

Container Bridge

FOUNDAMENTALS OF STRUCTURAL ANALYSIS

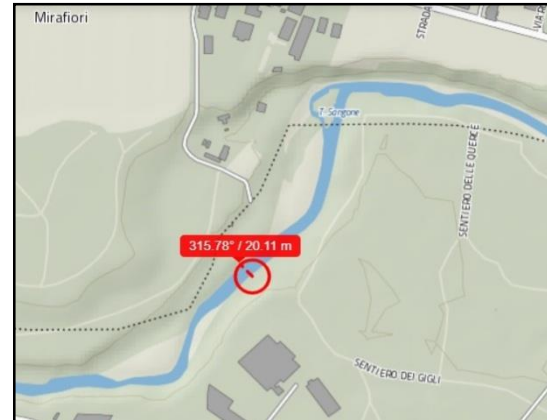
Adrianna Antonkiewicz, Yasemin Kavci, Mahtab Kianfar, Turkan Tezcan

Location

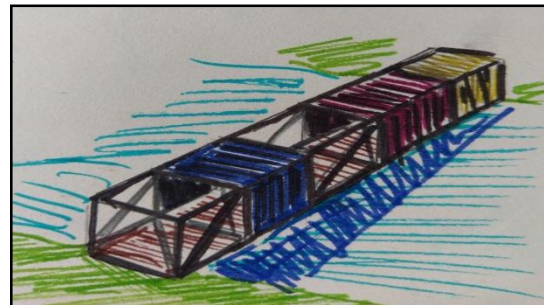
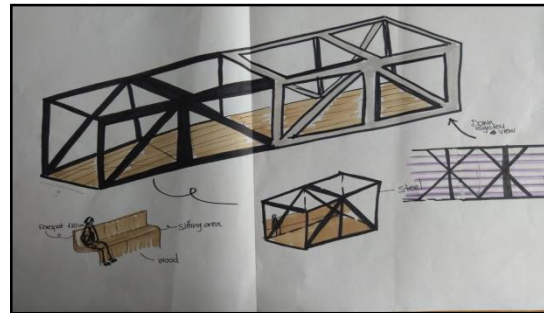


Footbridge is located in Nichelino (Piemonte) creates a passage between two parks, Parco Piemonte and Parco Boschetto on the Sangone River. (315.78 / 20.11 m)

The total span of the bridge is 20 m long. Consists of 5 simple structures with a length of 4 meters.



Sketches

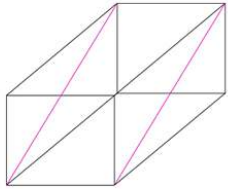
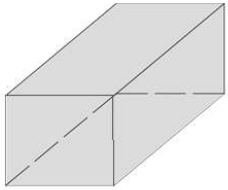


References

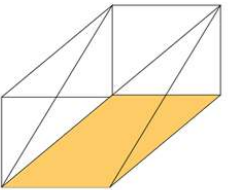


Each year 800.000 containers are de-utilized from the marine service. The idea of the bridge was inspired by the recycled shipping containers. The Ariel Sharon National Park Yoav bridge project by Messer Architects is located in Tel Aviv that is formed by 80 containers.

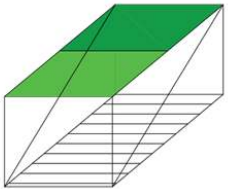
Materials



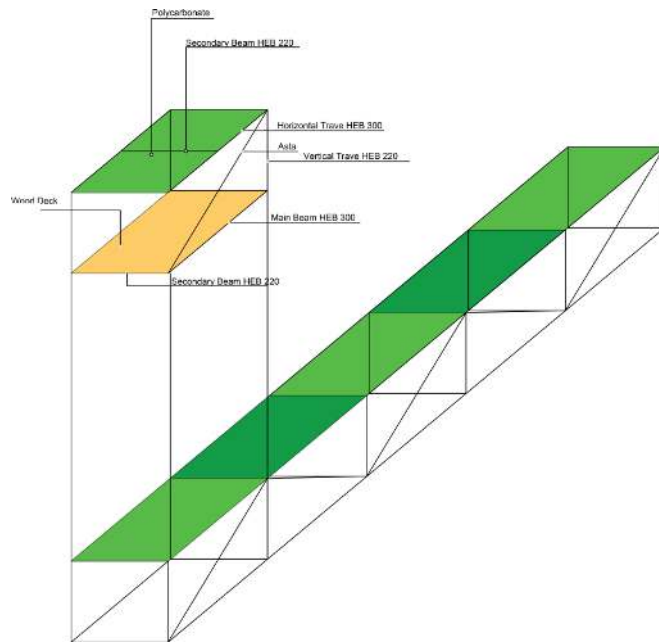
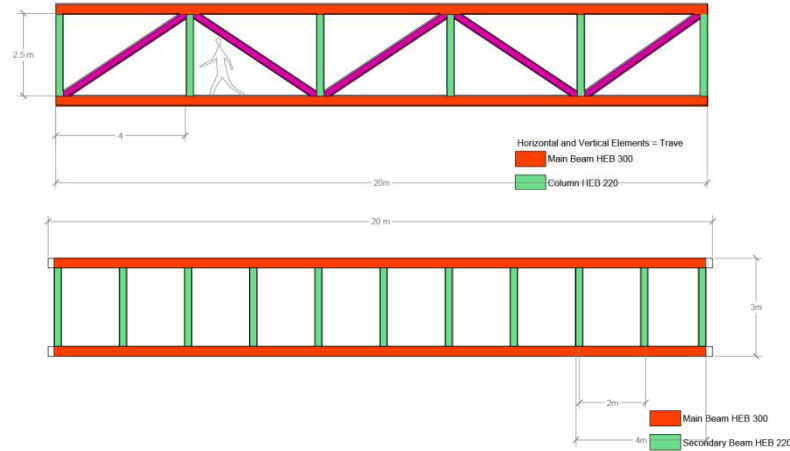
Truss



Wood Decking



Polycarbonate



Beam Types:

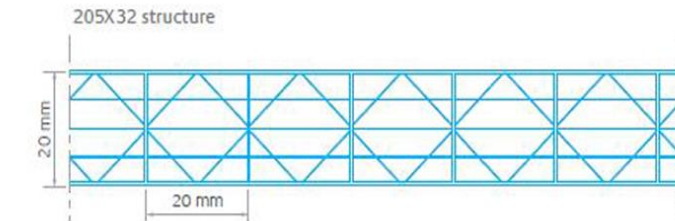
Identification	Nominal weight 1m	Nominal dimensions						Cross-section					Dimensions for detailing		Surface	
		b	h	s	t	r	A	h1	d	Ø	pmin	pmax	AL	AG		
	kg/m	mm						cm ²	mm	mm		mm	mm	m ² /m	m ² /m	
HEB 220	71,5	220	220	9,5	16	18	91,0	188	152	M27	100	118	1,270	17,77		
HEB 450	171	300	450	14	26	27	218,0	398	344	M27	124	198	2,026	11,84		

Identification	Section properties, static data												
	strong axis x-x						weak axis y-y						
	ix	Wel.x	Wpl.x	ix	Avy	Sx	ly	Wel.y	Wpl.y	iy	Ss	It	Iw
cm ⁴	cm ³	cm ³	cm	cm ²	cm ³	cm ⁴	cm ³	cm ³	cm	mm	cm ⁴	cm	
HEB 220	8091	735,5	827,0	9,43	27,92	414	2843	258,5	393,9	5,59	62,59	76,57	295,4
HEB 450	79890	3551	3982	19,14	79,66	1990	11720	781,4	1198	7,33	97,63	440,5	5258

Primary beam : HEB 450

Secondary beam : HEB 220

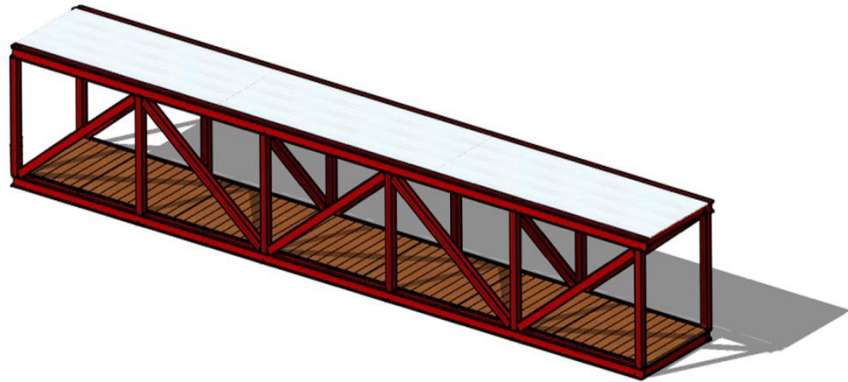
Roof Polycarbonate



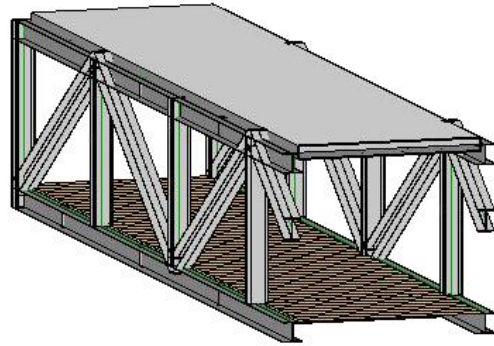
Floor Wood Decking



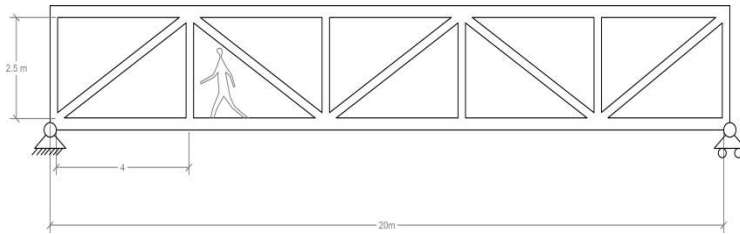
Drawings



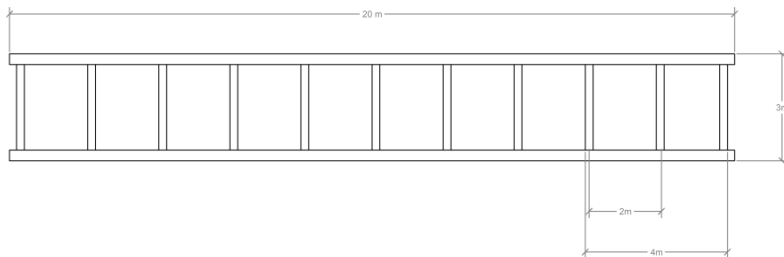
3D Model



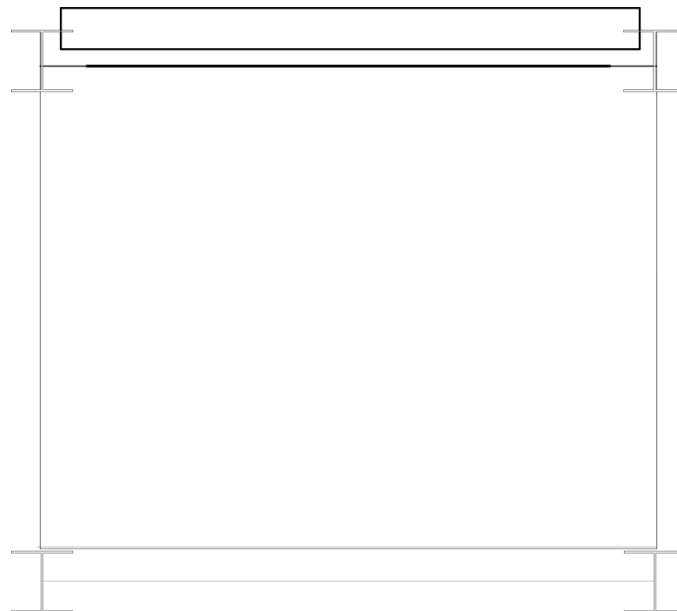
Sectioned-3D Model



Elevation

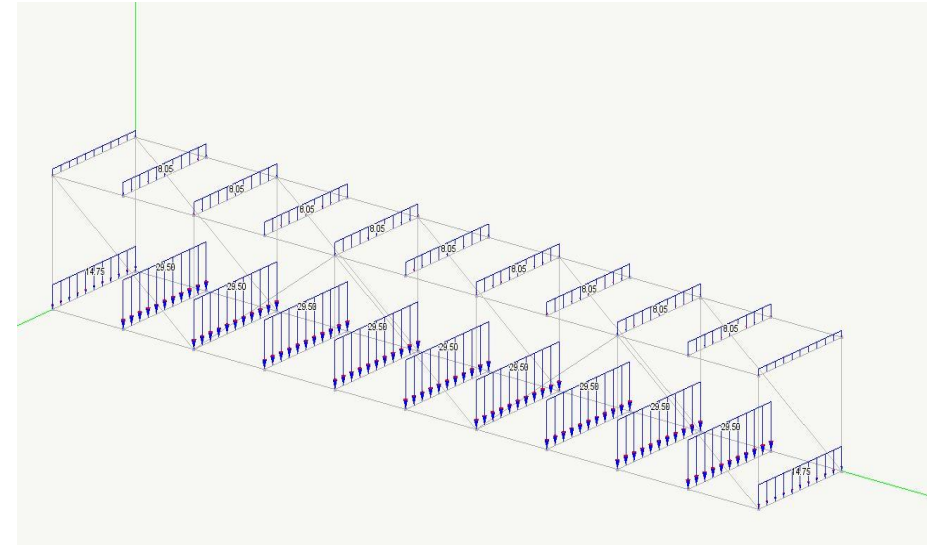


Plan



Section

Loads



Snow Load

$$S = \mu_i \times C_e \times C_t \times S_k$$

$$C_e \times C_t = 1 \text{ (from Table 5.1 1991.1.3:2003)}$$

$$\mu_i = 0,8 \text{ (from Table 5.2 1991.1.3:2003)}$$

$$S_k = 1,5 \text{ kN/m}^2$$

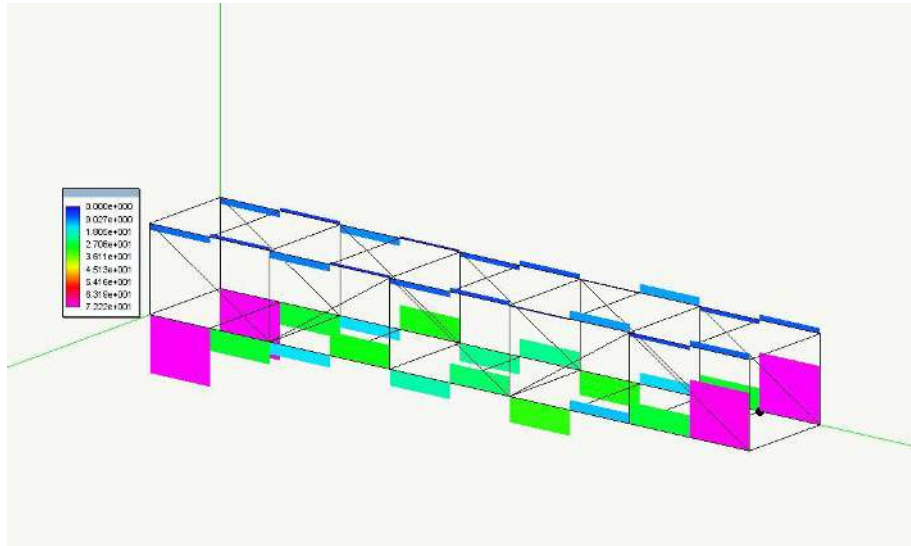
$$S = 1,2 \text{ kN/m}^2$$

Imposed Loads

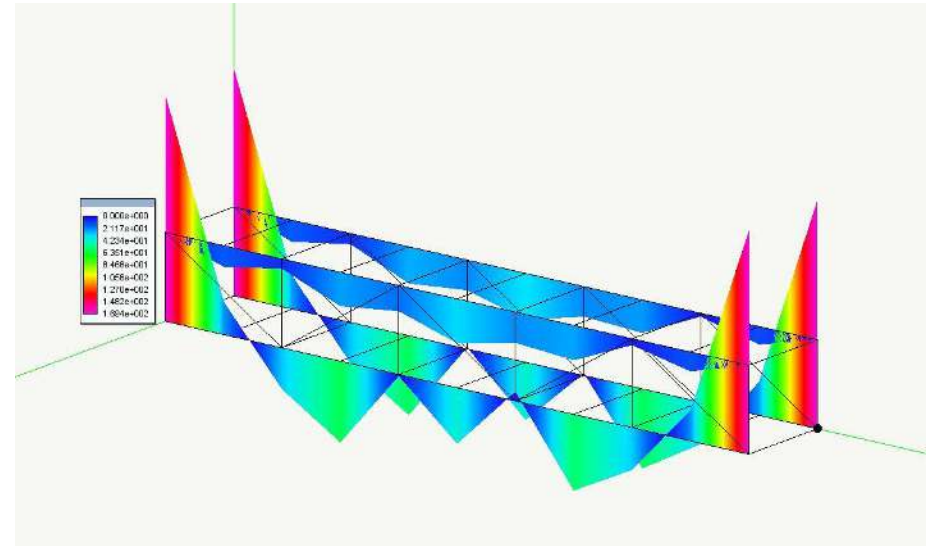
Category C4: Areas with possible physical activities

$$4.5\text{-}5.0 \text{ kN/m}^2$$

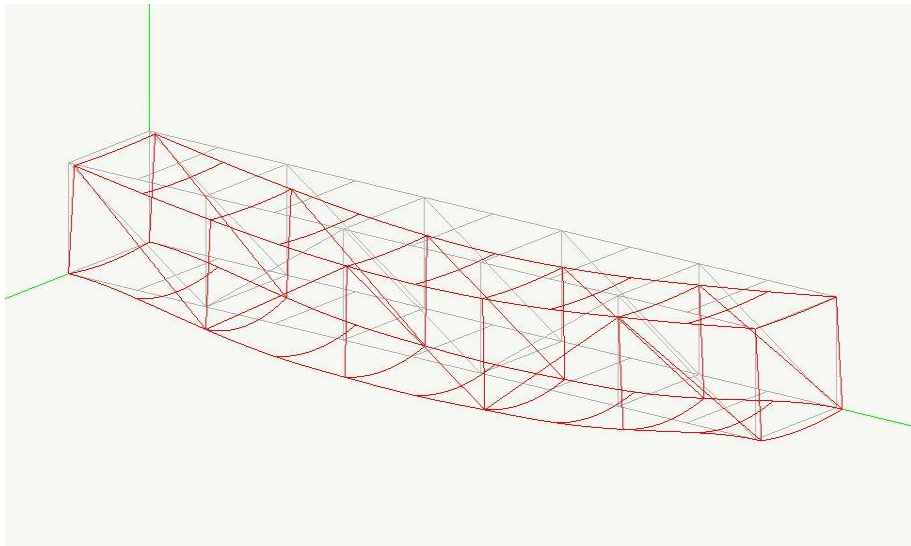
Nolian Calculations



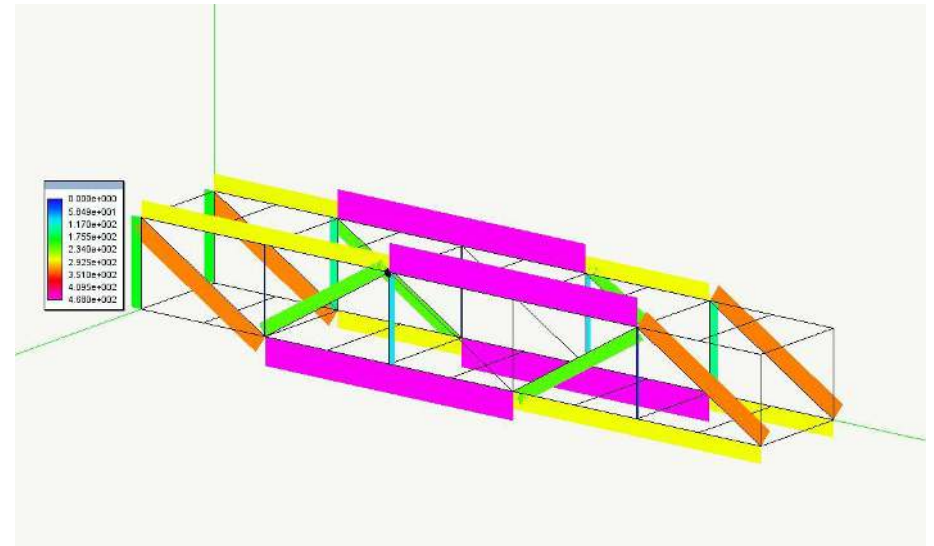
Shear Forces



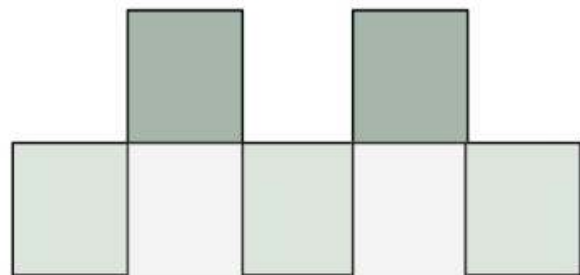
Moment



Deformation



Axial Forces



THANK YOU