ovunque minori delle corrispondenti deformazioni ultime.

Per gli elementi di fondazione la permanenza in campo elastico è ottenuta limitando la deformazione dell'acciaio alla deformazione di snervamento (1.97 per mille).

GUSCI	spess	INFERIORE ORIZZONTALE						INFERIORE VERTICALE					
		Af	Afc	Mom	Nor	epsC	epsF	Af	Afc	Mom	Nor	epsC	epsF
2	30	2.51	2.51	58.	0.	0.01	0.04	2.51	2.51	0.	0.	0.00	0.00
3	30	2.51	2.51	66.	0.	0.01	0.05	2.51	2.51	0.	0.	0.00	0.00
4	30	2.51	2.51	86.	0.	0.01	0.07	2.51	2.51	0.	0.	0.00	0.00
6	30	2.51	2.51	131.	0.	0.02	0.10	2.51	2.51	0.	0.	0.00	0.00
7	30	2.51	2.51	130.	0.	0.02	0.10	2.51	2.51	0.	0.	0.00	0.00
8	30	2.51	2.51	134.	0.	0.02	0.10	2.51	2.51	0.	0.	0.00	0.00
10	30	2.51	2.51	82.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
11	30	2.51	2.51	78.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
12	30	2.51	2.51	76.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
14	30	2.51	2.51	63.	0.	0.01	0.05	2.51	2.51	0.	0.	0.00	0.00
15	30	2.51	2.51	52.	0.	0.01	0.04	2.51	2.51	0.	0.	0.00	0.00
16	30	2.51	2.51	36.	0.	0.01	0.03	2.51	2.51	0.	0.	0.00	0.00
18	30	2.51	2.51	121.	0.	0.02	0.09	2.51	2.51	0.	0.	0.00	0.00
19	30	2.51	2.51	91.	0.	0.01	0.07	2.51	2.51	0.	0.	0.00	0.00
20	30	2.51	2.51	48.	0.	0.01	0.04	2.51	2.51	0.	0.	0.00	0.00
22	30	2.51	2.51	130.	0.	0.02	0.10	2.51	2.51	0.	0.	0.00	0.00
23	30	2.51	2.51	99.	0.	0.01	0.08	2.51	2.51	0.	0.	0.00	0.00
24	30	2.51	2.51	57.	0.	0.01	0.04	2.51	2.51	0.	0.	0.00	0.00
26	30	2.51	2.51	127.	0.	0.02	0.10	2.51	2.51	0.	0.	0.00	0.00
27	30	2.51	2.51	105.	0.	0.01	0.08	2.51	2.51	0.	0.	0.00	0.00
28	30	2.51	2.51	74.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
30	30	2.51	2.51	139.	0.	0.02	0.11	2.51	2.51	0.	0.	0.00	0.00
31	30	2.51	2.51	124.	0.	0.02	0.09	2.51	2.51	0.	0.	0.00	0.00
32	30	2.51	2.51	110.	0.	0.02	0.08	2.51	2.51	0.	0.	0.00	0.00
34	30	2.51	2.51	185.	0.	0.03	0.14	2.51	2.51	0.	0.	0.00	0.00
35	30	2.51	2.51	165.	0.	0.02	0.13	2.51	2.51	0.	0.	0.00	0.00
36	30	2.51	2.51	144.	0.	0.02	0.11	2.51	2.51	0.	0.	0.00	0.00
38	30	2.51	2.51	67.	0.	0.01	0.05	2.51	2.51	0.	0.	0.00	0.00
39	30	2.51	2.51	83.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
40	30	2.51	2.51	115.	0.	0.02	0.09	2.51	2.51	0.	0.	0.00	0.00
41	30	2.51	2.51	61.	0.	0.01	0.05	2.51	2.51	191.	0.	0.03	0.15
42	30	2.51	2.51	193.	0.	0.03	0.15	2.51	2.51	209.	0.	0.03	0.16
43	30	2.51	2.51	165.	0.	0.02	0.13	2.51	2.51	209.	0.	0.03	0.16
44	30	2.51	2.51	174.	0.	0.02	0.13	2.51	2.51	201.	0.	0.03	0.15
45	30	2.51	2.51	182.	0.	0.03	0.14	2.51	2.51	192.	0.	0.03	0.15

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

46	30	2.51	2.51	170.	0.	0.02	0.13	2.51	2.51	178.	0.	0.02	0.14
47	30	2.51	2.51	93.	0.	0.01	0.07	2.51	2.51	152.	0.	0.02	0.12
48	30	2.51	2.51	97.	0.	0.01	0.07	2.51	2.51	136.	0.	0.02	0.10
49	30	2.51	2.51	136.	0.	0.02	0.10	2.51	2.51	113.	0.	0.02	0.09
50	30	2.51	2.51	51.	0.	0.01	0.04	2.51	2.51	101.	0.	0.01	0.08
51	30	2.51	2.51	140.	0.	0.02	0.11	2.51	2.51	0.	0.	0.00	0.00
52	30	2.51	2.51	159.	0.	0.02	0.12	2.51	2.51	0.	0.	0.00	0.00
53	30	2.51	2.51	96.	0.	0.01	0.07	2.51	2.51	0.	0.	0.00	0.00
54	30	2.51	2.51	47.	0.	0.01	0.04	2.51	2.51	0.	0.	0.00	0.00
55	30	2.51	2.51	15.	0.	0.00	0.01	2.51	2.51	0.	0.	0.00	0.00
56	30	2.51	2.51	3.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
57	30	2.51	2.51	18.	0.	0.00	0.01	2.51	2.51	0.	0.	0.00	0.00
58	30	2.51	2.51	81.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
59	30	2.51	2.51	162.	0.	0.02	0.12	2.51	2.51	0.	0.	0.00	0.00
60	30	2.51	2.51	117.	0.	0.02	0.09	2.51	2.51	0.	0.	0.00	0.00
61	30	2.51	2.51	58.	0.	0.01	0.04	2.51	2.51	175.	0.	0.02	0.13
62	30	2.51	2.51	156.	0.	0.02	0.12	2.51	2.51	193.	0.	0.03	0.15
63	30	2.51	2.51	112.	0.	0.02	0.09	2.51	2.51	202.	0.	0.03	0.15
64	30	2.51	2.51	116.	0.	0.02	0.09	2.51	2.51	215.	0.	0.03	0.16
65	30	2.51	2.51	203.	0.	0.03	0.16	2.51	2.51	231.	0.	0.03	0.18
66	30	2.51	2.51	218.	0.	0.03	0.17	2.51	2.51	243.	0.	0.03	0.19
67	30	2.51	2.51	213.	0.	0.03	0.16	2.51	2.51	248.	0.	0.03	0.19
68	30	2.51	2.51	190.	0.	0.03	0.15	2.51	2.51	256.	0.	0.04	0.20
69	30	2.51	2.51	207.	0.	0.03	0.16	2.51	2.51	257.	0.	0.04	0.20
70	30	2.51	2.51	66.	0.	0.01	0.05	2.51	2.51	254.	0.	0.04	0.19
71	30	2.51	2.51	86.	0.	0.01	0.07	2.51	2.51	334.	0.	0.05	0.26
72	30	2.51	2.51	228.	0.	0.03	0.17	2.51	2.51	283.	0.	0.04	0.22
73	30	2.51	2.51	225.	0.	0.03	0.17	2.51	2.51	253.	0.	0.04	0.19
74	30	2.51	2.51	251.	0.	0.04	0.19	2.51	2.51	239.	0.	0.03	0.18
75	30	2.51	2.51	274.	0.	0.04	0.21	2.51	2.51	245.	0.	0.03	0.19
76	30	2.51	2.51	246.	0.	0.03	0.19	2.51	2.51	221.	0.	0.03	0.17
77	30	2.51	2.51	141.	0.	0.02	0.11	2.51	2.51	224.	0.	0.03	0.17
78	30	2.51	2.51	137.	0.	0.02	0.11	2.51	2.51	244.	0.	0.03	0.19
79	30	2.51	2.51	185.	0.	0.03	0.14	2.51	2.51	273.	0.	0.04	0.21
80	30	2.51	2.51	72.	0.	0.01	0.06	2.51	2.51	322.	0.	0.05	0.25
81	30	2.51	2.51	122.	0.	0.02	0.09	2.51	2.51	0.	0.	0.00	0.00
82	30	2.51	2.51	134.	0.	0.02	0.10	2.51	2.51	34.	0.	0.00	0.03
83	30	2.51	2.51	171.	0.	0.02	0.13	2.51	2.51	0.	0.	0.00	0.00
84	30	2.51	2.51	187.	0.	0.03	0.14	2.51	2.51	0.	0.	0.00	0.00
85	30	2.51	2.51	78.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
86	30	2.51	2.51	79.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
87	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
88	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
89	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
90	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
91	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
92	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
93	30	2.51	2.51	29.	0.	0.00	0.02	2.51	2.51	0.	0.	0.00	0.00
94	30	2.51	2.51	16.	0.	0.00	0.01	2.51	2.51	0.	0.	0.00	0.00
95	30	2.51	2.51	88.	0.	0.01	0.07	2.51	2.51	0.	0.	0.00	0.00
96	30	2.51	2.51	86.	0.	0.01	0.07	2.51	2.51	0.	0.	0.00	0.00
97	30	2.51	2.51	161.	0.	0.02	0.12	2.51	2.51	0.	0.	0.00	0.00
98	30	2.51	2.51	169.	0.	0.02	0.13	2.51	2.51	0.	0.	0.00	0.00
99	30	2.51	2.51	140.	0.	0.02	0.11	2.51	2.51	0.	0.	0.00	0.00
100	30	2.51	2.51	149.	0.	0.02	0.11	2.51	2.51	23.	0.	0.00	0.02
101	30	2.51	2.51	164.	0.	0.02	0.13	2.51	2.51	141.	0.	0.02	0.11
102	30	2.51	2.51	188.	0.	0.03	0.14	2.51	2.51	83.	0.	0.01	0.06
103	30	2.51	2.51	89.	0.	0.01	0.07	2.51	2.51	43.	0.	0.01	0.03
104	30	2.51	2.51	6.	0.	0.00	0.00	2.51	2.51	19.	0.	0.00	0.01
105	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	4.	0.	0.00	0.00
106	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	5.	0.	0.00	0.00
107	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	38.	0.	0.01	0.03
108	30	2.51	2.51	83.	0.	0.01	0.06	2.51	2.51	65.	0.	0.01	0.05
109	30	2.51	2.51	212.	0.	0.03	0.16	2.51	2.51	103.	0.	0.01	0.08
110	30	2.51	2.51	162.	0.	0.02	0.12	2.51	2.51	156.	0.	0.02	0.12
111	30	2.51	2.51	191.	0.	0.03	0.15	2.51	2.51	105.	0.	0.01	0.08
112	30	2.51	2.51	221.	0.	0.03	0.17	2.51	2.51	70.	0.	0.01	0.05
113	30	2.51	2.51	100.	0.	0.01	0.08	2.51	2.51	45.	0.	0.01	0.03
114	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	23.	0.	0.00	0.02
115	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	0.	0.	0.00	0.00
116	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	40.	0.	0.01	0.03
117	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	61.	0.	0.01	0.05
118	30	2.51	2.51	104.	0.	0.01	0.08	2.51	2.51	77.	0.	0.01	0.06
119	30	2.51	2.51	246.	0.	0.03	0.19	2.51	2.51	104.	0.	0.01	0.08
120	30	2.51	2.51	212.	0.	0.03	0.16	2.51	2.51	145.	0.	0.02	0.11
149	30	2.51	2.51	127.	0.	0.02	0.10	2.51	2.51	0.	0.	0.00	0.00
150	30	2.51	2.51	52.	0.	0.01	0.04	2.51	2.51	0.	0.	0.00	0.00
151	30	2.51	2.51	88.	0.	0.01	0.07	2.51	2.51	0.	0.	0.00	0.00
152	30	2.51	2.51	144.	0.	0.02	0.11	2.51	2.51	0.	0.	0.00	0.00
153	30	2.51	2.51	75.	0.	0.01	0.06	2.51	2.51	0.	0.	0.00	0.00
154	30	2.51	2.51	146.	0.	0.02	0.11	2.51	2.51	0.	0.	0.00	0.00

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

155	30	2.51	2.51	153.	0.	0.02	0.12	2.51	2.51	0.	0.	0.00	0.00
156	30	2.51	2.51	187.	0.	0.03	0.14	2.51	2.51	0.	0.	0.00	0.00
157	30	2.51	2.51	149.	0.	0.02	0.11	2.51	2.51	0.	0.	0.00	0.00
158	30	2.51	2.51	62.	0.	0.01	0.05	2.51	2.51	3.	0.	0.00	0.00

GUSCI	spess	SUPERIORE ORIZZONTALE				SUPERIORE VERTICALE				Mom	Nor	epsC	epsF
		Af	Afc	Mom	Nor	Af	Afc	Mom	Nor				
2	30	2.51	2.51	88.	0.	0.01	0.07	2.51	2.51	673.	0.	0.09	0.52
3	30	2.51	2.51	85.	0.	0.01	0.06	2.51	2.51	694.	0.	0.10	0.53
4	30	2.51	2.51	83.	0.	0.01	0.06	2.51	2.51	664.	0.	0.09	0.51
6	30	2.51	2.51	82.	0.	0.01	0.06	2.51	2.51	632.	0.	0.09	0.48
7	30	2.51	2.51	112.	0.	0.02	0.09	2.51	2.51	662.	0.	0.09	0.51
8	30	2.51	2.51	143.	0.	0.02	0.11	2.51	2.51	636.	0.	0.09	0.49
10	30	2.51	2.51	84.	0.	0.01	0.06	2.51	2.51	588.	0.	0.08	0.45
11	30	2.51	2.51	102.	0.	0.01	0.08	2.51	2.51	632.	0.	0.09	0.48
12	30	2.51	2.51	126.	0.	0.02	0.10	2.51	2.51	611.	0.	0.09	0.47
14	30	2.51	2.51	61.	0.	0.01	0.05	2.51	2.51	556.	0.	0.08	0.43
15	30	2.51	2.51	84.	0.	0.01	0.06	2.51	2.51	603.	0.	0.08	0.46
16	30	2.51	2.51	109.	0.	0.02	0.08	2.51	2.51	585.	0.	0.08	0.45
18	30	2.51	2.51	13.	0.	0.00	0.01	2.51	2.51	529.	0.	0.07	0.41
19	30	2.51	2.51	31.	0.	0.00	0.02	2.51	2.51	555.	0.	0.08	0.43
20	30	2.51	2.51	57.	0.	0.01	0.04	2.51	2.51	548.	0.	0.08	0.42
22	30	2.51	2.51	17.	0.	0.00	0.01	2.51	2.51	538.	0.	0.08	0.41
23	30	2.51	2.51	29.	0.	0.00	0.02	2.51	2.51	566.	0.	0.08	0.43
24	30	2.51	2.51	52.	0.	0.01	0.04	2.51	2.51	537.	0.	0.08	0.41
26	30	2.51	2.51	58.	0.	0.01	0.04	2.51	2.51	565.	0.	0.08	0.43
27	30	2.51	2.51	73.	0.	0.01	0.06	2.51	2.51	581.	0.	0.08	0.44
28	30	2.51	2.51	91.	0.	0.01	0.07	2.51	2.51	549.	0.	0.08	0.42
30	30	2.51	2.51	96.	0.	0.01	0.07	2.51	2.51	577.	0.	0.08	0.44
31	30	2.51	2.51	108.	0.	0.02	0.08	2.51	2.51	593.	0.	0.08	0.45
32	30	2.51	2.51	127.	0.	0.02	0.10	2.51	2.51	560.	0.	0.08	0.43
34	30	2.51	2.51	109.	0.	0.02	0.08	2.51	2.51	593.	0.	0.08	0.45
35	30	2.51	2.51	131.	0.	0.02	0.10	2.51	2.51	606.	0.	0.09	0.46
36	30	2.51	2.51	158.	0.	0.02	0.12	2.51	2.51	569.	0.	0.08	0.44
38	30	2.51	2.51	110.	0.	0.02	0.08	2.51	2.51	612.	0.	0.09	0.47
39	30	2.51	2.51	107.	0.	0.02	0.08	2.51	2.51	618.	0.	0.09	0.47
40	30	2.51	2.51	100.	0.	0.01	0.08	2.51	2.51	577.	0.	0.08	0.44
41	30	2.51	2.51	107.	0.	0.01	0.08	2.51	2.51	361.	0.	0.05	0.28
42	30	2.51	2.51	93.	0.	0.01	0.07	2.51	2.51	326.	0.	0.05	0.25
43	30	2.51	2.51	83.	0.	0.01	0.06	2.51	2.51	291.	0.	0.04	0.22
44	30	2.51	2.51	39.	0.	0.01	0.03	2.51	2.51	283.	0.	0.04	0.22
45	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	260.	0.	0.04	0.20
46	30	2.51	2.51	7.	0.	0.00	0.01	2.51	2.51	266.	0.	0.04	0.20
47	30	2.51	2.51	49.	0.	0.01	0.04	2.51	2.51	292.	0.	0.04	0.22
48	30	2.51	2.51	102.	0.	0.01	0.08	2.51	2.51	307.	0.	0.04	0.24
49	30	2.51	2.51	111.	0.	0.02	0.09	2.51	2.51	335.	0.	0.05	0.26
50	30	2.51	2.51	79.	0.	0.01	0.06	2.51	2.51	405.	0.	0.06	0.31
51	30	2.51	2.51	106.	0.	0.01	0.08	2.51	2.51	576.	0.	0.08	0.44
52	30	2.51	2.51	164.	0.	0.02	0.13	2.51	2.51	562.	0.	0.08	0.43
53	30	2.51	2.51	143.	0.	0.02	0.11	2.51	2.51	550.	0.	0.08	0.42
54	30	2.51	2.51	119.	0.	0.02	0.09	2.51	2.51	537.	0.	0.08	0.41
55	30	2.51	2.51	80.	0.	0.01	0.06	2.51	2.51	521.	0.	0.07	0.40
56	30	2.51	2.51	90.	0.	0.01	0.07	2.51	2.51	549.	0.	0.08	0.42
57	30	2.51	2.51	137.	0.	0.02	0.10	2.51	2.51	585.	0.	0.08	0.45
58	30	2.51	2.51	147.	0.	0.02	0.11	2.51	2.51	611.	0.	0.09	0.47
59	30	2.51	2.51	151.	0.	0.02	0.12	2.51	2.51	635.	0.	0.09	0.49
60	30	2.51	2.51	90.	0.	0.01	0.07	2.51	2.51	662.	0.	0.09	0.51
61	30	2.51	2.51	73.	0.	0.01	0.06	2.51	2.51	395.	0.	0.06	0.30
62	30	2.51	2.51	140.	0.	0.02	0.11	2.51	2.51	313.	0.	0.04	0.24
63	30	2.51	2.51	119.	0.	0.02	0.09	2.51	2.51	255.	0.	0.04	0.20
64	30	2.51	2.51	59.	0.	0.01	0.05	2.51	2.51	224.	0.	0.03	0.17
65	30	2.51	2.51	2.	0.	0.00	0.00	2.51	2.51	175.	0.	0.02	0.13
66	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	133.	0.	0.02	0.10
67	30	2.51	2.51	31.	0.	0.00	0.02	2.51	2.51	145.	0.	0.02	0.11
68	30	2.51	2.51	77.	0.	0.01	0.06	2.51	2.51	172.	0.	0.02	0.13
69	30	2.51	2.51	94.	0.	0.01	0.07	2.51	2.51	224.	0.	0.03	0.17
70	30	2.51	2.51	104.	0.	0.01	0.08	2.51	2.51	293.	0.	0.04	0.22
71	30	2.51	2.51	101.	0.	0.01	0.08	2.51	2.51	308.	0.	0.04	0.24
72	30	2.51	2.51	134.	0.	0.02	0.10	2.51	2.51	245.	0.	0.03	0.19
73	30	2.51	2.51	75.	0.	0.01	0.06	2.51	2.51	198.	0.	0.03	0.15
74	30	2.51	2.51	22.	0.	0.00	0.02	2.51	2.51	155.	0.	0.02	0.12
75	30	2.51	2.51	0.	0.	0.00	0.00	2.51	2.51	133.	0.	0.02	0.10
76	30	2.51	2.51	4.	0.	0.00	0.00	2.51	2.51	206.	0.	0.03	0.16
77	30	2.51	2.51	64.	0.	0.01	0.05	2.51	2.51	235.	0.	0.03	0.18
78	30	2.51	2.51	142.	0.	0.02	0.11	2.51	2.51	276.	0.	0.04	0.21
79	30	2.51	2.51	181.	0.	0.03	0.14	2.51	2.51	324.	0.	0.05	0.25
80	30	2.51	2.51	65.	0.	0.01	0.05	2.51	2.51	392.	0.	0.06	0.30
81	30	2.51	2.51	97.	0.	0.01	0.07	2.51	2.51	617.	0.	0.09	0.47
82	30	2.51	2.51	98.	0.	0.01	0.07	2.51	2.51	533.	0.	0.07	0.41
83	30	2.51	2.51	162.	0.	0.02	0.12	2.51	2.51	589.	0.	0.08	0.45
84	30	2.51	2.51	170.	0.	0.02	0.13	2.51	2.51	504.	0.	0.07	0.39

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

85	30	2.51	2.51	158.	0.	0.02	0.12	2.51	2.51	563.	0.	0.08	0.43
86	30	2.51	2.51	168.	0.	0.02	0.13	2.51	2.51	477.	0.	0.07	0.37
87	30	2.51	2.51	152.	0.	0.02	0.12	2.51	2.51	537.	0.	0.08	0.41
88	30	2.51	2.51	166.	0.	0.02	0.13	2.51	2.51	450.	0.	0.06	0.34
89	30	2.51	2.51	106.	0.	0.01	0.08	2.51	2.51	502.	0.	0.07	0.38
90	30	2.51	2.51	122.	0.	0.02	0.09	2.51	2.51	418.	0.	0.06	0.32
91	30	2.51	2.51	92.	0.	0.01	0.07	2.51	2.51	468.	0.	0.07	0.36
92	30	2.51	2.51	105.	0.	0.01	0.08	2.51	2.51	384.	0.	0.05	0.29
93	30	2.51	2.51	133.	0.	0.02	0.10	2.51	2.51	489.	0.	0.07	0.37
94	30	2.51	2.51	142.	0.	0.02	0.11	2.51	2.51	413.	0.	0.06	0.32
95	30	2.51	2.51	151.	0.	0.02	0.12	2.51	2.51	507.	0.	0.07	0.39
96	30	2.51	2.51	158.	0.	0.02	0.12	2.51	2.51	436.	0.	0.06	0.33
97	30	2.51	2.51	169.	0.	0.02	0.13	2.51	2.51	524.	0.	0.07	0.40
98	30	2.51	2.51	173.	0.	0.02	0.13	2.51	2.51	459.	0.	0.06	0.35
99	30	2.51	2.51	106.	0.	0.01	0.08	2.51	2.51	542.	0.	0.08	0.41
100	30	2.51	2.51	105.	0.	0.01	0.08	2.51	2.51	484.	0.	0.07	0.37
101	30	2.51	2.51	103.	0.	0.01	0.08	2.51	2.51	407.	0.	0.06	0.31
102	30	2.51	2.51	178.	0.	0.03	0.14	2.51	2.51	374.	0.	0.05	0.29
103	30	2.51	2.51	165.	0.	0.02	0.13	2.51	2.51	347.	0.	0.05	0.27
104	30	2.51	2.51	151.	0.	0.02	0.12	2.51	2.51	317.	0.	0.04	0.24
105	30	2.51	2.51	120.	0.	0.02	0.09	2.51	2.51	288.	0.	0.04	0.22
106	30	2.51	2.51	141.	0.	0.02	0.11	2.51	2.51	307.	0.	0.04	0.23
107	30	2.51	2.51	181.	0.	0.03	0.14	2.51	2.51	330.	0.	0.05	0.25
108	30	2.51	2.51	179.	0.	0.03	0.14	2.51	2.51	357.	0.	0.05	0.27
109	30	2.51	2.51	176.	0.	0.02	0.13	2.51	2.51	382.	0.	0.05	0.29
110	30	2.51	2.51	97.	0.	0.01	0.07	2.51	2.51	410.	0.	0.06	0.31
111	30	2.51	2.51	99.	0.	0.01	0.08	2.51	2.51	129.	0.	0.02	0.10
112	30	2.51	2.51	192.	0.	0.03	0.15	2.51	2.51	126.	0.	0.02	0.10
113	30	2.51	2.51	180.	0.	0.03	0.14	2.51	2.51	115.	0.	0.02	0.09
114	30	2.51	2.51	170.	0.	0.02	0.13	2.51	2.51	98.	0.	0.01	0.07
115	30	2.51	2.51	144.	0.	0.02	0.11	2.51	2.51	110.	0.	0.02	0.08
116	30	2.51	2.51	174.	0.	0.02	0.13	2.51	2.51	93.	0.	0.01	0.07
117	30	2.51	2.51	207.	0.	0.03	0.16	2.51	2.51	112.	0.	0.02	0.09
118	30	2.51	2.51	195.	0.	0.03	0.15	2.51	2.51	127.	0.	0.02	0.10
119	30	2.51	2.51	188.	0.	0.03	0.14	2.51	2.51	135.	0.	0.02	0.10
120	30	2.51	2.51	94.	0.	0.01	0.07	2.51	2.51	131.	0.	0.02	0.10
149	30	2.51	2.51	90.	0.	0.01	0.07	2.51	2.51	500.	0.	0.07	0.38
150	30	2.51	2.51	85.	0.	0.01	0.06	2.51	2.51	569.	0.	0.08	0.44
151	30	2.51	2.51	89.	0.	0.01	0.07	2.51	2.51	466.	0.	0.07	0.36
152	30	2.51	2.51	9.	0.	0.00	0.01	2.51	2.51	432.	0.	0.06	0.33
153	30	2.51	2.51	47.	0.	0.01	0.04	2.51	2.51	448.	0.	0.06	0.34
154	30	2.51	2.51	48.	0.	0.01	0.04	2.51	2.51	465.	0.	0.07	0.36
155	30	2.51	2.51	8.	0.	0.00	0.01	2.51	2.51	436.	0.	0.06	0.33
156	30	2.51	2.51	100.	0.	0.01	0.08	2.51	2.51	499.	0.	0.07	0.38
157	30	2.51	2.51	89.	0.	0.01	0.07	2.51	2.51	476.	0.	0.07	0.36
158	30	2.51	2.51	109.	0.	0.02	0.08	2.51	2.51	533.	0.	0.07	0.41

L'ARMATURA È OVUNQUE > DELLA QUANTITÀ RICHIESTA: IL PUNTO 2.3 DELLE NTC È VERIFICATO (Rd > Ed)

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

MACROGUSCIO Platea

VERIFICHE A FESSURAZIONE (EFFETTO MEMBRANA + PIASTRA)

CASI DI CARICO:

Nome	Descrizione
10	Rara (RARA)
11	Frequente (FREQUENTE)
12	Quasi Perm (QUASI PERMANENTE)

DATI:

copriferro inferiore (asse armatura): 3.9 cm
copriferro superiore (asse armatura): 3.9 cm

Af = area effettiva tesa (cm2 al metro)

Afc = area effettiva compressa (cm2 al metro)

Mom = momento flettente [daNcm/cm]

Nor = sforzo normale [daN]

sigC = tensione calcestruzzo [daN/cm2]

valore max per combinazione rara = 149.4 daN/cm2

valore max per combinazione frequente = 149.4 daN/cm2

valore max per combinazione quasi permanente = 112 daN/cm2

sigF = tensione acciaio [daN/cm2]

valore max per combinazione rara = 3600 daN/cm2

valore max per combinazione frequente = 3600 daN/cm2

valore max per combinazione quasi permanente = 3600 daN/cm2

wkR = apertura caratteristica per combinazione rara (mm) - valore max = 0.6 mm

wkF = apertura caratteristica per combinazione frequente (mm) - valore max = 0.4 mm

wkP = apertura caratteristica per combinazione quasi permanente (mm) - valore max = 0.3 mm

ARMATURA INFERIORE ORIZZONTALE

GUSCI			COMBINAZIONE RARA					COMBINAZIONE FREQUENTE					COMBINAZIONE QUASI PERMANENTE				
	Af	Afc	Mom	Nor	sigC	sigF	wkR	Mom	Nor	sigC	sigF	wkF	Mom	Nor	sigC	sigF	wkP
2	2.51	2.51	21	0.	0.42	34.	0.005	14	0.	0.29	23.	0.004	12	0.	0.24	20.	0.003
3	2.51	2.51	23	0.	0.45	37.	0.006	15	0.	0.30	25.	0.004	13	0.	0.26	21.	0.003
4	2.51	2.51	17	0.	0.34	28.	0.004	11	0.	0.22	18.	0.003	9	0.	0.19	15.	0.002
6	2.51	2.51	33	0.	0.65	53.	0.008	20	0.	0.40	32.	0.005	15	0.	0.30	24.	0.004
7	2.51	2.51	29	0.	0.57	46.	0.007	18	0.	0.35	28.	0.004	13	0.	0.26	21.	0.003
8	2.51	2.51	27	0.	0.53	43.	0.007	16	0.	0.32	26.	0.004	12	0.	0.24	19.	0.003
10	2.51	2.51	41	0.	0.81	66.	0.010	21	0.	0.41	33.	0.005	11	0.	0.22	18.	0.003
11	2.51	2.51	37	0.	0.73	59.	0.009	18	0.	0.36	29.	0.005	9	0.	0.18	15.	0.002
12	2.51	2.51	27	0.	0.52	43.	0.007	11	0.	0.22	18.	0.003	3	0.	0.07	5.	0.001
14	2.51	2.51	43	0.	0.86	70.	0.011	21	0.	0.41	34.	0.005	9	0.	0.18	15.	0.002
15	2.51	2.51	31	0.	0.61	50.	0.008	12	0.	0.24	20.	0.003	2	0.	0.04	3.	0.000
16	2.51	2.51	13	0.	0.25	20.	0.003	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
18	2.51	2.51	64	0.	1.26	103.	0.016	33	0.	0.66	53.	0.008	18	0.	0.36	29.	0.005
19	2.51	2.51	44	0.	0.88	71.	0.011	20	0.	0.39	32.	0.005	7	0.	0.14	11.	0.002
20	2.51	2.51	17	0.	0.33	27.	0.004	1	0.	0.02	1.	0.000	0.	0.	0.00	0.	0.000
22	2.51	2.51	70	0.	1.39	113.	0.018	37	0.	0.73	60.	0.009	22	0.	0.44	35.	0.006
23	2.51	2.51	51	0.	1.00	82.	0.013	24	0.	0.47	38.	0.006	11	0.	0.21	17.	0.003
24	2.51	2.51	22	0.	0.43	35.	0.005	4	0.	0.08	6.	0.001	0.	0.	0.00	0.	0.000
26	2.51	2.51	67	0.	1.33	108.	0.017	35	0.	0.69	57.	0.009	20	0.	0.40	32.	0.005
27	2.51	2.51	52	0.	1.02	83.	0.013	25	0.	0.50	40.	0.006	12	0.	0.24	19.	0.003
28	2.51	2.51	30	0.	0.58	48.	0.007	10	0.	0.21	17.	0.003	0.	0.	0.00	0.	0.000
30	2.51	2.51	62	0.	1.22	99.	0.015	33	0.	0.64	52.	0.008	20	0.	0.40	32.	0.005
31	2.51	2.51	54	0.	1.08	88.	0.014	28	0.	0.56	46.	0.007	17	0.	0.34	27.	0.004
32	2.51	2.51	43	0.	0.84	69.	0.011	20	0.	0.40	33.	0.005	10	0.	0.21	17.	0.003
34	2.51	2.51	49	0.	0.98	79.	0.012	25	0.	0.48	39.	0.006	16	0.	0.32	26.	0.004
35	2.51	2.51	35	0.	0.69	56.	0.009	18	0.	0.35	29.	0.004	12	0.	0.24	19.	0.003

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE COMUNALE - EDILIZIA SCOLASTICA II LOTTO
SCUOLA "A. GRAMSCI" - COMUNE DI NICHELINO

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

36	2.51	2.51	32	0.	0.62	51.	0.008	17	0.	0.33	27.	0.004	11	0.	0.22	18.	0.003
38	2.51	2.51	22	0.	0.43	35.	0.005	13	0.	0.27	22.	0.003	10	0.	0.19	16.	0.002
39	2.51	2.51	26	0.	0.51	42.	0.006	16	0.	0.32	26.	0.004	12	0.	0.24	19.	0.003
40	2.51	2.51	20	0.	0.39	32.	0.005	12	0.	0.24	20.	0.003	9	0.	0.17	14.	0.002
41	2.51	2.51	25	0.	0.49	40.	0.006	15	0.	0.29	23.	0.004	11	0.	0.22	18.	0.003
42	2.51	2.51	83	0.	1.64	133.	0.021	38	0.	0.76	62.	0.010	24	0.	0.48	39.	0.006
43	2.51	2.51	81	0.	1.60	130.	0.020	44	0.	0.87	71.	0.011	28	0.	0.56	45.	0.007
44	2.51	2.51	95	0.	1.87	152.	0.024	52	0.	1.03	84.	0.013	33	0.	0.66	54.	0.008
45	2.51	2.51	103	0.	2.03	165.	0.026	59	0.	1.17	95.	0.015	39	0.	0.78	63.	0.010
46	2.51	2.51	96	0.	1.89	154.	0.024	55	0.	1.09	88.	0.014	36	0.	0.72	59.	0.009
47	2.51	2.51	63	0.	1.24	101.	0.016	34	0.	0.68	55.	0.009	20	0.	0.40	33.	0.005
48	2.51	2.51	53	0.	1.05	86.	0.013	29	0.	0.57	46.	0.007	18	0.	0.35	29.	0.004
49	2.51	2.51	40	0.	0.79	64.	0.010	25	0.	0.49	40.	0.006	19	0.	0.37	30.	0.005
50	2.51	2.51	24	0.	0.47	38.	0.006	16	0.	0.32	26.	0.004	14	0.	0.28	23.	0.004
51	2.51	2.51	31	0.	0.62	51.	0.008	21	0.	0.41	34.	0.005	16	0.	0.33	27.	0.004
52	2.51	2.51	47	0.	0.92	75.	0.012	28	0.	0.55	45.	0.007	21	0.	0.42	34.	0.005
53	2.51	2.51	25	0.	0.49	40.	0.006	8	0.	0.16	13.	0.002	1	0.	0.01	1.	0.000
54	2.51	2.51	3	0.	0.06	5.	0.001	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
55	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
56	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
57	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
58	2.51	2.51	13	0.	0.26	21.	0.003	2	0.	0.04	3.	0.001	0.	0.	0.00	0.	0.000
59	2.51	2.51	46	0.	0.91	74.	0.011	30	0.	0.60	48.	0.008	24	0.	0.48	39.	0.006
60	2.51	2.51	31	0.	0.60	49.	0.008	21	0.	0.41	33.	0.005	18	0.	0.35	28.	0.004
61	2.51	2.51	27	0.	0.53	44.	0.007	19	0.	0.37	30.	0.005	16	0.	0.33	27.	0.004
62	2.51	2.51	49	0.	0.97	79.	0.012	31	0.	0.60	49.	0.008	24	0.	0.47	38.	0.006
63	2.51	2.51	62	0.	1.23	100.	0.016	35	0.	0.69	56.	0.009	23	0.	0.45	37.	0.006
64	2.51	2.51	75	0.	1.49	121.	0.019	43	0.	0.84	69.	0.011	28	0.	0.55	44.	0.007
65	2.51	2.51	116	0.	2.28	186.	0.029	68	0.	1.35	110.	0.017	48	0.	0.94	77.	0.012
66	2.51	2.51	123	0.	2.44	199.	0.031	72	0.	1.43	117.	0.018	50	0.	0.99	81.	0.013
67	2.51	2.51	118	0.	2.33	189.	0.029	65	0.	1.29	105.	0.016	43	0.	0.85	69.	0.011
68	2.51	2.51	98	0.	1.94	158.	0.024	53	0.	1.05	85.	0.013	35	0.	0.69	56.	0.009
69	2.51	2.51	87	0.	1.73	140.	0.022	54	0.	1.08	88.	0.014	36	0.	0.72	58.	0.009
70	2.51	2.51	31	0.	0.60	49.	0.008	17	0.	0.34	28.	0.004	13	0.	0.26	21.	0.003
71	2.51	2.51	40	0.	0.79	64.	0.010	25	0.	0.49	40.	0.006	16	0.	0.32	26.	0.004
72	2.51	2.51	91	0.	1.80	146.	0.023	57	0.	1.13	92.	0.014	45	0.	0.90	73.	0.011
73	2.51	2.51	127	0.	2.50	204.	0.032	68	0.	1.35	110.	0.017	44	0.	0.88	72.	0.011
74	2.51	2.51	152	0.	3.00	244.	0.038	87	0.	1.71	139.	0.022	57	0.	1.12	91.	0.014
75	2.51	2.51	151	0.	2.98	243.	0.038	89	0.	1.76	143.	0.022	63	0.	1.25	102.	0.016
76	2.51	2.51	143	0.	2.82	230.	0.036	85	0.	1.69	137.	0.021	61	0.	1.21	99.	0.015
77	2.51	2.51	89	0.	1.76	144.	0.022	52	0.	1.04	84.	0.013	36	0.	0.71	58.	0.009
78	2.51	2.51	74	0.	1.47	119.	0.019	43	0.	0.84	69.	0.011	30	0.	0.58	47.	0.007
79	2.51	2.51	67	0.	1.33	108.	0.017	41	0.	0.80	65.	0.010	31	0.	0.61	50.	0.008
80	2.51	2.51	32	0.	0.63	51.	0.008	23	0.	0.44	36.	0.006	20	0.	0.40	32.	0.005
81	2.51	2.51	36	0.	0.72	58.	0.009	25	0.	0.49	40.	0.006	21	0.	0.42	34.	0.005
82	2.51	2.51	43	0.	0.84	69.	0.011	30	0.	0.59	48.	0.007	26	0.	0.51	41.	0.006
83	2.51	2.51	54	0.	1.07	87.	0.013	36	0.	0.71	58.	0.009	29	0.	0.58	47.	0.007
84	2.51	2.51	61	0.	1.21	99.	0.015	41	0.	0.82	67.	0.010	34	0.	0.68	55.	0.009
85	2.51	2.51	3	0.	0.07	6.	0.001	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
86	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
87	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
88	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
89	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
90	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
91	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
92	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
93	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
94	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
95	2.51	2.51	11	0.	0.21	17.	0.003	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
96	2.51	2.51	7	0.	0.14	12.	0.002	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE COMUNALE - EDILIZIA SCOLASTICA II LOTTO
SCUOLA "A. GRAMSCI" - COMUNE DI NICHELINO

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

97	2.51	2.51	50	0.	0.98	80.	0.012	31	0.	0.62	50.	0.008	25	0.	0.49	40.	0.006
98	2.51	2.51	51	0.	1.01	82.	0.013	34	0.	0.67	55.	0.008	28	0.	0.54	44.	0.007
99	2.51	2.51	36	0.	0.71	58.	0.009	24	0.	0.48	39.	0.006	20	0.	0.39	32.	0.005
100	2.51	2.51	39	0.	0.76	62.	0.010	27	0.	0.52	43.	0.007	22	0.	0.43	35.	0.005
101	2.51	2.51	42	0.	0.83	68.	0.011	30	0.	0.58	48.	0.007	25	0.	0.49	40.	0.006
102	2.51	2.51	55	0.	1.10	89.	0.014	38	0.	0.75	61.	0.009	32	0.	0.63	51.	0.008
103	2.51	2.51	3	0.	0.06	5.	0.001	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
104	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
105	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
106	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
107	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
108	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
109	2.51	2.51	73	0.	1.44	117.	0.018	50	0.	0.98	80.	0.012	42	0.	0.83	68.	0.010
110	2.51	2.51	49	0.	0.97	79.	0.012	34	0.	0.68	56.	0.009	30	0.	0.59	48.	0.007
111	2.51	2.51	50	0.	0.98	80.	0.012	36	0.	0.71	58.	0.009	30	0.	0.60	49.	0.008
112	2.51	2.51	68	0.	1.34	109.	0.017	48	0.	0.95	77.	0.012	42	0.	0.82	67.	0.010
113	2.51	2.51	1	0.	0.02	2.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
114	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
115	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
116	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
117	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
118	2.51	2.51	0.	0.	0.01	1.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
119	2.51	2.51	96	0.	1.91	155.	0.024	67	0.	1.32	108.	0.017	58	0.	1.14	93.	0.014
120	2.51	2.51	61	0.	1.22	99.	0.015	43	0.	0.86	70.	0.011	38	0.	0.75	61.	0.009
149	2.51	2.51	35	0.	0.69	56.	0.009	21	0.	0.42	35.	0.005	16	0.	0.32	26.	0.004
150	2.51	2.51	22	0.	0.43	35.	0.005	15	0.	0.30	24.	0.004	13	0.	0.25	21.	0.003
151	2.51	2.51	46	0.	0.91	74.	0.011	24	0.	0.47	39.	0.006	14	0.	0.27	22.	0.003
152	2.51	2.51	78	0.	1.54	126.	0.020	43	0.	0.85	69.	0.011	26	0.	0.52	43.	0.007
153	2.51	2.51	53	0.	1.04	85.	0.013	27	0.	0.54	44.	0.007	15	0.	0.29	23.	0.004
154	2.51	2.51	79	0.	1.57	128.	0.020	43	0.	0.85	69.	0.011	26	0.	0.52	42.	0.007
155	2.51	2.51	85	0.	1.68	137.	0.021	47	0.	0.93	76.	0.012	30	0.	0.60	49.	0.008
156	2.51	2.51	60	0.	1.19	97.	0.015	29	0.	0.57	47.	0.007	19	0.	0.37	30.	0.005
157	2.51	2.51	70	0.	1.37	112.	0.017	37	0.	0.74	60.	0.009	23	0.	0.46	38.	0.006
158	2.51	2.51	22	0.	0.44	36.	0.006	14	0.	0.27	22.	0.003	10	0.	0.20	16.	0.003

ARMATURA INFERIORE VERTICALE

GUSCI	Af	Afc	Mom	COMBINAZIONE RARA				COMBINAZIONE FREQUENTE					COMBINAZIONE QUASI PERMANENTE				
				Nor	sigC	sigF	wkR	Mom	Nor	sigC	sigF	wkF	Mom	Nor	sigC	sigF	wkP
2	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
3	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
4	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
6	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
7	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
8	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
10	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
11	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
12	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
14	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
15	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
16	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
18	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
19	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
20	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
22	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
23	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
24	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
26	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
27	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
28	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

[illegible]

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE COMUNALE - EDILIZIA SCOLASTICA II LOTTO
SCUOLA "A. GRAMSCI" - COMUNE DI NICHELINO

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

92	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
93	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
94	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
95	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
96	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
97	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
98	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
99	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
100	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
101	2.51	2.51	96	0.	1.91	155.	0.024	70	0.	1.38	112.	0.017	61	0.	1.21	99.	0.015
102	2.51	2.51	59	0.	1.17	95.	0.015	42	0.	0.84	68.	0.011	37	0.	0.73	60.	0.009
103	2.51	2.51	35	0.	0.70	57.	0.009	25	0.	0.50	41.	0.006	20	0.	0.39	32.	0.005
104	2.51	2.51	18	0.	0.35	29.	0.004	11	0.	0.22	18.	0.003	8	0.	0.16	13.	0.002
105	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
106	2.51	2.51	12	0.	0.24	20.	0.003	2	0.	0.05	4.	0.001	0.	0.	0.00	0.	0.000
107	2.51	2.51	47	0.	0.94	76.	0.012	31	0.	0.62	51.	0.008	26	0.	0.51	42.	0.006
108	2.51	2.51	65	0.	1.28	104.	0.016	44	0.	0.87	71.	0.011	37	0.	0.74	60.	0.009
109	2.51	2.51	89	0.	1.77	144.	0.022	62	0.	1.23	100.	0.015	53	0.	1.06	86.	0.013
110	2.51	2.51	128	0.	2.54	207.	0.032	90	0.	1.78	145.	0.023	78	0.	1.55	126.	0.020
111	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
112	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
113	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
114	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
115	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
116	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
117	2.51	2.51	1	0.	0.02	2.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
118	2.51	2.51	6	0.	0.13	10.	0.002	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
119	2.51	2.51	11	0.	0.22	18.	0.003	7	0.	0.14	11.	0.002	4	0.	0.08	6.	0.001
120	2.51	2.51	18	0.	0.35	29.	0.004	13	0.	0.26	21.	0.003	12	0.	0.24	20.	0.003
149	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
150	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
151	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
152	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
153	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
154	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
155	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
156	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
157	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
158	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000

ARMATURA SUPERIORE ORIZZONTALE

GUSCI	Af	Afc	Mom	COMBINAZIONE RARA				Mom	Nor	COMBINAZIONE FREQUENTE				Mom	Nor	COMBINAZIONE QUASI PERMANENTE			
				Nor	sigC	sigF	wkR			sigC	sigF	wkF	sigC			sigF	wkP		
2	2.51	2.51	17	0.	0.34	28.	0.004	12	0.	0.24	20.	0.003	10	0.	0.20	16.	0.002		
3	2.51	2.51	34	0.	0.68	55.	0.009	24	0.	0.48	39.	0.006	21	0.	0.41	33.	0.005		
4	2.51	2.51	44	0.	0.87	71.	0.011	32	0.	0.62	51.	0.008	27	0.	0.53	44.	0.007		
6	2.51	2.51	34	0.	0.66	54.	0.008	24	0.	0.48	39.	0.006	21	0.	0.41	34.	0.005		
7	2.51	2.51	36	0.	0.71	58.	0.009	27	0.	0.53	43.	0.007	24	0.	0.46	38.	0.006		
8	2.51	2.51	54	0.	1.08	88.	0.014	40	0.	0.80	65.	0.010	36	0.	0.71	58.	0.009		
10	2.51	2.51	2	0.	0.03	3.	0.000	9	0.	0.17	14.	0.002	12	0.	0.24	20.	0.003		
11	2.51	2.51	19	0.	0.38	31.	0.005	21	0.	0.41	33.	0.005	23	0.	0.46	37.	0.006		
12	2.51	2.51	47	0.	0.92	75.	0.012	40	0.	0.80	65.	0.010	40	0.	0.80	65.	0.010		
14	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	4	0.	0.08	6.	0.001		
15	2.51	2.51	2	0.	0.04	4.	0.001	11	0.	0.21	17.	0.003	17	0.	0.34	28.	0.004		
16	2.51	2.51	33	0.	0.65	53.	0.008	32	0.	0.63	51.	0.008	35	0.	0.70	57.	0.009		
18	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000		
19	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000		
20	2.51	2.51	0.	0.	0.00	0.	0.000	8	0.	0.16	13.	0.002	17	0.	0.33	27.	0.004		
22	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000		

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE COMUNALE - EDILIZIA SCOLASTICA II LOTTO
SCUOLA "A. GRAMSCI" - COMUNE DI NICHELINO

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

23	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	8	0.	0.16	13.	0.002
24	2.51	2.51	9	0.	0.17	14.	0.002	17	0.	0.34	27.	0.004	24	0.	0.47	38.	0.006
26	2.51	2.51	6	0.	0.12	10.	0.002	12	0.	0.23	19.	0.003	17	0.	0.34	28.	0.004
27	2.51	2.51	20	0.	0.39	31.	0.005	22	0.	0.43	35.	0.005	26	0.	0.52	42.	0.007
28	2.51	2.51	39	0.	0.77	63.	0.010	36	0.	0.71	58.	0.009	39	0.	0.77	62.	0.010
30	2.51	2.51	27	0.	0.53	43.	0.007	26	0.	0.52	43.	0.007	27	0.	0.54	44.	0.007
31	2.51	2.51	35	0.	0.70	57.	0.009	33	0.	0.65	53.	0.008	33	0.	0.66	54.	0.008
32	2.51	2.51	52	0.	1.03	84.	0.013	43	0.	0.85	69.	0.011	43	0.	0.85	69.	0.011
34	2.51	2.51	73	0.	1.45	118.	0.018	51	0.	1.01	82.	0.013	43	0.	0.86	70.	0.011
35	2.51	2.51	66	0.	1.30	106.	0.016	47	0.	0.92	75.	0.012	40	0.	0.80	65.	0.010
36	2.51	2.51	73	0.	1.44	118.	0.018	53	0.	1.05	85.	0.013	47	0.	0.92	75.	0.012
38	2.51	2.51	41	0.	0.81	66.	0.010	28	0.	0.55	45.	0.007	24	0.	0.47	38.	0.006
39	2.51	2.51	56	0.	1.11	90.	0.014	39	0.	0.77	62.	0.010	33	0.	0.66	54.	0.008
40	2.51	2.51	61	0.	1.21	98.	0.015	43	0.	0.85	69.	0.011	37	0.	0.73	60.	0.009
41	2.51	2.51	31	0.	0.61	50.	0.008	20	0.	0.40	32.	0.005	16	0.	0.32	26.	0.004
42	2.51	2.51	71	0.	1.40	114.	0.018	48	0.	0.95	77.	0.012	40	0.	0.79	64.	0.010
43	2.51	2.51	12	0.	0.24	20.	0.003	16	0.	0.32	26.	0.004	18	0.	0.36	29.	0.005
44	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	5	0.	0.10	8.	0.001
45	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
46	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
47	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
48	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
49	2.51	2.51	18	0.	0.36	29.	0.005	13	0.	0.26	21.	0.003	10	0.	0.20	17.	0.003
50	2.51	2.51	1	0.	0.02	1.	0.000	0.	0.	0.01	1.	0.000	0.	0.	0.00	0.	0.000
51	2.51	2.51	50	0.	0.98	80.	0.012	35	0.	0.70	57.	0.009	31	0.	0.61	50.	0.008
52	2.51	2.51	64	0.	1.27	103.	0.016	47	0.	0.93	76.	0.012	42	0.	0.83	67.	0.010
53	2.51	2.51	72	0.	1.42	116.	0.018	58	0.	1.14	93.	0.014	56	0.	1.10	90.	0.014
54	2.51	2.51	62	0.	1.23	100.	0.016	53	0.	1.05	85.	0.013	54	0.	1.06	86.	0.013
55	2.51	2.51	38	0.	0.75	61.	0.010	38	0.	0.74	61.	0.009	41	0.	0.82	67.	0.010
56	2.51	2.51	35	0.	0.69	56.	0.009	35	0.	0.70	57.	0.009	40	0.	0.79	65.	0.010
57	2.51	2.51	66	0.	1.30	106.	0.016	55	0.	1.09	89.	0.014	56	0.	1.10	89.	0.014
58	2.51	2.51	74	0.	1.46	118.	0.018	59	0.	1.17	96.	0.015	57	0.	1.13	92.	0.014
59	2.51	2.51	49	0.	0.97	79.	0.012	36	0.	0.72	59.	0.009	33	0.	0.65	53.	0.008
60	2.51	2.51	37	0.	0.72	59.	0.009	26	0.	0.52	42.	0.007	23	0.	0.45	37.	0.006
61	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
62	2.51	2.51	8	0.	0.16	13.	0.002	5	0.	0.11	9.	0.001	3	0.	0.06	5.	0.001
63	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
64	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
65	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
66	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
67	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
68	2.51	2.51	3	0.	0.06	5.	0.001	10	0.	0.20	16.	0.002	12	0.	0.25	20.	0.003
69	2.51	2.51	70	0.	1.38	112.	0.017	46	0.	0.91	74.	0.012	37	0.	0.74	60.	0.009
70	2.51	2.51	23	0.	0.46	38.	0.006	14	0.	0.28	23.	0.004	11	0.	0.21	17.	0.003
71	2.51	2.51	13	0.	0.26	21.	0.003	7	0.	0.13	11.	0.002	4	0.	0.07	6.	0.001
72	2.51	2.51	68	0.	1.35	110.	0.017	44	0.	0.86	70.	0.011	34	0.	0.68	55.	0.009
73	2.51	2.51	0.	0.	0.00	0.	0.000	3	0.	0.05	4.	0.001	5	0.	0.10	8.	0.001
74	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
75	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
76	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
77	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
78	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
79	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
80	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
81	2.51	2.51	37	0.	0.73	59.	0.009	27	0.	0.53	43.	0.007	23	0.	0.46	37.	0.006
82	2.51	2.51	34	0.	0.68	55.	0.009	25	0.	0.49	40.	0.006	22	0.	0.43	35.	0.005
83	2.51	2.51	49	0.	0.97	79.	0.012	37	0.	0.72	59.	0.009	33	0.	0.65	53.	0.008
84	2.51	2.51	49	0.	0.98	79.	0.012	37	0.	0.73	59.	0.009	33	0.	0.65	53.	0.008
85	2.51	2.51	90	0.	1.79	145.	0.023	71	0.	1.41	115.	0.018	67	0.	1.33	108.	0.017
86	2.51	2.51	102	0.	2.02	164.	0.026	80	0.	1.58	128.	0.020	75	0.	1.48	120.	0.019

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE COMUNALE - EDILIZIA SCOLASTICA II LOTTO
SCUOLA "A. GRAMSCI" - COMUNE DI NICHELINO

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

87	2.51	2.51	87	0.	1.72	140.	0.022	70	0.	1.39	113.	0.018	69	0.	1.36	111.	0.017
88	2.51	2.51	101	0.	1.99	162.	0.025	80	0.	1.58	128.	0.020	77	0.	1.52	124.	0.019
89	2.51	2.51	58	0.	1.14	93.	0.014	51	0.	1.01	82.	0.013	54	0.	1.06	87.	0.013
90	2.51	2.51	76	0.	1.50	122.	0.019	64	0.	1.26	103.	0.016	65	0.	1.28	104.	0.016
91	2.51	2.51	57	0.	1.12	91.	0.014	51	0.	1.00	82.	0.013	53	0.	1.04	85.	0.013
92	2.51	2.51	66	0.	1.31	106.	0.016	57	0.	1.14	93.	0.014	58	0.	1.15	94.	0.015
93	2.51	2.51	77	0.	1.51	123.	0.019	63	0.	1.25	102.	0.016	63	0.	1.24	101.	0.016
94	2.51	2.51	86	0.	1.70	138.	0.021	70	0.	1.39	113.	0.018	69	0.	1.37	111.	0.017
95	2.51	2.51	85	0.	1.68	137.	0.021	67	0.	1.33	108.	0.017	65	0.	1.28	104.	0.016
96	2.51	2.51	89	0.	1.75	143.	0.022	70	0.	1.39	113.	0.018	67	0.	1.33	108.	0.017
97	2.51	2.51	62	0.	1.23	100.	0.015	45	0.	0.90	73.	0.011	41	0.	0.80	65.	0.010
98	2.51	2.51	61	0.	1.20	98.	0.015	44	0.	0.88	72.	0.011	40	0.	0.79	64.	0.010
99	2.51	2.51	46	0.	0.92	75.	0.012	33	0.	0.65	53.	0.008	29	0.	0.58	47.	0.007
100	2.51	2.51	44	0.	0.88	71.	0.011	32	0.	0.63	51.	0.008	28	0.	0.56	45.	0.007
101	2.51	2.51	40	0.	0.79	64.	0.010	29	0.	0.56	46.	0.007	26	0.	0.50	41.	0.006
102	2.51	2.51	59	0.	1.16	95.	0.015	43	0.	0.85	69.	0.011	38	0.	0.76	62.	0.010
103	2.51	2.51	94	0.	1.86	152.	0.024	74	0.	1.47	120.	0.019	71	0.	1.41	115.	0.018
104	2.51	2.51	94	0.	1.85	151.	0.023	76	0.	1.51	123.	0.019	75	0.	1.47	120.	0.019
105	2.51	2.51	77	0.	1.53	125.	0.019	66	0.	1.30	106.	0.016	65	0.	1.29	105.	0.016
106	2.51	2.51	93	0.	1.83	149.	0.023	75	0.	1.49	121.	0.019	75	0.	1.47	120.	0.019
107	2.51	2.51	113	0.	2.24	182.	0.028	89	0.	1.75	143.	0.022	85	0.	1.68	137.	0.021
108	2.51	2.51	112	0.	2.22	180.	0.028	86	0.	1.69	138.	0.021	80	0.	1.58	129.	0.020
109	2.51	2.51	47	0.	0.93	75.	0.012	35	0.	0.69	56.	0.009	31	0.	0.62	51.	0.008
110	2.51	2.51	31	0.	0.62	50.	0.008	23	0.	0.45	36.	0.006	20	0.	0.39	32.	0.005
111	2.51	2.51	31	0.	0.62	50.	0.008	22	0.	0.44	36.	0.006	20	0.	0.39	32.	0.005
112	2.51	2.51	55	0.	1.09	88.	0.014	39	0.	0.78	63.	0.010	35	0.	0.69	56.	0.009
113	2.51	2.51	102	0.	2.02	164.	0.025	80	0.	1.58	129.	0.020	76	0.	1.50	122.	0.019
114	2.51	2.51	105	0.	2.07	168.	0.026	84	0.	1.67	136.	0.021	82	0.	1.62	132.	0.020
115	2.51	2.51	91	0.	1.80	146.	0.023	75	0.	1.49	121.	0.019	74	0.	1.46	119.	0.018
116	2.51	2.51	111	0.	2.20	179.	0.028	89	0.	1.75	142.	0.022	86	0.	1.70	138.	0.021
117	2.51	2.51	129	0.	2.55	207.	0.032	100	0.	1.98	161.	0.025	95	0.	1.88	153.	0.024
118	2.51	2.51	122	0.	2.41	196.	0.030	93	0.	1.83	149.	0.023	86	0.	1.71	139.	0.022
119	2.51	2.51	40	0.	0.79	64.	0.010	30	0.	0.59	48.	0.007	27	0.	0.53	43.	0.007
120	2.51	2.51	23	0.	0.46	37.	0.006	17	0.	0.34	27.	0.004	15	0.	0.29	24.	0.004
149	2.51	2.51	27	0.	0.53	43.	0.007	20	0.	0.39	31.	0.005	16	0.	0.32	26.	0.004
150	2.51	2.51	10	0.	0.20	16.	0.003	7	0.	0.14	11.	0.002	5	0.	0.11	9.	0.001
151	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	5	0.	0.09	7.	0.001
152	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
153	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
154	2.51	2.51	0.	0.	0.00	0.	0.000	5	0.	0.10	8.	0.001	11	0.	0.22	18.	0.003
155	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
156	2.51	2.51	72	0.	1.43	116.	0.018	50	0.	0.98	80.	0.012	42	0.	0.83	67.	0.010
157	2.51	2.51	20	0.	0.39	32.	0.005	22	0.	0.43	35.	0.005	23	0.	0.45	37.	0.006
158	2.51	2.51	37	0.	0.72	59.	0.009	24	0.	0.48	39.	0.006	20	0.	0.40	33.	0.005

ARMATURA SUPERIORE VERTICALE

GUSCI	Af	Afc	Mom	COMBINAZIONE RARA				COMBINAZIONE FREQUENTE					COMBINAZIONE QUASI PERMANENTE				
				Nor	sigC	sigF	wkR	Mom	Nor	sigC	sigF	wkF	Mom	Nor	sigC	sigF	wkP
2	2.51	2.51	442	0.	8.73	710.	0.110	321	0.	6.35	517.	0.080	288	0.	5.68	463.	0.072
3	2.51	2.51	453	0.	8.95	729.	0.113	330	0.	6.52	531.	0.082	295	0.	5.84	475.	0.074
4	2.51	2.51	427	0.	8.44	687.	0.107	311	0.	6.16	501.	0.078	279	0.	5.52	450.	0.070
6	2.51	2.51	415	0.	8.21	668.	0.104	303	0.	6.00	488.	0.076	272	0.	5.37	437.	0.068
7	2.51	2.51	431	0.	8.51	693.	0.107	315	0.	6.23	507.	0.079	283	0.	5.59	455.	0.071
8	2.51	2.51	408	0.	8.06	656.	0.102	298	0.	5.89	479.	0.074	267	0.	5.29	430.	0.067
10	2.51	2.51	394	0.	7.79	634.	0.098	289	0.	5.71	465.	0.072	259	0.	5.13	417.	0.065
11	2.51	2.51	409	0.	8.08	658.	0.102	301	0.	5.95	484.	0.075	270	0.	5.34	435.	0.067
12	2.51	2.51	388	0.	7.67	625.	0.097	284	0.	5.61	456.	0.071	255	0.	5.04	410.	0.064
14	2.51	2.51	371	0.	7.34	597.	0.093	276	0.	5.46	445.	0.069	249	0.	4.92	401.	0.062
15	2.51	2.51	390	0.	7.70	627.	0.097	288	0.	5.69	463.	0.072	259	0.	5.12	417.	0.065

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE COMUNALE - EDILIZIA SCOLASTICA II LOTTO
SCUOLA "A. GRAMSCI" - COMUNE DI NICHELINO

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

16	2.51	2.51	369	0.	7.30	594.	0.092	271	0.	5.35	436.	0.068	244	0.	4.82	393.	0.061
18	2.51	2.51	354	0.	7.00	570.	0.088	262	0.	5.17	421.	0.065	238	0.	4.70	383.	0.059
19	2.51	2.51	358	0.	7.07	576.	0.089	265	0.	5.24	427.	0.066	240	0.	4.74	386.	0.060
20	2.51	2.51	339	0.	6.71	546.	0.085	250	0.	4.94	402.	0.062	226	0.	4.47	364.	0.056
22	2.51	2.51	366	0.	7.24	589.	0.091	269	0.	5.32	433.	0.067	242	0.	4.79	390.	0.060
23	2.51	2.51	367	0.	7.25	590.	0.092	271	0.	5.36	436.	0.068	245	0.	4.83	394.	0.061
24	2.51	2.51	338	0.	6.69	544.	0.084	248	0.	4.91	400.	0.062	225	0.	4.44	362.	0.056
26	2.51	2.51	375	0.	7.42	604.	0.094	276	0.	5.46	444.	0.069	248	0.	4.91	400.	0.062
27	2.51	2.51	377	0.	7.46	607.	0.094	279	0.	5.51	449.	0.070	251	0.	4.97	405.	0.063
28	2.51	2.51	348	0.	6.89	561.	0.087	256	0.	5.07	412.	0.064	232	0.	4.58	373.	0.058
30	2.51	2.51	382	0.	7.55	615.	0.095	281	0.	5.55	452.	0.070	253	0.	4.99	406.	0.063
31	2.51	2.51	385	0.	7.62	620.	0.096	285	0.	5.63	458.	0.071	257	0.	5.07	413.	0.064
32	2.51	2.51	357	0.	7.06	575.	0.089	263	0.	5.19	423.	0.066	237	0.	4.69	382.	0.059
34	2.51	2.51	391	0.	7.73	629.	0.098	288	0.	5.69	463.	0.072	259	0.	5.11	416.	0.065
35	2.51	2.51	394	0.	7.80	635.	0.098	292	0.	5.77	470.	0.073	263	0.	5.20	423.	0.066
36	2.51	2.51	368	0.	7.27	592.	0.092	270	0.	5.34	435.	0.067	244	0.	4.83	393.	0.061
38	2.51	2.51	401	0.	7.93	646.	0.100	296	0.	5.84	476.	0.074	266	0.	5.25	427.	0.066
39	2.51	2.51	404	0.	7.98	649.	0.101	298	0.	5.90	480.	0.074	269	0.	5.32	433.	0.067
40	2.51	2.51	376	0.	7.43	604.	0.094	277	0.	5.48	446.	0.069	251	0.	4.96	404.	0.063
41	2.51	2.51	244	0.	4.83	393.	0.061	180	0.	3.56	290.	0.045	172	0.	3.40	277.	0.043
42	2.51	2.51	207	0.	4.09	333.	0.052	155	0.	3.06	249.	0.039	152	0.	3.00	244.	0.038
43	2.51	2.51	184	0.	3.64	297.	0.046	139	0.	2.75	224.	0.035	135	0.	2.67	218.	0.034
44	2.51	2.51	182	0.	3.61	293.	0.046	138	0.	2.73	222.	0.034	134	0.	2.65	215.	0.033
45	2.51	2.51	163	0.	3.22	262.	0.041	124	0.	2.45	200.	0.031	128	0.	2.52	205.	0.032
46	2.51	2.51	169	0.	3.34	272.	0.042	128	0.	2.54	206.	0.032	131	0.	2.59	211.	0.033
47	2.51	2.51	192	0.	3.80	309.	0.048	144	0.	2.85	232.	0.036	142	0.	2.81	228.	0.035
48	2.51	2.51	204	0.	4.02	327.	0.051	152	0.	3.01	245.	0.038	148	0.	2.92	238.	0.037
49	2.51	2.51	223	0.	4.41	359.	0.056	166	0.	3.29	267.	0.041	161	0.	3.18	259.	0.040
50	2.51	2.51	263	0.	5.21	424.	0.066	195	0.	3.86	314.	0.049	192	0.	3.79	308.	0.048
51	2.51	2.51	314	0.	6.22	506.	0.078	234	0.	4.63	377.	0.058	213	0.	4.20	342.	0.053
52	2.51	2.51	309	0.	6.11	497.	0.077	230	0.	4.54	370.	0.057	209	0.	4.12	336.	0.052
53	2.51	2.51	301	0.	5.95	484.	0.075	224	0.	4.42	360.	0.056	203	0.	4.01	326.	0.051
54	2.51	2.51	292	0.	5.78	470.	0.073	217	0.	4.29	349.	0.054	197	0.	3.89	317.	0.049
55	2.51	2.51	281	0.	5.56	452.	0.070	208	0.	4.12	335.	0.052	189	0.	3.74	304.	0.047
56	2.51	2.51	294	0.	5.81	473.	0.073	218	0.	4.31	351.	0.054	197	0.	3.90	317.	0.049
57	2.51	2.51	321	0.	6.34	516.	0.080	236	0.	4.67	380.	0.059	213	0.	4.22	343.	0.053
58	2.51	2.51	338	0.	6.68	544.	0.084	248	0.	4.90	399.	0.062	223	0.	4.41	359.	0.056
59	2.51	2.51	354	0.	7.00	570.	0.088	259	0.	5.13	417.	0.065	233	0.	4.61	376.	0.058
60	2.51	2.51	369	0.	7.30	594.	0.092	270	0.	5.34	435.	0.067	243	0.	4.80	391.	0.061
61	2.51	2.51	275	0.	5.43	442.	0.069	200	0.	3.96	323.	0.050	181	0.	3.58	291.	0.045
62	2.51	2.51	210	0.	4.15	338.	0.052	159	0.	3.14	255.	0.040	145	0.	2.86	233.	0.036
63	2.51	2.51	159	0.	3.15	256.	0.040	123	0.	2.42	197.	0.031	119	0.	2.35	191.	0.030
64	2.51	2.51	136	0.	2.68	218.	0.034	104	0.	2.06	167.	0.026	102	0.	2.02	165.	0.026
65	2.51	2.51	101	0.	2.00	163.	0.025	78	0.	1.54	125.	0.019	77	0.	1.52	124.	0.019
66	2.51	2.51	81	0.	1.61	131.	0.020	62	0.	1.23	100.	0.016	61	0.	1.21	99.	0.015
67	2.51	2.51	88	0.	1.73	141.	0.022	67	0.	1.33	109.	0.017	66	0.	1.30	106.	0.016
68	2.51	2.51	90	0.	1.77	144.	0.022	71	0.	1.40	114.	0.018	71	0.	1.40	114.	0.018
69	2.51	2.51	113	0.	2.24	183.	0.028	91	0.	1.80	147.	0.023	93	0.	1.84	149.	0.023
70	2.51	2.51	167	0.	3.30	269.	0.042	139	0.	2.74	223.	0.035	134	0.	2.64	215.	0.033
71	2.51	2.51	197	0.	3.90	318.	0.049	148	0.	2.94	239.	0.037	136	0.	2.69	219.	0.034
72	2.51	2.51	145	0.	2.86	233.	0.036	109	0.	2.15	175.	0.027	100	0.	1.98	161.	0.025
73	2.51	2.51	117	0.	2.32	189.	0.029	87	0.	1.72	140.	0.022	79	0.	1.56	127.	0.020
74	2.51	2.51	104	0.	2.05	167.	0.026	75	0.	1.48	120.	0.019	66	0.	1.31	107.	0.017
75	2.51	2.51	89	0.	1.76	143.	0.022	64	0.	1.26	102.	0.016	56	0.	1.11	90.	0.014
76	2.51	2.51	116	0.	2.29	186.	0.029	85	0.	1.67	136.	0.021	78	0.	1.54	125.	0.019
77	2.51	2.51	142	0.	2.81	229.	0.035	104	0.	2.05	167.	0.026	95	0.	1.87	152.	0.024
78	2.51	2.51	171	0.	3.39	276.	0.043	126	0.	2.50	203.	0.032	116	0.	2.30	187.	0.029
79	2.51	2.51	209	0.	4.13	336.	0.052	154	0.	3.04	248.	0.038	141	0.	2.79	227.	0.035
80	2.51	2.51	256	0.	5.06	412.	0.064	187	0.	3.69	300.	0.047	168	0.	3.33	271.	0.042
81	2.51	2.51	276	0.	5.45	444.	0.069	203	0.	4.00	326.	0.051	183	0.	3.62	295.	0.046

INTERVENTO DI MANUTENZIONE STRAORDINARIA SUL PATRIMONIO IMMOBILIARE COMUNALE - EDILIZIA SCOLASTICA II LOTTO
SCUOLA "A. GRAMSCI" - COMUNE DI NICHELINO

RELAZIONE GEOTECNICA E SULLE FONDAZIONI

82	2.51	2.51	152	0.	3.01	245.	0.038	113	0.	2.24	182.	0.028	104	0.	2.06	167.	0.026
83	2.51	2.51	268	0.	5.29	431.	0.067	196	0.	3.87	315.	0.049	177	0.	3.50	285.	0.044
84	2.51	2.51	154	0.	3.05	248.	0.039	115	0.	2.27	184.	0.029	105	0.	2.07	169.	0.026
85	2.51	2.51	257	0.	5.08	414.	0.064	187	0.	3.70	301.	0.047	170	0.	3.35	273.	0.042
86	2.51	2.51	151	0.	2.99	243.	0.038	112	0.	2.22	181.	0.028	103	0.	2.03	165.	0.026
87	2.51	2.51	243	0.	4.81	392.	0.061	178	0.	3.52	286.	0.044	161	0.	3.19	259.	0.040
88	2.51	2.51	144	0.	2.84	231.	0.036	107	0.	2.11	172.	0.027	97	0.	1.93	157.	0.024
89	2.51	2.51	223	0.	4.40	359.	0.056	163	0.	3.23	263.	0.041	148	0.	2.93	238.	0.037
90	2.51	2.51	134	0.	2.64	215.	0.033	99	0.	1.96	160.	0.025	91	0.	1.79	146.	0.023
91	2.51	2.51	200	0.	3.94	321.	0.050	150	0.	2.96	241.	0.037	137	0.	2.71	220.	0.034
92	2.51	2.51	114	0.	2.26	184.	0.029	86	0.	1.69	138.	0.021	79	0.	1.56	127.	0.020
93	2.51	2.51	209	0.	4.13	336.	0.052	157	0.	3.11	253.	0.039	144	0.	2.84	231.	0.036
94	2.51	2.51	115	0.	2.28	185.	0.029	88	0.	1.74	142.	0.022	82	0.	1.62	131.	0.020
95	2.51	2.51	218	0.	4.31	351.	0.054	164	0.	3.24	264.	0.041	150	0.	2.97	241.	0.037
96	2.51	2.51	120	0.	2.37	193.	0.030	92	0.	1.81	148.	0.023	85	0.	1.68	137.	0.021
97	2.51	2.51	224	0.	4.43	361.	0.056	169	0.	3.34	272.	0.042	155	0.	3.06	249.	0.039
98	2.51	2.51	122	0.	2.41	196.	0.030	94	0.	1.85	151.	0.023	87	0.	1.72	140.	0.022
99	2.51	2.51	228	0.	4.50	366.	0.057	171	0.	3.39	276.	0.043	157	0.	3.11	253.	0.039
100	2.51	2.51	119	0.	2.34	191.	0.030	92	0.	1.81	147.	0.023	86	0.	1.69	138.	0.021
101	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
102	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
103	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
104	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
105	2.51	2.51	13	0.	0.25	20.	0.003	10	0.	0.20	16.	0.003	10	0.	0.20	16.	0.003
106	2.51	2.51	13	0.	0.25	20.	0.003	11	0.	0.21	17.	0.003	11	0.	0.22	18.	0.003
107	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	1	0.	0.01	1.	0.000
108	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
109	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
110	2.51	2.51	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000	0.	0.	0.00	0.	0.000
111	2.51	2.51	22	0.	0.44	36.	0.006	16	0.	0.32	26.	0.004	14	0.	0.28	23.	0.004
112	2.51	2.51	22	0.	0.43	35.	0.005	16	0.	0.32	26.	0.004	15	0.	0.29	23.	0.004
113	2.51	2.51	20	0.	0.39	32.	0.005	15	0.	0.30	24.	0.004	14	0.	0.27	22.	0.003
114	2.51	2.51	17	0.	0.35	28.	0.004	13	0.	0.26	21.	0.003	12	0.	0.24	19.	0.003
115	2.51	2.51	24	0.	0.47	38.	0.006	18	0.	0.36	29.	0.004	16	0.	0.31	25.	0.004
116	2.51	2.51	23	0.	0.46	38.	0.006	18	0.	0.36	29.	0.005	16	0.	0.32	26.	0.004
117	2.51	2.51	23	0.	0.45	37.	0.006	18	0.	0.35	29.	0.004	16	0.	0.31	26.	0.004
118	2.51	2.51	23	0.	0.45	37.	0.006	18	0.	0.36	29.	0.005	16	0.	0.32	26.	0.004
119	2.51	2.51	21	0.	0.42	34.	0.005	17	0.	0.34	28.	0.004	15	0.	0.31	25.	0.004
120	2.51	2.51	18	0.	0.35	29.	0.004	15	0.	0.30	24.	0.004	13	0.	0.26	21.	0.003
149	2.51	2.51	279	0.	5.52	450.	0.070	209	0.	4.12	336.	0.052	192	0.	3.79	308.	0.048
150	2.51	2.51	309	0.	6.10	497.	0.077	227	0.	4.49	365.	0.057	205	0.	4.05	330.	0.051
151	2.51	2.51	258	0.	5.09	415.	0.064	192	0.	3.80	309.	0.048	176	0.	3.48	283.	0.044
152	2.51	2.51	249	0.	4.93	401.	0.062	187	0.	3.69	300.	0.047	172	0.	3.41	277.	0.043
153	2.51	2.51	252	0.	4.98	405.	0.063	188	0.	3.72	303.	0.047	173	0.	3.41	278.	0.043
154	2.51	2.51	271	0.	5.36	436.	0.068	205	0.	4.06	330.	0.051	187	0.	3.70	301.	0.047
155	2.51	2.51	256	0.	5.05	411.	0.064	192	0.	3.80	310.	0.048	179	0.	3.54	289.	0.045
156	2.51	2.51	301	0.	5.95	485.	0.075	222	0.	4.39	358.	0.055	201	0.	3.97	323.	0.050
157	2.51	2.51	291	0.	5.75	468.	0.073	215	0.	4.25	346.	0.054	195	0.	3.85	313.	0.049
158	2.51	2.51	327	0.	6.46	526.	0.082	241	0.	4.76	387.	0.060	217	0.	4.29	349.	0.054