MANDATARIA:

ISOLA BOASSO
STUDIO DI INGEGNERIA

STUDIO D' INGEGNERIA ASSOCIATO
ISOLA-BOASSO & ASSOCIATI S.r.l.

MANDANTI:

ETATEC STUDIO PAOLETTI

ETATEC STUDIO PAOLETTI

C. & S. DI GIUSEPPE INGEGNERI ASSOCIATI SRL Socio Unico

C. & S. DI GIUSEPPE INGEGNERI ASSOCIATI SRL Socio Unico

CIG: 896704821A

Vs. Rif. arch.:

Ente destinatario:

-

ACQUA NOVARA.VCO S.p.A.

Via Triggiani, 9 - 28100 NOVARA (NO)
Tel. 0321/413111 - Fax. 0321/413196

FSC Fondo per lo Sviluppo e la Coesione

Piano Operativo Ambiente

MINISTERO DELL'AMBIENTE E DELLA TUTELA DEL TERRITORIO E DEL MARE

PROGETTO ESECUTIVO

TITOLO COMMESSA

ADEGUAMENTO DEL DEPURATORE DI GRAVELLONA TOCE ALLE DIRETTIVE COMUNITARIE

Via Trattati di Roma in Comune di Gravellona Toce (VB)

Rif. N° Commessa: W01M - 10030635
CUP: D49E17000030002
RUP: Dott. Ing Barbara Dell'Edera

Data: Maggio 2022	Rif. archivio: 002.19
Scala	ELABORATO: ST.01.004 A

Rev.	AGGIORNAMENTI	DATA

OGGETTO

FASCICOLO DEI CALCOLI – MANUFATTO PARTITORE AL BIOLOGICO

Il Responsabile Dott. Ing. Riccardo ISOLA	Visto

* Riservato all'Amministrazione

Sommario

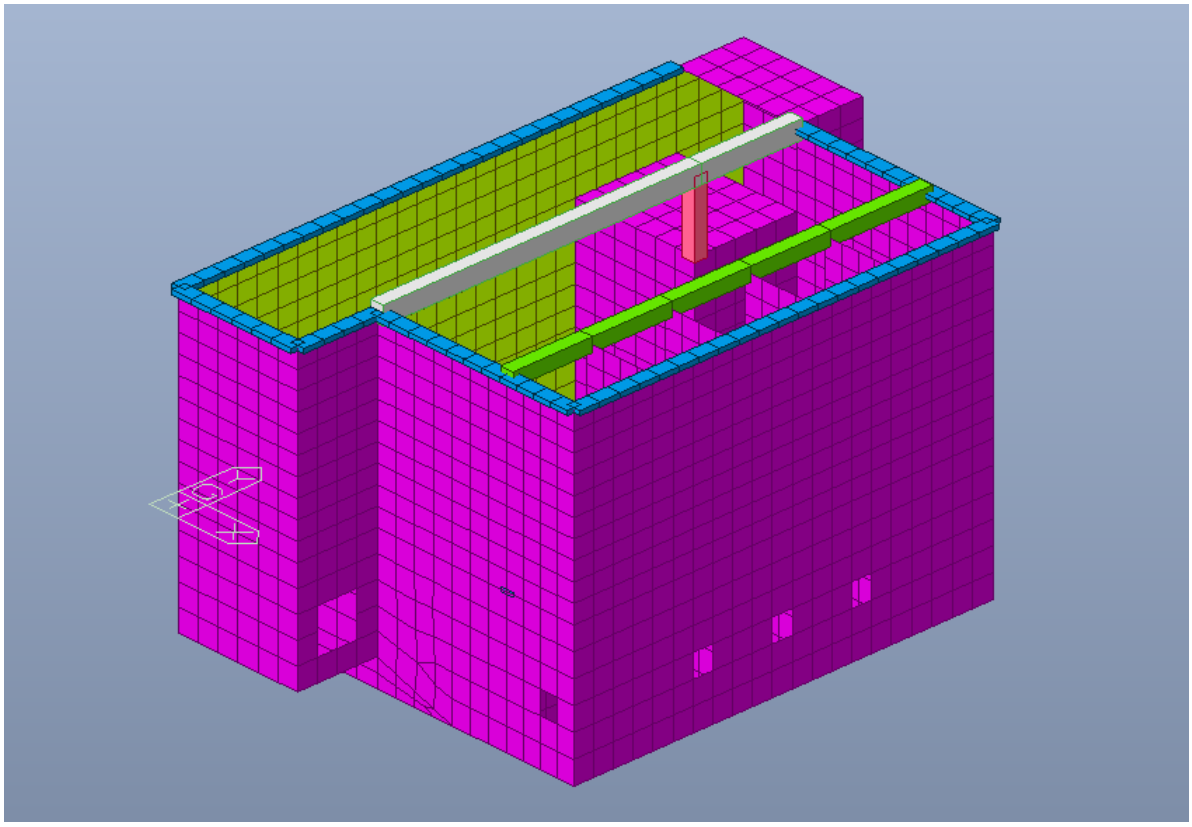
1 Fascicolo dei calcoli Manufatto partitore al Biologico

1.1 Dati della modellazione

Nelle immagini seguenti viene riportato il modello di calcolo agli elementi finiti, realizzato con Midas Gen, con evidenziati i vari spessori degli elementi strutturali.
Gli elementi finiti adottati sono di tipo plate per le pareti e beam per le travi.
In particolare, gli spessori adottati per gli elementi plate sono i seguenti:

- Platea di fondazione sp.40 cm;
- Parete esterna verso futuri filtri terziari sp.40 cm;
- Altre pareti esterne sp.30 cm;
- Pareti interne sp.30 cm.

Sono previste anche delle travi di sezione 30x30 cm e 30x40 cm ed un pilastro di sezione 30x30 cm, per il sostegno della copertura del manufatto.



Modello di Calcolo agli elementi finiti

L'interazione terreno struttura a livello del piano di fondazione è stata modellata con delle molle alla Winkler con costante di sottofondo media pari a circa 11700 kN/m^3, ricavata dalle caratteristiche geotecniche del terreno con la formula di Vesic.
L'analisi sismica è stata effettuata mediante analisi dinamica modale (coinvolge le masse delle parti fuori terra), a cui sono stati sommati i contributi delle sovra spinte sismiche sia del terreno che del liquame.

Di seguito vengono riportati i principali risultati dei periodi e delle frequenze dell'analisi dinamica, condotta con i vettori di Ritz per 20 modi.

EIGENVALUE ANALYSIS				
Mode No	Frequency		Period	Tolerance
	(rad/sec)	(cycle/sec)	(sec)	
1	34.2166	5.4457	0.1836	0.0000e+00
2	38.1616	6.0736	0.1646	0.0000e+00
3	44.8258	7.1343	0.1402	0.0000e+00
4	71.6515	11.4037	0.0877	0.0000e+00
5	73.4515	11.6902	0.0855	0.0000e+00
6	114.0679	18.1545	0.0551	0.0000e+00
7	121.7254	19.3732	0.0516	0.0000e+00
8	135.4332	21.5549	0.0464	0.0000e+00
9	189.0540	30.0889	0.0332	0.0000e+00
10	197.1071	31.3706	0.0319	0.0000e+00
11	204.5791	32.5598	0.0307	0.0000e+00
12	257.7662	41.0248	0.0244	0.0000e+00
13	262.6462	41.8014	0.0239	0.0000e+00
14	285.2173	45.3937	0.0220	0.0000e+00
15	341.2557	54.3125	0.0184	0.0000e+00
16	406.1773	64.6451	0.0155	0.0000e+00
17	490.0744	77.9978	0.0128	0.0000e+00
18	529.6929	84.3032	0.0119	0.0000e+00
19	915.7475	145.7457	0.0069	0.0000e+00
20	1033.3112	164.4566	0.0061	0.0000e+00

Di seguito vengono riportate le masse partecipanti ai vari modi di vibrare, con la sommatoria progressiva che dimostra che le masse coinvolte sono superiori all'85% della massa totale a quota superiore a zero:

MODAL PARTICIPATION MASSES PRINTOUT												
Mode No	TRAN-X		TRAN-Y		TRAN-Z		ROTN-X		ROTN-Y		ROTN-Z	
	MASS(%)	SUM(%)	MASS(%)	SUM(%)	MASS(%)	SUM(%)	MASS(%)	SUM(%)	MASS(%)	SUM(%)	MASS(%)	SUM(%)
1	43.2857	43.2857	2.0431	2.0431	0.0936	0.0936	2.7521	2.7521	58.9066	58.9066	0.5870	0.5870
2	2.2497	45.5355	33.4173	35.4604	2.1259	2.2194	73.1295	75.8817	3.7354	62.6420	0.0012	0.5883
3	0.0088	45.5443	0.8153	36.2757	97.6213	99.8407	1.9311	77.8127	0.0111	62.6531	0.0066	0.5949
4	4.4228	49.9671	0.0009	36.2766	0.0631	99.9038	0.3431	78.1559	1.2795	63.9326	1.7722	2.3671
5	0.5039	50.4710	0.0036	36.2803	0.0749	99.9788	0.2641	78.4199	7.0178	70.9504	1.5484	3.9155
6	0.0234	50.4944	0.0000	36.2803	0.0115	99.9902	0.0000	78.4200	0.0521	71.0025	0.7672	4.6827
7	0.0806	50.5750	0.0030	36.2833	0.0001	99.9903	0.0044	78.4243	0.1871	71.1896	0.0934	4.7761
8	2.4607	53.0357	0.0003	36.2836	0.0027	99.9929	0.0003	78.4246	4.1700	75.3596	0.4856	5.2617
9	0.0652	53.1009	0.0000	36.2837	0.0000	99.9929	0.0000	78.4246	0.0278	75.3874	0.9311	6.1928
10	0.0054	53.1063	0.0564	36.3401	0.0001	99.9930	0.0218	78.4464	0.0020	75.3893	0.0812	6.2741
11	1.2466	54.3528	0.0151	36.3552	0.0000	99.9930	0.0067	78.4531	0.7625	76.1519	1.2693	7.5433
12	3.8397	58.1925	0.0014	36.3566	0.0004	99.9934	0.0012	78.4543	1.9275	78.0794	3.7622	11.3055
13	0.2002	58.3928	7.2235	43.5801	0.0000	99.9935	2.9655	81.4198	0.1831	78.2625	1.7505	13.0560
14	0.1697	58.5624	1.9060	45.4861	0.0001	99.9935	0.6092	82.0290	0.1132	78.3756	0.7076	13.7635
15	9.2043	67.7667	0.0720	45.5581	0.0006	99.9942	0.0337	82.0626	5.2327	83.6083	12.1765	25.9401
16	0.2365	68.0032	6.7799	52.3380	0.0001	99.9943	2.4163	84.4789	0.1037	83.7120	1.8969	27.8369
17	12.2551	80.2583	0.6253	52.9633	0.0003	99.9946	0.2192	84.6981	6.1760	89.8880	2.5968	30.4337
18	0.0087	80.2671	22.6888	75.6521	0.0002	99.9948	7.4531	92.1512	0.0090	89.8970	0.1494	30.5831
19	14.0130	94.2801	0.1105	75.7626	0.0000	99.9948	0.0350	92.1862	7.0968	96.9938	0.2332	30.8163
20	0.0101	94.2901	18.0950	93.8576	0.0000	99.9948	5.8159	98.0021	0.0046	96.9984	0.0239	30.8402

1.2 Carichi e combinazioni di carico

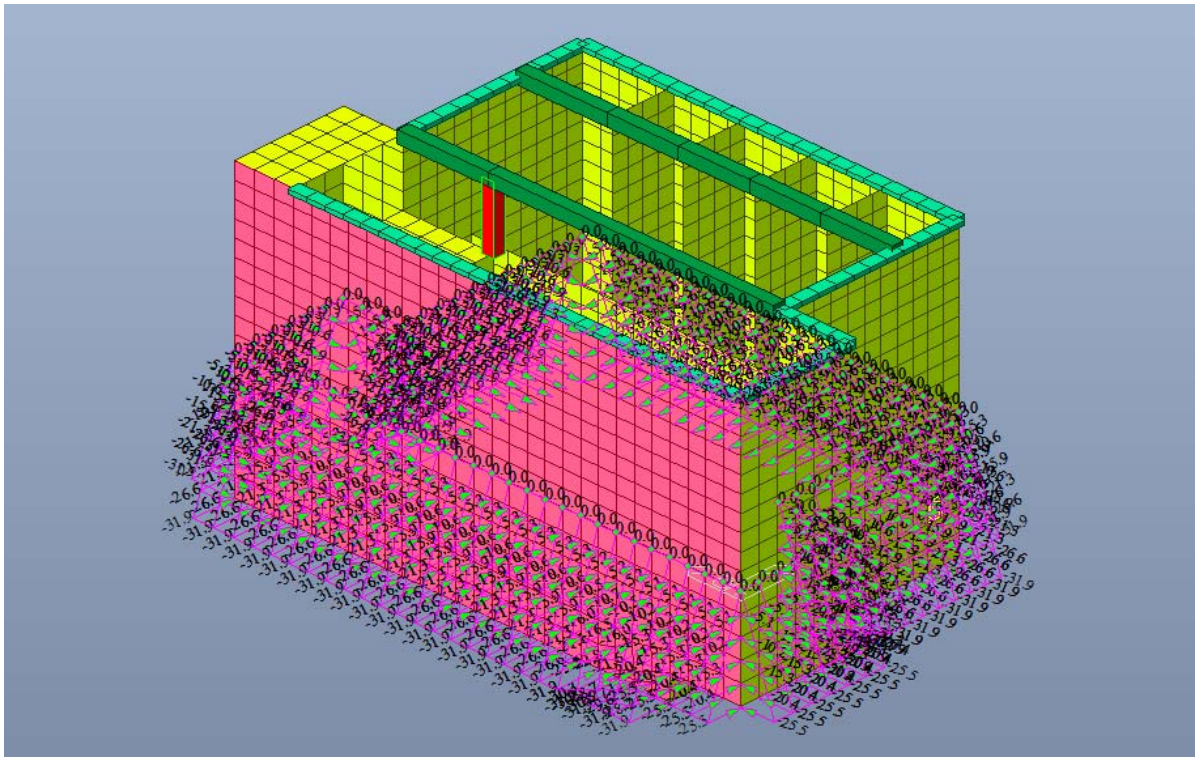
Per la determinazione delle azioni sul manufatto si faccia riferimento alla relazione strutturale.
Nel presente paragrafo vengono riportati i carichi assegnati ai vari elementi strutturali, le condizioni di carico elementari considerate e le combinazioni di carico.
Le condizioni di carico adottate nella modellazione della struttura sono le seguenti:

No	Name	Type	Description
1	DL	Dead Load (D)	Peso Proprio
2	PP	Dead Load (D)	Permanente Paratoie
3	PG	Dead Load (D)	Permanente Grigliati
4	SST	Dead Load (D)	Spinta Statica Terreno
5	SSTF	Dead Load (D)	Spinta Statica Terreno in Falda
6	SSL	Dead Load (D)	Spinta Statica Liquame
7	S GAL	Dead Load (D)	Spinta di galleggiamento
8	SSS	Live Load (L)	Spinta Statica Sovraccarico
9	SSF	Dead Load (D)	Spinta Statica Sovraccarico Filtri Terziari
10	VM	Live Load (L)	Variabile Manutenzione
11	ET X	Earthquake (E)	Sovraspinta Sismica Terreno X
12	ET Y	Earthquake (E)	Sovraspinta Sismica Terreno Y
13	EL X	Earthquake (E)	Sovraspinta Sismica Liquame X
14	EL Y	Earthquake (E)	Sovraspinta Sismica Liquame Y

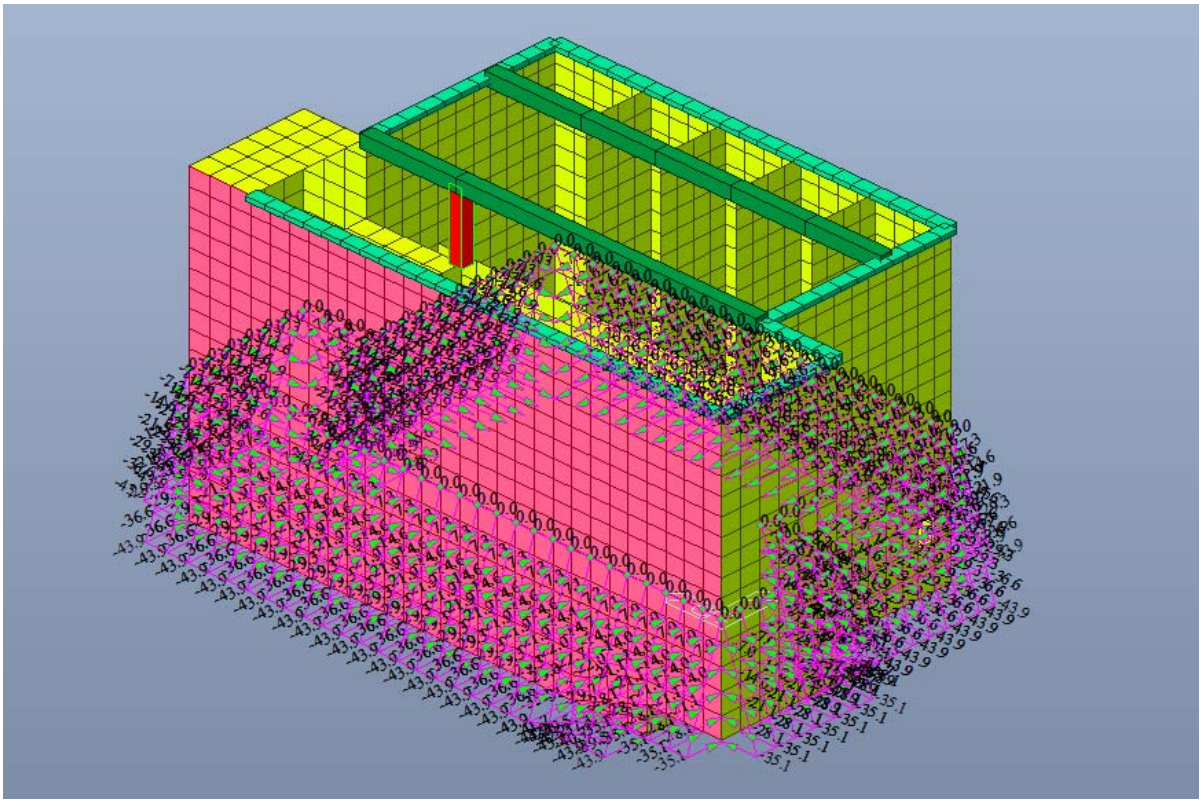
Le combinazioni delle condizioni di carico elementari, realizzate sulla base delle indicazioni del paragrafo 2.5.3 delle NTC 2018, sono le seguenti:

No	Name	DL(ST)	PP(ST)	PG(ST)	SST(ST)	SSTF(ST)	SSL(ST)	S GAL(ST)	SSS(ST)	SSF(ST)	VM(ST)	ET X(ST)	ET Y(ST)	EL X(ST)	EL Y(ST)	EX SLV(RS)	EY SLV(RS)	EX SLO(RS)	EY SLO(RS)
1	SLU 1	1.3000	1.3000	1.3000	1.3000		1.3000												
2	SLU 2	1.3000	1.3000	1.3000		1.3000			1.0500										
3	SLU 3	1.3000	1.3000	1.3000			1.3000												
4	SLU 4	1.3000	1.3000	1.3000	1.3000		1.3000		1.0500		1.5000								
5	SLU 5	1.3000	1.3000	1.3000	1.3000		1.3000		1.5000	1.3000									
6	SLU 6	1.3000	1.3000	1.3000	1.3000				1.5000	1.3000									
7	SLU 7	1.3000	1.3000	1.3000		1.3000		1.3000											
8	SLV V1	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		1.0000	0.3000			1.0000	0.3000		
9	SLV V2	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		1.0000	-0.3000			1.0000	-0.3000		
10	SLV V3	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		0.3000	1.0000			0.3000	1.0000		
11	SLV V4	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		-0.3000	1.0000			-0.3000	1.0000		
12	SLV V5	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		-1.0000	-0.3000			-1.0000	-0.3000		
13	SLV V6	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		-1.0000	0.3000			-1.0000	0.3000		
14	SLV V7	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		-0.3000	-1.0000			-0.3000	-1.0000		
15	SLV V8	1.0000	1.0000	1.0000	1.0000				0.3000	1.0000		0.3000	-1.0000			0.3000	-1.0000		
16	SLV F1	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		1.0000	0.3000	1.0000	0.3000	1.0000	0.3000		
17	SLV F2	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		1.0000	-0.3000	1.0000	-0.3000	1.0000	-0.3000		
18	SLV F3	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		0.3000	1.0000	0.3000	1.0000	0.3000	1.0000		
19	SLV F4	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-0.3000	1.0000	-0.3000	1.0000	-0.3000	1.0000		
20	SLV F5	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-1.0000	-0.3000	-1.0000	-0.3000	-1.0000	-0.3000		
21	SLV F6	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-1.0000	0.3000	-1.0000	0.3000	-1.0000	0.3000		
22	SLV F7	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-0.3000	-1.0000	-0.3000	-1.0000	-0.3000	-1.0000		
23	SLV F8	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		0.3000	-1.0000	0.3000	-1.0000	0.3000	-1.0000		
24	SLO 1	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		0.3000	0.1000	0.3000	0.1000			1.0000	0.3000
25	SLO 2	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		0.3000	-0.1000	0.3000	-0.1000			1.0000	-0.3000
26	SLO 3	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		0.1000	0.3000	0.1000	0.3000			0.3000	1.0000
27	SLO 4	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-0.1000	0.3000	-0.1000	0.3000			-0.3000	1.0000
28	SLO 5	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-0.3000	-0.1000	-0.3000	-0.1000			-1.0000	-0.3000
29	SLO 6	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-0.3000	0.1000	-0.3000	0.1000			-1.0000	0.3000
30	SLO 7	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-0.1000	-0.3000	-0.1000	-0.3000			-0.3000	-1.0000
31	SLO 8	1.0000	1.0000	1.0000	1.0000		1.0000		0.3000	1.0000		-0.1000	-0.3000	0.1000	-0.3000			0.3000	-1.0000
32	SLE R1	1.0000	1.0000	1.0000	1.0000		1.0000		1.0000	1.0000									
33	SLE R2	1.0000	1.0000	1.0000	1.0000		1.0000		0.7000	1.0000	1.0000								
34	SLE R3	1.0000	1.0000	1.0000		1.0000	1.0000		0.7000	1.0000	1.0000								
35	SLE R4	1.0000	1.0000	1.0000		1.0000	1.0000		1.0000	1.0000									
36	SLE R5	1.0000	1.0000	1.0000		1.0000		1.0000											
37	SLE F	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		0.5000	1.0000									
38	SLE Qp	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		0.3000	1.0000									

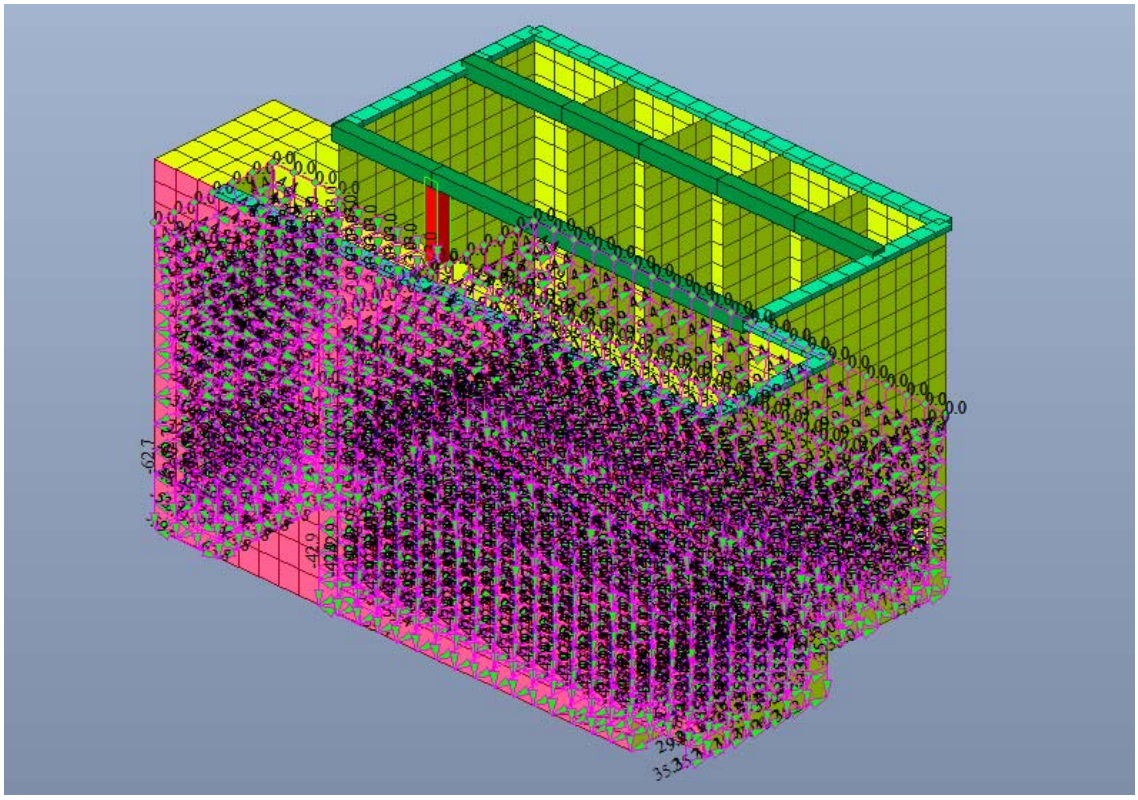
Nelle immagini seguenti si riportano le assegnazioni dei carichi:



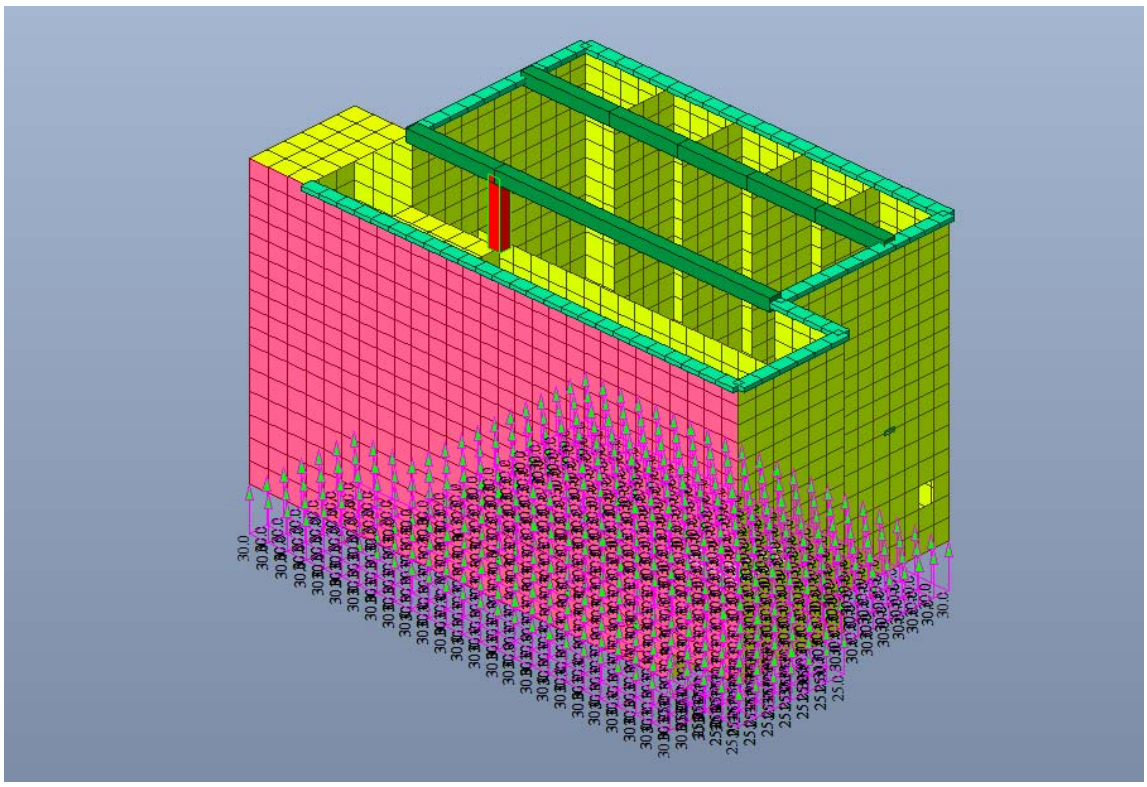
Assegnazione spinta statica del terreno (SST) - [kN/mq]



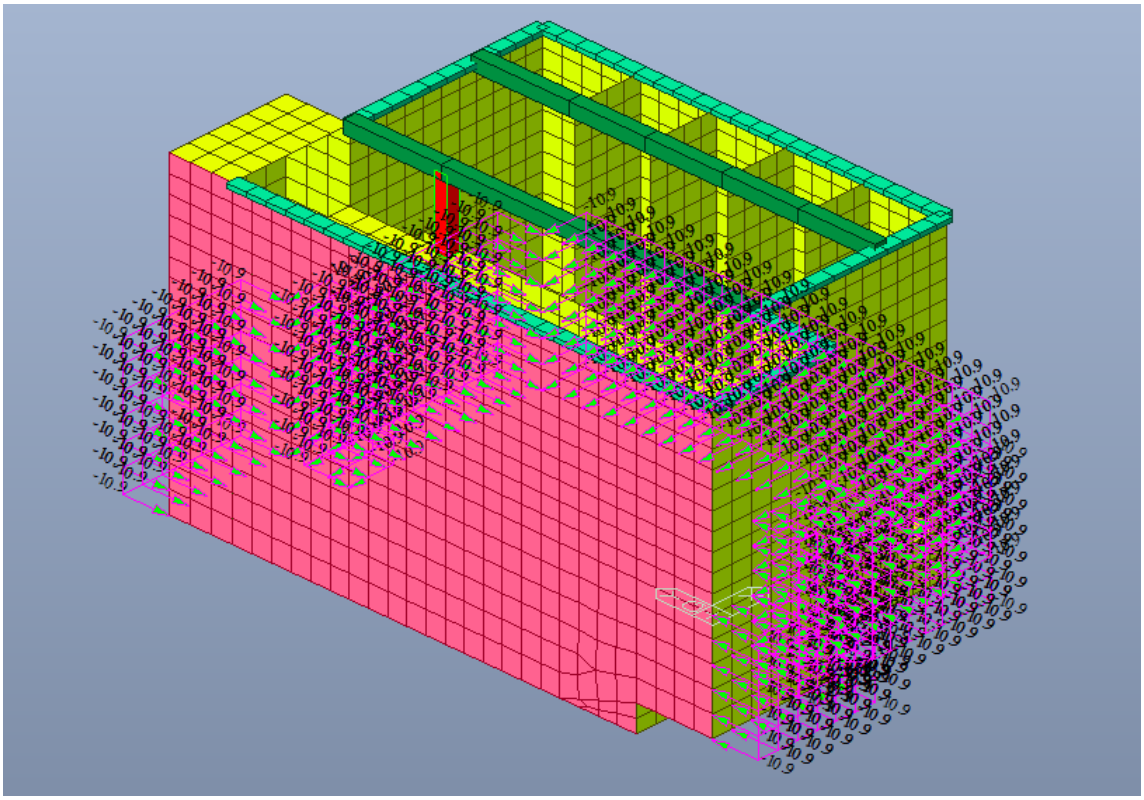
Assegnazione spinta statica del terreno con falda (SSTF) - [kN/mq]



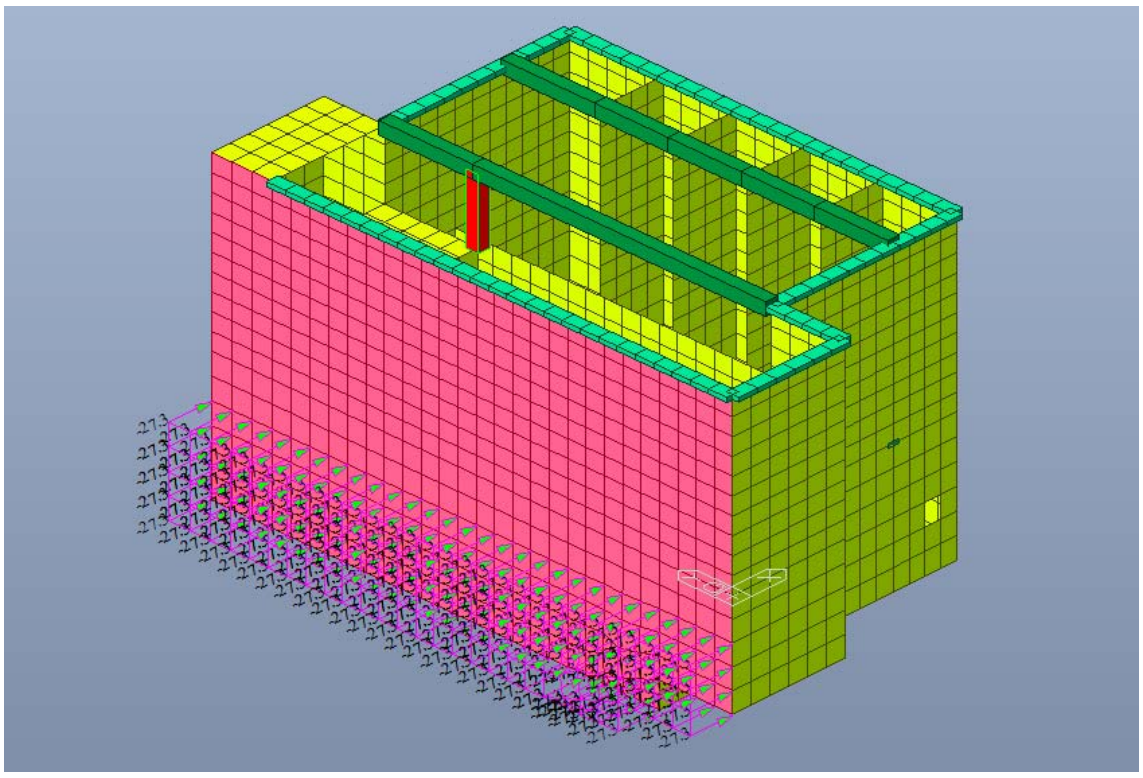
Assegnazione spinta statica liquame (SSL) - [kN/mq]



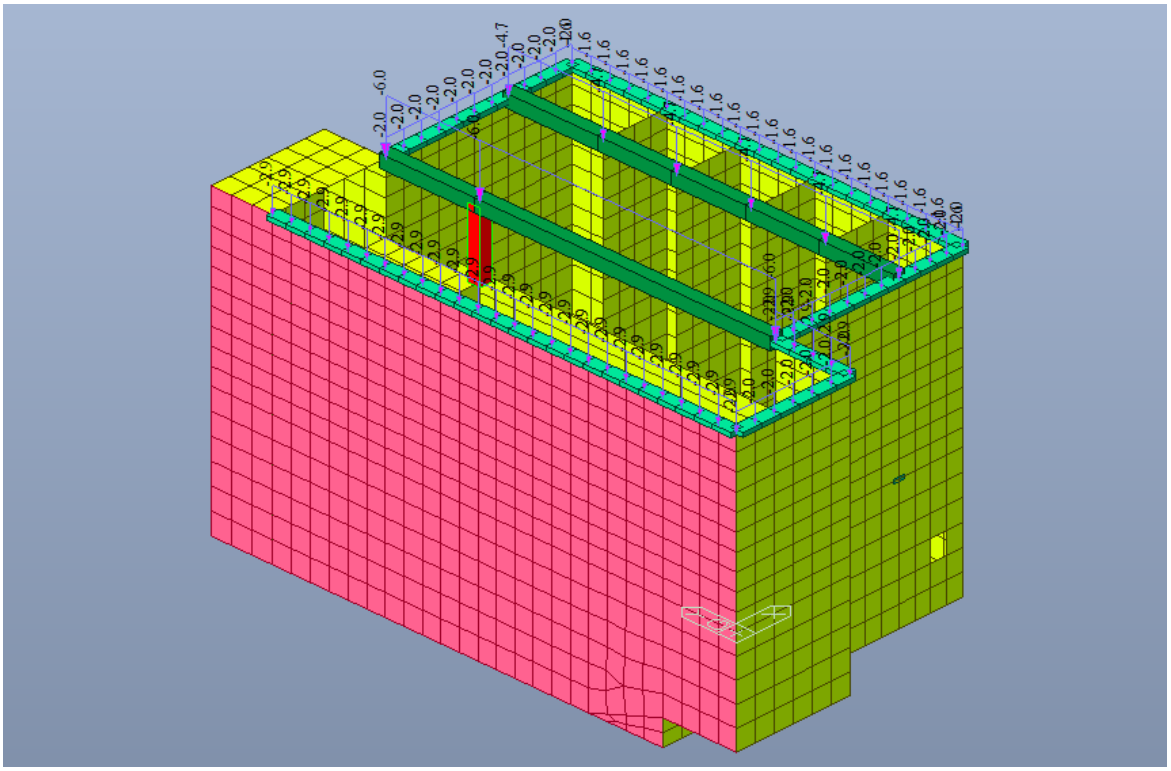
Assegnazione spinta galleggiamento (S GAL) - [kN/mq]



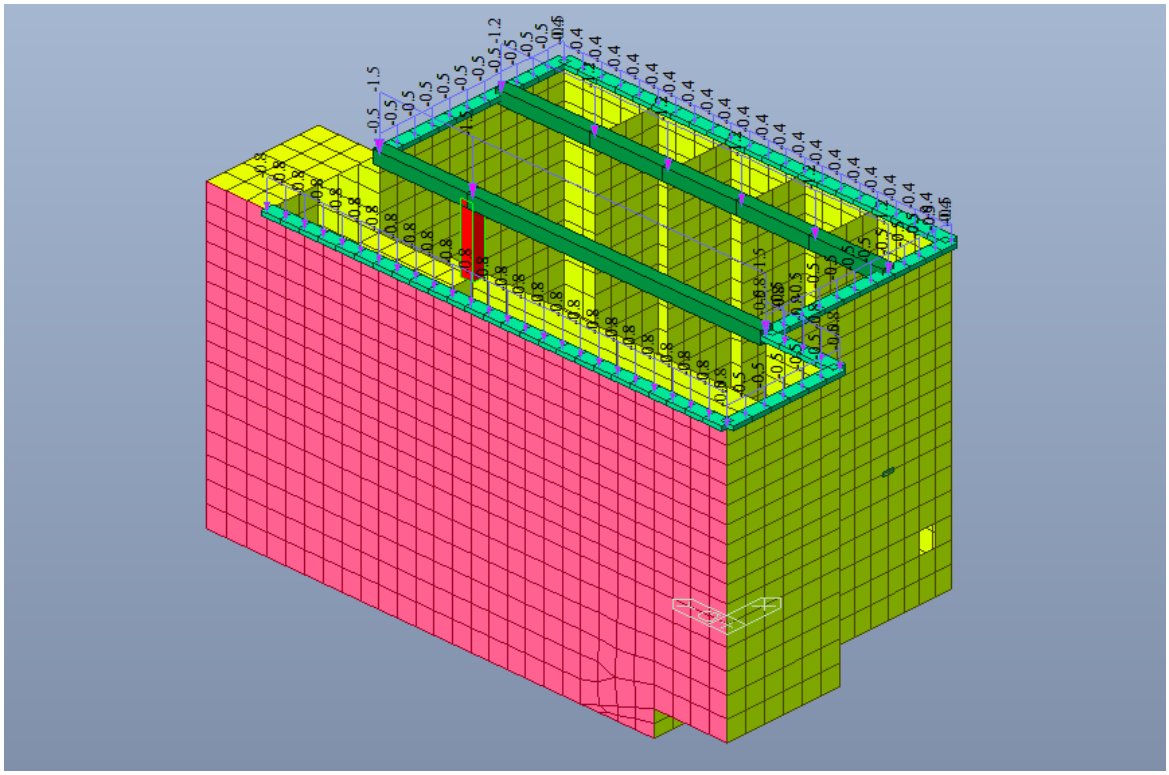
Assegnazione spinta statica sovraccarico (SSS) - [kN/mq]



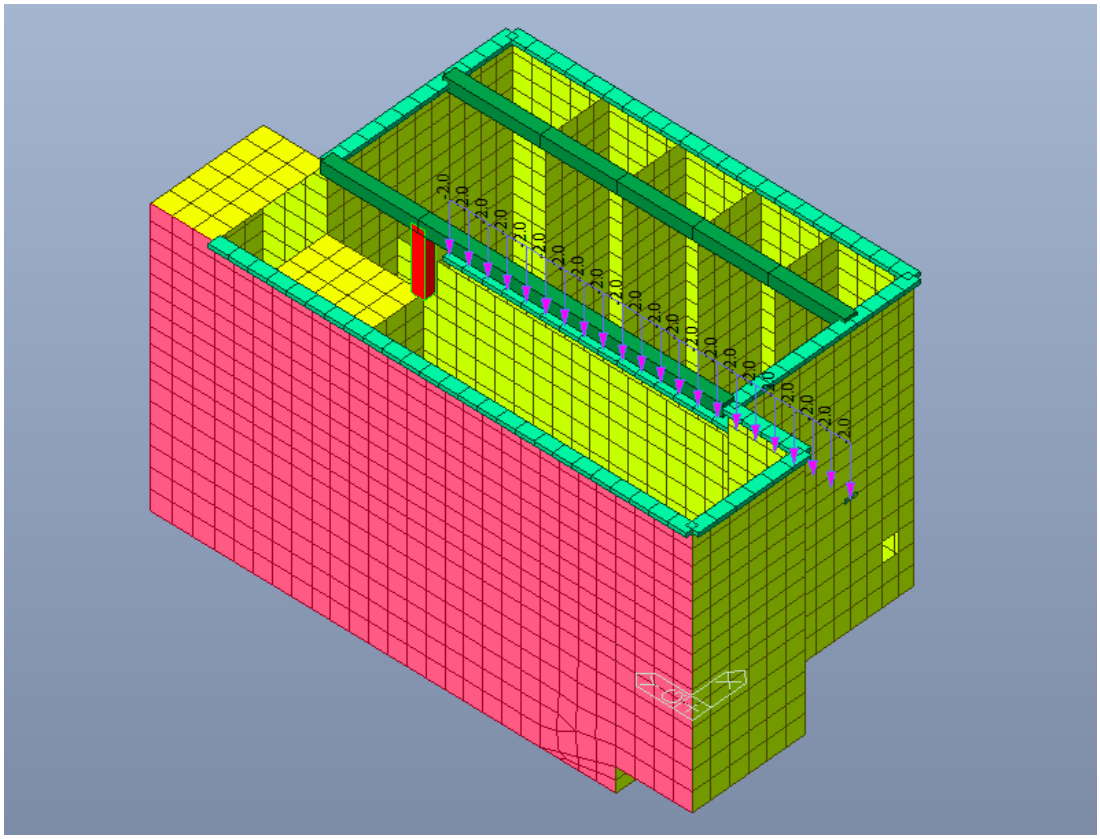
Assegnazione spinta statica sovraccarico edificio filtri (SSF) - [kN/mq]



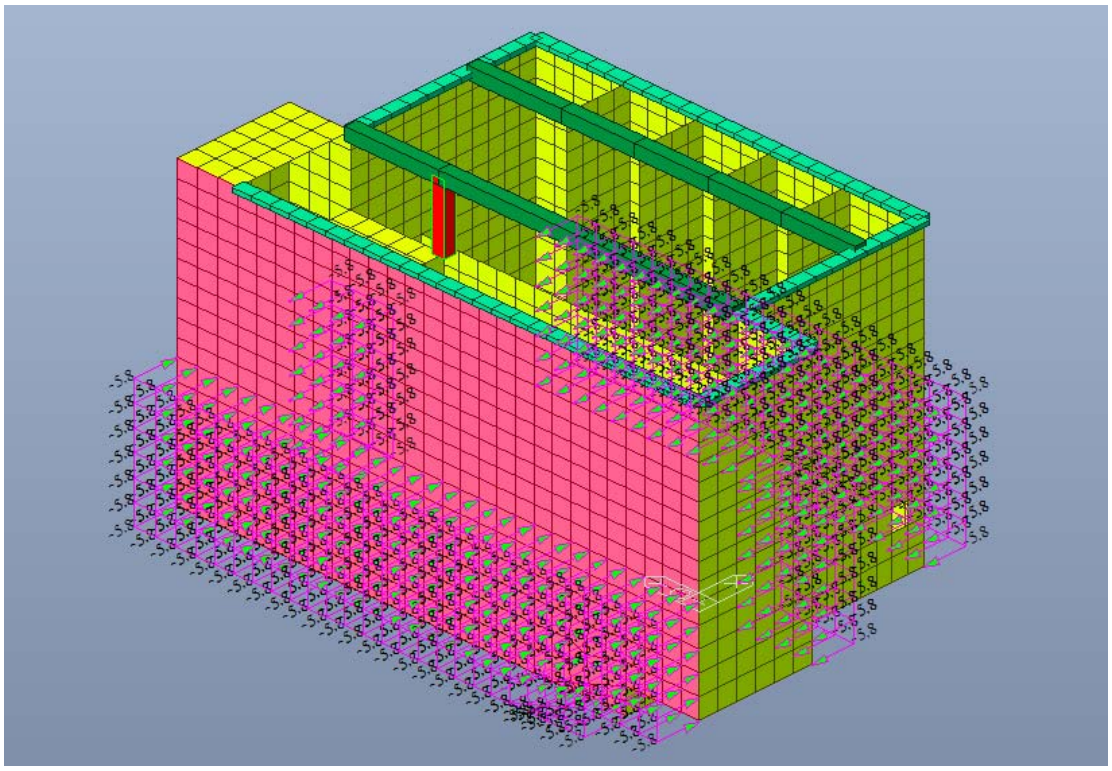
Assegnazione variabile manutenzione (VM) - [kN/m]



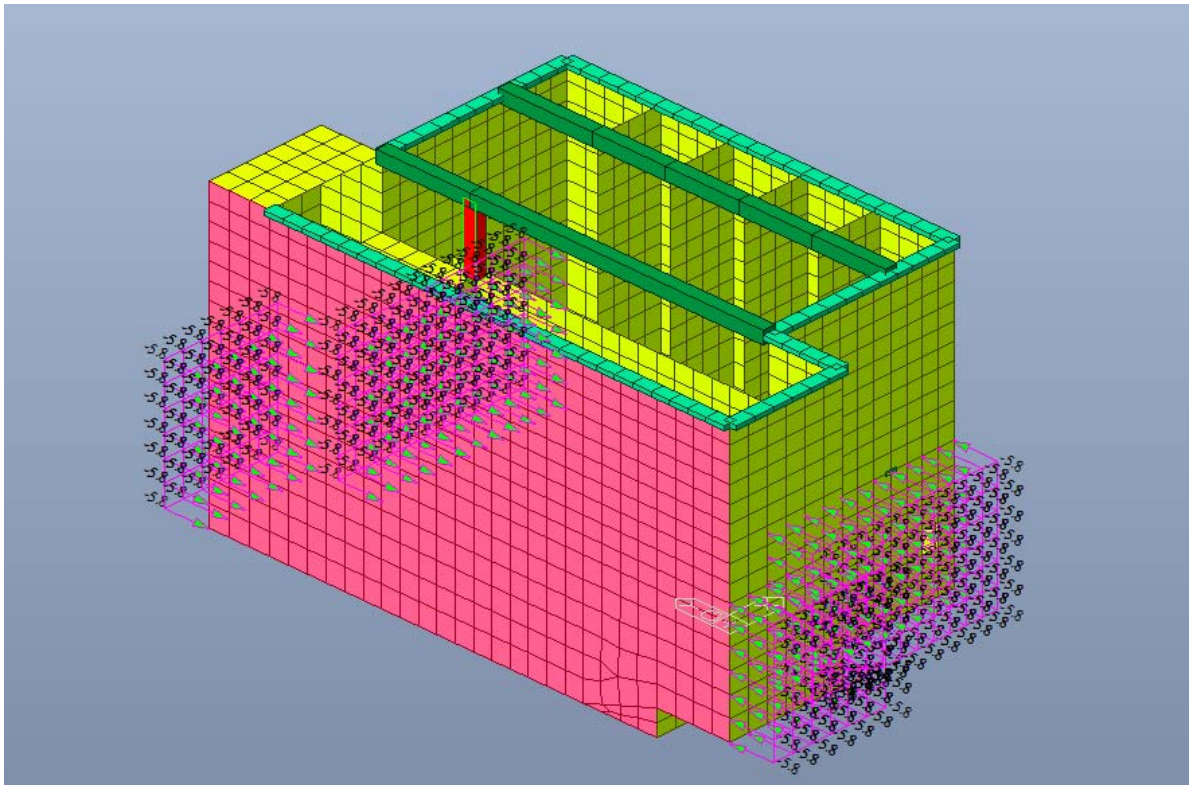
Assegnazione permanente grigliati (PG) - [kN/m]



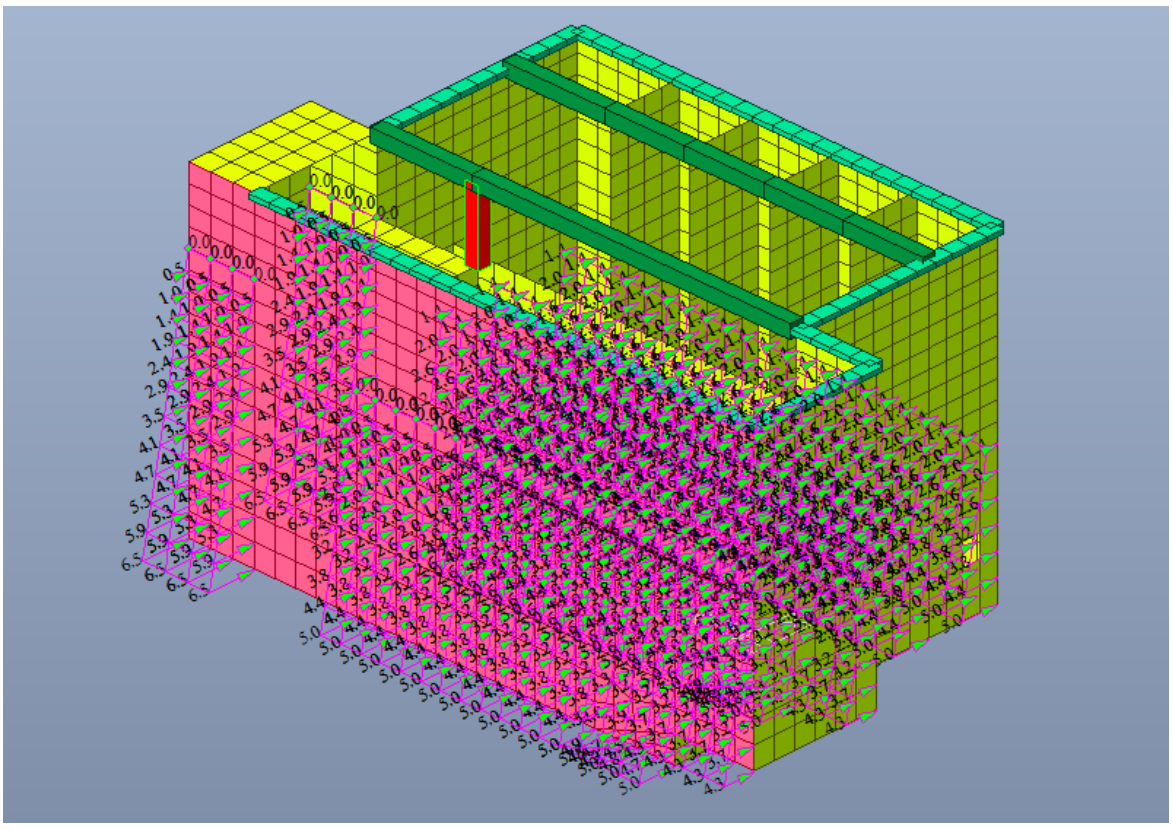
Assegnazione permanente paratoie (PP) - [kN/m]



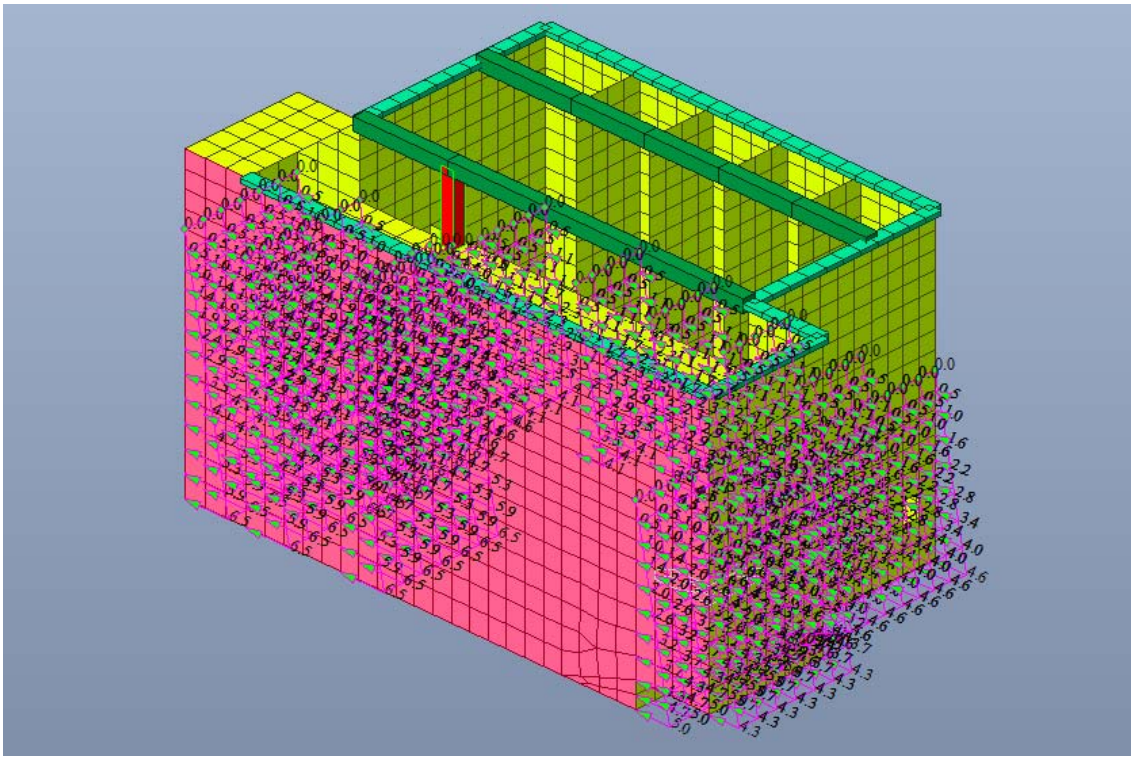
Assegnazione sovra spinta sismica terreno X (ET X) - [kN/mq]



Assegnazione sovra spinta sismica terreno Y (ET Y) - [kN/mq]



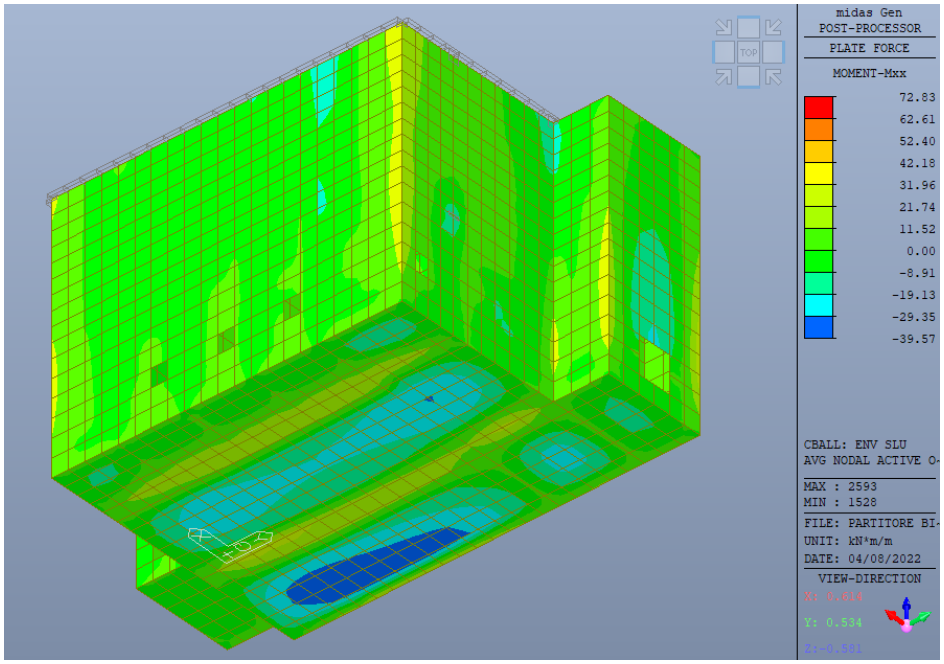
Assegnazione sovra spinta sismica liquame X (EL X) - [kN/mq]



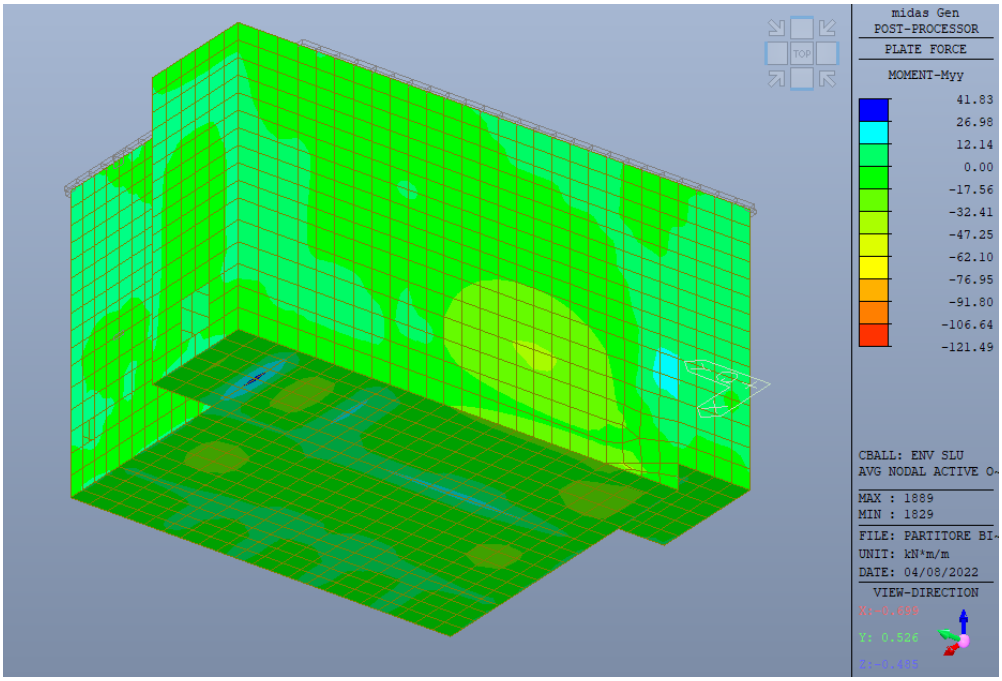
Assegnazione sovra spinta sismica liquame Y (EL Y) - [kN/mq]

1.3 Sollecitazioni

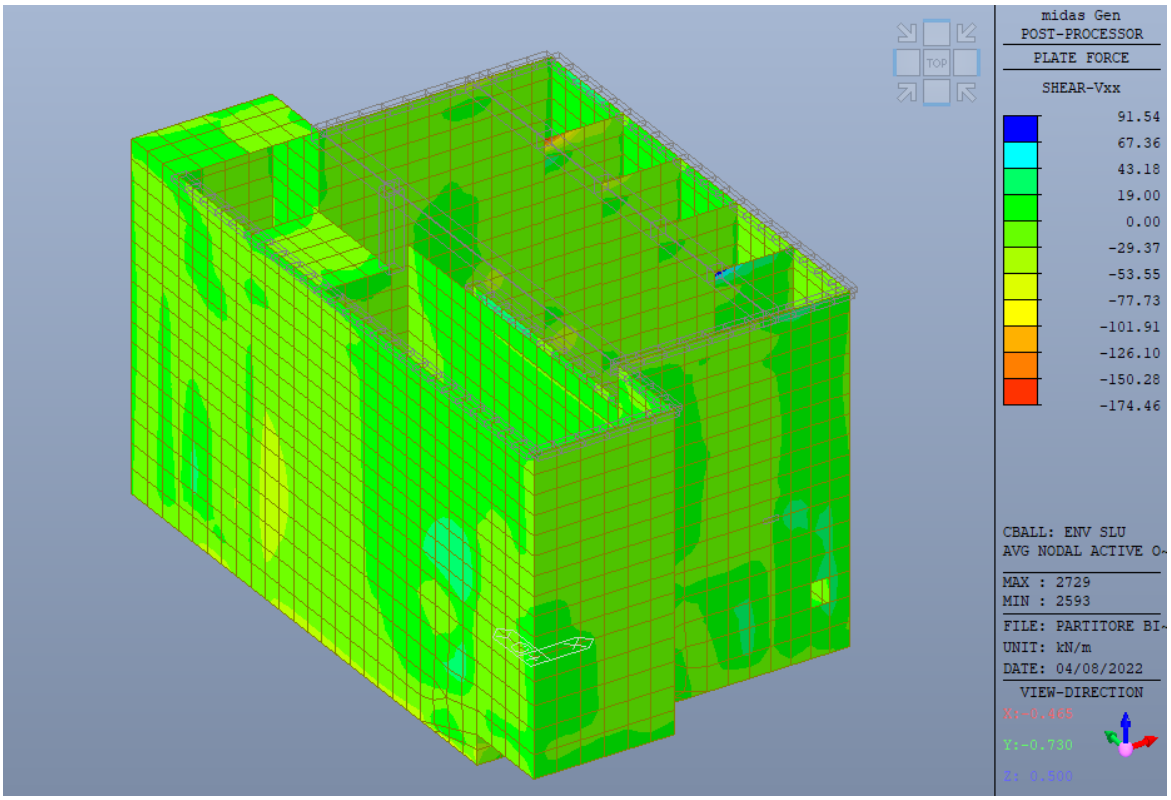
Nel presente paragrafo vengono riportate per via grafica le sollecitazioni sulla struttura indotte dai carichi applicati, per le varie combinazioni di carico statiche e sismiche.



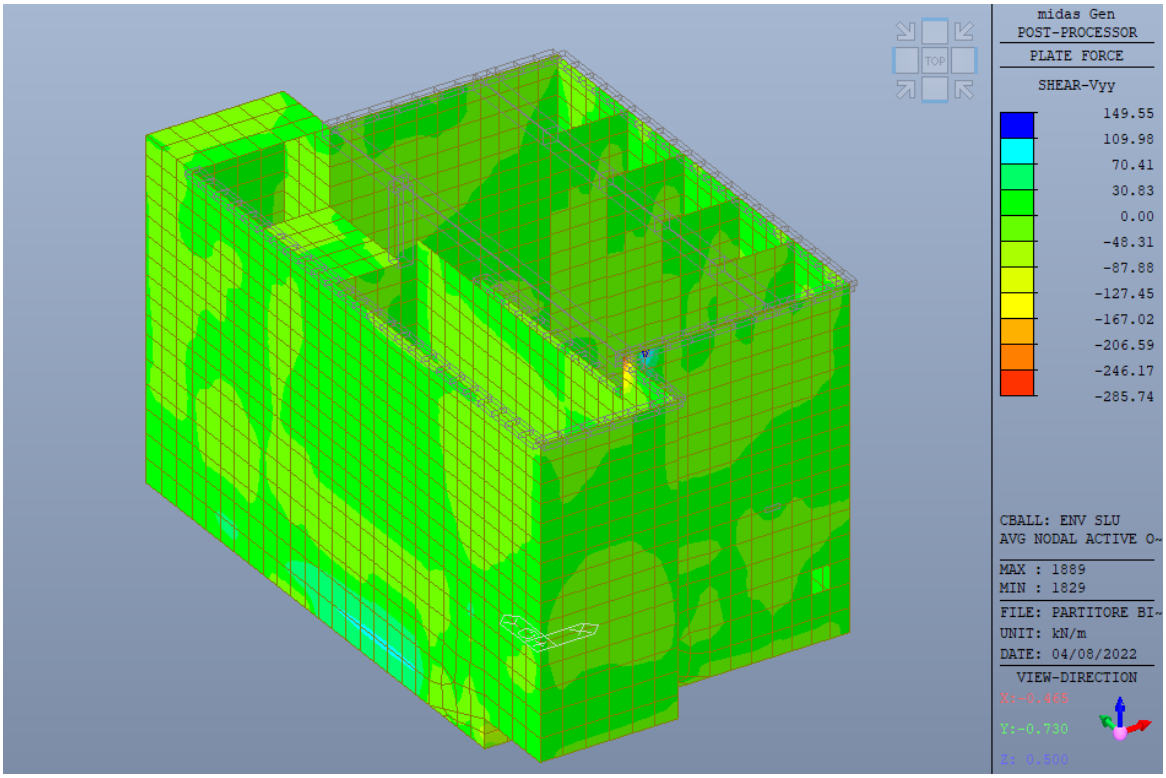
*Momento flettente membranale Mxx – inviluppo SLU [kN*m/m]*



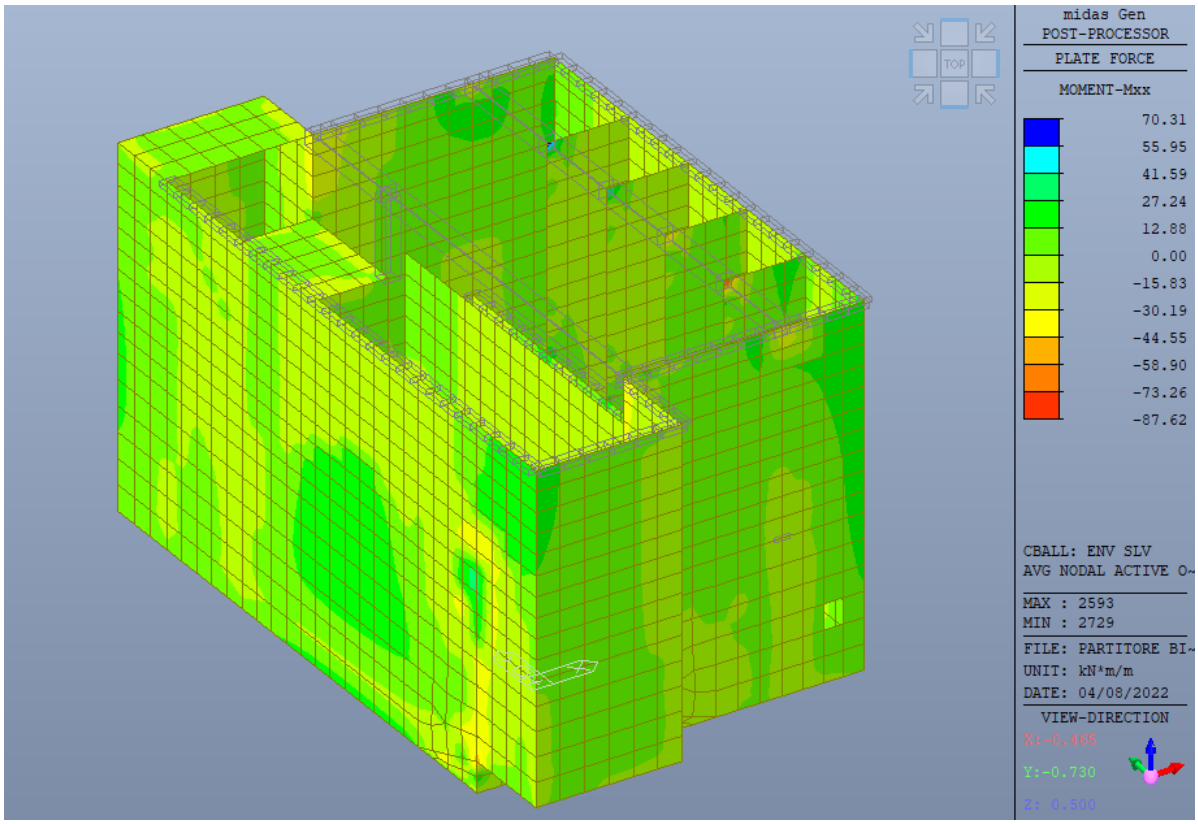
Momento flettente membranale Myy – inviluppo SLU [kN*m/m]



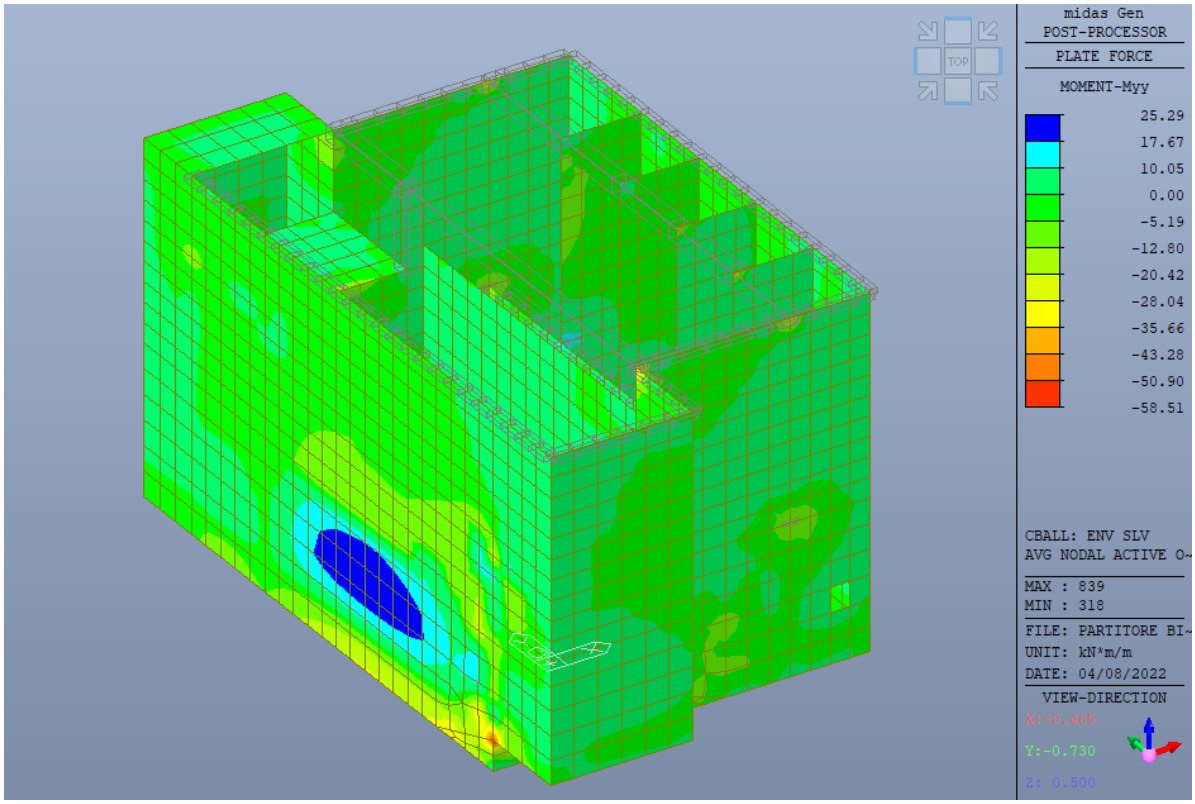
Sollecitazione tagliante Vxx – inviluppo SLU [kN/m]



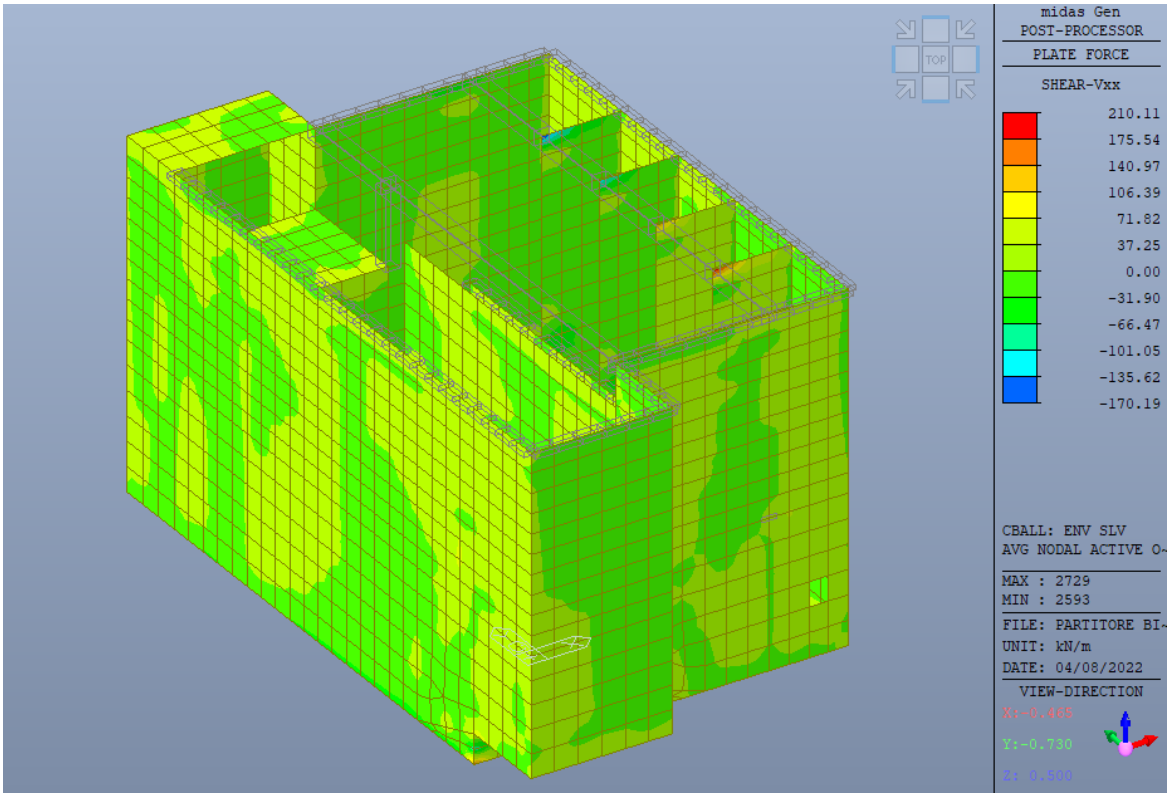
Sollecitazione tagliante Vyy – inviluppo SLU [kN/m]



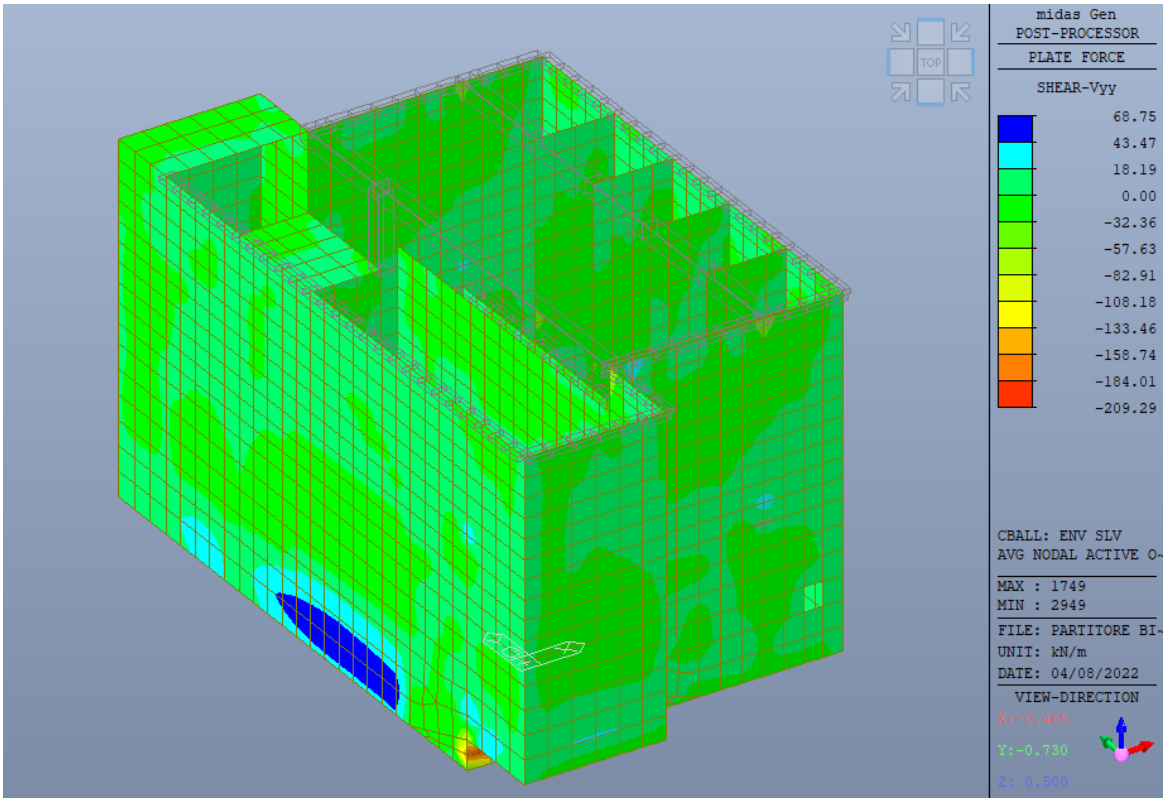
Momento flettente membranale Mxx – inviluppo SLV [kN*m/m]



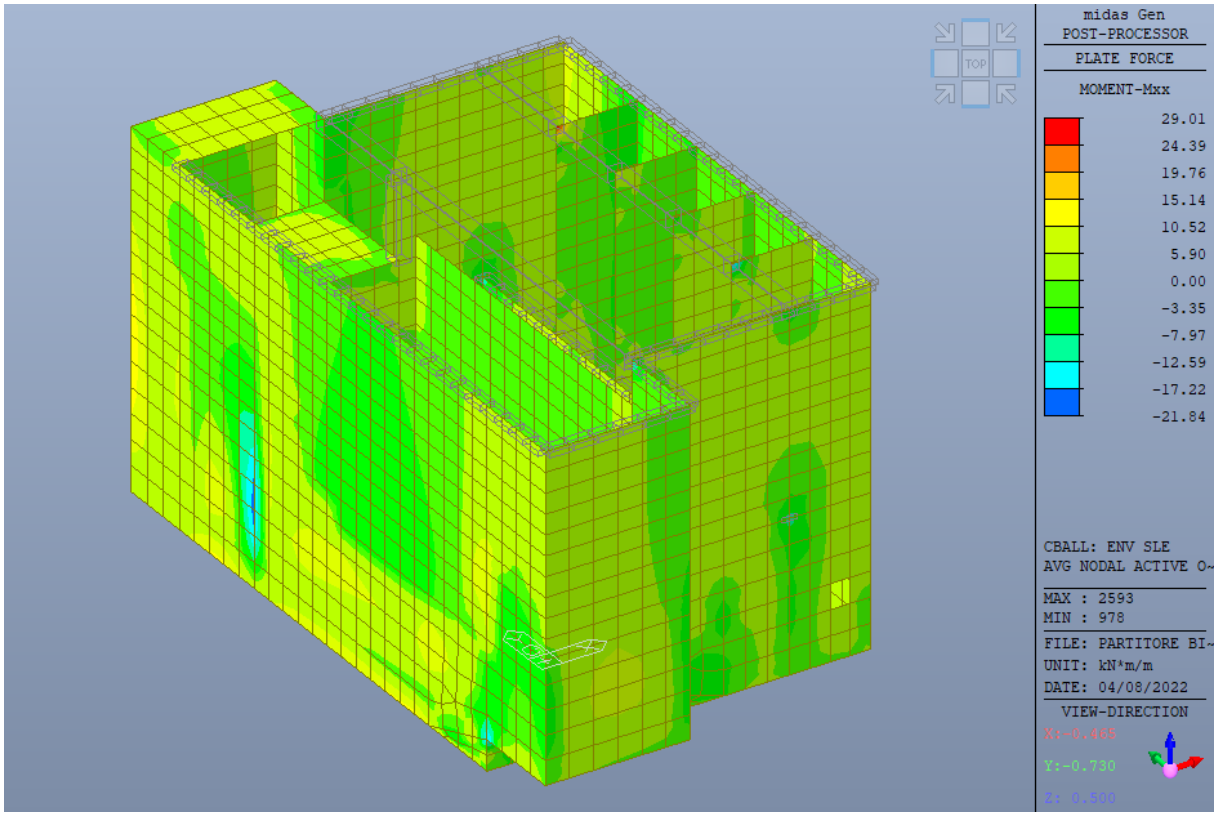
Momento flettente membranale Myy – inviluppo SLV [kN*m/m]



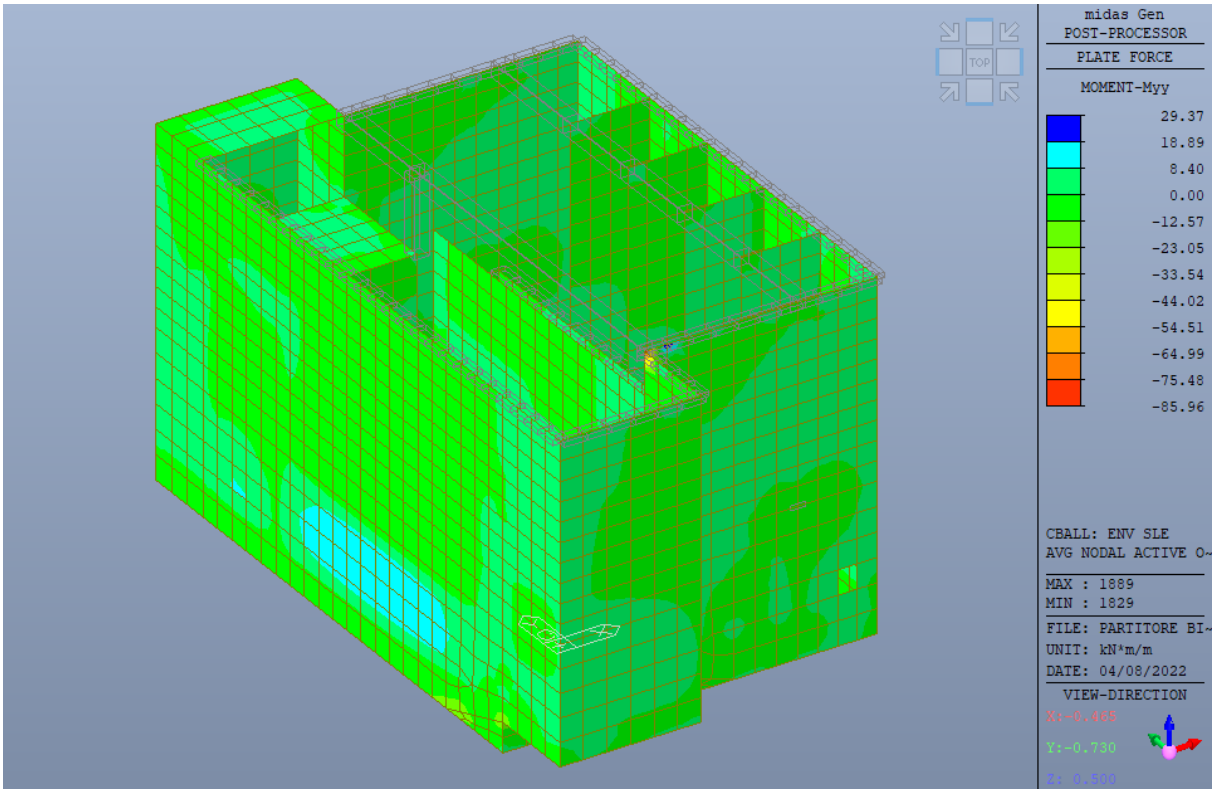
Sollecitazione tagliante Vxx – inviluppo SLV [kN/m]



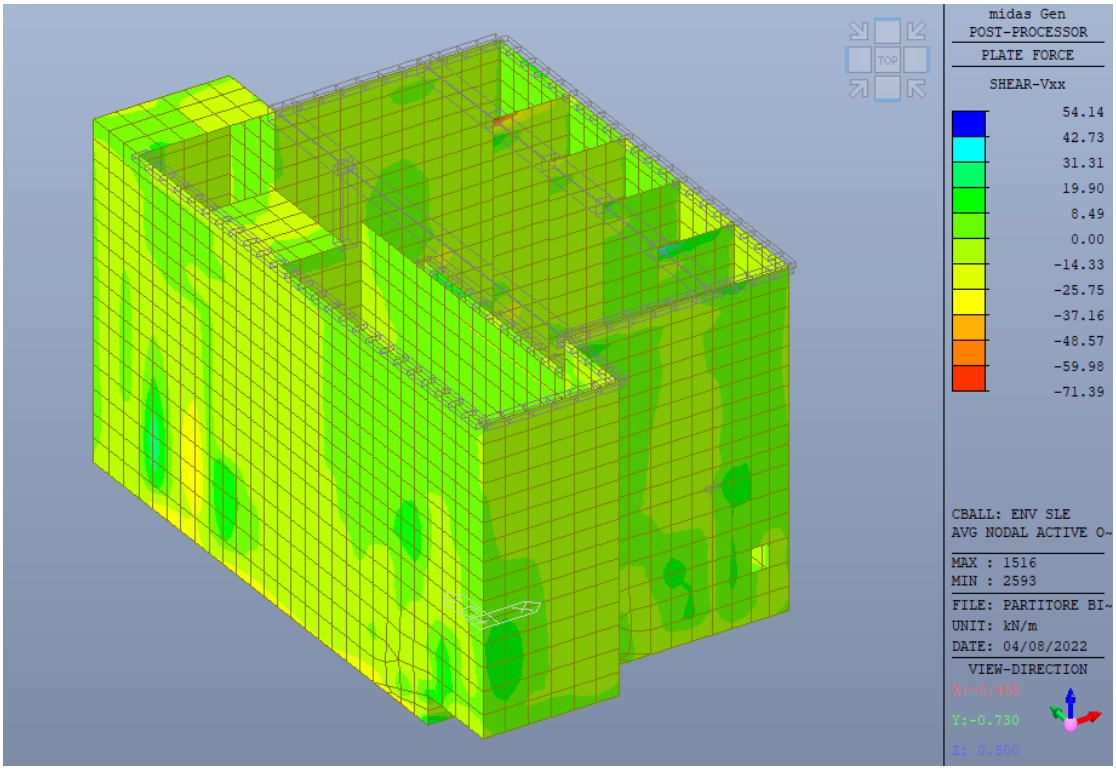
Sollecitazione tagliante Vyy – inviluppo SLV [kN/m]



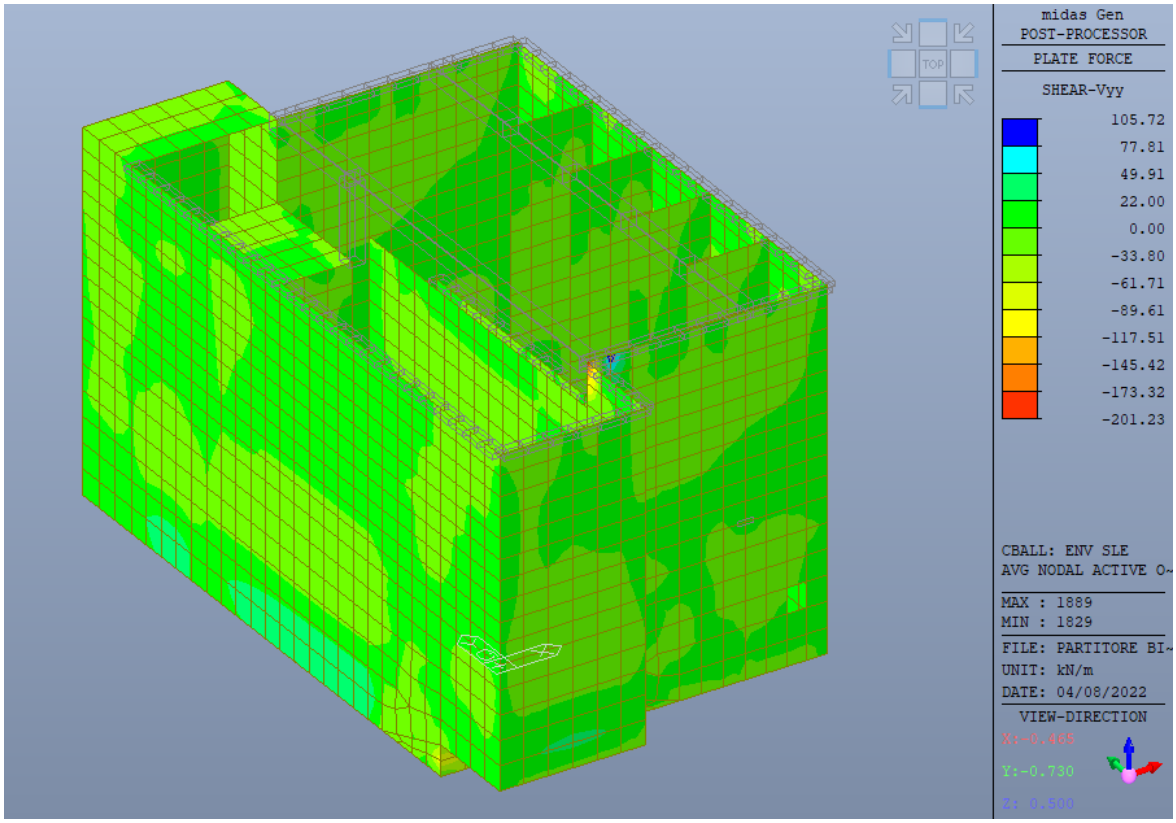
Momento flettente membranale Mxx – inviluppo SLE [kN*m/m]



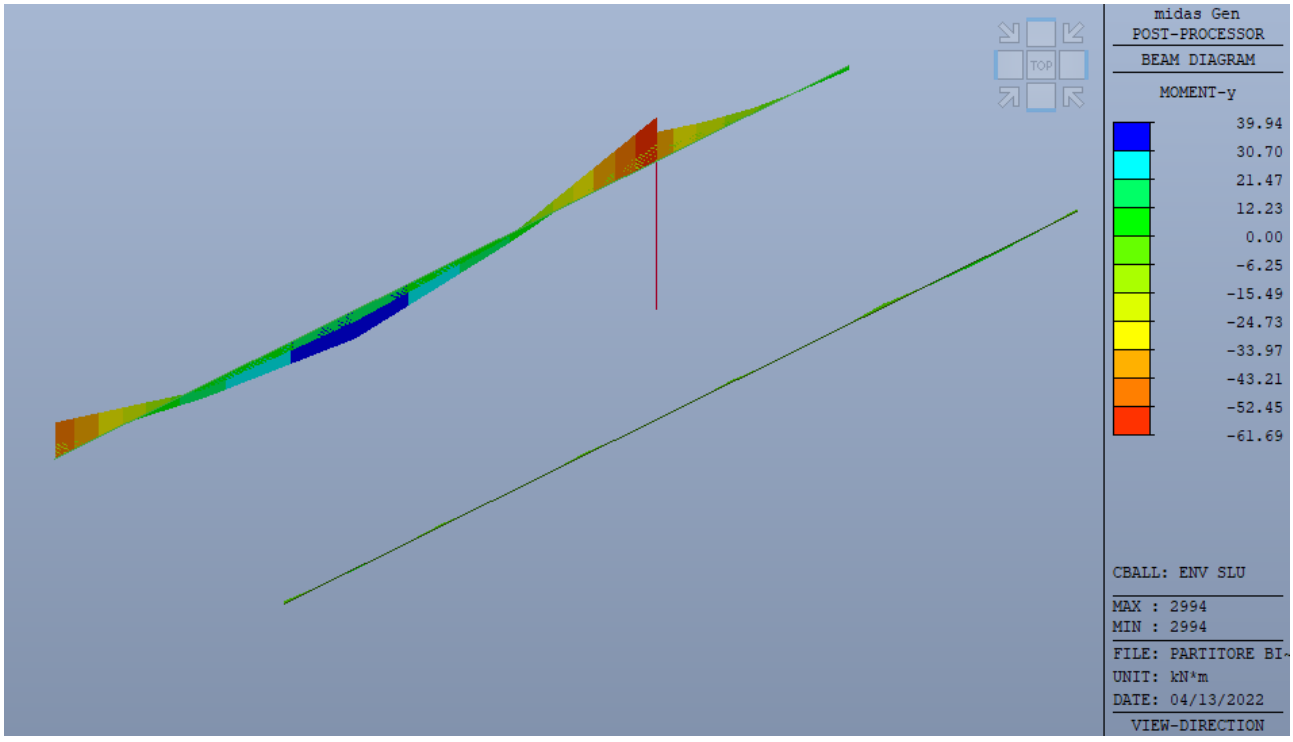
Momento flettente membranale Myy – inviluppo SLE [kN*m/m]



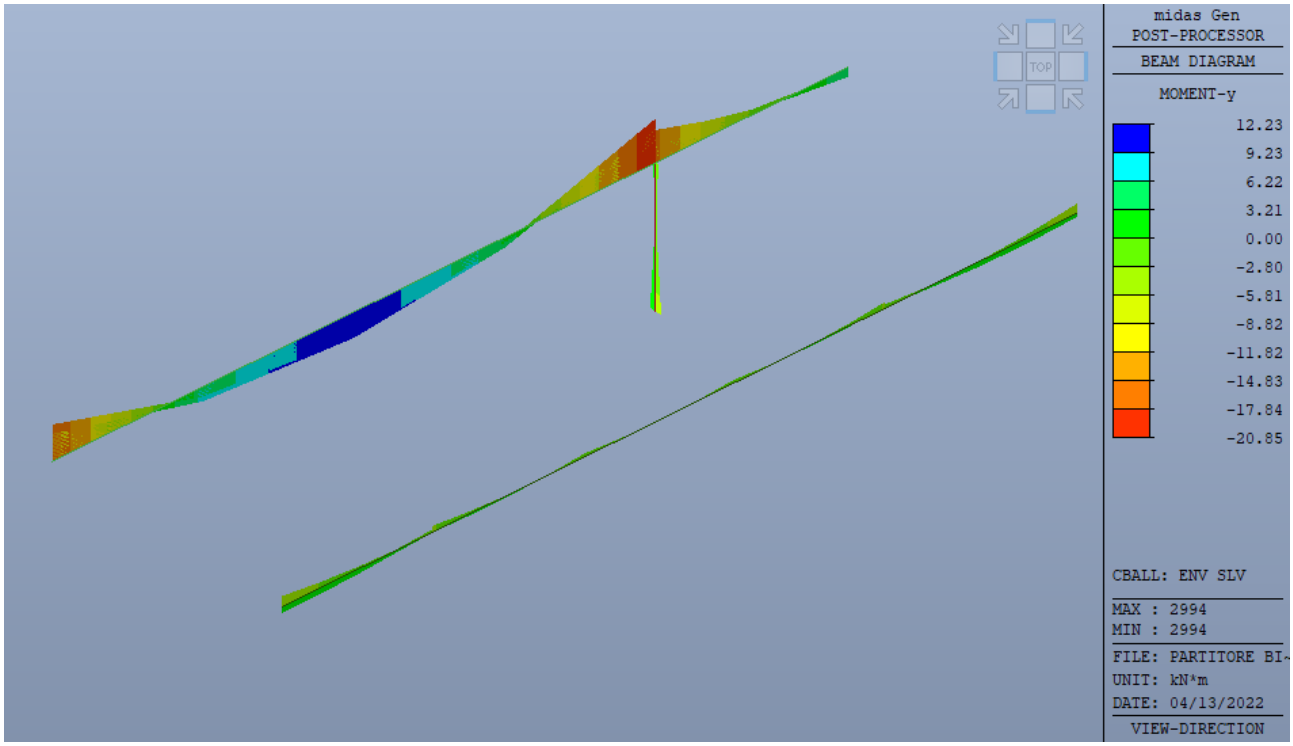
Sollecitazione tagliante Vxx – inviluppo SLE [kN/m]



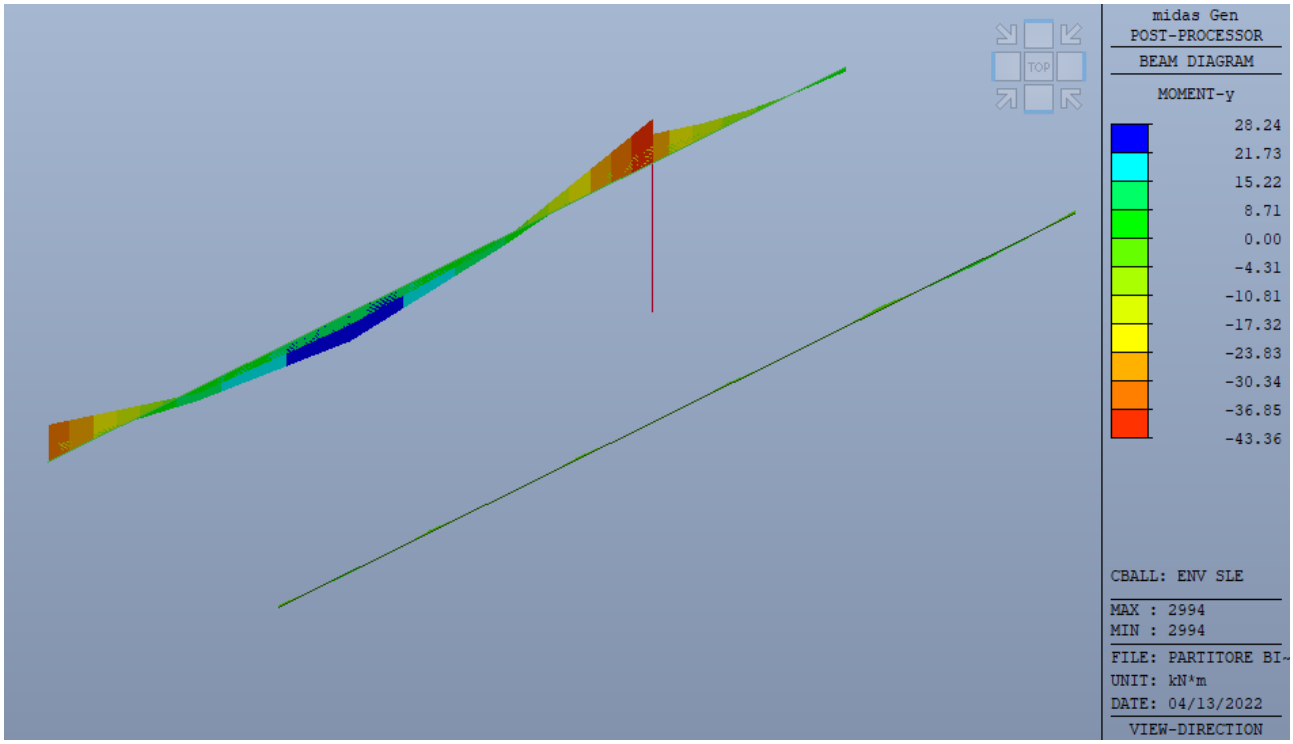
Sollecitazione tagliante Vyy – inviluppo SLE [kN/m]



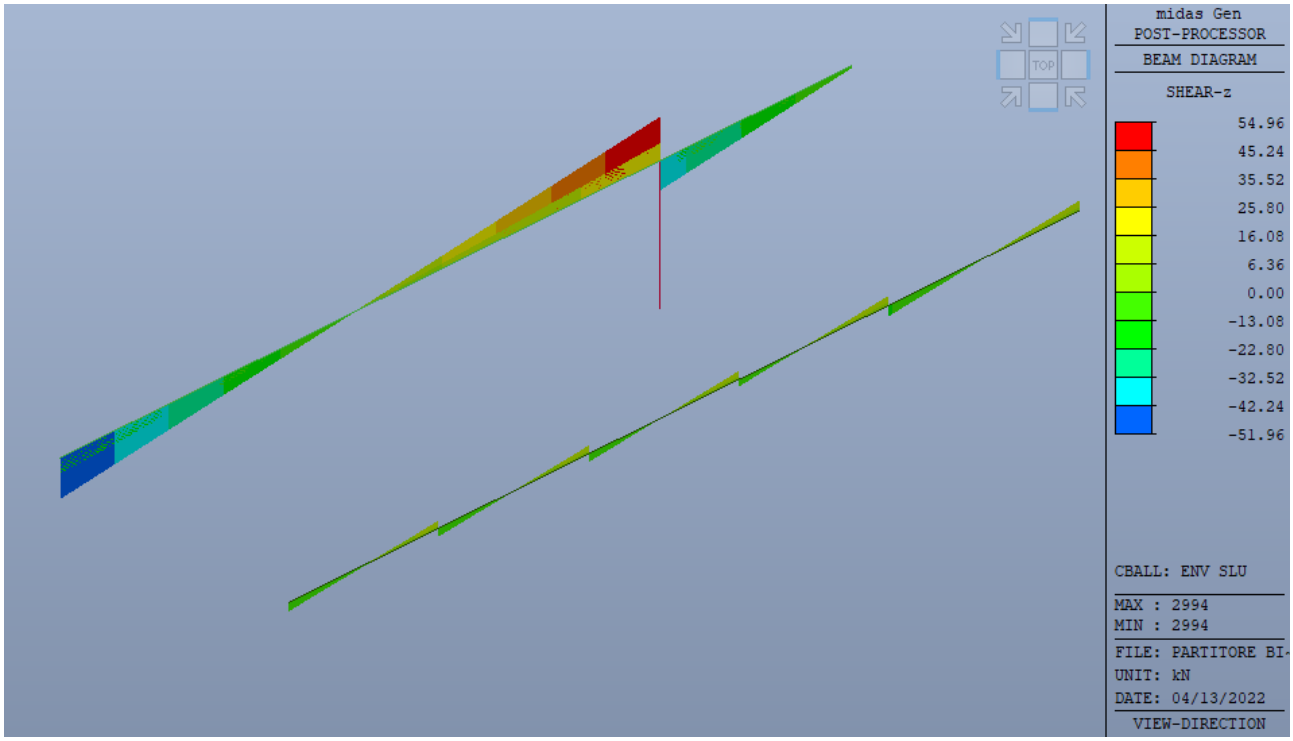
Momento flettente Travi e pilastri My – inviluppo SLU [kN*m]



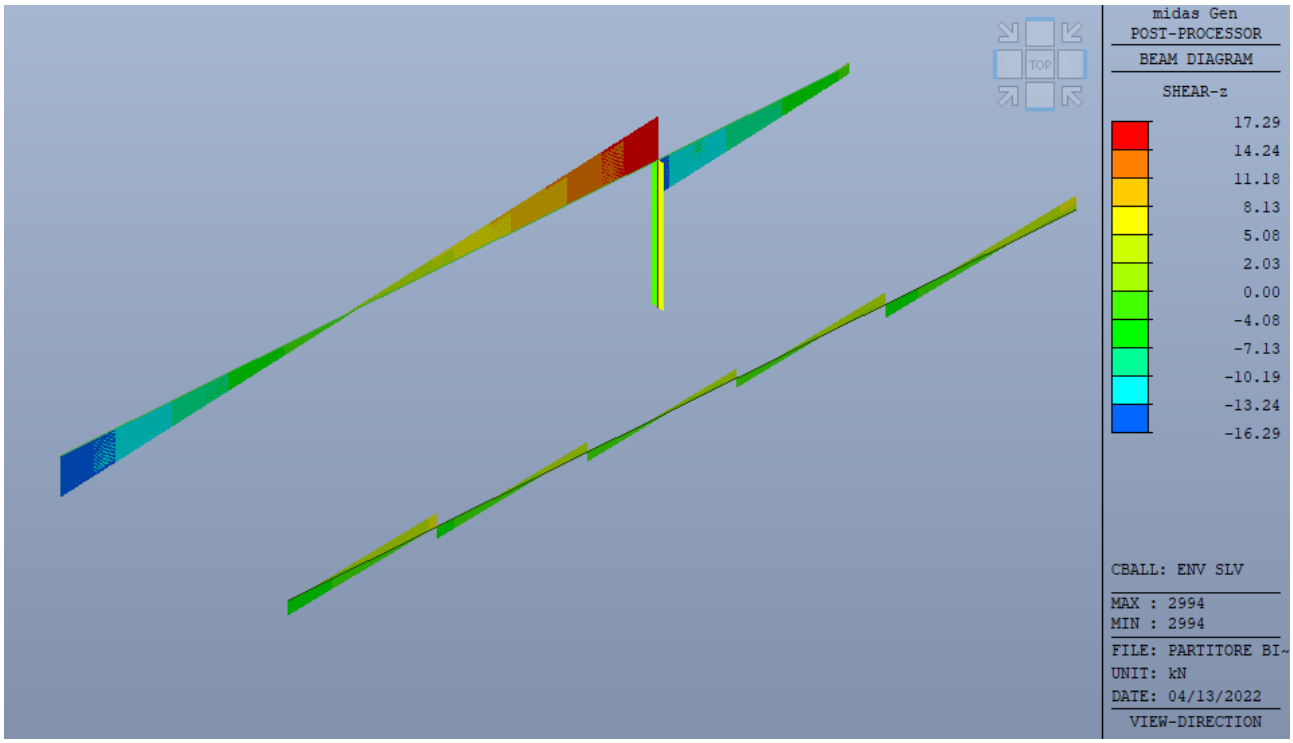
Momento flettente Travi e pilastri My – inviluppo SLV [kN*m]



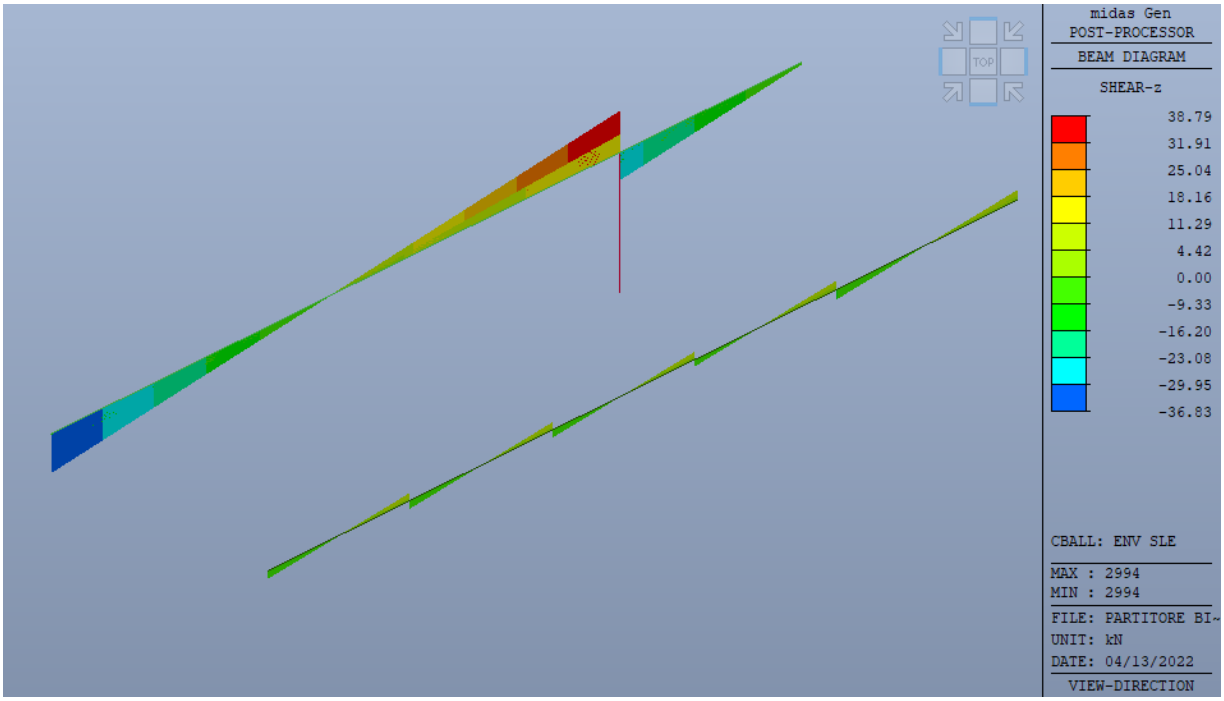
Momento flettente Travi e pilastri My – inviluppo SLE [kN*m]



*Taglio Fz Travi e pilastri – inviluppo SLU [kN*m]*



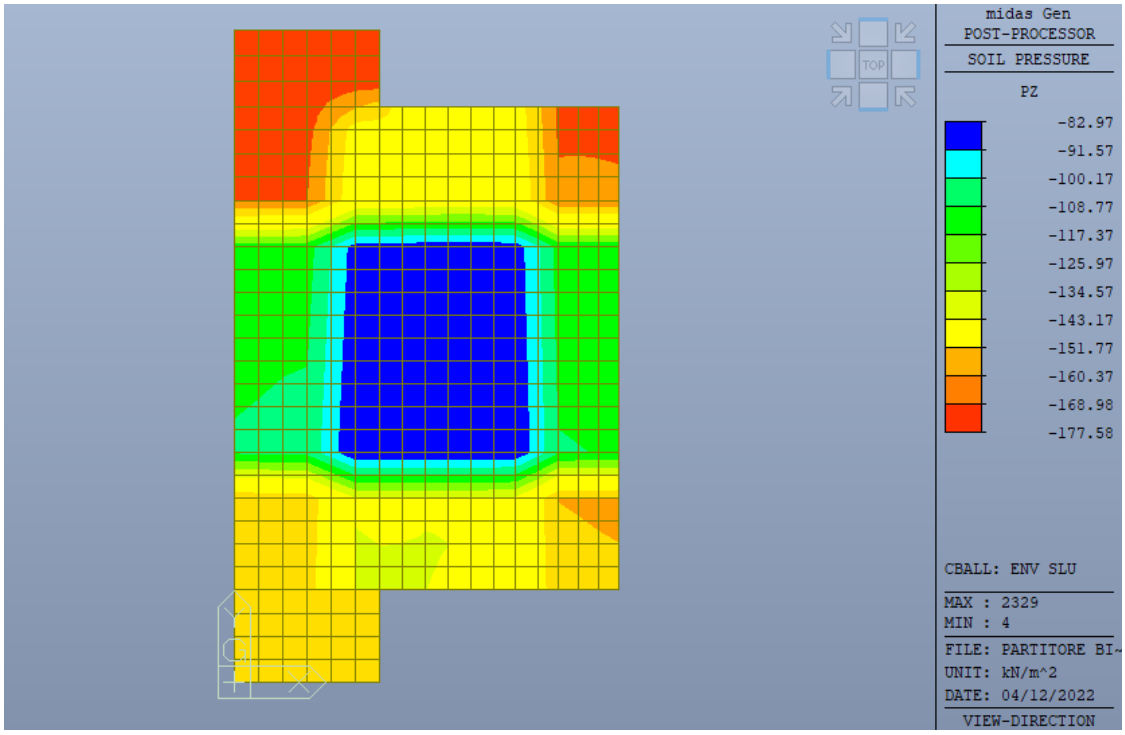
*Taglio Fz Travi e pilastri – inviluppo SLV [kN*m]*



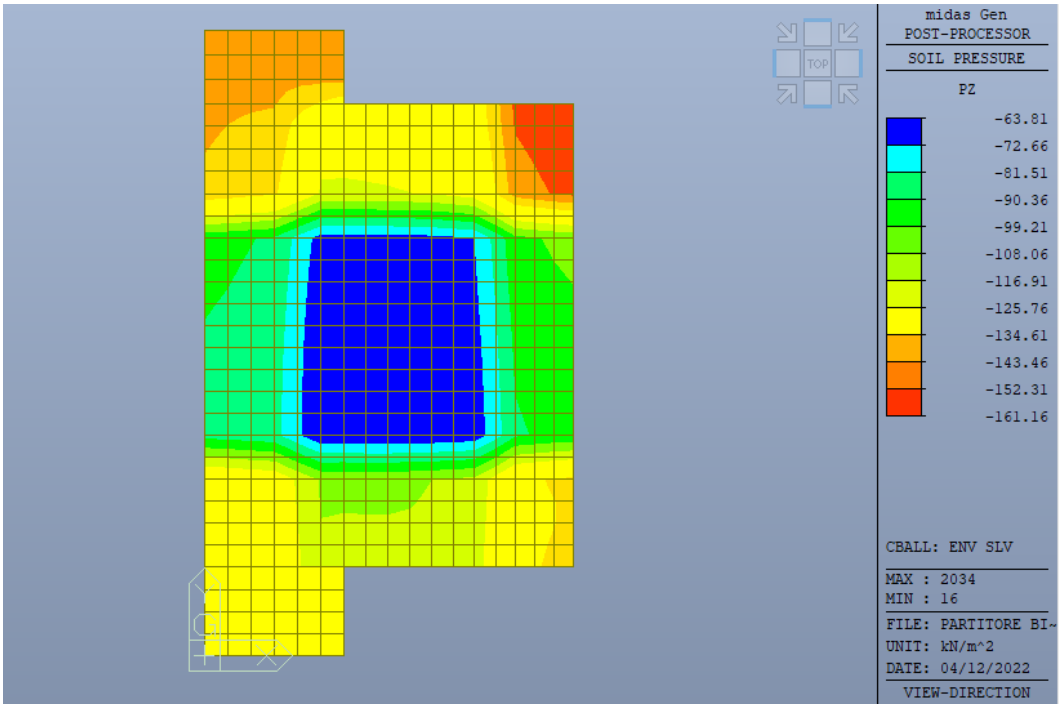
Taglio Fz Travi e pilastri – inviluppo SLE [kN*m]

1.4 Reazioni vincolari e pressioni sul terreno

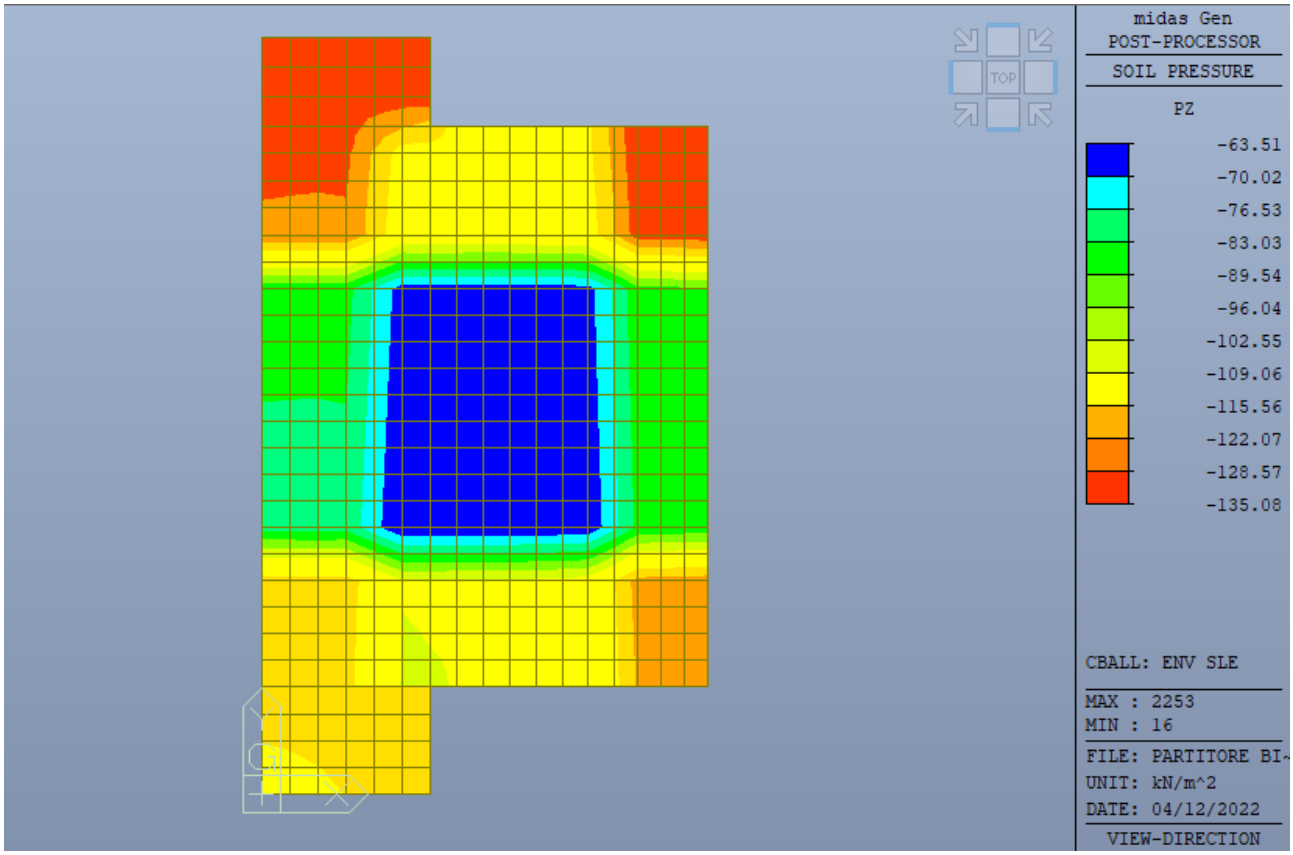
Nel presente paragrafo vengono riportate le reazioni vincolari e le pressioni sul terreno.



Pressioni sul terreno ENV SLU



Pressioni sul terreno ENV SLV



Pressioni sul terreno ENV SLE

Node	Load	FX (kN)	FY (kN)	FZ (kN)
				SUMMATION OF REACTION FORCES P
	Load	FX (kN)	FY (kN)	FZ (kN)
	SLU 1	-37.912418	-582.744877	10064.770950
	SLU 2	364.136073	60.388783	6061.185000
	SLU 3	-4.395677	-620.291100	10064.770950
	SLU 4	372.352528	-574.030717	10345.623450
	SLU 5	-325.273740	-570.296077	10064.770950
	SLU 6	-320.878063	49.995023	6061.185000
	SLU 7	-46.128873	51.674623	2930.460000
	SLV V1	-943.342884	-144.635809	4711.685932
	SLV V2	-991.977142	46.597705	4655.510652
	SLV V3	-615.556834	-311.468211	4762.419955
	SLV V4	-383.231620	-263.233898	4749.730979
	SLV V5	-217.559762	207.378749	4613.214068
	SLV V6	-168.925504	16.145235	4669.389348
	SLV V7	-545.345812	374.211151	4562.480045
	SLV V8	-777.671026	325.976838	4575.169021
	SLV F1	-1386.292922	-717.397369	7791.367432
	SLV F2	-1434.927180	-334.934735	7735.192152
	SLV F3	-750.808748	-1107.330411	7842.101455
	SLV F4	-254.742286	-1059.096098	7829.412479
	SLV F5	218.627696	-174.153691	7692.895568
	SLV F6	267.261954	-556.616325	7749.070848
	SLV F7	-416.856477	215.779351	7642.161545
	SLV F8	-912.922940	167.545038	7654.850521
	SLO 1	-848.135248	-542.171679	7760.340695
	SLO 2	-865.826643	-407.757908	7739.443484
	SLO 3	-640.734644	-667.857953	7779.288361
	SLO 4	-467.959265	-650.344395	7774.632007
	SLO 5	-319.529978	-349.379381	7723.922305
	SLO 6	-301.838583	-483.793152	7744.819516
	SLO 7	-526.930582	-223.693107	7704.974639
	SLO 8	-698.755921	-241.206665	7709.630993
	SLE R1	-310.322649	-439.966090	7742.131500
	SLE R2	-427.541205	-442.455850	7929.366500
	SLE R3	-437.242845	-431.587850	7929.366500
	SLE R4	-320.024289	-429.098090	7742.131500
	SLE R5	-35.483748	39.749710	2254.200000
	SLE F	-541.170657	-404.365980	7742.131500
	SLE Qp	-619.316361	-406.025820	7742.131500

Reazioni vincolari

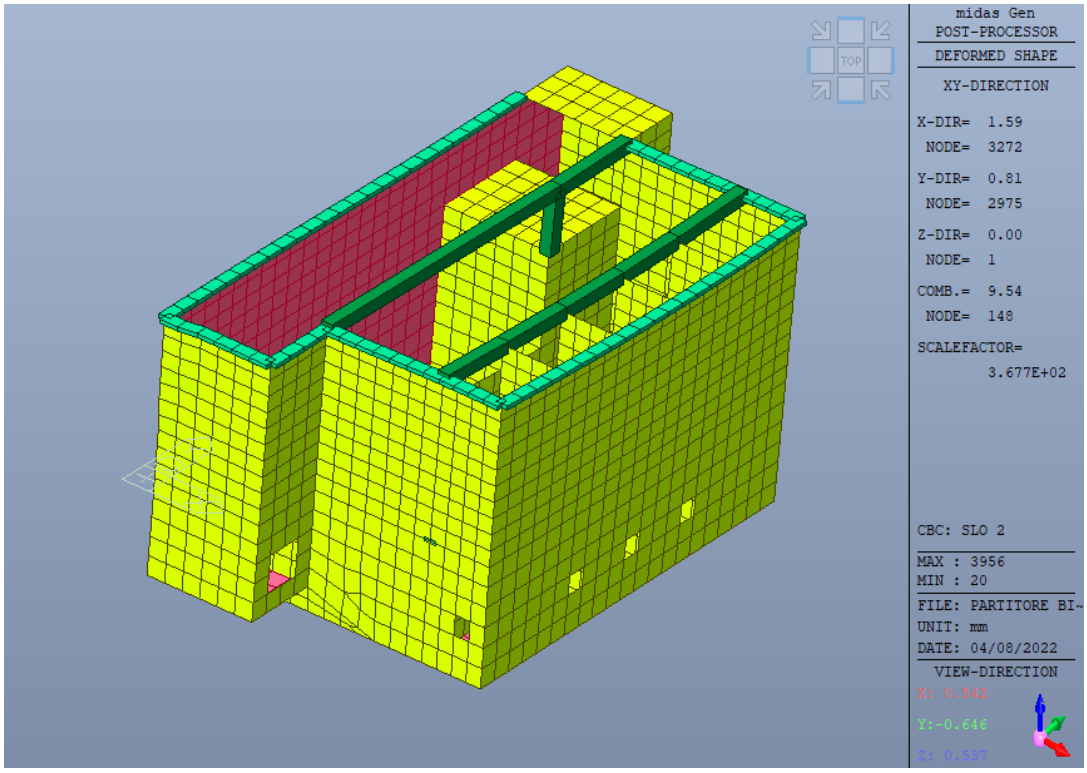
1.5 Deformazioni

Per le costruzioni ricadenti in classe d'uso IV si deve verificare che l'azione sismica di progetto non produca danni agli elementi costruttivi senza funzione strutturale tali da rendere temporaneamente non operativa la costruzione (rif §7.3.6.1 NTC 2018)

Nel caso delle costruzioni civili e industriali questa condizione si può ritenere soddisfatta quando gli spostamenti interpiano ottenuti dall'analisi in presenza dell'azione sismica di progetto relativa allo SLO siano inferiori ai 2/3 dei seguenti limiti:

- per tamponamenti collegati rigidamente alla struttura che interferiscono con la deformabilità della stessa: dr < 0,005 h
- per tamponamenti progettati in modo da non subire danni a seguito di spostamenti di interpiano drp, per effetto della loro deformabilità intrinseca ovvero dei collegamenti alla struttura: dr ≤ drp ≤ 0,01 h
- per costruzioni con struttura portante in muratura ordinaria: dr < 0,003 h
- per costruzioni con struttura portante in muratura armata: dr < 0,004 h

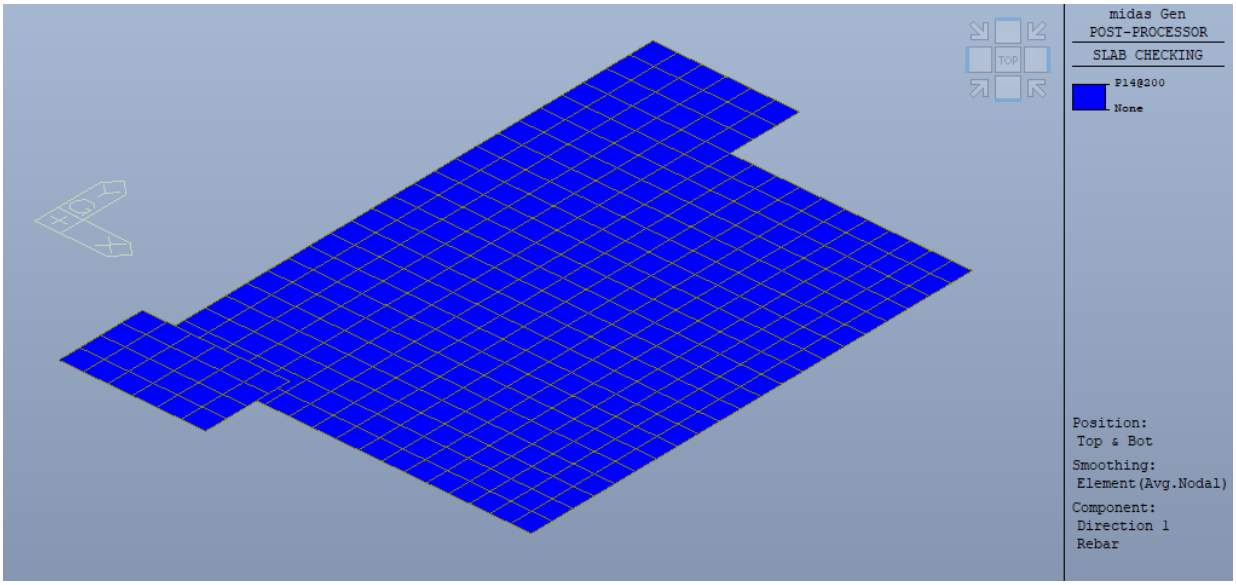
Premesso che l'opera in oggetto è completamente in c.a. e che quindi anche il superamento di questi limiti non produrrebbe alcun effetto, dall'immagine seguente si evince che lo spostamento massimo sotto l'azione sismica a SLO è pari a 1.6 mm che corrisponde a circa 0,0004 h, quindi trascurabile.



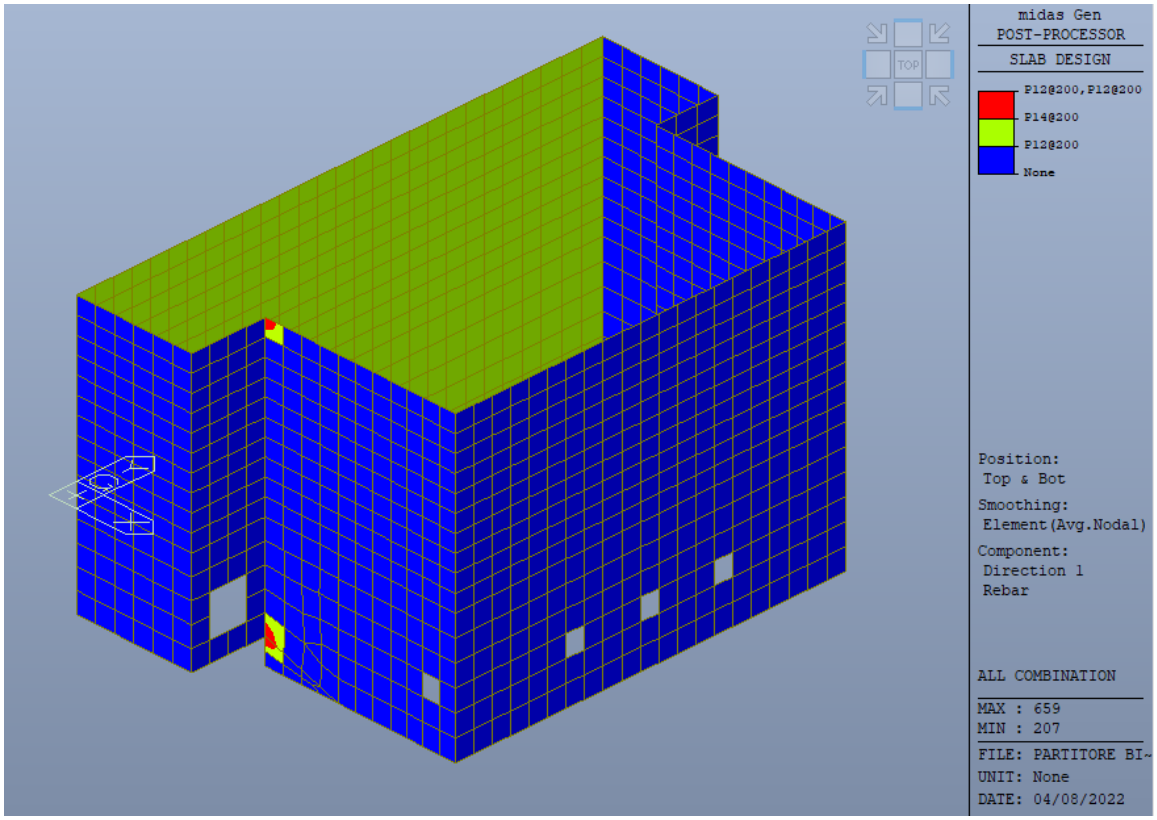
Massime deformazioni SLO combinata XY [cm]

1.6 Armature previste

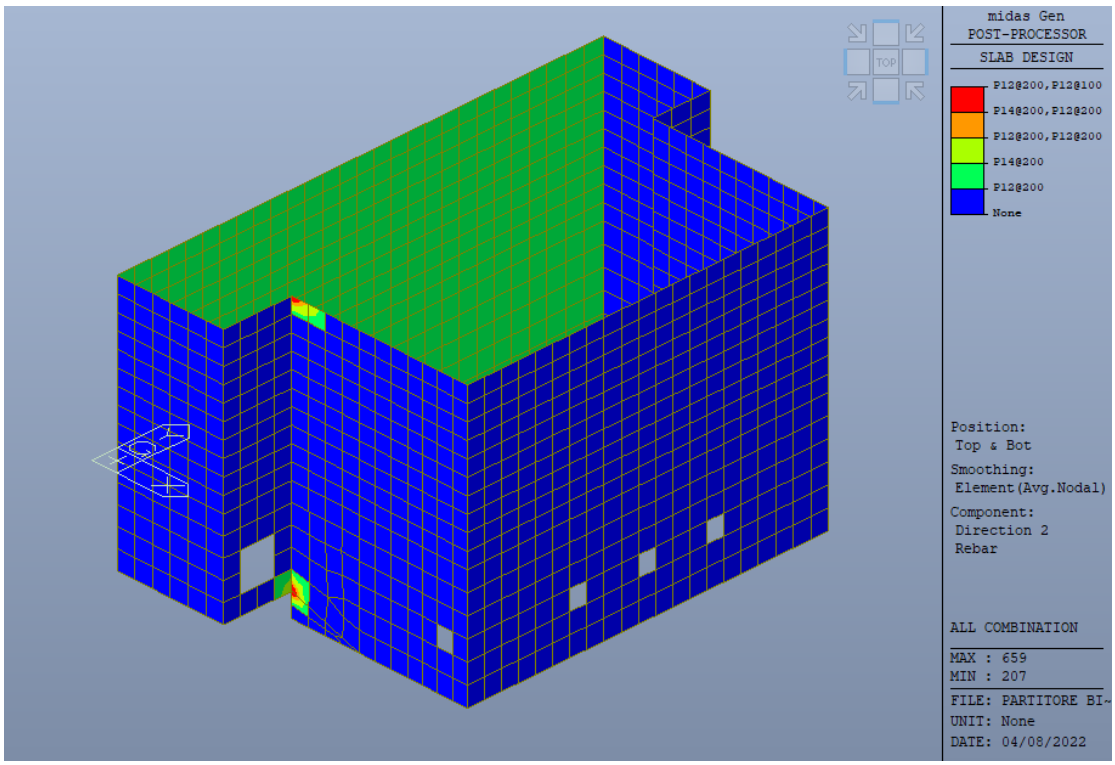
Nelle immagini seguenti vengono riportate le armature previste per i vari elementi strutturali.



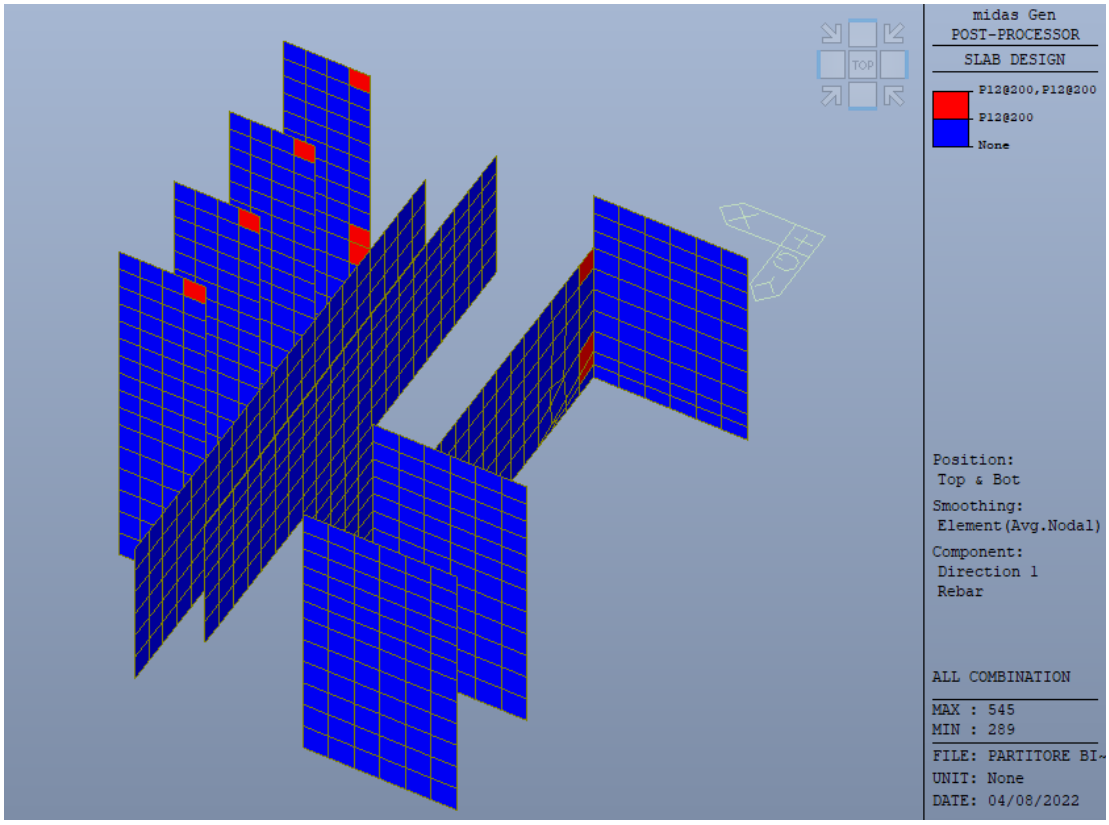
Platea – armature in direzione X e Y – ambo i lati



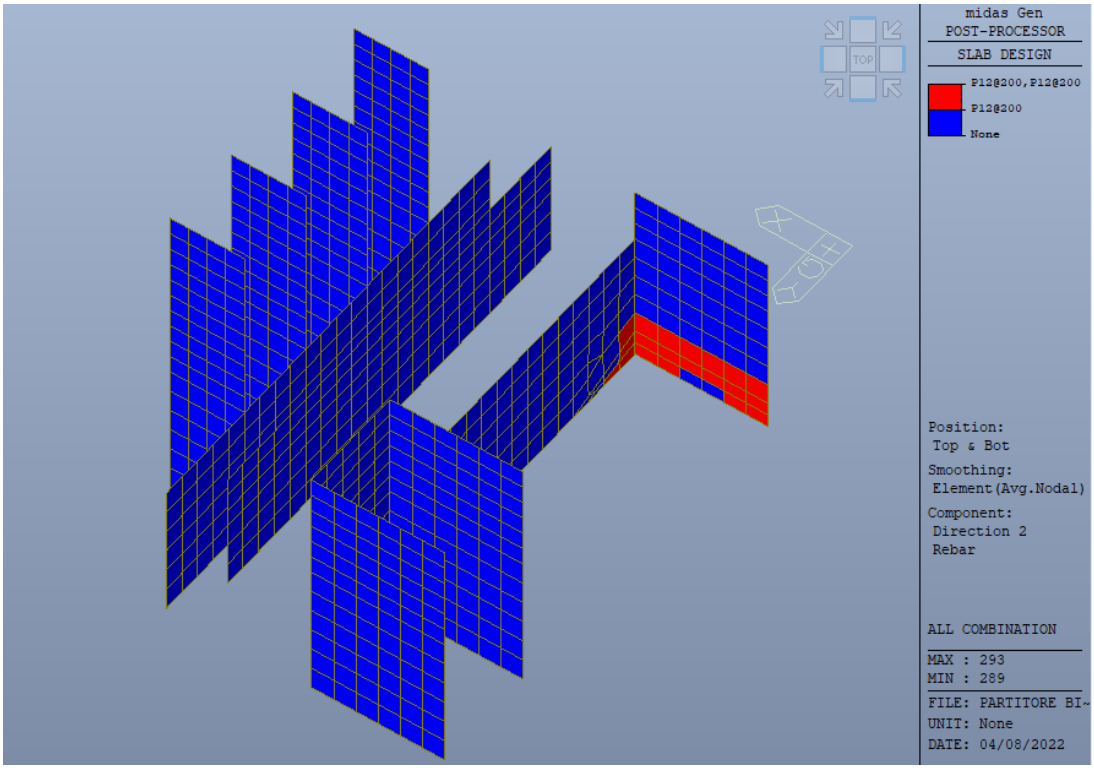
Pareti esterne – armature in direzione orizzontale – ambo i lati



Pareti esterne – armature in direzione verticale – ambo i lati



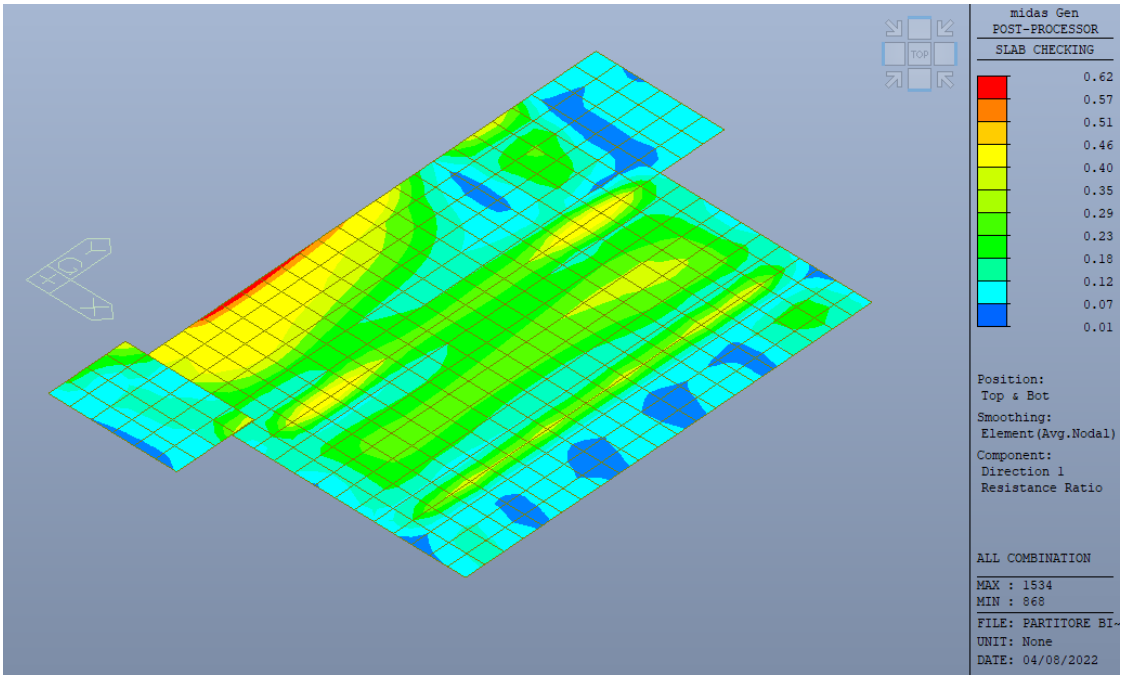
Pareti interne – armature in direzione orizzontale – ambo i lati



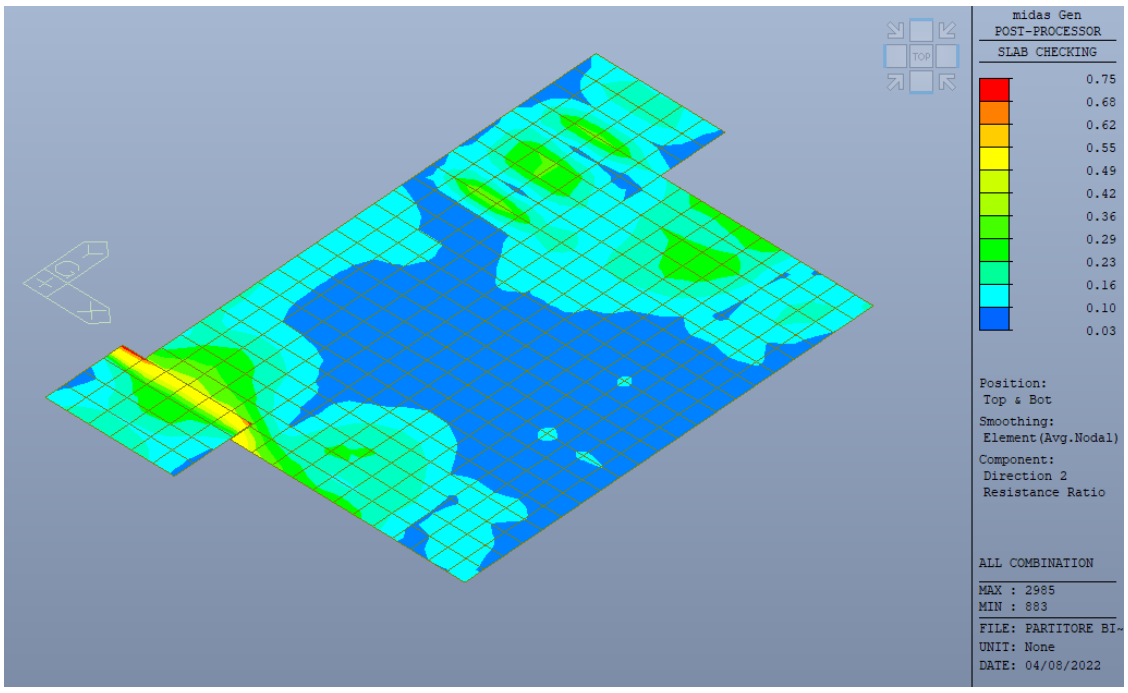
Pareti interne – armature in direzione verticale – ambo i lati

1.7 Verifiche di resistenza SLU grafiche

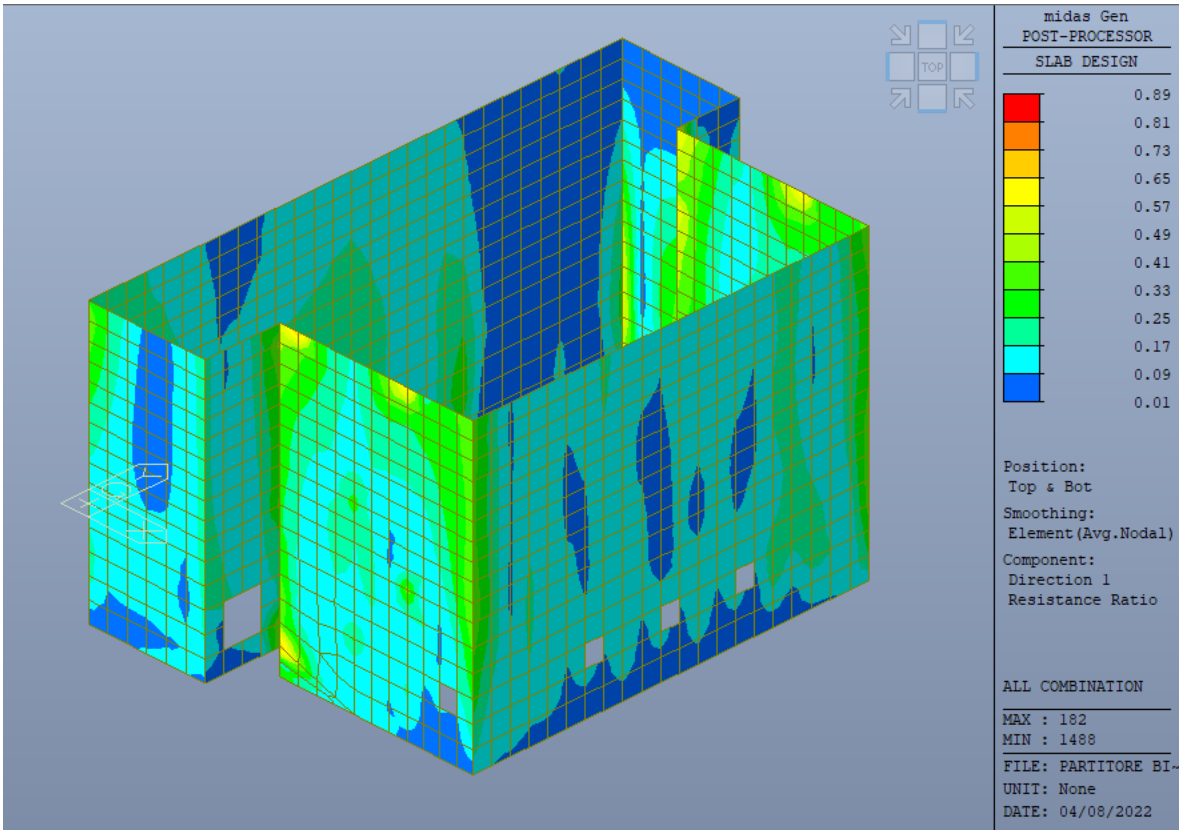
Nelle immagini seguenti vengono riportate le verifiche strutturali per via grafica, come tassi di sfruttamento dell'armatura nelle sezioni di cemento armato, sia per le sollecitazioni flessionali che taglianti:



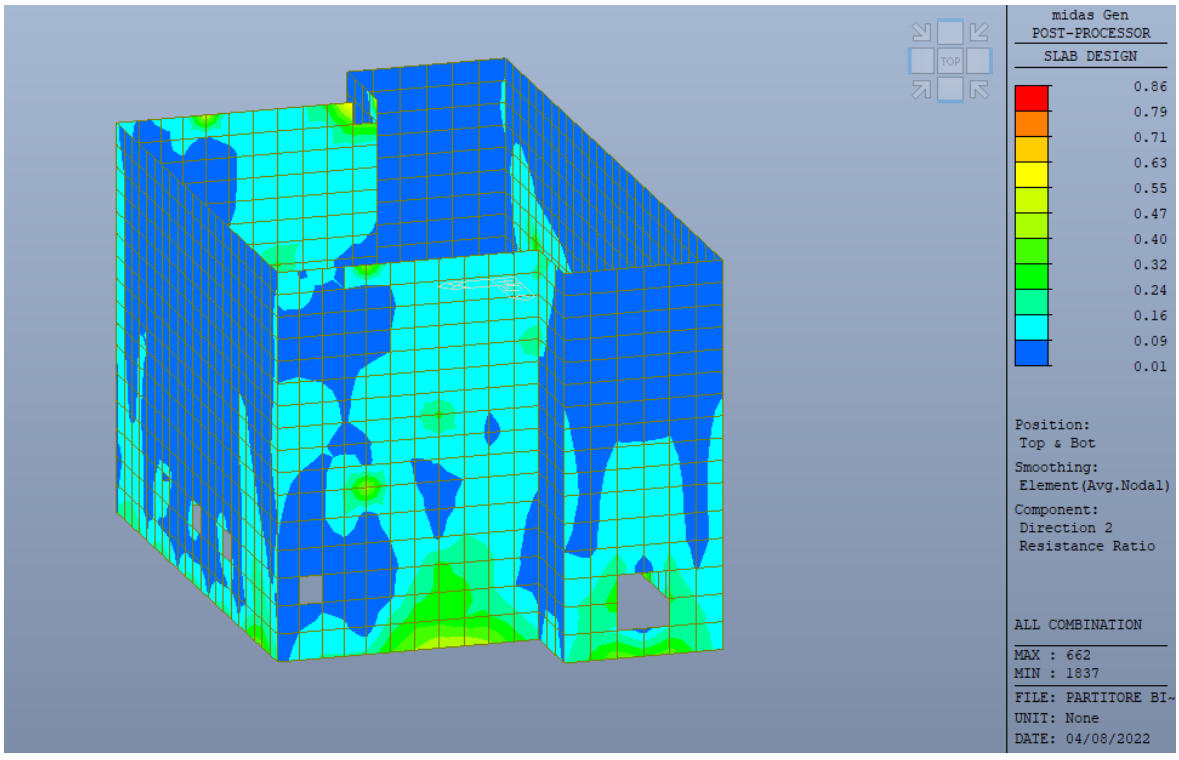
Platea - Indici di resistenza a flessione direzione X (inviluppo SLU e SLV)



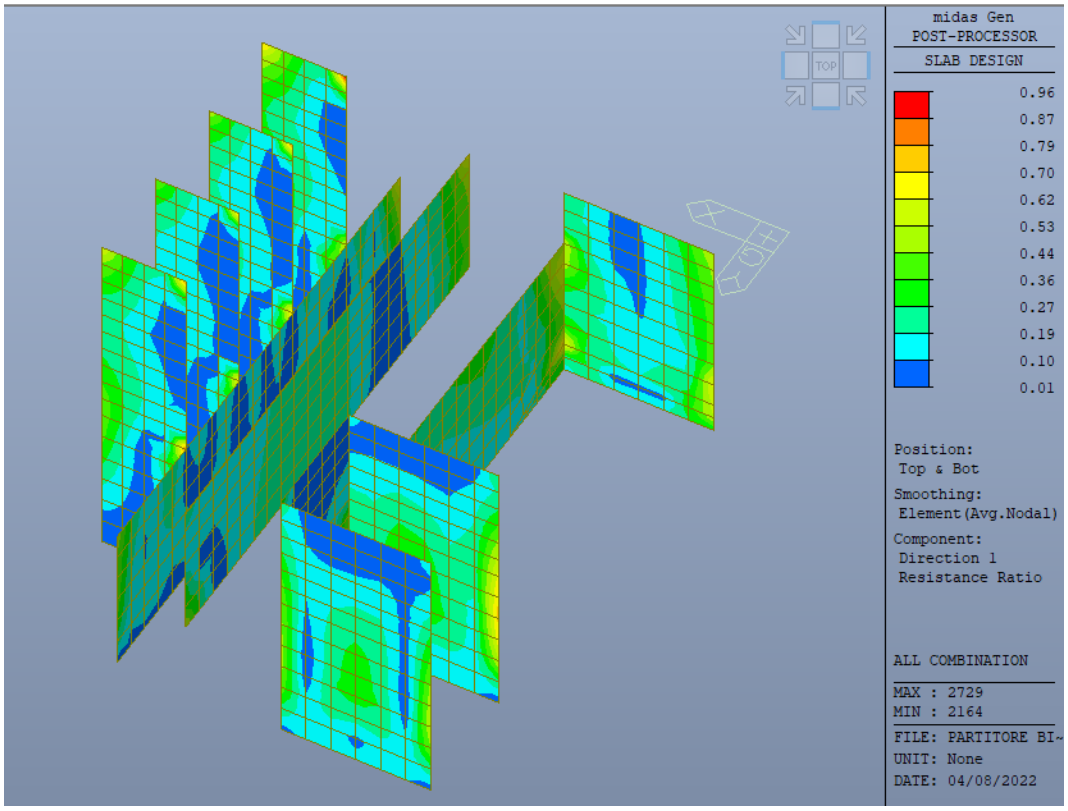
Platea - Indici di resistenza a flessione direzione Y (inviluppo SLU e SLV)



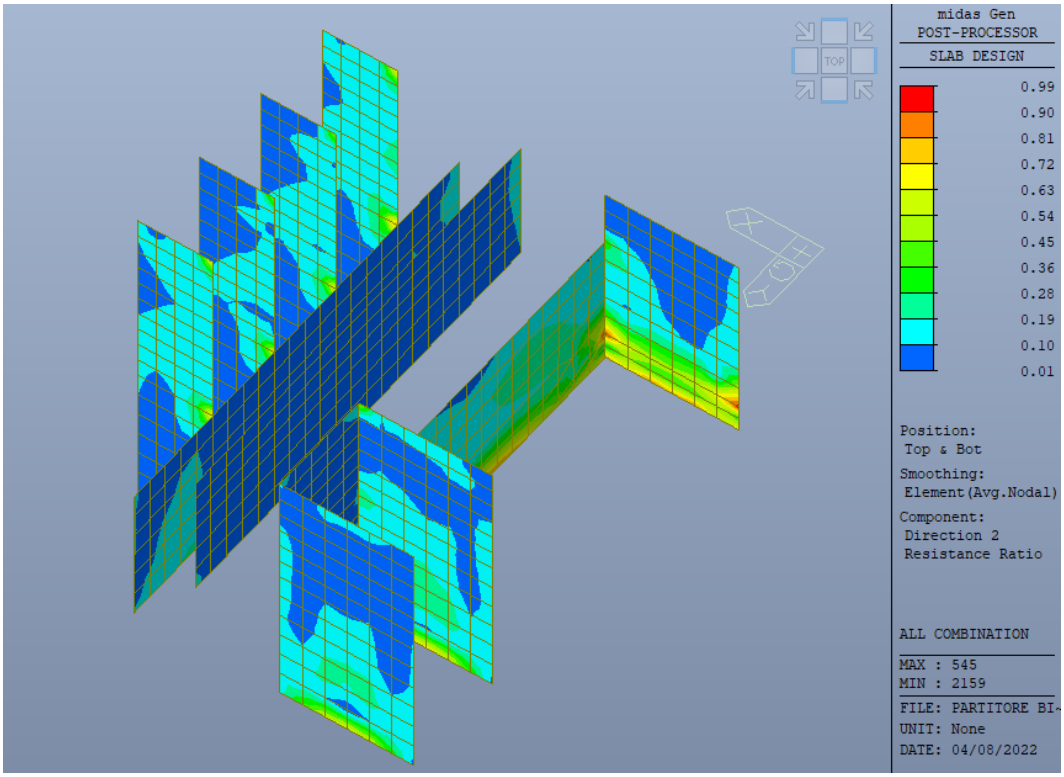
Pareti esterne - Indici di resistenza a flessione direzione orizzontale (inviluppo SLU e SLV)



Pareti esterne - Indici di resistenza a flessione direzione verticale (inviluppo SLU e SLV)



Pareti interne - Indici di resistenza a flessione direzione orizzontale (inviluppo SLU e SLV)



Pareti interne - Indici di resistenza a flessione direzione verticale (inviluppo SLU e SLV)

1.8 Verifiche di resistenza SLU analitiche

1.8.1 Verifiche Platea

```
================================================================================

  [[[*]]]  SLAB CHECKING MAXIMUM RESULT DATA : DOMAIN 1-Platea 1, Dir 1.

================================================================================

 ------------------------------------------------------------------

   Thk   Elem POS  AsReq  AsUse |   M_Ed( LCB)   M_Rd   Rat CHK

 ------------------------------------------------------------------

 0.4000   1535 BOT 0.0005 0.0008 | 63.9208(   6) 103.031 0.620  OK

        2632 TOP 0.0004 0.0008 | 55.3098(  17) 103.031 0.537  OK

 ------------------------------------------------------------------


<< BOTTOM >>


-. Information of Parameters.

  Elem No.  : 1535

  Thickness :   0.4000 m.

  Materials :  fck =  32000.0000 KPa.

               fcd =  21333.3333 KPa.

               fyk = 450000.0000 KPa.

  Covering  :  dB  =   0.0500 m.

               dT  =   0.0500 m.

  LCB No.   :   6


-. Information of Design.

  b       =   0.0010 m.  (by Code Unit Length).

  d       =   0.3500 m.

  lambda   =   0.800

  a       = lambda * x  =   0.014 m.

  eta      =   1.000

  Cc      = eta*fcd*b*a =      0.3004 kN.

  M_Rd     = Cc*(d-a/2)  =     103.0306  kN-m./m.
```

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 63.9208 kN-m./m.

M_Rd = 103.0306 kN-m./m.

RatM = M_Ed / M_Rd = 0.620 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.050

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.050/ 0.450 = 0.112 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2632

Thickness : 0.4000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.3500 m.

lambda = 0.800

a = lambda * x = 0.014 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.3004 kN.

M_Rd = Cc*(d-a/2) = 103.0306 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 55.3098 kN-m./m.

M_Rd = 103.0306 kN-m./m.

RatM = M_Ed / M_Rd = 0.537 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.050

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.050/ 0.450 = 0.112 ---> O.K

==========

[[[*]]] SLAB CHECKING MAXIMUM RESULT DATA : DOMAIN 1-Platea 1, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.4000 2985 BOT 0.0006 0.0008 | 72.5814(18) 96.8116 0.750 OK

2632 TOP 0.0005 0.0008 | 58.0159(19) 96.8116 0.599 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2985

Thickness : 0.4000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 18

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.3300 m.

lambda = 0.800

a = lambda * x = 0.014 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2997 kN.

M_Rd = Cc*(d-a/2) = 96.8116 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0006 m^2/m. (0.0006 m^2/m.)

M_Ed = 72.5814 kN-m./m.

M_Rd = 96.8116 kN-m./m.

RatM = M_Ed / M_Rd = 0.750 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.053

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.053/ 0.450 = 0.119 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2632

Thickness : 0.4000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 19

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.3300 m.

lambda = 0.800

a = lambda * x = 0.014 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2997 kN.

M_Rd = Cc*(d-a/2) = 96.8116 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 58.0159 kN-m./m.

M_Rd = 96.8116 kN-m./m.

RatM = M_Ed / M_Rd = 0.599 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.053

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.053/ 0.450 = 0.119 ---> O.K

1.8.2 Verifiche Pareti Esterne

```
================================================================================

  [[[*]]]  SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 1, Dir 2.

================================================================================

 ---------------------------------------------------------------------

   Thk   Elem POS  AsReq  AsUse |    M_Ed( LCB)    M_Rd   Rat CHK

 ---------------------------------------------------------------------

 0.4000    392 BOT 0.0006 0.0008 | 73.7050(  17) 96.8116 0.761  OK

         185 TOP 0.0006 0.0008 | 51.9925(  17) 96.8116 0.537  OK

 ---------------------------------------------------------------------


<< BOTTOM >>

-. Information of Parameters.

  Elem No.  : 392

  Thickness :   0.4000 m.

  Materials :  fck =  32000.0000 KPa.

               fcd =  21333.3333 KPa.

               fyk = 450000.0000 KPa.

  Covering  :  dB  =   0.0700 m.

               dT  =   0.0700 m.

  LCB No.   :   17


-. Information of Design.

  b       =   0.0010 m.  (by Code Unit Length).

  d       =   0.3300 m.

  lambda   =   0.800

  a       = lambda * x  =   0.014 m.

  eta      =   1.000

  Cc      = eta*fcd*b*a =      0.2997 kN.

  M_Rd     = Cc*(d-a/2)  =     96.8116  kN-m./m.
```

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0006 m^2/m. (0.0006 m^2/m.)

M_Ed = 73.7050 kN-m./m.

M_Rd = 96.8116 kN-m./m.

RatM = M_Ed / M_Rd = 0.761 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.044

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.044/ 0.450 = 0.098 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 185

Thickness : 0.4000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.3300 m.

lambda = 0.800

a = lambda * x = 0.014 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2997 kN.

M_Rd = Cc*(d-a/2) = 96.8116 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0006 m^2/m. (0.0006 m^2/m.)

M_Ed = 51.9925 kN-m./m.

M_Rd = 96.8116 kN-m./m.

RatM = M_Ed / M_Rd = 0.537 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 2, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 422 BOT 0.0004 0.0006 | 10.1146(16) 49.5572 0.204 OK

434 TOP 0.0004 0.0006 | 21.1603(5) 49.5572 0.427 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 422

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 16

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 10.1146 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.204 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 434

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 5

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 21.1603 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.427 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 3, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 501 BOT 0.0004 0.0006 | 13.3087(18) 49.5572 0.269 OK

1829 TOP 0.0004 0.0006 | 31.5086(4) 49.5572 0.636 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 501

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 18

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 13.3087 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.269 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 1829

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 4

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 31.5086 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.636 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 8, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 347 BOT 0.0004 0.0006 | 22.2355(3) 49.5572 0.449 OK

348 TOP 0.0004 0.0006 | 20.7685(3) 49.5572 0.419 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 347

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 22.2355 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.449 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 348

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 20.7685 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.419 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 7, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2490	BOT	0.0004	0.0006	19.5091(16)	49.5572	0.394	OK
	2487	TOP	0.0004	0.0006	12.3330(21)	49.5572	0.249	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2490

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 16

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 19.5091 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.394 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2487

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 12.3330 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.249 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 6, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	1361	BOT	0.0004	0.0006	29.0003(3)	49.5572	0.585	OK
	2378	TOP	0.0004	0.0006	19.6272(20)	49.5572	0.396	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 1361

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 29.0003 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.585 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2378

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 20

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 19.6272 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.396 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 5, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	626	BOT	0.0004	0.0006	8.18393(2)	49.5572	0.165	OK
	639	TOP	0.0004	0.0006	17.7840(2)	49.5572	0.359	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 626

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 2

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 8.1839 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.165 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 639

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 2

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 17.7840 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.359 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 4, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	1889	BOT	0.0005	0.0006	43.7938(4)	49.5572	0.884	OK

662 TOP 0.0004 0.0006 | 30.3748(14) 49.5572 0.613 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 1889

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 4

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 43.7938 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.884 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.054

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.054/ 0.450 = 0.120 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 662

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 14

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 30.3748 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.613 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 1, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.4000	392	BOT	0.0007	0.0008	91.7945(17)	103.031	0.891	OK
	392	TOP	0.0006	0.0008	54.6788(21)	103.031	0.531	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 392

Thickness : 0.4000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.3500 m.

lambda = 0.800

a = lambda * x = 0.014 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.3004 kN.

M_Rd = Cc*(d-a/2) = 103.0306 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0007 m^2/m. (0.0007 m^2/m.)

M_Ed = 91.7945 kN-m./m.

M_Rd = 103.0306 kN-m./m.

RatM = M_Ed / M_Rd = 0.891 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.049

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.049/ 0.450 = 0.108 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 392

Thickness : 0.4000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.3500 m.

lambda = 0.800

a = lambda * x = 0.014 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.3004 kN.

M_Rd = Cc*(d-a/2) = 103.0306 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P14 @200

As_req = 0.0006 m^2/m. (0.0006 m^2/m.)

M_Ed = 54.6788 kN-m./m.

M_Rd = 103.0306 kN-m./m.

RatM = M_Ed / M_Rd = 0.531 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 2, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 1790 BOT 0.0004 0.0006 | 20.9143(20) 54.0653 0.387 OK

1790 TOP 0.0004 0.0006 | 17.1528(8) 54.0653 0.317 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 1790

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 20

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 20.9143 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.387 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 1790

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 8

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 17.1528 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.317 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 3, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	1830	BOT	0.0004	0.0006	20.8239(21)	54.0653	0.385	OK
	1830	TOP	0.0004	0.0006	23.8178(17)	54.0653	0.441	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 1830

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 20.8239 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.385 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 1830

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 23.8178 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.441 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 8, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 339 BOT 0.0004 0.0006 | 23.2149(3) 54.0653 0.429 OK

322 TOP 0.0004 0.0006 | 29.3829(3) 54.0653 0.543 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 339

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 23.2149 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.429 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 322

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 29.3829 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.543 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 7, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2487 BOT 0.0004 0.0006 | 23.6245(9) 54.0653 0.437 OK

2487 TOP 0.0004 0.0006 | 35.0215(21) 54.0653 0.648 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2487

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 9

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 23.6245 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.437 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2487

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 35.0215 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.648 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 6, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2378	BOT	0.0004	0.0006	31.9697(17)	54.0653	0.591	OK
	2378	TOP	0.0004	0.0006	34.7197(21)	54.0653	0.642	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2378

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 31.9697 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.591 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2378

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 34.7197 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.642 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 5, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 1428 BOT 0.0004 0.0006 | 21.2271(17) 54.0653 0.393 OK

620 TOP 0.0004 0.0006 | 12.4973(2) 54.0653 0.231 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 1428

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 21.2271 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.393 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 620

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 2

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 12.4973 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.231 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Parete EXT 4, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	1889	BOT	0.0004	0.0006	39.4281(4)	54.0653	0.729	OK
	1999	TOP	0.0004	0.0006	36.2401(21)	54.0653	0.670	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 1889

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 4

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 39.4281 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.729 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.041

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.041/ 0.450 = 0.091 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 1999

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 36.2401 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.670 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

1.8.3 Verifiche Pareti Interne

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 1, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 318 BOT 0.0004 0.0006 | 34.6235(19) 54.0653 0.640 OK

2941 TOP 0.0004 0.0006 | 34.7837(19) 54.0653 0.643 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 318

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 19

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 34.6235 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.640 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2941

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 19

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 34.7837 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.643 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 3, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	855	BOT	0.0004	0.0006	28.2167(5)	54.0653	0.522	OK
	842	TOP	0.0004	0.0006	17.2149(3)	54.0653	0.318	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 855

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 5

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 28.2167 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.522 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 842

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 17.2149 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.318 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 2, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 920 BOT 0.0004 0.0006 | 19.0989(5) 54.0653 0.353 OK

932 TOP 0.0005 0.0006 | 40.5504(3) 54.0653 0.750 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 920

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 5

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 19.0989 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.353 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 932

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 40.5504 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.750 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.042

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.042/ 0.450 = 0.094 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 10, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2833	BOT	0.0004	0.0006	37.5705(17)	54.0653	0.695	OK
	2833	TOP	0.0004	0.0006	19.4772(13)	54.0653	0.360	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2833

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 37.5705 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.695 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2833

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 13

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 19.4772 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.360 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 8, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 602 BOT 0.0009 0.0011 | 77.9126(17) 105.845 0.736 OK

612 TOP 0.0006 0.0011 | 50.8908(21) 105.845 0.481 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 602

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4417 kN.

M_Rd = Cc*(d-a/2) = 105.8447 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0009 m^2/m. (0.0009 m^2/m.)

M_Ed = 77.9126 kN-m./m.

M_Rd = 105.8447 kN-m./m.

RatM = M_Ed / M_Rd = 0.736 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.081

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.081/ 0.450 = 0.180 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 612

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4417 kN.

M_Rd = Cc*(d-a/2) = 105.8447 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0006 m^2/m. (0.0006 m^2/m.)

M_Ed = 50.8908 kN-m./m.

M_Rd = 105.8447 kN-m./m.

RatM = M_Ed / M_Rd = 0.481 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.053

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.053/ 0.450 = 0.118 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 7, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2593	BOT	0.0010	0.0011	84.4676(3)	105.845	0.798	OK
	2593	TOP	0.0004	0.0006	38.0156(9)	54.0653	0.703	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2593

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4417 kN.

M_Rd = Cc*(d-a/2) = 105.8447 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0010 m^2/m. (0.0010 m^2/m.)

M_Ed = 84.4676 kN-m./m.

M_Rd = 105.8447 kN-m./m.

RatM = M_Ed / M_Rd = 0.798 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.088

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.088/ 0.450 = 0.196 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2593

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 9

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 38.0156 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.703 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 9, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2649 BOT 0.0004 0.0006 | 35.8562(17) 54.0653 0.663 OK

2649 TOP 0.0004 0.0006 | 34.6596(21) 54.0653 0.641 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2649

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 35.8562 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.663 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2649

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 34.6596 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.641 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 5, Dir 1.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2689	BOT	0.0005	0.0006	46.4380(21)	54.0653	0.859	OK
	2689	TOP	0.0007	0.0011	64.3419(17)	105.845	0.608	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2689

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 46.4380 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.859 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.048

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.048/ 0.450 = 0.107 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2689

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4417 kN.

M_Rd = Cc*(d-a/2) = 105.8447 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0007 m^2/m. (0.0007 m^2/m.)

M_Ed = 64.3419 kN-m./m.

M_Rd = 105.8447 kN-m./m.

RatM = M_Ed / M_Rd = 0.608 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.067

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.067/ 0.450 = 0.149 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 4, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2729 BOT 0.0005 0.0006 | 47.5691(13) 54.0653 0.880 OK

2729 TOP 0.0012 0.0011 | 101.571(17) 105.845 0.960 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2729

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 13

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 47.5691 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.880 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.050

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.050/ 0.450 = 0.110 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2729

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4417 kN.

M_Rd = Cc*(d-a/2) = 105.8447 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0012 m^2/m. (0.0012 m^2/m.)

M_Ed = 101.5709 kN-m./m.

M_Rd = 105.8447 kN-m./m.

RatM = M_Ed / M_Rd = 0.960 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.106

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.106/ 0.450 = 0.235 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 6, Dir 1.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2645 BOT 0.0007 0.0011 | 58.1536(21) 105.845 0.549 OK

2645 TOP 0.0005 0.0006 | 41.9567(9) 54.0653 0.776 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2645

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4417 kN.

M_Rd = Cc*(d-a/2) = 105.8447 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0007 m^2/m. (0.0007 m^2/m.)

M_Ed = 58.1536 kN-m./m.

M_Rd = 105.8447 kN-m./m.

RatM = M_Ed / M_Rd = 0.549 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.061

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.061/ 0.450 = 0.135 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2645

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0500 m.

dT = 0.0500 m.

LCB No. : 9

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2500 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2208 kN.

M_Rd = Cc*(d-a/2) = 54.0653 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 41.9567 kN-m./m.

M_Rd = 54.0653 kN-m./m.

RatM = M_Ed / M_Rd = 0.776 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.044

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.044/ 0.450 = 0.097 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 1, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2952 BOT 0.0007 0.0011 | 57.2962(19) 96.8370 0.592 OK

2951 TOP 0.0012 0.0011 | 95.0585(18) 96.8370 0.982 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2952

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 19

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4408 kN.

M_Rd = Cc*(d-a/2) = 96.8370 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0007 m^2/m. (0.0007 m^2/m.)

M_Ed = 57.2962 kN-m./m.

M_Rd = 96.8370 kN-m./m.

RatM = M_Ed / M_Rd = 0.592 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.071

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.071/ 0.450 = 0.157 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2951

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 18

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4408 kN.

M_Rd = Cc*(d-a/2) = 96.8370 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0012 m^2/m. (0.0012 m^2/m.)

M_Ed = 95.0585 kN-m./m.

M_Rd = 96.8370 kN-m./m.

RatM = M_Ed / M_Rd = 0.982 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.117

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.117/ 0.450 = 0.260 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 3, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 845 BOT 0.0004 0.0006 | 31.4771(4) 49.5572 0.635 OK

850 TOP 0.0004 0.0006 | 10.7626(3) 49.5572 0.217 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 845

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 4

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 31.4771 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.635 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 850

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 3

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 10.7626 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.217 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 2, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2384	BOT	0.0004	0.0006	13.8792(17)	49.5572	0.280	OK
	923	TOP	0.0004	0.0006	34.6225(5)	49.5572	0.699	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2384

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 13.8792 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.280 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 923

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 5

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 34.6225 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.699 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.043

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.043/ 0.450 = 0.095 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 10, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2308	BOT	0.0004	0.0006	9.23458(17)	49.5572	0.186	OK
	1986	TOP	0.0004	0.0006	18.8771(2)	49.5572	0.381	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2308

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 9.2346 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.186 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 1986

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 2

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 18.8771 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.381 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 8, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	602	BOT	0.0012	0.0011	95.7758(17)	96.8370	0.989	OK
	549	TOP	0.0009	0.0011	72.8435(17)	96.8370	0.752	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 602

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4408 kN.

M_Rd = Cc*(d-a/2) = 96.8370 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0012 m^2/m. (0.0012 m^2/m.)

M_Ed = 95.7758 kN-m./m.

M_Rd = 96.8370 kN-m./m.

RatM = M_Ed / M_Rd = 0.989 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.118

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.118/ 0.450 = 0.262 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 549

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.021 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.4408 kN.

M_Rd = Cc*(d-a/2) = 96.8370 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200 / P12 @200

As_req = 0.0009 m^2/m. (0.0009 m^2/m.)

M_Ed = 72.8435 kN-m./m.

M_Rd = 96.8370 kN-m./m.

RatM = M_Ed / M_Rd = 0.752 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.090

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.090/ 0.450 = 0.199 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 7, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2704 BOT 0.0004 0.0006 | 34.4144(20) 49.5572 0.694 OK

2704 TOP 0.0004 0.0006 | 19.8442(8) 49.5572 0.400 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2704

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 20

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 34.4144 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.694 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.042

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.042/ 0.450 = 0.094 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2704

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 8

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 19.8442 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.400 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 9, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2649	BOT	0.0004	0.0006	8.37115(17)	49.5572	0.169	OK
	2649	TOP	0.0004	0.0006	7.63178(21)	49.5572	0.154	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2649

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 17

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 8.3712 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.169 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2649

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 21

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 7.6318 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.154 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 5, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2772 BOT 0.0004 0.0006 | 24.5048(20) 49.5572 0.494 OK

2772 TOP 0.0004 0.0006 | 31.7160(16) 49.5572 0.640 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2772

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 20

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 24.5048 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.494 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2772

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 16

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 31.7160 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.640 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 4, Dir 2.

==========

Thk	Elem	POS	AsReq	AsUse	M_Ed(LCB)	M_Rd	Rat	CHK
0.3000	2784	BOT	0.0004	0.0006	19.8394(12)	49.5572	0.400	OK
	2784	TOP	0.0005	0.0006	41.2503(16)	49.5572	0.832	OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2784

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 12

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 19.8394 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.400 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2784

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 16

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0005 m^2/m. (0.0005 m^2/m.)

M_Ed = 41.2503 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.832 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.051

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.051/ 0.450 = 0.113 ---> O.K

==========

[[[*]]] SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-Setto INT 6, Dir 2.

==========

Thk Elem POS AsReq AsUse | M_Ed(LCB) M_Rd Rat CHK

0.3000 2744 BOT 0.0004 0.0006 | 29.0754(20) 49.5572 0.587 OK

2744 TOP 0.0004 0.0006 | 23.6137(8) 49.5572 0.476 OK

<< BOTTOM >>

-. Information of Parameters.

Elem No. : 2744

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 20

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 29.0754 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.587 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

<< TOP >>

-. Information of Parameters.

Elem No. : 2744

Thickness : 0.3000 m.

Materials : fck = 32000.0000 KPa.

fcd = 21333.3333 KPa.

fyk = 450000.0000 KPa.

Covering : dB = 0.0700 m.

dT = 0.0700 m.

LCB No. : 8

-. Information of Design.

b = 0.0010 m. (by Code Unit Length).

d = 0.2300 m.

lambda = 0.800

a = lambda * x = 0.010 m.

eta = 1.000

Cc = eta*fcd*b*a = 0.2204 kN.

M_Rd = Cc*(d-a/2) = 49.5572 kN-m./m.

-. Information of Moments and Result.

Rein. Bar : P12 @200

As_req = 0.0004 m^2/m. (0.0004 m^2/m.)

M_Ed = 23.6137 kN-m./m.

M_Rd = 49.5572 kN-m./m.

RatM = M_Ed / M_Rd = 0.476 < 1.0 ---> O.K !

-. Check ratio of neutral axis depth to effective depth.

x/d = 0.040

Limit(x/d) = 0.450 (fck <= 50 MPa.)

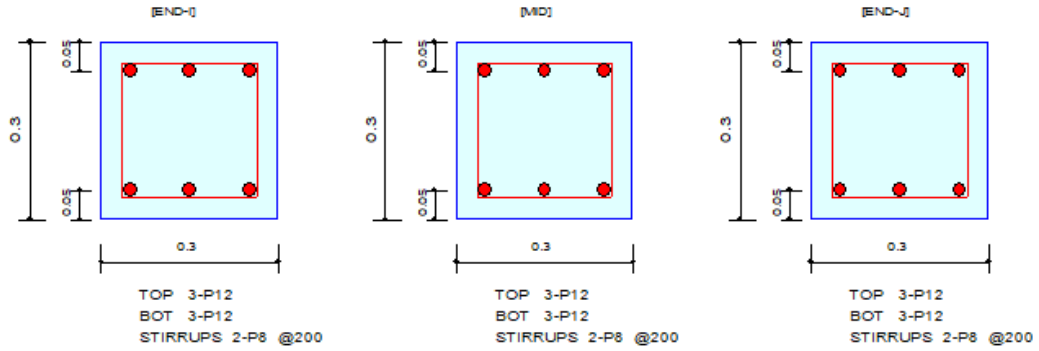
x/d ratio = 0.040/ 0.450 = 0.089 ---> O.K

1.8.4 Verifiche Travi sezione 30x30

Le travi di sezione 30x30 sono armate con 3+3 ϕ12 correnti superiori e inferiori e staffe ϕ8/20.

1. Design Information

Design Code	Eurocode2:04 & NTC2018	Unit System	kN, m
Material Data	fck = 32000, fyk = 450000, fyw = 450000 KPa		
Section Property	Travi 30x30 (No : 1)	Beam Span	2.3m



2. Bending Moment Capacity

	END-I	MID	END-J
(-) Load Combination No.	20	20	4
Moment (M_Ed)	5.05	2.73	5.19
Factored Strength (M_Rd)	33.26	33.26	33.26
Check Ratio (M_Ed/M_Rd)	0.1517	0.0821	0.1561
Neutral Axis (x/d)	0.1558	0.1558	0.1558
(+) Load Combination No.	16	4	20
Moment (M_Ed)	2.89	3.76	2.69
Factored Strength (M_Rd)	33.26	33.26	33.26
Check Ratio (M_Ed/M_Rd)	0.0870	0.1131	0.0808
Neutral Axis (x/d)	0.1558	0.1558	0.1558
Using Rebar Top (As_top)	0.0003	0.0003	0.0003
Using Rebar Bot (As_bot)	0.0003	0.0003	0.0003

3. Shear Capacity

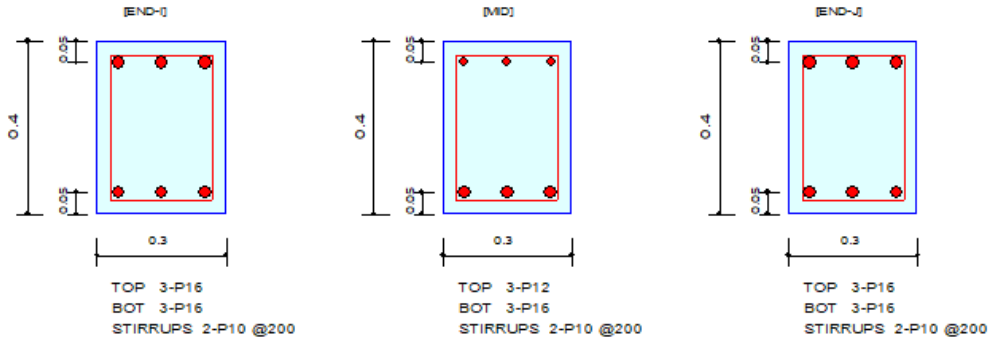
	END-I	MID	END-J
Load Combination No.	4	4	4
Factored Shear Force (V_Ed)	13.64	7.01	12.89
V_Rdc	41.54	41.54	41.54
V_Rds	44.02	44.02	44.02
V_Rdmax	360.00	360.00	360.00
Using Shear Reinf. (Asw)	0.0005	0.0005	0.0005
Using Stirrups Spacing	2-P8 @200	2-P8 @200	2-P8 @200
V_Ed / V_Rdc	0.3283	0.1687	0.3103
V_Ed / min(V_Rds, V_Rdmax)	0.3098	0.1592	0.2928
Check Ratio	0.3283	0.1687	0.3103

1.8.5 Verifiche Travi sezione 30x40

Le travi di sezione 30x40 sono armate con barre inferiori 3ϕ16, barre superiori 3ϕ16 agli appoggi e 3ϕ12 in mezzeria e staffe ϕ10/20. Di seguito le verifiche:

1. Design Information

Design Code	Eurocode2:04 & NTC2018	Unit System	kN, m
Material Data	fck = 32000, fyk = 450000, fyw = 450000 KPa		
Section Property	Trave 30x40 (No : 3)	Beam Span	7.2m



2. Bending Moment Capacity

	END-I	MID	END-J
(-) Load Combination No.	4	4	4
Moment (M_Ed)	50.87	21.46	61.69
Factored Strength (M_Rd)	78.33	46.85	78.33
Check Ratio (M_Ed/M_Rd)	0.6495	0.4580	0.7876
Neutral Axis (x/d)	0.1387	0.1196	0.1387
(+) Load Combination No.	4	4	4
Moment (M_Ed)	18.59	39.94	13.18
Factored Strength (M_Rd)	78.33	77.86	78.33
Check Ratio (M_Ed/M_Rd)	0.2374	0.5130	0.1683
Neutral Axis (x/d)	0.1387	0.1367	0.1387
Using Rebar Top (As_top)	0.0006	0.0003	0.0006
Using Rebar Bot (As_bot)	0.0006	0.0006	0.0006

3. Shear Capacity

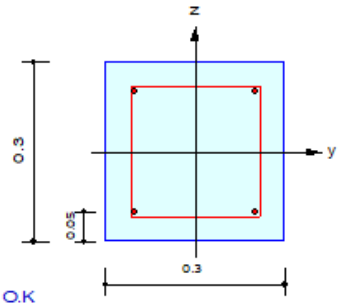
	END-I	MID	END-J
Load Combination No.	4	4	4
Factored Shear Force (V_Ed)	51.96	28.62	54.96
V_Rdc	58.39	58.39	58.39
V_Rds	97.38	97.38	97.38
V_Rdmax	504.00	504.00	504.00
Using Shear Reinf. (Asw)	0.0008	0.0008	0.0008
Using Stirrups Spacing	2-P10 @200	2-P10 @200	2-P10 @200
V_Ed / V_Rdc	0.8899	0.4902	0.9414
V_Ed / min(V_Rds, V_Rdmax)	0.5336	0.2939	0.5644
Check Ratio	0.8899	0.4902	0.9414

1.8.6 Verifiche Pilastro sezione 30x30

Il pilastro di sezione 30x30 è armato con 4 ϕ12 verticali e staffe ϕ8/20.

1. Design Condition

Design Code	: Eurocode2:04 & NTC2018	UNIT SYSTEM : kN, m
Member Number	: 2996 (PM), 2996 (Shear)	
Material Data	: fck = 32000, fyk = 450000, fyw = 450000 KPa	
Column Height	: 1.6 m	
Section Property	: Pilastri 30x30 (No : 4)	
Rebar Pattern	: 4 - 2 - P12	Ast = 0.000452 m^2 (Rhost = 0.005)

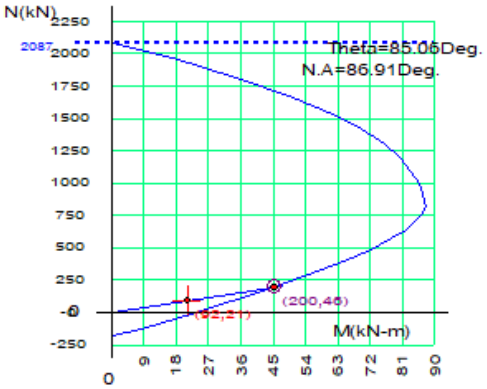


2. Axial and Moments Capacity

Load Combination : 4 (Pos : J)

Concentric Max. Axial Load	N_Rdmax	= 2087.23 kN	
Axial Load Ratio	N_Ed / N_Rd	= 92.1246 / 199.705	= 0.461 < 1.000 ..... O.K
Moment Ratio	M_Ed / M_Rd	= 21.3989 / 45.5938	= 0.469 < 1.000 ..... O.K
	M_Edy / M_Rdy	= 1.84249 / 3.92865	= 0.469 < 1.000 ..... O.K
	M_Edz / M_Rdz	= 21.3195 / 45.4242	= 0.469 < 1.000 ..... O.K

M-N Interaction Diagram



N_Rd(kN)	M_Rd(kN-m)
2087.23	0.00
1821.57	34.88
1550.88	60.70
1305.69	76.00
1090.98	83.76
917.56	86.79
818.59	87.49
754.66	86.36
645.10	81.82
493.26	72.27
292.96	55.00
-1.36	23.81
-176.87	0.00

3. Shear Capacity

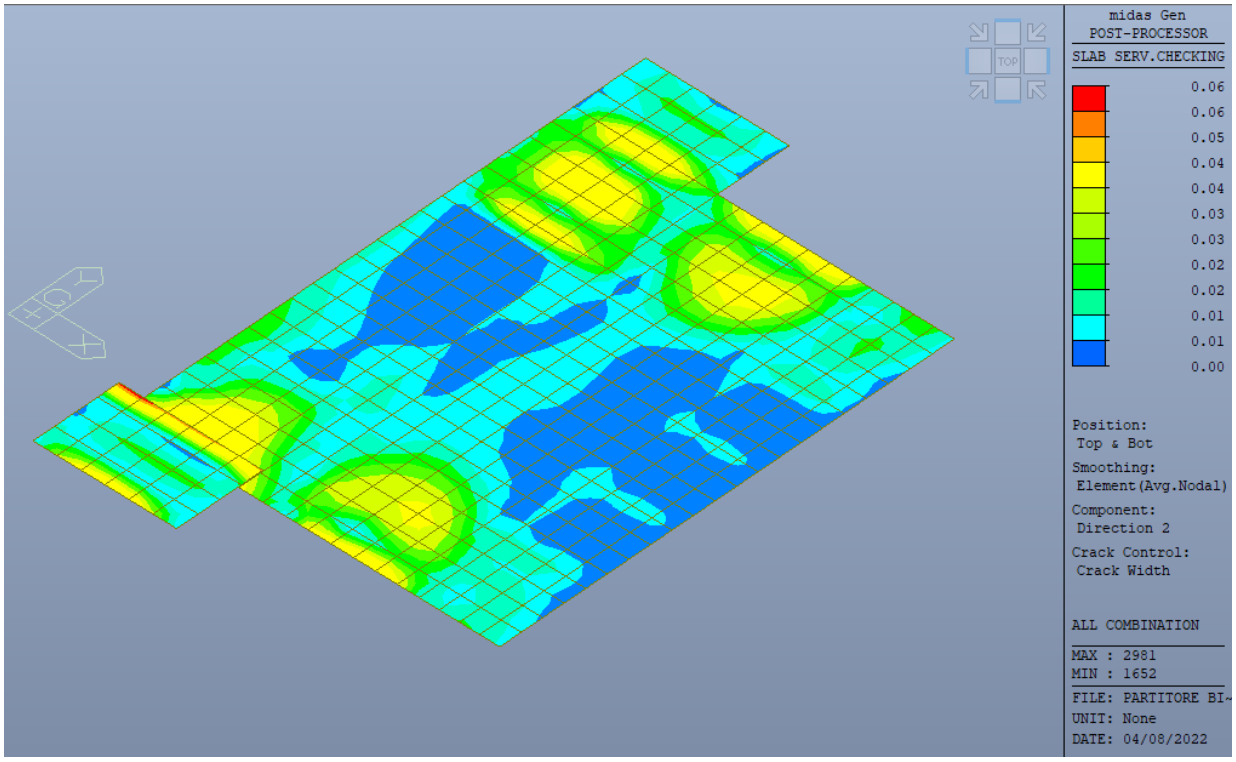
[END]	y (LCB : 4, POS : J)	z (LCB : 17, POS : J)
Applied Shear Force (V_Ed)	18.6096 kN	3.13569 kN
V_Ed / V_Rdc	18.6096 / 50.2343 = 0.370	3.13569 / 41.8601 = 0.075
V_Ed / V_Rds	18.6096 / 44.0217 = 0.423	3.13569 / 44.0217 = 0.071
V_Ed / V_Rdmax	18.6096 / 360.000 = 0.052	3.13569 / 360.000 = 0.009
Shear Ratio	0.370 < 1.000 ..... O.K	0.075 < 1.000 ..... O.K
Asw-H_use	0.00050 m^2/m, 2-P8 @200	0.00050 m^2/m, 2-P8 @200

[MIDDLE]	y (LCB : 4, POS : 1/2)	z (LCB : 17, POS : 1/2)
Applied Shear Force (V_Ed)	18.6096 kN	3.13569 kN
V_Ed / V_Rdc	18.6096 / 50.5268 = 0.368	3.13569 / 42.0851 = 0.075
V_Ed / V_Rds	18.6096 / 44.0217 = 0.423	3.13569 / 44.0217 = 0.071
V_Ed / V_Rdmax	18.6096 / 360.000 = 0.052	3.13569 / 360.000 = 0.009
Shear Ratio	0.368 < 1.000 ..... O.K	0.075 < 1.000 ..... O.K
Asw-H_use	0.00050 m^2/m, 2-P8 @200	0.00050 m^2/m, 2-P8 @200

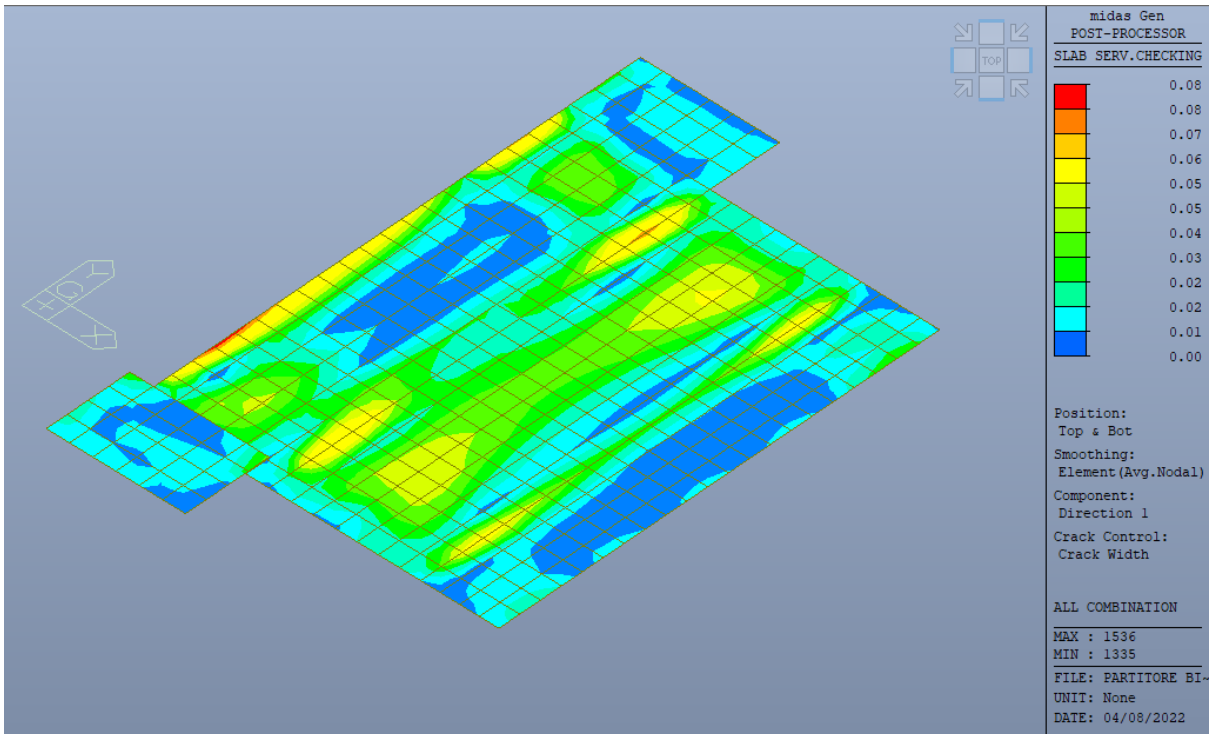
4. Serviceability : Stress Limit Check

	Conc.(Tens.)	Conc.(Comp.)	Conc.(Comp.)(QP)	Rebar
Load Combination	33(C)	33(C)	38(Q)	33(C)
Stress(s)	-2515.71	3882.08	1664.71	17386.47
Allowable Stress(sa)	3930.95	19200.00	14400.00	360000.00
Stress Ratio(s/sa)	0.6400	0.2022	0.1156	0.0483
Check Linear Creep			Linear Creep	

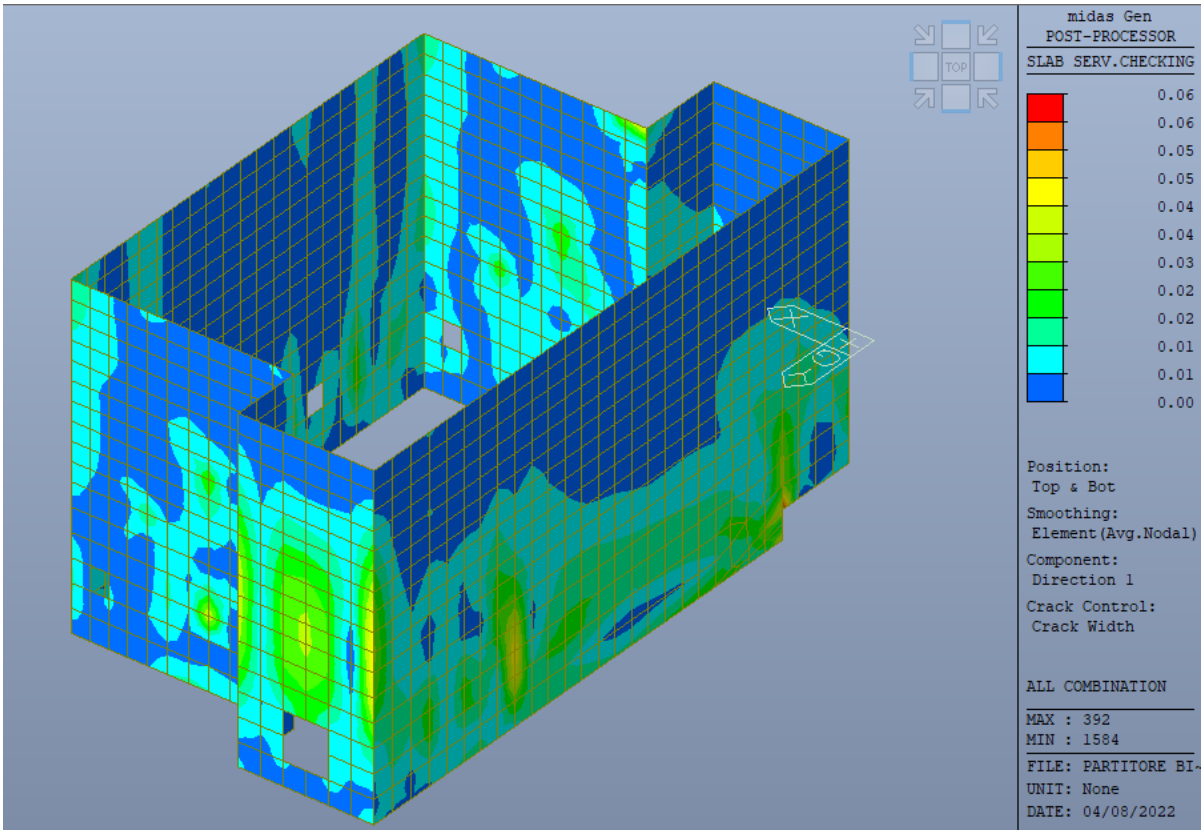
1.9 Verifiche in condizioni di esercizio SLE



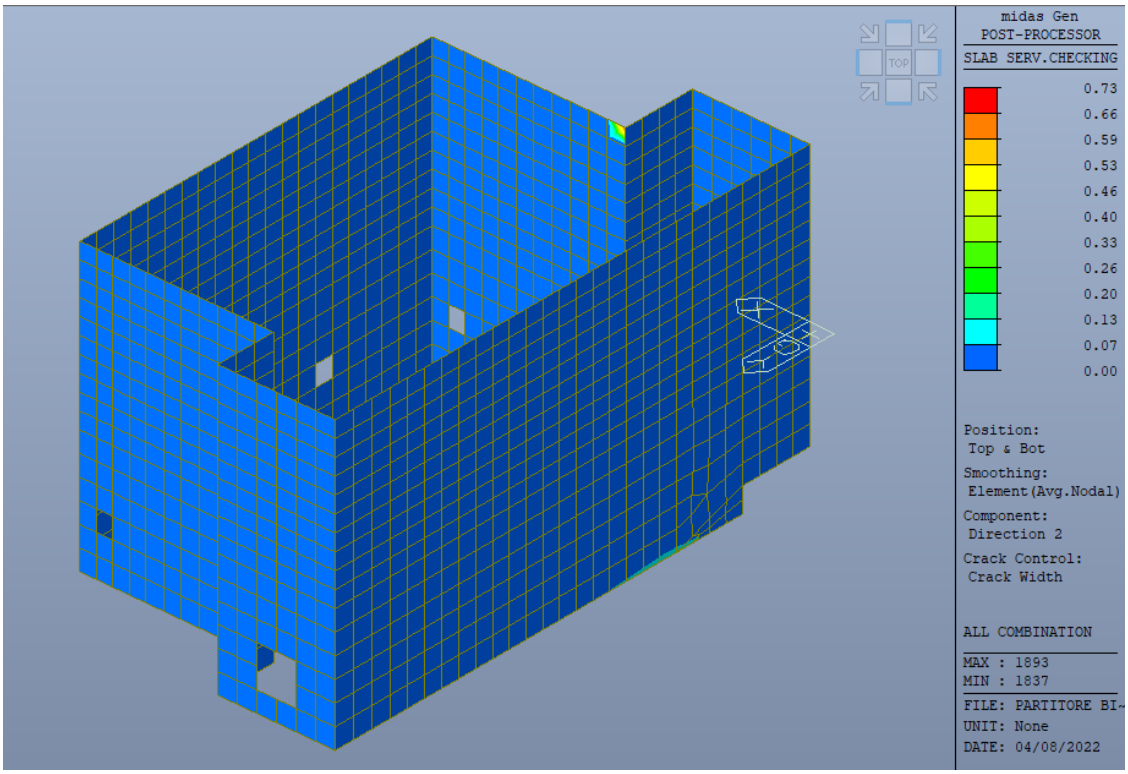
Platea – Verifica a fessurazione SLE - ratio direzione Y



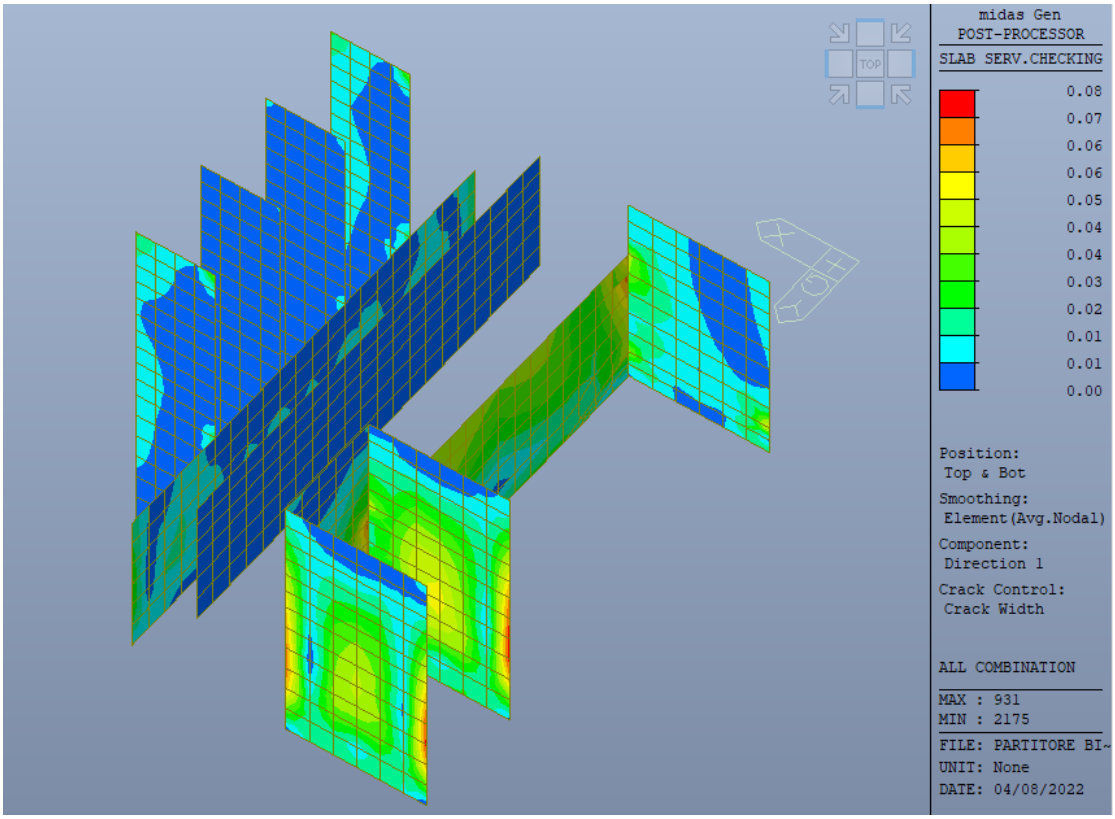
Platea – Verifica a fessurazione SLE - ratio direzione X



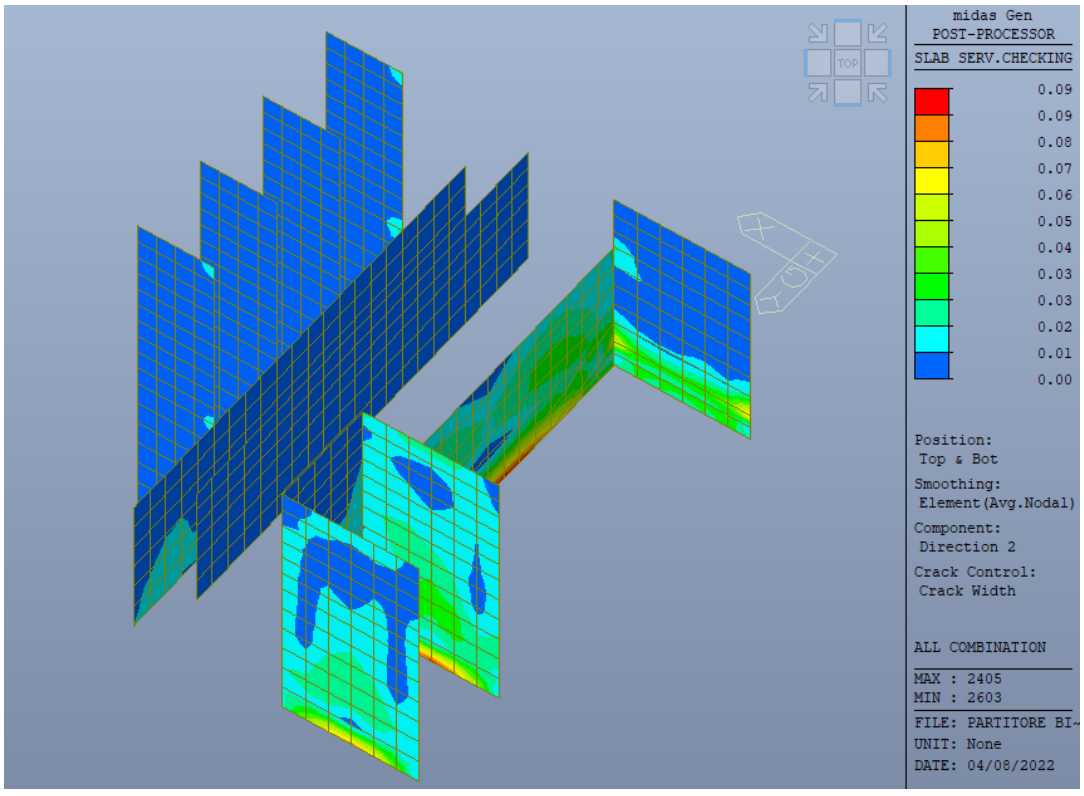
Pareti esterne – Verifica a fessurazione SLE - ratio direzione X



Pareti esterne – Verifica a fessurazione SLE - ratio direzione Y



Pareti interne – Verifica a fessurazione SLE - ratio direzione X



Pareti interne – Verifica a fessurazione SLE - ratio direzione Y