

**PART-1 DIRECT WORKS**



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
	<b>DIVISION 1 Fuel Storage Depot</b>							
1.1	<b>Section-1 Fuel Equipment</b>							
1.1.1	<b>Tank</b>							
1.1.1.1	10,000M <sup>3</sup> Fuel storage tank	No	6					
1.1.1.2	100M <sup>3</sup> Slop tank	No	2					
1.1.1.3	25M <sup>3</sup> Drum tank	No	1					
1.1.1.4	0.2M <sup>3</sup> Sample drum	No	6					
1.1.2	<b>Tank Accessories</b>							
1.1.2.1	Manhole Dg750	No	6					
1.1.2.2	Manhole Dg600	No	10					
1.1.2.3	Roof manhole B type Dg500	No	20					
1.1.2.4	Gauge hatch	No	8					
1.1.2.5	Breather valve Dg250	No	18					
1.1.2.6	Breather valve Dg100	No	2					
1.1.2.7	Flame arrester Dg250	No	18					
1.1.2.8	Flame arrester Dg100	No	2					

Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.1.2.9	FX type float suction Dg500	No	12					
1.1.3	<b>Pump</b>							
1.1.3.1	Hydrant pump Q=200m <sup>3</sup> /h H=125m	No	10					
1.1.3.2	Pressure pump Q=50m <sup>3</sup> /h H=125m	No	2					
1.1.3.3	Slop lorry loading Q=60m <sup>3</sup> /h H=125m	No	2					
1.1.4	<b>Filter</b>							
1.1.4.1	Filter separator Q=360m <sup>3</sup> /h	No	1					
1.1.4.2	Filter separator Q=240m <sup>3</sup> /h	No	10					
1.1.4.3	Filter separator Q=120m <sup>3</sup> /h	No	2					
1.1.4.4	Filter separator Q=90m <sup>3</sup> /h	No	2					
1.1.4.5	Pre-filter Q=360m <sup>3</sup> /h	No	1					
1.1.4.6	Y type strainer Dg200	No	14					
1.1.4.7	Y type strainer Dg150	No	2					

DIVISION 1 FUEL STORAGE DEPOT

Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.1.5	Valve							
1.1.5.1	Electric motor operated twin seal shutoff valve							
	Pg16 Dg600	No	2					
	Pg16 Dg500	No	18					
1.1.5.2	Twin seal shutoff valve							
	Pg16 Dg600	No	1					
	Pg16 Dg500	No	2					
	Pg16 Dg250	No	1					
1.1.5.3	Flow control valve Q=200 m <sup>3</sup> /h	No	10					
	Flow control valve Q=50 m <sup>3</sup> /h	No	2					
1.1.5.4	Pressure release valve Dg150 (control pressure : 1.6Mpa )	No	2					
1.1.5.5	Gate valve Pg16 Dg600	No	4					
	Gate valve Pg16 Dg500	No	18					
	Gate valve Pg16 Dg300	No	7					
	Gate valve Pg16 Dg200	No	48					
	Gate valve Pg16 Dg150	No	17					
	Gate valve Pg64 Dg300	No	5					
	Gate valve Pg16 Dg100	No	25					
	Gate valve Pg16 Dg80	No	10					
	Gate valve Pg16 Dg50	No	16					
	Gate valve Pg16 Dg40	No	13					

Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
	Gate valve Pg16 Dg25	No	14					
	Gate valve Pg64 Dg25	No	5					
1.1.5.6	Check valve Pg16 Dg200	No	11					
	Check valve Pg16 Dg150	No	2					
	Check valve Pg16 Dg100	No	4					
	Check valve Pg16 Dg40	No	7					
1.1.5.7	Needle valve Pg16 Dg15	No	36					
1.1.5.8	Globe valve Pg16 Dg600	No	3					
	Globe valve Pg16 Dg300	No	2					
	Globe valve Pg16 Dg200	No	11					
	Globe valve Pg16 Dg100	No	4					
	Globe valve Pg16 Dg80	No	4					
	Globe valve Pg16 Dg40	No	14					
	Ball valve Pg16 Dg25	No	35					
1.1.5.9	Safety valve Pg25 Dg25	No	6					
1.1.6	<b>Test Equipment</b>							
	Test equipment of fuel storage depot	No	1					

DIVISION 1 FUEL STORAGE DEPOT

Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost: Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.1.7	<b>Machinery Maintenance</b>							
1.1.7.1	Ordinary lathe C6140	No	1					
1.1.7.2	All-purpose milling machine with elevating platform X62W	No	1					
1.1.7.3	Universal Radial drilling machine Z3032	No	1					
1.1.7.4	Bench drilling machine Z412	No	1					
1.1.7.5	Vertical grinder MC330	No	1					
1.1.7.6	Bench grinder S3ST-250	No	1					
1.1.7.7	Welding machine BX1-250-2	No	1					
1.1.8	<b>Vehicles</b>							
1.1.8.1	Passenger-cargo bus	No	6					
1.1.8.2	Fork lift truck	No	1					
1.1.8.3	213 jeep	No	1					
1.1.8.4	Medium passenger bus	No	3					
1.1.8.5	Car	No	2					
1.1.8.6	Coach	No	2					
1.1.8.7	Truck for pumping oil	No	1					
1.1.8.8	10M <sup>3</sup> Truck for transport oil	No	1					
1.1.9	<b>Other</b>							
1.1.9.1	Hand-stretch chain block	No	1					
1.1.9.2	Combination kit GTP-323	No	1					
1.1.9.3	Millipore sampler	No	6					
1.1.9.4	Stainless steel hopper	No	16					







Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.2	<b>Section-2 Power Supply and Instrument</b>							
1.2.1	Dry-type transformer 1600/10/0.4 D.yml1	No	2					
1.2.2	H.V. switchgear	No	8					
1.2.3	L.V. switchboard	No	24					
1.2.4	Frequency conversion control panel of fuel pump (V.V.V.F)	No	2					
1.2.5	Power distribution cabinet	No	2					
1.2.6	Reduced voltage start cabinet	No	7					
1.2.7	Flush monut lighting distribution box	No	14					
1.2.8	Explosion-proof lighting distribution	No	1					
1.2.9	Soft starter for oil pump PSD-210	No	2					
1.2.10	Signal cabinet box	No	16					
1.2.11	<b>Lighting</b>							
1.2.11.1	Flood Light 8*100W	No	2					
1.2.11.2	Garden lamp 3*100W H=5.5m	No	60					
1.2.11.3	Pendent lighting fitting 200W	No	12					
1.2.11.4	Flame-proof lighting fitting 200W	No	77					
1.2.11.5	Fluorescent lighting fitting 2*40W	No	618					

DIVISION 1 FUEL STORAGE DEPOT



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.2.18	<b>Power cable And Wire</b>							
1.2.18.1	PVC/SWA/PVC-1KV 3*150+1*70	m	1092					
1.2.18.2	PVC/SWA/PVC-1KV 3*95+1*50	m	1291					
1.2.18.3	PVC/SWA/PVC-1KV 3*70+1*35	m	230					
1.2.18.4	PVC/SWA/PVC-1KV 3*50+1*25	m	122					
1.2.18.5	PVC/SWA/PVC-1KV 3*35+1*16	m	285					
1.2.18.6	PVC/SWA/PVC-1KV 3*16+1*10	m	517					
1.2.18.7	PVC/SWA/PVC-1KV 3*10+1*6	m	626					
1.2.18.8	PVC/SWA/PVC-1KV 3*6+1*4	m	1170					
1.2.18.9	PVC/SWA/PVC-1KV 3*4+1*2.5	m	14091					
1.2.18.10	PVC/SWA/PVC-0.5KV 14*1.5	m	9100					
1.2.18.11	PVC/SWA/PVC-0.5KV 7*1.5	m	880					
1.2.18.12	PVC/SWA/PVC-0.5KV 6*1.5	m	580					
1.2.18.13	PVC/SWA/PVC-0.5KV 5*2.5	m	880					
1.2.18.14	PVC/SWA/PVC-0.5KV 4*1.5	m	1450					
1.2.18.15	PVC/SWA/PVC-0.5KV 2P*1	m	1320					
1.2.18.16	PVC 2.5	m	22040					
1.2.18.17	Optic fiber cable OGLAP-CMZE 1C	m	7600					
1.2.19	<b>ITV</b>							
1.2.19.1	SYV-75-5-2	m	1250					
1.2.19.2	RVVP-5*0.2	m	1250					
1.2.19.3	RVVP-7*0.2	m	1250					
1.2.20	<b>Sleeve pipe</b>							
1.2.20.1	PVC SC100	m	206					
1.2.20.2	PVC SC80	m	50					

DIVISION 1 FUEL STORAGE DEPOT

Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.2.20.3	PVC SC40	m	3343					
1.2.20.4	PVC SC20	m	5520					
1.2.20.5	PVC SC15	m	11900					
1.2.21	Explosion-proof control station	No	10					
1.2.22	Instrument Equipment							
1.2.22.1	Computer monitoring system (DCS)	No	1					
1.2.22.2	Master station for MOV	No	2					
1.2.22.3	ITV System	No	1					
1.2.22.4	Power box 24V/5A	No	2					
	Flow transmitter							
1.2.22.5	Type Turbine Meter 3"	No	2					
1.2.22.6	Type Turbine Meter 6"	No	10					
1.2.22.7	Type Turbine Meter 8"	No	1					
1.2.22.8	Type Turbine Meter 12"	No	2					
1.2.22.9	Pressure transmitter	No	16					
1.2.22.10	Hand held brain terminal	No	1					
1.2.22.11	Pressure gauge Y-100 0-1.6MPa	No	2					
1.2.22.12	Pressure gauge Y-100 0-6.4MPa	No	1					
1.2.22.13	Vacuum pressure gauge YZ-100	No	21					
1.2.22.14	Multi-function needle valve for PG	No	38					
	Integrative temperature transmitter							
1.2.22.15	with RTD Pt100 l=250mm	No	1					
1.2.22.16	Pt100 l=450mm	No	2					
1.2.22.17	Explosion-proof float level controller	No	14					
1.2.22.18	Glass level meter L=1400mm	No	6					



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.3	<b>Section-3 Water Supply and Fire Fighting</b>							
1.3.1	<b>Depot Area</b>							
1.3.1.1	Water supply cast iron pipe Dg200	m	255					
1.3.1.2	Water supply cast iron pipe Dg100	m	430					
1.3.1.3	Galvanized steel pipe Dg80	m	70					
1.3.1.4	Galvanized steel pipe Dg65	m	88					
1.3.1.5	Galvanized steel pipe Dg50	m	10					
1.3.1.6	Galvanized steel pipe Dg32	m	60					
1.3.1.7	Galvanized steel pipe Dg25	m	35					
1.3.1.8	Galvanized steel pipe Dg20	m	60					
1.3.1.9	Gate valve Z44T-10 Dg200	No	3					
1.3.1.10	Gate valve Z44T-10 Dg100	No	2					
1.3.1.11	Gate valve Z44T-10 Dg80	No	1					
1.3.1.12	Gate valve Z44T-10 Dg65	No	3					
1.3.1.13	Gate valve Z44T-10 Dg50	No	1					
1.3.1.14	Stop valve J11X-10 Dg32	No	1					
1.3.1.15	Stop valve J11X-10 Dg25	No	2					
1.3.1.16	Stop valve J11X-10 Dg20	No	4					
1.3.1.17	Fire hydrant SS150-1.0	No	5					
1.3.1.18	Water meter LXL200	No	1					
1.3.1.19	Water supply valve well Dg1600	No	17					
1.3.1.20	Drainage concrete pipe Dg500	m	264					
1.3.1.21	Drainage concrete pipe Dg400	m	1700					
1.3.1.22	Drainage concrete pipe Dg300	m	510					
1.3.1.23	Drainage concrete pipe Dg200	m	1285					
1.3.1.24	Water meter well	No	1					
1.3.1.25	Valve Dg400	No	4					
1.3.1.26	Outfall valve well	No	4					
1.3.1.27	Sewage drain manhole	No	62					

Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.3.1.28	Storm sewage drain manhole	No	68					
1.3.1.29	Septic tank No.1	No	4					
1.3.1.30	Grease separator No.2	No	2					
1.3.1.31	Grease separator No.3	No	2					
1.3.1.32	Duplex storm inlet	No	83					
1.3.1.33	Single storm inlet	No	2					
1.3.2	<b>Tank Area</b>							
1.3.2.1	Seamless steel pipe Dg300	m	835					
1.3.2.2	Seamless steel pipe Dg250	m	820					
1.3.2.3	Seamless steel pipe Dg200	m	780					
1.3.2.4	Seamless steel pipe Dg150	m	420					
1.3.2.5	Seamless steel pipe Dg100	m	760					
1.3.2.6	Seamless steel pipe Dg70	m	80					
1.3.2.7	Motor operated valve							
	Z942H-16C Dg150	No	18					
1.3.2.8	Z942H-16C Dg100	No	12					
1.3.2.9	Valve RVHX-0300 Dg300	No	6					
1.3.2.10	Valve RVHX-0300 Dg250	No	4					
1.3.2.11	Valve RVHX-0300 Dg200	No	18					
1.3.2.12	Valve RVHX-0300 Dg50	No	12					
1.3.2.13	Ball valve Q41F-16C Dg200	No	12					
1.3.2.14	Ball valve Q41F-16C Dg150	No	12					
1.3.2.15	Ball valve Q41F-16C Dg100	No	12					
1.3.2.16	Ball valve Q41F-16C Dg50	No	6					
1.3.2.17	High pressure foam generator	No	12					
	PCY1800G							
1.3.2.18	PCY1350G	No	12					

DIVISION 1 FUEL STORAGE DEPOT



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.3.2.19	Air foam-water monitor PP32A	No	8					
1.3.2.20	Pressure meter Y150	No	24					
1.3.2.21	Water outlet cover KM65	No	32					
1.3.2.22	Pipe connection KM65	No	32					
1.3.2.23	Check valve ZSXH Dg200	No	18					
1.3.2.24	Foam nozzle PQ16	No	24					
1.3.2.25	Fire hose nozzle with valve QZ19	No	24					
1.3.2.26	Foam nozzle (hook type) PG16	No	24					
1.3.2.27	Fire hydrant SS100	No	20					
1.3.2.28	Fire hose Dg65	No	20					
1.3.2.29	Wheeled powder fire extinguisher	No	30					
1.3.2.30	Wheeled foam fire extinguisher	No	30					
1.3.2.31	Portalde powder fire extinguisher MF8	No	40					
1.3.2.32	Portalde foam fire extinguisher MP9	No	40					
1.3.2.33	Vertical round valve well Dg1600	No	6					
1.3.2.34	Flexible hose 16ZRH200F L2000	No	12					
1.3.3	Oil contaminated water treatment							
1.3.3.1	Drainage cast iron pipe Dg200	m	405					
1.3.3.2	Drainage cast iron pipe Dg100	m	15					
1.3.3.3	Galvanize steel pipe Dg32	m	12					
1.3.3.4	Galvanize steel pipe Dg25	m	5					
1.3.3.5	Galvanize steel pipe Dg15	m	3					
1.3.3.6	Drainage manhole Dg1000	No	18					
1.3.3.7	Drainage valve well	No	1					
1.3.3.8	Water sealed well	No	1					

## Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.3.3.9	Sewage well	No	8					
1.3.3.10	Squatting type water closet	No	2					
1.3.3.11	Stop valve Dg32	No	1					
1.3.3.12	Tap Dg15	No	1					
1.3.3.13	Floor drain Dg15	No	3					
1.3.3.14	Cleanout Dg100	No	1					
1.3.3.15	High efficient oil-water separator CYL-5	No	1					
1.3.4	<b>Fire Pump House</b>							
1.3.4.1	Foam mixture pump 200D-43*3	No	3					
1.3.4.2	Electric motor JR116-4	No	3					
1.3.4.3	Fire fighting cooling water pump 8SH-6	No	4					
1.3.4.4	Electric motor Y315S	No	4					
1.3.4.5	Foam concentrate lift pump IS50-32-125A	No	1					
1.3.4.6	Self priming pump 51-4A	No	1					
1.3.4.7	Self actuated ON-OFF valve 700X-0200	No	7					
1.3.4.8	Self actuated ON-OFF valve 600X-0300	No	7					
1.3.4.9	Quick joint	No	2					
1.3.4.10	Valve RVHX-0400	No	1					
1.3.4.11	Valve RVHX-0300	No	9					
1.3.4.12	Valve RVHX-0250	No	2					
1.3.4.13	Valve RVHX-0200	No	7					
1.3.4.14	Valve RVHX-0150	No	2					
1.3.4.15	Valve RVHX-080	No	2					
1.3.4.16	Valve RVHX-065	No	1					
1.3.4.17	Valve RVHX-050	No	7					

DIVISION 1 FUEL STORAGE DEPOT





Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.5	<b>Section -S Building</b>							
1.5.1	<b>Office Building 2,998m<sup>2</sup></b>	LS	1					
	Cement 84t							
	Steel products 154.97t							
	Timber 33.41m <sup>3</sup>							
1.5.2	<b>Fuel Pumps Shed 892m<sup>2</sup></b>	LS	1					
	Cement 101.18t							
	Steel products 10.26t							
	Timber 10.76m <sup>3</sup>							
1.5.3	<b>Fire Pumps House 344m<sup>2</sup></b>	LS	1					
	Cement 94.59t							
	Steel products 13.84t							
	Timber 2.66m <sup>3</sup>							
1.5.4	<b>Electrical Building and Control Room 607m<sup>2</sup></b>	LS	1					
	Cement 180.38t							
	Steel products 23.78t							
	Timber 6.46m <sup>3</sup>							
1.5.5	<b>Dining Hall 695m<sup>2</sup></b>	LS	1					
	Cement 221.59t							
	Steel products 26.93t							
	Timber 6.65m <sup>3</sup>							





Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.6	<b>Section-6 Air-conditioner and Ventilation</b>							
1.6.1	VRV air-conditioner $Q_L=28KW$	No	7					
	Outdoor RSXY10K $Q_H=31.5KW$							
	N=7.62KW							
	U=380V							
1.6.2	Indoor FXYC100KV $Q_L=11.2KW$	No	2					
	$Q_H=12.5KW$							
	N=90W							
	U=220V							
1.6.3	Indoor FXYC50KV $Q_L=5.6KW$	No	21					
	$Q_H=6.3KW$							
	N=20W							
	U=220V							
1.6.4	Indoor FXYC25KV $Q_L=2.8KW$	No	40					
	$Q_H=3.2KW$							
	N=15W							
	U=220V							

DIVISION 1 FUEL STORAGE DEPOT



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1.7	<b>Section-7 Earthwork</b>							
1.7.1	<b>Earthwork</b>							
1.7.1.1	Fine soil	m <sup>3</sup>	69088					
1.7.1.2	Transporting soil 2KM	t	140153.4					
1.7.1.3	Excavation	100 m <sup>2</sup>	82					
1.7.1.4	Back filling	100 m <sup>2</sup>	778.63					
1.7.2	<b>Road</b>							
1.7.2.1	C30 Cement concrete 22CM	100 m <sup>2</sup>	129					
1.7.2.2	2CM Fine stone levelling	100 m <sup>2</sup>	141.5					
1.7.2.3	15CM Second coat crushed stone	100 m <sup>2</sup>	141.5					
1.7.2.4	15CM Second coat crushed stone	100 m <sup>2</sup>	141.5					
1.7.3	<b>Sodding</b>							
		100 m <sup>2</sup>	290					
1.7.4	<b>Fence wall</b>							
		100 m <sup>2</sup>	39					
1.7.5	<b>Gate</b>							
		m <sup>3</sup>	60					



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
<b>DIVISION 2 FUEL SUPPLY DEPOT</b>								
2.1	<b>Section-1 Fuel Equipment</b>							
2.1.1	<b>Tank</b>							
2.1.1.1	25M <sup>3</sup> Drum tank	No	1					
2.1.2	<b>Tank Accessories</b>							
2.1.2.1	Manhole Dg600	No	1					
2.1.2.2	T type gauge cap Dg100	No	1					
2.1.3	<b>Filter</b>							
2.1.3.1	Filter separator O=120m <sup>3</sup> /h	No	2					
2.1.3.2	Pre-filter O=120m <sup>3</sup> /h	No	2					
2.1.3.3	Breather valve	No	4					
2.1.4	<b>Valve</b>							
2.1.4.1	Gate valve Pg16 Dg200	No	7					
	Gate valve Pg16 Dg150	No	10					
2.1.4.2	Globe valve Pg16 Dg200	No	8					
	Globe valve Pg16 Dg150	No	4					
	Globe valve Pg16 Dg100	No	1					
	Ball valve Pg16 Dg80	No	1					
	Ball valve Pg16 Dg25	No	8					

DIVISION 2 FUEL SUPPLY DEPOT



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
2.1.6	Facilities							
2.1.6.1	Hand pump	No	1					
2.1.6.2	Millipore sampler	No	2					
2.1.6.3	Surge absorber	No	1					
2.1.6.4	Pressure regulator Dg150	No	1					
2.1.7	Vehicles							
2.1.7.1	Local-built servicer	No.	6					
2.1.7.2	Imported refueler 47M <sup>3</sup>	No.	4					
2.1.7.3	Local-built refueler 47M <sup>3</sup>	No.	3					
2.1.7.4	Imported 1000GPM servicer	No.	6					
2.1.7.5	Multipurpose vehicle	No.	2					
2.1.7.6	10M <sup>3</sup> tank rolly	No.	2					
2.1.7.7	Truck for pumping oil	No.	1					
2.1.7.8	10M <sup>3</sup> transport truck	No.	1					
2.1.7.9	Cleaning vehicle	No.	1					

DIVISION 2 FUEL SUPPLY DEPOT



Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
2.2	<b>Section-2 Power Supply and Instrument</b>							
2.2.1	Flow meter							
2.2.1.1	Type turbire meter 6"	No	1					
2.2.1.2	Type turbire meter 4"	No	2					
2.2.2	Standard flow meter 6"	No	1					
2.2.3	Bourdon pressurre gauge Y-100 0~1.6Pa	No	6					
2.2.4	Neddle valve M20*1.5 G1/2" PN 1.6Mp	No	6					
2.2.5	Control cable PVC/SWA/PVC-0.5KV 2*2.5	m	70					
2.2.6	PVC/SWA/PVC-0.5KV 2*1.5	m	100					
2.2.7	Power cable PVC/SWA/PVC-1KV 3*6+1*4	m	670					
2.2.8	Galvanised conduit G20	m	438					
2.2.9	G15	m	330					
2.2.10	Explosion-proof control station	No	2					
2.2.11	Electostatic gounding rod	No	1					

Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
2.2.12	Grounding conductor copper 40*4	m	350					
2.2.13	Earth electrode	No	52					
2.2.14	Lightning protection copper Dg8	m	530					
2.2.15	Power distribution board Lighting	No	2					
2.2.16	Fluorescent fitting 2*40W	No	201					
2.2.17	Street lighting 4*40W H=5.5m	No	12					
2.2.18	Flood light 4*100W H=15m	No	2					
2.2.19	Receptacle 2-Gange receptacle	No	105					
2.2.20	Flush mounted switch 250V,10A	No	41					
2.2.21	Wire cable PVC/SWA/PVC-0.5KV 2.5	m	1150					
2.2.22	PVC/SWA/PVC-0.5KV 4	m	1100					
2.2.23	Distribution board	No	1					

DIVISION 2 FUEL SUPPLY DEPOT





Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Y.cn)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
2.4	Section-4 Building							
2.4.1	Office Building 1.650m <sup>2</sup>	LS	1					
	Cement 366.8t							
	Steel products 59.12t							
	Timber 15.2m <sup>3</sup>							
2.4.2	Service & Refueller Parking 1,909m <sup>2</sup>	LS	1					
	Cement 525.01t							
	Steel products 79.65t							
	Timber 14.51m <sup>3</sup>							
2.4.3	Guard 37m <sup>2</sup>	LS	1					
	Cement 8.59t							
	Steel products 0.73t							
	Timber 0.35m <sup>3</sup>							
2.4.4	Car Washing	LS	1					
	Cement 3.38t							
2.4.5	Refueller Loading	LS	2					
	Cement 12.72t							
2.4.6	Service Test 64m <sup>3</sup>	LS	1					
	Cement 13t	1	13					
2.4.7	Hydrant Valve Test 50m <sup>2</sup>	LS	1					
	Cement 10.7t							

DIVISION 2 FUEL SUPPLY DEPOT









Shanghai Pudong International Airport Project (Fuel Supply System)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Ycn)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
<b>DIVISION 3 FUEL HYDRANT PIPING</b>								
3.1	Section-1 Facilities for Apron Refuelling							
3.1.1	Facilities for Apron Refuelling							
3.1.1.1	4" Hydrant Valve	No	84					
3.1.1.2	Pit box	No	84					
3.1.1.3	Drain valve	No	23					
3.1.1.4	Vent valve	No	5					
3.1.1.5	Pit box (DJ47 type)	No	28					
3.1.1.6	4" API hose coupler	No	2					
3.1.1.7	Cover of refuelling well Dg700	No	16					
3.1.1.8	Cover of refuelling well Dg400	No	16					
3.1.2	Valve							
3.1.2.1	Twin seal high-integrity positive-shutoff valve							
	Pg16 Dg600	No	14					
	Pg16 Dg300	No	10					













**PART-2 GRAND SUMMARY**









JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SCIENCE AND TECHNOLOGY COMMISSION OF  
SHANGHAI MUNICIPAL PEOPLE'S GOVERNMENT,  
PEOPLE'S REPUBLIC OF CHINA

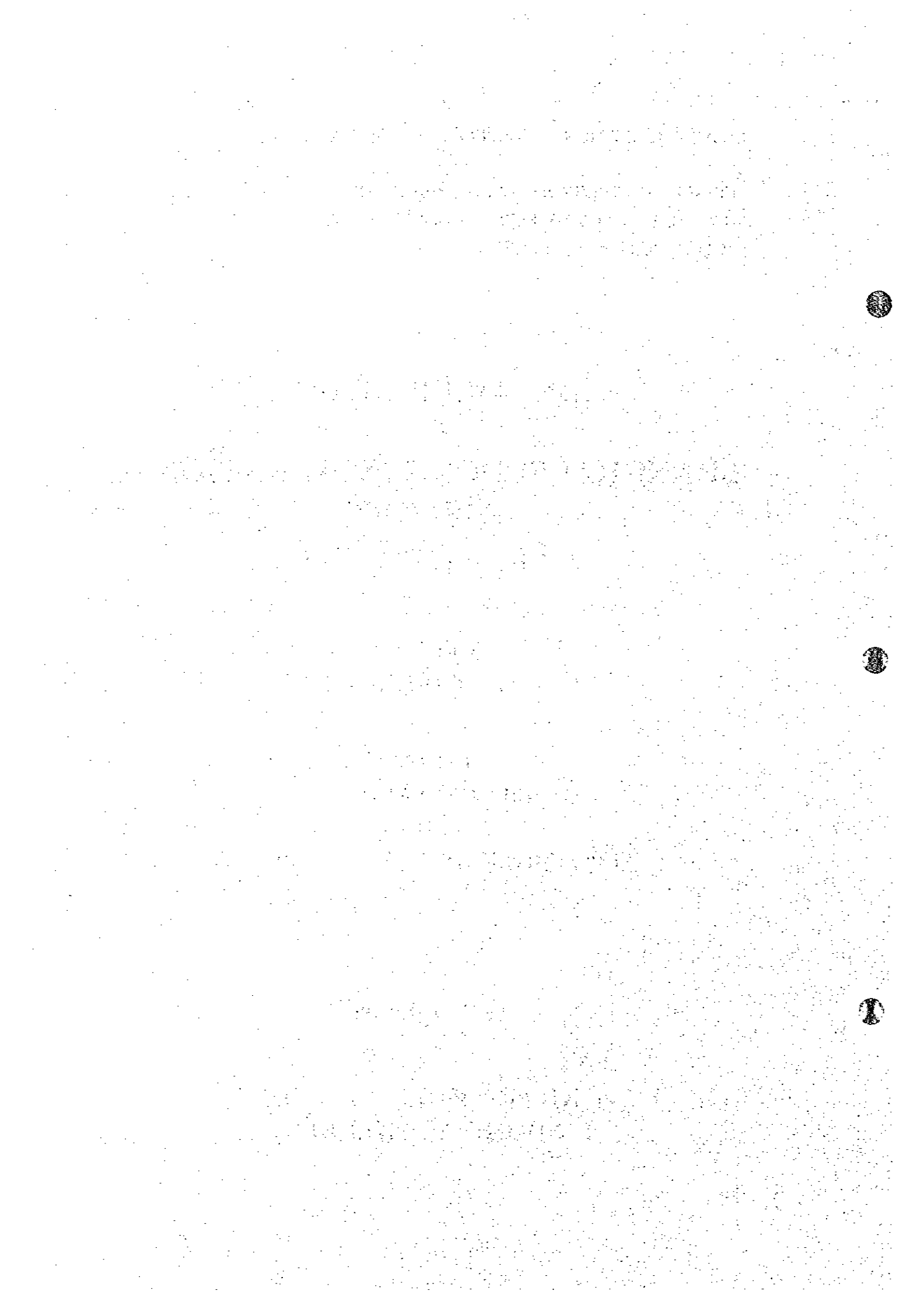
**DETAILED DESIGN  
OF  
SHANGHAI PUDONG INTERNATIONAL  
AIRPORT  
FINAL REPORT**

**VOLUME III  
TENDER DOCUMENT**

**PART V-4  
BILL OF QUANTITIES  
FOR  
FIRE FIGHTING AND RESCUE FACILITIES**

SEPTEMBER 1997

**NIPPON KOEI CO., LTD.  
NIKKEN SEKKEI LTD.**



PEOPLE'S REPUBLIC OF CHINA  
SHANHAI MUNICIPAL PEOPLE'S GOVERNMENT

SHANGHAI PUDONG INTERNATIONAL AIRPORT PROJECT  
FINAL REPORT

TENDER DOCUMENT  
PART V-4  
BILL OF QUANTITIES  
FOR  
FIRE FIGHTING AND RESCUE FACILITIES

**TABLE OF CONTENTS**

Clause	Page
<b>SECTION 1: PREAMBLE</b>	
1.1 Introduction.....	1
1.2 General.....	1
<b>SECTION 2: PRELIMINARY AND GENERAL ITEMS</b>	
2.1 Contractual Items .....	3
2.2 Specification Items.....	3
<b>SECTION 3: DIRECT WORKS</b>	
3.1 Method of Measurement .....	5
3.2 Measured Works.....	5

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

PHYSICS 354

LECTURE 1

1.1. THE CLASSICAL LIMIT

1.2. QUANTIZATION

1.3. THE HEISENBERG UNCERTAINTY PRINCIPLE

1.4. THE SCHRÖDINGER EQUATION

1.5. THE WAVEFUNCTION

1.6. THE ENERGY EIGENFUNCTIONS

1.7. THE TUNNELING EFFECT

1.8. THE CLASSICAL LIMIT

1.9. THE QUANTUM MECHANICS OF A PARTICLE

1.10. THE QUANTUM MECHANICS OF A PARTICLE

1.11. THE QUANTUM MECHANICS OF A PARTICLE

1.12. THE QUANTUM MECHANICS OF A PARTICLE

1.13. THE QUANTUM MECHANICS OF A PARTICLE

1.14. THE QUANTUM MECHANICS OF A PARTICLE

## **PREAMBLE TO BILL OF QUANTITIES**

### **SECTION 1: PREAMBLE**

#### **1.1 INTRODUCTION**

1.1.1 The Bill of Quantities (Schedule of Unit Rates, Prices and Quantities) comprises the following parts:

Preamble  
Preliminary And General Items  
Direct Works  
Grand Summary

The Grand Total on the General Summary Sheet shall equal the amount of the estimated Contract Price set forth in the Form of Tender.

1.1.2 The Bill of Quantities shall be used by the Shanghai Municipal People's Government (the Employer) and or the Engineer for:

- a) bid evaluations purposes
- b) the basis of remeasurement and valuation of estimated quantities
- c) the basis of evaluation for any variations or additional Works ordered under the Conditions of Contract
- d) assistance in the calculation of progress payments
- e) computation of the Contract Price

#### **1.2 GENERAL**

1.2.1 The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specification, Contract Drawings and all other Contract Documents relevant thereto and the cost of complying with the requirements and obligations thereof or which may be reasonably inferred therefrom shall be deemed to be included in the rates and prices set out in the Bill of Quantities.

- 1.2.2 Descriptions shall identify the work covered by the respective items, but the exact nature and extent of the work shall be ascertained from the Specification, Drawings and Conditions of Contract, as the case may be.
- 1.2.3 The order of stating dimensions in descriptions shall be in the sequence of length, width and height (or depth) unless otherwise described.
- 1.2.4 Where work is shown, described, indicated in or reasonably inferred or implied from the Specification and or Drawings but not specifically itemized in the Bill of Quantities, then the cost of such work shall be deemed to be included in the rates for the items associated with the particular work. No additional items, other than those stated in the Bill of Quantities, will be used to measure such work without the written consent of the Engineer.
- 1.2.5 Where the Contractor does not insert a rate against an item (or items) in the Bill of Quantities, the cost of carrying out the work described in the item(s) will be deemed to be included elsewhere and no measurement of the item(s) will be made.
- 1.2.6 Unit rates and prices shall be expressed in Chinese Renminbi and Japanese Yen to a maximum of two decimal places.
- 1.2.7 Throughout the Bill of Quantities the following abbreviations shall apply:

Abbreviation	Full Meaning
mm	millimetre
mm <sup>2</sup>	square millimetre
m	metre
m <sup>2</sup>	square metre
m <sup>3</sup>	cubic metre
ha	hectare
ea	each
No	number
kg	kilogramme
km	kilometre
t	tonne
ltr	litre
LS	Lump Sum
PS	Provisional Sum,
MM	Man Month
MD	Man Day
Rate	Unit Rate

- 1.2.8 The Bill of Quantities identifies and represents the Works to be carried out as part of this project. Sections of works that can not be accurately measured are noted as Lump Sum. Additionally Provisional Sums have been included, which sums shall be used in whole or in part, or not at all, or the instructions of the Engineer.
- 1.2.9 The General Principles of Measurement and Principles of Measurement for each part of the Bill of Quantities apply equally to all parts of the Bill of Quantities when relevant and are not limited to the parts in which they are contained.
- 1.2.10 Where reference is made to the "descriptions" or "as described" the term "descriptions" or "as described" shall mean the descriptions of the item(s) contained in the Bill of Quantities, the Specification or Drawings.

## **SECTION 2: PRELIMINARY AND GENERAL ITEMS**

### **2.1 CONTRACTUAL ITEMS**

#### **2.1.1 General**

2.1.1.1 For the purpose of Interim Payment Certificates, the amount entered against Contractual items in the Preliminaries and General Items Section will be certified as stated following:

- (a) Performance Bond: the amount entered against this item will be certified in the Interim Payment Certificate following approval of the institution providing the security and receipt of the Performance Bond.
- (b) Insurances: the amounts entered against these items will be certified in the Interim Payment Certificate following approval of the policies in accordance with the Conditions of Contract. Originals of receipts must be produced as evidence of payment.
- (c) All other amounts entered against Preliminary and General Contractual items will be certified for payment in direct proportion to the accumulative value of certified Site construction Works.

### **2.2 SPECIFICATION ITEMS**

#### **2.2.1 General**

2.2.1.1 For the purposes of Interim Payment Certificates, the amounts, entered against Specification Items in the Preliminaries and General Items Section will be certified as stated following:

- (a) Contractor's Site Establishment - on provision of the facilities and approval of the Engineer, 50% of the amount entered against this item will be certified for payment in the following Interim Payment Certificate. On completion of the Works, removal of the facilities and the making good of the area occupied thereby, all as specified and to the approval of the Engineer, 20% will be certified for payment in Final Payment Certificate. The remaining 30% will be certified for payment in equal monthly installments during the period for construction of the Works, providing that the facilities are maintained in accordance with the Contract and to the approval of the Engineer.
- (b) Construction Plant - on completion of mobilizing, erecting, testing and commissioning as specified of all plant and equipment and approval of the Engineer, 60% of the amount entered against this item will be certified for payment in the following Interim Payment Certificate. On completion of the demobilization of all plant and equipment and the making good of any area occupied thereby and approval of the Engineer, 40% of the amount will be certified for payment in the following Interim Payment Certificate.
- (c) General Site Requirement - on completion of the installations as specified and approval of the Engineer, 60% of the amount entered against this item will be certified for payment in the following Interim Payment Certificate. On completion of the Works removal of the installations and the making good of the area occupied thereby to the approval of the Engineer, 20% will be certified for payment in the next interim payment. The remaining 20% will be certified for payment in equal monthly installments during the period for construction of the Works, providing that the installations are maintained to the satisfaction of the Engineer.
- (d) Assistance to Engineer ( ) - the quantities stated will be measured in accordance with Clause 56 of the Conditions of Contract and the calculated amounts certified.
- (e) Site Investigation ( ) - where quantities are stated these will be measured in accordance with Clause 56 of the Conditions of Contract and the calculated amounts certified. Lump Sum amounts will be certified in direct proportion to the completion of that item.
- (f) Document Submission and Other Matters - the amount entered against these items will be certified in installments in proportion to the particular items completed.



## **SECTION 3: DIRECT WORKS**

### **3.1 METHOD OF MEASUREMENT**

- 3.1.1 The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the Contract will be those methods generally recognized as conforming to good engineering practices in China. All work completed under the Contract will be measured by the Engineer or his authorized representatives using metric-ton unit system of measurement.
- 3.1.2 Where appropriate, quantities have been rounded off to nearest integer (<0.5 rounded down, ≥0.5 rounded up). However, quantities of items measurement in hectares, tonnes or quantities of high value items have been expressed to one place of decimals.
- 3.1.3 When the application of 3.1.2 would cause an entire item to be eliminated, then such an item is enumerated stating the size or weight as appropriate.

### **3.2 MEASURED WORKS**

- 3.2.1 Quantities included under the Measured Works sections of the Bill of Quantities are estimated quantities based on the Scope of Works set forth in the Contract Documents and shall be subject to remeasurement in accordance with the provisions of the Contract and valued at the unit rates included therein. There shall be no basis of claim or adjustment of the unit rates and prices in the event that the quantity of Work performed for any item shown in the Bill of Quantities, as finally measured in accordance with the provisions of the Contract, is different from that shown in the Bill of Quantities.
- 3.2.2 Unless otherwise stated, all items shall be deemed fully inclusive of all that is necessary to fulfill the liabilities and obligations arising out of the contract and shall include, but not be limited to, the following
- a) Labour, supervision and all associated costs
  - b) Materials, goods and all associated costs
  - c) Fitting, jointing and fixing materials and goods in position
  - d) Cutting to size and allowances for wastage of materials and goods
  - e) Provision of plant
  - f) Temporary works
  - g) Maintenance and protection of finished work
  - h) Establishment charges, overheads and profit

- 3.2.3 The Contract price shall be computed from the quantities of work entered in the Bill of Quantities and valued at the unit and lump sum prices tendered against the respective items in the Bill of Quantities hereto.
- 3.2.4 The Tenderer shall ensure that his tender prices are well balanced and that no section of the Bill of Quantities is heavily priced to cause lower prices in another section. The Employer reserves the right to require balancing of the Tender before acceptance.
- 3.2.5 Any difference between the cost of executing work of a similar description in different areas of the Site shall be allowed for in pricing the items concerned.
- 3.2.6 Except as otherwise provided in the Conditions of Contract, items included in the Preliminary and General items section shall not be subject to adjustment or remeasurement.
- 3.2.7 The CAAC 1-xxx numbers indicated in parenthesis within the "Description of Works" Column in the Bill of Quantities have been entered for the convenience of the Engineer in making cost estimations, and may be ignored by the Tenderer. The Tenderer shall compile all estimated prices on the basis of the Contract Documents.

**PART-I PRELIMINARY AND GENERAL ITEMS**



Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
<b>1</b>	<b>PRELIMINARY AND GENERAL ITEMS</b>							
	<b>Contractual Items</b>							
1	Performance bond	Unit	1					
2	Insurance of the Works	Package	1					
3	Third party insurance	Package	1					
4	Other insurance (specify)	Package	1					
	<b>Total of Contractual Items</b>							
<b>2</b>	<b>Specification Items</b>							
1	<b>Contractor's Site Establishment</b>							
	a) Provide, maintain and remove on completion offices, yards, workshops, stores, lay-downs areas accommodation and camps as required, including all costs of services, maintenance security, ground rentals and the like.	Package	1					
2	<b>General Site Requirements</b>							
	a) Allow for the additional costs arising from the provision, maintenance and removal of temporary access roads	Package	1					
	b) Provide, erect and remove on completion notice and sign boards.	Package	1					
	c) Provide, erect and remove on completion temporary fencing and gates as specified.	Package	1					

Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
	d) Provide, erect and remove on completion temporary hoardings and gates as specified.	Package	1					
	e) Allow for all costs associated with the prevention of pollution, nuisance and construction noise.	Package	1					
	f) Allow for all costs associated with Security, Safety and Protection. Sub-total	Package	1					
3	Site Investigation a) Establish the coordinates system from existing fixed points and bench marks and undertake a topographical survey of the areas specified. b) Cross sections survey Profile leveling Sub-total	Package Package	1 1					
4	Document, Submission and Other Matters a) Progress photographs as specified b) Operation and Maintenance manuals as specified c) As-built Drawings as specified d) Construction Standards as specified	Package Package Package Package	1 1 1 1					

**Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)**

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
	e) Where not included in the Bill of Quantities elsewhere the Contractor shall allow for the preparation and handover of Spare Parts and Special Tools as required by the Engineer and or the instructions of the Engineer. Sub-total	Package	1					
	<b>Total of Specification Items</b>							
	<b>Total of Preliminary General and Items</b>							





PART-2 DIRECT WORKS



**PART-2-1 Main Fire Station**



Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

Main Fire Station ( Building Works )

No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined China Total RMB
				Rate	Amount	Rate	Amount	
	<b>Foundation Works</b>							
1	R.C.Foundation ( C20 H<1.5m)	M <sup>3</sup>	526.83					
2	R.C.Foundation Beam (C20)	M <sup>3</sup>	90.67					
	<b>Column &amp; Beam Works</b>							
3	R.C.Columns (C20)	M <sup>3</sup>	124.13					
4	R.C.Beams (C30)	M <sup>3</sup>	274.22					
5	Columns, Higher Than 3.6m	M <sup>3</sup>	74.48					
6	Beams, Higher Than 3.6m	M <sup>3</sup>	164.53					
	<b>Walls Works</b>							
7	Internal Wall On Frame	M <sup>2</sup>	3,976.00					
8	External Wall On Frame	M <sup>2</sup>	211.38					
9	Iron Sheet Rainwater Pipe (D45cm)	M	72.00					
10	Parapet Down spout Elbow (D100)	Set	8.00					
11	Internal Scaffolding ( H>3.6m)	M <sup>2</sup>	2,117.33					
12	External Scaffolding ( H<12m)	M <sup>2</sup>	1,750.32					
13	Full Scaffolding (3.61<H<5.80m)	M <sup>2</sup>	3,871.95					

**Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)**  
**Main Fire Station ( Building Works )**

No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined China Total RMB
				Rate	Amount	Rate	Amount	
	<b>Ground, Floor Roof Works</b>							
14	Land Grading	M <sup>2</sup>	2,086.56					
15	Indoor Backfill	M <sup>2</sup>	2,086.56					
16	Bedding Mortar (Thickness=1cm)	M <sup>2</sup>	801.84					
17	Bedding Concrete (Thickness=1cm C15)	M <sup>2</sup>	1,693.24					
18	Ement Mortar Course Bonding Tile	M <sup>2</sup>	2,165.88					
19	Asphalt Damp-Proof Course On Ground (One Felb Tow Pited)	M <sup>2</sup>	516.96					
20	Level Coat Of Fine Ballast Concrete (Thickness=3cm)	M <sup>2</sup>	583.20					
21	Level Coat Of Cement Mortar (Thickness=2cm)	M <sup>2</sup>	3,347.88					
22	Hardwood Strip Flowing Floor	M <sup>2</sup>	321.72					
23	Reinforced Fine Ballast Concrete Coat	M <sup>2</sup>	912.96					
24	Bedding Mortar (Thickness=4cm)	M <sup>2</sup>	1,483.56					
25	Per-0.5 Thickness Lively Coat Of Concrete Mortar	M <sup>2</sup>	1,483.56					
26	Asphalt Damp-Proof Course On Ground (One Felb Tow Pited)	M <sup>2</sup>	66.24					

Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

Main Fire Station (Building Works)

No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined China Total RMB
				Rate	Amount	Rate	Amount	
27	Cement Mortar Coat Polishing And Solidifying Thickness=2cm	M <sup>2</sup>	199.56					
28	Paper-Faced Gypsum Ailing Without Person	M <sup>2</sup>	885.72					
29	Glass Cloth Damp-Proof Course On Ground Lone Cloth The Pitch	M <sup>2</sup>	2,121.48					
30	Precise Concrete Color Slab With Sand Course	M <sup>2</sup>	2,038.68					
31	Cast-In Place R.C. Beam And Shed	M <sup>2</sup>	3,620.16					
32	Water Shed Flat Sunshading Board	M <sup>2</sup>	45.60					
33	Monolithic R.C. Steps C20	M <sup>2</sup>	60.03					
34	Wall Expansion Joint Filled Oil-Immersed Hemp	M	10.80					
35	Roof Expansion Joint Filled Oil-Immersed Hemp	M	17.10					
36	Floor Expansion Joint Covered By Steel Sheet	M	17.10					
37	Concrete Apron C15	M <sup>2</sup>	249.00					
38	Concrete Ramp C15	M <sup>2</sup>	424.32					
39	Concrete Steps C20	M <sup>2</sup>	43.72					
40	Cast-In-Place R.C. Slab, Floor Height>3.6m, Per 3m-Increment	M <sup>2</sup>	1,646.40					

**Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)**  
**Main Fire Station ( Building Works )**

No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined China Total RMB
				Rate	Amount	Rate	Amount	
	<b>Door &amp; Window Works</b>							
41	Phywood-Veneered	M <sup>2</sup>	244.41					
42	Sliding Window Silver Aluminum Alloy	M <sup>2</sup>	161.82					
43	Silver Aluminum Alloy Casement Door	M <sup>2</sup>	76.14					
44	Fixed Widow Silver Aluminum Alloy	M <sup>2</sup>	89.25					
45	Steel Wood Casement Door	M <sup>2</sup>	217.08					
	<b>Finish Work</b>							
46	Non Glazed Till 95*45	M <sup>2</sup>	2,111.38					
47	Pattemed Tile Cement Mortar 150*150	M <sup>2</sup>	723.24					
48	Oil Paint Emulsion Paint	M <sup>2</sup>	809.10					
49	Five-Ply Wood Wall Faringand Dada	M <sup>2</sup>	326.85					
50	Multi-Color Paint Wall And Columns	M <sup>2</sup>	9,340.14					
51	Multi-Color Plaster Ceiling Slab	M <sup>2</sup>	2,853.84					
	<b>Acid-Resistant, Preservation, Heat Reserving Work</b>							
52	Epoxid Coal-Tar Glue Connection	M <sup>2</sup>	82.80					
53	Cast-In-Place	M <sup>3</sup>	91.74					





Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)  
Main Fire Station PAVING

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1	EARTHWORK							
1_1	DIG SILT	CUBIC METRE	2000					
1_2	FILLING WITH EARTH	CUBIC METRE	7000					
2	ROAD							
2_1	C30 CEMENT CONCRETE 24CM	100 SQ.M.	141					
2_2	FINE STONE LEVELLING	100 SQ.M.	154					
2_3	15CM SECOND COAT CRUSHED STONE	100 SQ.M.	154					
2_4	15CM SECOND COAT CRUSHED STONE	100 SQ.M.	154					
3	GREENERY PATCHES	100 SQ.M.	60					

Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)  
 MAIN FIRE STATION POWER SUPPLY SYSTEM

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1	POWER DISTRIBUTION BOX		1					
2	LIGHTING/RECEPTACLE DISTRIBUTION BOX		7					
3	LIGHTING/RECEPTACLE DISTRIBUTION BOX		1					
4	BOILING WATER POWER PANEL		3					
5	SOCKET BOX		4					
6	EXHAUST FAN POWER CONTROL PANEL		1					
7	FIRE ALARM CONTROL POWER	24V	1					
8	THREE SPEED SWITCH		33					
9	FIRE SOUND AND SHINE ALARM	HX100	44					
10	MAIN FIRE STATION SECTION ENVIRONMENT LIGHTING		6					
11	EMERGENCY LIGHT	HJD 211	83					
12	FLUORESCENT	HYG28-1 1*40W	2					
13	FLUORESCENT	HYG28-2 1*40W	147					
14	ONE TUBE GRILLE FLUORESCENT	HYG329-1C 1*40W	18					
15	TWO TUBE GRILLE FLUORESCENT	HYG329-2C 1*40W	99					
16	BLAST FLUORESCENT	YB 3E-40 1*40W	4					
17	CIRCULAR OVERHEAD LIGHT	HXD233A 1*40W	36					
18	TUBE-SHAPE LAMP	HZD120B 1*40W	30					
19	HANGING-UP INDUSTRIAL LAMP	HGC 125-B 1*250W	50					
20	MULI-LAMP	HXD 243-4 4*40W	1					
21	WATER ANDDUST PROOF OVERHEAD LIGHT	HXD217A 1*40W	29					
22	ONE SWITCH ENCLOSED	250V 10A	72					
23	TWO SWITCH ENCLOSED	250V 10A	66					
24	THREE SWITCH ENCLOSED	250V 10A	7					
25	DOUBLE-CONTROL SWITCH	250V 10A	6					

Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)  
 MAIN FIRE STATION POWER SUPPLY SYSTEM

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
26	1 PHASE SOCKET		152					
27	WATER PROOF SOCKET		6					
28	WATER PROOF SOCKET		5					
29	WITH SWITCH SOCKET		3					
30	BLAST AXIAL FAN CONTROL BUTTON		1					
31	POWER INTAKE CABLE	m	540					
32	POWER INTAKE CABLE	m	600					
33	POWER SUPPLE CABLE	m	460					
34	POWER SUPPLE CABLE	m	100					
35	POWER SUPPLE CABLE	m	190					
36	FLEXIBLE CABLE	m	1020					
37	CABLE	m	9000					
38	CABLE	m	7050					
39	CABLE	m	225					
40	CABLE	m	450					
41	ELECTRIC PIPE	m	7370					
42	ELECTRIC PIPE	m	255					
43	ELECTRIC PIPE	m	235					
44	ELECTRIC PIPE	m	265					
45	LIGHTNING DISCHARGE WIRE	m	320					
46	GROUNDING ELECTRODE	m	23					
47	EARTH WIRE	m	200					

**Shanghai Pudong International Airport Project ( Fire Fighting and Rescue Facilities)  
Technological Design of Telephone Broadcast And TV Wiring For Main Fire Station**

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Ycn)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1	Jumper Cabinet (XRH01-7)	Set	1					
2	Jumper Cabinet (XRH01-2)	Set	1					
3	TV Cabinet	Set	1					
4	Outlet Connection Unit	Set	18					
5	Two Branch of TV	Set	17					
6	TV Socket	Set	34					
7	Broadcast Socket	Set	22					
8	Loud-speaker ( 5 W )	Set	14					
9	Loud-speaker ( 10 W )	Set	8					
10	Telephone Line	M	600					
11	Coaxial Cable	M	200					
12	Broadcawt Cable	M	350					
13	Steel Pipe ( G70 )	M	15					
14	Steel Pipe ( G50 )	M	35					
15	Steel Pipe ( G25 )	M	25					
16	Steel Pipe ( G15 )	M	30					
17	Communication Cable							
18	HYV2 ( 5 x 2 x 0.5 )	M	44					
19	Communication Cable HPVV ( 5 x 2 x 0.5 )	M	6					
20	Duty Dest	Set	1					
21	Power Amplifier	Set	1					
22	VHF Rx - Tx	Set	1					
23	UPS (1000W)	Set	1					
24	TV Antenna	Set	1					
	Red brick	Piece	800					

Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

MAIN FIRE STATION AC

Item No.	Description of Works Facilities		Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
	Specifications				Rate	Amount	Rate	Amount	
1	FAN-COIL UNIT			4					
	SHF-LP(H) 300 Q <sub>L</sub> =3320W N=68W								
	FAN-COIL UNIT			31					
	SHF-LP(H) 400 Q <sub>L</sub> =4470W N=86W								
	FAN-COIL UNIT			11					
	SHF-LP(H) 800 Q <sub>L</sub> =6440W N=167W								
	FAN-COIL UNIT			4					
	SHF-LP(H) 1200 Q <sub>L</sub> =9270W N=228W								
2	AUTOMATIC EXHAUST VALUE			10					
3	STOP VALUE			2					
	J41T-16 DN80			3					
	J41T-16 DN70			8					
	J41T-16 DN50			1					
	J41T-16 DN40			18					
	J41T-16 DN25			34					
	J41T-16 DN20			44					
	J41T-16 DN15			30					
4	GALVARNIZED STEEL PIPE		m	80					
	DN70		m	230					
	DN50		m	100					
	DN40		m	80					
	DN32		m						

Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

MAIN FIRE STATION AC

Item No.	Description of Works Facilities		Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
	Specifications				Rate	Amount	Rate	Amount	
	DN25		m	160					
	DN20		m	250					
	DN15		m	100					

Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

MAIN FIRE STATION HEATING

Item No.	Description of Works Facilities		Unit	Quantity	Foreign Cost Component (Ycn)		Local Cost Component (China RMB)		Combined Total China RMB
		Specifications			Rate	Amount	Rate	Amount	
1	GALVARNIZED STEEL PIPE		m	30					
		DN50	m	110					
		DN32	m	130					
		DN25	m	130					
		DN20	m	250					
		DN15	SET	360					
2	HEAT RADIATOR								
		FOUR CYLINDER (813) TYPE							
3	STOP VALVE								
		J41T-16 DN50	SET	2					
		J41T-16 DN32	SET	4					
		J41T-16 DN15	SET	42					
4	AUTOMATIC EXHAUST VALVE								
		ZP-1	SET	4					



Shanghai Pudong International Airport Project (Fire Fighting and Rescue Facilities)

MAIN FIRE STATION EXHAUST

Item No.	Description of Works	Unit	Quantity	Foreign Cost Component (Yen)		Local Cost Component (China RMB)		Combined Total China RMB
				Rate	Amount	Rate	Amount	
1	LOW-NOISE DIAGONAL FLOW FAN SWF7# L=15334m <sup>3</sup> /h i=537Pa N=4KW U=380V	SET	2					
2	EXPLOSION-PROOF LOW-NOISE AXIAL FAN BDZ-12 3C# L=1600m <sup>3</sup> /h N=0.06KW U=380V	SET	1					
3	EXHAUST FAN L=1200m <sup>3</sup> /h N=50W U=220V	SET	4					
4	FIRE CONTROL VALVE 1000X630	SET	1					
5	ALUMINUM ALLOY SINGLE-LAYER LOUVER VENT 400X400	SET	22					
6	MICRO-POROUS PLATE SILENCER 1000X630	SET	2					
7	GALVARNIZED STEEL PLATE L=2000mm/ (=1.0mm)	m <sup>2</sup>	310					
8	UMBRELLA-TYPE HOOD 12#	SET	2					

Shanghai Pudong International Airport Project ( fire Fighting and Rescue Facilities )  
 Indoor Water Supply And Sewage For Main Fire Station

Item No.	Description of Works		Unit	Quantity	Foreign Cost Component ( Yen )		Local Cost Component ( China RMB )		Combined Total China RMB
	Item	Model/Size			Rate	Amount	Rate	Amount	
1	Submersible Pump	AS10-2W/CB	p.c.	1					
2	Fire Hydrant	SG28/65-6	set	6					
3	Gas Hot Water Boiler	Gas Input 200kJ/hr	set	3					
4	Magnetic scale inhibitor	DN40	p.c.	1					
5	Full-Automatic Electrical Boiling Water Heater	N<10 kWatt.	set	3					
6	Full-Automatic Electrical Water Heater	N<3 kWatt.	set	4					
7	Butterfly Valve	DN80	p.c.	2					
8	Globe	DN15	p.c.	11					
9	Globe	DN20	p.c.	6					
10	Globe	DN25	p.c.	9					
11	Globe	DN32	p.c.	8					
12	Globe	DN40	p.c.	3					
13	Check Valve	DN40	p.c.	1					
14	Ball Valve	DN32	p.c.	6					
15	Automatic Gas Discharge Valve	DN15	p.c.	1					
16	Water Tap	DN15	p.c.	44					
17	Water Tap	DN20	p.c.	6					

**Shanghai Pudong International Airport Project ( fire Fighting and Rescue Facilities )**  
**Indoor Water Supply And Sewage For Main Fire Station**

Item No.	Description of Works		Unit	Quantity	Foreign Cost Component ( Yen )		Local Cost Component ( China RMB )		Combined Total China RMB
	Item	Model/Size			Rate	Amount	Rate	Amount	
18	Shower	DN15	set	10					
19	Metal Flexible Pipe	DN80	p.c.	2					
20	Urinal		set	11					
21	Closet		set	17					
22	Basin		set	17					
23	Galvanized Steel Pipe	DN15	m	72					
24	Galvanized Steel Pipe	DN20	m	70					
25	Galvanized Steel Pipe	DN25	m	65					
26	Galvanized Steel Pipe	DN32	m	95					
27	Galvanized Steel Pipe	DN40	m	33					
28	Galvanized Steel Pipe	DN50	m	19					
29	Galvanized Steel Pipe	DN65	m	42					
30	Galvanized Steel Pipe	DN80	m	103					
31	Cast Iron Drainage Pipe	DN50	m	135					
32	Cast Iron Drainage Pipe	DN75	m	52					
33	Cast Iron Drainage Pipe	DN100	m	140					
34	Cast Iron Drainage Pipe	DN150	m	5					

Shanghai Pudong International Airport Project ( fire Fighting and Rescue Facilities )

Indoor Water Supply And Sewage For Main Fire Station

Item No.	Description of Works		Quantity	Foreign Cost Component ( Yen )		Local Cost Component ( China RMB )		Combined Total China RMB
	Item	Model/Size		Rate	Amount	Rate	Amount	
35	Round cast-iron Floor Drain	DN50	18					
36	Round cast-iron Floor Drain	DN100						
37	Round cast-iron Floor Drain	DN150	1					
38	Cleanest	DN50	2					
39	Cleanout	DN75	5					
40	Cleanout	DN100	14					
41	Cast-iron Vent Cowl	DN75	2					
42	Cast-iron Vent Cowl	DN100	2					
43	Checkhole	DN75	4					
44	Checkhole	DN100	4					
45	Portable Phosphate Power Extinguisher	MF4	50					