Appendix 3-D

Coal Washing Plant of Murray River Coalmine, Northeast BC, Canada: Preliminary Design

HD International Mining Industry Co., Ltd.

Coal Washing Plant of Murray River Coalmine, Northeast BC, Canada

Preliminary Design

Taggart (Beijing) Engineering Co., Ltd.

August 2013

HD International Mining Industry Co., Ltd.

Coal Washing Plant of Murray River Coalmine, Northeast BC, Canada

Preliminary Design

Project number: C1136

Construction scale: 6 million t/a

General manager: Guomin Sun

Chief engineer: Yanfeng Xu

Project manager: Xianjian Liu

Taggart (Beijing) Engineering Co., Ltd.

August 2013

Contents

Chapter 1 General Introduction

I. The Profile of the Project

1. The Name, Ownership and Location of the Project

(1) The Name of the Project

Coal washing plant project of Murray River Coalmine, Northeast BC, Canada

(2) The Ownership of the Project

The exploitation right of Murray River coalfield shall be possessed by Canadian Dehua International Mines Group Inc. ("Dehua International" in short). Huiyong Holding Group Co., Ltd has already signed "Cooperation Agreement on Canadian Murray River Coalfield" with Canadian Dehua International Mines Group Inc. on July 17, 2009, in conformity with which Huiyong Holding Group Co., Ltd. ("Huiyong Group" in short), Canadian Dehua Nuliang International Mines Group Inc. ("Dehua International" in short) and Ruize Capital Co., Ltd. ("Ruize Capital" in short) shall establish a joint venture in Canada for co-developing Canadian Murray River Coalfield. The main articles of the agreement are as follows:

● Huiyong Group shall be liable for building up the shaft of coalmine with an annual output of over 6 million tons of raw coal, coal washing and related facilities and the funds needed herein and shall possess 55% (SAY FIFTY FIVE PERCENT) equity of the joint venture. Huiyong Group shall be fully entitled to manage shaft construction, operation and product sale within the joint venture.

● Dehua International shall invest with all its proprietary equities of the assets of 160km^2 Canadian Murray River Coalfield in the joint venture and possess 40% equity of the venture. Dehua International is liable for all related preparations for the development of Murray River Project, including while not limited to the approval and license of the government, feasibility study report of the assets of Murray River Coalfield issued by the authorities, overseas labor input, coordination with the government, relationship with local residents and human resources.

● Ruize Capital shall possess 5% equity of the joint venture, be liable for coordination work only and provide no investment.

● Once the coalmine shaft is completed and put into production, the profit bonus shared by Huiyong Group and Ruize Capital as shareholders of the joint venture shall be firstly used as the reimbursement for the mine construction costs input by Huiyong Group.

For this purpose, Huiyong Group has registered a proprietary branch "Huiyong Holding (British Columbia) Co., Ltd" in Canada on August 25, 2010 and obtained *Overseas Investment Certificate* with a serial number of MOCOIV No. 1100201000214 issued by the Ministry of Commerce of the People's Republic of China October 14, 2010.

(3) The Location of the Project

The project is located in Pease Rive Valley on the east side of Rocky Mountains, Northeast BC, Canada.

2. The Profile of Operating Unit

With a registered capital of RMB300 million, Huiyong Holding Group Co., Ltd ("Huiyong Group" in short), an energy enterprise incorporated in modern enterprise system has its main businesses including exploitation, washing and sale of coal.

In conformity with the development policies of both central and local governments in China for the coal industry, on the occasion of resources integration opportunities of acquisitions and reorganizations of small-size coalmines in Shanxi Province, under a philosophy of "safety, top quality, high efficiency and harmony" and the development principle of "intensive production and management, consecutive main conveying belt, auxiliary trackless rubber-tire transport & digital shaft managing", Huiyong Group has acquired and integrated 27 small-size coal mines in Pinglu District, Huairen County and Shanyin County in Suzhou Municipality as well as shouyang County, Jinzhong Municipality, built up four coalmine shafts i.e. Xingtao, Chaigou, Maweigou and Fengxi and related coal washing plants and realized an output of 18 million t/a for coal production and washing. Xingtao and Chaigou Coalmines have been appraised as "Standardized Shaft" and Resources Integration Model Project respectively by local governments in 2008 and 2009. It is now building three coalmine shafts i.e. Chongshen, Xinan and Beizu as well as related coal washing plants, with a production scale of 10 million t/a.

With powerful executive team and experienced technicians, Huiyong Group is provided with senior managing officials, who have once worked as leaders and top executives of the branch of Central Government and State-owned Enterprises under the State Council and feature outstanding performance and rich experience in macro-economy, energy engineering, international technical and economic cooperation as well as development and management of coal project. The middle- & top-level executives and backbone technicians are selected from the coal industry nationwide.

With a leading role in both development and operation of coalmine shafts in China,

Huiyong Group has the ability of completing the principal construction of coalmine shaft with an annual output of 5 million tons within less than 14 months and realizing coal production in the same year when the project starts; for long-wall coalmine shaft with an annual output of 7 million tons, totally 312 employees (including executives & logistics staff) are required for one working surface in one shaft.

With steady and reliable management of assets and financial affairs, Huiyong Group has reached total fixed assets of RMB4.652 billion, about 1.5 billion tons of coal resources reserve and 1221 registered employees by September 2010. In 2010, it has realized an output of 16-million-t raw coal and sales volume of about RMB6 billion. At the end 2011, with total production scale up to 25-30 billion t/a, it would grow up into a large-sized coal enterprise.

In conformity with energy development strategies in China, in order to seize overseas coal market and alleviate the shortage of coking coal at home, Huiyong Group has spared no efforts for co-developing Murray River coalfield project with Canadian Dehua International.

II. The Profile of the Project

1. The Profile of Coalfield

Murray River coalfield has a total area of 160km^2 and reserve of 3.18 billion t, where 1# Exploration Zone is 37.45 km^2 with developed reserve of 688 million t and in the scope of this designed coalfield. The chemical tests of coal type and quality done by both American & Chinese technical institutes prove top-quality coking coal.

2. Coal Bed

The main mining coal beds of the coalfield are the coal beds D, E, F and J.

3. Design Scale and Work System

The annual processing capability of the coal washing plant is 6.0Mt/a. The work system is 330 days, 16 working hours per day and 5280 hours per year. The raw coal-washing capability per hour is 1136t/h.

4. Coal-washing Process

According to the quality and product purpose of raw coal, raw coal is totally or partially washed. The process of primary washing system refers to 50-1.0mm raw coal, where two-product heavy medium cyclone is used for primary washing; TSS teetered bed used for separating 1.0-0.25mm coarse slime; slurry flotation for flotation-separating 0.25-0mm fine slime, where flotation tailing is dehydrated & recovered by plate-and-frame filter press.

III. Problem and Proposal

1. Finalized large-sample literature on raw coal production isn’t available yet at present.

Accordingly, quality literature of raw coal produced by nearby mine Willow Creek is taken as reference in this design. Therefore, large-sample literature on raw coal production of this mine shaft shall be provided as soon as possible, so as to finalize the design and ensure the accuracy of the project design.

2. Finalized geological exploration literature of the industrial site isn't available yet at present. Therefore, the engineering exploration literature within the industrial site shall be provided as soon as possible, so as to ensure the accuracy of structural design of civil works and the progress of the project.

Chapter 2 Completed Tasks

I. Analysis on Raw Coal Quality

(1) Water Content

The Gates coal bed exploited in the mine is low-water-content coal bed. The average value of air-dried water content of the entire coal bed of all main coal beds lies in 0.5-1.0%. Air-dried water content also means internal water content and has no impact upon thermal and metallurgical properties of coal.

(2) Ash Content

The average value and varying scope of the ash contents of raw coal and clean coal of all main coal beds in drilling records are summarized in Table 2-1 & 2-2. The analysis is as follows:

1) The ash content of raw coal as a whole in the beds J, E & F is the best while the bed D & G is inferior.

2) Most main coal beds except the bed G can yield the product with ash content less than 9% at the threshold density of 1.4.

3) The ash content of most high-ash-content raw coal can decline to the values in Table 2-1 in proper exploiting method. However, there exist some exceptions. The description on sampling interval, density logging & rock core shows that the quality of some raw coal cannot hugely arise in different exploiting methods. These drilling holes include: P1C47-D coal bed, P1C48-D coal bed, P1C44-E and G coal bed and P1R35-G-coal bed. For these coal beds, specific coal washing technique or lower output is required for reducing ash content.

Table 2-1 Ash Content of Raw Coal in Drilling Data

Coal bed	Quantity	Ash content of raw coal (%)		
		Average value*	Minimum value	Maximum value
D	9	23.54	5.25	45.50
E	7	17.34	11.16	28.33
F	11	21.45	11.04	39.24
G	7	27.38	18.89	38.01
J	13	16.78	9.60	33.66

Table 2-2 Ash Content of Clean Coal in Drilling Data

Coal bed	Quantity	1.4 RD ash content (%)		
		Average value*	Minimum value	Maximum value
D	6	6.36	3.53	7.62
E	6	7.29	4.02	12.95
F	8	6.73	3.41	8.02
G	5	9.86	5.81	14.88
J	11	6.53	3.91	12.15

(3) Volatile Content

The average value and varying scope of the volatile content (%) of raw coal and clean coal of all main coal beds in drilling records are summarized in Table 2-3 & 2-4.

Table 2-3 Volatile Content of Raw Coal in Drilling Data

Coal bed	Quantity	Volatile content of raw coal (%)		
		Average value*	Minimum value	Maximum value
D	6	19.18	13.68	23.40
E	6	20.62	17.96	22.18
F	8	19.08	16.20	22.69
G	5	17.44	14.98	19.91
J	11	18.46	15.90	21.06

Table 2-4 Volatile Content of Clean Coal in Drilling Data

Coal bed	Quantity	1.4-density volatile content (%)		
		Average value*	Minimum value	Maximum value
D	6	21.77	20.82	23.18
E	6	21.54	20.15	22.43
F	8	20.81	18.96	23.66
G	5	19.54	18.52	22.10
J	11	19.28	17.71	21.40

The table is analyzed as follows:

1) Volatile content usually increases when ash content declines.

2) The low volatile content of clean coal will turn out to be key index in the sale of metallurgical coal product.

3) A comparison of volatile content with water & ash contents shows no self-ignition and weathering of coal bed.

(4) Sulfur Content

The average value and varying scope of the sulfur content of raw coal and clean coal of all main coal beds in drilling records are summarized in Table 2-5 & 2-6.

Table 2-5 Sulfur Content of Raw Coal in Drilling Data

Coal bed	Quantity	Sulfur content of raw coal (%)		
		Average value*	Minimum value	Maximum value
D	9	1.40	0.46	3.84
E	7	0.73	0.19	1.46
F	10	0.59	0.29	2.55
G	7	0.54	0.36	0.72
J	13	0.29	0.15	0.65

Table 2-6 Sulfur Content of Clean Coal in Drilling Data

Coal bed	Quantity	1.4RD sulfur content (%)		
		Average value*	Minimum value	Maximum value
D	6	1.09	0.82	1.87
E	6	0.77	0.54	0.96
F	8	0.56	0.34	1.01
G	5	0.61	0.48	0.82
J	11	0.37	0.19	0.66

The table is analyzed as follows:

1) The sulfur content of raw coal in coal beds E, F, G and J is low and no higher than 1%.

2) The sulfur content of clean coal product of most coal beds lies in 0.8%-1% (moreover, clean coal with lower-than-0.5% sulfur content can be produced in the bed J).

3) A higher sulfur content of raw coal of the beds D, E and F may be related to the sulfur existing in pyrites and can decline to lower than 1.0% through coal washing.

(5) Thermal Value

The average value and varying scope of the thermal value (Mj/kg) of raw coal of all main coal beds in drilling records are summarized in Table 2-7. The thermal value is related to the ash content of raw coal. Thermal value of all coal beds is relatively higher.

(6) Swelling Number

Crucible swelling number (CSN), also known as free swelling index (FSI) is a primary index describing coking properties. The average value and varying scope of the raw coal CSN of all main coal beds in drilling records are described in Table 2-8.

Table 2-7 Thermal Value of Raw Coal in Drilling Data

Coal bed	Quantity	Thermal Value of Raw Coal (%)		
		Average value*	Minimum value	Maximum value
D	9	27.24	18.55	34.55
E	7	29.42	24.76	32.06
F	11	27.90	20.91	32.11
G	7	26.67	21.23	29.08
J	13	29.49	23.35	32.57

Table 2-8 Clean Coal CSN in Drilling Data

Coal bed	Quantity	1.4 Density CSN (%)		
		Average value*	Minimum value	Maximum value
D	6	8.0	6.0	9.0
E	6	7.5	6.0	9.0
F	8	7.5	5.5	9.0
G	5	7.0	5.5	9.0
J	11	5.5	5.5	8.0

1.4 Density

CSN value shows that the coal of all coal beds features the swelling properties of primary coking coal or coal blend product for coking. The value of average swelling properties can be further improved in selective exploitation.

(7) Density

The air-dried density value of raw coal is positively related to the ash content. In light of good contrast relationship between density measuring and ash content of raw coal, Norwest has established a report model of genuine density data. The average density of most main coal beds lies in 1.45-1.5g/cm^3 while that of the coal bed G is about 1.55g/cm^3. Genuine density data is used in the quantity evaluation of coal resources.

(8) Particle Size Analysis of Raw Coal

According to an analysis based on *Washability Test Report of Drilled Coal Samples* submitted by Huiyong Group in March 2011, the screening literature of raw coal core and sample is summarized as in Table 2-9.

Table 2-9 Screening Literature List of Raw Coal Core and Sample

Particle size /mm	D coal		E coal		J coal (P2R12(H10)		J coal P2R18(H15)		J coal P2R18(H15)	
	Yield /%	ash content /%	Yield /%	ash content /%	Yield /%	ash content /%	Yield /%	ash content /%	Yield /%	Ash content /%
13~6	85.93	5.56	32.74	12.10	43.14	15.70	46.25	13.84	91.48	6.77
6~3			33.91	9.78	24.84	10.93	25.65	11.68		
3~0.5			24.10	8.06	21.21	10.80	19.23	10.40		
0.5~0	14.07	4.69	9.25	9.54	10.81	10.44	8.87	10.90	8.52	6.47
Total	100.00	5.44	100.00	10.10	100.00	12.91	100.00	12.36	100.00	6.74

Due to the lack of screening literature on >13mm particle size, the content of lump coal cannot be specified while the table shows a low ash content of raw coal.

II. Float-and-sink Analysis on Screening

With no large-sample analysis for Murray River, no literature on the ash content and screening float-and-sink of the raw coal to be washed is available as the criteria in the design. Therefore, the literature needed in coal quality calculation is indirectly obtained for the design from analysis literature on drilled coal of Murray River provided by the employer.

Reference literature is as follows:

1) The exploitation planning chart of the entire mine in service life ten years after it's put into production. It shows the positions of different work faces in various coal beds

2) The sequential chart of work faces of the entire mine in service life ten years after it's put into production. In light of the chart above, it shows the planned exploiting year of different work faces of various coal beds

3) The tunnel layout and machine location plan of the mining area. It shows the location of drilling holes on exploiting face

4) The bar chart of different drilling holes, totally 19 charts,

5) The summary sheet of Canadian coal quality tests. Coal quality of different drilling holes (19 holes) in Document 3 is analyzed and summarized according to different coal beds.

1. Ash Content of Raw Coal

According to Document 1 and 2, the coal beds to be exploited in the first ten years are D, E, F and J, with details as follows.

Table 2-10 Mining Work Face in the First Ten Years

采区名称		序号	工作面编号	走向长度(m)	年推进度(m)	年产量(万t)	服务年限(a)	工作面接替顺序 单位:年									
								1	2	3	4	5	6	7	8	9	10
一盘区综采工作面	D煤东翼	1	D1101	2156	3696	224	0.58										
		2	D1102	2097	3696	224	0.57										
		3	D1103	1835	3696	224	0.50										
		4	D1104	1574	3696	224	0.43										
		5	D1105	1467	3696	224	0.40										
	F煤西翼	6	F1201	830	3696	224	0.22										
	B煤东翼	7	B1101	1468	3696	224	0.40										
		8	B1102	2212	3696	224	0.60										
二盘区综采工作面	D煤西翼	9	D2201	2303	3696	224	0.62										
		10	D2202	2797	3696	224	0.76										
	B煤西翼	11	B2201	2262	3696	224	0.61										
		12	B2202	2668	3696	224	0.72										
	F煤西翼	13	F2201	2420	3696	224	0.65										
		14	F2202	2791	3696	224	0.76										
		15	F2203	2835	3696	224	0.77										
		16	F2204	2664	3696	224	0.72										
一盘区大采高工作面	J煤西翼	17	J1201	2623	2640	375	0.99										
		18	J1202	2525	2640	375	0.96										
		19	J1203	2427	2640	375	0.92										
		20	J1204	1768	2640	375	0.67										
		21	J1205	860	2640	375	0.32										
	F煤东翼	22	F1101	2175	3168	359	0.69										
		23	F1102	2115	3168	359	0.67										
		24	F1103	1854	3168	359	0.58										
		25	F1104	1593	3168	359	0.50										
		26	F1105	1486	3168	359	0.47										
	J煤东翼	27	J1101	2138	2640	375	0.81										
		28	J1102	2078	2640	375	0.79										
		29	J1103	1817	2640	375	0.69										
		30	J1104	1555	2640	375	0.59										
		31	J1105	1448	2640	375	0.55										

采区名称	Name of mining zone
一盘区综采工作面	Fully-mechanized work face of Panel 1
二盘区综采工作面	Fully-mechanized work face of Panel 2
一盘区大采区高工作面	High wok face of large mining zone of Panel 1
序号	Serial number
工作面编号	Number of work face
走向长度	Horizontal length
年推进度	Annual progress
年产量	Annual output
服务年限	Service life
工作面接替顺序	Arranging sequence of work face
D 煤东翼	East wing of coal bed D

The reference documents 1-4 show: the drilling hole of different coal beds for exploiting in the 1st ten years, with the ash content analysis as follows:

1) In the coal bed D, there are six drilling holes i.e. H15, H17, H19, B060A093P03, P1R35 and H5 on the mining work faces in the 1st ten years. Document 5 lists out the analysis on coal samples of three drilling holes i.e. H15, H17 and H5 in drilled coal analysis of the coal bed D while doesn't cover others. The ash content of the coal bed D is derived from the coal bed thickness and related ash content of three drilling holes listed above in weighted average method: 7.86%.

Table 2-11 Ash Content of Drilled Coal of Coal Bed D

Hole number	Coal bed thickness /m	Ash content /%
H15	2.37	5.07
H17	1.3	4.87
H5	0.78	21.32
Weighted average	4.45	7.86

2) In the coal bed E, there are four drilling holes i.e. H5, DDH-79-2, P1R35 and B060A093P03 on the mining work faces in the 1st ten years, which aren't included in Document 5. Two drilling holes i.e. H15 & H6 are close to each other, of which coal sample analysis is listed in Document 5. Therefore, the drilling holes H5 & H6 are used instead. The ash content of the coal bed E is derived from the coal bed thickness and related ash content of drilling holes in weighted average method: 22.19%

Table 2-12 Ash Content of Drilled Coal of Coal Bed E

Hole number	Coal bed thickness /m	Ash content /%
H15 (in place of)	2.45	13.67
H6 (in place of)	1.15	29.22
	1.08	19.43
	2.98	27.48
Weighted average	7.66	22.19

3) In the coal bed F, there are ten drilling holes i.e. H5, H6, H15, H19, DDH-79-2, P1R35, B060A093P03, H13, H17 and H9 on the mining work faces in the 1st ten years. Document 5 lists out the analysis on coal samples of three drilling holes i.e. H5, H6, H15, H17 and H9 while doesn't cover others. Among the listed drilling holes, the ash content of H5 drilling hole is 46.27%, obviously higher than other drilling holes and cannot be taken as reference. Therefore, the ash content of coal bed F is derived from coal bed thickness and related ash content of the remaining nine drilling holes: 16.06%.

Table 2-13 Ash Content of Drilled Coal of Coal Bed F

Hole number	Coal bed thickness /m	Ash content /%
H5 (delete)	4.22	46.27
H6	1.98	13.47
H15	5.15	19.49
H17	3.52	13.97
H9	1.98	13.47
Weighted average	12.63	16.06

4) In the coal bed J, there are two drilling holes i.e. H11 and H12 on mining work face in the 1st five years, which aren't included in Document 5. Moreover, there are no other drilling holes closely located. Document 5 includes the analysis for the drilling holes H1, H5, H6, H9, H10, H15 and H18 of coal bed J. The ash content of analyzed drilling holes will be used in place of that of drilling holes H11 and H12. Coal bed thickness is taken as reference criteria. The bar chart of various drilling holes in Document 4 reveals that coal bed thickness of coal bed J in drilling hole H11 is 5.4m, that in H12 is 1.65m, closest to the coal bed thickness of H5 and H18. As a result, the ash content derived from coal bed thickness and related ash content of drilling holes H5 and H18 in weighted average method is taken as the ash content of coal bed J: 17.26%. Only the literature of adjacent H15 drilling hole is available for mining work face in later five years, with an ash content of 9.26%. Due to the reasons such as mining continuity of coal bed and the gangue in coal bed, the drilling hole H15 isn't used as design reference. An ash content of 17.26% is taken as integrated ash content for the 1st ten years.

Table 2-14 Ash Content of Drilled Coal of Coal Bed J

Hole number	Coal bed thickness /m	Ash content /%
H15 (delete)	5.73	9.26
H5 (in place of)	5.72	13.53
H18 (in place of)	5.73	20.98
Weighted average	11.45	17.26

The ash content of the coal beds E, F and J derived from drilled coal above is representative by and large and can be used as the criteria for design and calculation. However, ash content of coal bed D is only 7.86% and can hardly work as reference for coal washing. The designers hold opinion that the samples aren't representative or typical. *Coal Exploration Report of Dehua International on Murray River Coalfield* presents an ash content of the raw coal of coal bed D i.e. 4.87-23.93%, with an average of 11.96%, which is taken as the criteria for design and calculation of coal bed D.

2. Screening Literature

Document 5 presents the screening literature of three coal beds i.e. D, E and J as follows.

Table 2-15 Results of Screening Test of Coal Bed D

Hole number	P2R18(H15)	Test number	1014229	Weight of coal sample before screening			1000g	Ash content (Ad)	6.37%
Particle size (mm)	Quantity		Quality						
	Weight (g)	Percentage in the sample (%)	M_{ad} (%)	A_d (%)	V_{daf} (%)	Cinder properties	$S_{t,d}$ (%)	$Q_{b,d}$ (MJ/kg)	$Q_{gr,v,d}$ (MJ/kg)
13~6	855	85.93	0.34	5.56			2.99	34.58	
6~3									
3~0.5									
0.5~0	140	14.07	0.30	4.69			2.12	34.32	
13~0 Total	995	100.00		5.44			2.87	34.55	

Table 2-16 Results of Screening Test of Coal Bed E

Hole number	P2R18(H15)	Test number	1014229	Weight of coal sample before screening			1000g	Ash content (Ad)	6.37%
Particle size (mm)	Quantity		Quality						
	Weight (g)	Percentage in the sample (%)	M_{ad} (%)	A_d (%)	V_{daf} (%)	Cinder properties	$S_{t,d}$ (%)	$Q_{b,d}$ (MJ/kg)	$Q_{gr,v,d}$ (MJ/kg)
13~6	648	32.74	0.33	12.10			0.40	31.20	
6~3	671	33.91	0.48	9.78			0.41	32.57	
3~0.5	477	24.10	0.36	8.06			0.43	33.02	
0.5~0	183	9.25	0.62	9.54			0.44	32.48	
13~0 Total	1979	100.00		10.10			0.42	32.22	

Table 2-17 Results of Screening Test of Coal Bed J

Hole number	P2R18(H15)	Test number	1014229	Weight of coal sample before screening			1000g	Ash content (Ad)	6.37%
Particle size (mm)	Quantity		Quality						
	Weight (g)	Percentage in the sample (%)	M_{ad} (%)	A_d (%)	V_{daf} (%)	Cinder properties	$S_{t,d}$ (%)	$Q_{b,d}$ (MJ/kg)	$Q_{gr,v,d}$ (MJ/kg)
13~6	535	43.15	0.66	15.70			0.18	29.72	

6~3	308	24.84	0.84	10.93			0.21	31.85	
3~0.5	263	21.21	0.78	10.80			0.22	31.83	
0.5~0	134	10.81	0.84	10.44			0.23	32.25	
13~0 Total	1240	100.00		12.91			0.20	30.97	

The original screening literature covers only less-than-13mm particle size while the raw coal to be washed should be broken into a particle size of less than 50mm. Therefore, the screening literature of raw coal with less-than-50mm particle size is derived from the coal sample literature of adjacent coalmine (Willow Creek Mine) and existing raw coal literature of various coal beds as in the following table. The literature of different coal beds is calibrated in conformity with the ash content in the table and used as screening literature of raw coal of the coal bed.

Table 2-18 Screening Literature of Raw Coal in the Design

Particle size		Before calibration	
(mm)	Product name	r %	Ad %
50-1	Coal	60.00	16.70
1-0.25	Coal	20.00	12.60
0.25-0	Coal	20.00	12.30
Total		100.00	15.00

Table 2-19 Screening Literature of Raw Coal of Coal Bed D in the Design

Particle size		Before calibration		After calibration	
(mm)	product name	r %	Ad %	r %	Ad %
50-1	Coal	60.00	16.70	60.00	13.66
1-0.25	Coal	20.00	12.60	20.00	9.56
0.25-0	Coal	20.00	12.30	20.00	9.26
Total		100.00	15.00	100.00	11.96

Table 2-20 Screening Literature of Raw Coal of Coal Bed E in the Design

Particle size		Before calibration		After calibration	
(mm)	product name	r %	Ad %	r %	Ad %
50-1	Coal	60.00	16.70	60.00	23.89
1-0.25	Coal	20.00	12.60	20.00	19.79
0.25-0	Coal	20.00	12.30	20.00	19.49
Total		100.00	15.00	100.00	22.19

Table 2-21 Screening Literature of Raw Coal of Coal Bed F in the Design

Particle size		Before calibration		After calibration	
(mm)	product name	r %	Ad %	r %	Ad %
50-1	Coal	60.00	16.70	60.00	17.76
1-0.25	Coal	20.00	12.60	20.00	13.66
0.25-0	Coal	20.00	12.30	20.00	13.36
Total		100.00	15.00	100.00	16.06

Table 2-22 Screening Literature of Raw Coal of Coal Bed J in the Design

Particle size		Before calibration		After calibration	
(mm)	product name	r %	Ad %	r %	Ad %
50-1	Coal	60.00	16.70	60.00	18.96
1-0.25	Coal	20.00	12.60	20.00	14.86
0.25-0	Coal	20.00	12.30	20.00	14.56
Total		100.00	15.00	100.00	17.26

3. Float-and-sink Literature

The float-and-sink literature of three coal beds i.e. D, E & J are also included in Document 5. See the table as follows.

Table 2-23 Results of 13-0.5mm Float-and-sink Test of Coal Bed D

P2R18(H15)		P2R18(H15)-Q4, Q5		Coal bed					D
Density				Total (%)				Washing density	±0.1 Yield (%)
	Percentage in this level (%)	Percentage in the sample (%)	Ad (%)	Float coal		Sink coal			
				Yield %	Ad%	Yield %	Ad%		
-1.30	80.82	69.26	2.72	80.82	2.72	100.00	6.09	1.30	91.43
1.30~1.40	10.61	9.09	6.86	91.43	3.20	19.18	20.30	1.40	12.79
1.40~1.50	2.18	1.87	13.37	93.61	3.44	8.57	36.94	1.50	2.86
1.50~1.60	0.68	0.58	18.09	94.29	3.54	6.39	44.96	1.60	6.39
1.60~1.70	5.71	4.90	48.16	100.00	6.09	5.71	48.16		
Subtotal	100.00	85.70	6.09						
Slime	0.27	0.23	13.77						
Total	100.00	85.93	6.11						

Table 2-24 Results of 13-0.5mm Float-and-sink Test of Coal Bed E

P2R18(H15)		P2R18(H15)-Q6			coal bed			E
Density				Total (%)				
	Percentage in this level (%)	Percentage in the sample (%)	Ad (%)	Float coal		Sink coal		Washing density	±0.1 Yield (%)
				Yield %	Ad%	Yield %	Ad%		
-1.30	59.88	54.24	3.32	59.88	3.32	100.00	9.87	1.30	86.89
1.30~1.40	27.01	24.47	14.45	86.89	6.78	40.12	19.64	1.40	33.06
1.40~1.50	6.05	5.48	22.25	92.94	7.79	13.11	30.33	1.50	8.53
1.50~1.60	2.48	2.25	28.24	95.42	8.32	7.06	37.26	1.60	4.07
1.60~1.70	1.59	1.44	36.91	97.00	8.79	4.58	42.14	1.70	4.58
1.70~1.80	3.00	2.71	44.92	100.00	9.87	3.00	44.92		
Subtotal	100.00	90.58	9.87						
Slime	0.19	0.17	14.83						
Total	100.00	90.75	9.88						

Table 2-25 Results of 13-0.5mm Float-and-sink Test of Coal Bed J

Density				Total (%)				Washing density	±0.1 Yield (%)
	Percentage in this level (%)	Percentage in the sample (%)	Ad (%)	Float coal		Sink coal			
				Yield %	Ad%	Yield %	Ad%		
-1.30	13.40	11.88	2.58	13.40	2.58	100	13.13	1.30	64.58
1.30~1.40	51.18	45.36	6.09	64.58	5.36	86.60	14.76	1.40	63.03
1.40~1.50	11.85	10.50	14.64	76.43	6.80	35.42	27.29	1.50	17.34
1.50~1.60	5.49	4.87	21.74	81.92	7.80	23.57	33.65	1.60	11.31
1.60~1.70	5.81	5.15	25.34	87.73	8.96	18.08	37.27	1.70	8.14
1.70~1.80	2.32	2.06	32.92	90.05	9.58	12.27	42.93	1.80	4.97
1.80~1.90	2.64	2.34	36.14	92.70	10.34	9.95	45.27	1.90	1.69
1.90~2.00	1.69	1.50	40.18	94.39	10.87	7.30	48.57	2.00	5.61
+2.00	5.61	4.97	51.10	100.00	13.13	5.61	51.10		
Subtotal	100.00	88.63	13.13						
Slime	0.63	0.56	14.94						
Total	100.00	89.19	13.14						

The float-and-sink literature calibrated in accordance with the ash content of different coal beds is included in the table as follows. The calibrated float-and-sink literature is taken as the criteria for calculation of various coal beds. With no original float-and-sink literature of coal bed F available, due to the fact that work face of the coal bed F is adjacent to the coal bed E, the calibrated original float-and-sink literature of the coal bed E is used for the coal bed F instead.

Table 2-26 Calibrated 50-0.25mm Float-and-sink Literature of Coal Bed D

Density kg/L	>0.25mm			Total float		Total sink	
	Percentage in this level %	Percentage in the sample %	Ad,%	Percentage in this level %	Ad,%	Percentage in this level %	Ad,%
-1.30	73.67	58.77	2.72	73.67	2.72	100.00	12.63
1.30~1.40	9.67	7.72	6.86	83.34	3.20	26.33	40.36
1.40~1.50	1.98	1.58	13.37	85.33	3.44	16.66	59.81
1.50~1.60	0.62	0.49	18.09	85.95	3.54	14.68	66.08
1.60~1.70	5.21	4.16	48.16	91.15	6.09	14.06	68.20
+1.70	8.85	7.06	80.00	100.00	12.63	8.85	80.00
Subtotal	100.00	79.78	12.63				
Slime	0.27	0.22	13.77				
Total	100.00	80.00	12.64				

Table 2-27 Calibrated 50-0.25mm Float-and-sink Literature of Coal Bed E

Density kg/L	>0.25mm			Total float		Total sink	
	Percentage in this level %	Percentage in the sample %	Ad,%	Percentage in this level %	Ad,%	Percentage in this level %	Ad,%
-1.30	48.77	38.94	3.32	48.77	3.32	100.00	22.88
1.30~1.40	22.00	17.57	14.45	70.77	6.78	51.24	41.50
1.40~1.50	4.93	3.93	22.25	75.70	7.79	29.24	61.85
1.50~1.60	2.02	1.61	28.24	77.72	8.32	24.31	69.88
1.60~1.70	1.30	1.03	36.91	79.02	8.79	22.29	73.65
1.70~1.80	2.44	1.95	44.92	81.46	9.87	20.99	75.92
>1.8	18.55	14.81	80.00	100.00	22.88	18.55	80.00
Subtotal	100.00	79.85	22.88				
Slime	0.19	0.15	14.83				
Total	100.00	80.00	22.87				

Table 2-28 Calibrated 50-0.25mm Float-and-sink Literature of Coal Bed F

Density kg/L	>0.25mm			Total float		Total sink	
	Percentage in this level %	Percentage in the sample %	Ad,%	Percentage in this level %	Ad,%	Percentage in this level %	Ad,%
-1.30	54.02	43.13	3.32	54.02	3.32	100.00	16.74
1.30~1.40	24.37	19.46	14.45	78.38	6.78	45.99	32.49
1.40~1.50	5.46	4.36	22.25	83.84	7.79	21.63	52.82
1.50~1.60	2.24	1.79	28.24	86.08	8.32	16.17	63.14
1.60~1.70	1.43	1.15	36.91	87.51	8.79	13.93	68.75
1.70~1.80	2.71	2.16	44.92	90.22	9.87	12.50	72.40
>1.8	9.79	7.82	80.00	100.00	16.74	9.79	80.00
Subtotal	100.00	79.85	16.74				
Slime	0.19	0.15	14.83				
Total	100.00	80.00	16.74				

Table 2-29 Calibrated 50-0.25mm Float-and-sink Literature of Coal Bed J

Density kg/L	>0.25mm			Total float		Total sink	
	Percentage in this level %	Percentage in the sample %	Ad,%	Percentage in this level %	Ad,%	Percentage in this level %	Ad,%
-1.30	12.74	10.13	2.58	12.74	2.58	100.00	17.95
1.30~1.40	48.67	38.69	6.09	61.41	5.36	87.26	20.20
1.40~1.50	11.27	8.96	14.64	72.68	6.80	38.59	37.99
1.50~1.60	5.22	4.15	21.74	77.90	7.80	27.32	47.62
1.60~1.70	5.53	4.40	25.34	83.43	8.96	22.10	53.74
1.70~1.80	2.21	1.76	32.92	85.64	9.58	16.57	63.21
1.80~1.90	2.51	2.00	36.14	88.15	10.34	14.36	67.87
1.90~2.00	1.61	1.28	40.18	89.76	10.87	11.85	74.60
+2.0	10.24	8.14	80.00	100.00	17.95	10.24	80.00
Subtotal	100.00	79.85	16.74				
Slime	0.19	0.15	14.83				
Total	100.00	80.00	16.74				

III. Washability Analysis

According to the calibrated screening and float-and-sink literature of raw coal, the washability is analyzed as follows:

Table 2-30 Washability Analysis List of 50-0.25mm Raw Coal of Coal Bed D

Density	Integral level		Total float		Total sink		δ±0.1 content		Heavy & light product deducted Y %	Washability
	Percentage in this level %	Ad %	R %	Ad %	R %	Ad %	δ	Y %		
-1.30	73.67	2.72	73.67	2.72	100.00	12.63	1.30	46.51	51.02	Extremely hard to wash
1.30~1.40	9.67	6.86	83.34	3.20	26.33	40.36	1.40	11.66	12.79	Moderately washable
1.40~1.50	1.98	13.37	85.33	3.44	16.66	59.81	1.50	2.60	2.86	Easy to wash
150~1.60	0.62	18.09	85.95	3.54	14.68	66.08	1.60	5.83	6.39	Easy to wash
1.60~170	5.21	48.16	91.15	6.09	14.06	68.20	1.70	9.63	65.63	Extremely Hard to wash
+1.70	8.85	80.00	100.00	12.63	8.85	80.00				
Total	100.00	12.63								

Chart 2-1 Washability Curves of 50-0.25mm Raw Coal of Coal Bed D

Table 2-31 Washability Analysis Sheet of 50-0.25mm Raw Coal of Coal Bed E

Density	Integral level		Total float		Total sink		δ±0.1 content		Heavy & light product deducted Y %	Washability
	Percentage in this level %	Ad %	R %	Ad %	R %	Ad %	δ	Y %		
-1.30	48.77	3.32	48.77	3.32	100.01	22.88	1.30	46.39	56.94	Extremely hard to wash
1.30~1.40	22.00	14.45	70.77	6.78	51.24	41.50	1.40	26.93	33.06	Hard to wash
1.40~1.50	4.93	22.25	75.70	7.79	29.24	61.85	1.50	6.95	8.53	Easy to wash
1.50~1.60	2.02	28.24	77.72	8.32	24.31	69.88	1.60	3.32	4.07	Easy to wash
1.60~1.70	1.30	36.91	79.02	8.79	22.29	73.65	1.70	3.74	15.38	Moderately washable
1.70~1.80	2.44	44.92	81.46	9.87	20.99	75.92	1.80	11.72	48.21	Extremely hard to wash
>1.8	18.55	80.00	100.01	22.88	18.55	80.00				
Total	100.01	22.88								

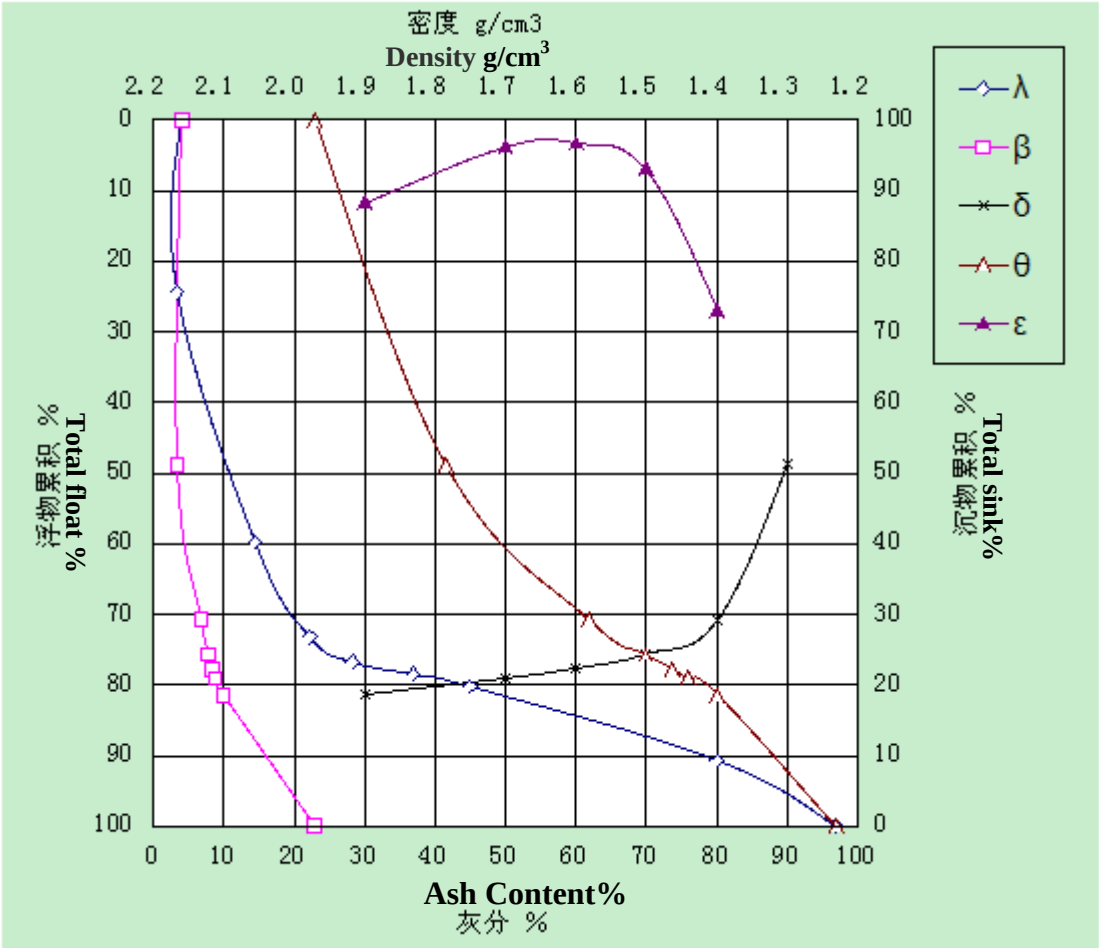


Chart 2-2 Washability Curves of 50-0.25mm Raw Coal of Coal Bed E

Table 2-32 Washability Analysis Sheet of 50-0.25mm Raw Coal of Coal Bed F

Density	Integral level		Total float		Total sink		δ±0.1 content		Heavy & light product deducted Y %	Washability
	Percentage in this level %	Ad %	R %	Ad %	R %	Ad %	δ	Y %		
-1.30	54.02	3.32	54.02	3.32	100.00	16.74	1.30	51.37	56.94	Extremely hard to wash
1.30~1.40	24.37	14.45	78.38	6.78	45.99	32.49	1.40	29.82	33.06	Hard to wash
1.40~1.50	5.46	22.25	83.84	7.79	21.63	52.82	1.50	7.69	8.53	Easy to wash
1.50~1.60	2.24	28.24	86.08	8.32	16.17	63.14	1.60	3.67	4.07	Easy to wash
1.60~1.70	1.43	36.91	87.51	8.79	13.93	68.75	1.70	4.14	25.61	Easy to wash
1.70~1.80	2.71	44.92	90.22	9.87	12.50	72.40	1.80	7.60	47.02	Extremely hard to wash
>1.8	9.79	80.00	100.00	16.74	9.79	80.00				
Total	100.00	16.74								

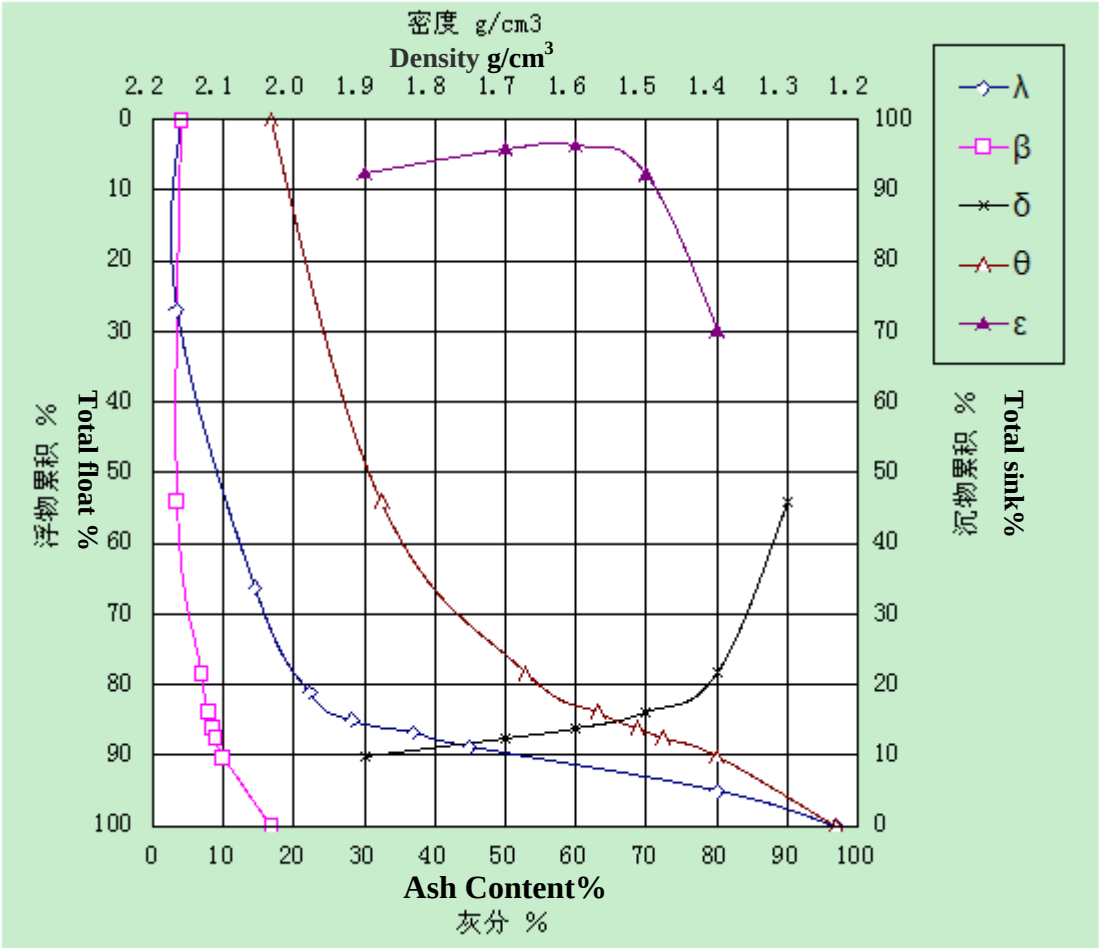


Chart 2-3 Washability Curves of 50-0.25mm Raw Coal of Coal Bed F

Table 2-33 Washability Analysis Sheet of 50-0.25mm Raw Coal of Coal Bed J

Density	Integral level		Total float		Total sink		δ±0.1 content		Heavy & light product deducted Y %	Washability
	Percentage in this level %	Ad %	R %	Ad %	R %	Ad %	δ	Y %		
<1.3	12.74	2.58	12.74	2.58	100.00	17.95	1.30	61.41	68.42	Extremely hard to wash
1.3~1.4	48.67	6.09	61.41	5.36	87.26	20.20	1.40	59.94	66.77	Extremely hard to wash
1.4~1.5	11.27	14.64	72.68	6.80	38.59	37.99	1.50	16.49	18.37	Moderately washable
1.5~1.6	5.22	21.74	77.90	7.80	27.32	47.62	1.60	10.75	11.98	Moderately washable
1.6~1.7	5.53	25.34	83.43	8.96	22.10	53.74	1.70	7.74	28.32	Hard to wash
1.7~1.8	2.21	32.92	85.64	9.58	16.57	63.21	1.80	4.72	17.29	Moderately washable
1.8~1.9	2.51	36.14	88.15	10.34	14.36	67.87	1.90	4.12	15.09	Moderately washable
1.9~2.0	1.61	40.18	89.76	10.87	11.85	74.60	2.00	11.85	43.37	Extremely hard to wash
>2.0	10.24	80.00	100.00	17.95	10.24	80.00				
Total	100.00	17.95								

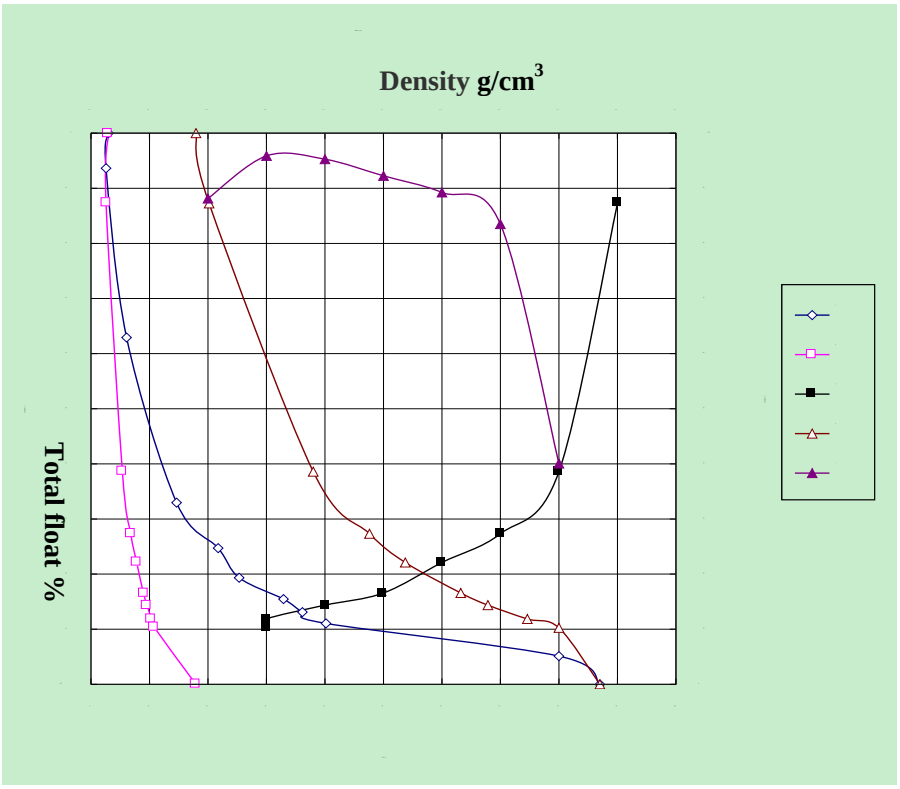


Chart 2-4 Washability Curves of 50-0.25mm Raw Coal of Coal Bed J

IV. Completed Designs

1. The technological flow has been designed and a technological flow diagram has been drawn according to the above-said coal quality analysis and the product specifications of the user;

2. The model of equipment has been selected and list of equipments worked out according to the defined technological flow;

3. The logistics flow of raw coal from the shaft-portal housing to the loading system of the railway has been designed and logistics flow chart defined.

Chapter 3 Coal Washing Process

Coal washing methods are compared and selected as follows:

1. Secondary Two-product Heavy Medium Cyclone for Washing Raw Coal (50-1.0mm)

At present, two mature coal washing methods are mainly used in the world: heavy medium cyclone (HMC) and heavy medium vessel (HMV) for washing.

Heavy medium vessel separator is used in washing 150-13mm lump coal mainly. Actual production of adjacent Teck mine that has run many years proves that the coal in the region features low content of lump coal while high content of slack coal. Moreover, heavy medium vessel has more terrible separating accuracy for smaller particle size. When particle size is less than 13mm, its separating result will fail to meet the product requirement. Therefore, heavy medium vessel separator isn't applicable for the raw coal featuring high content of slack coal in this region. Small content of lump coal can be broken firstly and then separated by heavy medium cyclone. This is the proposal featuring maximum utilization of the equipment and highest efficiency.

Heavy medium cyclone is recommended in this design for washing and separating 50-1.0mm slack coal, with reasons as follows:

- Wider scope of particle size of raw coal available;
- Higher separating accuracy;
- High processing capacity of single equipment, high adaptability for quality change of raw coal;
- Adjustable separating density between 1.4 and 1.9;
- Reliable equipment with simple structure, easy to operate and maintain;
- Mature and reliable equipment, widely applied in Canada.

2. TSS Teetered Bed Separator for Washing 1.0-0.25mm Coarse Slime

The continuous application innovation of the coarse-slime separating process in the world recent years proves that separate washing of coarse and fine slime can effectively improve the screening efficiency of deslime screens and the scraping result of D&R screens, obviously lower medium consumption in production and reduce the load of slime water system and maximize total recovery rate of fine coal. Presently, several methods e.g. slime heavy medium cyclone, slime-sediment teetered bed (TSS) and spiral separator are mainly

applied for separating coarse slime.

Many technological and economic problems in slime heavy medium cyclone system are to be resolved in practical application: strict limits on particle size of medium, ultrafine medium powder in need, such qualified product hardly available in the market and high price; additional medium grinding system is required for coal washing plant, and as a result, higher investment and operating costs are required. Moreover, the recovery and recycle efficiency of ultrafine heavy medium is also a problem unresolved. Magnetite powder of ordinary particle size can hardly ensure efficiency of technical process. The slime heavy medium cyclone and large-diameter pressureless non-desliming heavy medium cyclone are used together in China, instead of separate slime heavy-medium system while their actual separating effect isn't satisfying. Separating density is difficult to control, and separating for density higher than separating density of large cyclone is unavailable. That is to say, equal-border separating cannot be realized. Magnetite powder will be graded and concentrate in slime cyclone and cause problems such as high consumption of production medium. In sum, it isn't widely applied in China.

Spiral separator does separating in virtue of the gravity force with no power in need, is applicable for high-density separating and features a wide scope of particle size for separating. Teetered settling bed for slime features high separating accuracy while its separating process is greatly impacted by particle size. Its separating effect in narrow scope of particle size is better than spiral separator. To obtain better separating result, hole size of deslime screens is defined as 1mm in the design, with separating threshold of larger than 0.25mm. As a result, the scope of particle size of coarse slime entering teetered settling bed becomes narrow. At present, several forms of slime teetered settling bed e.g. TSS, TBS and RC exist. TSS separator is used in this design. On the basis of summing up actual production experiences of slime teetered settling bed, it has improved the structural form and automatic control of the teetered settling bed, with features as follows:

- High adaptability for the feed fluctuation, high-efficient separation available in case of feed change.
- High automation, automatic monitoring and adjustment available for separating density in centralized control room.
- Two differential-pressure detectors in the separator, separating for the whole separating zone available.
- No complicated feed distribution system.

- Round design can ensure the evenness of overflow.
- Ceramic inner lining for grinding part, long service life.

3. Mechanized Slurry Flotation for Washing 0.25-0mm

(1) If the flotation is set up

Although a flotation system increases the investments in equipment and operation, more clean coal can be recovered from fine slime through flotation, will improve the productivity of total clean coal along with other clean coal products and increase the economic benefits of coal washing plant. Moreover, some fine slime is recovered through flotation, and can also reduce the load of slime water system.

(2) Selection of Flotation Equipment

For slime flotation, two proposals i.e. mechanical-agitating slurry flotation and flotation column are compared in the design while the proposal of mechanical-agitating slurry flotation is recommended, with reasons as follows:

The floatability of coal is leveraged. Flotation column is usually used for the slime that can hardly float. In light of good floatability of the slime in the zone, slurry flotation can fully meet the requirement of the process. If flotation column is used for separating, due to the limited section of the column, clean coal that floats up rapidly will surely generate a thick foam layer. Too thick foam layer will impact the overflow ability of foam due to its huge weight, lower the height of trapping area and accordingly, lower the recovery rate of trapping area and the ash content of tailing coal on the contrary.

In comparison with flotation column, slurry flotation feature mature technique, simple structure and more reliable operation.

New-type large-size slurry flotation feature high discharge capacity of ore slurry and can facilitate the process layout and simplify the process system.

Therefore, new-type mechanical-agitating slurry flotation is recommended in the design for processing fine slime.

In sum, the separating methods finalized in the design are:

Two-product heavy medium cyclone for primary re-separating of 50-1.0mm raw coal;

TSS for separating 1.0-0.25mm coarse slime;

Slurry flotation for separating 0.25-0mm fine slime

Chapter 4 Water Content of Product

Water content of product is important parameter influencing the sale of the product. High-efficient dehydrating device can be used in lowering water content of product for the materials with big particle size. However, for slime with small particle size, average dehydrating device can hardly remove the water on the surface, for which additional drying is required.

I. Average Dehydration

1. Clean coal in heavy medium cyclone: HSG1500 horizontal vibrating centrifuge is used for dehydrating, with the product at water content of about 8%;

2. Middling coal in heavy medium cyclone: HSG1500 horizontal vibrating centrifuge is used for dehydrating, with the product at water content of about 8%;

3. Clean coal in TSS: H1000 slime centrifuge is used for dehydrating, with the product at water content of about 14%;

4. Flotation clean coal: quick-opening plate-and-frame filter press is used for dehydrating, with the product at water content of about 19%.

II. Drying Dehydration

The flotation clean coal features a particle size scope of 0.25-0mm. If only quick-opening plate press is used for dehydrating, water content of the product can reach no higher than 19% in normal situation. If it's mixed with other clean coal products for sale, the water content of clean coal as a whole will rise and accordingly, lower the quality of clean coal, increase unnecessary transport burden and cause higher transport cost. Moreover, the product will freeze on the carriage in winter and is difficult to clean during unloading.

The design has fully considered the water content problem of clean coal with small particle size, for which additional dry building of flotation clean coal is provided. In rainy season or winter, flotation clean coal can be directly conveyed to the dry building. With water content of about 14% after drying, the clean coal can be mixed with other clean coal for sale. In other seasons, flotation clean coal can pile up in open air, of which the water content can be lowered through natural air drying before it's mixed with other clean coal for sale. Such design complies with water content specification of clean coal and makes the system flexible in production as well.

The detailed descriptions of desiccation system are in Chapter 5.

Chapter 5 Desiccation System

I. Technological Flow of the Proposal

The principles in defining technological flow of desiccation system:

1. In conformity with the production organization and management of filter press building of flotation clean coal;

2. Efficient production organization, labor safety and environmental protection measure;

3. Adoption of new technique and new equipment, higher processing efficiency.

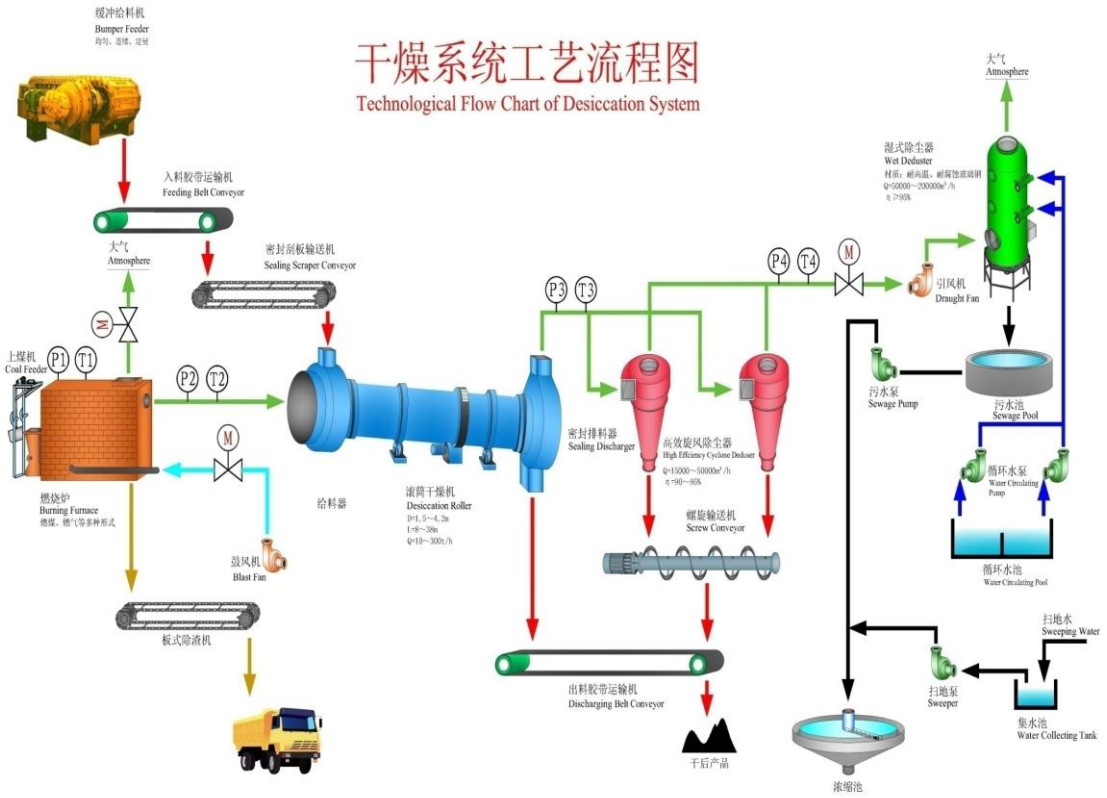


Chart 5-1 Technological Flow Chart of Desiccation System

Raw material of desiccation system (flotation clean coal) is loaded into an airtight scraper conveyer with cast-stone liner via one rubber-belt conveyer and then fed into roller dryer. The product after drying is delivered by a rubber-belt conveyer onto clean coal belt. Air flow is: cold air enters a burner via blast blower and fan set and is heated by burner into high-temperature air that enters roller dryer. Once high-temperature air qualified for drying completes a heat exchange with the wet flotation clean coal, it is discharged into the atmosphere through discharge device, cyclone dust catcher, draught fan and wet-type dust

catcher. The tail gas after treatment is in conformity with Canadian environmental protection policies in respect of various indices.

II. Environmental Protection

The desiccation system mainly processes the flotation clean coal. Due to high water content in flotation process, the flotation clean coal cannot be transported to other places through the storage, loading and transport system. Dry treatment can ultimately improve storage, loading and transport properties of the material. It not only effectively utilizes the coal resources, but also changes unfavorable material storage, transport and sale situation fundamentally, greatly improves the environments of the mine area. The project itself can be treated as environment-protecting project.

1. Waste Gas

Main pollutant of desiccation system is waste gas, mainly including carbon dioxide, small amount of sulfur dioxide, nitrogen oxides, dust and water vapor. Each project has different drying materials, different water vapors as well as different sulfur and nitrogen contents in the fuel. As a result, the components of waste gas are different. In the design, cyclone dust catcher is used in recovering small (tiny) particles in waste gas in virtue of centrifugal force, and the recovered part is also product. The rest of waste gas enters water bath for dust removal and is further purified. The waste gas is discharged into atmosphere after purified in conformity with the standards. In the selection of equipment model, the volume and concentration of waste gas is calculated in conformity with the nature of material and the degree of dryness. The calculation result is multiplied with proper coefficient as per the experiences. According to the result, the models of draught fan, cyclone dust catcher, water-bath dust catcher and water pump are selected. The assembly after the models are defined can meet the demands for purifying waste gas. Average waste gas with dust concentration of lower than 100mg/m3 and Lingeman black degree lower than Level-I is completely in conformity with Level-II standards in Chinese GB16297-1996 *Integrated Criteria on the Emission of Air Pollutants* and the indices in Canadian regulations.

2. Waste Water

The sewage of desiccation system mainly comes from wet-type dust catcher. Most sewage of dust catcher is recycled for re-use. High-consistency sewage is pumped by water pump into the slime/water treatment system of coal washing plant nearby for secondary treatment, and the system discharges no waste water into the outside. Additionally, one water-collecting basin and one cleanup pump are to be installed at proper site of the building

during the construction, which pumps cleanup weeping water and the accumulated water in the ditch in dry building into slime water system of coal washing plant for treatment.

Adequate effective measures will be taken for dust & noises control of desiccation system in order to prevent the impact on the surrounding environment. Additionally, relevant technical measures on environmental protection & labor safety are planned for high-temperature, high-humidity and high-dust drying operation.

3. Noises

The sources of environmental noises of the project mainly include one MGT3620 roller dryer, one Y4-73 draught fan, one G4-73, one set of air fan unit, two recycling water pumps and one cleanup pump in the building. For the purpose of reducing the noises, vibration-absorptive foundations are installed for different equipments in the building. Deadening treatment is done for internal and external wall of different vessels. Soft rubber joint is installed between water pump and inlet & outlet pipelines. The pump foundation is provided with rubber cushion or spring vibration damper. The outlet of draught fan is connected via soft material. Wet dust catcher is installed behind draught fan with deadening treatment to be done. Sound-insulating window and door are used in the building. With the above-said treatment, the noises one meter away from the building is lower than 70dB (A) and in conformity with environmental protection requirements.

Chapter 6 Detailed Description on Technological Flow

I. Heavy-medium System

The raw coal (50-0mm) in the main plant is firstly deslimed by raw coal deslime screens with screen size of 1.0mm. The deslimed material on the screens (50-1.0mm) enters heavy medium system for separating and the material below the screens (1.0-0mm) enters slime water system for new treatment.

After desliming, 50-1.0mm raw coal enters a primary heavy medium cyclone sump, and is mixed with the medium and then pumped into the primary heavy medium cyclone for separating two products i.e. clean coal and primary refuse. Clean coal is medium-drained & dehydrated by fixed screen and SD banana screen (with screen size of 1.0mm), of which material on the screens is dehydrated in clean coal centrifuge and treated as clean coal product; primary refuse is medium-drained and dehydrated by straight-line screen and fed into secondary heavy medium cyclone sump, and is mixed with the medium and then pumped into secondary heavy medium cyclone for separating two products i.e. middling coal & refuse. Middling coal is medium-drained and dehydrated by fixed screens and SD banana screen (with screen size of 1.0mm), and then dehydrated by middling coal centrifuge and treated as middling coal product; refuse is medium-drained by refuse D&R screens(with screen size of 1.0mm) and treated as refuse product for discharge.

II. Coarse Slime Separating System

The material below deslime screens is 1.0-0mm, enters slime sump and is pumped into the raw coal classifying cyclone and classified as per 0.25mm into two parts including 1.0-0.25mm underflow and 0.25-0 mm overflow. The underflow enters TSS separator for separating and clean coal product in TSS is pre-dehydrated by sieve-bend screen and further dehydrated by slime centrifuge and treated as clean coal product. TSS tailing coal is dehydrated by H-frequency screen and mixed with the reject of heavy medium system and all treated as reject product.

III. Fine Slime Separating System

The overflow of classifying cyclone, water below sieve-bend screen and liquid of slime centrifuge are blended and then mixed with float agent by ore-slurry pre-treating device and enter slurry flotation. The flotation will generate two products i.e. clean coal and tailing coal. Flotation clean coal dehydrated by plate-and-frame filter press can not only fall on the belt of

dry building and be further dried and added into clean coal, but also fall on the belt of the pileup site of flotation clean coal, be dried by natural air drying and added into clean coal.

IV. Slime Water-treatment

The water below H-frequency screen, flotation tailing and others all enter 35m-diameter thickener. After the concentration and clarification, -0.25mm-slime water overflows as clarified water & return to the system; the underflow of thickening device is discharged by underflow pump to tailing coal filter press building. After press-filtration and dehydration, tailing slime is added into refuse for disposal. The slime water can recycle to the system after it is clarified.

V. Medium Purifying and Recovery

Some qualified medium of D&R screens enters medium bleed box, of which the density is automatically adjusted as per the preset. Part of qualified medium enters dilute medium sump along with dilute medium of D&R screens. The bulk of the medium returns to heavy medium cyclone sump as per the preset proportion and is used in separating operation of heavy medium system; among the rest, qualified medium of primary D&R screens enters primary heavy medium cyclone sump. Qualified medium of secondary D&R screens enters secondary heavy medium cyclone sump. Dilute medium is pumped into magnetic separator for purifying and recovering, of which fine ore in magnetic separation enters qualified medium sump while tailing ore is used as flushing water of raw coal deslime screens. An Automatic density control system comprising density meter, automatic water valve and bleed box is able to realize the automatic adjustment of density.

Chapter 7 Detailed Description on Material Flow

I. Raw Coal Storage and Transport System

The raw coal of coal washing plant is from Murray River mine in the same industrial square. Once raw coal reaches the ground from the shaft, it's conveyed via belt to raw coal storage yard for storage. The raw coal in coal storage yard is sent by the belt machine to separating & breaking building.

II. Raw Coal Preparation System

The raw coal in separating and breaking building is classified by raw coal classifying screen (50mm), of which the material on the screen (>50mm) is broken by selective crushing machine to be less than 50mm, and mixed with the raw coal (50-0mm) below classifying screen, then classified by raw coal washing and classifying screen with screen size of 8mm (it can be adjusted to 13mm according to coal quality and demands of users in the market). The material on the screen (50-8mm) is conveyed by belt machine to the separating system of main building for separating. -8mm slack coal is directly treated as product and sold along with clean coal. Moreover, the slack coal (-8mm) can also be wholly or partially washed because the system is flexible.

III. Primary Washing System

After being washed and separated by primary washing system, raw coal has totally four products i.e. clean coal, middling coal, refuse and tailing slime.

IV. Product Storage & Transport System

Clean coal product is conveyed by plant-shipment belt to clean coal storage yard for storage or sent by the belt to rapid loading system of the railway for outbound railway transport.

Middling coal product is conveyed by plant-shipment belt to middling coal storage yard or sent by conveying belt to clean coal storage yard and then transferred to rapid loading system of the railway for outbound railway transport.

Refuse is conveyed by plant-shipment belt to refuse pileup yard.

Flotation clean coal can fall on the pileup yard for natural drying so as to further lower its water content and then fall on a belt between clean coal and clean coal storage yard. It can also enter dry building directly and be added into clean coal for sale after drying.

Tailing slime is pumped by underflow pump of thickening machine into filter press

building of tailing coal, and dehydrated and added into refuse and conveyed to refuse pileup yard. Clarified water can recycle to the system for re-use.

Chapter 8 Electric

1. Electric Power Source and Voltage Class

Voltage class of the equipment of coal washing plant is: high-voltage equipment 10KV, low-voltage equipment of production system 660V, and control, repair and lighting 380/220V.

Coal washing plant is provided with 10KV high-voltage power room, of which two-loop power source is input from private 10kV bus section of the substation of the shaft.

2. Electric Power Load and Electricity Consumption per 1t Coal:

The electric power load and electricity consumption of coal washing plant is estimated as follows:

Total capacity of the equipment: 15876.88kW

Working capacity of the equipment: 15571.78kW

If demand factor is taken into account:

Active power: 11027.35 kW

Reactive power: 4827.31 kVar

Apparent power: 12037.66 kVA

Natural power factory (after low-voltage compensation): 0.916

Electricity consumption per 1t coal: 9.7 kWh/t

3. Location of the Substation

Coal washing plant is installed with three power rooms as follows: high- and low-voltage power room of main plant, low-voltage power room of separating & breaking building and high- and low-voltage power room of loading station.

1) High- and Low-voltage Power Room of Main Plant

The power room is built up beside the flotation filter-press building and comprises 10KV high-voltage power room, 660V low-voltage power room & 380V low-voltage power room. High-voltage system of the power room provides power source and distribution for high-voltage motor, vehicle-loading station and relevant power rooms of the whole plant; 660V low-voltage distribution system provides power source and distribution for the production equipments of main plant, flotation building, dry building, clean coal storage yard and relevant transport system; 380V distribution system provides power source for control, repair and lighting of the above-said buildings.

In adoption of two-supply single-bus section-by-section wiring, 10kV high-voltage

system will employ KYN28 midship handcart cabinet as high-voltage switch cabinet with operating voltage of DC220V. Two-loop high-voltage power source is input from 10KV substation of the shaft and uses two pieces of YJV22-10kV, 3x240mm^2 cable for power supply.

660V distribution system has power supply of two-supply single-bus section-by-section mode. 380V distribution system features single-supply mode. MNS drawer cabinet is used as distributing cabinet. Low-voltage power room is installed with capacitor compensating unit. S11-Mb airtight transformer is used.

2) Low-voltage Power Room of Separating & Breaking Building

The power room is built up beside the separating & breaking building and comprises 660KV low-voltage power room and 330V low-voltage power room. The inlet power source is input from 10KV high-voltage power room of the main plant. 660V low-voltage distribution system of the power room provides power source and distribution for the production equipments of separating & breaking building, thickener, raw coal storage yard and relevant transport system; 380V distribution system provides power source for control, repair and lighting of the above-said buildings.

660V distribution system has power supply of two-supply single-bus section-by-section mode. 380V distribution system features single-loop supply mode. MNS drawer cabinet is used as distributing cabinet. Low-voltage power room is installed with capacitor compensating unit. S11-Mb airtight transformer is used.

3) High-and Low-voltage Power Room of Vehicle-loading Station

The power room is built up inside vehicle-loading station and comprises 10KV high-voltage power room and 380V low-voltage power room. It employs single-supply mode, of which 10KV high-voltage power source is input from 10KVhigh-voltage power room of main plant through inlet cable. KYN28 midship handcart cabinet is used as high-voltage switch cabinet with operating voltage of AC220V; MNS drawer cabinet is used as low-voltage distribution cabinet and installed with capacitor compensating unit. S11-Mb airtight transformer is used.

Chapter 9 Water Supply, Drainage and Heating

I. Water Supply

1. Water Supply Source

The water of coal washing plant is supplied according to different water quality respectively.

Underground water is used as domestic water for coal washing plant and stored in domestic water tank of the coal washing plant; reused water inside the shaft is used as fire-prevention water, coal-washing makeup water, automobile-rinsing water of the coal washing plant and is input from the water treatment station inside the shaft and stored in the production & fire prevention water tank of coal washing plan; reused water of sewage treatment station of coal washing plant is used in greening and road rinsing and stored in reused water tank of coal washing plant, of which the insufficient part is supplemented by the reused water inside the shaft.

2. Water Consumption

Daily water consumption peak for the production and domestic water supply in the coal washing plant is totally 2541.44m^3, including: domestic water 79.15m^3/d, production water 2130.80m^3/d, unknown water supply 331.49 m^3/d. The details are in Table 9-1 List of Estimated Water Consumptions.

The maximum fire-prevention water consumption of separating & breaking building at one time is calculated for the industrial site of coal washing plant, including:

Water consumption of the hydrants: outdoor hydrants 20L/s, indoor hydrants 10 L/s, fire time 3h;

Water consumption of fire-prevention water curtain: fire-prevention water 7L/s, fire time 1h;

Total fire-prevention water consumption of coal washing plant at one time is 349.2m^3.

3. Water Pressure

To meet different water pressure requirements of coal washing plant, the pressure of various water systems from the industrial site of the shaft to 1# transfer point of the industrial site of coal washing plant are as follows:

Domestic water supply: 0.40MPa;

Production water supply: 0.30Mpa;

Fire-prevention water supply: 0.75Mpa.

4. Water Supply System

1) Domestic water supply system: water intake pipeline and well→ domestic water tank→constant-pressure water supply equipment →various domestic water supply points of coal washing plant

2) Supply system for production & fire-prevention water: production sewage treatment station of the shaft→production & fire-prevention water tank→production water supply points, indoor hydrants and fire-prevention water curtain of coal washing plant

3) Water supply system for ground cleaning: water clarifying tank of thickening building of coal washing plant→rinsing water supply pump→ rinsing water supply pipeline→water supply point of different rinsing sites

4) Fire-prevention system and water supply system: temporary high pressure system is used for fire-prevention water supply of coal washing plant. Outdoor and indoor fire-prevention facilities compose one system. Elevated water tanks ensure pressure and water demands at very start of fire accident at ordinary times, the hydrants of the industrial site of coal washing plant are activated for pressurized fire fight in case of fire.

II. Drainage

1. Domestic Sewage and Waste Water

The sewage and waste water of coal washing plant are about 57.05m3/d and mainly include the drainage of sanitary equipments in the building and washing rooms in the plant. Domestic sewage and waste water are mixed together and trapped in the pipelines, and finally discharged into the sewage treatment station of coal washing plant with processing capacity of 10m3/h after preliminary treatment in septic tank, and are treated in conformity with the quality standards of miscellaneous water in the city and used in plant greening and road rinsing. The details of various drainages are in Table 9-2 List of Drainage Estimates.

2. Rinsing Waste Water

Ground-rinsing waste water is collected and discharged in combined mode of gravity flow and pressure flow. It flows into water-catch pit at the end through natural slope of trestle stand, floor drain and drain ditch in the building respectively and is pressurized and discharged by sewage pump to refuse D&R screens of main plant of coal washing plant and enter slime water-treatment system of coal washing plant and realizes a closed-circuit recycle of production water.

Table 9-1: List of Estimated Water Consumptions

Ref.	Water consumption item	Number of persons in need of water		Water consumption standard	Water consumption time (h)	Water consumption				Notes
		One day and night	Biggest shift			One day and night (m^3)	Hourly unbalanced coefficient	Max hour (m^3/h)	Calculated flow (L/s)	
(I)	Domestic water									
1	Drinking water for clerks in office	69	29	50L/peron. shift	24	4.35	2.5	0.18	0.05	
2	Water supply for mess	69	29	25L/ peron.day	20	3.45	1.5	0.26	0.07	
3	Water supply for bachelors' dormitory	56		100L/ peron.day	24	5.60	2.5	0.58	0.16	
4	Water supply for shower bath			540L/h. (shower set)	3	33.75	1.5	16.88	4.69	
5	Water renewal for boiler				16	32.00	—	2.00	0.56	
6	Subtotal					79.15		19.90	5.53	
7	Unknown water consumption			Subtotal x15% calculated		11.87		2.98	0.83	
8	Total								91.02	
(II)	Water supply for production									
1	Water renewal for coal washing			$0.1m^3$/t. coal	16	1818.18	1.0	113.64	31.57	
2	Water supply for spraying dust-removal			$0.3m^3$/h. spraying set	16	240.00	1.0	15.00	4.17	
3	Water supply for rinsing automobile	20 (vehicles)		500L/vehicle.time	2	1.50	1.5	1.13	0.31	Automobile rinsing one time weekly
4	Road watering	21460m^2		2.0L/m^2.d	4	42.92	1.0	10.73	2.98	2 times per day, two hours per time
5	Greening	28200m^2		1.0L/m^2.d		28.20	1.0	7.05	1.96	2 times per day, two hours per time
6	Subtotal					2130.80		147.55	40.99	
7	Unknown water consumption			Subtotal x15% calculated		319.62		22.13	6.15	
8	Total					2450.42		169.68	47.13	
(I) +(II)						2541.44		192.56	53.49	

Table 9-2: List of Drainage Estimates

Ref.	Drainage item	Drainage reduction coefficient	Hourly varying coefficient	Drainage capacity		Notes
				m^3/d	m^3/h max	
(I)	Domestic drainage	0.95	2.50	4.13	0.43	
1	Domestic drainage from employees	0.85	1.50	2.93	0.37	
2	Domestic drainage from mess	0.95	2.50	5.32	0.55	
3	Drainage from bachelors' dormitory	0.95	1.00	32.06	16.88	
4	Drainage from bath room			4.00	0.20	
5	Drainage of boiler room			48.44	18.43	Technological process literature
	Subtotal	0.95	2.50	4.13	0.43	
6	Unknown drainage	15% calculated		7.26	0.72	
	Total			55.70	19.15	
(II)	Oil-contained sewage					
1	Automobile-rinsing drainage	0.80	1.00	1.35	1.13	Technological process literature
2	Subtotal			1.35	1.13	
	Total of (I) and (II)			57.05	20.28	

2. Closed-circuit Recycle of Coal Washing Plant

Raw coal is sent by the belt conveyer into the plain plant for washing. In the washing process, the system will generate slime water containing -0.25mm coal (high frequency screen effluent, tailing flotation water, fine coal plate press effluent and tailing plate press effluent), which is collected and enters thickener for settlement through the pipelines. The underflow of thickener is pumped into tailing plate building for plate-press recovery treatment, in which filter cake is included in refuse for discharge and tailing plate press effluent is recycled to thickener in closed circuit. Clarified water can be re-used in the system.

Ground-rinsing waste water is collected and discharged in combined mode of gravity flow and pressure flow. It flows into water-catch pit at the end through natural slope of trestle stand, floor drain and drain ditch in the building respectively and is pressurized and discharged by sewage pump to refuse D&R screens of main plant of coal washing plant and enter slime water-treatment system of coal washing plant and realizes a closed-circuit recycle

of production water.

Table 9-3 Water Balance Sheet of Production System

Water consumption in coal washing		m3/h	Water discharge quantity in coal washing		m3/h
Circulating water	Circulating water in fine coal medium-draining	820	Cyclone system	Water quantity in fine coal	45
	Circulating water in middling coal medium-draining	410		Water quantity in middling coal	8
	Circulating water in refuse medium-draining	410		Water quantity in refuse	16
	Circulating water in raw coal desliming	1088	Coarse slime system	Water quantity in TSS fine coal	24
	TSS water supply	280		Water quantity in TSS middling coal	20
	Water for density adjusting of medium system	20	Flotation system	Flotation fine coal	32
				Flotation tailing coal	27
	Subtotal	3028	Subtotal		172
Clean water	Water makeup of the system	86	Returned clarified water	Circulating water of TSS pump	280
	Water in raw coal	86		Thickener overflow	2748
	Subtotal	172		Subtotal	3028
Total water consumption		3200	Total water discharge quantity		3200

III. Heating

1. Outdoor Meteorological Data

Calculated outdoor temperature for heating	-35℃
Average value of extreme lowest temperature	-41.9℃
Number of days in need of heating	208d (≤+5℃)

2. Heating and Air Conditioning

1) According to the technological requirements and health standards of industrial enterprise, centralized heating is required for the industrial site where some employees usually work or the building with temperature requirement inside.

115-70℃ high-temperature water is used for the heating of production system according to actual situation of the site. Thermal load for heating is calculated as 7883KW in total. A radiating & convective steel radiator is used and has a compression resistance of 1.0MPa.

Each front door of main plant is installed with two heat-air curtains of industrial plant. Each small door is installed with one wall-hung heat-air curtain for preventing the invasion of cold air outdoors.

2) Auxiliary high- and low-voltage power rooms all are provided with electric air heater and air conditioner for heating and cooling. Centralized room is equipped with cabinet air conditioner.

3. Ventilation

1) Overall ventilation is provided for main plant, floatation library and thickening building featuring high residual heat and moisture. The design comprises natural air inlet and mechanized exhaustion at 3-6 times per hour, for which low-noises glass-roof axial-flow fan is employed.

2) Ventilation for electric equipment room: natural air inlet and mechanized exhaustion at 3-6 times per hour is applied for electricity distribution room of the plant, for which low-noises glass-steel axial-flow fan is employed.

3) Natural ventilation mode is usually used for the buildings except the above-said.

4. Dust Removal

The production system will emit coal dust in the production. In order to prevent pervasion of coal dust and ensure safe producing environment and the health of production staff, the equipment and process generating dust should be airtight. Moreover, water spraying for dust removal will play supporting role.

5. Heat Supply Source and Boiler Room Equipments

1) The statistics on total heat loads is in Table 9-4.

Table 9-4 The Statistics on Heat Load

Ref.	Item	Heat consumption value (kW)	Loss of heating network	Heat load (kW)	Notes
1	Heating and ventilation of industrial building	7883	0.20	9459.6	115-70 ℃ high-temperature water
	Total			9459.6	

2) Boiler Model and Quantity

According to the heat load literature, three WNS4.2-1/115/70-Q full-automatic hot-water gas boilers are selected in the design for producing 115/70℃ high-temperature water, which is used in the heating of the building on industrial site.

A makeup water pump is applied in ensuring constant pressure of hot-water heating system, so as to guarantee that the peak of the system isn't empty and pressure at lowest point doesn't exceed pressure-bearing capacity of the radiator.

3) Water Supply Treatment and Pollution Discharge

After it's softened and deoxidized the water supply of boiler features water quality in conformity with local regulations.

4) The boiler room is provided with three steel chimney, of which the height is in conformity with local environmental protection requirements.

5) Automatic Control of Boiler

The water supply pipeline of each boiler is equipped with one set of automatic adjusting device and is able to realize automatic adjustment of water supply.

Chapter 10 Transport

1. Railway Transport

Canadian National Railway (CN Railway) passes through & around most parts of Murray River Coalfield. The coal of the coalfield (clean coal and middling coal) for outbound transport is transported from Tumbler Ridge to Port of Prince Rupert through CN Railway and then to Asia in ships. A new railway loading line is to be built up on the west side of the railway loading line from Teck coal washing plant to Tumbler Ridge. New railway loading station is 630m away from the industrial square of coal washing plant on the southwest. In virtue of vehicle-loading station, clean coal and middling coal of coal washing plant can be loaded for outbound transport through railway.

2. Highway Transport

The mine shaft is accessible mainly through three express highways with asphalt pavement i.e. No.29, 97 & 52 via Tumbler Ridge. In the area, local forest roads and other industrial roads all are available. The traffic conditions are very good. The express highway with asphalt pavement offers a maximum load of 63.5 t. Some forest service roads in existence on the industrial site can be re-built for accessing No.29 highway nearby for the material and equipment of the shaft as well as employees.

3. On-site Transport

The on-site roads are set up according to the demands of industrial site for daily production transport and fire prevention, and are able to link up different function zones inside the industrial site effectively.

Hardened special-purpose sites are planned around main plant, flotation/filter building, middling coal storage yard, repair room & medium warehouse and connected with roads for product & equipment transport.

On-site roads are connected with the existing forest service roads on the northwest and east of the site respectively.

4.0-9.0m-wide road are available inside the industrial site. Pavement structure is: C30 cement concrete pavement with 300mm thickness, and basal layer of graded broken stone with 200mm thickness and cushion layer of natural gravel with 200mm thickness. The structure of hardened site is the same as the road.

Chapter 11 Product Quality

On the basis of specified technological flow and existing coal quality literature, product prediction is done for four coal beds i.e. D, E, F and J. Different predictions are done in conformity with different ash contents of clean coal and thermal values of middling coal.

Table 11-1 Product Prediction on Coal Bed D

coal bed	Clean coal index	Product name	Yield	Output in the 1st ten years	ash content	water content
			r %	10,000t	Ad %	Mt %
D	7.5%	Clean coal	85.36	738	7.52	7.63
		Refuse	14.64	127	37.82	23.89
		Total	100.00	865	11.96	

Note: choose broken workshop < 8 mm partial bypass, 2 of dense medium cyclone is not open, flotation system is not open.

Table 11-2 Product Prediction on Coal Bed E

coal bed	Clean coal index	Product name	Yield	Output in the 1st ten years	ash content	water content
			r %	10,000t	Ad %	Mt %
E	7.5%	Clean coal	65.52	342	7.51	9.98
		Middling coal	8.29	43	26.17	8.96
		Refuse	26.19	137	57.66	21.21
		Total	100.00	522	22.19	
	8%	Clean coal	69.20	361	8.00	9.89
		Middling coal	5.96	31	29.42	8.96
		Refuse	24.84	130	59.99	21.09
		Total	100.00	522	22.19	
	8.5%	Clean coal	72.12	376	8.50	9.83
		Middling coal	3.62	19	35.49	8.96
		Refuse	24.26	127	60.90	20.85
		Total	100.00	522	22.19	
	9.0%	Clean coal	74.44	389	9.00	9.80
		Middling coal	2.36	12	41.01	8.96
		Refuse	23.20	121	62.59	20.65
		Total	100.00	522	22.19	

Table 11-3 Product Prediction on Coal Bed F

coal bed	Clean coal index	Product name	Yield	Output in the 1st ten years	ash content	water content
			r %	10,000t	Ad %	Mt %
F	7.5%	Clean coal	74.02	1291	7.50	10.15
		Middling coal	8.94	156	26.76	8.96
		Refuse	17.04	297	47.63	21.64
		Total	100.00	1744	16.06	
	8%	Clean coal	78.34	1366	7.99	10.02
		Middling coal	5.83	102	30.91	8.96
		Refuse	15.83	276	50.52	21.63
		Total	100.00	1744	16.06	
	8.5%	Clean coal	81.60	1423	8.50	9.95
		Middling coal	2.24	39	30.39	8.96
		Refuse	16.16	282	52.24	20.66
		Total	100.00	1744	16.06	
	9.0%	Clean coal	84.18	1468	9.00	9.93
		Middling coal	0.98	17	37.20	8.96
		Refuse	14.84	259	54.72	20.35
		Total	100.00	1744	16.06	

Table 11-4 Product Prediction on Coal Bed J

Coal bed	Clean coal index	Product name	Yield	Output in the 1st ten years	ash content	water content
			r %	10,000t	Ad %	Mt %
J	7.0%	Clean coal	63.00	1722	7.01	10.43
		Middling coal	14.51	397	18.80	8.96
		Refuse	22.49	615	44.98	21.33
		Total	100.00	2734	17.26	
	7.5%	Clean coal	69.16	1891	7.50	10.15
		Middling coal	9.72	266	21.89	8.96
		Refuse	21.12	577	47.11	21.49
		Total	100.00	2734	17.26	
	8%	Clean coal	73.52	2010	8.01	10.07
		Middling coal	6.57	180	24.84	8.96
		Refuse	19.91	544	48.93	20.89
		Total	100.00	2734	17.26	
	8.5%	Clean coal	76.58	2094	8.50	9.99
		Middling coal	4.24	116	26.88	8.96
		Refuse	19.18	524	50.12	20.75
		Total	100.00	2734	17.26	
	9.0%	Clean coal	79.32	2169	8.99	9.93

		Middling coal	2.39	65	29.24	8.96
		Refuse	18.29	500	51.56	20.60
		Total	100.00	2734	17.26	

The table of mining work face in the 1st ten year reveals that four coal beds will produce 58.65-million-ton raw coal in total. In light of product quality, a summary list is derived in the following. Among the rest, and 7.5% as that of D,E, F & J.

Table 11-5 Integrated Product Prediction of All Coal Beds in the 1st Ten Years

product name	Yield	Output in the 1st ten years	ash content
	r %	10,000t	Ad %
Clean coal	72.67	4262	7.50
Middling coal	7.93	465	23.92
Refuse	19.40	1138	47.48
Total	100.00	5865	16.56

Chapter 12 Scope

The production system, auxiliary producing system, administrative facilities and site facilities of coal washing plant from the head vessel of belt machine of main slant shaft downward to vehicle-loading station of the railway.

I. Production System

1. From wellhead housing of main shaft to trestle stand of raw coal storage yard;
2. Raw coal storage yard
3. From raw coal storage yard to blind pass of 1# transfer point;
4. From 1# transfer point to trestle stand of separating & breaking building;
5. Separating & breaking building;
6. From separating & breaking building to trestle stand of 2# transfer point;
7. From 2# transfer point to trestle stand of 3# transfer point;
8. Main-plant trestle stand of separating & breaking building;
9. Main plant;
10. Thickening building (no roof) and pump room;
11. From main plant to trestle stand of 3# transfer point;
12. From 3# transfer point to trestle stand of 5# transfer point;
13. Flotation/filter building;
14. From flotation/filter building to trestle stand of dry building;
15. Dry building;
16. From flotation/filter building to trestle stand of 4# transfer point;
17. From 4# transfer point to trestle stand at unloading point of flotation clean coal;
18. From coal-receiving point to trestle stand of 5# transfer point;
19. From 5# transfer point to trestle stand of 6# transfer point;
20. From 6# transfer point to trestle stand of middling coal unloading point;
21. From 6# transfer point to trestle stand of clean coal storage yard;
22. Clean coal storage yard;
23. From 7# transfer point to trestle stand of vehicle-loading station;
24. Vehicle-loading station;
25. From main plant to trestle stand of tailing-coal filter press building;
26. Tailing-coal filter press building;
27. From tailing-coal filter press building to trestle stand of 8# transfer point;

28. From trestle stand of 8# transfer point to trestle stand of refuse dump point.

II. Auxiliary System

1. Centralized control room of electricity transforming & distribution;
2. Medium warehouse;
3. Air compressor room;
4. Repair room;
5. Power room of separating & breaking building
6. Power room of vehicle-loading station
7. Boiler room
8. Floatation library

III. Administrative Facilities

1. Joint building of the resting room for temporary on-duty, office and mess

IV. Site Facilities

1. Hardening of the site
2. Roads
3. Drain ditch
4. Side slope

Chapter 13 Equipment Model

I. Equipment Model and Unbalance Coefficient

According to the technological specifications, literature on equipment performance and feed nature, and long-time model selection experiences, both unbalance coefficient and industrial standard are taken into account in the selection of equipment models respectively, including: the model selection of heavy medium separating system is based on the screening structure of raw coal as well as the fluctuation of separating density and screening structure, for which adequate space coefficient is preset. The impact of screening structure fluctuation is also taken into account in the equipment model selection of slime water system.

Unbalance coefficient of equipments is in conformity with the design criteria of coal washing project in Chinese GB 50359-2005.

1) 1.15 is taken for main coal flow system;

2) 1.25 is taken for slime water and medium system;

3) 1.5 is taken for refuse system;

4) 1.5 is taken for breaking equipment system;

5) Unbalance coefficients of other system are in conformity with the design criteria.

The capacity of main equipments is specified in conformity with the fluctuation scope of raw coal quality, changes of separating density and product structure. In equipment model selection of slime water system, the fluctuation of slime volume and impact of refuse argillization have been fully taken into account.

II. Main Equipment

1. Techgart screen classifiers are used for all raw coal classifying screens, raw coal deslime screens, D&R screens, sieve-bend screens & H-frequency screen. Techgart is world-famous specialized screening device manufacturer, of which the product features reasonable structure and is able to process higher volume with the same processing area, so as to reduce the quantity of screen classifiers and facilitate the production management and maintenance.

D&R screens with high processing capacity are able to ensure the medium-draining and dehydrating effect.

2. The products made by the largest cyclone manufacturer Krebs in the world are selected as heavy medium cyclone and classifying cyclone. It has produced over 70,000

cyclones worldwide and sold only over 400 in China.

The structure and parameter of cyclone is optimized in sophisticated technologies, which keep the separating & classifying process in optimal status. The internal lining of cyclone features an integral round sectional structure in need of no mechanical fixing or cementation. With high manufacturing precision, smooth internal surface and smooth joint seam, it provides good classifying efficiency and long service life.

3. Techgart Φ48”x 10’ magnetic separator is selected as dilute medium magnetic separator, and features high processing capacity by single device and low magnetic attenuation rate and is one of the most sophisticated magnetic-separating equipments in the world.

In adoption of sophisticated magnetic circuit design and reasonable vessel layout, it can ensure magnetic separating efficiency >99.8%.

4. Tema centrifuges are selected for all heavy-medium clean coal centrifuges, middling coal centrifuges and slime centrifuges. As one of mature and reliable centrifugal & dehydrating devices in the world, it features good mechanical performance, low failure rate, high processing capacity by single device and simple technological layout, and is equipped with overload, oil pressure and jamming protection.

Table 13-1 List of Main Equipments

Ref.	Cargo name	Model specifications and main technical parameters	Unit	Quantity
ITEM	NAME	SPECIFICATION	UNIT	QTY
I	Raw coal system			
(I)	raw coal storage yard			
1	From wellhead housing of main shaft to the belt of raw coal storage yard	B=1400mm V=3.15m/s L=188 m α=0-16 °	Set	1
2	Activation feeding machine	GDH8	Set	3
3	From raw coal storage yard to the belt of 1# transfer point	B=1400mm V=2.5 m/s L=68 m α=0°	Set	1
(II)	Separating & breaking building			
1	From 1# transfer point to the belt of separating & breaking building	B=1400mm V=2.5 m/s L=162m α=0-16 °	Set	1
2	Raw coal classifying screen	10’ X20’ SDB SD banana screen, screen hole 50mm	Set	1
3	Selective crushing machine of raw coal	12‘X28’	Set	1
4	Raw coal distributor drag conveyer	B=1200mm, L=26.2m,V=0.85m/s,a=0°	Set	1

Ref.	Cargo name	Model specifications and main technical parameters	Unit	Quantity
ITEM	NAME	SPECIFICATION	UNIT	QTY
5	Raw coal deslime screens	BFS3080SD, screen hole 8mm	Set	6
6	Raw coal distributor drag conveyor	Heavy type B=1200mm, L=25m,V=0.85m/s,a=0°	Set	1
7	Slack coal collecting drag conveyer	B=1200mm, L=25m,V=0.76m/s,a=0°	Set	1
II	Primary washing system			
(I)	Main plant			
1	From separating & breaking building to lump coal washing belt of main plant	B=1400mm V=2.5 m/s L=138m α=13.639 °	Set	1
2	Raw coal distributor drag conveyer	B=1200mm, L=31.4m,V=0.76m/s,a=0°	Set	1
3	Raw coal deslime screens	10'x20' S.D B, screen hole 1mm	Set	4
4	Primary heavy medium cyclone	D48,175 SQ. in inlet, 18" V.F.	Set	2
5	Clean coal D&R screens	10'X20' S.D B, screen hole 1mm	Set	4
6	Primary refuse D&R screens	10'X16' S.D.H, screen hole 1mm	Set	2
7	Clean coal centrifuge	BHSG1500	Set	4
8	Secondary heavy medium cyclone	D33-T214, 73 SQ.in inlet, 14 V.F.	Set	2
9	Middling coal D&R screens	10'X20' S.D B, screen hole 1mm	Set	2
10	Refuse D&R screens	10'X20' S.D B, screen hole 1mm	Set	2
11	Middling coal centrifuge	HSG1500	Set	2
12	Dilute medium magnetic separator	φ48“x8‘	Set	8
13	Medium-adding magnetic separator	CTN-1024	Set	2
14	Raw coal classifying cyclone	D15"φ, a group with 8 sets,T123	Set	2
15	TSS slime separator	φ2.4m	Set	4
16	TSS clean coal sieve-bend screen	6'X80XR45	Set	8
17	Slime centrifuge	H1000	Set	4
18	TSS tailing coal H-frequency screen	6'X12' H-frequency Dewatering Screen	Set	4
(II)	Flotation building			
1	Slurry flotation	XJM-S20 model, four vessels, single-vessel capacity 20m^3	Set	6
2	Clean coal plate press	KZG500/2000-U 500M^2	Set	6
3	Clean coal drag conveyer	B=1400mm, L=12.5m,V=0.48m/s a=3°	Set	6
4	Flotation reagent adding system	2.5m^3/0.3m^3	Set	4
(III)	Thickening building			

Ref.	Cargo name	Model specifications and main technical parameters	Unit	Quantity
ITEM	NAME	SPECIFICATION	UNIT	QTY
1	High-efficient thickener	35m-diameter high-efficient thickener, central driving	Set	2
2	Underflow pump of thickener		Set	4
3	Classified water pump		Set	2
(IV)	Tailing coal filter press building			
1	Tailing coal plate press	KZG500/2000-U 500M^2	Set	8
2	Tailing coal drag conveyer	B=1400mm, L=12.5m,V=0.48m/s a=3°	Set	8
III	Product storage & transport system			
(I)	2# transfer station			
1	From separating & breaking building to slack coal belt of 2# transfer station	B=1200mm V=2.5 m/s L=53 m α=3.845 °	Set	1
(II)	3# transfer station			
1	From main plant to clean coal belt of 3# transfer station	B=1200mm V=2.5 m/s L=80 m α=2.273°	Set	1
2	From main plant to middling coal belt of 3# transfer station	B=800mm V=2.5 m/s L=80 m α=2.273°	Set	1
(III)	4# transfer station			
1	From flotation building to the drag Conveyor of 4# transfer station	B=1000mm V=0.76 m/s L=80 m α=0 °	Set	1
(IV)	Fine slime unloading point			
1	From 4# transfer point to the belt of fine slime unloading point	B=1000mm V=2.5 m/s L=125.8 m α=20-0 °	Set	1
(V)	Flotation dry building			
1	From flotation building to feed belt of dry building	B=1000mm L=81，α=15.5°，v=2.5m/s	Set	1
2	Desiccation system		Set	1
(VI)	5# transfer point			
1	From coal-receiving pit to the belt of 5# transfer point	B=1000mm V=2.5 m/s L=182 m α=0-7.33 °	Set	1
(VII)	6# transfer point			
1	From 2# transfer point to the clean coal belt of 6# transfer point	B=1400mm V=3.15 m/s L=448 m α=0-12 °	Set	1
2	From 3# transfer point to middling coal belt of 6# transfer point	B=800mm V=2.5 m/s L=303m α=0-12 °	Set	1
(VIII)	Middling coal unloading point			
1	From 6# transfer point to middling coal belt of middling coal unloading point	B=800mm V=2.5 m/s L=83m α=0 °	Set	1
(IX)	Clean coal storage yard			

Ref.	Cargo name	Model specifications and main technical parameters	Unit	Quantity
ITEM	NAME	SPECIFICATION	UNIT	QTY
1	From 6# transfer point to the belt of clean coal storage yard	B=1600mm V=2.5 m/s L=168m α=12°	Set	1
2	Activation feeding machine	GDH8	Set	3
(X)	Vehicle-loading station of railway			
1	From 7# transfer point to the belt of vehicle-loading station of railway	B=1600mm V=3.15m/s L=709m α=0-2.83 °	Set	1
2	Vehicle-loading station of railway	3000 TPH	Set	1
(XI)	8# transfer point			
1	From main plant to the belt of filter press building	B=1000mm V=2.5 m/s L=66m α=0 °	Set	1
2	From filter press building to the belt of 8# transfer point	B=1000mm V=2.5 m/s L=508m α=-4-0 °	Set	1
(XII)	Refuse unloading point			
1	From 8# transfer point to the belt of refuse unloading point	B=1000mm V=2.5 m/s L=209 m α=0 °	Set	1
IV	Auxiliary production system			
(I)	Compressed air system			
1	Low-pressure air compressor	GA250-7.5	Set	2
2	High-pressure air compressor	GA22-13	Set	2

III. Introduction to Main Equipments

1. Activation Feeding Machine

The purpose of equipment .....feeding of coal-receiving pit

Quantity 6

Equipment model.....GDH8

Feed rate .....normal 1500t-5000/h, maximum 7000t/h

Particle size of feed 300-0mm

Motor .....18.5KW (vibrating motor), 2x22KW (hydraulic pump station motor)

Vibration mode.....shock vibration of eccentric block, interval vibration

Hydraulic system .....two motors and two pumps, one in use another standby

2. Raw Coal Classifying Screen

The purpose of equipment .....raw coal classifying

Quantity 1

Equipment model.....Techgart /DVE banana screen

Equipment specifications 3.0x 6.1m

Level number of screen face...1

Vibrator .....2 sets of DVE 4.1S Vibrator

Slope angle of screen face.....five angles: 30°, 22.5°, 15°, 7.5°, 0°

Frequency.....900r/min

Double amplitude.....10 mm

Supporting device .....seat-type rubber spring

Screen face.....screen size 50 mm

Protecting device.....included

Machine weight 12,020Kg

Motor .....37KW, 1460r/min, 660V, 50Hz, 3-phase, high starting torque, in conformity with Grade-C standards of National Electrical Manufacturers Association, protection grade IP55

Particle size of feed 300-0mm

Processing capacity 1300TPH/set

Equipment features .....1. Heavy-load bracket design, and with rubber gasket. 2. Side drive with universal drive shaft and sliding motor seat. 3. Feed box with wear-resisting lining board. 4. 203mm discharge nozzle with 3/8”-thick wear-resisting lining board. 5. Including motor and triangular belt drive system. 6. Paint coating: blast sanding close to the natural color of the metal: one layer of blue base coat, and one layer of enamel paint with blue luster. 7. With water-retaining board

3. Selective Crusing Machine of Raw Coal

The purpose of equipment .....raw coal breaking

Quantity 1

Equipment model.....12’ X28’

Feed .....raw coal

Particle size of feed 300-0mm

Particle size of discharge .....-50mm

Motor 110KW

Equipment features .....1.Super-large internal bin of the equipment, high processing capacity

2. Specialized feed vessel and discharge vessel

3. Filter board with 150mm screen hole

4. Raw Coal Deslime Screens

The purpose of equipment .....classifying of raw coal to be washed

Quantity 6

Equipment model.....BFS3080SD

Particle size of feed 50-0mm

Screen hole.....8(13) mm

Motor 30KW

Equipment features .....dry-method screening that can smoothly process the material in small particle size

5. Raw Coal Deslime Screens

The purpose of equipment .....raw coal desliming

Quantity 4

Equipment model.....Techgart /DVE banana screen

Equipment specifications 3.0x 6.1m

Level number of screen face...1

Vibrator .....2 sets of DVE 4.1S Vibrator

Slope angle of screen face.....five angles: 30°, 22.5°、15°、7.5°、0°

Frequency.....900r/min

Double amplitude.....10 mm

Supporting device .....seat-type rubber spring

Screen face.....screen size 1 mm

Protecting device.....Included

Machine weight 12,020Kg

motor .....37KW, 1460r/min, 660V, 50Hz, 3-phase, high starting torque , in conformity with Grade-C standards of National Electrical Manufacturers Association, protection grade IP55

Particle size of feed .....50-8(0) mm

Processing capacity 300TPH/set

Equipment features .....1. heavy-load bracket design , and with rubber gasket . 2. Side drive with universal drive shaft and sliding motor seat . 3. Feed box with wear-resisting lining board . 4. 203mm discharge nozzle with 3/8”-thick wear-resisting lining board. 5. Including motor and triangular belt drive system . 6. Paint coating: blast sanding close to the natural color of the metal: one layer of blue base coat, and one layer of enamel paint with blue luster. 7. With water-retaining board

6. Primary Heavy Medium Cyclone

The purpose of equipment ..... primary separating of raw coal

Quantity 2

Equipment model..... DB48 ceramic-internal-lining heavy medium cyclone

Diameter of column segment.. Φ48

Max feeding capacity .....575t/h, 1650 m^3/h

Upper limit of particle size of feed 80 mm

Max medium circulating capacity 1650 m^3/h

Feed pressure. ..... 11 m water-column

Separating density 1.3-1.9

Ep value 0.03-0.04

Installation angle..... 15~18°

Weight ..... about 2,000 kg

Internal lining material ..... wear-resisting ceramics

7. Clean Coal D&R Screens

The purpose of equipment..... dehydrating and medium-draining of clean coal

Quantity 4

Equipment model ..... Techgart /DVE banana screen

Equipment specifications 3.0x 6.1m

Level number of screen face .. 1

Vibrator ..... 2 sets of DVE 4.1S Vibrator

Slope angle of screen face..... five angles: 30°, 22.5°, 15°, 7.5°, 0°

Frequency..... 900r/min

Double amplitude..... 10 mm

Supporting device..... seat-type rubber spring

Screen face ..... screen size 1 mm

Protecting device..... Included

Machine weight 12,020Kg

motor ..... 37KW, 1460r/min, 660V, 50Hz, 3-phase, high starting torque , in conformity with Grade-C standards of National Electrical Manufacturers Association, protection grade IP55

Particle size of feed ..... 50-8(1) mm

Processing capacity 300TPH/set

Equipment features..... 1. heavy-load bracket design , and with rubber gasket . 2. Side drive with universal drive shaft and sliding motor seat . 3. Feed box with wear-resisting lining board . 4. 203mm discharge nozzle with 3/8”-thick wear-resisting lining board. 5. Including motor and triangular belt drive system . 6. Paint coating: blast sanding close to the natural color of the metal: one layer of blue base coat, and one layer of enamel paint with blue luster. 7. With water-retaining board

8. Primary Refuse D&R Screens

Purpose..... dehydrating and medium-draining of heavy product of primary heavy medium cyclone

Quantity 2

Equipment model ..... Techgart straight-line vibrating screen

Equipment specifications ..... 3.0 m×4.8 m

Level number of screen face .. 1

Vibrator ..... twin-G2000 vibration exciter

Frequency..... 900r/min

Double amplitude..... 10 mm

Supporting device..... seat-type steel spring

screen size 1.0mm

Protecting device..... Included

Transport weight ..... about 10,206 Kg

Motor ..... 22KW, 1460r/min, 660V, 50Hz, 3-phase, high starting torque, in conformity with Grade-C standards of National Electrical Manufacturers Association, protection grade IP55

Particle size of feed ..... 50-8(1) mm

Processing capacity 250TPH

Equipment features..... 1. heavy-load bracket design , and with rubber gasket . 2. Side drive with universal drive shaft and sliding motor seat . 3. Feed box with wear-resisting lining board . 4. 203mm discharge nozzle with 3/8”-thick wear-resisting lining board. 5. Including motor and triangular belt drive system . 6. Paint coating: blast sanding close to the natural color of the metal: one layer of white base coat, and one layer of enamel paint with white luster. 7. With water-retaining board

9. Centrifugal Dehydrator of Clean Coal

The purpose of equipment..... clean coal dehydrating by cyclone

Quantity 4

Equipment model ..... HSG1500 horizontal vibrating centrifuge

Equipment specifications ..... screen basket diameter Φ1500 mm

Screen basket seam..... 0.4 mm

Particle size of feed ..... 50-8(0) mm

Motor ..... 3-phase, 50Hz, 660V, IP55, Grade-F insulation

1. Power of primary drive motor: 55KW
2. Vibration drive motor: 5.5KW
3. Oil pump motor: 0.75KW

Protection ..... With a whole set of protection hood

Rotating speed in work..... 297 PRM

Vibration frequency..... 23-26 Hz

Double amplitude ..... 4-6 mm

Centrifugal intensity..... 67 g

Noises ..... ≤85 dB(A)

Weight ..... about 8,250 kg

External dimensions (LxWxH) 2900 x 22154 x 2180 mm

Processing capacity ..... 250 t/h

Water content of feed 12%

Water content of product Mt≤8.0% (water content of surface)

Service life..... running ratio 4200h/a, in normal transport, installation, service and maintenance condition, primary bearing: 3-5 years, internal lining of discharge hood: 3 years, screen basket : 6 months, host: ≥3 years

10. Secondary Heavy Medium Cyclone

The purpose of equipment ....raw coal re-separating

Quantity 2

Equipment model..... D33T124 ceramic-internal-lining heavy medium cyclone

Diameter of column segment Φ33 (diameter 825mm)

Feed capacity .....210t/h, 698 m^3/h

Upper limit of particle size of feed 50 mm

Medium circulating capacity 698 m^3/h

Feed pressure ..... 9.1 m water-column

Separating density 1.3-1.9

Ep value 0.03-0.04

Installation angle.....15-18°

Weight ..... about 1,800 kg

Internal lining material ..... wear-resisting ceramics

11. Middling Coal D&R Screens

The purpose of equipment middling coal dehydrating and medium-draining

Quantity 2

Equipment model ..... Techgart /DVE banana screen

Equipment specifications 3.0x 6.1m

Level number of screen face .. 1

Vibrator ..... 2 sets of DVE 4.1S Vibrator

Slope angle of screen face..... five angles: 30°, 22.5°, 15°, 7.5°, 0°

Frequency..... 900r/min

Double amplitude..... 10 mm

Supporting device..... seat-type rubber spring

Screen face ..... screen size 1 mm

Protecting device..... Included

Machine weight 12,020Kg

motor ..... 37KW, 1460r/min, 660V, 50Hz, 3-phase, high starting torque , in conformity with Grade-C standards of National Electrical Manufacturers Association, protection grade IP55

Particle size of feed ..... 50-8(1) mm

Processing capacity 300TPH/set

Equipment features..... 1. heavy-load bracket design , and with rubber gasket . 2. Side drive with universal drive shaft and sliding motor seat . 3. Feed box with wear-resisting lining board . 4. 203mm discharge nozzle with 3/8”-thick wear-resisting lining board. 5. Including motor and triangular belt drive system . 6. Paint coating: blast sanding close to the natural color of the metal: one layer of blue base coat, and one layer of enamel paint with blue luster. 7. With water-retaining board

12. Refuse D&R Screens

The purpose of equipment..... refuse dehydrating and medium-draining

Quantity 2

Equipment model ..... Techgart /DVE banana screen

Equipment specifications 3.0x 6.1m

Level number of screen face .. 1

Vibrator ..... 2 sets of DVE 4.1S Vibrator

Slope angle of screen face..... five angles: 30°, 22.5°, 15°, 7.5°, 0°

Frequency..... 900r/min

Double amplitude..... 10 mm

Supporting device..... seat-type rubber spring

Screen face ..... screen size 1 mm

Protecting device..... Included

Machine weight 12,020Kg

Motor ..... 37KW, 1460r/min, 660V, 50Hz, 3-phase, high starting torque, in conformity with Grade-C standards of National Electrical Manufacturers Association, protection grade IP55

Particle size of feed ..... 50-8(1) mm

Processing capacity 300TPH/set

Equipment features..... 1. heavy-load bracket design , and with rubber gasket . 2. Side drive with universal drive shaft and sliding motor seat . 3. Feed box with wear-resisting lining board . 4. 203mm discharge nozzle with 3/8”-thick wear-resisting lining board. 5. Including motor and triangular belt drive system . 6. Paint coating: blast sanding close to the natural color of the metal: one layer of blue base coat, and one layer of enamel paint with blue luster. 7. With water-retaining board

13. Dilute Medium Magnetic Separator

The purpose of equipment.....medium recovery

Quantity 8

Equipment model..... Techgart counterflow magnetic separator

Equipment specifications ..... ϕ1220× 2400 mm

Quantity of magnetic pole ..... 6 master magnetic poles, 5 slave magnetic poles

Angle of magnetic pole..... 132°

Magnetic intensity..... 950 Gauss (50mm away from roller surface)

Motor 4KW, IP55, 660V, 50HZ

Processing capacity ..... 240 m^3/h

Recovering rate of magnetic material..... 99.98%

Equipment features: .....

1. 3mm-thick stainless steel vessel wall, full-width feed box;
2. 5mm-thick stainless steel roller surface;
3. Wear-resisting aluminum roller terminal;
4. Low-carbon-steel chassis made of 100×100 hot-rolled square tube, and galvanized;
5. Gear-shift motor in vertical installation;
6. Chain drive device and chain wheel;
7. Discharge interval adjustable;
8. Half-counterflow mode;
9. Heavy-type design;
10. Magnetic pole packaged in stainless steel material;
11. Be installed with rocking arm and adjusting nut, and simple & easy angle adjustment of magnetic pole.

14. Raw Coal Classifying Cyclone

The purpose of equipment..... slime classifying of raw coal

Quantity ..... 2 groups (8 sets/group)

Equipment model.....classifying cyclone with wear-resisting lining

Diameter of column segment..... Φ380 mm

Feed capacity ..... 1558m^3/h

Particle size of feed ..... 1×0 mm

Particle size for classifying..... 0.15 mm

Feed pressure..... 18m water-column

Installation angle..... 90°

Internal lining material .....wear-resisting ceramics

15. TSS Slime Separator

The purpose of equipment..... 1.0-0.25 mm slime separating

Quantity 4

Equipment model..... Φ2400 teetered bed separator

Equipment specifications .....vessel diameter 2400 mm

Volume of ascending water flow.....60m^3/h

Particle size of feed ..... 1.0-0.25 mm

Separating density ..... 1.40/1.90 g/l

Weight ..... 3700 kg

Maximum processing capacity ..... 110 t/h.set

Cofferdam lining board..... ceramics

Equipment features.....

1) Good separating effect within feed particle size scope 3-0.1mm;
2) Valid separating density 1.4-1.9;
3) Separating density completely adjustable;
4) Full automatic control, no manual operation in need;
5) High adaptability for quality change of feed coal;
6) Complicated feed distribution system not in need;
7) Compact design, small installation space;
8) No heavy medium or chemical reagent in need;
9) No power consumption, low equipment maintenance cost.

16. Slime Sieve-bend Screen

The purpose of equipment..... coarse slime dehydration

Quantity 8

Equipment model..... central angle 45°, radius 2032mm

Equipment size..... 1830mm wide

Screen size 0.35mm

Particle size of feed 1.0-0.25mm

Stirring-up mechanism ..... available

Middle partition board..... No

Processing capacity..... 70m^3/h

Equipment features.....

1. Feed box glued with wear-resisting ceramic lining board inside
2. The opening degree of feed mouth equipped with adjusting device, with convenient operation
3. Light and flexible up-turning device, which one worker can operate
4. Specialized stainless steel wedge-shape screen bar, with good geometry and medium-draining effect.

17. Slime Centrifuge

The purpose of equipment..... slime dehydration

Quantity 4

Equipment model..... H1000horizontal vibrating centrifuge

Equipment specifications .....screen basket diameter Φ1000 mm

Screen basket seam..... 0.4 mm

Particle size of feed ..... 1.0-0.25 mm

Motor ..... 3-phase, 50Hz, 660v, IP55, GRADE-F INSULATION

1. Power of primary drive motor: 75KW
2. Oil pump motor : 0.75KW

Protection..... With a whole set of protection hood

Rotating speed in work..... 750 PRM

Centrifugal intensity..... 315 g

Noises ..... ≤85 dB(A)

Weight ..... 3850 kg

Processing capacity 38t/h.set

18. TSS Tailing Coal H-frequency Screen

The purpose of equipment .....TSS tailing coal dehydration

Quantity 4

Equipment model.....high-frequency dehydrating screen

Equipment size.....1.8×3.7m

Level number of screen face...1

Vibration exciter .....G-1000 vibration exciter

Slope angle of screen face.....feed 45°, working segment -5°

Speed.....1100 RPM

Vibration amplitude .....Double amplitude

Vibration-reduction system ...steel spring of the chassis

Screen face.....stainless steel-bar screen plate, screen size 0.35 mm

Protection.....Included

Transport weight .....4990 kg

Motor .....7.5kW, 1500r/min, 660V, 50Hz, protection grade IP55, insulation grade F

Maximum processing capacity 30 t/h

Equipment features .....1. Heavy-type screen-plate supporting structure

2. Oil paint, blast sanding close to nature color of metal, one layer of blue base coat, and one layer of enamel paint with blue luster

3. Revolving motor foundation

4. Transport as a whole

19. Slurry Preparing Device

Equipment model XK-1600

Equipment diameter 3000mm

Equipment Quantity 6

Slurry throughput ..... Q=800m^3/h.set

Motor power..... 22kW

Equipment features ..... slurry preparing device is mature and reliable high-efficient flotation reagent mineralizing equipment. It is used in mixing and mineralizing flotation raw coal and flotation reagent.

20. Slurry Flotations

The purpose of equipment ..... fine slime recovery

Quantity ..... 6 sets (4 vessels each set)

Equipment size..... 15.2×3.7m

Number of vessels..... 4

Volume of single vessel ..... 20 m^3

Maximum processing capacity of single vessel 1t/h(dry coal) , 10 m^3/h(slurry)

Transport weight 120t

Motor ..... mixing mechanism 4x45kW, 980r/min, 660V
drag motor 2x2.2kW, 25r/min, 660V

Equipment features ..... mechanical-agitating slurry flotation is a mature and reliable slime separating device universally accepted in coal washing industry at present. With high processing capacity and adaptability, it can ensure the stable & reliable running of the system.

21. Low-pressure air compressor

Equipment model GA250-7.5

Model ..... single-pole, air cooling, cabinet-type low-noises twin-screw air compressor

Equipment Quantity 2

Air displacement ..... 43.7m^3/min

Highest work pressure..... 0.75Mpa

Motor..... 660V, 250kw, IP55

Equipped air tank ..... C-6/0.8, two sets

Equipment features ..... the unit set equipped with computer control system realizes control & running in full automation, of which the control, protection and maintenance parameters can be set up and major operating parameters are in display. Automatic protection is available in case of failure shutdown, motor overload and startup status of compressor.

22. High-pressure air compressor

Equipment model GA18-13

Model ..... single-pole, air cooling, cabinet-type low-noises twin-screw air compressor

Equipment Quantity 2

Air displacement ..... 2.2m^3/min

Rated work pressure..... 1.5Mpa

Motor 660V, 18.5kw, IP55

Equipment features ..... low rotating speed, low noises, low vibration, complete safety protection measures, high reliability, long service life, low oil consumption, automatic pressure control, simple operation, easy maintenance.

Equipped cold dryer..... RD-2SA, one set

23. Thickener

Equipment model ..... diameter 35m

Model ..... central driving, high-efficient automatic rake-lifting thickener

Equipment Quantity ..... 2 sets (one in use, another in standby)

Slurry processing capacity ..... 1900m^3/h

Processing capacity ..... Q=42TPH

Primary motor 660V, 11KW

Equipment features ..... the thickener in reinforced concrete structure features main driving by hydraulic motor and hydraulic rake lifting mode, of which pressure detector is able to realize remote transmission of pressure signal, and PLC display, automatic elevation of main shaft and rake bracket and failure protection in case of driving device overload and shutdown are available.

24. Membrane Plate-and-frame Filter Press Flotation of Clean Coal

Equipment model KZG500/2000

Equipment Quantity 6

Processing capacity ..... Q=30TPH/set

Filtering area ..... $500m^2$

Capacity of filter chamber ..... $9.96m^3$

Pressing pressure..... 1.0MPa

Filtering pressure 0.8MPa

Motor power of pump station 18.5kW

Taking & drag motor 3.0KW

Circulating times..... 3-6 times/h

Equipment features ..... rapid-opening membrane plate-and-frame filter press, mature and reliable dehydrating equipment, is applicable in the dehydration of raw coal slime & flotation clean coal, especially for dehydration of slime with serious argillization. It can ensure reliable system in operation and is equipment of slime water-treatment system of coal washing plant.

25. Membrane Plate-and-frame Filter Press of Tailing Coal

Equipment model	KZG500/2000
Equipment Quantity	8
Processing capacity	Q=25TPH/set
Filtering area	500m^2
Capacity of filter chamber	9.96m^3
Pressing pressure	1.0MPa
Filtering pressure	0.8MPa
Motor power of pump station	18.5kW
Taking & drag motor	3.0KW
Circulating times	2-4 times/h
Equipment features	rapid-opening membrane plate-and-frame filter press, mature and reliable dehydrating equipment, is applicable in the dehydration of raw coal slime & flotation clean coal, especially for dehydration of the slime with serious argillization. It can ensure reliable system in operation and is equipment of slime water-treatment system of coal washing plant.

26. Medium-adding Magnetic Separator

Equipment model.....CTN-1024

Model..... counterflow roller-type magnetic separator

Equipment Quantity..... 2

Roller diameter..... 1000mm

Roller length..... 2400mm

Processing capacity..... $Q=130m^3/h$

Motor..... 660V, 5.5KW

Chapter 14 Waste Material Management

I. Type of Waste Material

The waste material of coal washing plant can be roughly divided into: waste water, waste gas, solid waste material and noises.

1. Waste Water

Waste water includes domestic sewage and production waste water of coal washing plant.

2. Waste Gas

Waste gas includes the flying dust, coal dust and tail gas generated in boiler's burning in coal washing plant.

3. Solid Waste Material

Solid waste material includes the production & domestic garbage, coal refuse and tailing slime.

4. Noise

Noises include mechanical noises and traffic noises.

II. Construction Stage

1. Waste Material Types in Construction Period

Waste gas mainly includes the flying dust of exposed ground surface in strong winds after the surface soil is removed in the construction of the buildings and roads on the site, smoke and dust from temporary cooking ranges of constructing personnel, and flying dust of building materials in transport, load & unload, flying dust generated by earthwork conveying vehicles, wind-erosion flying dust produced from temporary pileup yard of the materials and cement dust generated in concrete batching plant.

Waste water mainly main comes from rinsing water of building stone and constructing equipments, in which major pollutants are SS, BOD5, COD and petroleum pollutants. Domestic sewage of constructors is little and has major pollutants including SS, BOD5, COD, animal & plant oil, ammonia and nitrogen.

Solid waste material mainly comprises the constructing garbage and little domestic garbage in the construction process of ground buildings. In case of random pileup, solid

waste material will occupy the land, and may pollute soil and water system in rain erosion and tend to cause flying dust pollution in dry windy season. Constructors will produce small amount of domestic garbage.

The main source of noises pollution is mechanical noises and traffic noises in construction process, such as mechanical and vibrating noises generated by concrete mixing machine, vibrating rod, and excavator and material transport process.

2. Management Measures

(1) Prevention Measures of Waste Gas

A. After earthwork is excavated, the excavation should be backfilled in time. The constructing garbage should be conveyed to local garbage treatment yard in time, so as to alleviate the impact on construction area and prevent soil erosion;

B. Specialized pileup yard, instead of any random pileup in open air is required for bulk cement, sand, lime and other building materials which tend to generate flying dust. Moreover, an enclosure structure is required around the pileup yard for the purpose of preventing flying dust and the impact upon surrounding environments;

C. Concrete mixing machine should be installed within specialized site and the building materials such as cement on the ground should be frequently cleaned;

D. For the purpose of preventing secondary flying dust pollution in the transport, construction roads should be regularly watered. In any bold wind weather (wind speed ≥6m/s), earthwork construction should stop, and moreover, the key construction site that tends to generate secondary flying dust pollution should be covered;

E. Overload isn't allowed for the vehicle conveying building materials and facilities. The loading height of vehicles conveying particle materials cannot exceed the wagon box, which shall be tightly covered by tarpaulin and not leak out on the way.

(2) Prevention Measures of Waste Water

The waste water in the construction of the project mainly comes from the construction process such as sand rinsing and concrete mixing, and should be collected and treated. The construction site should be set up with waste water settling tank, where waste water in the construction will be treated in settling method and then re-used in constructing procedure such as mortar mixing.

(3) Prevention Measure of Solid Waste

Building garbage and waste produced in construction are delivered to local garbage treatment yard. In case of temporary pileup of these solid wastes on construction site for

transfer, some measures e.g. tarpaulin cover & watering are required. Random pileup everywhere is prohibited.

(4) Ecological Protection and Restoring Measures

Construction must be strictly confined within the preset construction scope. Any arbitrary expansion of the construction scope even inside the plant isn't allowed. The construction site should be enclosed with color bars. An impact on greening vegetation in the plant should be minimized.

(5) Prevention Measures of Noises Pollution

There are many large-size machines in civil engineering construction and equipment installation. The noises in the construction will exert some impact mainly upon constructors. Prevention measures are required.

A. Construction machines with good performance and low noises are required, for which regular maintenance should be done for keeping low noise level;

B. A rotatory working system is required for machine operators, so as to reduce the time of the workers in touch with high noises. Moreover, protective earplug is required in the operation;

C. A reasonable construction schedule is required. High-noises equipment should run in daytime, instead of at night. Transport vehicles should enter and leave at daytime, for the purpose of reducing the impact on villagers on the way.

III. Operation Stage

1. Type of Waste Materials in Operation Period

Waste gas mainly comprises the coal dust generated by raw coal in transfer, screening and loading as well as flying dust of refuse-conveying automobile and temporary refuse removal yard in refuse operating project.

Waste water mainly comes from slime water of coal washing plant. The main pollutants of domestic sewage are COD, BOD5, SS and small amount of oil.

Solid waste material mainly comprises washing refuse as well as small amount of domestic garbage.

Noises impact mainly comes from separating & breaking building, main plant, coal-conveying system and other noises equipment.

2. Prevention Measures

(1) Prevention Measure of Coal Dust

A. Water-spraying dust-control device is employed for the corridor and transfer point of belt-type conveyer. The transfer terminal of belt-type conveyer for coal delivery is provided with water spraying for dust control.

B. Strict management and the limits on load and speed are required for the vehicle conveying coal refuse. A vehicle fully loaded with materials should be covered with tarpaulin for preventing leakage;

C. Employees should be designated for the management of roads in the plant and usually provide regular maintenance for keeping good road conditions. Moreover, designated employees should clean up the material on the road in time. Regular road watering can help prevent the dust.

(2) Waste Water Treatment

Domestic sewage of coal washing plant is treated in sewage treatment station of the shaft in unified mode. The qualified water after treatment can be used in greening and water makeup of the production. Domestic sewage isn't discharged to the outside.

All slime water of the coal washing system enters slime thickener, of which underflow is pumped into filter press building ,where clarified water is pumped from circulating water tank of thickening building and used as production water. The whole coal washing system is closed circulation and discharges no waste water in production.

(3) Treatment Measures of Solid Waste Material

The refuse of coal washing plant is conveyed via belt to refuse yard for pileup. Two refuse yards are designed in the plant and offer adequate pileup sites for solid waste material of coal washing plant.

The tail slime after pressure filtration dehydration ， mixed in the refue.

(4) Prevention Measures of Noises

There exist many high-noise equipments in the process system of coal washing plant, mainly including pumps, screen classifiers and air compressors, which require integrated noise-reducing measures. In the layout of technological process, all high-noise pumps are centralized on the bottom floor of the plant for the purpose of reducing the transmission of noises outward.

In respect of model selection of equipments, priority should be given to low-noise equipments. For example, various screen classifiers should be equipped with polyurethane

screen plates as possible. Sophisticated low-noise equipments in the world should be selected as raw coal classifying, clean coal and refuse D&R screens and clean coal centrifugal dehydrators. Low-noise screw air compressor should be selected as air compressor. Noise-reducing measures should be taken for high-noise equipments, including internal lining rubber plate or macromolecule wear-resisting plate for refuse vessel and vibration-reducing treatment for equipment foundation.

a. Separating & Breaking Building

In case of high noises exceeding the standards, damping coating is set up on the external steel plate of the vessel for the purpose of reducing the vibration in the friction of steel plate with materials. The internal wall of vessel is provided with wear-resisting lining rubber for reducing vibration and the clash between steel plate and material.

b. Main Plant

Crushing machine, washing machine, motor and other equipments in the main building of coal washing plant are equipped with vibration reduction foundations. The motor is installed with sound insulation hood. Centralized sound-insulating control room is set up on the site where many operators work. The employees on patrol duty are provided with earplug or ear muff. Sound insulation door and window are employed.

Table 14-1 List of Waste Emissions

Pollutants		Emission	Notes
Waste water	Production and domestic sewage (10m3/d)	0	Integrated use
Solid waste	Washing refuse (10,000t/a)	≤1 million tons	Discharge to refuse removal yard
	Domestic garbage (t/a)	5	Centralized treatment
Noises	Separating & breaking building (dB(A))	75	Noise grade 1m away from the building
	Washing building (dB(A))	70	

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
I	**Raw Coal System**					
(I)	Raw Coal Storage Yard					
1	From wellhead housing of main shaft to the belt of raw coal storage yard	B=1400mm Q=1500t/h V=3.15m/s	Set	1		
		L=188 m α=0-16 °				
	Motor	Explosion-proof 10KV	Set	1	400	400
	Reductor		Set	1		
2	Activation feeding machine	GDH8	Set	3		
	Motor	Explosion-proof, 660v	Set	3	18.5	55.5
3	From raw coal storage yard to the belt of 1# transfer point	B=1400mm Q=1350t/h V=2.5 m/s	Set	1		
		L=68 m α=0°				
	Motor	Explosion-proof 660V	Set	1	90	90
	Reductor		Set	1		
4	Top electric hoist	Q=5t H=48m	Set	1		
	Lift motor	660V, explosion-proof	Set	1	7.5	7.5
	Run motor	660V, explosion-proof	Set	1	0.8	0.8
5	Electric hoist of blink pass	Q=5t H=12m	Set	1		
	Lift motor	660V, explosion-proof	Set	1	7.5	7.5
	Run motor	660V, explosion-proof	Set	1	0.8	0.8
6	1# transfer point electric hoist	Q=3t H=16m	Set	1		
	Lift motor	660V, explosion-proof	Set	1	4.5	4.5
	Run motor	660V, explosion-proof	Set	1	0.4	0.4

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
7	1# transfer point cleanup pump	100RV-SP	Set	1		
		Q=50m3/h, H=36.3m. density 1.10				
		Speed (rotating speed)1200rpm Efficiency 25%				
	Motor	660V, explosion-proof	Set	1	37	37
(II)	Separating & breaking building					
1	From 1# transfer point to the belt of Separating & breaking building	B=1400mm Q=1350t/h V=2.5 m/s	Set	1		
		L=162m α=0-16 °				
	Motor	explosion-proof 10KV	Set	1	315	315
	Reductor		Set	1		
2	Iron remover		Set	1		
3	Raw coal screen	10‘X20’SD banana screen	Set	1		
	Raw Coal Screen	screen hole 50mm				
	Motor	660V, 4P (explosion-proof)	Set	1	37	37
4	Selective raw coal crushing machine	12‘X28’	Set	1		
	Motor	660V, explosion-proof	Set	1	110	110
5	Raw Coal Distributor Drag Conveyor	Heavy type B=1200mm, L=26.2m, V=0.85m/s, a=0°	Set	1		
	Raw Coal Distributor Drag Conveyor	Feed particle size 50-0mm, Q=1300t/h				
	Motor	660V, 4P, explosion-proof	Set	1	55	55
	Reductor	SEW	Set	1		
	Gates		Set	7	4	28
6	Raw Coal Deslime Screens	BFS3080SD, 3.0x8.0	Set	6		
	Raw Coal Deslime Screens	Screen hole opening: 8mm				

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
		Feed particle size 50-0mm				
	Motor	660V, 4P, explosion-proof	Set	6	30	180
7	Raw Coal Distributor Drag Conveyor	Heavy type B=1200mm, L=25m, V=0.85m/s, a=0°	Set	1		
	Raw Coal Distributor Drag Conveyor	Feed particle size 50-0mm, Q=1300t/h				
	Motor	660V, 4P, explosion-proof	Set	1	55	55
	Reductor	SEW	Set	1		
8	Raw Coal Distributor Drag Conveyor	B=1200mm, L=25m, V=0.76m/s, a=0°	Set	1		
	Raw Coal Distributor Drag Conveyor	Feed particle size 50-0mm, Q=800t/h				
	Motor	660V, explosion-proof	Set	1	37	37
	Reductor	SEW	Set	1		
	Gates		Set	1	4	4
9	Electric hoist	Q=5t H=39m	Set	1		
	Lift motor	660V, explosion-proof	Set	1	7.5	7.5
	Run motor	660V, explosion-proof	Set	1	0.8	0.8
10	Cleanup pump	100RV-SP	Set	1		
		Q=50m3/h, H=36.3m. density 1.10				
		Speed (rotating speed)1200rpm Efficiency 25%				
	Motor	YB3-225S-4 explosion-proof 380V	Set	1	37	37
II	**Primary Washing System**					
(I)	Main Plant					
1	From Separating & breaking building to bump coal washing belt of main plant	B=1400mm Q=1300t/h V=2.5 m/s	Set	1		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
		L=138m α=13.639 °				
	Motor	Explosion-proof 10KV	Set	1	250	250
	Reductor		Set	1		
2	Raw Coal Distributor Drag Conveyor	B=1200mm, L=31.4m, V=0.76m/s, a=0°	Set	1		
	Raw Coal Distributor Drag Conveyor	Feed particle size 50-0mm, Q=700t/h				
	Motor	660V, 4P	Set	1	75	75
	Reductor	SEW	Set	1		
	Gates		Set	6	4	24
3	Raw Coal Deslime Screens	10'x20' S.D Banana Screen (3.0mX6.1m)	Set	4		
	Raw Coal Deslime Screens	Screen hole opening: 1mm				
		Feed particle size 50-0mm, Q=350t/h				
	Motor	660V, 4P		4	37	148
4	PRI. HMC Sump	Steel 50m3	Set	2		
	PRI. HMC Sump					
5	Primary HMC Feed Pump	14/12G-G	Set	2		
	Primary HMC Feed Pump	Q=1477m3/h, H=29m, ρ=1.65				
		Rotating speed: 490pm Efficiency 67% filling material CL drive				
	Motor	10KV, 8P	Set	2	355	710
	Dryer	220V	Set	2	0.5	1
6	Primary HMC	D48, 175 SQ. in inlet, 18" V.F.	Set	2		
	Primary HMC	Q=1477m3/h				
7	Fixed screens	Steel	Set	4		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Screen decks	3mx1.0m				
8	Clean Coal D&R Screens	10'X20' S.D Banana Screen(3.0mX6.1m)	Set	4		
	Clean Coal D&R Screens	Feed particle size, 50-1mm				
		Screen seam opening: 1mm Q=300t/h				
	Motor	660V, 4P	Set	4	37	148
9	Primary Refuse D&R Screen	10'X16' S.D Horizontal Screen(3.0mX4.8m)	Set	2		
	Primary Refuse D&R Screen	Feed Size, 50-1mm				
		Screen seam opening: 1mm Q=250t/h				
	Motor	660V, 4P	Set	2	22	44
10	Density gauge		Set	2		
11	Bleed box	Steel	Set	2		
	Pneumatic actuator		Set	2		
12	Fine coal centrifuges	HSG1500	Set	4		
	Fine Coal Centrifuges	Feed size, 50-1mm, Q=200t/h	Set			
	Main Motors	660V, 4P	Set	4	55	220
	Vibrating Motors	660V, 4P	Set	4	5.5	22
	Oil pump motor	380V, 4P	Set	4	0.75	3
13	SEC. HMC Sump	30m3	Set	2		
	SEC. HMC Sump					
14	Secondary HMC Feed Pump	12/10G-G	Set	2		
	Secondary HMC Feed Pump	Q=698m3/h, H=26.4m				
		Speed (rotating speed)590rpm Efficiency 66%, ρ=1.8 CR drive				
	Motor	660V, 6P		2	185	370

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
15	Secondary HMC	D33-T214, 73 SQ.in inlet, 14 V.F.	Set	2		
	Secondary HMC	Q=698m3/h				
16	Fixed Screen	Steel	Set	2		
	Screen Deck	3mx1.0m				
17	Middling D&R Screen	10'X20' S.D Banana Screen (3.0mX6.1m)	Set	2		
	Middling D&R Screen	Feed particle size, 50-1mm				
		Screen seam opening: 1mm Q=300t/h				
	Motor	660V, 4P	Set	2	37	74
18	Refuse D&R Screen	10'X20' S.D Banana Screen (3.0mX6.1m)	Set	2		
	Refuse D&R Screen	Feed particle size, 50-1mm				
		Screen seam opening: 1mm Q=300t/h				
	Motor	660V, 4P	Set	2	37	74
19	Density Gauge		Set	2		
20	Bleed box	Steel	Set	2		
	Pneumatic actuator		Set	2		
21	Middling Centrifuge	HSG1500	Set	2		
	Middling Centrifuge	Feed size, 50-1mm, Q=200t/h	Set			
	Main motor	660V, 4P	Set	2	55	110
	Vibrating Motor	660V, 4P	Set	2	5.5	11
	Oil pump motor	380V, 4P	Set	2	0.75	1.5
22	Dilute Media Sump	30m3	Set	2		
	Dilute Media Sump					
23	Dilute Pump	12/10ST-AH	Set	2		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Dilute Pump	Q=868m3/h, H=24.5m, ρ=1.2				
		Speed (rotating speed) 520rpm Efficiency 77%				
	Motor	660V, 6P	Set	2	132	264
24	Dilute Media Magnetic Separators	φ48"x8'(1.2m diameter , 2.4m length)	Set	8		
	Dilute Media Magnetic Separators	Q=240m3/h				
	Motor	660V	Set	8	4	32
25	Bleed box	Steel	Set	2		
	Pneumatic actuator		Set	2		
26	Dilute Pump	100RV-SP	Set	2		
	Dilute Pump	Q=130m3/h, H=13.8m, ρ=1.8				
		Speed (rotating speed) 800rpm Efficiency 53%				
	Motor	660V, 4P	Set	2	22	44
27	Overdense Concentrator	CTN-1024	Set	2		
	Overdense Concentrator					
	Motor	660V	Set	2	5.5	11
28	Raw Coal Sump	50m3	Set	2		
	Raw Coal Sump					
29	Raw Coal Classifying Cyclone	300S-L	Set	2		
	Raw Coal Classifying Cyclone	Q=1558m3/h, H=35.8m, ρ=1.1				
	Feed Pump	Speed (rotating speed) 800rpm Efficiency 78%				
	Motor	10KV, 4P	Set	2	280	560
	Dryer	220V	Set	2	0.4	0.8
30	Raw Coal Classifying Cyclones	D15"φ, 8 sets in one group, T123	Set	2		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Raw Coal Classifying Cyclones	Q=246t/h, 1558m3/h				
		14 SQ inlet, 6" VF				
31	TSS Water Sump	20m3	Set	2		
	TSS Water Sump					
32	TSS Water Pumps	4/3C-AH	Set	4		
	TSS Water Pumps	Q=70m3/h, H=27.9m, ρ=1.00, CV drive				
		Rotating speed 1630rpm, Efficiency 60%				
	Motor (VFD)	660V, 2P	Set	4	15	60
33	TSS slime separator	φ2.4m, Q=80-110t/set	Set	4		
34	TSS Fine Coal Sieve Bends	6'X80XR45	Set	8		
	TSS Fine Coal Sieve Bends	screen hole opening: 0.35mm, Q=70m3/h				
35	Slime centrifuge	H1000	Set	4		
	Fine coal Centrifuges	Screen basket diameter φ1000mm, screen hole 0.35mm				
	Main motor	660V, 4P	Set	4	75	300
	Lubricate motor	380V, 4P	Set	4	0.4	1.6
36	Effluent Transfer Sump	20m3	Set	2		
	Effluent Transfer Sump					
37	Effluent Transfer Pump	8/6E-AH	Set	2		
	Effluent Transfer Pump	Q=300m3/h, H=24.9m, ρ=1.1, CV drive				
		Speed(rotating speed)750rpm Efficiency 64%				
	Motor	660V, 4P	Set	2	55	110
38	TSS Refuse H-frequency Screens	6'X12' H-frequency Dewatering Screen	Set	4		
	TSS Refuse H-frequency Screens	Screen hole opening: 0.35mm, Q=60m3/h	Set	4		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Motor	660V, 4P	Set	4	7.5	30
39	Effluent Transfer Pump	20m3	Set	2		
40	Effluent Transfer Pump	100D-L	Set	2		
	Effluent Transfer Pump	Q=100m3/h, H=16m, ρ=1.1, CV drive				
		Speed (rotating speed)1070rpm Efficiency 60% secondary impeller				
	Motor	660V, 4P	Set	2	15	30
41	Heavy medium Clean Up Pump	65QV-SP	Set	2		
	Heavy medium Clean Up Pump	Q=68m3/h, H=20.5m, ρ=1.8				
		Efficiency 50%, rotating speed 1320rpm				
	Motor	660V, 4P	Set	2	18.5	37
42	Fine Coal Clean Up Pump	65QV-SP	Set	2		
	Fine Coal Clean Up Pump	Q=68m3/h, H=21.4m				
		Efficiency 50%, rotating speed 1350rpm, ρ=1.2				
	Motor	660V, 4P	Set	2	15	30
43	Gland Water Pump	40-250(I)A	Set	1		
	Gland Water Pump	Q=11m3/h, H=65m				
	Motor	660V	Set	1	7.5	7.5
45	Electric single-beam crane	LH-20/5, H=21m Lk=23m, track length 46.5m	Set	1		
	Primary lift motor	380V	Set	1	18.5	18.5
	Secondary lift motor	380V	Set	1	7.5	7.5
	Run motor of heavy truck	380V	Set	2	3	6
	Run motor of light truck	380V	Set	2	1.5	3

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
46	Electric hoist	CD1-5t, H=24m	Set	1		
	Motor	380V	Set	1	7.5	7.5
	Motor	380V	Set	1	0.8	0.8
47	Electric hoists	CD1-3t, H=12m	Set	1		
	Motors	380V	Set	1	4.5	4.5
	Motors	380V	Set	1	0.4	0.4
48	Differential-pressure level gauge		Set	20		
49	Ultra level gauge	Used in clarified water tank of thickener	Set	1		
50	Auto. valves	DN150, DN100, DN80	Set	3		
(II)	Flotation Building					
1	Slurry Conditioners	XK-1600, Q=800m3/h. set	Set	6		
	Slurry Conditioners					
	Motors	660V, 4P	Set	6	22	132
2	Slurry Flotation	XJM-S20, four vessels, single-vessel capacity 20m3	Set	6		
	Slurry Flotation	Feed particle size: 0.25-0mm				
	Mixer motor	660V, 4P	Set	24	45	1080
	Scraper motor	660V, 4P	Set	12	2.2	26.4
	Electric actuator of flashboard mechanism	220V	Set	6	0.12	0.72
3	Flotation Clean Coal Sump	70m3	Set	2		
	Flotation Clean Coal Sump					
4	Fine Coal Plate Press Feed Pumps	6/4F-HH	Set	6		
	Fine Coal Plate Press Feed Pumps	Q=240m3/h, H=69m				

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
		density 1.2, rotating speed 860rpm, Efficiency 51% filling material				
	Motor	660V, 4P	Set	6	160	960
5	Fine coal plate filter press	KZG500/2000-U 500M2	Set	6		
	Fine Coal Plate Filter Press	F=500m2, P=0.6-0.75MPa				
	Main motor of hydraulic station	660V	Set	6	18.5	111
	Drag motor	660V	Set	6	3	18
6	Fine coal drag conveyor	B=1400mm, L=12.5m, V=0.48m/s a=3°	Set	6		
	Fine Coal Drag Conveyors	Q=300t/h				
	Motor	660V	Set	6	15	90
	Reductor	SEW	Set	6		
7	Flotation reagent adding system	2.5m3/0.3m3	Set	4		
	Flotation Reagent Adding Systems					
	Ball-float level		Set	4		
	Regent pump (screw pump)	Q=10 L/m, H=20m	Set	6		
	Motor (VFD)	380V	Set	6	1.1	6.6
	Reagent storage tank	Stainless steel	Set	4		
	Reagent adding tank	Stainless steel	Set	4		
8	Gland Water Pump	50-250(I)	Set	1		
	Gland Water Pump	Q=17.5m3/h, H=82m				
	Motor	660V	Set	1	15	15
9	Flotation building Cleanup pump	65QV-SP	Set	1		
	Fine Coal Clean Up Pump	Q=68m3/h, H=15.3m				

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
		Efficiency 50%, rotating speed 1180rpm, ρ=1.2				
	Motor	660V, 4P	Set	1	11	11
10	Electric single-beam crane	LH-5, H=13m Lk=13.5m, track length 22m	Set	1		
	Lift motor	380V	Set	1	7.5	7.5
	Run motor	380V	Set	2	0.8	1.6
(III)	Thickening Building					
1	High-efficient thickener	Diameter 35m high-efficient thickener , central-drive motor	Set	2		
	Thickeners	Q=1900m3/h				
	Drive motor	660V, 4P	Set	2	11	22
2	Thickener underflow pump	8/6E-AH	Set	4		
	Thickener Underflow Pumps	Q=300m3/h, H=15.7m, ρ=1.2, CV drive				
		rotating speed 610rpm, Efficiency 67% secondary impeller				
	Motor	660V, 6P	Set	4	37	148
3	Clarified water pump	300S-L	Set	2		
	Clarified Water Pump	Q=1650m3/h, H=42.2m, ρ=1.00				
		Rotating speed 850rpm, Efficiency 77%				
	Motor	10KV, 4P	Set	2	315	630
	Dryer	220V	Set	2	0.4	0.8
4	Cleanup pump of pump room	65QV-SP	Set	1		
	Pump Room Clean Up Pump	Q=68m3/h, H=17.4m, ρ=1.2				
		Efficiency 50%, rotating speed 1240rpm				
	Motor	660V, 4P	Set	1	11	11

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
5	Wash down pump	3/2D-HH	Set	1		
	Wash Down Pump	Q=50m3/h, H=75.2m, CV drive				
		Efficiency 32%, rotating speed 1350rpm				
	Motor	660V, 4P	Set	1	45	45
6	Electric hoist	CD1-5t, H=15m	Set	1		
	Lift motor	380V, 4P	Set	1	7.5	7.5
	Run motor	380V, 4P	Set	1	0.8	0.8
7	Thickener clean-up pump	50WQ-10, Q=50m3/h, H=10m	Set	2		
	Thickener Clean-up Pumps	S.G=1.2				
	Motor	660V	Set	2	4	8
8	FLOCC. system		Set	2		
	FLOCC. System	Set up in the main plant (one set of negative ion, one set of positive ion)				
	Automatic dry-powder water supply valve	2" SS Ball Valve with Actuator	Set	2		
	Automatic rapid water-flush valve		Set	2		
	Dry-powder feed motor	Model VF-3 DC 220V	Set	2	0.37	0.74
	Dry-powder water tank		Set	2		
	Mixing motor	Model FF77DT100L4 660V	Set	2	3	6
	Ultrasonic level of mixing sump		Set	2		
	Automatic discharge valve of mixing sump		Set	2		
	Ultrasonic level of storage sump		Set	2		
9	Flocculant system measure pump	BN 5-6L	Set	2		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Measure Pump	Q=5m³/h H=30m				
	Motor (VFD)	660V	Set	2	1.5	3
(IV)	Filter Press Building					
1	Feed sump of tailing filter press building	70m3	Set	4		
	Slurry Sump					
	Mixing device motor	660V	Set	4	7.5	30
2	Tailings Plate Press Feed Pumps	6/4F-HH	Set	8		
	Tailings Plate Press Feed Pumps	Q=240m3/h, H=69m				
		density 1.2, rotating speed 860rpm, Efficiency 51% filling material				
	Motor	660V, 4P	Set	8	160	1280
3	Tailings plate press	KZG500/2000-U 500M2	Set	8		
	Fine Coal Plate Filter Presses	F=500m2, P=0.6-0.75MPa				
	Main motor of hydraulic station	660V	Set	8	18.5	148
	Drag Motors	660V	Set	8	3	24
4	Tailing filter-cake drag conveyor	B=1400mm, L=10m, V=0.48m/s a=3°	Set	8		
	Tailings Collection Drag Conveyors	Q=300t/h				
	Motor	660V	Set	8	11	88
	Reductor	SEW	Set	8		
5	Hydroseal pump of tailing plate-press feed pump	50-250	Set	1		
	Gland Water Pump	Q=8.8m3/h, H=82m				

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Motor	660V	Set	1	11	11
6	Filter press building Cleanup pump	65QV-SP	Set	1		
	Fine Coal Clean Up Pump	Q=68m3/h, H=15.3m				
		Efficiency 50%, rotating speed 1180rpm, ρ=1.2				
	Motor	660V, 4P	Set	1	11	11
7	Electric single-beam crane (ground operation)	LH-5, H=13m Lk=13.5m, track length 22m	Set	1		
	Lift motor	380V	Set	1	7.5	7.5
	Run motor	380V	Set	2	0.8	1.6
III	**Product Storage & Transport System**					
(I)	2# transfer point					
1	From Separating & breaking building to raw coal belt of 2# transfer point	B=1200mm Q=900t/h V=2.5 m/s	Set	1		
		L=53 m α=3.845 °				
	Motor	660V	Set	1	75	75
	Reductor		Set	1		
2	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30
3	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Run motor	660V	Set	1	0.4	0.4
(II)	3# transfer point					
1	From main plant to fine coal belt of 3# transfer point	B=1200mm Q=1000t/h V=2.5 m/s	Set	1		
		L=80 m α=2.273°				
	Motor	660V	Set	1	90	90
	Reductor		Set	1		
2	From main plant to middling belt of 3# transfer point	B=800mm Q=200t/h V=2.5 m/s	Set	1		
		L=80 m α=2.273°				
	Motor	660V	Set	1	30	30
	Reductor		Set	1		
2	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30
3	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
(III)	4# transfer point					
1	From flotation building to the belt of 4# transfer point	B=1000mm Q=500t/h V=2.5 m/s	Set	1		
		L=68 m α=8.488 °				
	Motor	660V	Set	1	55	55

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Reductor		Set	1		
2	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30
3	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
(IV)	Fine Slime Unloading Point					
1	From 4# transfer point to the scraper of fine slime unloading point	B=1000mm Q=500t/h	Set	1		
		L=80m V=0.76m/s α=0 °				
	Motor	660V	Set	1	185	185
	Reductor		Set	1		
	Liquid gate		Set	7	2.2	15.4
2	Feed machine of coal-receiving pit	K4 Q=400t/h	Set	1		
	Motor	660V	Set	1	18.5	18.5
	Reductor		Set	1		
	Liquid gate		Set	1	2.2	2.2
3	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
4	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
(V)	Flotation & Drying building (One Set of Electric Load in standby)					
1	From flotation building to slime feed belt of drying building	B=1000mm Q=500t L=81, α=15.5°, v=2.5m/s	Set	1		
		N=55kW	Set	1	55	55
2	Airtight feed drag conveyer	MXGZ/100, B=1000mm, L=8.8m	Set	1		
	Reductor	SEW	Set	1		
	Motor	N=11kW	Set	1		
3	Spiral thruster	MTX36-A, 16Mn	Set	1		
4	Feed machine	XGL36, fire-resisting material , metal structure	Set	1		
5	Roller-type dryer	MGT3620, frequency control	Set	1		
	Motor	N=185kW	Set	1		
	Reductor	SEW	Set	1		
6	Liquid gate	Liquid drive	Set	1		
	Motor	N=1.5kW	Set	1		
7	Discharge machine	XPL36-A, metal structure	Set	1		
8	Cyclone dust collector	XCL195, two on both right and left spiral	Set	4		
9	Discharge machine	Metal structure, weight dropper seal, automatic unloading with no electric power	Set	8		
10	Spiral conveyer	LS40, positive and negative spiral, middle unloading	Set	2		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Motor	N=3kW	Set	2		
11	Draught fan	Y4-73№14D, frequency control	Set	1		
	Motor	N=250kW	Set	1		
12	Reinforced-plastic wet-type dust collector	PCB36, η≥95%, wear-resisting and corrosion resistant reinforced plastic material	Set	1		
13	Circulating water pump	Q=80m³/h, H=35mH2O	Set	2		
	Motor	N=22kW	Set	2		
14	Sewage pump	Q=20m³/h, H=25mH2O		1		
	Motor	N=3kW	Set	1		
15	Burner	LQGH20000-WS model	Set	1		
16	Gas heating system	Dryer, temperature control, detector and etc.	Set	1		
17	Valve group system	Primary gas, ignition gas, compressed air and other valve groups	Set	1		
18	Burning device	Burner gun, ignition device, flame detection and control system	Set	1		
19	Air compressor set	Air distributor, muffler, vibration isolator and air door	Set	1		
	Motor	N=55kW	Set	1		
20	Gas-burned hot-air stove shell	High-efficient heat-insulating burning device	Set	1		
21	Fan	G4-73№11D, frequency control	Set	1		
	Motor	N=30kW	Set	1		
(VI)	5# Transfer Point					
1	From coal-receiving pit to drying building and the belt of 5# transfer point	B=1000mm Q=500t/h V=2.5 m/s	Set	1		
		L=182 m α=0-7.33 °				
	Motor	660V	Set	1	90	90

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Reductor		Set	1		
2	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30
3	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
(VII)	6# Transfer Point					
1	From 2# transfer point to fine coal belt of 6# transfer point	B=1400mm Q=1500t/h V=3.15 m/s	Set	1		
		L=448 m α=0-12 °				
	Motor	10KV	Set	1	450	450
	Reductor		Set	1		
3	From 3# transfer point to middling belt of 6# transfer point	B=800mm Q=200t/h V=2.5 m/s	Set	1		
		L=307m α=0-12 °				
	Motor	660V	Set	1	75	75
	Reductor		Set	1		
2	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
3	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
(VIII)	Middling Unloading point					
1	From 6# transfer point to middling belt of middling unloading point	B=800mm Q=200t/h V=2.5 m/s	Set	1		
		L=83m α=0 °				
	Motor	660V	Set	1	30	30
	Reductor		Set	1		
2	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
(IX)	Fine Coal Storage Yard					
1	From 6# transfer point to the belt of fine coal storage yard	B=1400mm Q=1500t/h V=2.5 m/s	Set	1		
		L=168m α=12°				
	Motor	10KV	Set	1	315	315
	Reductor		Set	1		
2	Activation feeding machine	GDH8	Set	3		
	Motor	explosion-proof, 660v	Set	3	18.5	55.5
3	Top electric hoist	Q=5t H=48m	Set	1		
	Lift motor	660V	Set	1	7.5	7.5
	Run motor	660V	Set	1	0.8	0.8

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
4	Electric hoist of blind pass	Q=5t H=12m	Set	2		
	Lift motor	660V	Set	2	7.5	15
	Run motor	660V	Set	2	0.8	1.6
5	Cleanup pump of blind pass	100RV-SP	Set	1		
		Q=50m3/h, H=36.3m. density 1.10				
		Speed (rotating speed)1200rpm Efficiency 25%				
	Motor	660V	Set	1	37	37
(X)	7# transfer point					
1	From fine coal storage yard to the belt of 7# transfer point	B=1600mm Q=3000t/h V=3.15 m/s	Set	1		
		L=160 m α=0°				
	Motor	660V	Set	1	185	185
	Reductor		Set	1		
2	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30
3	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
(XI)	Railway Loading Station					
1	From 7# transfer point to the belt of railway loading station	B=1600mm Q=3000t/h V=3.15m/s	Set	1		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
		L=709m α=0-2.83 °				
	Motor	10KV	Set	2	400	800
	Reductor		Set	1		
2	Electric hoist of coal belt driving room in loading station	Q=10t H=6m	Set	1		
	Lift motor	660V explosion-proof N=13KW	Set	1	13	13
	Run motor	660V explosion-proof N=0.8KW	Set	2	0.8	1.6
3	Railway loading station	5000 TPH	Set	1		
	Oil pump motor	660v	Set	2	55	110
	Filter pump motor	660v	Set	1	4	4
	Cooling fan	660v	Set	1	0.5	0.5
	oil tank dryer	660v	Set	2	5	10
	dust catcher	660v	Set	1	30	30
	Automatic lubrication	660v	Set	1	2.5	2.5
	Fan heater	660v	Set	6	20	120
	Electric hoist	660v	Set	1	18.5	18.5
	Control power	220v	Set	1	20	20
	Lighting	220v	Set	1	22	22
	Air conditioner	220v	Set	1	3	3
	Electric welder	660v	Set	1	30	30
	Power supply in standby	660v	Set	1	40	40
	Auxiliary system of loading station		Set	1		
4	Anti-freeze fluid spraying system					

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Mixing	660v	Set	1	7.5	7.5
	Conveying	660v, one in use and another in standby	Set	2	15	30
	Hydraulic station motor	660v	Set	1	4	4
5	Firming agent spraying system	660V explosion-proof N=25KW	Set	1	25	25
6	Gate spiral sampling device	For loading sampling of railway	Set	1		
	Motor	380V explosion-proof	Set	1	55	55
(XII)	8# Transfer Point					
1	From main plant to the belt of filter press building	B=1000mm Q=500t/h V=2.5 m/s	Set	1		
		L=66m α=0 °				
	Motor	660V	Set	1	30	30
	Reductor		Set	1		
2	From filter press building to the belt of 8# transfer point	B=1000mm Q=500t/h V=2.5 m/s	Set	1		
		L=508m α=-4-0 °				
	Motor	660V	Set	1	90	90
	Reductor		Set	1		
3	Cleanup pump	50ZJL-A35B	Set	1		
		Q=50m3/h H=43m				
		rotating speed 1470rpm Efficiency 42.0%				
	Motor	660V	Set	1	30	30
4	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	Run motor	660V	Set	1	0.4	0.4
(XIII)	Refuse Unloading Point					
1	From 8# transfer point to the belt of refuse Point	B=1000mm Q=500t/h V=2.5 m/s	Set	1		
		L=209 m α=0 °				
	Motor	660V	Set	1	55	55
	Reductor		Set	1		
2	Electric hoist	Q=3t H=9m	Set	1		
	Lift motor	660V	Set	1	4.5	4.5
	Run motor	660V	Set	1	0.4	0.4
IV	**Auxiliary Production System**					
(I)	Air Compressor Room					
1	Low pressure air compressor	GA250-7.5, air-cooling type	Set	2		
	Low Pressure Air compressors	Air quantity 24.1m3/min, air pressure 7.5bar				
	Main motor	660V, 4P	Set	2	132	264
	Fan Motors	660V, 4P	Set	4	3	12
	Communication module		Set	1		
	Gas tank	6m3, 0.8MPa	Set	2		
2	High pressure air compressor	GA18-13, oil-injection screw	Set	2		
	High Pressure Air compressors	Q=2.2m3/min, air pressure 13Bar				
	Motors	660V	Set	2	18.5	37
	Self-contained air trap	10m3	Set	2		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
3	Cold dryer	RD-2SA	Set	1		
	Instrument Air Dryers	Q=2.2m3/min, air pressure 12Bar				
	Motor	220V	Set	1	0.74	0.74
	Motor Fans	220V	Set	1	0.12	0.12
(II)	Newly Built Flotation Reagent Library					
1	Oil tank	Metal structure V=30m3	Set	2		
2	Reagent pump	ZYB-55 oil residual pump	Set	3		
		55L/m discharge pressure 0.33Mpa				
		Two in use and one in standby				
	Motor	660V explosion-proof N=1.5KW	Set	3	1.5	4.5
V	**Water Supply, Drainage, Heating and Ventilation**					
(I)	Heating and Ventilation					
A	Heating, Air Conditioner					
	Main plant					
1	Fan heater	5GS Q=30.48KW	Set	40		
		N=0.37kW 380V			0.37	14.8
2	Vertical hot-air curtain	RM30Z-CS-12 Q=110.9KW	Set	6		
		N=3kW 380V			1.2	7.2
3	Suspended hot-air curtain	KMW-S-12 Q=40KW	Set	4		
		N=0.8kW 380V			0.8	3.2
	Flotation building					
4	Fan heater	5GS Q=30.48KW	Set	30		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
		N=0.37kW 380V			0.37	11.1
5	Vertical hot-air curtain	RM30Z-CS-12 Q=110.9KW	Set	4		
		N=3kW 380V			1.2	4.8
6	Suspended hot-air curtain	KMW-S-12 Q=40KW	Set	4		
		N=0.8kW 380V			0.8	3.2
	Drying building , Filter press building					
7	Fan heater	5GS Q=30.48KW	Set	20		
		N=0.37kW 380V			0.37	7.4
8	Vertical hot-air curtain	RM30Z-CS-12 Q=110.9KW	Set	4		
		N=3kW 380V			1.2	4.8
9	Suspended hot-air curtain	KMW-S-12 Q=40KW	Set	4		
		N=0.8kW 380V			0.8	3.2
	Integrated office building					
10	Cooling & Heating cabinet air conditioner	KFLd-120LW	Set	10		
		N=4.7KW 380V			4.7	47
	Control room of power distribution building					
11	Cooling & Heating cabinet air conditioner	KFLd-120LW	Set	8		
		N=4.7KW 380V			4.7	37.6
12	Electric fan heater	DNF-10 heat dissipating capacity 8.5KW	Set	7		
		N=10kW 380V			10	70
B	Ventilation					
13	Power distribution room					
	Axial-flow fan	BT35-11No2.8 220V	Set	6		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
		N=0.12kW explosion-proof motor				
		1500m3/h 59Pa			0.12	0.72
14	Main plant					
	Roof fan	DWT-Ⅰ Φ1000, air quantity 39000m3/h, P=317Pa	Set	3		
	Motor	N=5.5kW 380V	Set	3	0.75	2.25
C	Boiler Room					
16	Full-automatic gas-burned steam boiler	WNS4.2-1/95/70-Q N=12KW P=1.0MPa	Set	3		
17	Circulating water pump	Q=150m³/h H=32m N=22KW	Set	4		
18	Water makeup pump	Q=6.3m³/h H=32m N=2.2KW	Set	2		
19	Full-automatic water softening device	Q=8m³/h H=2200 φ=600	Set	1		
20	De-oxygenizing softening water tank	V=8m³	Set	1		
21	De-oxygenizing pump	Q=12.5m³/h H=60m N=5.5KW	Set	2		
22	De-oxygenizing device	Q=10m³/h N=6KW	Set	1		
23	Steel chimney	Φ1000	Set	1		
24	Low-noises axial-flow fan	BT35-11No2.8 220V	Set	1		
		N=0.12kW explosion-proof motor				
		1500m3/h 59Pa				0.12
25	Low-noises axial-flow fan	BT35-11No3.55 380V	Set	1		
		N=0.55kW explosion-proof motor				
		4405m3/h 237Pa				0.55
26	Pipeline valve		Set	1		
27	Control cabinet		Set	1		
D	Outdoor pipelines					

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
21	Rectangular vale well	AXBXH=2000X2000X2000	Set	18		
22	seamless steel pipe	D273×7	Meter	200		
	seamless steel pipe	D219×6	Meter	300		
	seamless steel pipe	D159×4.5	Meter	500		
	seamless steel pipe	D133×4	Meter	600		
	seamless steel pipe	D108×4	Meter	400		
23	Unpassible trench	1400×1800(high)	Meter	1000		
(II)	Water Supply and Drainage					
A	Indoor Part					
1	Stainless steel compound water tank	V=20m3	Set	1		
2	Fire-prevention pressure-stabilizing & -boosting device	ZW(L)-I-XZ-13, 0.22MPa	Set	1		
	Accessory water pump	H=50m, Q=3L/s	Set	2	1.5	3
	Pneumatic tank	D800	Set	1		
	Control cabinet		Set	1		
3	Pipeline pump	02115DFG50-50/4, Q=12.5m3/h, H=50m	Set	2	7.5	15
4	Spraying dust-catching device		Set	16		
B	Outdoor Part					
1)	Water Supply System					
1	Spheroidal graphite cast-iron pipe for water supply	DN200	Meter	2100		
2	Spheroidal graphite cast-iron pipe for water supply	DN150	Meter	1500		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
3	Spheroidal graphite cast-iron pipe for water supply	DN100	Meter	150		
4	Outdoor underground hydrant	SS100/65	Set	28		
5	Gate valve	DN200	Set	12		
6	Gate valve	DN150	Set	8		
7	Hydrant well	D1200 (bricked)	Set	28		
8	Valve well	D1500 (bricked)	Set	8		
9	Water meter	LXL-100, helical-vane-type water meter	Set	1		
10	Water meter well	AxB=2750X1300 (concrete)	Set	1		
2)	Drainage system					
1	UPVC double-wall corrugated pipe	dn200	m	450		
2	Welded steel pipe	DN80	m	200		
4	Inspection well	Bricked , D1200	Set	15		
5	Septic tank	AxBxH=4800x1500x2500(concrete)	Set	1		
VI	**Electric Power Distribution Control System of Coal Washing Plant**					
(I)	High-voltage Power Distribution System					
1	High-voltage inlet wire, contact cabinet	KYN28 1250A	Set	3		
2	High-voltage PT cabinet	KYN28	Set	2		
3	High-voltage disconnector cabinet	KYN28	Set	10		
4	High-voltage contactor cabinet	KYN28	Set	11		
5	Direct current screen	100Ah	Set	1		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
6	Microcomputer protection module of high-voltage switch	ZBT-11	Set	26		
7	High-voltage power cable	YJV-10KV 3*95mm2	Meter	500		
8	High-voltage power cable	YJV-10KV 3*70mm2	Meter	900		
9	High-voltage power cable	YJV-10KV 3*50mm2	Meter	500		
10	High-voltage power cable	MYJV-10KV 3*35mm2	Meter	3200		
11	High-voltage power cable	YJV-10KV 3*35mm2	Meter	3000		
12	Cable tray	600*100	Meter	100		
13	Cable tray	400*100	Meter	200		
14	Cable tray	200*100	Meter	500		
(II)	Low-voltage Power Distribution System of Screen and Crushing Building					
1	Omni-seal energy-saving transformer	S11-Mb-2000KVA 10/0.69KV	Set	2		
2	Dry-type transformer cabinet	SCB10-800KVA 10/0.4KV	Set	1		
3	High-resistance earthing cabinet		Set	2		
4	660V inlet wire cabinet (contact cabinet)	GCS model	Set	3		
5	660V capacitor cabinet	GCS model	Set	4		
6	660V distribution cabinet	GCS model	Set	21		
7	380V inlet wire cabinet	GCS model	Set	1		
8	380V capacitor cabinet	GCS model	Set	1		
9	380V distribution cabinet	GCS model	Set	7		
10	Frequency converter	0.55KW 380V	Set	2		
11	Frequency converter	3KW 380V	Set	2		
12	Soft starter	160KW	Set	8		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
13	Low-voltage electric power cable	MYJV-1000 3×95mm2	Meter	1300		
14	Fire-retardant low-voltage electric power cable	MYJV-1000 3×50mm2	Meter	2000		
15	Fire-retardant low-voltage electric power cable	MYJV-1000 3×25mm2	Meter	1500		
16	Fire-retardant low-voltage electric power cable	MYJV-1000 3×16mm2	Meter	2600		
17	Fire-retardant low-voltage electric power cable	MYJV-1000 3×10mm2	Meter	1500		
18	Fire-retardant low-voltage electric power cable	MYJV-1000 3×6mm2	Meter	2600		
19	Fire-retardant low-voltage electric power cable	MYJV-1000 3×4mm2	Meter	3000		
20	Fire-retardant low-voltage electric power cable	MYJV-1000 3×25+1×16mm2	Meter	2200		
21	Fire-retardant low-voltage electric power cable	MYJV-1000 3×10+1×6mm2	Meter	1000		
22	Fire-retardant low-voltage electric power cable	MYJV-1000 3×4+1*2.5mm2	Meter	3600		
23	Fire-retardant low-voltage electric power cable	MYJV-1000 3×2.5+1*1.5mm2	Meter	2000		
24	Low-voltage electric power cable	YJV-1000 3×50mm2	Meter	3400		
25	Low-voltage electric power cable	YJV-1000 3×25mm2	Meter	400		
26	Low-voltage electric power cable	YJV-1000 3×16mm2	Meter	1200		
27	Low-voltage electric power cable	YJV-1000 3×10mm2	Meter	2000		
28	Low-voltage electric power cable	YJV-1000 3×6mm2	Meter	500		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
29	Low-voltage electric power cable	YJV-1000 3×4mm2	Meter	4600		
30	Low-voltage electric power cable	YJV-1000 3×2.5mm2	Meter	1500		
31	Shielded power cable	YJVP-1000 3×2.5mm2	Meter	1200		
32	Rubber-packed cable	U-1000 3×4+1*2.5mm2	Meter	800		
33	Bus bridge	2500A	Meter	22		
34	Cable tray	600*100	Meter	300		
35	Cable tray	400*100	Meter	1300		
36	Cable tray	200*100	Meter	1800		
37	Cable tray	100*100	Meter	800		
38	Repair power source cabinet	Water-proof and dust-proof model	Set	7		
39	Repair power source cabinet	Explosion-proof model	Set	10		
40	Tubes and pipes		Ton	30		
(III)	Low-voltage Power Distribution System of Main Plant					
1	Omni-seal energy-saving transformer	S11-Mb-2500KVA 10/0.69KV	Set	4		
2	Dry-type transformer cabinet	SCB10-800KVA 10/0.4KV	Set	1		
3	High-resistance earthing cabinet		Set	4		
4	660V inlet wire cabinet (contact cabinet)	GCS model	Set	6		
5	660V capacitor cabinet	GCS model	Set	12		
6	660V distribution cabinet	GCS model	Set	43		
7	380V inlet wire cabinet	GCS model	Set	1		
8	380V capacitor cabinet	GCS model	Set	1		
9	380V distribution cabinet	GCS model	Set	9		
10	Frequency converter	15KW 660V	Set	4		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
11	Soft starter	132KW	Set	2		
12	Soft starter	160KW	Set	6		
13	Soft starter	185KW	Set	3		
14	Fire-retardant low-voltage electric power cable	MYJV-1000 3×50mm2	Meter	850		
15	Fire-retardant low-voltage electric power cable	MYJV-1000 3×70mm2	Meter	1000		
16	Fire-retardant low-voltage electric power cable	MYJV-1000 3×25mm2	Meter	1500		
17	Fire-retardant low-voltage electric power cable	MYJV-1000 3×16mm2	Meter	2600		
18	Fire-retardant low-voltage electric power cable	MYJV-1000 3×10mm2	Meter	500		
19	Fire-retardant low-voltage electric power cable	MYJV-1000 3×4mm2	Meter	5600		
20	Fire-retardant low-voltage electric power cable	MYJV-1000 3×25+1×16mm2	Meter	1500		
21	Fire-retardant low-voltage electric power cable	MYJV-1000 3×10+1×6mm2	Meter	1000		
22	Fire-retardant low-voltage electric power cable	MYJV-1000 3×4+1*2.5mm2	Meter	1000		
23	Low-voltage electric power cable	YJV-1000 3×150mm2	Meter	1200		
24	Low-voltage electric power cable	YJV-1000 3×70mm2	Meter	2000		
25	Low-voltage electric power cable	YJV-1000 3×50mm2	Meter	2800		
26	Low-voltage electric power cable	YJV-1000 3×35mm2	Meter	1800		
27	Low-voltage electric power cable	YJV-1000 3×25mm2	Meter	7000		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
28	Low-voltage electric power cable	YJV-1000 3×16mm2	Meter	3100		
29	Low-voltage electric power cable	YJV-1000 3×10mm2	Meter	2400		
30	Low-voltage electric power cable	YJV-1000 3×6mm2	Meter	3000		
31	Low-voltage electric power cable	YJV-1000 3×4mm2	Meter	6500		
32	Low-voltage electric power cable	YJV-1000 3×2.5mm2	Meter	13000		
33	Low-voltage electric power cable	YJV-1000 3×25+1*16mm2	Meter	1200		
34	Low-voltage electric power cable	YJV-1000 3×16+1*10mm2	Meter	1000		
35	Low-voltage electric power cable	YJV-1000 3×6+1*4mm2	Meter	800		
36	Low-voltage electric power cable	YJV-1000 3×4+1*2.5mm2	Meter	2600		
37	Low-voltage electric power cable	YJV-1000 3×2.5+1×1.5mm2	Meter	2500		
38	Shielded power cable	YJVP-1000 3×95mm2	Meter	700		
39	Shielded power cable	YJVP-1000 3×70mm2	Meter	700		
40	Shielded power cable	YJVP-1000 3×4mm2	Meter	1000		
41	Rubber-packed cable	U-1000 3×4+1*2.5mm2	Meter	1000		
42	Bus bridge	2500A	Meter	44		
43	Cable tray	600*100	Meter	300		
44	Cable tray	400*100	Meter	1600		
45	Cable tray	200*100	Meter	2000		
46	Cable tray	100*100	Meter	800		
47	Repair power source cabinet	Water-proof and dust-proof model	Set	18		
48	Repair power source cabinet	Explosion-proof model	Set	10		
49	Distribution box	Water-proof and dust-proof model	Set	6		
50	Tubes and pipes		Ton	40		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
(IV)	Power Distribution System of Loading Station					
1	High-voltage inlet wire	KYN28	Set	1		
2	High-voltage PT cabinet	KYN28	Set	1		
3	High-voltage disconnector cabinet	KYN28	Set	2		
4	High-voltage contactor cabinet	KYN28	Set	2		
5	Dry-type transformer cabinet	SCB10-500KVA 10/0.4KV	Set	1		
6	Dry-type transformer cabinet	SCB10-400KVA 10/0.4KV	Set	1		
7	High-voltage load switch	100A	Set	1		
8	380V inlet wire cabinet	GCS model	Set	2		
9	380V capacitor cabinet	GCS model	Set	2		
10	380V distribution cabinet	GCS model	Set	8		
11	Soft starter	185KW	Set	1		
12	Control system of fine coal storage yard		Set	1		
13	Control system of rapid loading station		Set	1		
14	Weighing system		Set	1		
15	Electric control of anti-freeze fluid spraying system		Set	1		
16	Field exchange	SICOM3000BA	Set	1		
17	Optical fiber adapter	1786-RPA	Set	2		
18	Optical fiber module	1786-RPFM	Set	2		
19	Repair power source cabinet	Explosion-proof model	Set	7		
20	Cable cabinet	Explosion-proof model	Set	7		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
21	High-voltage power cable	MYJV-10KV 3*50mm2	Meter	2000		
22	High-voltage power cable	MYJV-10KV 3*35mm2	Meter	1500		
23	Fire-retardant low-voltage electric power cable	MYJV-1000 3×95+1*50mm2	Meter	300		
24	Fire-retardant low-voltage electric power cable	MYJV-1000 3*35+1*25mm2	m	700		
25	Fire-retardant low-voltage electric power cable	MYJV-1000 3*25+1*16mm2	m	1500		
26	Fire-retardant low-voltage electric power cable	MYJV-1000 3*16+1*10mm2	m	400		
27	Fire-retardant low-voltage electric power cable	MYJV-1000 3*10+1*6mm2	m	2000		
28	Fire-retardant low-voltage electric power cable	MYJV-1000 3*6+1*4mm2	m	600		
29	Fire-retardant low-voltage electric power cable	MYJV-1000 3*4+1*2.5mm2	m	2600		
30	Rubber-packed cable	U-1000 3×4+1*2.5mm2	Meter	200		
31	Control cable	KVV-500 37*1.5	Meter	500		
32	Control cable	KVV-500 24*1.5	Meter	1000		
33	Control cable	KVV-500 14*1.5	Meter	800		
34	Control cable	KVV-500 4*1.5	Meter	3500		
35	Shielded cable	DJYVP 4*1.0	Meter	1000		
36	optical fiber cable	4-core	Meter	1000		
37	Cable tray	400*100	Meter	100		
38	Cable tray	200*100	Meter	1200		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
39	Cable tray	100*100	Meter	300		
40	Tubes and pipes		Ton	10		
(V)	Electric Power Supply Line of Coal Washing Plant					
1	High-voltage power cable	YJV-10KV 3*240mm2	Meter	28000		
2	Cable tray	400*150	Meter	7000		
3	Tubes and pipes		Ton	7		
(VI)	Power Distribution System of Administrative Facilities					
1	High-voltage ring-net cabinet	100A	Set	1		
2	Dry-type transformer cabinet	SCB10-315KVA 10/0.4KV	Set	1		
3	380V inlet wire cabinet	GCS model	Set	1		
5	380V distribution cabinet	GCS model	Set	4		
6	Distribution box	Non-standard	Set	2		
7	High-voltage power cable	YJV-10KV 3*35mm2	Meter	1000		
8	Low-voltage electric power cable	YJV-1000 3×70+1*35mm2	Meter	500		
9	Low-voltage electric power cable	YJV-1000 3×25+1*16mm2	Meter	800		
10	Low-voltage electric power cable	YJV-1000 3×16+1*10mm2	Meter	500		
11	Low-voltage electric power cable	YJV-1000 3×6+1*4mm2	Meter	800		
12	Low-voltage electric power cable	YJV-1000 3×4+1*2.5mm2	Meter	1000		
13	Cable tray	200*100	Meter	800		
14	Cable tray	100*100	Meter	200		
15	Tubes and pipes		Ton	6		
(VII)	Centralized Control System of Coal Washing Plant					

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
1	Power distribution room PLC module of screen and crushing building					
	17 vessel bracket	1756-A17	Set	4		
	Power source module	1756-PA75	Set	4		
	ControlNet module	1756-CNB	Set	4		
	DeviceNet module	1756-DNB	Set	2		
	ModBus communication module	MVI56-MCM	Set	1		
	DH+module	1756-DHRIO	Set	1		
	Input module	1756-IM16I	Set	40		
	Output module	1756-OW16I	Set	6		
	Input module of analog quantity	1756-IF16	Set	4		
	Output module of analog quantity	1756-OF8	Set	1		
	Input module	1756-IB16	Set	1		
	Module wiring terminal	1756-TBCH	Set	50		
	Module wiring terminal	1756-TBNH	Set	2		
2	Power distribution room PLC module of main plant					
	17 vessel bracket	1756-A17	Set	8		
	Power source module	1756-PA72	Set	8		
	CPU module	1756-L63	Set	1		
	ControlNet module	1756-ENBT	Set	1		
	ControlNet module	1756-CNB	Set	8		
	DeviceNet module	1756-DNB	Set	6		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
	ModBus communication module	MVI56-MCM	Set	1		
	DH+ module	1756-DHRIO	Set	1		
	C communication module	MVI56-ADM	Set	1		
	PROFI-BUS communication module	1756-SST-PFB-CLX	Set	1		
	PROFIBUS-DP bus joint	6ES7972-0BA41-0XA0	Set	2		
	Input module	1756-IM16I	Set	77		
	Output module	1756-OW16I	Set	10		
	Input module of analog quantity	1756-IF16	Set	12		
	Output module of analog quantity	1756-OF8	Set	4		
	Input module	1756-IB16	Set	1		
	Module wiring terminal	1756-TBCH	Set	99		
	Module wiring terminal	1756-TBNH	Set	5		
3	Intelligent motor controller	UMC22-FBP	Set	265		
4	Communication resistance pin	DNR11-FBP120	Set	8		
5	Optical fiber adapter	1786-RPA	Set	2		
6	Optical fiber module	1786-RPFM	Set	2		
7	High-voltage microcomputer protection and monitoring system		Set	1		
8	PROFIBUS-DP bus cable	6XV1830-0EH10	Meter	300		
9	DeviceNet cable	1485C-P1-C300	Bundle	5		
10	DH+ cable	1770-CD10	Bundle	2		
11	RG6 shielded co-axial cable	1786-RG6	Bundle	1		
12	ControlNet terminal device	1786-XT	Set	30		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
13	ControlNet splitter	1786-TPR	Set	30		
14	PLC cabinet	Non-standard	Set	6		
15	Mining DC source	FD480, 24DC	Set	2		
16	UPS	APC 2000VA standard time	Set	2		
17	UPS	5KVA, AC220V APC	Set	1		
18	Monitoring host	Two-core/2G/160G	Set	2		
19	Statement computer	Two-core /2G/320G	Set	2		
20	LCD display	Samsung 22"	Set	4		
21	Dispatching desk and chair	Non-standard	Set	1		
22	Printer	HP	Set	1		
23	Field exchange	SICOM3000BA	Set	1		
24	RSView32 run software	9301-2SE3403	Set	2		
25	RSView32 development software	9301-2SE2403	Set	1		
26	ControlNet network configuration software	9357-CNETL3	Set	1		
27	EtherNet network configuration software	9357-ENETL3	Set	1		
28	Hot-resistance isolation converter	Output current: 4－20mA	Set	160		
29	Prewarning electric whistle		Set	34		
30	Dust-proof button	800H-2HA4RLW	Set	170		
31	Dust-proof button	800H-3HA4RLW	Set	30		
32	Explosion-proof button	Shuanglian	Set	60		
33	Explosion-proof button	Sanlian	Set	6		
34	Limit switch		Set	44		
35	Coal piling switch	20-39	Set	95		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
36	Slipping switch		Set	40		
37	Pull cord switch	KG9001A	Set	82		
38	Anti-deviation switch	KG1007A	Set	80		
39	Liquid level switch		Set	18		
40	Cable cabinet	Water-proof and dust-proof model	Set	26		
41	Cable cabinet	Explosion-proof model	Set	22		
42	Optical fiber cable	4-core	Meter	1000		
43	Optical fiber cable junction box		Set	4		
44	Optical fiber jumping wire		Piece	8		
45	Control cable	KVV-500 37X1.5	Meter	3500		
46	Control cable	KVV-500 24X1.5	Meter	3500		
47	Control cable	KVV-500 19X1.5	Meter	4000		
48	Control cable	KVV-500 14X1.5	Meter	4500		
49	Control cable	KVV-500 7X1.5	Meter	4200		
50	Control cable	KVV-500 4X1.5	Meter	34000		
51	Control cable	KVV-500 4X2.5	Meter	1000		
52	Shielded cable	KVVP-500 30X1.0	Meter	4000		
53	Shielded cable	KVVP-500 19X1.0	Meter	3200		
54	Shielded cable	KVVP-500 10X1.0	Meter	2600		
55	Shielded cable	KVVP-500 4X1.0	Meter	5000		
56	Shielded cable	DJYVP 4X1.0	Meter	1200		
57	Shielded cable	DJYVP 2X1.0	Meter	2200		
58	Shielded cable	DJYVP 2X0.75	Meter	8000		

APPENDIX: EQUIPMENT LIST

ITEM	NAME	SPECIFICATION	UNIT	QTY	POWER	TOT-POW
59	Cable tray	200*100	Meter	3800		
60	Cable tray	100*100	Meter	1400		
61	Tubes and pipes		Ton	28		

HD 矿业国际公司加拿大 BC 省墨玉河煤矿选煤厂

HD International Mining Industry Co., Ltd.

Coal Washing Plant of Murray River Coalmine, Northeast BC, Canada

初步设计

Preliminary Design

图册

Drawing

泰戈特（北京）工程技术有限公司

Taggart (Beijing) Engineering Co., Ltd.

2013．8

HD 矿业国际公司加拿大 BC 省墨玉河煤矿选煤厂

HD International Mining Industry Co., Ltd.
Coal Washing Plant of Murray River Coalmine, Northeast BC, Canada

初步设计

Preliminary Design

工程编号 Project number：C1136

建设规模 Construction scale：6.0Mt/a

总 经 理 General manager：孙国敏

总工程师 Chief engineer：徐延枫

项目经理 Project manager：刘先建

2013年度图纸报审专用章
甲127 泰戈特（北京）工程技术有限公司
证书编号 证书分类 资质等级
A111001763 工程设计 甲 级
有效期至：2013年12月31日止

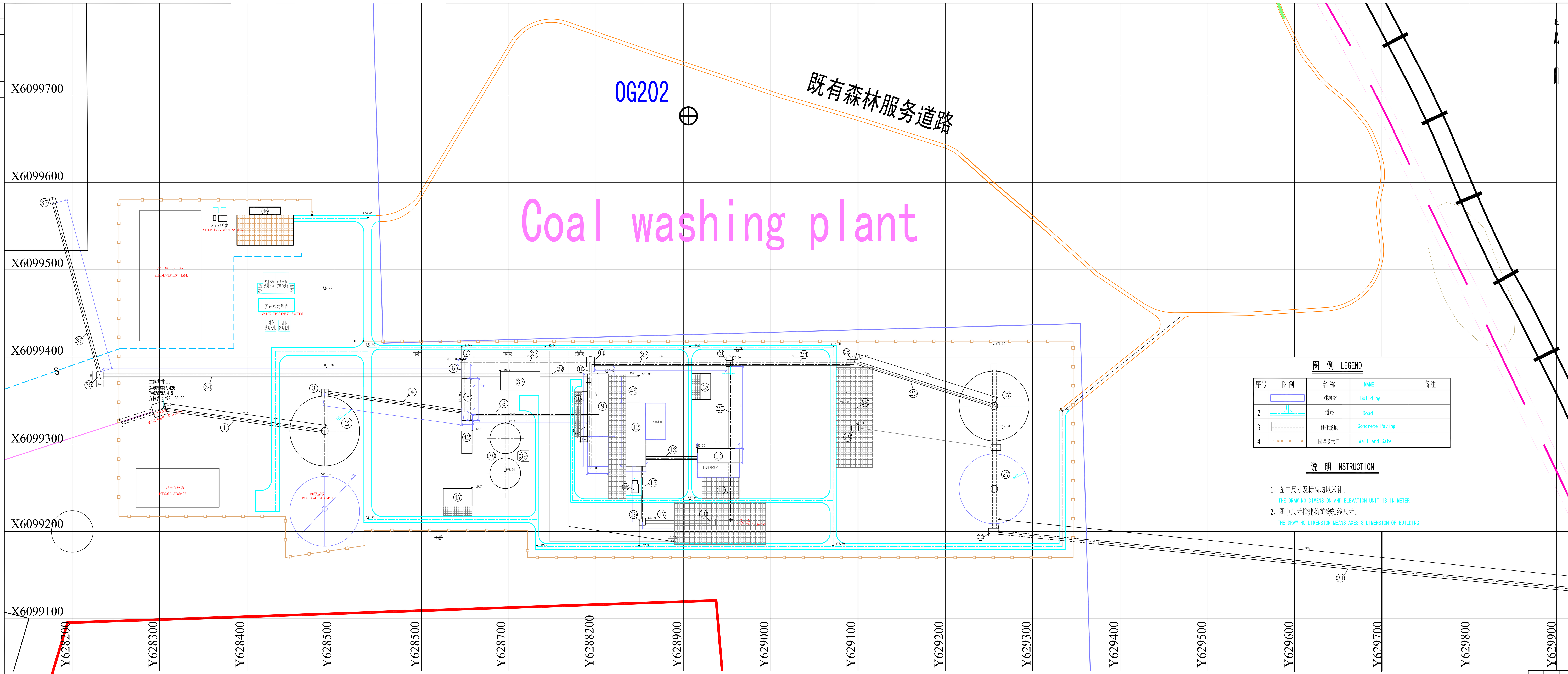
泰戈特（北京）工程技术有限公司

Taggart (Beijing) Engineering Co., Ltd.

2013．8

附图	HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂				
序号	图纸名称（layout）	图号	序号	图纸名称	图号
1	工业场地总平面布置图	C1136-2400-01	17	6#转载点至中煤卸载点剖面	C1136-2202-14
	General plot plan			From 6# transfer point to trestle stand of middling coal unloading point	
2	工艺设备流程图	C1136-2200-01	18	7#转载点至装车站剖面	C1136-2202-15
	Process & Equi flowsheet			From 7# transfer point to trestle stand of vehicle-loading station	
3	物料流程图	C1136-2200-02	19	主厂房至尾煤压滤车间剖面	C1136-2202-16
	Material flowsheet			From main plant to trestle stand of tailing-coal filter press building	
4	主井井口房至原煤储煤场剖面	C1136-2202-01	20	尾煤压滤车间至8#转载点剖面	C1136-2202-17
	From wellhead housing of main shaft to trestle stand of raw coal storage yard			From tailing-coal filter press building to trestle stand of 8# transfer point	
5	原煤储煤场至1#转载点剖面	C1136-2202-02	21	8#转载点至矸石卸载点剖面	C1136-2202-18
	From raw coal storage yard to trestle stand of 1# transfer point			From trestle stand of 8# transfer point to trestle stand of refuse dump point	
6	1#转载点至选碎车间剖面	C1136-2202-03	22	主厂房设备布置及安装图 标高0.00平面	C1136-2210-01
	From 1# transfer point to trestle stand of separating & breaking building			Main plant -plan	
7	选碎车间至2#转载点剖面	C1136-2202-04	23	主厂房设备布置及安装图 标高2.50&5.00平面	C1136-2210-02
	From separating & breaking building to trestle stand of 2# transfer point			Main plant -plan	
8	选碎车间至主厂房剖面	C1136-2202-05	24	主厂房设备布置及安装图 标高6.50&9.50平面	C1136-2210-03
	From separating & breaking building to trestle stand of Main plant			Main plant -plan	
9	主厂房至3#转载点剖面	C1136-2202-06	25	主厂房设备布置及安装图 标高14.50&17.90平面	C1136-2210-04
	From main plant to trestle stand of 3# transfer point			Main plant -plan	
10	浮选车间至干燥车间剖面	C1136-2202-07	26	主厂房设备布置及安装图 标高13.00&16.20&20.00平面	C1136-2210-05
	From flotation/filter building to trestle stand of dry building			Main plant -plan	
11	浮选车间至4#转载点剖面	C1136-2202-08	27	主厂房设备布置及安装图 D-B 剖面	C1136-2210-06
	From flotation/filter building to trestle stand of 4# transfer point			Main plant -section	
12	4#转载点至煤泥卸载点剖面	C1136-2202-09	28	主厂房设备布置及安装图 B-C 剖面	C1136-2210-07
	From 4# transfer point to trestle stand at unloading point of flotation clean coal			Main plant -section	
13	受煤坑至干燥至5#转载点剖面	C1136-2202-10	29	主厂房设备布置及安装图 A-B 剖面	C1136-2210-08
	From coal-receiving point to trestle stand of 5# transfer point			Main plant -section	
14	2#转载点至6#转载点剖面	C1136-2202-11	30	选碎车间布置图	C1136-2208-01
	From 2# transfer point to trestle stand of 6# transfer point			Separating & breaking building -plan	
15	6#转载点至精煤储煤场剖面	C1136-2202-12	31	选碎车间布置图	C1136-2208-02
	From 6# transfer point to trestle stand of clean coal storage yard			Separating & breaking building -section	
16	精煤储煤场	C1136-2202-13	32	浮选车间设备布置图 标高0.00平面	C1136-2212-01
	Clean coal storage yard			Flotation/filter building-plan	

附图	HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂				
序号	图纸名称（layout）	图号	序号	图纸名称	图号
33	浮选车间设备布置图 剖面	C1136-2212-02			
	Flotation/filter building-section				
34	尾煤压滤车间设备布置图	C1136-2216-01			
	Tailing-coal filter press building-section				
35	尾煤压滤车间设备布置图 标高0.00平面	C1136-2216-02			
	Tailing-coal filter press building-plan				
36	尾煤压滤车间设备布置图 标高8.00平面	C1136-2216-03			
	Tailing-coal filter press building-plan				
37	浓缩车间设备布置及安装图--平面图	C1136-2211-01			
	Thickening building-plan				
38	浓缩车间设备布置及安装图--剖面图	C1136-2211-02			
	Thickening building-section				
39	项目设计、采购及施工进度安排表				
	Schedule				



建构筑物一览表

序号	名称	
1	主井井口房至原煤场栈桥	From wellhead housing of main shaft to trestle stand of raw coal storage yard
2	原煤场	Raw coal storage yard(stockpile)
3	1#转载点	1# transfer point
4	1#转载点至选碎车间栈桥	From 1# transfer point to trestle stand of separating & breaking building
5	选碎车间	separating & breaking building
6	选碎车间至2#转载点栈桥	From separating & breaking building to trestle stand of 2# transfer point
7	2#转载点	2# transfer point
8	选碎车间至主厂房栈桥	From separating & breaking building to trestle stand of Main plant
9	主厂房	Main plant
10	主厂房至3#转载点栈桥	From main plant to trestle stand of 3# transfer point
11	3#转载点	3# transfer point
12	浮选压滤车间	Flotation/filter building
13	浮选压滤车间至干燥车间栈桥	Flotation/filter building to trestle stand of dry building
14	干燥车间	dry building
15	浮选压滤车间至4#转载点栈桥	Flotation/filter building to trestle stand of 4# transfer point
16	4#转载点	4# transfer point
17	4#转载点至浮选精煤卸载点栈桥	From 4# transfer point to trestle stand at unloading point of flotation clean coal
18	浮选精煤卸载点	unloading point of flotation clean coal
19	受煤坑至干燥车间栈桥	From coal-receiving point to trestle stand of dry building
20	干燥车间至5#转载点栈桥	From dry building to trestle stand of 5# transfer point
21	5#转载点	5# transfer point
22	2#转载点至3#转载点栈桥	From 2# transfer point to trestle stand of 3# transfer point
23	3#转载点至5#转载点栈桥	From 3# transfer point to trestle stand of 5# transfer point
24	5#转载点至6#转载点栈桥	From 5# transfer point to trestle stand of 6# transfer point
25	6#转载点	6# transfer point
26	6#转载点至精煤场栈桥	From 6# transfer point to trestle stand of clean coal storage yard
27	精煤场	clean coal storage yard
28	6#转载点至中煤卸煤点栈桥	From 6# transfer point to trestle stand of middling coal unloading point
29	中煤卸煤点	Middling coal unloading point
30	7#转载点	7# transfer point
31	7#转载点至装车站栈桥	From 7# transfer point to trestle stand of vehicle-loadimg station
32	主厂房至尾煤压滤车间栈桥	From main plant to trestle stand of tailing-coal filter press building
33	尾煤压滤车间	Tailing-coal filter press building
34	尾煤压滤车间至8#转载点栈桥	From tailing-coal filter press building to trestle stand of 8# transfer point
35	8#转载点	8# transfer point
36	8#转载点至矸石卸料点栈桥	From 8# transfer point to trestle stand of refuse dump point
37	矸石卸料点	Refuse dump point
38	浓缩车间浓缩池（2座）	Thickener building
39	浓缩车间泵房	Thickener pump room
40	空压机房	Air compressor room
41	介质库	Medium warehouse(magnetite room)
42	选粹车间配电室	Power room of separating & breaking building
43	主厂房配电室	Power room of main plant

图 例 LEGEND

序号	图例	名称	MAME	备注
1		建筑物	Building	
2		道路	Road	
3		硬化场地	Concrete Paving	
4		围墙及大门	Wall and Gate	

说 明 INSTRUCTION

1、图中尺寸及标高均以米计。
THE DRAWING DIMENSION AND ELEVATION UNIT IS IN METER
2、图中尺寸指建构筑物轴线尺寸。
THE DRAWING DIMENSION MEANS AXES'S DIMENSION OF BUILDING

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION.

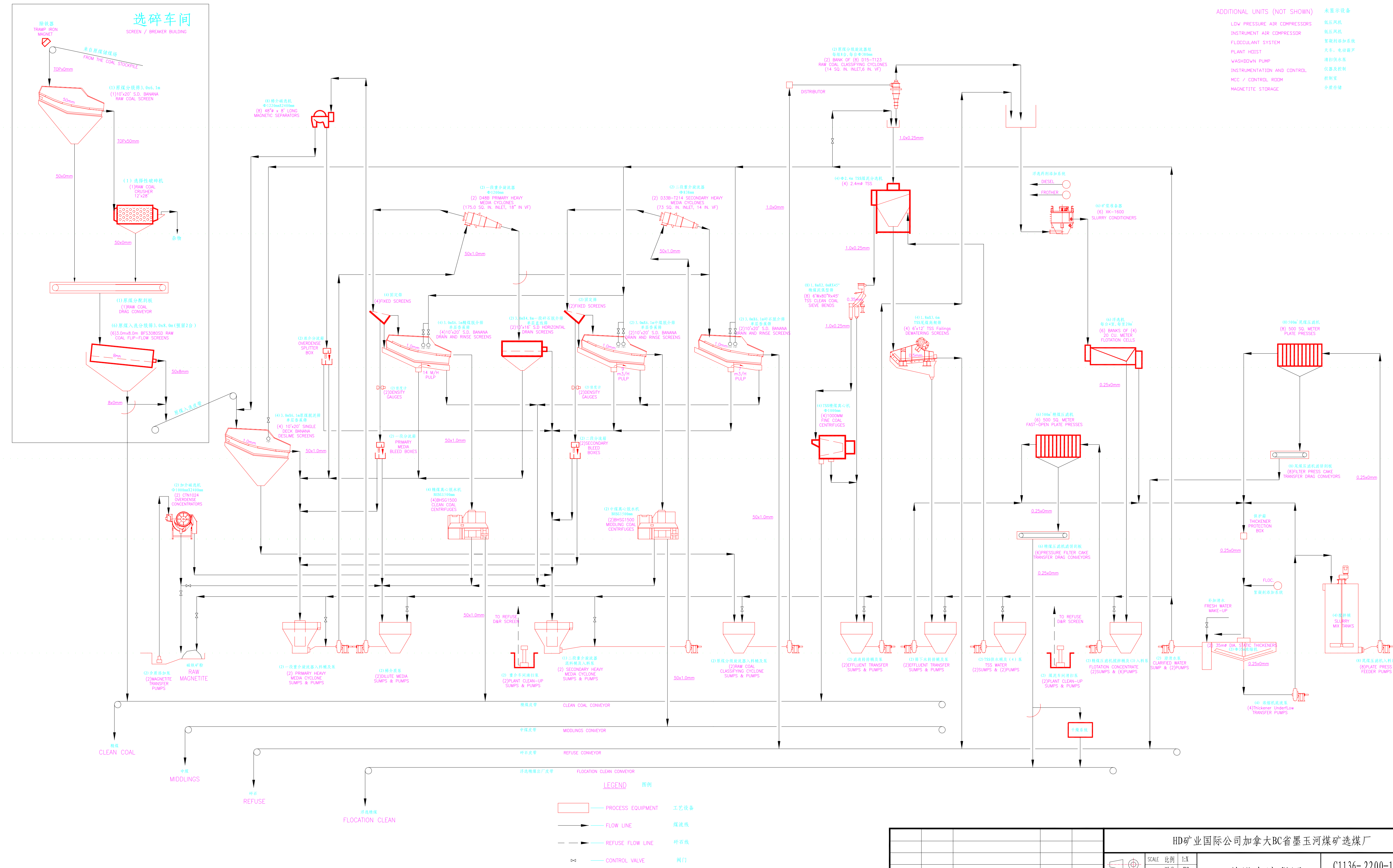
HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

工业场地总平面布置图
General plot plan

C1136-2400-01

SCALE 比例 1:5000 DWGTYPE 图类 GA
DRAWN 设计
CHECKED 校核
APPROVED 审核
MANAGER 项目经理
SHEET 第 页 OF 共 页 WEIGHT 重量 kg REV.版本

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION.

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:X	
DWG TYPE 图类	FS	
DRAWN 设计		
CHECKED 校核		
APPROVED 审核		
MANAGER 项目经理		

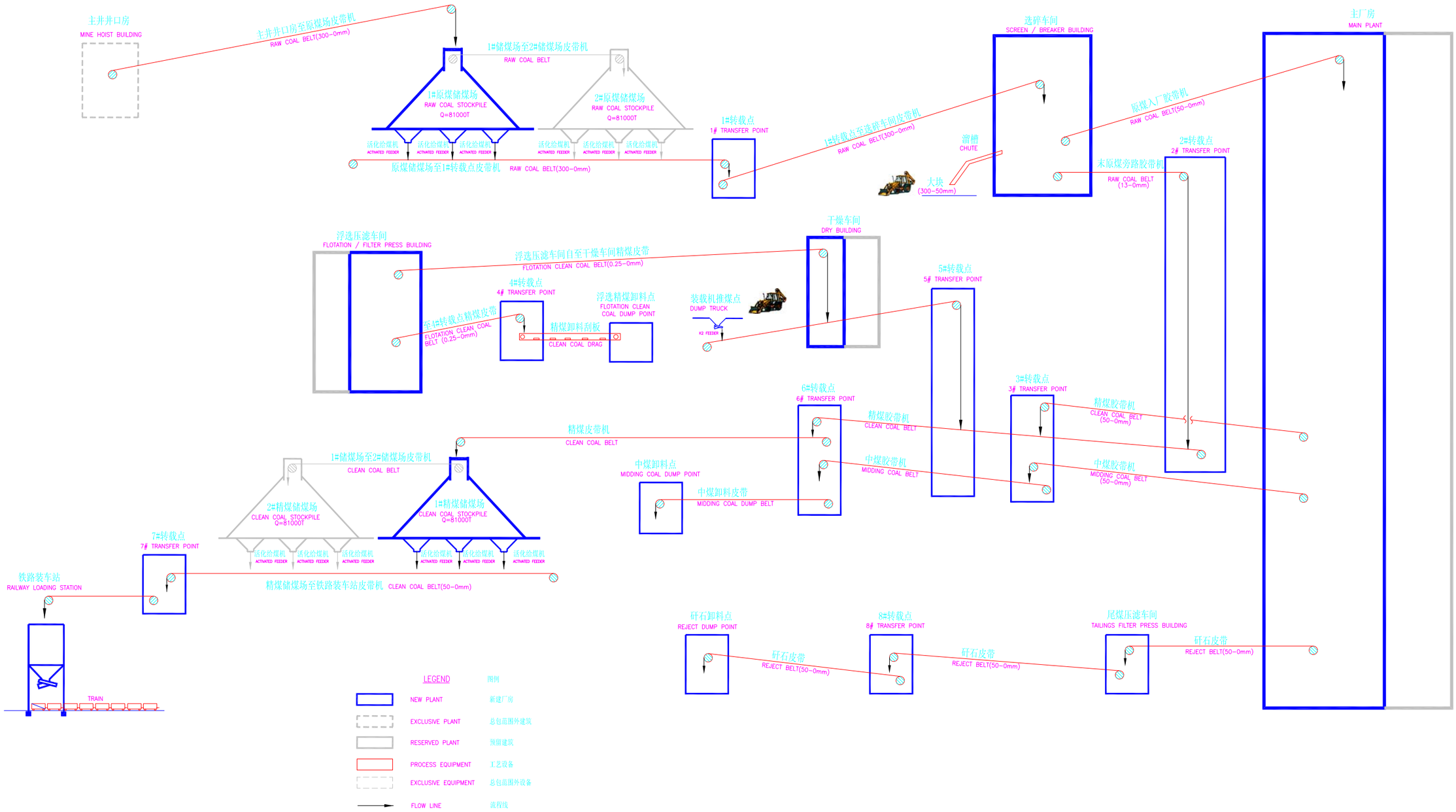
工艺设备流程图
PROCESS FLOWSHEET

C1136-2200-1

SHEET 第 1 页	WEIGHT 重量	REV.版本
OF 共 1 页	kg	2

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

日期			
姓名			
专业			
日期			
姓名			
专业			



No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省曼三河煤矿选煤厂

SCALE 比例 1:
DWG TYPE 图类 FS

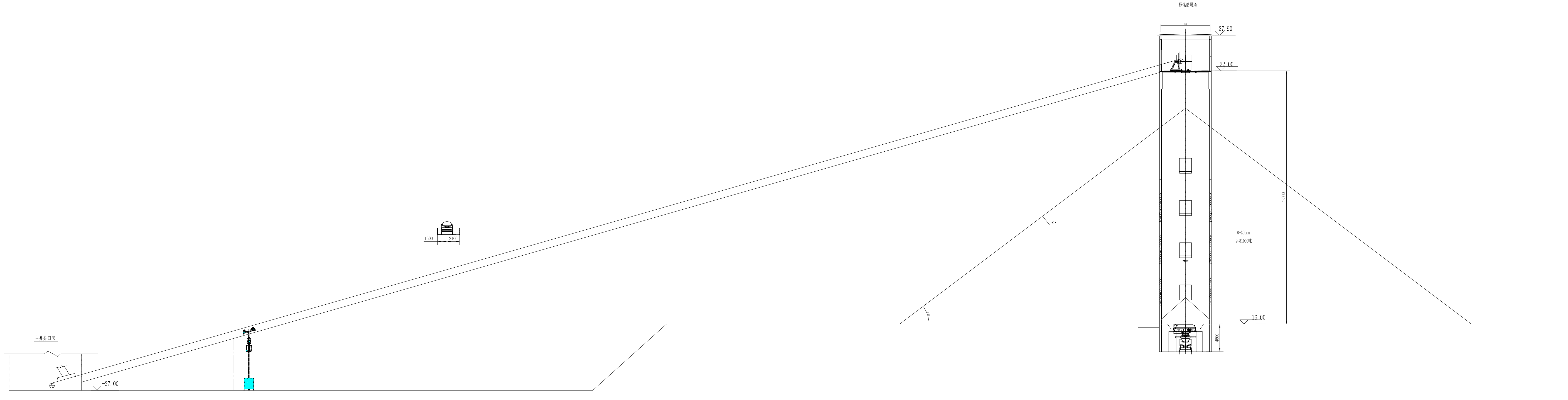
DRAWN 设计
CHECKED 校核
APPROVED 审核
MANAGER 项目经理

物料流程图
MATERIAL FLOWSHEET

C1136-2200-02

SHEET 第 1 页 OF 共 1 页 | WEIGHT 重量 kg | REV. 版本 0

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



说明：

1. 本设计以绝对标高867.30m作为相对标高±0.000m。
2. 图中标高单位以米计，其余单位以毫米计算。

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

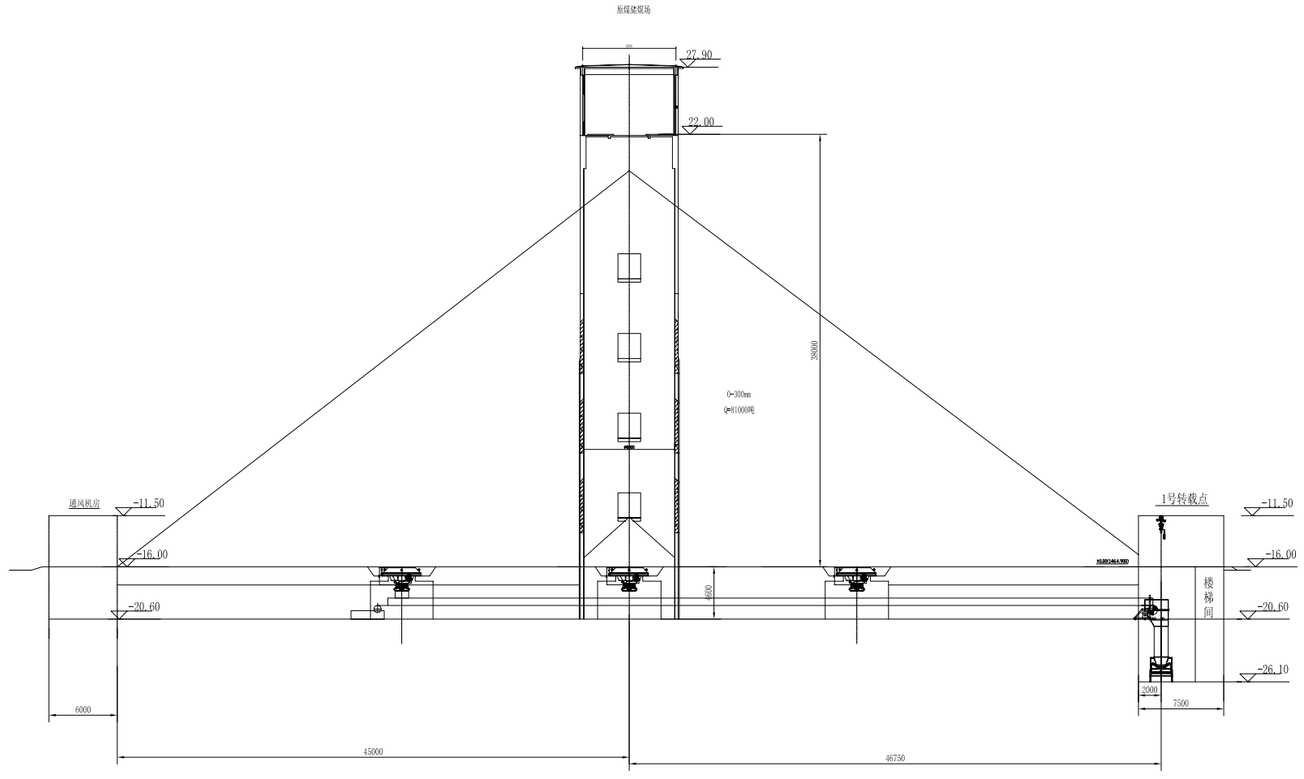
加拿大BC省墨里河煤矿选煤厂

SCALE 比例	NA	主井井口房至原煤储煤场剖面
DWG TYPE 图类		
DRAWN 设计		
CHECKED 校核		
APPROVED 审核		
MANAGER 项目经理		

C1136-2202-01

SHEET 第 页	WEIGHT 重量	REV.版本
OF 共 页	kg	

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



No 版本号	DATE 日期	REVISION 修改内容		BY 设计	APP 审核	

加拿大BC省墨里河煤矿选煤厂

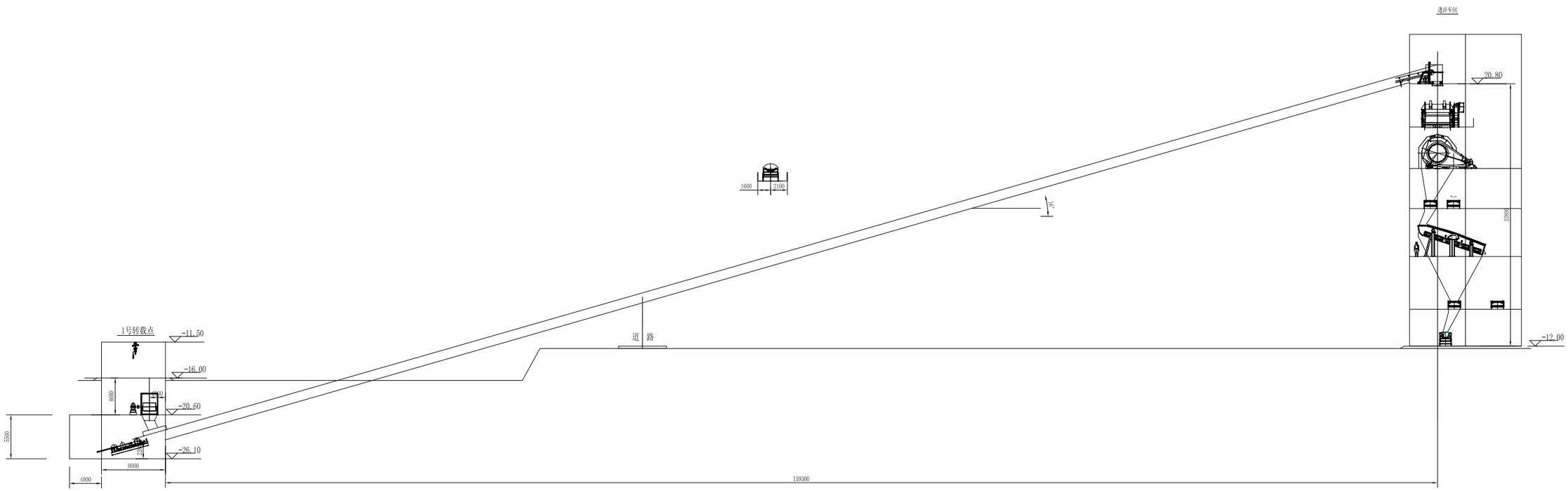
SCALE 比例	NA
DWG TYPE 图类	
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 项目负责人	

原煤储煤场至1号转载点剖面

C1136-2202-02

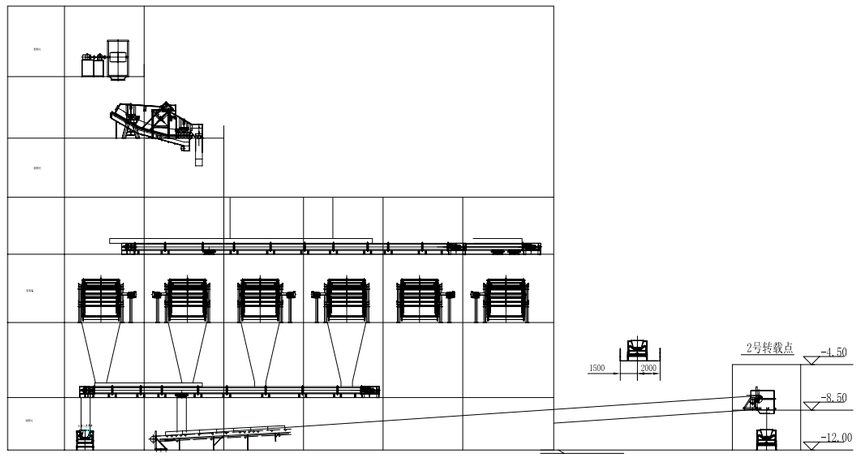
SHEET 第 页	WEIGHT 重量	REV. 版本	
OF 共 页	kg		

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



						加拿大BC省墨里河煤矿选煤厂	
						SCALE 比例 NA	C1136-2202-03
						DWG TYPE 图类	
						DRAWN 设计	1号转载点至选砷车间剖面
						CHECKED 校核	SHEET 第 页 WEIGHT 重量 REV.版本
						APPROVED 审核	OF 共 页 kg
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核		MANAGER 项目经理	泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

选矿车间



No 版本号	DATE 日期	REVISION 修改内容		BY 设计	APP 审核	

加拿大BC省墨里河煤矿选煤厂

SCALE 比例	NA
2ND TYPE 图类	
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 项目经理	

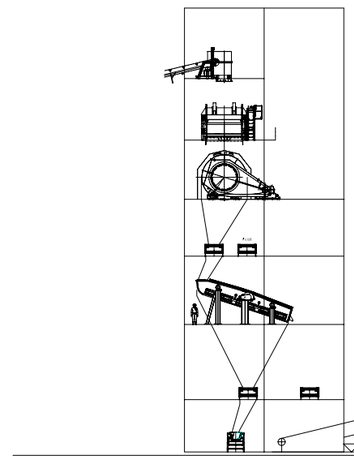
选砷车间至2号转载点剖面

C1136-2202-04

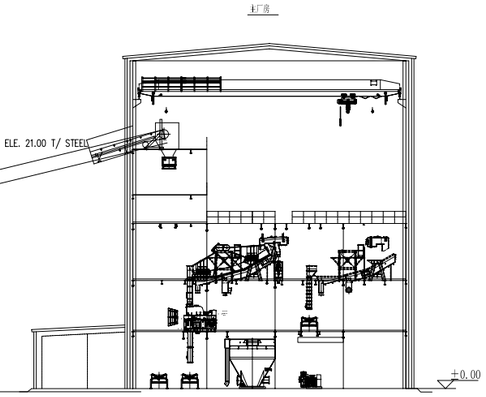
SHEET 第 页	WEIGHT 重量	REV.版本
OF 共 页	kg	

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

选矿车间



主厂房



No 版本号	DATE 日期	REVISION 修改内容		BY 设计	APP 审核	

加拿大BC省墨里河煤矿选煤厂

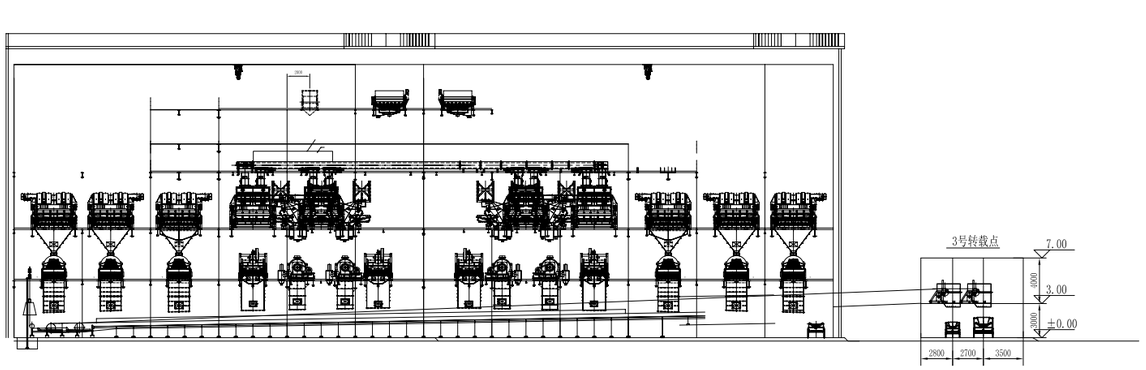
SCALE 比例	NA
DWG TYPE 图类	
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 项目经理	

选砷车间至主厂房剖面

C1136-2202-05

SHEET 第 页	WEIGHT 重量	REV. 版本
OF 共 页	kg	

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



No.版本号	DATE.日期	REVISION 修改内容	BY.设计	APP.审核

加拿大BC省墨里河煤矿选煤厂

SCALE 比例	NA
DWG TYPE 图类	
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 经理	

主厂房至3号转载点剖面

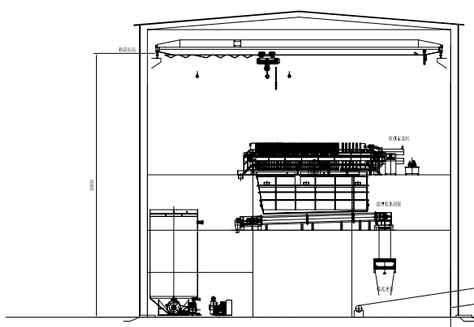
C1136-2202-06

SHEET 第 页 | WEIGHT 重量 | REV.版本

OF 共 页 | kg

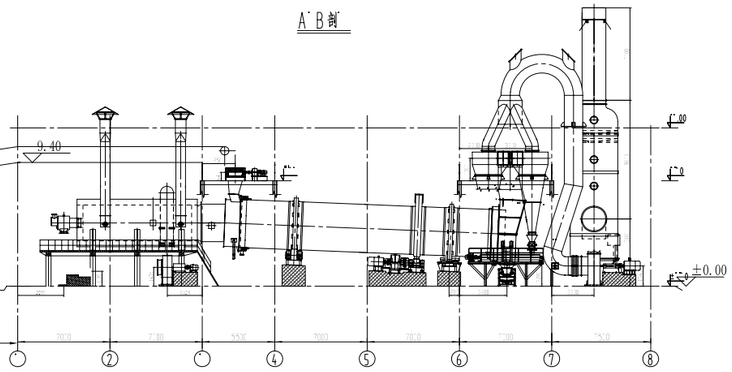
泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

浮选车间



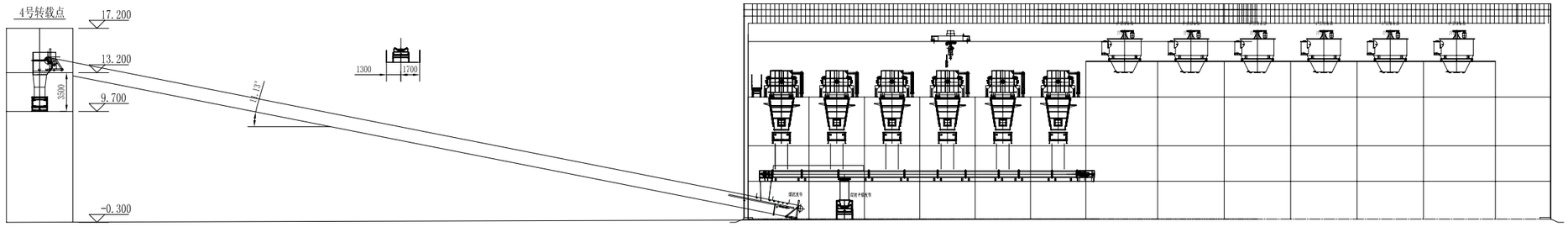
主煤车间

A-B剖



						加拿大BC省墨里河煤矿选煤厂		
						SCALE 比例 NA		
						DWG TYPE 图类	浮选车间至干燥车间剖面	C1136-2202-07
						DRAWN 设计		SHEET 第 页 / OF 共 页 / WEIGHT 重量 kg / REV.版本
						CHECKED 校核		
No.版本号	DATE.日期	REVISION 修改内容	BY 设计	APP 审核		APPROVED 审核		
						MANAGER 项目经理	泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD	

浮选压滤车间

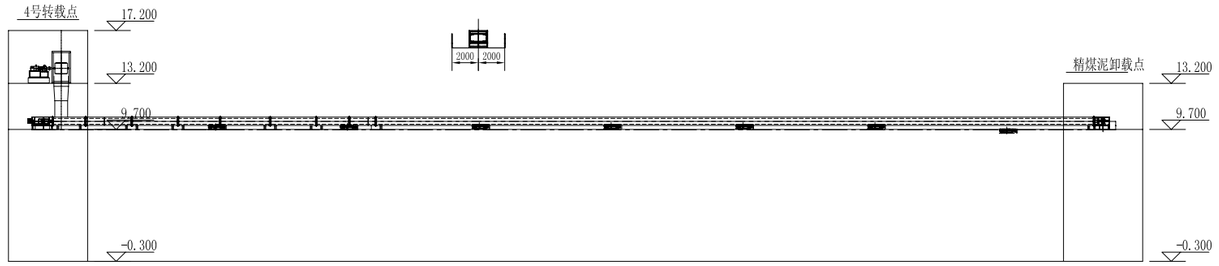


No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核	

CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION

加拿大BC省墨里河煤矿选煤厂

SCALE 比例	NA	浮选压滤车间至4号转载点剖面	C1136-2202-08
DRG TYPE 图类			
DRAWN 设计		SHEET 第 页	WEIGHT 重量 REV.版本
CHECKED 校核		OF 共 页	kg
APPROVED 审核		泰戈特(北京)工程技术有限公司	TAGGART (BEIJING) ENGINEERING CO.,LTD
MANAGER 项目经理			



No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

加拿大BC省墨里河煤矿选煤厂

SCALE 比例	从
DWG TYPE 图类	
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 项目负责	

4号转载点至精煤泥卸载点剖面

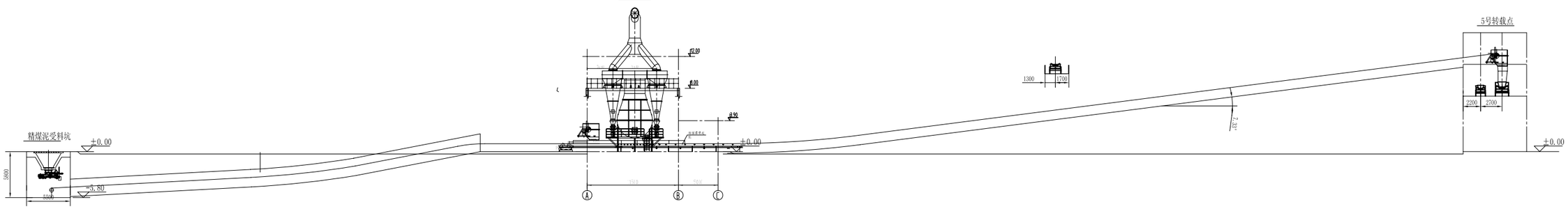
C1136-2202-09

SHEET 第 页 | WEIGHT 重量 | REV.版本
OF 共 页 | kg

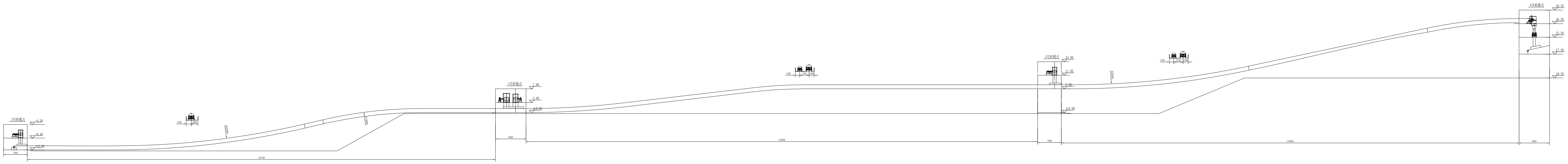
泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

干燥车间

7-6 剖面



						加拿大BC省墨里河煤矿选煤厂	
						SCALE 比例 NA	
						DWG TYPE 图类	C1136-2202-10
						DRAWN 设计	受料坑至干燥至5号转载点剖面
						CHECKED 专业	SHEET 第 页 WEIGHT 重量 REV 版本
						APPROVED 专业	OF 共 页 kg
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核		MANAGER 项目经理	泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION.

加拿大BC省墨里河煤矿选煤厂

SCALE 比例 NA
DWG TYPE 图类

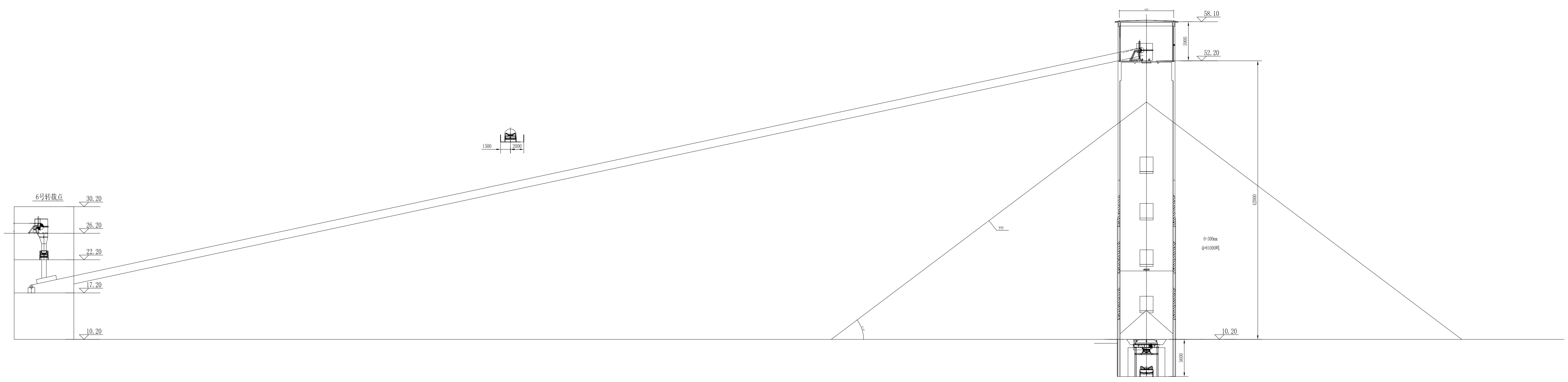
DRAWN 设计
CHECKED 校核
APPROVED 审核
MANAGER 批准

2#转载点至6#转载点剖面

C1136-2202-11

SHEET 第 页 / OF 共 页 | WEIGHT 重量 kg | REV. 版本

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

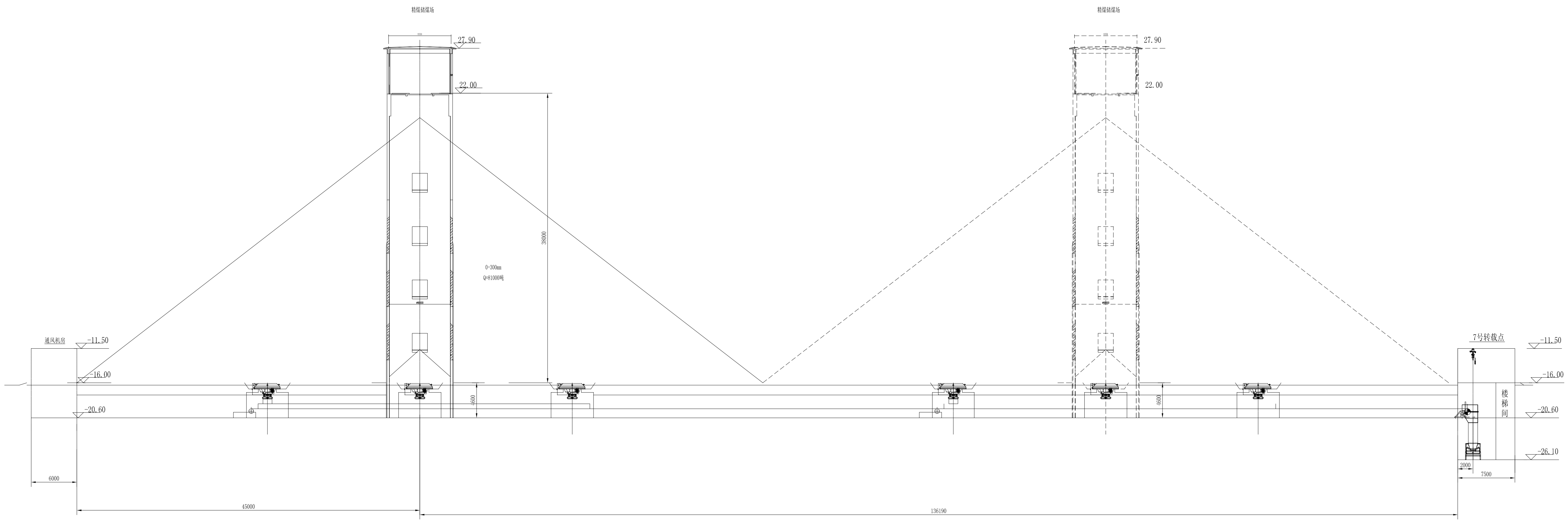


No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核	
CONFIDENTIAL THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION.					

加拿大BC省墨里河煤矿选煤厂

SCALE 比例	NA	6号转载点至精煤储煤场剖面	C1136-2202-12
DWG TYPE 图类			SHEET 第 页 / OF 共 页
DRAWN 设计			WEIGHT 重量 kg
CHECKED 校核			REV. 版本
APPROVED 审核			
MANAGER 项目经理			

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



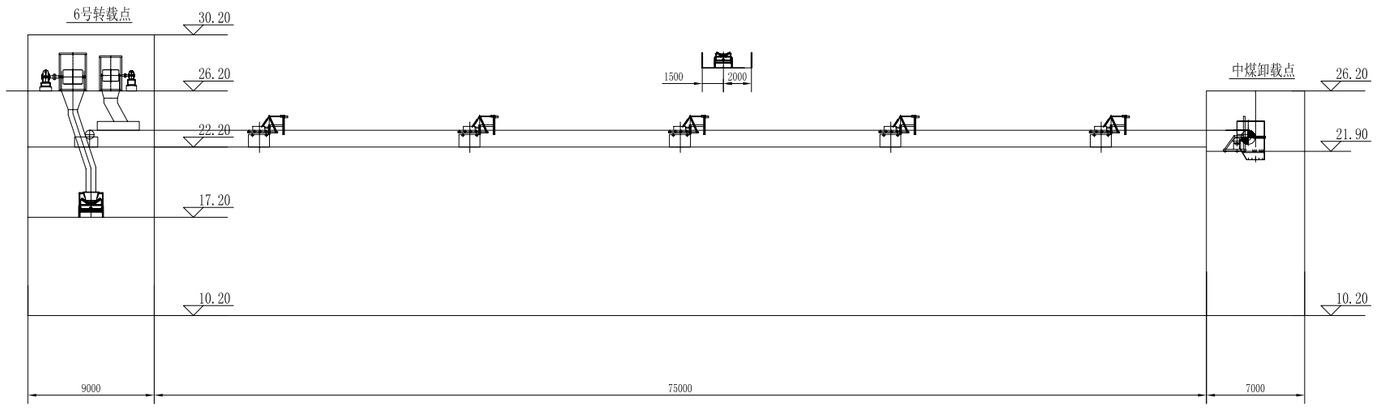
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION.

加拿大BC省墨里河煤矿选煤厂

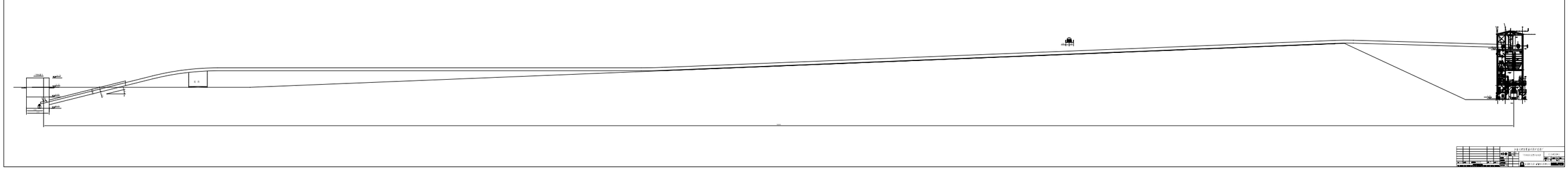
SCALE 比例 NA	精煤储煤场剖面	C1136-2202-13	
DWG TYPE 图类			
DRAWN 设计		SHEET 第 页	WEIGHT 重量	REV.版本
CHECKED 校核		OF 共 页	kg	
APPROVED 审核				
MANAGER 项目经理				

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

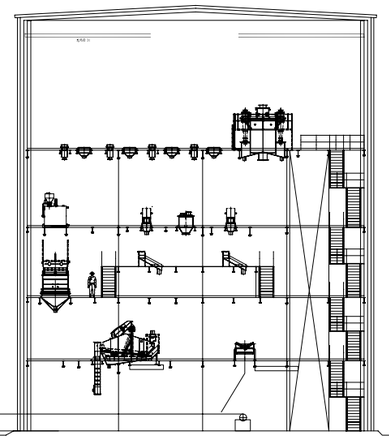


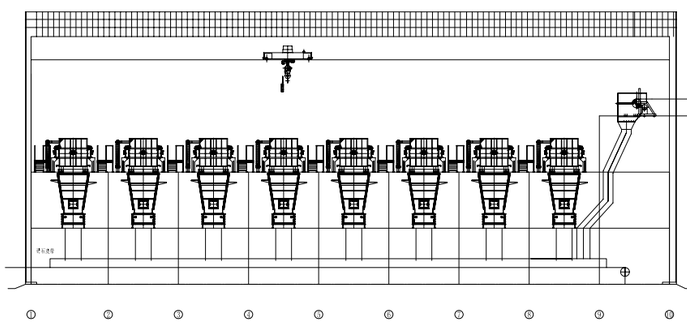
					加拿大BC省墨里河煤矿选煤厂
					SCALE 比例 NA DWG TYPE 图类
					6号转载点至中煤卸料点剖面
					C1136-2202-14
					DRAWN 设计
					CHECKED 校核
					APPROVED 审核
					MANAGER 项目经理
					SHEET 第 页 / OF 共 页
					WEIGHT 重量 kg
					REV.版本
No.版本号	DATE 日期	REVISION 修改内容	BY. 设计	APP. 审核	

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



主厂房





压滤车间

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION

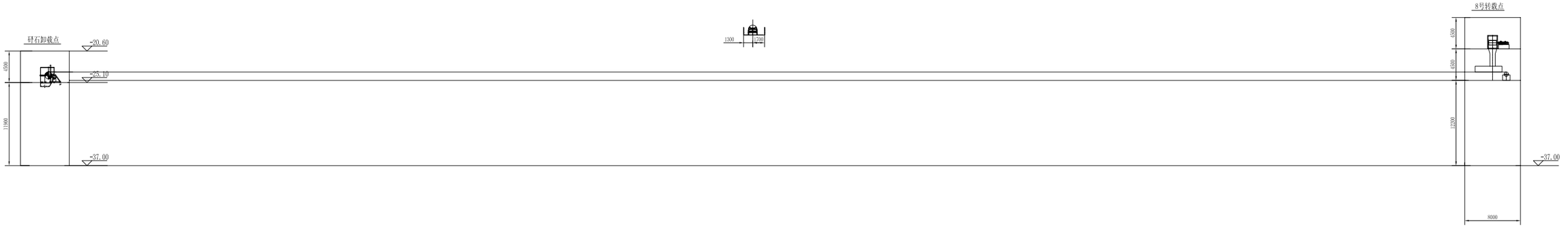
加拿大BC省墨里河煤矿选煤厂

SCALE 比例	NA	C1136-2202-16
DWG TYPE 图类		
DRAWN 设计		主厂房至尾煤压滤车间剖面
CHECKED 校核		SHEET 第 页 / WEIGHT 重量 / REV.版本
APPROVED 审批		OF 共 页 / kg
MANAGER 项目经理		

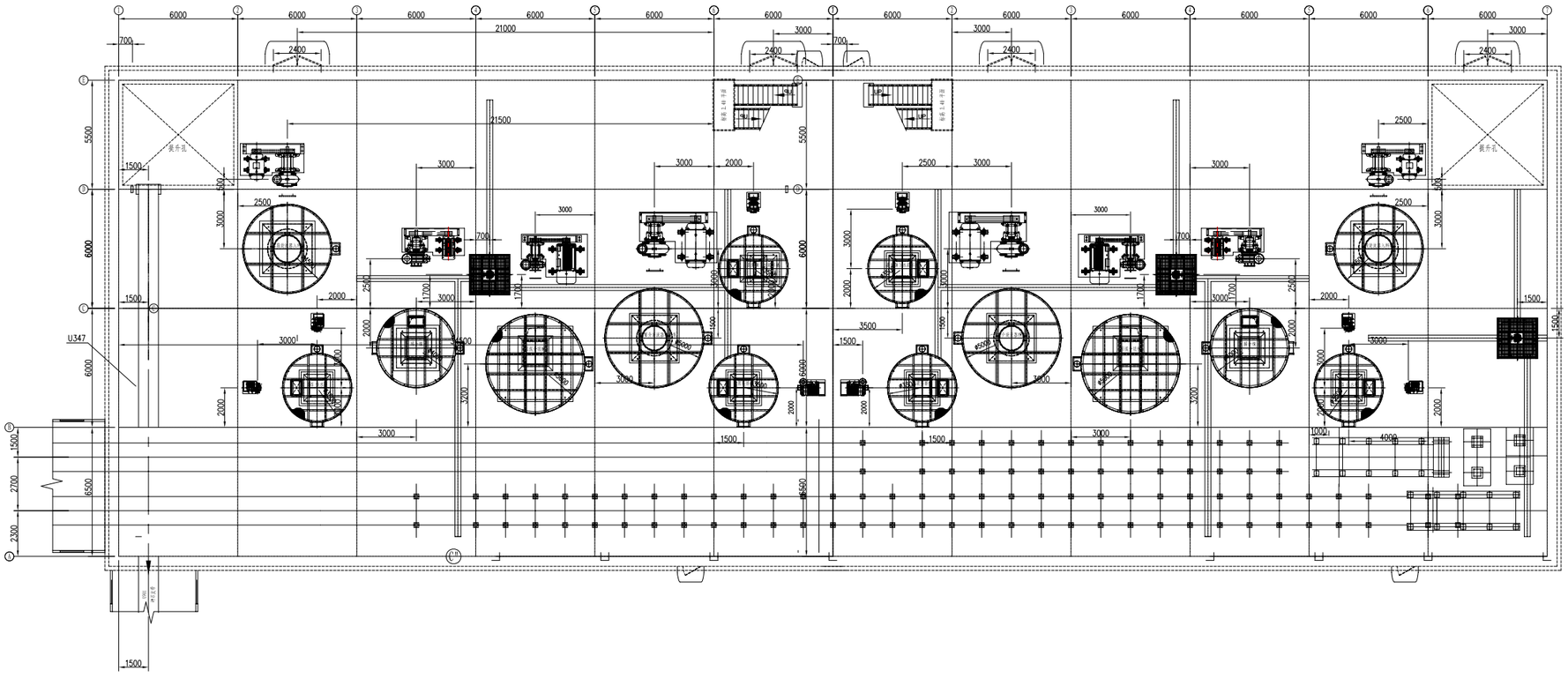
泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

加拿大BC省墨里河煤矿选煤厂				
SCALE 比例	尾煤压滤车间至8号转载点剖面	C1136-2202-17		
DWG TYPE 图类		SHEET 第 页	WEIGHT 重量	REV. 版本
DRAWN 设计		OF 共 页	kg	
CHECKED 校核				
APPROVED 审核	泰戈特(北京)工程技术有限公司	TAGGART (BEIJING) ENGINEERING CO.,LTD		
MANAGER 项目经理				

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核



						加拿大BC省墨里河煤矿选煤厂	
						SCALE 比例 1:1 / MM. 单位	C1136-2202-18
						DRAWN 设计 / CHECKED 校核 / APPROVED 审核 / MANAGER 项目负责	8号转载点至碎石卸载点剖面
							SHEET 第 张 / OF 共 张 / WEIGHT 重量 kg / REV 版本
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核		泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD	



No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

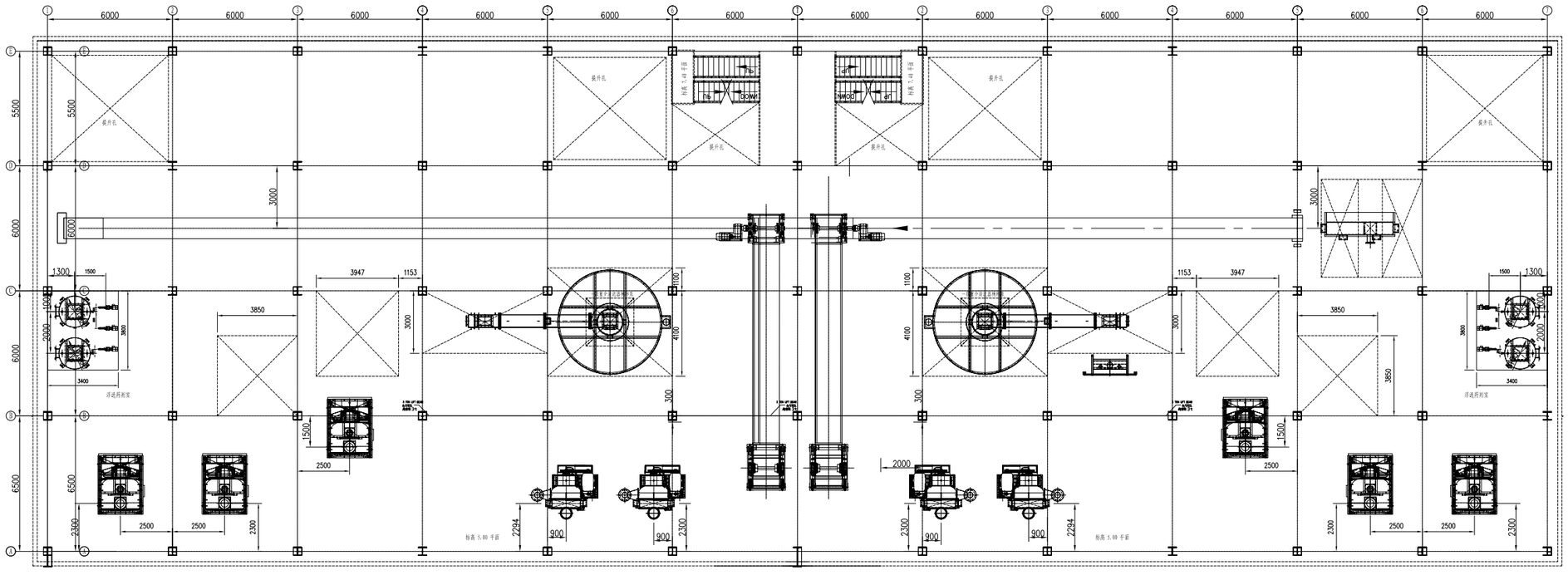
CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100	主厂房设备布置及安装图 标高 0.00 平面	S1136-2210-01
DWG TYPE 图类	GA		
DRAWN 设计			SHEET 第1页 / WEIGHT 重量 / REV.版本
CHECKED 校核			OF 共 页 / kg / A
APPROVED 审核			
MANAGER 项目经理			

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

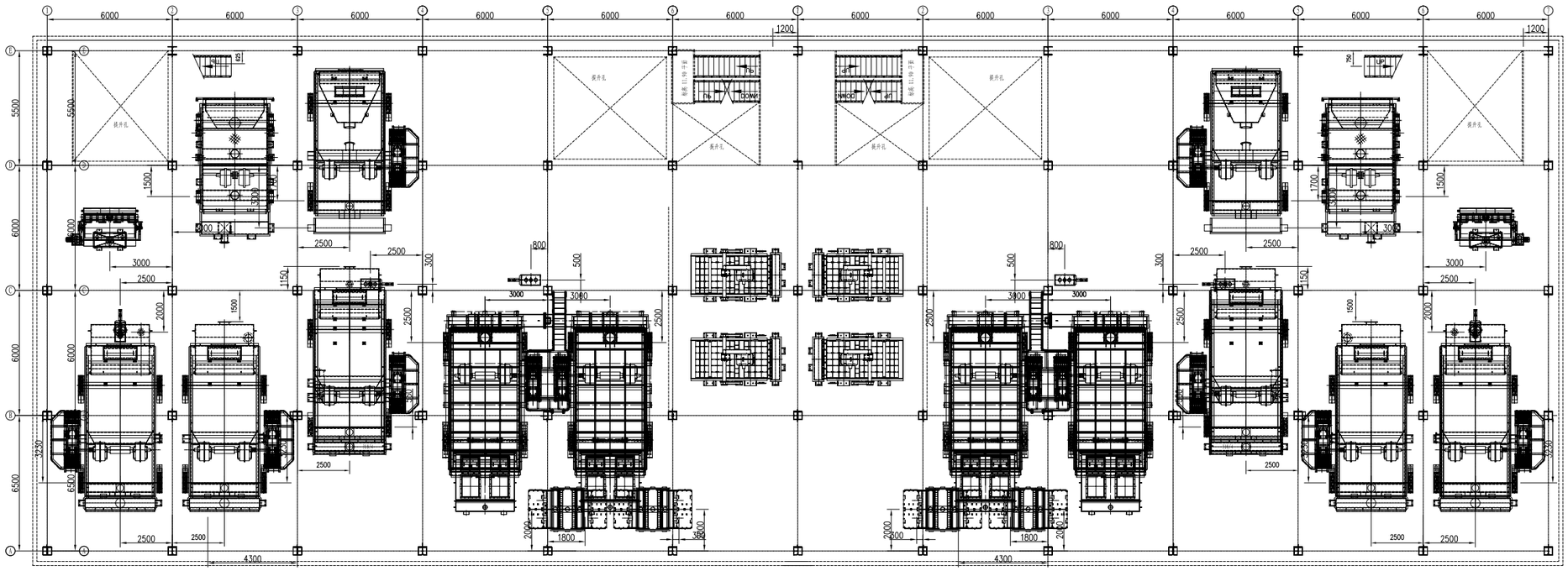
专业	姓名	日期
专业	姓名	日期



No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例 1:100 / DWG TYPE 图类 GA	主厂房设备布置及安装图 标高 2.50 & 5.00 平面	S1136-2210-02
DRAWN 设计		SHEET 第 页 / WEIGHT 重量 / REV.版本
CHECKED 校核		OF 共 页 / kg / A
APPROVED 审核		
MANAGER 项目经理	泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD	



标高 6.50 & 9.50 平面

标高 6.50 & 9.50 平面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100
DWG TYPE 图类	GA
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 项目经理	

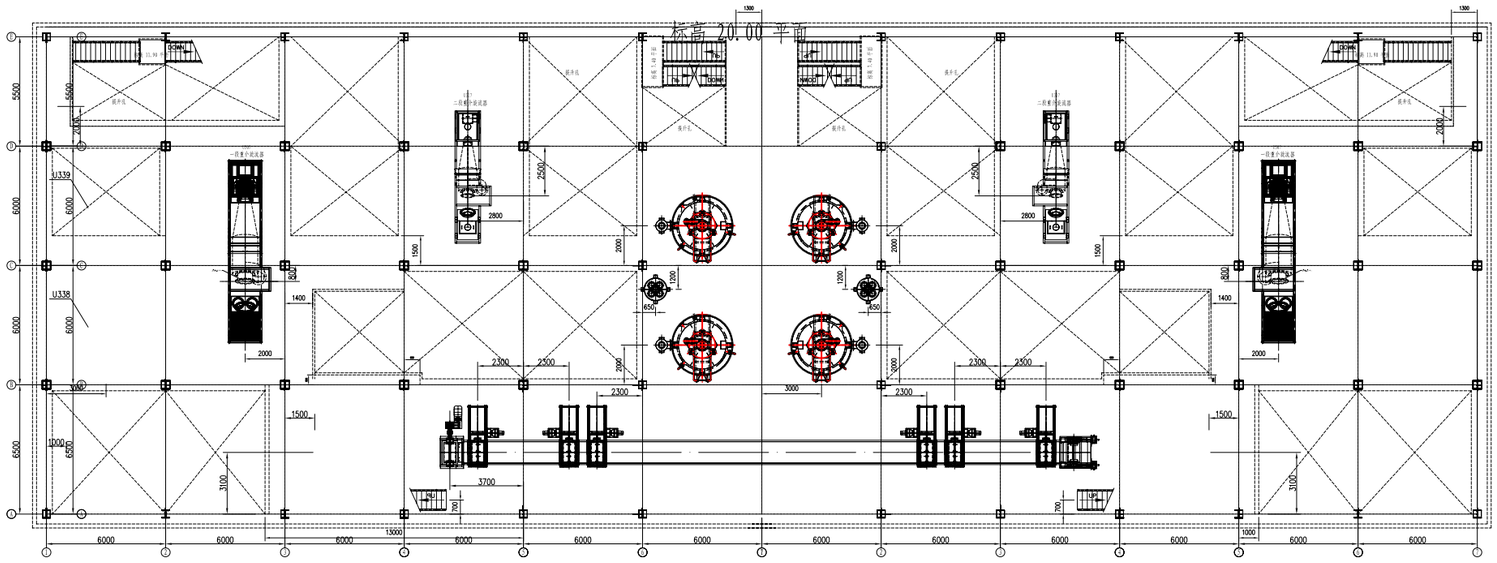
主厂房设备布置及安装图
标高 6.50 & 9.50 平面

S1136-2210-03

SHEET 第 页	WEIGHT 重量	REV.版本
OF 共 页	kg	A

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

日期				
姓名				
专业				
日期				
姓名				
专业				



标高 14.50 & 17.90 平面

标高 14.50 & 17.90 平面

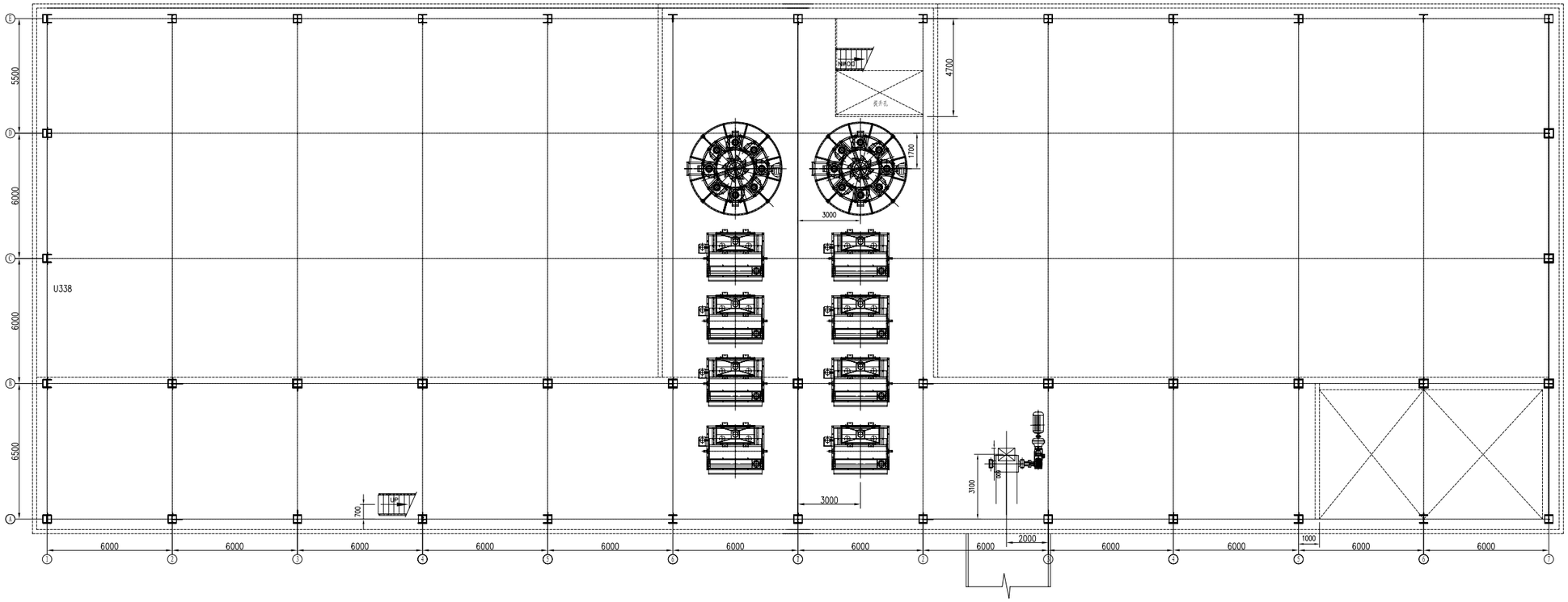
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100	主厂房设备布置及安装图 标高 14.50 & 17.90 平面	S1136-2210-04
DWG TYPE 图类	GA		
DRAWN 设计			
CHECKED 校核			
APPROVED 审核			
MANAGER 项目经理			

SHEET 第 页	WEIGHT 重量	REV.版本
OF 共 页	kg	A

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



专业	姓名	日期
专业	姓名	日期

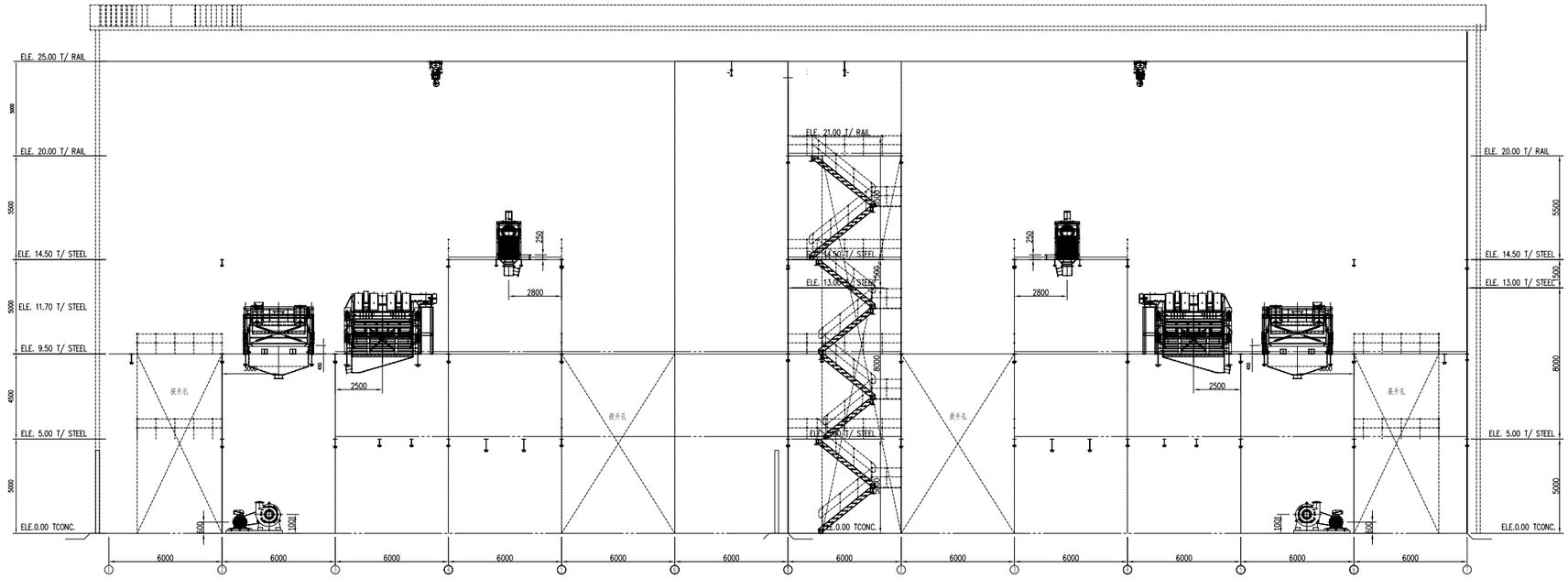
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100	主厂房设备布置及安装图	S1136-2210-05
DWG TYPE 图类	GA	标高 13.00 & 16.20 & 20.00 平面	
DRAWN 设计			SHEET 第 页 / WEIGHT 重量 / REV.版本
CHECKED 校核			OF 共 页 / kg / A
APPROVED 审核			
MANAGER 项目经理			

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期



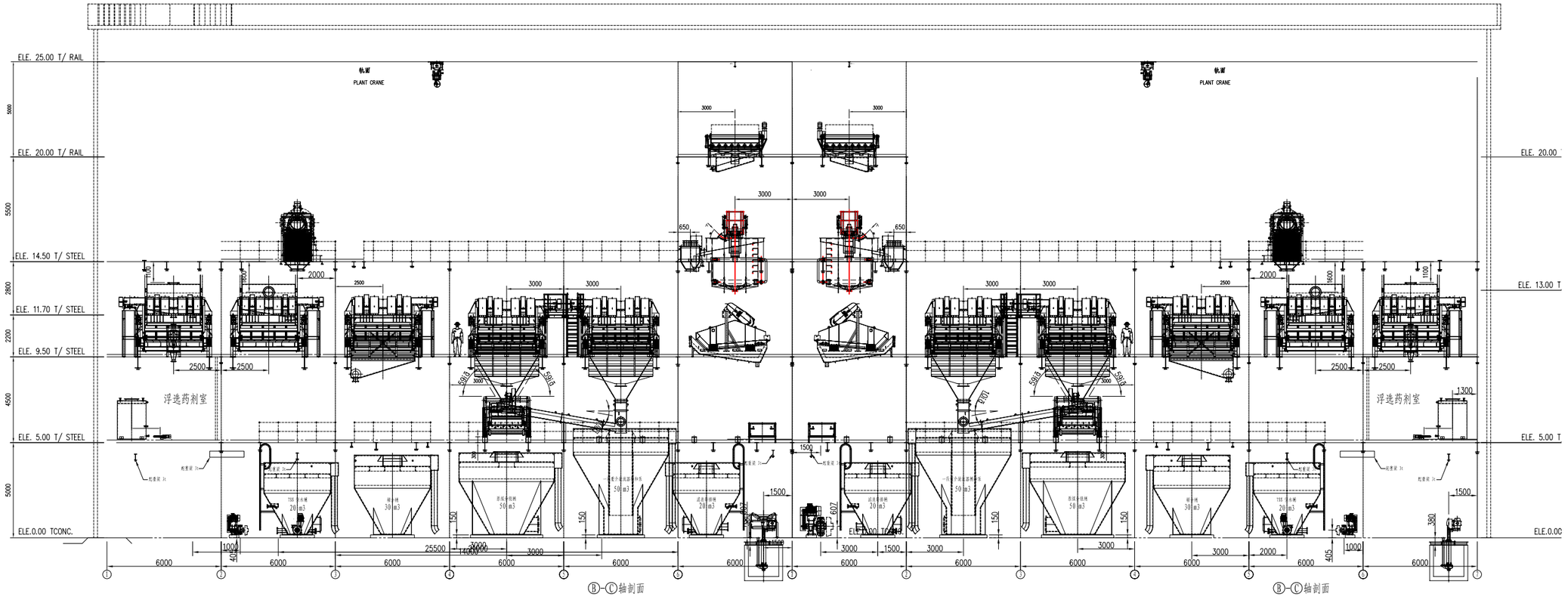
Ⓓ-Ⓔ轴剖面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100	主厂房设备布置及安装图 Ⓓ-Ⓔ轴剖面
DWG TYPE 图类	GA	S1136-2210-6
DRAWN 设计		SHEET 第 页 / OF 共 页
CHECKED 校核		WEIGHT 重量 kg
APPROVED 审核		REV. 版本 A
MANAGER 项目经理		

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



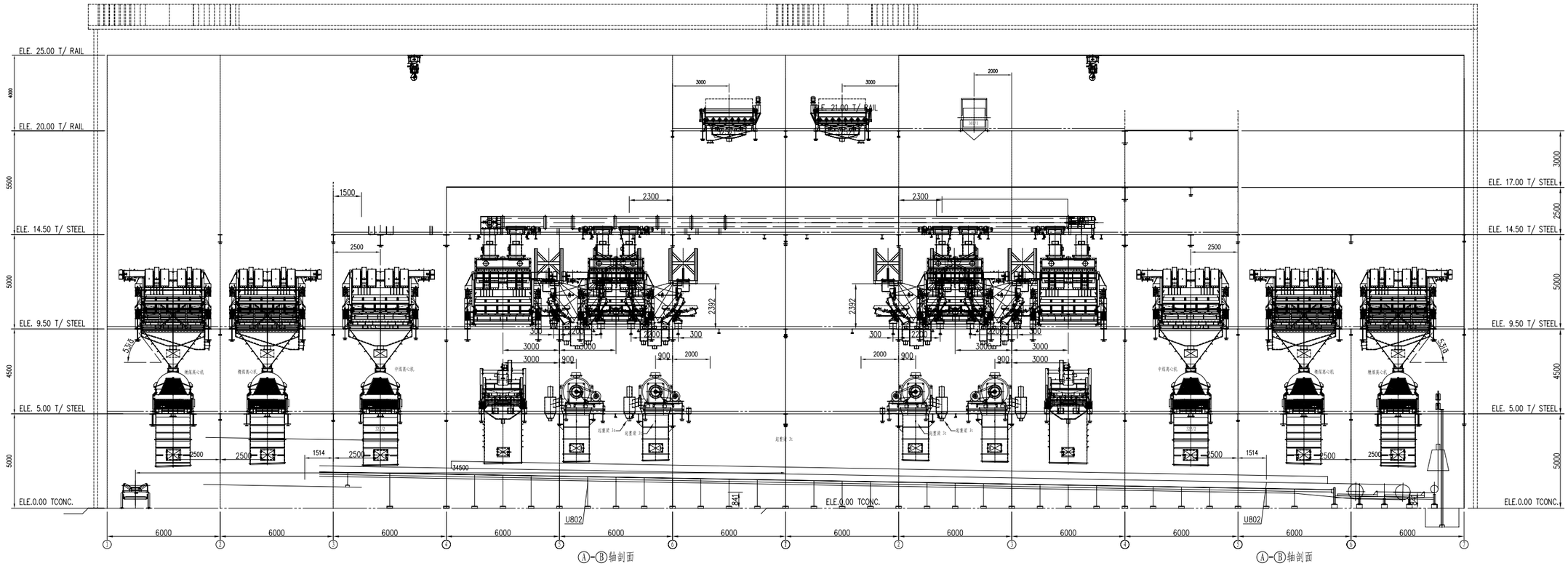
Ⓑ-Ⓒ轴剖面　　Ⓑ-Ⓒ轴剖面

No.版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100	主厂房设备布置及安装图 Ⓑ-Ⓒ轴剖面	S1136-2210-07
DWG TYPE 图类	GA		
DRAWN 设计			SHEET 第 页 / OF 共 页
CHECKED 校核			WEIGHT 重量 kg
APPROVED 审核			REV.版本 A
MANAGER 项目经理			

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



Ⓐ-Ⓑ轴剖面

Ⓐ-Ⓑ轴剖面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100
DWG TYPE 图类	GA
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 项目经理	

主厂房设备布置及安装图

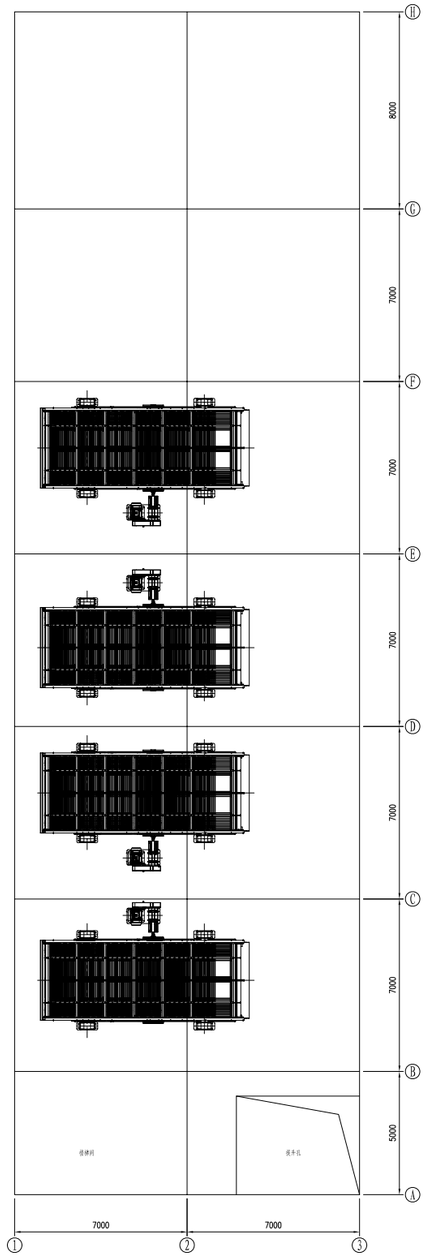
Ⓐ-Ⓑ轴剖面

S1136-2210-08

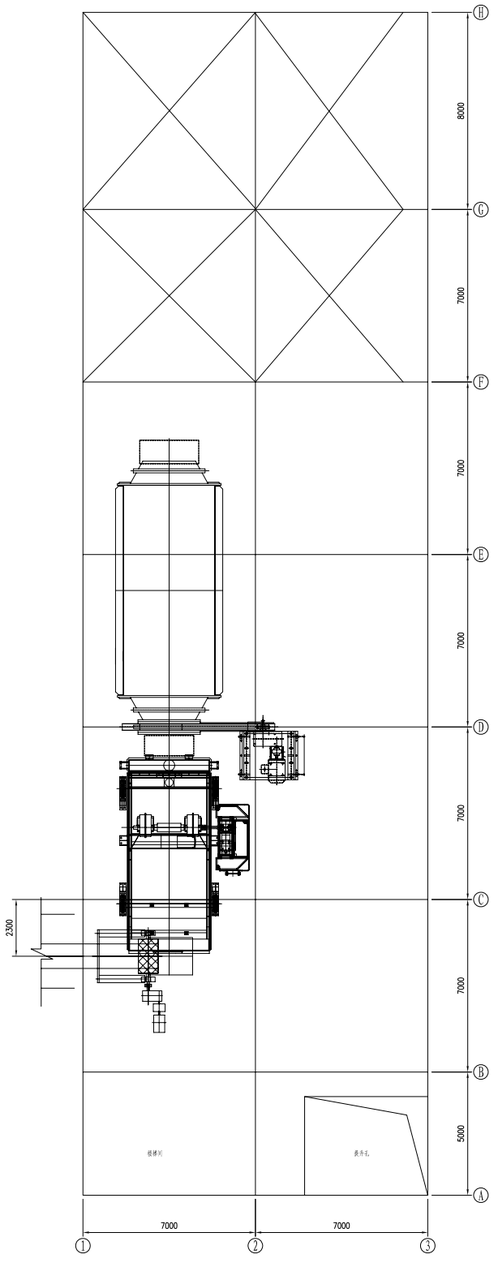
SHEET 第 x 页	WEIGHT 重量	REV. 版本
OF 共 页	kg	A

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期



标高 11.200m 平面



标高 22.200m & 27.400m & 32.800m 平面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

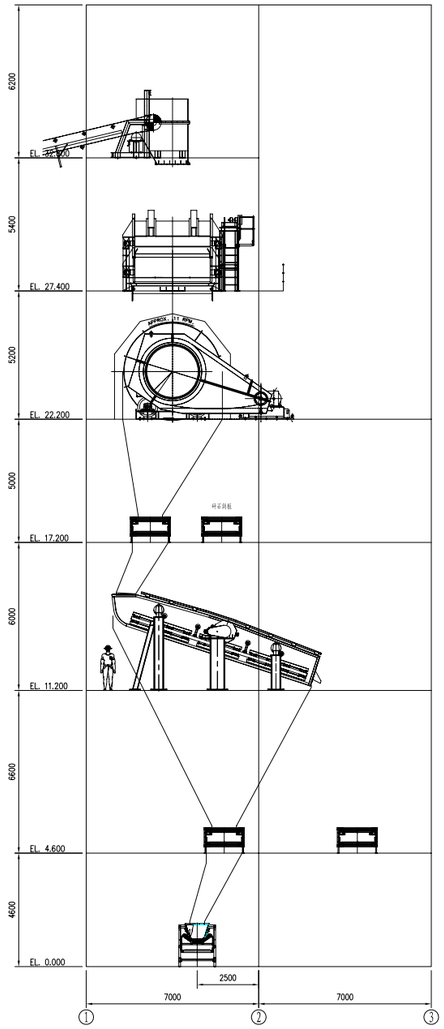
SCALE 比例	1:120	
DWG TYPE 图类	GA	
DRAWN 设计		
CHECKED 校核		
APPROVED 审核		
MANAGER 项目负责		

选碎车间布置图
平面图

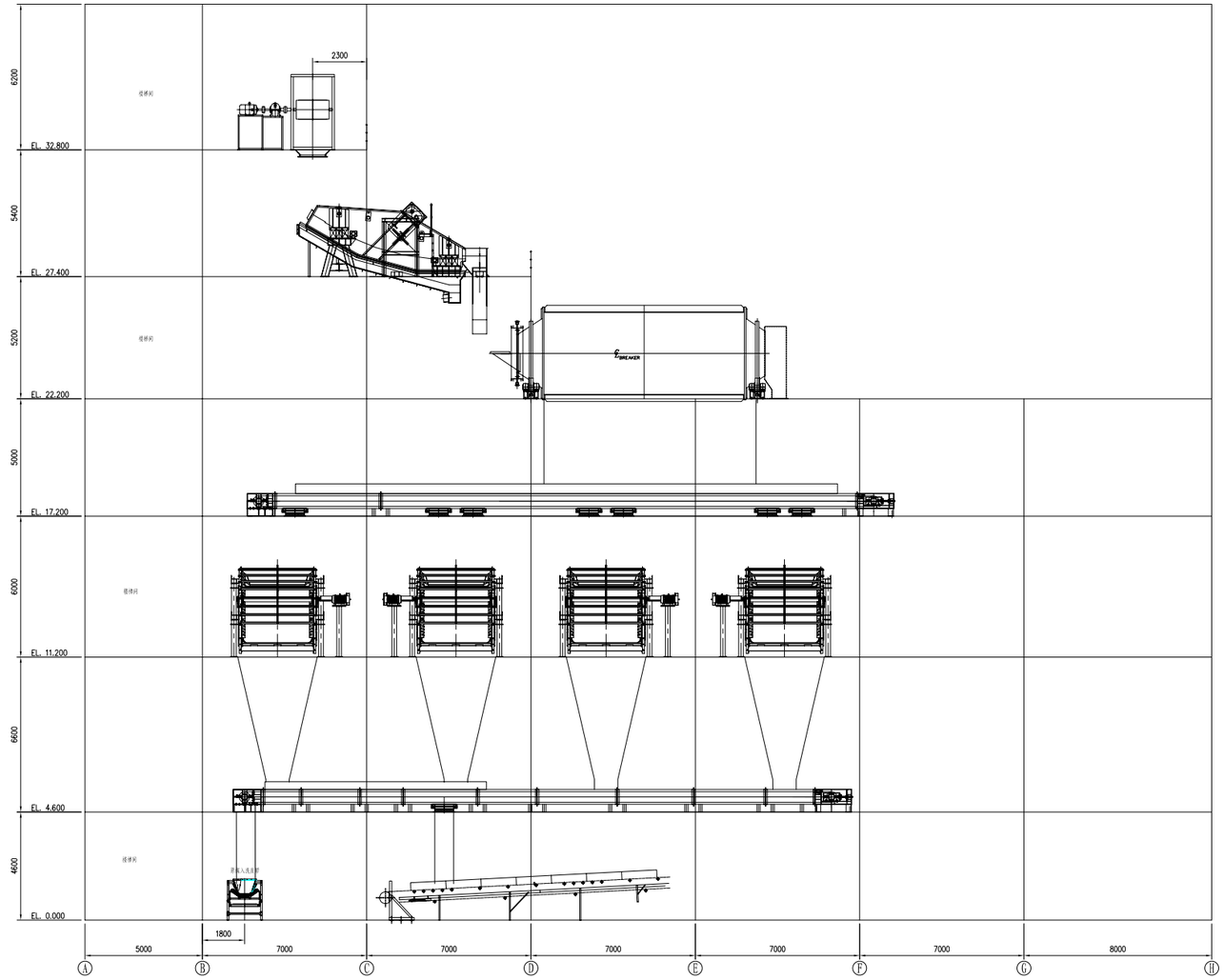
C1136-2208-01

SHEET 第 页	WEIGHT 重量	REV. 版本
OF 共 页	kg	0

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD



B-F轴 剖面



2-1轴 剖面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

CONFIDENTIAL
THIS DRAWING OR ITS CONTENTS MAY NOT BE REPRODUCED OR COPIED WITHOUT WRITTEN PERMISSION

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

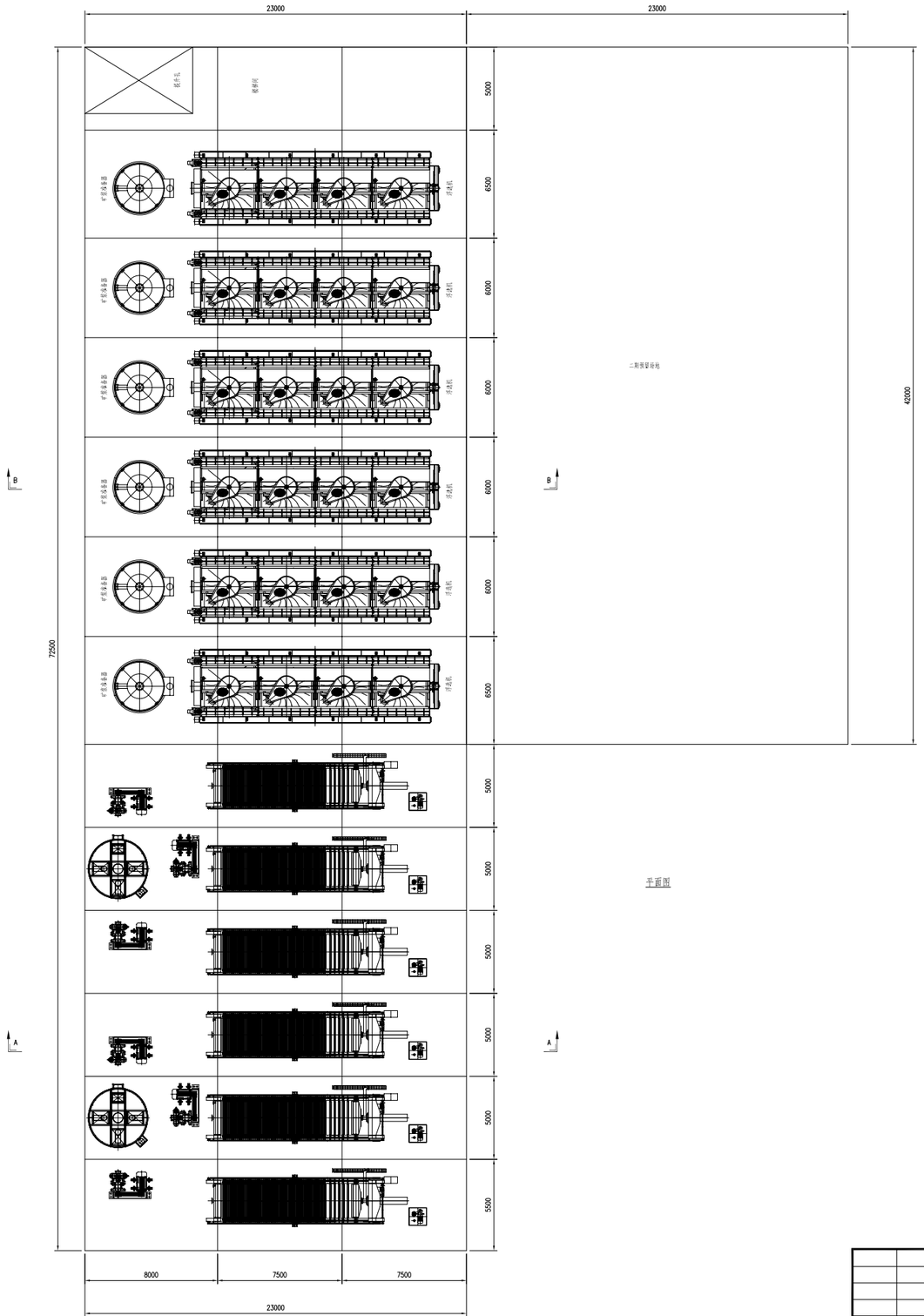
SCALE 比例	1:120	选碎车间布置图 剖面图
DWG TYPE 图类	GA	
DRAWN 设计		
CHECKED 校核		
APPROVED 审核		
MANAGER 项目经理		

C1136-2208-02

SHEET 第 页	WEIGHT 重量	REV. 版本
OF 共 页	kg	0

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期
专业	姓名	日期



平面图

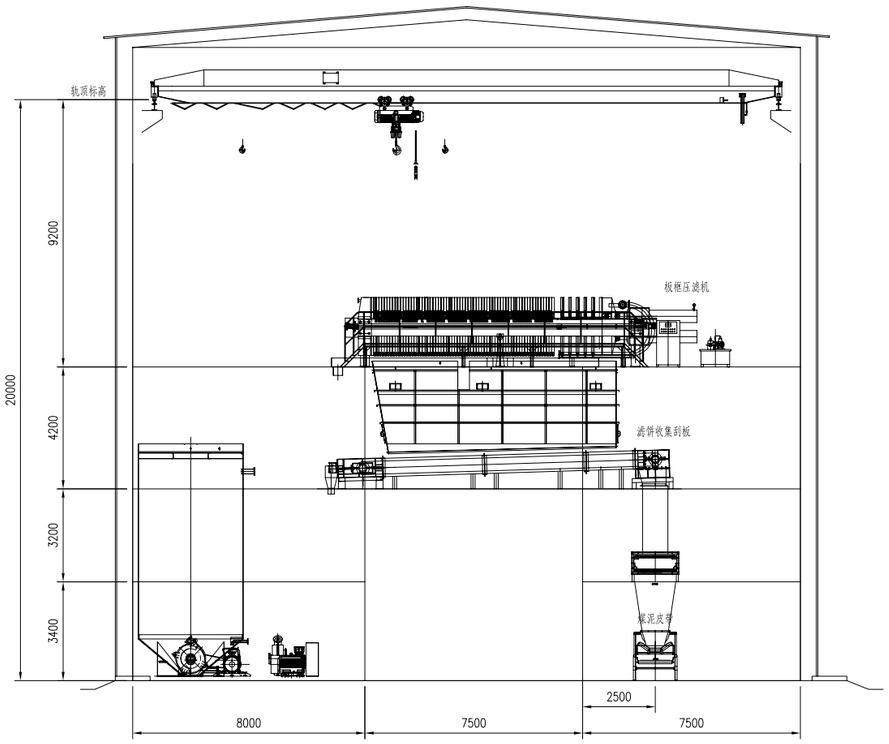
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

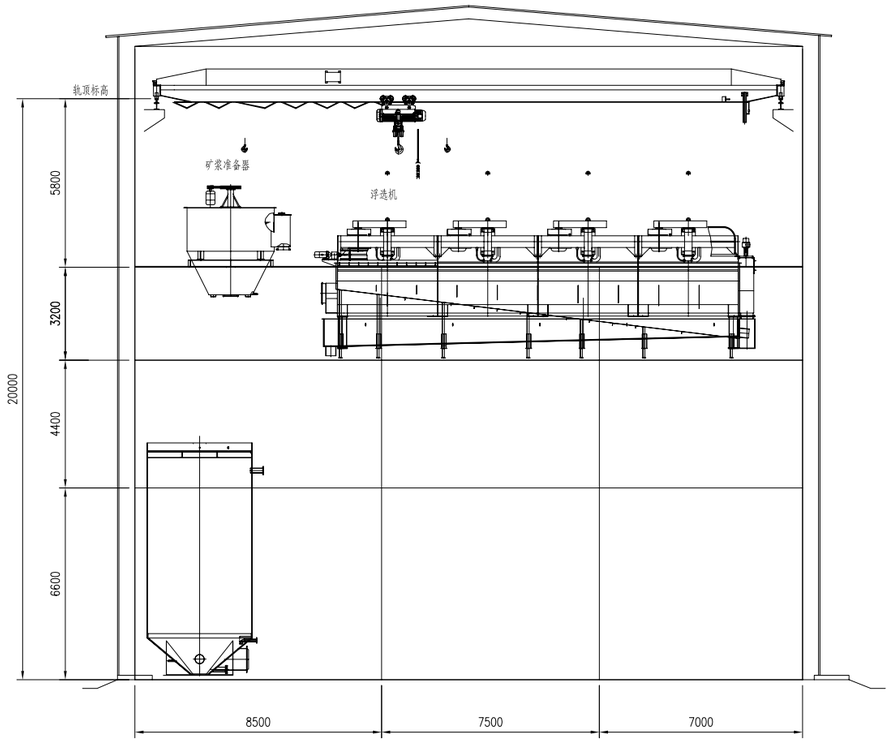
SCALE 比例	1:150	浮选车间设备布置图 标高 0.000m 平面
DWG TYPE 图类	GA	C1136- 2212-01
DRAWN 设计		SHEET 第 页 / WEIGHT 重量 / REV.版本
CHECKED 校核		OF 共 页 / kg / 0
APPROVED 审核		
MANAGER 项目经理		

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期



A-A轴 剖面



B-B轴 剖面

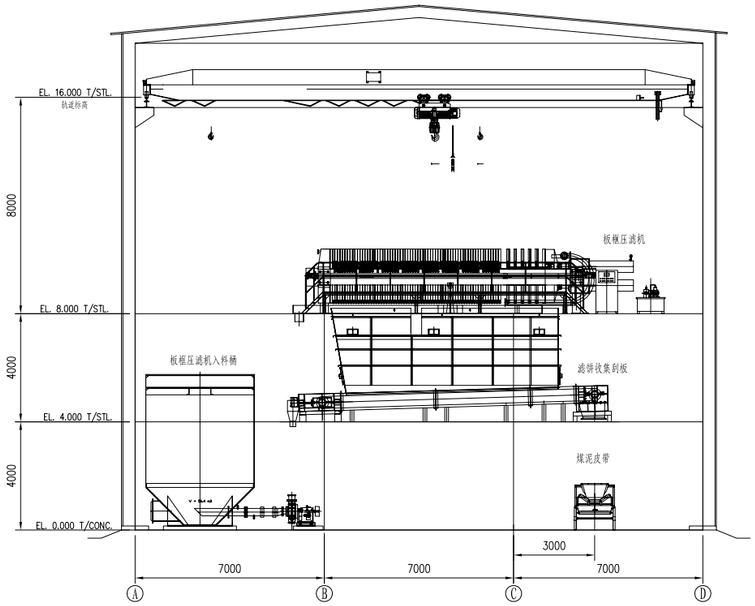
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

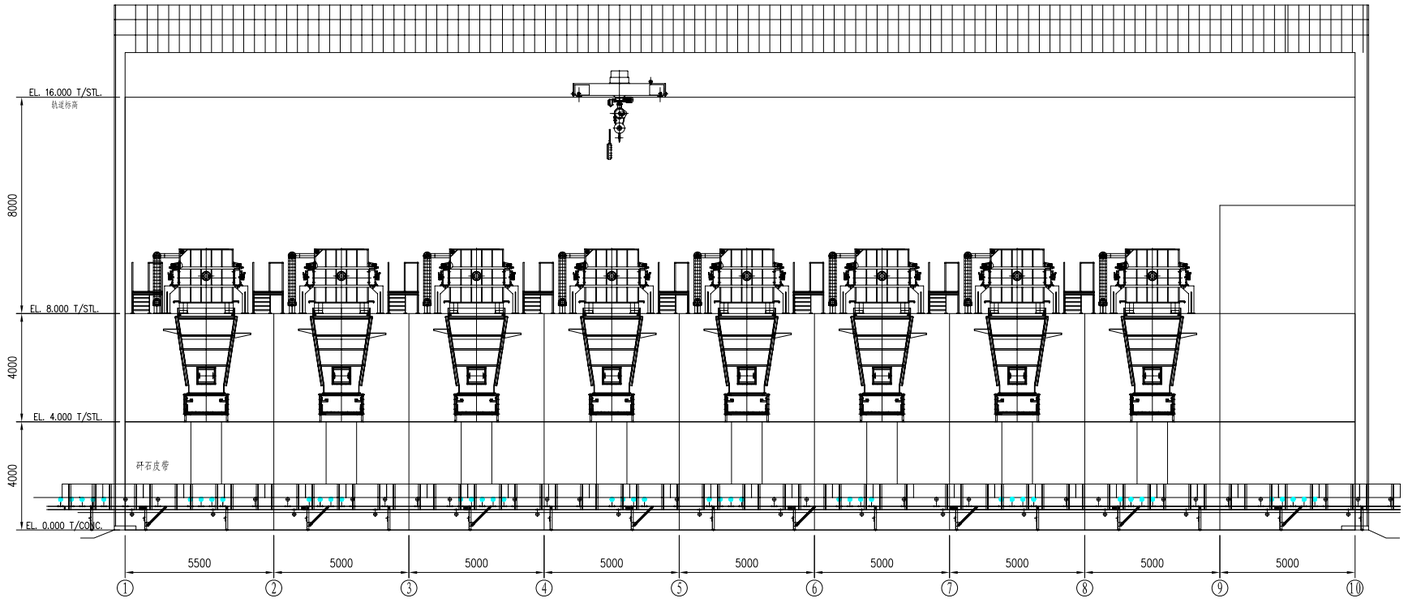
SCALE 比例	1:100	浮选车间设备布置图 剖面图	C1136- 2212-02
DWG TYPE 图类	GA		
DRAWN 设计			SHEET 第 页 / WEIGHT 重量 / REV.版本
CHECKED 校核			OF 共 页 / kg / 0
APPROVED 审核			
MANAGER 项目经理			

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期
专业	姓名	日期



10-2轴 剖面



A-D轴 剖面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100
DWG TYPE 图类	GA
DRAWN 设计	
CHECKED 校核	
APPROVED 审核	
MANAGER 项目经理	

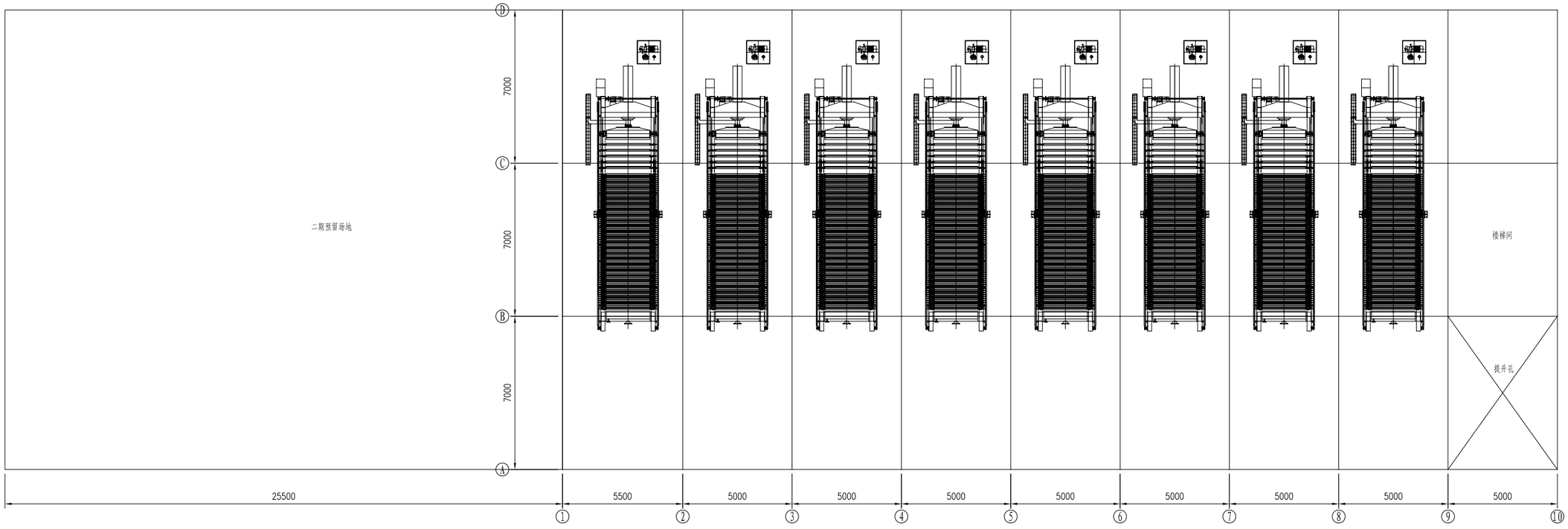
尾煤压滤车间设备布置图
剖面图

C1136- 2216-01

SHEET 第 页	WEIGHT 重量	REV.版本
OF 共 页	kg	0

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期



标高 8.000m 平面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100	
DWG TYPE 图类	GA	
DRAWN 设计		
CHECKED 校核		
APPROVED 审核		
MANAGER 项目经理		

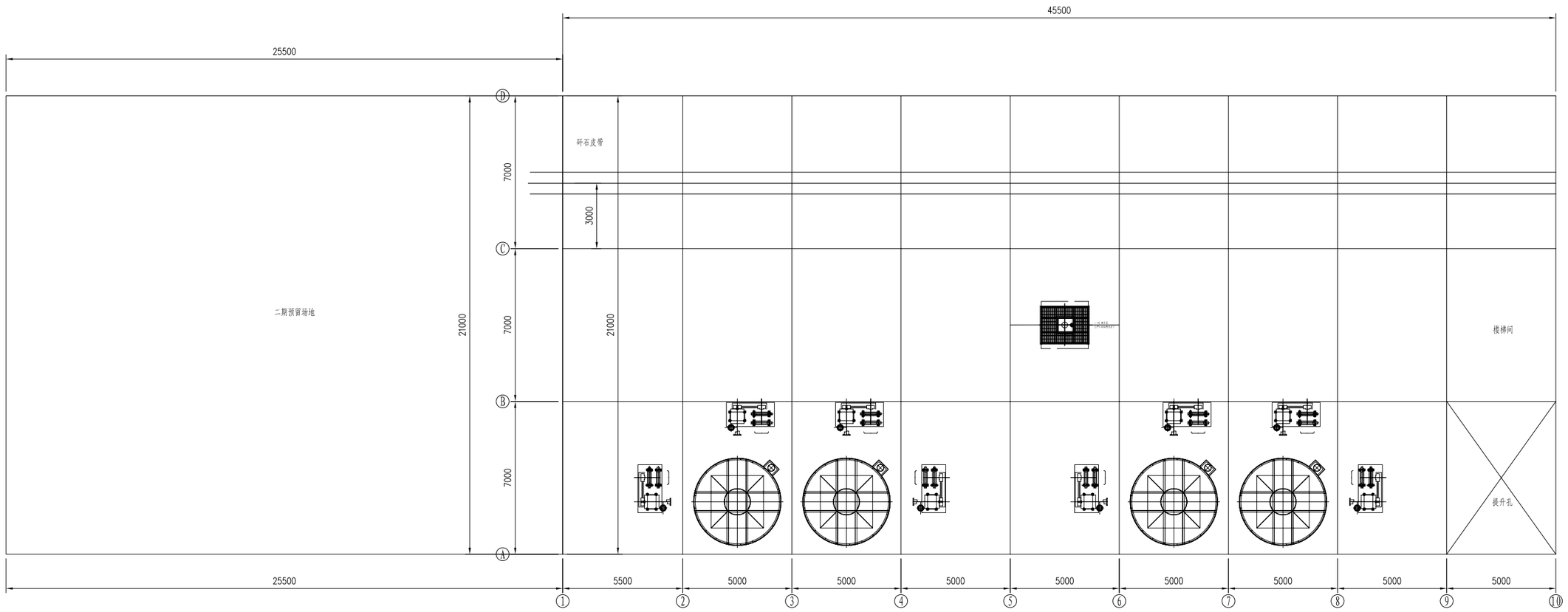
尾煤压滤车间设备布置图
标高 8.000m 平面

C1136- 2216-03

SHEET 第 页	WEIGHT 重量	REV.版本
OF 共 页	kg	0

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期



标高 0.000m 平面

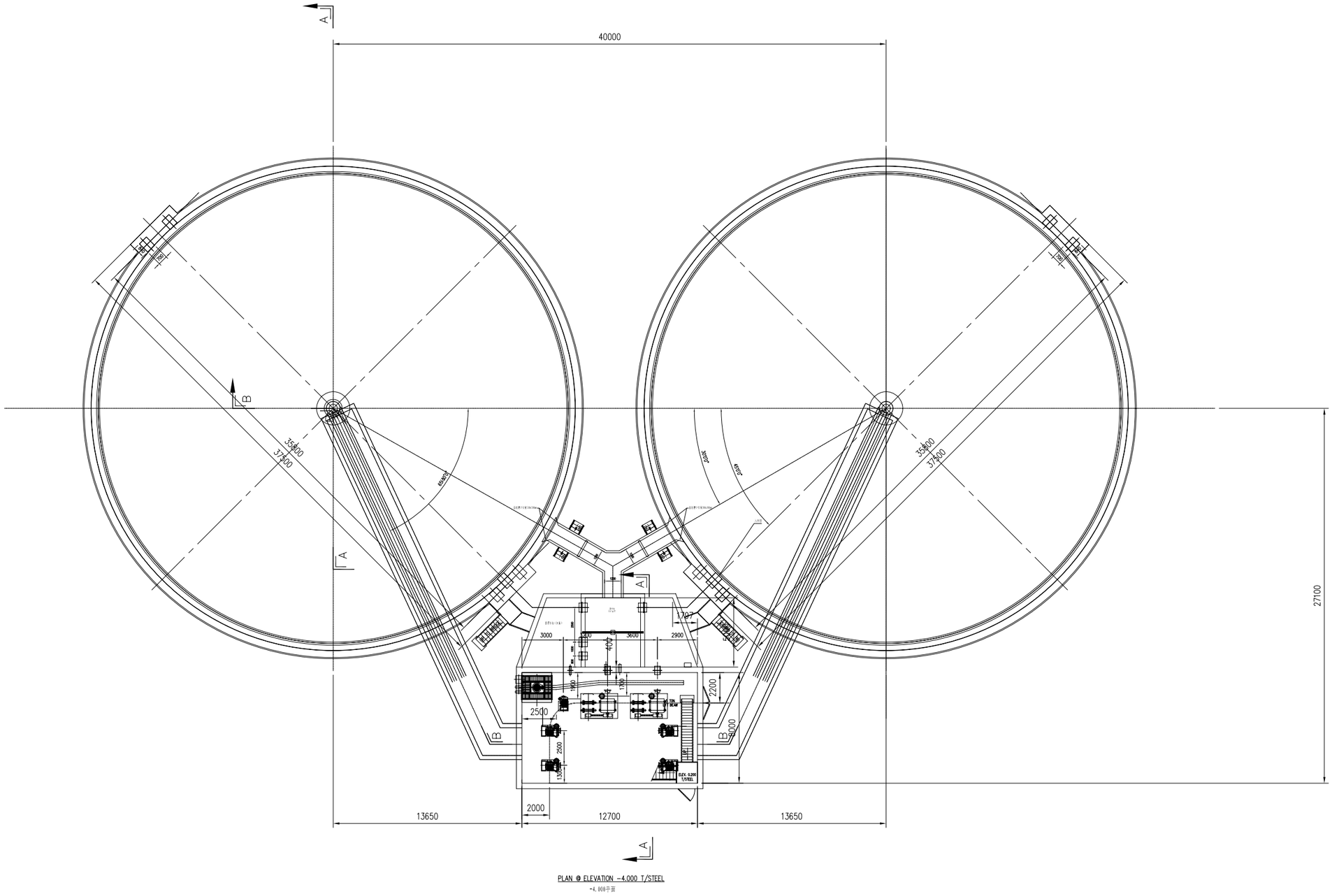
No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:100	尾煤压滤车间设备布置图 标高 0.000m 平面
DWG TYPE 图类	GA	C1136- 2216-02
DRAWN 设计		SHEET 第 页 / OF 共 页
CHECKED 校核		WEIGHT 重量 kg
APPROVED 审核		REV.版本 0
MANAGER 项目经理		

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

专业	姓名	日期
专业	姓名	日期



PLAN @ ELEVATION -4.000 T/STEEL

-4.000平面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

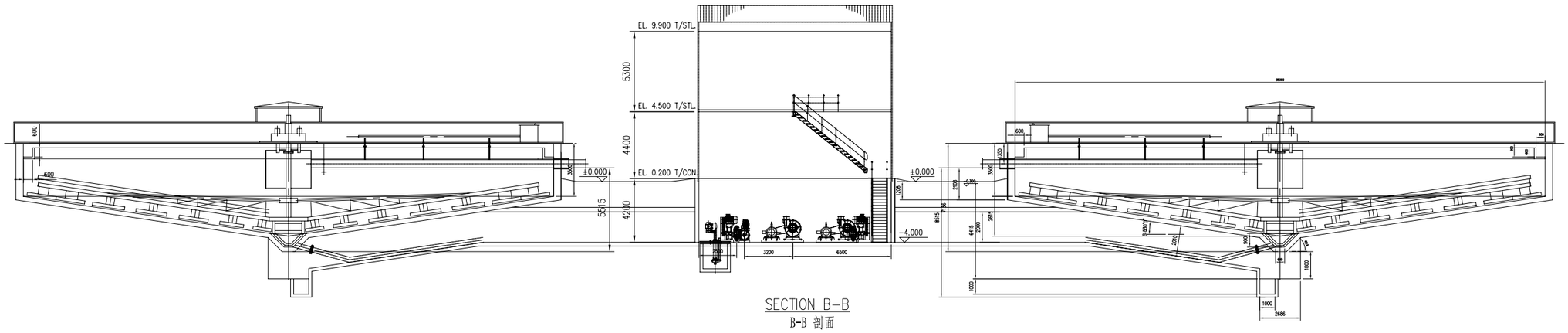
SCALE 比例	1:150	浓缩车间设备布置及安装图
DWG TYPE 图类	GA	平面图
DRAWN 设计		
CHECKED 校核		
APPROVED 审核		
MANAGER 项目经理		

C1136- 2211-01

SHEET 第 页	WEIGHT 重量	REV. 版本
OF 共 页	kg	0

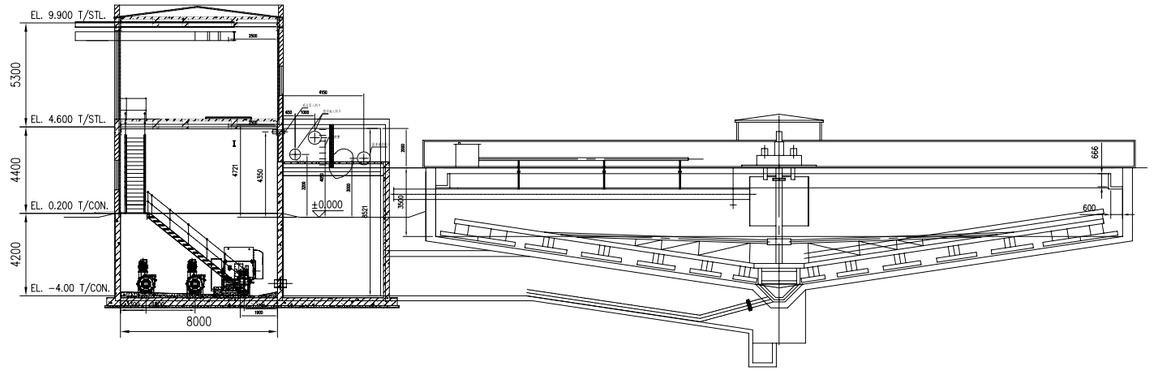
泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

日期					
姓名					
专业					
日期					
姓名					
专业					



SECTION B-B

B-B 剖面



SECTION A-A

A-A 剖面

No 版本号	DATE 日期	REVISION 修改内容	BY 设计	APP 审核

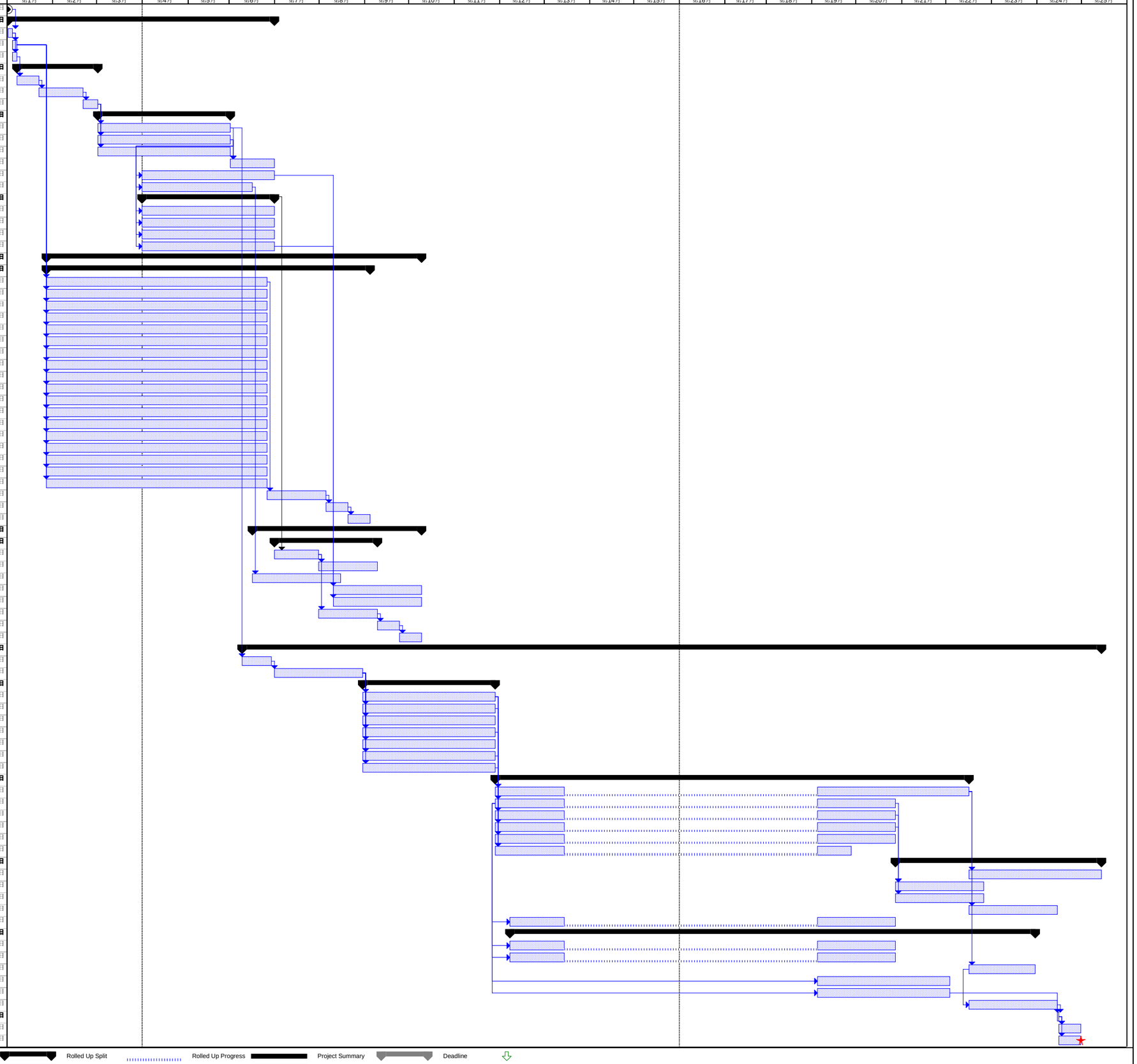
HD矿业国际公司加拿大BC省墨玉河煤矿选煤厂

SCALE 比例	1:150	浓缩车间设备布置及安装图 剖面图
DWG TYPE 图类	GA	C1136- 2211-02
DRAWN 设计		SHEET 第 页 / OF 共 页
CHECKED 校核		WEIGHT 重量 kg
APPROVED 审核		REV.版本 0
MANAGER 项目经理		

泰戈特(北京)工程技术有限公司 TAGGART (BEIJING) ENGINEERING CO.,LTD

MURRUAY RIVER COAL PREPARATION FACILITYPROJECT SCHEDULE墨玉河选煤厂进度表

标识号	Task Name	工期	开始时间	完成时间
1	**CONTRACT AWARD 合同签定**	1 day	2013年10月1日	2013年10月1日
2	**ENGINEERING 工程设计**	**181 days**	**2013年10月2日**	**2014年3月31日**
3	Finalize P&ID PID关系图	3 days	2013年10月2日	2013年10月4日
4	Equipment Selection 设备最终选型	3 days	2013年10月5日	2013年10月7日
5	General Arrangements 总布置	3 days	2013年10月5日	2013年10月7日
6	**Soil Surveying 地勘**	**55 days**	**2013年10月8日**	**2013年12月1日**
7	Layout point 布点	15 days	2013年10月8日	2013年10月22日
8	Site Survey 现场勘探	30 days	2013年10月23日	2013年11月21日
9	Report 报告	10 days	2013年11月22日	2013年12月1日
10	**Foundations 基础**	**90 days**	**2013年12月2日**	**2014年3月1日**
11	Raw coal and products storage 原煤、产品煤储运基础部分	90 days	2013年12月2日	2014年3月1日
12	Plant, sizing buliding, Loadout and thicheners 厂房筛分装车和浓缩池基础部分	90 days	2013年12月2日	2014年3月1日
13	MCC, Office & magnitite storage 配电综合楼、介质库等基础部分	90 days	2013年12月2日	2014年3月1日
14	Civil (tunnel and thickener) 土建 （暗道、浓缩池等）	30 days	2014年3月2日	2014年3月31日
15	Piping 管路	90 days	2014年1月1日	2014年3月31日
16	Platework 溜槽非标	75 days	2014年1月1日	2014年3月16日
17	**Structural steel 钢结构**	**90 days**	**2014年1月1日**	**2014年3月31日**
18	Plant steel structure 主厂房部分	90 days	2014年1月1日	2014年3月31日
19	Material handling sys steel structure 外围物料运输部分	90 days	2014年1月1日	2014年3月31日
20	Train Loadout 装车站	90 days	2014年1月1日	2014年3月31日
21	Electrical电气	90 days	2014年1月1日	2014年3月31日
22	**PROCUREMENT 采购**	**255 days**	**2013年10月28日**	**2014年7月9日**
23	**Equipment设备**	**220 days**	**2013年10月28日**	**2014年6月4日**
24	Screens & Sieve Bands 筛子及弧形筛	150 days	2013年10月28日	2014年3月26日
25	Crusher 破碎机	150 days	2013年10月28日	2014年3月26日
26	HM & Classifying Cyclones 重介和分级旋流器	150 days	2013年10月28日	2014年3月26日
27	Centrifuges离心机	150 days	2013年10月28日	2014年3月26日
28	Magnetic Separators 磁选机	150 days	2013年10月28日	2014年3月26日
29	Thickeners 浓缩机	150 days	2013年10月28日	2014年3月26日
30	TSS 煤泥分选机	150 days	2013年10月28日	2014年3月26日
31	Pumps泵	150 days	2013年10月28日	2014年3月26日
32	Flotation Cell 浮选机	150 days	2013年10月28日	2014年3月26日
33	Filter Press 压滤机	150 days	2013年10月28日	2014年3月26日
34	Air Compressors 空压机	150 days	2013年10月28日	2014年3月26日
35	Flocc & reagent sys. 絮凝剂、浮选药剂填加系统	150 days	2013年10月28日	2014年3月26日
36	Feeders and discharge gate 给料机和排料闸门	150 days	2013年10月28日	2014年3月26日
37	Belt Conveyors and scrapers 刮板机和皮带运输机	150 days	2013年10月28日	2014年3月26日
38	Iron magnet, belt scale 除铁器、皮带称	150 days	2013年10月28日	2014年3月26日
39	Instrumentation and Density Gauges 控制仪表及密度仪	150 days	2013年10月28日	2014年3月26日
40	Batch weigh train loadout 快速装车站	150 days	2013年10月28日	2014年3月26日
41	Electral system 电气系统设备	150 days	2013年10月28日	2014年3月26日
42	Sea Fright 海运	40 days	2014年3月27日	2014年5月5日
43	Custom clearance 清关	15 days	2014年5月6日	2014年5月20日
44	Inland transportation 内陆运输	15 days	2014年5月21日	2014年6月4日
45	**Materials 材料**	**115 days**	**2014年3月17日**	**2014年7月9日**
46	**Structural Steel 钢结构**	**70 days**	**2014年4月1日**	**2014年6月9日**
47	The first shipment 第一批	30 days	2014年4月1日	2014年4月30日
48	The se3cond shipment 第二批	40 days	2014年5月1日	2014年6月9日
49	Platework 溜槽非标	60 days	2014年3月17日	2014年5月15日
50	Electrical 电气	60 days	2014年5月11日	2014年7月9日
51	Piping 管路	60 days	2014年5月11日	2014年7月9日
52	Sea Fright 海运（分多次运输）	40 days	2014年5月1日	2014年6月9日
53	Custom clearance 清关	15 days	2014年6月10日	2014年6月24日
54	Inland transportation 内陆运输	15 days	2014年6月25日	2014年7月9日
55	**CONSTRUCTION 土建及安装**	**584 days**	**2014年3月10日**	**2015年10月14日**
56	Mobilization 进场	20 days	2014年3月10日	2014年3月29日
57	Ground treatment 地基处理	60 days	2014年4月1日	2014年5月30日
58	**Civil 土建**	**90 days**	**2014年5月31日**	**2014年8月28日**
59	Plant Foundations 基础（筛分、浮选车间、主厂房和浓缩池等）	90 days	2014年5月31日	2014年8月28日
60	Raw coal storage 原煤储运系统	90 days	2014年5月31日	2014年8月28日
61	Clean Coal storage and loadout 精煤储运和装车系统	90 days	2014年5月31日	2014年8月28日
62	Refuse dumping 矸石排放系统	90 days	2014年5月31日	2014年8月28日
63	Thickeners 主厂房和浓缩池土建	90 days	2014年5月31日	2014年8月28日
64	Transformer, MCC & Control room foundation 变压器、配电室和控制室基础	90 days	2014年5月31日	2014年8月28日
65	magnitite storage & boiler building & others（介质库、锅炉房等基础）	90 days	2014年5月31日	2014年8月28日
66	**Structural Erection 钢结构安装**	**322 days**	**2014年8月29日**	**2015年7月16日**
67	Raw and clean coal storage 原煤、产品煤储运结构部分	150 days	2014年8月29日	2015年7月16日
68	Main Plant 主厂房	100 days	2014年8月29日	2015年5月27日
69	Sizing building 筛分车间	100 days	2014年8月29日	2015年5月27日
70	Floatation Shop 浮选车间	100 days	2014年8月29日	2015年5月27日
71	Refuse dumping 矸石排放系统	100 days	2014年8月29日	2015年5月27日
72	Auxiliary buildings 附属建筑结构	70 days	2014年8月29日	2015年4月27日
73	**Roofing & Siding Installation 彩板维护安装**	**140 days**	**2015年5月28日**	**2015年10月14日**
74	Raw and clean coal storage cover 原煤、精煤储煤场	90 days	2015年7月17日	2015年10月14日
75	Plant equipment 主厂房和筛分车间设备部分	60 days	2015年5月28日	2015年7月26日
76	Floatation Shop 浮选车间	60 days	2015年5月28日	2015年7月26日
77	Conveyor galleries 皮带运输走廊部分	60 days	2015年7月17日	2015年9月14日
78	Platework Installation 溜槽非标安装	90 days	2014年9月8日	2015年5月27日
79	**Equipment Installation 设备安装**	**357 days**	**2014年9月8日**	**2015年8月30日**
80	Plant equipment 主厂房和筛分车间设备部分	90 days	2014年9月8日	2015年5月27日
81	Floatation Shop 浮选车间	90 days	2014年9月8日	2015年5月27日
82	Material handling system equipment 外围物料运输设备部分	45 days	2015年7月17日	2015年8月30日
83	Piping Installation管路安装	90 days	2015年4月5日	2015年7月3日
84	Electrical Installation 电气安装	90 days	2015年4月5日	2015年7月3日
85	Other installations 其他安装工程(水、暖、照明等)	60 days	2015年7月17日	2015年9月14日
86	**Mechanical Completion 机械安装完成**	1 day	**2015年9月15日**	**2015年9月15日**
87	**Material handling system commissioning （外围系统调试）**	15 days	2015年9月16日	2015年9月30日
88	**PLANT COMMISSIONING 厂房系统调试**	15 days	2015年9月16日	2015年9月30日



CANADA
Date: 2013年8月22日
Murray River Schedule 130820

Task | Progress | Summary | Rolled Up Split | Rolled Up Progress | Project Summary | Deadline
Split | Milestone | Rolled Up Task | Rolled Up Milestone | External Tasks | External Milestone