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PFEIFER and PFEIFER Systems

Retractable Cable structures for Qatar FIFA World Cup

Al Wakrah Stadium

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PFEIFER group

PFEIFER
group

Lifting. Securing. Connecting.

These three words describe everything that motivates PFEIFER.

As a brand. As a group of companies. As a supplier of solutions to the most demanding tasks in cable structures and rock-fall protection as well as in wire rope, lifting and construction technology.

Our thoughts, research and actions revolve around these three words – and have done so for generations. In eight business units, in 33 operative companies and in 19 countries around the world with over 1500 employees.

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PFEIFER Business Units

Rope Application	Attachment Equipment	Lifting Technology	Elevator Products
Mining and Industry Ropes	Rockfall Protection	Connecting and Lifting	Structures

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Structures – Operative units

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structures

PFEIFER Covertex	PFEIFER Systems	FabriTec Structures	Guard All Building Solutions

covertex

PFEIFER Systems

FabriTec STRUCTURES

GUARD-ALL BUILDING SOLUTIONS

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Structures – Operative bases and sales locations

Europe	America	Middle East	Asia
Memmingen, **Germany**	Dallas, Texas, **USA**	Dubai, **UAE**	Shanghai, **China**
Satteins, **Austria**	Tustin, California, **USA**	Doha, **Qatar**	**Singapore**
Wroclawia, **Poland**	New York, **USA**		
Madrid, **Spain**	Toronto, **Canada**		
Paris, **France**			
London, **UK**			

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Structures – Turnkey solution

- Cable and tension rod systems
- Roof, façade and bridge structures
- In-house design, high quality fabrication, approved standard products
- Long-term experience in quality control
- Full scope project management, worldwide installation

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PFEIFER Systems – Experts in Retractable Systems

PFEIFER Systems is specialized in all sorts of retractable systems, which convert a fully enclosed building into an open one, and vice versa. We can offer innovative solutions for the development, engineering and construction of special drive technology and kinetic architecture solutions.

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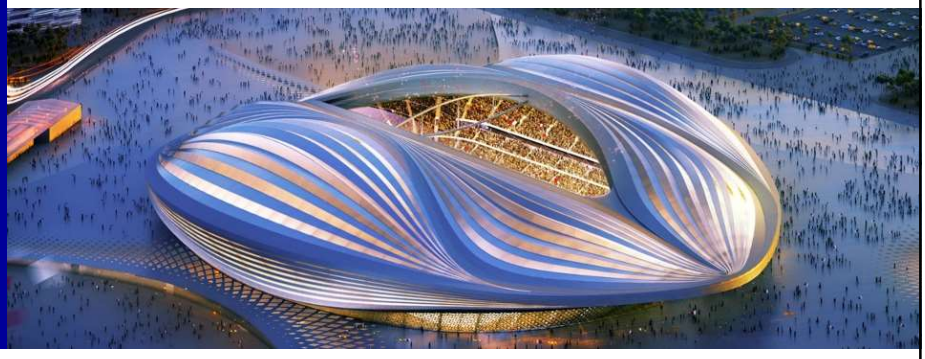
Al Wakrah Stadium; Qatar; FIFA World Cup 2022
Start 2017
Finished 2019



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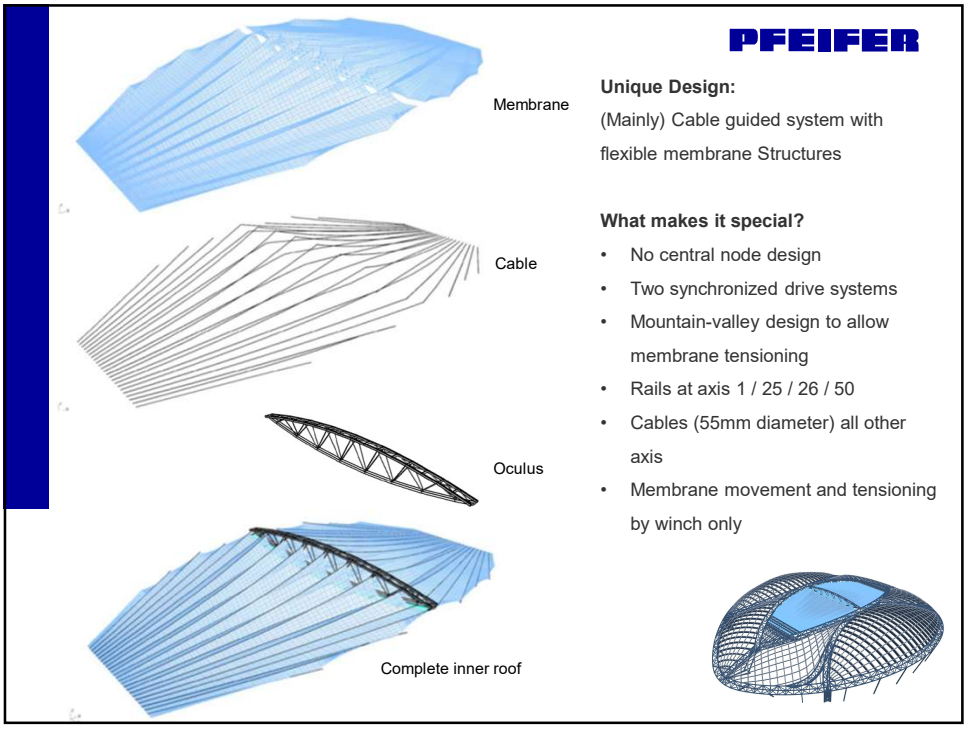
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Membrane
Cable
Oculus
Complete inner roof
Unique Design:
(Mainly) Cable guided system with flexible membrane Structures
What makes it special?
• No central node design
• Two synchronized drive systems
• Mountain-valley design to allow membrane tensioning
• Rails at axis 1 / 25 / 26 / 50
• Cables (55mm diameter) all other axis
• Membrane movement and tensioning by winch only

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Project data and mock-up
Covered Area: 90m x 50m (2 times)
Roof surface: 4.500m² (2 times
Winch system for movement and tensioning
Winch 50 pc
Winch capacity 60 up to 200 kN
Sliding carriage 664 pc
Driving carriage 50 pc
Cable Diameter 55mm
Cable Length 40 up to 60 m
Rail at the side 4 pc
Mock-up finished in December 2017

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Drive system components:

Components along cable

664 Sliding carriages

46 Driving carriages

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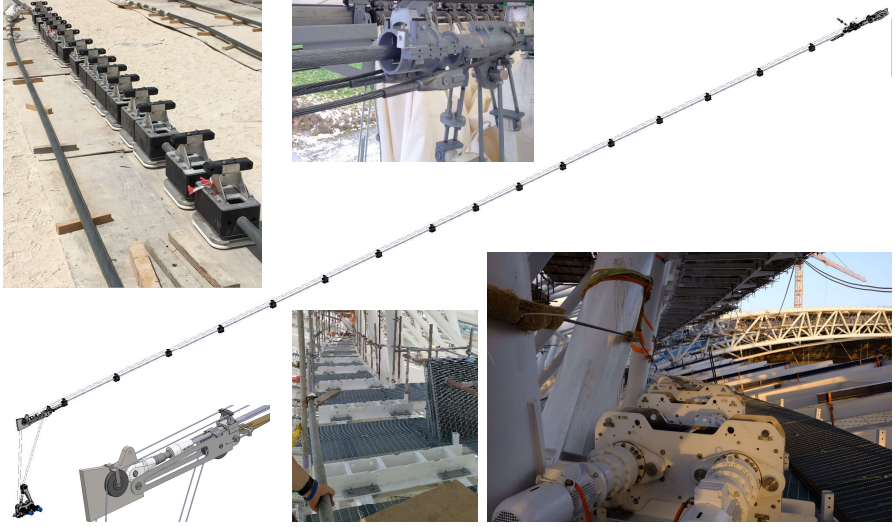

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Drive system components:

Components along rail

20 Standard bogies

4 Drive bogies

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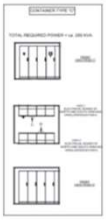
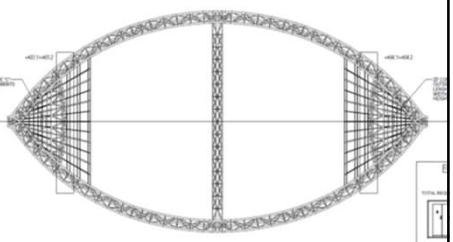
Challenge 1: Extreme environmental conditions

- High corrosion class C5 (coastal area and offshore)
- High temperatures





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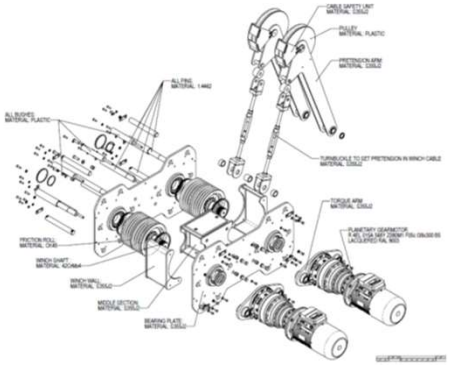
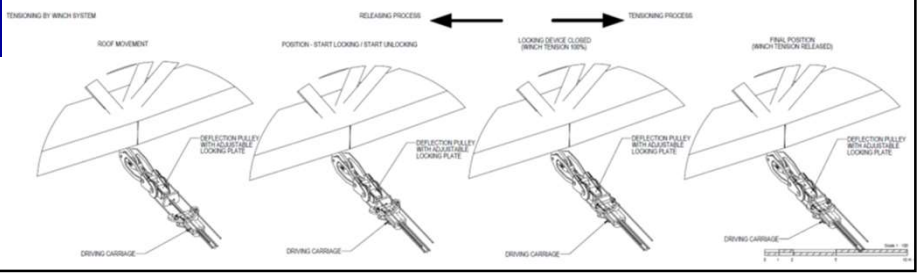
Challenge 2: Minimized visual appearance

- Reduction of catwalks and gratings
- Tensioning by winch instead of hydraulics





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Challenge 3: Membrane (1/3)

- PVC membrane with TIO2 Coating
- High membrane forces and big belts

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Challenge 3: Membrane (2/3)

- Fabrication, delivery and installation in one piece

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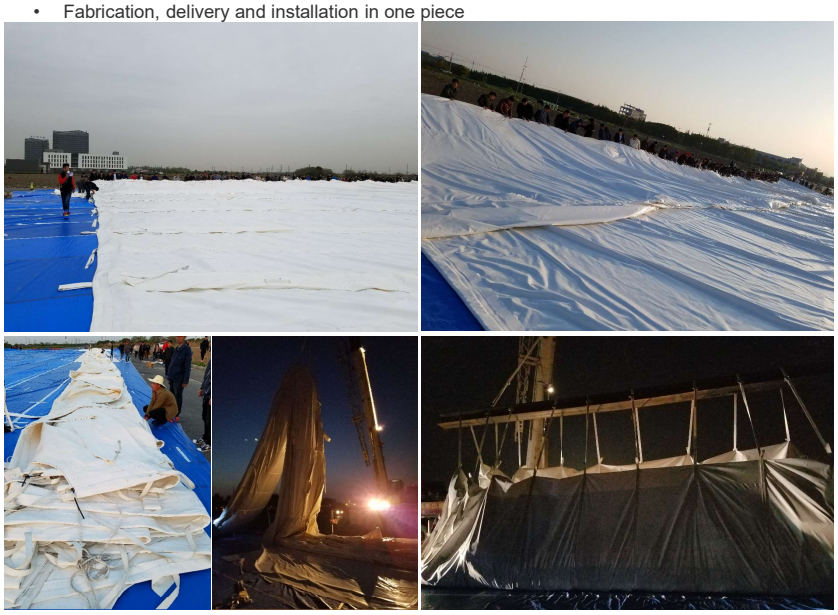
Challenge 3: Membrane (3/3)

- Fabrication, delivery and installation in one piece



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Challenge 4: Short project time

- 23 month between contract and finalization
- No estimation of transport duration possible
- Huge amount of documentation necessary
- Short fabrication and pre-assembly time

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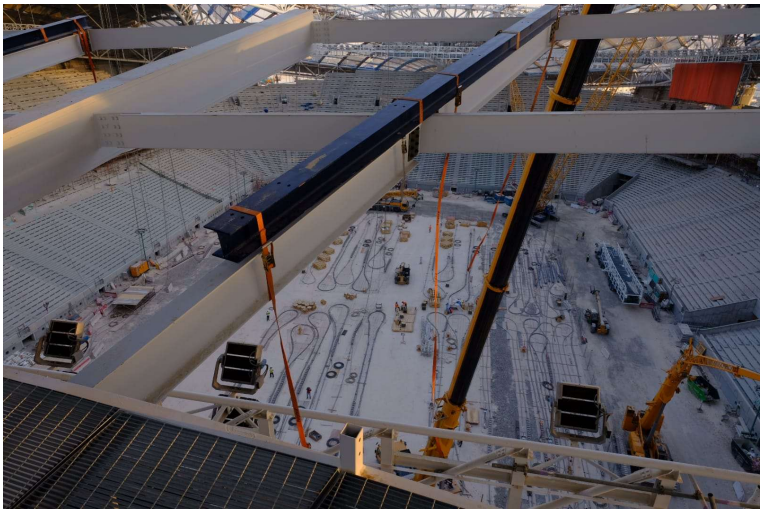
Impression from on site works



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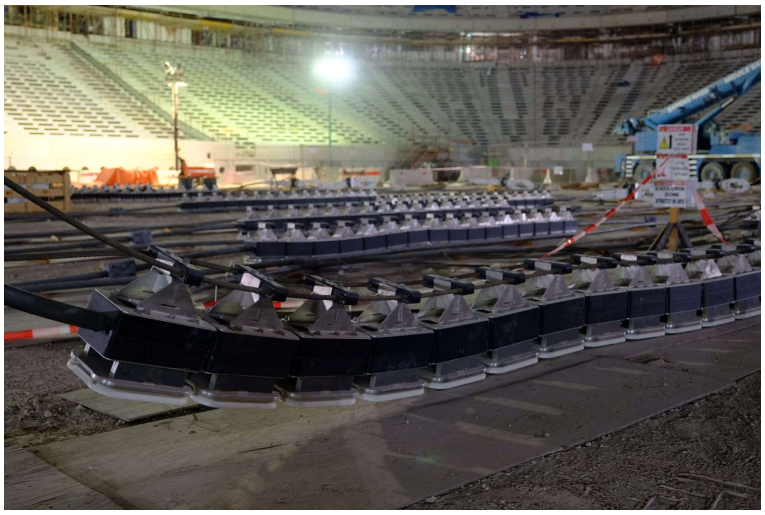
Impression from on site works



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Impression from on site works

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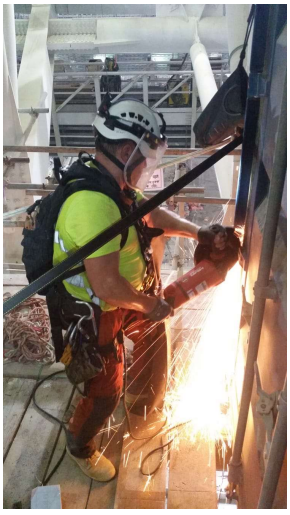
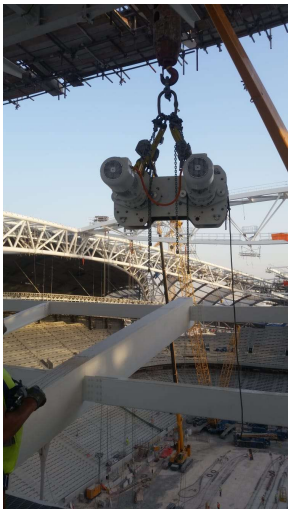
Impression from on site works





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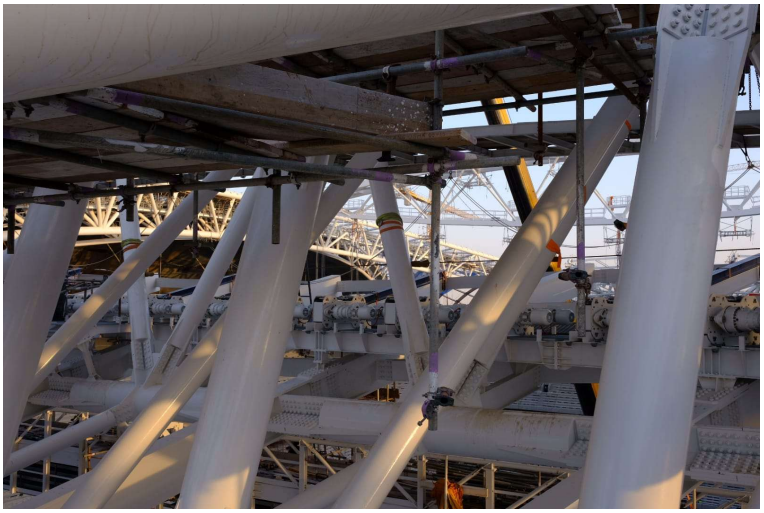

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Impression from on site works

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Impression from on site works

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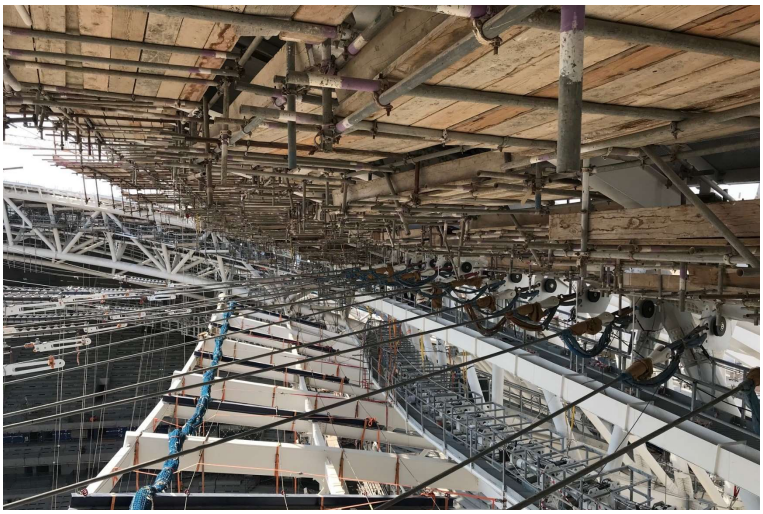
Impression from on site works



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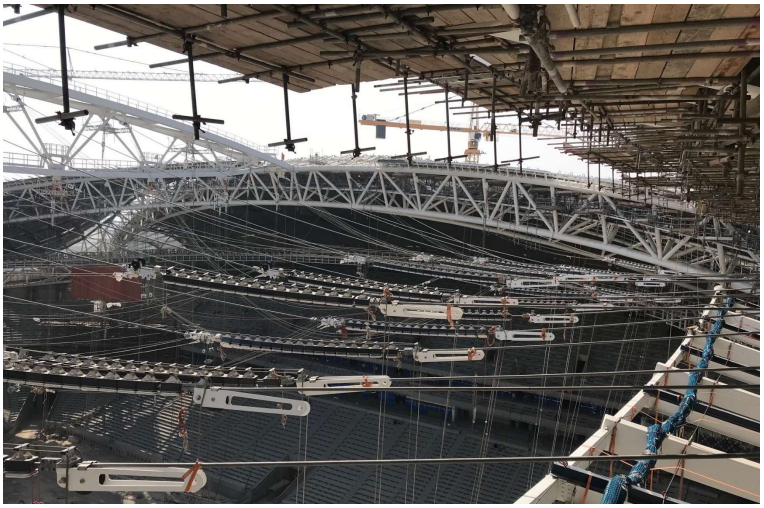
Impression from on site works



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Al Thumama Stadium
Start 2018
Finished 2020

Scope:

- Cable net
- Membrane at roof

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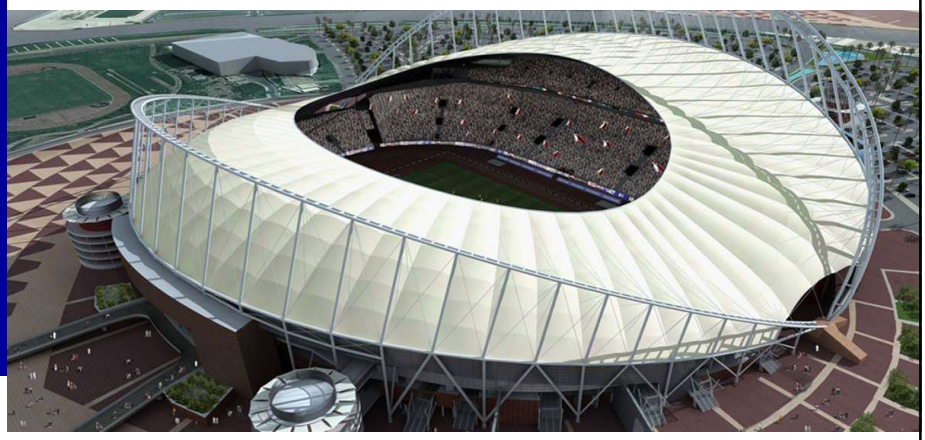
Kalifa Stadium FIFA World Cup 2022
Start 2015
Finished 2016



Scope:

- Cable net

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