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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

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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
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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.

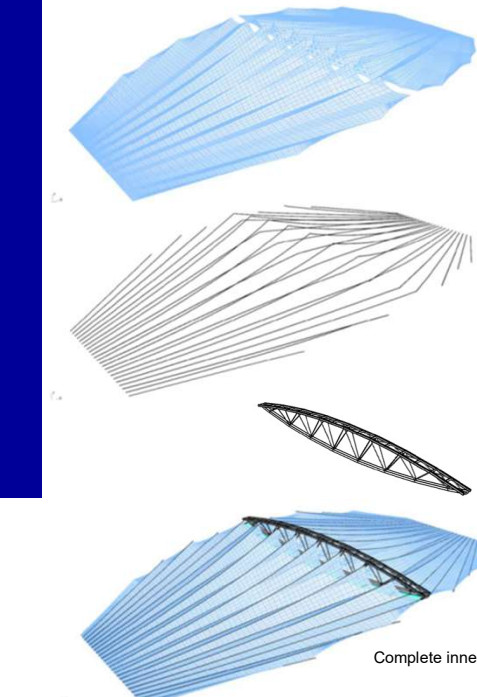
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Al Wakrah Stadium; Qatar; FIFA World Cup 2022
Start 2017
Finished 2019



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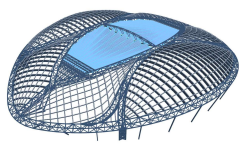


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Unique Design:
(Mainly) Cable guided system with flexible membrane Structures

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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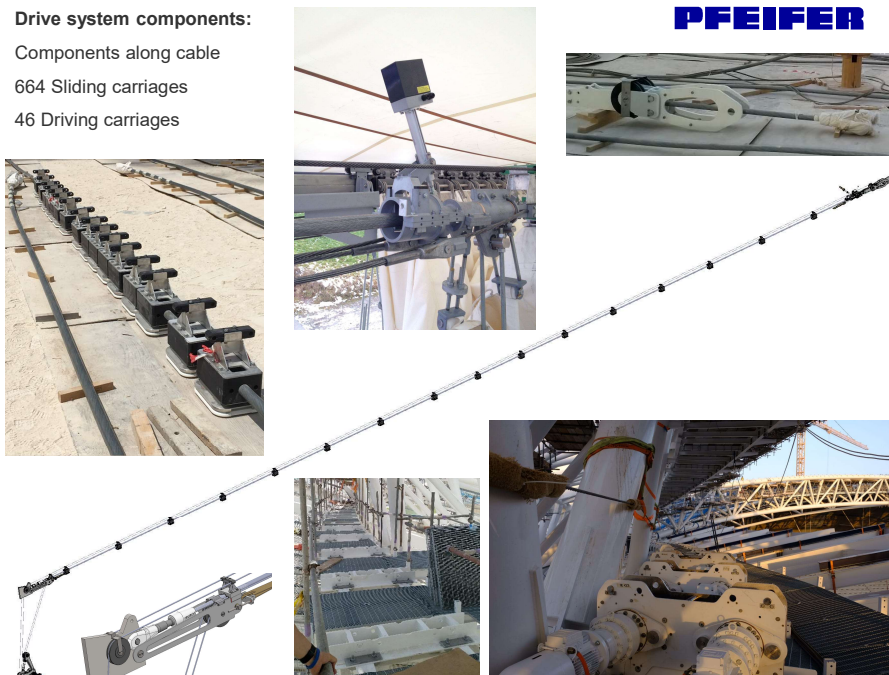




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Drive system components:
Components along cable
664 Sliding carriages
46 Driving carriages

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The image collage for slide 11 features a central photograph of a long, silver cable with numerous small black sliding carriages attached. To the left, a close-up shows a carriage on a track. Above the cable, a driving carriage with a motor is shown. To the right, a large industrial structure with a cable system is visible. Below the cable, a close-up of a carriage is shown. In the bottom right, a large industrial structure with a cable system is visible.

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Drive system components:
Components along rail
20 Standard bogies
4 Drive bogies

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The image collage for slide 12 features a central photograph of a long, silver rail with many bogies attached. To the left, a close-up shows a bogie on a track. Above the rail, a drive bogie with a motor is shown. To the right, a large industrial structure with a rail system is visible. Below the rail, a close-up of a bogie is shown. In the bottom right, a large industrial structure with a rail system is visible.

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Challenge 1: Extreme environmental conditions

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

The collage features several elements: a photograph of a large industrial cabinet with its doors open, revealing internal components; a photograph of a narrow, dark corridor with reflective surfaces; a technical drawing of a cable tray structure with various components labeled; and a photograph of a control panel with a keypad and a small display screen.

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Challenge 2: Minimized visual appearance

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

The collage features several elements: a photograph of a cable tray system with multiple cables; a detailed technical drawing of a winch mechanism with various components labeled; and a sequence of four diagrams illustrating the tensioning and releasing process. The diagrams are labeled: 'ROOF MOVEMENT', 'POSITION: START LOCKING / START UNLOCKING', 'LOCKING DEVICE CLOSED (WINCH TENSION 100%)', and 'FINAL POSITION (WINCH TENSION RELEASED)'. A central arrow indicates the 'RELEASING PROCESS' and 'TENSIONING PROCESS'.

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Challenge 3: Membrane (1/3) **PFEIFER**

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



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Challenge 3: Membrane (2/3) **PFEIFER**

- 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

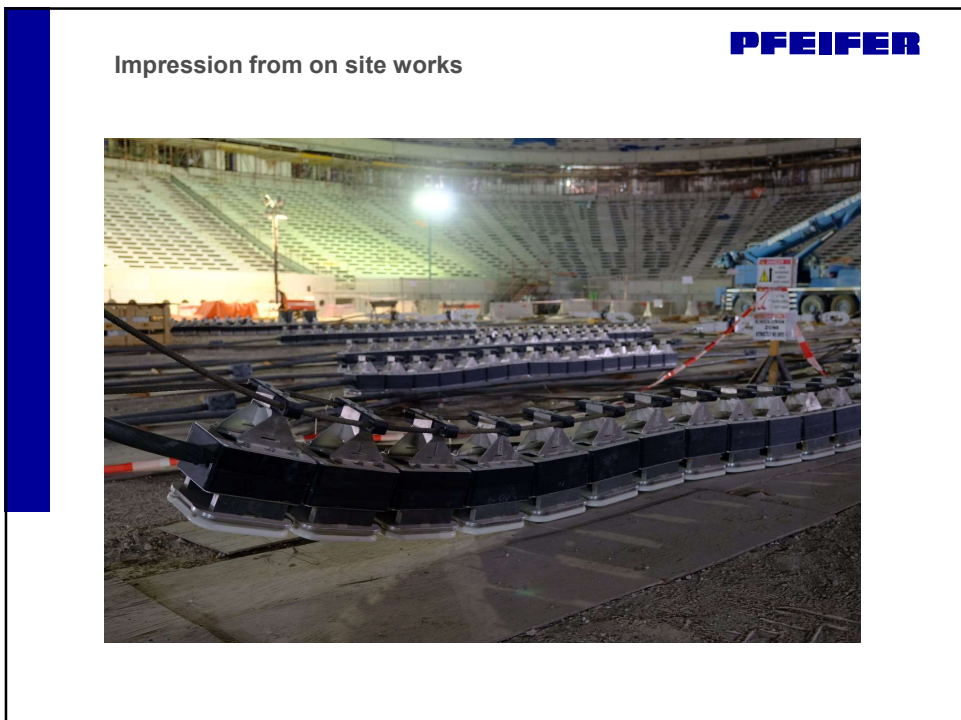
- 23 month between contract and finalization
- No estimation of transport duration possible
- Huge amount of documentation necessary
- Short fabrication and pre-assembly time



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Impression from on site works **PFEIFER**



A photograph showing the interior of a large industrial structure, likely a wind turbine nacelle or tower. The image features numerous white cylindrical components, possibly blades or structural parts, arranged in a complex, radial pattern. A network of steel beams and pipes is visible, creating a dense, industrial environment. The lighting is bright, highlighting the metallic surfaces and the intricate geometry of the structure.

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Impression from on site works **PFEIFER**



A photograph of a construction site. In the foreground, there is a yellow wooden safety barrier or fence. Behind it, a large, curved, white, ribbed structure is visible, which appears to be part of a large-scale construction project, possibly a stadium or a large industrial building. The background shows a complex network of steel beams and pipes, similar to the image on the previous slide. The lighting is bright, and the overall scene is one of active construction.

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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




This photograph shows the interior of a large stadium during its construction phase. The focus is on the complex steel truss structure that supports the roof and seating tiers. Numerous cables and rigging systems are visible, likely used for the installation of the roof membrane. The seating areas are partially completed, showing rows of seats and structural supports. The lighting is bright, highlighting the industrial and architectural details of the site.

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Al Thumama Stadium
Start 2018
Finished 2020



This is an aerial architectural rendering of the Al Thumama Stadium. The stadium is a large, circular structure with a unique, white, perforated facade that features a repeating geometric pattern. It is surrounded by landscaped grounds, including green fields, walkways, and parking areas. The overall design is modern and distinctive, reflecting the architectural style of the stadium.


Scope:

- Cable net
- Membrane at roof

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Kalifa Stadium FIFA World Cup 2022
Start 2015
Finished 2016

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Scope:

- Cable net

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