

**SEMWW**

**Provides easy and safe TRD equipment. Our professional service will help you succeed in making deep foundation walls.**

**Professional Solutions Create More Value**



# TRD系列工法机

Trench cutting & Re-mixing Deep wall Series method equipment

**上海工程机械厂有限公司**  
**SHANGHAI ENGINEERING MACHINERY CO.,LTD.**

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## EXPERTISE IN DELIVERING TURNKEY SOLUTIONS TO DEEP FOUNDATION ISSUES

# TRD系列工法机

## Trench Cutting & Remixing Deep Wall Equipmen



### COMPANY PROFILE

Shanghai Engineering Machinery Co., Ltd. was founded in 1921. SEMW is specializing in design, manufacture and distribution of piling and deep foundation equipment, such as, Trench Cutting & Re-mixing Deep Wall Equipment, SDP110 Pre-bored Pre-cast Piling Equipment, CRD-200H full casing rotary drilling rig, Dual Power Rotary Auger, Multi-shaft Agitating Augers, Hydraulically driven Pile Driving Rigs, Hydraulic Walking Piling Rigs, Casing oscillator, D series Diesel Pile Hammers, Vibratory Hammers, Hydraulic Impact Hammers. It mainly provides mechanical equipment and turnkey solutions for large and extra-large projects such as expressways, skyscrapers, bridges, subways, airports, deep-water docks and power stations.

SEMW has been dedicated to deep foundations. With years of independent research and development, specialized piling equipment have been produced and used in many Key projects of China. We built up a Research and Develop team of specialists and experienced engineers. In recent years, SEMW products have been awarded "Shanghai New Hi-tech Achievement Transformation Project", "Shanghai science and technology small giant enterprise" "Shanghai Science and Technology Progress Award" and "Shanghai Famous Industrial Product", etc.

**A hundred years of historical accumulation, breeding**

**strong technical innovation strength, product repeatedly refresh industry construction capacity record. A large number of products, such as Diesel Pile Hammer, Hydraulic walking piling Rig, Hydraulic Pile Driving Rig, multi-shaft Agitating Auger, TRD machine, Pre-bored Pre-cast Piling Equipment lead the market and have become the benchmark of the piling machinery industry.**

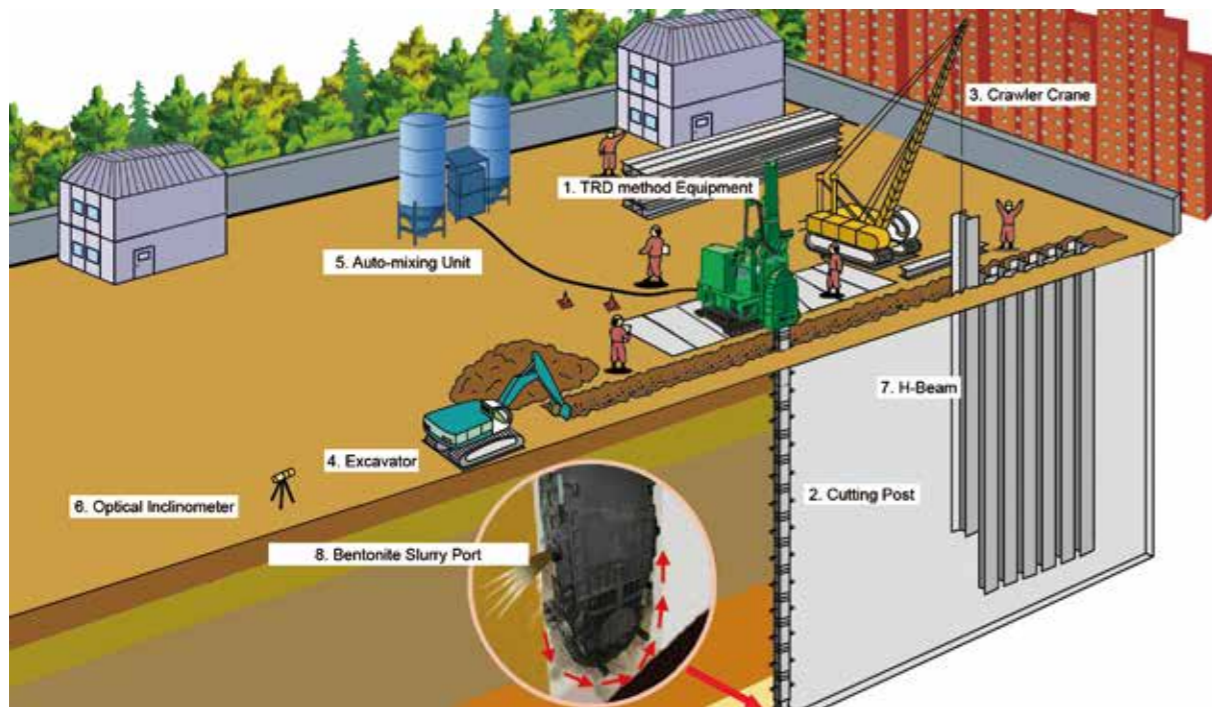
SEMW is the first company who independently developed Trench Cutting and Re-mixing Deep Wall Method Equipment in 2013 according to the domestic geological characteristics and conditions, which is the leading equipment for the TRD method in China. Suitable for the domestic current situation of the formation conditions and the construction of professional equipment, construction efficiency is beyond the similar foreign products, and won the Shanghai science and technology progress award, the national scientific and technological progress second prize and other honorary titles. In 2017, TRD-E with full electric power was successfully launched to meet the requirements of low noise in urban construction, and can be exchanged with TRD-D power cabinet, further expanding the construction adaptability of TRD method.

"Professional solutions create more value". SEMW delivers on the promise of making the most benefit for our customers and satisfying their needs. We will keep providing good products and better service.

## INTRODUCTION OF TRD METHOD

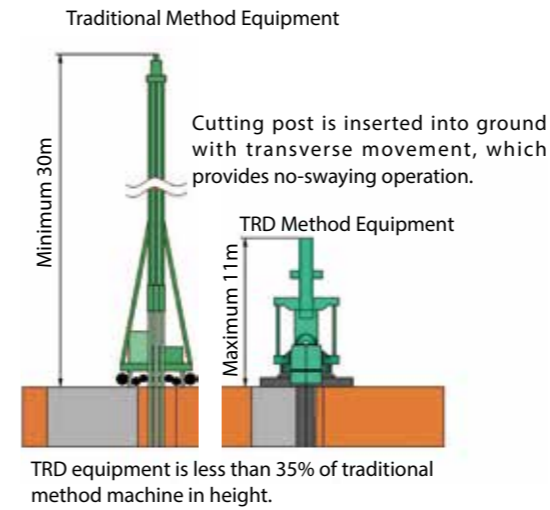
Trench cutting Re-mixing Deep wall method (TRD for short) is different from Soil Mixed Wall method (SMW). With TRD method, the chain saw tools are mounted on a long rectangular section "cutting post" and inserted into ground, to be moved transversely for cutting and grout pouring, mixing, agitating, and consolidation of soil at the original location, so as to make an underground diaphragm wall. This mechanism has been first developed in Japan in 1994 for making cut-off walls or slurry diaphragm walls, which has been widely used in subway stations, landfills, impermeable walls to prevent contamination from ground water, etc. TRD method has been widely used in job sites in Japan since 1990s. TRD method get rapid development, since TRD was first introduced to China in 2009. Only in the year of 2018, the total wall areas made by TRD method is up to 1 million square meters and over 80 projects in domestic.

TRD method can be used in various ground conditions, such as gravels of diameter less than 100mm or soft rock of uniaxial compressive strength no more than 5MPa, as well as sand. The maximum cutting depths is up to 86 meters. Compared with traditional construction technology, TRD method is available for various ground conditions, even the soil with pebbles or boulders and limestone. Nowadays, besides Japan, TRD method has been also well received in U.S.A. and Singapore. This method has been widely used after it was introduced into China and has a very broad development prospect.



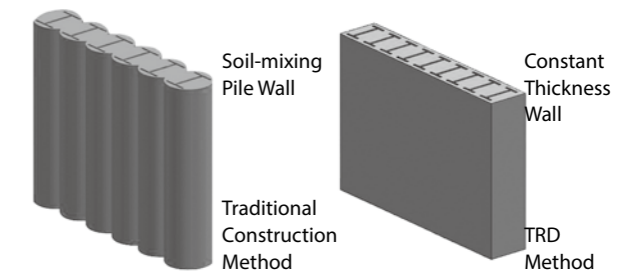
## TRD METHOD FEATURES

### 1 High Security of TRD Equipment



### 2 Continuous, Constant Thickness and Joint-free Wall

- Transverse movement of cutting post makes continuous joint-free wall with high impermeability.
- Constant thickness wall is suitable for inserting H-beam with any distances.



### 3 Walls of Homogeneity and Equal Strength

- Vertical movement of cutting chain, mixing soil with concrete slurry, all of these assure a high quality of homogeneity wall.
- Compared with traditional method, TRD makes thinner walls with same impermeability.

### 4 High Accuracy

- All the main working institutions have measuring sensors, which can effectively monitor the straightness and verticality of the wall to ensure the precision of the wall.



## TRD METHOD APPLICATION

1 Temporary Cut-off Wall Tall building basement, Sewage treatment infrastructure, Tunnel, Subway, etc.

2 Permanent Impermeable Wall Dam, Levee reinforcement, Groundwater dam, Landfill.

3 Other Foundation Improvement Building foundation, Base of dam, Harbor, Oil reserve facility.

## TRD METHOD EQUIPMENT

TRD method is realized by professional equipment TRD machine. Our company in conjunction with the construction units in the domestic geological characteristics and operating conditions on the basis of a large number of construction experience. After field investigation and technical research, mastered the whole set of TRD technology, and developed and trial-produced the ultra-deep TRD machine. The maximum construction depth of TRD-60D/E is reached 61m, and wall thickness up to 900mm. The maximum construction depth of TRD-80D/E is reached 86m, and wall thickness up to 1100mm. Since its launch in 2013, TRD has been widely praised by the market for its high construction efficiency, strong ability to deal with complex strata and good reliability.



Construction Site

## TRD-D METHOD EQUIPMENT FEATURES

### 1 High Power & High Efficiency

- Imported high-power engine and high-power hydraulic drive motor are adopted to provide larger cutting propulsion and lifting force of cutting system, ensuring larger cutting torque and reliable power supply.



Power Pack

### 2 Famous-brand Spare Parts & High Quality

- Imported famous-brand hydraulic components, which assure the equipments' stability and security.
- Imported famous-brand hydro power cutting system with low speed and large torque, which is stable and reliable, produces low heat and ensures long-term continuous work.
- Imported famous brand electric control proportional pump, can control the torque and rotation speed of cutting mechanism according to the program, improve the flexibility of construction and quality control.



Hydro Motor



Displacement Pump

### 3 Track Base Machine & High Stability

- TRD equipment is designed in compact structure and suitable for various ground conditions. Base machine can be transported integrally.
- Rotary track base machine reduces ground pressure, makes stable and easy travel, good displacement straightness during construction.
- Compared with the crawler base machine, track system is more suitable for deep cut in hard ground.
- Transverse-moving-track with main frame inlay transmits the reacting force to the track, to avoid the damage of jack cylinders. Four pairs of jack cylinders, eight in total. Each track can act with solo jack or dual jacks, which assures balancing operation of the equipment.



Base Machine

柴油转速	1778 RPM	上水平位移	590 mm	上水平推力	0.00 t
主系统压力	6.01 MPa	下水平位移	547 mm	下水平推力	-1.71 t
全系统回油压力	0.00 MPa	左斜撑位移	385 mm	左斜撑推力	-12.74 t
冷却水温度	79 °C	右斜撑位移	384 mm	右斜撑推力	-7.89 t
液压油温度	69.3 °C	升降油缸位移	1693 mm	升降油缸推力	402.13 t
润滑油温度	0 °C	辅助电机电流A	0 A	链条油缸推力	39.05 t
切割器速度	0.0 m/min	辅助电机电流B	0 A		
		大泵压力	0.08 MPa		
		小泵压力	0.11 MPa		

深度(m)	Left 左侧		Right 右侧		主梁 主梁		外筒 外筒		显示数值
	50cm	90cm	角度	偏移	角度	偏移	角度	偏移	
-4.0			0.42	1	0.07	0			
-12.4			0.42	5	0.07	0			
-20.8			0.42	12	0.07	1			
-29.5			0.18	15	-0.05	0			
-37.7			0.18	16	-0.05	0			
-40.1			0.18	19	-0.05	0			

Inclinometer Monitor

#### 4 Smart Control & Facile Operation

- Inclinometers for each main structure, provides easy control and feedback of the equipment.
- Smart control of outrigger cylinder, provides automatic deviation correction when the cutting post works. It assures the quality of wall making and easy operation.
- Smart control of the torque avoids overload and damage of the equipment.

#### 5 Dual Power Systems & Advanced Technology

- Two power systems for TRD equipment: Main power (Diesel) and Auxiliary Power (Electric), which works independently. But the Auxiliary power can be substitute for the Main power when the fuel supply is cut off or the machine is halted. In this case, the cutting post can be safely parked in the trench without being cemented in.

#### 6 Localization service & Better guarantee

- Special designed cutting chain for TRD method, with lube-bath technology, high quality materials and favorable price, stock available anytime.
- Sprocket (Driving wheel) is made with alloy materials, fine machining. Sufficient supplies and timely delivery.
- Follower (Driven wheel inserted in underground) is designed with special sealing technology. Imported famous brand bearings and cement-proof seals. Sufficient supplies and good maintenance service.
- Exclusive supplier of the cutter. Imported, sufficient supplies and easy maintenance.

### TRD-E METHOD EQUIPMENT

SEMW TRD-E was launched into the market in 2013, its performance and quality has been constantly improved, broke the record of difficulty construction, and led the peers in technical level, which is well received by customers.

In order to meet the new requirements of low noise, energy saving and environmental protection for the construction projects of subway and integrated pipe corridor, On the basis of keeping the TRD-D performance parameters SEMW successfully developed the TRD-E with full electric.

It can be exchanged with the power cabinet of TRD-D diesel engine, the close distance remote control operation makes the cutting box more convenient, the TRD-80E is equipped with three hydraulic motors, the cutting power is more powerful, and further improve the construction efficiency.



TRD-E Construction Site

## TRD-E METHOD EQUIPMENT FEATURES

### 1 Optimize the main control system, more energy saving and environmental protection

- In the operation according to different soil, different load, different depth, different process stages of cutting force and cutting speed requirements are different, different working conditions, through the drive hydraulic system four groups of motor oil pump group work separately, so as to save energy, reduce cost and increase efficiency.



### 2 Integrated dual power system control, wider adaptability

- On the same equipment, integrated diesel power and electric drive two sets of control systems, diesel power cabinet and motor power cabinet output interface is completely the same, users can choose power source according to needs, or choose one machine and two cabinets, more easily to cope with various construction requirements.



### 3 Remote control operation, better precision

- When cutting box splicing, due to the influence of environmental noise and present information transmission lag, the driver cannot fully and timely understand the real situation of the docking position, it is difficult to splicing, cause time-consuming, operators have safety risks and other adverse factors. Using remote control operation, intuitive and effective between the boxes, convenient splicing, save time, improve efficiency.



### 4 Reasonable starting mode, strong compatibility of equipment

- The motor start control adopts frequency conversion soft start mode + proportional no-load start, which does not affect the voltage drop of the site network. Constant power hydraulic control and intelligent network closed loop control are adopted to ensure the normal operation of the equipment when the voltage fluctuates.



**5 Optimize heat dissipation system to ensure construction stability**

- The internal structure of the electric driving force cabinet is more optimized: the two-in-one heat dissipation device of the blower and the hydraulic heat dissipation device is used to ensure the stable operation of the equipment when the ambient temperature is higher.



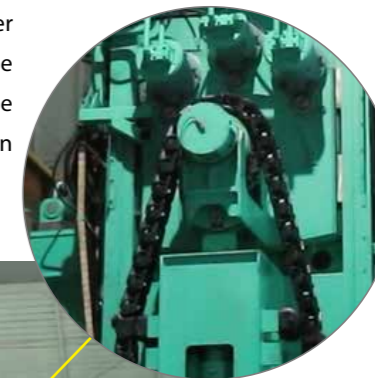
**6 Constant pressure control system, more durable**

- The control of TRD-80E lifting cylinder, designed the longitudinal constant pressure control system of cutting head, so that the pressure of cutting tool downward to the soil remains constant value, does not change with the number of cutting box, to ensure the vertical cutting while extending the service life of the tool head.



**7 Intelligent closed-loop control, effectively prevent the derailment of the chain**

- The TRD-80E chain tensioning cylinder's tensioning force is closed loop controlled by the pressure sensor and proportional valve through the processor. With the change of cutting depth and load, if the tensioning force exceeds the preset value, the cylinder will automatically relieve pressure. Meanwhile, the horizontal pushing cylinder is controlled to reduce the advance speed to protect the cutter and chain from damage. When the tensioning force is lower than the set value, the proportional valve control will automatically adjust the cylinder tensioning force back to the set value to prevent the chain loosening accident.



**8 Equipment emergency lifting function, to deal with unexpected situation at the site**

- TRD-80E emergency lifting function: when the cutting box is buried due to an emergency, the lifting cylinder can switch to the emergency lifting mode and use the front leg cylinder to prop up the ground. The lifting cylinder can provide nearly 300 tons of lifting force to pull the box out of the ground in a short time, effectively shortening the rescue time and reducing the construction risk.

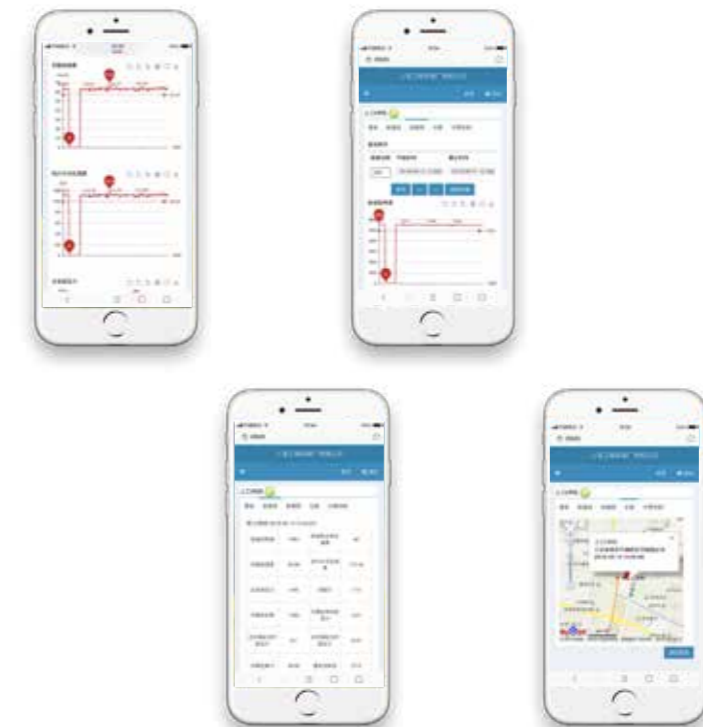


**9 The main technical performance parameters remain the same with the TRD-D model**

Type	Highest power cabinet pressure ( MPa )	Maximum flow rate of power cabinet ( L/min )	Auxiliary system pressure ( MPa )	Auxiliary system flow ( L/min )	Total power of power cabinet ( kW )
TRD-60D	25	1044	25	145	380
TRD-60E	25	1044	25	145	337
TRD-80D	25	1450	20	145	520
TRD-80E	25	1450	20	145	455

**10 Intelligent construction management system, more easy**

- The equipment has an intelligent construction management system, and the main working parameters are collected from the sensor to the data recorder, which can realize the construction process tracking and construction quality monitoring. Equipped with abnormal equipment alarm and fault diagnosis function to effectively guide troubleshooting; And through the client APP, remote data transmission and monitoring can be implemented, so that managers can keep abreast of the use of equipment.





## SPECIFICATIONS OF TRD-D/E EQUIPMENT

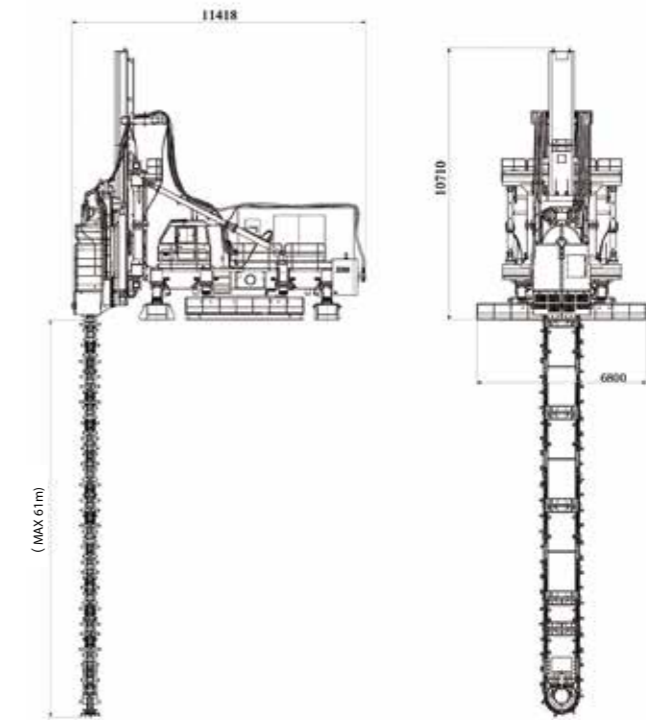
### MAIN SPECIFICATIONS OF TRD-D/E EQUIPMENT

Parts	Items	Units	Parameters			
			TRD-60D	TRD-60E	TRD-80D (customization)	TRD-80E (customization)
Main Power	Rated Power (Main)	kW	380 (Diesel engine)	337 (Electric engine)	520 (Diesel engine)	455 (Electric engine)
	Rated Pressure	MPa	25	25	25	25
Auxiliary Power	Power	kW	90	90	116 ( Electric engine )	
	Rated Pressure	MPa	25	25	20	
Cutting	Standard Cutting Width	m	36 ( Max. 61m )		68 ( Max. 86m )	
	Cutting Width	mm	550~850 ( Max. 900mm )		900-1100	
	Cutting Speed	m/min	7-70		7-70	
	Lifting Stroke	mm	5000		6000	
	Pullout Force	kN	882		1400	
	Press-in Force	kN	470		400	
	Transverse Stroke	mm	1200		1200	
	Transverse Pushing Force	kN	627		760	
	Transverse Pulling Force	kN	470		515	
	Outrigger Stroke	mm	1000		1000	
	Tilt Angle of column	°	± 5		± 5	
	Frame Tilt Angle	°	± 6		± 6	
	Base Machine	Max. distance from tracks to ground	mm	400		400
Transverse Step		mm	2200		2200	
Vertical Step		mm	600		600	
Counter Weight		kg	25000		36000	
Whole Machine	Weight of Whole Machine	t	185 ( 60m cutting post )		274 ( 86m cutting post )	
	Dimensions (above ground)	mm	11418 × 6800 × 10710		13460 × 6800 × 13100	

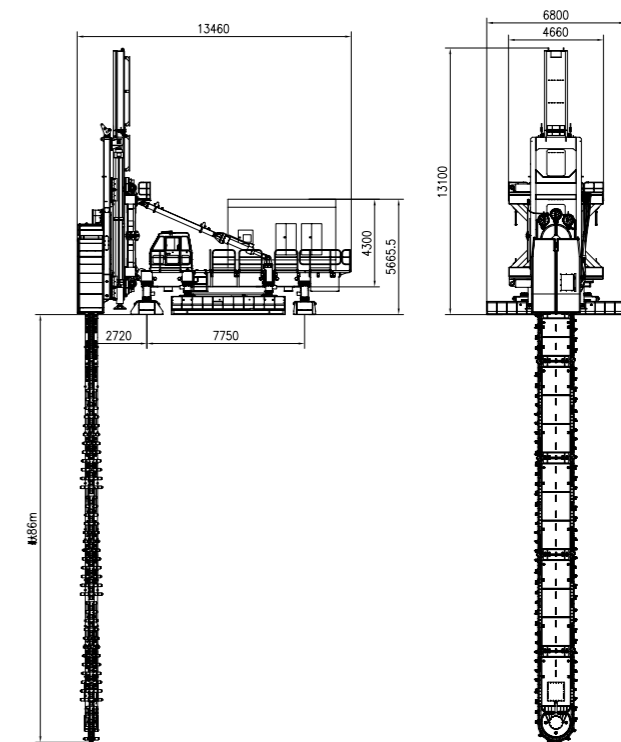
Note: TRD-E Net capacitance matching requirements: 630kVA

\*Specifications are subjected to change without prior notice.

· TRD60D/E Dimensions



· TRD80D/E Dimensions



## TRD Equipment Job Sites

### 1 Shanghai zhangjiang hard X-ray free electron laser device project

- Difficulties: No.5 foundation trench impermeable walls 366m length, 900m thickness, 69.4m depth, mainly used to partition two layers of fine silt with a depth of 56.99~66.4m and the confined water of the first artesian aquifer, and must achieve "zero leakage".
- Target: Impermeable walls
- TRD method design for walls:  
Thickness: 900mm; Test depth: 86m; Design depth:69.4m



Job Site

### 2 Nanjing NO.2014G34 project A & E block project

- Difficulties: The project has high requirements for verticality, water stop, engineering depth and complex strata
- Target: Impermeable walls
- TRD method design for walls:  
Thickness: 700mm  
Design depth:62.5m



Job Site



Job Site



( Effect Drawing )



Job Site

### 3 TAD demonstration

Method features: TAD method (Trench cutting Assembled Diaphragm wall), the method involved in the channel cut cement-soil diaphragm wall (or double hinge into wall) from cement wall inserted between prestressed mortise and tenon joint structure (lock) reinforced concrete prefabricated panel form fabricated a construction technology of underground diaphragm wall.

## PROFESSIONAL SOLUTIONS CREATE MORE VALUE

### 1、FREE-CALL CENTER SERVICE

We provide free-call center service for 24hours. For further information of SEMW products or after-sale service, please call us at+0086-21-4008881749. We will provide information or solutions you need.

### 2、CONSULTANCY & SOLUTIONS

Our professional team offers free consulting services according to different job sites, soil conditions and your requirements.

### 3、TESTING & TRAINING

SEMW is committed to free guidance of installation and testing, to make sure that you can make proper operations.

We will offer training on site if it is necessary, to make sure you know the correct way for maintenance, analysis and debugging of the malfunctions.

### 4、MAINTENANCE & REPAIR

We have offices in many places in China, easy for maintenance.

Sufficient supplies for spare parts and wearing parts.

Our service team has a wide range of professional experience on any size project large or small. They provide best solutions with quick response.

### 5、CUSTOMERS & CONNECTIONS

After-sale customer file was set up for better understanding your need and feedback.

More services are provided, such as, sending info of new released products, latest technology. We also provide special offer for you.

