

# HOT ROLLING MILL



ZOB NAVARD TAVANARAM Co.  
塔瓦纳拉姆钢铁公司



Yiwu YILI Import and export Trading Co. Ltd.  
义乌市一力贸易有限公司



Tianjin Tianzhong Zhongzhi Technology Engineering Co., Ltd  
天津天重中直



中钢国际工程技术股份有限公司  
SINO STEEL ENGINEERING & TECHNOLOGY CO.,LTD.

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**Yiwu YILI Import and Export Trading Co. Ltd.**

义乌市一力贸易有限公司

# OUR COMPANY

In the course of our corporate history we have been able to provide our clients with project planning, processing, and relevant advisory, as well as all necessary services requested by our customers, such as evaluations, dismantling, arrangement of transportation, supervision of erection and so forth.

Our high level of customer satisfaction positions us as an outstandingly reputable company. This commitment to our customers has, moreover, led former clients to introduce us to other companies of various applications.

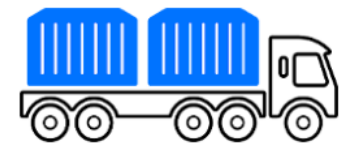
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Dismantling, loading and supervision of re-installation

Turn-key projects

Improvement of production quality and capacity

Transportation and forwarding services



# VISION AND MISSION

## VISION

To be the preferred partner in supplying products and equipment.

## MISSION

- To provide our clients competitive and premium quality equipment and services.
- To strengthen the acceptability of our brands with clients and contractors.
- To seek growth through new ideas, new products and strong partnerships.
- To recruit, train and retain the best talent in the industry.
- To continuously improve our business processes leading to prompt and efficient sales and after sales services.

# SUPPLY SCOPE

## USED HOT ROLLING MILL PRODUCTION LINE + ACCESSORIES

- Hot rolling is a metalworking process in which metal is heated above the recrystallization temperature to plastically deform it in the working or rolling operation. This process is used to create shapes with the desired geometrical dimensions and material properties while maintaining the same volume of metal.
- This heavy industrial Hot Rolling Mill has been refurbishment and manufactured at 2019.
- The most important trend in the steel plate is the demand for plates with increasingly higher strengths, high toughness, hardness, and good weldability. Prime quality in terms of thickness, width, profile, flatness, rectangularity, and a homogeneous microstructure are likewise expected with all steel grades and even extreme dimensions. At the same time, ever closer tolerances are being demanded in respect of dimensional accuracy and flatness. For meeting of these requirements, the plate mills are required to have the capabilities of large range of product mix with a high proportion of high strength plates to be produced, and hence new plate mills are designed for a great variety of production technologies. In addition to this, unrestricted compilation of the rolling campaigns is called for with great variations in terms of thickness, width, and steel grades from one plate to the next without negative effects on the productivity.
- for the production of the heavy plate, there are requirements of qualified operators, efficient plant installations, and suitable control and instrumentation systems for all the process stages. Systematic procedures based on the up-to-date know-how and considerable quantities of energy (heating gases, and power for drive systems, etc.) are to flow into the rolling mill as input with the output consisting of, in addition to the plates, comprehensive process data registered for the purpose of quality monitoring and evaluation, and of test samples for mechanical and technological testing by the acceptance inspection personnel.

- Reheating furnaces are used in hot rolling mills to heat the steel stock (Billets, blooms or slabs) to the rolling temperatures of around 1200 deg C which is suitable for plastic deformation of steel and hence for rolling in the mill. The heating process in a reheating furnace is a continuous process where the steel stock is charged at the furnace entrance, heated in the furnace, and discharged at the furnace exit. Heat is transferred to the steel stock during its traverse through the furnace mainly by means of convection and radiation from the burner gases and the furnace walls. Uncoiling, leveling and shearing production line is an equipment for leveling metal sheet and shearing it into massive plate. Normally it's composed of skip car, uncoiling machine, guide plate pressing device, leveling machine, active bridge-oriented correction device, sizing mechanism, shearing machine, conveying workbench, hydraulic lifting stacking station, transport rolling platform, hydraulic system, and electrical system. Main hydraulic pneumatic electrical control components and sizing system mechanism use internationally brand-name products. This equipment is mainly used to process cold rolled carbon steel coil plate, stainless steel coil plate and non-ferrous metal plate. Fitted with six-roll leveling machine, it can execute leveling, fixing length, transport material and shearing on plates with high panel requirements such as metal aluminum plate. There are ordinary mechanical or hydraulic shearing machines to choose for shearing, based on user need for cross shear or horizontal shear. Relevant supporting machines can have functions extensions to a larger extent.
- In addition to carbon steel, this line is capable of rolling stainless steel and silicon steel

## List of Used Hot Rolling Mill factory:

### REHEATING FURNACE

- Entry roller table (1 set)
- Pusher and hydraulic system (1 set)
- Furnace and dust remove system (1 set)
- Tapping machine and exit roller tables (1 set)
- All electrical and control equipment (1 set)

### ROLLING STANDS

- Roughing horizontal and vertical stands including electromotors and gearbox (8 set)
- Finishing horizontal and vertical stands including electromotors and gearbox (10 set)
- Roller tables between equipment (1 set)
- Hydraulic system and lubrication system (1 set)
- Descaler system (1 set)
- All electrical and control equipment (1 set)

### LEVELING AND SHEARING

- Five roll tension leveler (1 set)
- Tight coiler (2 set)
- Hydraulic system and lubrication system (1 set)
- All electrical and control equipment (1 set)

The Line Layout Has Attached

**Line specification:** yearly 1.2 million tons hot roll strips with variety range of input slab and output strip width.

The range of strip is up to 650 mm and variety of thicknesses from 1 mm start with.

This heavy industrial Hot Rolling Mill has been refurbishment and manufactured at 2019.

Includes all necessary accessories and auxiliaries, main cranes, grinders and lathes.



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# TIAN ZHONG ZHONG ZHI

PROFESSIONAL SOLUTION

since 1998



**Company address:** No. 16, Jingxiang Road, South District of Beichen Science and Technology Park, Tianjin, China

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**Company phone:** +86 22 86993626

Tianjin Tianzhong Zhongzhi Technology Engineering Co., Ltd (hereinafter referred to as Zhongzhi company) was established in 1998. The former...

**62** /years  
Originated in 1958

**200** /More than  
Completed rolling project

**600** /people  
Active employees



Tianjin Tianzhong Zhongzhi Technology Engineering Co., Ltd (hereinafter referred to as Zhongzhi company) was established in 1998. The former is Tianjin Heavy Machinery Plant, one of China's eight heavy machinery plants. The main business is rolling equipment and rolling service. Zhongzhi company is the state level high-tech enterprise, which is engaged in metallurgy designing development, equipment manufacturing, electromechanical and hydraulic equipment for rolling production lines and EPC general contracting for rolling engineering. The company has more than 40 years of experience in the design and manufacture of rolling projects, which has its own technical center and comprehensive mechanical processing base and has applied for more than 100 authorized patents. Zhongzhi company has completed more than 200 rolling projects so far. Its business covers more than 20 provinces and cities in China and extends to Thailand, Malaysia, Iran, Saudi Arabia, Indonesia and other countries.

The company occupies an area of 120,000 square meters, with a modern plant of 70,000 square meters where we can machinery process and assembly products and an office building of 9000 square meters . There are more than ten workshops, such as large-scale equipment processing workshops, high-precision CNC machining workshops, large-scale equipment assembly workshops, physical and chemical center test rooms, riveting and welding workshops, electrical workshops and hydraulic workshops, etc. The heavy-duty machining and assembly workshop lifting height is 24 meters and lifting capacity is 2\*200 tons. The company formed the manufacturing system with CNC mechanical processing, large-scale welding, and large-scale assembly and the production system with the electronic control, hydraulic product processing, assembly and testing. Comprehensive large-scale machining base has been formed.



## Our mission

Our mission is to help our clients make distinctive, lasting, and substantial improvements in their performance and to build a great firm that attracts, develops, excites, and retains exceptional people. Integrity, Innovation, Dedication and Pragmatism is our Corporate purposes

## Our vision

Motivated by passion for innovation, driven by our values and mission we create the path of continuous improvement and success.

## Our Value

Be passionate. Love your work, do not compromise on quality, and aim for success. Be reliable unconditionally. Respond to changes, and never break the trust. Be a visionary. Always think innovatively, think differently, and think about future.





## EPC project

For the new rolling project of hot rolled strip, bar and section production line, provide the whole process of rolling production line services from rolling process, equipment design and manufacturing, procurement, equipment installation and commissioning. According to the actual situation of customers, we can make the best process plan and the most cost-effective rolling line configuration for customers.

## Rolling mill & other equipment

We can provide a variety of hot-rolled strip, bar, section production line in the use of a single device. For example, the two high strip mill, the four high strip mill, the three high reversible mill, the two high reversible mill, the universal section steel mill, the rod and wire short stress mill, as well as the discharging device, the flying shear, the looper, the strip coiler, the cooling bed, the hot saw, the cold saw, the straightener, various roller table, etc

## Standby and spare parts

For the existing rolling mill equipment of hot rolling strip, bar and section production line, we can provide all kinds of spare parts, such as bearing seat, roll system assembly and so on.

## Hot-rolled steel service

1. Process layout and overall scheme design of the rolling production line;
2. Design of process equipment in the rolling production line;



3. Design of equipment installation, writing of commissioning procedures, operation regulations, maintenance regulations and safety regulations.
4. On-site technical guidance during equipment installation and commissioning. (Individually charging according to the actual staff number)
5. The seller is responsible for training the technical, operating and maintenance staff for the buyer.
6. Technical consultation on rolling process and equipment.
7. Modification scheme, equipment design and equipment manufacture of rolling production line;
8. Design and manufacture of spare machines and spare parts for various equipment in the rolling production line.



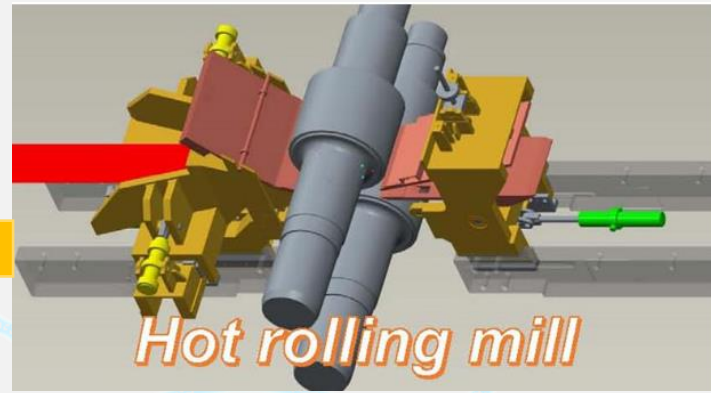


### Mach,Auto & Liq equipment for the hot-rolled steel line

For the production line of hot-rolled strip, bar and section, a complete set of Machinery, automation and hydraulic process equipment is provided for the whole line. We have a professional design team, a complete set of modern CNC machining workshop, a large number of experienced mill equipment processing and assembly personnel.

### Upgrading of hot-rolled production line

For the existing production lines of hot rolled strip, bar and section, new process and technology are applied to help customers upgrade the rolling line, so as to achieve the purpose of improving production line output and product quality.



## OUR CERTIFICATION

Tianzhongzhongzhi has been the Tianjin City technological medium and small-sized enterprise and has gained these honorary titles for many years: "Tianjin City One hundred private enterprise"、 Tianjin City keep faith enterprise"、 "Tianjin City famous brand" . So far, the company has achieved a leaping development and excellent results, and has entered the national "outstanding private enterprises".

Tianzhongzhongzhi has passed ISO9001: 2008 quality system、 carries out the quality guideline "forge ahead continuously improve keep faith satisfy customer "all the time and practices and innovates continuously. Tianzhongzhongzhi has been the Tianjin City technological medium and small-sized enterprise and has gained these honorary titles for many years: "Tianjin City One hundred private enterprise"、 "Tianjin City keep faith enterprise"、 " Tianjin City famous brand". So far, the company has achieved excellent performance and entered the country "Excellent private enterprises" ranks.

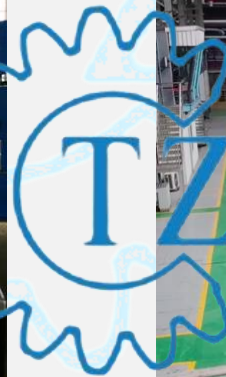


## Steel-rolling project

Tianjin TianZhongZhongZhi Technology Engineering Co., Ltd. (hereinafter referred to as "ZhongZhi Co.") was founded in 1998. It is located in Beichen Science and Technology Park, Tianjin City...









The main products of the electrical department include the design and equipment of electrical transmission and automation systems such as strip production lines, bar and wire production lines and section steel production lines in the metallurgical industry. In recent years, it has successively undertaken sets of electrical transmission and automation systems for dozens of production lines, such as Malaysia Qingfeng bar rolling mill unit, Luoyang Shuangrui 1450mm titanium plate hot rolling unit, Inner Mongolia Huaye 850mm stainless steel continuous rolling unit, Jiangsu Danyang Jinggong special steel wire hot rolling Unit, Dalian Zhengda H-beam production line, Xinya ,Liaogang and so on.





## **Technical Information:**

### **Description of Plate Mill**

1. Our proposal is 1.2 million tons hot roll strips yearly with variety range of input slab and output strip width

The range of strip is up to 650 mm and variety of thicknesses from 1 mm start with

.2. Weight of the entire mechanicals is 3500 T

3. This heavy industrial Hot Rolling Mill has been refurbishment and manufactured at 2019.

- We will take overall responsibility
- We guarantee the completeness and functionality of the equipment as per the scope described in the attached division list
- We shall be responsible for the process functionality of the complete system: technology + mechanics + automation+ electricians to produce the targeted product mix/ productivity in the guaranteed quality.

The equipment involved in the supply are as follows:

### **REHEATING FURNACE**

- Entry roller table (1 set)
- Pusher and hydraulic system (1 set)



- Furnace and dust remove system (1 set)
- Tapping machine and exit roller tables (1 set)
- All electrical and control equipment (1 set)

#### **- ROLLING STANDS**

- Roughing horizontal and vertical stands including electromotors and gearbox (8 set)
- Finishing horizontal and vertical stands including electromotors and gearbox (10 set)
- Roller tables between equipment (1 set)
- Hydraulic system and lubrication system (1 set)
- Descaler system (1 set)
- All electrical and control equipment (1 set)

#### **- LEVELING AND SHEARING**

- Five roll tension leveler (1 set)
- Tight coiler (2 set)
- Hydraulic system and lubrication system (1 set)
- All electrical and control equipment (1 set)



Note: The first time the line was established and start to manufacturing at 2015

### 3. Production Process Flow

#### 3.1 Slab Reheating

The slabs, after being put on the charging skid by the crane, are pushed onto the charging roller table and sent to the RF run-in table by the pusher for reheating. The cold slabs will be reheated up to 1050~1200°C and delivered to the RF run-out table by the slab withdrawing machine.

#### 3.2 High Pressure Water Descaling Machine

There are three descaling point, the first being arranged after the RF, the second before the 4HI mill and the last after the mill

The reheated slabs will be transported to the descaling box via the roller table after RF and the scales are removed from the slab surfaces with 20MPa high pressure water. The height of the descaling nozzles can be adjusted in accordance with slabs' different thickness.

#### 3.3 Rolling Process

Conventional Rolling Based on the slab width and required final plate width, the slabs will be rolled on the 4HI mill in forming rolling process, or spreading rolling process and stretching rolling process. Namely, when the slab length is not quite suitable, the slab will first undergoes forming rolling for 1~3 passes, then the slab will be turned 90°before/after the 4HI mill for spreading rolling until it is rolled as wide as required final product width, then turned 90°again for stretching rolling.



When the slab length is close to or as long as the max. Slab length specified, the slab will first be turned 90 ° before the 4HI mill for spreading rolling until it is as wide as required final product width, then turned 90 ° again for stretching rolling. In some special cases, only cross rolling or longitudinal rolling will be used.

### Control Rolling (TMR or CR Rolling)

There are two phases in control rolling. For 8~50mm thick plate with a yield strength about 500MPa or less, control rolling can be adopted.

The intermediate slabs before entering the straightener, according to the rolling process, final plate thickness and mechanical property requirements, shall be 1.5~2.5 times of final product thickness; and with special products, it can be 4~5 times of final product thickness. The intermediate slabs swing on the roller table waiting to get cooled to 850°C for final rolling which will be carried out at around 700~750°C. During the rolling process, the regenerated scales on the slab surface shall be removed by the descaling machine. The rolling speed and screw down speed shall be carried out according to the rolling schedule based on the final plate size and steel grade.

### 3.4 Cooling and Straightening

An ultra-fast cooling system is applied between the 4HI mill and the straightener. The rolled pieces from the last pass leaving the 4HI mill will be delivered at specified speed to the ACC device via the roller table. The plate entering the ACC device will be sprayed with water on both surfaces for fast cooling, so that the plate temperature will rapidly drop from 700~800°C to 400-650°C.

The plates usually enter the 11HI straightener at 600-850°C, while thinner plates can be straightened at 500-550°C and thicker ones around 800-900°C. The straightening speed ranges at 0-2.5m/s. The plates after straightening usually go onto the cooling bed at 600-900°C.

Note: The most main parts are from different years 2013 and so on.



### 3.5 Plate Cooling and Shearing

The plates are cooled down to 100-150°C on the cooling bed and then transported to the inspection stand for visual check on the top/bottom surfaces, edges, flatness, etc.

The cooled plates are then sent to the trimming line, where they are cut off the heads and tails by the crop shear first, and then cut to length if needed for the next edge trimming process. The plate edges will be trimmed after the shear gap is adjusted according to the specified final plate width.

The plates will be cut to length by the cut-to-length shear and then labeled before they are piled and lifted to the warehouse by the crane

Hot strip mills have evolved in various steps from original tinplate and sheet rolling mills. The development of semi-continuous and continuous multi-stand mills followed, producing small-diameter and eventually large-diameter steel coil products. Low-, medium- and high-carbon steels, high-strength low alloy steels, X grade pipe steels, silicon steels and stainless steels were rolled. Surface defects may occur due to scale, rust or impurities. Scale is produced when the hot surface is oxidized by air. This mill scale can reduce corrosion if steel is exposed to air over short periods, however, the corrosion increases if exposed for long periods. Large amounts of mill scale also cause severe pitting corrosion if the surface is in contact with water.

In addition to carbon steel, this line is capable of rolling stainless steel and silicon steel.



# TIANZHONG ZHONG ZHI

PROFESSIONAL SOLUTION

Since 1998



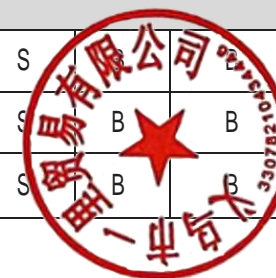
Yiwu YILI Import and Export Trading Co. Ltd.								
Main Technical Equipment								
ITEM NUMBER	DESCRIPTION	SUPPLY						
		QTY	SUP	BD	BE	DE	ASE	ASC
<b>1.0</b>	<b>Reheating Furnace</b>							
	Entry roller table	1 set	S	S	S	S	B	B
	Pusher and hydraulic system	1 set	S	S	S	S	B	B
	Furnace and dust remove system	1 set	S	S	S	S	B	B
	Tapping machine and exit roller tables	1 set	S	S	S	S	B	B
	All electrical and control equipment	1 set	S	S	S	S	S	S
<b>2.0</b>	<b>Rolling Mill Stands</b>							
	Roughing horizontal and vertical stands including electromotors and gearbox	8 set	S	S	S	S	S	S
	Finishing horizontal and vertical stands including electromotors and gearbox	10 set	S	S	S	S	S	S
	Roller tables between equipment	1 set	S	S	S	S	S	S
	Hydraulic system and lubrication system	1 set	S	S	S	S	S	S
	Descaler system	1 set	S	S	S	S	S	S
	All electrical and control equipment	1 Set	S	S	S	S	S	S
<b>3.0</b>	<b>Levelling &amp; Shearing</b>							



Yiwu YILI Import and Export Trading Co. Ltd.

Main Technical Equipment

ITEM NUMBER	DESCRIPTION	SUPPLY						
		QTY	SUP	BD	BE	DE	ASE	ASC
	Five roll tension levelers	1 set	s	s	s	B	B	B
	Tight coiler	2 set	s	s	s	B	B	B
	Hydraulic system and lubrication system	1 set	s	s	s	s	s	s
	All electrical and control equipment	1 set	s	s	s	s	s	s
	shearing line roller table	1 set	S	S	S	S	S	S
	trimming shear	1set	s	S	S	S	S	S
	dividing shear	1 set	S	S	S	S	S	S
	crane pick-up at the end of the roller table	1 set	S	S	S	S	S	S
<b>4.0</b>	<b>Media</b>							
	Mill oil lubrication station	1 Set	S	S	S	S	B	B
	Mill motor oil lubrication station	1 Set	S	S	S	S	B	B
	Mill hydraulic station	1 Set	S	S	S	S	B	B



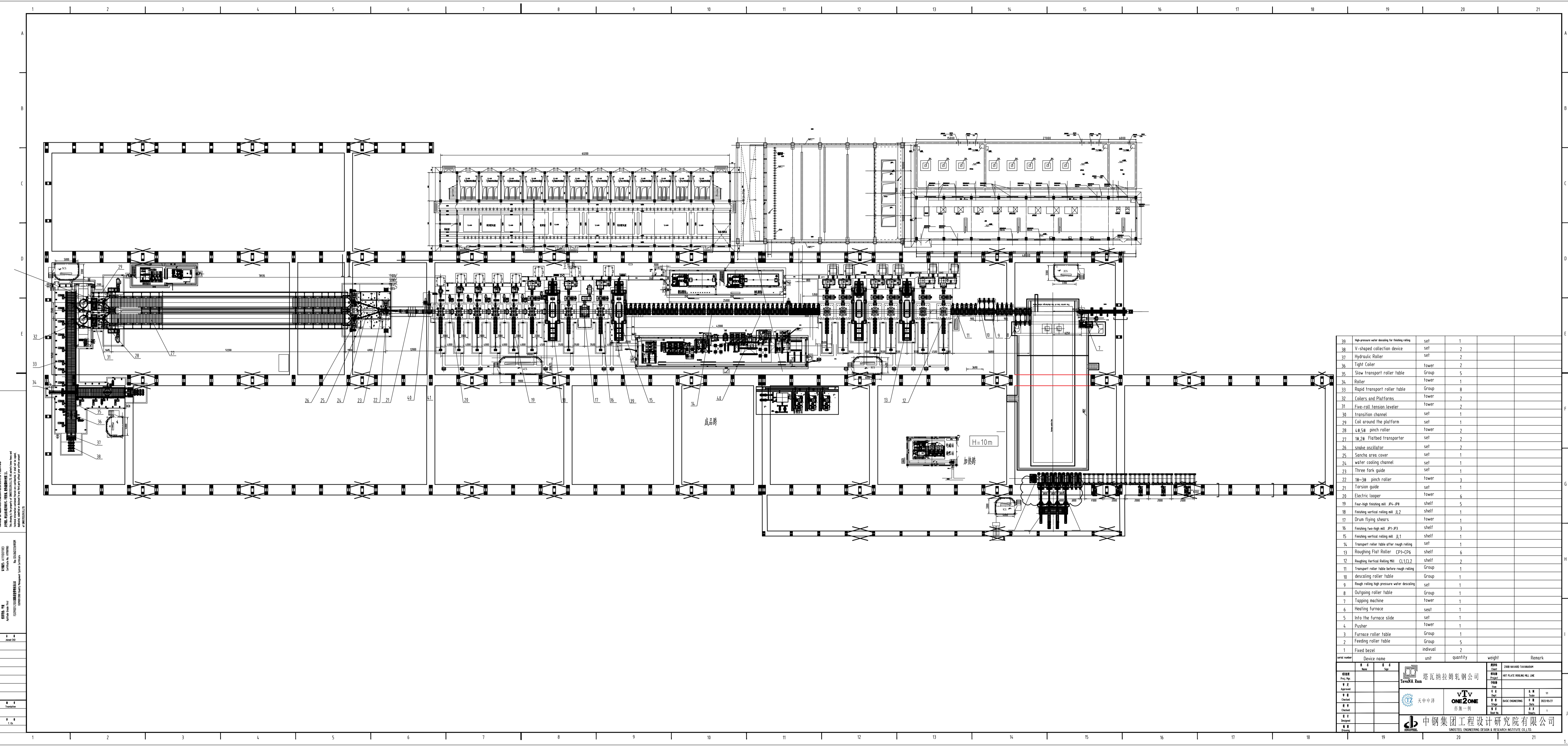
Yiwu YILI Import and Export Trading Co. Ltd.								
Main Technical Equipment								
ITEM NUMBER	DESCRIPTION	SUPPLY						
		QTY	SUP	BD	BE	DE	ASE	ASC
	HAGC hydraulic station (HP)	1 Set	S	S	S	S	B	B
	Descaler HP water pumps	1 set	S	S	S	S	S	S
<b>5.0</b>	<b>Automation (complete, covering mill mechanical scope)</b>							
	Level-1 automation: complete HW and SW	1 Set	S	S	S	S	S	S
	Level-2 automation: complete HW and SW	1 Set	S	S	S	S	S	S
	HMI system	1 Set	S	S	S	S	S	S
	operation stations incl. pulpits	1 Set	S	S	S	S	S	S
	field devices and Sensors	1 Set	S	S	S	S	S	S
	technological gauges	1 Set	S	S	S	S	S	S
	Pyrometer	1 Set	S	S	S	S	S	S
<b>6.0</b>	<b>Electrics (for mechanical scope of supply)</b>							
	MV power distribution	1 Set	S	S	S	S	S	S
	VAR compensation SVC and harmonic filters	1 Set	S	S	S	S	S	S



Yiwu YILI Import and Export Trading Co. Ltd.								
Main Technical Equipment								
ITEM NUMBER	DESCRIPTION	SUPPLY						
		QTY	SUP	BD	BE	DE	ASE	ASC
	LV power distribution, PCC ande MCC	1 Set	S	S	S	S	S	S
	AC & DC converters (main and aux.)	1 Set	S	S	S	S	S	S
	AC & DC motors (main and aux)	1 Set	S	S	S	S	S	S
	UPS	1 Set	S	S	S	S	S	S
<b>7.0</b>	<b>Installation</b>							
	WTP for Plate Mill incl. Make-up water system	1 Set	S	S	S	S	S	S
	Compressed air plant (if applicable)	1 Set	B	S	S	S	S	S
	Gas main supply station incl. safety S/D and regulation valves (if applicable)	1 Set	B	S	S	S	S	S
<b>8.0</b>	<b>Accessories &amp; Auxiliaries of The Line</b>							

- Main equipment's manufacturer is Tianjin Tianzhong Zhongzhi Technology Engineering Co., Ltd.
- Sinosteel Group provided the engineering services in first installation.
- Yiwu YILI Import and Export Trading Co. Ltd is providing whole package of the work.





no	Device name	unit	quantity	weight	Remark
39	High-pressure water decaying for feeding rolling	set	1		
38	V-shaped collection device	set	2		
37	Hydraulic Roller	set	2		
36	High Cooler	tower	2		
35	Slow transport roller table	Group	5		
34	Roller	tower	1		
33	Rapid transport roller table	Group	8		
32	Coilers and Platforms	tower	2		
31	Five-roll tension leveler	tower	2		
30	Transition channel	set	1		
29	Coil around the platform	set	1		
28	4.8.5m pinch roller	tower	2		
27	18.7m Flatbed transporter	set	2		
26	snake oscillator	set	2		
25	Sancho area cover	set	1		
24	water cooling channel	set	1		
23	Three fork guide	set	1		
22	18-3m pinch roller	tower	3		
21	Torsion guide	set	1		
20	Electric Lopper	tower	6		
19	Four-high finishing mill 24-24	shelf	5		
18	Finishing vertical rolling mill J1.2	shelf	1		
17	Drum flying shears	tower	1		
16	Finishing two-high mill J1.1	shelf	3		
15	Finishing vertical rolling mill J1.1	shelf	1		
14	Transport roller table after rough rolling	set	1		
13	Roughing Flat Roller CPS-CPS	shelf	6		
12	Reheating Vertical Rolling Mill CL1C2	shelf	2		
11	Transport roller table before rough rolling	Group	1		
10	descaling roller table	Group	1		
9	Rough rolling high pressure water decaying	set	1		
8	Outgoing roller table	Group	1		
7	Tapping furnace	tower	1		
6	Heating furnace	set	1		
5	Into the furnace slide	set	1		
4	Pusher	tower	1		
3	Furnace roller table	Group	1		
2	Feeding roller table	Group	5		
1	Fixed bezel	indrust	2		

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