



**KRAMPE HAREX®**

KNOW WHY.

## Reference | Tunnel

# STORMWATER SYSTEM DUBAI | UNITED ARAB EMIRATES

A sustainable drainage system for about 40% of the entire urban area of Dubai.

### PROJECT INFORMATION

<b>Project</b>	Stormwater System
<b>Location</b>	Dubai, UAE
<b>Application</b>	Tunnel
<b>Component</b>	Stormwater tunnel (TBM tunnel)
<b>Art</b>	Tübbings
<b>Construction period</b>	2018 - 2020
<b>Requirement</b>	According to fib Model Code 2010: Class 4 c

<b>Concrete</b>	C 55/67 Durability requirement 120 years
<b>Fibre type</b>	DE 60/0.9 H
<b>Dosage rate</b>	40 kg/m <sup>3</sup>
<b>Total volume</b>	5,000t

### SPECIAL FEATURE

For the planned C55/67 concrete with expected real 28-day compressive strength of >80 N/mm<sup>2</sup>, a cold-drawn wire fiber of type DE 60/0.9 H with tensile strength 1,900 N/mm<sup>2</sup> is best suited.

## Reference | Stormwater System

# DEEP TUNNEL STORMWATER - A PIONEERING FUTURE PROJECT

With a sustainable drainage system for about 40% of the urban area, the city of Dubai is creating security for the future and for the Expo in 2022.

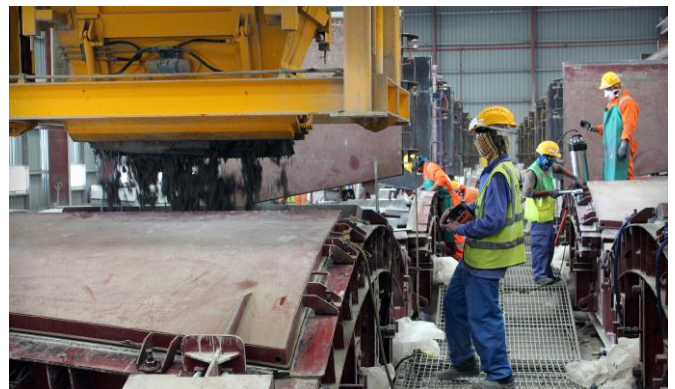
Thinking big. One of the most ambitious infrastructure projects ever undertaken by Dubai Municipality, the Deep Tunnel Stormwater System is being built jointly by experts from various international companies. The gigaproject is scheduled for completion by October 2020 - right at the start of the rainy season. KrampeHarex is also involved in the construction of the central drainage tunnel as a technology partner, supplying the fibers that guarantee the stability and durability of the concrete.

DEEP TUNNEL  
THE HEART OF THE STORMWATER SYSTEM DRAINAGE

Under the ground the central tunnel being built for the "Stormwater System" breaks all records previously set in the United Arab Emirates.

5.000t KRAMPEHAREX STEEL FIBRES  
CORE OF STABILITY  
DELIVERED ON TIME

For the planned concrete class C 55 / 67 with an expected real 28-day compressive strength of  $>80 \text{ N/mm}^2$ , KrampeHarex's experience and research has shown that a cold-drawn wire fiber of type DE 60/0.9 H with a tensile strength of  $1,900 \text{ N/mm}^2$  is best suited. The selected fiber not only ensures an optimum price-performance ratio, but also impresses with its very good processability - because it has no tendency to gel, float or settle.





## Reference | Stormwater System



**10.4** km  
total length

KrampeHarex selected from its high-performance portfolio a DE 60/0.9 H type fiber, a cold-drawn wire fiber with a length of 60 mm, a diameter of 0.9 mm, a slenderness of 67 and a tensile strength of 1,900 N/mm<sup>2</sup>.

Based on experience from previous projects and research activity in KrampeHarex's in-house concrete laboratory, this fiber proved to be the best choice for the planned concrete class C55/67 with an expected real 28-day compressive strength of >80 N/mm<sup>2</sup>. Die hohe Leistungsfähigkeit, Qualität und Zugfestigkeit der Fasern führten

in combination with a very good length-to-diameter ratio results in a very high-quality fiber-reinforced concrete with continuously good test results during the entire production period.

Another significant aspect is the very good workability. The fibres do not clump together, and no adhesive is needed that could affect the concrete mix by reacting with its constituents.



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## Reference | Stormwater System



» Our specialization guarantees that we can supply even extensive large-scale projects with large quantities of fibers quickly and just-in-time. This was decisive for our involvement in the tunnel construction project in Dubai."

**Dipl.-Ing. Wilhelm Nell**  
Product- & Business Development  
Manager, KrampeHarex

## A GIGANTIC PROJECT WITH A SPORTY SCHEDULE

Dubai is one of the most dynamic metropolises in the world. What is being built here in terms of urban development is fascinating and groundbreaking for the future of cities with millions of inhabitants around the globe. This applies to the organization of housing, living and working as well as to the protection of residents - for example, from heavy rain events.

The challenge in Dubai is primarily that increasing urbanization comes together with a high groundwater table and the heavy rainfall events that occur during the rainy season. It's hard to imagine in this country, but the groundwater level there is actually so high that even in dry weather, water can rise to the surface in the low-lying areas.

This means not only that high demands must be made on the stability of buildings and the construction of their foundations. But also that when it rains, there is no possibility for the additional water to seep into the ground. How often heavy rain occurs is not relevant in such a situation.

The fact is that when it rains and the water is not artificially drained, the consequences are immediately fatal. And that can be the case in Dubai at any time during the rainy season from November to April.



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Visit: [krampeharex.com/en/blog](https://krampeharex.com/en/blog)

## OTHER PROJECTS

### MESAIMEER TUNNEL

Doha / Qatar

**Application:** Tunnel  
**Length:** 10 km  
**Volume:** 1,400 t  
**Fibre type:** DE 60/0.9 H

### CITYRINGEN SYDHAVN

Kopenhagen / Dänemark

**Application:** Tunnel  
**Length:** 4.5 km  
**Volume:** 1.000 t  
**Fibre type:** DE 60/0.8 M

### DTSS2 Tog INNER SHELL

Singapore

**Application:** Tunnel  
**Länge:** 12 km  
**Volume:** 2,500 t  
**Fasertyp:** DE 60/0.9 H

### EMSCROSS A66o

Emden / GER-NLD

**Application:** Tunnel  
**Length:** 3.50 m  
**Concrete:** F 1.4 / 1.2  
**Länge:** 4 km

