

OnSite

UNDERGROUND

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Innovation

A power change
that changes everything

Drilling

New drilling rig increased
performance and higher flexibility

Tools

Reliability, efficiency, innovation
in drilling equipment

Tunnelling

The Stuttgart-Ulm rail project

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Soilmec

The Soilmec flagship

A Soilmec SR-145 HIT drilling rig was used in the foundation works for the improvement project of the cruise ship dock in the Savona harbor, which hosted on 21 December the maiden voyage of the Costa Smeralda, the new flagship of Costa Crociere "Excellence" class

by *Ettore Zanatta*

Savona is one of the major Italian harbors both for cruise sector and merchant marine traffic. Since 1996, when the collaboration with Costa Crociere began, the cruise sector traffic of the Savona harbor increased, requiring over the years

several investments relating to port infrastructures for cruise traffic. The main goal was to adapt the cruise terminals to the needs of the cruise market, which is oriented towards more and more larger ships.

In 2019 the Port System Authority of the Western Ligurian Sea started the

works in the Savona cruise terminal to meet the needs of new generation ships and be able to host the "Costa Smeralda, a 180,000 tons megaship powered by LNG liquefied natural gas. The project included works to deepen from 9 to 11 meters the seabed in front of the main quay of the cruise terminal



in areas 8-9-10 of the Savona basin and the reinforcement of the structure.

The 17 million euros contract was entrusted to RCM Costruzioni and Fincosit. The foundation works included the construction of a frame made of reinforced casings and sheet piles which was used to enlarge the existing quay.

The foundation piles of the project, drilled up to a depth of 32 m from the seabed, have a diameter from 1,100 mm and 1,700 mm. The geological composition of the subsoil included a first layer of fill material followed by alternated layers of medium-fine sands and gravels in a sandy and silty matrix up to a depth of about 20 from the ground level and a stone substrate consisting of fractured schists.

The piles were drilled using the bored pile technology with telescopic kelly rod and bucket type excavation tool. Furthermore, having to work at sea, the drilling takes place inside casing previously anchored to the seabed using a crane equipped with a vibrator.

The machine used for drilling operations was a Soilmec SR-145 HIT, the Soilmec flagship designed to achieve maximum performance for high depth bored piles.

Boasting an operating weight of about 145 tons, the SR-145 HIT is able to support 24.5 m kelly rods for a maximum depth of over 120 m extendable to 138 m with a special kit.

The fixed double-jack mechanism ensures a more rigid and stable mast – frame connection, providing an optimal solution for rock drilling.

The rotary table has been designed with a particularly compact and light case with advantages in terms of weight and dimensions for an increased pull force under the rotary and features the Soilmec automatic torque control system, which calibrates the torque according to excavation conditions and ground resistance in order to maximize the excavation speed and therefore transfer all the available power to the tool.

The CAT C18 diesel engine delivers up to 470 kW to maximize excavation performance even in the case of simultane-



Port of Savona, December, 21, 2019: departure of the first cruise of the Costa Smeralda



Soilmec SR-145 HIT drilling rig, the Soilmec flagship designed to achieve maximum performance for high depth bored piles



➤ The foundation piles of the project, drilled up to a depth of 32 m from the seabed, have a diameter from 1,100 mm and 1,700 mm

ous power requests; the Soilmec “low idle” system automatically adjusts the rpm to the minimum speed when the main circuits are not in use, providing significant advantages in terms of power efficiency and operating costs and therefore reducing pollution.

The engine is mounted in line with the longitudinal axis of the machine to improve accessibility during maintenance and is protected by fiberglass canopies featuring sound-absorbing and damping materials that make the SR-145 HIT the quietest drilling rig in its mar-

ket segment at 109 dBA LwA and suitable for works in metropolitan and residential areas.

Soilmec uncompromising comfort and safety characteristics are fully met by the SR-145 HIT: full protected walkways on both sides of the machine, radio control allowing the operator to load/unload the machine on the transport trolley, 5-cameras system complete with a dedicated 7 multiscreen LCD screen, for permanent 360° view of the construction site are just some of the features installed on the machine. The cabin provides the highest comfort level featuring sliding door, air conditioning, adjustable automotive seat and touch-screen DMS monitor (providing full control over machine performance and on-site production), more ergonomic controls and joysticks.

The works were carried out with no hassle and within the set times also thanks to the performance of the Soilmec equipment. On November 14, 2019 the new quay was officially inaugurated with the ribbon cutting ceremony. ■

ITALIAN ABSTRACT

L'AMMIRAGLIA DI SOILMEC

Una perforatrice Soilmec SR-145 HIT è stata impiegata per i lavori di fondazione del progetto di adeguamento dell'accosto crocieristico nel bacino portuale di Savona che il 21 dicembre ha ospitato la partenza della crociera inaugurale della Costa Smeralda, la nuova ammiraglia di classe “Excellence” di Costa Crociere. L'appalto, con un importo base di 17 milioni di euro, è stato affidato all'ATI composto da RCM Costruzioni srl e Fincosit srl. I lavori di fondazione prevedevano la costruzione di una paratia costituita da casing armati alternati a delle palancole che è stata utilizzata per ampliare la banchina esistente.

I pali di fondazioni del progetto erano di diametro variabile tra 1100 mm e 1700 mm, trivellati sino ad una profondità di 32 m dal fondo marino.

La composizione geologica del sottosuolo, dopo un primo strato materiale di riporto, vede un alternanza di strati di sabbie medio-fini e ghiaie in matrice sabbiosa e limosa fino ad una profondità di circa 20 da piano campagna (p.c.), seguito da un substrato roccioso, costituito da scisti fratturati.

Per l'esecuzione dei pali è stato scelto di utilizzare la tecnologia del palo trivellato con asta kelly telescopica e utensile di scavo di tipo bucket. Inoltre dovendo lavorare in mare la perforazione avviene all'interno di casing precedentemente infissi sul fondale utilizzando una gru equipaggiata con vibratore.

La macchina utilizzata per la perforazione è stata una Soilmec SR-145 HIT, la “grande ammiraglia” di casa Soilmec sviluppata nell'ottica di ottenere le massime prestazioni per pali trivellati ad altissime profondità.



➤ The Soilmec SR-145 HIT is able to support 24.5 m kelly rods for a maximum depth of over 120 m extendable to 138 m with a special kit