

**THE WORLD'S  
LARGEST  
CAPACITY  
LAND-BASED  
CRANES**

**MAMMOET  
SK CRANES**

# OVERVIEW

Mammoet's SK cranes help the world to build bigger. The world's largest by capacity, they install modules faster, allow life to thrive as infrastructure changes and support larger, higher-yield renewables. Capable of lifting 10,000t, they continue to break records and redefine what's possible in heavy lifting.





# INNOVATION SERIES

We think big to help our clients find new and more efficient ways to solve their challenges. Nowhere is this better demonstrated than through our Innovation Series, which includes world-first technology that has reduced schedule and risk for a range of major projects.

The Innovation Series evolved from the collaborative approach we take with our clients to identify key challenges at the pre-FEED stage and engineer the ideal solution. This allows us to develop best-in-class equipment and new ground-breaking implementations where the challenge demands it.

## SK CRANES

The world is building bigger. Constructing larger FPSO and FLNG modules onshore is helping to expedite project schedules; taller offshore wind turbines are generating unprecedented levels of renewable energy; installing civil components such as bridges in one piece helps to get critical infrastructure back in place sooner.

The challenge is to ensure the right technology is available to facilitate the lifting and installation of these super-sized components.

Enter Mammoet's SK cranes. With an unparalleled capacity of up to 10,000t, this new breed of lifting machine has facilitated more efficient construction methodologies across a range of industry sectors.

The SK cranes are not just pioneering in terms of lifting capacity. Their revolutionary design was developed to optimise flexibility in their configuration, maximise effective operation for a range of site conditions and to meet the latest, most stringent safety standards. This is why for over ten years they have been the go-to lifting technology for major projects across the globe.



## KEY SYSTEM BENEFITS

- World's largest capacity land-based cranes
- Up to 10,000t lifting capacity
- Outreach with jib up to 200m
- Minimal plot area required
  - Variable ballast radius
  - Full ring available but not usually required
- Even ground load distribution and known imposed loads
- Capable of accommodating ground settlement
- High operating wind speed
- On-site relocation in as little as five days
- Containerised for low-cost shipping
- Automated boom section assembly for safe working

# DESIGN BENEFITS

## 1 LOW, EVEN GROUND DISTRIBUTION

Proprietary load-spreading design and hydraulic systems ensure ground bearing pressures are kept to a minimum. The unique honeycomb design of the load spreading mats enables uniform load distribution over the whole mat area.

## 2 UNRIVALLED LIFTING CAPACITY

A maximum lifting capacity of 10,000t is greater than any other land-based crane. Depending on the reeving required, lifting speeds are up to 150m per hour.

## 3 HEAVY DUTY JIB ASSEMBLY

Because the ballast is located centrally to the crane's rotation, the ballast radius can be adjusted to suit both lift and site conditions. This can increase lift capacity by up to 100% or reduce the crane footprint by up to 75%. If required, the ballast can also be located on the ring as a traditional ring crane. Ballast material such as sand, gravel or similar aggregate, can be sourced local to the site. Specially reinforced 40' shipping containers are filled by standard mechanical shovel.

## 4 INCREASED SITE EFFICIENCY

Compact footprint means the SK cranes can be assembled on site with minimal disruption to other operations.

The large lifting radius allows the SK cranes to be fully rigged and operated off-plot, with fewer lifting positions and less ground preparation. Foundation work can continue while critical pieces are installed.

The SK cranes are capable of operating at higher wind speeds than conventional crawler or ring cranes.

## 5 SMALL PLOT AREA

The SK's central ballast design eliminates the need to install a full ring or crane track. Instead, just the section required for the project – as little as 45 degrees – can be used, minimising valuable space taken up on site.

## 6 LONGER REACH FOR HIGHER CAPACITY LIFTS

With a wider radius, the SK cranes can provide extended reach to areas inaccessible to crawler cranes.

All SK cranes can also be fitted with a heavy-duty jib assembly, which can increase outreach up to a maximum of 200m.

This means clients can achieve significant reductions in equipment deployment, schedule and working areas.

## 7 SIMPLIFIED LOGISTICS AND ASSEMBLY

Containerised design and fast assembly features minimise mobilisation and installation time.

Assembly onsite can be completed in a matter of weeks using just standard plant equipment and a 600t crawler crane.



# SK10,000

The SK10,000 is the world's largest capacity land-based crane. It enables new levels of project efficiencies in schedule, safety and cost for the lifting of ultra-heavy modules, particularly in FPSO and FLNG construction.

Its exceptional 10,000t capacity means modules can be installed directly onto ships' hulls, utilising the same design as the other SK cranes for unparalleled lifting power in a compact plot area with flexible ring configuration.







# SK350

Since its launch in 2013, the 5,000t capacity SK350 has delivered a number of world-record lifts for major oil and gas projects. Its capacity and 354,000tm load moment – the largest in the world until the launch of the SK10,000 – opened new possibilities in modular construction.

The power and reach of the SK350 means larger modules can be lifted directly from the fabrication location, minimising the need for additional equipment and work in moving modules to a specific lift site. Outreach is

further enhanced by a heavy-duty jib, which allows greater scope to perform all lifting from one strategic location rather than reconfiguring and moving the crane multiple times.

# SK350 COMPLETES RECORD BREAKING LIFT FOR EGINA FPSO

**Six modules needed to be installed during Total's Egina project. The modules ranged between 335t and nearly 3,000t, which only the SK350 was capable of lifting.**

The crane was rigged in its biggest configuration with a 124m A-frame main boom, 49m ballast radius and 38m jib for additional outreach.

Use of the jib and the crane's flexibility in not requiring the full ring to be installed ensured that minimal room was needed in the congested site at the SHI-MCI yard in Lagos, Nigeria. The largest "S2" module weighed a total of 2,810t and was moved directly onto the ship's hull by the SK350.

#### KEY BENEFITS

- Record breaking lift
- Compact footprint
- Jib for additional outreach

**The project really showcases the capabilities of the SK350 and the jib to perform some of the world's heaviest ever crane lifts in a congested site. When combined with the unique heavy duty jib and the largest crane configuration, this represents another record-breaking achievement**

**Carlito Alberto, Project Engineer**





# SINGLE SITE POSITION FOR THREE MODULE LIFTS IN TEXAS, USA

**The SK350's huge lifting capacity and outreach were instrumental in the assembly of a topside constructed in Ingleside, TX. Three modules weighing a combined total of 6,614t were lifted with the crane rigged with a 124m main boom, 49m ballast radius and heavy winch system.**

Using an installation outreach of up to 42.8m, the SK350 was able to lift all three modules onto the topside from a single position, whereas other ring cranes would have required relocation for each lift. This saved time and disruption to other operations at the busy site.

The modules weighed from 1,200t up to 2,884t, the largest of which was the heaviest ever lifted by a land-based crane in the USA.

#### **KEY BENEFITS**

- Project efficiency
- Long outreach

# LIFT AND INSTALLATION OF FPSO MODULES USING THE SK350 CRANE, BRAZIL

**Modules weighing up to 3000t were lifted and installed directly from their fabrication location.**

The SK350's high capacity, offered the client the opportunity to fabricate and join modules M09A and M09B to form the heaviest module on site.

Mammoet's SK350 crane was rigged in its current biggest configuration with 49m ballast radius and 4,000t ballast. The main boom is a 130m long A-frame design on a very stable 18m wide base. The crane is equipped with a 4,000t main winch and 600t auxiliary winch systems.

One of the advantages of using the SK350 was its ability to lift all of the modules from their fabrication location in the yard and minimise the need for additional equipment on site to transport the modules.

As the SK350 cranes give a much greater reach, we were able to lift all modules from their fabrication location unlike our competitors who would need to move the modules closer to their crane using SPMTs.

For the 3,000t lift, Mammoet used its SK350 crane to lift module 'M09' using its 4,000t winch system and high-speed slew. The crane was positioned at a radius of 86m and was even extended to over 142m for certain lifting operations.

Despite the site being located in the windiest region of Brazil, the fact that the SK350 has a 14 m/s operating speed reduce the impact of the challenging wind conditions and enabled Mammoet to complete the lifting operation ahead of schedule.

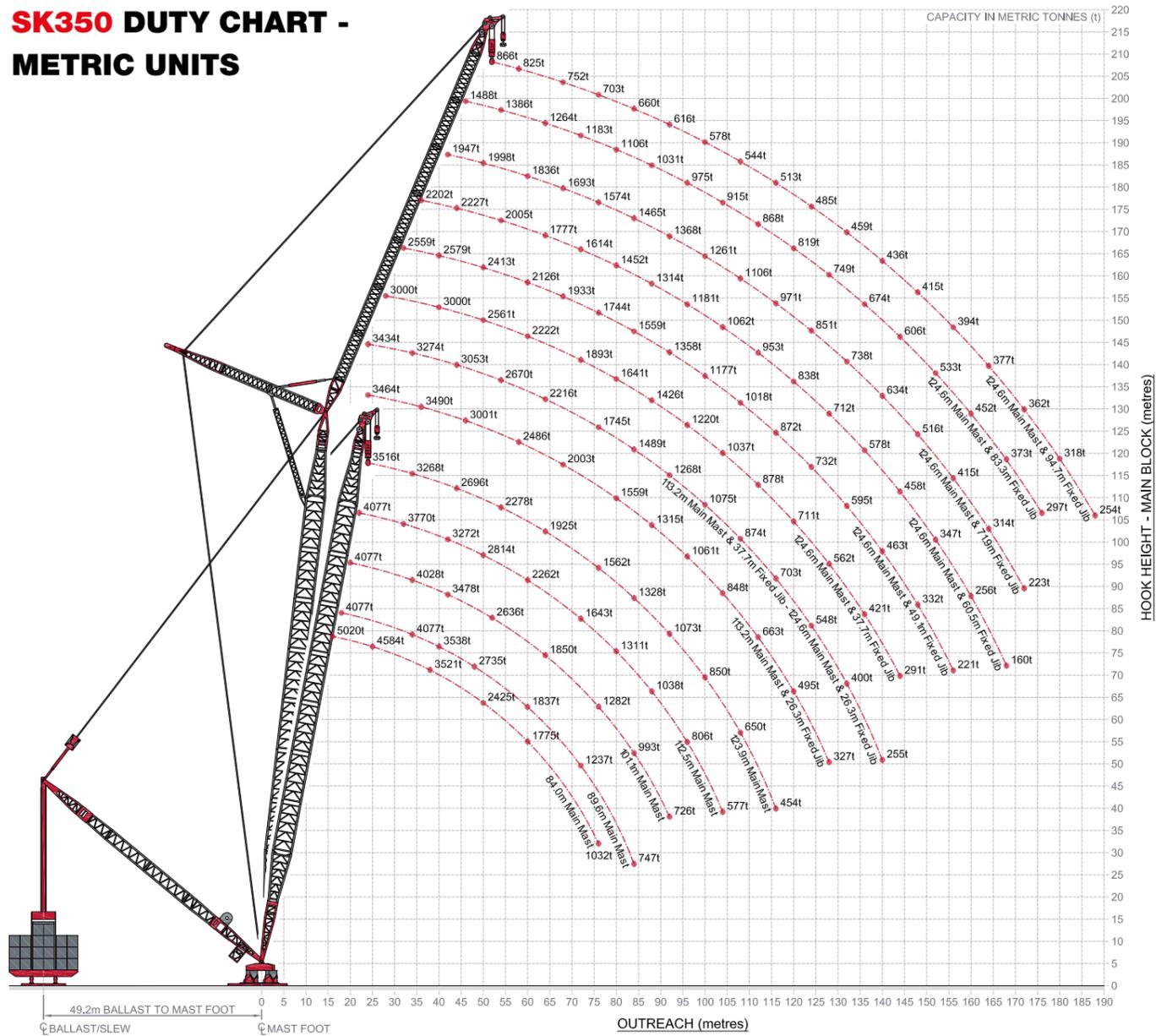
Throughout the project, the SK 350 lifted a combined weight of over 36,000t (including tackle) was lifted. The project lasted approximately four months.

## **KEY BENEFITS**

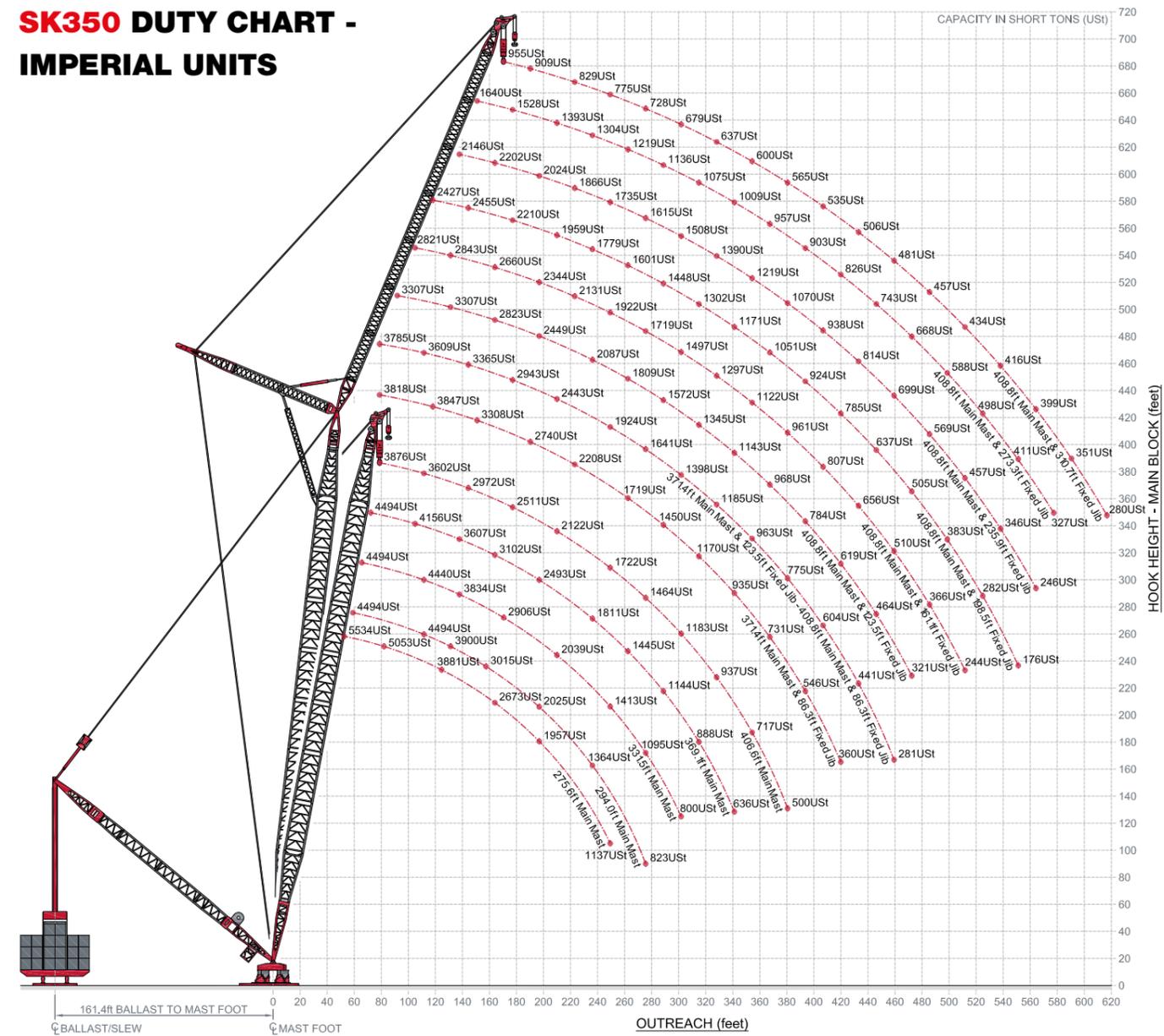
- Record breaking lifts
- Supported growing module size
- Overcame poor weather conditions



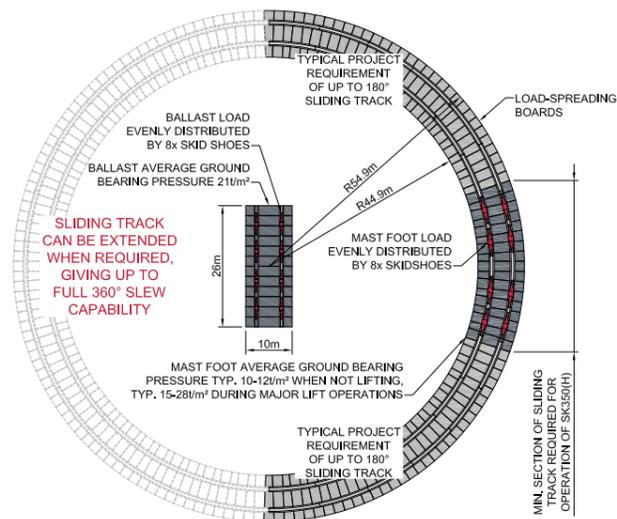
# SK350 DUTY CHART - METRIC UNITS



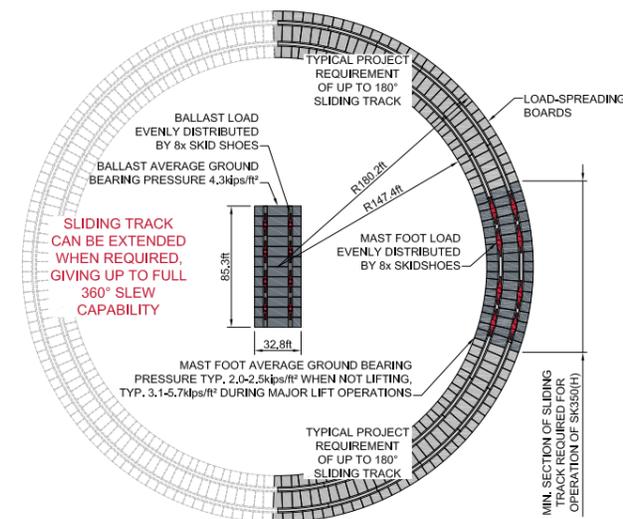
# SK350 DUTY CHART - IMPERIAL UNITS



# SK350 FOOTPRINT - METRIC UNITS



# SK350 FOOTPRINT - IMPERIAL UNITS





# SK190

The SK190 has a capacity of 4,300t and a load moment of 196,000tm, delivering this huge lifting power in a footprint of just 35m x 55m. In over a decade of operation, this pioneering crane has performed heavy lifts across a range of industry sectors.

Its versatile design has enabled a range of complex projects to be completed across the petrochemical, civil and offshore sectors, optimising both site space and scheduling.



# MAJOR CIVILS PROJECT, UK

**The SK190 crane minimised disruption to local residents as it lifted 61 transport beams up to 1,500t, assisting in the demolition of Earl's Court, London, UK**

The SK190 was specifically chosen for this project as it provided the optimum engineering solution to minimise the impact on local residents, to help reduce the carbon footprint of the project and significantly shorten the enabling work's timescale by two years. Furthermore, as the crane can operate in higher wind speeds, the operational window was widened.

The beams were lifted using the SK190 overnight in 'engineering hours'. A total of 21,016t was lifted with a total outreach change of 1,393m in the 195-day lifting window.

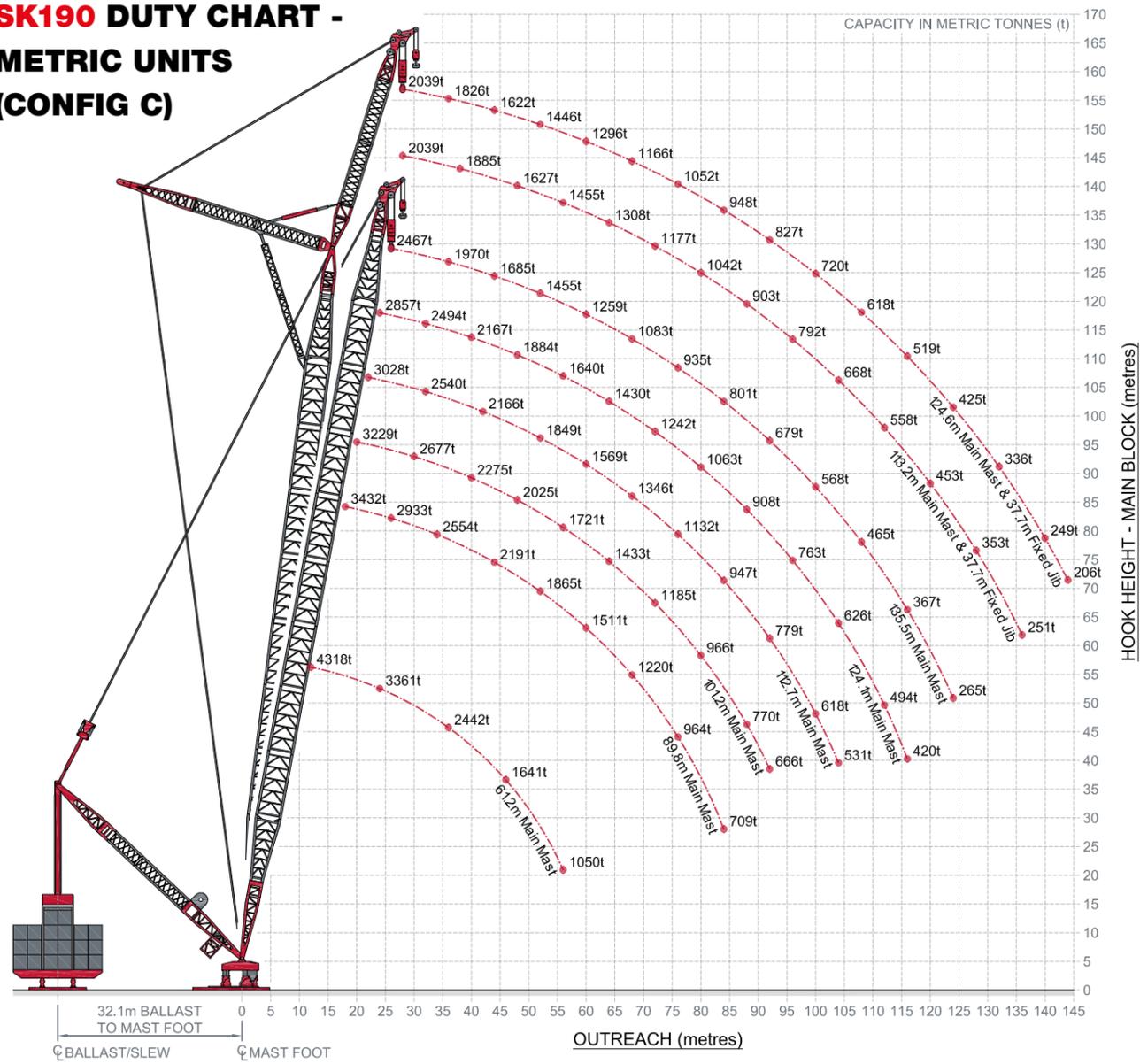
The crane performed all lifts from a single location. This had benefits in terms of a reduction in site space used and in time to complete the lifts, but also reduced risk, as fewer lifts took place over London Underground metro tunnels.

## **KEY BENEFITS**

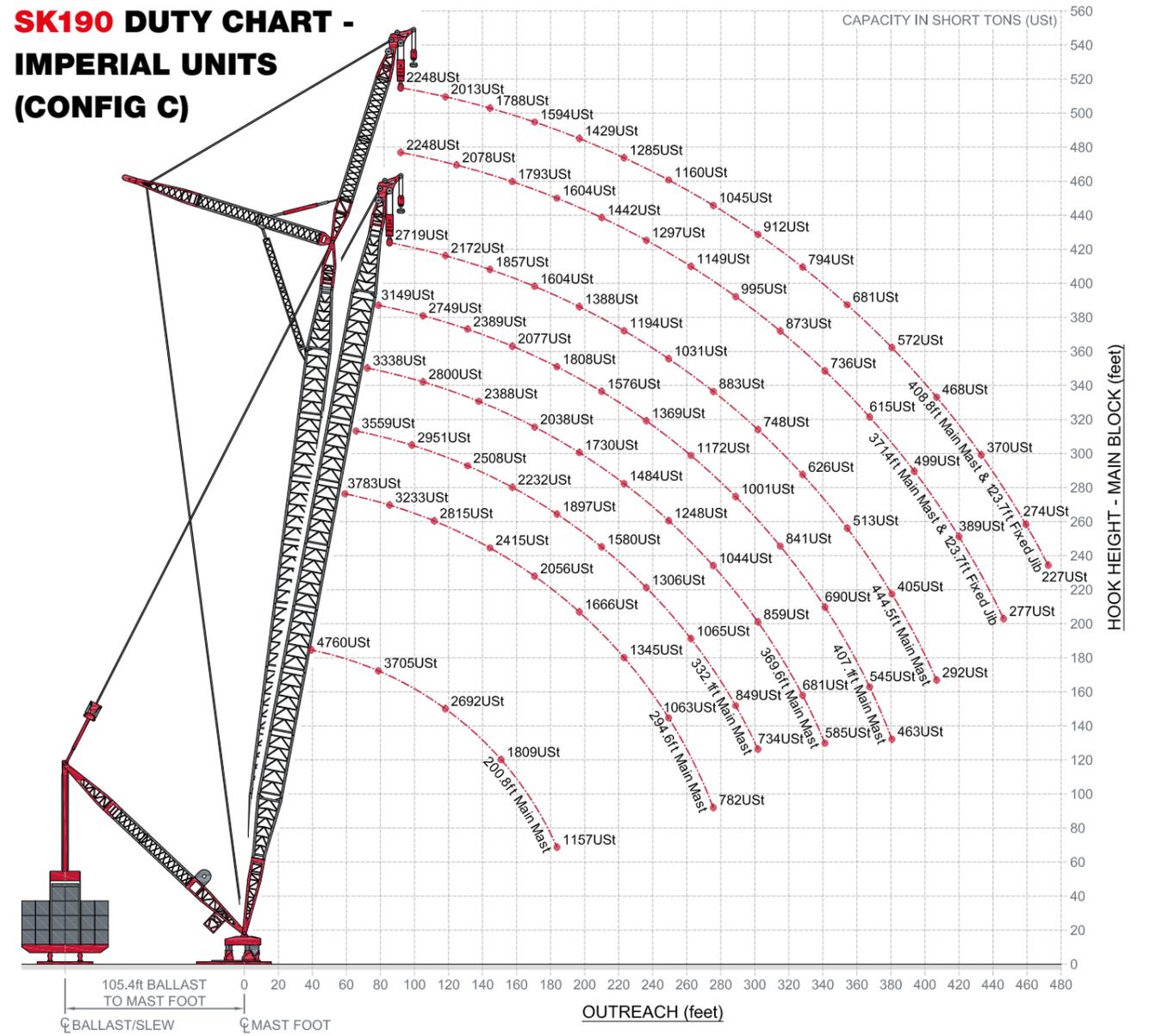
- Compact footprint
- Single lifting location



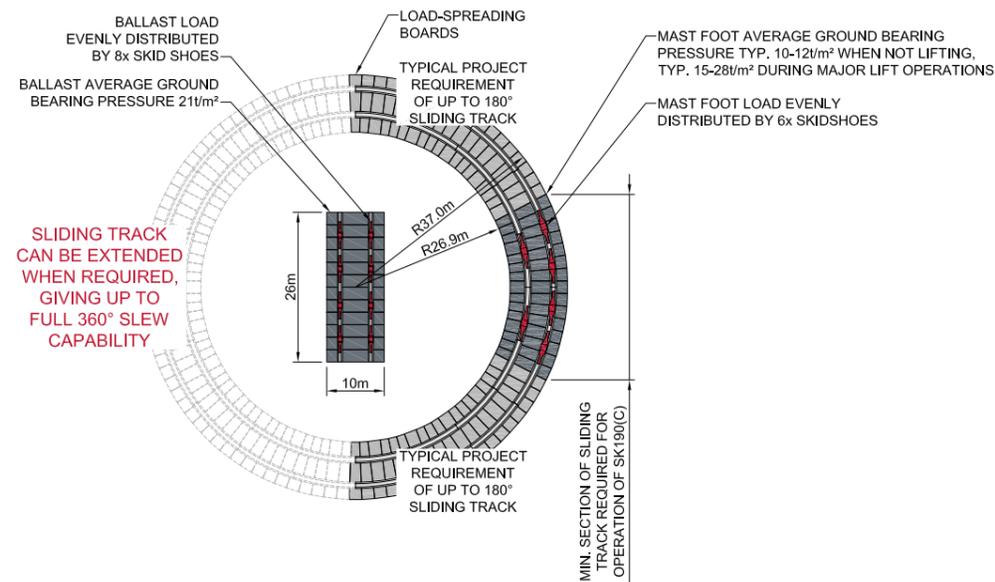
**SK190 DUTY CHART - METRIC UNITS (CONFIG C)**



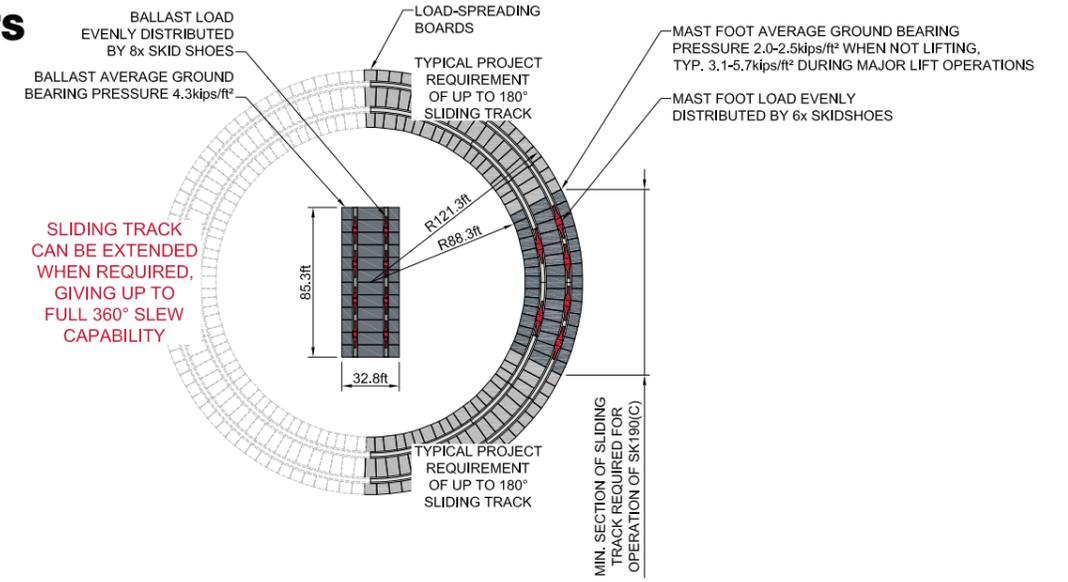
**SK190 DUTY CHART - IMPERIAL UNITS (CONFIG C)**



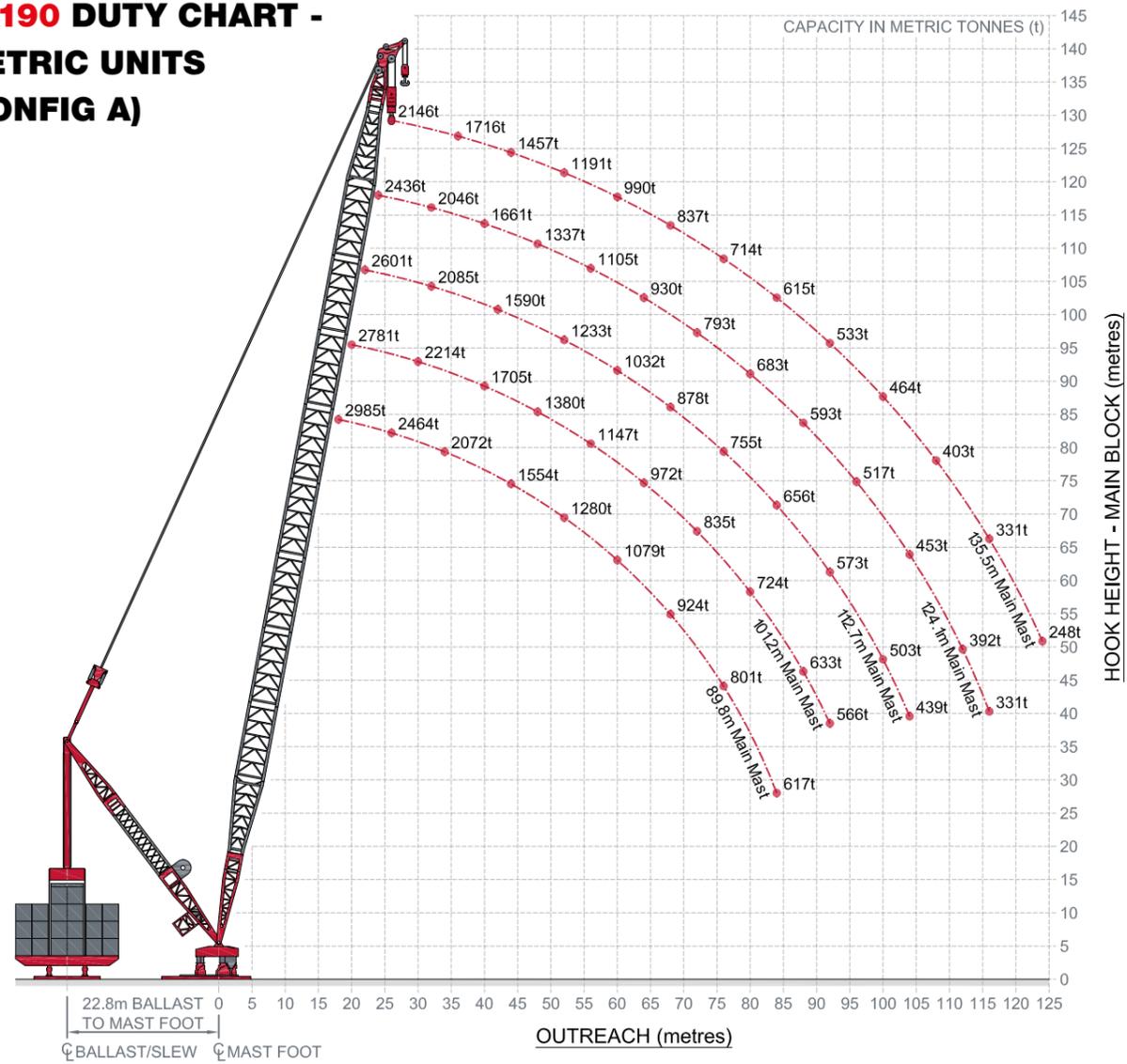
**SK190 FOOTPRINT - METRIC UNITS (CONFIG C)**



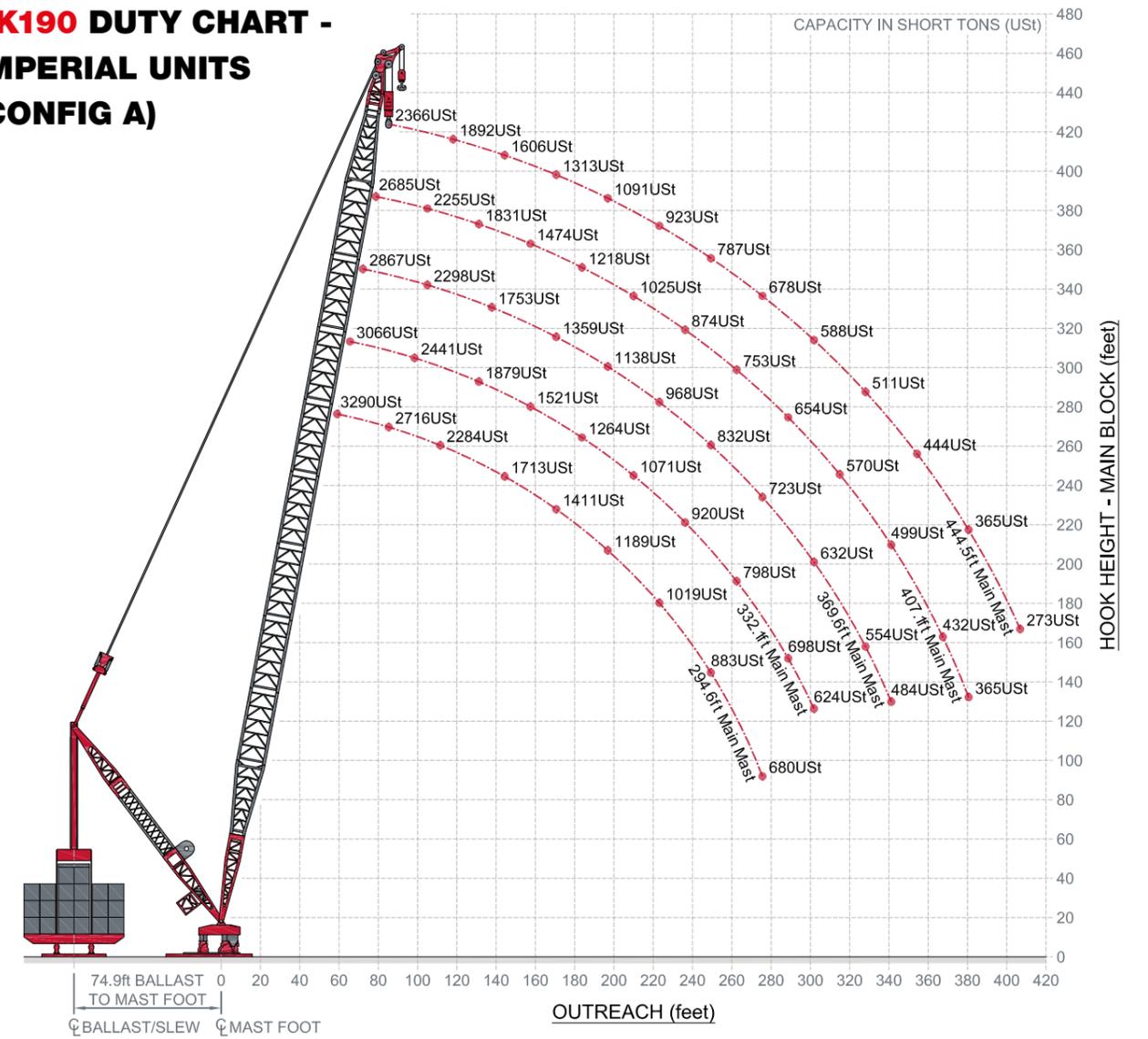
**SK190 FOOTPRINT - IMPERIAL UNITS (CONFIG C)**



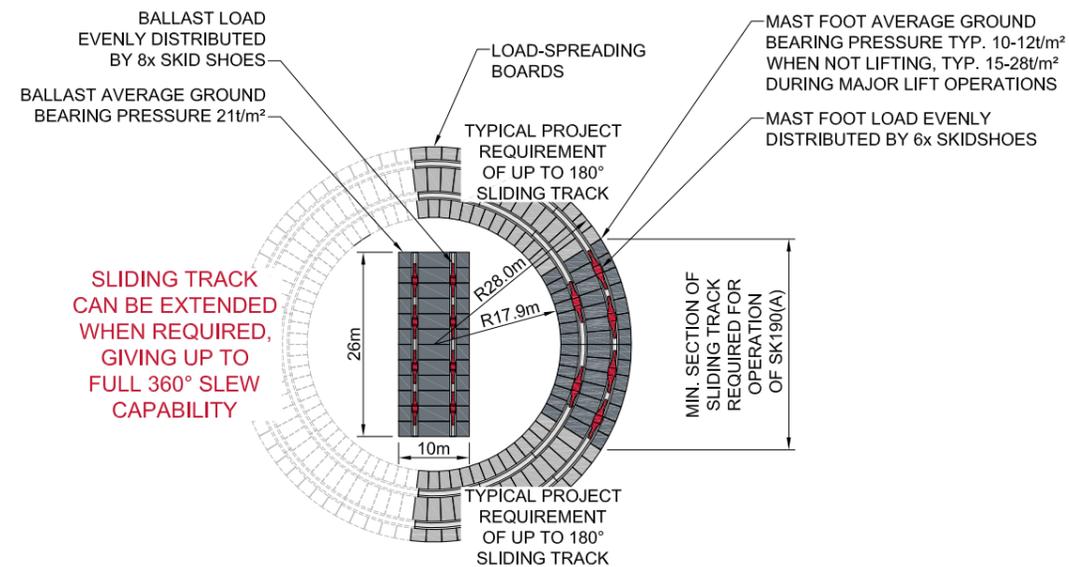
**SK190 DUTY CHART -  
METRIC UNITS  
(CONFIG A)**



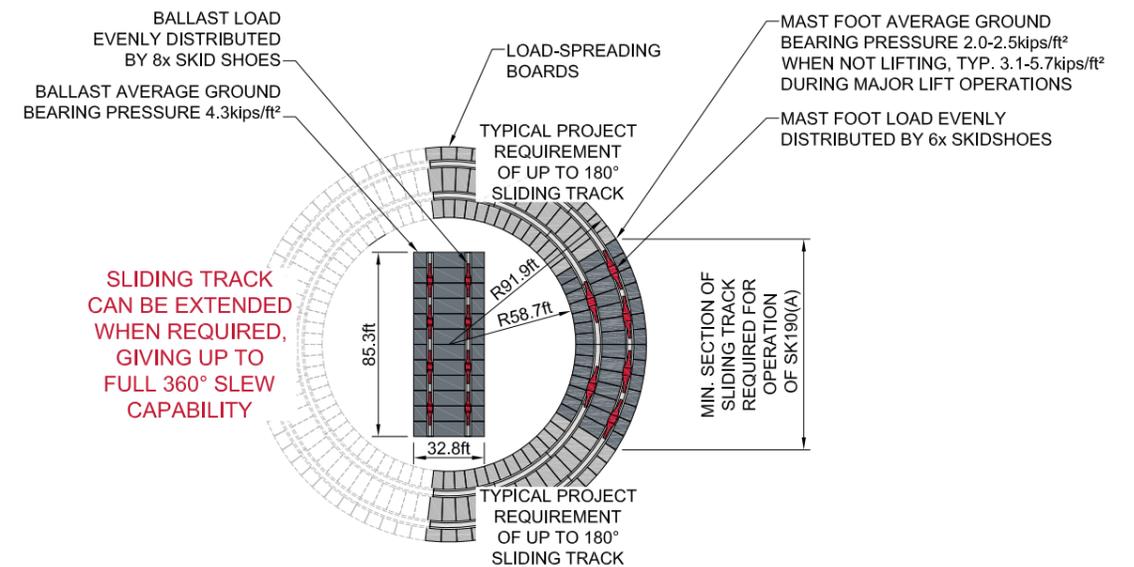
**SK190 DUTY CHART -  
IMPERIAL UNITS  
(CONFIG A)**



**SK190 FOOTPRINT -  
METRIC UNITS  
(CONFIG A)**



**SK190 FOOTPRINT -  
IMPERIAL UNITS  
(CONFIG A)**





# REFINERY EXPANSION PROJECT, UAE

**The SK190 proved the most efficient solution for a series of huge module lifts at a refinery expansion project within the Ruwais area, UAE. This work allowed a new RFCC unit to be installed**

This project saw a number of heavy lifts carried out at separate locations within the plant. During these lifts, Mammoet's 1,600t capacity CC8800-1 was used as the tailing crane for the SK190. The first of the seven pieces included a 1,100t reactor, a 1,200t main fractionator column, and a 1,900t regenerator.

#### **KEY BENEFITS**

- Lifting capacity
- Integrated operations

**MAMMOET HAS OVER 140 OFFICES AND BRANCHES WORLDWIDE.**

Below are the Mammoet regional head offices on each continent. To contact an office near you, please visit [www.mammoet.com/contact](http://www.mammoet.com/contact) and select 'Find an office'.



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