

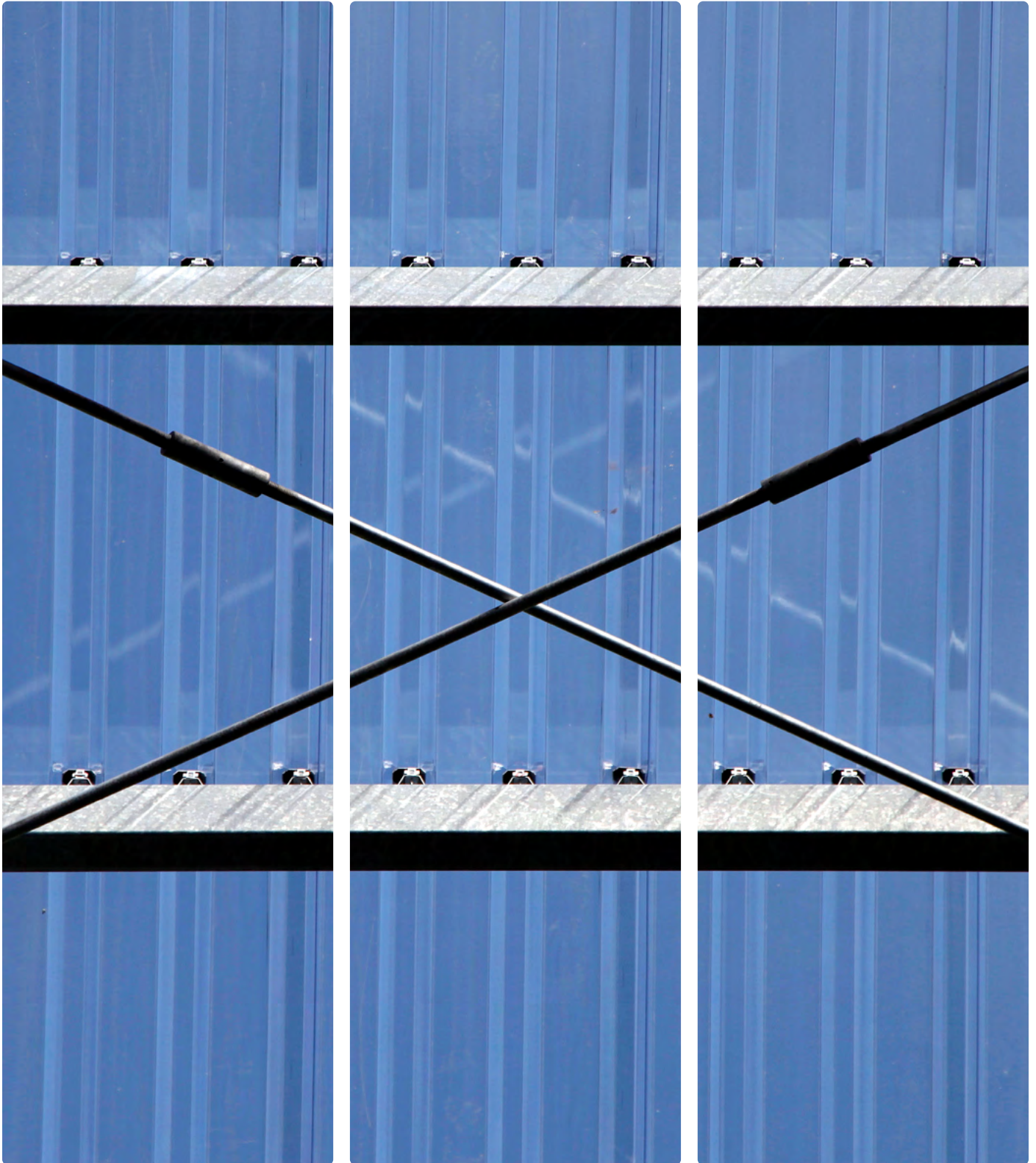


SUNTUF® Stadia

Solid Profiled Polycarbonate System



SUNTUF® Stadia Solid Profiled Polycarbonate System



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Introduction

SUNTUF Stadia is robust and durable polycarbonate panel system that is specifically designed for roofs with large spans. While other translucent cladding materials require supporting substructure, SUNTUF Stadia can be installed directly on the main structure. By using SUNTUF Stadia you can save on the metal structure and save even more on installation labor.

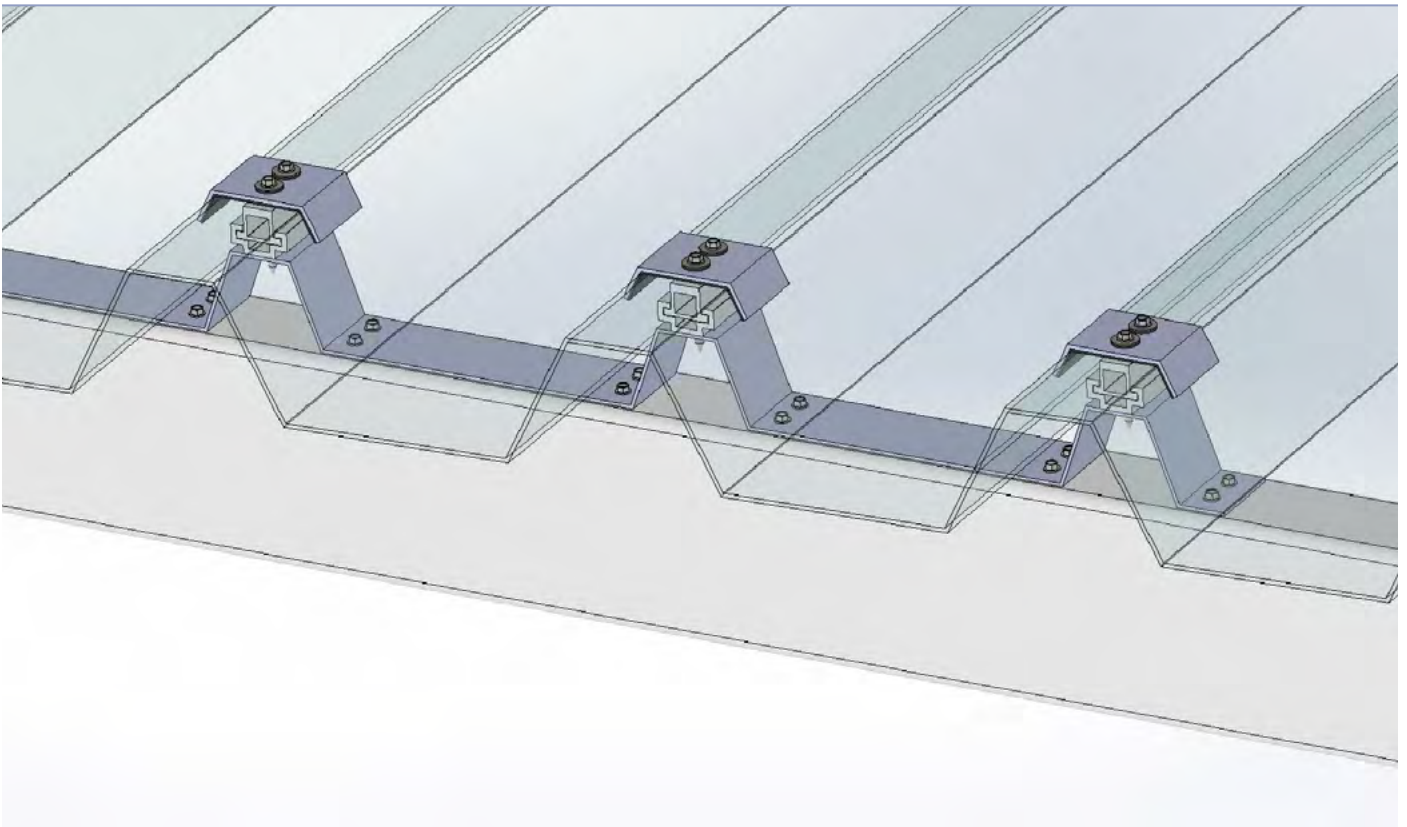
SUNTUF Stadia provides excellent light transmission, impact resistance, flexibility and load capacity. The system is lightweight and very easy to fabricate and install. SUNTUF Stadia is perfectly suited for large roofs such as sports stadia and arenas, concert halls, and logistic centers.

Main benefits:

- Installation over large spans
- Excellent light transmission and transparency
- Impressive load capacity
- Lightweight and flexible
- Easy to cut and drill
- Simple and fast installation
- Allows free expansion and contraction
- Integrated UV protection
- SolarSmart™ cool light colors

Typical applications:

- Stadiums and arenas
- Concert halls
- Banquet halls
- Open markets
- Large commercial and logistic facilities
- Covered parking spaces



SUNTUF® Stadia - big roofs, wide range of solutions

SUNTUF Stadia has proven itself time and again on a variety of roofs. The secret to its success is Palram's flexibility in tailoring the solution to the specific requirements of the designer or the builder. Over the years, we've developed a range of solutions catering to different roofing needs, such as heavy loads, water drainage, light transmission and diffusion, as well as ease, safety and speed of installation.

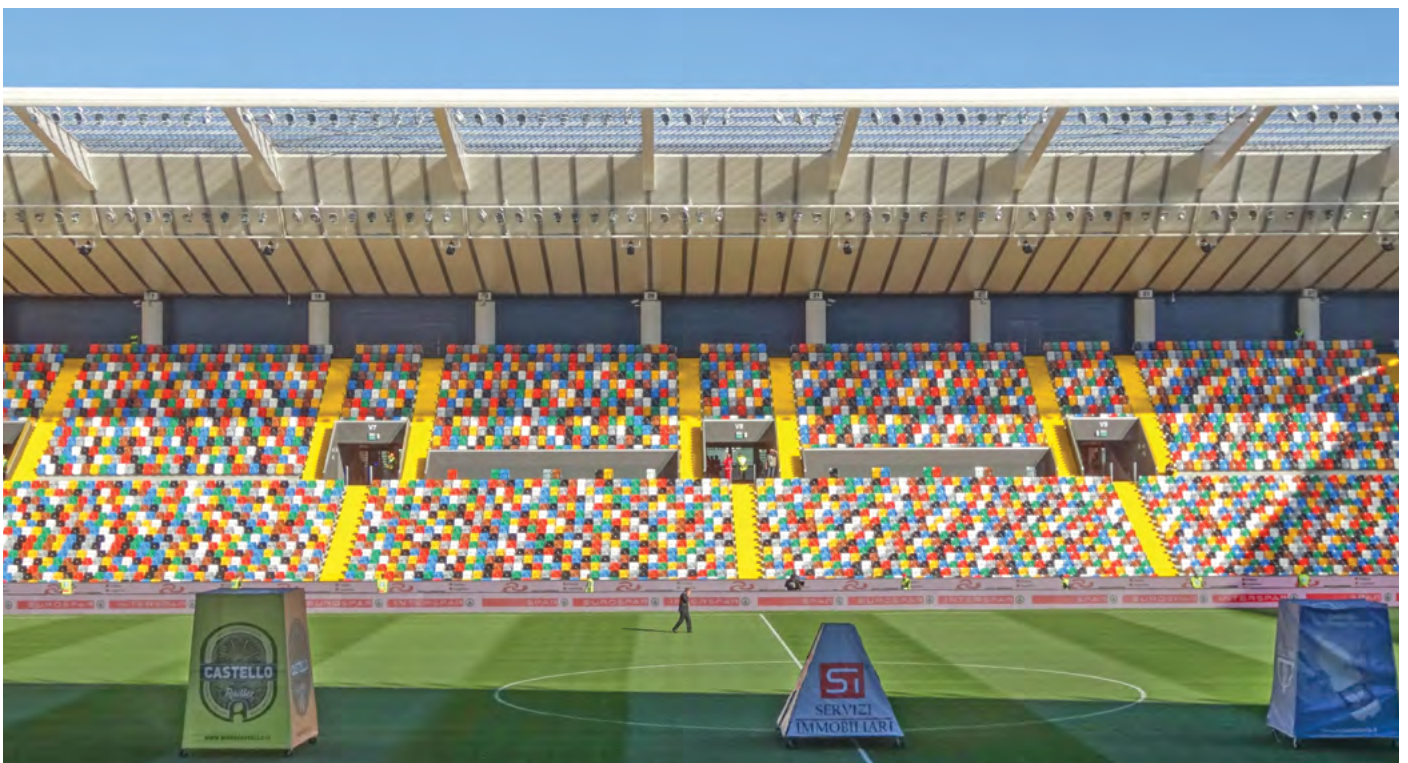
SAMMY OFER STADIUM / ISRAEL

Architect: KSS, in collaboration with Mansfeld-Kehat | Product Type: SUNTUF Stadia , Clear Embossed 3mm | Application Type - Skylight | Total Product Usage: 5,000 sqm.



FRIULI STADIUM / ITALY

Main Architect: Lorenzo Giacomuzzi Moore | Product Type : SUNTUF Stadia , Clear Embossed 3mm | Application Type - Skylight
Total Product Usage: 4000 sqm.



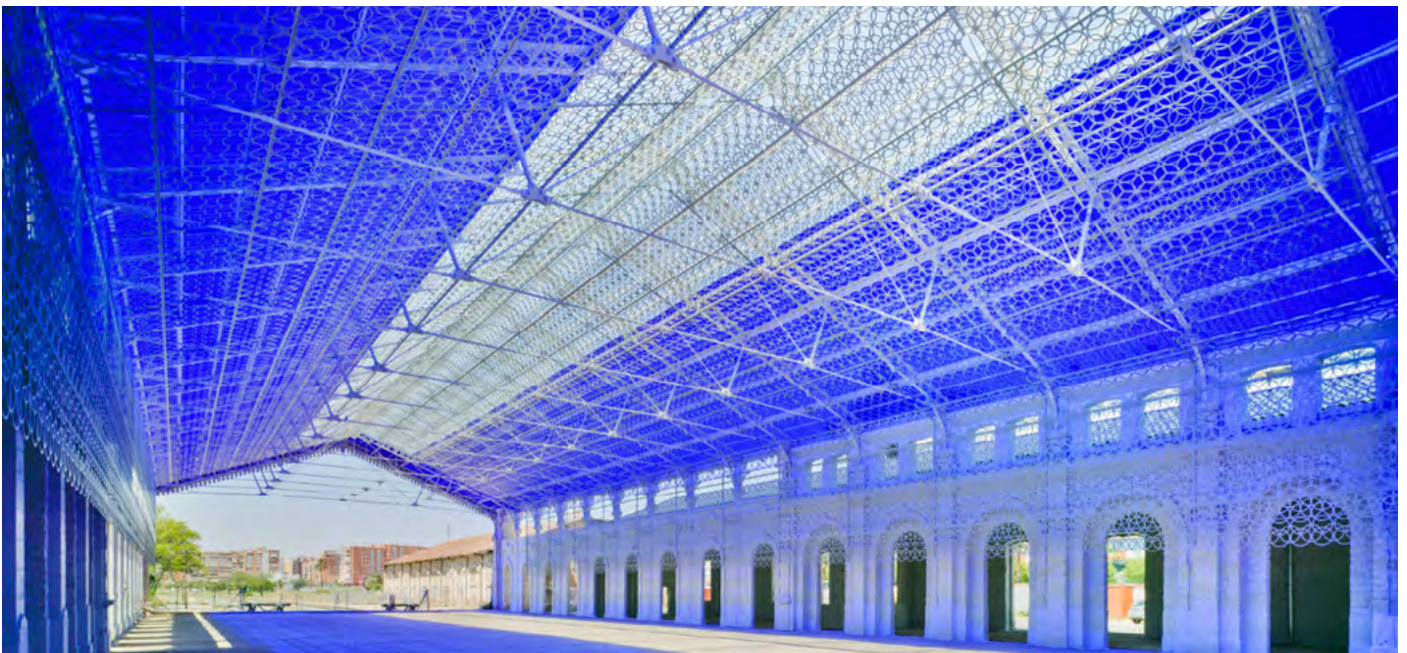
CUBIERTA CAMPO DA FESTA / SPAIN

Architect: José Antonio González Mejide and Arturo Antón Casado (TEMHA) | Product Type : SUNTUF Stadia , Green
Application Type - Skylight | Total Product Usage: 1,440 sqm.



CASA MEDITERRÁNEO STATION / SPAIN

Product Type : SUNTUF Stadia , Blue and Clear | Application Type - Skylight | Total Product Usage: 900 sqm.



Focus on ION OBLEMENCO STADIUM, CRAIOVA, ROMANIA

Solution highlights:

In order to allow installation of long, continuous polycarbonate panels, SUNTUF Stadia included a solution to overcome thermal expansion. Special profiles allowed creation of an oval roof from rectangular pieces. The solution was designed to withstand heavy snow loads.

CRAIOVA STADIUM / ROMANIA

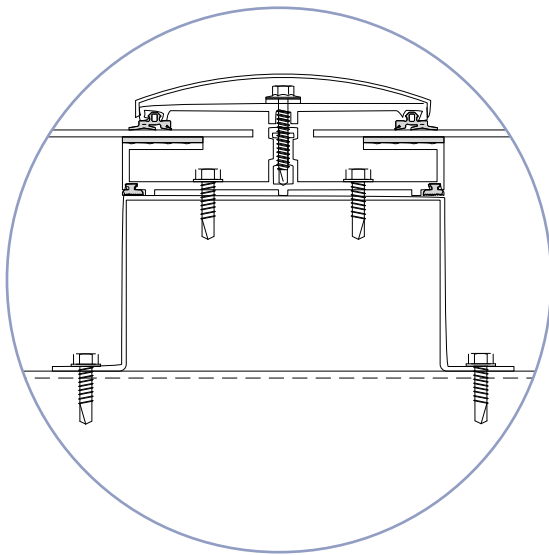
Main Architect: Dico si Tiganas, Romania

Product Type: SUNTUF Stadia, Clear 2mm

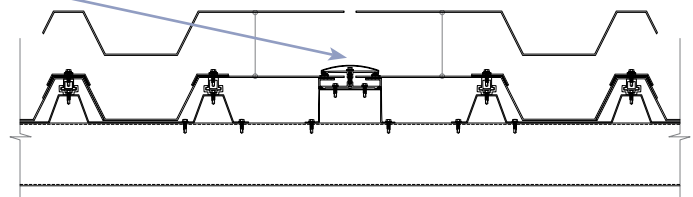
Application Type: Skylight

Total Product Usage: 14000 sqm.





Radial seam detail



Focus on AVIVA STADIUM, DUBLIN, IRELAND

Solution highlights:

Here's how Palram tailored the SUNTUF Stadia solution for this world renowned roof.

The polycarbonate geometry followed the roof's wavy design

A specially designed profile allowed water drainage in two directions.

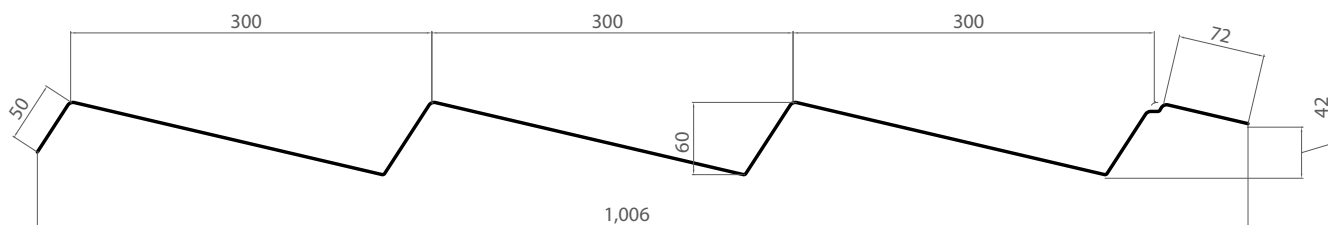
A special diffuser finish allowed plenty of light to come in without radiating directly on the spectators.

Installation was considerably faster than a standard glazing solution.

AVIVA STADIUM / IRELAND

Architect: HOK Sport (Populous) | Product Type: SUNTUF Stadia, Clear and Matt 3mm | Application Type: Skylight

Total Product Usage: 20000 sqm.





Colors

Color*	% Light Transmission ASTM D-1003	Solar Heat Gain (SHGC) ASTM E-424-71	Shading Coefficient ASTM E-424-71
Clear	90	0.87	1.00
Bronze	20	0.45	0.52
	35	0.56	0.64
	50	0.65	0.75
Solar Grey	20	0.44	0.51
	35	0.56	0.64
	50	0.65	0.75
White Opal	28	0.32	0.37
White Diffuser	80	0.87	1.00
Solar Ice	20	0.37	0.45
Solar Control	20	0.33	0.36
	35	0.45	0.52
	50	0.54	0.61
Solar Olympic	20	0.41	0.47
	35	0.52	0.60
	50	0.63	0.73
Smart Green	70	0.58	0.67
Smart Blue	70	0.57	0.65
Bluish Breeze	70	0.55	0.63

*Values in the table above relate to 3mm Sheet. Further information on additional products is available upon request.

*SUNTUF Stadia comes in an embossed finish

Legend

LT (Light Transmission) = The percentage of incident visible light that passes through an object.

SHGC (Solar Heat Gain Coefficient) = The percentage of incident solar radiation transmitted by an object, which includes the direct solar transmission and the part of the solar absorption radiated inward.

SC (Shading Coefficient) = The amount of the sun's heat transmitted through a given window compared with that of a standard 3mm thick single pane of glass under the same conditions.



SolarSmart™ - Energy Efficiency

SolarSmart™ are energy-efficient colors break the traditional ratio between light transmission and shading coefficient. SolarSmart™ panels block Infrared energy that causes heat buildup, and transmit "cool light" that reduces air-conditioning and lighting costs.

More energy-saving, natural visible light is transmitted.

SolarSmart™ Panel



Blocking Infra-Red reduces heat buildup.

Flammability

SUNTUF Stadia flammability classification appears in the attached table, based on a test performed by certified independent laboratories. The quoted certificate represents the flammability performance of the entire system.

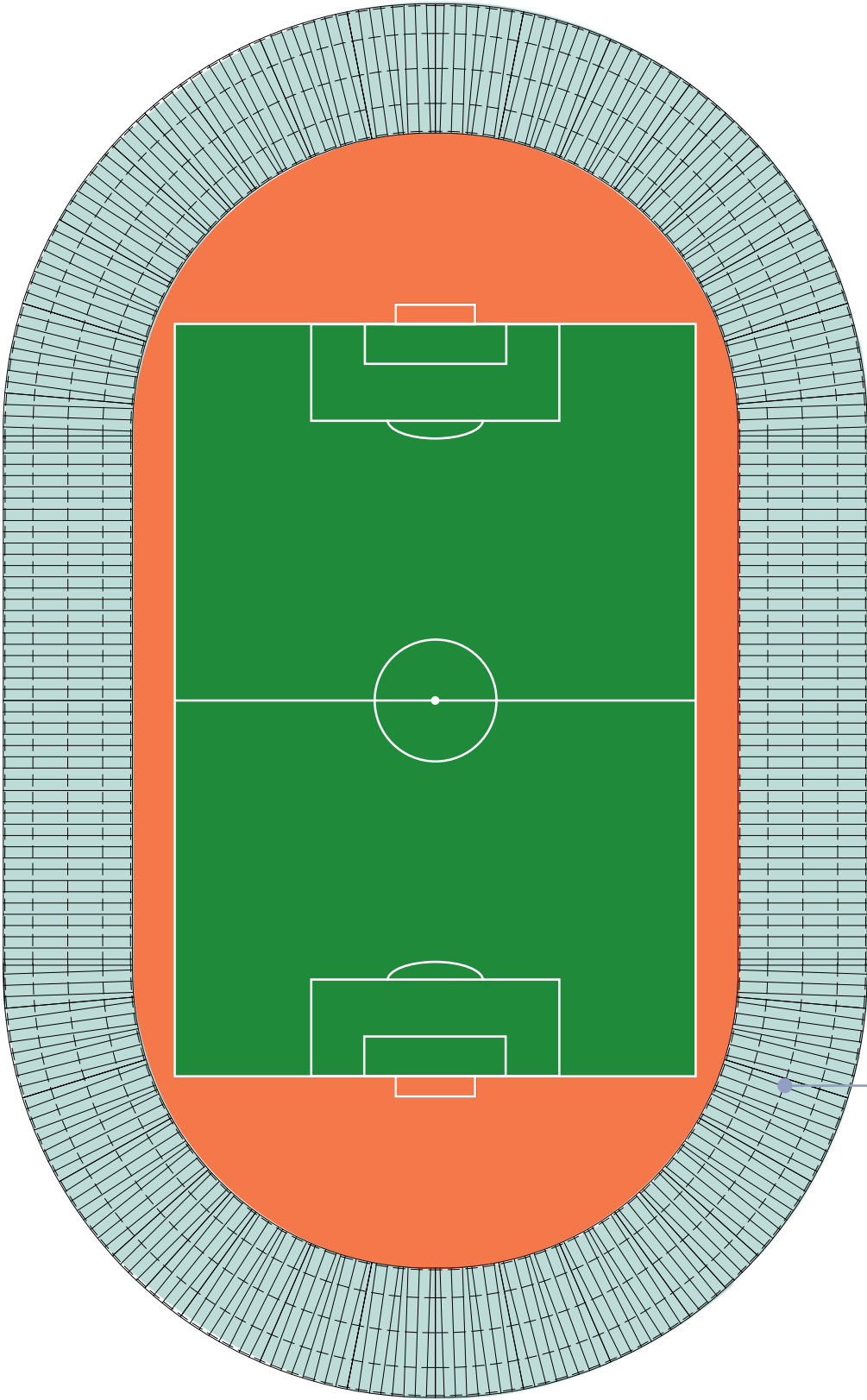
Method	Classification*
EN 13501	B, s1, d0

*Depends on panel thickness.

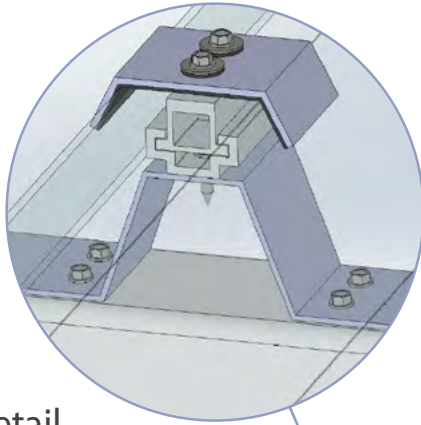
Typical properties

Property	Standard	Conditions	Unit	Value
Density	ASTDM D792	-	g/cm ³	1.2
Heat deflection temperature	ASTDM D648	1.82 MPa	°C	130
Service temperature (Short term)	-	-	°C	-50 to 120
Service temperature (Long term)	-	-	°C	-50 to 100
Coefficient of linear thermal expansion	ASTDM D696	-	cm/cm °C	6.5 x 10 ⁻⁵
Thermal conductivity	ASTDM D177	-	W/mK	0.21
Tensile strength at yield	ASTDM D638	10mm/min	MPa	62
Tensile strength at break	ASTDM D638	10mm/min	MPa	65
Elongation at yield	ASTDM D638	10mm/min	%	7
Elongation at break	ASTDM D638	10mm/min	%	>80
Tensile modulus of elasticity	ASTDM D638	10mm/min	MPa	2300
Flexural strength	ASTDM D790	1-3mm/min	MPa	93
Flexural modulus	ASTDM D790	1-3mm/min	MPa	1890
Impact falling weight (E-50)	ISO 6603/1		J	50
Rockwell hardness	ASTDM D785		R Scale	118R
Light transmission	ASTDM D1003		%	90
Haze	ASTDM D1003		%	>0.5
Yellowness index	ASTDM D1925			>1

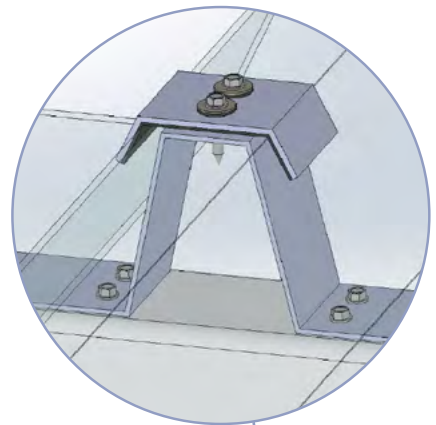
Typical stadium application - Stadium transparent canopy plan



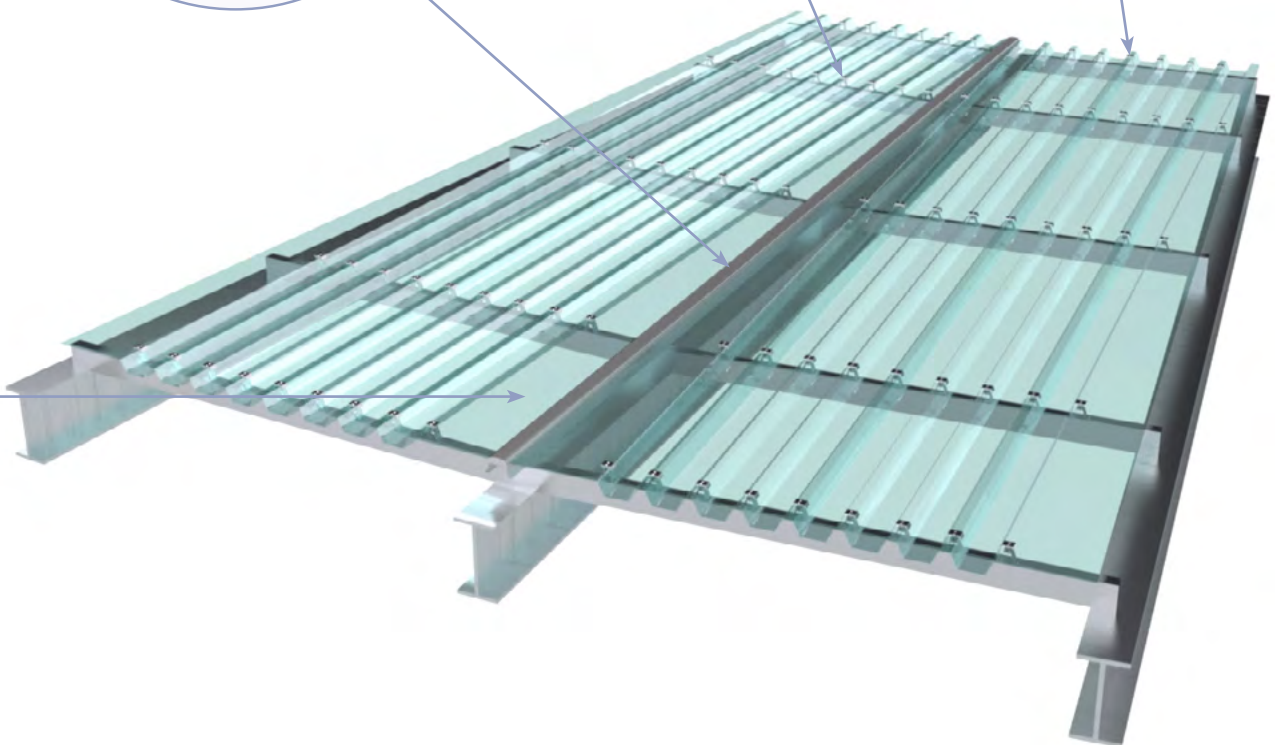
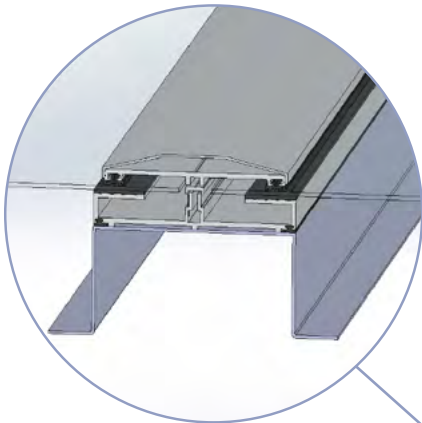
Sliding Mechanism



Stopper Detail



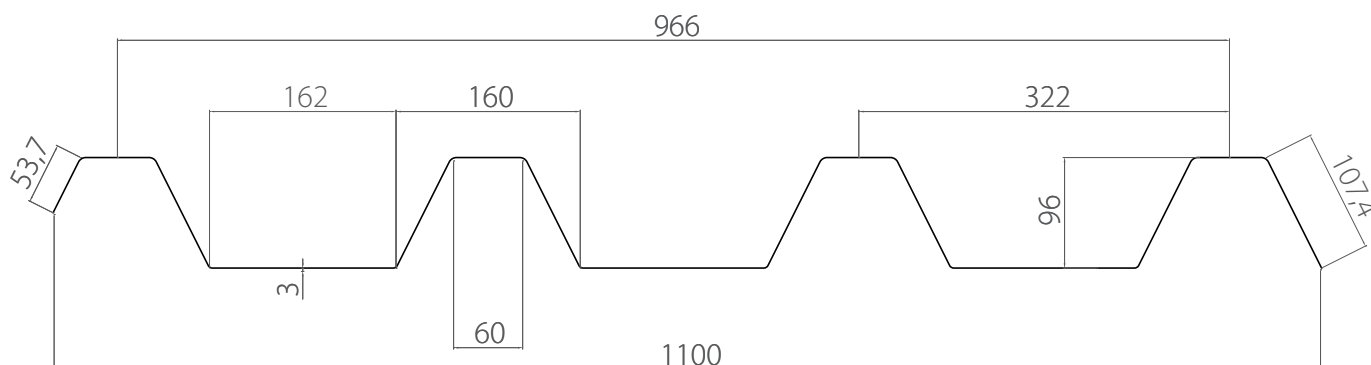
Radial Seam Detail



The data below describes a main SUNTUF Stadia polycarbonate profile

Profile (mm)	Thickness (mm)	Length (m)	Overall width (mm)	Cover width (mm)	Side-Lap (%)
322/96	3	1.5-11.6	1100	966	12%

Profile diagram :



Geometric properties:

Area (mm ²)	Ixx (mm ⁴)	Iyy (mm ⁴)	Zxx (mm ³)	Yc (mm)	Xc (mm)
4633	6752690	49358717	120050	42.75	558.05

Palram can tailor the profile geometry per the project requirements.

Profile height is typically between 60 mm and 100 mm, thickness up to 3 mm.

The polycarbonate panel is available with one or two sides co-extruded UV protection.

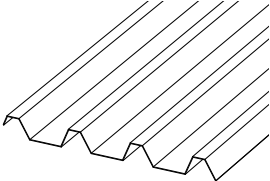
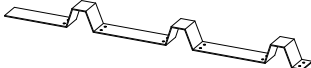
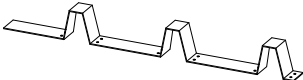
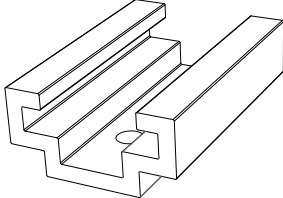
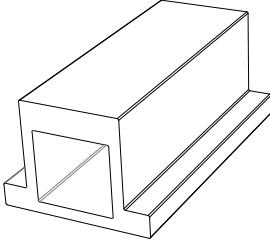
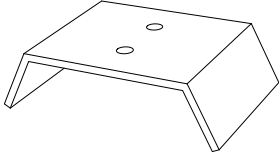
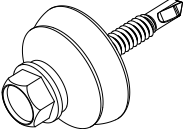
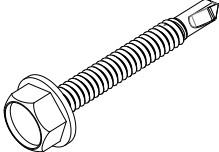
Load Kg/sqm	Maximum roof span (mm) 322/96 profile, thickness 3 mm	
	End span	Mid span
150	2700	3400
200	2600	3300
250	2500	3200
300	2400	3100
350	2300	3000
400	2200	2900
450	2100	2800

Notes:

- The specified dimensions do not supersede the requirements of local construction codes.
- The given spans are according to deflections criterion of L/20, and minimum slope of 10%.
- The maximum roof spans are based on calculation model and practical testing.
- The mentioned load refers to wind and snow load only.

System components:

Standard system components

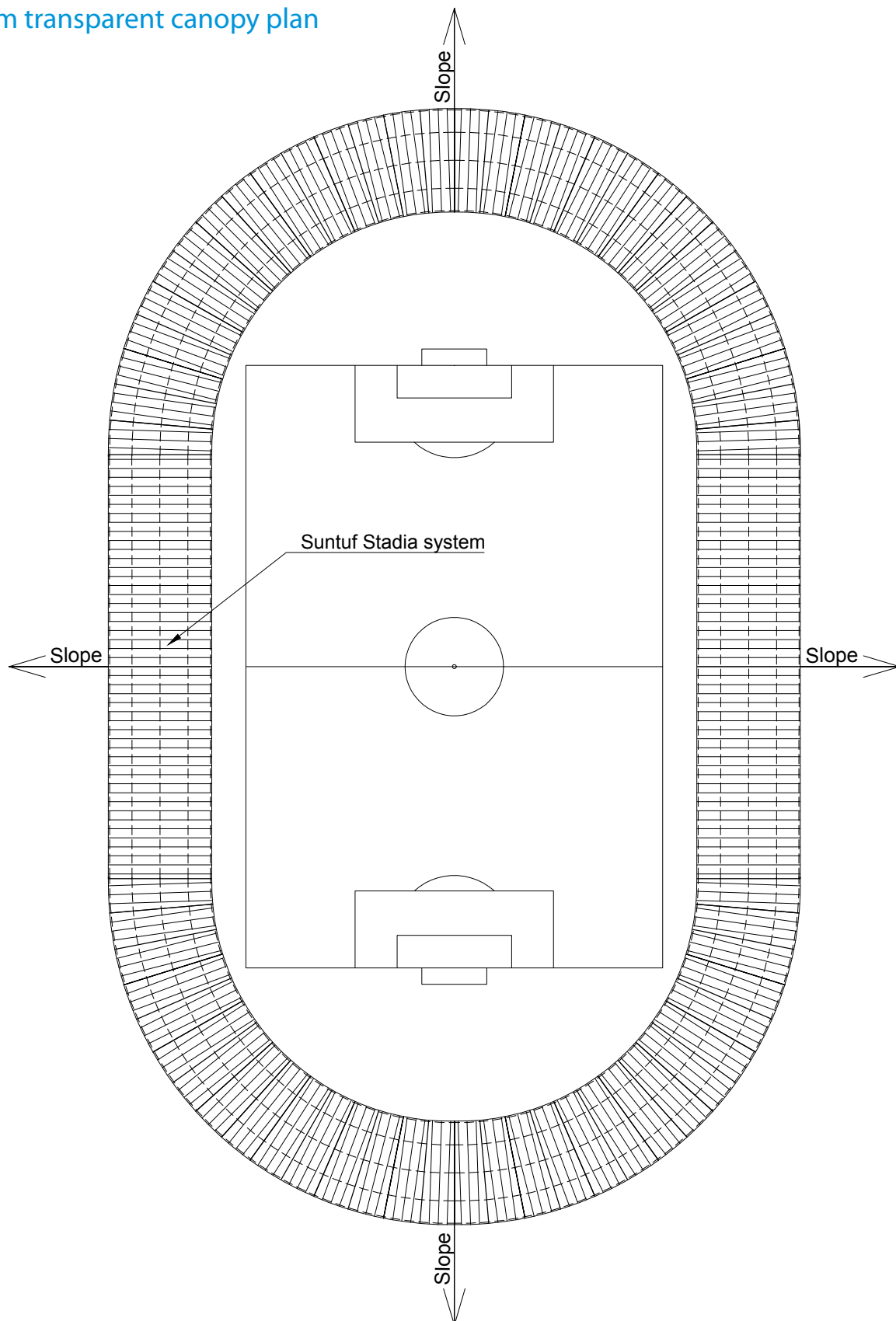
1. SUNTUF Stadia PC panel	2. Steel omega – (Galvanized)	3. Stopper steel omega – (Galvanized)	4. Bottom Aluminum Sliding Profile - (Mill finish)
			
5. Top Aluminum Sliding Profile (Mill finish)	6. Crest Rider - with EPDM strip (Galvanized)	7. Self-drilling screws Ø6.3x31mm + Neoprene washer	8. Self-drilling screws Ø6.3x31mm
			

Components for Radial seam connection:

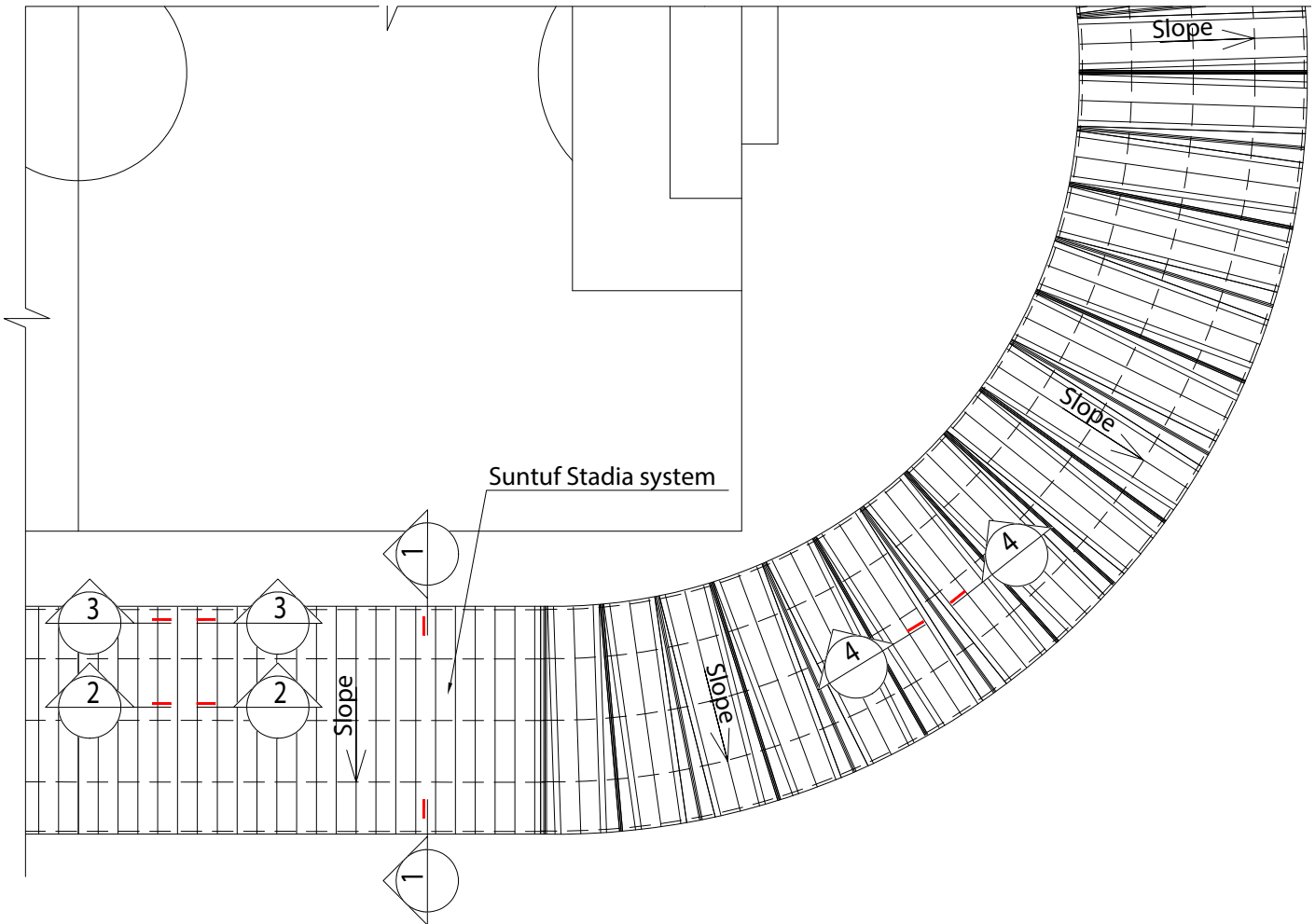
9. PC panel for Radial seam connection	10. Aluminum SNG3 - (Mill Finish)	11. Aluminum SNG2 - (Mill Finish)	13. Aluminum SNG4 - (Mill Finish)
		12. Aluminum SNG1 - (Mill Finish) 	
14. Top EPDM (#2312)	15. Bottom EPDM	16. EPDM Strip 1 side adhesive - t=3mm	17. Self-drilling screws Ø5.5x38mm + Neoprene washer
			

Typical stadium application - installation details

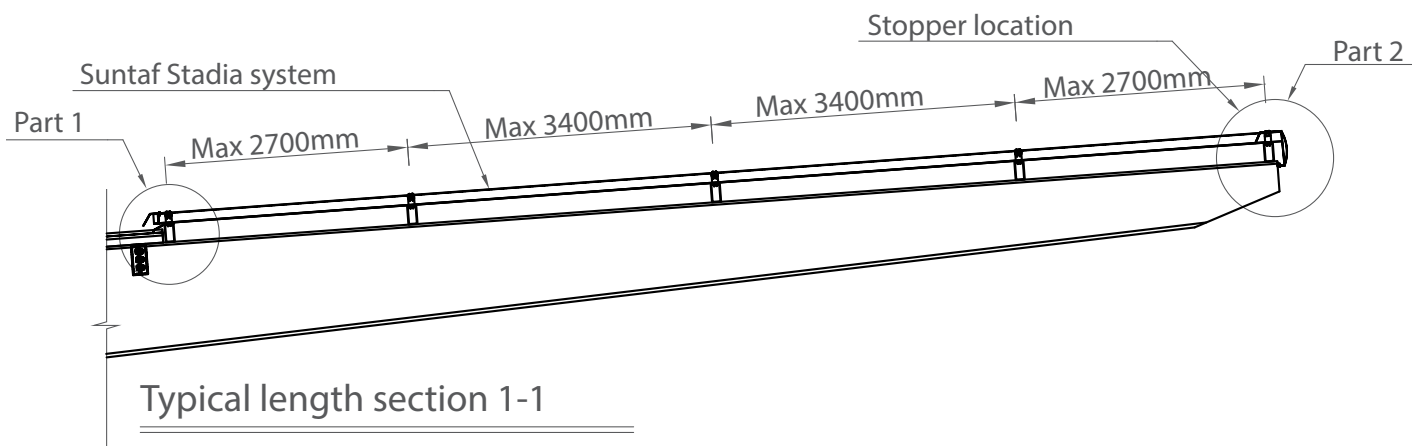
Stadium transparent canopy plan



Typical sector plan

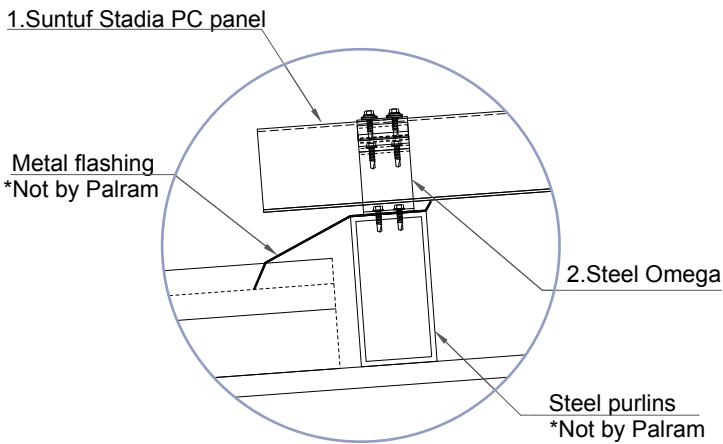


Typical length section 1-1

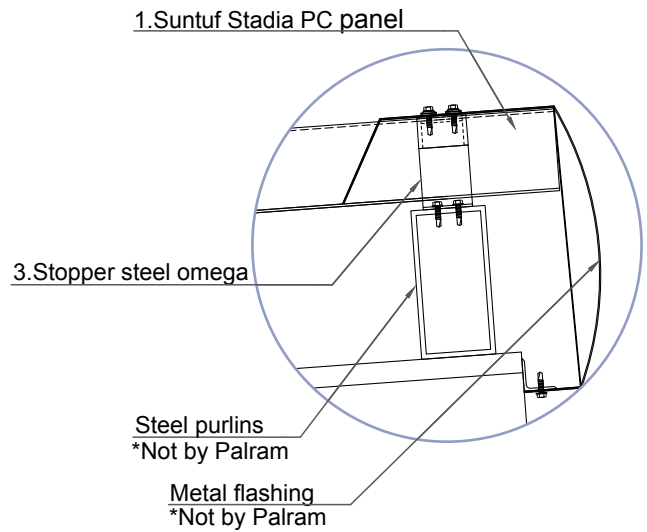


*All Details must be approved by structural engineer before application.

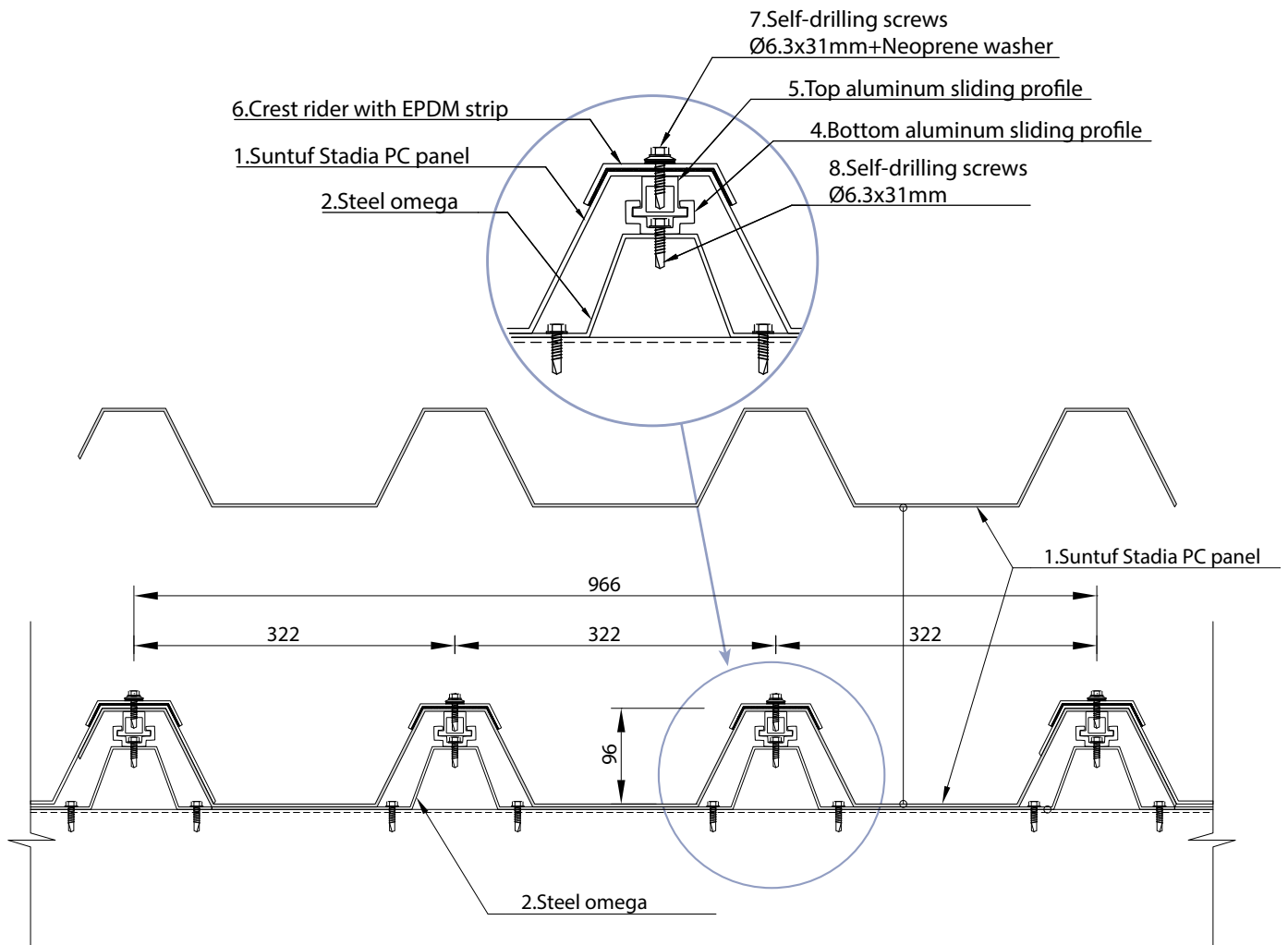
Part 1



Part 2

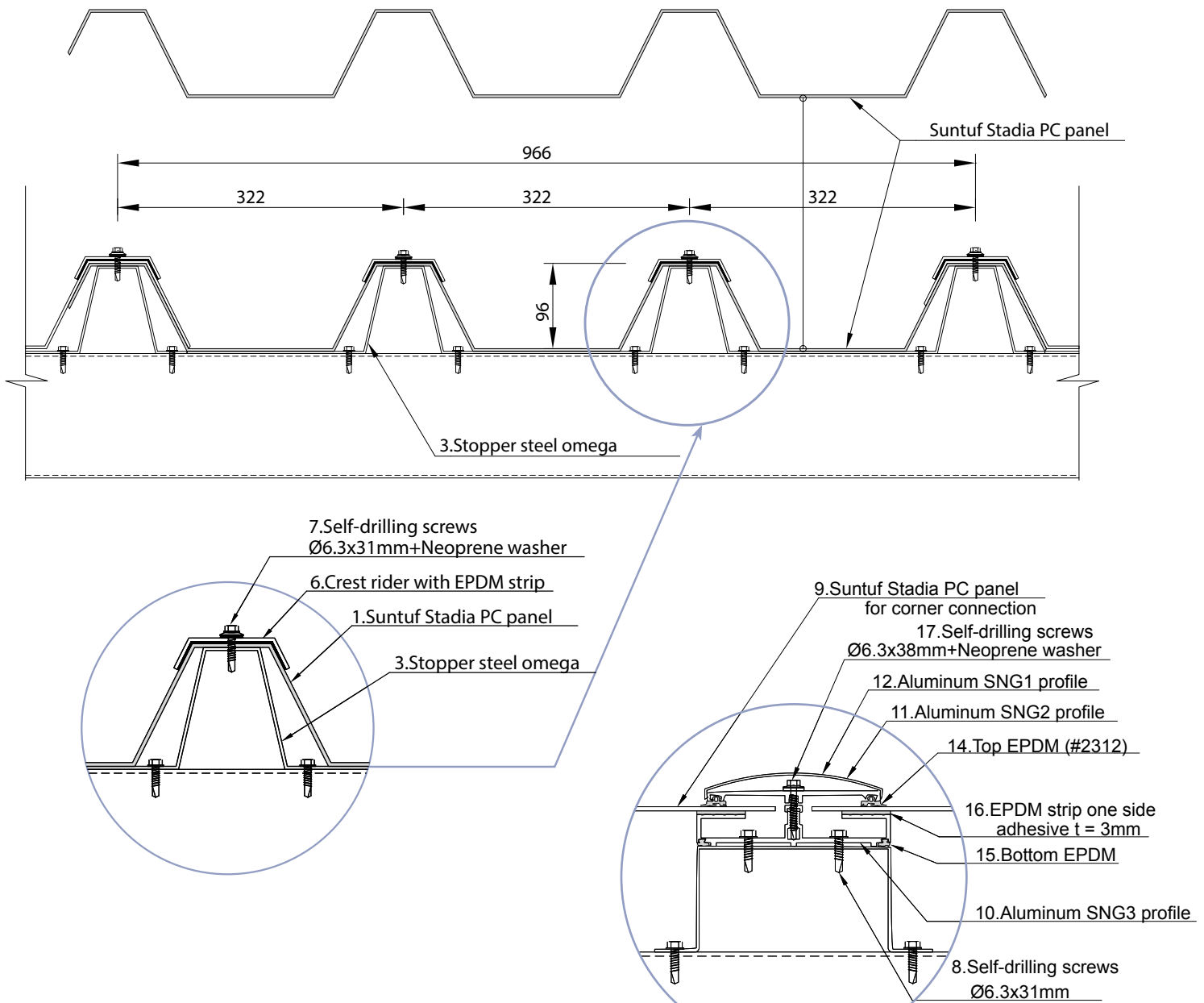


Typical width section at sliding detail (Sec 2-2)

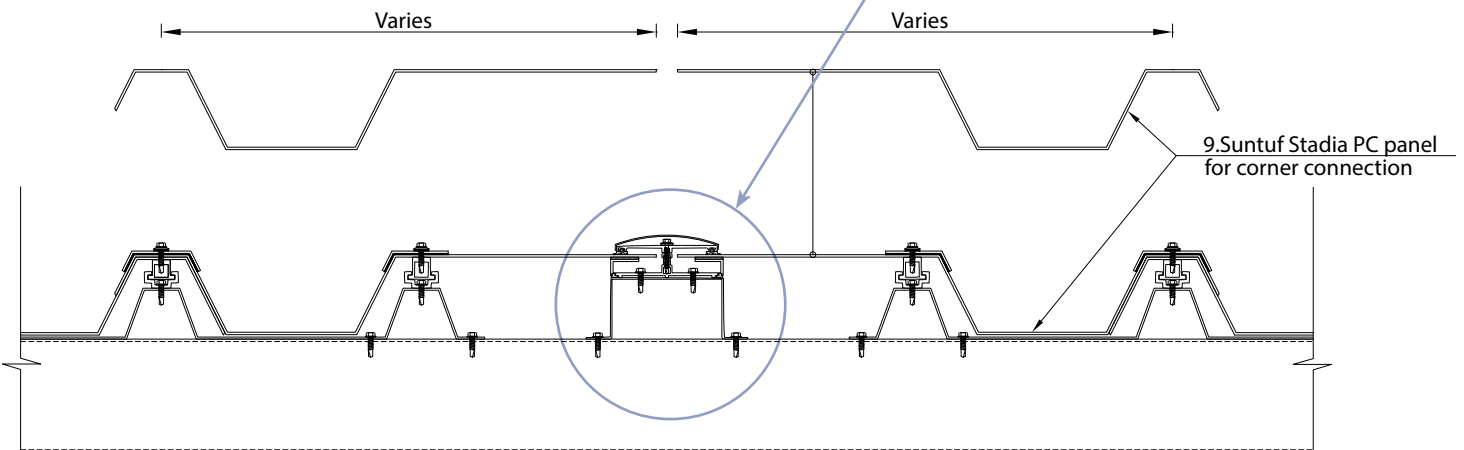


*All Details must be approved by structural engineer before application.

Typical width section at stopper (Sec 3-3)



Typical width section at radial seam (Sec 4-4)



*All Details must be approved by structural engineer before application.

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