



GUALINI®

A great overview.

Allianz Riviera e Arena 92

Esempi di involucri edilizi ad alte prestazioni

SVILUPPO E VALORIZZAZIONE DEGLI IMPIANTI SPORTIVI
14 Marzo 2016 - Politecnico di Milano



**POLITECNICO
MILANO 1863**

DIPARTIMENTO DI ARCHITETTURA,
INGEGNERIA DELLE COSTRUZIONI
E AMBIENTE COSTRUITO



Laboratorio di Management e Tecnologia per il
settore delle costruzioni, immobiliare e il territorio

Con il patrocinio di:



Con il contributo di:



Media partner:



Giuseppe Francavilla

Responsabile Marketing e Comunicazione Gualini Group

g.francavilla@gualini.eu

AGENDA

- Gualini Group: A solid background
- Building envelope: Curtain walls
- Stadium Projects
 - Allianz Riviera – Nice Ecostadium
 - Arena 92 - Paris



Gualini S.p.A. Headquarter | Costa di Mezzate, Bergamo | Italy

World presence



Gualini Group

Gualini's headquarter

- 12.000 sqm factory fully covered
- 2.000 sqm offices
- Daily Production:
 - 250 sqm - Curtain Wall
 - 200 sqm - Door & Window frames
 - 350 sqm - Ventilated Facades

Gualini Group

Building Envelope:

- Curtain walling
- Door and window frames
- Ventilated façades
- Metal constructions



A great overview.

Main references

2015

Palazzo Italia | EXPO2015 | Milano



2015

Control Tower | Ben Gurion Airport | Tel Aviv



2016

Rishonim Center I Tel Aviv



2016

Scalo Milano | Locate Triulzi





A great overview.

Building envelope: Curtain wall

Curtain wall: «Less is More»

1957: L. Mies van der Rohe
Seagram Building – New York



Curtain wall: High-Tech Architecture



1977: R. Rogers & R. Piano – Centre Pompidou, Parigi

Curtain wall: High-Tech Architecture



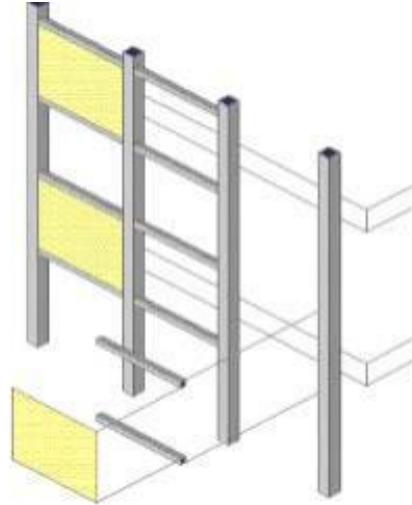
2003-2006: N. Foster
Hearst Tower - New York

Curtain wall: Features

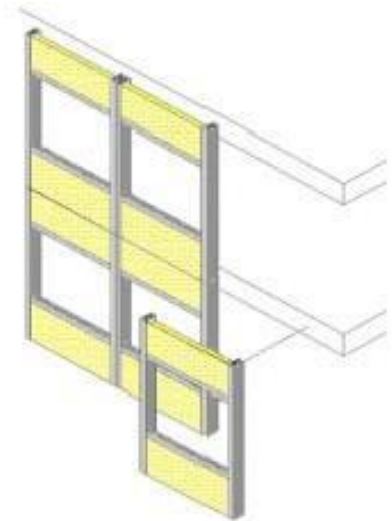
- Modular elements;
- Indoor and Outdoor division;
- Visual (Daylighting, Aesthetics);
- Thermal Performance (Conduction, Solar Radiation, Thermal Break, Comfort);
- Health and Indoor Air Quality;
- Moisture Protection (Water Penetration, Condensation Resistance);
- Safety (Fire safety, falling ice and snow...).

Curtain wall: Types

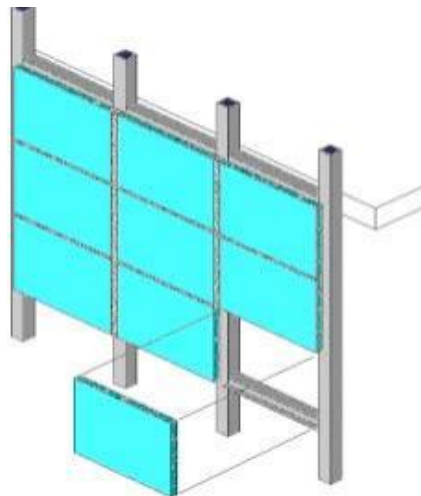
- Stick systems



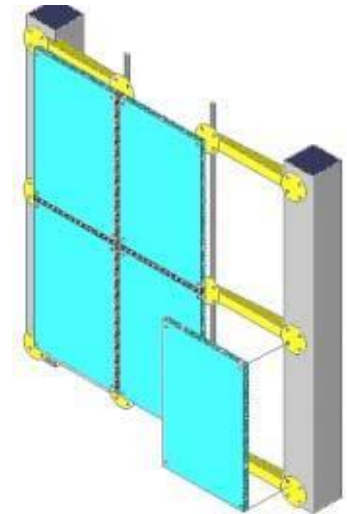
- Modular systems



- Structural systems



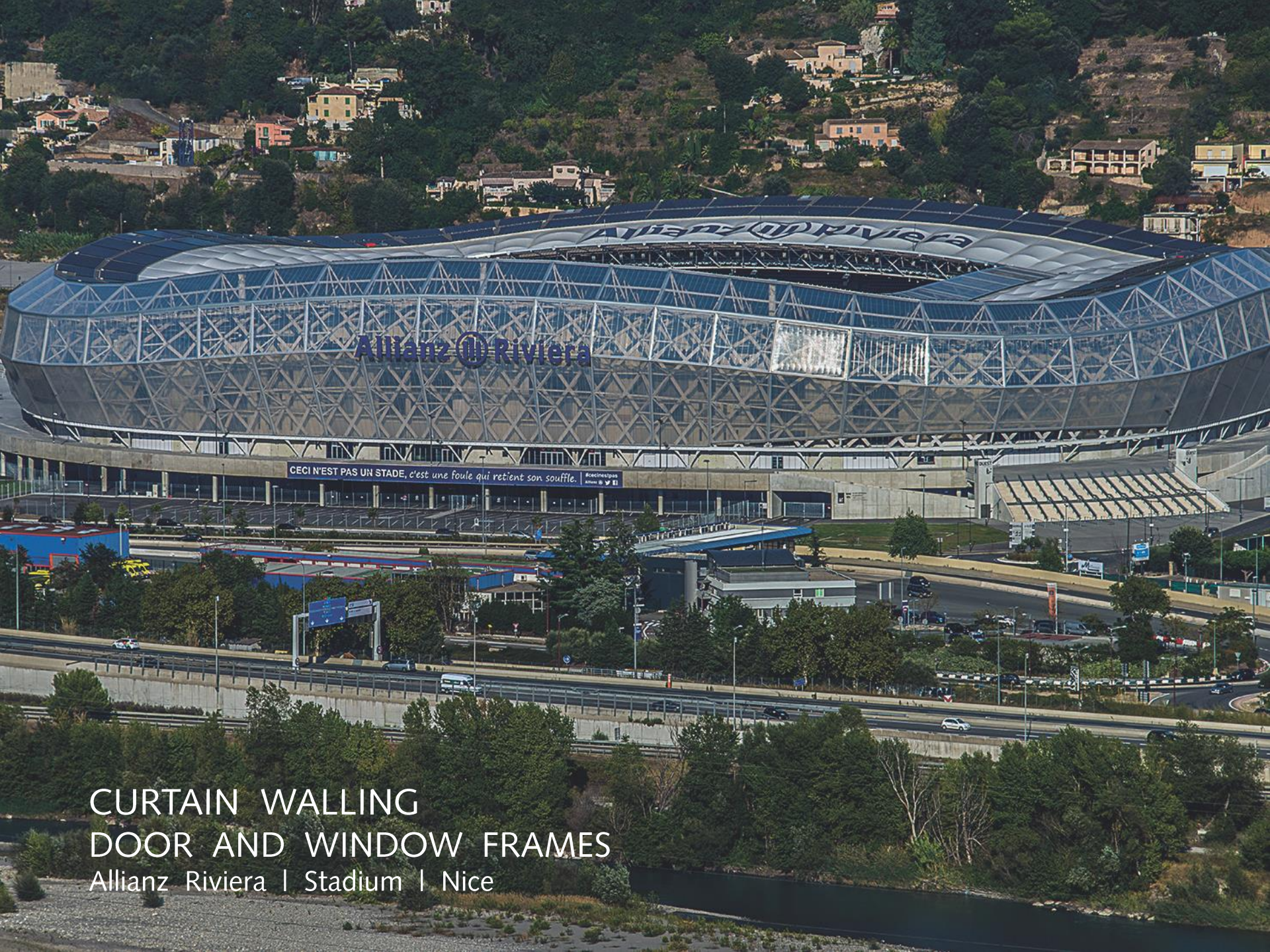
- Point-fixed systems





A great overview.

Stadium Projects



CURTAIN WALLING
DOOR AND WINDOW FRAMES
Allianz Riviera | Stadium | Nice

Nice Ecostadium



ALLIANZ RIVIERA

Nice Ecostadium



Nice Ecostadium - Construction

en 761 jours.

Nice Ecostadium - Project

- 245 mln €
- 35.624 seats
- The first sustainable stadium:
 - Internal structure: laminated wood and metal T-3500;
 - 7.500 sqm of solar panels on the floor and 6.000 sqm on the perimeter;
 - ETFE (ethylene-tetrafluoroethylene) translucent membrane. This means that at least 90% of the natural light enters.

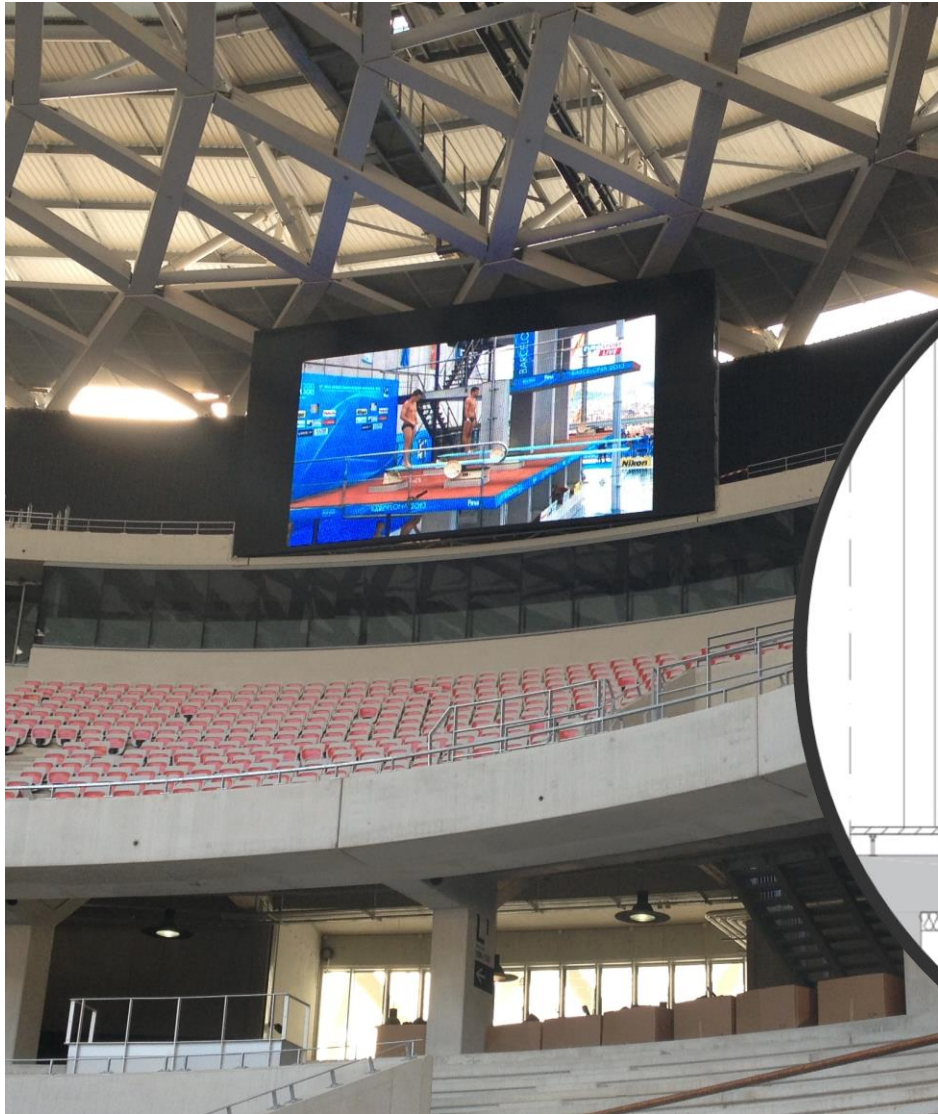
Nice Ecostadium - Gualini Products

- 10.000 sqm. Curtain Walls
- 1.000 sqm. Steel and glass fire walls

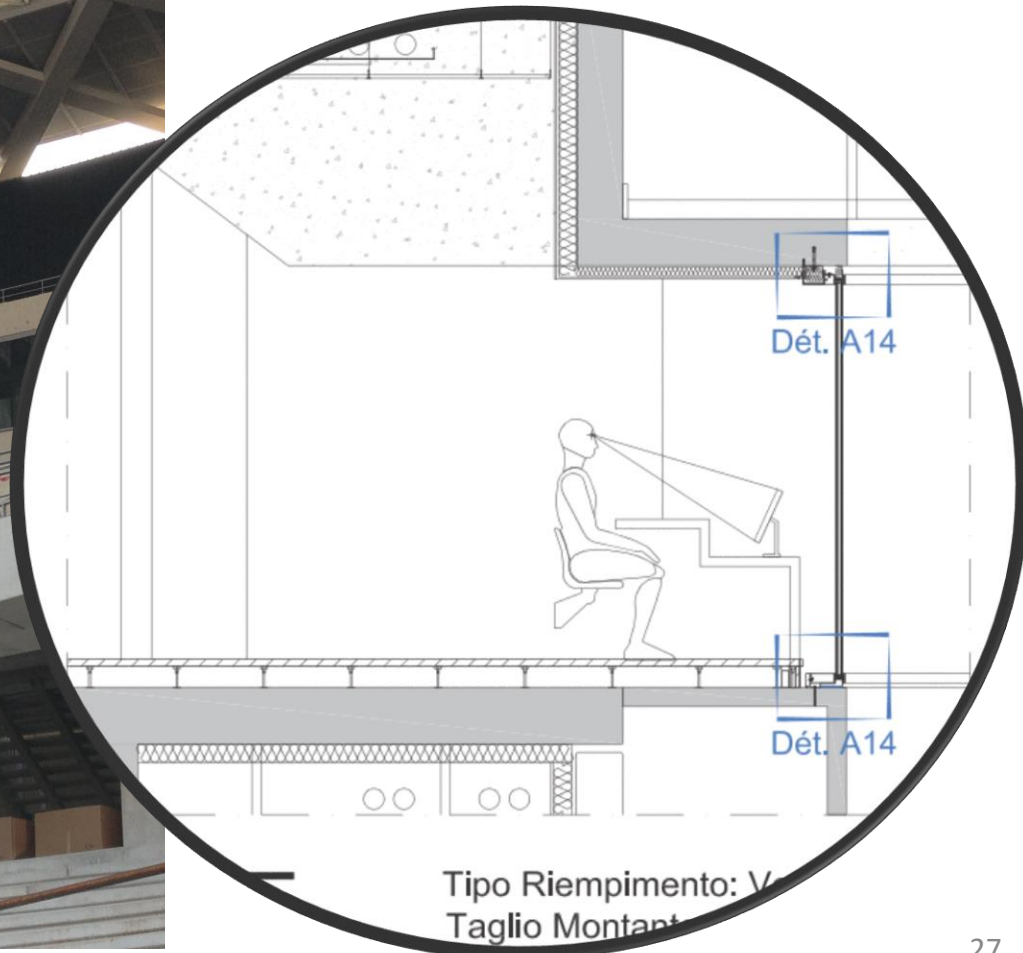
Nice Ecostadium - Features

- Acoustic features
- Fire resistance
- Building's ventilation

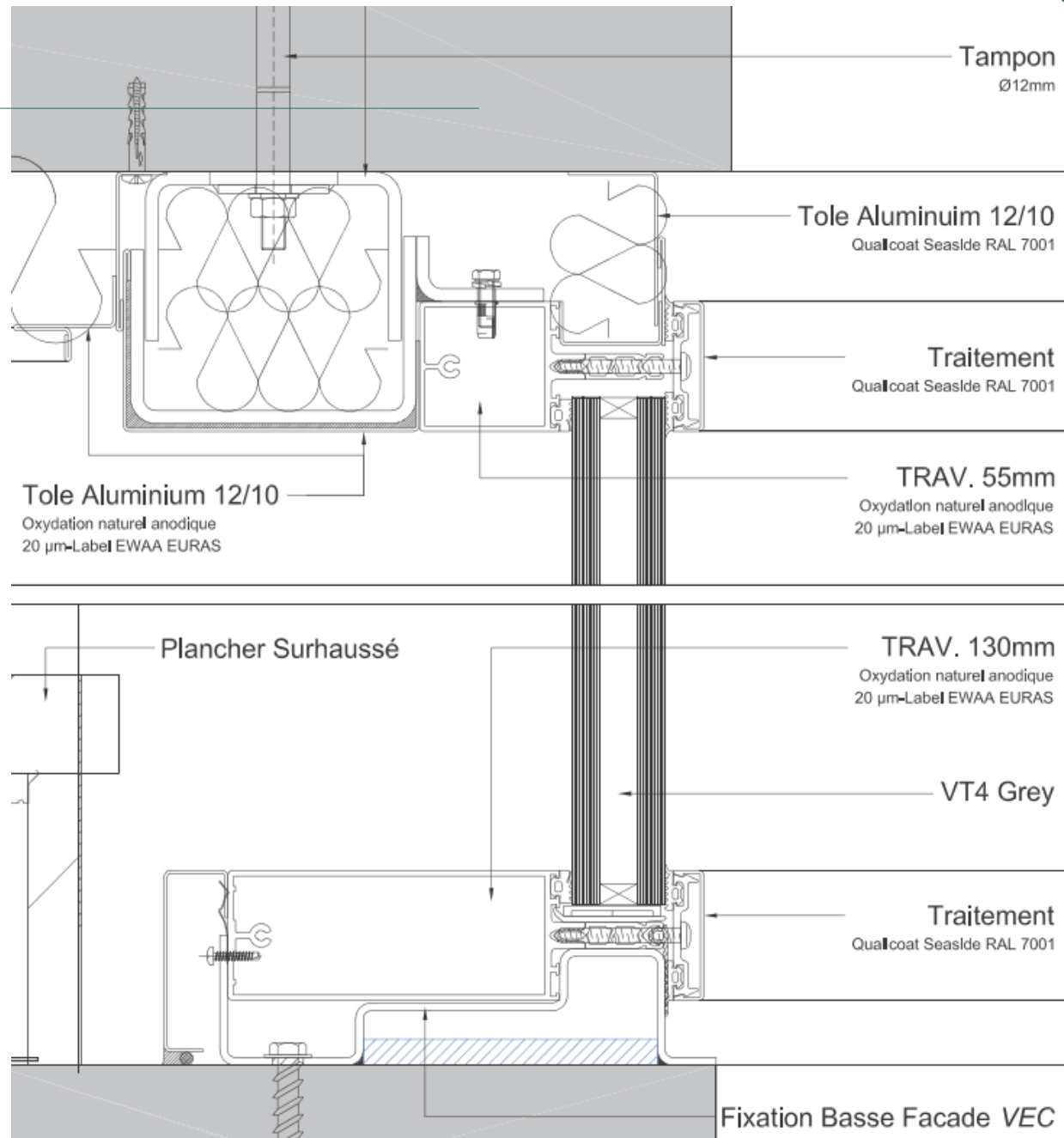
Gualini Project: TV direction



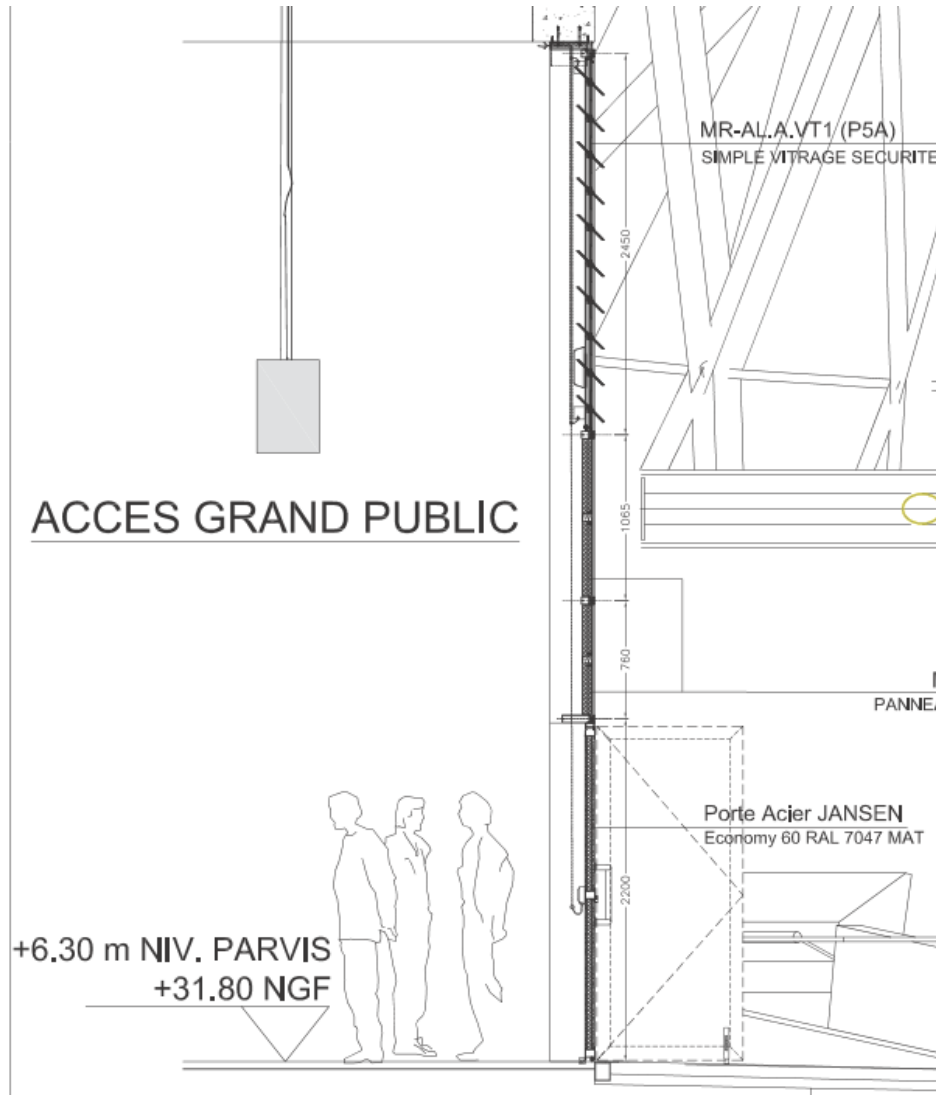
RA, tr = 45db



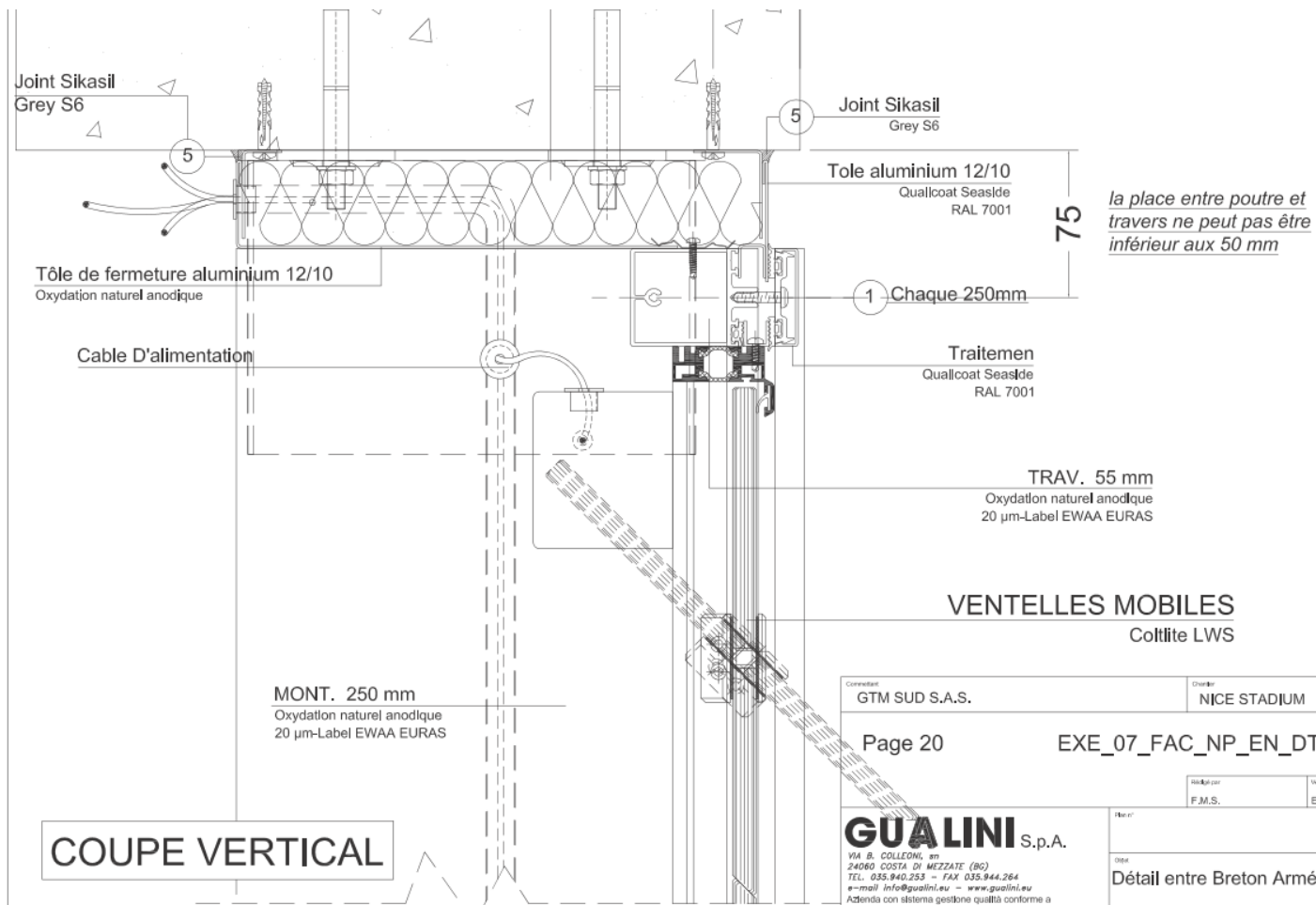
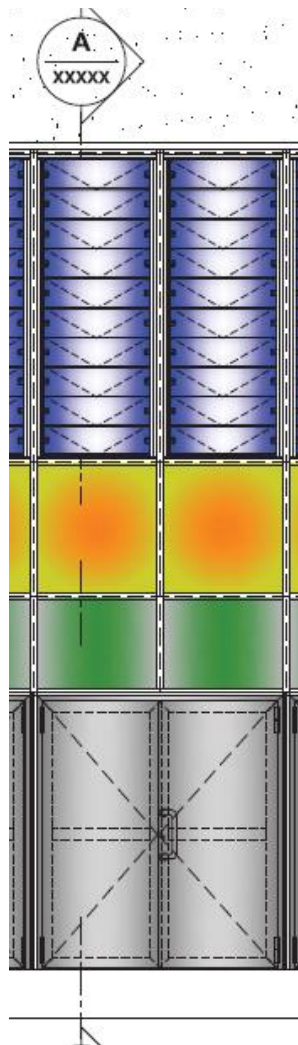
Acoustic Features



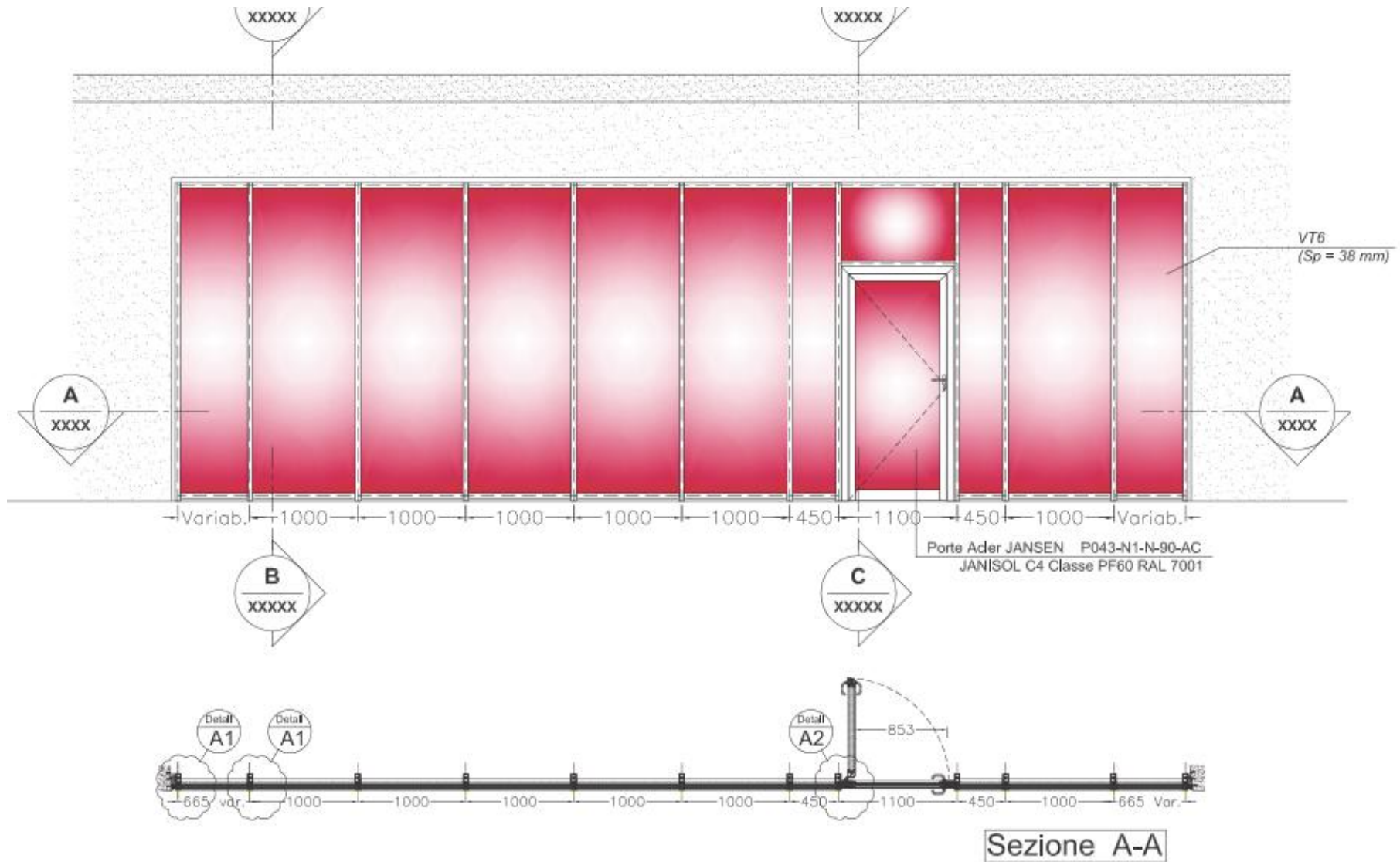
Gualini Project: Building's ventilation



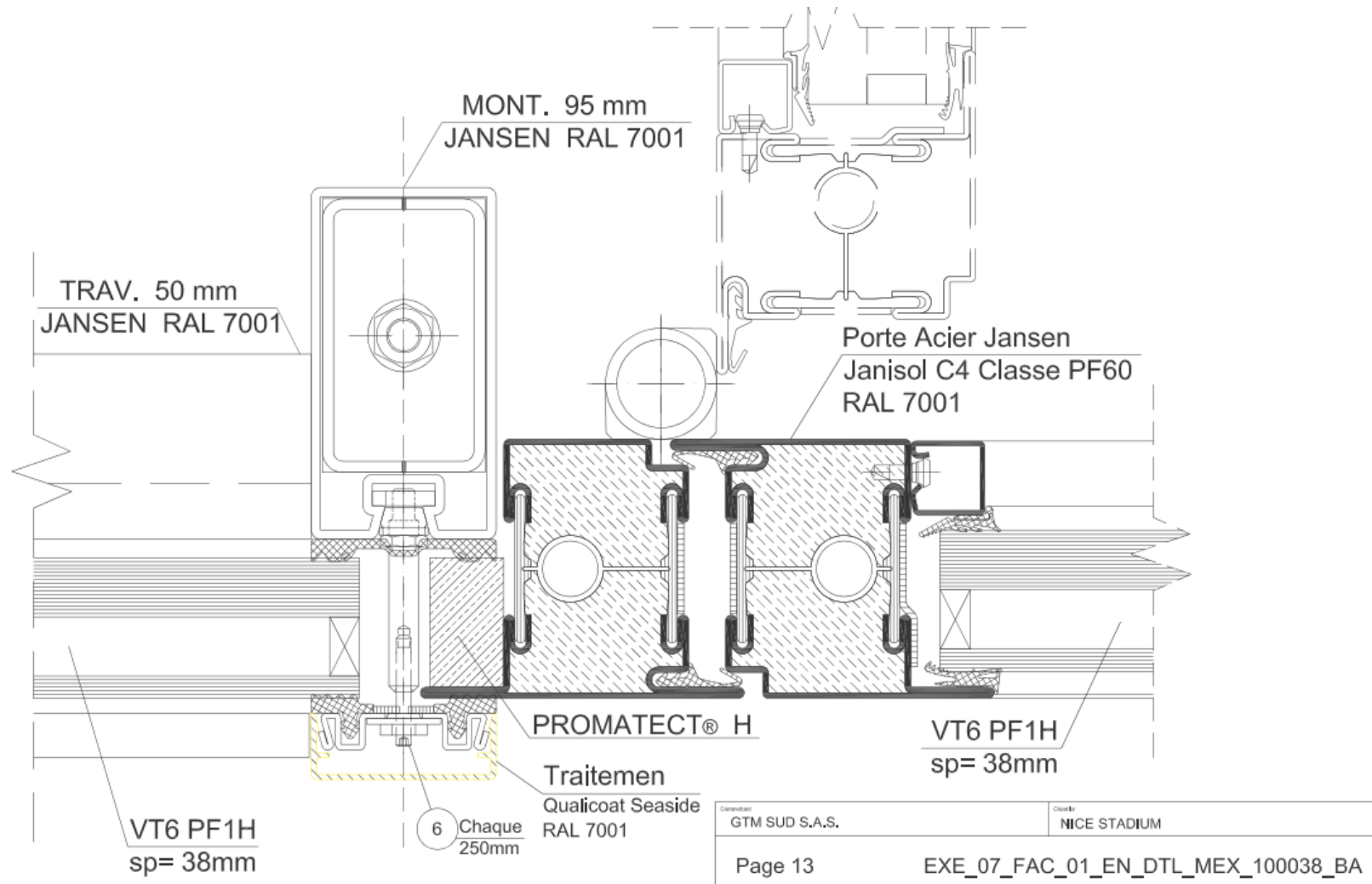
Gualini Project: Building's ventilation



Gualini Project: Fire resistance



Gualini Project: Fire resistance



CURTAIN WALLING

Arena 92 | Stadium | Paris



Arena 92 - Paris



Arena 92 Paris - Construction



Arena 92 Paris - Project

- 320 mln €
- 117.000 sqm.
- The retractable roof offers three separate configurations:
 - For concerts, it will be able to seat 40,000
 - 32,000 seats in rugby configuration
 - a movable stand will allow it to be used for indoor sports, with a capacity as low as 5,000

Arena 92 Paris - Gualini Products

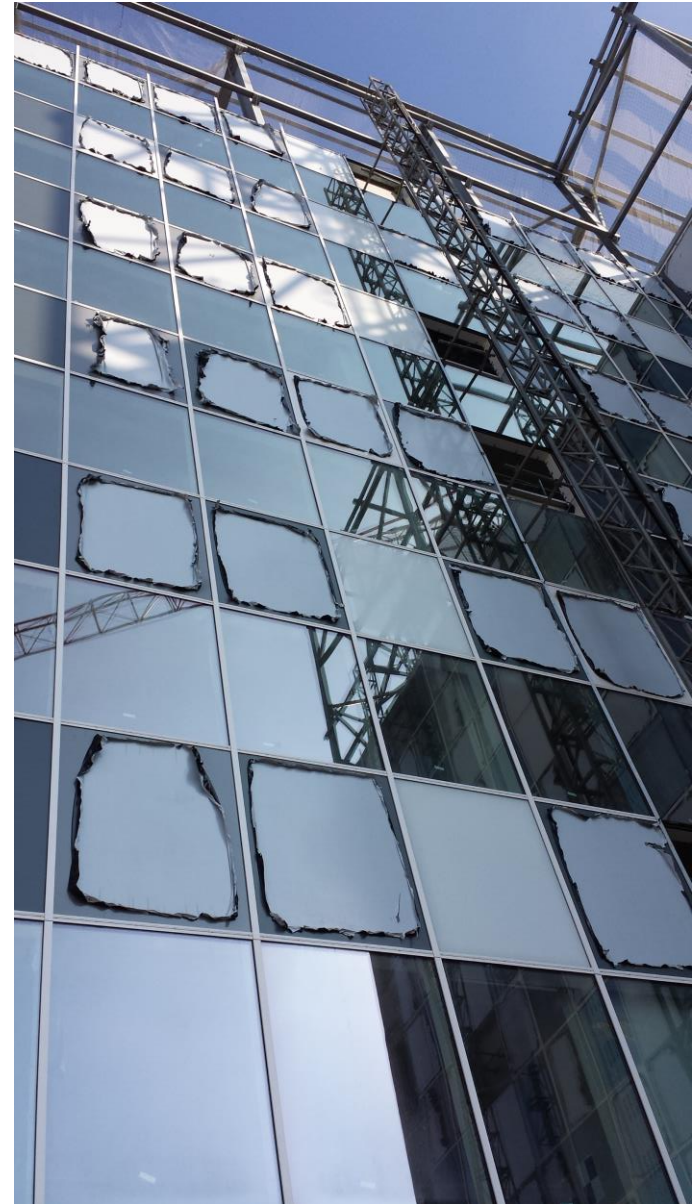
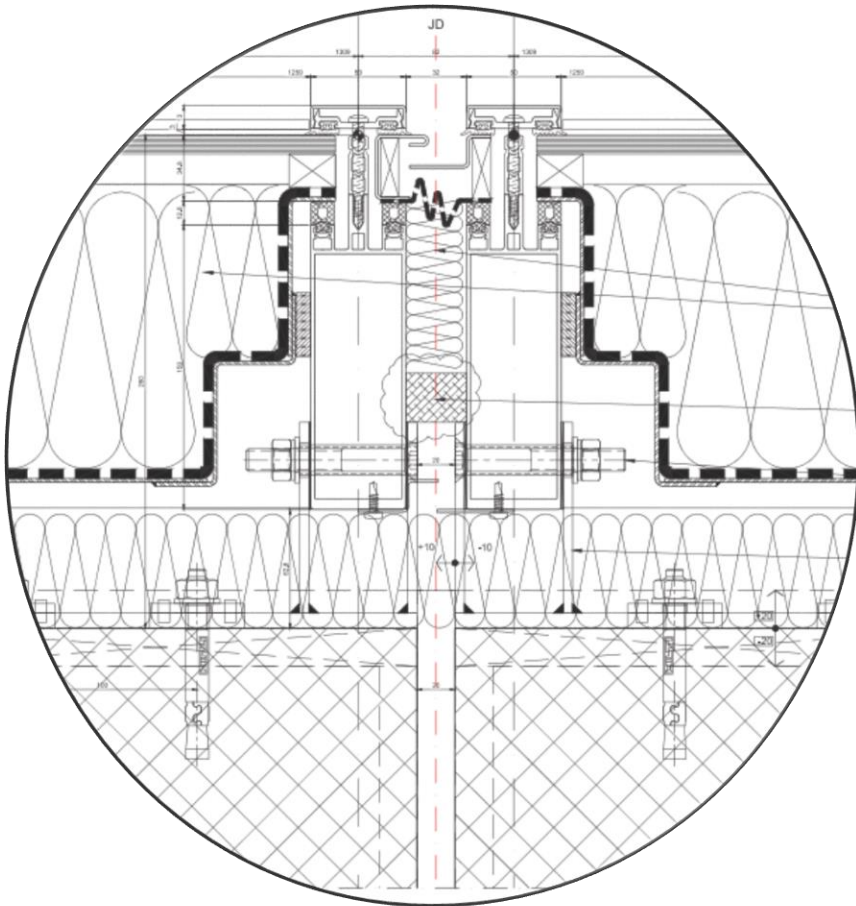
- 10.500 sqm. Curtain Walls
- 5.000 sqm. Ventilated alucobond façades
- Metal door and window frames
- Bright roof with steel structure.

Arena 92 Paris - Features

- Acoustic features
- Thermal insulation

Gualini Project: Acoustic features

RA, tr ≥ 30 db



Acoustic Features

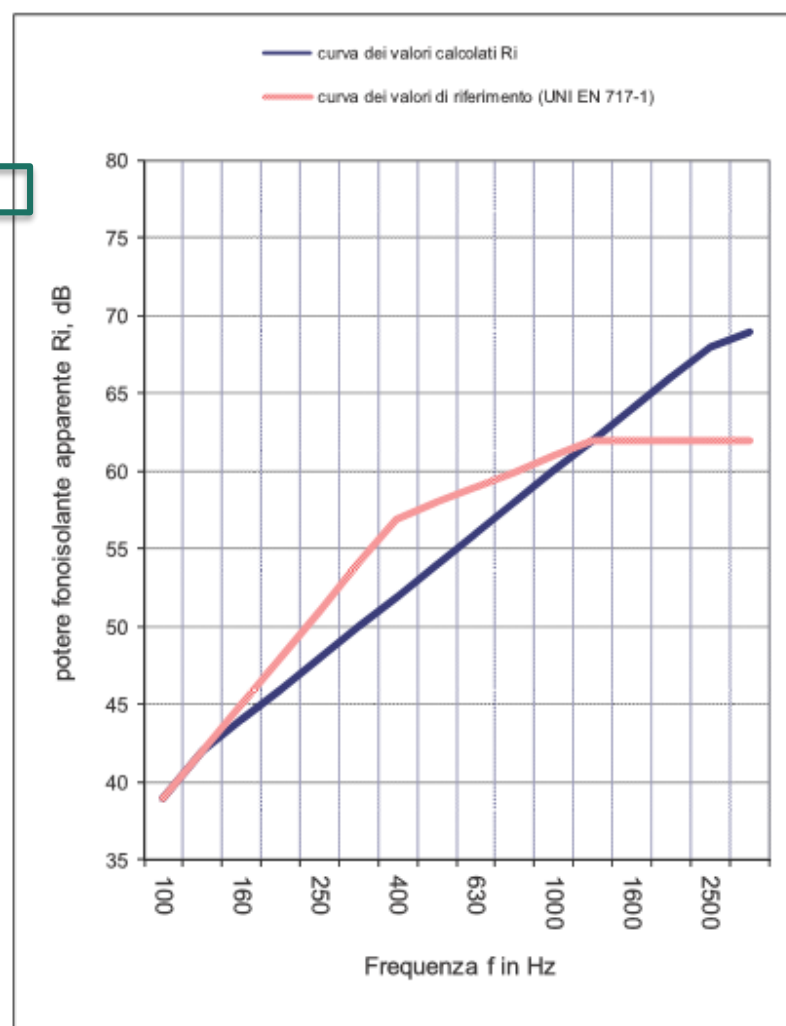
$R_w(63\text{Hz}) > 18\text{db}$

Frequenza Hz	R dB	R dB
50	17,0	
63	28,0	27,0
80	35,0	
100	39,0	
125	42,0	41,0
160	44,0	
200	46,0	
250	48,0	48,0
315	50,0	
400	52,0	
500	54,0	54,0
630	56,0	
800	58,0	
1000	60,0	60,0
1250	62,0	
1600	64,0	
2000	66,0	66,0
2500	68,0	
3150	69,0	
4000	70,0	69,0
5000	69,0	

Valutazione secondo la ISO 717-1:

$R_w =$ **58 dB**

$D_nT_w =$ **60 dB**



C -1; Ctr-5 dB

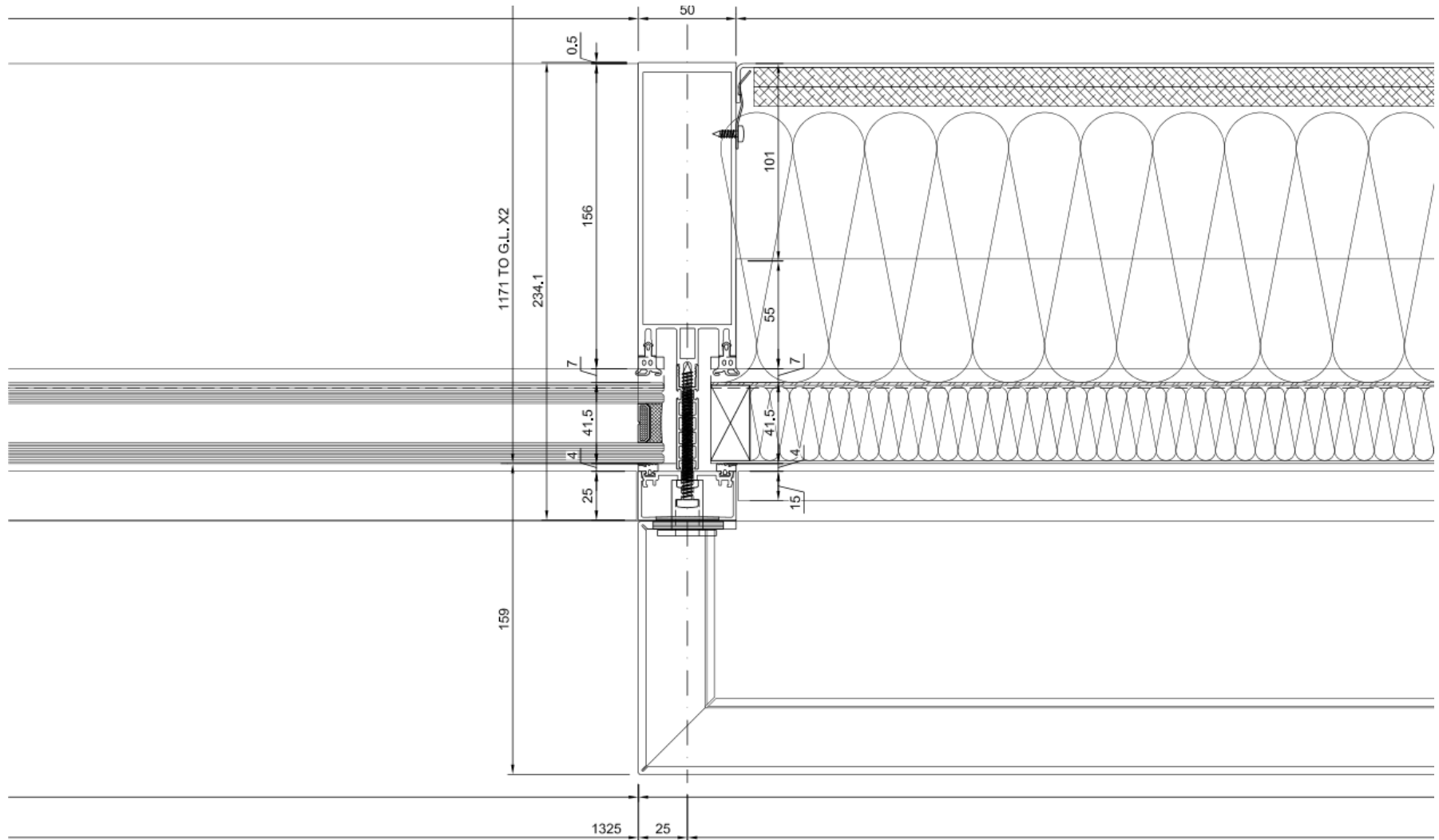
Figure 8 Calcul du pouvoir phono-isolante de la partie courante (coupe B)

Gualini Project: Thermal insulation



$U_{tot} = 1,2 \text{ W/m}^2\text{K}$

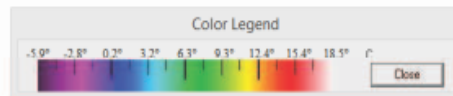
Gualini Project: Thermal insulation



Gualini Project: Thermal insulation

Montant fixe verre-verre

U-Factors					
	U-factor W/m ² ·K	delta T C	Length mm	Rotation	
Edge	1.1150	27.0	2050	N/A	Projected X



U-Factors					
	U-factor W/m ² ·K	delta T C	Length mm	Rotation	
Edge	1.1150	27.0	2050	N/A	Projected X

Display

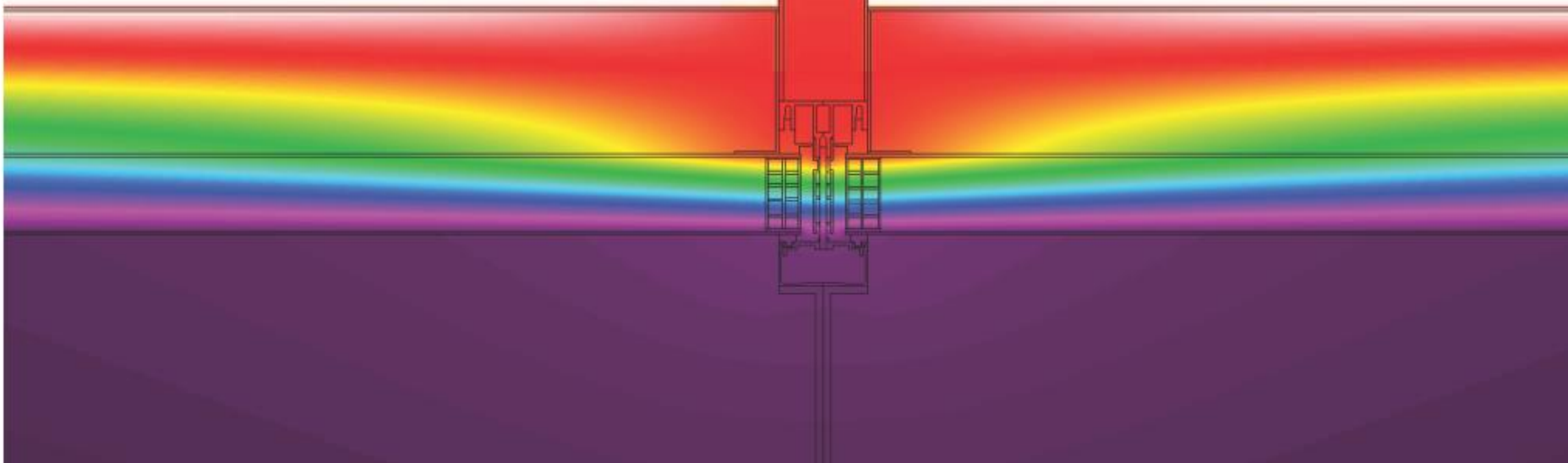
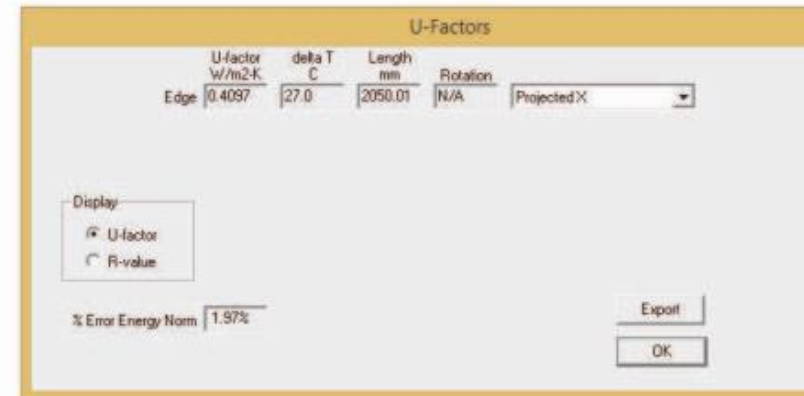
☒ U-factor
☐ R-value

% Error Energy Norm 1.52%

Export
OK

Gualini Project: Thermal insulation

Montant fixe panneau-panneau



Grazie per l'attenzione

g.francavilla@gualini.eu

