

# Productive, multipurpose and heavily used

We visited the Asti region to see a Comacchio CH 450 in the CFA configuration tackling the task of drilling 1,000 mm piles at 19 m depth. The CH 450 has been utilized by the drilling company Terra.Con within the expansion project at a local organic waste recovery plant

 DI CRISTIANO PINOTTI  DI COMACCHIO



A thousand hours of work performed in a few months of use. This figure would suffice to explain how the new Comacchio CH 450 has found its ideal habitat in the Asti region. After all, Terra.Con srl, owner of the drilling rig, is a company that has a long-term partnership with the well-known Italian manufacturer. The new CH 450 has joined the 12 Comacchio machines already in Terra.Con's fleet. A loyalty that has proved rewarding also in the large-diameter sector, in terms of productivity, cost efficiency, and operational flexibility.

A gloomy September morning is the prelude to our visit to the construction site. We are in San Damiano d'Asti, where the general contractor, the Asti-based company Ruscalla Renato, has entrusted Terra.Con with the execution of an array of foundation works. The works include the construction of a permanent soldier pile (Berliner) wall made of CFA piles, a retention system with permanent tie rods, and the foundations for the construction of a biodigester for the expansion of an organic waste recovery plant. "Overall," - explains Marco Framarin, technical director at Terra.Con, "we have drilled 130 piles with a depth of 19 m and a diameter of 1,000 mm for the construction of the soldier wall, and we have to drill another 70 CFA piles, with the same diameter and depth, which are required for the biodigester's foundations. The excavation works are reaching a depth of 20 m." To carry out the construction of the soldier wall, Terra.Con had to set up the rig on a series of successive terraces cut



into the slope. This required frequent rig-up and rig-down operations on the Comacchio rig, which, continues Framarin, "has always proved stable even with the auger string mounted. While constructing the soldier wall we encountered soil consisting mainly of clay and some sandy layers, while the substrate is made of compact marly clay that forced us to change the drilling tool, adopting a reinforced pilot auger with teeth, as the conventional clay auger we were using was not enough". As we arrive on site, the work has progressed to the construction of the foundation piles, allowing Framarin to weigh in on the performance of the Comacchio machine. "Our new CH 450," - he commented, "is giving us good results. We can easily drill large diameters at a depth of 20 m, with a production of 5 piles per day which, for the given conditions, is a quite good production rate. The rig

has fully met our expectations in terms of fuel consumption: it displays high fuel-economy. We are loyal customers and we have decided to place our trust in Comacchio also for large-diameter piling equipment. We are well aware of Comacchio's professionalism, the quality of their machines and the quality of the after-sales and technical assistance. In fact, with the CH 450, we continue along the path we embarked upon with Comacchio years ago." In addition to being equipped with a datalogger, which obviously serves to ensure compliance and certification, the drilling rig incorporates some 4-IR features: thanks to the ComNect system developed by Comacchio, the rig is constantly monitored remotely by the client and by service technicians. "Furthermore," - resumes the technical director at Terra. Con, "our CH 450 has a special

## #Technical Data

<b>Make and model</b>	Comacchio CH 450	
<b>Undercarriage</b>	Variable width	
<b>Overall tracks width</b>	2,550 - 4,000 mm	
<b>Overall tracks length</b>	4,950 mm	
<b>Operator cabin</b>	TOPS and FOPS-1 certified	
<b>Control system type</b>	Can-Bus	
<b>User interface</b>	12" touch screen display	
<b>Engine</b>	Cummins B6.7 Stage V / Tier 4Final with 6700 cc displacement and 209 kW (284 HP) power	
<b>Rotary head</b>	CR 19	
<b>Nominal max. torque</b>	190 kNm at 33 MPa	
<b>Hydraulic circuit</b>	3 pumps (2x241 l/min - 1x160 l/min)	
<b>Main winch</b>	controlled descent, 2 rope layers	
<b>1st layer line pull</b>	160 kN	
<b>1st layer rope speed</b>	75 m/min	
<b>Rope diameter</b>	24 mm	
<b>Service winch</b>	controlled descent	free fall
<b>1st layer line pull</b>	72 kN	72 kN
<b>1st layer rope speed</b>	55 m/min	49 m/min
<b>Rope diameter</b>	18 mm	18 mm

## The Company

*Terra.Con S.r.l. is a geotechnical contractor that specializes in ground engineering and specialty geotechnical construction*

**G**eotechnical contracting services from Terra. Con encompass the full range of solutions including: large-diameter piles, micropiles, ground anchors (soil anchors and rock anchors), micro-drains, low- and high-pressure grouting, compaction works, drainage wells, slope stabilization, road foundations construction, and road repair. Terra.Con also carries out all kinds of road and landscape

slope stabilization works with the use of shotcrete, bio-mats, and anchored or soil-nailed solutions. The company also specializes in soil bioengineering solutions including installation of rockfall barriers. Since its establishment in 2015, Terra. Con boasts hundreds of slope improvement, clearance, and repair interventions on the roads network managed by regional and municipal authorities, including

flood emergency response. The availability of 15-20 crews allows work to be carried out simultaneously at different sites in a targeted and timely manner. The staff, trained to comply with the high quality standards set by government agencies and major private sector clients, includes about 50 people, 75% of whom are operating on site. Seven specialized technicians form an integral part of the staff: three

engineers and four supervisors with long-term experience in the sector. The company's fleet comprises numerous micropile and anchoring drilling rigs (including several skid-mounted units), compressors, mini excavators, mixing and injection systems, pumps, generators, lifting equipment, as well as all type of drilling equipment to perform drilling in all kind of soil conditions.

## ➔ Maximum **Versatility**

The unique design of the CH 450 adapts to a wide range of drilling technologies that include:

- BP (Bored Piles) uncased bored piles excavated by dry method or stabilized by fluid overpressure;
- CBP (Cased Bored Piles) bored piles with casing installation by rotary drive or optionally by hydraulic casing oscillator;
- CFA (Continuous Flight Auger) piles that are drilled uncased by the use of a continuous hollow auger stem;
- DP (Displacement Piles) piles installed without soil removal by advancing a special tool into the ground that causes the soil to be displaced radially and vertically;
- SM (Soil Mixing) piles constructed by mixing and partly replacing the existing soils with grout using a soil mixing tool;
- LDTH (Large DTH) piles installed with DTH method using bits of a larger diameter than standard bits;
- MP (Micropiles) installed using conventional air-flush rotary drilling.

The CH 450 can be offered in two different LHR (low head room) configurations, designed for the construction of bored piles in challenging access sites.

configuration: its multipurpose design also includes a DTH kit. A request that derives from specific needs: we are experiencing an increasing demand for large-diameter down-the-hole drilling from our clients. In response to this increasing demand, Comacchio has designed a special configuration that includes clamps and extractors. By simply replacing the rotary shaft and the sleeve, we can fit the floating spindle onto the rotary head and our CH 450 becomes perfectly suited for DTH drilling. It is a modification that we can carry out on our own in a fast and easy way. Once the rotary head is modified and the clamps are installed, we



**Alexandru Cozma, operator for Terra.Con**



**Mr. Marco Framarin, technical director at Terra.Con Srl**



only need to adjust some settings in the CCS software controlling the machine to switch from CFA to DTH drilling. The torque is reduced and all the necessary adjustments to the various drilling parameters are made by the software automatically. In this configuration, the machine is operated with an external radio control." If that were not enough, Terra.Con decided to equip the new rig also with a micropiles kit. After all, the CH 450 stands out for its incomparable versatility and compact size, offering advantages both in operations and in the transport phase. Like all the piling rigs of the CH series, it is equipped with the CCS system and a 12" touch screen for the control and monitoring of the drilling parameters and machine performance. At the same time, the machine's outstanding fuel economy deserves special mention. Totally self-erecting, it can be transported in one piece with the Kelly bar and rotary head mounted. Once on site, the drilling rig is simply off-loaded from the truck and put into operation without the use of a service crane or any other external equipment. In a few minutes, the CH 450 is rigged-up in full safety. Finally, we cannot but notice the satisfied look on the face

of Alexandru Cozma, who has been an operator for Terra.Con for almost 15 years. "For me," - he says, "going from small- to large-diameter drilling with the Comacchio CH 450 is a new experience. I'm getting used to it, and the Comacchio machine is making the task easy. I spent a few days with Comacchio to see the assembly and disassembly of the machine and understand how to make the most of its capabilities; then a Comacchio technician was with us at the first job site to train me and show me all the tricks. Until now, I have always used the rig for CFA drilling, but for the next project, we will use it for micropiles installation and later also for down-the-hole drilling, something a bit special. I have always worked with Comacchio rigs and I feel great with this one too, even if it is the first time that I get to work sitting in a cabin. The set-up is not a problem, as it's fully automatic. You just need to select the pile and start drilling".

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**THE CH 450 IS A REMARKABLE EXAMPLE OF OPERATIONAL VERSATILITY. THE RIG WE SAW AT WORK CONSTRUCTING CFA PILES IN SAN DAMIANO D'ASTI CAN ALSO BE USED FOR MICROPILE INSTALLATION AND DTH DRILLING WITH A LARGE-DIAMETER DOWN-THE-HOLE HAMMER.**