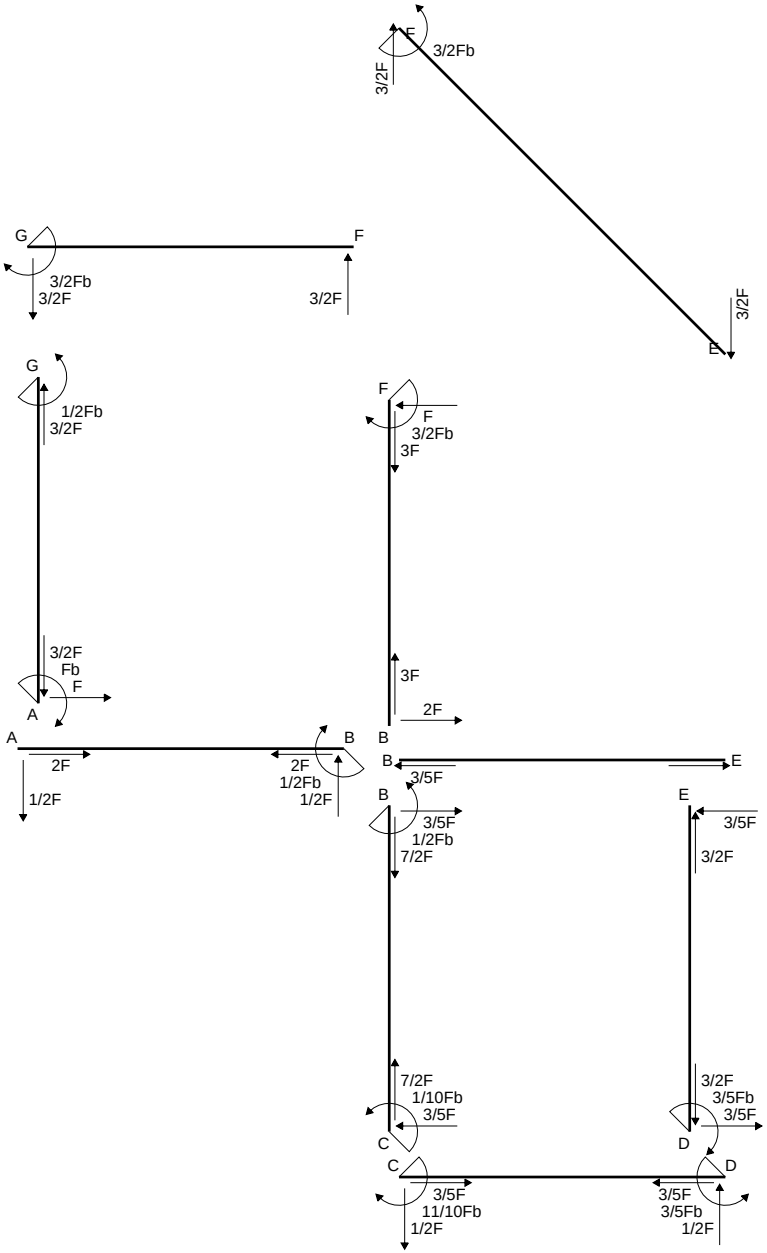
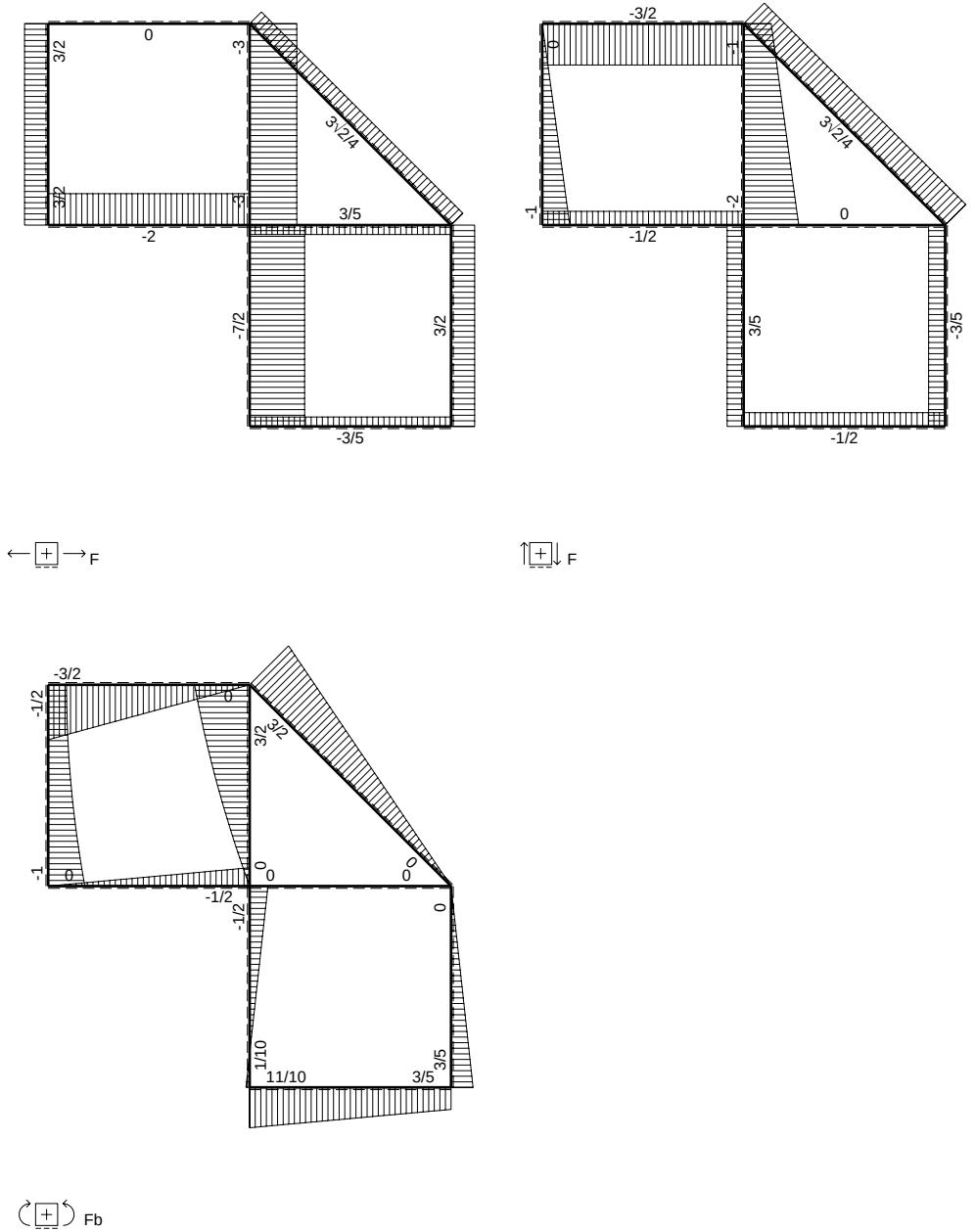
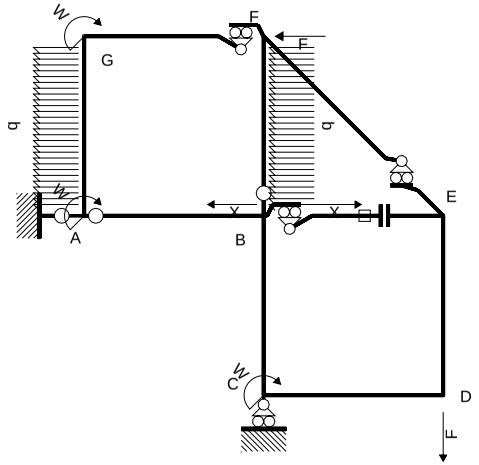
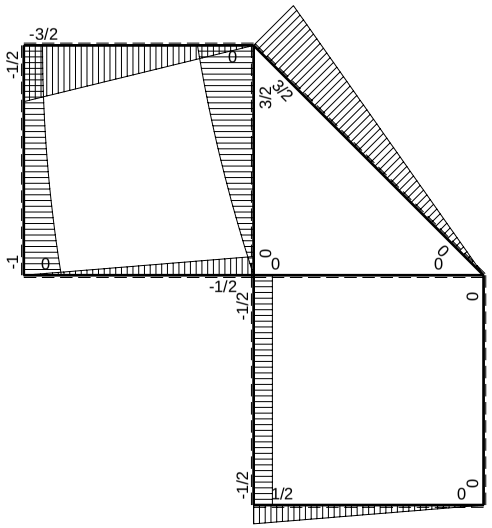

E
3/2Fb
3/2F
G
F
3/2Fb
3/2F
3/2F
E
G
1/2Fb
3/2F
F
F
3/2Fb
3F
3/2F
Fb
F
A
3F
2F
A
B
B
B
E
2F
2F
1/2Fb
1/2F
3/5F
1/2F
B
E
3/5F
3/5F
1/2Fb
7/2F
3/2F
7/2F
1/10Fb
3/5F
3/2F
3/5Fb
3/5F
C
D
C
D
3/5F
11/10Fb
1/2F
3/5F
3/5Fb
1/2F

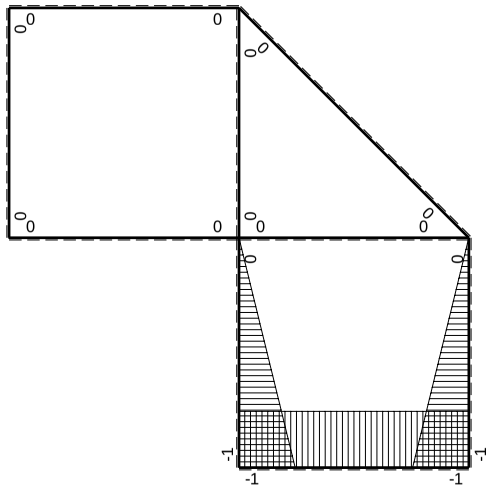

3/2
0
-3
3√2/4
3/2
-3
3/5
-2
-7/2
3/2
-3/5
F
-3/2
-1
0
-1
3√2/4
-1
-2
0
-1/2
3/5
-3/5
-1/2
F
-3/2
-1/2
0
3/2
3√2/2
-1
0
0
0
0
-1/2
-1/2
0
1/10
11/10
3/5
3/5
Fb



Schema di calcolo iperstatico



M_0 flessione da carichi assegnati



M_x flessione da iperstatica X=1

Quadro contributi PLV per iperstatica $X=H_{BE}$

→	$M_x(x)$	$M_o(x)$	M_xM_o	M_xM_x	$\int M_xM_o/EJdx$	$\int XM_xM_x/EJdx$
AB b	0	-1/2Fx	0	0	0	0
BA b	0	1/2Fb-1/2Fx	0	0		
BC b	-x	-1/2Fb	1/2Fbx	x^2	$1/4Fb^3/EJ$	$1/3Xb^3/EJ$
CB b	b-x	1/2Fb	$1/2Fb^2-1/2Fbx$	$b^2-2bx+x^2$		
CD b	-b	1/2Fb-1/2Fx	$-1/2Fb^2+1/2Fbx$	b^2	$-1/4Fb^3/EJ$	Xb^3/EJ
DC b	b	-1/2Fx	-1/2Fbx	b^2		
DE b	-b+x	0	0	$b^2-2bx+x^2$	0	$1/3Xb^3/EJ$
ED b	x	0	0	x^2		
EF √2b	0	3√2/4Fx	0	0	0	0
FG b	0	-3/2Fx	0	0	0	0
GF b	0	3/2Fb-3/2Fx	0	0		
GA b	0	$-1/2Fb-1/2qx^2$	0	0	0	0
AG b	0	$Fb-Fx+1/2qx^2$	0	0		
FB b	0	$3/2Fb-Fx-1/2qx^2$	0	0	0	0
BF b	0	$-2Fx+1/2qx^2$	0	0		
BE b	0	0	0	0	0	0
EB b	0	0	0	0		
BE	elongazione asta $N_{1BE}\varepsilon_{BE}L_{BE}$				Fb^3/EJ	
	totali				Fb^3/EJ	$5/3Xb^3/EJ$
	iperstatica $X=H_{BE}$				-3/5F	

Sviluppi di calcolo iperstatica

$$L^{XX}_{BC} = \int_o^b (x^2/b^2)\, b^2\, 1/EJ\, dx = \left[1/3\, x^3/b^2\right]_o^b b^2\, 1/EJ$$
$$= (1/3\, b)\, b^2\, 1/EJ = 1/3\ b^3/EJ$$

$$L^{XX}_{CB} = \int_o^b (1 - 2\, x/b + x^2/b^2)\, b^2\, 1/EJ\, dx = \left[\, x - x^2/b + 1/3\, x^3/b^2 \,\right]_o^b b^2\, 1/EJ$$
$$= (\, b - b + 1/3\, b\,)\, b^2\, 1/EJ = 1/3\ b^3/EJ$$

$$L^{XX}_{CD} = \int_o^b (1)\, b^2\, 1/EJ\, dx = \left[\, x \,\right]_o^b b^2\, 1/EJ$$
$$= (\, b\,)\, b^2\, 1/EJ = b^3/EJ$$

$$L^{XX}_{DC} = \int_o^b (1)\, b^2\, 1/EJ\, dx = \left[\, x \,\right]_o^b b^2\, 1/EJ$$
$$= (\, b\,)\, b^2\, 1/EJ = b^3/EJ$$

$$L^{XX}_{DE} = \int_o^b (1 - 2\, x/b + x^2/b^2)\, b^2\, 1/EJ\, dx = \left[\, x - x^2/b + 1/3\, x^3/b^2 \,\right]_o^b b^2\, 1/EJ$$
$$= (\, b - b + 1/3\, b\,)\, b^2\, 1/EJ = 1/3\ b^3/EJ$$

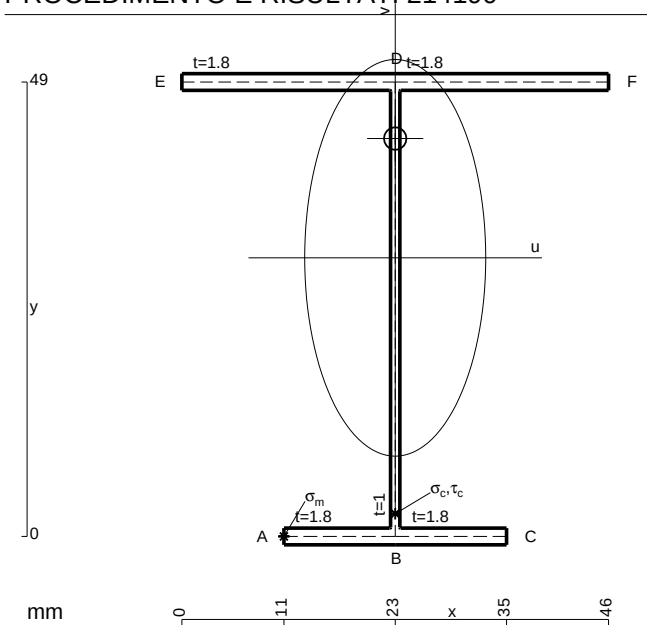
$$L^{XX}_{ED} = \int_o^b (x^2/b^2)\, b^2\, 1/EJ\, dx = \left[1/3\, x^3/b^2\right]_o^b b^2\, 1/EJ$$
$$= (1/3\, b)\, b^2\, 1/EJ = 1/3\ b^3/EJ$$

$$L^{Xo}_{BC} = \int_o^b (1/2\, x/b)\, Fb^2\, 1/EJ\, dx = \left[1/4\, x^2/b\right]_o^b Fb^2\, 1/EJ$$
$$= (1/4\, b)\, Fb^2\, 1/EJ = 1/4\ Fb^3/EJ$$

$$L^{Xo}_{CB} = \int_o^b (1/2 - 1/2\, x/b)\, Fb^2\, 1/EJ\, dx = \left[1/2\, x - 1/4\, x^2/b\right]_o^b Fb^2\, 1/EJ$$
$$= (1/2\, b - 1/4\, b)\, Fb^2\, 1/EJ = 1/4\ Fb^3/EJ$$

$$L^{Xo}_{CD} = \int_o^b (-1/2 + 1/2\, x/b)\, Fb^2\, 1/EJ\, dx = \left[-1/2\, x + 1/4\, x^2/b\right]_o^b Fb^2\, 1/EJ$$
$$= (-1/2\, b + 1/4\, b)\, Fb^2\, 1/EJ = -1/4\ Fb^3/EJ$$

$$L^{Xo}_{DC} = \int_o^b (-1/2\, x/b)\, Fb^2\, 1/EJ\, dx = \left[-1/4\, x^2/b\right]_o^b Fb^2\, 1/EJ$$
$$= (-1/4\, b)\, Fb^2\, 1/EJ = -1/4\ Fb^3/EJ$$



A = 175. mm^2
J_u = 80057. mm^4
J_v = 16674. mm^4
J_t = 152.4 mm^4
y_o = 12.86 mm
y_g = 30.04 mm
T_y = -765. N
M_x = -558450. Nmm
x_m = 11. mm
u_m = -12. mm
v_m = -30.04 mm
$\sigma_m = -Mv/J_u$ = -209.6 N/mm^2
x_c = 23. mm
v_c = -30.04 mm
$\sigma_c = -Mv/J_u$ = -209.6 N/mm^2
$\tau_c = TS^*/tJ_u$ = 12.4 N/mm^2
$\tau_g = TS^*/tJ_u$ = 12.4 N/mm^2
t_c = 510. mm
$\sigma_o = \sqrt{\sigma^2 + 3\tau^2}$ = 210.7 N/mm^2

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