



CITTÀ DI LUCCA

Amministrazione Comunale

Settore 5 - Lavori Pubblici e Traffico U.O. 5.3 – Edilizia Sportiva
Lucca Riscossioni e Servizi S.R.L.

Dirigente: Ing. Antonella Giannini
Responsabile Unico di Progetto: Ing. Arianna De Cicco

P.T. 39-2026
REALIZZAZIONE DEL PALAZZETTO DELLO SPORT SILVER 1
NELL'AREA "EX CROCEROSSA"
STRALCIO 1
CUP J65B25001060005

PROGETTO DI FATTIBILITÀ TECNICO ECONOMICA

FASCICOLO DEI CALCOLI BLOCCO CAMPO

RTP: "PALAZZETTO DELLO SPORT AREA "EX CROCEROSSA"

Capogruppo, Progetto Opere Edili e Strutture:
Ing. Giuseppe Amante

Progetto Impianti, Antincendio, Acustica:
Studio Bellandi & Petri s.r.l. s.t.p.

Coordinatore della Sicurezza in fase di Progettazione:
Ing. Dario Lucarotti

Collaboratori alla Progettazione:
Ing. Dario Lucarotti
Arch. Riccardo Ricci

Giovane Professionista:
Arch. Barbara Tomei

Committente per la parte del Progetto di competenza Lucca Riscossioni e Servizi



Geologia:
Studio INGEO

Rilievo: Geom. Paolo Paoli, Comune di Lucca



Data Emissione

Revisione n°/data

18/02/2026

Revisione n°1 del 14/03/2026

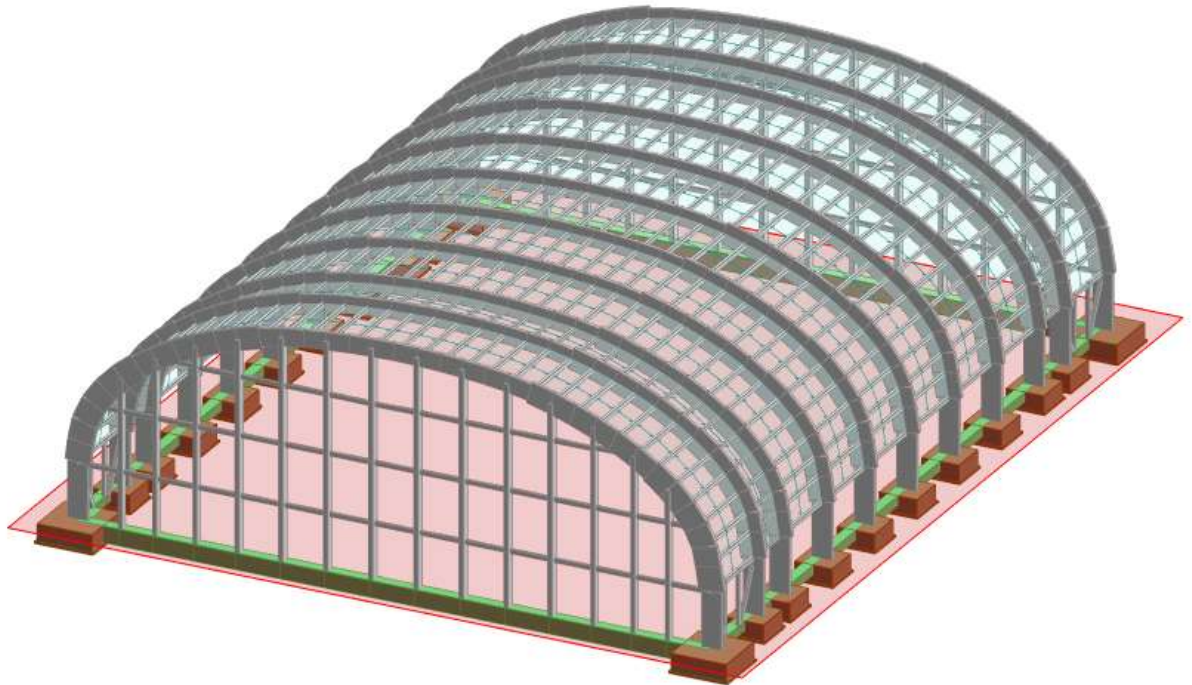
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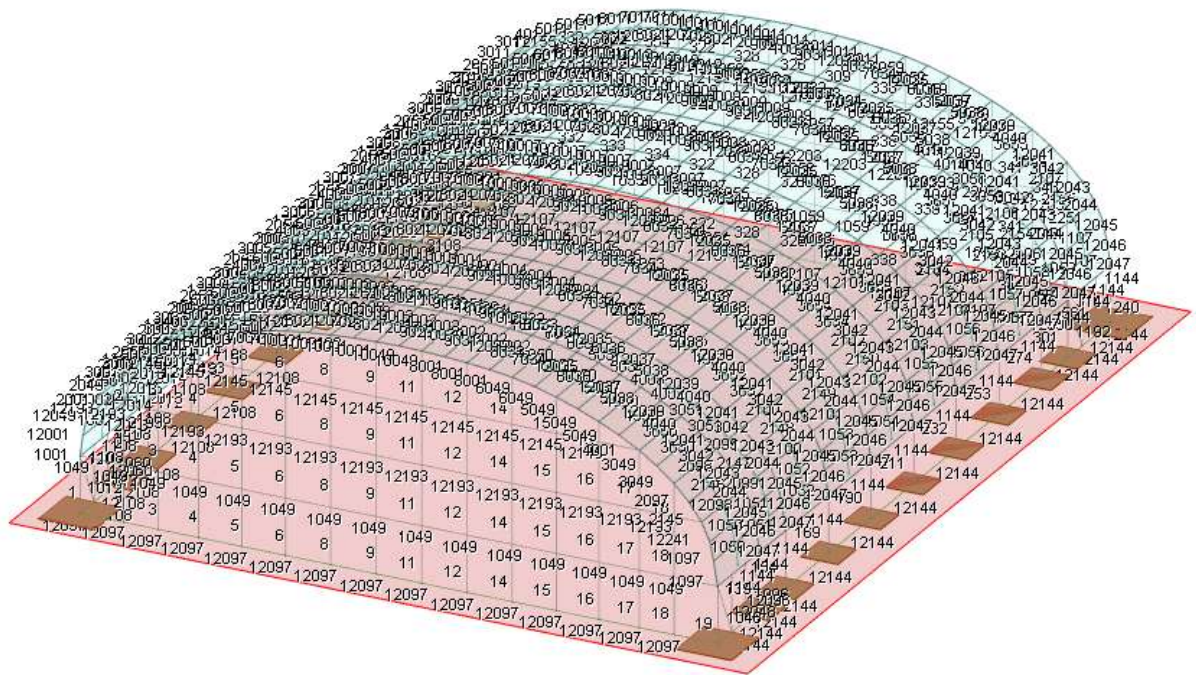
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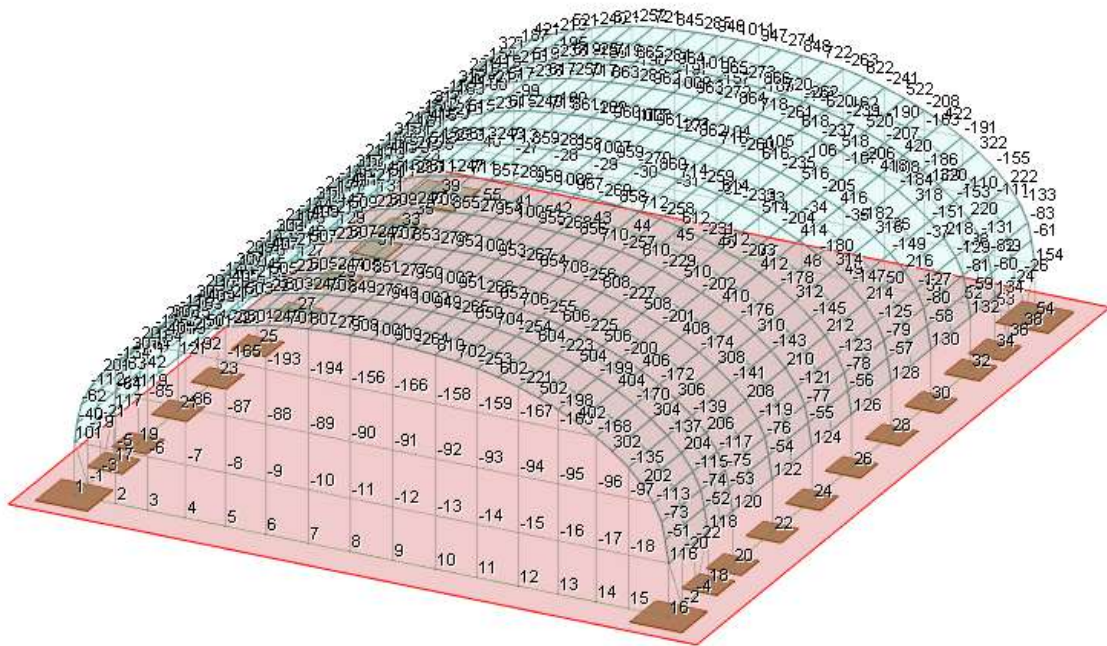
BLOCCO CAMPO

MODELLO 3D





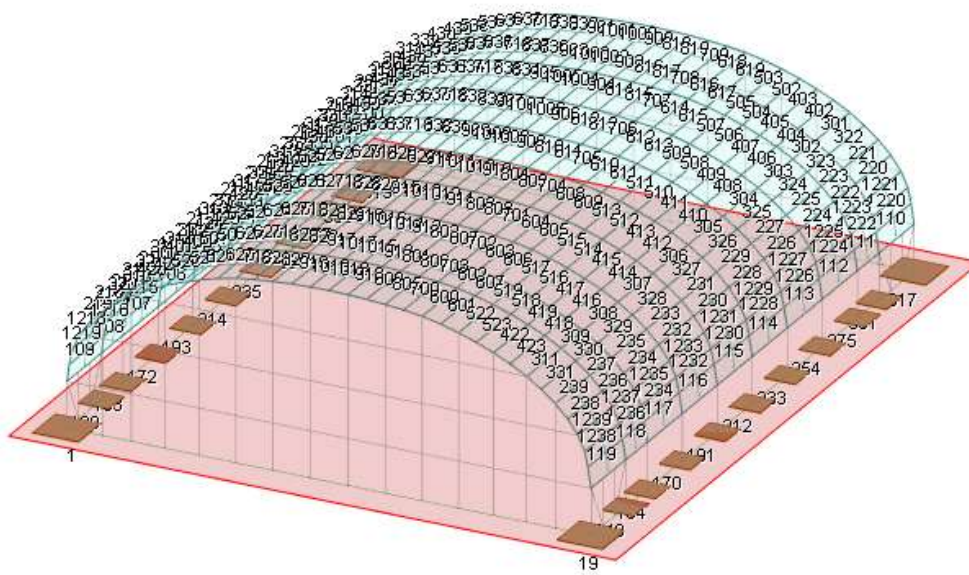
NODI



Esporta Stampa

Vn	Commento	TV	Sx	Sy	Sz	Rx	Ry	Rz	RL	Ly <m>	Lz <m>	Kt <daN/mc>
1	Libero		L	L	L	L	L	L				
2	Incastro		B	B	B	B	B	B				
3	El. sew 110001		B	B	L	L	L	B				
4	plinto								No	2.3	2.3	5850000

SOLAI E PLINTI



PARAMETRI DI CALCOLO

La modellazione della struttura e la rielaborazione dei risultati del calcolo sono stati effettuati con:
ModeSt ver. 8.32, licenza n. 7222, prodotto da Tecnisoft s.a.s. - Prato
La struttura è stata calcolata utilizzando come solutore agli elementi finiti:
Xfinest ver. 9.4.5, licenza n. -1091016651, prodotto da Ce.A.S. S.r.l. - Milano

Tipo di normativa: stati limite D.M. 18
Tipo di calcolo: sismica statica
Vincoli esterni: Considera sempre vincoli assegnati in modellazione
Schematizzazione piani rigidi:
Selezione solai controventati: tip 1 310 420 421 520 521 621 620 710 821 820 919 1018 1019 918 800 805 700 600
601 522 523 422 423 300 401 400 501 500 622 623 711 822 823 917 1017 1015 913 801 806 703 602 607 519 518 419 418
309 311 339 439 538 539 639 638 719 839 901 1001 1000 900 818 819 709 618 503 502 403 402 301 302 404 405 504 505
617 616 708 817 816 902 1002 1003 903 836 837 718 636 637 537 536 437 436 338 1016 1014 1013 1012 1011 1010 1009
1008 1007 1006 1005 1004 620 338 438 838 619
Modalità di recupero masse secondarie: mantenere sul nodo masse e forze relative

Generazione combinazioni

- Tipo di analisi: Lineare
- Valuta spostamenti e non sollecitazioni: No
- Buckling: No

Opzioni di calcolo

- Sono state considerate infinitamente rigide le zone di connessione fra travi, pilastri ed elementi bidimensionali con una riduzione del 20%
- Calcolo con offset rigidi dai nodi: No
- Uniformare i carichi variabili: No
- Massimizzare i carichi variabili: No
- Recupero carichi zone rigide: taglio e momento flettente
- Modalità di combinazione momento torcente: disaccoppiare le azioni

Opzioni del solutore

Opzioni generali:
- Trascura deformabilità a taglio delle aste: No
- Analisi dinamica con metodo di Lanczos: Sì
- Check sequenza di Sturm: Sì
- Usa formulazione secante per buckling: No
- Trascura buckling torsionale: No

- Tipo di elemento bidimensionale: QF46
- Calcolo sforzo nei nodi: No

Opzioni per analisi P-Delta:
- Numero massimo di iterazioni: 15
- Valore della norma euclidea degli spostamenti: 1.0000E-04

Opzioni per analisi pushover:
- Esegui analisi in regime di piccoli spostamenti: Sì

Opzioni per analisi pushover murature:
- Interrompi analisi nel caso di plasticizzazione per carichi statici: Sì
- Utilizza sforzo normale medio: Sì

Metodo di convergenza:
- Forze e momenti residui (F)
Valore della norma euclidea delle forze: 1.0000E-03
Valore della norma euclidea dei momenti: 1.0000E-02

- Opzioni aggiuntive per analisi non lineari in presenza di elementi bidimensionali con comportamento Drucker-Prager:
OPTION PARAM AUTO_INCREMENT=YES
OPTION PARAM LINE_SEARCHES=YES
OPTION PARAM BGINCRS=1.0
OPTION PARAM AVINCRS=1.0

Dati struttura

- Sito di costruzione: lucca via delle tagliate LON. 10.50510 LAT. 43.85140
Contenuto tra ID reticolo: 19604 19382 19603 19381

Simbologia

Ag = Accelerazione orizzontale massima al sito
C_c = Coefficiente funzione della categoria del suolo
Fo = Valore massimo del fattore di amplificazione dello spettro in accelerazione orizzontale
S_s = Coefficiente di amplificazione stratigrafica
T_R = Periodo di ritorno <anni>
TCC = Tipo di combinazione di carico
SLU = Stato limite ultimo
SLE R = Stato limite d'esercizio, combinazione rara
SLE F = Stato limite d'esercizio, combinazione frequente
SLE Q = Stato limite d'esercizio, combinazione quasi permanente
SLD = Stato limite di danno
SND = Stato limite di salvaguardia della vita (non dissipativo)
Tc* = Periodo di inizio del tratto a velocità costante dello spettro in accelerazione orizzontale <sec>

TCC	T _R	A _g <g>	F _o	T _c *	S _s	C _c
SLD	75	0.0614	2.57	0.26	1.50	1.63
SLV	712	0.1487	2.38	0.30	1.49	1.57

- Edificio esistente: No
- Spettri: Automatici da normativa
- Tipo di opera: Opera ordinaria
- Vita nominale V_N: 50.00
- Classe d'uso: Classe III
- SL Esercizio: SLOPvr No, SLDPvr 63.00
- SL Ultimi: SLVPvr 10.00, SLCPvr No
- Struttura dissipativa: No
- Quota di riferimento: 0.00 <m>
- Quota max della struttura: 12.80 <m>
- Altezza della struttura: 12.80 <m>
- Numero piani edificio: 0
- Coefficiente θ : 0.00
- Edificio regolare in altezza: Sì
- Edificio regolare in pianta: Sì
- Forze orizzontali convenzionali per stati limite non sismici: No
- Genera stati limite per verifiche di resistenza al fuoco: No

Dati di calcolo

- Categoria del suolo di fondazione: C
- Tipologia strutturale: archi in legno con unioni di continuità semirigide

Periodo T ₁	0.33836
Coeff. λ SLD	1.00
Coeff. λ SLV	1.00
Rapporto di sovraresistenza (α_0/α_1)	--
Valore di riferimento del fattore di comportamento (q ₀)	2.50
Fattore riduttivo (K _v)	1.00
Fattore riduttivo regolarità in altezza (KR)	1.00
Fattore di comportamento dissipativo (q)	2.50
Fattore di comportamento non dissipativo (qND)	1.50
Fattore di comportamento per SLD (qD)	1.50

- Categoria topografica: T1 - Superficie pianeggiante, pendii e rilievi isolati con inclinazione media $i \leq 15^\circ$
- Coeff. amplificazione topografica S_T: 1.00
- Accelerazione di picco del terreno AgS: 0.2213 <g>
- Fattore di comportamento per sisma verticale (qv): 1.50
- Smorzamento spettro: 5.00%

Ambienti di carico

Simbologia

N = Numero
 Comm. = Commento
 1=Permanenti strutturali
 2=Permanenti non strutturali
 3=Accidentali neve
 4=Accidentali manutenzione
 5=Vento x
 6=Vento lungo y
 7=Neve accumulo
 F = azioni orizzontali convenzionali
 SLU = Stato limite ultimo
 SLR = Stato limite per combinazioni rare
 SLF = Stato limite per combinazioni frequenti
 SLQ/D = Stato limite per combinazioni quasi permanenti o di danno
 S = Si
 N = No

N	Comm.	1	2	3	4	5	6	7	S	SLU	SLR	SLF	SLQ
1	Calcolo sismico	S	S	S	S	N	N	N	S	S	N	N	N
2	Calcolo statico	S	S	S	S	N	N	N	S	S	S	S	S
3	Vento da 0°	S	S	S	S	S	S	N	S	S	S	S	S

Elenco combinazioni di carico simboliche

Simbologia

CC = Numero della combinazione delle condizioni di carico elementari
 Comm. = Commento
 TCC = Tipo di combinazione di carico
 SLU = Stato limite ultimo
 SLE R = Stato limite d'esercizio, combinazione rara
 SLE F = Stato limite d'esercizio, combinazione frequente
 SLE Q = Stato limite d'esercizio, combinazione quasi permanente
 SLD = Stato limite di danno
 SND = Stato limite di salvaguardia della vita (non dissipativo)

CC	Comm.	TCC	1	2	3	4	5	6	7	S
1	Amb. 1 (Sisma)	SLU S	1	1	Ψ_2	Ψ_2	-----	-----	Ψ_2	1
2	Amb. 2 (SLU)	SLU	γ max	γ max	γ max	$\Psi_0 * \gamma$ max	-----	-----	γ max	-----
3	Amb. 2 (SLE R)	SLE R	1	1	1	Ψ_0	-----	-----	1	-----
4	Amb. 2 (SLE F)	SLE F	1	1	Ψ_1	Ψ_2	-----	-----	Ψ_1	-----
5	Amb. 2 (SLE Q)	SLE Q	1	1	Ψ_2	Ψ_2	-----	-----	Ψ_2	-----
6	Amb. 3 (SLU)	SLU	γ max	γ max	γ max	$\Psi_0 * \gamma$ max	γ max	γ max	γ max	-----
7	Amb. 3 (SLE R)	SLE R	1	1	1	Ψ_0	1	1	1	-----
8	Amb. 3 (SLE F)	SLE F	1	1	Ψ_1	Ψ_2	Ψ_1	Ψ_1	Ψ_1	-----
9	Amb. 3 (SLE Q)	SLE Q	1	1	Ψ_2	Ψ_2	Ψ_2	Ψ_2	Ψ_2	-----

Genera le combinazioni con un solo carico di tipo variabile come di base: No

Considera sollecitazioni dinamiche con segno dei modi principali: No

Combinazioni delle CCE

Simbologia

An. = Tipo di analisi
 L = Lineare
 NL = Non lineare
 PD = P-Delta
 Bk = Buckling
 S = Si
 N = No
 CC = Numero della combinazione delle condizioni di carico elementari
 Comm. = Commento
 TCC = Tipo di combinazione di carico
 SLU = Stato limite ultimo
 SLE R = Stato limite d'esercizio, combinazione rara
 SLE F = Stato limite d'esercizio, combinazione frequente
 SLE Q = Stato limite d'esercizio, combinazione quasi permanente
 SLD = Stato limite di danno
 SND = Stato limite di salvaguardia della vita (non dissipativo)

CC	Comm.	TCC	An.	Bk	1	2	3	4	5	6	7	S X	S Y
1	Amb. 1 (SLU S) S +X+0.3Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.30
2	Amb. 1 (SLE) S +X+0.3Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.30
3	Amb. 1 (SLU S) S +X-0.3Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	-0.30
4	Amb. 1 (SLE) S +X-0.3Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	-0.30
5	Amb. 1 (SLU S) S -X+0.3Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.30
6	Amb. 1 (SLE) S -X+0.3Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.30
7	Amb. 1 (SLU S) S -X-0.3Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-1.00	-0.30
8	Amb. 1 (SLE) S -X-0.3Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-1.00	-0.30
9	Amb. 1 (SLU S) S +0.3X+Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.30	1.00
10	Amb. 1 (SLE) S +0.3X+Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.30	1.00
11	Amb. 1 (SLU S) S -0.3X+Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.30	1.00
12	Amb. 1 (SLE) S -0.3X+Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.30	1.00
13	Amb. 1 (SLU S) S +0.3X-Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.30	-1.00
14	Amb. 1 (SLE) S +0.3X-Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.30	-1.00
15	Amb. 1 (SLU S) S -0.3X-Y	SND	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.30	-1.00
16	Amb. 1 (SLE) S -0.3X-Y	SLD	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.30	-1.00

17	Amb. 2 (SLU) NEVE BASE	SLU	L	N	1.30	1.50	1.50	0.00	0.90	0.90	1.50	0.00	0.00
18	Amb. 2 (SLE R)	SLE R	L	N	1.00	1.00	1.00	0.00	0.60	0.60	1.00	0.00	0.00
19	Amb. 2 (SLE F)	SLE F	L	N	1.00	1.00	0.20	0.00	0.00	0.00	0.20	0.00	0.00
20	Amb. 2 (SLE Q)	SLE Q	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	Amb. 3 (SLU) VENTO Y	SLU	L	N	1.30	1.50	0.75	0.00	0.00	1.50	0.75	0.00	0.00
22	VENTO X	SLU	L	N	1.30	1.50	0.75	0.00	1.50	0.00	0.75	0.00	0.00
23	Amb. 3 (SLE R)	SLE R	L	N	1.00	1.00	0.50	0.00	1.00	1.00	0.50	0.00	0.00
24	Amb. 3 (SLE F)	SLE F	L	N	1.00	1.00	0.20	0.00	0.20	0.20	0.20	0.00	0.00
25	Amb. 3 (SLE Q)	SLE Q	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	MANUTENZIONE BASE	SLU	L	N	1.30	1.50	0.75	1.30	0.90	0.90	0.75	0.00	0.00
27	MANUTENZIONE BASE	SLE R	L	N	1.00	1.00	0.50	1.00	0.60	0.60	0.50	0.00	0.00
28	NEVE	SLU	L	N	1.30	1.50	1.50	0.00	0.00	0.00	1.50	0.00	0.00
29	VENTO Y SLE	SLE R	L	N	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
30	ECCEZIONALE	SLU	L	N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	VENTO X	SLE R	L	N	1.30	1.50	0.00	0.00	1.50	0.00	0.00	0.00	0.00
32	NEVE SLU	SLU	L	N	1.30	1.50	1.50	0.00	0.00	0.00	1.50	0.00	0.00
33	NEVE SLE	SLE R	L	N	1.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00

ELENCO MASSE NODI

Simbologia

Mo = Massa orizzontale

Nodo = Numero del nodo

Nodo	Mo <kg>	Nodo	Mo <kg>	Nodo	Mo <kg>	Nodo	Mo <kg>	Nodo	Mo <kg>	Nodo	Mo <kg>	Nodo	Mo <kg>	Nodo	Mo <kg>
-285	352.08	-284	435.95	-283	434.72	-282	497.12	-281	497.12	-280	497.12	-279	497.12	-278	497.12
-276	432.89	-275	349.02	-274	351.89	-273	435.65	-272	434.43	-271	496.75	-270	496.75	-269	496.75
-267	496.75	-266	434.43	-265	432.59	-264	348.83	-263	428.75	-262	478.82	-261	477.37	-260	549.78
-258	549.78	-257	549.78	-256	549.78	-255	477.37	-254	475.21	-253	425.14	-252	428.41	-251	478.75
-249	549.70	-248	549.70	-247	549.70	-246	549.70	-245	549.70	-244	477.30	-243	475.14	-242	424.81
-240	413.23	-239	460.02	-238	459.86	-237	458.76	-236	458.60	-235	524.41	-234	524.22	-233	524.41
-231	524.41	-230	524.22	-229	524.41	-228	524.22	-227	524.41	-226	524.22	-225	458.76	-224	458.60
-222	456.71	-221	410.18	-220	410.08	-219	360.60	-218	414.74	-217	413.71	-216	467.44	-215	467.44
-213	467.44	-212	467.44	-211	413.71	-210	412.16	-209	358.02	-208	360.54	-207	414.67	-206	413.64
-204	467.36	-203	467.36	-202	467.36	-201	467.36	-200	413.64	-199	412.08	-198	357.95	-197	137.22
-195	79.24	-194	137.22	-193	131.44	-192	79.24	-191	392.88	-190	119.43	-189	140.02	-188	119.43
-186	406.40	-185	406.40	-184	405.40	-183	405.40	-182	457.73	-181	457.73	-180	457.73	-179	457.73
-177	457.73	-176	457.73	-175	457.73	-174	457.73	-173	457.73	-172	405.40	-171	405.40	-170	403.89
-168	390.37	-167	119.43	-166	140.02	-165	119.43	-164	390.37	-163	79.06	-162	131.58	-161	137.22
-159	131.58	-158	137.22	-157	140.02	-156	140.02	-155	376.06	-154	376.06	-153	417.56	-152	417.56
-150	416.56	-149	468.42	-148	468.42	-147	468.42	-146	468.42	-145	468.42	-144	468.42	-143	468.42
-141	468.42	-140	468.42	-139	416.56	-138	416.56	-137	415.07	-136	415.07	-135	383.09	-134	373.57
-132	349.55	-131	391.47	-130	409.14	-129	390.53	-128	408.17	-127	439.92	-126	459.23	-125	439.92
-123	439.92	-122	459.23	-121	439.92	-120	459.23	-119	439.92	-118	459.23	-117	390.53	-116	408.17
-114	406.70	-113	332.22	-112	347.11	-111	85.65	-110	108.38	-109	110.03	-108	145.41	-107	145.87
-105	146.35	-104	145.96	-103	146.32	-102	146.01	-101	145.41	-100	110.20	-99	108.38	-98	85.65
-96	108.38	-95	110.03	-94	145.41	-93	145.87	-92	146.14	-91	146.35	-90	145.96	-89	146.32
-87	145.41	-86	110.20	-85	108.38	-84	85.65	-83	308.51	-82	367.81	-81	366.92	-80	414.07
-78	414.07	-77	414.07	-76	414.07	-75	366.92	-74	365.58	-73	306.29	-72	338.34	-71	403.00
-69	452.52	-68	452.52	-67	452.52	-66	452.52	-65	452.52	-64	402.04	-63	400.59	-62	335.93
-60	419.07	-59	409.36	-58	460.53	-57	460.53	-56	460.53	-55	460.53	-54	460.53	-53	409.36
-51	350.66	-50	337.51	-49	400.69	-48	392.33	-47	441.89	-46	441.89	-45	441.89	-44	441.89
-42	392.33	-41	398.18	-40	335.00	-39	107.69	-38	106.99	-37	108.69	-36	143.50	-35	144.04
-33	144.43	-32	144.43	-31	144.31	-30	144.00	-29	143.50	-28	108.73	-27	106.99	-26	43.16
-24	43.16	-23	41.16	-22	42.58	-21	40.63	-20	42.58	-19	40.63	-18	107.69	-17	106.99
-15	143.50	-14	144.04	-13	144.31	-12	144.43	-11	144.43	-10	144.31	-9	144.00	-8	143.50
-6	106.99	-5	107.69	40	63.76	101	277.18	116	303.06	117	303.28	118	334.44	119	319.48
121	351.95	122	389.73	123	351.95	124	389.73	125	351.95	126	389.73	127	351.95	128	389.73
130	389.73	131	319.48	132	353.99	133	304.10	134	335.37	139	277.96	154	303.96	201	340.96
203	406.54	204	406.54	205	408.00	206	408.00	207	459.05	208	459.05	209	459.05	210	459.05
212	459.05	213	459.05	214	459.05	215	459.05	216	459.05	217	408.00	218	408.00	219	408.98
221	343.40	222	343.40	301	336.83	302	336.83	303	403.05	304	403.05	305	404.52	306	404.52
308	455.97	309	455.97	310	455.97	311	455.97	312	455.97	313	455.97	314	455.97	315	455.97
317	404.52	318	404.52	319	405.51	320	405.51	321	339.29	322	339.29	401	343.87	402	343.35
404	412.34	405	414.50	406	413.88	407	467.73	408	467.05	409	467.73	410	467.05	411	467.73
413	467.73	414	467.05	415	467.73	416	467.05	417	414.50	418	413.88	419	415.52	420	414.90
422	345.91	501	350.33	502	350.19	503	421.28	504	421.11	505	422.89	506	422.72	507	479.86
509	479.86	510	479.68	511	479.86	512	479.68	513	479.86	514	479.68	515	479.86	516	479.68
518	422.72	519	423.96	520	423.79	521	353.01	522	352.87	601	385.35	602	386.19	603	484.81
605	486.99	606	488.04	607	561.65	608	562.83	609	561.65	610	562.83	611	561.65	612	562.83
614	562.83	615	561.65	616	562.83	617	486.99	618	488.04	619	488.45	620	489.50	621	388.99
701	370.96	702	370.87	703	468.93	704	468.82	705	471.06	706	470.94	707	542.20	708	542.08
				709	542.20										

710	542.08	711	542.20	712	542.08	713	542.20	714	542.08	715	542.20	716	542.08	717	471.06	718	470.94
719	472.47	720	472.36	721	374.50	722	374.41	807	427.15	810	426.05	845	430.69	848	429.59	849	470.27
850	468.66	851	472.40	852	470.79	853	543.71	854	541.90	855	543.71	856	541.90	857	543.71	858	541.90
859	543.71	860	541.90	861	543.71	862	541.90	863	472.40	864	470.79	865	473.82	866	472.20	908	384.46
909	385.15	946	387.03	947	387.73	948	395.66	949	396.97	950	397.20	951	398.52	952	450.68	953	452.13
954	450.68	955	452.13	956	450.68	957	452.13	958	450.68	959	452.13	960	450.68	961	452.13	962	397.20
963	398.52	964	398.23	965	399.55	1001	326.71	1002	396.31	1003	397.86	1004	451.40	1005	451.40	1006	451.40
1007	451.40	1008	451.40	1009	397.86	1010	398.89	1011	329.29								

Totali masse nodi

Mo
<kg>
187735.00

ELENCO FORZE SISMICHE NODALI ALLO SLD

Simbologia

Fx = Forza in dir. X
 Fy = Forza in dir. Y
 Nodo = Numero del nodo
 cx = Coeff. c in dir. X
 cy = Coeff. c in dir. Y

Nodo	cx	cy	Fx <daN>	Fy <daN>	Nodo	cx	cy	Fx <daN>	Fy <daN>	Nodo	cx	cy	Fx <daN>	Fy <daN>	Nodo	cx	cy	Fx <daN>	Fy <daN>
-285	0.00	0.00	71.33	71.33	-284	0.00	0.00	88.32	88.32	-283	0.00	0.00	88.07	88.07	-282	0.00	0.00	100.71	100.71
-281	0.00	0.00	100.71	100.71	-280	0.00	0.00	100.71	100.71	-279	0.00	0.00	100.71	100.71	-278	0.00	0.00	100.71	100.71
-277	0.00	0.00	88.07	88.07	-276	0.00	0.00	87.70	87.70	-275	0.00	0.00	70.71	70.71	-274	0.00	0.00	71.26	71.26
-273	0.00	0.00	88.22	88.22	-272	0.00	0.00	87.97	87.97	-271	0.00	0.00	100.59	100.59	-270	0.00	0.00	100.59	100.59
-269	0.00	0.00	100.59	100.59	-268	0.00	0.00	100.59	100.59	-267	0.00	0.00	100.59	100.59	-266	0.00	0.00	87.97	87.97
-265	0.00	0.00	87.60	87.60	-264	0.00	0.00	70.64	70.64	-263	0.00	0.00	84.30	84.30	-262	0.00	0.00	94.14	94.14
-261	0.00	0.00	93.86	93.86	-260	0.00	0.00	108.09	108.09	-259	0.00	0.00	108.09	108.09	-258	0.00	0.00	108.09	108.09
-257	0.00	0.00	108.09	108.09	-256	0.00	0.00	108.09	108.09	-255	0.00	0.00	93.86	93.86	-254	0.00	0.00	93.43	93.43
-253	0.00	0.00	83.59	83.59	-252	0.00	0.00	84.20	84.20	-251	0.00	0.00	94.09	94.09	-250	0.00	0.00	93.81	93.81
-249	0.00	0.00	108.03	108.03	-248	0.00	0.00	108.03	108.03	-247	0.00	0.00	108.03	108.03	-246	0.00	0.00	108.03	108.03
-245	0.00	0.00	108.03	108.03	-244	0.00	0.00	93.81	93.81	-243	0.00	0.00	93.38	93.38	-242	0.00	0.00	83.49	83.49
-241	0.00	0.00	77.28	77.28	-240	0.00	0.00	77.27	77.27	-239	0.00	0.00	86.01	86.01	-238	0.00	0.00	85.99	85.99
-237	0.00	0.00	85.78	85.78	-236	0.00	0.00	85.75	85.75	-235	0.00	0.00	98.06	98.06	-234	0.00	0.00	98.02	98.02
-233	0.00	0.00	98.06	98.06	-232	0.00	0.00	98.02	98.02	-231	0.00	0.00	98.06	98.06	-230	0.00	0.00	98.02	98.02
-229	0.00	0.00	98.06	98.06	-228	0.00	0.00	98.02	98.02	-227	0.00	0.00	98.06	98.06	-226	0.00	0.00	98.02	98.02
-225	0.00	0.00	85.78	85.78	-224	0.00	0.00	85.75	85.75	-223	0.00	0.00	85.43	85.43	-222	0.00	0.00	85.40	85.40
-221	0.00	0.00	76.70	76.70	-220	0.00	0.00	76.68	76.68	-219	0.00	0.00	62.49	62.49	-218	0.00	0.00	71.87	71.87
-217	0.00	0.00	71.69	71.69	-216	0.00	0.00	81.00	81.00	-215	0.00	0.00	81.00	81.00	-214	0.00	0.00	81.00	81.00
-213	0.00	0.00	81.00	81.00	-212	0.00	0.00	81.00	81.00	-211	0.00	0.00	71.69	71.69	-210	0.00	0.00	71.42	71.42
-209	0.00	0.00	62.04	62.04	-208	0.00	0.00	62.42	62.42	-207	0.00	0.00	71.79	71.79	-206	0.00	0.00	71.61	71.61
-205	0.00	0.00	80.91	80.91	-204	0.00	0.00	80.91	80.91	-203	0.00	0.00	80.91	80.91	-202	0.00	0.00	80.91	80.91
-201	0.00	0.00	80.91	80.91	-200	0.00	0.00	71.61	71.61	-199	0.00	0.00	71.34	71.34	-198	0.00	0.00	61.97	61.97
-197	0.00	0.00	21.31	21.31	-196	0.00	0.00	20.41	20.41	-195	0.00	0.00	12.31	12.31	-194	0.00	0.00	21.31	21.31
-193	0.00	0.00	20.41	20.41	-192	0.00	0.00	12.31	12.31	-191	0.00	0.00	60.98	60.98	-190	0.00	0.00	18.54	18.54
-189	0.00	0.00	21.73	21.73	-188	0.00	0.00	18.54	18.54	-187	0.00	0.00	60.98	60.98	-186	0.00	0.00	63.08	63.08
-185	0.00	0.00	63.08	63.08	-184	0.00	0.00	62.93	62.93	-183	0.00	0.00	62.93	62.93	-182	0.00	0.00	71.05	71.05
-181	0.00	0.00	71.05	71.05	-180	0.00	0.00	71.05	71.05	-179	0.00	0.00	71.05	71.05	-178	0.00	0.00	71.05	71.05
-177	0.00	0.00	71.05	71.05	-176	0.00	0.00	71.05	71.05	-175	0.00	0.00	71.05	71.05	-174	0.00	0.00	71.05	71.05
-173	0.00	0.00	71.05	71.05	-172	0.00	0.00	62.93	62.93	-171	0.00	0.00	62.93	62.93	-170	0.00	0.00	62.69	62.69
-169	0.00	0.00	62.69	62.69	-168	0.00	0.00	60.59	60.59	-167	0.00	0.00	18.54	18.54	-166	0.00	0.00	21.73	21.73
-165	0.00	0.00	18.54	18.54	-164	0.00	0.00	60.59	60.59	-163	0.00	0.00	12.27	12.27	-162	0.00	0.00	20.41	20.41
-161	0.00	0.00	21.29	21.29	-160	0.00	0.00	12.27	12.27	-159	0.00	0.00	20.41	20.41	-158	0.00	0.00	21.29	21.29
-157	0.00	0.00	21.69	21.69	-156	0.00	0.00	21.69	21.69	-155	0.00	0.00	49.81	49.81	-154	0.00	0.00	49.81	49.81
-153	0.00	0.00	55.31	55.31	-152	0.00	0.00	55.31	55.31	-151	0.00	0.00	55.18	55.18	-150	0.00	0.00	55.18	55.18
-149	0.00	0.00	62.05	62.05	-148	0.00	0.00	62.05	62.05	-147	0.00	0.00	62.05	62.05	-146	0.00	0.00	62.05	62.05
-145	0.00	0.00	62.05	62.05	-144	0.00	0.00	62.05	62.05	-143	0.00	0.00	62.05	62.05	-142	0.00	0.00	62.05	62.05
-141	0.00	0.00	62.05	62.05	-140	0.00	0.00	62.05	62.05	-139	0.00	0.00	55.18	55.18	-138	0.00	0.00	55.18	55.18
-137	0.00	0.00	54.98	54.98	-136	0.00	0.00	54.98	54.98	-135	0.00	0.00	50.74	50.74	-134	0.00	0.00	49.48	49.48
-133	0.00	0.00	34.65	34.65	-132	0.00	0.00	36.20	36.20	-131	0.00	0.00	40.54	40.54	-130	0.00	0.00	42.37	42.37
-129	0.00	0.00	40.44	40.44	-128	0.00	0.00	42.27	42.27	-127	0.00	0.00	45.56	45.56	-126	0.00	0.00	47.56	47.56
-125	0.00	0.00	45.56	45.56	-124	0.00	0.00	47.56	47.56	-123	0.00	0.00	45.56	45.56	-122	0.00	0.00	47.56	47.56
-121	0.00	0.00	45.56	45.56	-120	0.00	0.00	47.56	47.56	-119	0.00	0.00	45.56	45.56	-118	0.00	0.00	47.56	47.56
-117	0.00	0.00	40.44	40.44	-116	0.00	0.00	42.27	42.27	-115	0.00	0.00	40.30	40.30	-114	0.00	0.00	42.12	42.12
-113	0.00	0.00	34.41	34.41	-112	0.00	0.00	35.95	35.95	-111	0.00	0.00	8.86	8.86	-110	0.00	0.00	11.22	11.22
-109	0.00	0.00	11.39	11.39	-108	0.00	0.00	15.05	15.05	-107	0.00	0.00	15.09	15.09	-106	0.00	0.00	15.12	15.12
-105	0.00	0.00	15.14	15.14	-104	0.00	0.00	15.10	15.10	-103	0.00	0.00	15.14	15.14	-102	0.00	0.00	15.11	15.11

-101	0.00	0.00	15.05	15.05	-100	0.00	0.00	11.40	11.40	-99	0.00	0.00	11.22	11.22	-98	0.00	0.00	8.86	8.86
-97	0.00	0.00	9.85	9.85	-96	0.00	0.00	11.22	11.22	-95	0.00	0.00	11.39	11.39	-94	0.00	0.00	15.05	15.05
-93	0.00	0.00	15.09	15.09	-92	0.00	0.00	15.12	15.12	-91	0.00	0.00	15.14	15.14	-90	0.00	0.00	15.10	15.10
-89	0.00	0.00	15.14	15.14	-88	0.00	0.00	15.11	15.11	-87	0.00	0.00	15.05	15.05	-86	0.00	0.00	11.40	11.40
-85	0.00	0.00	11.22	11.22	-84	0.00	0.00	8.86	8.86	-83	0.00	0.00	27.08	27.08	-82	0.00	0.00	32.28	32.28
-81	0.00	0.00	32.20	32.20	-80	0.00	0.00	36.34	36.34	-79	0.00	0.00	36.34	36.34	-78	0.00	0.00	36.34	36.34
-77	0.00	0.00	36.34	36.34	-76	0.00	0.00	36.34	36.34	-75	0.00	0.00	32.20	32.20	-74	0.00	0.00	32.08	32.08
-73	0.00	0.00	26.88	26.88	-72	0.00	0.00	29.13	29.13	-71	0.00	0.00	34.69	34.69	-70	0.00	0.00	34.61	34.61
-69	0.00	0.00	38.96	38.96	-68	0.00	0.00	38.96	38.96	-67	0.00	0.00	38.96	38.96	-66	0.00	0.00	38.96	38.96
-65	0.00	0.00	38.96	38.96	-64	0.00	0.00	34.61	34.61	-63	0.00	0.00	34.49	34.49	-62	0.00	0.00	28.92	28.92
-61	0.00	0.00	25.31	25.31	-60	0.00	0.00	30.02	30.02	-59	0.00	0.00	29.33	29.33	-58	0.00	0.00	32.99	32.99
-57	0.00	0.00	32.99	32.99	-56	0.00	0.00	32.99	32.99	-55	0.00	0.00	32.99	32.99	-54	0.00	0.00	32.99	32.99
-53	0.00	0.00	29.33	29.33	-52	0.00	0.00	29.83	29.83	-51	0.00	0.00	25.12	25.12	-50	0.00	0.00	23.05	23.05
-49	0.00	0.00	27.37	27.37	-48	0.00	0.00	26.80	26.80	-47	0.00	0.00	30.18	30.18	-46	0.00	0.00	30.18	30.18
-45	0.00	0.00	30.18	30.18	-44	0.00	0.00	30.18	30.18	-43	0.00	0.00	30.18	30.18	-42	0.00	0.00	26.80	26.80
-41	0.00	0.00	27.19	27.19	-40	0.00	0.00	22.88	22.88	-39	0.00	0.00	5.40	5.40	-38	0.00	0.00	5.37	5.37
-37	0.00	0.00	5.45	5.45	-36	0.00	0.00	7.20	7.20	-35	0.00	0.00	7.22	7.22	-34	0.00	0.00	7.24	7.24
-33	0.00	0.00	7.24	7.24	-32	0.00	0.00	7.24	7.24	-31	0.00	0.00	7.24	7.24	-30	0.00	0.00	7.22	7.22
-29	0.00	0.00	7.20	7.20	-28	0.00	0.00	5.45	5.45	-27	0.00	0.00	5.37	5.37	-26	0.00	0.00	2.16	2.16
-25	0.00	0.00	2.06	2.06	-24	0.00	0.00	2.16	2.16	-23	0.00	0.00	2.06	2.06	-22	0.00	0.00	2.14	2.14
-21	0.00	0.00	2.04	2.04	-20	0.00	0.00	2.14	2.14	-19	0.00	0.00	2.04	2.04	-18	0.00	0.00	5.40	5.40
-17	0.00	0.00	5.37	5.37	-16	0.00	0.00	5.45	5.45	-15	0.00	0.00	7.20	7.20	-14	0.00	0.00	7.22	7.22
-13	0.00	0.00	7.24	7.24	-12	0.00	0.00	7.24	7.24	-11	0.00	0.00	7.24	7.24	-10	0.00	0.00	7.24	7.24
-9	0.00	0.00	7.22	7.22	-8	0.00	0.00	7.20	7.20	-7	0.00	0.00	5.45	5.45	-6	0.00	0.00	5.37	5.37
-5	0.00	0.00	5.40	5.40	40	0.00	0.00	3.20	3.20	101	0.00	0.00	13.90	13.90	116	0.00	0.00	15.20	15.20
117	0.00	0.00	15.21	15.21	118	0.00	0.00	16.77	16.77	119	0.00	0.00	16.02	16.02	120	0.00	0.00	17.75	17.75
121	0.00	0.00	17.65	17.65	122	0.00	0.00	19.54	19.54	123	0.00	0.00	17.65	17.65	124	0.00	0.00	19.54	19.54
125	0.00	0.00	17.65	17.65	126	0.00	0.00	19.54	19.54	127	0.00	0.00	17.65	17.65	128	0.00	0.00	19.54	19.54
129	0.00	0.00	17.65	17.65	130	0.00	0.00	19.54	19.54	131	0.00	0.00	16.02	16.02	132	0.00	0.00	17.75	17.75
133	0.00	0.00	15.25	15.25	134	0.00	0.00	16.82	16.82	139	0.00	0.00	13.94	13.94	154	0.00	0.00	15.24	15.24
201	0.00	0.00	40.49	40.49	202	0.00	0.00	40.49	40.49	203	0.00	0.00	48.28	48.28	204	0.00	0.00	48.28	48.28
205	0.00	0.00	48.46	48.46	206	0.00	0.00	48.46	48.46	207	0.00	0.00	54.52	54.52	208	0.00	0.00	54.52	54.52
209	0.00	0.00	54.52	54.52	210	0.00	0.00	54.52	54.52	211	0.00	0.00	54.52	54.52	212	0.00	0.00	54.52	54.52
213	0.00	0.00	54.52	54.52	214	0.00	0.00	54.52	54.52	215	0.00	0.00	54.52	54.52	216	0.00	0.00	54.52	54.52
217	0.00	0.00	48.46	48.46	218	0.00	0.00	48.46	48.46	219	0.00	0.00	48.57	48.57	220	0.00	0.00	48.57	48.57
221	0.00	0.00	40.78	40.78	222	0.00	0.00	40.78	40.78	301	0.00	0.00	48.74	48.74	302	0.00	0.00	48.74	48.74
303	0.00	0.00	58.33	58.33	304	0.00	0.00	58.33	58.33	305	0.00	0.00	58.54	58.54	306	0.00	0.00	58.54	58.54
307	0.00	0.00	65.98	65.98	308	0.00	0.00	65.98	65.98	309	0.00	0.00	65.98	65.98	310	0.00	0.00	65.98	65.98
311	0.00	0.00	65.98	65.98	312	0.00	0.00	65.98	65.98	313	0.00	0.00	65.98	65.98	314	0.00	0.00	65.98	65.98
315	0.00	0.00	65.98	65.98	316	0.00	0.00	65.98	65.98	317	0.00	0.00	58.54	58.54	318	0.00	0.00	58.54	58.54
319	0.00	0.00	58.68	58.68	320	0.00	0.00	58.68	58.68	321	0.00	0.00	49.10	49.10	322	0.00	0.00	49.10	49.10
401	0.00	0.00	56.77	56.77	402	0.00	0.00	56.68	56.68	403	0.00	0.00	68.18	68.18	404	0.00	0.00	68.07	68.07
405	0.00	0.00	68.43	68.43	406	0.00	0.00	68.33	68.33	407	0.00	0.00	77.22	77.22	408	0.00	0.00	77.11	77.11
409	0.00	0.00	77.22	77.22	410	0.00	0.00	77.11	77.11	411	0.00	0.00	77.22	77.22	412	0.00	0.00	77.11	77.11
413	0.00	0.00	77.22	77.22	414	0.00	0.00	77.11	77.11	415	0.00	0.00	77.22	77.22	416	0.00	0.00	77.11	77.11
417	0.00	0.00	68.43	68.43	418	0.00	0.00	68.33	68.33	419	0.00	0.00	68.60	68.60	420	0.00	0.00	68.50	68.50
421	0.00	0.00	57.19	57.19	422	0.00	0.00	57.11	57.11	501	0.00	0.00	63.25	63.25	502	0.00	0.00	63.22	63.22
503	0.00	0.00	76.06	76.06	504	0.00	0.00	76.03	76.03	505	0.00	0.00	76.35	76.35	506	0.00	0.00	76.32	76.32
507	0.00	0.00	86.63	86.63	508	0.00	0.00	86.60	86.60	509	0.00	0.00	86.63	86.63	510	0.00	0.00	86.60	86.60
511	0.00	0.00	86.63	86.63	512	0.00	0.00	86.60	86.60	513	0.00	0.00	86.63	86.63	514	0.00	0.00	86.60	86.60
515	0.00	0.00	86.63	86.63	516	0.00	0.00	86.60	86.60	517	0.00	0.00	76.35	76.35	518	0.00	0.00	76.32	76.32
519	0.00	0.00	76.54	76.54	520	0.00	0.00	76.51	76.51	521	0.00	0.00	63.73	63.73	522	0.00	0.00	63.70	63.70
601	0.00	0.00	74.11	74.11	602	0.00	0.00	74.27	74.27	603	0.00	0.00	93.24	93.24	604	0.00	0.00	93.44	93.44

605	0.00	0.00	93.66	93.66	606	0.00	0.00	93.86	93.86	607	0.00	0.00	108.01	108.01	608	0.00	0.00	108.24	108.24
609	0.00	0.00	108.01	108.01	610	0.00	0.00	108.24	108.24	611	0.00	0.00	108.01	108.01	612	0.00	0.00	108.24	108.24
613	0.00	0.00	108.01	108.01	614	0.00	0.00	108.24	108.24	615	0.00	0.00	108.01	108.01	616	0.00	0.00	108.24	108.24
617	0.00	0.00	93.66	93.66	618	0.00	0.00	93.86	93.86	619	0.00	0.00	93.94	93.94	620	0.00	0.00	94.14	94.14
621	0.00	0.00	74.81	74.81	622	0.00	0.00	74.97	74.97	701	0.00	0.00	73.88	73.88	702	0.00	0.00	73.86	73.86
703	0.00	0.00	93.39	93.39	704	0.00	0.00	93.37	93.37	705	0.00	0.00	93.82	93.82	706	0.00	0.00	93.79	93.79
707	0.00	0.00	107.98	107.98	708	0.00	0.00	107.96	107.96	709	0.00	0.00	107.98	107.98	710	0.00	0.00	107.96	107.96
711	0.00	0.00	107.98	107.98	712	0.00	0.00	107.96	107.96	713	0.00	0.00	107.98	107.98	714	0.00	0.00	107.96	107.96
715	0.00	0.00	107.98	107.98	716	0.00	0.00	107.96	107.96	717	0.00	0.00	93.82	93.82	718	0.00	0.00	93.79	93.79
719	0.00	0.00	94.10	94.10	720	0.00	0.00	94.08	94.08	721	0.00	0.00	74.59	74.59	722	0.00	0.00	74.57	74.57
807	0.00	0.00	85.89	85.89	810	0.00	0.00	85.67	85.67	845	0.00	0.00	86.60	86.60	848	0.00	0.00	86.38	86.38
849	0.00	0.00	94.56	94.56	850	0.00	0.00	94.23	94.23	851	0.00	0.00	94.99	94.99	852	0.00	0.00	94.66	94.66
853	0.00	0.00	109.33	109.33	854	0.00	0.00	108.96	108.96	855	0.00	0.00	109.33	109.33	856	0.00	0.00	108.96	108.96
857	0.00	0.00	109.33	109.33	858	0.00	0.00	108.96	108.96	859	0.00	0.00	109.33	109.33	860	0.00	0.00	108.96	108.96
861	0.00	0.00	109.33	109.33	862	0.00	0.00	108.96	108.96	863	0.00	0.00	94.99	94.99	864	0.00	0.00	94.66	94.66
865	0.00	0.00	95.27	95.27	866	0.00	0.00	94.95	94.95	908	0.00	0.00	78.16	78.16	909	0.00	0.00	78.30	78.30
946	0.00	0.00	78.68	78.68	947	0.00	0.00	78.83	78.83	948	0.00	0.00	80.44	80.44	949	0.00	0.00	80.70	80.70
950	0.00	0.00	80.75	80.75	951	0.00	0.00	81.02	81.02	952	0.00	0.00	91.62	91.62	953	0.00	0.00	91.92	91.92
954	0.00	0.00	91.62	91.62	955	0.00	0.00	91.92	91.92	956	0.00	0.00	91.62	91.62	957	0.00	0.00	91.92	91.92
958	0.00	0.00	91.62	91.62	959	0.00	0.00	91.92	91.92	960	0.00	0.00	91.62	91.62	961	0.00	0.00	91.92	91.92
962	0.00	0.00	80.75	80.75	963	0.00	0.00	81.02	81.02	964	0.00	0.00	80.96	80.96	965	0.00	0.00	81.23	81.23
1001	0.00	0.00	66.58	66.58	1002	0.00	0.00	80.76	80.76	1003	0.00	0.00	81.07	81.07	1004	0.00	0.00	91.99	91.99
1005	0.00	0.00	91.99	91.99	1006	0.00	0.00	91.99	91.99	1007	0.00	0.00	91.99	91.99	1008	0.00	0.00	91.99	91.99
1009	0.00	0.00	81.07	81.07	1010	0.00	0.00	81.28	81.28	1011	0.00	0.00	67.10	67.10					

Totali forze sismiche

Fx <daN>	Fy <daN>
29075.90	29075.90

Elenco forze sismiche nodali allo SND

Nodo	cx	cy	Fx <daN>	Fy <daN>	Nodo	cx	cy	Fx <daN>	Fy <daN>	Nodo	cx	cy	Fx <daN>	Fy <daN>	Nodo	cx	cy	Fx <daN>	Fy <daN>
-285	0.00	0.00	158.48	158.48	-284	0.00	0.00	196.23	196.23	-283	0.00	0.00	195.68	195.68	-282	0.00	0.00	223.76	223.76
-281	0.00	0.00	223.76	223.76	-280	0.00	0.00	223.76	223.76	-279	0.00	0.00	223.76	223.76	-278	0.00	0.00	223.76	223.76
-277	0.00	0.00	195.68	195.68	-276	0.00	0.00	194.85	194.85	-275	0.00	0.00	157.10	157.10	-274	0.00	0.00	158.33	158.33
-273	0.00	0.00	196.02	196.02	-272	0.00	0.00	195.47	195.47	-271	0.00	0.00	223.51	223.51	-270	0.00	0.00	223.51	223.51
-269	0.00	0.00	223.51	223.51	-268	0.00	0.00	223.51	223.51	-267	0.00	0.00	223.51	223.51	-266	0.00	0.00	195.47	195.47
-265	0.00	0.00	194.64	194.64	-264	0.00	0.00	156.96	156.96	-263	0.00	0.00	187.30	187.30	-262	0.00	0.00	209.17	209.17
-261	0.00	0.00	208.54	208.54	-260	0.00	0.00	240.18	240.18	-259	0.00	0.00	240.18	240.18	-258	0.00	0.00	240.18	240.18
-257	0.00	0.00	240.18	240.18	-256	0.00	0.00	240.18	240.18	-255	0.00	0.00	208.54	208.54	-254	0.00	0.00	207.60	207.60
-253	0.00	0.00	185.72	185.72	-252	0.00	0.00	187.08	187.08	-251	0.00	0.00	209.06	209.06	-250	0.00	0.00	208.43	208.43
-249	0.00	0.00	240.04	240.04	-248	0.00	0.00	240.04	240.04	-247	0.00	0.00	240.04	240.04	-246	0.00	0.00	240.04	240.04
-245	0.00	0.00	240.04	240.04	-244	0.00	0.00	208.43	208.43	-243	0.00	0.00	207.48	207.48	-242	0.00	0.00	185.50	185.50
-241	0.00	0.00	171.72	171.72	-240	0.00	0.00	171.68	171.68	-239	0.00	0.00	191.12	191.12	-238	0.00	0.00	191.05	191.05
-237	0.00	0.00	190.59	190.59	-236	0.00	0.00	190.53	190.53	-235	0.00	0.00	217.87	217.87	-234	0.00	0.00	217.79	217.79
-233	0.00	0.00	217.87	217.87	-232	0.00	0.00	217.79	217.79	-231	0.00	0.00	217.87	217.87	-230	0.00	0.00	217.79	217.79
-229	0.00	0.00	217.87	217.87	-228	0.00	0.00	217.79	217.79	-227	0.00	0.00	217.87	217.87	-226	0.00	0.00	217.79	217.79
-225	0.00	0.00	190.59	190.59	-224	0.00	0.00	190.53	190.53	-223	0.00	0.00	189.81	189.81	-222	0.00	0.00	189.74	189.74
-221	0.00	0.00	170.41	170.41	-220	0.00	0.00	170.37	170.37	-219	0.00	0.00	138.84	138.84	-218	0.00	0.00	159.69	159.69
-217	0.00	0.00	159.29	159.29	-216	0.00	0.00	179.98	179.98	-215	0.00	0.00	179.98	179.98	-214	0.00	0.00	179.98	179.98
-213	0.00	0.00	179.98	179.98	-212	0.00	0.00	179.98	179.98	-211	0.00	0.00	159.29	159.29	-210	0.00	0.00	158.69	158.69
-209	0.00	0.00	137.85	137.85	-208	0.00	0.00	138.69	138.69	-207	0.00	0.00	159.52	159.52	-206	0.00	0.00	159.12	159.12
-205	0.00	0.00	179.78	179.78	-204	0.00	0.00	179.78	179.78	-203	0.00	0.00	179.78	179.78	-202	0.00	0.00	179.78	179.78
-201	0.00	0.00	179.78	179.78	-200	0.00	0.00	159.12	159.12	-199	0.00	0.00	158.52	158.52	-198	0.00	0.00	137.70	137.70
-197	0.00	0.00	47.35	47.35	-196	0.00	0.00	45.36	45.36	-195	0.00	0.00	27.34	27.34	-194	0.00	0.00	47.35	47.35

-193	0.00	0.00	45.36	45.36	-192	0.00	0.00	27.34	27.34	-191	0.00	0.00	135.50	135.50	-190	0.00	0.00	41.19	41.19
-189	0.00	0.00	48.29	48.29	-188	0.00	0.00	41.19	41.19	-187	0.00	0.00	135.50	135.50	-186	0.00	0.00	140.16	140.16
-185	0.00	0.00	140.16	140.16	-184	0.00	0.00	139.82	139.82	-183	0.00	0.00	139.82	139.82	-182	0.00	0.00	157.87	157.87
-181	0.00	0.00	157.87	157.87	-180	0.00	0.00	157.87	157.87	-179	0.00	0.00	157.87	157.87	-178	0.00	0.00	157.87	157.87
-177	0.00	0.00	157.87	157.87	-176	0.00	0.00	157.87	157.87	-175	0.00	0.00	157.87	157.87	-174	0.00	0.00	157.87	157.87
-173	0.00	0.00	157.87	157.87	-172	0.00	0.00	139.82	139.82	-171	0.00	0.00	139.82	139.82	-170	0.00	0.00	139.30	139.30
-169	0.00	0.00	139.30	139.30	-168	0.00	0.00	134.63	134.63	-167	0.00	0.00	41.19	41.19	-166	0.00	0.00	48.29	48.29
-165	0.00	0.00	41.19	41.19	-164	0.00	0.00	134.63	134.63	-163	0.00	0.00	27.25	27.25	-162	0.00	0.00	45.36	45.36
-161	0.00	0.00	47.30	47.30	-160	0.00	0.00	27.25	27.25	-159	0.00	0.00	45.36	45.36	-158	0.00	0.00	47.30	47.30
-157	0.00	0.00	48.19	48.19	-156	0.00	0.00	48.19	48.19	-155	0.00	0.00	110.67	110.67	-154	0.00	0.00	110.67	110.67
-153	0.00	0.00	122.89	122.89	-152	0.00	0.00	122.89	122.89	-151	0.00	0.00	122.60	122.60	-150	0.00	0.00	122.60	122.60
-149	0.00	0.00	137.86	137.86	-148	0.00	0.00	137.86	137.86	-147	0.00	0.00	137.86	137.86	-146	0.00	0.00	137.86	137.86
-145	0.00	0.00	137.86	137.86	-144	0.00	0.00	137.86	137.86	-143	0.00	0.00	137.86	137.86	-142	0.00	0.00	137.86	137.86
-141	0.00	0.00	137.86	137.86	-140	0.00	0.00	137.86	137.86	-139	0.00	0.00	122.60	122.60	-138	0.00	0.00	122.60	122.60
-137	0.00	0.00	122.16	122.16	-136	0.00	0.00	122.16	122.16	-135	0.00	0.00	112.74	112.74	-134	0.00	0.00	109.94	109.94
-133	0.00	0.00	76.99	76.99	-132	0.00	0.00	80.43	80.43	-131	0.00	0.00	90.08	90.08	-130	0.00	0.00	94.14	94.14
-129	0.00	0.00	89.86	89.86	-128	0.00	0.00	93.92	93.92	-127	0.00	0.00	101.23	101.23	-126	0.00	0.00	105.67	105.67
-125	0.00	0.00	101.23	101.23	-124	0.00	0.00	105.67	105.67	-123	0.00	0.00	101.23	101.23	-122	0.00	0.00	105.67	105.67
-121	0.00	0.00	101.23	101.23	-120	0.00	0.00	105.67	105.67	-119	0.00	0.00	101.23	101.23	-118	0.00	0.00	105.67	105.67
-117	0.00	0.00	89.86	89.86	-116	0.00	0.00	93.92	93.92	-115	0.00	0.00	89.54	89.54	-114	0.00	0.00	93.58	93.58
-113	0.00	0.00	76.44	76.44	-112	0.00	0.00	79.87	79.87	-111	0.00	0.00	19.69	19.69	-110	0.00	0.00	24.92	24.92
-109	0.00	0.00	25.30	25.30	-108	0.00	0.00	33.43	33.43	-107	0.00	0.00	33.54	33.54	-106	0.00	0.00	33.60	33.60
-105	0.00	0.00	33.65	33.65	-104	0.00	0.00	33.56	33.56	-103	0.00	0.00	33.64	33.64	-102	0.00	0.00	33.57	33.57
-101	0.00	0.00	33.43	33.43	-100	0.00	0.00	25.34	25.34	-99	0.00	0.00	24.92	24.92	-98	0.00	0.00	19.69	19.69
-97	0.00	0.00	21.88	21.88	-96	0.00	0.00	24.92	24.92	-95	0.00	0.00	25.30	25.30	-94	0.00	0.00	33.43	33.43
-93	0.00	0.00	33.54	33.54	-92	0.00	0.00	33.60	33.60	-91	0.00	0.00	33.65	33.65	-90	0.00	0.00	33.56	33.56
-89	0.00	0.00	33.64	33.64	-88	0.00	0.00	33.57	33.57	-87	0.00	0.00	33.43	33.43	-86	0.00	0.00	25.34	25.34
-85	0.00	0.00	24.92	24.92	-84	0.00	0.00	19.69	19.69	-83	0.00	0.00	60.16	60.16	-82	0.00	0.00	71.72	71.72
-81	0.00	0.00	71.55	71.55	-80	0.00	0.00	80.74	80.74	-79	0.00	0.00	80.74	80.74	-78	0.00	0.00	80.74	80.74
-77	0.00	0.00	80.74	80.74	-76	0.00	0.00	80.74	80.74	-75	0.00	0.00	71.55	71.55	-74	0.00	0.00	71.29	71.29
-73	0.00	0.00	59.72	59.72	-72	0.00	0.00	64.72	64.72	-71	0.00	0.00	77.09	77.09	-70	0.00	0.00	76.90	76.90
-69	0.00	0.00	86.56	86.56	-68	0.00	0.00	86.56	86.56	-67	0.00	0.00	86.56	86.56	-66	0.00	0.00	86.56	86.56
-65	0.00	0.00	86.56	86.56	-64	0.00	0.00	76.90	76.90	-63	0.00	0.00	76.62	76.62	-62	0.00	0.00	64.26	64.26
-61	0.00	0.00	56.24	56.24	-60	0.00	0.00	66.71	66.71	-59	0.00	0.00	65.16	65.16	-58	0.00	0.00	73.31	73.31
-57	0.00	0.00	73.31	73.31	-56	0.00	0.00	73.31	73.31	-55	0.00	0.00	73.31	73.31	-54	0.00	0.00	73.31	73.31
-53	0.00	0.00	65.16	65.16	-52	0.00	0.00	66.29	66.29	-51	0.00	0.00	55.82	55.82	-50	0.00	0.00	51.22	51.22
-49	0.00	0.00	60.80	60.80	-48	0.00	0.00	59.54	59.54	-47	0.00	0.00	67.06	67.06	-46	0.00	0.00	67.06	67.06
-45	0.00	0.00	67.06	67.06	-44	0.00	0.00	67.06	67.06	-43	0.00	0.00	67.06	67.06	-42	0.00	0.00	59.54	59.54
-41	0.00	0.00	60.42	60.42	-40	0.00	0.00	50.84	50.84	-39	0.00	0.00	12.00	12.00	-38	0.00	0.00	11.92	11.92
-37	0.00	0.00	12.11	12.11	-36	0.00	0.00	15.99	15.99	-35	0.00	0.00	16.05	16.05	-34	0.00	0.00	16.08	16.08
-33	0.00	0.00	16.09	16.09	-32	0.00	0.00	16.09	16.09	-31	0.00	0.00	16.08	16.08	-30	0.00	0.00	16.05	16.05
-29	0.00	0.00	15.99	15.99	-28	0.00	0.00	12.12	12.12	-27	0.00	0.00	11.92	11.92	-26	0.00	0.00	4.81	4.81
-25	0.00	0.00	4.59	4.59	-24	0.00	0.00	4.81	4.81	-23	0.00	0.00	4.59	4.59	-22	0.00	0.00	4.74	4.74
-21	0.00	0.00	4.53	4.53	-20	0.00	0.00	4.74	4.74	-19	0.00	0.00	4.53	4.53	-18	0.00	0.00	12.00	12.00
-17	0.00	0.00	11.92	11.92	-16	0.00	0.00	12.11	12.11	-15	0.00	0.00	15.99	15.99	-14	0.00	0.00	16.05	16.05
-13	0.00	0.00	16.08	16.08	-12	0.00	0.00	16.09	16.09	-11	0.00	0.00	16.09	16.09	-10	0.00	0.00	16.08	16.08
-9	0.00	0.00	16.05	16.05	-8	0.00	0.00	15.99	15.99	-7	0.00	0.00	12.12	12.12	-6	0.00	0.00	11.92	11.92
-5	0.00	0.00	12.00	12.00	40	0.00	0.00	7.10	7.10	101	0.00	0.00	30.88	30.88	116	0.00	0.00	33.77	33.77
117	0.00	0.00	33.79	33.79	118	0.00	0.00	37.27	37.27	119	0.00	0.00	35.60	35.60	120	0.00	0.00	39.44	39.44
121	0.00	0.00	39.22	39.22	122	0.00	0.00	43.43	43.43	123	0.00	0.00	39.22	39.22	124	0.00	0.00	43.43	43.43
125	0.00	0.00	39.22	39.22	126	0.00	0.00	43.43	43.43	127	0.00	0.00	39.22	39.22	128	0.00	0.00	43.43	43.43
129	0.00	0.00	39.22	39.22	130	0.00	0.00	43.43	43.43	131	0.00	0.00	35.60	35.60	132	0.00	0.00	39.44	39.44
133	0.00	0.00	33.88	33.88	134	0.00	0.00	37.37	37.37	139	0.00	0.00	30.97	30.97	154	0.00	0.00	33.87	33.87

201	0.00	0.00	89.97	89.97	202	0.00	0.00	89.97	89.97	203	0.00	0.00	107.28	107.28	204	0.00	0.00	107.28	107.28
205	0.00	0.00	107.67	107.67	206	0.00	0.00	107.67	107.67	207	0.00	0.00	121.14	121.14	208	0.00	0.00	121.14	121.14
209	0.00	0.00	121.14	121.14	210	0.00	0.00	121.14	121.14	211	0.00	0.00	121.14	121.14	212	0.00	0.00	121.14	121.14
213	0.00	0.00	121.14	121.14	214	0.00	0.00	121.14	121.14	215	0.00	0.00	121.14	121.14	216	0.00	0.00	121.14	121.14
217	0.00	0.00	107.67	107.67	218	0.00	0.00	107.67	107.67	219	0.00	0.00	107.92	107.92	220	0.00	0.00	107.92	107.92
221	0.00	0.00	90.62	90.62	222	0.00	0.00	90.62	90.62	301	0.00	0.00	108.30	108.30	302	0.00	0.00	108.30	108.30
303	0.00	0.00	129.60	129.60	304	0.00	0.00	129.60	129.60	305	0.00	0.00	130.07	130.07	306	0.00	0.00	130.07	130.07
307	0.00	0.00	146.61	146.61	308	0.00	0.00	146.61	146.61	309	0.00	0.00	146.61	146.61	310	0.00	0.00	146.61	146.61
311	0.00	0.00	146.61	146.61	312	0.00	0.00	146.61	146.61	313	0.00	0.00	146.61	146.61	314	0.00	0.00	146.61	146.61
315	0.00	0.00	146.61	146.61	316	0.00	0.00	146.61	146.61	317	0.00	0.00	130.07	130.07	318	0.00	0.00	130.07	130.07
319	0.00	0.00	130.39	130.39	320	0.00	0.00	130.39	130.39	321	0.00	0.00	109.10	109.10	322	0.00	0.00	109.10	109.10
401	0.00	0.00	126.14	126.14	402	0.00	0.00	125.95	125.95	403	0.00	0.00	151.48	151.48	404	0.00	0.00	151.25	151.25
405	0.00	0.00	152.04	152.04	406	0.00	0.00	151.82	151.82	407	0.00	0.00	171.57	171.57	408	0.00	0.00	171.32	171.32
409	0.00	0.00	171.57	171.57	410	0.00	0.00	171.32	171.32	411	0.00	0.00	171.57	171.57	412	0.00	0.00	171.32	171.32
413	0.00	0.00	171.57	171.57	414	0.00	0.00	171.32	171.32	415	0.00	0.00	171.57	171.57	416	0.00	0.00	171.32	171.32
417	0.00	0.00	152.04	152.04	418	0.00	0.00	151.82	151.82	419	0.00	0.00	152.42	152.42	420	0.00	0.00	152.19	152.19
421	0.00	0.00	127.08	127.08	422	0.00	0.00	126.88	126.88	501	0.00	0.00	140.53	140.53	502	0.00	0.00	140.47	140.47
503	0.00	0.00	168.99	168.99	504	0.00	0.00	168.92	168.92	505	0.00	0.00	169.63	169.63	506	0.00	0.00	169.56	169.56
507	0.00	0.00	192.49	192.49	508	0.00	0.00	192.41	192.41	509	0.00	0.00	192.49	192.49	510	0.00	0.00	192.41	192.41
511	0.00	0.00	192.49	192.49	512	0.00	0.00	192.41	192.41	513	0.00	0.00	192.49	192.49	514	0.00	0.00	192.41	192.41
515	0.00	0.00	192.49	192.49	516	0.00	0.00	192.41	192.41	517	0.00	0.00	169.63	169.63	518	0.00	0.00	169.56	169.56
519	0.00	0.00	170.06	170.06	520	0.00	0.00	169.99	169.99	521	0.00	0.00	141.60	141.60	522	0.00	0.00	141.55	141.55
601	0.00	0.00	164.66	164.66	602	0.00	0.00	165.02	165.02	603	0.00	0.00	207.16	207.16	604	0.00	0.00	207.61	207.61
605	0.00	0.00	208.09	208.09	606	0.00	0.00	208.54	208.54	607	0.00	0.00	240.00	240.00	608	0.00	0.00	240.50	240.50
609	0.00	0.00	240.00	240.00	610	0.00	0.00	240.50	240.50	611	0.00	0.00	240.00	240.00	612	0.00	0.00	240.50	240.50
613	0.00	0.00	240.00	240.00	614	0.00	0.00	240.50	240.50	615	0.00	0.00	240.00	240.00	616	0.00	0.00	240.50	240.50
617	0.00	0.00	208.09	208.09	618	0.00	0.00	208.54	208.54	619	0.00	0.00	208.72	208.72	620	0.00	0.00	209.17	209.17
621	0.00	0.00	166.22	166.22	622	0.00	0.00	166.58	166.58	701	0.00	0.00	164.16	164.16	702	0.00	0.00	164.12	164.12
703	0.00	0.00	207.51	207.51	704	0.00	0.00	207.46	207.46	705	0.00	0.00	208.45	208.45	706	0.00	0.00	208.40	208.40
707	0.00	0.00	239.93	239.93	708	0.00	0.00	239.88	239.88	709	0.00	0.00	239.93	239.93	710	0.00	0.00	239.88	239.88
711	0.00	0.00	239.93	239.93	712	0.00	0.00	239.88	239.88	713	0.00	0.00	239.93	239.93	714	0.00	0.00	239.88	239.88
715	0.00	0.00	239.93	239.93	716	0.00	0.00	239.88	239.88	717	0.00	0.00	208.45	208.45	718	0.00	0.00	208.40	208.40
719	0.00	0.00	209.08	209.08	720	0.00	0.00	209.03	209.03	721	0.00	0.00	165.72	165.72	722	0.00	0.00	165.68	165.68
807	0.00	0.00	190.83	190.83	810	0.00	0.00	190.34	190.34	845	0.00	0.00	192.42	192.42	848	0.00	0.00	191.92	191.92
849	0.00	0.00	210.10	210.10	850	0.00	0.00	209.38	209.38	851	0.00	0.00	211.05	211.05	852	0.00	0.00	210.33	210.33
853	0.00	0.00	242.91	242.91	854	0.00	0.00	242.10	242.10	855	0.00	0.00	242.91	242.91	856	0.00	0.00	242.10	242.10
857	0.00	0.00	242.91	242.91	858	0.00	0.00	242.10	242.10	859	0.00	0.00	242.91	242.91	860	0.00	0.00	242.10	242.10
861	0.00	0.00	242.91	242.91	862	0.00	0.00	242.10	242.10	863	0.00	0.00	211.05	211.05	864	0.00	0.00	210.33	210.33
865	0.00	0.00	211.68	211.68	866	0.00	0.00	210.96	210.96	908	0.00	0.00	173.66	173.66	909	0.00	0.00	173.98	173.98
946	0.00	0.00	174.83	174.83	947	0.00	0.00	175.14	175.14	948	0.00	0.00	178.72	178.72	949	0.00	0.00	179.32	179.32
950	0.00	0.00	179.42	179.42	951	0.00	0.00	180.02	180.02	952	0.00	0.00	203.58	203.58	953	0.00	0.00	204.23	204.23
954	0.00	0.00	203.58	203.58	955	0.00	0.00	204.23	204.23	956	0.00	0.00	203.58	203.58	957	0.00	0.00	204.23	204.23
958	0.00	0.00	203.58	203.58	959	0.00	0.00	204.23	204.23	960	0.00	0.00	203.58	203.58	961	0.00	0.00	204.23	204.23
962	0.00	0.00	179.42	179.42	963	0.00	0.00	180.02	180.02	964	0.00	0.00	179.89	179.89	965	0.00	0.00	180.48	180.48
1001	0.00	0.00	147.93	147.93	1002	0.00	0.00	179.44	179.44	1003	0.00	0.00	180.14	180.14	1004	0.00	0.00	204.38	204.38
1005	0.00	0.00	204.38	204.38	1006	0.00	0.00	204.38	204.38	1007	0.00	0.00	204.38	204.38	1008	0.00	0.00	204.38	204.38
1009	0.00	0.00	180.14	180.14	1010	0.00	0.00	180.60	180.60	1011	0.00	0.00	149.09	149.09					

Totali forze sismiche

Fx <daN>	Fy <daN>
64603.90	64603.90

SPOSTAMENTI MASSIMI - STATI LIMITE ESERCIZIO

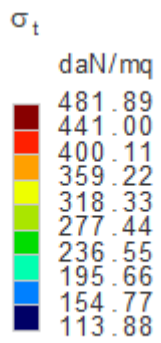
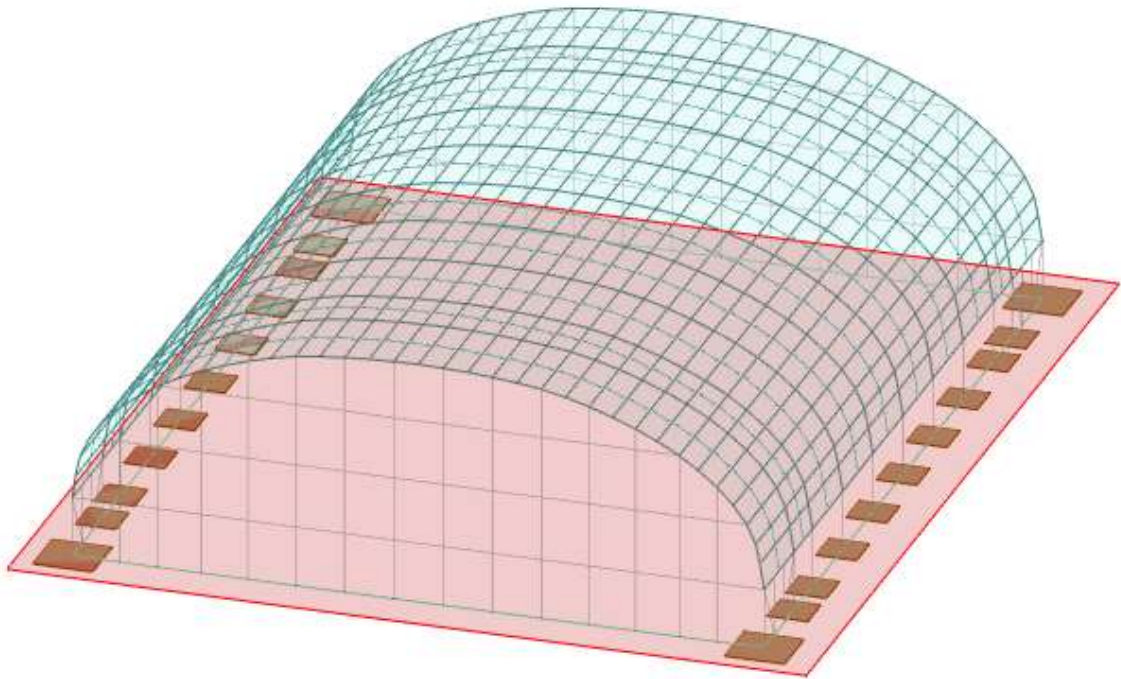
Nodo	CC	TCC	Sx <cm>	Sy <cm>	Sz <cm>	Rx <rad>	Ry <rad>	Rz <rad>
	7	SND	-0.02308	-0.00222	0.00324	0.00003	-0.00048	0.00003
	8	SLD	-0.01014	-0.00096	0.00114	0.00001	-0.00015	0.00001
	9	SND	0.00687	0.00677	-0.00185	-0.00010	0.00028	-0.00009
	10	SLD	0.00291	0.00296	-0.00108	-0.00005	0.00018	-0.00004
	11	SND	-0.00686	0.00663	0.00034	-0.00009	-0.00007	-0.00008
	12	SLD	-0.00307	0.00290	-0.00013	-0.00005	0.00003	-0.00004
	13	SND	0.00657	-0.00659	-0.00130	0.00007	0.00029	0.00006
	14	SLD	0.00278	-0.00286	-0.00084	0.00002	0.00019	0.00002
	15	SND	-0.00716	-0.00673	0.00088	0.00008	-0.00006	0.00007
	16	SLD	-0.00320	-0.00293	0.00011	0.00003	0.00004	0.00002
	17	SLU	0.00062	0.00149	-0.00108	0.00072	0.00023	0.00065
	18	SLE R	0.00040	0.00100	-0.00070	0.00048	0.00017	0.00044
	19	SLE F	-0.00025	0.00002	-0.00050	-0.00001	0.00012	-0.00001
	20	SLE Q	-0.00015	0.00002	-0.00048	-0.00001	0.00011	-0.00001
	21	SLU	-0.00053	0.00244	-0.00080	0.00121	0.00020	0.00111

Smax y=2.30 cm

Nodo	CC	TCC	Sx <cm>	Sy <cm>	Sz <cm>	Rx <rad>	Ry <rad>	Rz <rad>
	24	SLE F	0.00019	0.00578	-0.00057	-0.00005	0.00003	0.00006
	25	SLE Q	-0.00001	0.00000	-0.00059	-0.00000	0.00001	-0.00000
	26	SLU	0.00089	0.03049	-0.00094	-0.00021	0.00010	0.00025
	27	SLE R	0.00059	0.02032	-0.00073	-0.00014	0.00007	0.00017
	28	SLU	-0.00025	0.00000	-0.00142	-0.00009	-0.00001	0.00000
	29	SLE R	0.00001	0.03386	-0.00058	-0.00023	0.00001	0.00028
	30	SLU	-0.00001	0.00000	-0.00059	-0.00000	0.00001	-0.00000
	31	SLE R	0.00167	0.00001	0.00003	-0.00000	0.00016	-0.00000
	32	SLU	-0.00025	0.00000	-0.00142	-0.00000	-0.00001	0.00000
	33	SLE R	-0.00017	0.00000	-0.00101	-0.00000	-0.00001	0.00000
-91	1	SND	0.02022	0.00192	-0.00056	-0.00017	0.00141	-0.00002
	2	SLD	0.00885	0.00084	-0.00057	-0.00007	0.00061	-0.00001
	3	SND	0.02017	-0.00187	-0.00056	0.00016	0.00142	-0.00000
	4	SLD	0.00883	-0.00082	-0.00058	0.00007	0.00061	-0.00000
	5	SND	-0.02005	0.00187	-0.00062	-0.00016	-0.00144	0.00000

Smax y=3.38 cm

TENSIONE SUL TERRENO



CC 21

VERIFICHE E ARMATURE TRAVI

Simbologia

Δ_{sm} = Distanza media tra le fessure
 Φ_{eq} = Diametro equivalente delle barre
 ϵ_{sm} = Deformazione unitaria media dell'armatura (*1000)
 σ_c = Tensione nel calcestruzzo
 σ_r inf = Tensione nel ferro - inferiore
 σ_r sup = Tensione nel ferro - superiore
 σ_s = Tensione nell'acciaio nella sezione fessurata
 A_c eff = Area di calcestruzzo efficace
 A_s = Area complessiva dei ferri nell'area di calcestruzzo efficace
 $A_{fE I}$ = Area di ferro effettiva totale presente nel punto di verifica, inferiore
 $A_{fE S}$ = Area di ferro effettiva totale presente nel punto di verifica, superiore
 $A_{fE St.}$ = Area di ferro effettiva della staffatura (d'anima per travi a T o L)
 $A_{fEP I}$ = Area di ferro effettiva parziale presente nella CC considerata, per la sollecitazione indicata, inferiore
 $A_{fEP S}$ = Area di ferro effettiva parziale presente nella CC considerata, per la sollecitazione indicata, superiore
 B = Base
 CC = Combinazione delle condizioni di carico elementari
 c = momento fittizio in campata
 a = momento fittizio agli appoggi
 T = momento traslato per taglio
 e = eccentricità aggiuntiva in caso di compressione o pressoflessione
 TG = taglio da gerarchia delle resistenze
 $TGND$ = taglio non dissipativo limitante la gerarchia
 $TG (Li)$ = taglio da gerarchia delle resistenze, limite inferiore
 $TG (Ls)$ = taglio da gerarchia delle resistenze, limite superiore
 $Caso$ = Caso di verifica
 Cf inf = Copriferro inferiore
 Cf sup = Copriferro superiore
 Cls = Tipo di calcestruzzo
 El = Elemento (asta) in cui viene effettuato il progetto/verifica (progressivo sul numero di aste)
 Fcd = Resistenza di calcolo a compressione del calcestruzzo
 Fck = Resistenza caratteristica cilindrica a compressione del calcestruzzo
 $Fctd$ = Resistenza di calcolo a trazione del calcestruzzo
 $Fctk$ = Resistenza caratteristica a trazione del calcestruzzo
 Fyd = Resistenza di calcolo dell'acciaio
 Fyk = Tensione caratteristica di snervamento dell'acciaio
 H = Altezza
 In = Codice identificativo della travata facente parte dell'involuppo
 K_2 = Coefficiente per distribuzione deformazioni
 $Lung.$ = Lunghezza del tratto di progettazione
 $M'ydy$ = Momento resistente massimo in campo sostanzialmente elastico intorno all'asse Y
 $MRdy$ = Momento resistente allo stato limite ultimo intorno all'asse Y
 My = Momento flettente intorno all'asse Y
 $Sez.$ = Numero della sezione
 $Sic.$ = Sicurezza
 $Staff.$ = Staffatura adottata
 TCC = Tipo di combinazione di carico
 SLU = Stato limite ultimo
 $SLE R$ = Stato limite d'esercizio, combinazione rara
 $SLE F$ = Stato limite d'esercizio, combinazione frequente
 $SLE Q$ = Stato limite d'esercizio, combinazione quasi permanente
 SLD = Stato limite di danno
 SND = Stato limite di salvaguardia della vita (non dissipativo)
 $Tipo$ = Tipologia
 $Cir.$ = Circolare
 R = Rettangolare
 Tp = Tipo di acciaio
 $VRcd$ = Taglio ultimo lato calcestruzzo
 $VRsd$ = Taglio ultimo lato armatura
 $Vrdu$ = Taglio ultimo resistente
 $Vsdu$ = Taglio agente nella direzione del momento ultimo
 Wk = Ampiezza caratteristica delle fessure
 X = Coordinata progressiva rispetto al nodo iniziale
 $X0$ = Coordinata progressiva (dal nodo iniziale) dell'inizio del tratto
 $X1$ = Coordinata progressiva (dal nodo iniziale) della fine del tratto
 Xg = Coordinata progressiva (dal primo nodo) in cui viene effettuato il progetto/verifica
 bw = Larghezza membratura resistente al taglio
 c = Ricoprimento dell'armatura
 $ctg\theta$ = Cotangente dell'angolo di inclinazione dei puntoni di calcestruzzo
 s = Distanza massima tra le barre

Travata

n.

12097

Nodi: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Caratteristiche delle sezioni e dei materiali utilizzati

Sez.	Tipo	B <cm>	H <cm>	Cf sup <cm>	Cf inf <cm>	Cls	Fck <daN/cmq>	Fctk <daN/cmq>	Fcd <daN/cmq>	Fctd <daN/cmq>	Tp	Fyk <daN/cmq>	Fyd <daN/cmq>
2R		60.00	90.00	4.10	4.10	C28/35	290.50	19.84	164.62	13.23	B450C	4500.00	3913.04

Stato limite ultimo - Verifiche a flessione/pressoflessione

Xg <m>	CC	TCC	El	X <cm>	AfE S <cmq>	AfE I <cmq>	AfEP S <cmq>	AfEP I <cmq>	My <daNm>	MRdy <daNm>	Sic.
0.55	28	SLU	1	55.00	10.81	10.81	10.81	10.81	-3547.10	-35391.50	9.978
1.45	28	SLU	1	145.00	10.81	10.81	10.81	10.81	4752.46	35391.50	7.447
2.35	28	SLU	1	235.00	10.81	10.81	10.81	10.81	4752.46	35391.50	7.447
2.55	28	SLU	2	10.00	10.81	10.81	10.81	10.81	-7641.39	-35391.50	4.632
4.30	28	SLU	2	185.00	10.81	10.81	10.81	10.81	6147.90	35391.50	5.757
4.50	28	SLU	3	10.00	10.81	10.81	10.81	10.81	-8087.15	-35391.50	4.376
6.57	28	SLU	3	217.00	10.81	10.81	10.81	10.81	6228.09	35391.50	5.683
6.77	28	SLU	4	10.00	10.81	10.81	10.81	10.81	-7729.84	-35391.50	4.579
8.96	28	SLU	4	229.00	10.81	10.81	10.81	10.81	5734.49	35391.50	6.172
9.18	28	SLU	5	11.00	10.81	10.81	10.81	10.81	-5304.03	-35391.50	6.673
11.43	28	SLU	5	236.00	10.81	10.81	10.81	10.81	3544.53	35391.50	9.985
11.65	28	SLU	6	11.00	10.81	10.81	10.81	10.81	-3180.55	-35391.50	11.127

13.96	22	SLU	6	242.00	10.81	10.81	10.81	10.81	-2199.06	-35391.50	16.094
14.18	28	SLU	7	11.00	10.81	10.81	10.81	10.81	-5130.93	-35391.50	6.898
16.51	28	SLU	7	244.00	10.81	10.81	10.81	10.81	3320.30	35391.50	10.659
16.73	28	SLU	8	11.00	10.81	10.81	10.81	10.81	-2431.21	-35391.50	14.557
18.40	28	SLU	8	178.14	10.81	10.81	10.81	10.81	974.67	35391.50	36.311
19.07	28	SLU	8	245.00	10.81	10.81	10.81	10.81	974.67	35391.50	36.311
19.29	22	SLU	9	11.00	10.81	10.81	10.81	10.81	-1570.17	-35391.50	22.540
20.95	29	SLU	9	177.43	10.81	10.81	10.81	10.81	-2593.00	-35391.50	13.649
21.62	29	SLU	9	244.00	10.81	10.81	10.81	10.81	-2593.00	-35391.50	13.649
21.84	17	SLU	10	11.00	10.81	10.81	10.81	10.81	-1245.65	-35391.50	28.412
23.49	29	SLU	10	176.00	10.81	10.81	10.81	10.81	-1775.04	-35391.50	19.938
24.15	29	SLU	10	242.00	10.81	10.81	10.81	10.81	-1775.04	-35391.50	19.938
24.37	28	SLU	11	11.00	10.81	10.81	10.81	10.81	2757.29	35391.50	12.836
25.98	28	SLU	11	172.43	10.81	10.81	10.81	10.81	-4414.08	-35391.50	8.018
26.63	28	SLU	11	237.00	10.81	10.81	10.81	10.81	-4414.08	-35391.50	8.018
26.85	28	SLU	12	11.00	10.81	10.81	10.81	10.81	6513.52	35391.50	5.434
28.10	28	SLU	12	135.57	10.81	10.81	10.81	10.81	-8546.70	-35391.50	4.141
29.03	28	SLU	12	229.00	10.81	10.81	10.81	10.81	-8546.70	-35391.50	4.141
29.23	28	SLU	13	10.00	10.81	10.81	10.81	10.81	7560.39	35391.50	4.681
30.61	28	SLU	13	148.00	10.81	10.81	10.81	10.81	-9524.83	-35391.50	3.716
31.30	28	SLU	13	217.00	10.81	10.81	10.81	10.81	-9524.83	-35391.50	3.716
31.50	28	SLU	14	10.00	10.81	10.81	10.81	10.81	8172.49	35391.50	4.331
32.38	28	SLU	14	97.50	21.61	21.61	21.61	21.61	-9852.44	-69978.00	7.103
33.25	28	SLU	14	185.00	10.81	10.81	10.81	10.81	-9852.44	-35391.50	3.592
33.45	28	SLU	15	10.00	10.81	10.81	10.81	10.81	7278.23	35391.50	4.863
35.25	28	SLU	15	190.00	10.81	10.81	10.81	10.81	-5208.43	-35391.50	6.795

Stato limite elastico - Verifiche a flessione/pressoflessione

Xg <cm>	CC	TCC	El	X <cm>	AfE S <cmq>	AfE I <cmq>	AfEP S <cmq>	AfEP I <cmq>	My <daNm>	M' ydy <daNm>	Sic.
0.55	1	SND	1	55.00	10.81	10.81	10.81	10.81	-11575.40	-34050.60	2.942
1.45	1	SND	1	145.00	10.81	10.81	10.81	10.81	17073.10	34050.60	1.994
2.35	1	SND	1	235.00	10.81	10.81	10.81	10.81	17073.10	34050.60	1.994
2.55	1	SND	2	10.00	10.81	10.81	10.81	10.81	-7272.02	-34050.60	4.682
4.30	1	SND	2	185.00	10.81	10.81	10.81	10.81	6023.31	34050.60	5.653
4.50	5	SND	3	10.00	10.81	10.81	10.81	10.81	-4967.03	-34050.60	6.855
6.57	5	SND	3	217.00	10.81	10.81	10.81	10.81	3580.95	34050.60	9.509
6.77	7	SND	4	10.00	10.81	10.81	10.81	10.81	-6591.89	-34050.60	5.166
8.96	7	SND	4	229.00	10.81	10.81	10.81	10.81	4917.86	34050.60	6.924
9.18	7	SND	5	11.00	10.81	10.81	10.81	10.81	-5820.84	-34050.60	5.850
11.43	7	SND	5	236.00	10.81	10.81	10.81	10.81	4234.24	34050.60	8.042
11.65	5	SND	6	11.00	10.81	10.81	10.81	10.81	-4679.69	-34050.60	7.276
13.96	3	SND	6	242.00	10.81	10.81	10.81	10.81	-3398.55	-34050.60	10.019
14.18	5	SND	7	11.00	10.81	10.81	10.81	10.81	-4568.15	-34050.60	7.454
16.51	5	SND	7	244.00	10.81	10.81	10.81	10.81	3047.80	34050.60	11.172
16.73	5	SND	8	11.00	10.81	10.81	10.81	10.81	-3082.54	-34050.60	11.046
18.40	1	SND	8	178.14	10.81	10.81	10.81	10.81	-3091.32	-34050.60	11.015
19.07	1	SND	8	245.00	10.81	10.81	10.81	10.81	-3091.32	-34050.60	11.015
19.29	1	SND	9	11.00	10.81	10.81	10.81	10.81	3148.86	34050.60	10.814
20.95	1	SND	9	177.43	10.81	10.81	10.81	10.81	-4680.39	-34050.60	7.275
21.62	1	SND	9	244.00	10.81	10.81	10.81	10.81	-4680.39	-34050.60	7.275
21.84	7	SND	10	11.00	10.81	10.81	10.81	10.81	-3538.22	-34050.60	9.624
23.49	1	SND	10	176.00	10.81	10.81	10.81	10.81	-4722.43	-34050.60	7.210
24.15	1	SND	10	242.00	10.81	10.81	10.81	10.81	-4722.43	-34050.60	7.210
24.37	3	SND	11	11.00	10.81	10.81	10.81	10.81	4346.37	34050.60	7.834
25.98	3	SND	11	172.43	10.81	10.81	10.81	10.81	-5956.85	-34050.60	5.716
26.63	3	SND	11	237.00	10.81	10.81	10.81	10.81	-5956.85	-34050.60	5.716
26.85	3	SND	12	11.00	10.81	10.81	10.81	10.81	5201.40	34050.60	6.546
28.10	3	SND	12	135.57	10.81	10.81	10.81	10.81	-6898.46	-34050.60	4.936
29.03	3	SND	12	229.00	10.81	10.81	10.81	10.81	-6898.46	-34050.60	4.936
29.23	1	SND	13	10.00	10.81	10.81	10.81	10.81	4222.46	34050.60	8.064
30.61	1	SND	13	148.00	10.81	10.81	10.81	10.81	-5676.76	-34050.60	5.998
31.30	1	SND	13	217.00	10.81	10.81	10.81	10.81	-5676.76	-34050.60	5.998
31.50	5	SND	14	10.00	10.81	10.81	10.81	10.81	4944.17	34050.60	6.887
32.38	5	SND	14	97.50	21.61	21.61	21.61	21.61	-6080.17	-67127.30	11.040
33.25	5	SND	14	185.00	10.81	10.81	10.81	10.81	-6080.17	-34050.60	5.600
33.45	5	SND	15	10.00	10.81	10.81	10.81	10.81	17715.60	34050.60	1.922
35.25	5	SND	15	190.00	10.81	10.81	10.81	10.81	-11997.10	-34050.60	2.838

Stato limite d'esercizio - Verifiche tensionali

Xg <cm>	CC	TCC	El	X <cm>	AfE S <cmq>	AfE I <cmq>	My <daNm>	σ_f sup <daN/cm ² >	σ_f inf <daN/cm ² >	σ_c <daN/cm ² >
0.55	34	SLE R	1	55.00	10.81	10.81	-2538.15	291.92	-56.18	4.91
0.55	20	SLE Q	1	55.00	10.81	10.81	-1557.40	179.12	-34.47	3.01
1.45	34	SLE R	1	145.00	10.81	10.81	3373.37	-74.67	387.98	6.52
1.45	20	SLE Q	1	145.00	10.81	10.81	1878.86	-41.59	216.09	3.63
2.35	34	SLE R	1	235.00	10.81	10.81	3373.37	-74.67	387.98	6.52
2.35	20	SLE Q	1	235.00	10.81	10.81	1878.86	-41.59	216.09	3.63
2.55	34	SLE R	2	10.00	10.81	10.81	-5433.85	624.96	-120.27	10.51
2.55	20	SLE Q	2	10.00	10.81	10.81	-3077.10	353.91	-68.11	5.95
4.30	34	SLE R	2	185.00	10.81	10.81	4332.80	-95.90	498.33	8.38
4.30	20	SLE Q	2	185.00	10.81	10.81	2176.46	-48.17	250.32	4.21
4.50	34	SLE R	3	10.00	10.81	10.81	-5741.26	660.32	-127.08	11.10
4.50	20	SLE Q	3	10.00	10.81	10.81	-3238.67	372.49	-71.68	6.26
6.57	34	SLE R	3	217.00	10.81	10.81	4364.27	-96.60	501.95	8.44
6.57	20	SLE Q	3	217.00	10.81	10.81	2063.21	-45.67	237.30	3.99
6.77	34	SLE R	4	10.00	10.81	10.81	-5485.14	630.86	-121.41	10.61
6.77	20	SLE Q	4	10.00	10.81	10.81	-3109.29	357.61	-68.82	6.01

526	13.96	19	SLE F	6	2	242.00	518.66	30.33	254.00	0.50	21.50	545.24	10.81	615.00	59.65	0.02	0.02
563	14.18	20	SLE Q	7	2	11.00	-1752.78	30.33	254.00	0.50	21.50	545.24	10.81	615.00	201.59	0.06	0.05
567	14.18	19	SLE F	7	2	11.00	-2127.15	30.33	254.00	0.50	21.50	545.24	10.81	615.00	244.65	0.07	0.07
598	16.51	20	SLE Q	7	2	244.00	647.29	30.33	254.00	0.50	21.50	545.24	10.81	615.00	74.45	0.02	0.02
600	16.51	19	SLE F	7	2	244.00	896.02	30.33	254.00	0.50	21.50	545.24	10.81	615.00	103.05	0.03	0.03
641	16.73	20	SLE Q	8	2	11.00	-599.98	30.33	254.00	0.50	21.50	545.24	10.81	615.00	69.01	0.02	0.02
645	16.73	19	SLE F	8	2	11.00	-818.63	30.33	254.00	0.50	21.50	545.24	10.81	615.00	94.15	0.03	0.03
692	18.40	20	SLE Q	8	2	178.14	-608.57	30.33	254.00	0.50	21.50	545.24	10.81	615.00	69.99	0.02	0.02
698	18.40	24	SLE F	8	2	178.14	-470.26	30.33	254.00	0.50	21.50	545.24	10.81	615.00	54.09	0.02	0.01
732	19.07	20	SLE Q	8	2	245.00	-608.57	30.33	254.00	0.50	21.50	545.24	10.81	615.00	69.99	0.02	0.02
738	19.07	24	SLE F	8	2	245.00	-470.26	30.33	254.00	0.50	21.50	545.24	10.81	615.00	54.09	0.02	0.01
770	19.29	20	SLE Q	9	2	11.00	650.00	30.33	254.00	0.50	21.50	545.24	10.81	615.00	74.76	0.02	0.02
772	19.29	19	SLE F	9	2	11.00	634.47	30.33	254.00	0.50	21.50	545.24	10.81	615.00	72.97	0.02	0.02
818	20.95	20	SLE Q	9	2	177.43	-1756.97	30.33	254.00	0.50	21.50	545.24	10.81	615.00	202.07	0.06	0.05
822	20.95	19	SLE F	9	2	177.43	-1722.83	30.33	254.00	0.50	21.50	545.24	10.81	615.00	198.15	0.06	0.05
865	21.62	20	SLE Q	9	2	244.00	-1756.97	30.33	254.00	0.50	21.50	545.24	10.81	615.00	202.07	0.06	0.05
869	21.62	19	SLE F	9	2	244.00	-1722.83	30.33	254.00	0.50	21.50	545.24	10.81	615.00	198.15	0.06	0.05
909	21.84	20	SLE Q	10	2	11.00	419.89	30.33	254.00	0.50	21.50	545.24	10.81	615.00	48.29	0.01	0.01
913	21.84	19	SLE F	10	2	11.00	394.18	30.33	254.00	0.50	21.50	545.24	10.81	615.00	45.34	0.01	0.01
961	23.49	20	SLE Q	10	2	176.00	-1167.88	30.33	254.00	0.50	21.50	545.24	10.81	615.00	134.32	0.04	0.04
965	23.49	19	SLE F	10	2	176.00	-1017.51	30.33	254.00	0.50	21.50	545.24	10.81	615.00	117.03	0.03	0.03
1008	24.15	20	SLE Q	10	2	242.00	-1167.88	30.33	254.00	0.50	21.50	545.24	10.81	615.00	134.32	0.04	0.04
1012	24.15	19	SLE F	10	2	242.00	-1017.51	30.33	254.00	0.50	21.50	545.24	10.81	615.00	117.03	0.03	0.03
1042	24.37	20	SLE Q	11	2	11.00	948.72	30.33	254.00	0.50	21.50	545.24	10.81	615.00	109.11	0.03	0.03
1044	24.37	19	SLE F	11	2	11.00	1140.15	30.33	254.00	0.50	21.50	545.24	10.81	615.00	131.13	0.04	0.04
1090	25.98	20	SLE Q	11	2	172.43	-2173.28	30.33	254.00	0.50	21.50	545.24	10.81	615.00	249.95	0.07	0.07
1094	25.98	19	SLE F	11	2	172.43	-2373.32	30.33	254.00	0.50	21.50	545.24	10.81	615.00	272.96	0.08	0.07
1133	26.63	20	SLE Q	11	2	237.00	-2173.28	30.33	254.00	0.50	21.50	545.24	10.81	615.00	249.95	0.07	0.07
1137	26.63	19	SLE F	11	2	237.00	-2373.32	30.33	254.00	0.50	21.50	545.24	10.81	615.00	272.96	0.08	0.07
1165	26.85	20	SLE Q	12	2	11.00	1858.01	30.33	254.00	0.50	21.50	545.24	10.81	615.00	213.69	0.06	0.06
1167	26.85	19	SLE F	12	2	11.00	2391.88	30.33	254.00	0.50	21.50	545.24	10.81	615.00	275.10	0.08	0.07
1213	28.10	20	SLE Q	12	2	135.57	-3133.01	30.33	254.00	0.50	21.50	545.24	10.81	615.00	360.34	0.10	0.10
1217	28.10	19	SLE F	12	2	135.57	-3712.79	30.33	254.00	0.50	21.50	545.24	10.81	615.00	427.02	0.12	0.12
1251	29.03	20	SLE Q	12	2	229.00	-3133.01	30.33	254.00	0.50	21.50	545.24	10.81	615.00	360.34	0.10	0.10
1255	29.03	19	SLE F	12	2	229.00	-3712.79	30.33	254.00	0.50	21.50	545.24	10.81	615.00	427.02	0.12	0.12
1282	29.23	20	SLE Q	13	2	10.00	1935.89	30.33	254.00	0.50	21.50	545.24	10.81	615.00	222.65	0.06	0.06
1284	29.23	19	SLE F	13	2	10.00	2596.05	30.33	254.00	0.50	21.50	545.24	10.81	615.00	298.58	0.09	0.08
1330	30.61	20	SLE Q	13	2	148.00	-3098.51	30.33	254.00	0.50	21.50	545.24	10.81	615.00	356.37	0.10	0.10
1334	30.61	19	SLE F	13	2	148.00	-3815.27	30.33	254.00	0.50	21.50	545.24	10.81	615.00	438.81	0.13	0.12
1375	31.30	20	SLE Q	13	2	217.00	-3098.51	30.33	254.00	0.50	21.50	545.24	10.81	615.00	356.37	0.10	0.10
1379	31.30	19	SLE F	13	2	217.00	-3815.27	30.33	254.00	0.50	21.50	545.24	10.81	615.00	438.81	0.13	0.12
1424	31.50	20	SLE Q	14	2	10.00	1981.44	30.33	254.00	0.50	21.50	545.24	10.81	615.00	227.89	0.07	0.06
1428	31.50	19	SLE F	14	2	10.00	2716.82	30.33	254.00	0.50	21.50	545.24	10.81	615.00	312.47	0.09	0.08
1474	32.38	20	SLE Q	14	2	97.50	-2862.18	30.33	101.60	0.50	21.50	121.84	21.61	615.00	166.70	0.05	0.01
1478	32.38	19	SLE F	14	2	97.50	-3665.99	30.33	101.60	0.50	21.50	121.84	21.61	615.00	213.51	0.06	0.01
1524	33.25	20	SLE Q	14	2	185.00	-2862.18	30.33	254.00	0.50	21.50	545.24	10.81	615.00	329.19	0.10	0.09
1528	33.25	19	SLE F	14	2	185.00	-3665.99	30.33	254.00	0.50	21.50	545.24	10.81	615.00	421.63	0.12	0.11
1557	33.45	20	SLE Q	15	2	10.00	1817.52	30.33	254.00	0.50	21.50	545.24	10.81	615.00	209.04	0.06	0.06
1559	33.45	19	SLE F	15	2	10.00	2464.05	30.33	254.00	0.50	21.50	545.24	10.81	615.00	283.40	0.08	0.08
1605	35.25	20	SLE Q	15	2	190.00	-1516.63	30.33	254.00	0.50	21.50	545.24	10.81	615.00	174.43	0.05	0.05
1609	35.25	19	SLE F	15	2	190.00	-1941.51	30.33	254.00	0.50	21.50	545.24	10.81	615.00	223.30	0.07	0.06

Stato limite ultimo - Verifiche a taglio

CC	X0 <m>	X1 <m>	Lung. <m>	Staff.	AfE St. <cmq/m>	bw <m>	Vsdu <daN>	ctgθ	VRsd <daN>	VRcd <daN>	Vrdu <daN>	Sic.
1 SND	0.55	2.35	1.80	ø10/16 2 br.	9.82	0.60	16569.20	2.50	74248.90	131654.00	74248.90	4.481
28 SLU	2.55	4.30	1.75	ø10/16 2 br.	9.82	0.60	9044.25	2.50	74248.90	131654.00	74248.90	8.210
28 SLU	4.50	6.57	2.07	ø10/16 2 br.	9.82	0.60	8379.43	2.50	74248.90	131654.00	74248.90	8.861
28 SLU	6.77	8.96	2.19	ø10/16 2 br.	9.82	0.60	7714.50	2.50	74248.90	131654.00	74248.90	9.625
7 SND	9.18	11.43	2.25	ø10/16 2 br.	9.82	0.60	5810.84	2.50	74248.90	131654.00	74248.90	12.778
5 SND	11.65	13.96	2.31	ø10/16 2 br.	9.82	0.60	4802.30	2.50	74248.90	131654.00	74248.90	15.461
28 SLU	14.18	16.51	2.33	ø10/16 2 br.	9.82	0.60	5353.21	2.50	74248.90	131654.00	74248.90	13.870
1 SND	16.73	19.07	2.34	ø10/16 2 br.	9.82	0.60	3500.22	2.50	74248.90	131654.00	74248.90	21.213
1 SND	19.29	21.62	2.33	ø10/16 2 br.	9.82	0.60	4763.16	2.50	74248.90	131654.00	74248.90	15.588
1 SND	21.84	24.15	2.31	ø10/16 2 br.	9.82	0.60	4837.31	2.50	74248.90	131654.00	74248.90	15.349
3 SND	24.37	26.63	2.26	ø10/16 2 br.	9.82	0.60	5905.91	2.50	74248.90	131654.00	74248.90	12.572
28 SLU	26.85	29.03	2.18	ø10/16 2 br.	9.82	0.60	8382.79	2.50	74248.90	131654.00	74248.90	8.857
28 SLU	29.23	31.30	2.07	ø10/16 2 br.	9.82	0.60	9614.91	2.50	74248.90	131654.00	74248.90	7.722
28 SLU	31.50	33.25	1.75	ø10/16 2 br.	9.82	0.60	11322.60	2.50	74248.90	131654.00	74248.90	6.558
5 SND	33.45	35.25	1.80	ø10/16 2 br.	9.82	0.60	17130.40	2.50	74248.90	131654.00	74248.90	4.334

Travata

n.

12107

Nodi: 39 55 41 42 43 44 45 46 47 48 49 50 51 52 53 54

Caratteristiche delle sezioni e dei materiali utilizzati

Sez.	Tipo	B <cm>	H <cm>	Cf sup <cm>	Cf inf <cm>	Cls	Fck <daN/cm²>	Fctk <daN/cm²>	Fcd <daN/cm²>	Fctd <daN/cm²>	TP	Fyk <daN/cm²>	Fyd <daN/cm²>
2R		60.00	90.00	4.10	4.10	C28/35	290.50	19.84	164.62	13.23	B450C	4500.00	3913.04

Stato limite ultimo - Verifiche a flessione/pressoflessione

Xg <m>	CC	TCC	EL	X <cm>	AfE S <cmq>	AfE I <cmq>	AfEP S <cmq>	AfEP I <cmq>	My <daNm>	MRdy <daNm>	Sic.
0.55	28	SLU	1	55.00	10.81	10.81	10.81	10.81	-2483.83	-35391.50	14.249
1.50	28										

6.57	28	SLU	3	217.00	10.81	10.81	10.81	10.81	6582.53	35391.50	5.377
6.77	28	SLU	4	10.00	10.81	10.81	10.81	10.81	-7844.50	-35391.50	4.512
8.96	28	SLU	4	229.00	10.81	10.81	10.81	10.81	5836.85	35391.50	6.063
9.18	28	SLU	5	11.00	10.81	10.81	10.81	10.81	-5347.18	-35391.50	6.619
11.43	28	SLU	5	236.00	10.81	10.81	10.81	10.81	3583.08	35391.50	9.877
11.65	28	SLU	6	11.00	10.81	10.81	10.81	10.81	-3204.43	-35391.50	11.045
13.96	22	SLU	6	242.00	10.81	10.81	10.81	10.81	-2139.41	-35391.50	16.543
14.18	28	SLU	7	11.00	10.81	10.81	10.81	10.81	-5134.14	-35391.50	6.893
16.51	28	SLU	7	244.00	10.81	10.81	10.81	10.81	3322.70	35391.50	10.651
16.73	28	SLU	8	11.00	10.81	10.81	10.81	10.81	-2419.25	-35391.50	14.629
18.40	28	SLU	8	178.14	10.81	10.81	10.81	10.81	966.67	35391.50	36.612
19.07	28	SLU	8	245.00	10.81	10.81	10.81	10.81	966.67	35391.50	36.612
19.29	22	SLU	9	11.00	10.81	10.81	10.81	10.81	-1594.58	-35391.50	22.195
20.95	28	SLU	9	177.43	10.81	10.81	10.81	10.81	-2076.93	-35391.50	17.040
21.62	28	SLU	9	244.00	10.81	10.81	10.81	10.81	-2076.93	-35391.50	17.040
21.84	17	SLU	10	11.00	10.81	10.81	10.81	10.81	-1509.43	-35391.50	23.447
23.49	29	SLU	10	176.00	10.81	10.81	10.81	10.81	-1349.83	-35391.50	26.219
24.15	29	SLU	10	242.00	10.81	10.81	10.81	10.81	-1349.83	-35391.50	26.219
24.37	28	SLU	11	11.00	10.81	10.81	10.81	10.81	2714.41	35391.50	13.038
25.98	28	SLU	11	172.43	10.81	10.81	10.81	10.81	-4367.33	-35391.50	8.104
26.63	28	SLU	11	237.00	10.81	10.81	10.81	10.81	-4367.33	-35391.50	8.104
26.85	28	SLU	12	11.00	10.81	10.81	10.81	10.81	6483.58	35391.50	5.459
28.10	28	SLU	12	135.57	10.81	10.81	10.81	10.81	-8513.70	-35391.50	4.157
29.03	28	SLU	12	229.00	10.81	10.81	10.81	10.81	-8513.70	-35391.50	4.157
29.23	28	SLU	13	10.00	10.81	10.81	10.81	10.81	7572.97	35391.50	4.673
30.61	28	SLU	13	148.00	10.81	10.81	10.81	10.81	-9538.83	-35391.50	3.710
31.30	28	SLU	13	217.00	10.81	10.81	10.81	10.81	-9538.83	-35391.50	3.710
31.50	28	SLU	14	10.00	10.81	10.81	10.81	10.81	8224.66	35391.50	4.303
32.38	28	SLU	14	97.50	21.61	21.61	21.61	21.61	-9910.02	-69978.00	7.061
33.25	28	SLU	14	185.00	10.81	10.81	10.81	10.81	-9910.02	-35391.50	3.571
33.45	28	SLU	15	10.00	10.81	10.81	10.81	10.81	7014.19	35391.50	5.046
35.25	28	SLU	15	190.00	10.81	10.81	10.81	10.81	-5034.18	-35391.50	7.030

Stato limite elastico - Verifiche a flessione/pressoflessione

Xg <cm>	CC	TCC	El	X <cm>	AfE S <cmq>	AfE I <cmq>	AfEP S <cmq>	AfEP I <cmq>	My <daNm>	M' ydy <daNm>	Sic.
0.55	3	SND	1	55.00	10.81	10.81	10.81	10.81	-6467.82	-34050.60	5.265
1.50	3	SND	1	150.00	10.81	10.81	10.81	10.81	10040.40	34050.60	3.391
2.45	3	SND	1	245.00	10.81	10.81	10.81	10.81	10040.40	34050.60	3.391
2.45	1	SND	2	0.00	10.81	10.81	10.81	10.81	-14532.50	-34050.60	2.343
4.30	1	SND	2	185.00	10.81	10.81	10.81	10.81	11178.40	34050.60	3.046
4.50	11	SND	3	10.00	10.81	10.81	10.81	10.81	-3572.67	-34050.60	9.531
6.57	9	SND	3	217.00	10.81	10.81	10.81	10.81	2383.13	34050.60	14.288
6.77	5	SND	4	10.00	10.81	10.81	10.81	10.81	-6045.70	-34050.60	5.632
8.96	5	SND	4	229.00	10.81	10.81	10.81	10.81	4429.50	34050.60	7.687
9.18	5	SND	5	11.00	10.81	10.81	10.81	10.81	-5509.81	-34050.60	6.180
11.43	5	SND	5	236.00	10.81	10.81	10.81	10.81	3953.69	34050.60	8.612
11.65	7	SND	6	11.00	10.81	10.81	10.81	10.81	-4560.56	-34050.60	7.466
13.96	1	SND	6	242.00	10.81	10.81	10.81	10.81	-3248.84	-34050.60	10.481
14.18	7	SND	7	11.00	10.81	10.81	10.81	10.81	-4636.85	-34050.60	7.343
16.51	7	SND	7	244.00	10.81	10.81	10.81	10.81	3111.69	34050.60	10.943
16.73	7	SND	8	11.00	10.81	10.81	10.81	10.81	-3128.69	-34050.60	10.883
18.40	3	SND	8	178.14	10.81	10.81	10.81	10.81	-3151.08	-34050.60	10.806
19.07	3	SND	8	245.00	10.81	10.81	10.81	10.81	-3151.08	-34050.60	10.806
19.29	3	SND	9	11.00	10.81	10.81	10.81	10.81	3076.46	34050.60	11.068
20.95	3	SND	9	177.43	10.81	10.81	10.81	10.81	-4603.30	-34050.60	7.397
21.62	3	SND	9	244.00	10.81	10.81	10.81	10.81	-4603.30	-34050.60	7.397
21.84	5	SND	10	11.00	10.81	10.81	10.81	10.81	-3486.66	-34050.60	9.766
23.49	3	SND	10	176.00	10.81	10.81	10.81	10.81	-4657.02	-34050.60	7.312
24.15	3	SND	10	242.00	10.81	10.81	10.81	10.81	-4657.02	-34050.60	7.312
24.37	1	SND	11	11.00	10.81	10.81	10.81	10.81	4285.76	34050.60	7.945
25.98	1	SND	11	172.43	10.81	10.81	10.81	10.81	-5892.08	-34050.60	5.779
26.63	1	SND	11	237.00	10.81	10.81	10.81	10.81	-5892.08	-34050.60	5.779
26.85	1	SND	12	11.00	10.81	10.81	10.81	10.81	5165.76	34050.60	6.592
28.10	1	SND	12	135.57	10.81	10.81	10.81	10.81	-6860.47	-34050.60	4.963
29.03	1	SND	12	229.00	10.81	10.81	10.81	10.81	-6860.47	-34050.60	4.963
29.23	3	SND	13	10.00	10.81	10.81	10.81	10.81	4193.68	34050.60	8.120
30.61	3	SND	13	148.00	10.81	10.81	10.81	10.81	-5646.15	-34050.60	6.031
31.30	3	SND	13	217.00	10.81	10.81	10.81	10.81	-5646.15	-34050.60	6.031
31.50	7	SND	14	10.00	10.81	10.81	10.81	10.81	5182.13	34050.60	6.571
32.38	7	SND	14	97.50	21.61	21.61	21.61	21.61	-6341.52	-67127.30	10.585
33.25	7	SND	14	185.00	10.81	10.81	10.81	10.81	-6341.52	-34050.60	5.369
33.45	7	SND	15	10.00	10.81	10.81	10.81	10.81	17812.50	34050.60	1.912
35.25	7	SND	15	190.00	10.81	10.81	10.81	10.81	-12061.00	-34050.60	2.823

Stato limite d'esercizio - Verifiche tensionali

Xg <cm>	CC	TCC	El	X <cm>	AfE S <cmq>	AfE I <cmq>	My <daNm>	σ_f sup <daN/cmq>	σ_f inf <daN/cmq>	σ_c <daN/cmq>	
0.55	34	SLE	R	1	55.00	10.81	10.81	-1740.81	200.22	-38.53	3.37
0.55	20	SLE	Q	1	55.00	10.81	10.81	-862.22	99.17	-19.08	1.67
1.50	32	SLE	R	1	150.00	10.81	10.81	-2658.75	305.79	-58.85	5.14
1.50	20	SLE	Q	1	150.00	10.81	10.81	870.09	-19.26	100.07	1.68
2.45	32	SLE	R	1	245.00	10.81	10.81	-2658.75	305.79	-58.85	5.14
2.45	20	SLE	Q	1	245.00	10.81	10.81	870.09	-19.26	100.07	1.68
2.45	34	SLE	R	2	0.00	10.81	10.81	-7165.12	824.08	-158.59	13.86
2.45	20	SLE	Q	2	0.00	10.81	10.81	-4394.28	505.40	-97.26	8.50
4.30	34	SLE	R	2	185.00	10.81	10.81	5155.04	-114.10	592.90	9.97
4.30	20	SLE	Q	2	185.00	10.81	10.81	2879.12	-63.73	331.13	5.57

4.50	34	SLE R	3	10.00	10.81	10.81	-6034.90	694.09	-133.57	11.67
4.50	20	SLE Q	3	10.00	10.81	10.81	-3493.16	401.76	-77.32	6.76
6.57	34	SLE R	3	217.00	10.81	10.81	4630.03	-102.48	532.51	8.95
6.57	20	SLE Q	3	217.00	10.81	10.81	2293.47	-50.76	263.78	4.44
6.77	34	SLE R	4	10.00	10.81	10.81	-5572.71	640.93	-123.34	10.78
6.77	20	SLE Q	4	10.00	10.81	10.81	-3194.25	367.38	-70.70	6.18
8.96	34	SLE R	4	229.00	10.81	10.81	4083.11	-90.37	469.61	7.90
8.96	20	SLE Q	4	229.00	10.81	10.81	1903.32	-42.13	218.91	3.68
9.18	34	SLE R	5	11.00	10.81	10.81	-3793.79	436.33	-83.97	7.34
9.18	20	SLE Q	5	11.00	10.81	10.81	-2151.75	247.48	-47.63	4.16
11.43	32	SLE R	5	236.00	10.81	10.81	-3152.01	362.52	-69.77	6.10
11.43	20	SLE Q	5	236.00	10.81	10.81	939.06	-20.78	108.00	1.82
11.65	34	SLE R	6	11.00	10.81	10.81	-2275.55	261.72	-50.37	4.40
11.65	20	SLE Q	6	11.00	10.81	10.81	-1233.69	141.89	-27.31	2.39
13.96	32	SLE R	6	242.00	10.81	10.81	-2966.93	341.24	-65.67	5.74
13.96	20	SLE Q	6	242.00	10.81	10.81	443.70	-9.82	51.03	0.86
14.18	34	SLE R	7	11.00	10.81	10.81	-3626.04	417.04	-80.26	7.01
14.18	20	SLE Q	7	11.00	10.81	10.81	-1748.15	201.06	-38.69	3.38
16.51	32	SLE R	7	244.00	10.81	10.81	-3170.52	364.65	-70.18	6.13
16.51	20	SLE Q	7	244.00	10.81	10.81	644.13	-14.26	74.08	1.25
16.73	34	SLE R	8	11.00	10.81	10.81	-1684.54	193.74	-37.28	3.26
16.73	20	SLE Q	8	11.00	10.81	10.81	-594.15	68.34	-13.15	1.15
18.40	32	SLE R	8	178.14	10.81	10.81	-1542.01	177.35	-34.13	2.98
18.40	20	SLE Q	8	178.14	10.81	10.81	-614.83	70.71	-13.61	1.19
19.07	32	SLE R	8	245.00	10.81	10.81	-1542.01	177.35	-34.13	2.98
19.07	20	SLE Q	8	245.00	10.81	10.81	-614.83	70.71	-13.61	1.19
19.29	32	SLE R	9	11.00	10.81	10.81	-1532.91	176.30	-33.93	2.96
19.29	20	SLE Q	9	11.00	10.81	10.81	646.29	-14.30	74.33	1.25
20.95	34	SLE R	9	177.43	10.81	10.81	-1588.26	182.67	-35.15	3.07
20.95	20	SLE Q	9	177.43	10.81	10.81	-1751.53	201.45	-38.77	3.39
21.62	34	SLE R	9	244.00	10.81	10.81	-1588.26	182.67	-35.15	3.07
21.62	20	SLE Q	9	244.00	10.81	10.81	-1751.53	201.45	-38.77	3.39
21.84	18	SLE R	10	11.00	10.81	10.81	-1017.62	117.04	-22.52	1.97
21.84	20	SLE Q	10	11.00	10.81	10.81	418.84	-9.27	48.17	0.81
23.49	32	SLE R	10	176.00	10.81	10.81	-1053.88	121.21	-23.33	2.04
23.49	20	SLE Q	10	176.00	10.81	10.81	-1160.27	133.45	-25.68	2.24
24.15	32	SLE R	10	242.00	10.81	10.81	-1053.88	121.21	-23.33	2.04
24.15	20	SLE Q	10	242.00	10.81	10.81	-1160.27	133.45	-25.68	2.24
24.37	34	SLE R	11	11.00	10.81	10.81	1893.51	-41.91	217.78	3.66
24.37	20	SLE Q	11	11.00	10.81	10.81	937.97	-20.76	107.88	1.81
25.98	34	SLE R	11	172.43	10.81	10.81	-3140.48	361.19	-69.51	6.07
25.98	20	SLE Q	11	172.43	10.81	10.81	-2156.91	248.07	-47.74	4.17
26.63	34	SLE R	11	237.00	10.81	10.81	-3140.48	361.19	-69.51	6.07
26.63	20	SLE Q	11	237.00	10.81	10.81	-2156.91	248.07	-47.74	4.17
26.85	34	SLE R	12	11.00	10.81	10.81	4505.95	-99.73	518.24	8.71
26.85	20	SLE Q	12	11.00	10.81	10.81	1844.91	-40.83	212.19	3.57
28.10	34	SLE R	12	135.57	10.81	10.81	-6008.32	691.03	-132.99	11.62
28.10	20	SLE Q	12	135.57	10.81	10.81	-3118.70	358.69	-69.03	6.03
29.03	34	SLE R	12	229.00	10.81	10.81	-6008.32	691.03	-132.99	11.62
29.03	20	SLE Q	12	229.00	10.81	10.81	-3118.70	358.69	-69.03	6.03
29.23	34	SLE R	13	10.00	10.81	10.81	5245.16	-116.09	603.26	10.14
29.23	20	SLE Q	13	10.00	10.81	10.81	1936.18	-42.85	222.69	3.74
30.61	34	SLE R	13	148.00	10.81	10.81	-6691.79	769.64	-148.11	12.94
30.61	20	SLE Q	13	148.00	10.81	10.81	-3099.00	356.43	-68.59	5.99
31.30	34	SLE R	13	217.00	10.81	10.81	-6691.79	769.64	-148.11	12.94
31.30	20	SLE Q	13	217.00	10.81	10.81	-3099.00	356.43	-68.59	5.99
31.50	34	SLE R	14	10.00	10.81	10.81	5694.01	-126.03	654.88	11.01
31.50	20	SLE Q	14	10.00	10.81	10.81	1990.11	-44.05	228.89	3.85
32.38	34	SLE R	14	97.50	21.61	21.61	-6920.61	403.07	-114.53	9.36
32.38	20	SLE Q	14	97.50	21.61	21.61	-2871.87	167.26	-47.52	3.89
33.25	34	SLE R	14	185.00	10.81	10.81	-6920.61	795.96	-153.18	13.38
33.25	20	SLE Q	14	185.00	10.81	10.81	-2871.87	330.30	-63.56	5.55
33.45	34	SLE R	15	10.00	10.81	10.81	4854.96	-107.46	558.38	9.39
33.45	20	SLE Q	15	10.00	10.81	10.81	1664.80	-36.85	191.47	3.22
35.25	34	SLE R	15	190.00	10.81	10.81	-3512.19	403.95	-77.74	6.79
35.25	20	SLE Q	15	190.00	10.81	10.81	-1415.85	162.84	-31.34	2.74

Stato limite d'esercizio - Verifiche a fessurazione

Caso	Xg	CC	TCC	El	Sez.	X	My	c	s	K ₂	Φ _{eq}	Δ _{sm}	A _s	A _{c eff}	σ _s	ε _{sm}	Wk
	<mm>					<cm>	<daNm>	<mm>	<mm>			<mm>	<cmq>	<cmq>	<daN/cmq>		<mm>
42	0.55	20	SLE Q	1	2	55.00	-862.22	30.33	254.00	0.50	21.50	545.24	10.81	615.00	99.17	0.03	0.03
46	0.55	19	SLE F	1	2	55.00	-1037.94	30.33	254.00	0.50	21.50	545.24	10.81	615.00	119.38	0.03	0.03
93	1.50	20	SLE Q	1	2	150.00	870.09	30.33	254.00	0.50	21.50	545.24	10.81	615.00	100.07	0.03	0.03
97	1.50	19	SLE F	1	2	150.00	1085.70	30.33	254.00	0.50	21.50	545.24	10.81	615.00	124.87	0.04	0.03
127	2.45	20	SLE Q	1	2	245.00	870.09	30.33	254.00	0.50	21.50	545.24	10.81	615.00	100.07	0.03	0.03
129	2.45	19	SLE F	1	2	245.00	1085.70	30.33	254.00	0.50	21.50	545.24	10.81	615.00	124.87	0.04	0.03
174	2.45	20	SLE Q	2	2	0.00	-4394.28	30.33	254.00	0.50	21.50	545.24	10.81	615.00	505.40	0.15	0.14
178	2.45	19	SLE F	2	2	0.00	-4948.45	30.33	254.00	0.50	21.50	545.24	10.81	615.00	569.13	0.17	0.15
221	4.30	20	SLE Q	2	2	185.00	2879.12	30.33	254.00	0.50	21.50	545.24	10.81	615.00	331.13	0.10	0.09
225	4.30	19	SLE F	2	2	185.00	3334.30	30.33	254.00	0.50	21.50	545.24	10.81	615.00	383.49	0.11	0.10
270	4.50	20	SLE Q	3	2	10.00	-3493.16	30.33	254.00	0.50	21.50	545.24	10.81	615.00	401.76	0.12	0.11
274	4.50	19	SLE F	3	2	10.00	-4001.51	30.33	254.00	0.50	21.50	545.24	10.81	615.00	460.22	0.13	0.12
302	6.57	20	SLE Q	3	2	217.00	2293.47	30.33	254.00	0.50	21.50	545.24	10.81	615.00	362.78	0.08	0.07
304	6.57	19	SLE F	3	2	217.00	2760.78	30.33	254.00	0.50	21.50	545.24	10.81	615.00	317.52	0.09	0.09
340	6.77	20	SLE Q	4	2	10.00	-3194.25	30.33	254.00	0.50	21.50	545.24	10.81	615.00	367.38	0.11	0.10
343	6.77	19	SLE F	4	2	10.00	-3669.94	30.33	254.00	0.50	21.50	545.24	10.81	615.00	422.09	0.12	0.11
373	8.96	20	SLE Q	4	2	229.00	1903.32	30.33	254.00	0.50	21.50	545.24	10.81	615.00	218.91	0.06	0.06
375	8.96	19	SLE F	4	2	229.00	2339.28	30.33	254.00	0.50	21.50	545.24	10.81	615.00	269.05	0.08	0.07
411	9.18	20	SLE Q	5	2	11.00	-2151.75	30.33	254.00	0.50	21.50	545.24	10.81	615.00	247.48	0.07	0.07

415	9.18	19	SLE F	5	2	11.00	-2480.16	30.33	254.00	0.50	21.50	545.24	10.81	615.00	285.25	0.08	0.08
446	11.43	20	SLE Q	5	2	236.00	939.06	30.33	254.00	0.50	21.50	545.24	10.81	615.00	108.00	0.03	0.03
448	11.43	19	SLE F	5	2	236.00	1241.79	30.33	254.00	0.50	21.50	545.24	10.81	615.00	142.82	0.04	0.04
487	11.65	20	SLE Q	6	2	11.00	-1233.69	30.33	254.00	0.50	21.50	545.24	10.81	615.00	141.89	0.04	0.04
491	11.65	19	SLE F	6	2	11.00	-1442.06	30.33	254.00	0.50	21.50	545.24	10.81	615.00	165.86	0.05	0.04
527	13.96	20	SLE Q	6	2	242.00	443.70	30.33	254.00	0.50	21.50	545.24	10.81	615.00	51.03	0.01	0.01
529	13.96	19	SLE F	6	2	242.00	525.21	30.33	254.00	0.50	21.50	545.24	10.81	615.00	60.41	0.02	0.02
566	14.18	20	SLE Q	7	2	11.00	-1748.15	30.33	254.00	0.50	21.50	545.24	10.81	615.00	201.06	0.06	0.05
570	14.18	19	SLE F	7	2	11.00	-2123.73	30.33	254.00	0.50	21.50	545.24	10.81	615.00	244.26	0.07	0.07
601	16.51	20	SLE Q	7	2	244.00	644.13	30.33	254.00	0.50	21.50	545.24	10.81	615.00	74.08	0.02	0.02
603	16.51	19	SLE F	7	2	244.00	893.64	30.33	254.00	0.50	21.50	545.24	10.81	615.00	102.78	0.03	0.03
644	16.73	20	SLE Q	8	2	11.00	-594.15	30.33	254.00	0.50	21.50	545.24	10.81	615.00	68.34	0.02	0.02
648	16.73	19	SLE F	8	2	11.00	-812.23	30.33	254.00	0.50	21.50	545.24	10.81	615.00	93.42	0.03	0.03
695	18.40	20	SLE Q	8	2	178.14	-614.83	30.33	254.00	0.50	21.50	545.24	10.81	615.00	70.71	0.02	0.02
701	18.40	19	SLE F	8	2	178.14	-478.27	30.33	254.00	0.50	21.50	545.24	10.81	615.00	55.01	0.02	0.01
735	19.07	20	SLE Q	8	2	245.00	-614.83	30.33	254.00	0.50	21.50	545.24	10.81	615.00	70.71	0.02	0.02
741	19.07	19	SLE F	8	2	245.00	-478.27	30.33	254.00	0.50	21.50	545.24	10.81	615.00	55.01	0.02	0.01
773	19.29	20	SLE Q	9	2	11.00	646.29	30.33	254.00	0.50	21.50	545.24	10.81	615.00	74.33	0.02	0.02
775	19.29	19	SLE F	9	2	11.00	631.83	30.33	254.00	0.50	21.50	545.24	10.81	615.00	72.67	0.02	0.02
821	20.95	20	SLE Q	9	2	177.43	-1751.53	30.33	254.00	0.50	21.50	545.24	10.81	615.00	201.45	0.06	0.05
825	20.95	19	SLE F	9	2	177.43	-1718.88	30.33	254.00	0.50	21.50	545.24	10.81	615.00	197.69	0.06	0.05
868	21.62	20	SLE Q	9	2	244.00	-1751.53	30.33	254.00	0.50	21.50	545.24	10.81	615.00	201.45	0.06	0.05
872	21.62	19	SLE F	9	2	244.00	-1718.88	30.33	254.00	0.50	21.50	545.24	10.81	615.00	197.69	0.06	0.05
914	21.84	20	SLE Q	10	2	11.00	418.84	30.33	254.00	0.50	21.50	545.24	10.81	615.00	48.17	0.01	0.01
918	21.84	19	SLE F	10	2	11.00	392.99	30.33	254.00	0.50	21.50	545.24	10.81	615.00	45.20	0.01	0.01
966	23.49	20	SLE Q	10	2	176.00	-1160.27	30.33	254.00	0.50	21.50	545.24	10.81	615.00	133.45	0.04	0.04
970	23.49	19	SLE F	10	2	176.00	-1008.96	30.33	254.00	0.50	21.50	545.24	10.81	615.00	116.04	0.03	0.03
1012	24.15	20	SLE Q	10	2	242.00	-1160.27	30.33	254.00	0.50	21.50	545.24	10.81	615.00	133.45	0.04	0.04
1016	24.15	19	SLE F	10	2	242.00	-1008.96	30.33	254.00	0.50	21.50	545.24	10.81	615.00	116.04	0.03	0.03
1046	24.37	20	SLE Q	11	2	11.00	937.97	30.33	254.00	0.50	21.50	545.24	10.81	615.00	107.88	0.03	0.03
1048	24.37	19	SLE F	11	2	11.00	1121.96	30.33	254.00	0.50	21.50	545.24	10.81	615.00	129.04	0.04	0.03
1094	25.98	20	SLE Q	11	2	172.43	-2156.91	30.33	254.00	0.50	21.50	545.24	10.81	615.00	248.07	0.07	0.07
1098	25.98	19	SLE F	11	2	172.43	-2353.63	30.33	254.00	0.50	21.50	545.24	10.81	615.00	270.70	0.08	0.07
1137	26.63	20	SLE Q	11	2	237.00	-2156.91	30.33	254.00	0.50	21.50	545.24	10.81	615.00	248.07	0.07	0.07
1141	26.63	19	SLE F	11	2	237.00	-2353.63	30.33	254.00	0.50	21.50	545.24	10.81	615.00	270.70	0.08	0.07
1169	26.85	20	SLE Q	12	2	11.00	1844.91	30.33	254.00	0.50	21.50	545.24	10.81	615.00	212.19	0.06	0.06
1171	26.85	19	SLE F	12	2	11.00	2377.11	30.33	254.00	0.50	21.50	545.24	10.81	615.00	273.40	0.08	0.07
1217	28.10	20	SLE Q	12	2	135.57	-3118.70	30.33	254.00	0.50	21.50	545.24	10.81	615.00	358.69	0.10	0.10
1221	28.10	19	SLE F	12	2	135.57	-3696.62	30.33	254.00	0.50	21.50	545.24	10.81	615.00	425.16	0.12	0.11
1255	29.03	20	SLE Q	12	2	229.00	-3118.70	30.33	254.00	0.50	21.50	545.24	10.81	615.00	358.69	0.10	0.10
1259	29.03	19	SLE F	12	2	229.00	-3696.62	30.33	254.00	0.50	21.50	545.24	10.81	615.00	425.16	0.12	0.11
1286	29.23	20	SLE Q	13	2	10.00	1936.18	30.33	254.00	0.50	21.50	545.24	10.81	615.00	222.69	0.06	0.06
1288	29.23	19	SLE F	13	2	10.00	2597.97	30.33	254.00	0.50	21.50	545.24	10.81	615.00	298.80	0.09	0.08
1334	30.61	20	SLE Q	13	2	148.00	-3099.00	30.33	254.00	0.50	21.50	545.24	10.81	615.00	356.43	0.10	0.10
1338	30.61	19	SLE F	13	2	148.00	-3817.56	30.33	254.00	0.50	21.50	545.24	10.81	615.00	439.07	0.13	0.12
1381	31.30	20	SLE Q	13	2	217.00	-3099.00	30.33	254.00	0.50	21.50	545.24	10.81	615.00	356.43	0.10	0.10
1385	31.30	19	SLE F	13	2	217.00	-3817.56	30.33	254.00	0.50	21.50	545.24	10.81	615.00	439.07	0.13	0.12
1430	31.50	20	SLE Q	14	2	10.00	1990.11	30.33	254.00	0.50	21.50	545.24	10.81	615.00	228.89	0.07	0.06
1434	31.50	19	SLE F	14	2	10.00	2730.89	30.33	254.00	0.50	21.50	545.24	10.81	615.00	314.09	0.09	0.08
1480	32.38	20	SLE Q	14	2	97.50	-2871.87	30.33	101.60	0.50	21.50	121.84	21.61	615.00	167.26	0.05	0.01
1484	32.38	19	SLE F	14	2	97.50	-3681.62	30.33	101.60	0.50	21.50	121.84	21.61	615.00	214.42	0.06	0.01
1530	33.25	20	SLE Q	14	2	185.00	-2871.87	30.33	254.00	0.50	21.50	545.24	10.81	615.00	330.30	0.10	0.09
1534	33.25	19	SLE F	14	2	185.00	-3681.62	30.33	254.00	0.50	21.50	545.24	10.81	615.00	423.43	0.12	0.11
1563	33.45	20	SLE Q	15	2	10.00	1664.80	30.33	254.00	0.50	21.50	545.24	10.81	615.00	191.47	0.06	0.05
1565	33.45	19	SLE F	15	2	10.00	2302.84	30.33	254.00	0.50	21.50	545.24	10.81	615.00	264.86	0.08	0.07
1611	35.25	20	SLE Q	15	2	190.00	-1415.85	30.33	254.00	0.50	21.50	545.24	10.81	615.00	162.84	0.05	0.04
1615	35.25	19	SLE F	15	2	190.00	-1835.12	30.33	254.00	0.50	21.50	545.24	10.81	615.00	211.06	0.06	0.06

Stato limite ultimo - Verifiche a taglio

CC	X0 <m>	X1 <m>	Lung. <m>	Staff.	AfE St. <cmq/m>	bw <m>	Vsdu <daN>	ctgθ	VRsd <daN>	VRcd <daN>	Vrdu <daN>	Sic.
3 SND	0.55	2.45	1.90	ø10/16 2 br.	9.82	0.60	9696.48	2.50	74248.90	131654.00	74248.90	7.657
3 SND	2.45	4.30	1.85	ø10/16 2 br.	9.82	0.60	14426.40	2.50	74248.90	131654.00	74248.90	5.147
28 SLU	4.50	6.57	2.07	ø10/16 2 br.	9.82	0.60	8725.50	2.50	74248.90	131654.00	74248.90	8.509
28 SLU	6.77	8.96	2.19	ø10/16 2 br.	9.82	0.60	7810.36	2.50	74248.90	131654.00	74248.90	9.506
28 SLU	9.18	11.43	2.25	ø10/16 2 br.	9.82	0.60	5657.08	2.50	74248.90	131654.00	74248.90	13.125
7 SND	11.65	13.96	2.31	ø10/16 2 br.	9.82	0.60	4706.85	2.50	74248.90	131654.00	74248.90	15.775
28 SLU	14.18	16.51	2.33	ø10/16 2 br.	9.82	0.60	5356.22	2.50	74248.90	131654.00	74248.90	13.862
3 SND	16.73	19.07	2.34	ø10/16 2 br.	9.82	0.60	3549.10	2.50	74248.90	131654.00	74248.90	20.921
3 SND	19.29	21.62	2.33	ø10/16 2 br.	9.82	0.60	4705.22	2.50	74248.90	131654.00	74248.90	15.780
3 SND	21.84	24.15	2.31	ø10/16 2 br.	9.82	0.60	4787.72	2.50	74248.90	131654.00	74248.90	15.508
1 SND	24.37	26.63	2.26	ø10/16 2 br.	9.82	0.60	5855.51	2.50	74248.90	131654.00	74248.90	12.680
28 SLU	26.85	29.03	2.18	ø10/16 2 br.	9.82	0.60	8355.57	2.50	74248.90	131654.00	74248.90	8.886
28 SLU	29.23	31.30	2.07	ø10/16 2 br.	9.82	0.60	9627.39	2.50	74248.90	131654.00	74248.90	7.712
28 SLU	31.50	33.25	1.75	ø10/16 2 br.	9.82	0.60	11382.70	2.50	74248.90	131654.00	74248.90	6.523
7 SND	33.45	35.25	1.80	ø10/16 2 br.	9.82	0.60	17216.40	2.50	74248.90	131654.00	74248.90	4.313

<m>					<cm>	<cmq>	<cmq>	<cmq>	<cmq>	<cmq>	<daNm>	<daNm>	
0.08	28	SLU	b	1	8.00	6.28	6.28	6.28	6.28	6.28	3289.04	11033.40	3.355
1.28	28	SLU	b	1	128.27	6.28	6.28	6.28	6.28	6.28	-4397.25	-11033.50	2.509
1.58	28	SLU	b	1	158.33	12.57	12.57	12.57	12.57	12.57	-4397.25	-21359.90	4.858
1.58	21	SLU	b	2	-0.00	12.57	12.57	12.57	12.57	12.57	4007.81	21359.90	5.330
2.84	21	SLU	b	2	125.47	6.28	6.28	6.28	6.28	6.28	-4837.97	-11033.50	2.281
3.15	21	SLU	b	2	156.83	6.28	6.28	6.28	6.28	6.28	-4837.97	-11033.50	2.281
3.15	21	SLU	b	3	0.00	6.28	6.28	6.28	6.28	6.28	-3265.81	-11033.50	3.378
4.64	21	SLU	b	3	148.83	6.28	6.28	6.28	6.28	6.28	2348.96	11033.40	4.697
4.80	26	SLU	a	4	8.00	6.28	6.28	6.28	6.28	6.28	-1270.62	-11033.50	8.684
7.59	26	SLU	a	4	287.00	6.28	6.28	6.28	6.28	6.28	358.83	11033.40	30.748
7.75	22	SLU	b	5	8.00	6.28	6.28	6.28	6.28	6.28	-1808.55	-11033.50	6.101
12.37	22	SLU	b	5	470.00	6.28	6.28	6.28	6.28	6.28	-1671.52	-11033.50	6.601
12.53	22	SLU	b	6	8.00	6.28	6.28	6.28	6.28	6.28	-1735.71	-11033.50	6.357
17.15	22	SLU	b	6	470.00	6.28	6.28	6.28	6.28	6.28	-1730.41	-11033.50	6.376
17.31	22	SLU	b	7	8.00	6.28	6.28	6.28	6.28	6.28	-1733.98	-11033.50	6.363
21.93	22	SLU	b	7	470.00	6.28	6.28	6.28	6.28	6.28	-1731.38	-11033.50	6.373
22.09	22	SLU	b	8	8.00	6.28	6.28	6.28	6.28	6.28	-1733.60	-11033.50	6.365
26.71	22	SLU	b	8	470.00	6.28	6.28	6.28	6.28	6.28	-1731.27	-11033.50	6.373
26.87	22	SLU	b	9	8.00	6.28	6.28	6.28	6.28	6.28	-1732.16	-11033.50	6.370
31.18	22	SLU	b	9	439.20	6.28	6.28	6.28	6.28	6.28	-1732.51	-11033.50	6.369
31.49	22	SLU	b	9	470.00	6.28	6.28	6.28	6.28	6.28	-1732.51	-11033.50	6.369
31.65	22	SLU	b	10	8.00	6.28	6.28	6.28	6.28	6.28	-1672.99	-11033.50	6.595
35.96	22	SLU	b	10	439.20	6.28	6.28	6.28	6.28	6.28	-1804.61	-11033.50	6.114
36.27	22	SLU	b	10	470.00	6.28	6.28	6.28	6.28	6.28	-1804.61	-11033.50	6.114
36.43	29	SLU	a	11	8.00	6.28	6.28	6.28	6.28	6.28	-353.67	-11033.50	31.198
38.91	22	SLU	a	11	256.00	6.28	6.28	6.28	6.28	6.28	-1163.38	-11033.50	9.484
39.22	22	SLU	a	11	287.00	6.28	6.28	6.28	6.28	6.28	-1163.38	-11033.50	9.484
39.38	22	SLU	a	12	8.00	6.28	6.28	6.28	6.28	6.28	1823.11	11033.40	6.052
40.60	22	SLU	a	12	130.13	6.28	6.28	6.28	6.28	6.28	-2618.89	-11033.50	4.213
40.91	22	SLU	a	12	160.67	6.28	6.28	6.28	6.28	6.28	-2618.89	-11033.50	4.213
40.91	29	SLU	a	13	0.00	6.28	6.28	6.28	6.28	6.28	3175.99	11033.40	3.474
42.51	29	SLU	a	13	160.67	6.28	6.28	6.28	6.28	6.28	-3938.35	-11033.50	2.802
42.51	21	SLU	b	14	0.00	6.28	6.28	6.28	6.28	6.28	-5548.02	-11033.50	1.989
44.04	21	SLU	b	14	152.67	6.28	6.28	6.28	6.28	6.28	4220.16	11033.40	2.614

Stato limite elastico - Verifiche a flessione/pressoflessione

Xg	CC	TCC	In	El	X	AfE S	AfE I	AfE S	AfE I	My	M'ydy	Sic.
<m>					<cm>	<cmq>	<cmq>	<cmq>	<cmq>	<daNm>	<daNm>	
0.08	15	SND	b	1	8.00	6.28	6.28	6.28	6.28	4541.25	10462.20	2.304
1.28	15	SND	b	1	128.27	6.28	6.28	6.28	6.28	-5855.56	-10462.20	1.787
1.58	15	SND	b	1	158.33	12.57	12.57	12.57	12.57	-5855.56	-20506.10	3.502
1.58	15	SND	a	2	0.00	12.57	12.57	12.57	12.57	-6883.22	-20506.10	2.979
2.84	9	SND	a	2	125.47	6.28	6.28	6.28	6.28	-7554.85	-10462.20	1.385
3.15	9	SND	a	2	156.83	6.28	6.28	6.28	6.28	-7554.85	-10462.20	1.385
3.15	9	SND	b	3	0.00	6.28	6.28	6.28	6.28	-4235.45	-10462.20	2.470
4.64	9	SND	b	3	148.83	6.28	6.28	6.28	6.28	3212.28	10462.20	3.257
4.80	1	SND	b	4	8.00	6.28	6.28	6.28	6.28	-1118.96	-10462.20	9.350
7.59	7	SND	b	4	287.00	6.28	6.28	6.28	6.28	-527.06	-10462.20	19.850
7.75	1	SND	a	5	8.00	6.28	6.28	6.28	6.28	-1526.35	-10462.20	6.854
12.37	7	SND	b	5	470.00	6.28	6.28	6.28	6.28	-1392.13	-10462.20	7.515
12.53	1	SND	a	6	8.00	6.28	6.28	6.28	6.28	-1469.01	-10462.20	7.122
17.15	7	SND	b	6	470.00	6.28	6.28	6.28	6.28	-1428.15	-10462.20	7.326
17.31	1	SND	a	7	8.00	6.28	6.28	6.28	6.28	-1456.03	-10462.20	7.185
21.93	7	SND	b	7	470.00	6.28	6.28	6.28	6.28	-1432.06	-10462.20	7.306
22.09	1	SND	a	8	8.00	6.28	6.28	6.28	6.28	-1443.85	-10462.20	7.246
26.71	7	SND	b	8	470.00	6.28	6.28	6.28	6.28	-1435.43	-10462.20	7.289
26.87	1	SND	a	9	8.00	6.28	6.28	6.28	6.28	-1431.12	-10462.20	7.311
31.18	7	SND	b	9	439.20	6.28	6.28	6.28	6.28	-1439.63	-10462.20	7.267
31.49	7	SND	b	9	470.00	6.28	6.28	6.28	6.28	-1439.63	-10462.20	7.267
31.65	5	SND	b	10	8.00	6.28	6.28	6.28	6.28	-1391.47	-10462.20	7.519
35.96	7	SND	b	10	439.20	6.28	6.28	6.28	6.28	-1486.20	-10462.20	7.040
36.27	7	SND	b	10	470.00	6.28	6.28	6.28	6.28	-1486.20	-10462.20	7.040
36.43	5	SND	b	11	8.00	6.28	6.28	6.28	6.28	-541.13	-10462.20	19.334
38.91	3	SND	b	11	256.00	6.28	6.28	6.28	6.28	-1125.73	-10462.20	9.294
39.22	3	SND	b	11	287.00	6.28	6.28	6.28	6.28	-1125.73	-10462.20	9.294
39.38	13	SND	b	12	8.00	6.28	6.28	6.28	6.28	3379.87	10462.20	3.095
40.60	13	SND	b	12	130.13	6.28	6.28	6.28	6.28	-4446.17	-10462.20	2.353
40.91	13	SND	b	12	160.67	6.28	6.28	6.28	6.28	-4446.17	-10462.20	2.353
40.91	15	SND	b	13	0.00	6.28	6.28	6.28	6.28	-7455.07	-10462.20	1.403
42.51	11	SND	a	13	160.67	6.28	6.28	6.28	6.28	-6835.79	-10462.20	1.531
42.51	11	SND	b	14	0.00	6.28	6.28	6.28	6.28	-5896.40	-10462.20	1.774
44.04	11	SND	b	14	152.67	6.28	6.28	6.28	6.28	4574.09	10462.20	2.287

Stato limite d'esercizio - Verifiche tensionali

Xg	CC	TCC	In	El	X	AfE S	AfE I	My	σ _f sup	σ _f inf	σ _c	
<m>					<cm>	<cmq>	<cmq>	<daNm>	<daN/cmq>	<daN/cmq>	<daN/cmq>	
0.08	34	SLE	R	b	1	8.00	6.28	6.28	2379.78	-140.09	891.01	16.08
0.08	20	SLE	Q	b	1	8.00	6.28	6.28	1577.45	-92.86	590.61	10.66
1.28	34	SLE	R	b	1	128.27	6.28	6.28	-3197.25	1197.08	-188.22	21.61
1.28	20	SLE	Q	b	1	128.27	6.28	6.28	-2223.96	832.67	-130.92	15.03
1.58	34	SLE	R	b	1	158.33	12.57	12.57	-3197.25	609.49	-153.79	15.24
1.58	20	SLE	Q	b	1	158.33	12.57	12.57	-2223.96	423.95	-106.97	10.60
1.58	30	SLE	R	a	2	0.00	12.57	12.57	2560.44	-123.16	488.10	12.21
1.58	20	SLE	Q	b	2	-0.00	12.57	12.57	175.01	-8.42	33.36	0.83
2.84	30	SLE	R	a	2	125.47	6.28	6.28	-3147.16	1178.33	-185.27	21.27
2.84	20	SLE	Q	b	2	125.47	6.28	6.28	-495.67	185.58	-29.18	3.35
3.15	30	SLE	R	a	2	156.83	6.28	6.28	-3147.16	1178.33	-185.27	21.27

921	17.31	20	SLE Q	a	7	3	8.00	-1280.55	31.00	510.00	0.50	20.00	301.65	6.28	615.00	479.45	0.14	0.07
928	17.31	24	SLE F	b	7	3	8.00	-1286.23	31.00	510.00	0.50	20.00	301.65	6.28	615.00	481.58	0.14	0.07
975	21.93	20	SLE Q	b	7	3	470.00	-1274.31	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.12	0.14	0.07
980	21.93	24	SLE F	b	7	3	470.00	-1276.35	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.88	0.14	0.07
1025	22.09	20	SLE Q	a	8	3	8.00	-1279.30	31.00	510.00	0.50	20.00	301.65	6.28	615.00	478.98	0.14	0.07
1032	22.09	24	SLE F	b	8	3	8.00	-1285.27	31.00	510.00	0.50	20.00	301.65	6.28	615.00	481.22	0.14	0.07
1079	26.71	20	SLE Q	b	8	3	470.00	-1274.15	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.06	0.14	0.07
1084	26.71	24	SLE F	b	8	3	470.00	-1275.38	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.52	0.14	0.07
1129	26.87	20	SLE Q	a	9	3	8.00	-1277.33	31.00	510.00	0.50	20.00	301.65	6.28	615.00	478.25	0.14	0.07
1136	26.87	24	SLE F	b	9	3	8.00	-1283.50	31.00	510.00	0.50	20.00	301.65	6.28	615.00	480.56	0.14	0.07
1183	31.18	20	SLE Q	b	9	3	439.20	-1274.97	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.36	0.14	0.07
1188	31.18	24	SLE F	b	9	3	439.20	-1275.38	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.51	0.14	0.07
1235	31.49	20	SLE Q	b	9	3	470.00	-1274.97	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.36	0.14	0.07
1240	31.49	24	SLE F	b	9	3	470.00	-1275.38	31.00	510.00	0.50	20.00	301.65	6.28	615.00	477.51	0.14	0.07
1285	31.65	20	SLE Q	a	10	3	8.00	-1235.42	31.00	510.00	0.50	20.00	301.65	6.28	615.00	462.55	0.13	0.07
1292	31.65	24	SLE F	b	10	3	8.00	-1239.15	31.00	510.00	0.50	20.00	301.65	6.28	615.00	463.95	0.14	0.07
1339	35.96	20	SLE Q	b	10	3	439.20	-1328.23	31.00	510.00	0.50	20.00	301.65	6.28	615.00	497.30	0.14	0.07
1344	35.96	24	SLE F	b	10	3	439.20	-1327.60	31.00	510.00	0.50	20.00	301.65	6.28	615.00	497.07	0.14	0.07
1391	36.27	20	SLE Q	b	10	3	470.00	-1328.23	31.00	510.00	0.50	20.00	301.65	6.28	615.00	497.30	0.14	0.07
1396	36.27	24	SLE F	b	10	3	470.00	-1327.60	31.00	510.00	0.50	20.00	301.65	6.28	615.00	497.07	0.14	0.07
1479	36.43	20	SLE Q	b	11	3	8.00	174.46	31.00	510.00	0.50	20.00	301.65	6.28	615.00	65.32	0.02	0.01
1487	36.43	19	SLE F	b	11	3	8.00	175.33	31.00	510.00	0.50	20.00	301.65	6.28	615.00	65.64	0.02	0.01
1574	38.91	20	SLE Q	b	11	3	256.00	-808.06	31.00	510.00	0.50	20.00	301.65	6.28	615.00	302.55	0.09	0.05
1582	38.91	19	SLE F	b	11	3	256.00	-807.90	31.00	510.00	0.50	20.00	301.65	6.28	615.00	302.49	0.09	0.05
1632	39.22	20	SLE Q	b	11	3	287.00	-808.06	31.00	510.00	0.50	20.00	301.65	6.28	615.00	302.55	0.09	0.05
1636	39.22	19	SLE F	b	11	3	287.00	-807.90	31.00	510.00	0.50	20.00	301.65	6.28	615.00	302.49	0.09	0.05
1686	39.38	20	SLE Q	a	12	3	8.00	943.95	31.00	510.00	0.50	20.00	301.65	6.28	615.00	353.42	0.10	0.05
1690	39.38	19	SLE F	a	12	3	8.00	971.37	31.00	510.00	0.50	20.00	301.65	6.28	615.00	363.69	0.11	0.05
1775	40.60	20	SLE Q	a	12	3	130.13	-1458.59	31.00	510.00	0.50	20.00	301.65	6.28	615.00	546.11	0.16	0.08
1783	40.60	19	SLE F	a	12	3	130.13	-1491.18	31.00	510.00	0.50	20.00	301.65	6.28	615.00	558.31	0.16	0.08
1838	40.91	20	SLE Q	a	12	3	160.67	-1458.59	31.00	510.00	0.50	20.00	301.65	6.28	615.00	546.11	0.16	0.08
1842	40.91	19	SLE F	a	12	3	160.67	-1491.18	31.00	510.00	0.50	20.00	301.65	6.28	615.00	558.31	0.16	0.08
1895	40.91	20	SLE Q	b	13	3	0.00	-540.95	31.00	510.00	0.50	20.00	301.65	6.28	615.00	202.54	0.06	0.03
1899	40.91	19	SLE F	b	13	3	0.00	-612.60	31.00	510.00	0.50	20.00	301.65	6.28	615.00	229.36	0.07	0.03
1951	42.51	20	SLE Q	b	13	3	160.67	194.97	31.00	510.00	0.50	20.00	301.65	6.28	615.00	73.00	0.02	0.01
1954	42.51	24	SLE F	a	13	3	160.67	-510.11	31.00	510.00	0.50	20.00	301.65	6.28	615.00	190.99	0.06	0.03
2003	42.51	20	SLE Q	b	14	3	0.00	-2205.41	31.00	510.00	0.50	20.00	301.65	6.28	615.00	825.73	0.24	0.12
2007	42.51	19	SLE F	b	14	3	0.00	-2398.63	31.00	510.00	0.50	20.00	301.65	6.28	615.00	898.07	0.26	0.13
2055	44.04	20	SLE Q	b	14	3	152.67	1557.39	31.00	510.00	0.50	20.00	301.65	6.28	615.00	583.10	0.17	0.09
2059	44.04	19	SLE F	b	14	3	152.67	1716.99	31.00	510.00	0.50	20.00	301.65	6.28	615.00	642.86	0.19	0.10

Stato limite ultimo - Verifiche a taglio

CC	X0 <m>	X1 <m>	Lung. <m>	In	Staff.	AfE St. <cmq/m>	bw <m>	Vsdu <daN>	ctgθ	VRsd <daN>	VRcd <daN>	Vrdu <daN>	Sic.
15 SND	0.08	1.58	1.50	b	ø10/16 2 br.	9.82	0.60	7116.15	2.50	39674.30	70348.10	39674.30	5.575
15 SND	1.58	2.08	0.50	a	ø10/16 2 br.	9.82	0.60	8358.03	2.50	39674.30	70348.10	39674.30	4.747
9 SND	2.08	2.65	0.57	a	ø10/16 2 br.	9.82	0.60	8771.28	2.50	39674.30	70348.10	39674.30	4.523
9 SND	2.65	3.15	0.50	a	ø10/16 2 br.	9.82	0.60	9164.86	2.50	39674.30	70348.10	39674.30	4.329
9 SND	3.15	4.64	1.49	b	ø10/16 2 br.	9.82	0.60	5305.90	2.50	39674.30	70348.10	39674.30	7.477
29 SLU	4.80	5.30	0.50	a	ø10/16 2 br.	9.82	0.60	1704.37	2.50	39674.30	70348.10	39674.30	23.278
26 SLU	5.30	7.09	1.79	a	ø10/16 2 br.	9.82	0.60	1240.10	2.50	39674.30	70348.10	39674.30	31.993
7 SND	7.09	7.59	0.50	b	ø10/16 2 br.	9.82	0.60	1079.99	2.50	39674.30	70348.10	39674.30	36.736
22 SLU	7.75	8.25	0.50	b	ø10/16 2 br.	9.82	0.60	2172.83	2.50	39674.30	70348.10	39674.30	18.259
22 SLU	8.25	11.87	3.62	b	ø10/16 2 br.	9.82	0.60	1698.21	2.50	39674.30	70348.10	39674.30	23.363
22 SLU	11.87	12.37	0.50	b	ø10/16 2 br.	9.82	0.60	2112.28	2.50	39674.30	70348.10	39674.30	18.783
22 SLU	12.53	13.03	0.50	b	ø10/16 2 br.	9.82	0.60	2135.14	2.50	39674.30	70348.10	39674.30	18.582
22 SLU	13.03	16.65	3.62	b	ø10/16 2 br.	9.82	0.60	1664.12	2.50	39674.30	70348.10	39674.30	23.841
22 SLU	16.65	17.15	0.50	b	ø10/16 2 br.	9.82	0.60	2132.80	2.50	39674.30	70348.10	39674.30	18.602
22 SLU	17.31	17.81	0.50	b	ø10/16 2 br.	9.82	0.60	2134.07	2.50	39674.30	70348.10	39674.30	18.591
22 SLU	17.81	21.43	3.62	b	ø10/16 2 br.	9.82	0.60	1663.18	2.50	39674.30	70348.10	39674.30	23.855
22 SLU	21.43	21.93	0.50	b	ø10/16 2 br.	9.82	0.60	2132.92	2.50	39674.30	70348.10	39674.30	18.601
22 SLU	22.09	22.59	0.50	b	ø10/16 2 br.	9.82	0.60	2133.72	2.50	39674.30	70348.10	39674.30	18.594
22 SLU	22.59	26.21	3.62	b	ø10/16 2 br.	9.82	0.60	1662.90	2.50	39674.30	70348.10	39674.30	23.859
22 SLU	26.21	26.71	0.50	b	ø10/16 2 br.	9.82	0.60	2132.69	2.50	39674.30	70348.10	39674.30	18.603
22 SLU	26.87	27.37	0.50	b	ø10/16 2 br.	9.82	0.60	2133.00	2.50	39674.30	70348.10	39674.30	18.600
22 SLU	27.37	30.99	3.62	b	ø10/16 2 br.	9.82	0.60	1662.39	2.50	39674.30	70348.10	39674.30	23.866
22 SLU	30.99	31.49	0.50	b	ø10/16 2 br.	9.82	0.60	2133.16	2.50	39674.30	70348.10	39674.30	18.599
22 SLU	31.65	32.15	0.50	b	ø10/16 2 br.	9.82	0.60	2111.96	2.50	39674.30	70348.10	39674.30	18.786
22 SLU	32.15	35.77	3.62	b	ø10/16 2 br.	9.82	0.60	1695.90	2.50	39674.30	70348.10	39674.30	23.394
22 SLU	35.77	36.27	0.50	b	ø10/16 2 br.	9.82	0.60	2170.12	2.50	39674.30	70348.10	39674.30	18.282
29 SLU	36.43	36.93	0.50	a	ø10/16 2 br.	9.82	0.60	1095.71	2.50	39674.30	70348.10	39674.30	36.209
22 SLU	36.93	38.72	1.79	a	ø10/16 2 br.	9.82	0.60	1166.46	2.50	39674.30	70348.10	39674.30	34.013
22 SLU	38.72	39.22	0.50	a	ø10/16 2 br.	9.82	0.60	1619.03	2.50	39674.30	70348.10	39674.30	24.505
13 SND	39.38	40.91	1.53	b	ø10/16 2 br.	9.82	0.60	5438.54	2.50	39674.30	70348.10	39674.30	7.295
15 SND	40.91	41.41	0.50	b	ø10/16 2 br.	9.82	0.60	8852.28	2.50	39674.30	70348.10	39674.30	4.482
15 SND	41.41	42.01	0.61	b	ø10/16 2 br.	9.82	0.60	8458.83	2.50	39674.30	70348.10	39674.30	4.690
11 SND	42.01	42.51	0.50	a	ø10/16 2 br.	9.82	0.60	8125.37	2.50	39674.30	70348.10	39674.30	4.883
11 SND	42.51	44.04	1.53</										

VERIFICHE E ARMATURE PLINTI/PALI

Simbologia

Δ_{sm}	= Distanza media tra le fessure
Φ_{eq}	= Diametro equivalente delle barre
ϵ_{sm}	= Deformazione unitaria media dell'armatura (*1000)
σ_c	= Tensione nel calcestruzzo
σ_f	= Tensione nel ferro
σ_{fx}	= Tensione nell'armatura nel fondo in dir. X
σ_{fy}	= Tensione nell'armatura nel fondo in dir. Y
σ_s	= Tensione nell'acciaio nella sezione fessurata
σ_t	= Tensione sul terreno
$A_{c\ eff}$	= Area di calcestruzzo efficace
A_s	= Area complessiva dei ferri nell'area di calcestruzzo efficace
A_{fx}	= Area di ferro nel fondo in dir. X
A_{fy}	= Area di ferro nel fondo in dir. Y
A_{fC}	= Area di ferro compressa
A_{fT}	= Area di ferro tesa
A_z	= Azioni ed effetti sul plinto/palo RVN = Reazioni vincolari agenti TAG = Effetti dovuti ai tagli ECC = Effetti dovuti all'eccentricità PP = Effetti dovuti al peso proprio SVR = Effetti dovuti ai sovraccarichi e al peso del terreno TOT = Azioni totali di calcolo
CC	= Numero della combinazione delle condizioni di carico elementari
Caso	= Caso di verifica
Cf	= Copriferro
Cls	= Tipo di calcestruzzo
Coord.	= Coordinata del punto di verifica
FDtirX	= Forza resistente complessiva di tiro nell'armatura di fondo in dir. X
FDtirY	= Forza resistente complessiva di tiro nell'armatura di fondo in dir. Y
Fcd	= Resistenza di calcolo a compressione del calcestruzzo
Fck	= Resistenza caratteristica cilindrica a compressione del calcestruzzo
Fctd	= Resistenza di calcolo a trazione del calcestruzzo
Fctk	= Resistenza caratteristica a trazione del calcestruzzo
FtirX	= Forza complessiva di tiro nell'armatura di fondo in dir. X
FtirY	= Forza complessiva di tiro nell'armatura di fondo in dir. Y
Fyd	= Resistenza di calcolo dell'acciaio
Fyk	= Tensione caratteristica di snervamento dell'acciaio
K_2	= Coefficiente per distribuzione deformazioni
M'yd	= Momento resistente massimo in campo sostanzialmente elastico
MRd	= Momento resistente allo stato limite ultimo
Mom	= Momento flettente
M_x	= Momento intorno all'asse X
M_y	= Momento intorno all'asse Y
N	= Sforzo normale
Nodo	= Nodo plinto/palo
PV	= Punto di verifica XXn = Posizione di verifica (coord. Y) per flessione intorno all'asse X YYn = Posizione di verifica (coord. X) per flessione intorno all'asse Y
Sic.	= Sicurezza
TCC	= Tipo di combinazione di carico SLU = Stato limite ultimo SLE R = Stato limite d'esercizio, combinazione rara SLE F = Stato limite d'esercizio, combinazione frequente SLE Q = Stato limite d'esercizio, combinazione quasi permanente SLD = Stato limite di danno SND = Stato limite di salvaguardia della vita (non dissipativo)
Tipo	= Tipo di verifica effettuata
Tp	= Tipo di acciaio
Tx	= Taglio in dir. X
Ty	= Taglio in dir. Y
Wk	= Ampiezza caratteristica delle fessure
c	= Ricoprimento dell'armatura
s	= Distanza massima tra le barre

Plinti pilastri n. 1-19-316-319

Caratteristiche delle sezioni e dei materiali utilizzati

Cf	Cls	Fck	Fctk	Fcd	Fctd	Tp	Fyk	Fyd
<cm>		<daN/cmq>	<daN/cmq>	<daN/cmq>	<daN/cmq>		<daN/cmq>	<daN/cmq>
4.00	C25/30	249.00	17.91	141.10	11.94	B450C	4500.00	3913.04

Le tensioni sul terreno vengono calcolate oltre che per l'effetto delle reazioni vincolari anche considerando i seguenti effetti

Azioni ed effetti comuni

Az	N	M_x	M_y
	<daN>	<daNm>	<daNm>
PP	22823.70	0.00	0.00
SVR	0.00		

Azioni, effetti e tensioni sul terreno

Caso	Nodo	CC	TCC	Az	N <daN>	Tx <daN>	Ty <daN>	Mx <daNm>	My <daNm>	σ_t <daN/cm ² >
55	54	5	SND	RVN	4858.20	2159.52	-157.25	4134.72	20497.30	
	54	5	SND	TAG				149.39	2051.55	
	54	5	SND	ECC				0.00	0.00	
	54	5	SND	TOT	27681.90	2159.52	-157.25	4284.11	22548.80	-0.94
46	16	28	SLU	RVN	8814.13	-652.86	-2.16	-3619.78	9563.72	
	16	28	SLU	TAG				2.05	-620.22	
	16	28	SLU	ECC				0.00	0.00	
	16	28	SLU	TOT	31637.90	-652.86	-2.16	-3617.73	8943.50	-0.58
38	16	20	SLE Q	RVN	5123.78	-325.48	-1.42	-1723.92	3257.13	
	16	20	SLE Q	TAG				1.35	-309.21	
	16	20	SLE Q	ECC				0.00	0.00	
	16	20	SLE Q	TOT	27947.50	-325.48	-1.42	-1722.58	2947.92	-0.38
52	16	34	SLE R	RVN	6499.16	-474.97	-1.61	-2617.44	6744.71	
	16	34	SLE R	TAG				1.53	-451.22	
	16	34	SLE R	ECC				0.00	0.00	
	16	34	SLE R	TOT	29322.90	-474.97	-1.61	-2615.91	6293.49	-0.48
37	16	19	SLE F	RVN	5398.86	-355.38	-1.46	-1902.63	3954.64	
	16	19	SLE F	TAG				1.38	-337.61	
	16	19	SLE F	ECC				0.00	0.00	
	16	19	SLE F	TOT	28222.60	-355.38	-1.46	-1901.24	3617.03	-0.40

Stato limite ultimo - Verifiche a flessione/pressoflessione

Caso	Nodo	CC	TCC	PV	Coord. <m>	Mom <daNm>	MRd <daNm>	Sic.
46	16	28	SLU	XX1	0.08	9062.63	55579.60	6.13
46	16	28	SLU	XX2	-0.08	9062.63	55579.60	6.13
46	16	28	SLU	YY1	0.55	3653.88	55580.80	15.21
46	16	28	SLU	YY2	-0.55	3653.88	55580.80	15.21

Stato limite ultimo - Verifiche a flessione/pressoflessione

Caso	Nodo	CC	TCC	PV	Coord. <m>	Mom <daNm>	M'yd <daNm>	Sic.
55	54	5	SND	XX1	0.08	18430.90	-53767.20	2.92
55	54	5	SND	XX2	-0.08	18430.90	-53767.20	2.92
55	54	5	SND	YY1	0.55	7430.99	-53778.30	7.24
55	54	5	SND	YY2	-0.55	7430.99	-53778.30	7.24

Stato limite d'esercizio - Verifiche a flessione

Caso	Nodo	CC	TCC	PV	Coord. <m>	Mom <daNm>	AfT <cmq>	AfC <cmq>	σ_c <daN/cm ² >	σ_f <daN/cm ² >
37	16	19	SLE F	XX1	0.08	4398.99	15.83	14.70	-2.83	318.07
37	16	19	SLE F	XX2	-0.08	4398.99	15.83	14.70	-2.83	318.07
37	16	19	SLE F	YY1	0.55	1773.59	15.83	15.83	-1.14	128.23
37	16	19	SLE F	YY2	-0.55	1773.59	15.83	15.83	-1.14	128.23
38	16	20	SLE Q	XX1	0.08	3874.82	15.83	14.70	-2.49	
38	16	20	SLE Q	XX2	-0.08	3874.82	15.83	14.70	-2.49	
38	16	20	SLE Q	YY1	0.55	1562.25	15.83	15.83	-1.00	
38	16	20	SLE Q	YY2	-0.55	1562.25	15.83	15.83	-1.00	
52	16	34	SLE R	XX1	0.08	6495.63	15.83	14.70	-4.18	469.67
52	16	34	SLE R	XX2	-0.08	6495.63	15.83	14.70	-4.18	469.67
52	16	34	SLE R	YY1	0.55	2618.91	15.83	15.83	-1.68	189.35
52	16	34	SLE R	YY2	-0.55	2618.91	15.83	15.83	-1.68	189.35

Stato limite d'esercizio - Verifiche a fessurazione

Caso	Nodo	CC	TCC	PV	Coord. <m>	Mom <daNm>	c <mm>	s <mm>	K ₂	Φ_{eq}	Δ_{sm} <mm>	A _s <cmq>	A _{c eff} <cmq>	σ_s <daN/cm ² >	ϵ_{sm}	Wk <mm>
38	16	20	SLE Q	XX1	0.08	3874.82	34.00	229.53	0.50	12.00	633.02	15.83	3100.00	280.17	0.08	0.09
38	16	20	SLE Q	XX2	-0.08	3874.82	34.00	229.53	0.50	12.00	633.02	15.83	3100.00	280.17	0.08	0.09
38	16	20	SLE Q	YY1	0.55	1562.25	34.00	231.38	0.50	12.00	633.25	15.83	3100.00	112.95	0.03	0.04
38	16	20	SLE Q	YY2	-0.55	1562.25	34.00	231.38	0.50	12.00	633.25	15.83	3100.00	112.95	0.03	0.04
37	16	19	SLE F	XX1	0.08	4398.99	34.00	229.53	0.50	12.00	633.02	15.83	3100.00	318.07	0.09	0.10
37	16	19	SLE F	XX2	-0.08	4398.99	34.00	229.53	0.50	12.00	633.02	15.83	3100.00	318.07	0.09	0.10
37	16	19	SLE F	YY1	0.55	1773.59	34.00	231.38	0.50	12.00	633.25	15.83	3100.00	128.23	0.04	0.04
37	16	19	SLE F	YY2	-0.55	1773.59	34.00	231.38	0.50	12.00	633.25	15.83	3100.00	128.23	0.04	0.04

Verifiche effettuate

Caso	Tipo
55	$\sigma_{t \min}$ (max compr.), SND N cost - min. sic. lim. el.
46	SLU N cost - min. sic.
38	C.Q.Per. - $\sigma_{c \min}$ (max compr.), C.Q.Per. - W _{k max}
52	C.Rare - $\sigma_{c \min}$ (max compr.), C.Rare - $\sigma_{f \max}$ (max traz.), C.Rare - $\sigma_{f \min}$ (max compr.)
37	C.Freq - W _{k max}

Plinti pilastri n. 120-139-152-154-169-172-190-193-211-214-232-235-253-256-274-277-299-301

Caratteristiche delle sezioni e dei materiali utilizzati

Cf <cm>	Cls	Fck <daN/cmq>	Fctk <daN/cmq>	Fcd <daN/cmq>	Fctd <daN/cmq>	TP	Fyk <daN/cmq>	Fyd <daN/cmq>
4.00	C25/30	249.00	17.91	141.10	11.94	B450C	4500.00	3913.04

Le tensioni sul terreno vengono calcolate oltre che per l'effetto delle reazioni vincolari anche considerando i seguenti effetti

Azioni ed effetti comuni

Az	N <daN>	Mx <daNm>	My <daNm>
PP	9922.50	0.00	0.00
SVR	0.00		

Azioni, effetti e tensioni sul terreno

Caso	Nodo	CC	TCC	Az	N <daN>	Tx <daN>	Ty <daN>	Mx <daNm>	My <daNm>	σ_t <daN/cmq>
376	34	3	SND	RVN	7325.60	-3036.07	160.35	-5001.19	0.00	
			TAG				-144.31	-2732.46		
			ECC				0.00	0.00		
			TOT		17248.10	-3036.07	160.35	-5145.51	-2732.46	-0.91
300	29	26	SLU	RVN	9681.85	778.72	-191.91	341.13	0.00	
			TAG				172.72	700.85		
			ECC				0.00	0.00		
			TOT		19604.30	778.72	-191.91	513.85	700.85	-0.52
306	29	32	SLE R	RVN	8378.21	104.69	-5.95	-16.61	0.00	
			TAG				5.35	94.22		
			ECC				0.00	0.00		
			TOT		18300.70	104.69	-5.95	-11.26	94.22	-0.42

Stato limite ultimo - Verifiche armatura fondo

Caso	Nodo	CC	TCC	FtirX <daN>	Af _x <cmq>	FDtirX <daN>	FtirY <daN>	Af _y <cmq>	FDtirY <daN>
300	29	26	SLU	5910.43	11.31	44255.50	5910.43	11.31	44255.50

Stato limite ultimo - Verifiche armatura fondo

Caso	Nodo	CC	TCC	FtirX <daN>	Af _x <cmq>	FDtirX <daN>	FtirY <daN>	Af _y <cmq>	FDtirY <daN>
376	34	3	SND	4472.02	11.31	44255.50	4472.02	11.31	44255.50

Stato limite d'esercizio - Verifiche armatura fondo

Caso	Nodo	CC	TCC	FtirX <daN>	Af _x <cmq>	σ_{ex} <daN/cmq>	FtirY <daN>	Af _y <cmq>	σ_{fy} <daN/cmq>
306	29	32	SLE R	5114.61	11.31	452.23	5114.61	11.31	452.23

Verifiche effettuate

Caso	Tipo
376	σ_t min. (max compr.)
300	SLU N cost - min. sic.
306	C.Rare - σ_f max. (max traz.)

SOLLECITAZIONI MASSIME E VERIFICHE ARCOSTRUTTURA

Sollecitazioni Massime- (a favore di sicurezza di considerano i massimi delle sollecitazioni)

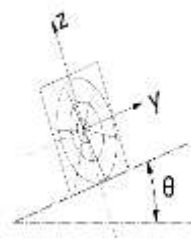
Per L si intende la lunghezza libera della trave tra due ritegni

SEZIONE 1 del modello- media 110x16 cm

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
301 (34 134)	1	SND	0.00	-9233.040	-134.311	233.433	3306.780	0.000	0.483
		SLD	3.15	-9022.370	-134.311	-189.647	3306.780	10416.400	0.483
	2	SND	0.00	-6319.690	-61.125	105.073	1756.860	0.000	-1.708
		SLD	3.15	-6109.020	-61.125	-87.471	1756.860	5534.110	-1.708
	3	SND	0.00	-10019.800	160.350	-284.303	3036.070	0.000	-10.345
		SLD	3.15	-9809.150	160.350	220.799	3036.070	9563.630	-10.345
	4	SND	0.00	-6673.790	71.492	-127.942	1635.020	0.000	-6.581
		SLD	3.15	-6463.120	71.492	97.257	1635.020	5150.320	-6.581
	5	SND	0.00	2140.980	-162.809	284.350	-2059.250	0.000	3.342
		SLD	3.15	2359.650	-162.809	-228.499	-2059.250	-6486.630	3.342
	6	SND	0.00	-1197.050	-73.951	127.988	-658.199	0.000	-0.421
		SLD	3.15	-986.378	-73.951	-104.956	-658.199	-2073.330	-0.421
	7	SND	0.00	1362.200	131.852	-233.387	-2329.960	0.000	-7.486
		SLD	3.15	1572.870	131.852	181.948	-2329.960	-7339.360	-7.486
	8	SND	0.00	-1551.150	58.666	-105.027	-780.036	0.000	-5.295
		SLD	3.15	-1340.480	58.666	79.771	-780.036	-2457.110	-5.295
	9	SND	0.00	-4331.430	-488.057	855.280	1744.500	0.000	14.117
		SLD	3.15	-4120.760	-488.057	-682.100	1744.500	5495.170	14.117
	10	SND	0.00	-4113.650	-220.333	384.944	1053.730	0.000	4.428
		SLD	3.15	-3902.980	-220.333	-309.106	1053.730	3319.250	4.428
	11	SND	0.00	-916.823	-496.606	870.555	134.689	0.000	14.975
		SLD	3.15	-706.151	-496.606	-693.755	134.689	424.270	14.975
	12	SND	0.00	-2576.860	-224.181	391.818	329.214	0.000	4.814
		SLD	3.15	-2366.190	-224.181	-314.352	329.214	1037.020	4.814
Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
316 (54 154)	1	SND	0.00	-17795.200	-122.765	221.610	2719.830	0.000	13.885
		SLD	3.15	-17585.500	-122.765	-165.100	2719.830	8567.480	13.885
	2	SND	0.00	-9783.780	-52.549	96.291	1408.430	0.000	8.264
		SLD	3.15	-9573.110	-52.549	-69.238	1408.430	4436.550	8.264
	3	SND	0.00	-15041.700	167.083	-291.190	2829.890	0.000	-2.434
		SLD	3.15	-14831.000	167.083	235.113	2829.890	8914.160	-2.434
	4	SND	0.00	-8544.090	77.902	-134.506	1457.960	0.000	0.920
		SLD	3.15	-8333.420	77.902	110.884	1457.960	4592.580	0.920
	5	SND	0.00	8588.720	-157.251	278.658	-2159.520	0.000	9.762
		SLD	3.15	8799.390	-157.251	-216.682	-2159.520	-6802.500	9.762
	6	SND	0.00	2091.120	68.070	121.966	-787.595	0.000	6.408
		SLD	3.15	2301.790	68.070	-92.453	-787.595	-2480.920	6.408
	7	SND	0.00	11343.200	132.597	-234.150	-2049.460	0.000	-6.557
		SLD	3.15	11553.900	132.597	183.531	-2049.460	-6455.810	-6.557
	8	SND	0.00	3330.800	62.381	-108.830	-738.061	0.000	-0.936
		SLD	3.15	3541.470	62.381	87.669	-738.061	-3324.890	-0.936
	9	SND	0.00	-11775.000	-472.991	839.852	883.652	0.000	31.480
		SLD	3.15	-11564.300	-472.991	-650.070	883.652	2783.500	31.480
	10	SND	0.00	-7073.860	-210.173	374.540	582.930	0.000	16.183
		SLD	3.15	-6863.190	-210.173	-287.505	582.930	1833.390	16.183
	11	SND	0.00	-3859.520	-483.337	856.967	-580.154	0.000	30.244
		SLD	3.15	-3648.840	-483.337	-665.544	-580.154	-1827.480	30.244
	12	SND	0.00	-3511.390	-214.829	382.242	-76.777	0.000	15.627
		SLD	3.15	-3300.720	-214.829	-294.470	-76.777	-241.848	15.627
Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
301 (34 134)	1	SND	0.00	-9233.040	-134.311	233.433	3306.780	0.000	0.483
		SLD	3.15	-9022.370	-134.311	-189.647	3306.780	10416.400	0.483
	2	SND	0.00	-6319.690	-61.125	105.073	1756.860	0.000	-1.708
		SLD	3.15	-6109.020	-61.125	-87.471	1756.860	5534.110	-1.708
	3	SND	0.00	-10019.800	160.350	-284.303	3036.070	0.000	-10.345
		SLD	3.15	-9809.150	160.350	220.799	3036.070	9563.630	-10.345
	4	SND	0.00	-6673.790	71.492	-127.942	1635.020	0.000	-6.581
		SLD	3.15	-6463.120	71.492	97.257	1635.020	5150.320	-6.581
	5	SND	0.00	2140.980	-162.809	284.350	-2059.250	0.000	3.342
		SLD	3.15	2359.650	-162.809	-228.499	-2059.250	-6486.630	3.342
	6	SND	0.00	-1197.050	-73.951	127.988	-658.199	0.000	-0.421
		SLD	3.15	-986.378	-73.951	-104.956	-658.199	-2073.330	-0.421
	7	SND	0.00	1362.200	131.852	-233.387	-2329.960	0.000	-7.486
		SLD	3.15	1572.870	131.852	181.948	-2329.960	-7339.360	-7.486
	8	SND	0.00	-1551.150	58.666	-105.027	-780.036	0.000	-5.295
		SLD	3.15	-1340.480	58.666	79.771	-780.036	-2457.110	-5.295
	9	SND	0.00	-4331.430	-488.057	855.280	1744.500	0.000	14.117
		SLD	3.15	-4120.760	-488.057	-682.100	1744.500	5495.170	14.117
	10	SND	0.00	-4113.650	-220.333	384.944	1053.730	0.000	4.428
		SLD	3.15	-3902.980	-220.333	-309.106	1053.730	3319.250	4.428
	11	SND	0.00	-916.823	-496.606	870.555	134.689	0.000	14.975
		SLD	3.15	-706.151	-496.606	-693.755	134.689	424.270	14.975
	12	SND	0.00	-2576.860	-224.181	391.818	329.214	0.000	4.814
		SLD	3.15	-2366.190	-224.181	-314.352	329.214	1037.020	4.814

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
31E (54 154)	26	SLU	0.00	-9563.140	-332.572	415.320	486.016	0.000	14.170
		SLU	3.15	-8807.320	-91.597	-252.747	-686.016	-2160.950	14.170
	27	SLE R	0.00	-6982.640	-221.536	276.949	-526.193	0.000	8.621
		SLE R	3.15	-6450.670	60.886	-167.867	-526.193	-1657.510	8.621
	28	SLU	0.00	-5632.240	2.390	-0.414	-771.202	0.000	-8.151
		SLU	3.15	-5358.370	2.390	7.116	-771.202	-2429.290	-8.151
	29	SLU	0.00	-7350.260	-654.534	687.385	481.669	0.000	35.059
		SLU	3.15	-7076.390	-162.909	-426.838	-481.669	-1517.260	35.059
	30	SLE R	0.00	-5379.360	-369.516	458.255	-368.293	0.000	22.720
		SLE R	3.15	-5168.690	-101.766	-284.015	-368.293	-1160.120	22.720
	31	SLU	0.00	-3766.770	1.444	-0.103	-385.679	0.000	-5.250
		SLU	3.15	-3556.100	1.444	4.445	-385.679	-1214.890	-5.250
32	SLE R	0.00	-7567.680	0.383	3.853	-259.277	0.000	-9.884	
	SLE R	3.15	-6490.550	0.383	5.061	-259.277	-816.723	-9.884	
33	SLU	0.00	-5632.240	2.390	-0.414	-771.202	0.000	-8.151	
	SLU	3.15	-5358.370	2.390	7.116	-771.202	-2429.290	-8.151	
34	SLE R	0.00	-4234.020	1.767	-0.277	-561.315	0.000	-6.007	
	SLE R	3.15	-4023.340	1.767	5.288	-561.315	-1768.140	-6.007	
31E (54 154)	1	SND	0.00	-17796.290	-122.765	221.610	2719.830	0.000	13.885
		SND	3.15	-17585.500	-122.765	-165.100	2719.830	8567.460	13.885
	2	SND	0.00	-9783.780	-52.549	96.291	1408.430	0.000	8.264
		SND	3.15	-9573.110	-52.549	-69.238	1408.430	4436.550	8.264
	3	SND	0.00	-15041.700	167.083	-291.198	2829.890	0.000	-2.434
		SND	3.15	-14831.000	167.083	235.113	2829.890	8914.160	-2.434
Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
33 (133)	1	SND	3.15	-341.244	-174.894	-250.875	1603.230	5050.180	1.412
		SND	0.00	-2573.300	-81.394	138.539	444.028	0.000	3.199
	2	SND	3.15	-2362.630	-81.394	-117.853	444.028	1398.690	3.199
		SND	0.00	-920.219	130.130	-227.120	1815.430	0.000	9.251
	3	SND	3.15	-709.547	130.130	182.790	1815.430	5718.590	9.251
		SND	0.00	-2739.060	55.886	-98.718	539.529	0.000	6.728
	4	SND	3.15	-2528.390	55.886	77.325	539.529	1699.520	6.728
		SND	0.00	-7534.960	-139.879	239.854	-2824.740	0.000	0.073
	5	SND	3.15	-7324.280	-139.879	-200.765	-2824.740	-8897.940	0.073
		SND	0.00	-5716.120	-65.635	111.451	-1548.850	0.000	2.597
	6	SND	3.15	-5505.440	-65.635	-95.300	-1548.850	-4878.870	2.597
		SND	0.00	-7903.260	165.145	-287.307	-2612.550	0.000	7.913
	7	SND	3.15	-7692.590	165.145	232.900	-2612.550	-8229.530	7.913
		SND	0.00	-5881.880	71.645	-125.805	-1453.340	0.000	6.125
	8	SND	3.15	-5671.200	71.645	99.877	-1453.340	-4578.040	6.125
		SND	0.00	-2566.290	-518.500	893.997	-194.121	0.000	-8.203
	9	SND	3.15	-2355.620	-518.500	-739.279	-194.121	-511.482	-8.203
		SND	0.00	-3479.900	-236.039	405.858	-364.897	0.000	-1.128
	10	SND	3.15	-3269.230	-236.039	-337.666	-364.897	-1149.420	-1.128
		SND	0.00	-4561.210	-507.996	875.941	-1522.510	0.000	-8.604
	11	SND	3.15	-4450.530	-507.996	-724.246	-1522.510	-4795.920	-8.604
		SND	0.00	-4422.740	-231.312	397.731	-962.759	0.000	-1.308
	12	SND	3.15	-4212.070	-231.312	-330.900	-962.759	-3032.690	-1.308
		SND	0.00	-3793.970	498.247	-863.207	513.197	0.000	17.929

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE MEDIA 110X16 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	ρ_m	420 kg/mc			
B	16 cm	$E_{0,m}$	11500 MPa			
H	110 cm	G_m	650 MPa			
H/B =	6,88	$f_{m,k}$	24,00 MPa			
L	300 cm	$f_{t,0,k}$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k}$	24,00 MPa			
λ	93 cm	$f_{v,k}$	3,50 MPa			
Lato maggiore	110 cm	θ	0,00 °			
A =	1760 cm ²					
J_y	1774667 cm ⁴	J_z	37547 cm ⁴	* È necessaria la verifica di instabilità		
W_y	32267 cm ³	W_z	4693 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1398	1631	1864	2097	2564	
$N_{Rd,c}$ (kN)	-1748	-2039	-2330	-2622	-3204	
$M_{Rd,y}$ (kN m)	320	374	427	481	587	
$M_{Rd,z}$ (kN m)	51	60	68	77	94	
$V_{Rd,y}$ (kN)	170	198	227	255	312	
$V_{Rd,z}$ (kN)	170	198	227	255	312	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)					-177,97	
$M_{Ed,y}$ (kN m)					104,17	
$M_{Ed,z}$ (kN m)					8,94	
$V_{Ed,y}$ (kN)					5,55	
$V_{Ed,z}$ (kN)					33,06	
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d}$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d}$	0,00	0,00	0,00	1,01	0,00	
$\sigma_{m,y,d}$	0,00	0,00	0,00	3,23	0,00	
$\sigma_{m,z,d}$	0,00	0,00	0,00	1,90	0,00	
$\tau_{d,y}$	0,00	0,00	0,00	0,05	0,00	$k_{cf} = 1$
$\tau_{d,z}$	0,00	0,00	0,00	0,28	0,00	$k_{sh} = 2$
τ_d	0,00	0,00	0,00	0,29	0,00	
Eq. [4.4.5]	0,00	0,00	0,00	0,31	0,00	Flessione
Eq. [4.4.6]	0,00	0,00	0,00	0,31	0,00	Tensoflessione
Eq. [4.4.7]	0,00	0,00	0,00	0,31	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05}$	9600	$a =$	3,261818182	$J_{tor} =$	138132	$\beta_c = 0,1$
$G_{0,05}$	543	$1/a =$	0,307	$M_{y,crit} =$	1206	
$\sigma_{y,crit}$	37,38	$\lambda_{rel,c} =$	1,48			
$\lambda_{rel,m}$	0,80	$k =$	1,65			
$k_{crit,m}$	0,96	$k_{crit,c} =$	0,420			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26]	0,00	0,00	0,00	0,32	0,00	Flessione
Eq. [7.27]	0,00	0,00	0,00	0,32	0,00	Tensoflessione
Eq. [7.28]	0,00	0,00	0,00	0,16	0,00	Compressione
Eq. [7.31]	0,00	0,00	0,00	0,48	0,00	Pressoflessione

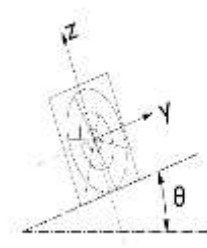


SEZIONE 6 del modello - media 140x16 cm

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
1107 (-83 -61)	1	SND	0.00	93.691	26.936	13.176	1417.100	-14723.100	-12.736
		SND	1.03	-93.743	26.936	41.029	1378.230	-13277.800	-12.735
	2	SLD	0.00	93.702	8.423	8.963	658.325	-7545.560	-7.793
		SLD	1.03	-93.732	8.423	17.673	619.450	-6884.920	-7.793
	3	SND	0.00	93.701	-58.684	5.431	1660.500	-14454.800	0.204
		SND	1.03	-93.733	-58.684	-55.252	1621.630	-12757.900	0.204
	4	SLD	0.00	93.707	-30.111	5.477	767.871	-7424.820	-1.969
		SLD	1.03	-93.727	-30.111	-25.660	728.996	-6650.900	-1.969
	5	SND	0.00	93.720	45.230	5.599	-1585.810	11111.700	-7.702
		SND	1.03	-93.714	45.230	52.369	-1624.690	9451.830	-7.702
	6	SLD	0.00	93.715	16.657	5.553	-693.181	4081.770	-5.528
		SLD	1.03	-93.719	16.657	22.777	-732.056	3344.890	-5.528
	7	SND	0.00	93.731	-40.391	-2.146	-1342.410	11380.000	5.238
		SND	1.03	-93.703	-40.391	-43.912	-1381.290	9971.790	5.238
	8	SLD	0.00	93.720	-21.878	2.067	-583.635	4202.510	0.296
		SLD	1.03	-93.714	-21.878	-20.556	-622.510	3578.900	0.296
	9	SND	0.00	93.689	133.229	19.561	82.113	-5993.860	-26.069
		SND	1.03	-93.746	133.229	157.327	43.238	-5929.050	-26.069
	10	SLD	0.00	93.701	56.262	11.836	57.494	-3616.850	-13.794
		SLD	1.03	-93.733	56.262	70.014	18.619	-3577.500	-13.794
	11	SND	0.00	93.697	138.718	17.288	-818.762	1756.590	-24.559
		SND	1.03	-93.737	138.718	160.728	-857.637	889.847	-24.559
	12	SLD	0.00	93.705	58.732	10.813	-347.958	-128.655	-13.114
		SLD	1.03	-93.729	58.732	71.546	-386.833	-508.560	-13.114
Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
	13	SND	0.00	-101.586	-21.444	19.511	351.787	1816.750	-4.384
		SND	1.21	101.583	-21.444	-6.440	257.376	2185.360	-4.384
	14	SLD	0.00	-101.586	-9.610	8.773	365.305	-55.777	-2.020
		SLD	1.21	101.583	-9.610	-2.857	270.894	329.190	-2.020
	15	SND	0.00	-101.588	-21.950	19.789	291.517	-4856.020	-4.014
		SND	1.21	101.581	-21.950	-6.775	197.106	-4560.350	-4.014
	16	SLD	0.00	-101.587	-9.837	8.897	338.180	-3058.950	-1.853
		SLD	1.21	101.582	-9.837	-3.008	243.768	-2706.810	-1.853
	17	SLU	0.00	-318.313	8.226	-7.388	717.456	-2359.530	1.341
		SLU	1.21	318.309	8.226	2.567	594.722	-1565.530	1.341
	18	SLE R	0.00	-225.754	5.494	-4.927	525.111	-1763.020	0.883
		SLE R	1.21	225.750	5.494	1.722	430.700	-1184.660	0.883
	19	SLE F	0.00	-101.586	0.076	-0.016	375.793	-1832.820	-0.087
		SLE F	1.21	101.583	0.076	0.076	281.382	-1435.160	-0.087
	20	SLE Q	0.00	-101.586	0.075	-0.016	376.368	-1588.240	-0.085
		SLE Q	1.21	101.583	0.075	0.075	281.957	-1189.890	-0.085
	21	SLU	0.00	-132.062	13.474	-12.226	527.852	-3063.830	2.458
		SLU	1.21	132.058	13.474	4.080	405.117	-2499.290	2.458
	22	SLU	0.00	-442.481	0.263	-0.093	835.566	-344.956	-0.246
		SLU	1.21	442.477	0.263	0.226	712.831	591.986	-0.246
	23	SLE R	0.00	-308.532	9.101	-8.200	627.629	-452.846	1.543
		SLE R	1.21	308.529	9.101	2.815	533.218	249.587	1.543
	24	SLE F	0.00	-142.975	1.881	-1.653	426.333	-1483.450	0.240
		SLE F	1.21	142.972	1.881	0.623	331.921	-1024.630	0.240
Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
3009 (-150 317)	1	SND	0.00	-71.264	-1.491	-0.874	-2513.370	9874.600	2.497
		SND	1.24	71.279	-1.491	-2.720	-2692.940	6650.680	2.497
	2	SLD	0.00	-71.268	-0.855	-0.335	-732.041	4289.890	1.168
		SLD	1.24	71.274	-0.855	-1.393	-911.607	3272.090	1.168
	3	SND	0.00	-71.263	-1.912	-1.392	-3079.540	10282.900	2.673
		SND	1.24	71.279	-1.912	-3.760	-3259.110	6357.790	2.673
	4	SLD	0.00	-71.268	-1.044	-0.568	-986.854	4473.650	1.248
		SLD	1.24	71.274	-1.044	-1.862	-1166.420	3140.270	1.248
	5	SND	0.00	-71.280	1.243	1.605	4531.130	-10844.100	-2.511
		SND	1.24	71.262	1.243	3.145	4351.560	-5343.660	-2.511
	6	SLD	0.00	-71.275	0.376	0.781	2438.440	-5034.870	-1.085
		SLD	1.24	71.267	0.376	1.245	2258.870	-2126.140	-1.085
	7	SND	0.00	-71.280	0.822	1.085	3964.960	-10435.800	-2.334
		SND	1.24	71.263	0.822	2.105	3785.390	-5636.550	-2.334
	8	SLD	0.00	-71.275	0.186	0.547	2183.620	-4851.110	-1.006
		SLD	1.24	71.267	0.186	0.778	2004.060	-2257.960	-1.006
	9	SND	0.00	-71.270	-0.043	0.599	612.735	2146.710	0.538
		SND	1.24	71.272	-0.043	0.547	433.169	2794.370	0.538
	10	SLD	0.00	-71.271	-0.203	0.328	674.909	811.842	0.287
		SLD	1.24	71.271	-0.203	0.077	495.343	1536.500	0.287
	11	SND	0.00	-71.275	0.778	1.343	2726.090	-4068.900	-0.964
		SND	1.24	71.267	0.778	2.305	2546.520	-803.931	-0.964
	12	SLD	0.00	-71.273	0.166	0.663	1626.050	-1985.590	-0.389
		SLD	1.24	71.269	0.166	0.869	1446.490	-82.968	-0.389

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>	
	29	SLU	0.00	-7350.260	-554.534	687.385	-481.669	0.000	35.059	
		SLU	3.15	-7076.390	-152.909	-426.838	-481.669	-1517.260	35.059	
	30	SLE R	0.00	-5379.360	-369.516	458.255	-368.293	0.000	22.720	
		SLE R	3.15	-5168.690	-101.766	-284.015	-368.293	-1160.120	22.720	
	31	SLU	0.00	-3766.770	1.444	-0.103	-385.679	0.000	-5.250	
		SLU	3.15	-3556.100	1.444	4.445	-385.679	-1214.890	-5.250	
	32	SLE R	0.00	-7567.680	0.383	3.853	-259.277	0.000	-9.884	
		SLE R	3.15	-6490.550	0.383	5.061	-259.277	-816.723	-9.884	
	33	SLU	0.00	-5632.240	2.390	-0.414	-771.202	0.000	-8.151	
		SLU	3.15	-5358.370	2.390	7.116	-771.202	-2429.290	-8.151	
	34	SLE R	0.00	-4234.020	1.767	-0.277	-561.315	0.000	-6.087	
		SLE R	3.15	-4023.340	1.767	5.288	-561.315	-1768.140	-6.087	
	316 (54 154)	1	SND	0.00	-17796.200	-122.765	221.610	2719.830	0.000	13.885
			SND	3.15	-17585.500	-122.765	-165.100	2719.830	8567.460	13.885
2		SLD	0.00	-9783.780	-52.549	96.291	1408.430	0.000	8.264	
		SLD	3.15	-9573.110	-52.549	-69.238	1408.430	4436.550	8.264	
3		SND	0.00	-15041.700	167.083	-291.198	2829.890	0.000	-2.434	
		SND	3.15	-14831.000	167.083	235.113	2829.890	8914.160	-2.434	
4		SLD	0.00	-8544.090	77.902	-134.506	1457.960	0.000	0.920	
		SLD	3.15	-8333.420	77.902	110.884	1457.960	4592.580	0.920	
5		SND	0.00	8588.720	-157.251	278.658	-2159.520	0.000	9.762	
		SND	3.15	8799.390	-157.251	-216.882	-2159.520	-6802.500	9.762	
6		SLD	0.00	2091.120	-68.070	121.966	-787.595	0.000	6.408	
		SLD	3.15	2301.790	-68.070	-92.453	-787.595	-2480.920	6.408	
Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>	
	5	SLD	3.15	-2528.390	55.886	77.325	539.529	1699.520	6.728	
		SND	0.00	-7534.960	-139.879	239.854	-2824.740	0.000	0.073	
	6	SND	3.15	-7324.280	-139.879	-200.765	-2824.740	-8897.940	0.073	
		SLD	0.00	-5716.120	-65.635	111.451	-1548.850	0.000	2.597	
	7	SLD	3.15	-5505.440	-65.635	-95.300	-1548.850	-4878.870	2.597	
		SND	0.00	-7903.260	165.145	-287.307	-2612.550	0.000	7.913	
	8	SND	3.15	-7692.590	165.145	232.900	-2612.550	-8229.530	7.913	
		SLD	0.00	-5881.880	71.645	-125.805	-1453.340	0.000	6.125	
	9	SLD	3.15	-5671.200	71.645	99.877	-1453.340	-4578.040	6.125	
		SND	0.00	-2566.290	-518.500	893.997	-194.121	0.000	-8.203	
	10	SND	3.15	-2355.620	-518.500	-739.279	-194.121	-611.482	-8.203	
		SLD	0.00	-3479.900	-236.039	405.858	-364.897	0.000	-1.128	
	11	SLD	3.15	-3269.230	-236.039	-337.666	-364.897	-1149.420	-1.128	
		SND	0.00	-4661.210	-507.996	875.941	-1522.510	0.000	-8.604	
	12	SND	3.15	-4450.530	-507.996	-724.246	-1522.510	-4795.920	-8.604	
		SLD	0.00	-4422.740	-231.312	397.731	-962.759	0.000	-1.308	
	13	SLD	3.15	-4212.070	-231.312	-330.900	-962.759	-3032.690	-1.308	
		SND	0.00	-3793.970	498.247	-863.207	513.197	0.000	17.929	
	14	SND	3.15	-3583.300	498.247	706.271	513.197	1615.570	17.929	
		SLD	0.00	-4032.430	221.563	-384.998	-46.558	0.000	10.633	
	15	SLD	3.15	-3821.760	221.563	312.925	-46.558	-146.657	10.633	
		SND	0.00	-5888.880	508.751	-881.263	-815.195	0.000	17.527	
	16	SND	3.15	-5678.210	508.751	721.304	-815.195	-2567.860	17.527	
		SLD	0.00	-4975.280	226.290	-393.124	-644.420	0.000	10.452	

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE MEDIA 16X140 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	ρ_m	420 kg/mc			
B	16 cm	$E_{0,m}$	11500 MPa			
H	140 cm	G_m	650 MPa			
H/B =	8,75	$f_{m,k}$	24,00 MPa			
L	360 cm	$f_{t,0,k}$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k}$	24,00 MPa			
λ	111 cm	$f_{v,k}$	3,50 MPa			
Lato maggiore	140 cm	θ	0,00 °			
A =	2240 cm ²					
J_y	3658667 cm ⁴	J_z	47787 cm ⁴	* È necessaria la verifica di instabilità		
W_y	52267 cm ³	W_z	5973 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1780	2076	2373	2669	3263	
$N_{Rd,c}$ (kN)	-2225	-2595	-2966	-3337	-4078	
$M_{Rd,y}$ (kN m)	519	606	692	779	952	
$M_{Rd,z}$ (kN m)	65	76	87	98	120	
$V_{Rd,y}$ (kN)	216	252	288	324	397	
$V_{Rd,z}$ (kN)	216	252	288	324	397	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)						-4,43
$M_{Ed,y}$ (kN m)						147,24
$M_{Ed,z}$ (kN m)						8,94
$V_{Ed,y}$ (kN)						45,32
$V_{Ed,z}$ (kN)						5,55
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d}$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d}$	0,00	0,00	0,00	0,02	0,00	
$\sigma_{m,y,d}$	0,00	0,00	0,00	2,82	0,00	
$\sigma_{m,z,d}$	0,00	0,00	0,00	1,50	0,00	
$\tau_{d,y}$	0,00	0,00	0,00	0,30	0,00	$k_{cf} = 1$
$\tau_{d,z}$	0,00	0,00	0,00	0,04	0,00	$k_{sh} = 2$
τ_d	0,00	0,00	0,00	0,31	0,00	
Eq. [4.4.5] =	0,00	0,00	0,00	0,26	0,00	Flessione
Eq. [4.4.6] =	0,00	0,00	0,00	0,26	0,00	Tensoflessione
Eq. [4.4.7] =	0,00	0,00	0,00	0,26	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05}$	9600	$a =$	3,205714286	$J_{tor} =$	178881	$\beta_c = 0,1$
$G_{0,05}$	543	$1/a =$	0,312	$M_{y,crit} =$	1290	
$\sigma_{y,crit}$	24,69	$\lambda_{rel,c} =$	1,77			
$\lambda_{rel,m}$	0,99	$k =$	2,14			
$k_{crit,m}$	0,82	$k_{crit,c} =$	0,299			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26] =	0,00	0,00	0,00	0,30	0,00	Flessione
Eq. [7.27] =	0,00	0,00	0,00	0,30	0,00	Tensoflessione
Eq. [7.28] =	0,00	0,00	0,00	0,00	0,00	Compressione
Eq. [7.31] =	0,00	0,00	0,00	0,31	0,00	Pressoflessione



SEZIONE 7 del modello - 135x16 cm

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
4	SLD		0.00	-56.844	2.179	-0.696	-3286.070	4854.570	0.743
	SLD		1.18	56.909	2.179	1.879	-3454.970	872.220	0.743
5	SND		0.00	-56.905	-1.539	1.547	5544.150	-7753.440	0.102
	SND		1.18	56.848	-1.539	-0.271	5375.250	-1302.670	0.102
6	SLD		0.00	-56.882	-0.129	0.696	2195.300	-2971.860	0.345
	SLD		1.18	56.871	-0.129	0.544	2026.400	-477.843	0.345
7	SND		0.00	-56.903	-2.595	0.860	5766.880	-7844.570	-0.810
	SND		1.18	56.849	-2.595	-2.206	5597.970	-1130.650	-0.810
8	SLD		0.00	-56.881	-0.604	0.387	2295.540	-3012.880	-0.065
	SLD		1.18	56.872	-0.604	-0.326	2126.640	-400.424	-0.065
9	SND		0.00	-56.853	3.713	0.785	-2776.860	3715.350	2.333
	SND		1.18	56.900	3.713	5.172	-2945.760	334.647	2.333
10	SLD		0.00	-56.858	2.235	0.354	-1549.690	2189.830	1.349
	SLD		1.18	56.894	2.235	2.994	-1718.590	259.054	1.349
11	SND		0.00	-56.877	1.858	1.507	943.682	-1528.860	1.794
	SND		1.18	56.875	1.858	3.702	774.777	-513.661	1.794
12	SLD		0.00	-56.869	1.400	0.678	124.792	-170.402	1.107
	SLD		0.87	27.174	1.400	1.900	0.000	-115.934	1.107
	SLD		1.18	56.883	1.400	2.332	-44.113	-122.740	1.107
13	SND		0.00	-56.848	0.193	-1.506	-2034.450	3411.570	-0.706
	SND		1.18	56.905	0.193	-1.278	-2203.350	908.038	-0.706
14	SLD		0.00	-56.856	0.651	-0.678	-1215.560	2063.110	-0.019
	SLD		1.18	56.897	0.651	0.091	-1384.460	517.116	-0.019
15	SND		0.00	-56.873	-1.662	-0.784	1686.090	-1832.650	-1.245

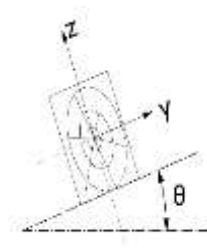
Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
29	SLU		1.18	-27812.300	0.037	-0.111	41.182	-4945.650	-0.028
	SLU		0.00	-10672.700	-0.272	1.254	241.456	-1613.340	0.132
30	SLE R		1.18	-10620.500	-0.272	0.933	21.879	-1457.770	0.132
	SLE R		0.00	-7997.230	-0.180	0.830	173.590	-1188.160	0.087
31	SLE R		1.18	-8110.980	-0.180	0.617	4.685	-1082.850	0.087
	SLU		0.00	-8000.580	0.014	-0.060	174.991	-1185.570	-0.011
32	SLU		1.18	-8114.330	0.014	-0.043	6.086	-1078.600	-0.011
	SLE R		0.00	6391.280	0.018	-0.081	-144.703	51.226	-0.012
33	SLE R		1.18	6243.400	0.018	-0.059	668.965	360.941	-0.012
	SLU		0.00	-27684.400	0.037	-0.155	260.759	-5124.020	-0.028
34	SLU		1.18	-27812.300	0.037	-0.111	41.182	-4945.650	-0.028
	SLE R		0.00	-19325.000	0.026	-0.110	186.459	-3528.620	-0.020
3055 (-180 314)	SLE R		1.18	-19438.800	0.026	-0.079	17.553	-3408.100	-0.020
	SND		0.00	-6060.590	15.392	-5.651	-685.611	-4659.540	0.640
1	SND		1.18	-6174.340	15.392	12.534	-854.516	-5569.390	0.640
	SLD		0.00	-7126.530	6.814	-2.422	-212.843	-2749.530	0.344
2	SLD		1.18	-7240.280	6.814	5.629	-381.749	-3100.790	0.344
	SND		0.00	-6054.630	-14.547	4.590	-689.165	-4673.000	-0.884
3	SND		1.18	-6168.380	-14.547	-12.598	-858.070	-5587.050	-0.884
	SLD		0.00	-7123.850	-6.661	2.187	-214.443	-2755.580	-0.341
4	SLD		1.18	-7237.600	-6.661	-5.683	-383.348	-3108.740	-0.341
	SND		0.00	-9943.150	14.135	-4.149	1037.300	2300.230	1.089
5	SND		1.18	-10056.900	14.135	12.552	868.395	3426.050	1.089
	SLD		0.00	-8873.940	6.248	-1.746	562.578	382.819	0.546

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
3	SLD		1.18	56.908	2.654	2.750	-3555.210	794.801	1.153
	SND		0.00	-56.821	3.589	-1.546	-6634.920	9636.150	0.986
4	SND		1.18	56.932	3.589	2.694	-6803.820	1697.040	0.986
	SLD		0.00	-56.844	2.179	-0.696	-3286.070	4854.570	0.743
5	SLD		1.18	56.909	2.179	1.879	-3454.970	872.220	0.743
	SND		0.00	-56.905	-1.539	1.547	5544.150	-7753.440	0.102
6	SND		1.18	56.848	-1.539	-0.271	5375.250	-1302.670	0.102
	SLD		0.00	-56.882	-0.129	0.696	2195.300	-2971.860	0.345
7	SLD		1.18	56.871	-0.129	0.544	2026.400	-477.843	0.345
	SND		0.00	-56.903	-2.595	0.860	5766.880	-7844.570	-0.810
8	SND		1.18	56.849	-2.595	-2.206	5597.970	-1130.650	-0.810
	SLD		0.00	-56.881	-0.604	0.387	2295.540	-3012.880	-0.065
9	SLD		1.18	56.872	-0.604	-0.326	2126.640	-400.424	-0.065
	SND		0.00	-56.853	3.713	0.785	-2776.860	3715.350	2.333
10	SND		1.18	56.900	3.713	5.172	-2945.760	334.647	2.333
	SLD		0.00	-56.858	2.235	0.354	-1549.690	2189.830	1.349
11	SLD		1.18	56.894	2.235	2.994	-1718.590	259.054	1.349
	SND		0.00	-56.877	1.858	1.507	943.682	-1528.860	1.794
12	SND		1.18	56.875	1.858	3.702	774.777	-513.661	1.794
	SLD		0.00	-56.869	1.400	0.678	124.792	-170.402	1.107
13	SLD		0.87	27.174	1.400	1.900	0.000	-115.934	1.107
	SLD		1.18	56.883	1.400	2.332	-44.113	-122.740	1.107
14	SND		0.00	-56.848	0.193	-1.506	-2034.450	3411.570	-0.706
	SND		1.18	56.905	0.193	-1.278	-2203.350	908.038	-0.706

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
20		SLE F	1.30	-53.413	-0.517	-0.629	-868.710	280.244	0.079
		SLE Q	0.00	53.441	-0.423	-0.039	-504.119	981.649	0.036
21		SLE Q	1.30	-53.417	-0.423	-0.587	-700.600	199.972	0.036
		SLU	0.00	69.488	-110.646	-103.084	-1266.330	2552.060	46.897
22		SLU	1.30	-69.427	-110.646	-246.669	-1521.750	743.021	46.897
		SLU	0.00	69.464	-0.121	0.281	-589.357	550.879	0.252
23		SLU	1.30	-69.451	-0.121	0.123	-280.287	-13.386	0.252
		SLE R	0.00	53.435	-73.283	-68.706	-424.850	573.944	31.302
24		SLE R	1.30	-53.423	-73.283	-163.805	-245.001	139.314	31.302
		SLE F	0.00	53.442	-15.042	-13.732	-572.320	1049.320	6.311
25		SLE F	1.30	-53.416	-15.042	-33.252	-693.535	227.976	6.311
		SLE Q	0.00	53.441	-0.423	-0.039	-504.119	981.649	0.036
26		SLE Q	1.30	-53.417	-0.423	-0.587	-700.600	199.972	0.036
		SLU	0.00	69.483	-66.553	-61.779	-1271.870	2078.410	28.230
27		SLU	1.30	-69.433	-66.553	-148.144	-1188.600	481.942	28.230
		SLE R	0.00	53.448	-44.445	-41.195	-946.945	1573.920	18.826
28		SLE R	1.30	-53.410	-44.445	-98.871	-917.628	364.098	18.826
		SLU	0.00	69.502	-1.268	0.550	-1932.910	3535.900	0.369
29		SLU	1.30	-69.414	-1.268	-1.095	-2188.340	861.838	0.369
		SLU	0.00	69.474	-110.293	-103.385	-635.914	1432.960	46.734
30		SLU	1.30	-69.441	-110.293	-245.512	-891.340	442.004	46.734
		SLE R	0.00	53.441	-73.577	-68.928	-480.003	1071.820	31.163
31		SLE R	1.30	-53.417	-73.577	-164.408	-676.485	321.440	31.163
		SLU	0.00	53.441	-0.423	-0.039	-504.119	981.649	0.036

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
18		Asta (Nodo1 Nodo2)	0.00	69.488	-66.631	-61.431	-1483.320	2497.500	28.410
		SLU	1.30	-69.428	-66.631	-147.897	-1400.050	626.635	28.410
19		SLE R	0.00	53.451	-44.468	-40.959	-1044.940	1781.520	18.947
		SLE R	1.30	-53.408	-44.468	-98.665	-1015.630	444.527	18.947
20		SLE F	0.00	53.445	-0.517	0.041	-672.229	1280.080	0.079
		SLE F	1.30	-53.413	-0.517	-0.629	-868.710	280.244	0.079
21		SLE Q	0.00	53.441	-0.423	-0.039	-504.119	981.649	0.036
		SLE Q	1.30	-53.417	-0.423	-0.587	-700.600	199.972	0.036
22		SLU	0.00	69.488	-110.646	-103.084	-1266.330	2552.060	46.897
		SLU	1.30	-69.427	-110.646	-246.669	-1521.750	743.021	46.897
23		SLU	0.00	69.464	-0.121	0.281	-589.357	550.879	0.252
		SLU	1.30	-69.451	-0.121	0.123	-280.287	-13.386	0.252
24		SLE R	0.00	53.435	-73.283	-68.706	-424.850	573.944	31.302
		SLE R	1.30	-53.423	-73.283	-163.805	-245.001	139.314	31.302
25		SLE F	0.00	53.442	-15.042	-13.732	-572.320	1049.320	6.311
		SLE F	1.30	-53.416	-15.042	-33.252	-693.535	227.976	6.311
26		SLE Q	0.00	53.441	-0.423	-0.039	-504.119	981.649	0.036
		SLE Q	1.30	-53.417	-0.423	-0.587	-700.600	199.972	0.036
27		SLU	0.00	69.483	-66.553	-61.779	-1271.870	2078.410	28.230
		SLU	1.30	-69.433	-66.553	-148.144	-1188.600	481.942	28.230
28		SLE R	0.00	53.448	-44.445	-41.195	-946.945	1573.920	18.826
		SLE R	1.30	-53.410	-44.445	-98.871	-917.628	364.098	18.826
29		SLU	0.00	69.502	-1.268	0.550	-1932.910	3535.900	0.369
		SLU	1.30	-69.414	-1.268	-1.095	-2188.340	861.838	0.369

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE 135X16 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	$\rho_m =$	420 kg/mc			
B	16 cm	$E_{0,m} =$	11500 MPa			
H	135 cm	$G_m =$	650 MPa			
H/B =	8,44	$f_{m,k} =$	24,00 MPa			
L	360 cm	$f_{t,0,k} =$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k} =$	24,00 MPa			
$\lambda =$	111 cm	$f_{v,k} =$	3,50 MPa			
Lato maggiore	135 cm	$\theta =$	0,00 °			
A =	2160 cm ²					
$J_y =$	3280500 cm ⁴	$J_z =$	46080 cm ⁴	* È necessaria la verifica di instabilità		
$W_y =$	48600 cm ³	$W_z =$	5760 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1716	2002	2288	2574	3146	
$N_{Rd,c}$ (kN)	-2145	-2503	-2860	-3218	-3933	
$M_{Rd,y}$ (kN m)	483	563	644	724	885	
$M_{Rd,z}$ (kN m)	63	73	84	94	115	
$V_{Rd,y}$ (kN)	209	243	278	313	382	
$V_{Rd,z}$ (kN)	209	243	278	313	382	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)					-278,13	
$M_{Ed,y}$ (kN m)					-78,84	
$M_{Ed,z}$ (kN m)					-2,47	
$V_{Ed,y}$ (kN)					57,67	
$V_{Ed,z}$ (kN)					1,11	
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d} =$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d} =$	0,00	0,00	0,00	0,00	1,29	
$\sigma_{m,y,d} =$	0,00	0,00	0,00	0,00	-1,62	
$\sigma_{m,z,d} =$	0,00	0,00	0,00	0,00	-0,43	
$\tau_{d,y} =$	0,00	0,00	0,00	0,00	0,40	$k_{cf} = 1$
$\tau_{d,z} =$	0,00	0,00	0,00	0,00	0,01	$k_{sh} = 2$
$\tau_d =$	0,00	0,00	0,00	0,00	0,40	
Eq. [4.4.5] =	0,00	0,00	0,00	0,00	-0,09	Flessione
Eq. [4.4.6] =	0,00	0,00	0,00	0,00	-0,09	Tensoflessione
Eq. [4.4.7] =	0,00	0,00	0,00	0,00	-0,08	Pressoflessione
Verifica di stabilità						
$E_{0,05} =$	9600	$a =$	3,213333333	$J_{tor} =$	172083	$\beta_c = 0,1$
$G_{0,05} =$	543	$1/a =$	0,311	$M_{y,crit} =$	1243	
$\sigma_{y,crit} =$	25,57	$\lambda_{rel,c} =$	1,77			
$\lambda_{rel,m} =$	0,97	$k =$	2,14			
$k_{crit,m} =$	0,83	$k_{crit,c} =$	0,299			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26] =	0,00	0,00	0,00	0,00	-0,10	Flessione
Eq. [7.27] =	0,00	0,00	0,00	0,00	-0,10	Tensoflessione
Eq. [7.28] =	0,00	0,00	0,00	0,00	0,24	Compressione
Eq. [7.31] =	0,00	0,00	0,00	0,00	0,14	Pressoflessione



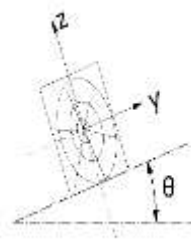
SEZIONE 8 del modello - media 94x16 cm

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>	
10011 (1011 947)	26	SLE Q	1.28	2.425	-0.094	0.072	2987.180	2982.240	0.009	
		SLU	0.00	-2.952	-10.723	0.429	4862.900	-1741.210	-0.303	
	27	SLU	1.28	3.177	-10.723	-13.300	4935.570	4531.520	-0.303	
		SLE R	0.00	-2.289	-7.168	0.323	3857.350	-1339.900	-0.201	
	28	SLE R	1.28	2.445	-7.168	-8.854	3878.980	3612.700	-0.201	
		SLU	0.00	-2.875	-0.375	0.560	8814.100	-2763.000	0.047	
	29	SLU	1.28	3.254	-0.375	0.080	8552.590	8354.710	0.047	
		SLU	0.00	-2.974	-17.717	0.436	4064.190	-1354.170	-0.575	
	30	SLU	1.28	3.154	-17.717	-22.247	3802.690	3682.000	-0.575	
		SLE R	0.00	-2.290	-11.821	0.312	3065.950	-1008.590	-0.382	
	31	SLE R	1.28	2.425	-11.821	-14.823	2864.800	2788.120	-0.382	
		SLU	0.00	-2.289	-0.094	0.192	3188.330	-971.167	0.009	
	32	SLU	1.28	2.425	-0.094	0.072	2987.180	2982.240	0.009	
		SLE R	0.00	-3.111	0.150	-0.144	-2556.280	431.216	0.040	
	33	SLE R	1.28	3.018	0.150	0.048	-2260.820	-2652.570	0.040	
		SLU	0.00	-2.875	-0.375	0.560	8814.100	-2763.000	0.047	
	34	SLU	1.28	3.254	-0.375	0.080	8552.590	8354.710	0.047	
		SLE R	0.00	-2.223	-0.260	0.394	6232.560	-1947.810	0.032	
	10011 (1011 947)	1	SLE R	1.28	2.491	-0.260	0.061	6031.410	5903.270	0.032
			SND	0.00	2.416	-0.024	0.312	-2657.080	2722.540	0.027
	10011 (1011 947)	2	SND	1.28	-2.298	-0.024	0.281	-2858.230	-808.231	0.027
			SLD	0.00	2.419	0.098	0.179	-2819.210	2865.360	0.015
			SLD	1.28	-2.296	0.098	0.304	-3020.360	-872.991	0.015
	3	SND	0.00	2.417	0.258	0.061	-2810.180	2964.570	0.040	
	6055 (-259 614)	29	SLU	1.29	-23578.100	-0.075	-0.008	170.786	4451.710	0.020
			SLU	0.00	-9187.560	0.252	-0.260	14.880	1381.730	0.049
30		SLU	0.07	-9190.750	0.252	-0.241	-0.002	1382.280	0.049	
		SLU	1.29	-9242.720	0.252	0.065	-242.535	1235.050	0.049	
31		SLE R	0.00	-6878.190	0.164	-0.168	20.624	1015.690	0.035	
		SLE R	0.13	-6882.610	0.164	-0.146	-0.000	1017.080	0.035	
32		SLE R	1.29	-6920.620	0.164	0.043	-177.387	914.692	0.035	
		SLU	0.00	-6881.870	-0.034	0.041	20.684	1014.040	0.014	
33		SLU	0.13	-6886.300	-0.034	0.037	-0.000	1015.430	0.014	
		SLU	1.29	-6924.300	-0.034	-0.003	-177.327	913.113	0.014	
34		SLE R	0.00	7706.580	-0.075	0.075	-570.219	-119.639	0.045	
		SLE R	1.29	7651.420	-0.075	-0.022	299.250	-294.225	0.045	
6055 (-259 614)		1	SLU	0.00	-23523.000	-0.075	0.088	428.201	4065.780	0.020
			SLU	1.29	-23578.100	-0.075	-0.008	170.786	4451.710	0.020
6055 (-259 614)		2	SLE R	0.00	-16435.100	-0.054	0.064	296.172	2805.060	0.015
			SLE R	1.29	-16477.600	-0.054	-0.006	98.160	3059.130	0.015
6055 (-259 614)		3	SND	0.00	-3625.940	-0.218	0.331	-298.752	1740.790	0.326
			SND	1.29	-3668.370	-0.218	0.050	-496.764	1228.240	0.326
6055 (-259 614)		4	SLD	0.00	-5415.150	-0.165	0.203	-123.055	1342.090	0.146
			SLD	1.29	-5458.580	-0.165	-0.010	-321.067	1055.940	0.146
6055 (-259 614)		4	SND	0.00	-3619.490	-0.489	0.032	-299.748	1741.950	0.158
			SND	1.29	-3661.920	-0.489	-0.598	-497.759	1228.110	0.158
6055 (-259 614)		4	SLD	0.00	-5413.250	-0.287	0.068	-123.503	1342.610	0.071
			SLD	1.29	-5455.680	-0.287	-0.301	-321.515	1055.880	0.071
10001 (908 1001)		25	SLE Q	0.00	-2.289	-0.094	0.192	3188.330	-971.167	0.009
			SLE Q	1.28	2.425	-0.094	0.072	2987.180	2982.240	0.009
	26	SLU	0.00	-2.952	-10.723	0.429	4862.900	-1741.210	-0.303	
		SLU	1.28	3.177	-10.723	-13.300	4935.570	4531.520	-0.303	
	27	SLE R	0.00	-2.289	-7.168	0.323	3857.350	-1339.900	-0.201	
		SLE R	1.28	2.445	-7.168	-8.854	3878.980	3612.700	-0.201	
	28	SLU	0.00	-2.875	-0.375	0.560	8814.100	-2763.000	0.047	
		SLU	1.28	3.254	-0.375	0.080	8552.590	8354.710	0.047	
	29	SLU	0.00	-2.974	-17.717	0.436	4064.190	-1354.170	-0.575	
		SLU	1.28	3.154	-17.717	-22.247	3802.690	3682.000	-0.575	
	30	SLE R	0.00	-2.290	-11.821	0.312	3065.950	-1008.590	-0.382	
		SLE R	1.28	2.425	-11.821	-14.823	2864.800	2788.120	-0.382	
	31	SLU	0.00	-2.289	-0.094	0.192	3188.330	-971.167	0.009	
		SLU	1.28	2.425	-0.094	0.072	2987.180	2982.240	0.009	
	32	SLE R	0.00	-3.111	0.150	-0.144	-2556.280	431.216	0.040	
		SLE R	1.28	3.018	0.150	0.048	-2260.820	-2652.570	0.040	
	33	SLU	0.00	-2.875	-0.375	0.560	8814.100	-2763.000	0.047	
		SLU	1.28	3.254	-0.375	0.080	8552.590	8354.710	0.047	
	34	SLE R	0.00	-2.223	-0.260	0.394	6232.560	-1947.810	0.032	
		SLE R	1.28	2.491	-0.260	0.061	6031.410	5903.270	0.032	
	10001 (908 1001)	1	SND	0.00	-2.286	0.383	-0.295	3419.010	-1065.680	0.104
			SND	1.28	2.428	0.383	0.195	3217.850	3183.070	0.104
	10001 (908 1001)	2	SLD	0.00	-2.288	0.240	-0.244	3298.460	-1014.280	0.052
			SLD	1.28	2.427	0.240	0.062	3097.300	3080.120	0.052

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
9	SND	0.00	-8206.420	63.996	-30.993	-612.543	-40.052	0.580	
		1.28	-8199.350	63.996	50.653	-812.912	-949.347	0.580	
10	SLD	0.00	-7424.520	28.805	-13.954	-660.428	82.130	0.275	
		1.28	-7417.450	28.805	22.796	-860.797	-888.256	0.275	
11	SND	0.00	-5430.250	63.958	-30.938	-779.567	391.581	0.461	
		1.28	-5423.180	63.958	50.660	-979.936	-730.802	0.461	
12	SLD	0.00	-6175.070	28.788	-13.930	-735.599	276.393	0.221	
		1.28	-6168.000	28.788	22.799	-935.969	-789.896	0.221	
13	SND	0.00	-8139.000	-63.947	30.918	-619.667	-27.333	-0.410	
		1.28	-8131.920	-63.947	-50.665	-820.036	-945.716	-0.410	
14	SLD	0.00	-7394.180	-28.777	13.910	-663.634	87.855	-0.171	
		1.28	-7387.110	-28.777	-22.804	-864.003	-886.622	-0.171	
15	SND	0.00	-5362.830	-63.985	30.973	-786.690	404.300	-0.529	
		1.28	-5355.750	-63.985	-50.659	-987.059	-727.171	-0.529	
16	SLD	0.00	-6144.720	-28.794	13.934	-738.806	282.118	-0.224	
		1.28	-6137.650	-28.794	-22.801	-939.175	-788.262	-0.224	
17	SLU	0.00	-9192.600	0.056	-0.064	-1492.630	-126.649	0.081	
		1.28	-9183.400	0.056	0.008	-1083.700	-1770.090	0.081	
18	SLE R	0.00	-6874.550	0.038	-0.044	-1059.540	-65.412	0.057	
		1.28	-6867.480	0.038	0.005	-813.636	-1260.310	0.057	
19	SLE F	0.00	-7949.500	0.005	-0.010	-865.396	192.786	0.026	
		1.28	-7942.430	0.005	-0.003	-1065.760	-1039.100	0.026	
20	SLE Q	0.00	-6784.620	0.006	-0.010	-699.617	182.124	0.025	
		1.28	-6777.550	0.006	-0.003	-899.986	-838.259	0.025	

Asta (N1 N2)	CC	TCC	X <m>	N <daN>	Ty <daN>	Mz <daNm>	Tz <daN>	My <daNm>	Mx <daNm>
9	SND	0.00	-8206.420	63.996	-30.993	-612.543	-40.052	0.580	
		1.28	-8199.350	63.996	50.653	-812.912	-949.347	0.580	
10	SLD	0.00	-7424.520	28.805	-13.954	-660.428	82.130	0.275	
		1.28	-7417.450	28.805	22.796	-860.797	-888.256	0.275	
11	SND	0.00	-5430.250	63.958	-30.938	-779.567	391.581	0.461	
		1.28	-5423.180	63.958	50.660	-979.936	-730.802	0.461	
12	SLD	0.00	-6175.070	28.788	-13.930	-735.599	276.393	0.221	
		1.28	-6168.000	28.788	22.799	-935.969	-789.896	0.221	
13	SND	0.00	-8139.000	-63.947	30.918	-619.667	-27.333	-0.410	
		1.28	-8131.920	-63.947	-50.665	-820.036	-945.716	-0.410	
14	SLD	0.00	-7394.180	-28.777	13.910	-663.634	87.855	-0.171	
		1.28	-7387.110	-28.777	-22.804	-864.003	-886.622	-0.171	
15	SND	0.00	-5362.830	-63.985	30.973	-786.690	404.300	-0.529	
		1.28	-5355.750	-63.985	-50.659	-987.059	-727.171	-0.529	
16	SLD	0.00	-6144.720	-28.794	13.934	-738.806	282.118	-0.224	
		1.28	-6137.650	-28.794	-22.801	-939.175	-788.262	-0.224	
17	SLU	0.00	-9192.600	0.056	-0.064	-1492.630	-126.649	0.081	
		1.28	-9183.400	0.056	0.008	-1083.700	-1770.090	0.081	
18	SLE R	0.00	-6874.550	0.038	-0.044	-1059.540	-65.412	0.057	
		1.28	-6867.480	0.038	0.005	-813.636	-1260.310	0.057	
19	SLE F	0.00	-7949.500	0.005	-0.010	-865.396	192.786	0.026	
		1.28	-7942.430	0.005	-0.003	-1065.760	-1039.100	0.026	
20	SLE Q	0.00	-6784.620	0.006	-0.010	-699.617	182.124	0.025	

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE MEDIA 94X16 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	$\rho_m =$	420 kg/mc			
B	16 cm	$E_{0,m} =$	11500 MPa			
H	94 cm	$G_m =$	650 MPa			
H/B =	5,88	$f_{m,k} =$	24,00 MPa			
L	130 cm	$f_{t,0,k} =$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k} =$	24,00 MPa			
$\lambda =$	40 cm	$f_{v,k} =$	3,50 MPa			
Lato maggiore	94 cm	$\theta =$	0,00 °			
A =	1504 cm ²					
$J_y =$	1107445 cm ⁴	$J_z =$	32085 cm ⁴	* È necessaria la verifica di instabilità		
$W_y =$	23563 cm ³	$W_z =$	4011 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1195	1394	1593	1792	2191	
$N_{Rd,c}$ (kN)	-1494	-1743	-1992	-2240	-2738	
$M_{Rd,y}$ (kN m)	234	273	312	351	429	
$M_{Rd,z}$ (kN m)	44	51	58	66	80	
$V_{Rd,y}$ (kN)	145	169	194	218	266	
$V_{Rd,z}$ (kN)	145	169	194	218	266	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)				-235,79		
$M_{Ed,y}$ (kN m)				83,55		
$M_{Ed,z}$ (kN m)				0,51		
$V_{Ed,y}$ (kN)				88,15		
$V_{Ed,z}$ (kN)				0,64		
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d} =$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d} =$	0,00	0,00	0,00	1,57	0,00	
$\sigma_{m,y,d} =$	0,00	0,00	0,00	3,55	0,00	
$\sigma_{m,z,d} =$	0,00	0,00	0,00	0,13	0,00	
$\tau_{d,y} =$	0,00	0,00	0,00	0,88	0,00	$k_{cf} = 1$
$\tau_{d,z} =$	0,00	0,00	0,00	0,01	0,00	$k_{sh} = 1,8813$
$\tau_d =$	0,00	0,00	0,00	0,88	0,00	
Eq. [4.4.5] =	0,00	0,00	0,00	0,24	0,00	Flessione
Eq. [4.4.6] =	0,00	0,00	0,00	0,24	0,00	Tensoflessione
Eq. [4.4.7] =	0,00	0,00	0,00	0,26	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05} =$	9600	$a =$	3,306382979	$J_{tor} =$	116449	$\beta_c = 0,1$
$G_{0,05} =$	543	$1/a =$	0,302	$M_{y,crit} =$	2363	
$\sigma_{y,crit} =$	100,27	$\lambda_{rel,c} =$	0,64			
$\lambda_{rel,m} =$	0,49	$k =$	0,72			
$k_{crit,m} =$	1,00	$k_{crit,c} =$	0,948			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26] =	0,00	0,00	0,00	0,24	0,00	Flessione
Eq. [7.27] =	0,00	0,00	0,00	0,24	0,00	Tensoflessione
Eq. [7.28] =	0,00	0,00	0,00	0,11	0,00	Compressione
Eq. [7.31] =	0,00	0,00	0,00	0,36	0,00	Pressoflessione
Note:						



VERIFICA INCENDIO

Si considera la sezione ridotta di 2.1 cm su tre lati in quanto la struttura deve possedere caratteristiche REI 30. Di seguito la verifica di resistenza. La condizione di carico considerata è quella "Quasi permanente"
A favore di sicurezza si sono considerate le sollecitazioni massime con la sezione minima

Resistenza di sezioni rettangolari in legno

Trave CNR-DT 206 R1/2018 -SEZIONE MINIMA 94X16
Oggetto: ARCOSTRUTTURA

Caratteristiche meccaniche e geometriche

Classe di Servizio	1	Legno	GL24h	Legno lamellare
γ_M	1,45	ρ_m	420 kg/mc	
B	12 cm	$E_{0,m}$	11500 MPa	
H	92 cm	G_m	650 MPa	
H/B =	7,79	$f_{m,k}$	24,00 MPa	
L	0 cm	$f_{t,0,k}$	19,20 MPa	
$\beta = L_{eff}/L$	1,427	$f_{c,0,k}$	24,00 MPa	
λ	0 cm	$f_{v,k}$	3,50 MPa	
Lato maggiore	92 cm	θ	0,00 °	
A =	1084 cm ²	J_z	12583 cm ⁴ *	
J_y	763216 cm ⁴	W_z	2133 cm ³	
W_y	16610 cm ³			

Resistenza della sezione rettangolare

	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_{th} = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_{th} = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_{th} = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	862	1005	1149	1292	1580	
$N_{Rd,c}$ (kN)	-1077	-1256	-1436	-1615	-1974	
$M_{Rd,y}$ (kN m)	165	192	220	247	302	
$M_{Rd,z}$ (kN m)	23	27	31	35	43	
$V_{Rd,y}$ (kN)	105	122	140	157	192	
$V_{Rd,z}$ (kN)	105	122	140	157	192	

Sollecitazioni di progetto

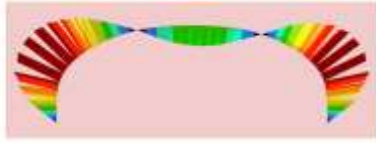
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo
N_{Ed} (kN)				-4,43	
$M_{Ed,y}$ (kN m)				147,24	
$M_{Ed,z}$ (kN m)				8,94	
$V_{Ed,y}$ (kN)				45,32	
$V_{Ed,z}$ (kN)				5,55	

Verifica di resistenza

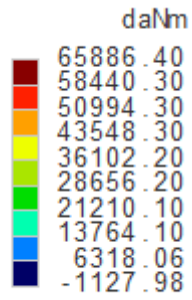
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d}$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d}$	0,00	0,00	0,00	0,04	0,00	
$\sigma_{m,y,d}$	0,00	0,00	0,00	8,86	0,00	
$\sigma_{m,z,d}$	0,00	0,00	0,00	4,19	0,00	
$\tau_{d,y}$	0,00	0,00	0,00	0,63	0,00	$k_{cf} = 1$
$\tau_{d,z}$	0,00	0,00	0,00	0,08	0,00	$k_{sh} = 2$
τ_d	0,00	0,00	0,00	0,63	0,00	
Eq. [4.4.5] =	0,00	0,00	0,00	0,79	0,00	Flessione
Eq. [4.4.6] =	0,00	0,00	0,00	0,79	0,00	Tensoflessione
Eq. [4.4.7] =	0,00	0,00	0,00	0,79	0,00	Pressoflessione

VERIFICA ARCOSTRUTTURA CON SINGOLO ARCO

A favore di sicurezza, per i carichi gravitazionali, vengono riportate le verifiche delle sezioni più sollecitate trascurando l'effetto della compartecipazione degli altri archi e delle controventature



MOMENTO

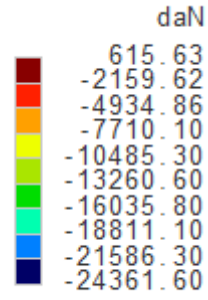


CC SLU

Momento



SFORZO NORMALE

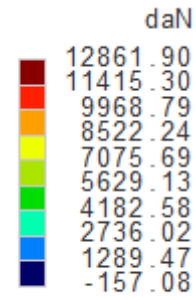


CC SLU

Sforzo Normale



TAGLIO



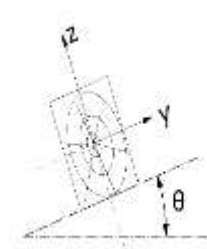
CC SLU

Taglio

SEZIONE 130X16

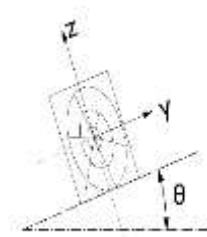
L=Luce tra due ritegni

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE MEDIA 130*X16 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	$\rho_m =$	420 kg/mc			
B	16 cm	$E_{0,m} =$	11500 MPa			
H	130 cm	$G_m =$	650 MPa			
H/B	8,13	$f_{m,k} =$	24,00 MPa			
L	300 cm	$f_{t,0,k} =$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k} =$	24,00 MPa			
$\lambda =$	93 cm	$f_{v,k} =$	3,50 MPa			
Lato maggiore	130 cm	θ	0,00 °			
A	2080 cm ²					
$J_y =$	2929333 cm ⁴	$J_z =$	44373 cm ⁴	* È necessaria la verifica di instabilità		
$W_y =$	45067 cm ³	$W_z =$	5547 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1653	1928	2203	2479	3030	
$N_{Rd,c}$ (kN)	-2066	-2410	-2754	-3098	-3787	
$M_{Rd,y}$ (kN m)	448	522	597	671	821	
$M_{Rd,z}$ (kN m)	61	71	81	91	111	
$V_{Rd,y}$ (kN)	201	234	268	301	368	
$V_{Rd,z}$ (kN)	201	234	268	301	368	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)	-224,95					
$M_{Ed,y}$ (kN m)	403,377					
$M_{Ed,z}$ (kN m)						
$V_{Ed,y}$ (kN)	128,18					
$V_{Ed,z}$ (kN)						
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d} =$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d} =$	0,00	0,00	0,00	1,08	0,00	
$\sigma_{m,y,d} =$	0,00	0,00	0,00	8,95	0,00	
$\sigma_{m,z,d} =$	0,00	0,00	0,00	0,00	0,00	
$\tau_{d,y} =$	0,00	0,00	0,00	0,92	0,00	$k_{cf} = 1$
$\tau_{d,z} =$	0,00	0,00	0,00	0,00	0,00	$k_{sh} = 2$
$\tau_d =$	0,00	0,00	0,00	0,92	0,00	
Eq. [4.4.5] =	0,00	0,00	0,00	0,60	0,00	Flessione
Eq. [4.4.6] =	0,00	0,00	0,00	0,60	0,00	Tensoflessione
Eq. [4.4.7] =	0,00	0,00	0,00	0,61	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05} =$	9600	$a =$	3,221538462	$J_{tor} =$	165287	$\beta_c = 0,1$
$G_{0,05} =$	543	$1/a =$	0,310	$M_{y,crit} =$	1434	
$\sigma_{y,crit} =$	31,83	$\lambda_{rel,c} =$	1,48			
$\lambda_{rel,m} =$	0,87	$k =$	1,65			
$k_{crit,m} =$	0,91	$k_{crit,c} =$	0,420			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26] =	0,00	0,00	0,00	0,66	0,00	Flessione
Eq. [7.27] =	0,00	0,00	0,00	0,66	0,00	Tensoflessione
Eq. [7.28] =	0,00	0,00	0,00	0,17	0,00	Compressione
Eq. [7.31] =	0,00	0,00	0,00	0,83	0,00	Pressoflessione
Note:						



SEZIONE 140X16

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE MEDIA 16X140 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	$\rho_m =$	420 kg/mc			
B	16 cm	$E_{0,m} =$	11500 MPa			
H	145 cm	$G_m =$	650 MPa			
$H/B =$	9,06	$f_{m,k} =$	24,00 MPa			
L	260 cm	$f_{t,0,k} =$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k} =$	24,00 MPa			
$\lambda =$	80 cm	$f_{v,k} =$	3,50 MPa			
Lato maggiore	145 cm	θ	0,00 °			
$A =$	2320 cm ²					
$J_y =$	4064833 cm ⁴	$J_z =$	49493 cm ⁴	* È necessaria la verifica di instabilità		
$W_y =$	56067 cm ³	$W_z =$	6187 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1843	2150	2458	2765	3379	
$N_{Rd,c}$ (kN)	-2304	-2688	-3072	-3456	-4224	
$M_{Rd,y}$ (kN m)	557	650	742	835	1021	
$M_{Rd,z}$ (kN m)	68	79	90	101	124	
$V_{Rd,y}$ (kN)	224	261	299	336	411	
$V_{Rd,z}$ (kN)	224	261	299	336	411	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)					-225,45	
$M_{Ed,y}$ (kN m)					658,86	
$M_{Ed,z}$ (kN m)					-5,21	
$V_{Ed,y}$ (kN)					-102,71	
$V_{Ed,z}$ (kN)					-1,81	
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d} =$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d} =$	0,00	0,00	0,00	0,97	0,00	
$\sigma_{m,y,d} =$	0,00	0,00	0,00	11,75	0,00	
$\sigma_{m,z,d} =$	0,00	0,00	0,00	-0,84	0,00	
$\tau_{d,y} =$	0,00	0,00	0,00	-0,66	0,00	$k_{cf} = 1$
$\tau_{d,z} =$	0,00	0,00	0,00	-0,01	0,00	$k_{sh} = 2$
$\tau_d =$	0,00	0,00	0,00	0,66	0,00	
Eq. [4.4.5] =	0,00	0,00	0,00	0,75	0,00	Flessione
Eq. [4.4.6] =	0,00	0,00	0,00	0,75	0,00	Tensoflessione
Eq. [4.4.7] =	0,00	0,00	0,00	0,75	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05} =$	9600	$a =$	3,19862069	$J_{tor} =$	185680	$\beta_c = 0,1$
$G_{0,05} =$	543	$1/a =$	0,313	$M_{y,crit} =$	1853	
$\sigma_{y,crit} =$	33,04	$\lambda_{rel,c} =$	1,28			
$\lambda_{rel,m} =$	0,85	$k =$	1,37			
$k_{crit,m} =$	0,92	$k_{crit,c} =$	0,541			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26] =	0,00	0,00	0,00	0,82	0,00	Flessione
Eq. [7.27] =	0,00	0,00	0,00	0,82	0,00	Tensoflessione
Eq. [7.28] =	0,00	0,00	0,00	0,12	0,00	Compressione
Eq. [7.31] =	0,00	0,00	0,00	0,94	0,00	Pressoflessione



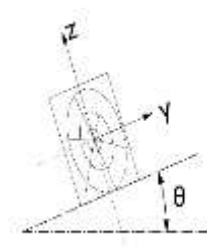
SEZIONE 135X16

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE MEDIA 128X16 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	ρ_m	420 kg/mc			
B	16 cm	$E_{0,m}$	11500 MPa			
H	135 cm	G_m	650 MPa			
H/B =	8,44	$f_{m,k}$	24,00 MPa			
L	260 cm	$f_{t,0,k}$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k}$	24,00 MPa			
λ	80 cm	$f_{v,k}$	3,50 MPa			
Lato maggiore	135 cm	θ	0,00 °			
A =	2160 cm ²					
J_y	3280500 cm ⁴	J_z	46080 cm ⁴	* È necessaria la verifica di instabilità		
W_y	48600 cm ³	W_z	5760 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1716	2002	2288	2574	3146	
$N_{Rd,c}$ (kN)	-2145	-2503	-2860	-3218	-3933	
$M_{Rd,y}$ (kN m)	483	563	644	724	885	
$M_{Rd,z}$ (kN m)	63	73	84	94	115	
$V_{Rd,y}$ (kN)	209	243	278	313	382	
$V_{Rd,z}$ (kN)	209	243	278	313	382	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)	-209,18					
$M_{Ed,y}$ (kN m)	584,4					
$M_{Ed,z}$ (kN m)						
$V_{Ed,y}$ (kN)	91,43					
$V_{Ed,z}$ (kN)						
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d}$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d}$	0,00	0,00	0,00	0,97	0,00	
$\sigma_{m,y,d}$	0,00	0,00	0,00	12,02	0,00	
$\sigma_{m,z,d}$	0,00	0,00	0,00	0,00	0,00	
$\tau_{d,y}$	0,00	0,00	0,00	0,63	0,00	$k_{cf} = 1$
$\tau_{d,z}$	0,00	0,00	0,00	0,00	0,00	$k_{sh} = 2$
τ_d	0,00	0,00	0,00	0,63	0,00	
Eq. [4.4.5]	0,00	0,00	0,00	0,81	0,00	Flessione
Eq. [4.4.6]	0,00	0,00	0,00	0,81	0,00	Tensoflessione
Eq. [4.4.7]	0,00	0,00	0,00	0,81	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05}$	9600	$a =$	3,213333333	$J_{tor} =$	172083	$\beta_c = 0,1$
$G_{0,05}$	543	$1/a =$	0,311	$M_{y,crit} =$	1721	
$\sigma_{y,crit}$	35,41	$\lambda_{rel,c} =$	1,28			
$\lambda_{rel,m}$	0,82	$k =$	1,37			
$k_{crit,m}$	0,94	$k_{crit,c} =$	0,541			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26]	0,00	0,00	0,00	0,86	0,00	Flessione
Eq. [7.27]	0,00	0,00	0,00	0,86	0,00	Tensoflessione
Eq. [7.28]	0,00	0,00	0,00	0,12	0,00	Compressione
Eq. [7.31]	0,00	0,00	0,00	0,98	0,00	Pressoflessione



SEZIONE 94X16

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 - SEZIONE MEDIA 128X16 ARCOSTRUTTURA						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	ρ_m	420 kg/mc			
B	16 cm	$E_{0,m}$	11500 MPa			
H	94 cm	G_m	650 MPa			
H/B =	5,88	$f_{m,k}$	24,00 MPa			
L	130 cm	$f_{t,0,k}$	19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k}$	24,00 MPa			
λ	40 cm	$f_{v,k}$	3,50 MPa			
Lato maggiore	94 cm	θ	0,00 °			
A =	1504 cm ²					
J_y	1107445 cm ⁴	J_z	32085 cm ⁴	* È necessaria la verifica di instabilità		
W_y	23563 cm ³	W_z	4011 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	1195	1394	1593	1792	2191	
$N_{Rd,c}$ (kN)	-1494	-1743	-1992	-2240	-2738	
$M_{Rd,y}$ (kN m)	234	273	312	351	429	
$M_{Rd,z}$ (kN m)	44	51	58	66	80	
$V_{Rd,y}$ (kN)	145	169	194	218	266	
$V_{Rd,z}$ (kN)	145	169	194	218	266	
Sollecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)						-144
$M_{Ed,y}$ (kN m)						268
$M_{Ed,z}$ (kN m)						
$V_{Ed,y}$ (kN)						58,49
$V_{Ed,z}$ (kN)						
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d}$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d}$	0,00	0,00	0,00	0,96	0,00	
$\sigma_{m,y,d}$	0,00	0,00	0,00	11,37	0,00	
$\sigma_{m,z,d}$	0,00	0,00	0,00	0,00	0,00	
$\tau_{d,y}$	0,00	0,00	0,00	0,58	0,00	$k_{cf} = 1$
$\tau_{d,z}$	0,00	0,00	0,00	0,00	0,00	$k_{sh} = 1,8813$
τ_d	0,00	0,00	0,00	0,58	0,00	
Eq. [4.4.5]	0,00	0,00	0,00	0,76	0,00	Flessione
Eq. [4.4.6]	0,00	0,00	0,00	0,76	0,00	Tensoflessione
Eq. [4.4.7]	0,00	0,00	0,00	0,77	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05}$	9600	$a =$	3,306382979	$J_{tor} =$	116449	$\beta_c = 0,1$
$G_{0,05}$	543	$1/a =$	0,302	$M_{y,crit} =$	2363	
$\sigma_{y,crit}$	100,27	$\lambda_{rel,c} =$	0,64			
$\lambda_{rel,m}$	0,49	$k =$	0,72			
$k_{crit,m}$	1,00	$k_{crit,c} =$	0,948			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26]	0,00	0,00	0,00	0,76	0,00	Flessione
Eq. [7.27]	0,00	0,00	0,00	0,76	0,00	Tensoflessione
Eq. [7.28]	0,00	0,00	0,00	0,07	0,00	Compressione
Eq. [7.31]	0,00	0,00	0,00	0,83	0,00	Pressoflessione



VERIFICA INCENDIO

Si considera la sezione ridotta di 2.1 cm su tre lati in quanto la struttura deve possedere caratteristiche REI 30. Di seguito la verifica di resistenza. La condizione di carico considerata è quella "Quasi permanente"
 A favore di sicurezza si sono considerate le sollecitazioni massime con la sezione minima

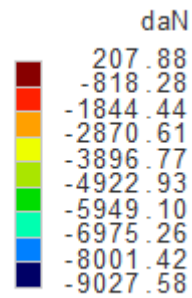


Momento

Sforzo Normale

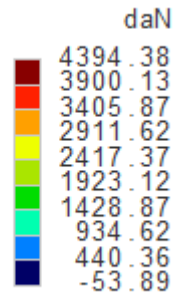
Taglio

N



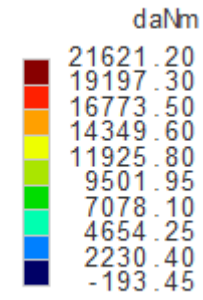
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CC SLEQ

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CC SLEQ

Resistenza di sezioni rettangolari in legno

Trave CNR-DT 206 R1/2018 -SEZIONE Ridotta

Oggetto: calcolo REI

Caratteristiche meccaniche e geometriche

Classe di Servizio	1	Legno	GL24h	Legno lamellare
γ_M	1,45	ρ_m	420 kg/mc	
B	12 cm	$E_{0,m}$	11500 MPa	
H	89 cm	G_m	650 MPa	
H/B =	7,53	$f_{m,k}$	24,00 MPa	
L		$f_{t,0,k}$	19,20 MPa	
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k}$	24,00 MPa	
λ	628 cm	$f_{v,k}$	3,50 MPa	
Lato maggiore	89 cm	θ	0,00 °	
A =	1049 cm ²		12172	
J_y =	690885 cm ⁴	J_z =	cm ⁴ *	
W_y =	15543 cm ³	W_z =	2063 cm ³	



Resistenza della sezione rettangolare

	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	$k_h = 1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	7,94	9,27	10,59	11,92	14,57	$k_h = 1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	833	972	1111	1250	1528	
$N_{Rd,c}$ (kN)	-1042	-1215	-1389	-1563	-1910	
$M_{Rd,y}$ (kN m)	154	180	206	232	283	
$M_{Rd,z}$ (kN m)	23	26	30	34	41	
$V_{Rd,y}$ (kN)	101	118	135	152	186	
$V_{Rd,z}$ (kN)	101	118	135	152	186	

Sollecitazioni di progetto

	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo
N_{Ed} (kN)				-90,27	
$M_{Ed,y}$ (kN m)				216,21	
$M_{Ed,z}$ (kN m)					
$V_{Ed,y}$ (kN)				43,94	
$V_{Ed,z}$ (kN)					

Verifica di resistenza

	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d}$ =	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d}$ =	0,00	0,00	0,00	0,86	0,00	
$\sigma_{m,y,d}$ =	0,00	0,00	0,00	13,91	0,00	
$\sigma_{m,z,d}$ =	0,00	0,00	0,00	0,00	0,00	
$\tau_{d,y}$ =	0,00	0,00	0,00	0,63	0,00	$k_{cf} = 1$
$\tau_{d,z}$ =	0,00	0,00	0,00	0,00	0,00	$k_{sh} = 2$
τ_d =	0,00	0,00	0,00	0,63	0,00	
Eq. [4.4.5]						
=	0,00	0,00	0,00	0,93	0,00	Flessione
Eq. [4.4.6]						
=	0,00	0,00	0,00	0,93	0,00	Tensoflessione
Eq. [4.4.7]						
=	0,00	0,00	0,00	0,94	0,00	Pressoflessione

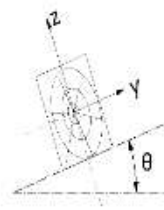
CALCOLO PUNTONE DI STABILIZZAZIONE ASTE COMPRESSE

Per stabilizzare fuori piano le travi presso inflesse si utilizza un ritegno sempre in legno con sezione pari a 16x16 cm. Tale puntone è soggetto ad una forza F_d che è pari al 2% della forza di compressione massima.

Si considera il Momento e lo sforzo normale massimo

$$F = 0.02 \cdot (M/h + N) = 0.02 \cdot (65887/1.4 + 24362) = 1428 \text{ kg}$$

Resistenza di sezioni rettangolari in legno						
Oggetto: Trave CNR-DT 206 R1/2018 -PUNTONE ANTISVERGOLAMENTO						
Caratteristiche meccaniche e geometriche						
Classe di Servizio	1	Legno	GL24h	Legno lamellare		
γ_M	1,45	ρ_m	= 420 kg/mc			
B	16 cm	$E_{0,m}$	= 11500 MPa			
H	16 cm	G_m	= 650 MPa			
H/B	= 1,00	$f_{m,k}$	= 24,00 MPa			
L	468 cm	$f_{t,0,k}$	= 19,20 MPa			
$\beta_0 = L_{eff}/L$	1,427	$f_{c,0,k}$	= 24,00 MPa			
λ	= 145 cm	$f_{v,k}$	= 3,50 MPa			
Lato maggiore	16 cm	θ	0,00 °			
A	= 256 cm ²					
J_y	= 5461 cm ⁴	J_z	= 5461 cm ⁴	* È necessaria la verifica di instabilità		
W_y	= 683 cm ³	W_z	= 683 cm ³			
Resistenza della sezione rettangolare						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
k_{mod}	0,6	0,7	0,8	0,9	1,1	
$f_{m,y,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h = 1,1$
$f_{t,0,d}$ (MPa)	8,74	10,20	11,65	13,11	16,02	$k_h = 1,1$
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21	
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66	
$N_{Rd,t}$ (kN)	224	261	298	336	410	
$N_{Rd,c}$ (kN)	-254	-297	-339	-381	-466	
$M_{Rd,y}$ (kN m)	7	9	10	11	14	
$M_{Rd,z}$ (kN m)	7	9	10	11	14	
$V_{Rd,y}$ (kN)	25	29	33	37	45	
$V_{Rd,z}$ (kN)	25	29	33	37	45	
Solllecitazioni di progetto						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
N_{Ed} (kN)					-14,28	
$M_{Ed,y}$ (kN m)						
$M_{Ed,z}$ (kN m)						
$V_{Ed,y}$ (kN)						
$V_{Ed,z}$ (kN)						
Verifica di resistenza						
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
$\sigma_{t,0,d}$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{c,0,d}$	0,00	0,00	0,00	0,56	0,00	
$\sigma_{m,y,d}$	0,00	0,00	0,00	0,00	0,00	
$\sigma_{m,z,d}$	0,00	0,00	0,00	0,00	0,00	
$\tau_{d,y}$	0,00	0,00	0,00	0,00	0,00	$k_{cf} = 1$
$\tau_{d,z}$	0,00	0,00	0,00	0,00	0,00	$k_{sh} = 1,15$
τ_d	0,00	0,00	0,00	0,00	0,00	
Eq. [4.4.5]	0,00	0,00	0,00	0,00	0,00	Flessione
Eq. [4.4.6]	0,00	0,00	0,00	0,00	0,00	Tensoflessione
Eq. [4.4.7]	0,00	0,00	0,00	0,00	0,00	Pressoflessione
Verifica di stabilità						
$E_{0,05}$	= 9600	a	= 4,8	J_{tor}	= 13653	$\beta_c = 0,1$
$G_{0,05}$	= 543	$1/a$	= 0,208	$M_{y,crit}$	= 93	
$\sigma_{y,crit}$	= 135,81	$\lambda_{rel,c}$	= 2,30			
$\lambda_{rel,m}$	= 0,42	k	= 3,25			
$k_{crit,m}$	= 1,00	$k_{crit,c}$	= 0,181			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26]	= 0,00	0,00	0,00	0,00	0,00	Flessione
Eq. [7.27]	= 0,00	0,00	0,00	0,00	0,00	Tensoflessione
Eq. [7.28]	= 0,00	0,00	0,00	0,21	0,00	Compressione
Eq. [7.31]	= 0,00	0,00	0,00	0,21	0,00	Pressoflessione



CALCOLO ARcarecci

Verifica di travi rettangolari in legno

Oggetto: TRAVICELLO IN LEGNO NEVE MAX
14x22

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} = 24$ MPa
$\gamma_M =$	1,45		$f_{v,k} = 3,5$ MPa
Classe di Servizio	1		$\rho_m = 420$ kg/mc
			$E = 11500$ MPa

Caratteristiche geometriche

b	14 cm	$A =$	308 cm	
h	22 cm		12423	
L	462 cm	$J_y =$	cm ⁴	θ 45°
i	130 cm	$W_y =$	1129 cm ³	
L_{eff}/L	0,9	$h/b =$	1,57	

Analisi dei carichi

$G_1 =$	10	kg/mq	$q_{G1} =$	13	kg/m
$G_2 =$	42	kg/mq	$q_{G2} =$	55	kg/m
$Q_1 =$	186	kg/mq	$q_{Q1} =$	242	kg/m
Tot =	238	kg/mq	Tot =	309	kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1; G_2$)	264	Permanente	0,60	2,81	9,93	0,28	3,54
Flessione Max ($G_1; G_2; Q_1$)	1231	Breve	0,90	13,11	14,90	0,88	1,14

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1; G_2$)	228	Permanente	0,60	0,16	1,45	0,11	9,31
Taglio Max ($G_1; G_2; Q_1$)	1066	Breve	0,90	0,73	2,17	0,33	2,99

Verifica deformazione SLE ($u = \chi q l^4/EJ$)

	Tipo	$\psi_{2,i}$	k_{def}	E (GPa)	u (cm)	
$u_{1,inst}$	perm. ist.			11,50	0,28	
$u_{21,inst}$	var. ist.			11,50	1,00	L/461
u_{inst}	tot. ist.			$u_{1,inst} + u_{21,inst} =$	1,28	
$u_{1,fin}$	perm. fin.		0,60	7,19	0,45	
$u_{21,fin}$	var. fin.	0,6	0,60	8,46	1,36	L/339
u_{fin}	tot. fin.			$u_{1,fin} + u_{21,fin} =$	1,81	
u_0	controfreccia iniziale				0	
$u_{net,fin}$	fin. netta			$u_{fin} - u_0 =$	1,81	L/255

Verifica di travi rettangolari in legno

Oggetto: TRAVICELLO IN LEGNO 14x22
REI 30

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} = 24$ MPa
$\gamma_M =$	1,45		$f_{v,k} = 3,5$ MPa
Classe di Servizio	1		420
			$\rho_m =$ kg/mc
			11500
			$E =$ MPa

Caratteristiche geometriche

b	10 cm	$A =$	174 cm	
h	18 cm	$J_y =$	4606 cm ⁴	θ 45°
L	462 cm	$W_y =$	518 cm ³	
i	130 cm	$h/b =$	1,82	
L_{eff}/L	0,9			

Analisi dei carichi

$G_1 =$	6	kg/mq	$q_{G1} =$	8	kg/m
G_2	51	kg/mq	$q_{G2} =$	66	kg/m
Q_1	40	kg/mq	$q_{Q1} =$	52	kg/m
Tot =	97	kg/mq	Tot =	126	kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	α 8	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1;G_2$)	293	Permanente	0,60		6,81	9,93	0,69	1,46
Flessione Max ($G_1;G_2;Q_1$)	501	Breve	0,90		11,64	14,90	0,78	1,28

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	β 2	τ_d (MPa)	$f_{v,d}$ (MPa)	$k_{cr} =$	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1;G_2$)	254	Permanente	0,60		0,31	1,45	0,71	0,21	4,74
Taglio Max ($G_1;G_2;Q_1$)	434	Breve	0,90		0,52	2,17		0,24	4,16

Verifica di travi rettangolari in legno

Oggetto: TRAVICELLO IN LEGNO NEVE MAX
14x20

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} = 24$ MPa
$\gamma_M =$	1,45		$f_{v,k} = 3,5$ MPa
Classe di Servizio	1		$\rho_m = 420$ kg/mc
			$E = 11500$ MPa

Caratteristiche geometriche

b	14 cm	$A =$	280 cm	θ
h	20 cm	$J_y =$	9333 cm ⁴	
L	462 cm	$W_y =$	933 cm ³	
i	130 cm	$h/b =$	1,43	
L_{eff}/L	0,9			

Analisi dei carichi

$G_1 =$	9	kg/mq	$q_{G1} =$	12	kg/m
$G_2 =$	39	kg/mq	$q_{G2} =$	51	kg/m
$Q_1 =$	128	kg/mq	$q_{Q1} =$	166	kg/m
Tot =	176	kg/mq	Tot =	229	kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1; G_2$)	245	Permanente	0,60	3,15	9,93	0,32	3,15
Flessione Max ($G_1; G_2; Q_1$)	910	Breve	0,90	11,73	14,90	0,79	1,27

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1; G_2$)	212	Permanente	0,60	0,16	1,45	0,11	9,12
Taglio Max ($G_1; G_2; Q_1$)	788	Breve	0,90	0,59	2,17	0,27	3,67

Verifica deformazione SLE ($u = \chi q l^4/EJ$)

	Tipo	$\psi_{2,i}$	k_{def}	E (GPa)	u (cm)	
$u_{1,inst}$	perm. ist.			11,50	0,35	
$u_{21,inst}$	var. ist.			11,50	0,92	L/503
u_{inst}	tot. ist.			$u_{1,inst} + u_{21,inst} =$	1,26	
$u_{1,fin}$	perm. fin.		0,60	7,19	0,55	
$u_{21,fin}$	var. fin.	0,6	0,60	8,46	1,25	L/370
u_{fin}	tot. fin.			$u_{1,fin} + u_{21,fin} =$	1,80	
u_0	controflessa iniziale				0	
$u_{net,fin}$	fin. netta			$u_{fin} - u_0 =$	1,80	L/256

Verifica di travi rettangolari in legno

Oggetto: VERIFICA REI 30 TRAVICELLO IN LEGNO 14x20

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} = 24$ MPa
$\gamma_M =$	1,45		$f_{v,k} = 3,5$ MPa
Classe di Servizio	1		420
			$\rho_m =$ kg/mc
			11500
			$E =$ MPa

Caratteristiche geometriche

b	10 cm	$A =$	155 cm	
h	16 cm	$J_y =$	3221 cm ⁴	θ 45°
L	462 cm	$W_y =$	408 cm ³	
i	130 cm	$h/b =$	1,61	
L_{eff}/L	0,9			

Analisi dei carichi

$G_1 =$	5 kg/mq	$q_{G1} =$	7 kg/m
$G_2 =$	39 kg/mq	$q_{G2} =$	51 kg/m
$Q_1 =$	25,6 kg/mq	$q_{Q1} =$	33 kg/m
Tot =	69,6 kg/mq	Tot =	91 kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1;G_2$)	227	Permanente	0,60	6,70	9,93	0,67	1,48
Flessione Max ($G_1;G_2;Q_1$)	360	Breve	0,90	10,62	14,90	0,71	1,40

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1;G_2$)	197	Permanente	0,60	0,27	1,45	0,18	5,43
Taglio Max ($G_1;G_2;Q_1$)	312	Breve	0,90	0,42	2,17	0,19	5,13

Verifica di travi rettangolari in legno

Oggetto: TRAVICELLO IN LEGNO NEVE MAX
14x18

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} = 24$ MPa
$\gamma_M =$	1,45		$f_{v,k} = 3,5$ MPa
Classe di Servizio	1		$\rho_m = 420$ kg/mc
			$E = 11500$ MPa

Caratteristiche geometriche

b	14 cm	$A =$	252 cm	θ
h	18 cm	$J_y =$	6804 cm ⁴	
L	462 cm	$W_y =$	756 cm ³	
i	130 cm	$h/b =$	1,29	
L_{eff}/L	0,9			

Analisi dei carichi

$G_1 =$	8	kg/mq	$q_{G1} =$	11	kg/m
$G_2 =$	39	kg/mq	$q_{G2} =$	51	kg/m
$Q_1 =$	80	kg/mq	$q_{Q1} =$	104	kg/m
Tot =	127	kg/mq	Tot =	166	kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1; G_2$)	241	Permanente	0,60	3,83	9,93	0,39	2,59
Flessione Max ($G_1; G_2; Q_1$)	657	Breve	0,90	10,45	14,90	0,70	1,43

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1; G_2$)	209	Permanente	0,60	0,17	1,45	0,12	8,33
Taglio Max ($G_1; G_2; Q_1$)	569	Breve	0,90	0,47	2,17	0,22	4,58

Verifica deformazione SLE ($u = \chi q l^4/EJ$)

	Tipo	$\psi_{2,i}$	k_{def}	E (GPa)	u (cm)	
$u_{1,inst}$	perm. ist.			11,50	0,47	
$u_{21,inst}$	var. ist.			11,50	0,79	L/587
u_{inst}	tot. ist.			$u_{1,inst} + u_{21,inst} =$	1,25	
$u_{1,fin}$	perm. fin.		0,60	7,19	0,75	
$u_{21,fin}$	var. fin.	0,6	0,60	8,46	1,07	L/432
u_{fin}	tot. fin.			$u_{1,fin} + u_{21,fin} =$	1,82	
u_0	controfreccia iniziale				0	
$u_{net,fin}$	fin. netta			$u_{fin} - u_0 =$	1,82	L/254

Verifica di travi rettangolari in legno

Oggetto: TRAVICELLO IN LEGNO 14x18
incendio

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} = 24$ MPa
$\gamma_M =$	1,45		$f_{v,k} = 3,5$ MPa
Classe di Servizio	1		420
			$\rho_m =$ kg/mc
			11500
			$E =$ MPa

Caratteristiche geometriche

b	10 cm	$A =$	135 cm	
h	14 cm	$J_y =$	2146 cm ⁴	θ 45°
L	462 cm	$W_y =$	311 cm ³	
i	130 cm	$h/b =$	1,41	
L_{eff}/L	0,9			

Analisi dei carichi

$G_1 =$	5 kg/mq	$q_{G1} =$	6 kg/m
$G_2 =$	41 kg/mq	$q_{G2} =$	53 kg/m
$Q_1 =$	16 kg/mq	$q_{Q1} =$	21 kg/m
Tot =	62 kg/mq	Tot =	80 kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	α 8	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1;G_2$)	234	Permanente	0,60		9,05	9,93	0,91	1,10
Flessione Max ($G_1;G_2;Q_1$)	317	Breve	0,90		12,26	14,90	0,82	1,21

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	β 2	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1;G_2$)	203	Permanente	0,60		0,31	1,45	0,22	4,60
Taglio Max ($G_1;G_2;Q_1$)	275	Breve	0,90		0,43	2,17	0,20	5,09

Verifica di travi rettangolari in legno

Oggetto: TRAVICELLO IN LEGNO NEVE MAX
12x14

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} = 24$ MPa
$\gamma_M =$	1,45		$f_{v,k} = 3,5$ MPa
Classe di Servizio	1		$\rho_m = 420$ kg/mc
			$E = 11500$ MPa

Caratteristiche geometriche

b	12 cm	$A =$	168 cm	θ	45°
h	14 cm	$J_y =$	2744 cm ⁴		
L	280 cm	$W_y =$	392 cm ³		
i	130 cm	$h/b =$	1,17		
L_{eff}/L	0,9				

Analisi dei carichi

$G_1 =$	6	kg/mq	$q_{G1} =$	8	kg/m
$G_2 =$	46	kg/mq	$q_{G2} =$	60	kg/m
$Q_1 =$	186	kg/mq	$q_{Q1} =$	242	kg/m
Tot =	238	kg/mq	Tot =	310	kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1; G_2$)	98	Permanente	0,60	3,01	9,93	0,30	3,30
Flessione Max ($G_1; G_2; Q_1$)	454	Breve	0,90	13,91	14,90	0,93	1,07

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1; G_2$)	140	Permanente	0,60	0,18	1,45	0,12	8,27
Taglio Max ($G_1; G_2; Q_1$)	648	Breve	0,90	0,81	2,17	0,37	2,68

Verifica deformazione SLE ($u = \chi q l^4/EJ$)

	Tipo	$\psi_{2,i}$	k_{def}	E (GPa)	u (cm)	
$u_{1,inst}$	perm. ist.			11,50	0,17	
$u_{21,inst}$	var. ist.			11,50	0,61	L/457
u_{inst}	tot. ist.			$u_{1,inst} + u_{21,inst} =$	0,78	
$u_{1,fin}$	perm. fin.		0,60	7,19	0,27	
$u_{21,fin}$	var. fin.	0,6	0,60	8,46	0,83	L/336
u_{fin}	tot. fin.			$u_{1,fin} + u_{21,fin} =$	1,11	
u_0	controflessa iniziale				0	
$u_{net,fin}$	fin. netta			$u_{fin} - u_0 =$	1,11	L/253

Verifica di travi rettangolari in legno

Oggetto: Fuoco travicello
12x14

Caratteristiche dei materiali

Legno	GL24h	Lamellare	$f_{m,k} =$	24 MPa
$\gamma_M =$	1,45		$f_{v,k} =$	3,5 MPa
Classe di Servizio	1			420
			$\rho_m =$	kg/mc
				11500
			$E =$	MPa

Caratteristiche geometriche

b	8 cm	$A =$	92 cm
h	12 cm	$J_y =$	1068 cm ⁴
L	280 cm	$W_y =$	181 cm ³
i	130 cm	$h/b =$	1,51
L_{eff}/L	0,9		

θ 45°

Analisi dei carichi

$G_1 =$	3 kg/mq	$q_{G1} =$	4 kg/m
$G_2 =$	49 kg/mq	$q_{G2} =$	64 kg/m
$Q_1 =$	40 kg/mq	$q_{Q1} =$	52 kg/m
Tot =	92 kg/mq	Tot =	120 kg/m

Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2/\alpha$)

	M_{Ed} (kg m)	Durata	k_{mod}	α	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1; G_2$)	99	Permanente	0,60	8	6,56	9,93	0,66	1,51
Flessione Max ($G_1; G_2; Q_1$)	175	Breve	0,90		11,63	14,90	0,78	1,28

Verifica a taglio SLU ($V_{Ed} = q_{SLU} L/\beta$)

	V_{Ed} (kg)	Durata	k_{mod}	β	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1; G_2$)	141	Permanente	0,60	2	0,32	1,45	0,22	4,50
Taglio Max ($G_1; G_2; Q_1$)	250	Breve	0,90		0,57	2,17	0,26	3,80

VERIFICHE BARACCATURE

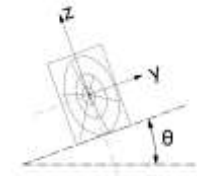
BARACCATURA ZONA CAMPO

Il carico vento risulta essere in pressione pari a $q=110$ kg/mq

La baraccatura orizzontale è costituita da travi in legno cons sezione pari a $S=10 \times 14$ cm ancorate sui montanti che presentano una sezione pari a $S=20 \times 36$ cm il tutto come riportato negli elaborati grafici.

Considerando le travi orizzontali semplicemente appoggiate sui montanti si ha la seguente situazione:

Oggetto: ORDITURA SECONDARIA BARACCATURE							
Caratteristiche dei materiali							
Legno	GL24h	Lamellare	$f_{m,k} =$	24 MPa			
$\gamma_M =$	1,45		$f_{v,k} =$	3,5 MPa			
Classe di Servizio	1		$\rho_m =$	420 kg/mc			
			$E =$	11500 MPa			
Caratteristiche geometriche							
b	10 cm	$A =$	140 cm				
h	14 cm	$J_y =$	2287 cm ⁴				
L	255 cm	$W_y =$	327 cm ³				
i	300 cm	$h/b =$	1,40				
L_{eff}/L	0						
Analisi dei carichi							
$G_1 =$	2 kg/mq	$q_{G1} =$	6 kg/m				
$G_2 =$	0 kg/mq	$q_{G2} =$	0 kg/m				
$Q_1 =$	108 kg/mq	$q_{Q1} =$	324 kg/m				
Tot =	110 kg/mq	Tot =	330 kg/m				
Verifica a flessione SLU ($M_{Ed} = q_{SLU} L^2 / \alpha$)							
	M_{Ed} (kg m)	Durata	k_{mod}	$\sigma_{m,d}$ (MPa)	$f_{m,d}$ (MPa)	E_d/R_d	FS
Flessione Max ($G_1; G_2$)	6	Permanente	0,60	0,19	9,93	0,02	51,17
Flessione Max ($G_1; G_2; Q_1$)	401	Breve	0,90	12,29	14,90	0,82	1,21
Verifica a taglio SLU ($V_{Ed} = q_{SLU} L / \beta$)							
	V_{Ed} (kg)	Durata	k_{mod}	τ_d (MPa)	$f_{v,d}$ (MPa)	$\tau_d/f_{v,d}$	FS
Taglio Max ($G_1; G_2$)	10	Permanente	0,60	0,01	1,45	0,01	97,09
Taglio Max ($G_1; G_2; Q_1$)	630	Breve	0,90	0,94	2,17	0,43	2,30
Verifica deformazione SLE ($u = \chi q l^4 / EJ$)							
	Tipo	$\psi_{2,i}$	k_{def}	E (GPa)	u (cm)		
$u_{1,inst}$	perm. ist.			11,50	0,01		
$u_{21,inst}$	var. ist.			11,50	0,68	L/377	
u_{inst}	tot. ist.			$u_{1,inst} + u_{21,inst} =$		0,69	
$u_{1,fin}$	perm. fin.		0,60	7,19	0,02		
$u_{21,fin}$	var. fin.	0,6	0,60	8,46	0,92	L/277	
u_{fin}	tot. fin.			$u_{1,fin} + u_{21,fin} =$		0,94	
u_0	controfreccia iniziale				0		
$u_{net,fin}$	fin. netta			$u_{fin} - u_0 =$	0,94	L/271	



$\theta = 0^\circ$

Considerando la reazione agli appoggia si ha $R=630$ kg agli SLU mentre agli SLE risulta una $R=330*2.55/2=421$ kg

Considerando il montante semplicemente appoggiato con una luce di circa $L=12.00$ m e su di esso i carichi concentrati derivanti dai travetti orizzontali si ottiene una trave appoggiata divisa in quattro campi con tre carichi concentrati pari a $Q=421*2=842$ kg posti ad una distanza pari a circa 3.00 m. Considerando che il primo carico in realtà è coperto dalla porzione dei fabbricati spogliatoio e ingresso, a favore di sicurezza si utilizza un unico carico concentrato pari a $Q=842*2=1684$ kg posti a 9.00 m da terra

Considerando la sezione del montante $S=20*36$ cm , la stessa ha un $J=20*36^3/12=77.760$ cm⁴

Freccia di calcolo $f_c=(1/3)*P*a^2*b^2/(E*J*L)$ dove $a=9.00$ m e $b=3.00$ m, pertanto $f_c=3.98$ cm che è minore di $L/300$ ovvero di 4.00 cm

Momento $M=P*a*b/L=1684*3*6/12=1684$ kg.m

Taglio $T=P*b/L=842$ kg

Resistenza di sezioni rettangolari in legno												
Oggetto:	Trave CNR-DT 206 R1/2018 -SEZIONE BARACCATURA											
Caratteristiche meccaniche e geometriche												
Classe di Servizio	1	Legno	GL24h	Legno lamellare								
γ_M	1,45	$\rho_m =$	420 kg/mc									
B	20 cm	$E_{0,m} =$	11500 MPa									
H	36 cm	$G_m =$	650 MPa									
H/B =	1,80	$f_{m,k} =$	24,00 MPa									
L	1200 cm	$f_{t,0,k} =$	19,20 MPa									
$\beta_0 = L_{eff}/L$	1,25	$f_{c,0,k} =$	24,00 MPa									
$\lambda =$	260 cm	$f_{v,k} =$	3,50 MPa									
Lato maggiore	36 cm	θ	0,00 °									
A =	720 cm ²											
$J_y =$	77760 cm ⁴	$J_z =$	24000 cm ⁴	* È necessaria la verifica di instabilità								
$W_y =$	4320 cm ³	$W_z =$	2400 cm ³									
Resistenza della sezione rettangolare												
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo							
k_{mod}	0,6	0,7	0,8	0,9	1,1							
$f_{m,y,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h =$	1,1					
$f_{m,z,d}$ (MPa)	10,92	12,74	14,57	16,39	20,03	$k_h =$	1,1					
$f_{t,0,d}$ (MPa)	8,74	10,20	11,65	13,11	16,02	$k_h =$	1,1					
$f_{c,0,d}$ (MPa)	9,93	11,59	13,24	14,90	18,21							
$f_{v,d}$ (MPa)	1,45	1,69	1,93	2,17	2,66							
$N_{Rd,t}$ (kN)	629	734	839	944	1154							
$N_{Rd,c}$ (kN)	-715	-834	-953	-1073	-1311							
$M_{Rd,y}$ (kN m)	47	55	63	71	87							
$M_{Rd,z}$ (kN m)	26	31	35	39	48							
$V_{Rd,y}$ (kN)	70	81	93	104	127							
$V_{Rd,z}$ (kN)	70	81	93	104	127							
Sollecitazioni di progetto												
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo							
N_{Ed} (kN)												
$M_{Ed,y}$ (kN m)					16,84							
$M_{Ed,z}$ (kN m)												
$V_{Ed,y}$ (kN)					8,42							
$V_{Ed,z}$ (kN)												
Verifica di resistenza												
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo							
$\sigma_{t,0,d} =$	0,00	0,00	0,00	0,00	0,00							
$\sigma_{c,0,d} =$	0,00	0,00	0,00	0,00	0,00							
$\sigma_{m,y,d} =$	0,00	0,00	0,00	0,00	3,90							
$\sigma_{m,z,d} =$	0,00	0,00	0,00	0,00	0,00							
$\tau_{d,y} =$	0,00	0,00	0,00	0,00	0,18	$k_{cf} =$	1					
$\tau_{d,z} =$	0,00	0,00	0,00	0,00	0,00	$k_{sh} =$	1,27					
$\tau_d =$	0,00	0,00	0,00	0,00	0,18							
Eq. [4.4.5] =	0,00	0,00	0,00	0,00	0,19	Flessione						
Eq. [4.4.6] =	0,00	0,00	0,00	0,00	0,19	Tensoflessione						
Eq. [4.4.7] =	0,00	0,00	0,00	0,00	0,19	Pressoflessione						

Verifica di stabilità						
$E_{0,05} =$	9600	$a =$	4	$J_{tor} =$	72000	$\beta_c =$ 0,1
$G_{0,05} =$	543	$1/a =$	0,250	$M_{y,crit} =$	199	
$\sigma_{y,crit} =$	46,00	$\lambda_{rel,c} =$	4,13			
$\lambda_{rel,m} =$	0,72	$k =$	9,24			
$k_{crit,m} =$	1,00	$k_{crit,c} =$	0,057			
	Permanente	Lunga durata	Media durata	Breve durata	Istantaneo	
Eq. [7.26] =	0,00	0,00	0,00	0,00	0,19	Flessione
Eq. [7.27] =	0,00	0,00	0,00	0,00	0,19	Tensoflessione
Eq. [7.28] =	0,00	0,00	0,00	0,00	0,00	Compressione
Eq. [7.31] =	0,00	0,00	0,00	0,00	0,19	Pressoflessione