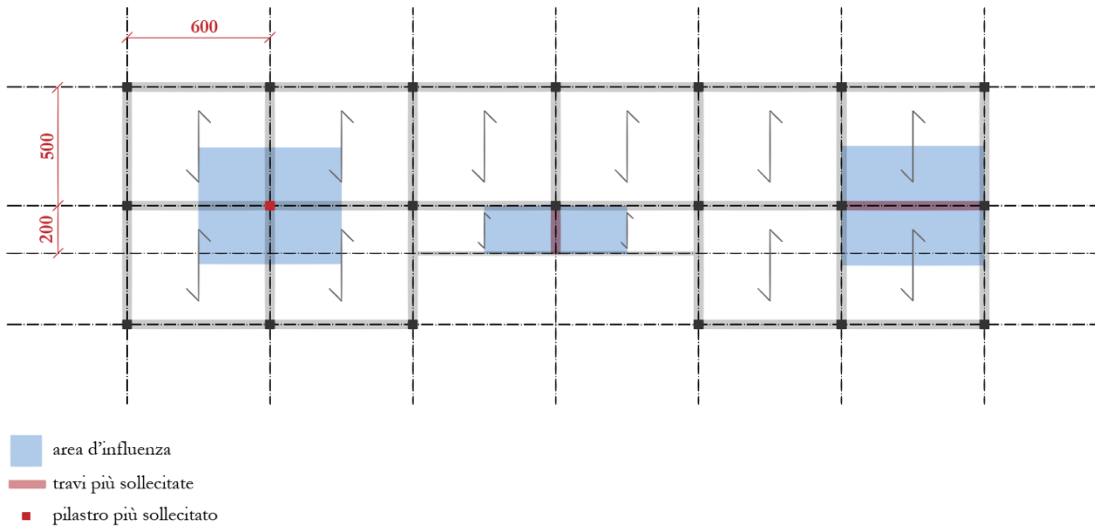
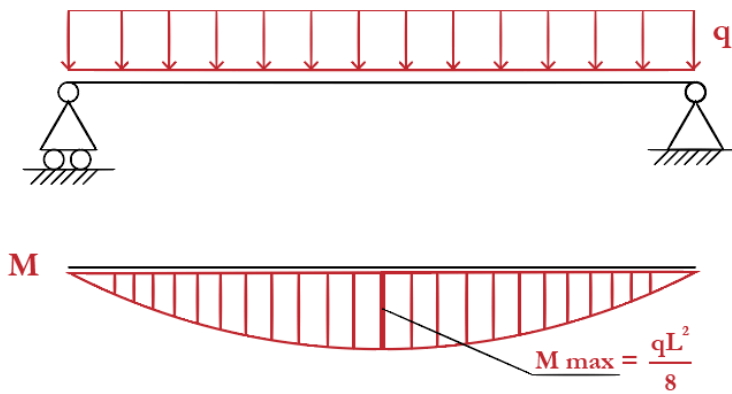


Allegato 01 _ Progetto di una struttura a telai piani in calcestruzzo armato

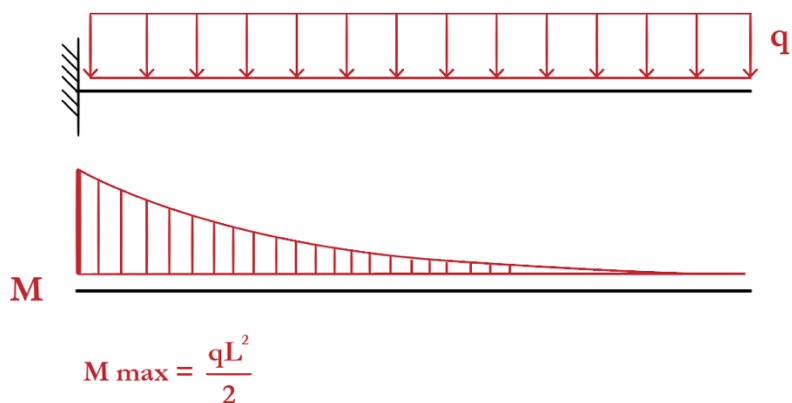
▼ IMG. 01



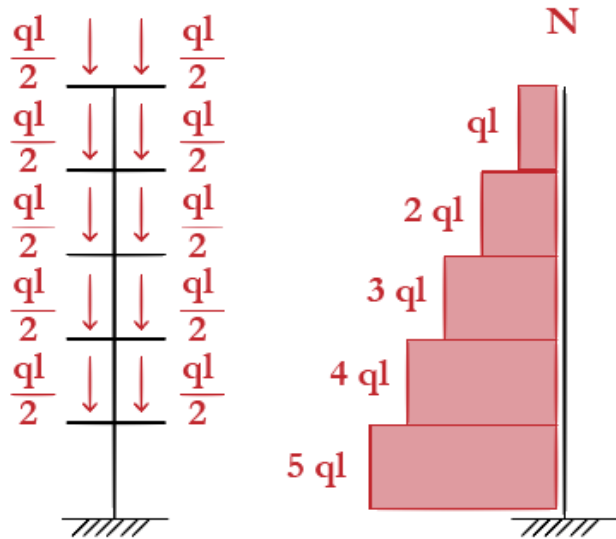
▼ IMG. 02



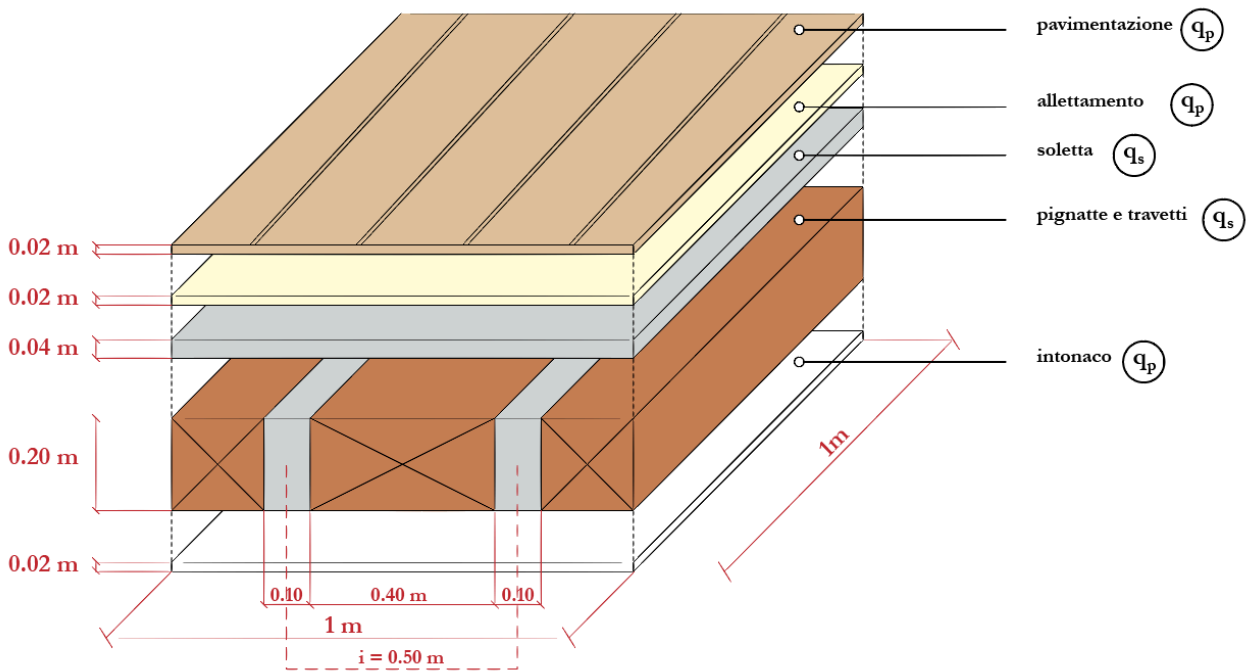
▼ IMG. 03



▼ IMG. 04



▼ IMG. 05



▼ IMG. 06

⑨ CARICHI STRUTTURALI tot. **3,76** $\left(\frac{KN}{m^2}\right)$

- Soletta) $\frac{[0.04 (m) \times 1.0 (m) \times 1.0 (m)] \cdot 25 \left(\frac{KN}{m^2}\right)}{1.0 (m^2)} = 1 KN/m^2$
- Travetti) $\frac{[0.10 (m) \times 1.0 (m) \times 0.20 (m)] \cdot 25 \left(\frac{KN}{m^2}\right) \cdot \frac{1}{0.5 m}}{1.0 (m^2)} = 1 KN/m^2$
- Pignatte) $\frac{[0.40 (m) \times 1.0 (m) \times 0.20 (m)] \cdot 25 \left(\frac{KN}{m^2}\right) \cdot \frac{1}{0.5 m}}{1.0 (m^2)} = 1,76 KN/m^2$

⑨ SOVRACCARICHI PERMANENTI tot. **1,58** $\left(\frac{KN}{m^2}\right)$

- Pavimentazione) $\frac{[1.0 (m) \times 1.0 (m) \times 0.02 (m)] \cdot 5 \left(\frac{KN}{m^3}\right)}{1.0 (m^2)} = 0,1 KN/m^2$
- Allettamento) $\frac{[1.4 (m) \times 1.0 (m) \times 0.02 (m)] \cdot 20 \left(\frac{KN}{m^3}\right)}{1.0 (m^2)} = 0,4 KN/m^2$
- Massetto) $\frac{[1.0 (m) \times 1.0 (m) \times 0.04 (m)] \cdot 18 \left(\frac{KN}{m^3}\right)}{1.0 (m^2)} = 0,72 KN/m^2$
- Intonaco) $\frac{[1.0 (m) \times 1.0 (m) \times 0.02 (m)] \cdot 18 \left(\frac{KN}{m^3}\right)}{1.0 (m^2)} = 0,36 KN/m^2$

⑨ CARICHI ACCIDENTALI tot. **2,00** $\left(\frac{KN}{m^2}\right)$

▼ **IMG. 07 – 08 - 09**

$$q_* = 1.3 \times 3.76 \left(\frac{KN}{m^2} \right) + 1.5 \times 1.58 \left(\frac{KN}{m^2} \right) + 1.5 \times 2.0 \left(\frac{KN}{m^2} \right) = 10,26 \left(\frac{KN}{m^2} \right)$$

$$q_u \left(\frac{KN}{m} \right) = q_* \times i = 10,26 \left(\frac{KN}{m^2} \right) \times 5.0 (m) = 51,29 \left(\frac{KN}{m} \right)$$

$$M_{max} = \frac{51,29 \left(\frac{KN}{m} \right) \times 6.0 (m)}{8} = 230,81 (KN \cdot m)$$

interasse (m)	q _s (KN/m ²)	q _p (KN/m ²)	q _a (KN/m ²)	q _u (KN/m)	luce (m)	M _{max} (KN*m)
5,00	3,76	1,58	2,00	51,29	6,00	230,81

▼ **IMG. 10**

Tabella 4.1.I – Classi di resistenza

CLASSE DI RESISTENZA
C8/10
C12/15
C16/20
C20/25
C25/30
C28/35
C 32/40
C35/45
C40/50
C45/55
C50/60
C55/67
C60/75
C70/85
C80/95
C90/105

Tabella 4.1.II – Impiego delle diverse classi di resistenza

STRUTTURE DI DESTINAZIONE	CLASSE DI RESISTENZA MINIMA
Per strutture non armate o a bassa percentuale di armatura (§ 4.1.11)	C8/10
Per strutture semplicemente armate	C16/20
Per strutture precomprese	C28/35

▼ **IMG. 11**

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m)	luce (m)	M_{max} (KN*m)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	β	r	b (cm)	h_u (cm)	δ (cm)	H_{min} (cm)	H	H/I	area (m ²)	peso unitario (KN/m)
2																				
3	3,76	1,58	2,00	51,29	6,00	230,81	450,00	391,30	16,00	9,07	0,26	2,91	30,00	84,85	5,00	89,85	90,00	0,15	0,27	6,75

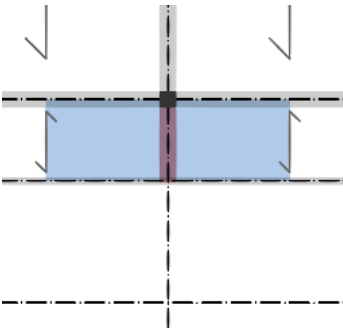
▼ **IMG. 12**

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
1	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m)	luce (m)	M_{max} (KN*m)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	β	r	b (cm)	h_u (cm)	δ (cm)	H_{min} (cm)	H	H/I	area (m ²)	peso unitario (KN/m)	
2																					
3	3,76	1,58	2,00	51,29	6,00	230,81	450,00	391,30	16,00	9,07	0,26	2,91	30,00	84,85	5,00	89,85	90,00	0,15	0,27	6,75	
4				60,07	6,00	270,29	450,00	391,30	16,00	9,07	0,26	2,91	30,00	91,82	5,00	96,82	non verificata				

▼ **IMG. 13**

	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m)	luce (m)	M_{max} (KN*m)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	β	r	b (cm)	h_u (cm)	δ (cm)	H_{min} (cm)	H	H/I	area (m ²)	peso unitario (KN/m)	
1	3,76	1,58	2,00	51,29	6,00	230,81	450,00	391,30	16,00	9,07	0,26	2,91	40,00	73,48	5,00	78,48	90,00	0,13	0,36	9,00	
2				62,99	6,00	283,46	450,00	391,30	16,00	9,07	0,26	2,91	40,00	81,43	5,00	86,43	verificata				

▼ **IMG. 14**



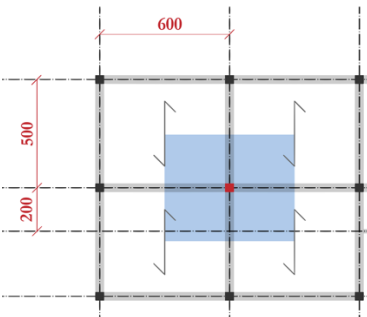
▼ **IMG. 15**

interasse (m)	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m ²)	q_e (KN/m)	luce (m)	M_{max} (KN*m)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	f_{xk} (N/mm ²)	f_{y2} (N/mm ²)	β	r	b (cm)	h_u (cm)	δ (cm)	H_{min} (cm)	H (cm)	area (m ²)	peso (KN/m)
6	3,76	1,58	2,00	81,55	2	123,10	450	391,30	16	9,07	0,26	2,91	40	53,66	5	58,66	70	0,28	7,00
				70,85	2,00	141,30	450,00	391,30	16,00	9,07	0,26	2,91	40,00	57,48	5,00	62,48	verificata		

▼ **IMG. 16**

q_e	E (N/mm ²)	I_x (cm ⁴)	v_{max} (cm)	l/v_{max}	
45,04	21000	1143333	0,04	5330,82	Si

▼ **IMG. 17**



▼ **IMG. 18**

L_p	L_s	Area	trave _p	trave _s	q _{trave}	q _s	q _p	q _a	q _{solaio}	η_{piani}	N	f _{ck}	f _{cd}	A _{min}
m	m	m ²	kN/m	kN/m	kN	kN/mq	kN/mq	kN/mq	kN		kN	Mpa	Mpa	cm ²
6,00	5,00	30,00	9,00	9,00	128,70	3,76	1,58	2,00	307,74	5	2182	16,00	9,1	2406,8

▼ **IMG. 19**

E	β	l	λ^*	ρ_{min}	b _{min}	b	h _{min}	h	A _{design}
Mpa		m		cm	cm	cm	cm	cm	cm ²
21000	1,00	4,00	151,19	2,65	9,16	40,00	60,17	40,00	1600

▼ **IMG. 20**

E	β	l	λ^*	ρ_{min}	b _{min}	b	h _{min}	h	A _{design}	I _{design}	I _{max}	W _{max}	q _t	M _t	σ_{max}	
Mpa		m		cm	cm	cm	cm	cm	cm ²	cm ⁴	cm ⁴	cm ³	kN/m	kN*m	Mpa	
21000	1,00	4,00	151,19	2,65	9,16	40,00	60,17	40,00	1600	213333	213333	10666,67	51,29	153,87	28,06	No

▼ **IMG. 21**

E	β	l	λ^*	ρ_{min}	b _{min}	b	h _{min}	h	A _{design}	I _{design}	I _{max}	W _{max}	q _t	M _t	σ_{max}	
Mpa		m		cm	cm	cm	cm	cm	cm ²	cm ⁴	cm ⁴	cm ³	kN/m	kN*m	Mpa	
21000	1,00	4,00	151,19	2,65	9,16	65,00	37,03	65,00	4225	#####	1487552	45770,83	51,29	153,87	8,53	Si