

Delmag RH24 Short Mast and SIP&T Kelly bar during the start up



SIP&T and Hammer&Steel agreement is growing up

More than a year after the signing of the distribution agreement between SIP&T and the American company Hammer & Steel involved in rental & sale piling rigs and equipment of German brand Delmag, SIP&T is extremely satisfied with H&S partnership, thanks to the sale of the whole product range through its faithful network of dealers.

Low Head Room Environments

Structures modifications under bridges, in halls, tunnels and under electric cables often require the addition to reinforce the existing foundations. This frequently requires that drill rigs used to drill the reinforcing holes operate in low headroom

The booming synergy between SIP&T, the innovative supplier of rotary drilling tools, and the American company Hammer & Steel involved in rental & sale piling rigs and equipment of German brand Delmag, is moving forward in the best way

environments. Presently, H&S can supply short mast version drill rigs that can perform this function for the different earth formations encountered, particularly hard rock, in a drilling operation. The task of Delmag design team was to develop a reliable drill rig for low headroom environ-

ments that could drill through all types of earth. Particularly, Delmag and SIP&T design team focused on designing the Kelly bar system for the drill rig. All of this has been done! Nowadays, H&S can supply rigs capable to install augered piling in sites that have very limited headroom



and access. This specialized equipment enables contractors to install piling where and when required under extremely challenging conditions. Equipment is built in our state-of-the-art facilities therefore we can modify it to fit any specific condition. H&S has the necessary equipment and experience to complete the most challenging restricted access and low head room piling projects anywhere in the US. If your project has either restricted load bearing, width or height conditions then H&S has the ideal piling solution. Our experience of these types of projects coupled with our investment in the after sale, continued expansion of our service offering and innovative techniques maintains our position as No.1 in this specialist market and ensures clients come back time and time again.

Delmag Drill Rig RH 24 Short Mast Version

The short version of the RH 24 is a special machine that reaches a max. working height of 7,600 mm at maximum reach on special customer request. Extensive modifications were necessary due to this specification. The rotary head will be delivered without hollow shaft with stop pipe and without center disc with cardan. The kelly bar that will be provided by the customer

is directly screwed to the rotary head by means of the outer kelly bar. All parts are constructed such that a later conversion to the standard RH 24 is possible with calculable expenditure. The machine can be used in the short as well as in the standard version. Due to the conversion option a broader range of application can be covered with only one machine. The demands on foundation and special civil engineering works are increasing, at the same time the restricted space on the construction sites

presents a considerable problem for the construction companies. With the Delmag drill rigs with short leader mast it is possible to develop construction sites where the head clearance is the decisive criterion, without having to renounce to performance, as the performance of the rotary head of the standard version is available. The short mast version can be converted into a standard model thus allowing the end user to cover with only one unit a wider application field.



RH24 under electrical cables



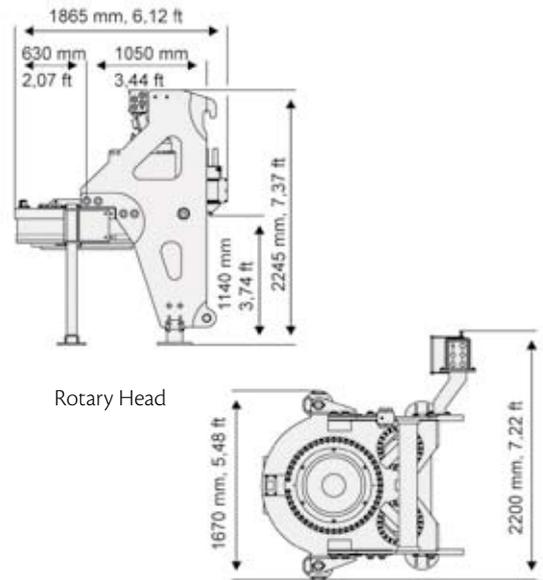
RH24 during drilling operation

SIP&T Kelly bar

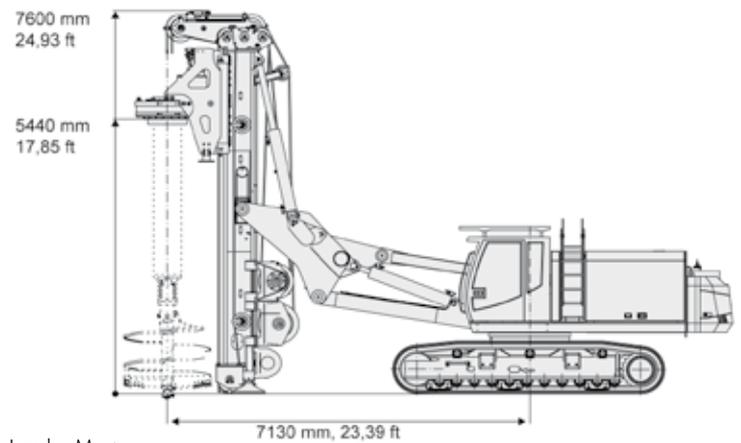
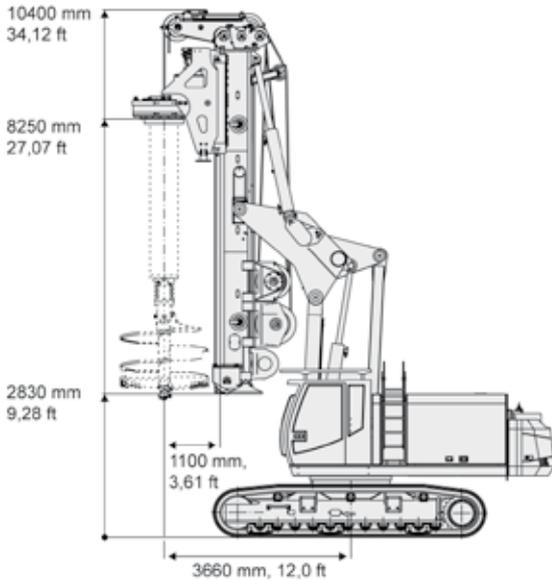
SIP&T core business is, without any doubt, kelly bar production (both interlocking and friction). Understanding customer requests, analyzing reports from the different construction sites where SIP&T kelly bars have been used, studying their performance in geologically challenging soil strata and checking their output, it has been decided to enrich and develop company know-how by introducing the Finite Element Method (FEM) for each kelly bar. FEM is a numerical method that can be used to solve complex problems and today, has become the main method for structural analysis. SIP&T has gained enormous benefits from implementing this analysis into its production process; in detail, the variety of materials used to build kelly bars has been increased, optimized weight, thickness and shape, re-

Data sheet

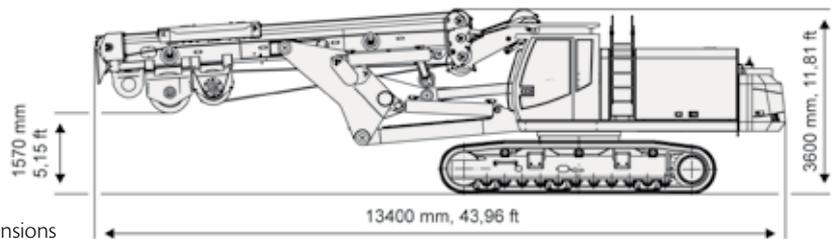
DELMAG RH 24 Short Mast	Main Technical Data
Working height at max. reach	7,600 mm
Working height at min. reach	10,400 mm
Inclination forward / backward	4/14 degree
Inclination left / right	9/9 degree
Free diameter in front of the crowd pulleys	1,960 mm
Rotary head - torque	245 kNm
Weight including rotary head	69 t
Transport dimensions	with 700 mm track shoes
Length	13,400 mm
Height	3,600 mm
Width	3,000 mm



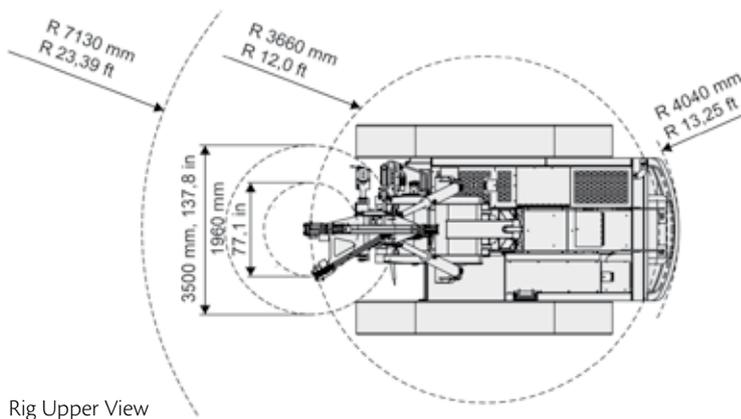
Rotary Head



Leader Mast



Transport Dimensions



Rig Upper View

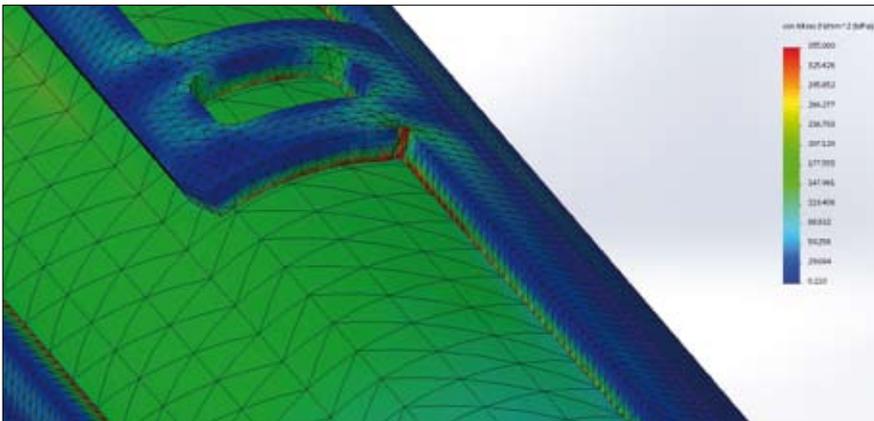
duced testing time and, with it, time-to-market. The Italian company can customize the length of the kelly bar, the number of its elements, the rotary drive passage, the drive stub, the kelly guide flange, the swivel joint with the wire steel cable, the upper and lower shock absorber systems, the profile and pitch of the lock and unlock systems on the different elements, as well as the drive shell on specific customer requests. Perfect kelly bar sizing requires studying of soil geological report, precise

Data sheet

SIP&T Interlock kelly bar 6x3.5 m	Main technical data
Number of scopes	6
Scopes length	3,530 mm
Kelly extended length	19,260 mm
Max drilling depth	19,000 mm
Outer pipe diameter and thickness	559x12.5 mm
Drive shell length	400 mm
Bottom safety flange length	50 mm
Upper ring length	100 mm
Lower shock absorber	with discs
Drive stub	200x200 mm
Transport length	4,660 mm
Approx. weight	4,400 kg



SIP&T Interlock Kelly bar per Delmag RH24



Stress on Lock Device (FEM analysis)



Upper flange detail



Lower part detail

knowledge of the maximum torque that can be applied to the Kelly bar, the suitable tool to advance quickly and safely. Upstream of all of this is proper FEM analysis that considers all the previously mentioned parameters plus the mechanical features of the materials used. It is evi-

dent that kelly bar is the crucial component in the drilling operation as it transmits the torque and crowd (downward force) to the drilling tool. The first stage of the project involved defining the design constraints for the kelly bars. The bars would have to operate under a 27.07 ft

ceiling and drill to 62.33 ft depths under a torque of 245 kNm. The critical design feature of the bars would be their ability to transmit downward force to the tool without collapsing during hard rock drilling. The second stage involved the generation of concepts and their evaluation. Feasibility studies revealed that using geometry and the available kinematics of the kelly bar system would provide the best solution. Consequently, the SIP&T team developed a set of kelly bars that locked and unlocked themselves automatically via a set of keys and slots activated by the available rotational motion. Finite element analyses performed on the kelly bars verified the structural integrity of the design and a working prototype confirmed that the design does work. ■

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