

Rapporti di forma per il pre-dimensionamento strutturale di travi in acciaio: il caso dei profili europei a doppio T laminati a caldo con svergolamento impedito

Span-depth ratios for the preliminary sizing of steel beams: the case of european I&H shapes without lateral-torsional buckling

- Nomogrammi 2D & 3D

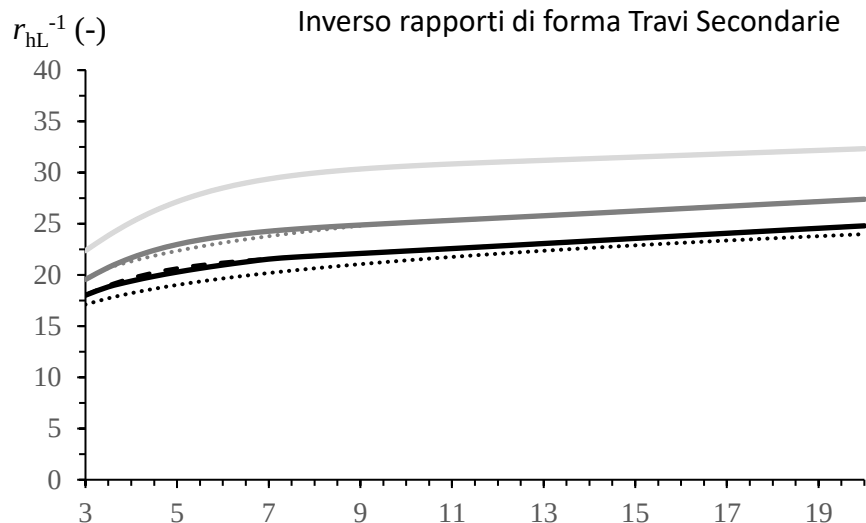


Figure aggiuntive non presenti nell'articolo

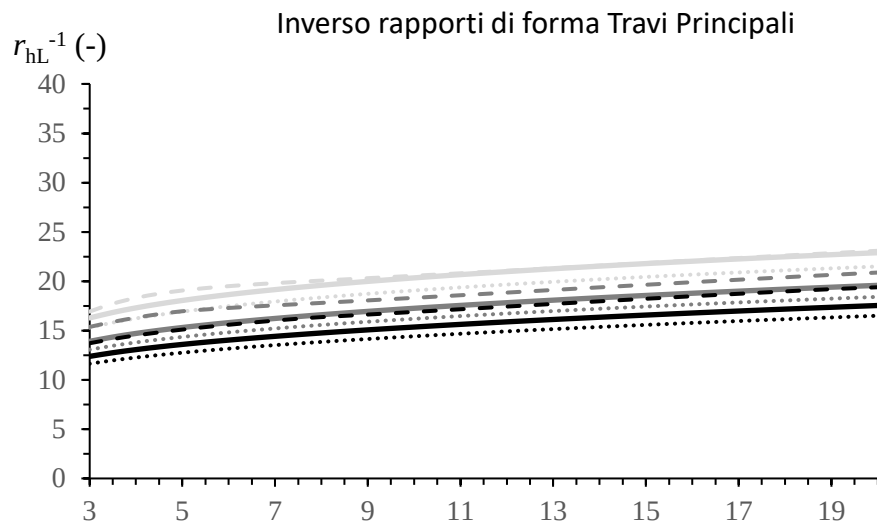
Nomogrammi 2D e 3D

Travi in acciaio con profili IPE

Nomogrammi 2D dei rapporti di forma di travi IPE in semplice appoggio appartenenti ad impalcati di calpestio (vedi Fig. 12)



- iTs=1m S235
- iTs=1m S275
- - - iTs=1m S355, S420, S460
- iTs=2m S235
- iTs=2m S275
- - - iTs=2m S355, S420, S460
- iTs=3m S235
- iTs=3m S275
- - - iTs=3m S355, S420, S460

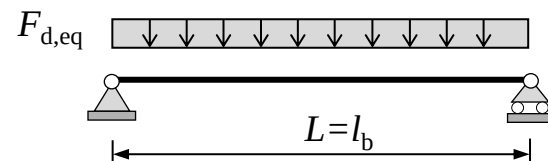


- iTp=4m S235
- iTp=4m S275
- - - iTp=4m S355, S420, S460
- iTp=6m S235
- iTp=6m S275
- - - iTp=6m S355, S420, S460
- iTp=8m S235
- iTp=8m S275
- - - iTp=8m S355, S420, S460

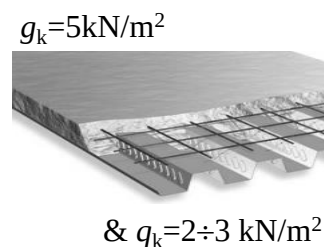
Rapporto di forma $r_{hL} = \frac{h}{L}$

Tipologia sezione IPE

Modello analitico strutturale:
Trave app.-app.

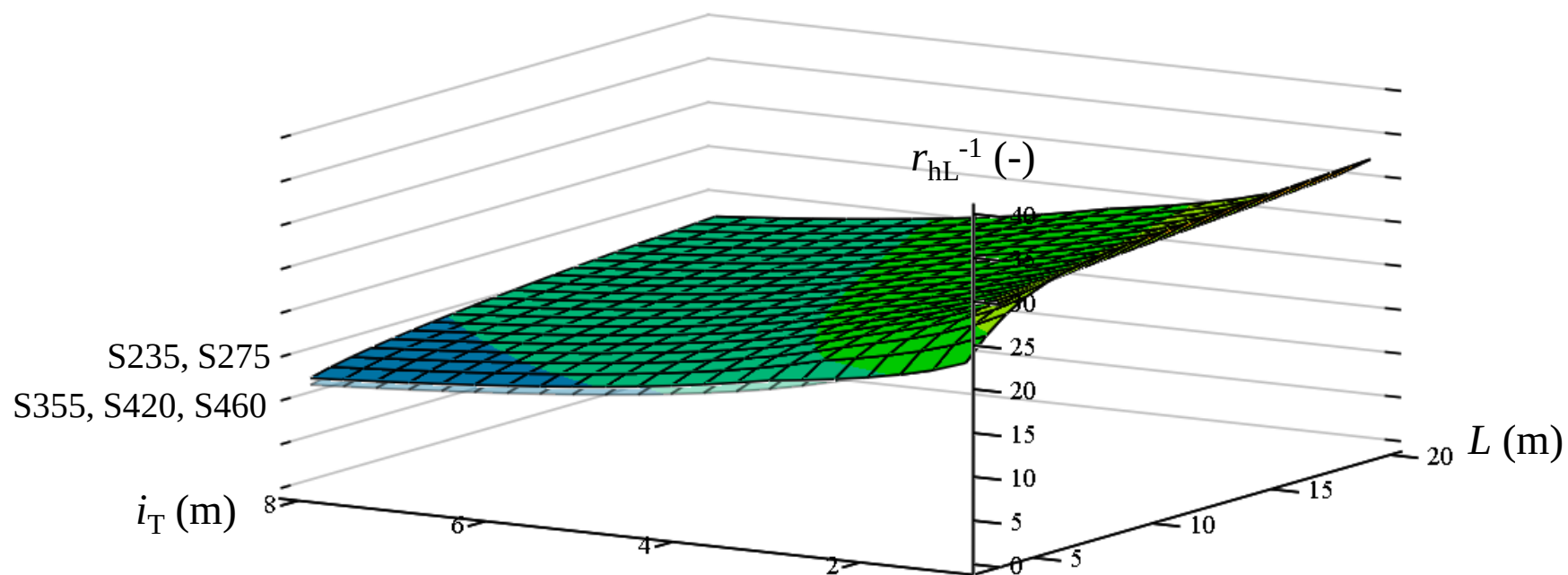


Tipo di impalcato e Carichi unitari

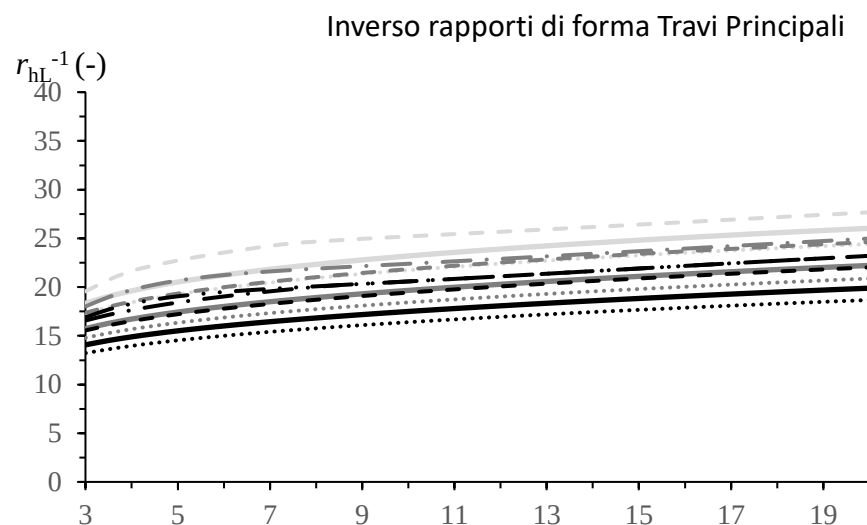
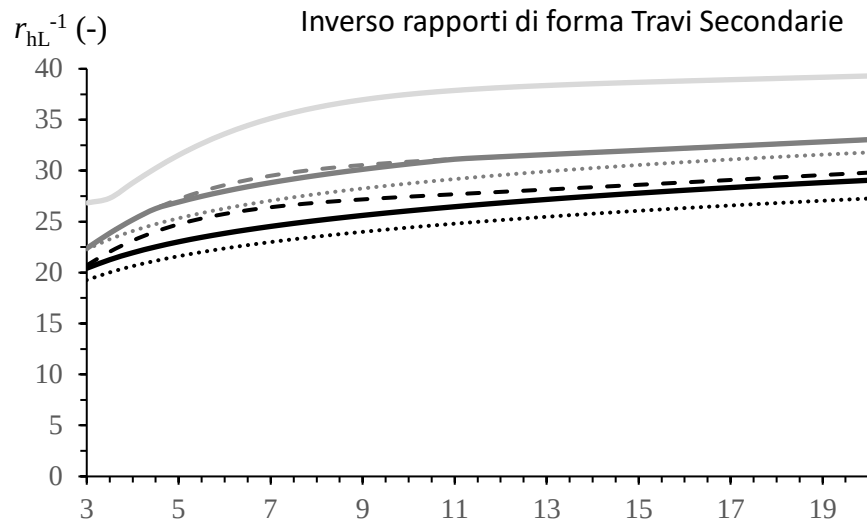




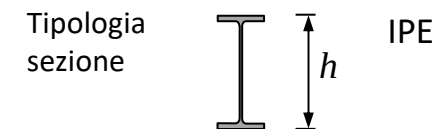
Nomogrammi 3D dei rapporti di forma di travi IPE in semplice appoggio appartenenti ad impalcati di calpestio



Nomogrammi 2D dei rapporti di forma di travi IPE continue o con appoggi cedevoli appartenenti ad impalcati di calpestio (vedi Fig. 13)

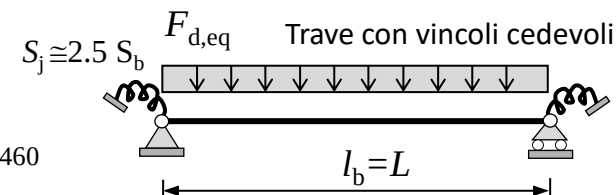
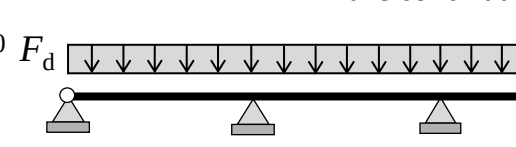


Rapporto di forma $r_{hL} = \frac{h}{L}$

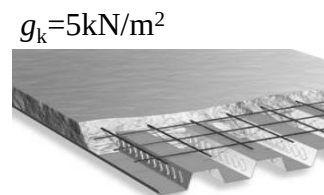


Modello analitico strutturale:

Trave continua



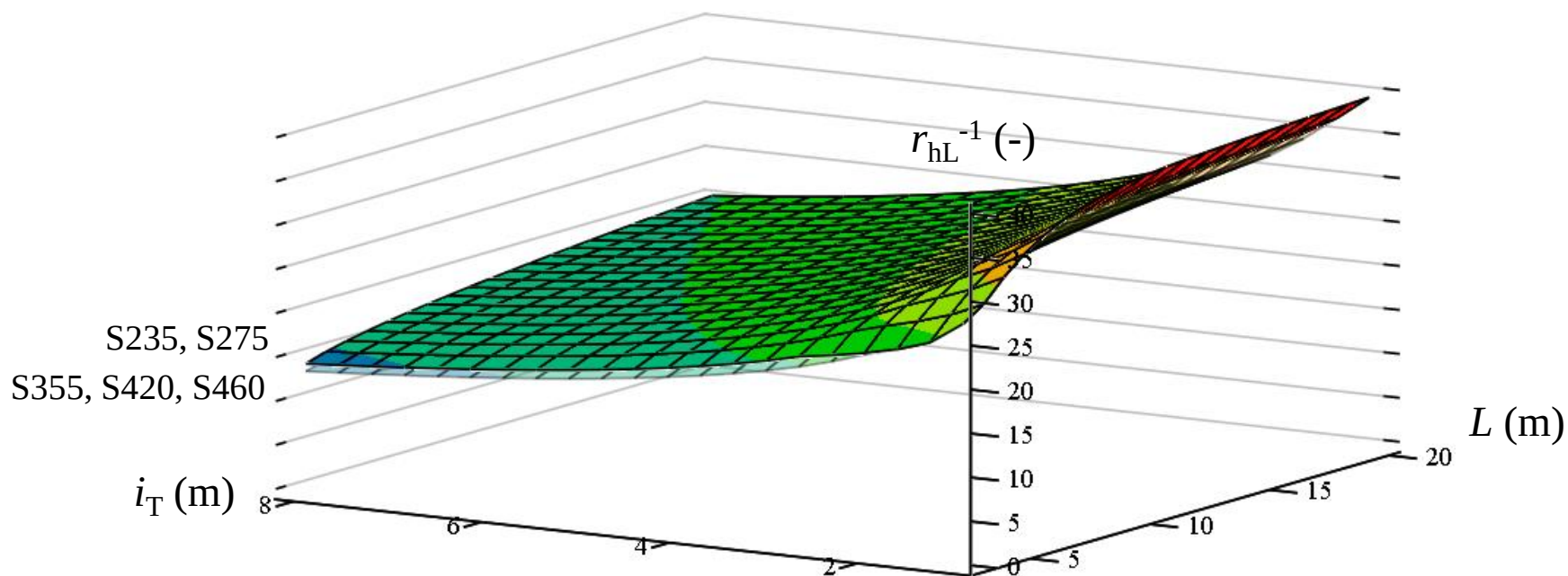
Tipo di impalcato e Carichi unitari



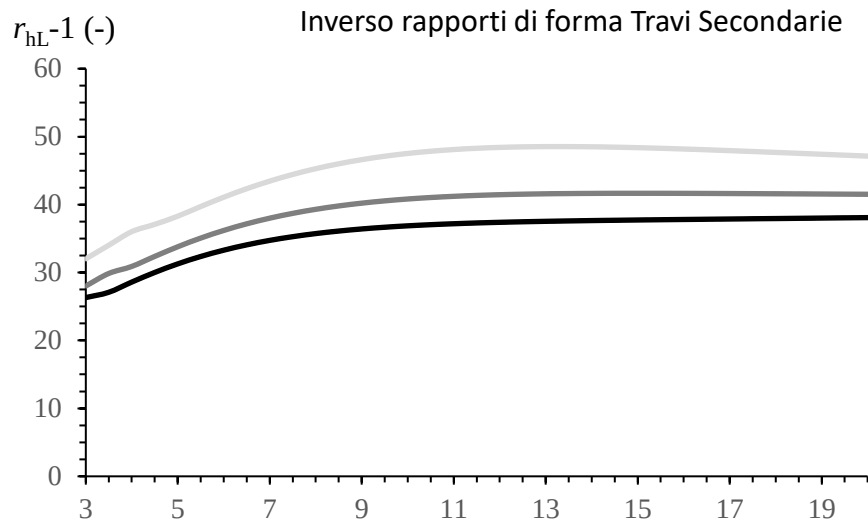
& $q_k = 2 \div 3 \text{ kN/m}^2$



Nomogrammi 3D dei rapporti di forma di travi IPE continue o con appoggi cedevoli appartenenti ad impalcati di calpestio



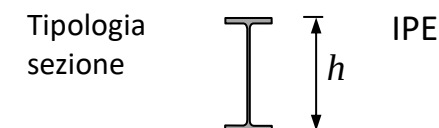
Nomogrammi 2D dei rapporti di forma di travi IPE in semplice appoggio appartenenti ad impalcati di copertura (a secco) (vedi Fig. 14)



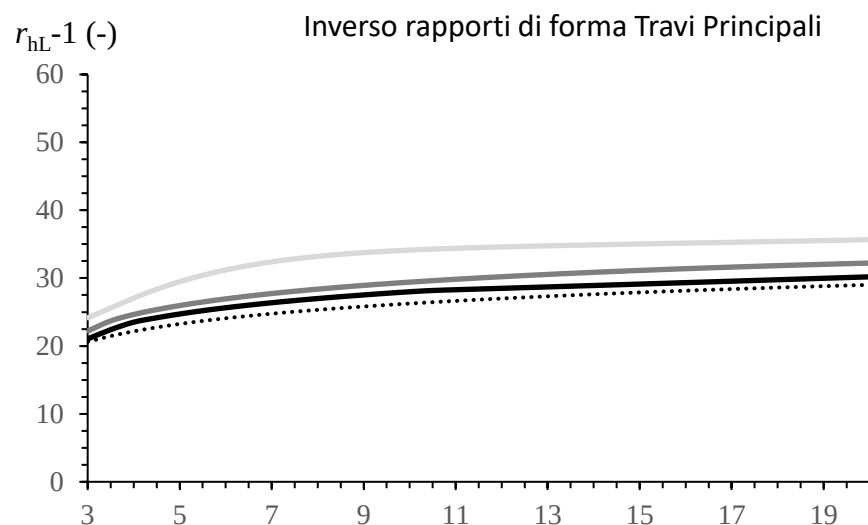
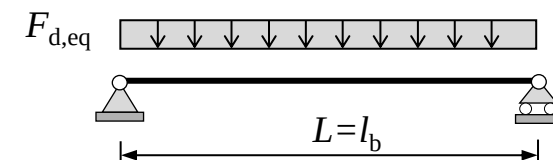
- iTs=1m S235
- iTs=1m S275
- - - iTs=1m S355, S420, S460
- iTs=2m S235
- iTs=2m S275
- - - iTs=2m S355, S420, S460
- iTs=3m S235
- iTs=3m S275
- - - iTs=3m S355, S420, S460

Rapporto di forma

$$r_{hL} = \frac{h}{L}$$

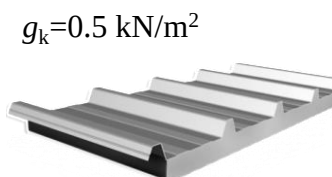


Modello analitico strutturale:
Trave app.-app.



- iTp=4m S235
- iTp=4m S275
- - - iTp=4m S355, S420, S460
- iTp=6m S235
- iTp=6m S275
- - - iTp=6m S355, S420, S460
- iTp=8m S235
- iTp=8m S275
- - - iTp=8m S355, S420, S460

Tipo di impalcato e
Carichi unitari

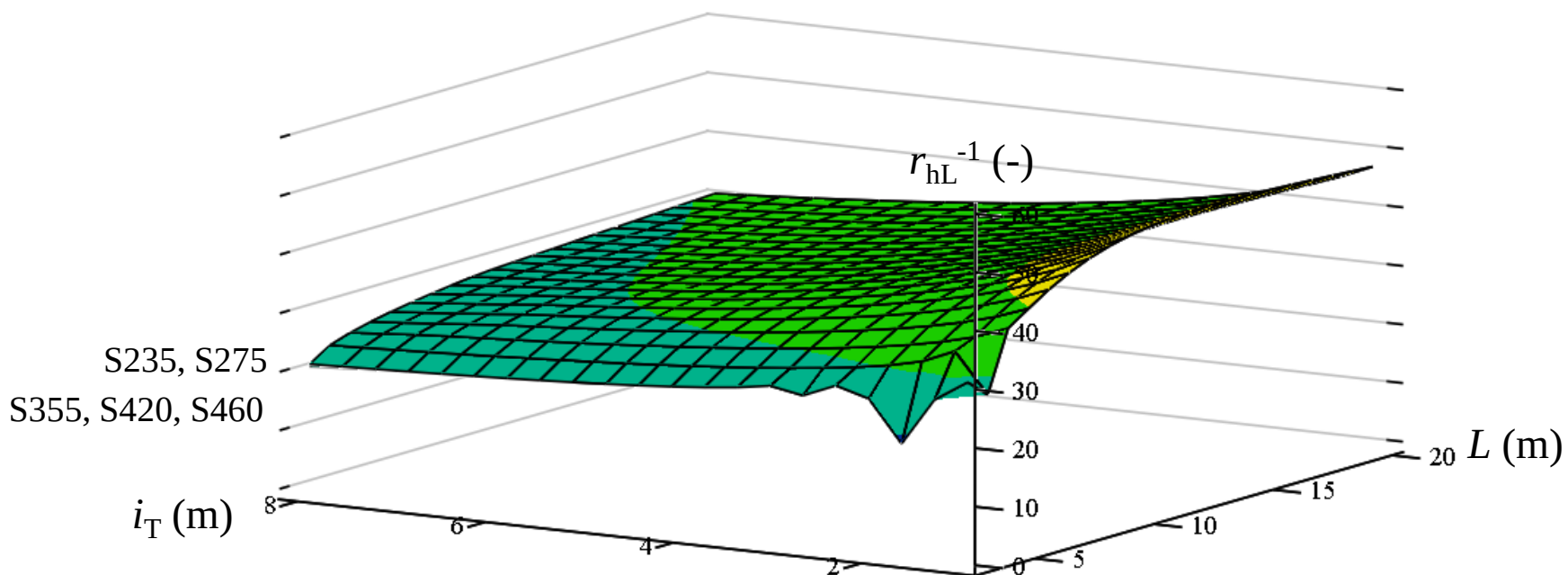


$$g_k = 0.5 \text{ kN/m}^2$$

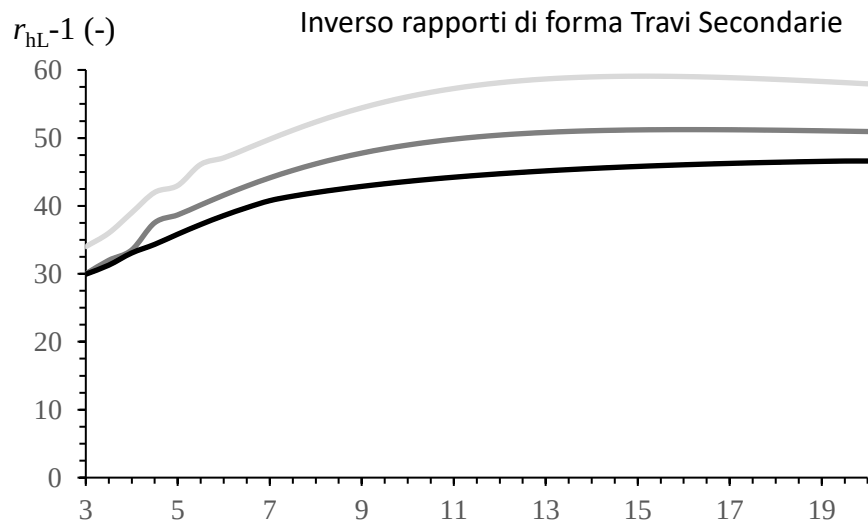
$$\& q_k = 1 \div 1.5 \text{ kN/m}^2$$



Nomogrammi 3D dei rapporti di forma di travi IPE in semplice appoggio appartenenti ad impalcati di copertura (a secco)

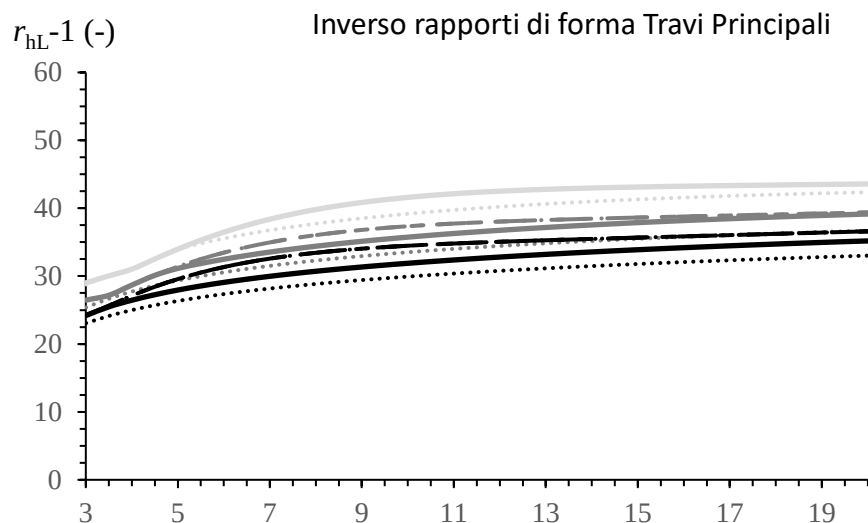


Nomogrammi 2D dei rapporti di forma di travi IPE continue o con appoggi cedevoli appartenenti ad impalcati di copertura (a secco) (vedi Fig. 15)



- iTs=1m S235
- iTs=1m S275
- - - iTs=1m S355, S420, S460
- iTs=2m S235
- iTs=2m S275
- - - iTs=2m S355, S420, S460
- iTs=3m S235
- iTs=3m S275
- - - iTs=3m S355, S420, S460

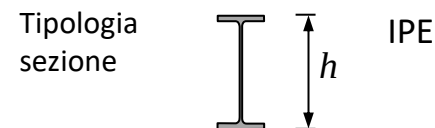
L (m)



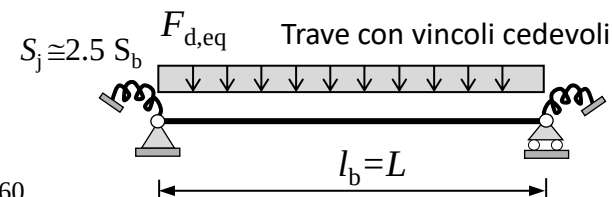
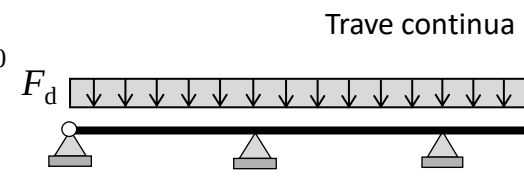
- iTp=4m S235
- iTp=4m S275
- - - iTp=4m S355, S420, S460
- iTp=6m S235
- iTp=6m S275
- - - iTp=6m S355, S420, S460
- iTp=8m S235
- iTp=8m S275
- - - iTp=8m S355, S420, S460

L (m)

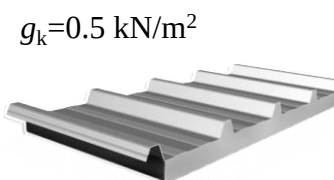
Rapporto di forma $r_{hL} = \frac{h}{L}$



Modello analitico strutturale:



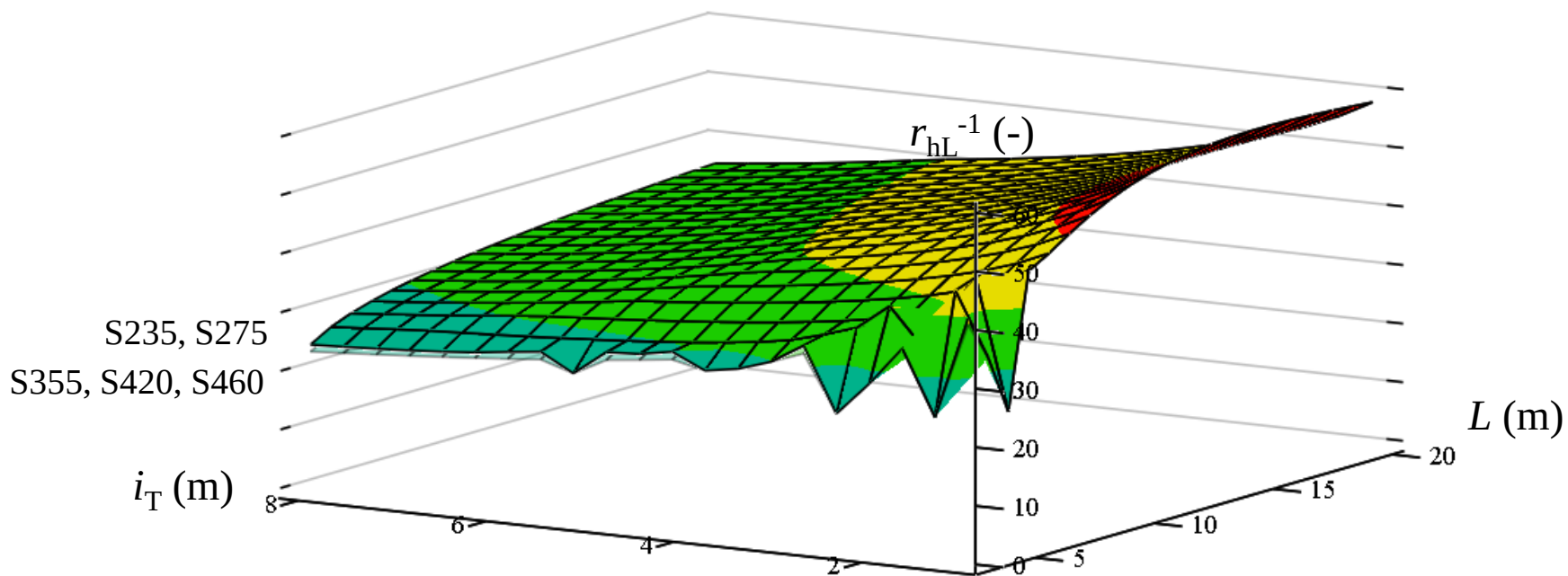
Tipo di impalcato e Carichi unitari



$g_k = 0.5 \text{ kN/m}^2$
& $q_k = 1 \div 1.5 \text{ kN/m}^2$



Nomogrammi 3D dei rapporti di forma di travi IPE continue o con appoggi cedevoli appartenenti ad impalcati di copertura (a secco)

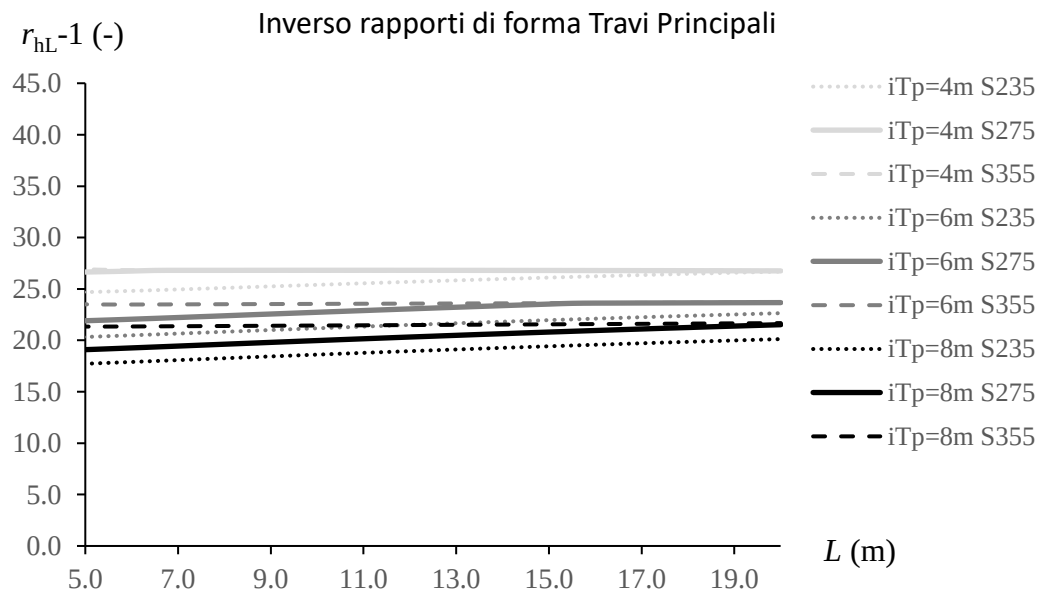
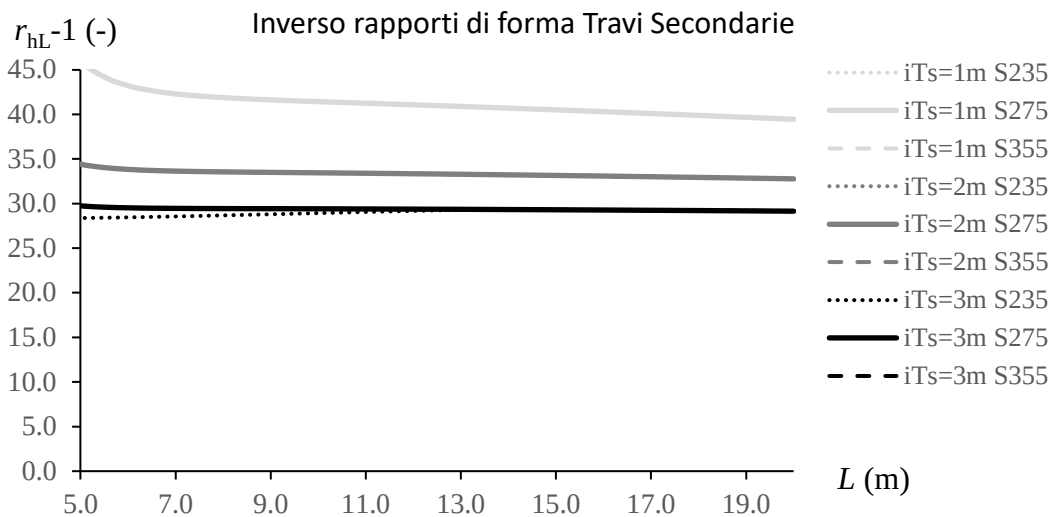


Nomogrammi 2D e 3D

Travi composte acciaio calcestruzzo con
profili IPE

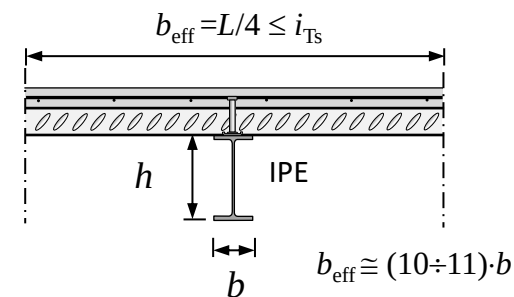


Nomogrammi 2D dei rapporti di forma per travi scomposte acciaio-calcestruzzo a completo ripristino generate da profili IPE ed appartenenti ad impalcati di calpestio (schema in semplice appoggio)

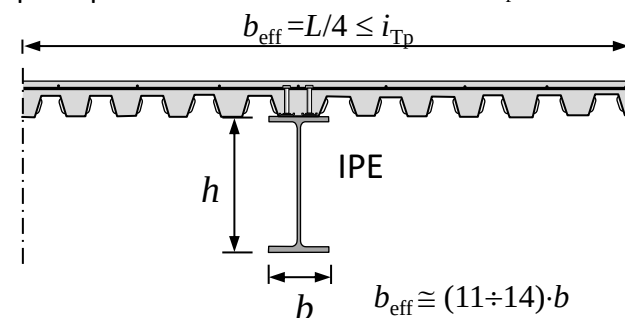


Rapporto di forma $r_{hL} = \frac{h}{L}$

Lamiera grecata disposta trasversalmente alle travi secondarie con una fila di connettori $n_r=1$

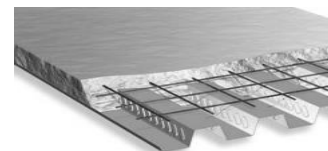


Lamiera grecata disposta longitudinalmente alle travi principali con due file di connettori $n_r=2$



Tipo di impalcato e Carichi unitari

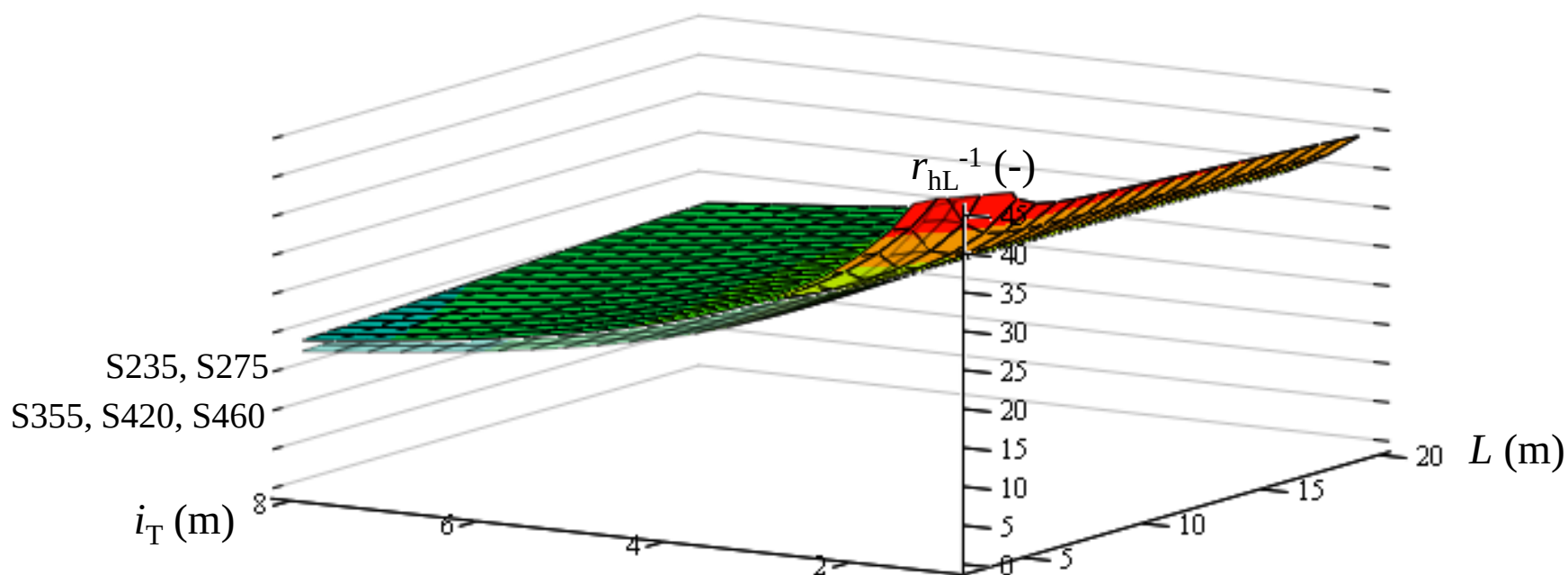
$$g_k=5\text{kN/m}^2$$



$$\& q_k=2\div3\text{ kN/m}^2$$

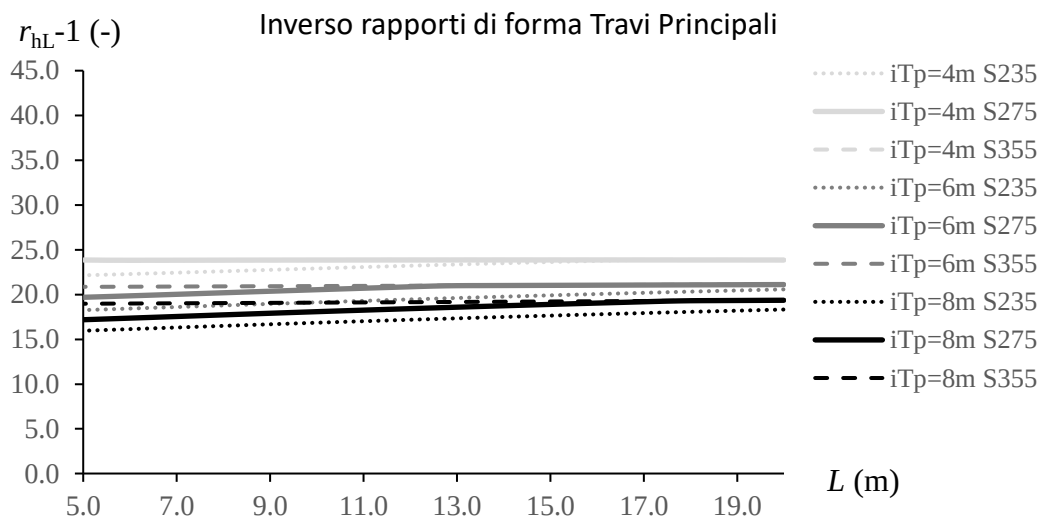
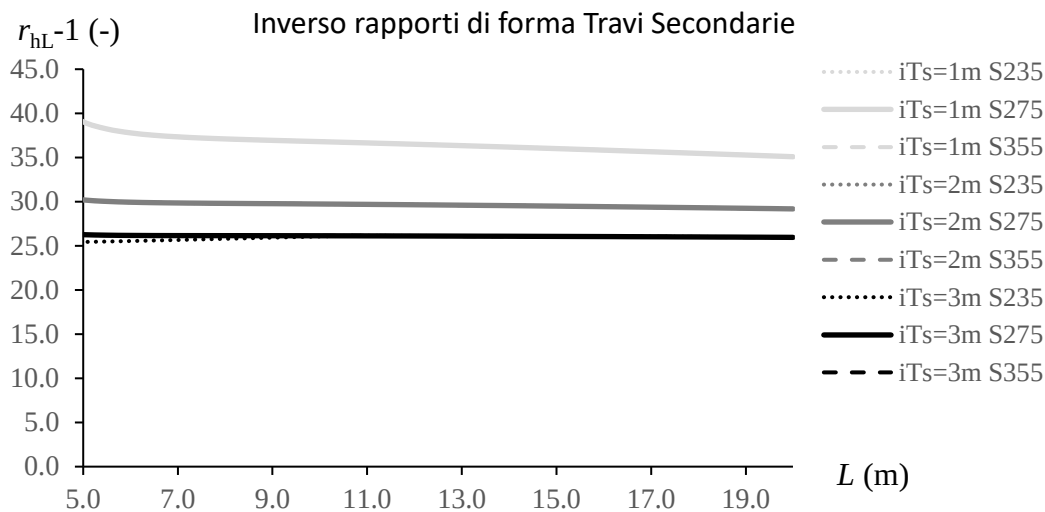


Nomogrammi 3D dei rapporti di forma per travi scomposte acciaio-calcestruzzo a completo ripristino generate da profili IPE ed appartenenti ad impalcati di calpestio (schema in semplice appoggio)



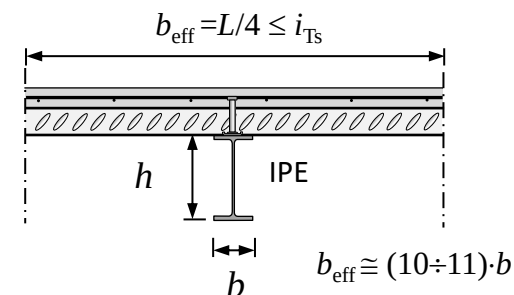


Nomogrammi 2D dei rapporti di forma per travi secondarie composte acciaio-calcestruzzo a parziale ripristino generate da profili IPE ed appartenenti ad impalcati di calpestio (schema in semplice appoggio)

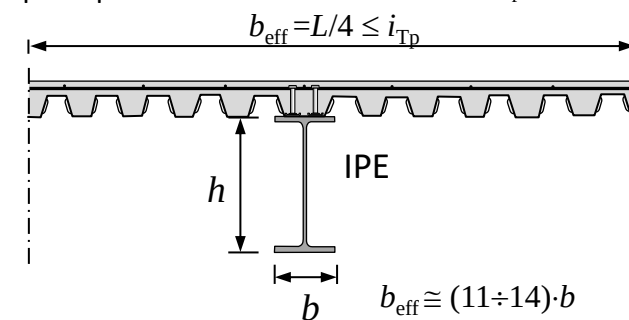


Rapporto di forma $r_{hL} = \frac{h}{L}$

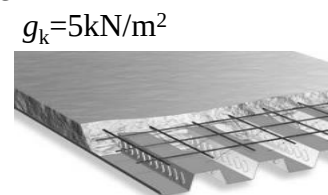
Lamiera grecata disposta trasversalmente alle travi secondarie con una fila di connettori $n_r=1$



Lamiera grecata disposta longitudinalmente alle travi principali con due file di connettori $n_r=2$



Tipo di impalcato e Carichi unitari

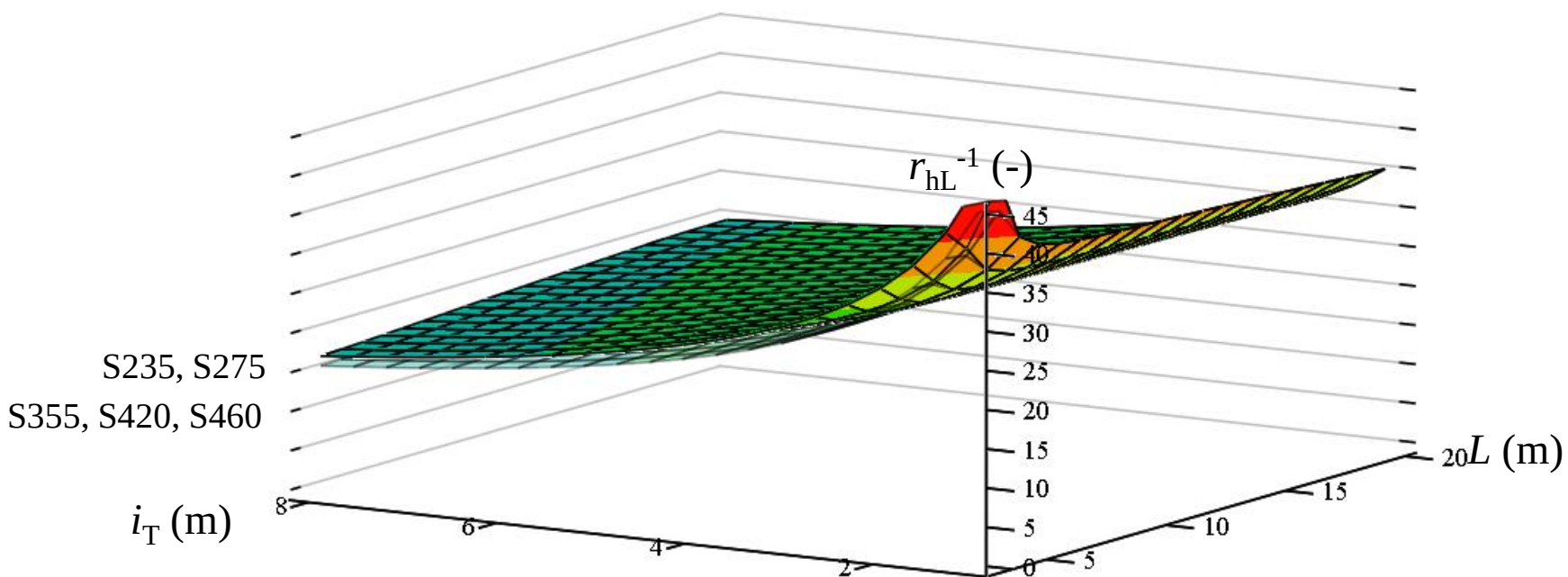


$g_k=5kN/m^2$

& $q_k=2÷3 kN/m^2$



Nomogrammi 3D dei rapporti di forma per travi secondarie composte acciaio-calcestruzzo a parziale ripristino generate da profili IPE ed appartenenti ad impalcati di calpestio (schema in semplice appoggio)

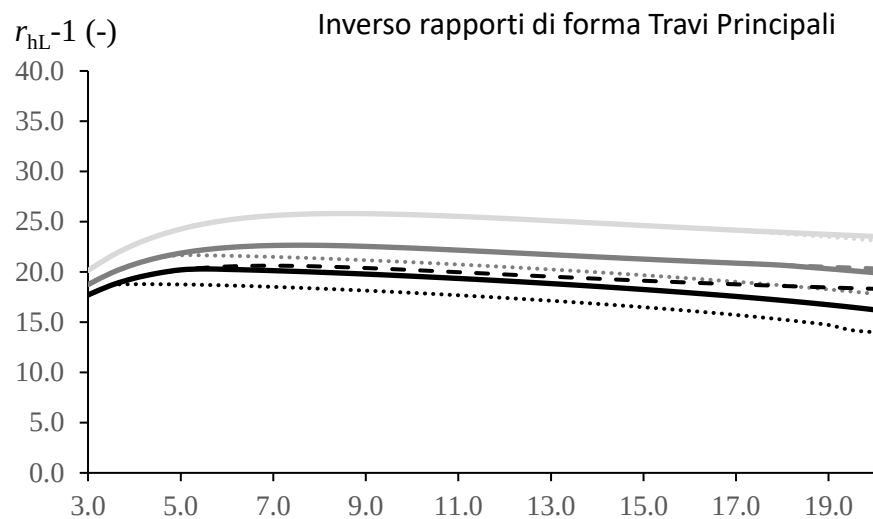
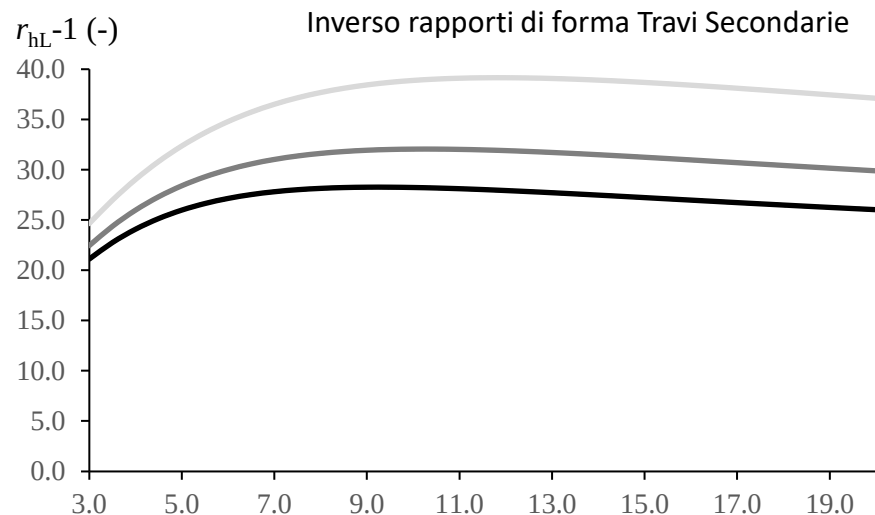


Nomogrammi 2D e 3D

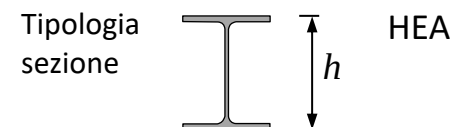
Travi in acciaio con profili HE-A



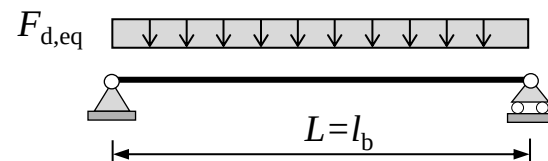
Nomogrammi 2D dei rapporti di forma di travi HEA in semplice appoggio appartenenti ad impalcati di calpestio



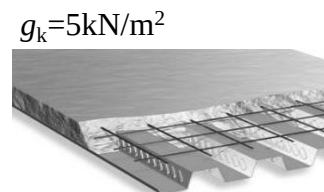
Rapporto di forma $r_{hL} = \frac{h}{L}$



Modello analitico strutturale:
Trave app.-app.



Tipo di impalcato e
Carichi unitari

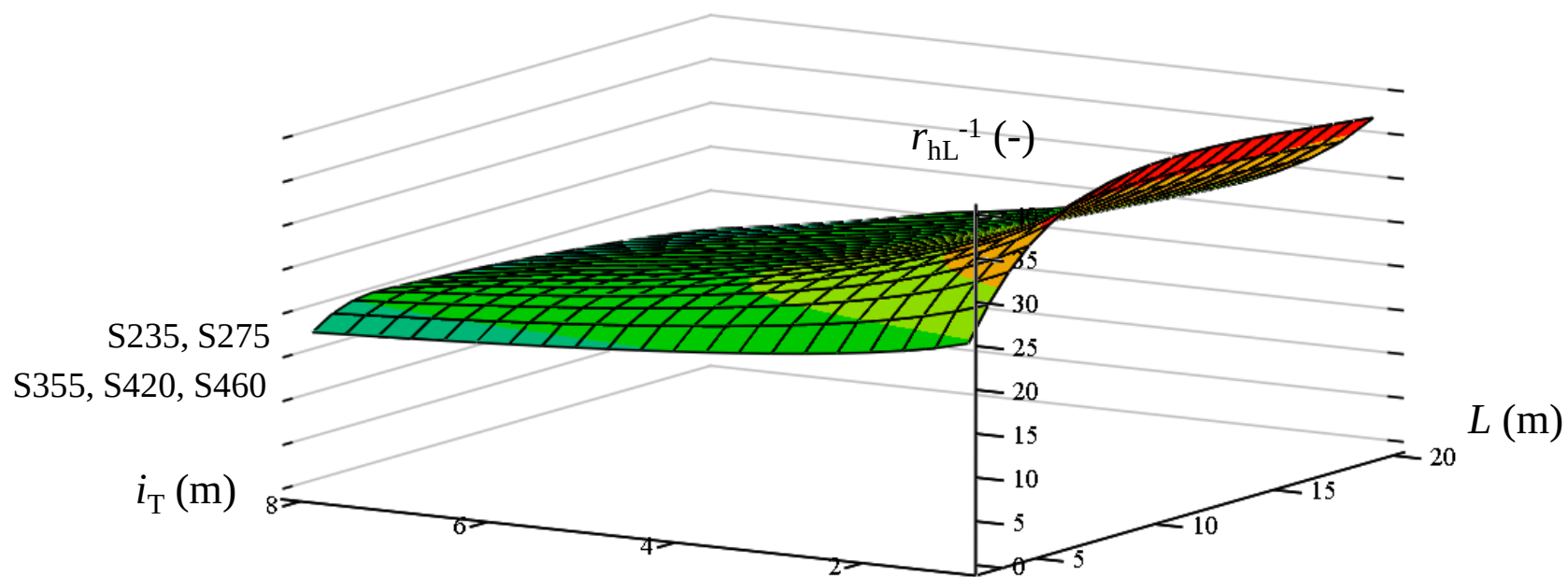


$g_k=5kN/m^2$

& $q_k=2\div3 kN/m^2$

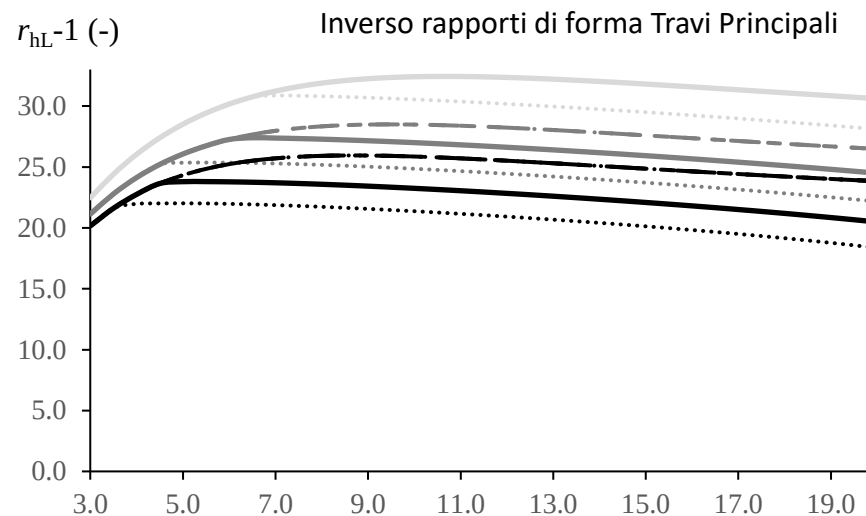
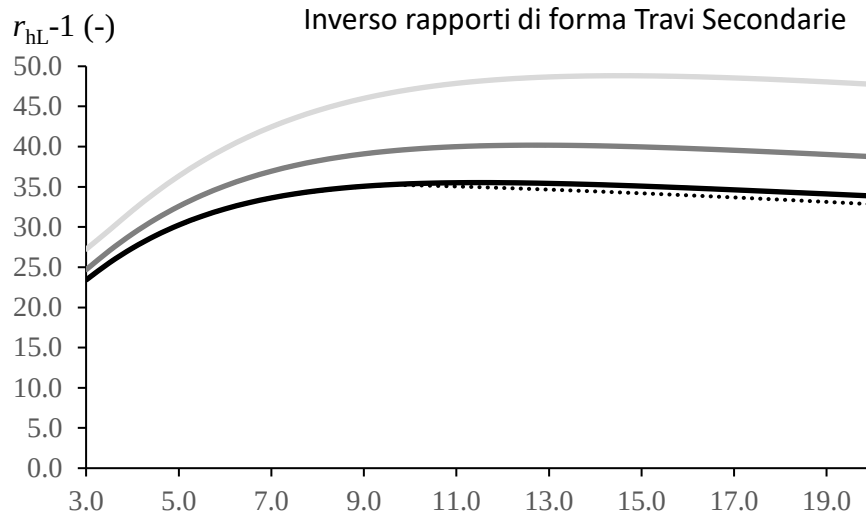


Nomogrammi 3D dei rapporti di forma di travi HEA in semplice appoggio appartenenti ad impalcati di calpestio

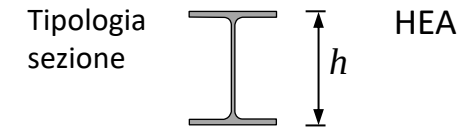




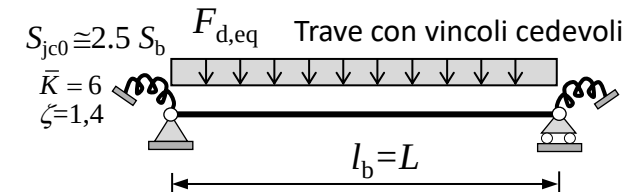
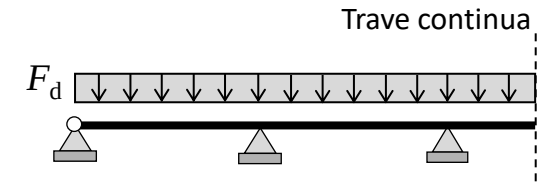
Nomogrammi 2D dei rapporti di forma di travi HEA continue o con appoggi cedevoli appartenenti ad impalcati di calpestio



Rapporto di forma $r_{hL} = \frac{h}{L}$



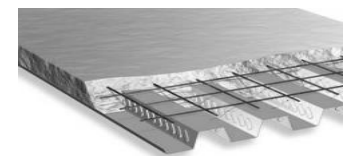
Modello analitico strutturale:



$$S_{jc} = \bar{K} \cdot \left(\frac{1}{1+\zeta} \right) \cdot E \cdot K_b \quad \zeta = \frac{K_b}{K_c} = \frac{I_b \cdot L_c}{I_c \cdot L_b}$$

Tipo di impalcato e Carichi unitari

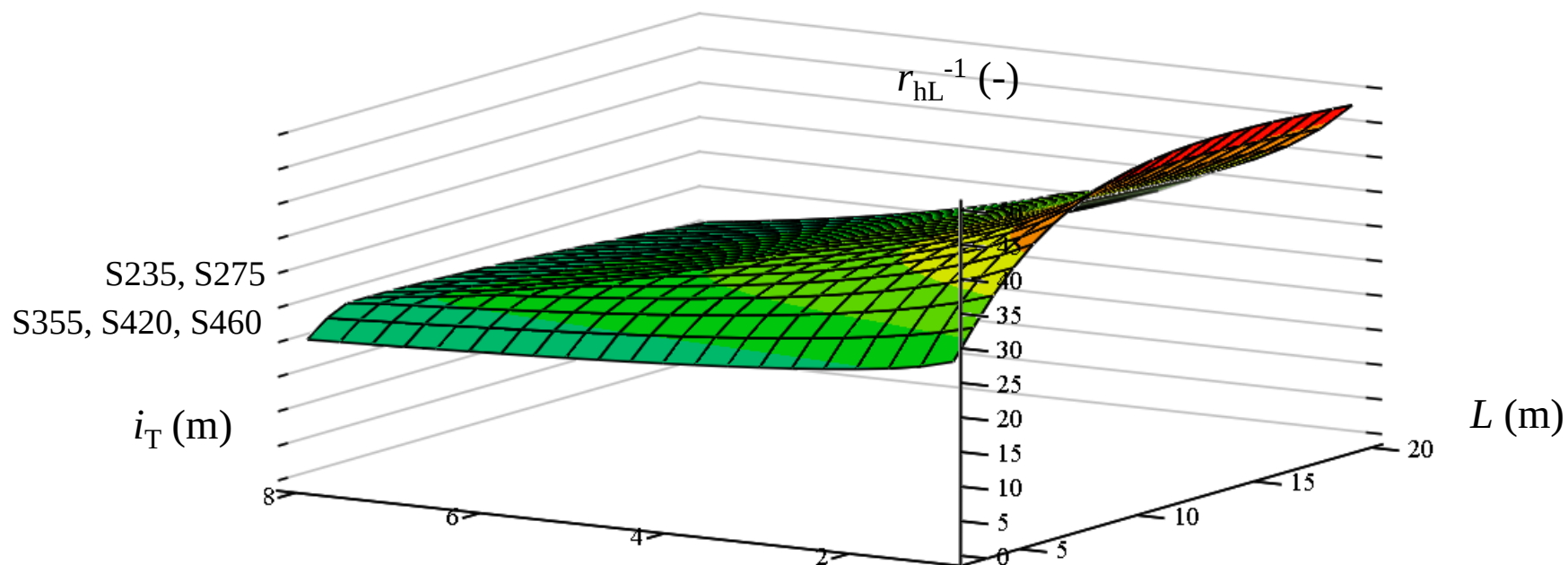
$g_k = 5 \text{ kN/m}^2$



& $q_k = 2 \div 3 \text{ kN/m}^2$

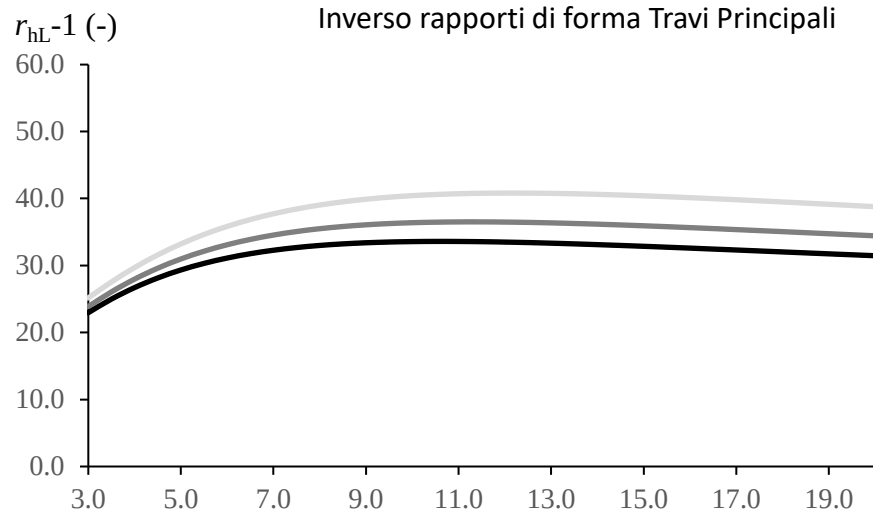
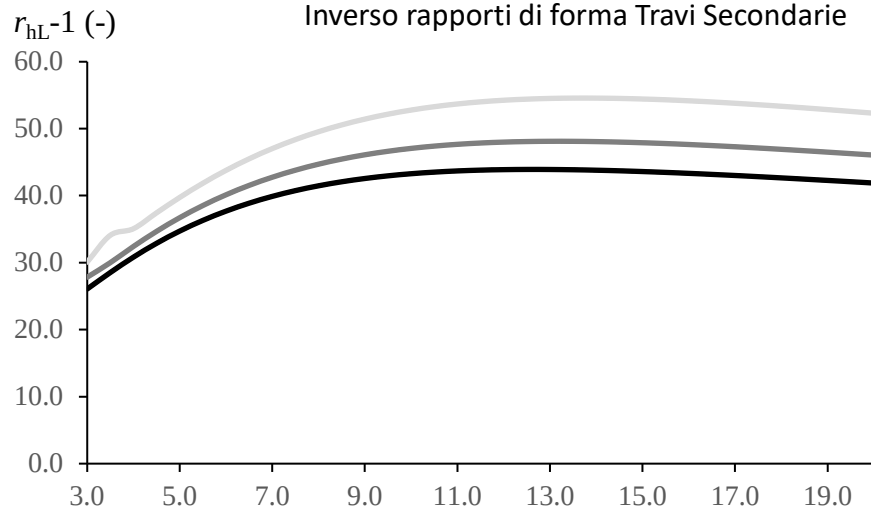


Nomogrammi 3D dei rapporti di forma di travi HEA continue o con appoggi cedevoli appartenenti ad impalcati di calpestio

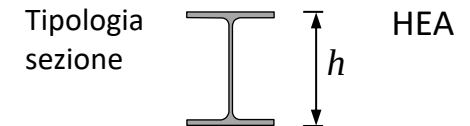




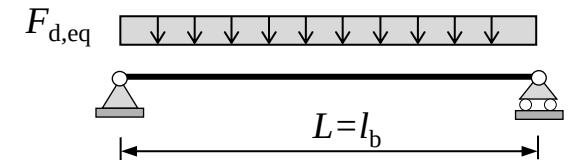
Nomogrammi 2D dei rapporti di forma di travi HEA in semplice appoggio appartenenti ad impalcati di coperture (a secco)



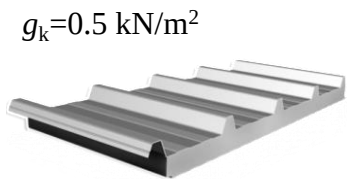
Rapporto di forma $r_{hL} = \frac{h}{L}$



Modello analitico strutturale:
Trave app.-app.



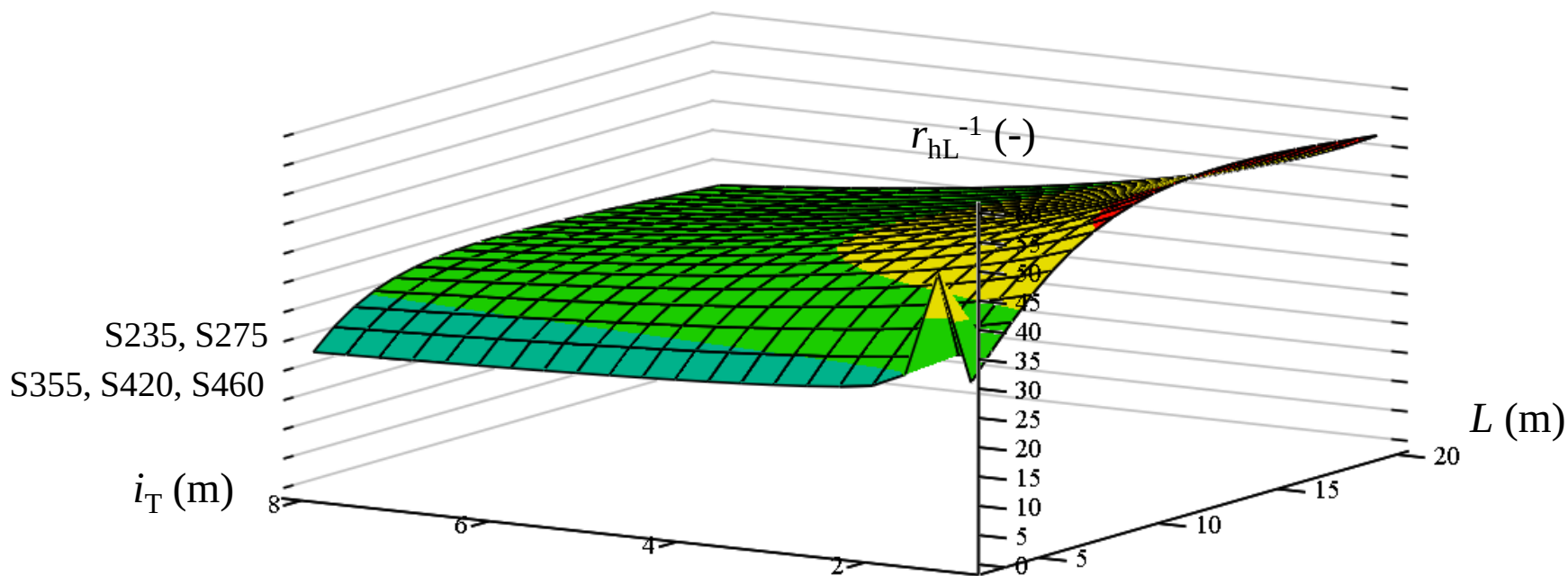
Tipo di impalcato e
Carichi unitari



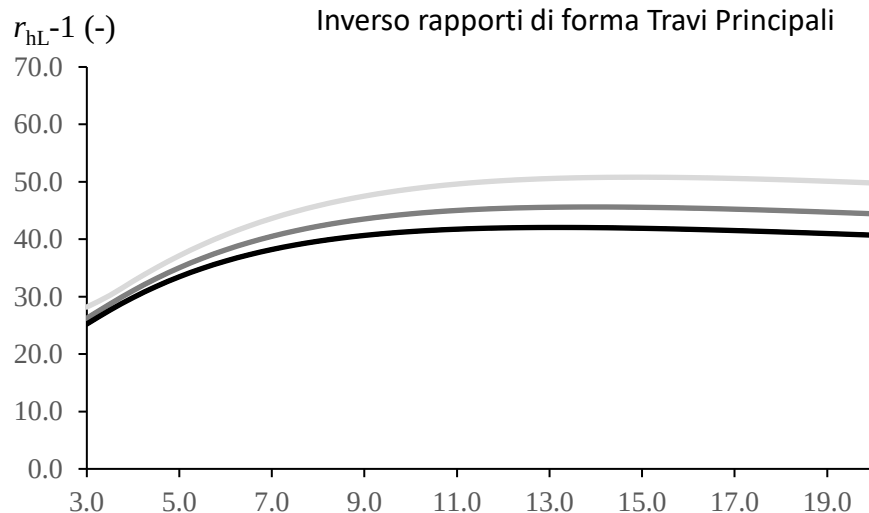
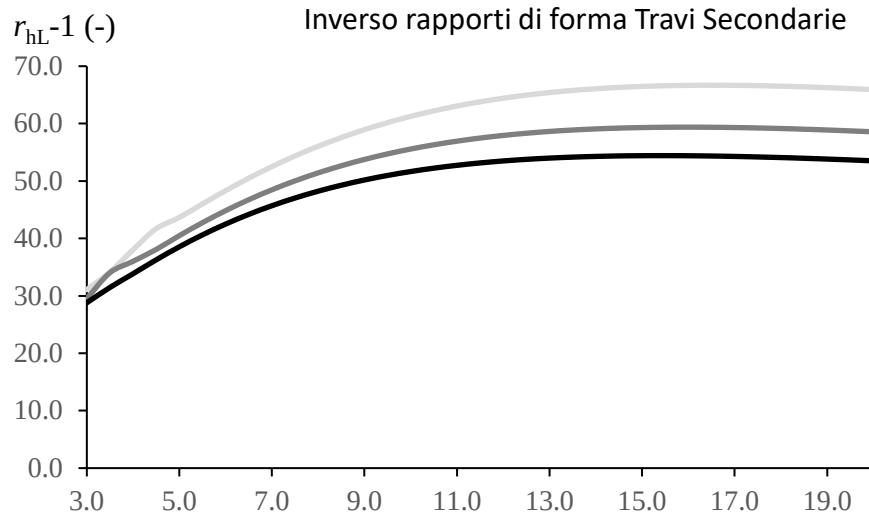
$g_k=0.5 \text{ kN/m}^2$
& $q_k=1\div 1.5 \text{ kN/m}^2$



Nomogrammi 3D dei rapporti di forma di travi HEA in semplice appoggio appartenenti ad impalcati di copertura (a secco)

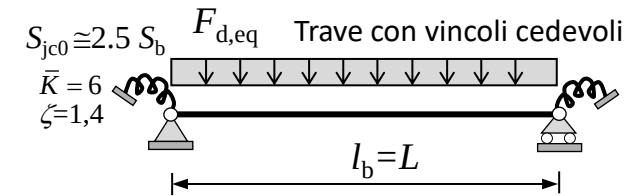
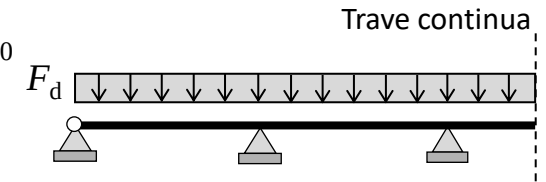


Nomogrammi 2D dei rapporti di forma di travi HEA continue o con appoggi cedevoli appartenenti ad impalcati di copertura (a secco)



Rapporto di forma $r_{hL} = \frac{h}{L}$

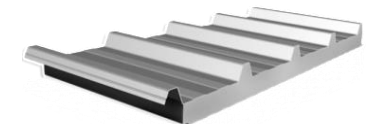
Tipologia sezione		HEA
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$$S_{jc} = \bar{K} \cdot \left(\frac{1}{1 + \zeta} \right) \cdot \overbrace{E \cdot K_b}^b \zeta = \frac{K_b}{K_c} = \frac{I_b \cdot L_c}{I_c \cdot L_b}$$

Tipo di impalcato e
Carichi unitari

$$g_k=0.5 \text{ kN/m}^2$$



$$\& q_k=1\div 1.5 \text{ kN/m}^2$$



Nomogrammi 3D dei rapporti di forma di travi HEA continue o con appoggi cedevoli appartenenti ad impalcati di copertura (a secco)

