



## S. Mark Oil Field Engineering Pvt Ltd

ASIAN OIL	SMOF/ASIAN/KOD/191/2022	Date: 18.01.2022
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### TECHNICAL PROPOSAL

To,  
Asian Energy Services Ltd.  
3-B, Omkar E-Square,  
Opp. Chunabhatti Signal,  
Eastern Express Highway,  
Sion East, Mumbai-400022  
Maharashtra, India

**Kind Attn:** Mr. Siddhesh Kadam

**Subject:** Quotation for Flare KOD

**Reference:** Inquiry via Email: Quotation require for "Flare KOD" dated 7<sup>TH</sup> NOV 2021.

### REVISION TABLE

REV. NO.	DATE	DESCRIPTION	PREP BY	CHK BY	RWD BY
00	12.01.2022	Technical Proposal	CM	MS	KB
01	18.01.2022	Techno-commercial proposal	CM	MS	KB



HQ: 63 NEW YORK TOWER-A, NR. THALTEJ CROSS ROAD, AHMEDABAD 380054, INDIA

WORKS: 3133-1/2 GIDC CHHATRAL, KALOL, GANDHINAGAR 382729, INDIA



## S. Mark Oil Field Engineering Pvt Ltd

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INQUIRY CHECKLIST					
Product	Flare KOD				
S. MARK SCOPE					
Scope		Remarks	Scope		Remarks
Material	✓		Gratings	X	
Fabrication	✓		E & I	✓	
Vessel Structure and skid	✓		E & I Labor	✓	
DOCUMENTS					
Documents	Received or not received		Remarks		
SOW	X				
MDS	✓		Please Refer Annexure – A		
PDS	X				
GAD	X				
Piping BOM	X				
Structure GAD	X				
Structure BOM	X				
P & ID	✓				
PMS	X				
AVL	X				
QAP/ITP	X				



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SCOPE MATRIX (Annexure – I)			
Sr. No.	Description	Scope	
		ASIAN OIL	S. Mark
Design and Engineering			
01	Supply of Vessels as per SMOF Specs		✓
02	Fabrication of Vessels as per offer		✓
03	Design of Vessels		✓
04	Mechanical design including Pressure loss calculation or any other type of calculations	NA	NA
05	Process design calculation including Stress analysis or any other type of analysis	NA	NA
Vessels			
06	Supply of Vessels material		✓
07	Fabrication of Vessels		✓
08	Blasting and painting of Vessels		✓
09	Supply of Testing Blinds and hydro-testing gasket		✓
10	Supply of insulating gasket (if required)	NA	NA
11	Supply and fabrication of RF pad		✓
Structure			
12	Supply and fabrication of structure (Vessel Support only)		✓
13	Supply and fabrication of equipment support for Vessels		✓
14	Supply of gratings.	NA	NA
15	Supply of Tag Plates for Vessels		✓
16	Supply of Junction box stands, instrument supports, etc.	As per Annexure B	
17	Supply of earthing bosses (SS) and lifting lugs. (IS 2062)		✓
Electrical & Instrumentation			
18	Supply of instrument gauges, and mechanical valves	As Per Annexure – B (Shown MTO List	
19	Supply of differential pressure & temperature transmitters, temperature thermo wells, meters & flow conditioners. JB and cables etc.		



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20	Supply of Electrical accessories		
21	Supply of Instrumentation tube fitting (if applicable)		
22	Supply of Cable & electrical and instrumentation cabling accessories		
Testing			
23	RT (spot), UT, PT, MPI & other non-destructive examination of welds for Vessels (If required by standards/codes)		✓
24	Charpy Test	NA	NA
25	Hydrostatic test.		✓
26	System leak test.	NA	NA
27	PMI Testing (if applicable as per code)	NA	NA
28	Calibration of equipment	NA	NA
29	Calibration wet test and additional equipment required for wet calibration test	NA	NA
30	Material Certification EN 10204 3.1 (Pressure Parts) 2.2 for non-pressure parts		✓
31	Material Certification EN 10204 3.2	NA	NA
32	TPI (if applicable)	✓	
33	Factory acceptance test		✓
34	Site acceptance test	✓	
Documentation			
35	Standard WPS/PQR		✓
36	Inspection report		✓
37	Calibration reports	NA	NA
38	SAT documentation (as per provided list)	NA	NA
39	Inspection test plan or Quality control plan	✓	✓
40	Document dossier	✓	✓
General			
41	PWHT	NA	NA
42	Sunshades	NA	NA



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43	Guarantee on the functioning of instruments and other equipment	NA	NA
44	Grouting	NA	NA
45	Packing (Plastic Wrapping)		✓
46	Sea-worthy packing	NA	NA
47	Insulation	NA	NA
48	Any kind of civil work	✓	
49	Painting		✓

### Notes:

- Design will be in client scope, Client to provide the fabrication drawing for the same
- Non-U Stamp Design considered for the same
- Change in process parameters, usage of the application, mechanical conditions will lead to the price implication



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### SPECIAL NOTES (ANNEXURE-II)

#### SCOPE OF WORK

- Supply of Flare KOD

Sr No	Description	MOC	Qty in No.
1	Flare KOD	1275 mm ID X 4000 mm L Vessel Thk: 8 mm Dished End: 10 mm	1

#### QA-QC DOCUMENT DOSSIER

1. Procedure for Handling of Welding Consumables
2. Procedure for Materials traceability & Identification
3. Procedure for Material Handling
4. WPS & PQR
5. Procedure for Welder Qualification Test
6. Procedure for Weld repairs
7. NDT Procedures (UT, MPT, DPT)
8. Procedure for PWHT
9. Procedure for PMI
10. Procedure for Hydro Test
11. Procedure for Pneumatic Test
12. Procedure for Coating & Repair (Painting)
13. Inspection & Test Plans

Material for the Vessel (Non-NACE)

Plate: SA 516 GR 70

Pipe: SA 106 GR B

Flanges: SA 105

Gasket: SPWD + CS inner and outer Ring

All the valves are soft seated and CS material and instrument material for internals will be CS or SS304 based on the requirement.

#### PAINTING

- Paint: Berger/Jotun or equivalent make (if another makes required, it will cost extra)
- Preparation: SA 2 1/2
- Primary: 1x layer of paint Epoxy-Zinc-Silicate, 70 microns minimum DFT
- Intermediate: 1x layer Epoxy high-build with iron-oxide, 100 microns minimum DFT
- Finish layer: 2x layers 50 microns minimum, polyurethane paint DFT
- Total DFT: 270 microns

#### STRUCTURE

- Structure material IS 2062 Gr. B
- Structure makes: SAIL, Vizag, Essar, OR Equivalent Indian Make

#### S. MARK CONSIDERED VENDOR LIST

Flange	<p>Prioritize the vendor selection Criteria</p> <ol style="list-style-type: none"> <li>1. S. Mark Approved vendor</li> <li>2. Oil and Gas PTR records vendor</li> </ol>
Fittings	
Fasteners	
Pipe make	
Gasket	
Structure makes	
Paint	



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### PRICE SCHEDULE (ANNEXURE-IV)

Sr. No.	DESCRIPTION	QTY	UNIT	Unit Rate (INR)	Total Price (INR)
<b>Supply of flare KOD</b>					
1	Flare KOD	1	No	31,50,000/-	31,50,000/-
<b>TOTAL PRICE</b>					<b>31,50,000</b>

#### Note:

1. Change in material specification or quantity will revise the final amount to the quoted rate.
2. All Prices are quoted in Indian Rupees (INR) net.
3. All applicable Taxes will be extra at actual.





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TERMS & CONDITIONS
<b>Offer Validity:</b>
<ul style="list-style-type: none"><li>The quoted prices will remain firm for 30 days after the date of submission</li></ul>
<b>Payments Terms:</b>
<ul style="list-style-type: none"><li>10 % advance against order acceptance</li><li>20% against the issuance of the purchase order to vendors (plates, flanges, fittings)</li><li>15 % against major raw material identification (Plates)</li><li>50 % against submission of TPI IRN prior to dispatch</li><li>5 % against submission of final documents</li></ul>
<b>Taxes and Duties:</b>
<ul style="list-style-type: none"><li>Taxes and duties shall be charged additionally at actual prevailing rates at the time of dispatch/invoicing.</li><li>GST to be considered as actual at the time of invoicing.</li></ul>
<b>Price Basis:</b>
<ul style="list-style-type: none"><li>All Prices are quoted in Indian Rupees (INR) net, Ex-works</li></ul>
<b>Delivery:</b>
<ul style="list-style-type: none"><li>Ex-works, within 16-18 weeks from date of receipt of fabrication drawing.</li></ul>
<b>Cancellation:</b>
<ul style="list-style-type: none"><li>Within 1 week from the date of PO – 5 % of the actual contract value.</li><li>Within 3 weeks from the date of PO – 10 % of the actual contract value.</li><li>After 4 weeks from the date of PO – Actual amount of completion including procured material cost</li></ul>

*We thank you for the opportunity to submit our proposal. If you require any further clarification, please do not hesitate to contact us.*

Best Regards.

For, S. Mark Oil Field Engineering Pvt. Ltd

**Bhavin Gole**

**Proposal – Lead**

Mail ID: [bdm1@smark.in](mailto:bdm1@smark.in)

- **Annexures A**

## Horizontal Separator Calculation

Project Name  
Customer  
Vessel Name  
Tag No

2 or 3 Phase Operation

Flare KOD		
ID, mm	1,250	
T/T, mm	4,000	
L : D	3.20	

Vessel Capacity	
Vol m <sup>3</sup>	5.42
Area, m <sup>2</sup>	1.23

### Input Data

Operating Temp/Press

Bulk Fluid Description

Fluid Flowrate

Fluid Density

Fluid Viscosity

Gas MW

Liquid Surface Tension

Actual Flowrate

Standard Flowrate

MMSCFD / BPD

Normal Case				Design Case			
°C	50.0	barg	3.50	°C	50.0	barg	3.50
Gas	Oil	Water		Gas	Oil	Water	
21,000	2,000			23,100	2,200		
13.00	900.0	967.8		13.00	900.0	967.8	
0.015	0.60			0.015	0.60		
21.00				21.00			
	13.6				13.6		
1,615.4	2.2	0.0		1,776.9	2.4	0.0	
22,410.0				24,651.0			
20.06	336	0		22.07	369	0	

Water Cut

0.0%

0.0%

### Basic Sizing Summary

Normal Liquid Levels

Calc. Liquid Hold-up Time

Calc. Liquid Velocity

Calc. Droplet Dia Separated

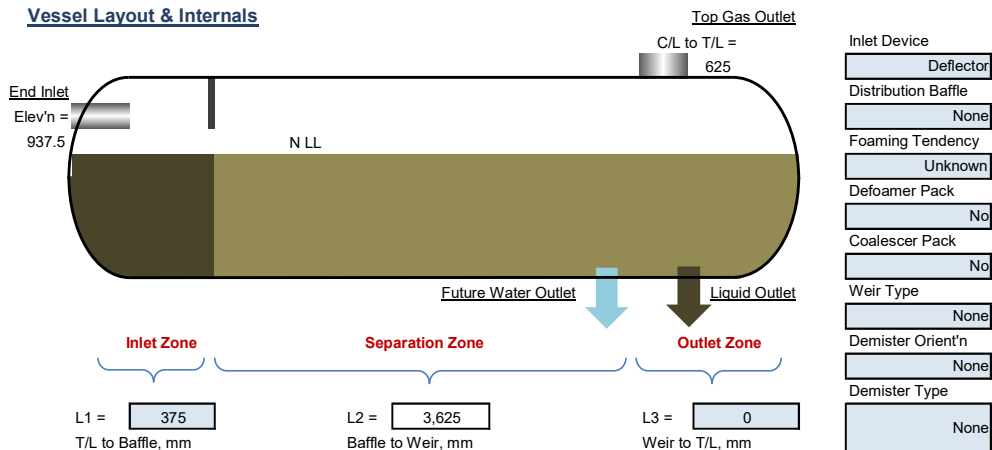
Calc. Carryover/under

Gas Area & K Factor

Mist Elim. Area & K-Factor

	550	0		550	0
@ NLL	59.00	N/A	@ NLL	53.64	N/A
@ NLL	0.07	N/A	@ NLL	0.08	N/A
@ NLL			@ NLL		
@ NLL			@ NLL		
m <sup>2</sup> 0.71	m/s 0.08		m <sup>2</sup> 0.71	m/s 0.08	
m <sup>2</sup> 0.00	m/s 0.00		m <sup>2</sup> 0.00	m/s 0.00	

### Vessel Layout & Internals



### Nozzle Sizing Data

Loc'n	Nozzle Data	ID, mm	NB	Normal Case		Design Case	
		In		Vel, m/s	pv <sup>2</sup> , Pa	Vel, m/s	pv <sup>2</sup> , Pa
End	N1 Feed Inlet	250	10	9.2	1,191	10.1	1,442
Top	N2 Gas Outlet	250	10	9.1	1,086	10.1	1,314
	N3 Liquid Outlet	80	3	0.1	14	0.1	16
	N/A		0				

Document Title

Process Design Summary for  
Horizontal Separator

Document No.

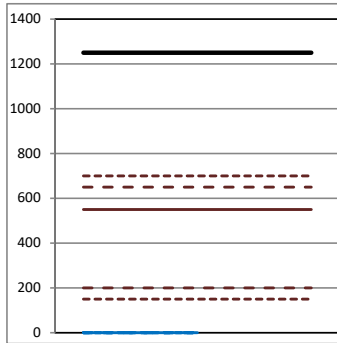
Sheet 1 of 3

## Horizontal Separator Calculation

Project Name  
Customer  
Vessel Name  
Tag No

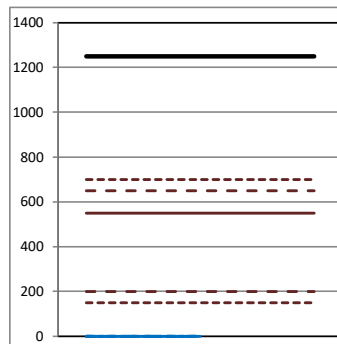
Flare KOD

### Levels & Holdups



Normal Case																		
Oil			U/S of weir			Oil			D/S of weir									
mm			Vol, m³			Holdup, min			mm			Vol, m³			Holdup, min			
HH	700		2.98		80.44		700		0.15		4.07							
H	650		2.71		73.30		650		0.14		3.66							
N	550		2.19		59.00		550		0.10		2.83							
L	200		0.52		14.16		200		0.02		0.47							
LL	150		0.34		9.28		150		0.01		0.27							
Weir Type			None															
Weir Height							0			to			0			Suggested		
Water			U/S of weir															
HH			N/A		N/A													
H			N/A		N/A													
N	0		N/A		N/A		Oil			2.2			m³/h					
L			N/A		N/A		Water			0.0			m³/h					
LL			N/A		N/A													
			N/A		N/A		Slug Vol						m³					

### Levels & Holdups



Design Case														
Oil			U/S of weir				Oil			D/S of weir				
mm			Vol, m <sup>3</sup>		Holdup, min		mm			Vol, m <sup>3</sup>		Holdup, min		
HH	700		2.98		73.13		700			0.15		3.70		
H	650		2.71		66.64		650			0.14		3.33		
N	550		2.19		53.64		550			0.10		2.58		
L	200		0.52		12.87		200			0.02		0.43		
LL	150		0.34		8.44		150			0.01		0.25		
Weir Type			None				0 to 0 Suggested							
Weir Height			0											
Water			U/S of weir				Inlet Flow Rates							
HH	0		N/A		N/A		Oil			2.4		m³/h		
H	0		N/A		N/A		Water			0.0		m³/h		
N	0		N/A		N/A		Slug Vol						m³	
L	0		N/A		N/A									
LL	0		N/A		N/A									

### Gas Space Calculations

Normal Case				Design Case					
		m <sup>2</sup>	Vel, m/s	K Factor			m <sup>2</sup>	Vel, m/s	K Factor
HH	N	0.520	0.863	0.104	0.520	0.949	0.115		
		0.582	0.771	0.093	0.582	0.848	0.103		
H	ator	0.707	0.635	0.077	0.707	0.698	0.085		
		0.000	0.000	0.000	0.000	0.000	0.000		

Estimated Foam Height mm 55 mm 55

Trial & Error Droplet KO Calc at face of Mist Eliminator  
 microns 300 Sep Length 734 OK microns 300 Sep Length 808 OK

Document Title		Document No.
Process Design Summary for Horizontal Separator		Sheet 2 of 3

### Horizontal Separator Calculation

Project Name  
Customer  
Vessel Name  
Tag No

Flare KOD

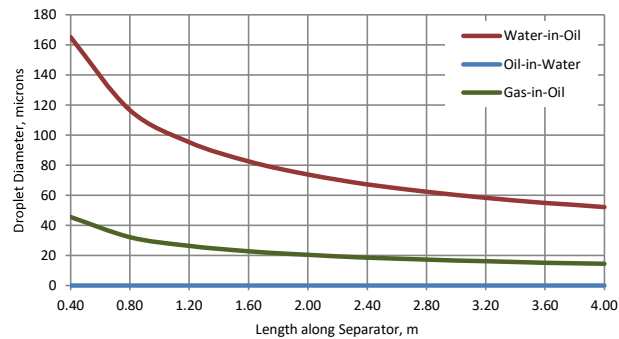
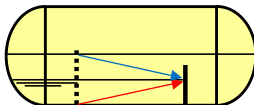
### Pressure Drop Summary (Gas)

	Normal Case	Design Case
Inlet Nozzle & Distributor	6.0	7.2
Inlet Cyclone (if applicable)	0.0	0.0
Defoamer	0.0	0.0
Mist Eliminator	0.0	0.0
Outlet nozzle	2.7	3.3
	<b>mbar</b>	<b>mbar</b>
	<b>8.7</b>	<b>10.5</b>

### Summary of Performance

		Normal Case	Design Case
		Guarantee	Calculated
Oil R.T. At NLL	min		59.00
Water-in-Oil Carryover	% vol		
	microns		
Water R.T. At NLL	min		N/A
Oil-in-Water Carryover	ppmv		
	microns		
Gas-in-Oil Carryunder	% vol		0.05
	microns		15
Liquid-in-Gas Entrainment			
Onto mist eliminator	microns	10	300
Exit mist eliminator	microns	10	
Exit mist eliminator	l/MNm <sup>3</sup>	0.0135	
Pressure Drop Overall	mbar	50	9

Design Case  
Graphical Performance of  
Theoretical Droplet Settling  
along the Separator  
(for 3 phase option)



Notes

- 1)
- 2)
- 3)

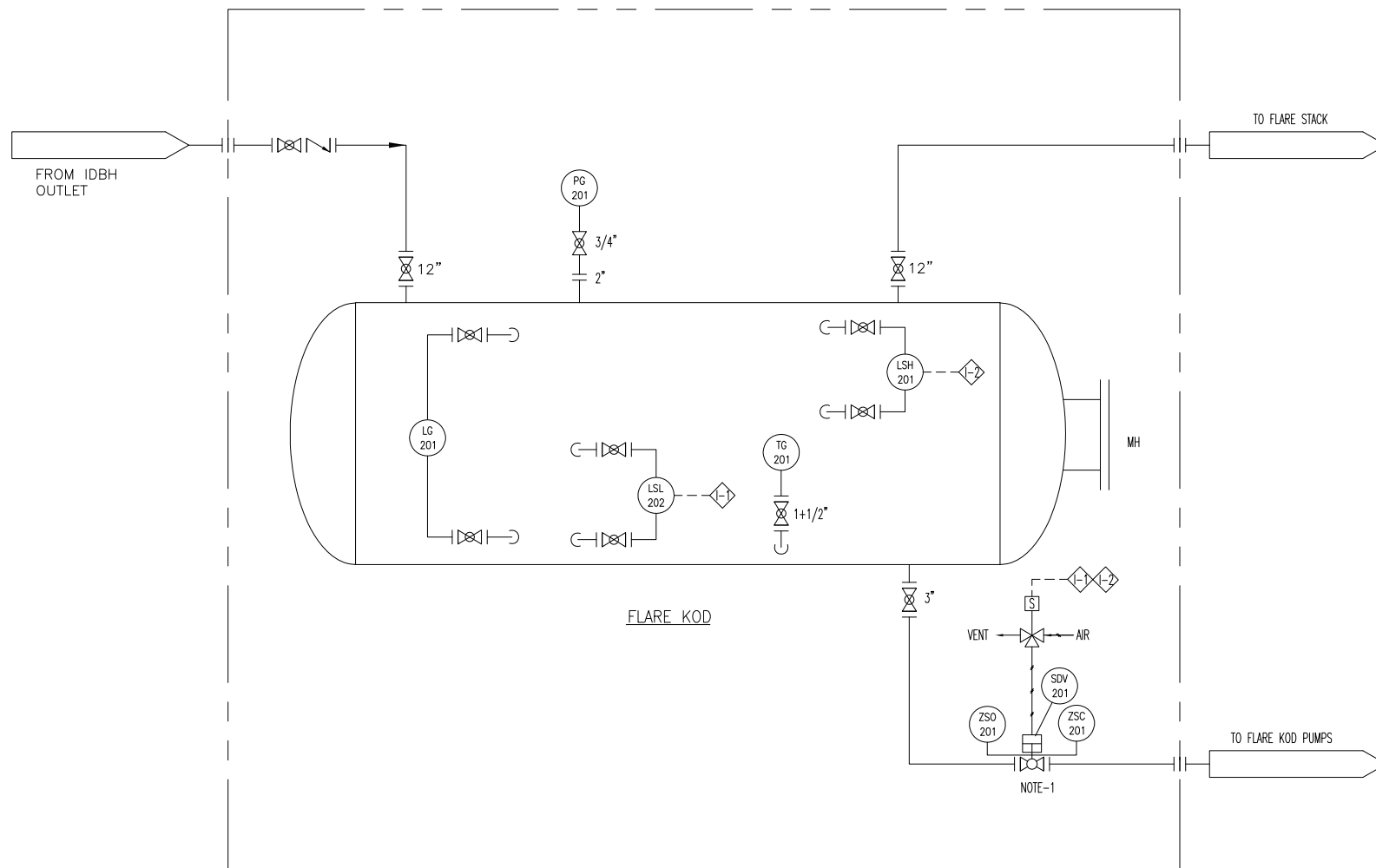
	Document Title	Document No.
	<b>Process Design Summary for Horizontal Separator</b>	Sheet 3 of 3

# FLARE KOD

SIZE (mm) : 1275 ID x 4000 TL/TL  
 DP/ DT : 3.5 kg/cm<sup>2</sup>g / 150°C  
 MOC : SA 516 GR.70 + 3 mm CA

## NOTE:-

1. LSH-201, LSL-202 WILL CLOSE SDV-201



TYPICAL

- **Annexures B**

Bill of Material					
S. No	ITEM	Description	Size	Qty	Unit
1	Ball Valve full bore	150# X SCH 40 Material CS + Soft Seated	12"	3	No
2	NRV	150# X SCH 40 Material CS + Soft Seated	12"	1	No
3	Pressure Gauge	0-20Kg Cm2, 6" Dial Gauge	3/4"	1	No
4	Temperature Gauge	0-100 Deg C 6" Dial Gauge	1.5"	1	No
5	Level Switch (HH and LL)			0	No
6	Level gauge	Glass Type level gauge	2"	1	No
7	Level trasmitter	GWR	1"	1	No
8	Ball Valve full bore	150# X SCH 40 Material CS + Soft Seated	2"	7	No
9	Ball Valve full bore	150# X SCH 40 Material CS + Soft Seated	3/4"	1	No
10	Ball Valve full bore	150# X SCH 40 Material CS + Soft Seated	3"	1	No
11	XSV	150# X SCH 40 Ball Valve CS material	3"	1	No
12	Inst Cables	FRLS Cable	1P	1	Lot
13	JB	Die Cast Aluminium		1	No
14	Cable Tray	FRP Cable Tray	50 mm X 3 mm T	1	Lot