

B.Cube
Società di Ingegneria

Façade Department

Façade Department

In a context characterized by increasing design complexity and a high level of interdisciplinary integration and coordination between structures, building envelope, architecture and MEP systems, in 2024 **B.Cube** expanded its service offering in the construction sector with the establishment of the **Façade Department**.

The Façade Department plays a central role as a qualified technical interface between design teams, technical offices, manufacturing and construction sites, ensuring consistency in decision-making and continuity in performance control throughout the entire project lifecycle. It therefore represents a **strategic reference point for the management of complex projects**.

Drawing on the experience of its Senior Advisors, gained in leading national and international contexts, **B.Cube**'s Façade Department integrates cross-disciplinary expertise ranging from engineering and production to site management and coordination.

The aim is to provide comprehensive assistance that goes beyond conventional technical consultancy services, supporting our clients with an **operational partnership** model geared towards the tangible improvement of project performance in terms of efficiency, cost optimization and risk mitigation. Within this framework, **B.Cube** supports general contractors and manufacturers throughout all phases of project's development, with particular focus on:

- Identification and management of technical and contractual issues
- Optimization of timescales, costs and production processes
- Coordinated integration between façade, structures and MEP systems
- Quality control, safety and performance monitoring

Through this approach, the Façade Department positions itself as a key asset in ensuring reliability, control and value in highly complex technical projects.





OUR SERVICES

Tender and bid process support

We assist contractors and clients throughout all stages of the tender process, through activities including document analysis, performance verification, value engineering and the development of technical documentation, for both tender and bid preparation. We provide **specialist expertise**, ensuring **qualified support** that combines regulatory compliance, construction reliability and optimization of economic and technical performance.

With a view to the technical and economic optimization of the entire project, our **value engineering** work is not limited to evaluating construction alternatives aimed at reducing the time and costs of supplying façade systems alone. Adopting an **integrated approach** combining technical expertise, rigorous documentation and a **systems-based perspective**, we ensure that the proposed solutions are consistent with other disciplines and do not conflict with other activities during the construction phase, thereby preventing critical issues and ensuring an **effective improvement** in the cost-benefit ratio of the **entire project**, without compromising the required performance levels in terms of safety, quality, durability, maintainability and regulatory compliance.

The drafting of **technical documentation**, either for tender or bid, is carried out in line with the project's targets and the reference framework required by the contractual and procedural context. This activity includes the development of drawings, technical reports, technical and performance specifications, design specifications and technical terms of reference, as well as cost estimates consistent with the bidding strategies and the **client's goals**.

To support the selection process, we manage the preparation of **bidder lists**, we follow **technical reviews and clarifications exchanges** with potential bidders and carry out comparative analysis of technical and financial bids, providing a structured and objective framework to support decision-making.



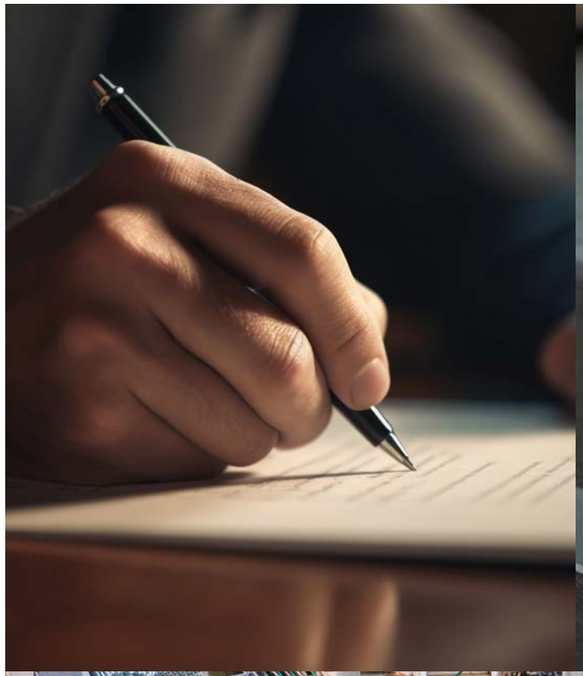
Contract management support

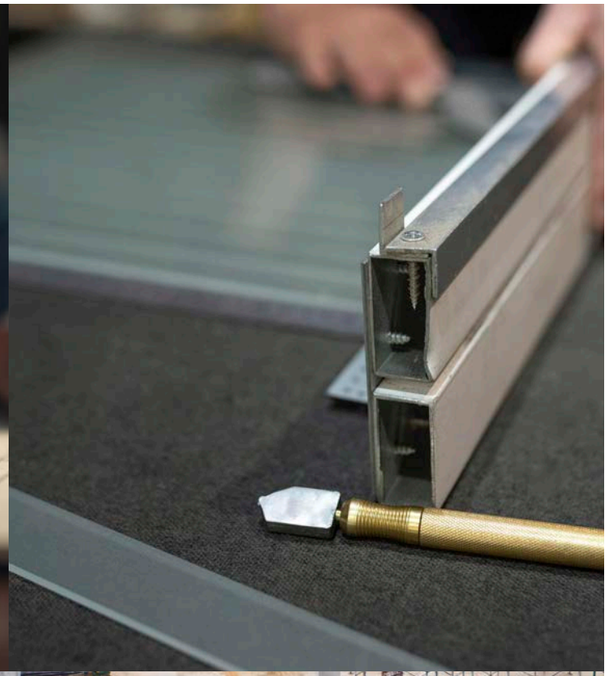
We support clients in the **technical and operational management** of façade's supply and installation contracts, ensuring continuity and efficiency on site. Our goal is **preventing delays, conflicts and potential disputes**.

We coordinate and plan activities **from design to installation**, ensuring consistency and full **alignment with project objectives** by:

- Checking the compliance of supply and installation activities
- Monitoring the progress of procurement and installation works against the time schedule
- Anticipating technical and operational issues
- Supporting the management of claims and variations









Design documentation review

We verify that the façades are suitable for the intended **service conditions**, as well as being correctly dimensioned and configured to meet the required performance standards throughout the building's entire lifecycle.
We carry out a **thorough review** of design documentation, to identify omissions, and potential conflicts between documents, with the aim of preventing complications during the construction phase. This activity includes the analysis of requirements relating to:

- **Material** specifications
- **Resistance** to design loads
- Air and water **tightness**
- Thermal and acoustic **insulation**
- **Impact** resistance
- **Fire** resistance
- **Corrosion** resistance
- **CE** marking
- **Interfaces** with other disciplines
- **Cleaning** and **maintenance** strategies

Permeabilità all' aria	Specchiature fisse: Classe A4 (UNI EN 12152)
	Elementi apribili: classe 4 (UNI EN 12207)
Permeabilità all' acqua	Specchiature fisse: classe RE750 (UNI EN 12154)
	Elementi apribili: classe E750 (UNI EN 12208)
Resistenza all'impatto	Classe esterno: classe E5 (UNI EN 14019)
	Classe interno: classe I5 (UNI EN 14019)

Percorso di fiancheggiamento	Indice minimo di isolamento acustico
indice minimo di riduzione del rumore laterale $D_{nT,w}$ dei **montanti della facciata**	Minimo $D_{nT,w}$ **45 dB** per una privacy normale Minimo $D_{nT,w}$ **53 dB** per privacy confidenziale o tra diversi tenant

Simulazione di dati sulle prestazioni in opera del vetro

Caratteristiche luminose - EN 410

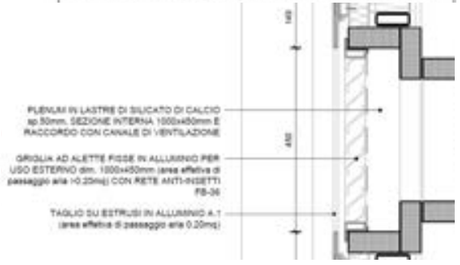
Trasmissione luminosa : τv [%]	63
Riflessione luminosa : ρv [%]	16
Riflessione luminosa interna : ρvi [%]	19
Indice di resa dei colori : Ra [%]	97

Proprietà termiche - EN 673

Trasmittanza termica (vetri verticali) : U value [W/(m².K)]

Riduzione acustica

Direct airborne sound reduction - Interpolated : Rw (C;Ctr) [dB]

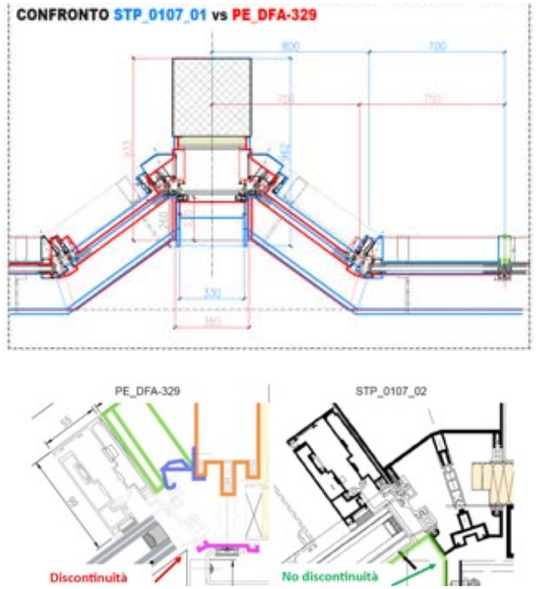


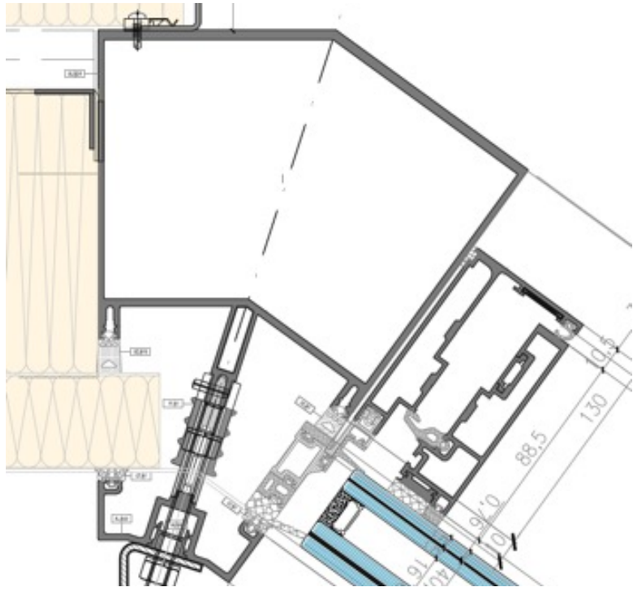
Acting in advance of manufacturing allows for the timely identification of any technical issues, reducing the likelihood of errors and the occurrence of operational delays and extra costs.

Design optimization

We work closely with the client to identify the most suitable materials and systems for optimizing the project in terms of **manufacturability and installation**. This includes evaluating potentially more effective existing alternatives, as well as developing **customized solutions** that aim to combine performance suitability, maximum fidelity to the architectural intent, and simplicity and speed of execution.

In order to **identify in advance** any issues that may hinder the construction process, we systematically examine interfaces and clashes with the other components as well as installation sequences and the requirements of the equipment to be used.



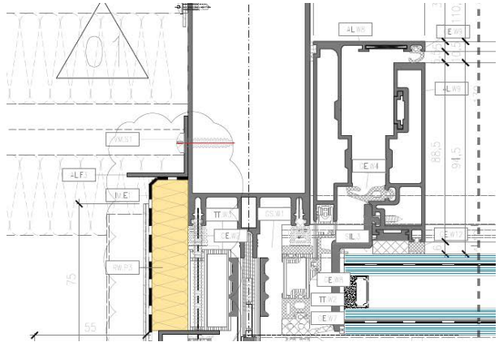


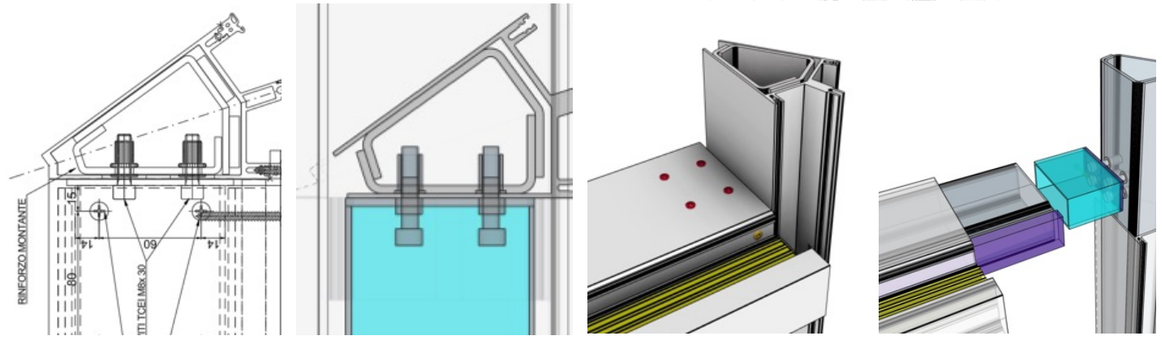
Design drawings

We develop general and detailed drawings **down to construction level** (1:1 scale), defining and specifying all system and non-system materials and components, with a driving focus on the **constructability** and the **simplification** of installation activities, also by means of 3D modeling and analyses.

With a **preventive approach**, already from the development of construction details, we aim to avoid the need for corrective measures during execution, limiting site delays and unforeseen costs, to the benefit of safety, durability, and long-term performance continuity.



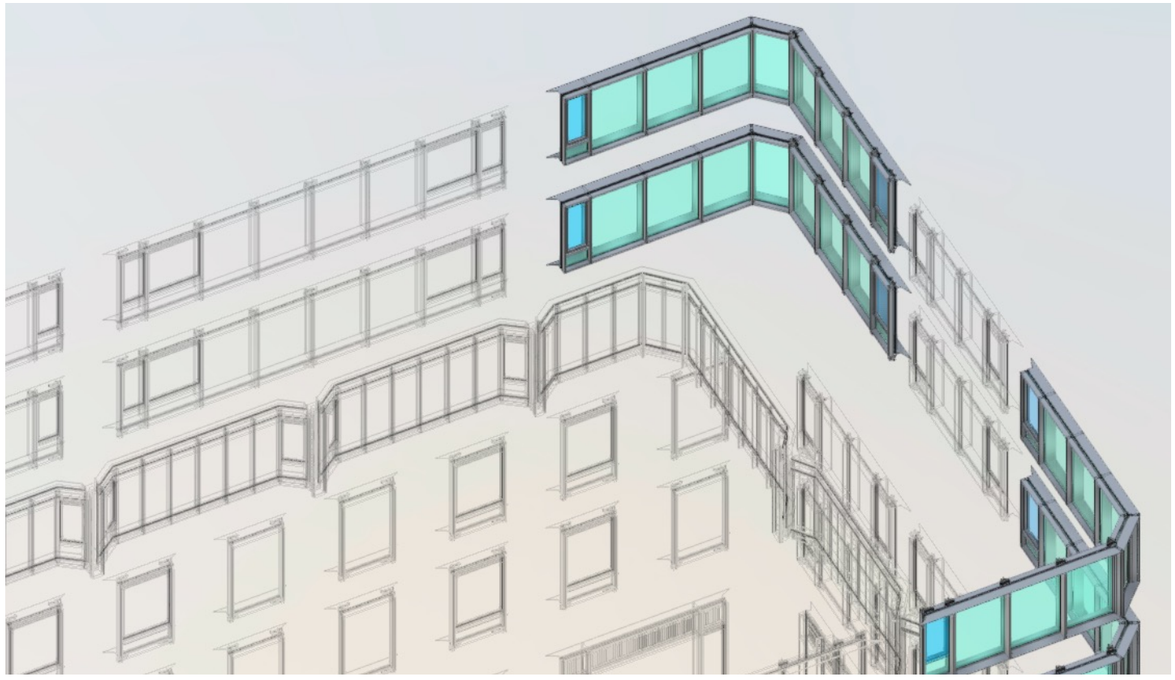




BIM Modeling

We develop models describing the geometries of the **main physical components** of the building envelope, both for **coordination** purposes and as a basis for generating general drawings (plans, sections, and overall elevations).

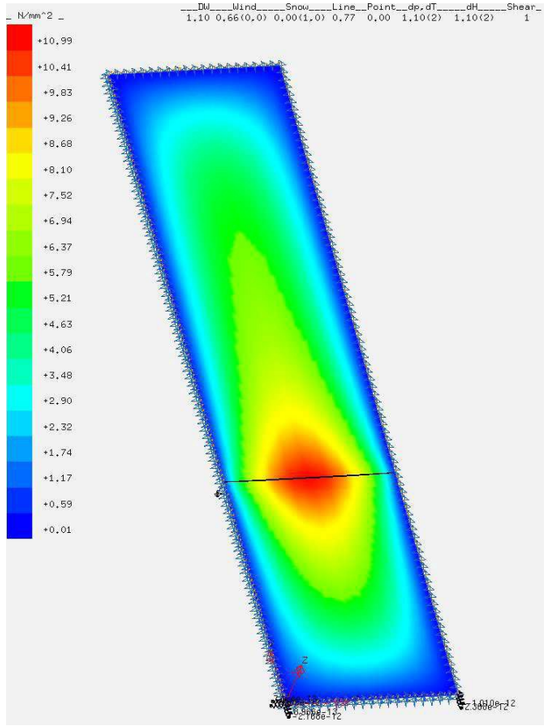
We enhance the models by incorporating **information parameters**, down to achieve the as-built level, creating a tool for the client to monitor and manage the structure throughout the building's lifespan.

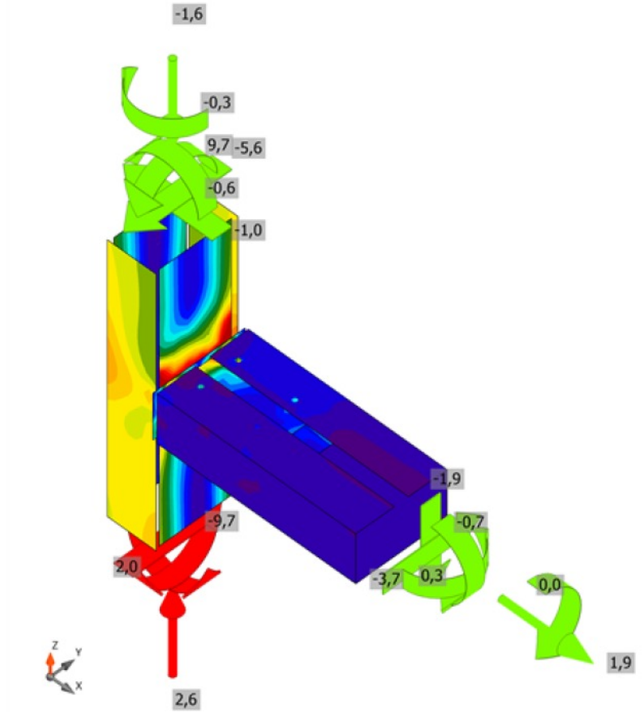


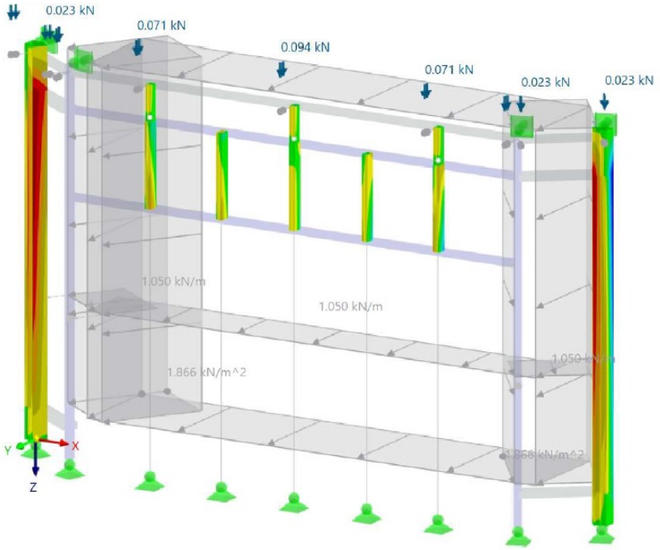
Structural analyses

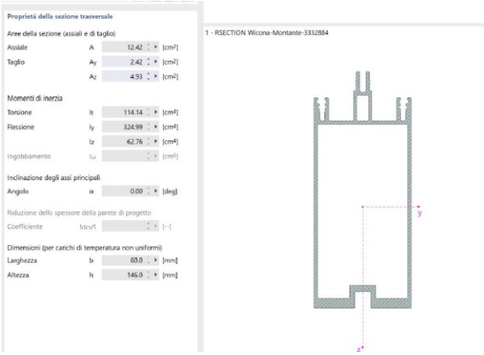
We ensure that the structure is **properly dimensioned** and suitable for all **functional requirements** of the project over time.

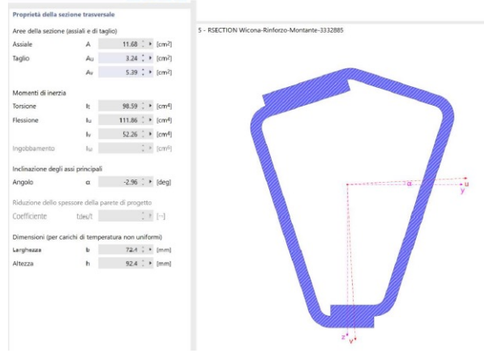
We develop general and detailed **FEM models** to assess the behavior of the structure and all its components, not only at a **global** level but also **locally**, ensuring that design safety and reliability requirements are fully met, while respecting the overall architectural vision, project budget, and existing construction constraints.

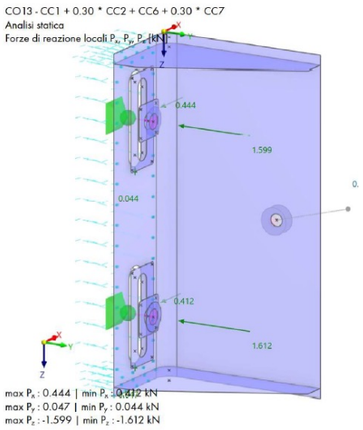


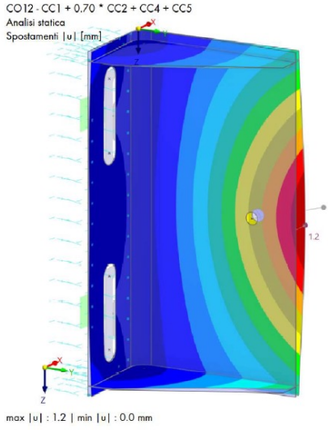


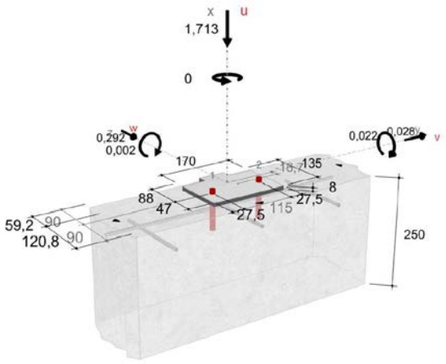












Thermal analyses

We secure that the thermal performance of the building envelope **complies** with project requirements in terms of **thermal inertia** and/or **thermal transmittance** by integrating two-dimensional FEM modeling with 3D analyses to assess localized thermal bridges.

We assess the **risk of condensation**, both surface and interstitial, as well as the consequent risk of mold formation, identifying in advance the **critical operating conditions** to mitigate their effects proactively.

Trasmittanza UTj: 3.3 W/m²K

Modalità di calcolo

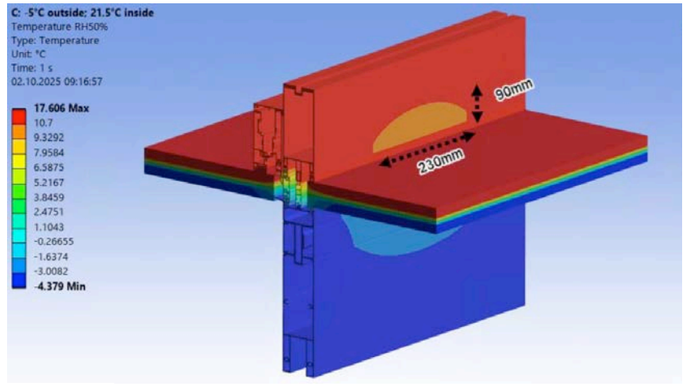
*UTj = ([ΦTot/ΔT] - Σ [U*l])/Bf* *ΔT=20 °C*

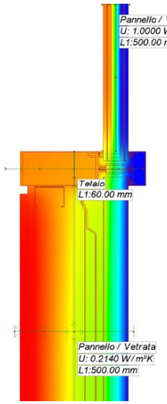
Risultati simulazione

Conduttanza bidimensionale L2d	0.80441 W/mK
Flusso termico bidimensionale ΦTot	16.08817 W/m
Errore flusso 10211 C2e	0.000469
Errore flusso 10211 C2d	0.008746 %
Triangoli	63157

Condizioni ai contorni

Nome	Col.	T Aria [°C]	R [m²K/W]
Interno		20.0	0.13
Esterno		0.0	0.04
Adiabatico			
Rsi maggiorata		20.0	0.20
Esterno 0.13		0.0	0.13

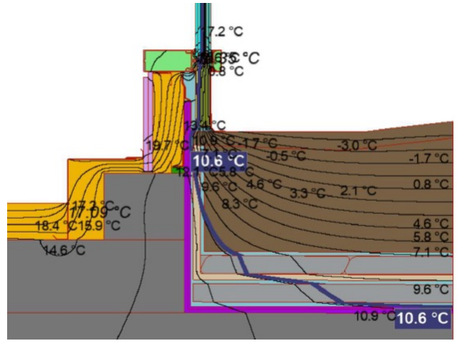




Materiali

Nome	λ [W/mK]	ε	Colore
Acciaio	50.0000	0.900	
Alluminio verniciato/anodizzato	160.0000	0.900	
Canalina	0.1400	0.900	
Cartongesso bassa densità (1000 kg/m3)	0.4000	0.900	
EN ISO 10077 singola cond. equiv.	-	0.900	
EPDM	0.2500	0.900	
Intercapedine aria	0.1750	0.900	
Isolante sandwich	0.0230	0.900	
Lana di roccia	0.0350	0.900	
PE foam	0.0360	0.900	
PVB	0.2200	0.900	
Silicone - IGU - Two-box model	0.4000	0.900	
Vetro comune	1.0000	0.900	
Vetrocamera equivalente	0.0201	0.900	
Vite equivalente	0.2800	0.260	
XPET foam	0.0300	0.900	

Trasmittanza U1=1.00 W/m²K *Lunghezza L1: 500 mm*
Trasmittanza U2=0.21 W/m²K *Lunghezza L2: 500 mm*



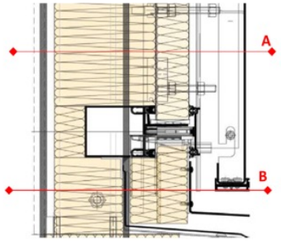
Acoustic analyses

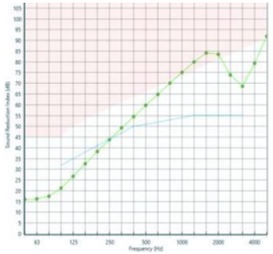
We verify that the materials used in the façade system are **suitable** for meeting the project's acoustic requirements through the assessment of the overall **weighted sound reduction** index (R_w) of the entire façade based on that of its individual components.

Starting from the façade overall Rw value, we proceed with the **provisional assessment** of the adequacy of the the standardized façade sound insulation index ($D_{2m,nT,w}$), **promptly identifying potential issues** so that they can be resolved already at the design stage.

Tamponamento opaco Inferiore [A]		
Strati	Materiale	Spessore mm
Ext 1	Lamiera alluminio	2
2	Aria	65
2	Pannello Isopar HP	40
3	Lana di roccia Rockwool	120
Int 4	Lastre cartongesso x 2	25

Rw (da calcolo Insul) = 51 ± 3 dB





Calcolo R'w

$$R'_w = -10\log\left[\sum_{i=1}^{n}\frac{S_i}{S}\cdot 10^{\frac{-R_{wi}}{10}} + \sum_{i=1}^{n}\frac{A_0}{S}\cdot 10^{\frac{-D_{ne,wi}}{10}}\right] - k$$

Potere fonoisolante apparente composto	Rw [dB]	44

Calcolo $D_{2m,nT,w}$

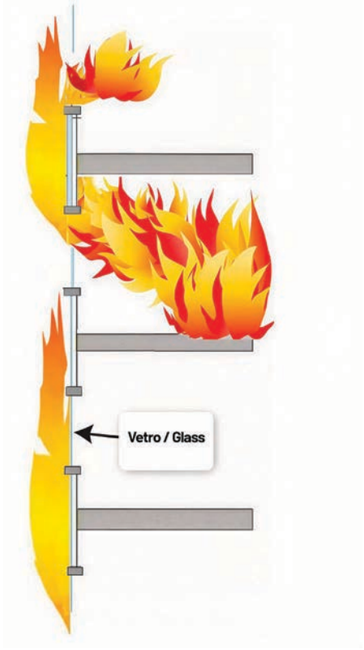
$$D_{2m,nT,w} = R'_w + \Delta L_{fs} + 10\log\left(\frac{V}{6T_0S}\right)$$

Indice di isolamento acustico di facciata	$D_{2m,nT,w}$ [dB]	48
Incertezza di calcolo (Rif. UNI12354-3)	u	-1,5
Indice di isolamento acustico di facciata finale	$D_{2m,nT,w}$ [dB]	46

Fire engineering

We support the client in verifying the adequacy of design solutions with respect to the fire safety measures defined in the **fire prevention strategy**, ensuring compliance with applicable regulations and project-specific requirements.
The activity includes the assessment of requirements related to:

- Characterization of **boundary enclosures**
- **Reaction** to fire
  - Materials/components reaction class / material grouping
  - Impact of insulation, sealants and sealing materials
- Fire **resistance**
  - Compartmentation
  - Vertical separation
  - Horizontal separation
  - Junction between façade and compartmentation elements
  - Double-skin façades and cavities
- **Occupant Evacuation** (safety exits doors)
  - Opening direction
  - Clear opening dimensions
  - Opening devices and accessories
- **Smoke and heat** control
  - Smoke exhaust devices
  - Net ventilation area



To **optimize** design solutions, these analyses necessarily include the evaluation of already certified systems, as well as the verification of existing certifications and potential applicability and extendibility.

Our approach aims to **prevent errors** as early as the design stage, to ensure the fire safety performance of the building throughout its service life.

Quality control during production

To ensure compliance, safety, durability, and long-term performance continuity of the works, by means of the adherence to applicable technical standards, we assist the client in performing quality control tasks **during the production phase** along the **whole supply chain**, with activities including:

- Verification of traceability documentation and certificates for materials and components
- Dimensional checks
- Performance testing to verify compliance with design and regulatory requirements
- Inspections at manufacturers' facilities (e.g., extrusion plants, glass processors, painting
- and/or anodizing facilities, aluminum/steel processing facilities, precast concrete and/or
- GFRC panels production plants).



Technical support on-site

During the installation of façade systems, we assist contractors by providing **technical support** and **supervision** of installation activities.

B.Cube's contribution not limited to on-site quality control — which involves verifying materials and their certifications and confirming compliance with design requirements — and focuses on the **early identification and prompt resolution** of technical issues that could hinder the installation activities.

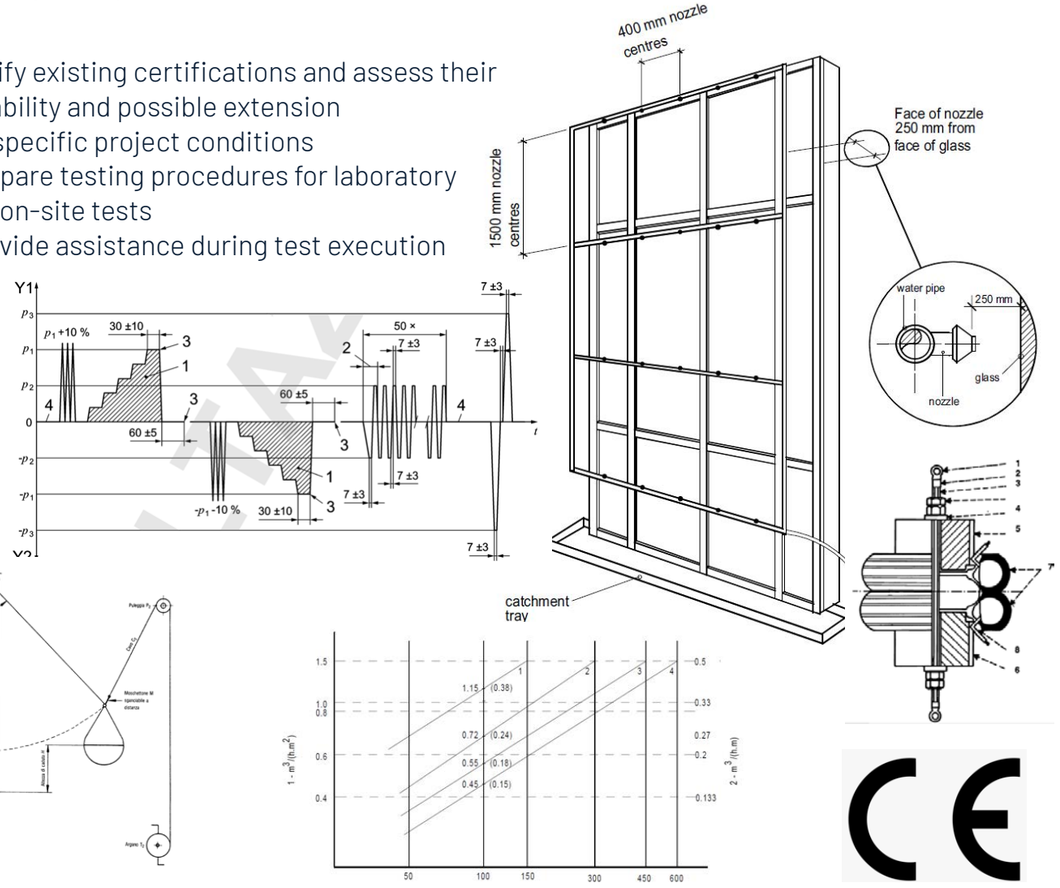
To the same end, we closely oversee and monitor compliance with installation sequences, related operating procedures, and safety measures for each work phase, with particular attention to interfaces and clashed with other works.



Performance verification

We support the client in verifying **compliance and consistency** of the performance of the building envelope system and its components with respect to project requirements and applicable regulatory standards. To this end:

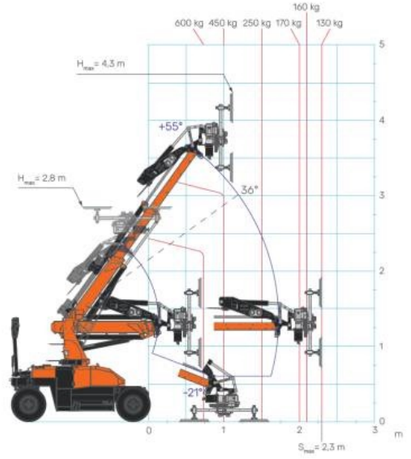
- We verify existing certifications and assess their applicability and possible extension to the specific project conditions
- We prepare testing procedures for laboratory and/or on-site tests
- We provide assistance during test execution

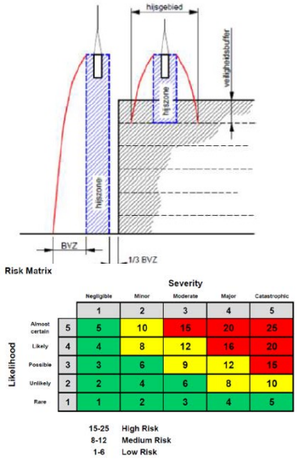


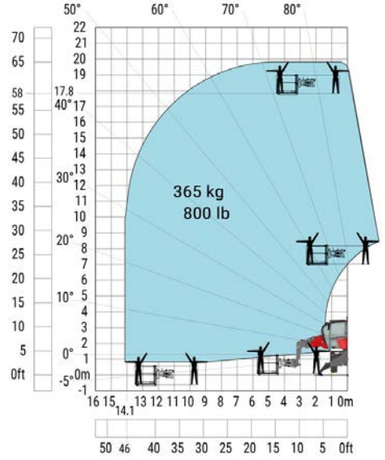
Development and verification of lifting / installation / erection plans

We ensure that the installation of façade systems is carried out in a safe and sustainable manner, while adhering to the project schedule, with the preparation of detailed operational plans including the definition and scheduling of all execution phases. In defining the installation sequences, we assess every aspect that may contribute to maximizing execution efficiency and therefore optimizing time and execution costs, including:

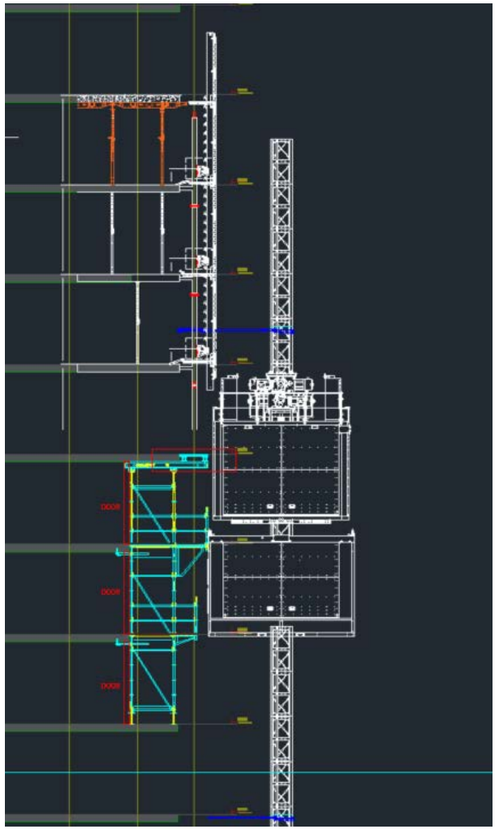
- **Logistics planning**, including the identification of the most suitable horizontal and vertical **handling equipment and lifting means** based on site constraints
- Planning of **lifting and assembly** phases and their execution timelines
- Analysis of interfaces with other trades to **minimize clashes** and risk of delays
- Risk assessment for each activity, with definition of the related procedures and **safety measures** to be implemented

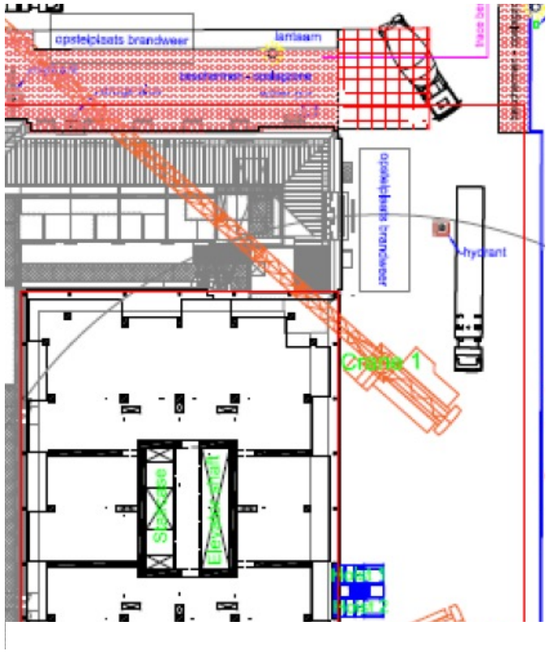


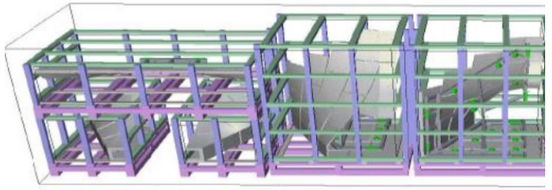








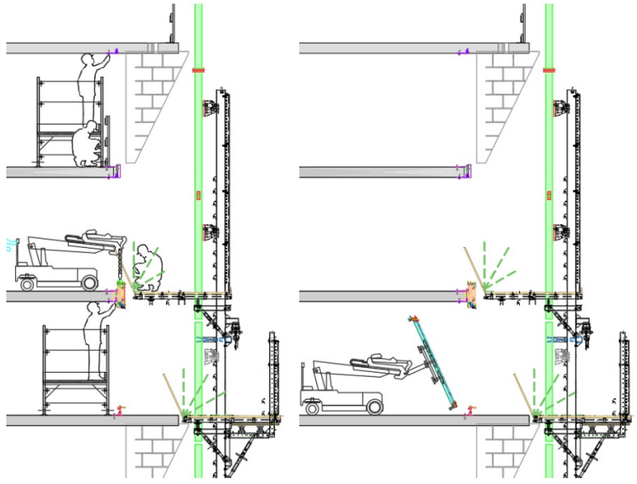


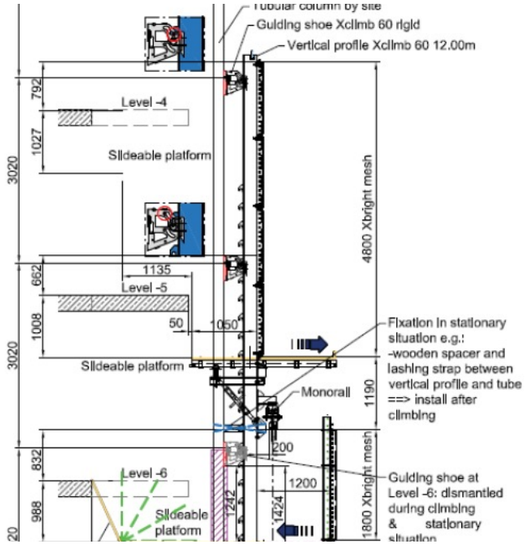


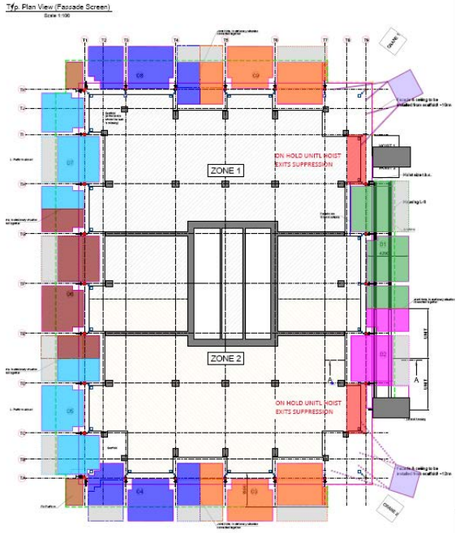
VERTICAL MOVEMENTS WITH HOIST	PEAK DAY: Wx-03			ELEMENTS PER MOVEMENT		QUANTITY OF MOVEMENTS		
	Wx-03	Wx-03	Wx-03					
	TRUCKS	MATERIAL TO BE LIFTED						
		CAGES	EURO-PALLETS	CAGES	EURO-PALLETS	CAGES	EURO-PALLETS	TOTAL*
TOTAL	6	39	10	-	-	35	3	38
L(+2)	0.1	-	5	-	-	-	1	2
Brackets (all installed onto RC str.)	0.1	-	5	1	4	-	1.25	2
L(+1)	2.8	22	4	-	-	18	1	19
Arches	1.0	10	4	1.67	4	6	1	7
Skirt and Rails	0.3	4	-	1	4	4	-	4
Glass Panels	0.5	4	-	1	4	4	-	4
GFRC inner columns	1.0	4	-	1	4	4	-	4
L(+0)	3.3	17	1	-	-	17	0	17
Glass Panels	0.5	3	-	1	4	3	-	3
GFRC outer columns	0.2	3	1	1	4	3	0.25	3
GFRC inner columns	1.0	4	-	1	4	4	-	4
GFRC fascia at balconies	-	-	-	1	4	-	-	-
Waterproofing	-	-	-	1	4	-	-	-
Insulation	0.6	2	-	1	4	2	-	2
Balustrade Rails	0.7	2	-	1	4	2	-	2
Balustrade Glass	-	-	-	1	4	-	-	-




SAFETY FIRST
NO SMOKING
NO ENTRY
NO SLIPPER
NO PHOTOGRAPH
WEAR HEAD PROTECTION
WEAR SAFETY GLASSES
WEAR FOOT PROTECTION
WEAR HAND PROTECTION




Tubular column by site
Guiding shoe Xclimb 60 rigid
Vertical profile Xclimb 60 12.00m
Level -4
Slideable platform
Level -5
Slideable platform
Monorail
Level -6
Slideable platform
Fixation in stationary situation e.g.:
-wooden spacer and lashing strap between vertical profile and tube
==> install after climbing
Guiding shoe at Level -6: dismantled during climbing & stationary situation
4800 Xbright mesh
1800 Xbright mesh
792
1027
3020
662
1008
3020
832
988
20
1135
50
050
1190
200
1200
242
424


Typ. Plan View (Façade Screen)
ZONE 1
ZONE 2




PYRAMID
ARCHITECTURAL GLASS

The B.Cube Value

In the field of façade systems, **B.Cube** serves as a **technical benchmark** capable of understanding and managing the entire project lifecycle. Our **specialized expertise**, combined with a **comprehensive understanding of design, production, and construction dynamics**, enables us to support the project throughout all its decisive phases.

Our involvement focuses on coordinating interfaces and controlling **technical decisions**, from system definition to on-site execution, ensuring operational continuity and minimizing the exposure to technical, production, and organizational risks.

B.Cube supports each project with constant oversight, aimed not only at technical quality, but also at **practical feasibility, economic balance, and execution reliability**.









B.Cube
Società di Ingegneria

Our approach

- Integrated control of interfaces between design, production, and installation
- Client support in technical choices and decision-making processes
- Coordinated management of the entire project lifecycle
- Ensuring quality, safety, and high performance
- Reduction of technical, contractual, and operational risks
- Tender and bid process support
- Optimization of execution time and costs



CONSTRUCTION



Zavattari 12 - Ivory

A renovation project of an existing building, covering an area of approximately 14,000 sqm distributed over 12 above-ground floors. The project also includes approximately 1,400 sqm of panoramic terraces, as well as spaces intended for mixed-uses and retail purposes. The façades feature large double-height glazed modules, set in between horizontal and vertical metal elements, in an alternating arrangement that lends rhythm and dynamism to the overall architectural composition.

Client: **COIMA**
Intended use: **Administrative/Commercial**
General Contractor: **Impresa CEV S.p.A.**
Construction cost: **~ 30 mln €**
Durata: **~ 24 Months**

Design Architect: **PIUARCH**
Glass façades: **~ 3.000 m²**
Metal cladding: **~ 1.700 m²**
Certifications: **LEED Gold®, WELL Gold®, WiredScore Gold®**

Façade Department activities:

- Project Management (PM) activities, including support to the façade contractor's Project Manager, coordinationwith other disciplines and with production, and interfacing with the Client and Third Parties.







Lorenzini 8

An urban regeneration project involving the construction of a new office complex comprising 2 basement levels and 2 new buildings, both with an L-shaped plan layout, consisting of 4 and 5 above-ground floors respectively, for a total area of approximately 32,500 m^2. The façades are characterized by glazed modules set within a frames of precast reinforced concrete panels, with extensive integration of green elements and landscaping features.

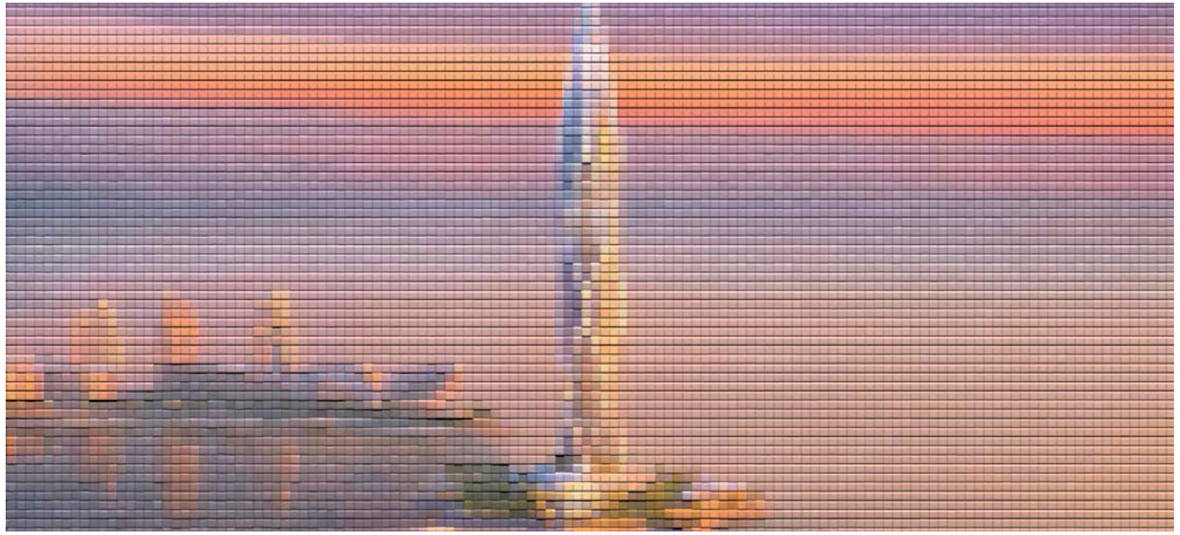
Client: **COIMA**
Intended use: **Administrative/Commercial**
General Contractor: **Carron Cav. Angelo S.p.A.**
Construction cost: **~ 50 mln €**
Durata: **~ 30 Months**

Design Architect: **KPF**
Glass façades: **~ 4.800 m^2**
Metal cladding: **~ 1.100 m^2**
Certifications: **LEED C&S Gold®, WELL Core Gold®, WiredScore Gold®**



Façade Department activities:

- Analysis and review of design documentation
- Façade detailed design, including drafting, BIM modeling, and engineering activities (structural / thermal / acoustic / fire analyses)
- Project Management (PM) activities, including support to the façade contractor's Project Manager, coordination with other disciplines and production, and interfacing with the Client and third parties







High Rise Tower

A luxury mixed-use skyscraper featuring a 5-star hotel, branded residences, duplex penthouses, lobby, restaurants, meeting rooms, spa and wellness facilities, and multi-level parking, as well as two independent mansions and leisure areas with swimming pools, a gym, a kids club, and padel courts. For the façade of the 62-storey tower unitized curtain wall system with double-glazed units featuring a decorative GFRC cladding is planned.

Client: **n.d.**
Intended use: **Hospitality / Residential / Retail**.
General Contractor: **n.d.**
Construction cost:**~ 1.000 mln €**
Durata: **39 Months**

Design Architect: **n.d.**
Glass façades: **~ 35.000 m²**
Rivestimenti un GFRC: **~ 15.000 m²**
Certifications: **n.d.**

Façade Department activities:

- Analysis and review of design documentation
- Extraction and verification of the Bill of Quantities (BoQ) from BIM models
- Integration of the BoQ with material and performance specifications for the various façade typologies and related components

Key Staff Experience

The team is composed of professionals with **consolidated experience** in the planning and construction of complex façade systems, developed through **projects of national and international relevance** characterized by high technical, logistical, and construction requirements.

The team's expertise includes the design and delivery of complex façades featuring the integration of various materials, advanced architectural geometries, a high level of customization, and combinations of diverse structural systems for residential, office, and/or commercial buildings — including **high-rise developments** — as well as next-generation sports facilities.

The professionals involved have contributed to the customization of façade systems, the development of logistics analyses, **construction strategies and installation methodologies, as well as cleaning and maintenance** solutions, operating in contexts with high operational complexity and stringent requirements in terms of safety, quality, and schedule control.

This experience enables the team to address all pre-construction and construction phases effectively, ensuring an approach focused on buildability, risk management, and optimization of the project's overall performance.

- **Post Rotterdam Tower**
  Location: **Rotterdam (NL)**
  Construction cost: **100 Mln €**
  Glass façades: **20.000 m²**
  GFRC cladding: **17.000 m²**
  High max: **155 m**

- **VTB Arena - Central Stadium Dynamo.**
  Location: **Mosca (RF)**
  Construction cost: **560 Mln €**
  Period: **2014- 2018**
  Façade Shell: **22.000 m²**
  Metal roofing: **30.000 m²**

- **Ganja Mall**
  Location: **Ganja (AZE)**
  Construction cost: **70 Mln €**
  Period: **2015- 2017**
  Glass Façade : **12.000 m²**
  Terracotta façade : **18.000 m²**

- **EUR Convention Center – Rome**
  Location: **Rome**
  Construction cost: **240 Mln €**
  Period: **2010- 2011**
  Façade (Teca): **28.000 m²**

- **Ristrutturazione Façade Channel 4**
  Location: **Londra (UK)**
  Construction cost: **N/A €**
  Period: **2023- 2024**
  Façade: **2.000 m²**

- **Kula Tower**
  Location: **Belgrado (SRB)**
  Construction cost: **200 Mln €**
  Period: **2016- 2024**
  Façade: **23.000 m²**
  Maximum height: **170 m**

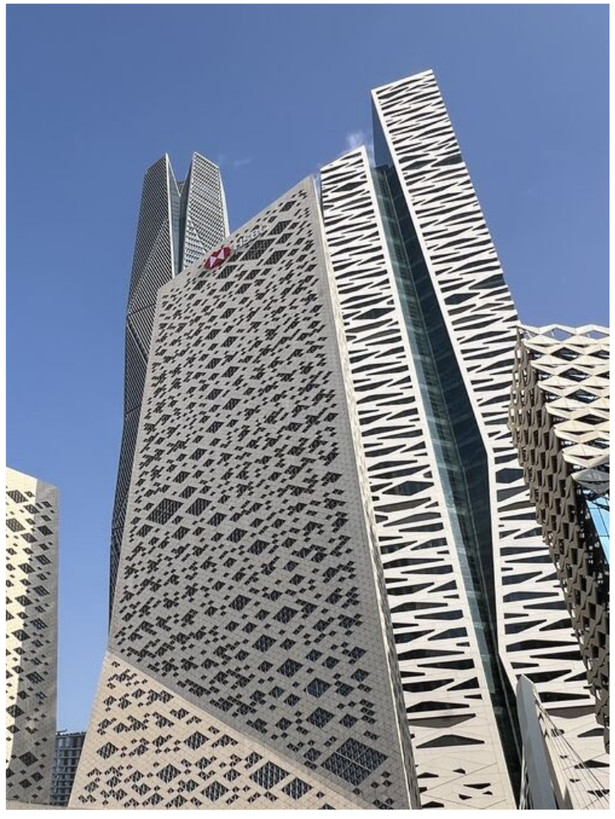
- **KAFD Parcel 1.10 (Crystal Tower)**
  Location: **Riyadh (KSA)**
  Construction cost: **200 Mln. $**
  Period: **2012- 2013**
  Façade: **35.000 m²**
  Maximum height: **140 m**

- **MFC Grand-Tower**
  Location: **Mosca (RUS)**
  Construction cost: **400 Mln €**
  Period: **2018- 2022**
  Façade : **110.000 m²**
  Maximum height: **300 m**

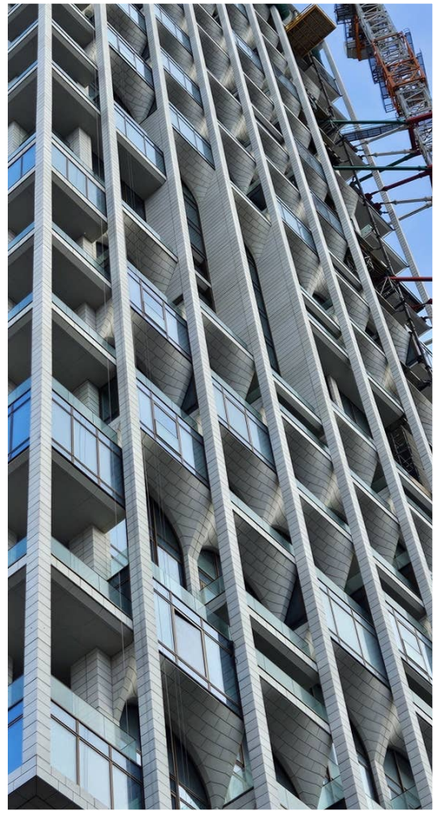
- **Rostech City K1**
  Location: **Mosca (RUS)**
  Construction cost: **160 Mln €**
  Period: **2019- 2020**
  Façade: **26.000 m²**
  Maximum height: **100 m**

- **MFC Gazprom Center**
  Location: **Minsk (BLR)**
  Construction cost: **740 Mln €**
  Period: **2019- 2021**
  Façade: **150.000 m²**
  Maximum height: **Main tower: 190 m**





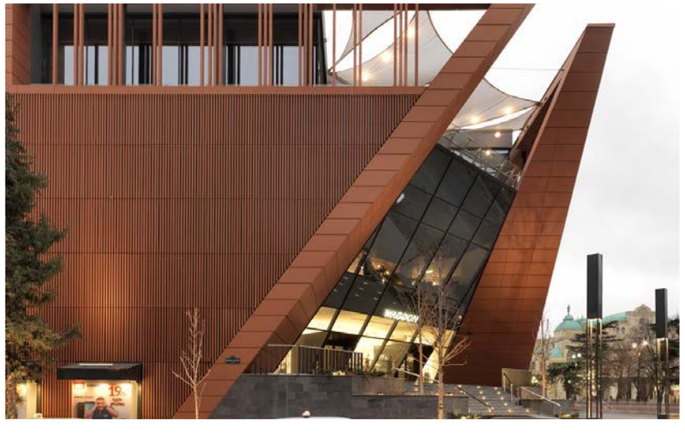








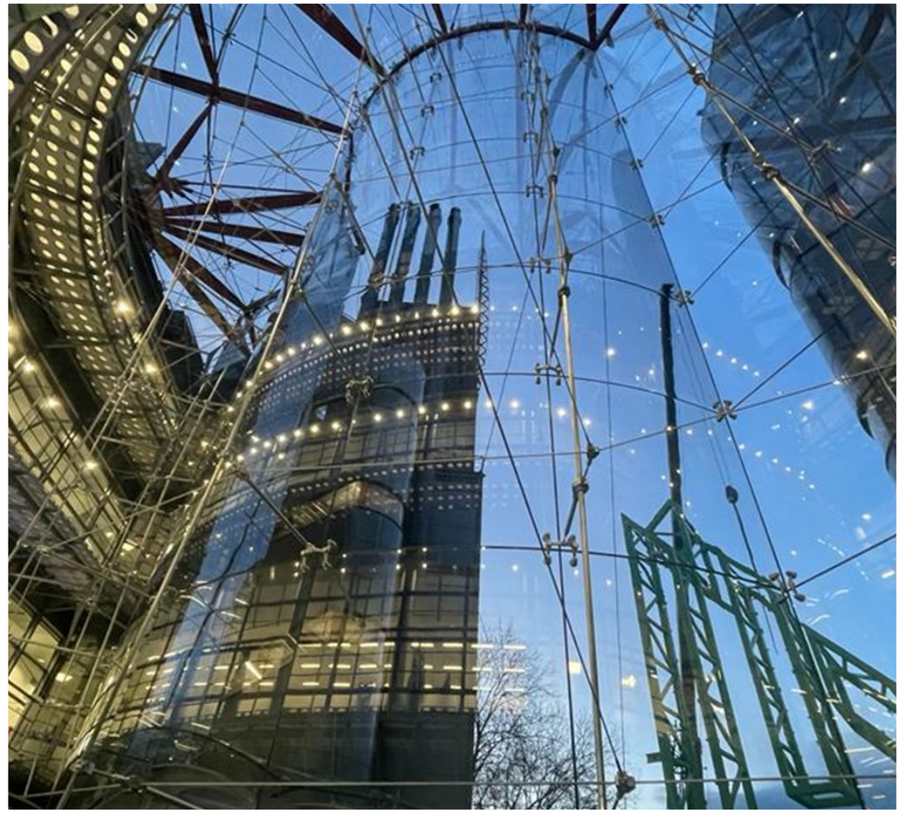




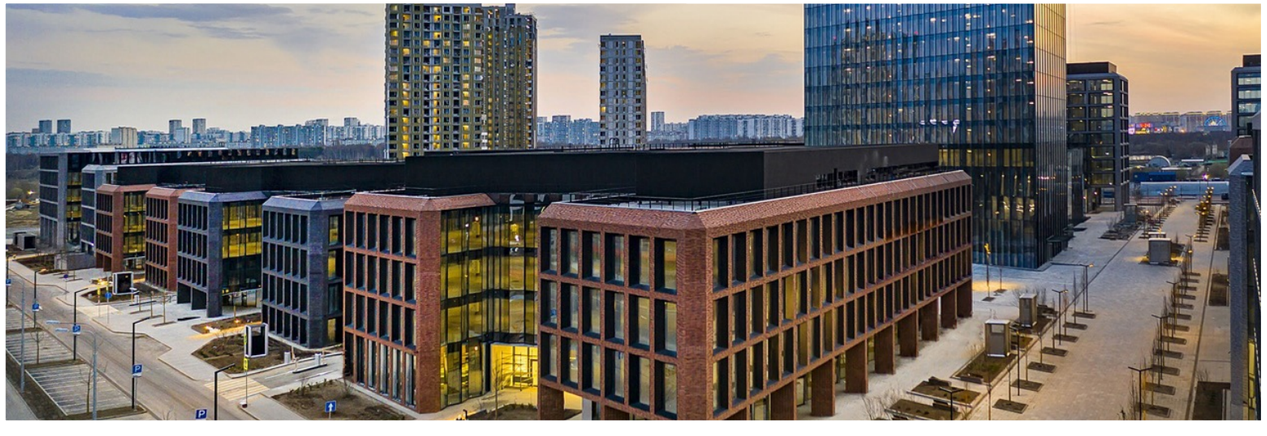





ВТБ АРЕНА

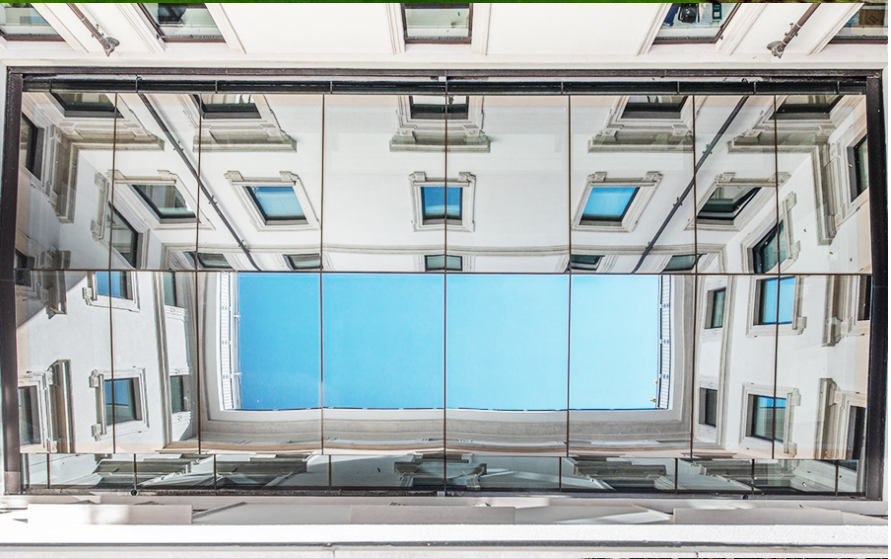



#ДинамоДома











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