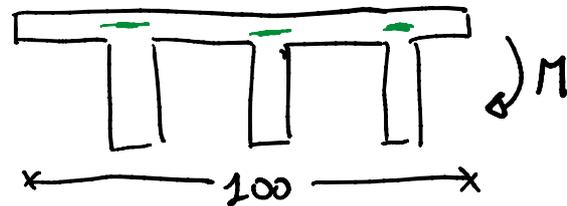
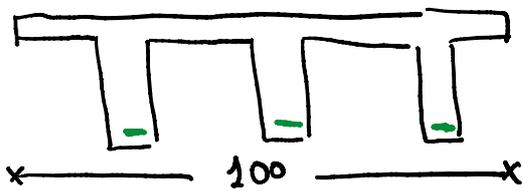
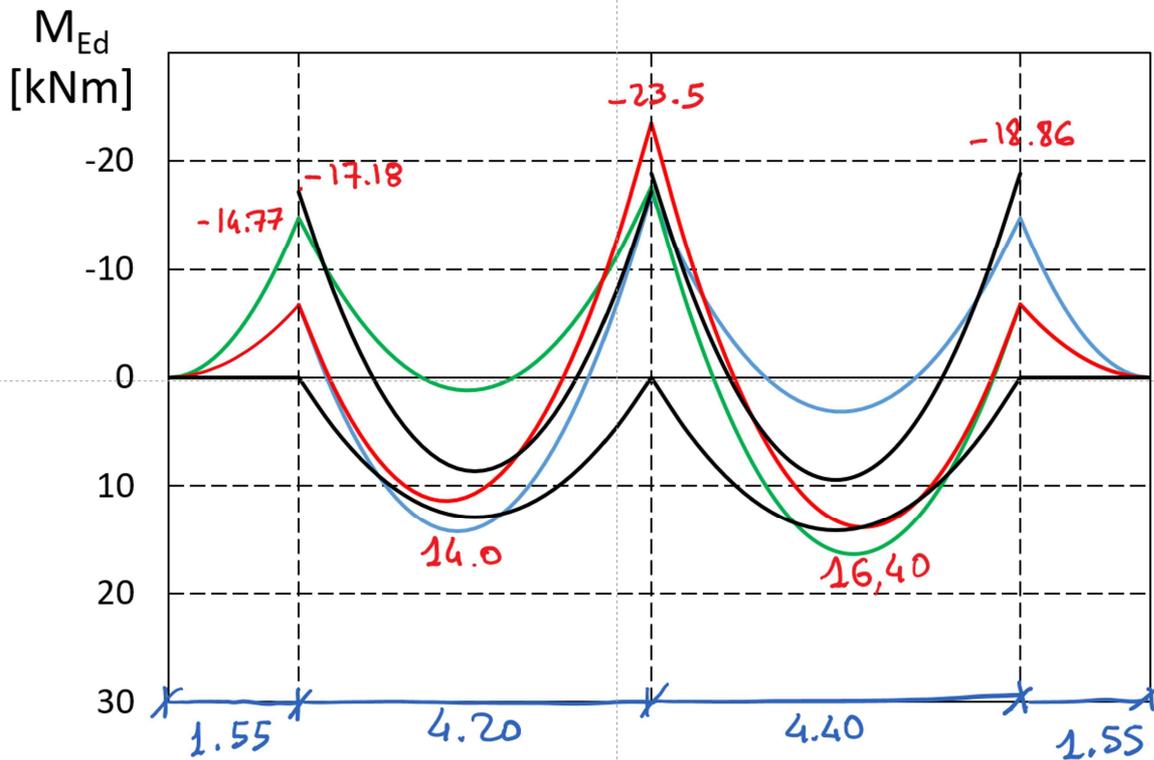


PROGETTO ARMATURE SOLAIO

giovedì 7 maggio 2020 14:02



$$c = 3 \text{ cm}$$

$$d = h - c = 23 \text{ cm} - 3 = 20 \text{ cm}$$

$$1. \quad A_s = \frac{M_{Ed}}{0.9 d f_{yd}} = \frac{14 \text{ kNm} \times 10}{0.9 \times 0.20 \text{ m} \times 331.3 \frac{\text{N}}{\text{mm}^2}} = 1.99 \text{ cm}^2$$

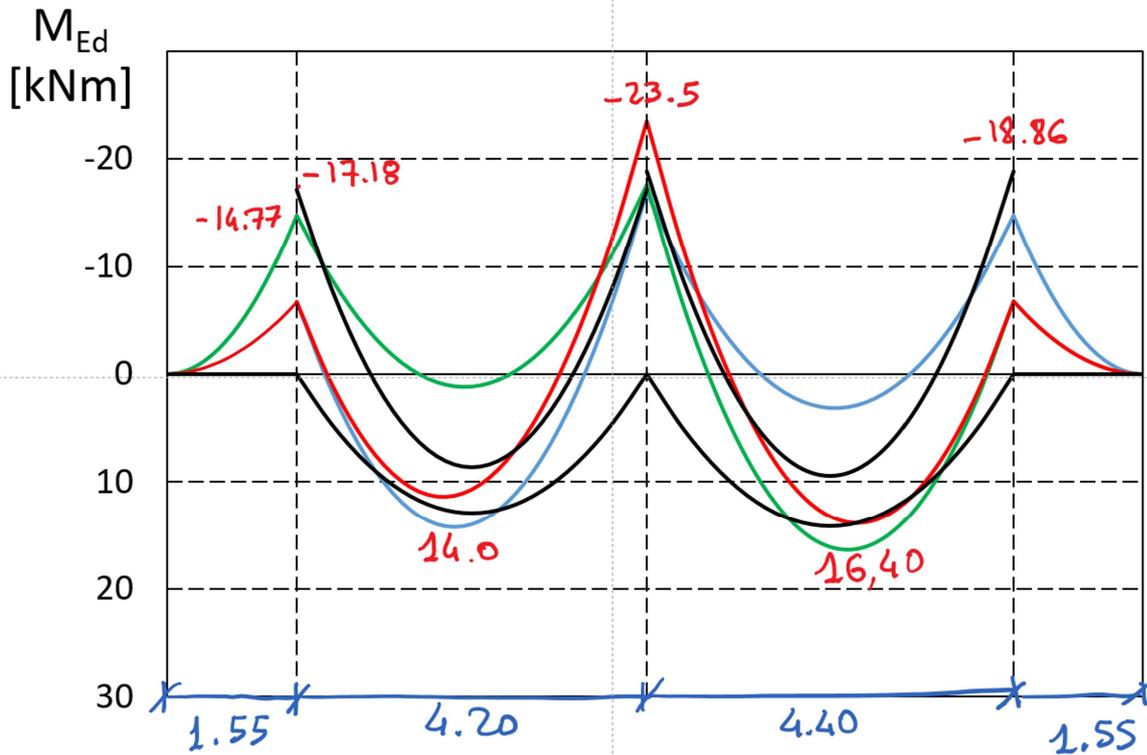
$$A_{\text{TRAVETTO}} = \frac{A_s}{N_{TR}} = \frac{A_s}{3} = \frac{1.99 \text{ cm}^2}{3} = 0.66 \text{ cm}^2$$

CAMPATA	M_{Ed}	d	$A_{s,nec}$	$A_{TRAVETTO}$
1	24 kNm	0,20 m	1,99 cm ²	0,66 cm ²
2	16,4 kNm	0,20 m	2,33 cm ²	0,78 cm ²

APPoggi	M_{Ed}	d	$A_{s,nec}$	$A_{TRAVETTO}$
1	-17,18	d_{SALZO} 0,20 m	2,44 cm ²	0,81 cm ²
2	-23,5	0,20 m	3,34 cm ²	1,11 cm ²
3	-18,86	d_{SALZO}	2,68 cm ²	0,83 cm ²

ARMATURA NECESSARIA

giovedì 7 maggio 2020 14:14



ARMATURA PER TRAVETTO	1.55m	4.20m	4.40m	1.55m
	2φ10 0,81 cm ²	2φ10 1,11 cm ²	2φ10 0,83 cm ²	
		0,66 cm ² 1φ10	0,78 cm ² 1φ10	

$$A_{\phi 10} = \frac{\pi \cdot 1^2}{4} = 0.79 \text{ cm}^2$$

$$A_{\phi 14} = \frac{\pi \cdot 1.4^2}{4} = 1.54 \text{ cm}^2$$

$$M_{red} = A_s \cdot \rho_{yd} \cdot 0.9d \Rightarrow$$

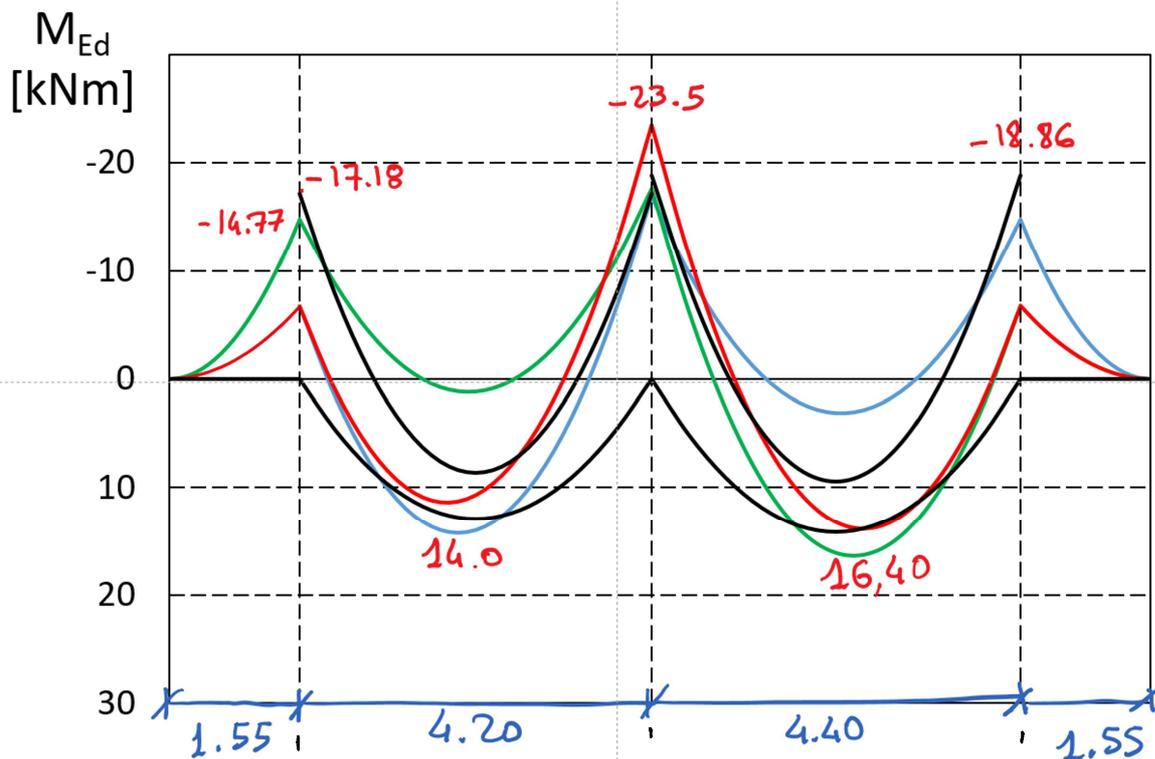
ARMATURA DISPOSTA

$$M_{red \phi 10} = \underset{\substack{\uparrow \\ \text{PER 3M} \\ \text{DI SOLAIO}}}{N_T} \times \underset{\uparrow}{A_{\phi 10}} \times 391.3 \frac{\text{N}}{\text{mm}^2} \times 0.9 \times 0.20 \text{ m} \cdot \frac{1}{10}$$

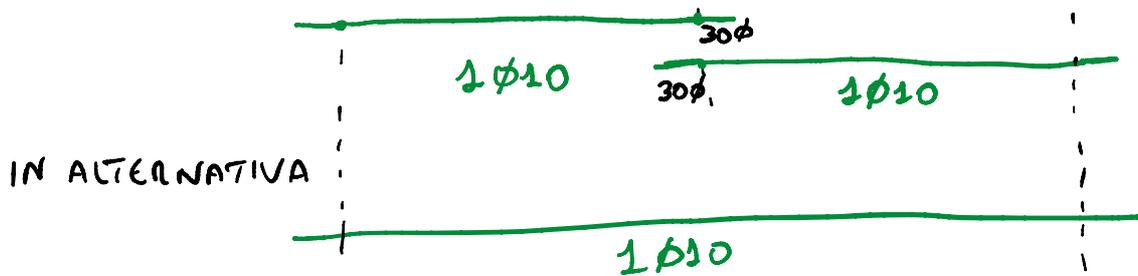
$$= 16.7 \text{ kNm}$$

ARMATURE INFERIORI

giovedì 7 maggio 2020 14:19



DISTINTA ARMATURE PER TRAVETTO



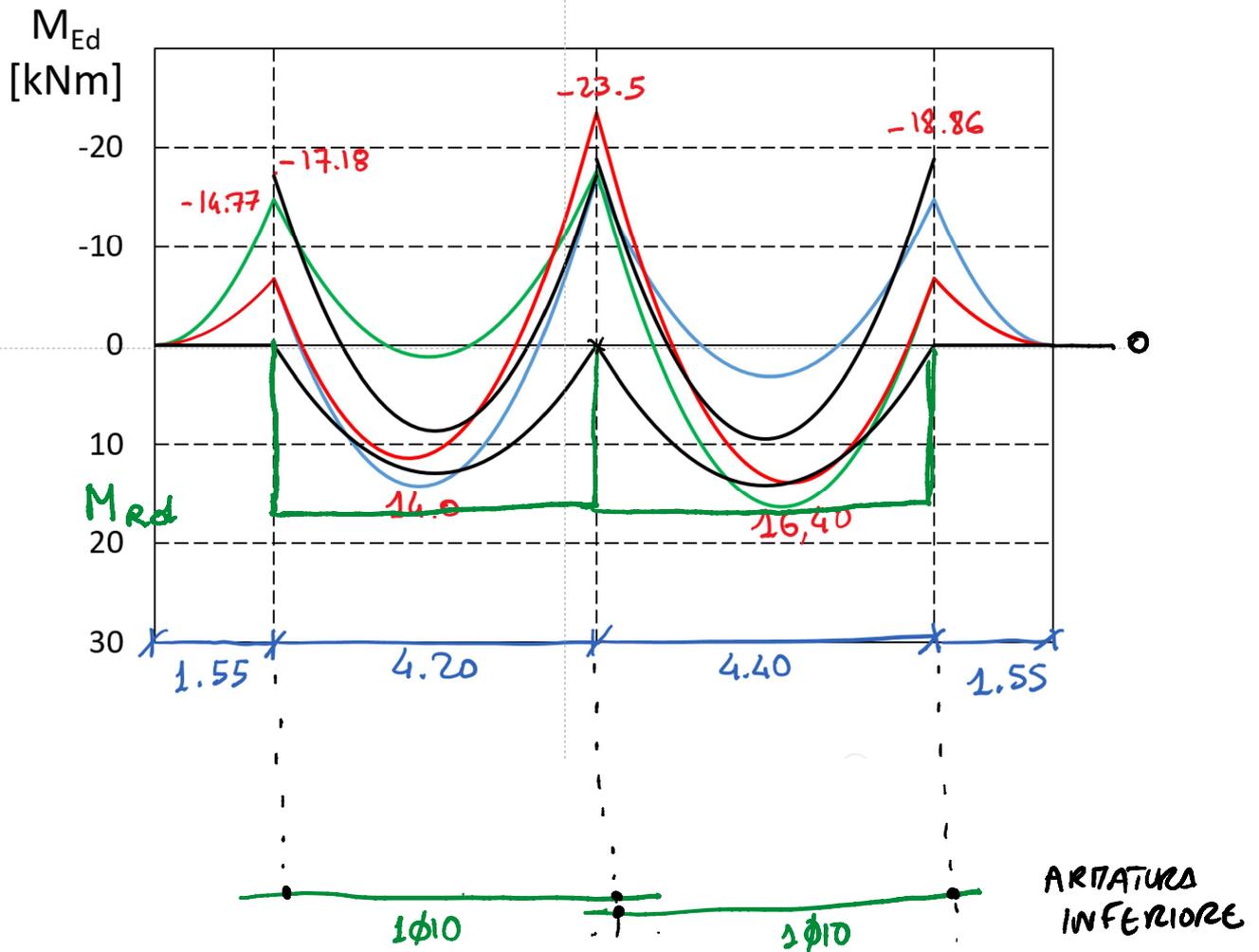
SE $L_b \leq 12 m$

ARMATURE INFERIORI

SI DISPONGONO DA APPOGGIO AD APPOGGIO

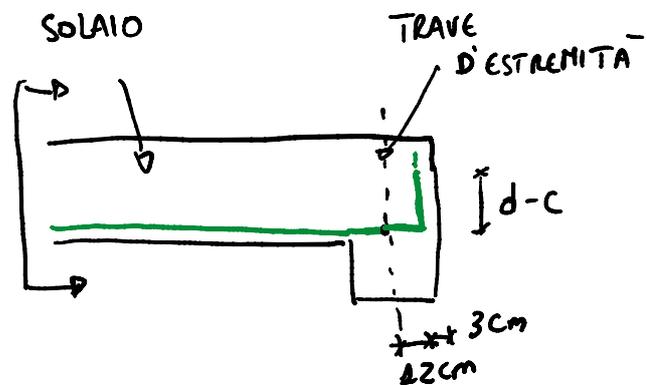
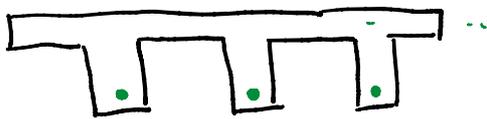
MOMENTO RESISTENTE ARMATURE

giovedì 7 maggio 2020 14:27



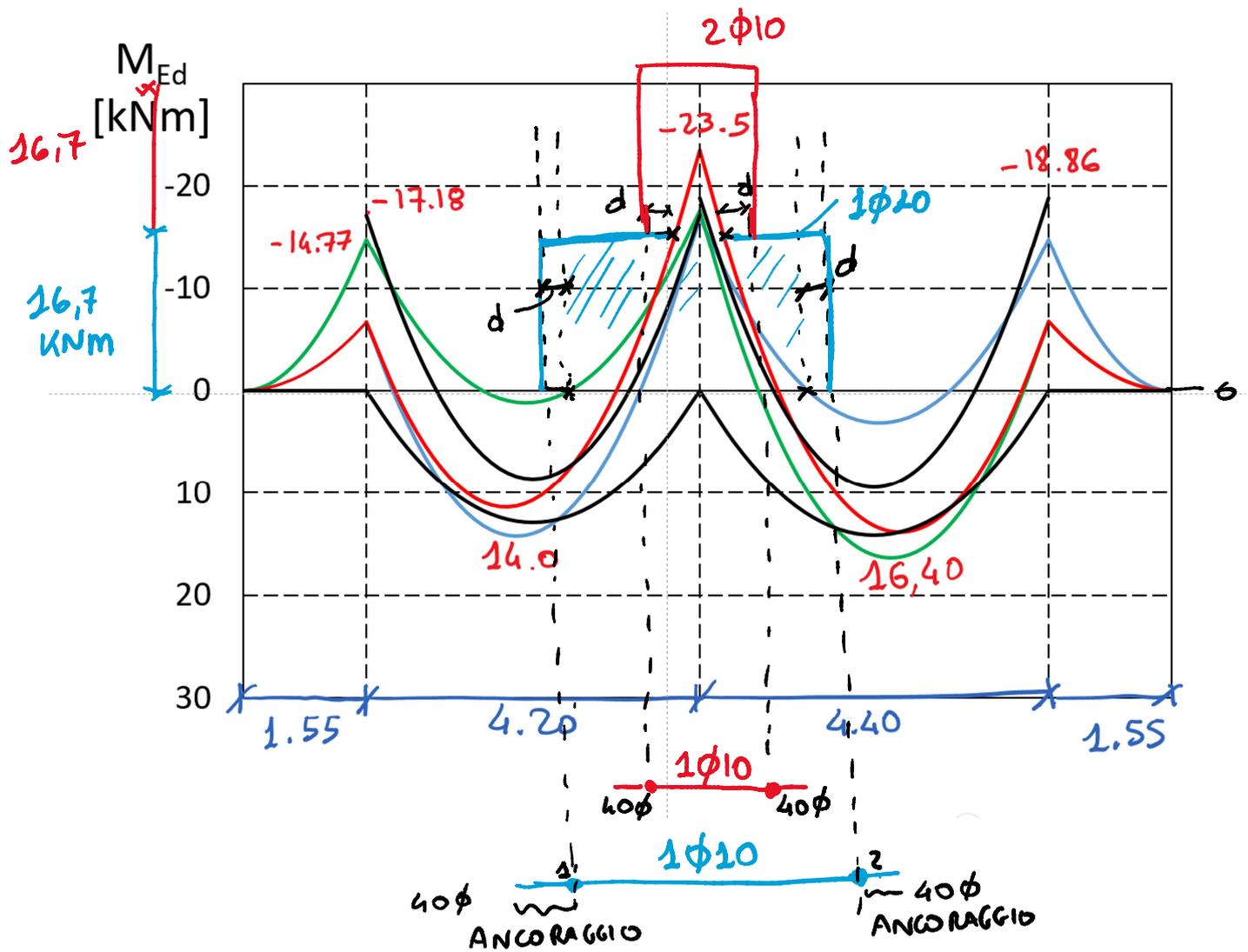
DETTAGLIO ANCORAGGI

IN ASSENZA DI SBALZO



ARMATURE SUPERIORI - APPOGGIO CENTRALE

giovedì 7 maggio 2020 14:34

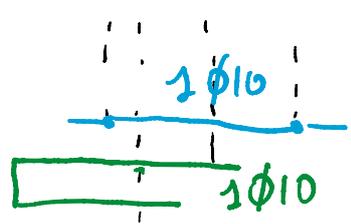
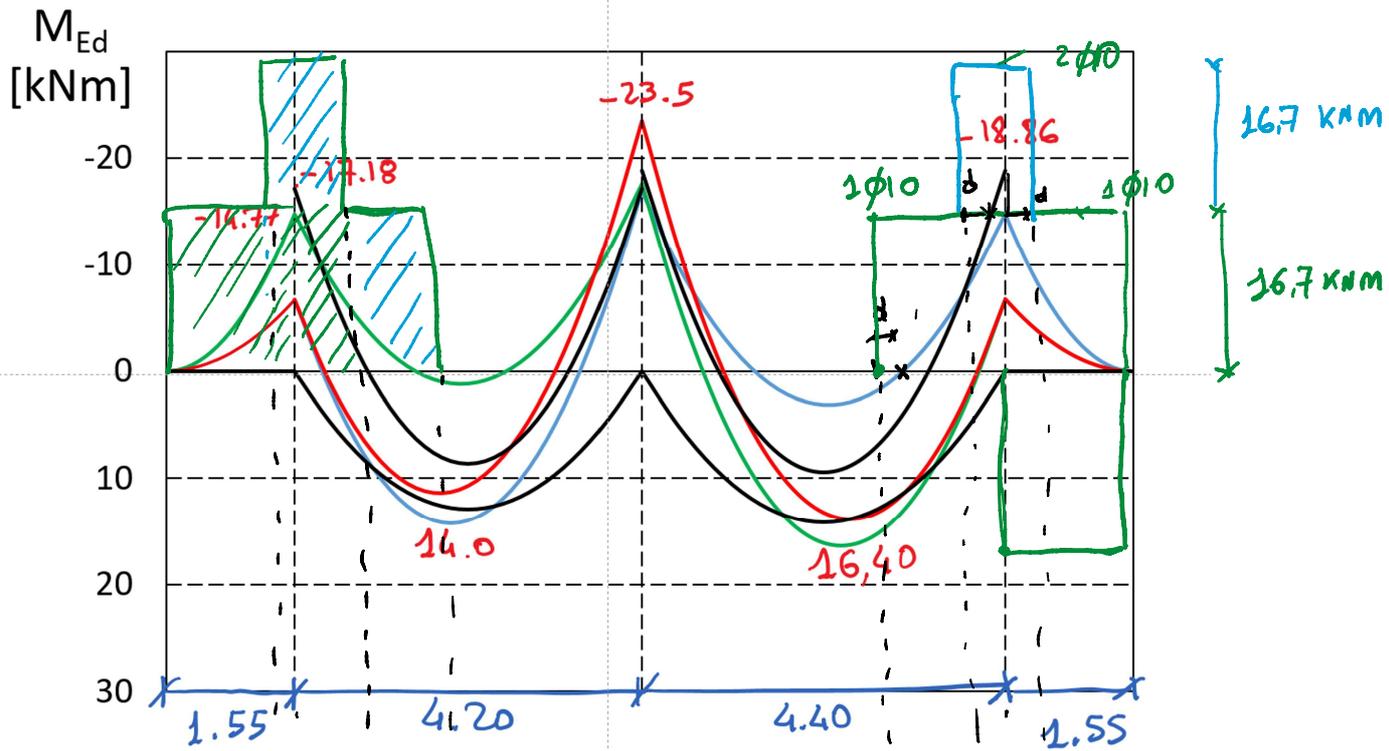


ARMATURA SUPERIORE

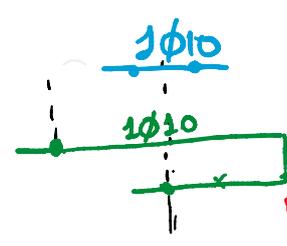
SI DISPONE SOLO DOVE NECESSARIA → QUANDO $M < 0$

ARMATURA SBALZI

giovedì 7 maggio 2020 14:44

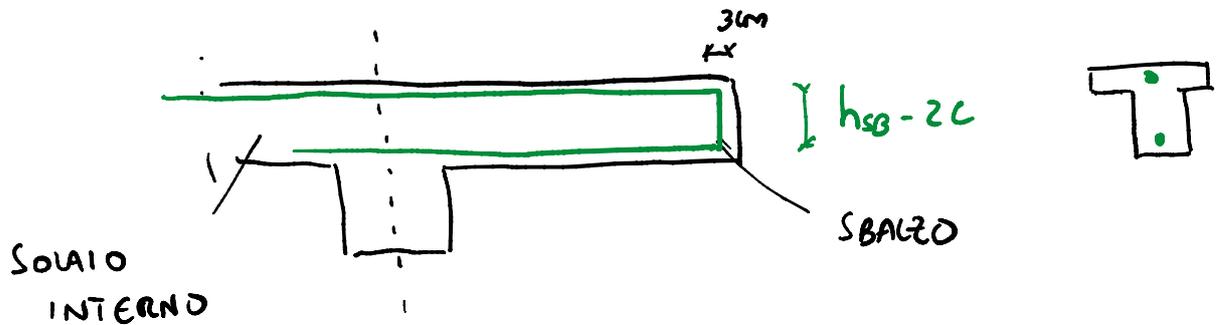


OPZIONE 1

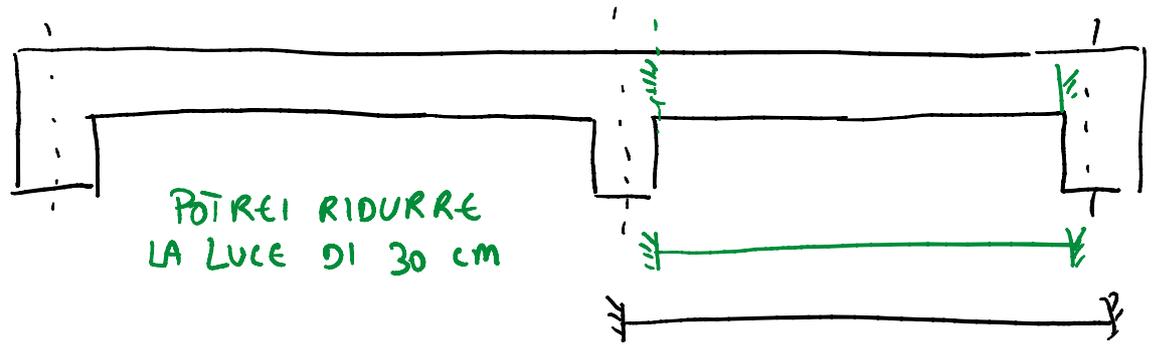


OPZIONE 2

ARMATURA SBALZO : ARMATURA A MOLLA

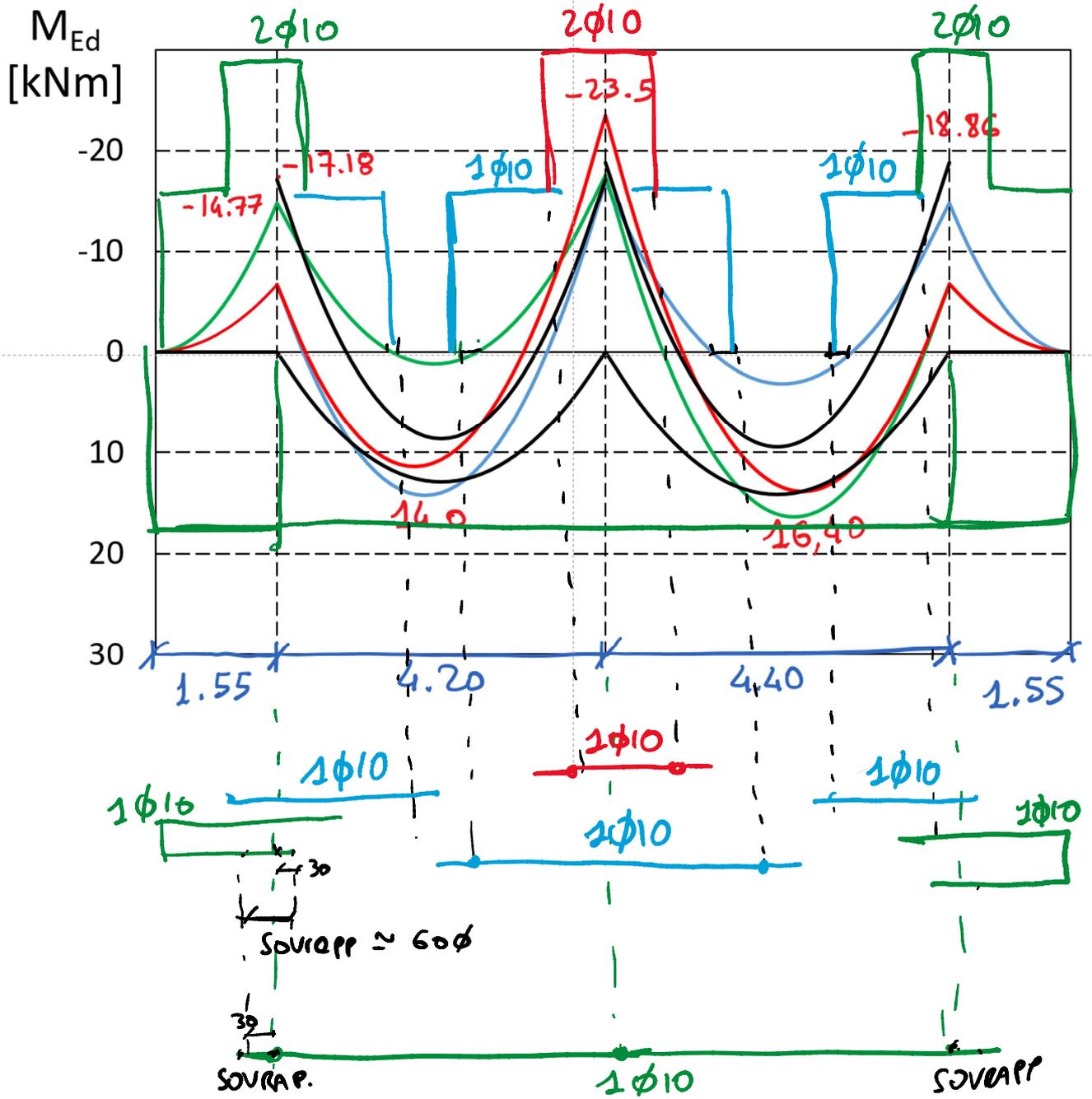


CONSIDERAZIONI SULLO SCHEMA LIMITE DI INCASTRO



DISTINTA FINALE

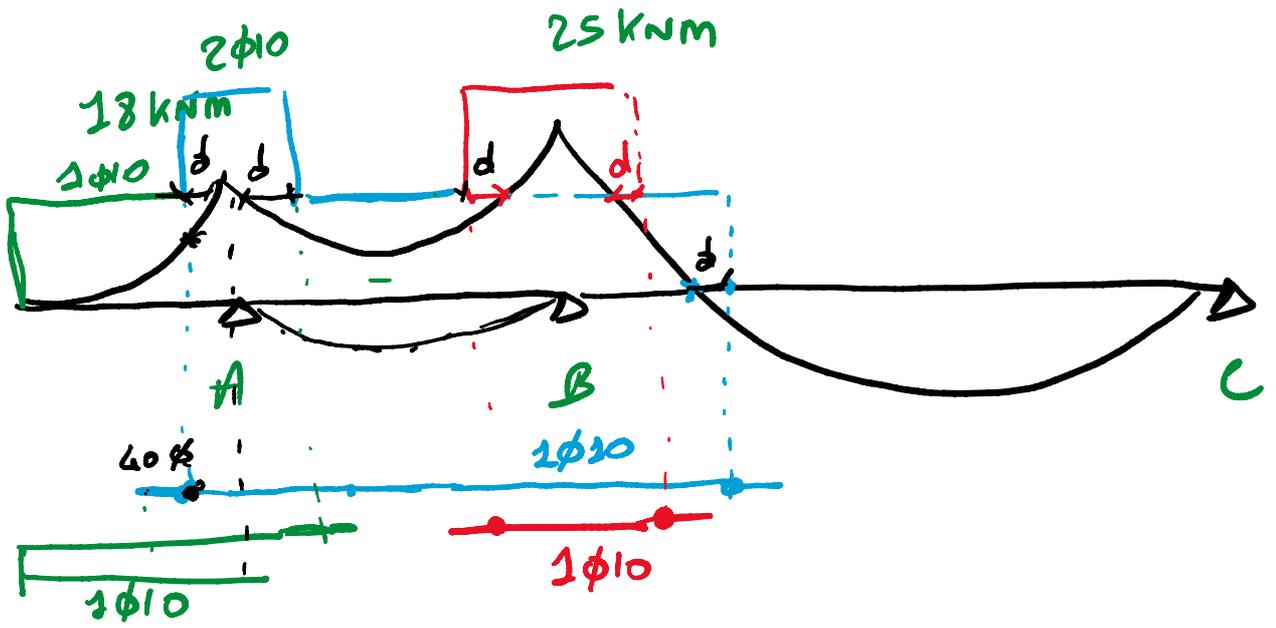
giovedì 7 maggio 2020 14:54



CASO PARTICOLARE $M_{ed} < 0$ IN CAMPATA

giovedì 7 maggio 2020

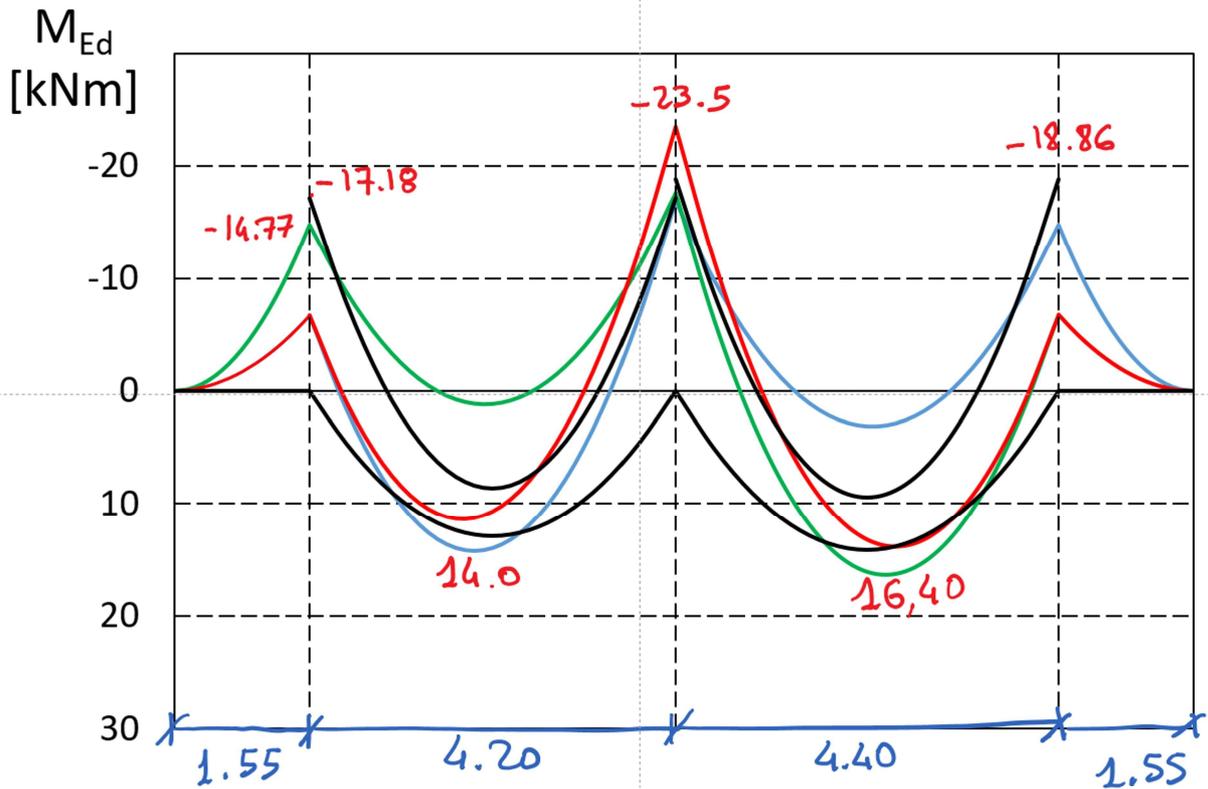
14:59



SOLAIO CON 2 TRAVETTI AL METRO

giovedì 7 maggio 2020

14:02



$$c = 3 \text{ cm}$$

$$d = h - c = 23 \text{ cm} - 3 = 20 \text{ cm}$$

$$2. \quad A_s = \frac{M_{Ed}}{0.9 d \rho_{yd}} = \frac{14 \text{ kNm} \times 10}{0.9 \times 0.20 \text{ m} \times 331.3 \frac{\text{N}}{\text{mm}^2}} = 1.99 \text{ cm}^2$$

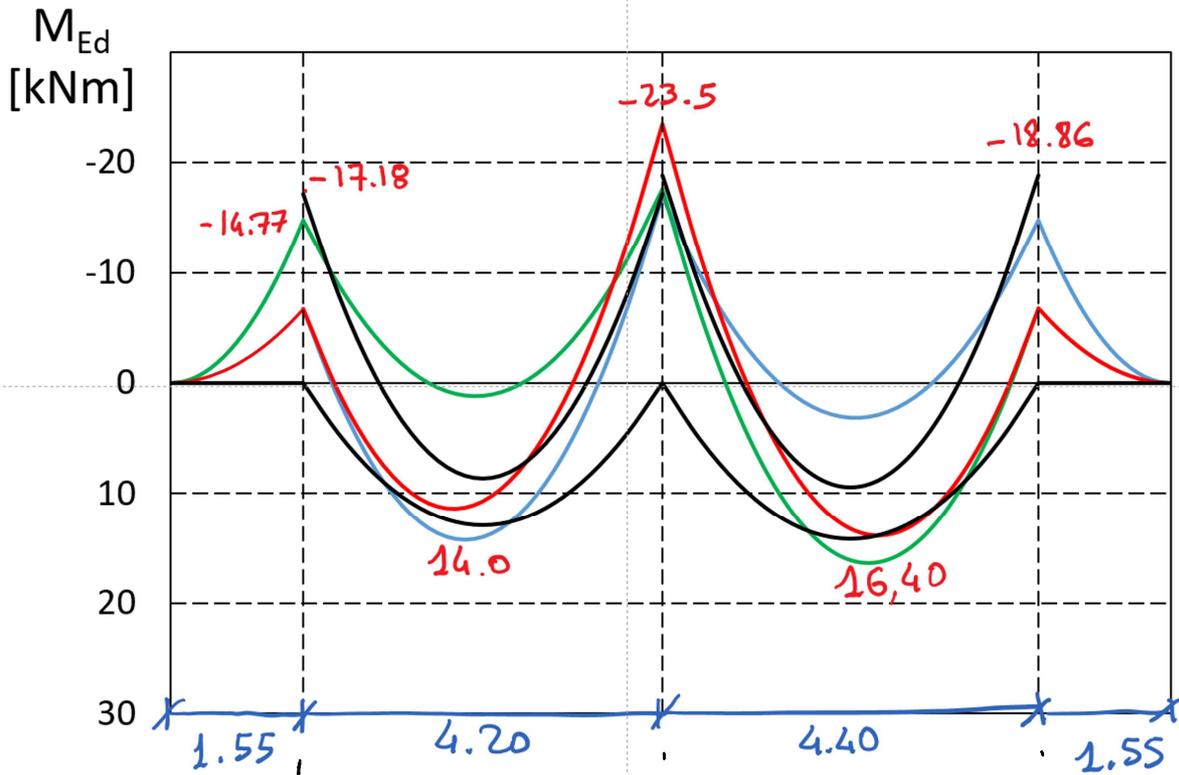
$$A_{\text{TRAVETTO}} = \frac{A_s}{N_{\text{TR}}} = \frac{A_s}{2} = \frac{1.99 \text{ cm}^2}{2}$$

CAMPATA	M _{Ed}	d	A _{s,nec}	A _{TRAVETTO}
1	14 kNm	0,20 m	1,99 cm ²	1 cm ²
2	16,4 kNm	0,20 m	2,33 cm ²	1,16 cm ²

APPoggi	M_{ed}	d	$A_{s,NEC}$	$A_{TRAVETTO}$
1	-17.18	d_{SBALZO} 0.20m	2.44 cm ²	1.22
2	-23.5	0.20m	3.34 cm ²	1.67 cm ²
3	-18.86	d_{SBALZO}	2.68 cm ²	1.34 cm ²

ARMATURA CON SAGOMATI

giovedì 7 maggio 2020 15:12

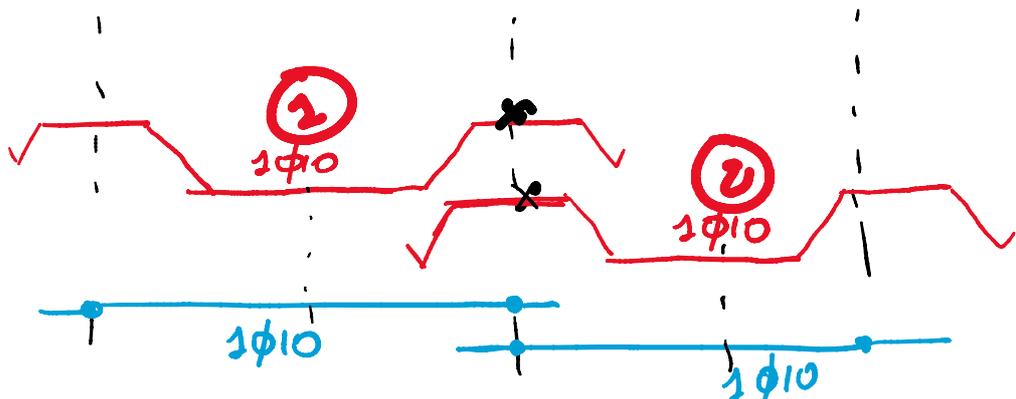


(oppure 1φ10+1φ14)
 2φ10 1.22
 3φ10 1.67
 2φ10 1.34 cm²

1.00 cm² 2φ10
 1.16 cm² 2φ10

2 BARRE INFERIORI

- 1 DITTA (QUELLA CON Ø MAGGIORE)
- 1 SAGOMATA



SAGOMANDO LE BARRE ① E ② DISPONGO GIÀ
2 $\phi 10$ NELL'APPOGGIO CENTRALE \rightarrow ARMO LON. 3 $\phi 10$

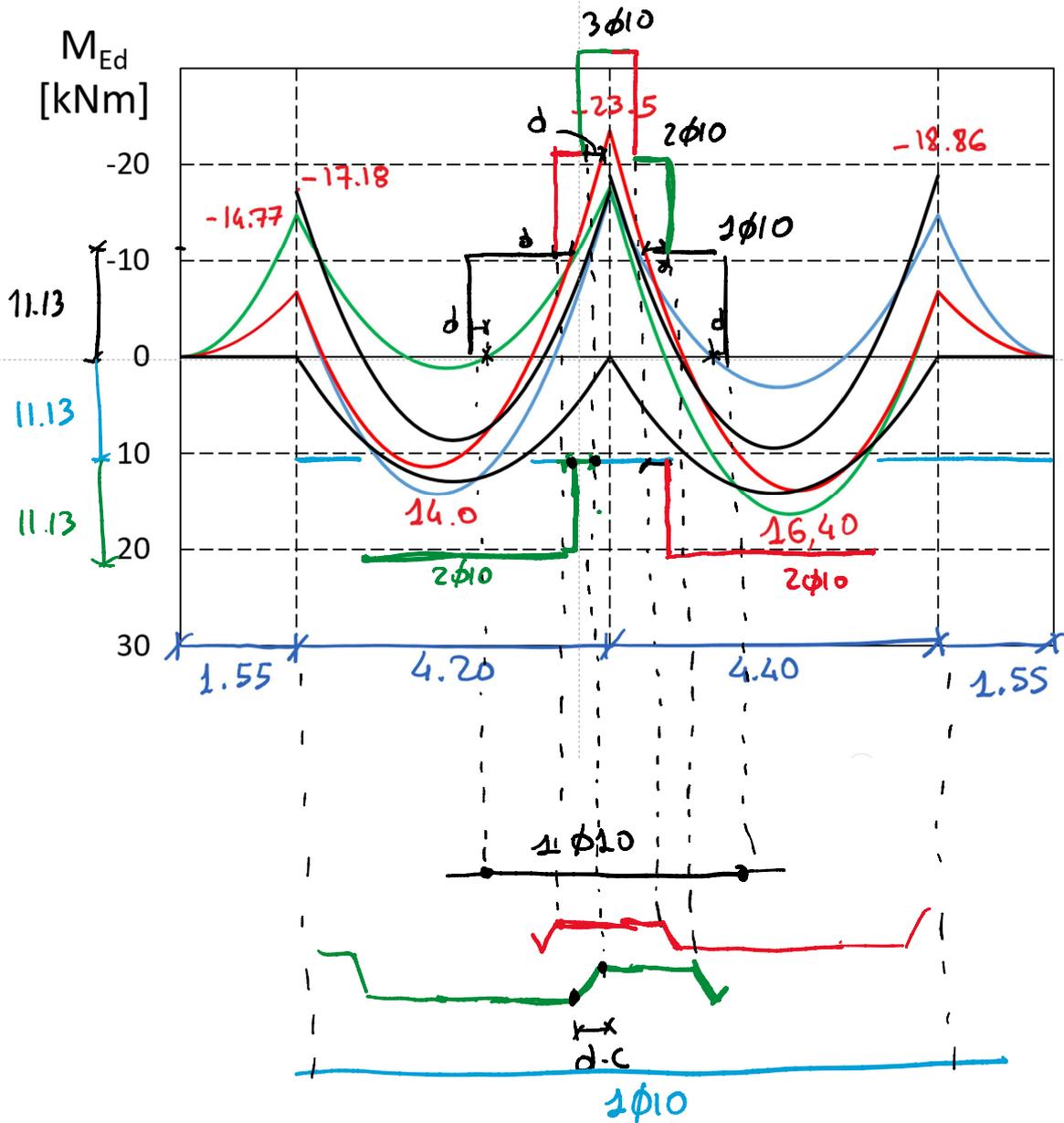
DOVE SAGOMARE LE BARRE?

DISPOSIZIONE APPOGGIO CENTRALE

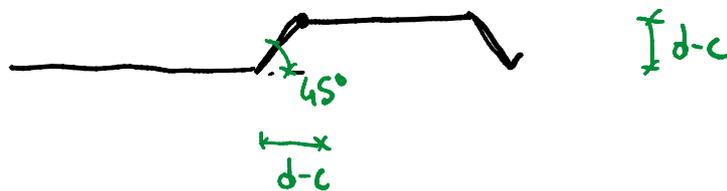
giovedì 7 maggio 2020 15:22

SAGOMO LE BARRE NELLA POSIZIONE PIU' VICINA POSSIBILE ALL'APPOGGIO

$$M_{red \phi 10} = \frac{2 \times 0,79 \text{ cm}^2 \times 0,9 \times 0,20 \text{ m} \times 391,3 \frac{\text{N}}{\text{mm}^2}}{N_{TR} \cdot A_{\phi 10} \cdot 0,9d \cdot f_{yd}} \cdot \frac{1}{10} = 11.13 \text{ kNm}$$

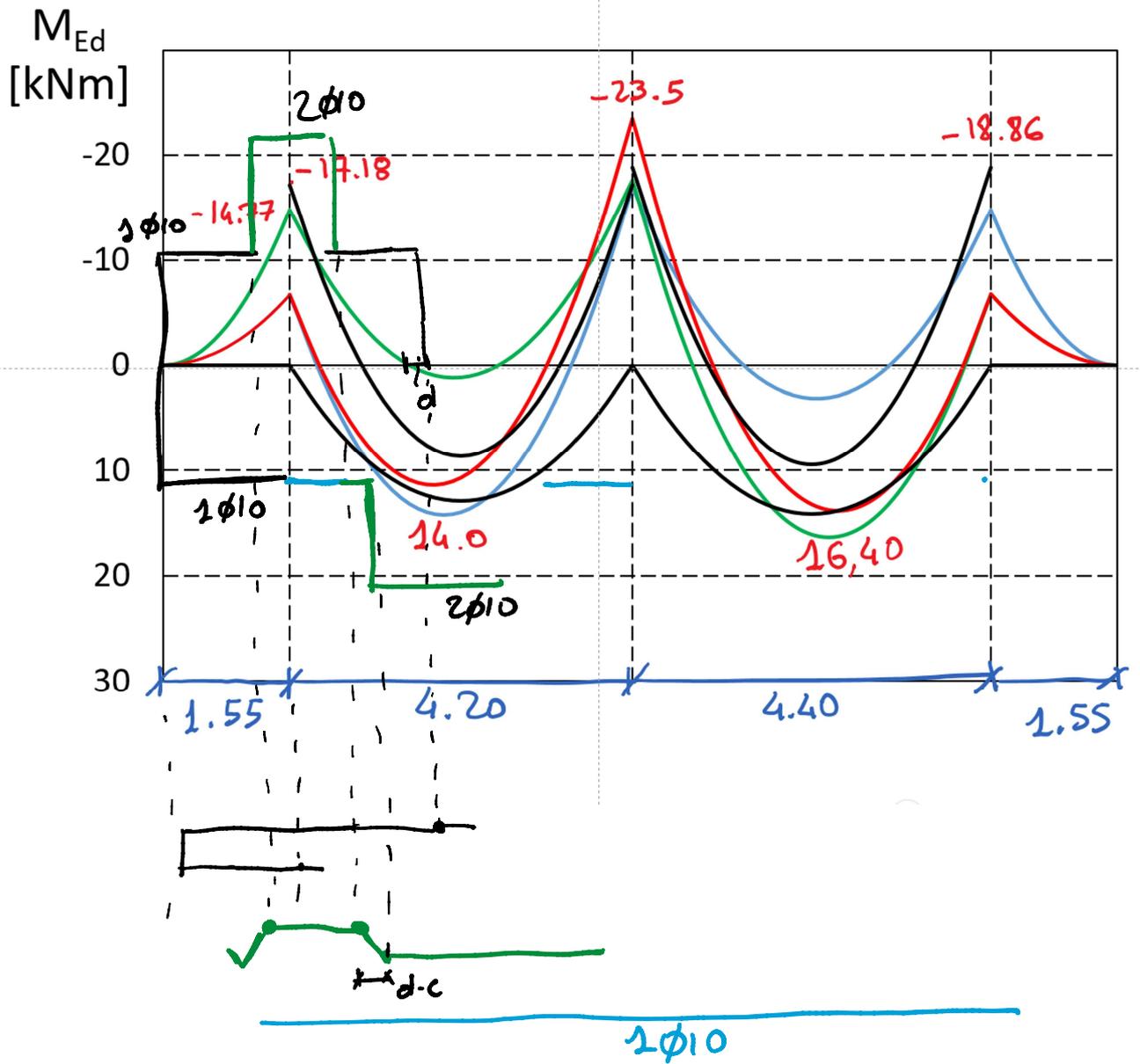


DETTAGLIO DEL SAGOMATO



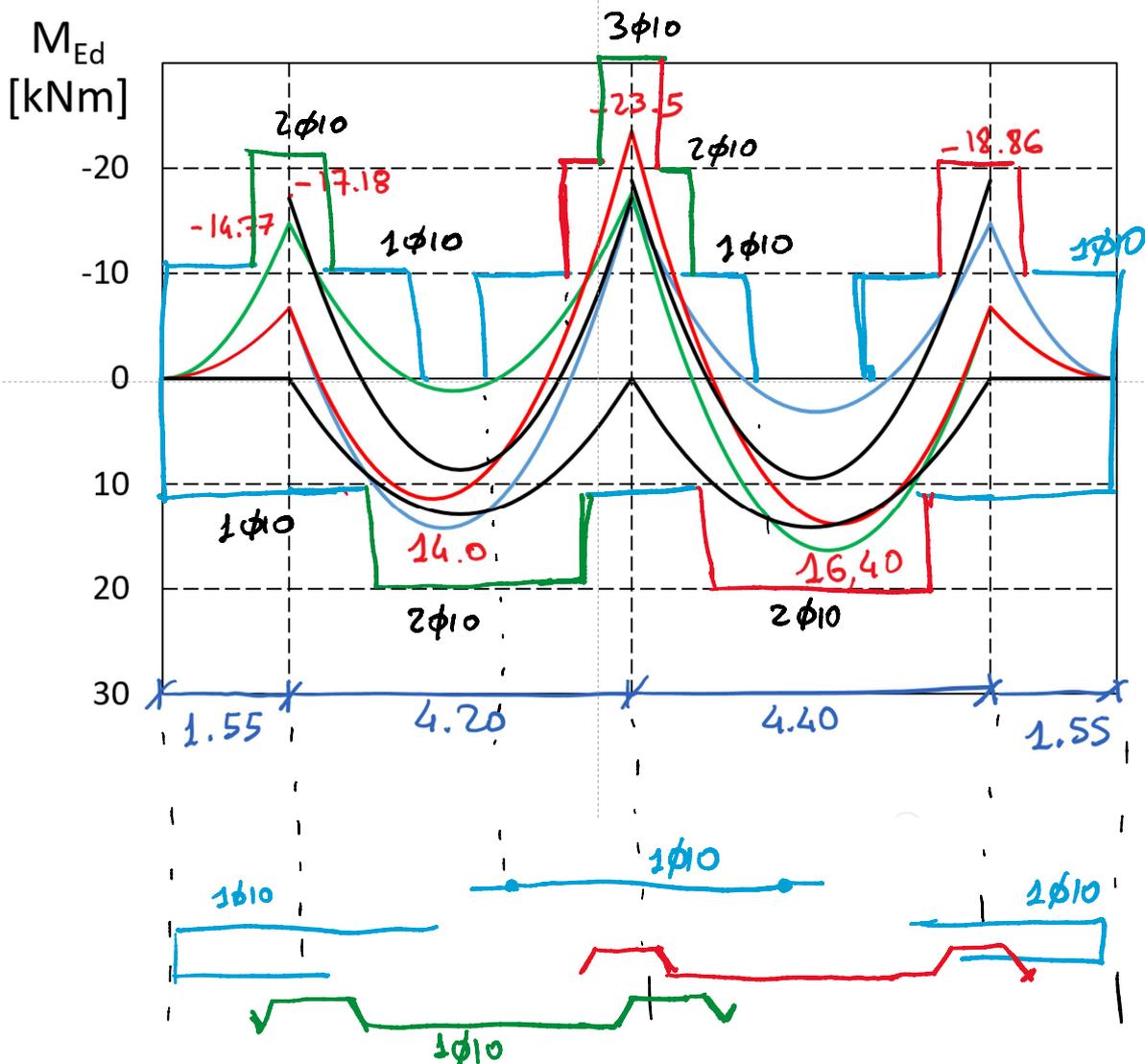
PRIMO APPAGGIO

giovedì 7 maggio 2020 15:38

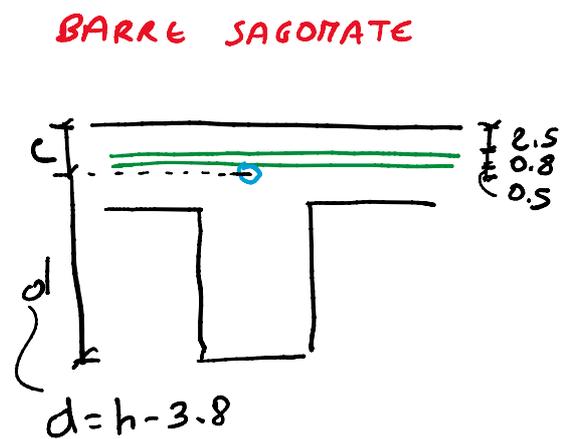
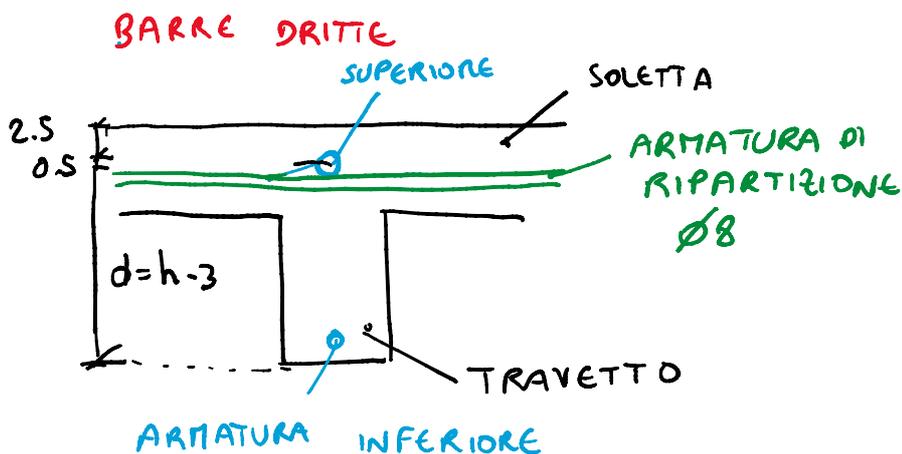


DISTINTA COMPLETA (SAGOMATI)

giovedì 7 maggio 2020 15:42

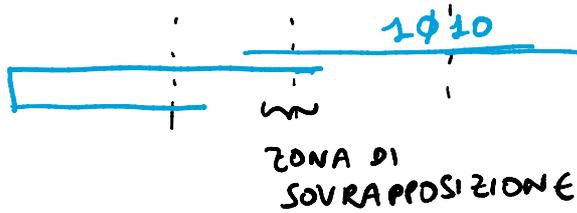
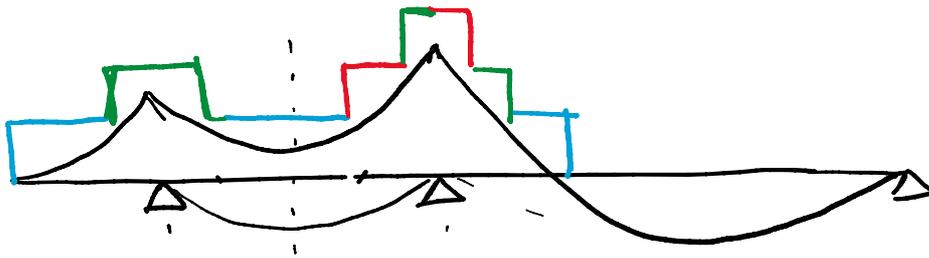


NOTA : PER ARMATURE CON SAGOMATI NEL CALCOLO DI d PER ARMATURE SUPERIORI ASSUMERE $h-4\text{cm}$



CASO PARTICOLARE CON MEDIO IN CAMPATA

giovedì 7 maggio 2020 15:53



← DISPOSIZIONE
ARMATURE SUPERIORI



NOTA : SE IN CAMPATA NON SONO NECESSARIE 2
BARRE L'UTILIZZO DI SAGOMATI NON E'
POSSIBILE (DEVO AVERE SEMPRE ALTIENO UNA
BARRA CHE RIMANE DRITTA)