



ENKA

ENGINEERING & CONSTRUCTION

POWER

REAL ESTATE

TRADE



AN ELITE CATEGORY STADIUM
ACCORDING TO **UEFA** CRITERIA

UNDER COMPERATIVE CONSIDERATION WITH **FIFA**
TECHNICAL RECOMMENDATIONS AND REQUIREMENTS 2011

**DONBASS
ARENA**

**OVERVIEW
2015**

LOCATION:

Donetsk, Ukraine

OWNER / CLIENT:

Stadion Shakhtar Limited.

BASIC DESIGN:

Arup Sport

PROJECT DURATION:

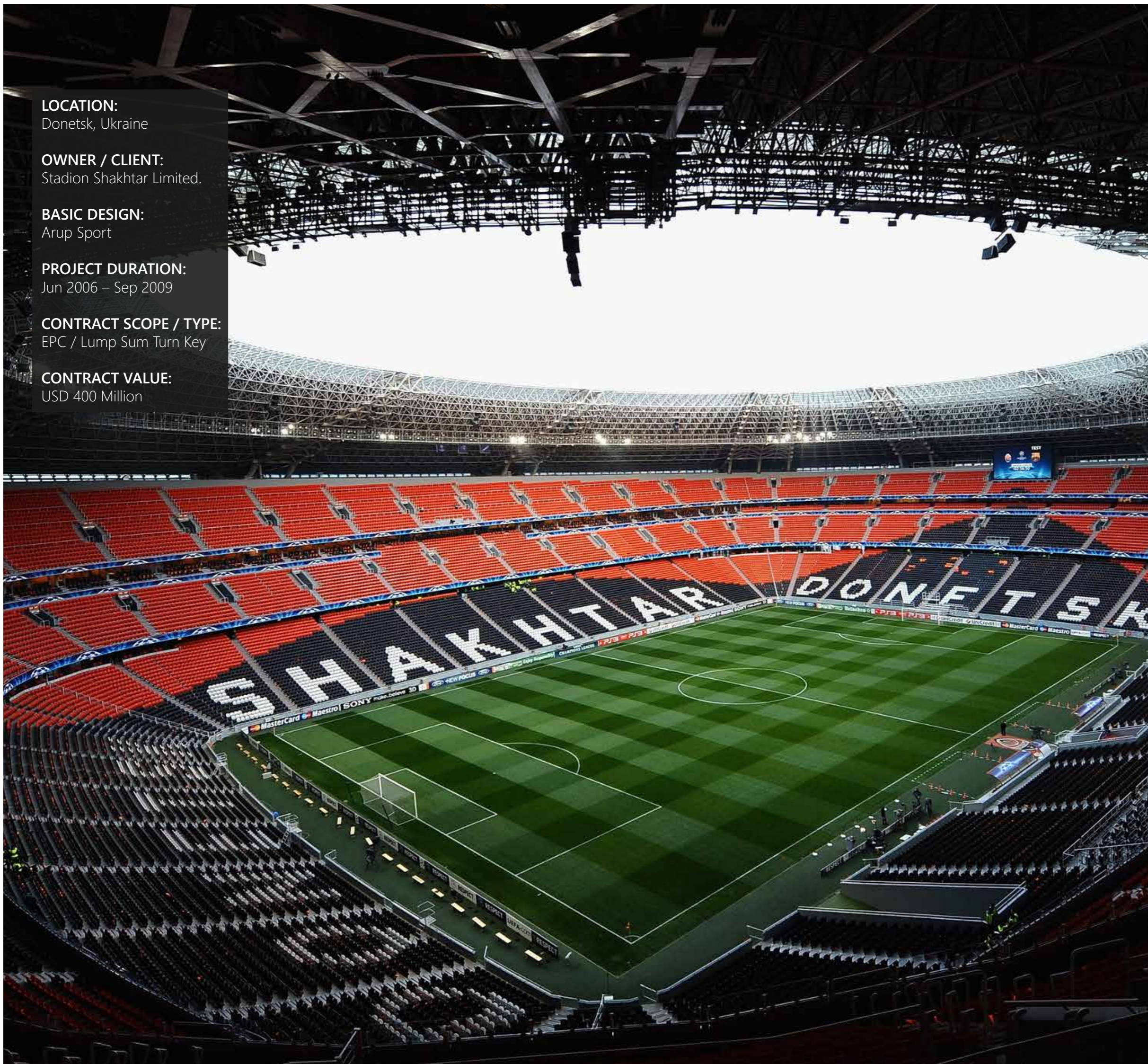
Jun 2006 – Sep 2009

CONTRACT SCOPE / TYPE:

EPC / Lump Sum Turn Key

CONTRACT VALUE:

USD 400 Million



CONTENT

History

General Information

- Construction
- Capacity
- Arena
- Pitch
- Park

Project Key Quantities

Stadium Net Capacity

Special Seats

Visibility - Seat Arrangement

Parking Areas

Press Facilities

Prep Rooms

VIP Hosting Areas

Spectator Restrooms&First Aid

Pitch

Technical Features

IT & Security Systems

ENKA

GENERAL INFORMATION

ENKA acted as the prime contractor. Construction was started in 2006 and completed in 2009. To erect the five-star arena to such a tight schedule (3 years) over 1,600 people worked on site at peak times.

Turn-key construction of **UEFA** Elite Class stadium in Donetsk, Ukraine for 51,540 visitors of which 3,680 are VIP. The shape of the Stadium has an oval form with an inclined roof. Inside the Stadium, restaurants, bars, cafes, fast food facilities, sports center, Club Museum and Shops are available.

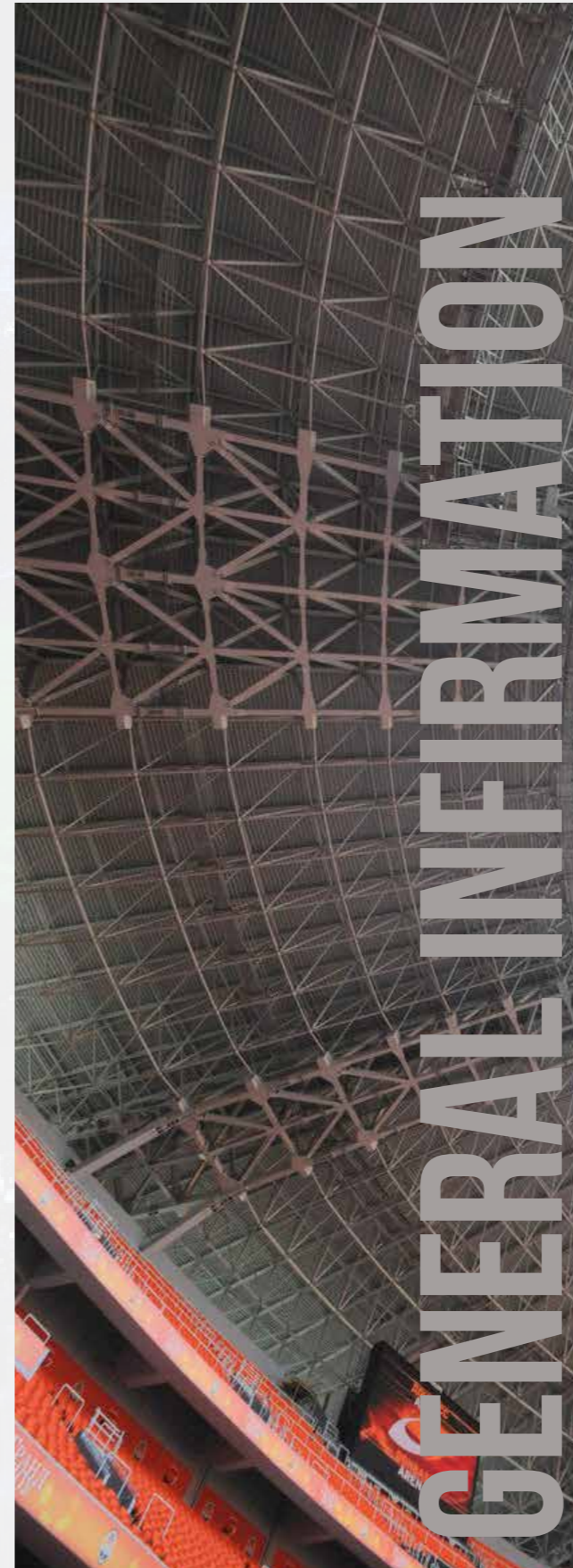
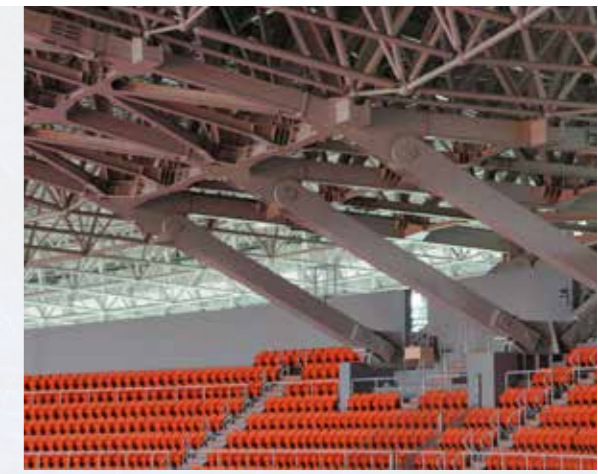
The eye-catching stadium was designed by Arup Sport, which was the creative and inspirational force behind some of the world's greatest arenas, such as the City of Manchester Stadium (Manchester, England), Allianz Arena stadium (Munich, Germany), the new stadium of Valencia CF (Valencia, Spain), Sydney Football Stadium (Sydney, Australia), Beijing National Stadium (or the Bird's Nest in Beijing, China) etc. The total project budget was USD 400 mil.

CONSTRUCTION:

- Construction was launched on **27 June 2006**
- USD **400 mil.** was spent on the stadium construction and the surrounding park landscaping.
- Over **160,000 m³** of concrete was cast into the building frame.
- **12,295** tons of rebar was used for manufacturing the structure frame.
- **458,761 m³** of soil was excavated to make the foundation pit.
- **234,376 sq.m** was the total construction site area (inclusive of mobilization areas).
- About **1,200 km** of cabling was laid for various systems.
- **1,158** days passed since the construction start until the arena's grand opening date.
- The stadium was officially opened on **29 August 2009**.

CAPACITY:

- **52,667** is the total seating capacity of the stadium.
- **290** seats for the media, whereof **152** seats for journalists and **138** seats for TV commentators (an aggregate of 46 commentary boxes).
- **196** positions and seats for people with disabilities and their carers (**104** and **92** respectively).
- The stadium's **44** corporate boxes can accommodate **915** people.
- **180** media representatives can always feel at home at a spacious Conference Room at the arena.
- All restaurants, bars and cafes at the stadium have a total of **1,830** covers.
- The stadium has over **1,000** car parking spaces (**245** of which are underground).





ARENA:

- The total area of the stadium's glazed facade is **14,283** sq.m.
- **2,482** triple-pane glass units were used for glazing the stadium's outer façade.
- Over **16,000** sq.m of vertical surfaces are made of glass, totaling **3,108** heavy-duty panes.
- The underground height of the building is: parking lot area - **12m**; dressing rooms - **8m**, media space rooms - **4m**.
- Height from pitch level to the topmost roof point is **54m**.
- The total floor area of all the stadium's levels makes **83,823** sq.m.
- **93%** of stands are roof-covered, only **3,800** seats in the bottom tier are not covered.
- **24** first-aid stations (**18** permanent ones and **6** mobile ambulance groups).
- **53** fast-food outlets, a fan cafe, **4** Silver bars, **3** restaurants (**Diamond, Platinum, Gold**), a media cafe and a lounge bar will satisfy any visitor's taste.
- **2,000** lux is the lighting intensity, ensured by **272** high-precision targeting spotlights mounted along the perimeter of the stadium's roof.
- **6,000** ports installed in the stadium for concurrent network connection.
- The stadium's video monitoring system comprises **570** CCTV cameras.
- **588** monitors installed throughout the stadium.
- **92** sq.m is the display surface of each of the **2** giant LED screens.
- **267m** is the total length of the LED electronic advertising hoardings
- **34** staircases available throughout the stadium space.
- **11,978** is the total number of stairs at the stadium. The flights of stairs comprise **4,181** steps.
- **550** heaters aggregately radiate **22** MW of thermal energy.
- The bowl is divided into **24** heated areas.
- The prime cost of heating one spectator seat during the match is about **UAH 1**.
- The system consumes some **2200-2300** cubic centimetres of gas per hour

PARK:

PITCH:

- The pitch size is **105m x 68m**.
- The ground surface includes: natural grass - **7,992** sq.m, artificial turf - **1,877** sq.m.
- **810** rolls of natural grass (each 10m long) were brought from Slovakia by 27 trucks.
- **26** automatic sprinklers water the pitch.

- **25** ha is the total area covered by the park area.
- **13** ha is the total area of the green lawns in the park.
- **77,000** plants grow in the park (**281** trees and about **35,000** rose bushes).
- **40.5** tons is the total weight of the fountain ball which is located at the south entrance (the ball alone weighs 28 tons (made of a single piece of granite) and the stand weighs another 12.5 tons).
- **228** m³ of water circulates within the fountain cascades facing Chelyuskintsev St.

PROJECT KEY QUANTITIES

Key Quantities	Commodity	UoM	Total
	Concrete	m ³	160,000
	Rebar	ton	12,295
	Excavation	m ³	458,761
	Cabling	km	1,200
	Pre-cast Element	ea	3,400
	Tubular Pile	ea	3,248

Total Construction Area:
235,000 m²

Total Closed Area:
84,000 m²

Total weight of metal construction of roof is more than **6,000 tons** (Including **3,800 ton** of support structure)

1,680 workers worked in the construction at peak (majority Turkish & Ukrainian).

Stadium facade is **22,058m²**, with **16,003m²** glass and **6,055 m²** louvre area

Stadium roof is **34,764m²**, out of which **5,188m²** is glass.

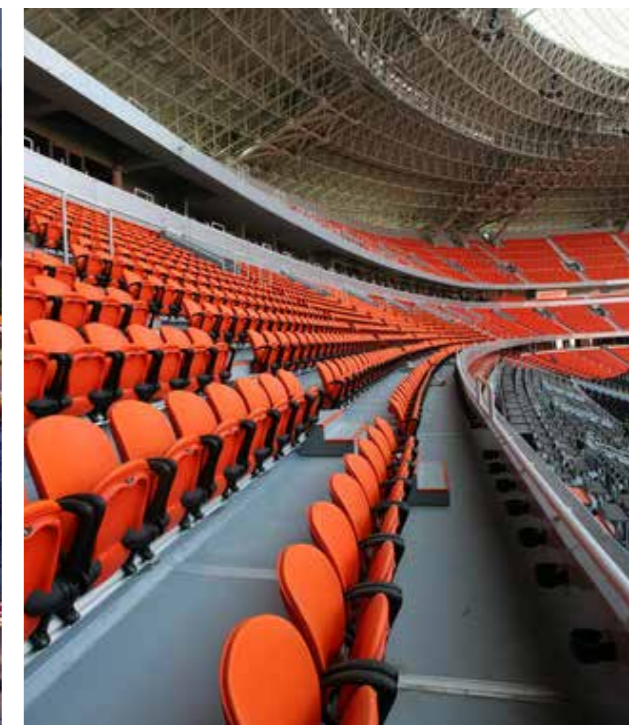
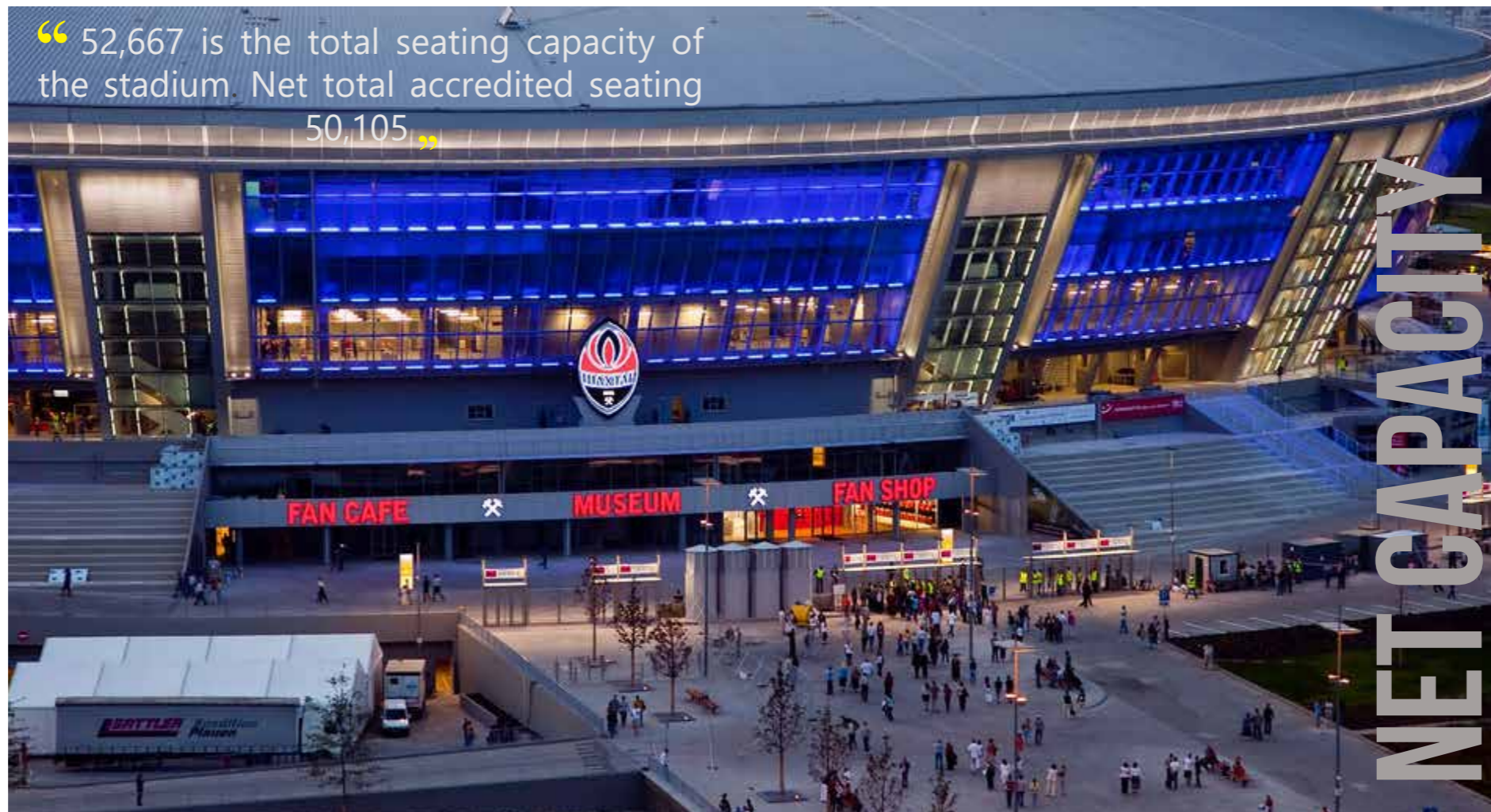
“Over **160,000 m³** of concrete was cast into the building frame.”

“Construction Work has been completed in **36 months 2006-2009.**”





“ 52,667 is the total seating capacity of the stadium. Net total accredited seating 50,105 ”



STADIUM NET CAPACITY

Project Commitment

Press:
856 seats

Commentator:
46 cabins
138 seats

Observer:
168 seats

UEFA Requirements

Press:
700 seats

Commentator:
40 cabins
138 seats

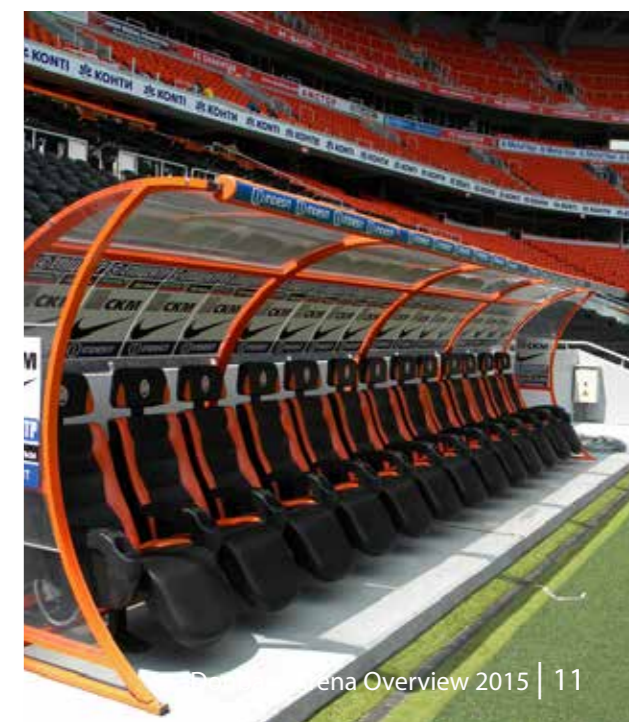
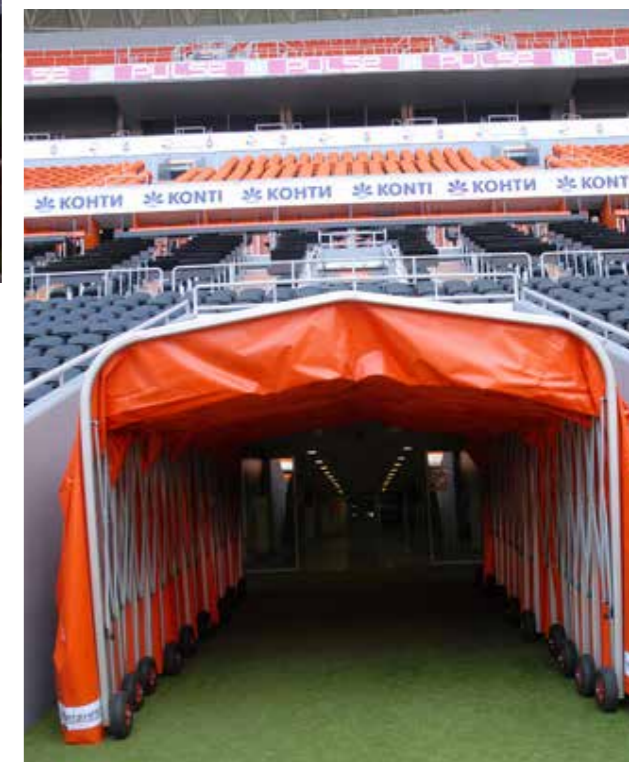
Observer:
168 seats
(UEFA Final & Semifinal)

FIFA Requirements

Press:
800 for Semifinal & Third Place Game;
1000 for Opening & Final Game

Commentator:
50-90 cabins, **130-160** seats

Observer:
200-375 seats





SPECIAL SEATS

Disabled Seating

Seating Places for disabled and companion seats : Acc. to **UEFA** they need to be situated at minimum **2** sectors with minimum **50** capacity each sector.

FIFA requires **0,5-1,0%** of total capacity

Donbass Arena:
Total **104** capacity with **92** companion seats at **4** sectors, two access ramps at two sectors with **18** special disabled turnstiles

VIP Seating

Acc. to **UEFA** Min. 1,500 VIP seats are required, min 200 reserved for visiting team.

FIFA Requirements

FIFA requirement for hospitality seating **8%** for Opening Game and Final, **5%** for the rest games;

VIP Boxes:

300-1,350

Donbass Arena:

VIP Boxes: **830**

VIP seats: **3,680**





VISIBILITY – SEAT ARRANGEMENT

For net capacity of the stadium **UEFA** accepts all seats with a visibility of min. **C=90** without any obstacles such as balustrades, barriers and segregation etc.

Recommended **FIFA** minimum **C=90**

To achieve **C=90**, the tiers have to raise with a parabolic arrangement and distance to field is essential. In order to achieve that, tiers have been designed with different heights and seats have been mounted on different levels. (between **40-55** cm)

Donbass Arena seating design has been conducted considering near to **C=90** values at corners at upper tier, and more then **C=90** values have been achieved elsewhere. **250** seats behind substitute benches and other **100** obstructed seats with less **C=90** value are not considered in net capacity of the stadium for **UEFA** Games (Allowed max. is **10%**)

UEFA accepts 190 m as maximum distance to the field, whereas this distance is **142** m in Donbass Arena

Different price category seats, as well as away fan seats have been separated with glass partitions in order not to obstruct visibility near such segregations.

FIFA Spectator Seat requirements : Riser min : **30**cm, Tread min : **80**cm,
Width min : **45**cm opt: **50**cm and Rake angle max : **34**°

SEAT ARRANGEMENT



PARKING AREAS

Project Commitment

- 250** VIP parking places in covered garage
- 500** open parking places at stadium area
- 2,000** parking places around stadium area
- 70** bus parking places at stadium area
- 330** bus parking places around stadium area

UEFA Requirements

- Min **150** VIP parking places
- 1,400** parking places
- 400** bus parking places

FIFA Requirements

- 80-200** VVIP parking places
- 150-200** VIP parking places
- 1,800** Host+Visitor parking places
- 545** bus parking places

“Donbass Arena has over **1,000** car parking spaces (**250** of which are underground),”



PRESS FACILITIES

UEFA is asking 16 camera positions for live broadcast of semi-final and final games. (FIFA 22 fix, 15 temporary)

Min 12 m² main camera platform is needed (FIFA requires 1 camera platform 2x10-20m)

In Donbass Arena, 20 m² main camera platform (with 3 cameras) and 9 other camera platforms have been built

Including field cameras, the match is recorded with 17 cameras in total

All Press tables are equipped with network connection as well as wireless network. All over the entrance level, level 3, wireless internet access is available.



Project Commitment

UEFA Requirements

OB-Van Area:
TV Studios:
Press Center:
Press Working Area:

9160 m² *
3 panoramic **66** m³
4 standard **26** m²
180 seats, **261** m²

2000 m²
1 panoramic **20** m²
3 standard **25** m²
100 seats,
UEFA final: 250 m²

FIFA Requirements

OB-Van Area :
TV Studios :
Press Center:
Press Working Area:

4000-6000 m²
4x160 m² – **8x320** m²
3 standard **25** m²
150-200 seats, **500** m²
Stadium Media Center for
800-2000 people **4000 – 7000** m² (temporary)

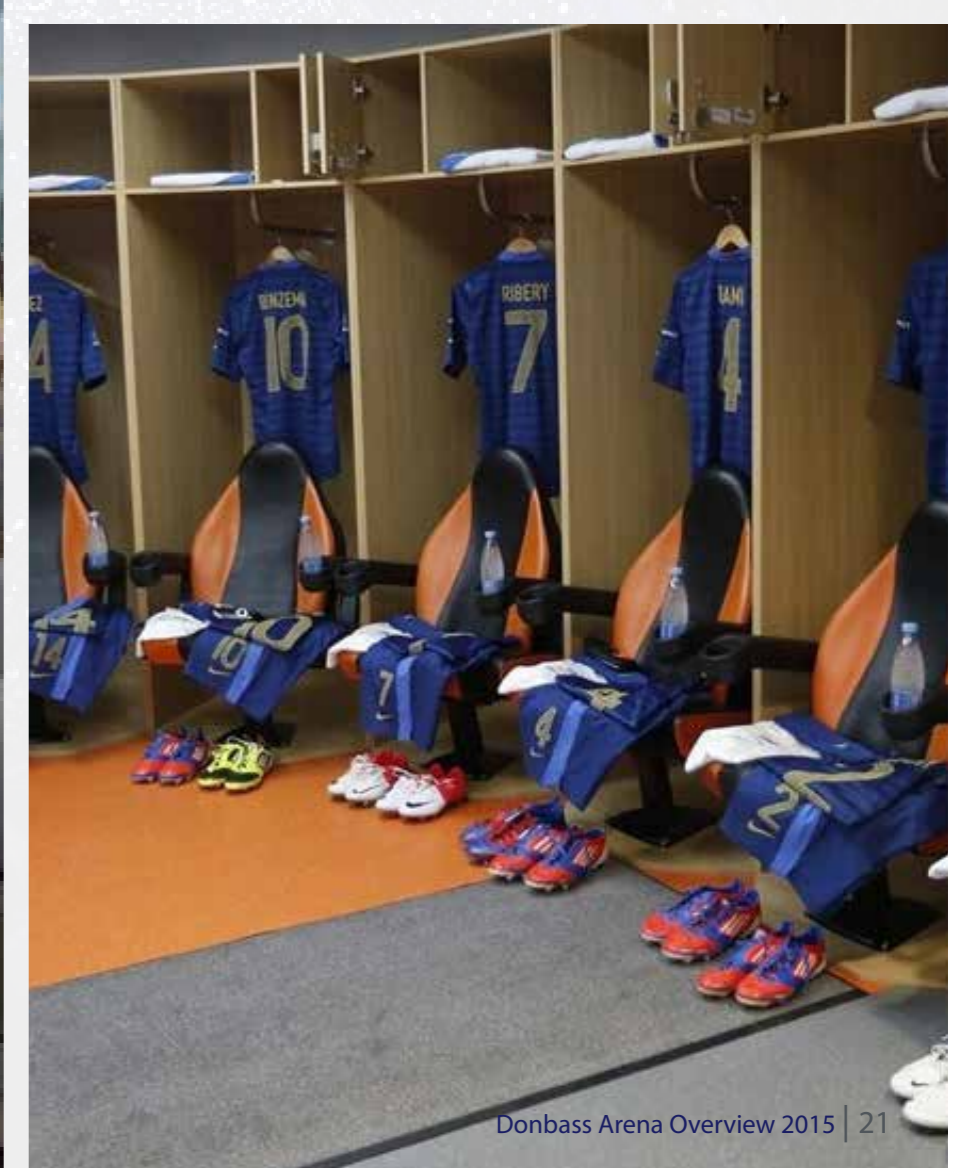
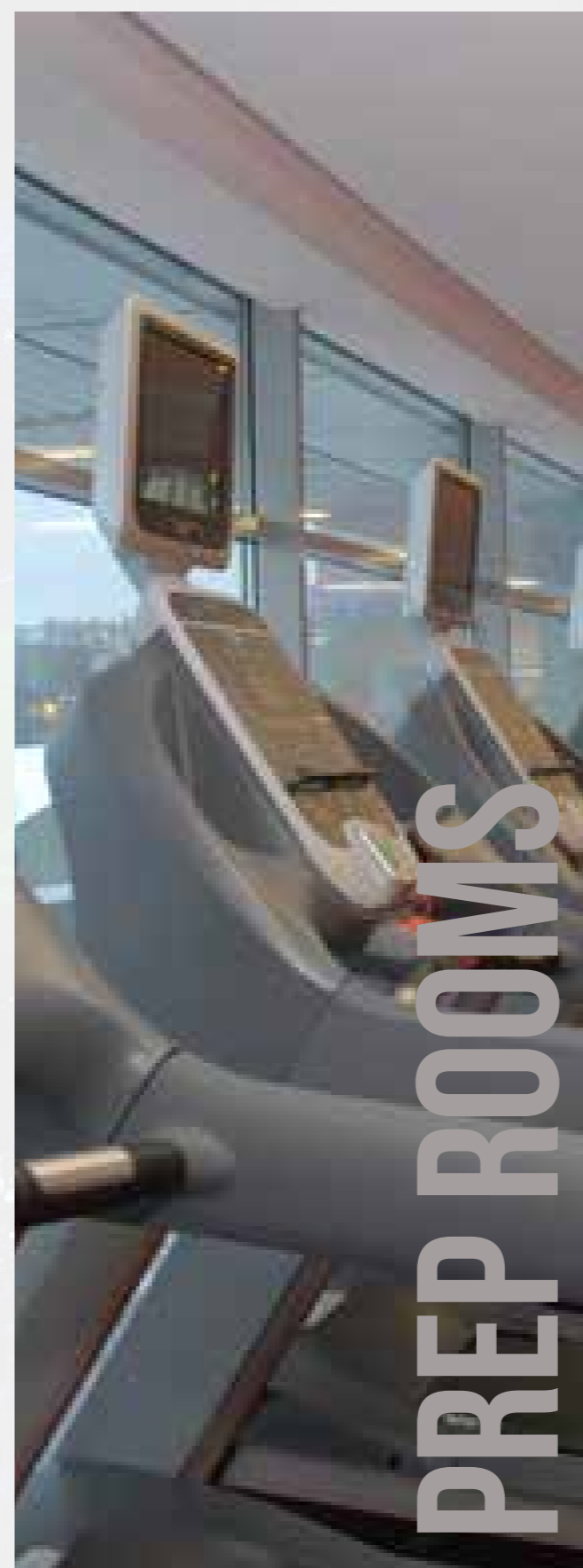
“* EURO 2012 final requirement **9000** m² „

PREP ROOMS

	Project Commitment	UEFA Requirements
Dressing Rooms:	2x220 m ² both teams 11 showers, 2 massage rooms,	125 m ² , 5 showers, 1 massage room,
Referee Room:	2 dressing rooms, 4 shower & toilet, 27 m ² meeting room	1 shower & toilet, 5 seats
First Aid Room:	47 m ² , fully equipped with X-Ray, shower & toilet	Fully equipped, min 24 m ²
UEFA Delegate Room:	46 m ² , office room with toilet and with communication capabilities	Min 16 m ² , near referee room with communication capabilities
Doping Control Room:	46 m ² , shower, toilet and waiting room, near to dressing rooms without access from press rooms	Min 20 m ² , with toilet and waiting room including min 2 test cabins

FIFA Requirements

Dressing Rooms:	2x80 m ² , 11 showers each, 1 massage room 40 m ² for 8 people,
Referee Room:	3 showers & toilet, 5-7 seats
First Aid Room:	Fully equipped, 50 m ²
UEFA Delegate Room:	Unlike UEFA , FIFA requires not only Delegate room but many FIFA Offices at main stand at lower level
Doping Control Room:	Min 36 m ² waiting room for 8 people with toilet including 4 medical offices



PREP ROOMS

VIP HOSTING AREAS

Project Commitment

V VIP Lounge:

VIP Hosting:

Diamond Club, **563** m² restaurant, **265** VVIP Seats, special covered garage

Platinum Club, **463** m² restaurant, **315** VIP Seats, dedicated parking place

Gold Club, **546** m² restaurant, **372** VIP Seats dedicated parking place near stadium

Silver Club, **4** bars, **297** m², **2,147** premium seats, dedicated parking place near stadium

Tribune Lounge, **870** m² lounge bar, **581** premium seats, dedicated parking place in stadium area

UEFA / FIFA Requirements

V VIP Lounge:

VIP Hosting:

UEFA; Min **100** seats with min. **2** m² space each,

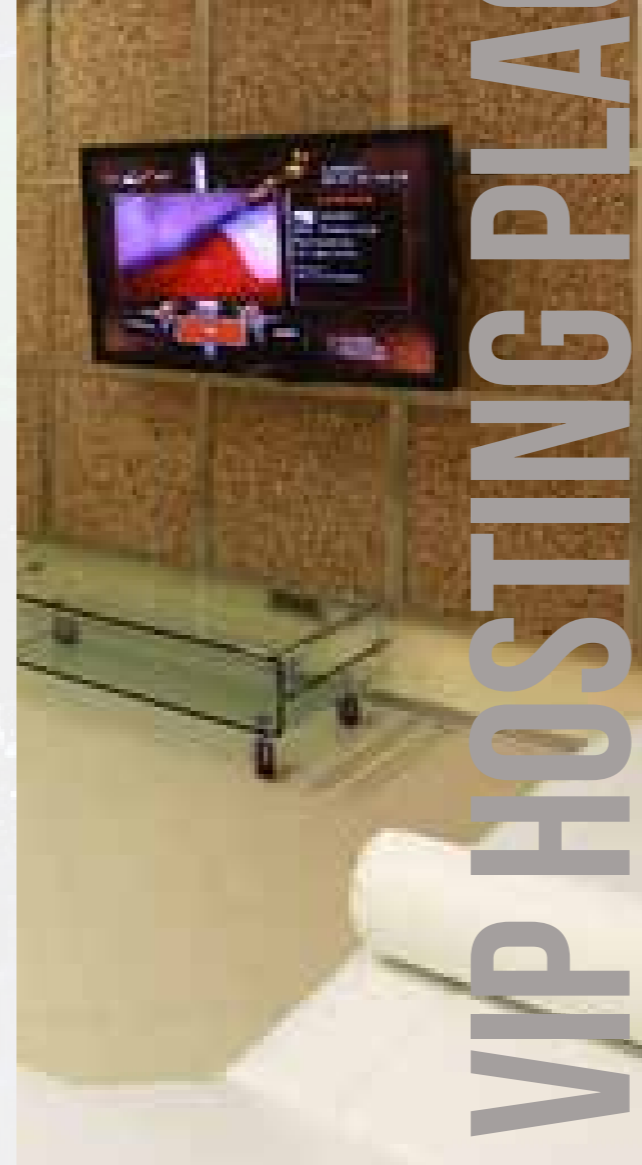
FIFA; Min **150** seats with min. **1,8** m² space each

UEFA Final; **450** seats, **CL** Final; 700 seats VIP hosting with easy access to seats (min. **1,5** m²/person)

Min. **250** VIP Guest hosting area for each team (min. **1,5** m²/person)

VIP Hosting area for min. **1000** **UEFA** guests (not necessarily within the Stadium)

FIFA; **550 – 1350** seats (min. 1 m²/person)



SPECTATOR RESTROOMS & FIRST AID

Project Commitment

UEFA Requirements

Restrooms :

487 urinal, **619** toilet cabin
40% dedicated for women
16 pieces for disabled

1 toilet for each **200** seats and
1 urinal for each **125** seats
(411 urinal, **257** toilet for
50,000 capacity)

First Aid :

Each sector at each level **1**
 room; in total **21** first aid
 rooms, **2** of which are fully
 equipped

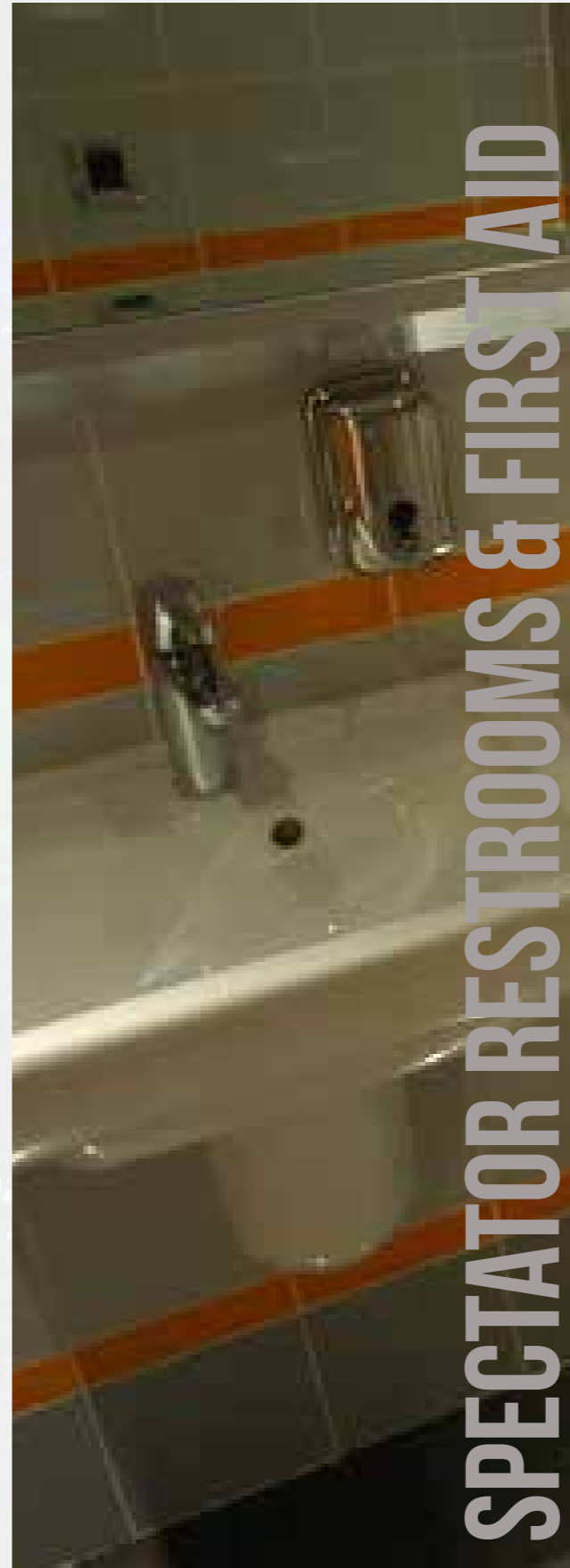
FIFA Requirements

Restrooms :

3 WC, **15** Urinal, **6** wash basin for each **1000** male
 spectator
28 WC, **14** wash basin for each **1000** female spectator

First Aid :

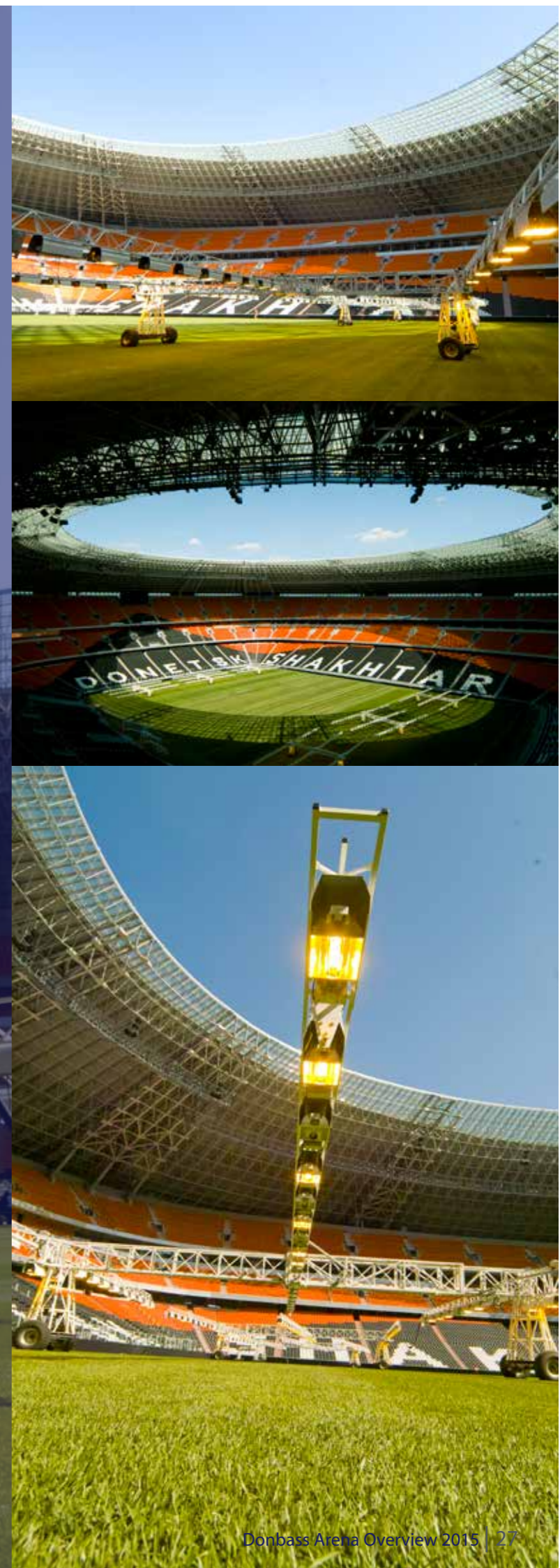
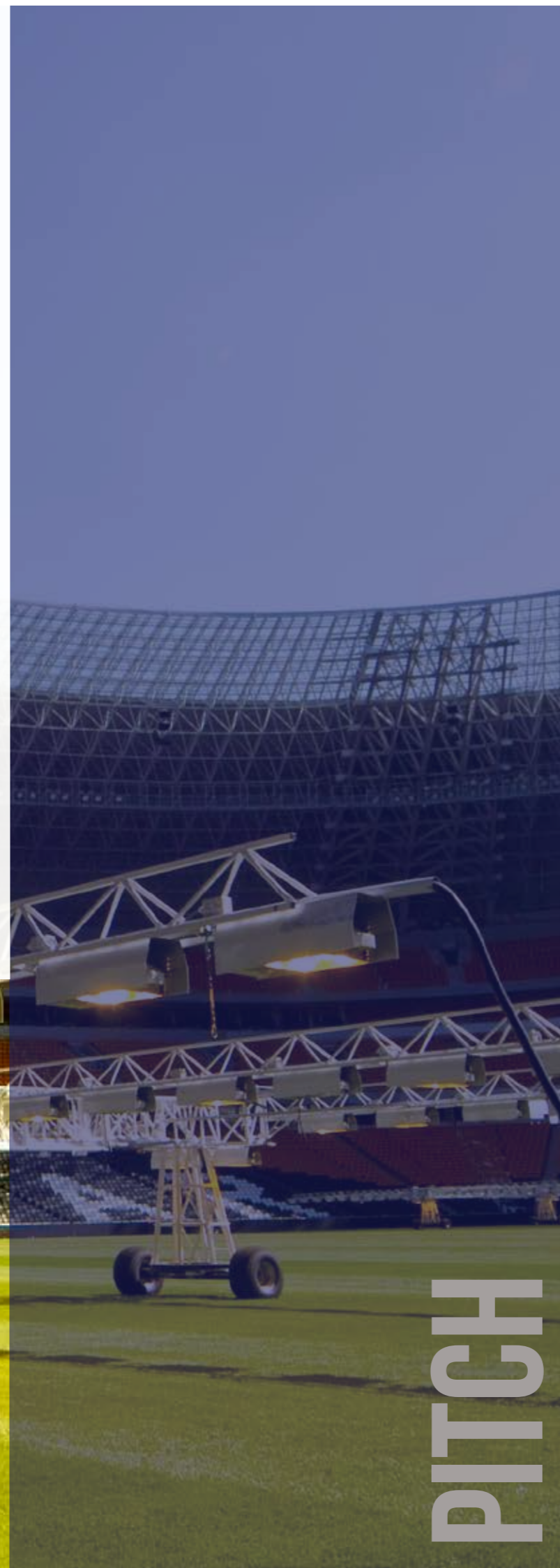
Every hall **1** First Aid Room, **1** fully furnished FA min. 20 m²
 for players and match officials



PITCH

- **UEFA** requires natural turf for semi-final and final games.
- In today's modern stadiums, the closed structure is an obstacle for natural light and natural ventilation of the pitch, which is vital for the healthy growth of the grass.
- The roof of Donbass Arena is partially transparent to allow natural light to the grass for longer periods of time
- To achieve good ventilation on pitch, entrance level 3 has louvered doors all over. In addition to that, sides and upper parts of all stair cores and facade to roof connection all over the stadium has been equipped with louvres
- In addition to all such natural ventilation measures, the drainage system of the pitch has been integrated to a patented ventilation system to blow or vacuum air as and when necessary.
- Due to freezing winter conditions the pitch has been equipped with undersoil heating system. System has all means of control to achieve +2C on the surface at min. -10C ambient temperature and prevent the roots from boiling, assuring a maximum temperature of (20C) at the roots.
- Automatic irrigation system of the pitch has been designed to water the field with 26 sprinklers during 15min. half time when necessary. There is an irrigation water tank of 200 ton capacity inside the stadium

All the above are included in **FIFA** Recommendations

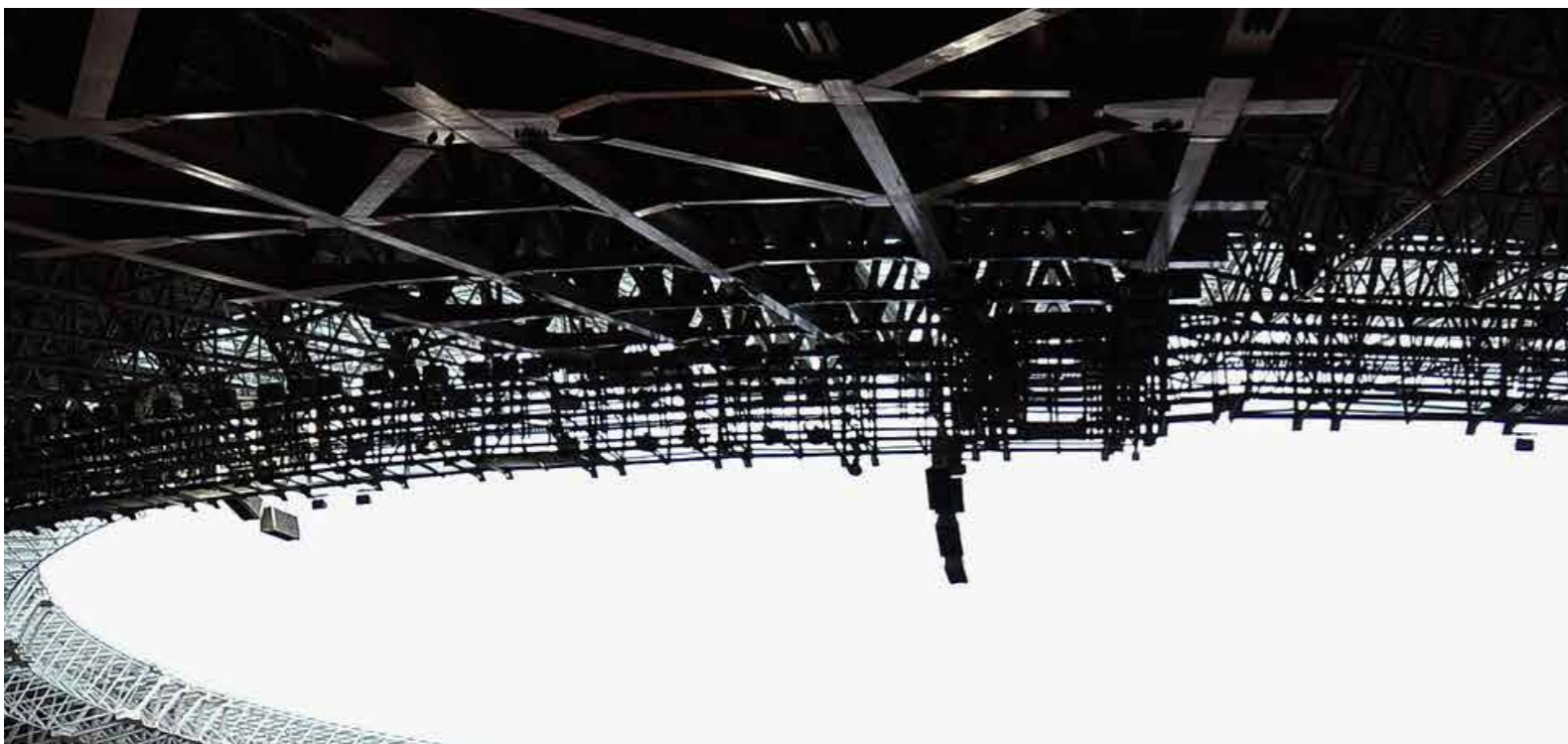


PITCH

TECHNICAL FEATURES

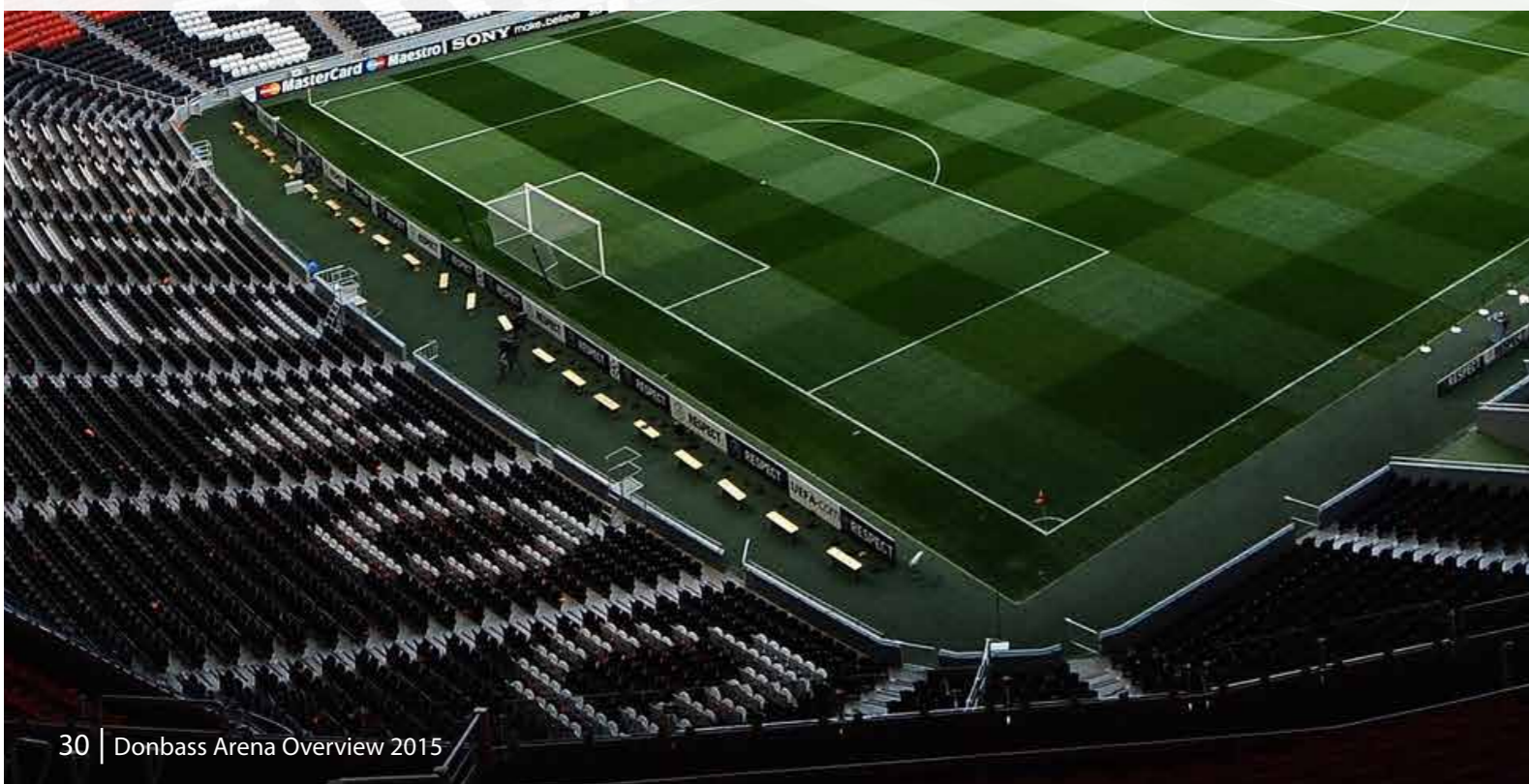
- For the comfort of VIP premisses, heating and cooling is supplied from Energy Center built near the stadium. All comfort zones are equipped with HVAC Systems. Piping passing trough unheated spaces are equipped with trace heating system controlled via Building Management System (BMS).
- Toilets in unheated areas are equipped with electrical heaters to assure min +5C in coldest design ambient temperatures.
- All Comfort systems of the stadium are connected to BMS and are controlled and monitored from a single dispatcher center. BMS also monitors fire alarm , CCTV, PA/VA Systems, Pitch heating, irrigation and aeration systems, elevators and fasçade lighting, and also commands some of those.
- There are 20 elevators in the stadium dedicated to VIP visitors and for Catering purposes. (UEFA requirement :min.4) **"FIFA Recommends elevator and escalators with required number for VVIP, VIP and Media and Services."**
- 106 turnstiles, one for each 500 visitor has been installed whereas **UEFA** is asking one for 660 visitor. In addition to that, 18 disabled turnstile is present
- 2 off each 92 m² electronic scoreboard are installed at east-west axis on upper tier, to serve maximum number of visitors. **"FIFA requires minimum 2 scoreboards each with min. 70 m² for Stadia with >50,000 spectator capacity."**
- Premium Class Public Announce and Voice Alarm Systems to serve both inside and the bowl have been installed. System is backed up with UPS for announce purposes.
- 588 pieces 46" and 52" plasma monitors have been installed in concourse areas to serve commercial and emergency needs with closed circuit broadcasting.
- Interior and exterior signage systems, illuminated as and when necessary, have been designed and installed to lead the home and away fans without crossing each other.



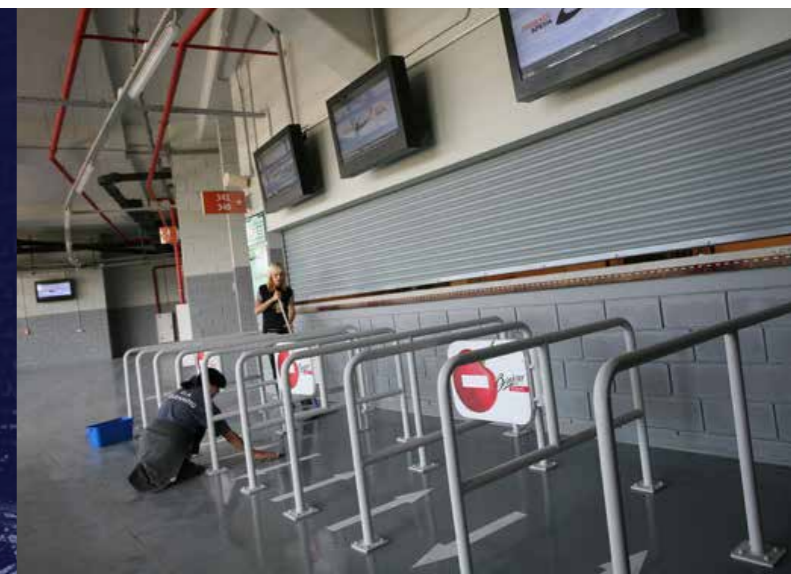


IT & SECURITY SYSTEMS

- According to **UEFA** an Elite Stadium needs to have a closed circuit TV system, to show messages to lead the visitors as necessary. Camera surveillance and picture taking must be possible whenever required. An Elite Class stadium CCTV system must have minimum 240 cameras. Donbass Arena is monitored with 448 cameras.
- IT system has been designed to command CCTV, Access Control, Security, Parking System, Cashless Shopping and TV & Data systems for the beginning. All such systems are connected to fiberoptic structural Cabling System. In the future the system will be retrofitted to cover other hi-tech comfort services such as; digital signage, electronic trade, mobile platform, web platform, call center, Full wireless network.



IT & SECURITY SYSTEMS





ENKA

İNŞAAT VE SANAYİ A.Ş.

Balmumcu Mah., Zincirlikuyu Yolu No: 10, 34349

Beşiktaş / İstanbul

Phone: +90 (212) 376 10 00 (pbx) Fax: +90 (212) 272 88 69

e-mail: enka@enka.com web: <http://www.enka.com>