

# REVERSE CIRCULATION DRILLING RIG



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| Trust cannot be replaced



**BUMA CE CO., LTD.**  
BUMA Construction Equipment





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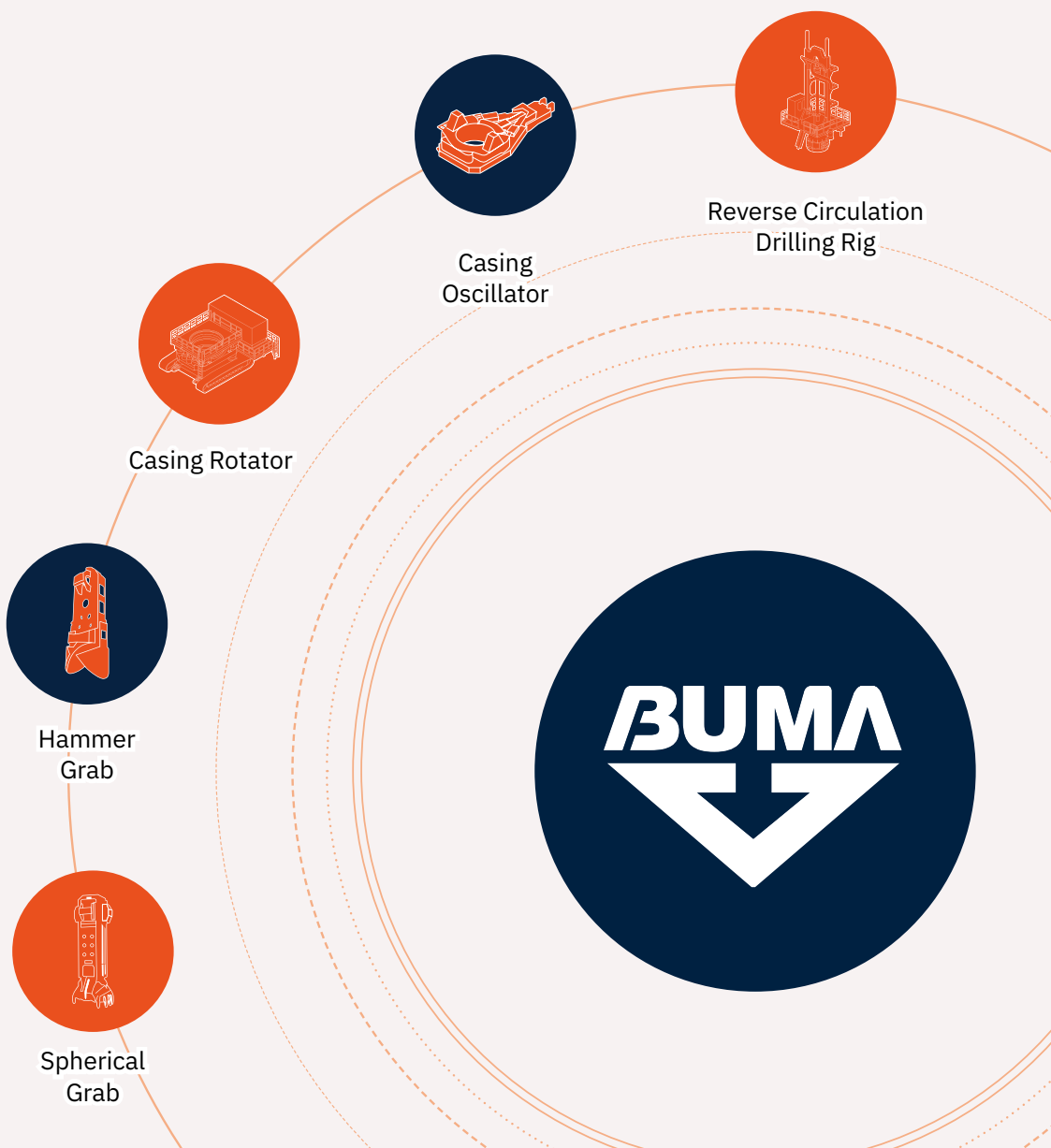
BUMA CE stands as a premier manufacturer and supplier of advanced foundation drilling equipment, headquartered in Korea. Established in 1992, BUMA has swiftly evolved into a global powerhouse, renowned for its unwavering commitment to excellence and profound mastery of foundation work and methodologies.

## Our Mission

At BUMA CE, our overarching mission centers on delivering ingenious solutions that are deeply rooted in engineering principles and fortified by decades of hands-on experience. Through our innovative approach, we empower our valued customers with cutting-edge solutions that redefine industry standards.

## Application Range

- Bore Piling for Big Structure Building and Bore Piling at Any Offshore Condition.
- Bore Piling for Bridge & Terminal (Coal, Oil & Gas).
- Bore Piling for Jetty & Harbour & Drydocks.





# Reverse Circulation Drilling Rig

## Method

The Reverse Circulation Drilling System (RCD), also referred to as airlifting, is an efficient drilling technique that utilizes compressed air. This air is injected into the drill pipe below the water level, effectively reducing the density of the internal water column and facilitating the removal of slurries through circulation. The resulting mixture of water, air, and cuttings is then flushed out through the drill pipe and directed into settling tanks.

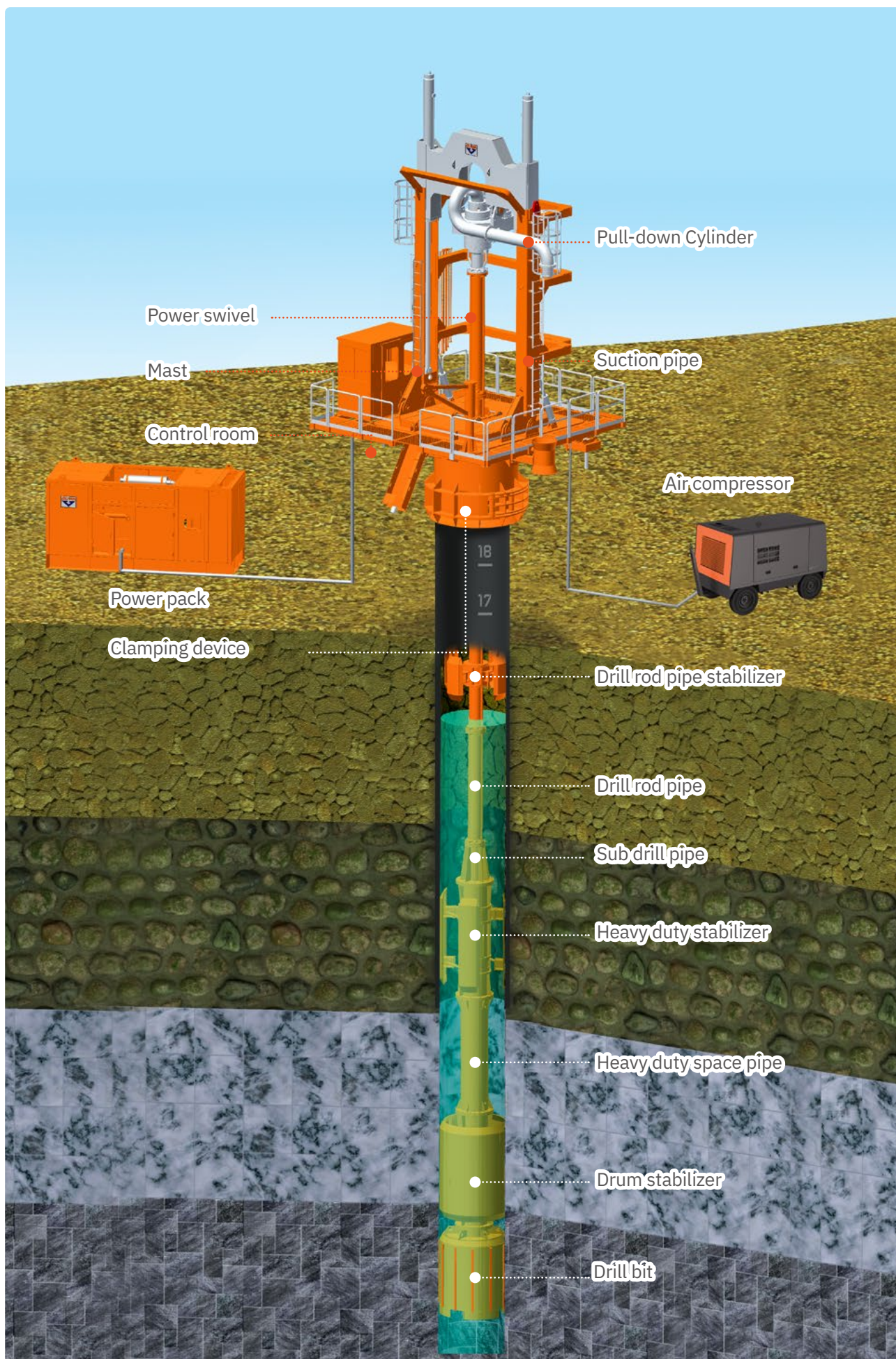
Employing RCD Rigs offers a highly efficient, safe, and environmentally friendly solution for drilling projects requiring substantial diameters and depths. If your project falls within any of the following conditions, the RCD method is the optimal choice:

- **Large Diameter** (Exceeding 750 mm)
- **Considerable Depth** (Beyond 20 m)
- **Hard Rock Drilling** (Up to 350 MPa)
- **Marine Bore Piling**

## Composition of Equipment







# Reverse Circulation Drilling Rig

## Specification

Model	R1315	R1815	R1820	R3025	R3030	R3837	R9050
Max. Drilling Diameter	1,500mm	1,500mm	2,000mm	2,500mm	3,000mm	3,700mm	5,000mm
Max. Drilling Torque	129kN.m	179kN.m	179kN.m	300kN.m	300kN.m	393kN.m	879kN.m
Rotation Speed	0~24rpm	0~16.2rpm	0~16.2rpm	0~21rpm	0~21rpm	0~17rpm	0~8rpm
Thrust Force	88ton			122ton			265ton
Pull-Up Force	129ton			201ton			394ton
Mast Tilting	22°		26°	30°	32°	37.6°	30°
Platform Tilting	16°		20°	16°	12.5°	12°	10°
Weight(Approx.) *	21.8ton	27.8ton	28.5ton	36ton	39.8ton	50ton	100ton
Drill String	NW200		NW200 / NW300	NW300		NW350	
Power Pack	P2812 / P3618 / P3818			P3618 / P3818 / P6128	P6128	P8040	P8040

\* Including Clamping Device

\*\* The specifications may be subject to change to enhance performance or meet specific customer requirements.

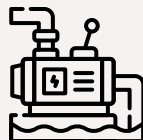
## Necessary Equipment and Tools



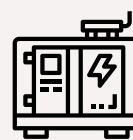
Crane



Air Compressor



Water Pump



Generator

Equipment		RCD R1815	RCD R1820	RCD R3025	RCD R3030
Lifting Crane		100 ton-grade	100 ton-grade	120 ton-grade	120 ton-grade
Air Compressor	Volume	600 cfm	600~800 cfm	800 cfm	800 cfm
	Pressure	8 bar	8 bar	8 bar	8 bar
	Air Hose	2"- 40 m	2"- 40 m	2"- 40 m	2"- 40 m
Water Pump	Volume	5 m3/min	5~10 m3/min	10 m3/min	10 m3/min
	Head	20~30 m	20~30 m	20~30 m	20~30 m
	Water Hose	8"	8"	8"	8"
Generator		175 kW	175 kW	175 kW	175 kW

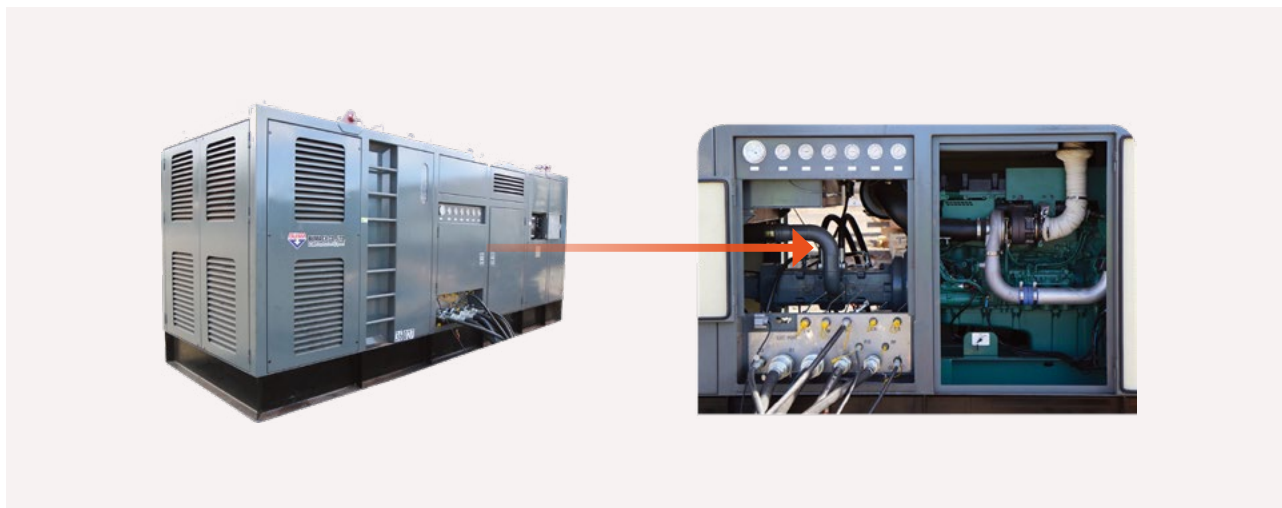
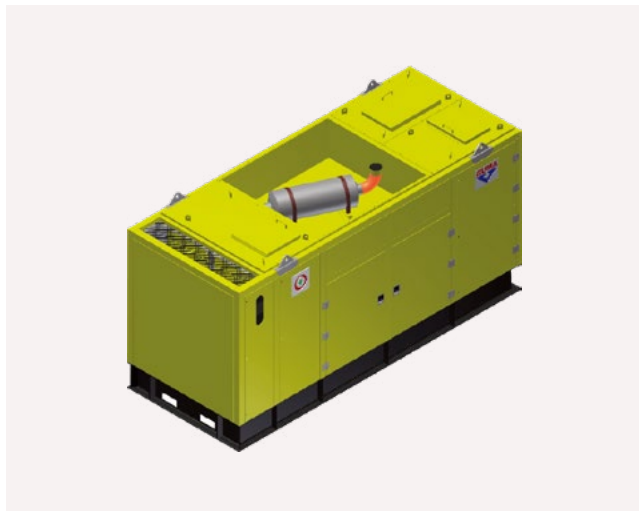
\*\* In marine applications, it may be necessary to utilize a jack-up barge (measuring 20 x 40 meters) and a disposal barge.

\*\* The required amount of air pressure varies based on the drilling depth. Typically, a pressure of 1 bar is necessary for every 10 meters of depth. Considering that air pressure gradually decreases during construction, it is advisable to set the pressure level 50% higher than the recommended value.



# Power Pack

Excellent Stability, Powerful Performance



## ■ Specification

Model	Emission Compliance	Engine Output & rpm	Hyd.Pump 250bar (Max. 350bar)	Dimension (W×L×H)	Weight
P2812	TIER 2, 3	194 kW / 260 HP / 2,200 rpm	201 ℓ/min × 2	1,912 × 4,000 × 2,283	7.5 ton
P3618	TIER 3	265 kW / 360 HP / 2,100 rpm	324 ℓ/min × 2	1,912 × 4,800 × 2,476	9 ton
P3818	TIER 4F	283 kW / 380 HP / 2,100 rpm	324 ℓ/min × 2	1,912 × 4,800 × 2,476	9 ton
P6128	TIER 3, 4F	450 kW / 612 HP / 1,800 rpm	504 ℓ/min × 2	1,912 × 5,400 × 2,562	11.5 ton
P8040	STAGE 5	585 kW / 800 HP / 1,900 rpm	760 ℓ/min × 2	2,300 × 6,500 × 3,230	14 ton

\*\* The specifications may be subject to change to enhance performance or meet specific customer requirements.

# Drill String

BUMA offers two different sizes of drill pipes, determined by their internal pipe diameter: NW200 (183 mm) and NW300 (302 mm). The NW200 pipe is compatible with the R1820 machine (smaller) and a shaft diameter of 1.5 (shorter)

In order to prevent buckling of the bottom part of the casing, the use of the Basic Drill String is necessary. The Basic Drill String consists of components such as the Drum Stabilizer, Heavy Duty Space Pipe, Heavy Duty Stabilizer, and a Sub Drill Pipe (Reducing Pipe)



## Drill Rod Pipe Stabilizer

To prevent bending of the drill string, we strongly recommend using 1 Drill Rod Pipe Stabilizer for every 3 Drill Rod Pipes (1 Drill Rod Pipe = 3 m)

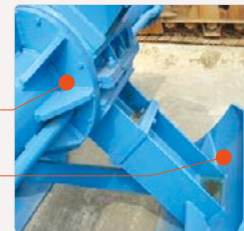
Suction Hole

Air Hole



Suction Hole

Air Hole

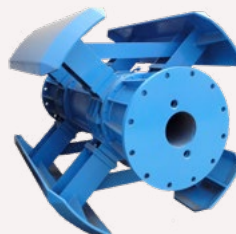


Stabilizer Dia.(mm)	750	900	1,100	1,200	1,500	1,800	2,000	.....	3,000
NW 200	Stab. Guide Welding Assembly		Stab. Guide Bolting Assembly						
NW 300			Stab. Guide Welding Assembly		Stab. Guide Bolting Assembly				

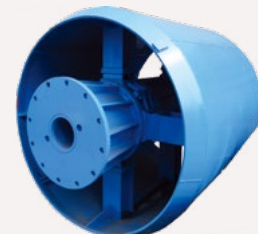
### ▪ Drill Rod Pipe Stabilizer



### ▪ Heavy Duty Stabilizer



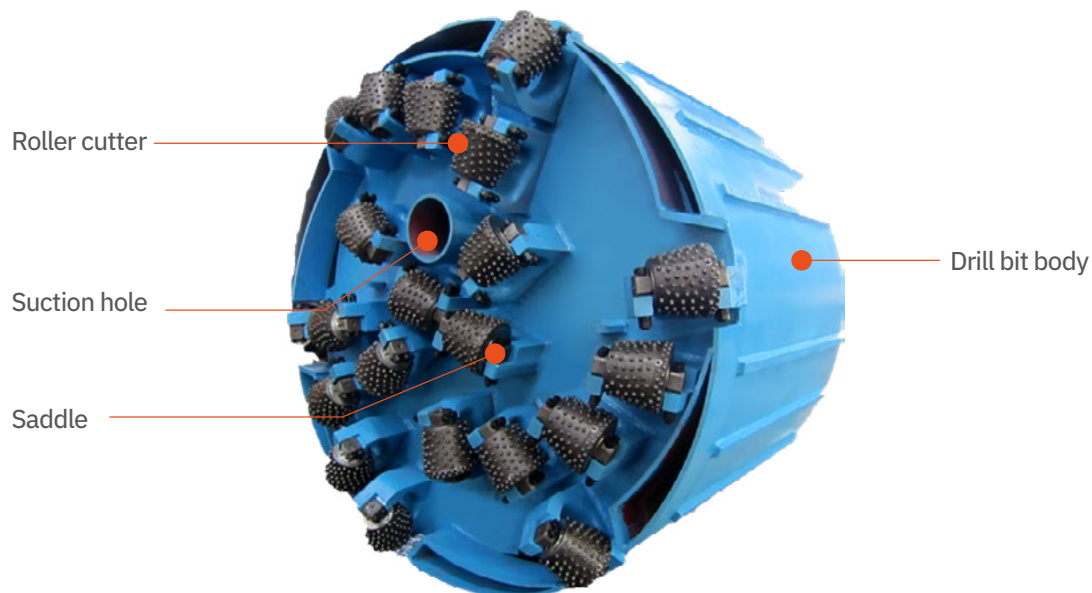
### ▪ Drum Stabilizer





# Drill Bit

BUMA offers a range of 3 distinct types of Roller Cutters, each designed to excel in specific soil conditions



## ▪ Tooth Cutter



Designed for drilling soft soil and soft rock layers (0 ~ 75 MPa).

## ▪ TCI Button Cutter



Designed for drilling hard rock layers (80 ~ 250 MPa).

## ▪ TCI Button Disc Cutter



Designed for drilling hard rock layers (80 ~ 350 MPa).

\*\* Drill bits are designed for use in both soil and rock layers.

## ▪ Specification

Drill Bit Cutting Dia.	850 mm	1,050 mm	1,350 mm	1,650 mm	1,830 mm	2,300 mm	2,750 mm
Drill Bit Length	1,500 mm	2,000 mm	2,000 mm	2,000 mm	2,500 mm	2,500 mm	2,500 mm
Suction Pipe	NW 200	NW 200	NW 200 / NW 300	NW 300	NW 300	NW 300	NW 300
Roller Cutter	8 SER.	8 SER.	12 SER.	12 SER.	12 SER.	12 SER.	12 SER.
-5° Cutter	1	1	1	1	1	1	1
+10° Cutter	2	2	2	3	3	7	11
+20° Cutter	N/A	N/A	N/A	2	2	3	3
+35° Cutter	2	3	N/A	N/A	N/A	N/A	N/A
+40° Cutter	N/A	N/A	3	3	4	5	6
Total	5	6	6	9	11	17	22
Weight	1,500 kg	2,500 kg	3,500 kg	6,000 kg	7,650 kg	10,500 kg	14,300 kg

# Kennedy Mill Road

Harrodsburg KY, USA

Pile Diameter : Ø 2,520 mm

Depth : 85.5 m

Rock : Hard Rock 100~150 MPa

Equipment : RCD R3030





# Kowloon Express Train Station

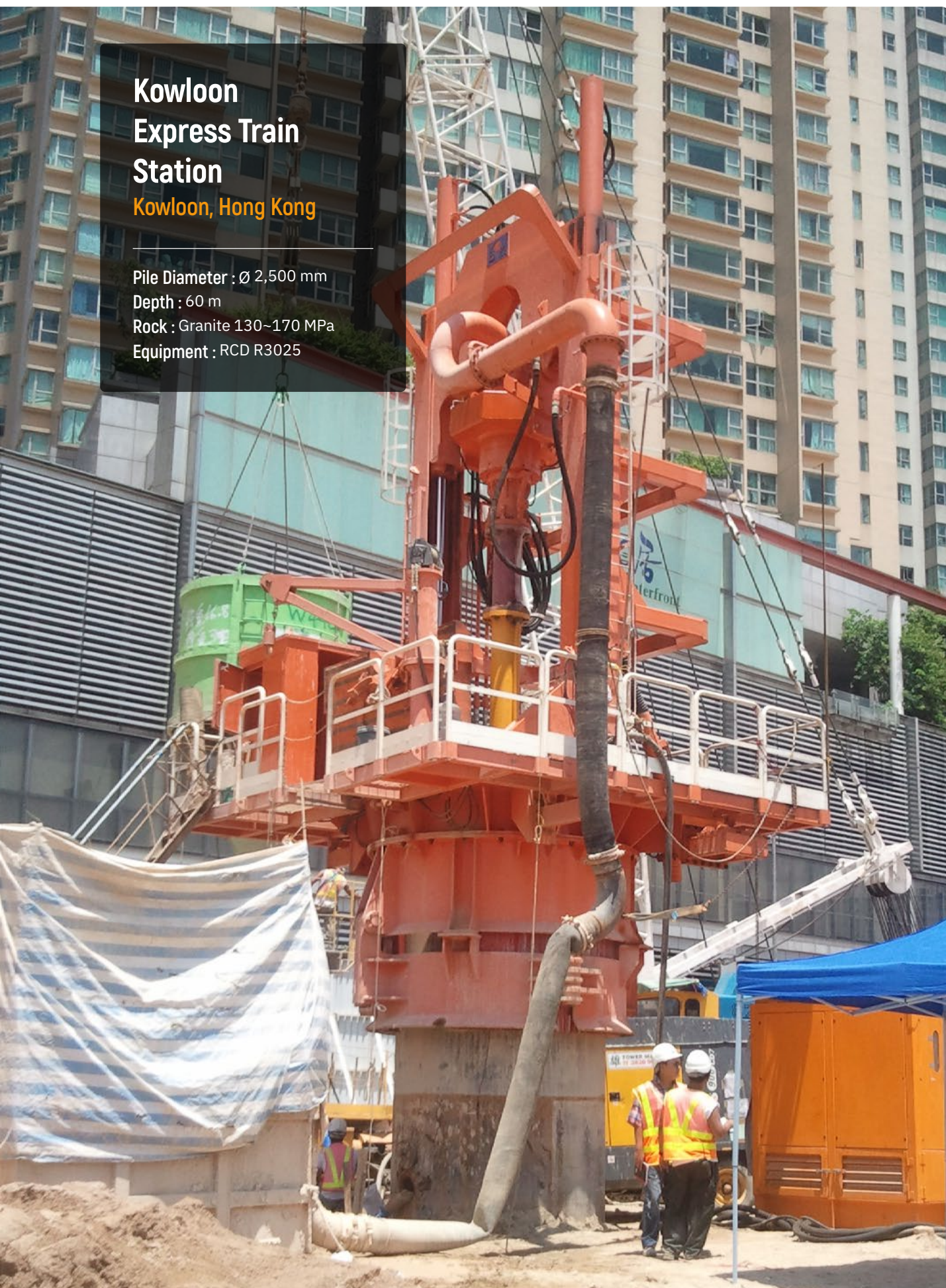
Kowloon, Hong Kong

Pile Diameter :  $\varnothing$  2,500 mm

Depth : 60 m

Rock : Granite 130~170 MPa

Equipment : RCD R3025





# Black Sea Dry Dock

Novorossiysk, Russia

Pile Diameter : Ø 2,520 mm

Depth : 85.5 m

Rock : Hard Rock 100~150 MPa

Equipment : RCD R1820





# Signature Bridge

Delhi, India

Pile Diameter :  $\varnothing$  1,250 mm

Depth : 49 m

Rock : Weathered Basalt,  
Hard Rock 80~120 MPa

Equipment : RCD R1820





# Belo Horizonte Bridge Expansion

Belo horizonte, Brazil

Pile Diameter : Ø 1,300 mm

Depth : 50 m

Equipment : RCD R1315





## Bandra Worli Sea Link

Mumbai, India

Pile Diameter : Ø 1,500 mm

Depth : 50 m

Rock : Basalt 200 MPa ~

Equipment : RCD R1820





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