



Torre PWC

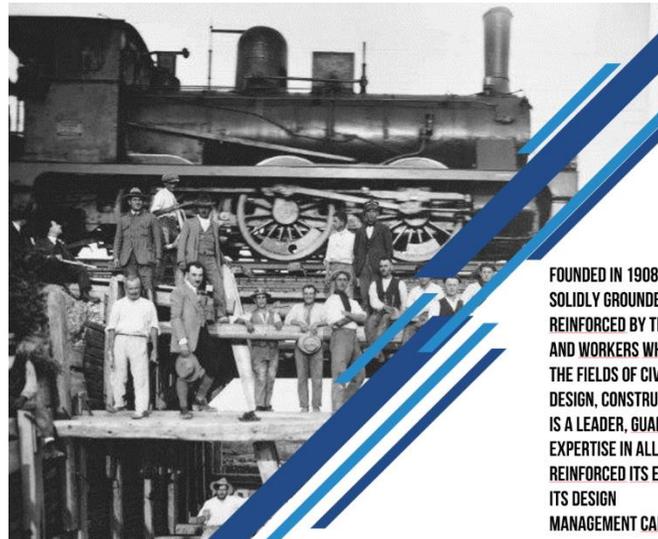
L'utilizzo del BIM dal progetto alla realizzazione di strutture complesse

Webinar del 17 Marzo 2021

«La Costruzione»

Eng. Tommaso Salvo – Responsabile di Commessa CMB

CMB background information



cmb
DESIGN, CONSTRUCTION,
MANAGEMENT

FOUNDED IN 1908 AND WITH OVER A CENTURY OF EXPERIENCE, CMB IS SOLIDLY GROUNDED IN A CONSISTENT INTER-GENERATIONAL HERITAGE REINFORCED BY THE CONTRIBUTION OF NUMEROUS SKILLED SHAREHOLDERS AND WORKERS WHO GUARANTEE ADDED VALUE TO EACH PROJECT, BOTH IN THE FIELDS OF CIVIL CONSTRUCTION AND INFRASTRUCTURE. DESIGN, CONSTRUCTION AND MANAGEMENT OF LARGE-SCALE WORKS: CMB IS A LEADER, GUARANTEEING ITS CUSTOMERS WITH QUALITY AND EXPERTISE IN ALL PROCESSES AND PRODUCTS. OVER THE YEARS IT HAS REINFORCED ITS EXCELLENT CONSTRUCTION CAPABILITIES BY IMPROVING ITS DESIGN MANAGEMENT CAPABILITIES AND OPERATION AND MANAGEMENT SKILLS.

PEOPLE

2017

MORE THAN **560** EMPLOYEES



STRENGTHS

CERTIFICATIONS	SICURI PER MESTIERE	SOCIAL RESPONSIBILITY	BIM
UNI EN ISO 9001:2015 BS OHSAS 18001:2007 ISO EN 14001:2015	Behavior-based project that flanks the certification system in the task of safeguarding the safety and health of the workers in the construction sites.	Pursuit of development in terms of growth and economic results, transforming them into opportunities for employment, security and social progress.	Innovative approach implemented since 2013, after some years of R&D, now used extensively in complex projects, such as skyscrapers and hospitals.
CERTIFIED PUBLIC WORKS CONTRACTOR FOR 23 CATEGORIES	TEN YEARS OF EXPERIMENTATION	VALUES FROM CMB'S DUAL NATURE AS A COOPERATIVE AND A MODERN COMPANY.	CUSTOM-BUILT DATA SHARING PLATFORM

TECHNOLOGY VISION

CLOUD PLATFORM
BIM
CDE
FIELD APPLICATION
AUGMENTED REALITY/AUGMENTED
VIRTUALITY

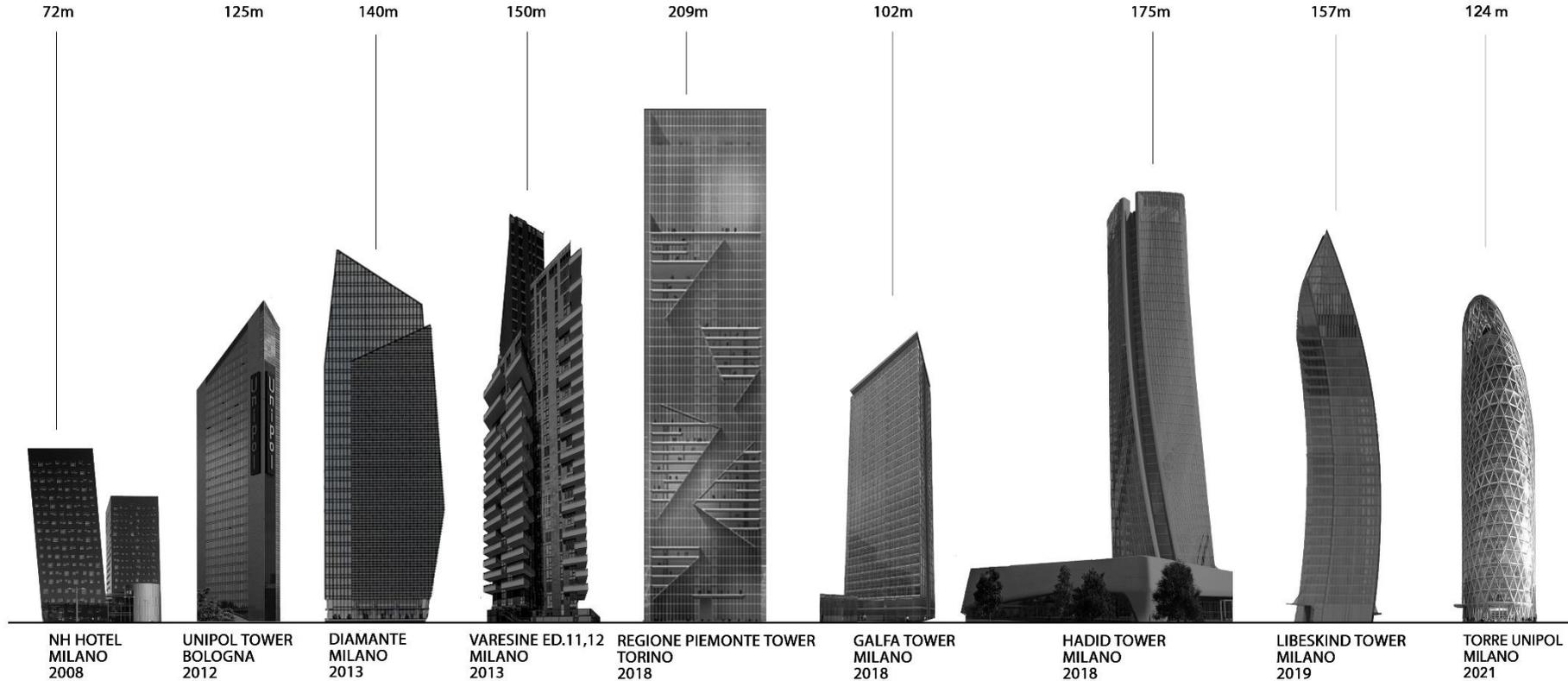
14 BIM REAL CASES

OFFICES
HOSPITALS
FACTORIES
RESIDENTIAL

14 PEOPLE IN BIM

OFFICES
HOSPITALS
FACTORIES
RESIDENTIAL

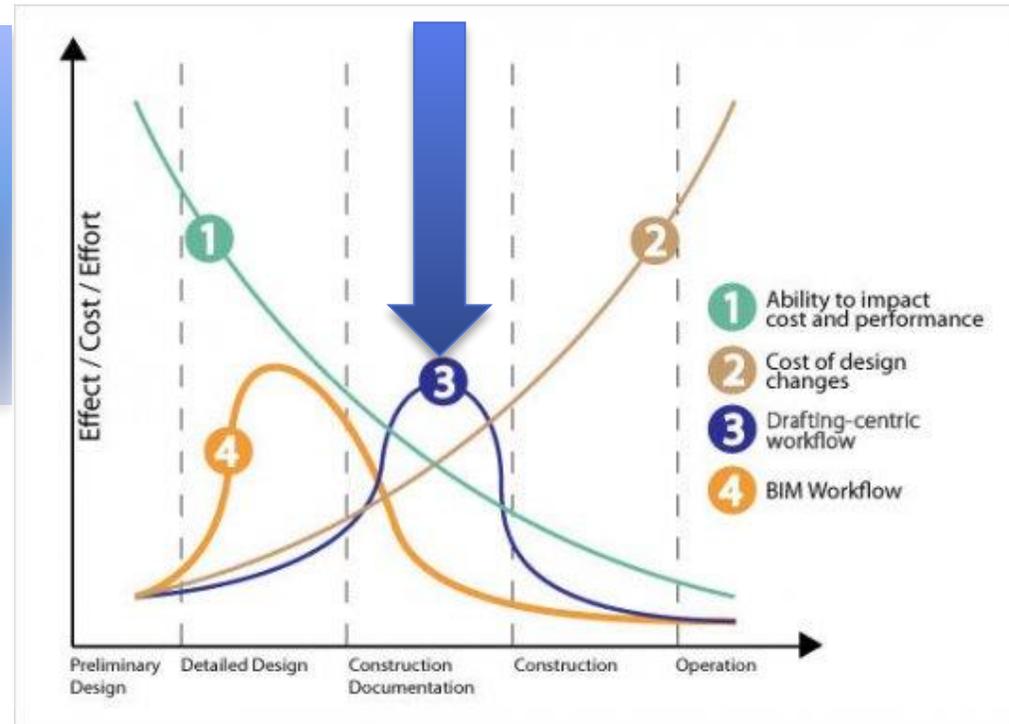
More than 10 years of towers... how our cities are changing



Looking for efficiency in the construction market, design processes, construction processes, maintenance and operations must be organized looking for the highest level of **INTEGRATION IN THE DESIGN ACTIVITIES** and maximum **SHARING DATA/INFOS** since the beginning of the project (Owners/Designers/Constructor/Property managers).

INTEGRATED DESIGN
3D modelling
BIM COLLABORATION
Clash detection
DIGITAL VIRTUAL SURVEYING
TIME SCHEDULING
DIGITALIZATION OF PROCESSES

It is mainly at the beginning of the design process that it's possible to be effective on construction's quality and performance. And more: you can be effective on costs and effects of design variations (McLeamy Curve, 2004)



Project Management Processes in a digitalized environment (BIM):



Libeskind tower

LIBESKIND TOWER

Architect: Daniel Libeskind

Construction period:

August 2016- September 2020

Value of work: 80.000.000 €

Function: Office

Height : 168,5 m (30 storeys)

Structure: Reinforced Concrete

Facade: Glass curtain wall



GLA: 35,882 mq



HEIGHT: 168m



COST: € 85 ML



CONSTRUCTION: 24MONTHS

FLOOR	OFFICES
28 ^o	612 m ²
27 ^o	982 m ²
26 ^o	999 m ²
25 ^o	1.042 m ²
24 ^o	1.066 m ²
23 ^o	1.090 m ²
22 ^o	1.112 m ²
21 ^o	1.136 m ²
20 ^o	1.155 m ²
19 ^o	1.176 m ²
18 ^o	1.126 m ²
17 ^o	1.144 m ²
16 ^o	1.163 m ²
15 ^o	1.181 m ²
14 ^o	1.195 m ²
13 ^o	1.209 m ²
12 ^o	1.225 m ²
11 ^o	1.236 m ²
10 ^o	1.247 m ²
9 ^o	1.240 m ²
8 ^o	1.248 m ²
7 ^o	1.257 m ²
6 ^o	1.266 m ²
5 ^o	1.272 m ²
4 ^o	1.278 m ²
3 ^o	1.281 m ²
2 ^o	1.285 m ²
1 ^o	1.288 m ²
mezzanino mezzanine	48 m ²
0 ^o	961 m ²

25th FLOOR



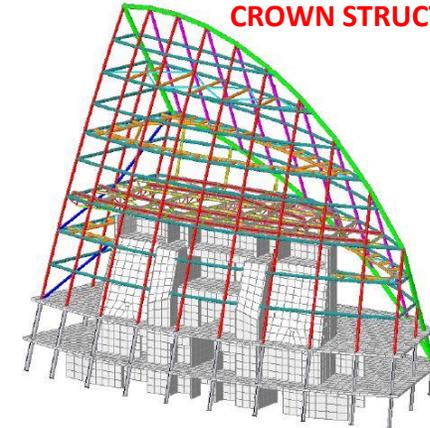
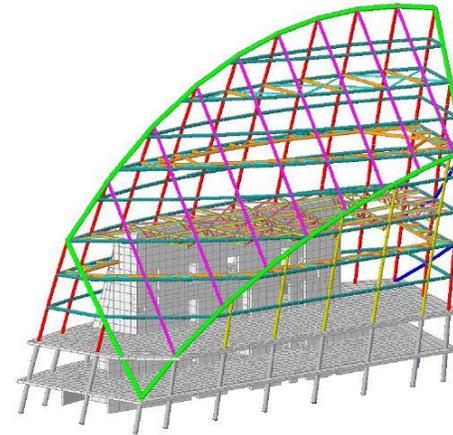
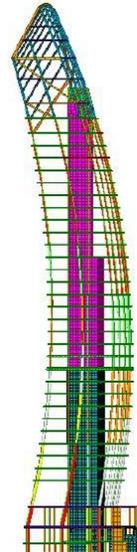
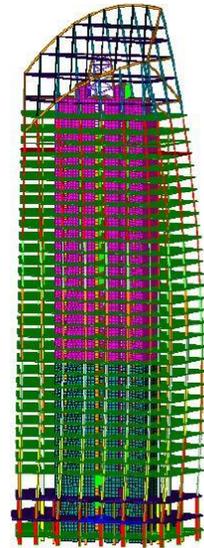
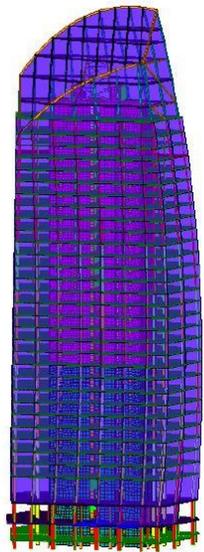
15th FLOOR



5th FLOOR

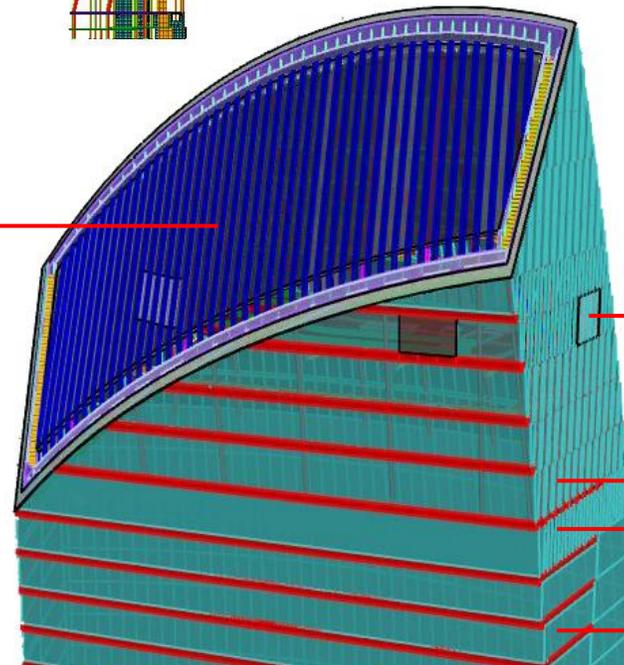


- open-space offices
- single offices
- meeting rooms
- break rooms
- back up spaces



CROWN STRUCTURES

**PHOTOVOLTAIC
GLASS SYSTEM**



BMU LEVEL



SERVICES LEVELS



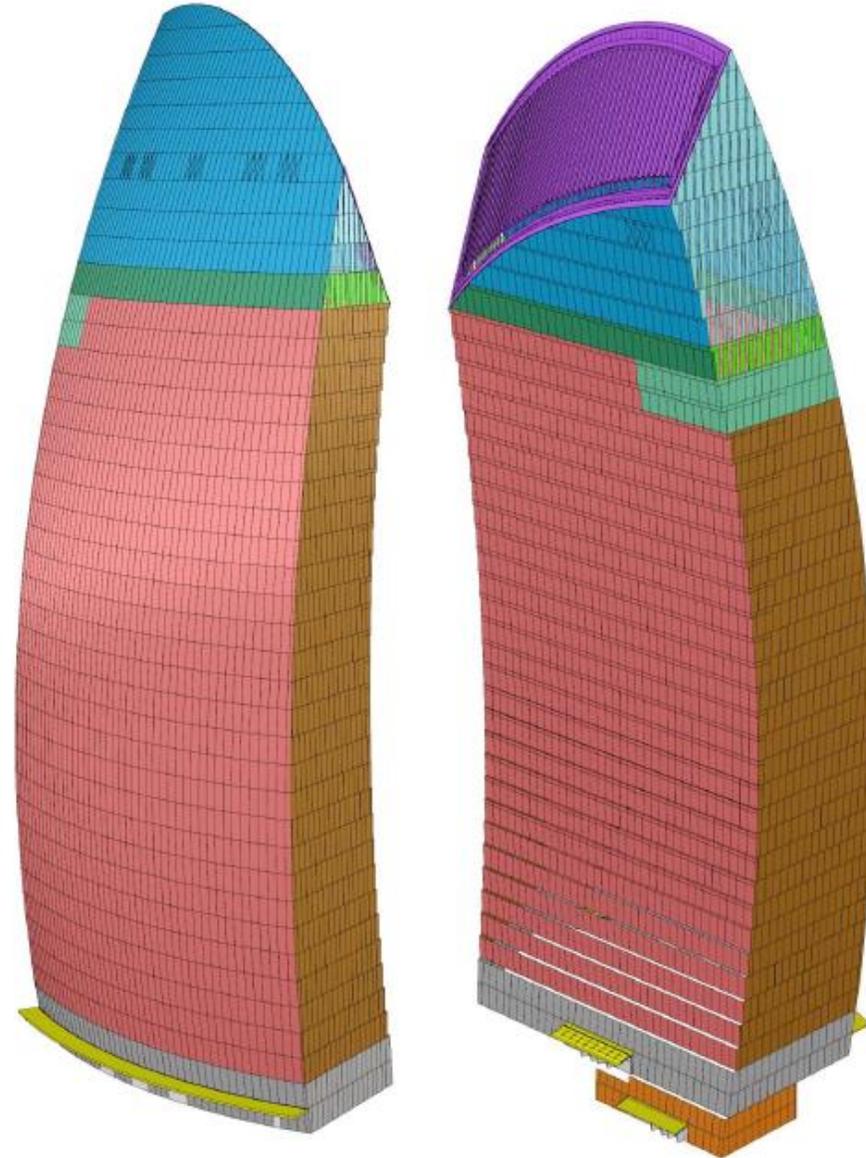
CONFERENCE ROOM



Main facade system

The façade has:

- Flat panels
- For north, east and west elevations the panels are inclined to follow the envelope geometry
- For south elevation the panels are vertical, for this on the façade develops some steps and overhangs



Construction Management and field BIM





BIM-based coordination of the CMB design office – 3D

Solibri Model Checker - 180301_Cordinamento CMB

FILE MODEL CHECKING COMMUNICATION INFORMATION TAKEOFF + TO DO (5/16) VIEWS

Spin Info

MODEL TREE

- AR
 - (III_AR_AR_Mod_PB_Viabillà TCC_rev00_bozza16
 - (III_AR_P00-0M) TCc-TC-M3-AR-P00-0M-200-A_bozza02
 - (III_AR_P01-05) TCc-TC-M3-AR-P01-05-301-A_bozza01
 - (III_AR_P06-09) TCc-TC-M3-AR-P06-10-302-A
 - (III_AR_P11) PTT-NO-M3-AR-P11-002-A_bozza01
 - (III_AR_P12) PTT-NO-M-AR-M-P12-001-A_bozza01
 - (III_P10-15_AR) TCc-TC-M3-AR-P10-15-103-A_bozza01
 - (III_P16-19_AR) TCc-TC-M3-AR-P16-19-104-A
- CO
- FC

Federated model

175 IFC

Manage digital complexty

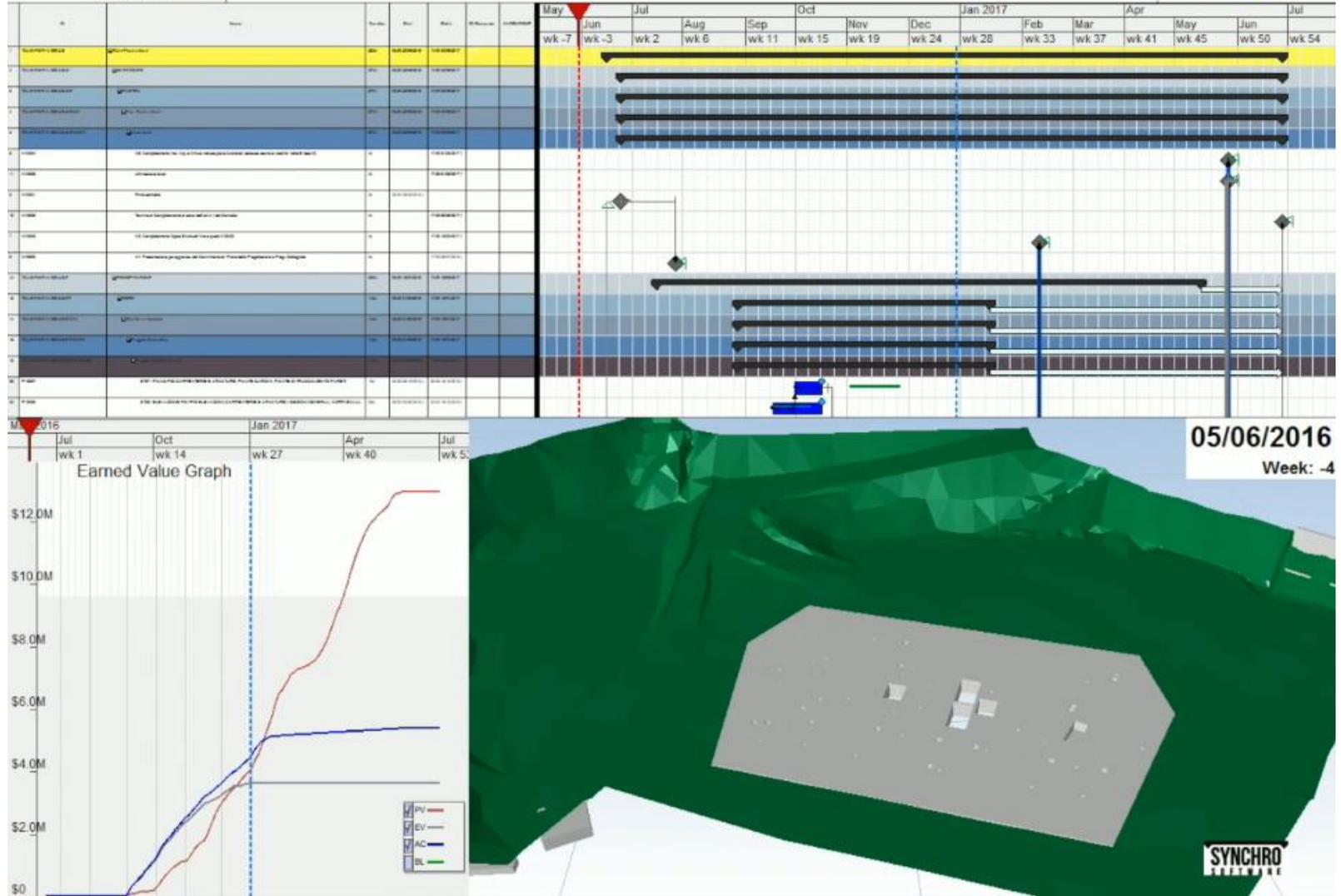
WBS CMB updated with all components

Role: Quantity Take-off Selected: 138,506

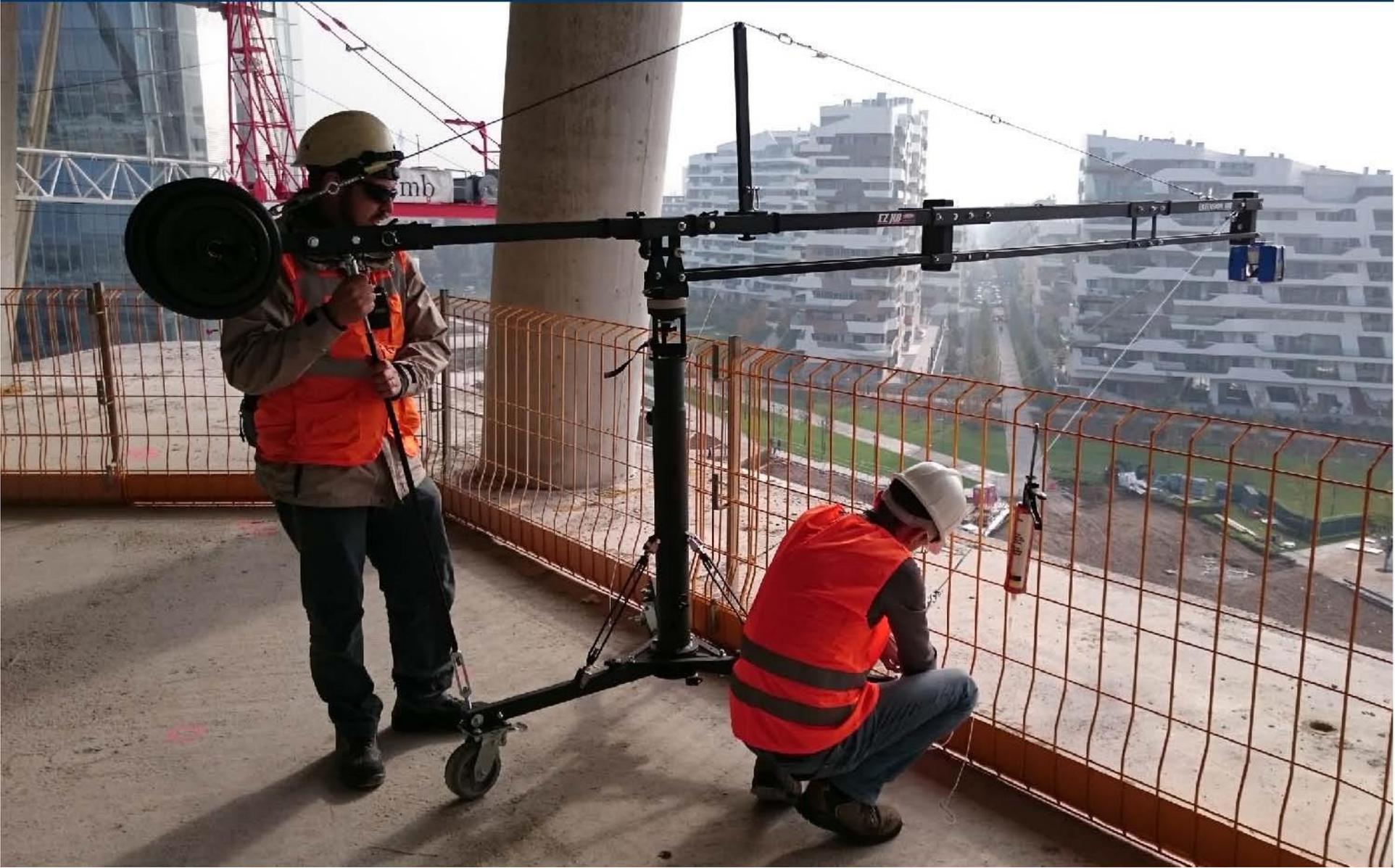
Code Detection: CMB



4D & 5D:
Revenue control

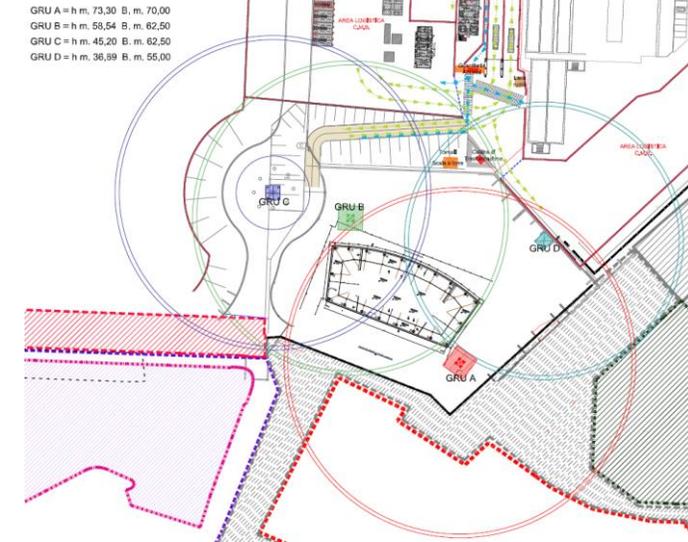
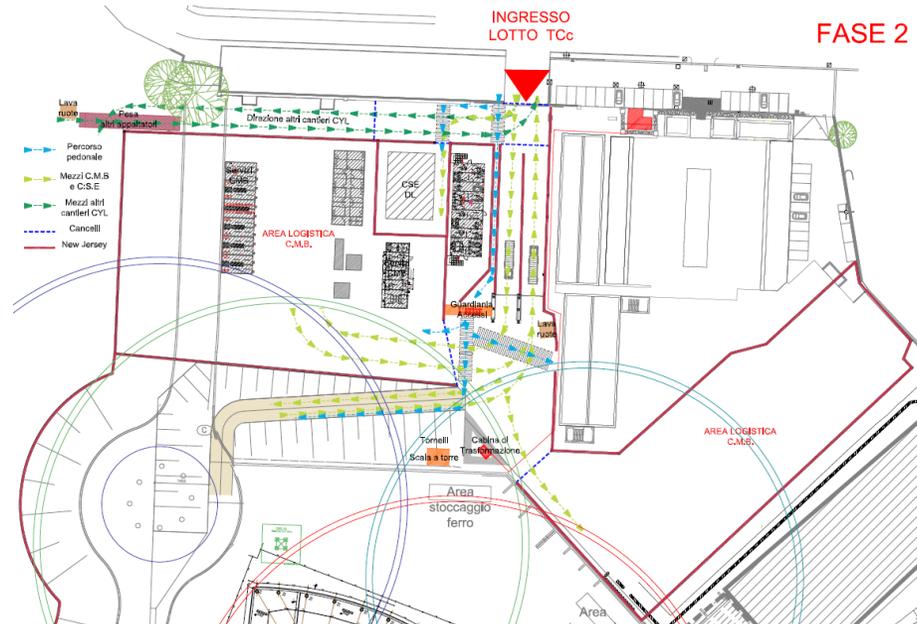






AREA BARACCAMENTI ACCESSO MEZZI

- UFFICI DI CANTIERE
- INFERMERIA
- REFETTORIO
- SPOGLIATOI
- SERVIZI IGIENICI
- INGRESSO PRESIDATO
- AREA DI ATTESA
- SBARRA CONTROLLATA
- ILLUMINAZIONE 24h
- SEGNALETICA
- VERIFICA AUTORIZZAZIONI



ACCESSO AREA OPERATIVA

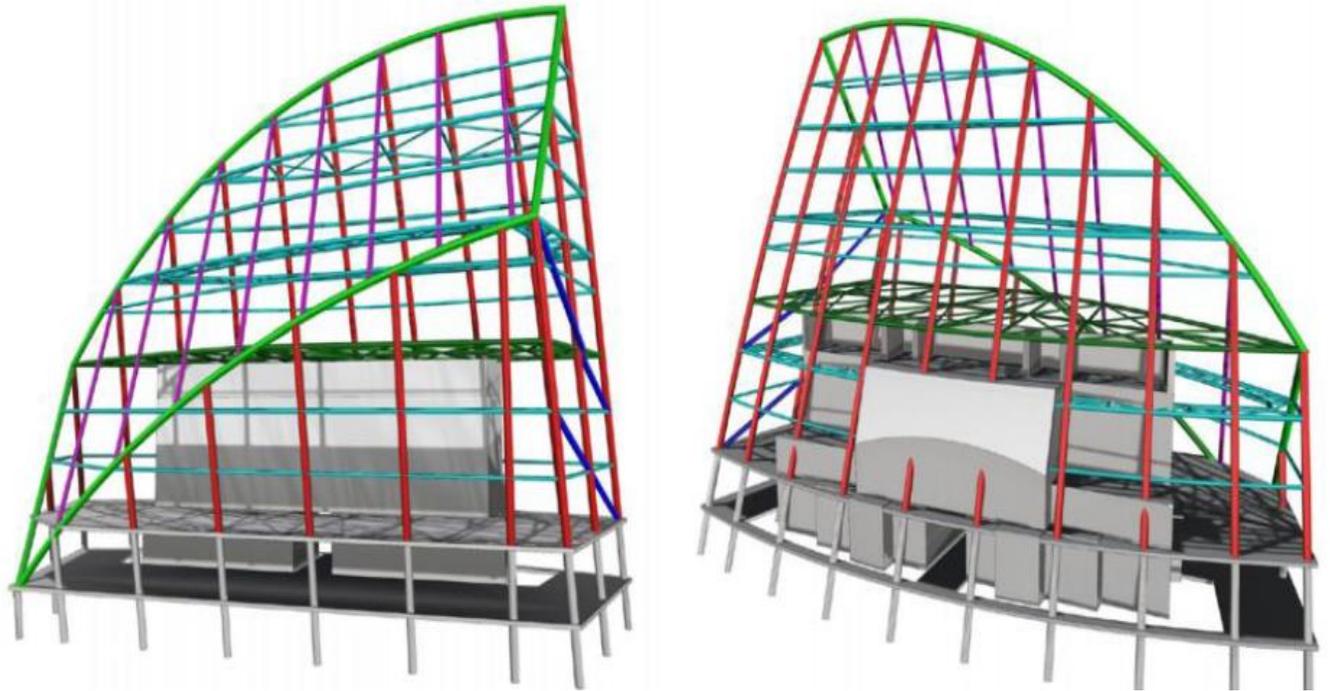
- RAMPA
- NEW JERSEY DI PROTEZIONE
- PERCORSO PEDONALE SEGREGATO
- WC CHIMICI
- IMPIANTO IDRICO DI CANTIERE
- IMPIANTO ELETTRICO DI CANTIERE
- GRU EDILI A TORRE (e)

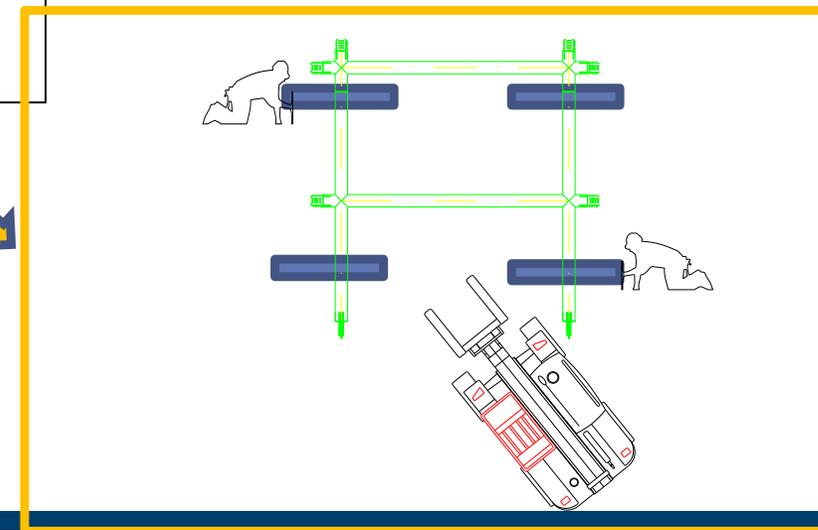
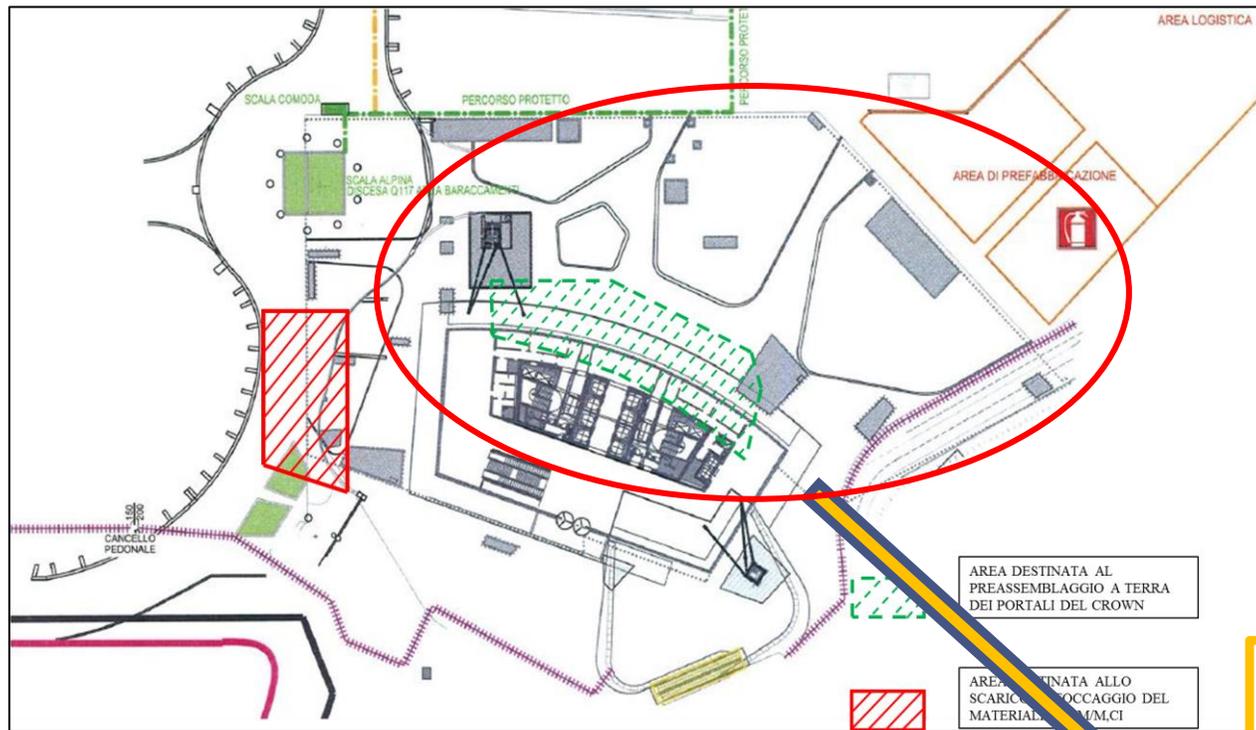
CROWN

La struttura che completa la sommità della torre, denominata “crown”, è costituita da elementi in carpenteria metallica. Le componenti perimetrali di questo elemento hanno una geometria che ripercorre la forma dell’involucro di cui parimenti costituiscono il sostegno.

Le membrature verticali che convergono sul piano inclinato, che costituisce la “copertura” della torre, sono stabilizzate da un sistema di centine orizzontali che conferisce rigidità al sistema.

La presenza di controventi sul lato est completa il sistema che trova la sua solidità nella convergenza nei nodi di estremità dei sistemi di stabilità (centine e controventi) riportando le azioni al nucleo controvento in c.a..

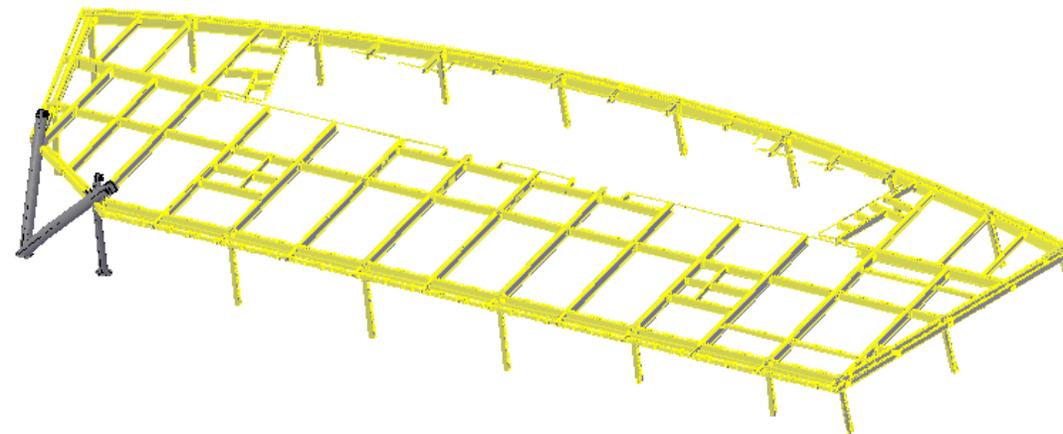
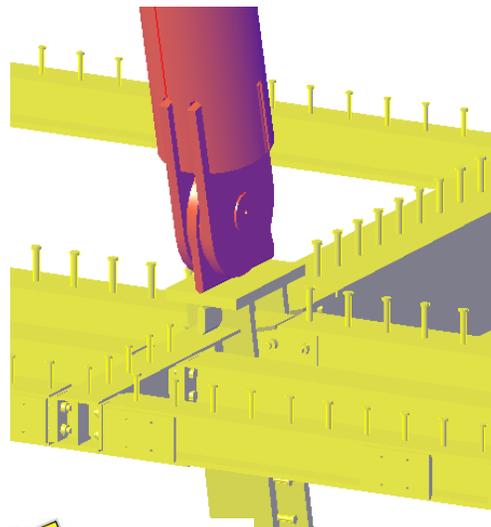
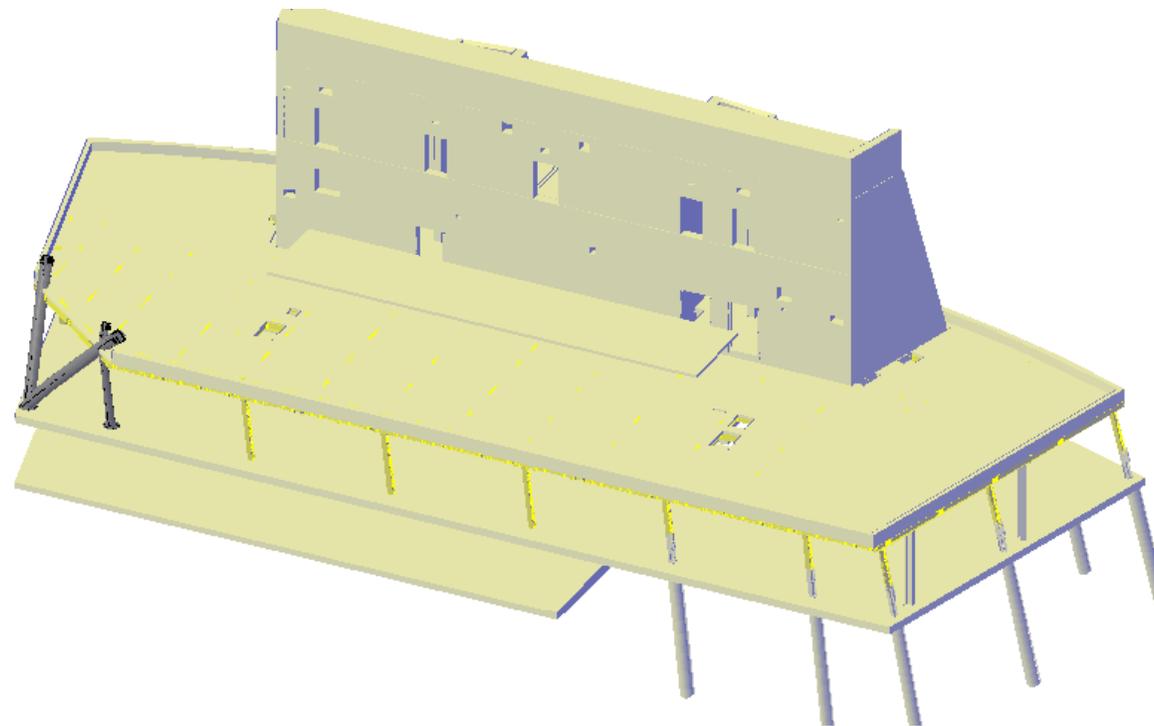


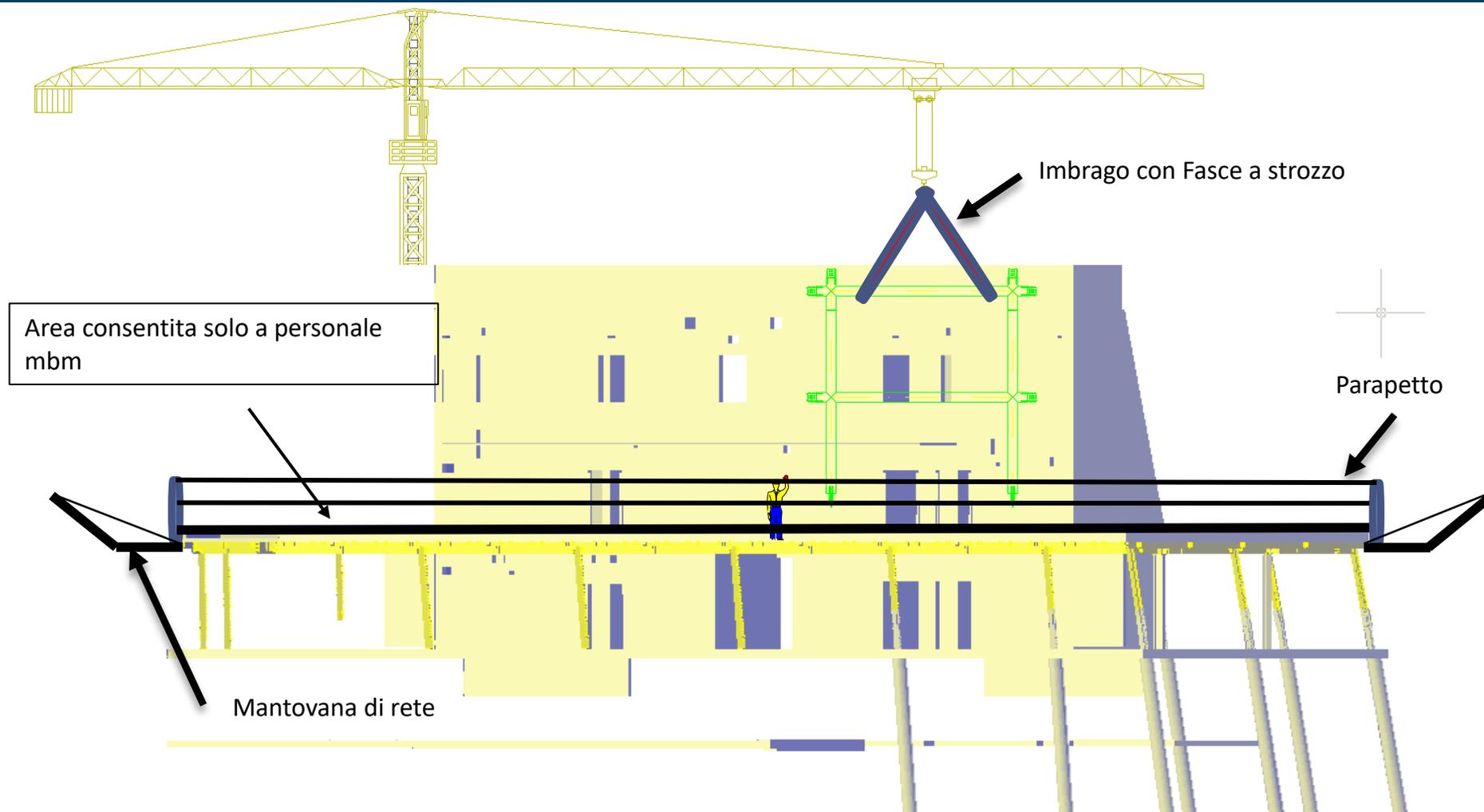


Per gli assiemaggi e gli spostamenti a terra, sono stati verificati i pesi massimi dei pezzi da sollevare e trasportare

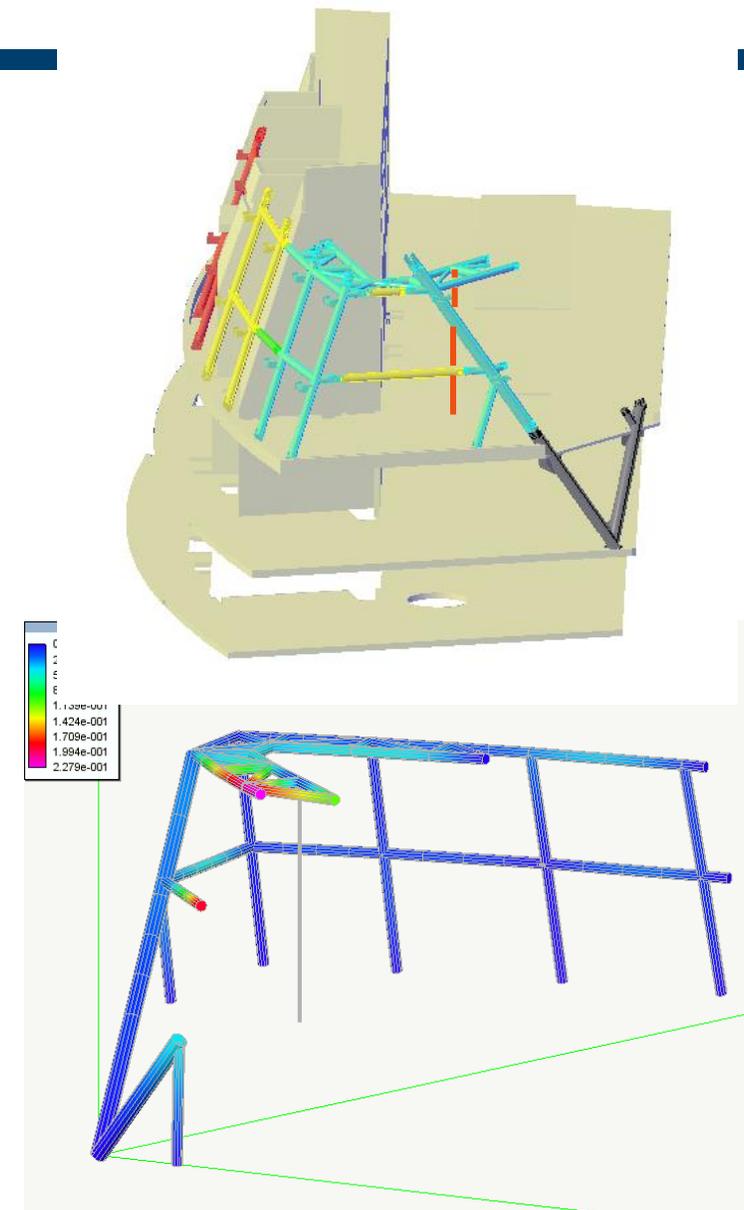
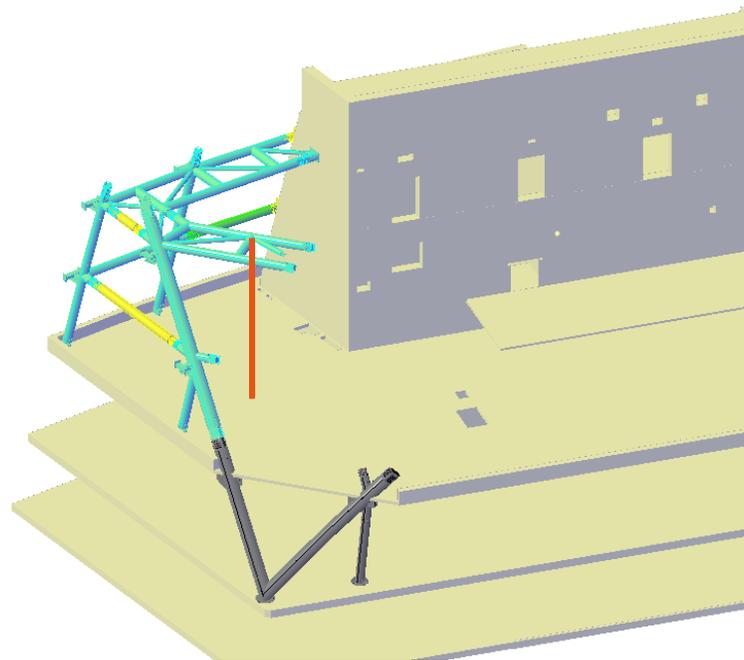
L'attività di posa delle strutture del CROWN ha luogo a partire dal solaio al piano P30 con le seguenti attività:

- Tracciatura topografica per il posizionamento delle piastre di ancoraggio colonne
- Saldatura delle suddette piastre per successiva installazione con connessione a perno



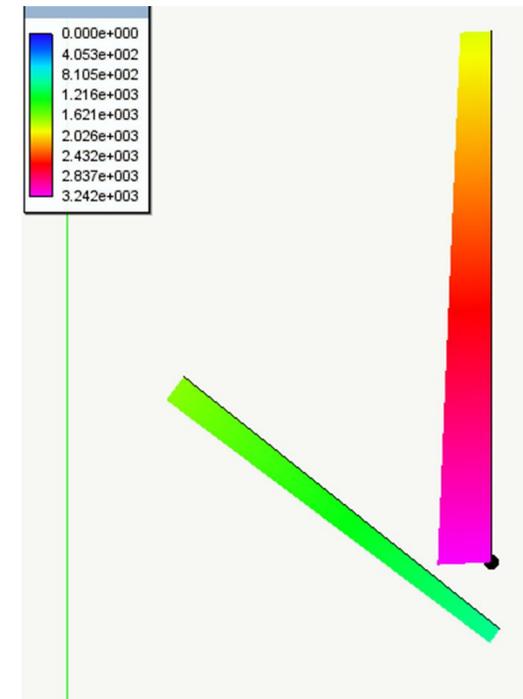
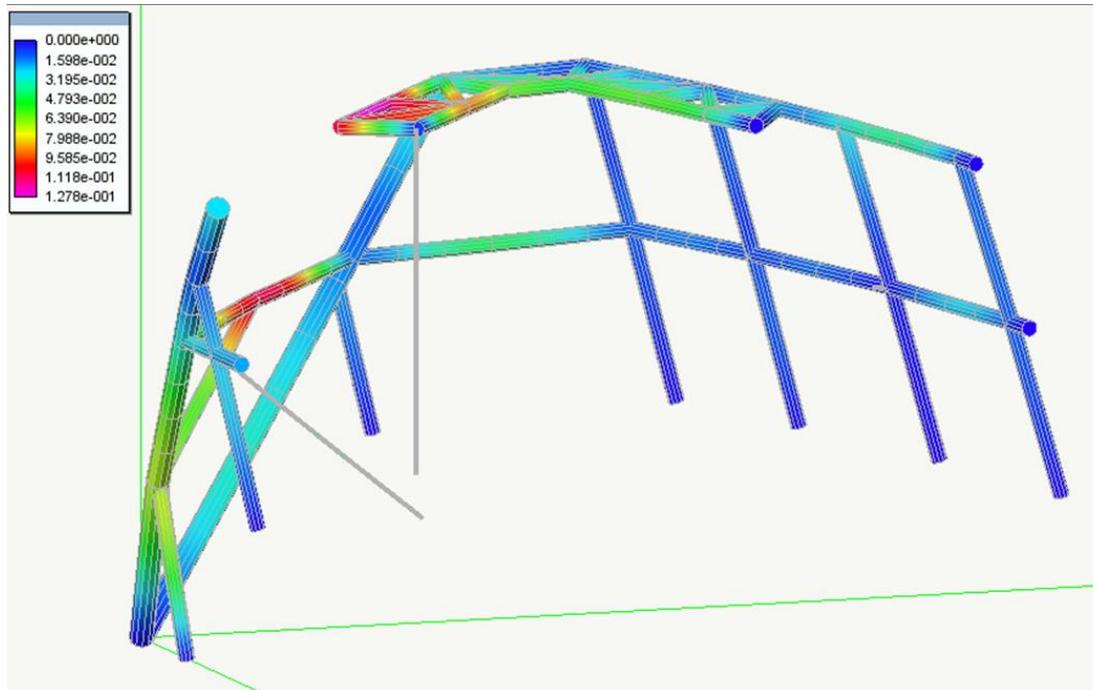
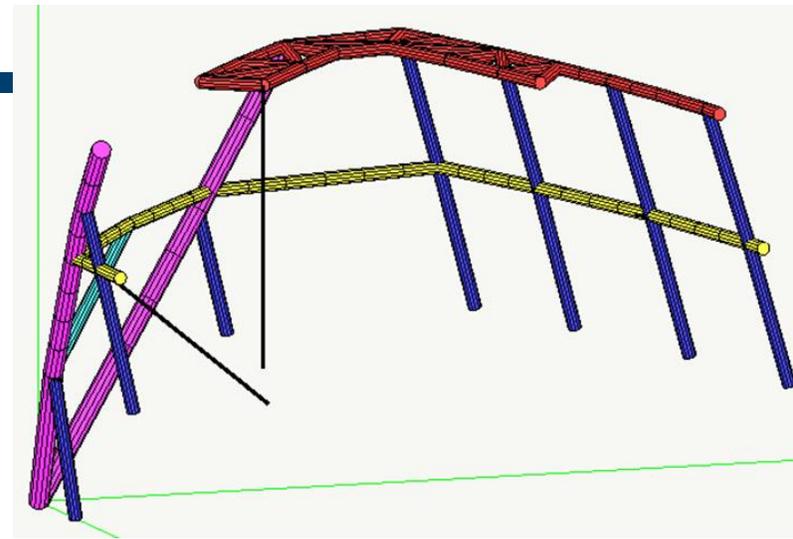


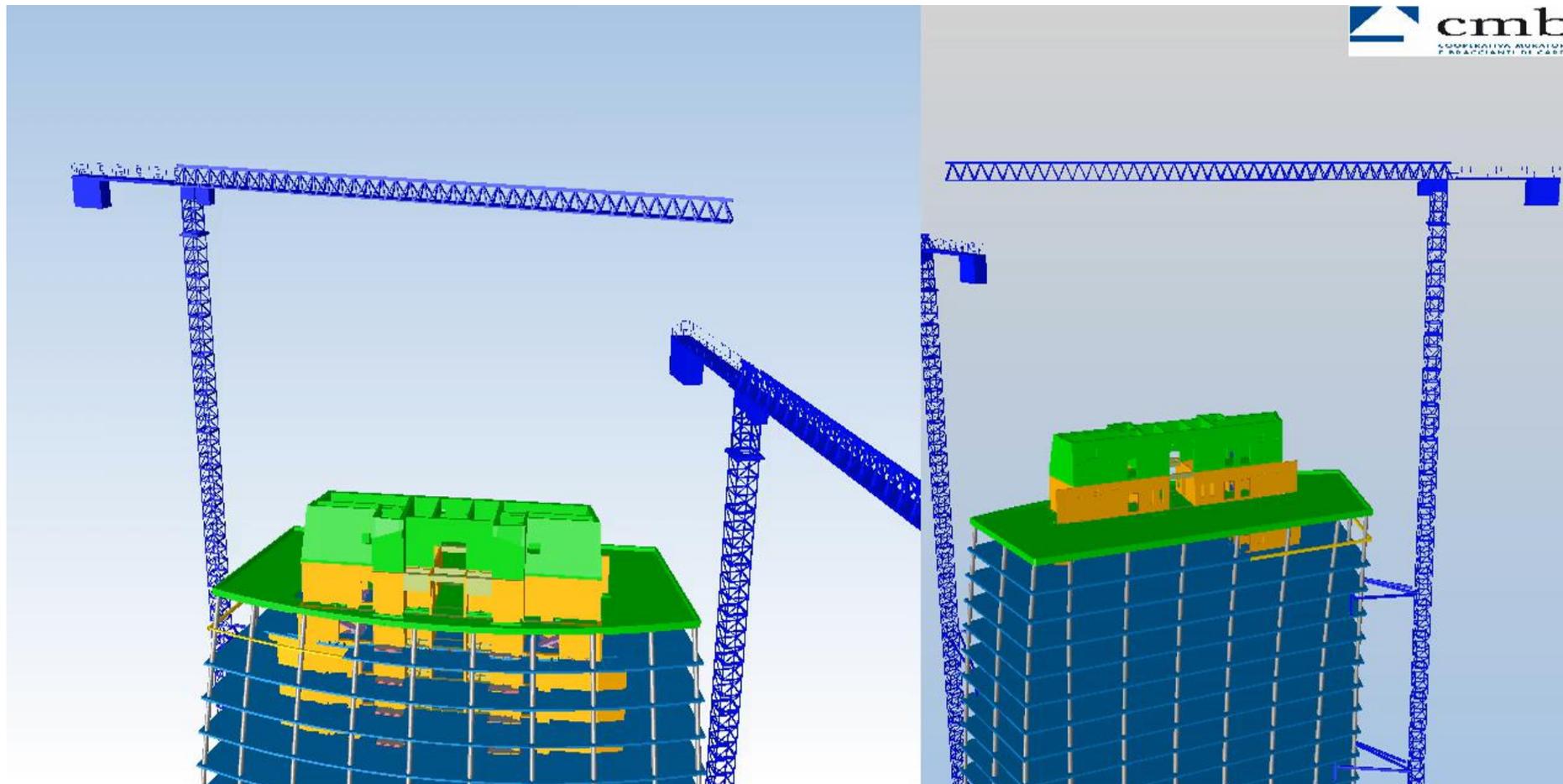
Si prosegue con l'installazione delle strutture lungo il lato EST dove si riscontra la necessità di installare un puntello provvisorio al fine di contenere la deformazione degli elementi.

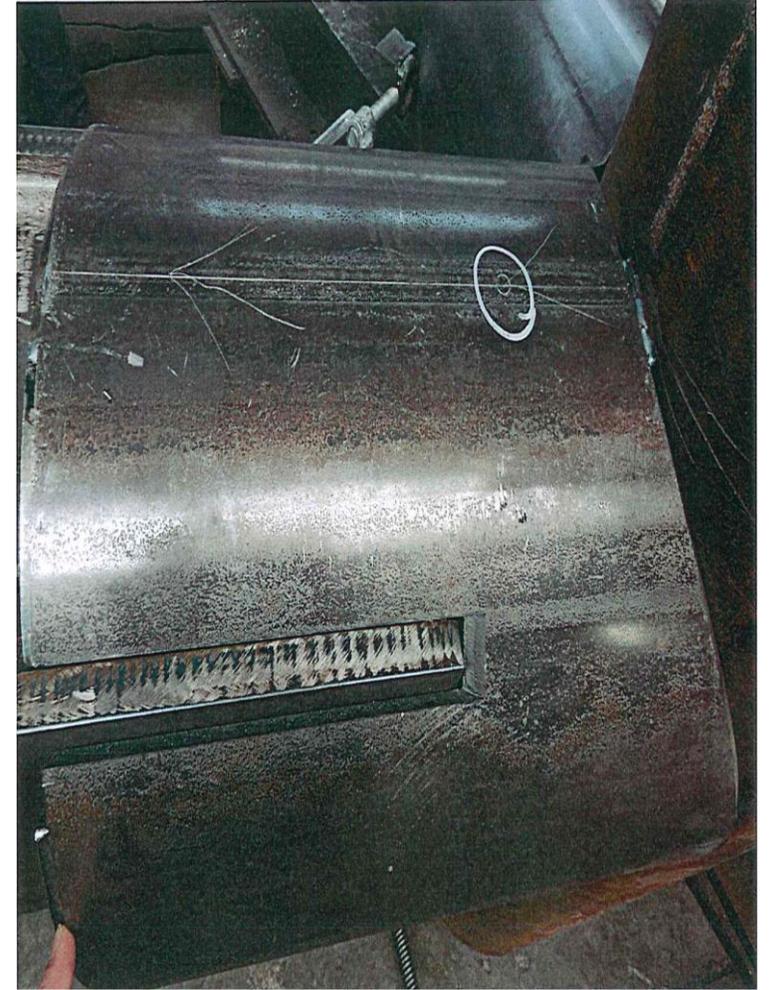
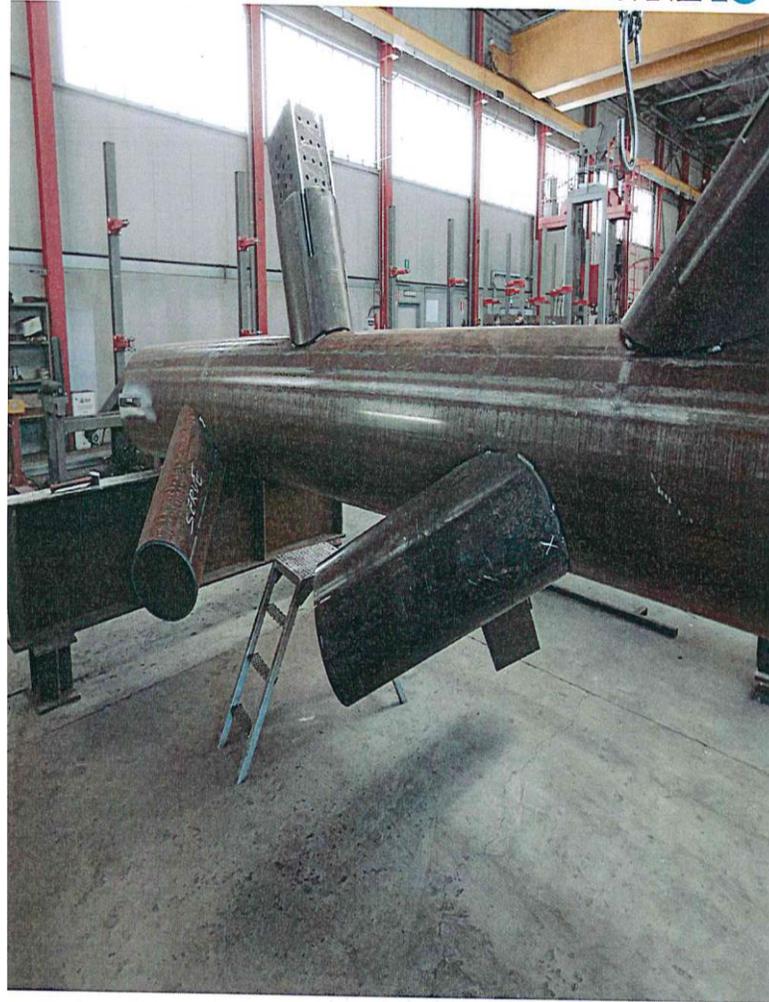


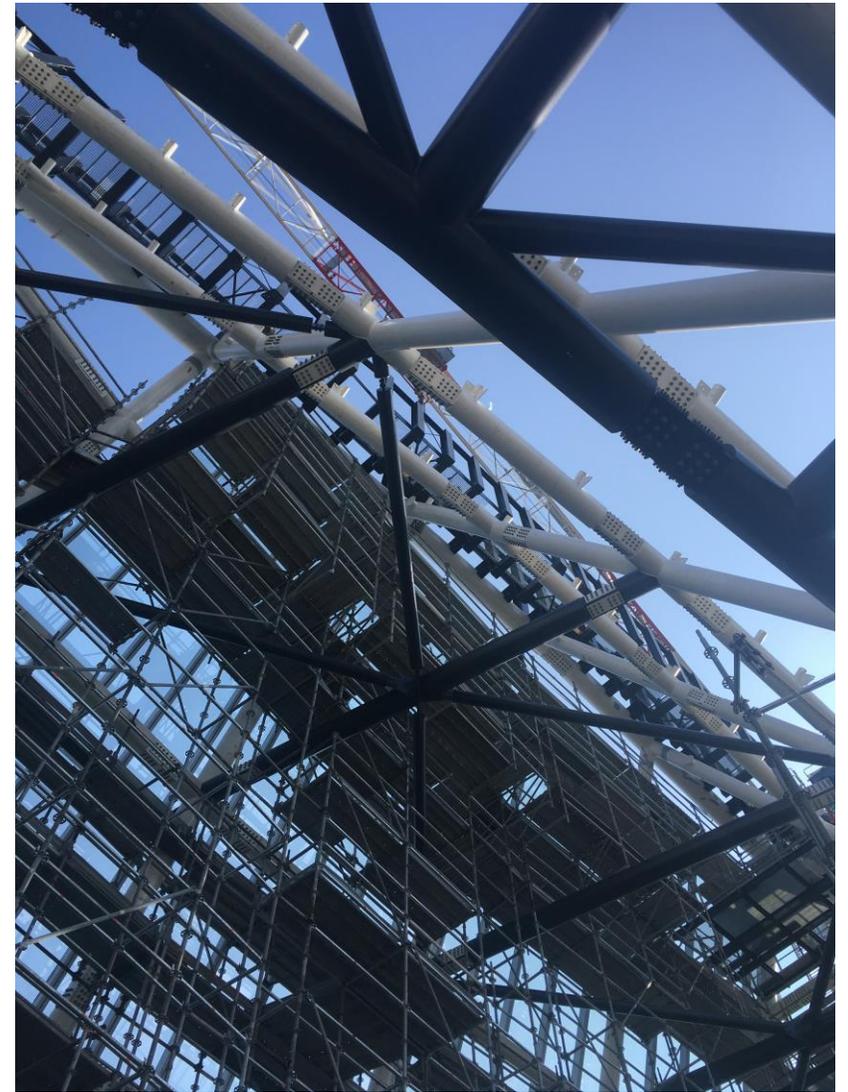
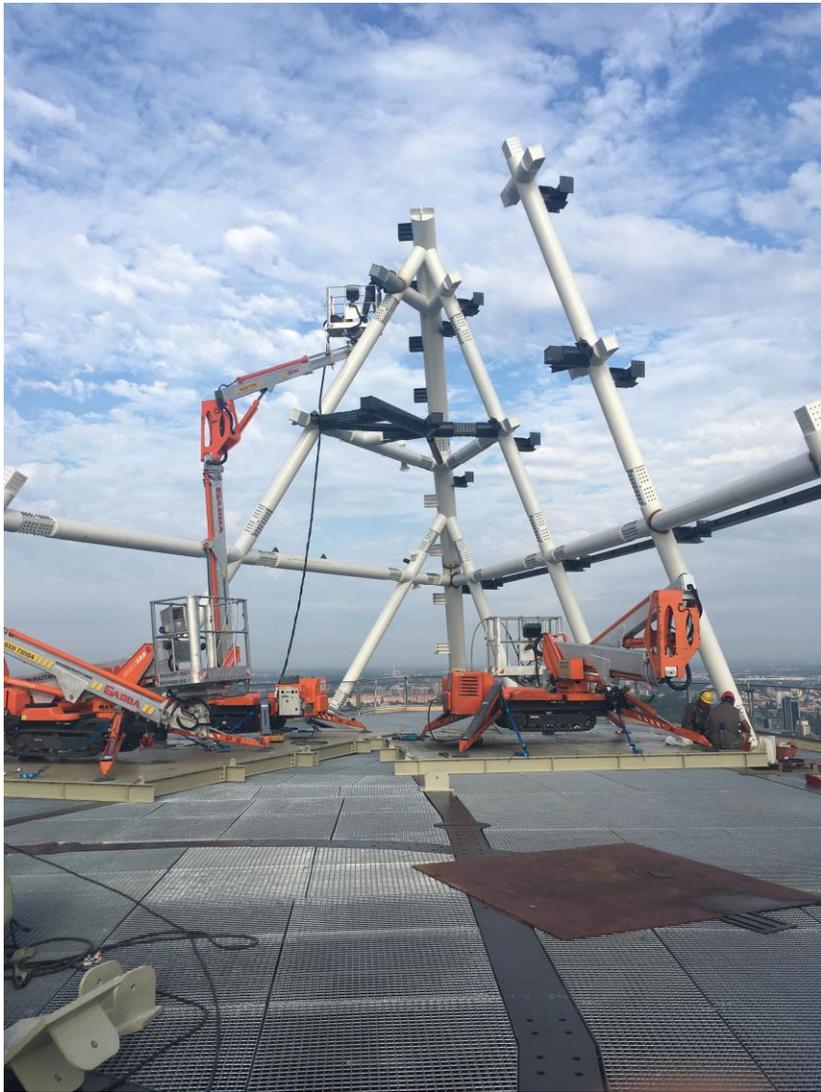
Come osservabile dal diagramma allegato, lo sforzo da peso proprio è di circa 3.300 kg.

Si adotteranno puntelli in grado di assolvere a sforzi di oltre 7500 kg in modo da portare in conto anche azioni da carico da Vento.

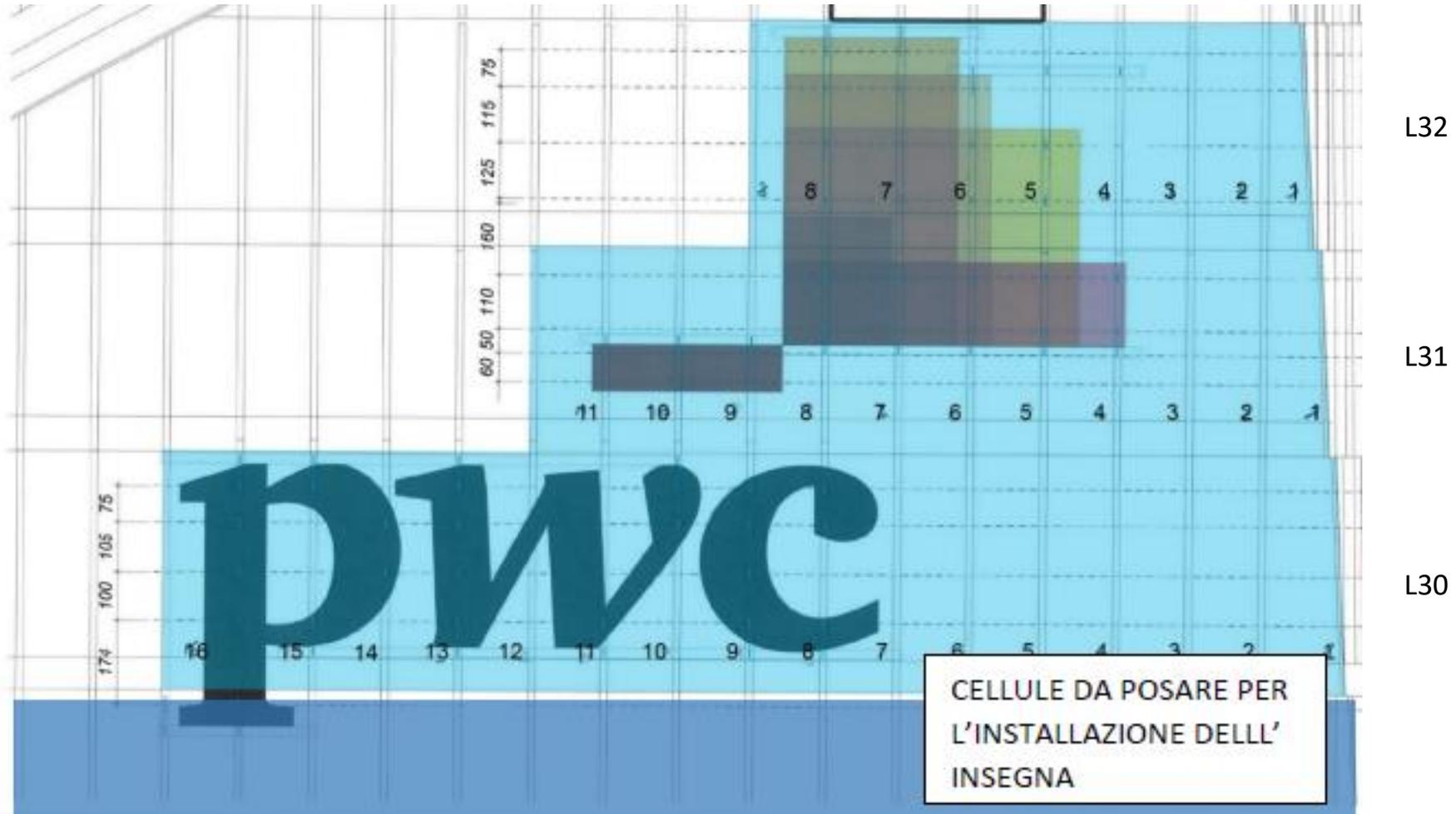


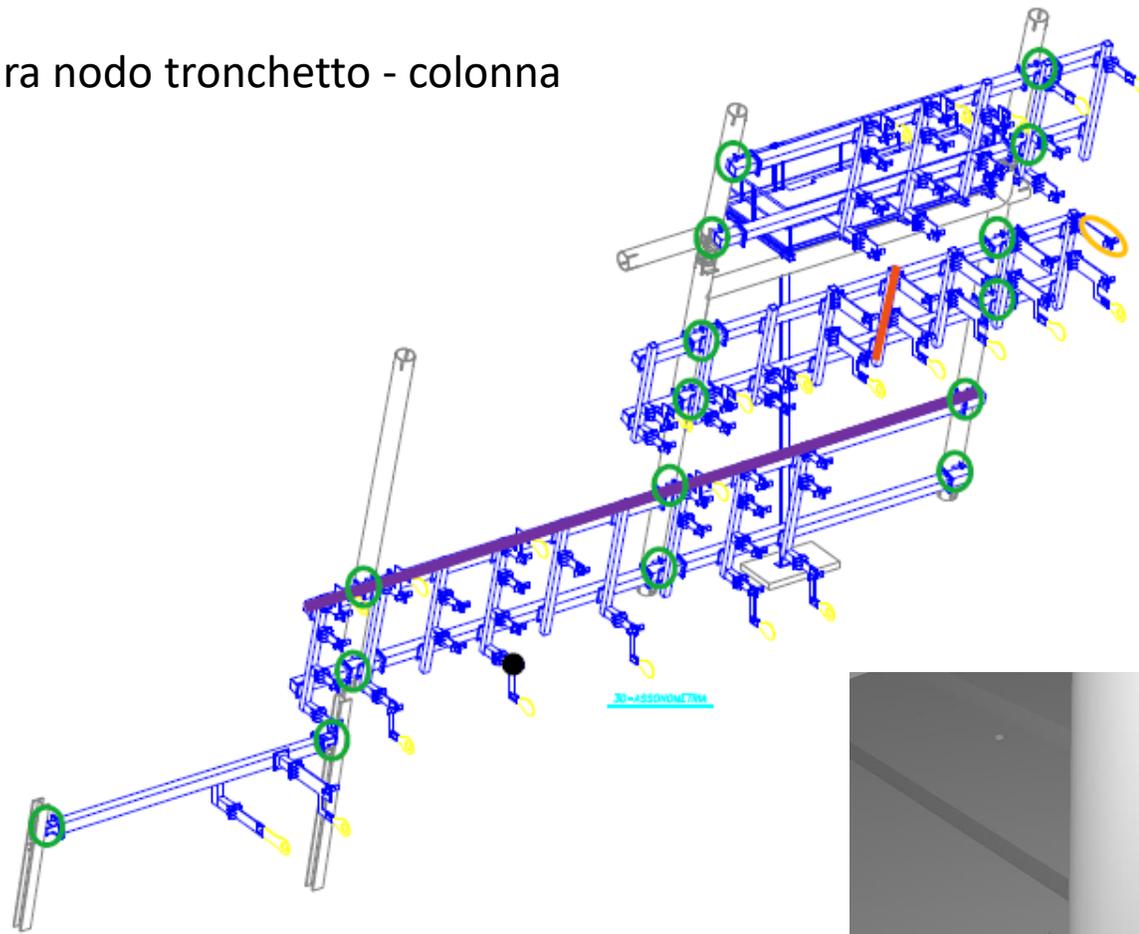






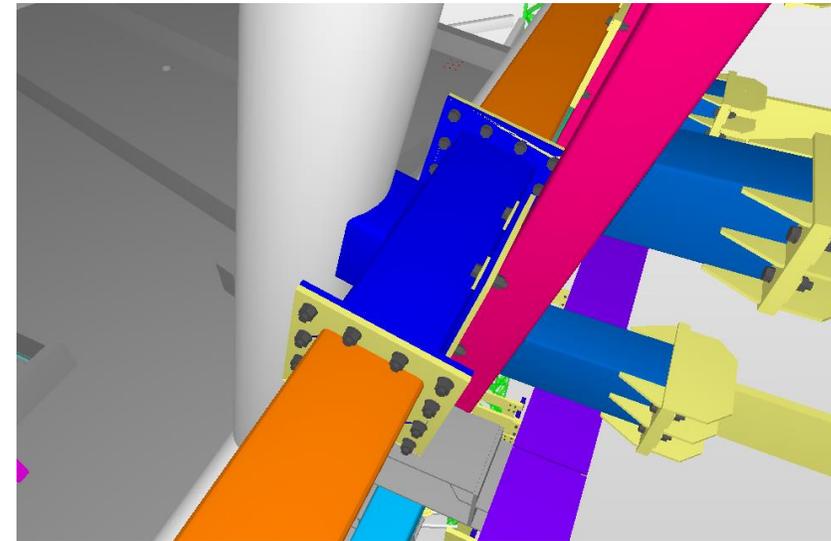
Prospetto cellule sud





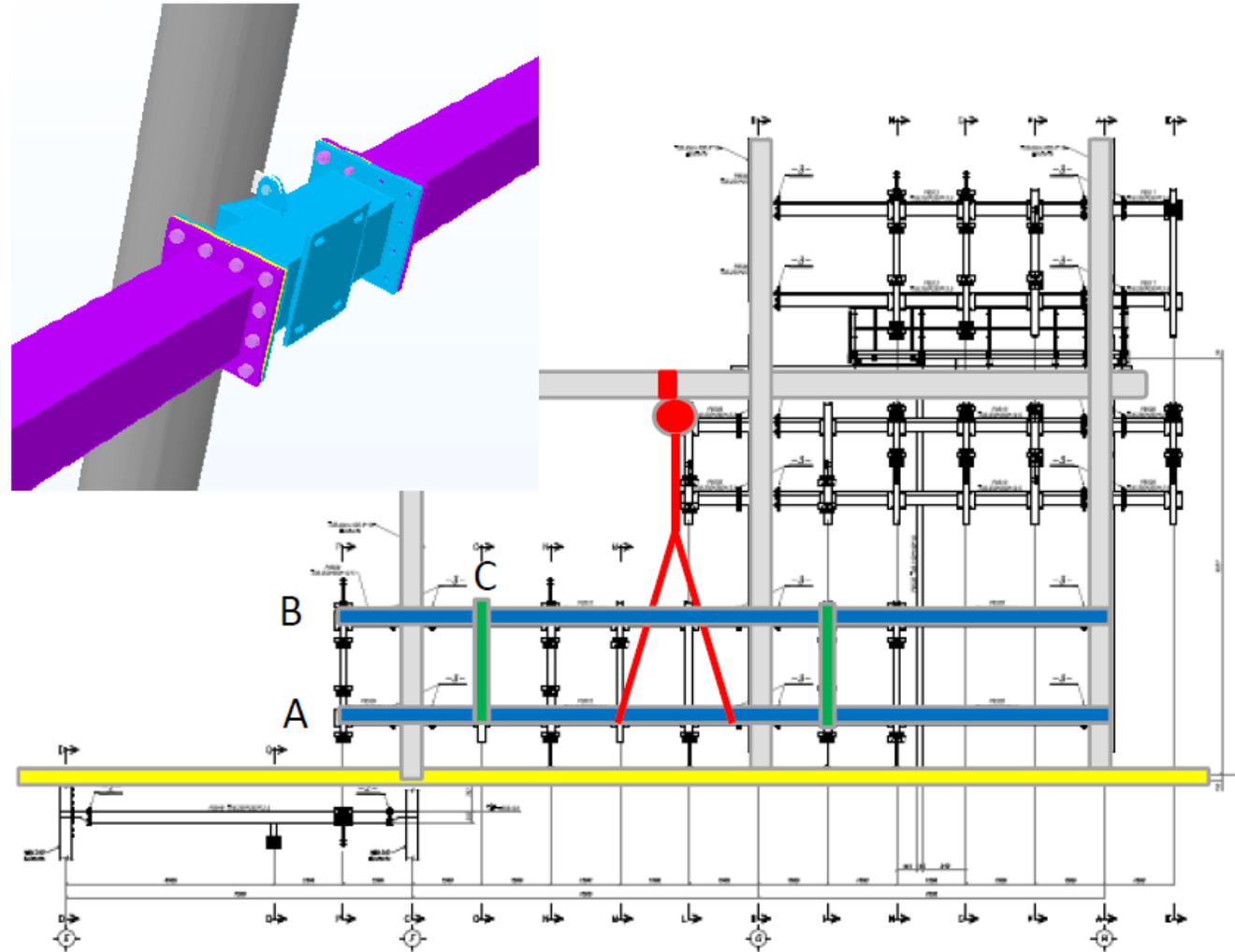
Descrizione elementi principali:

1. Tronchetti 

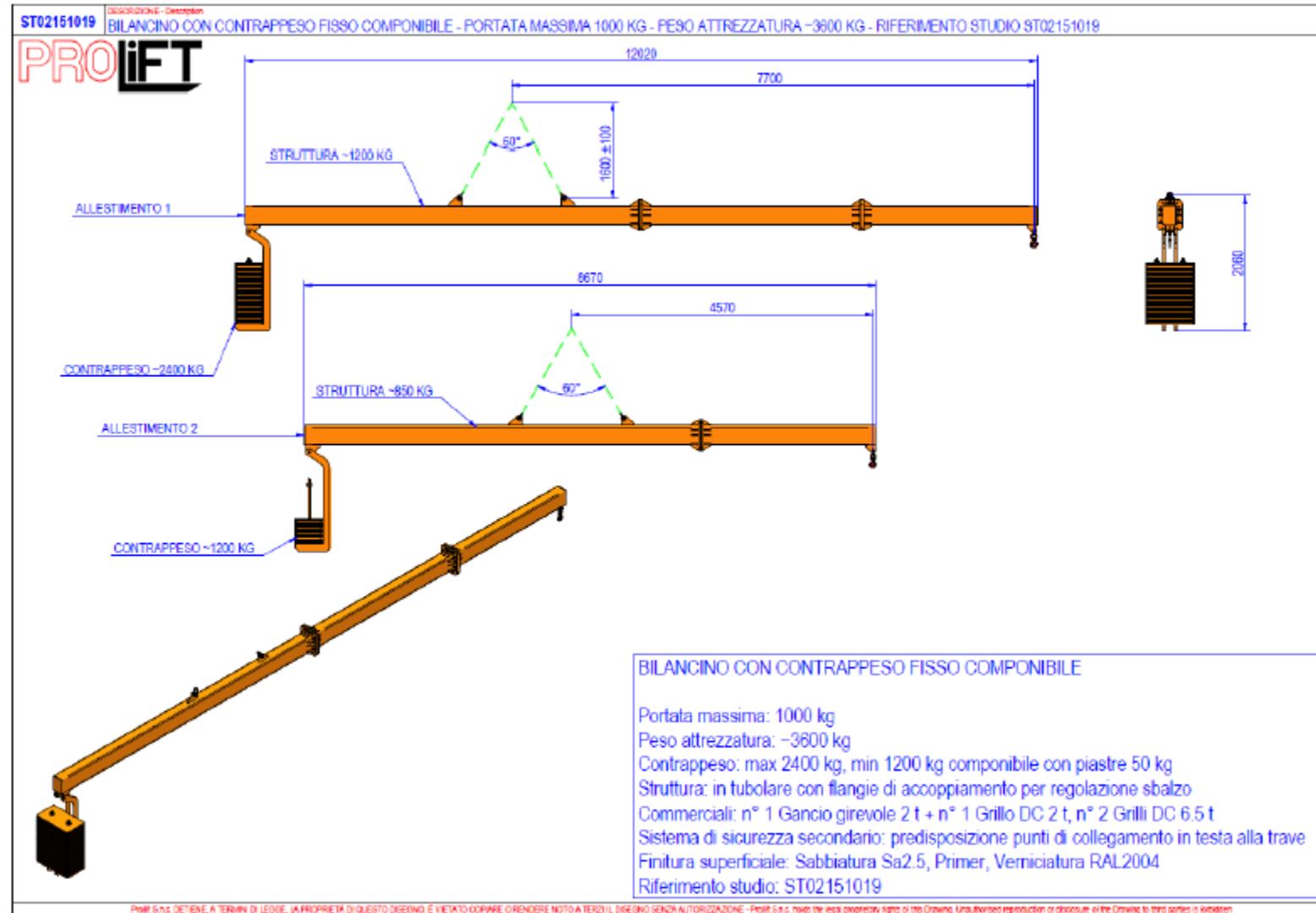


FARE CLIC PER MODIFICARE LO STILE DEL TITOLO

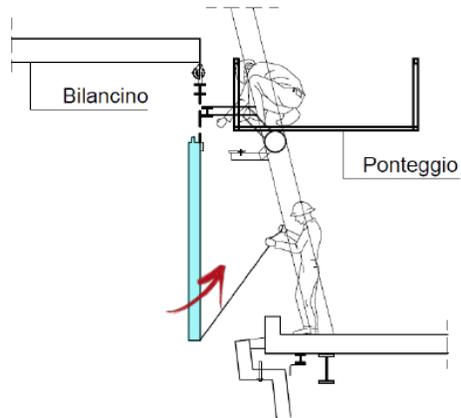
Dettaglio



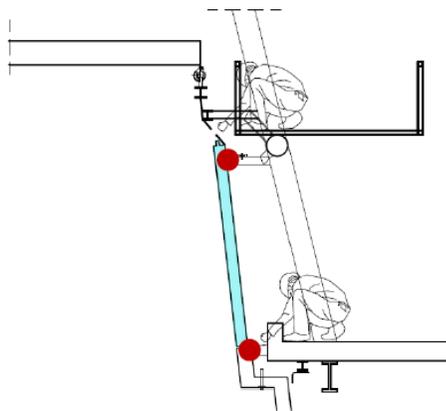
Bilancino per posa cellule sud



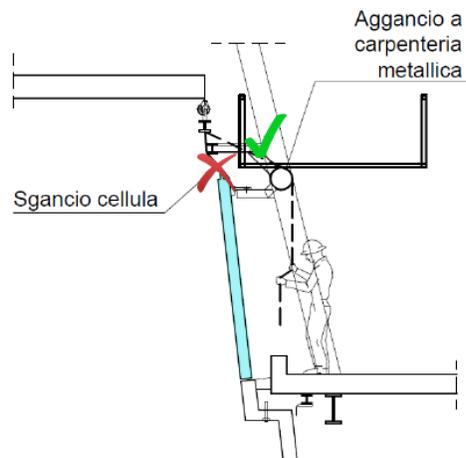
Fasi di posa cellule sud



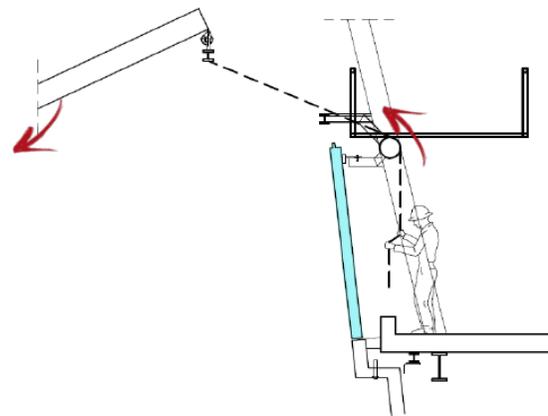
1) Movimentazione cella con bilancino



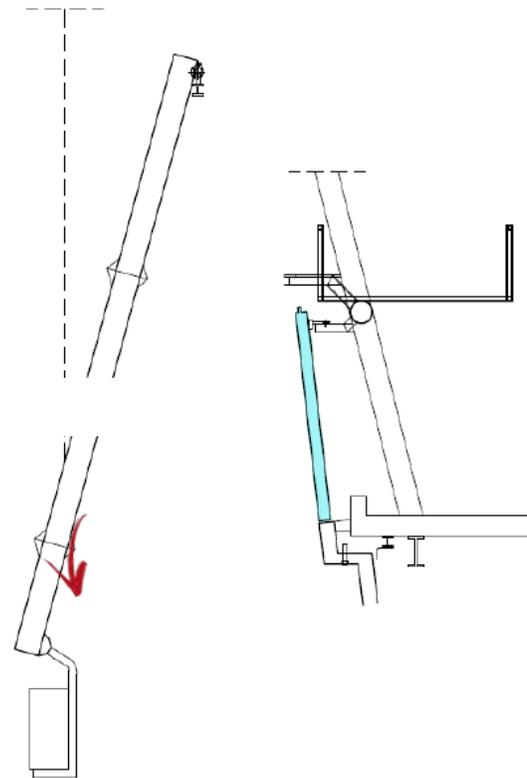
2) Installazione cella



3) Scarico del bilancino



4) Rilascio del bilancino



5) Trasporto in sicurezza del bilancino a terra



Grazie per l'attenzione

CityLife SHOPPING DISTRICT