

PIPING MATERIAL SPECIFICATION

Spec Name : 6544-00-16-71-SP-02 Rev 0

Spec Desc. : PIPING MATERIAL SPECIFICATION

Client : HPCL

Project : MUNDRA-DELHI P/L PRJ

Location : MUNDRA - DELHI

Job No. : 6544

Dept/Sec. : 16/71

0	21/02/2005	Issued for Engineering
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Rev. No	Date	Purpose	Prepared by	Checked by	Approved by
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Abbreviations:

BE - BEVEL END

BW - BUTT WELD

FF - FLAT FACE

FLGD - FLANGED

HSD - HIGH SPEED DIESEL

MS - MOTOR SPIRIT

NDT - NON DESTRUCTIVE TESTING

P&ID - PIPING AND INSTRUMENTATION DIAGRAM

PBE - PLAIN BOTH ENDS

PE - PLAIN END

RF - RAISED FACE

RTJ - RING TYPE JOINT

SAW - SUBMERGED ARC WELDED

SCRF - SCREWED END - FEMALE

SCRM - SCREWED END - MALE

SKO - SUPERIOR KEROSENE OIL

SW - SOCKET WELD

ULMS - ULTRA LOW MOTOR SPIRIT

ULSHSD- ULTRA LOW SULPHUR HIGH SPEED DIESEL

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Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	

PIPING MATERIAL SPECIFICATION INDEX

Sl. No	Piping Class	Rating	C.A	Spl. Reqt.	Basic Material	Service	Remarks
1	A1A	150	1.5	NON IBR	CARBON STEEL	NON CORROSIVE/ FLAMMABLE / NON FLAMMABLE/ NON LETHAL -PROCESS & HYDROCARBONS; LUBE OIL BEFORE FILTER; AMMONIA, STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A), PLANT AIR, NITROGEN, CARBONDIOXIDE; WATER - BEYOND A3A AND A10A; IN OFFSITES ONLY BEYOND A10A; MS/ ULMS/ HSD/ ULSHSD/ SKO	
2	A1K	150	0	NON IBR	SS 304	CORROSION INHIBITOR (CHEMICALS)	
3	A3A	150	1.5	NON IBR	CARBON STEEL	NON CORROSIVE UTILITIES (ABOVE GROUND) CATEGORY "D" FLUID - COOLING WATER, INSTRUMENT AIR(2" & ABOVE), PLANT AIR, INERT GAS, CARBON DI OXIDE (DRY), NITROGEN, CONDENSATE & BOILER FEED SUCTION (NON IBR). THIS CLASS DOES NOT COVER UNDERGROUND PIPING AND THE FIRE WATER SERVICE. FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 6.6 KG/CM2G RESPECTIVELY.	As per ASME B 31.3
4	B1A	300	1.5	NON IBR	CARBON STEEL	MS/ ULMS/ HSD/ ULSHSD/ SKO	
5	B1K	300	0	NON IBR	SS 304	CORROSION INHIBITOR (CHEMICALS)	
6	D1A	600	1.5	NON IBR	CARBON STEEL	MS/ ULMS/ HSD/ ULSHSD/ SKO	
7	D1K	600	0	NON IBR	SS 304	CORROSION INHIBITOR (CHEMICALS)	
8	E1A	900	1.5	NON IBR	CARBON STEEL	MS/ ULMS/ HSD/ ULSHSD/ SKO	

Notes : 1. For PMS General notes refer Annexure-I of this document

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1A Sheet 1 of 7

PIPE CLASS : A1A
RATING : 150
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93	149	204	260	316	343	371
PRESS	20.03	20.03	18.28	16.17	14.06	11.95	9.84	8.78	7.73

SERVICE

NON CORROSIVE/ FLAMMABLE / NON FLAMMABLE/ NON LETHAL -PROCESS & HYDROCARBONS; LUBE OIL BEFORE FILTER; AMMONIA, STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A), PLANT AIR, NITROGEN, CARBONDIOXIDE; WATER - BEYOND A3A AND A10A; IN OFFSITES ONLY BEYOND A10A; MS/ ULMS/ HSD/ ULSHSD/ SKO

NOTES

- 1 NDT REQUIREMENTS AS PER EIL STANDARD 6-44-0016.
- 102 ALL VENTS AND DRAINS SHALL BE PROVIDED WITH GATE VALVE UNLESS OTHERWISE INDICATED IN P&ID.
- 104 WALL THICKNESS FOR LINEPIPE USED IN VARIOUS SECTIONS SHALL BE AS PER TABLE-1 OF ANNEXURE-I (GENERAL NOTES) OF THIS DOCUMENT.
- 105 BALL VALVE TO BE USED IN MAIN PIPELINE SHALL HAVE BUTT WELDED ENDS.
- 106 MAINLINE WELDING AND NDT REQUIREMENTS OF WELDS SHALL BE AS PER SPECIFICATION NO. 6-77-0007.
- 109 FOR PIPELINE SPECIALITY ITEMS AND THEIR MATERIAL DESCRIPTION REFER TABLE-3 OF ANNEXURE-I (GENERAL NOTES) OF THIS DOCUMENT.
- 110 NDT OF MAINLINE WELDS SHALL BE AS FOLLOWS:
RADIOGRAPHY: ALL BUTT WELDS 100%
MPI: SOCKET WELDS 100%.
ALL OTHER REQUIREMENTS SHALL BE AS PER 6-44-0016.
- 111 PIPING DESIGN AS PER ASME B 31.4 & OISD 141.
- 115 FOR VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION , BRANCH CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE GIVEN ON NEXT PAGE. THE BRANCH DETAILS INDICATED IN APPLICABLE STANDARD SHALL BE IGNORED.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.
- 124 FOR VALVE SIZE ABOVE 24", FLANGE ENDS SHALL BE AS PER ASME B 16.47, SERIES-A
- 126 BRANCH CONNECTIONS ON MAINLINE SHALL BE WELDOLET/FLOW TEE (REDUCING/EQUAL) AS APPLICABLE. REFER ANNEXURE-I FOR DETAILS.
- 127 NDT OF WELDS SHALL BE AS FOLLOWS:
RADIOGRAPHY: ALL BUTT WELDS 100%
MPI: SOCKET WELDS 100%.
ALL OTHER REQUIREMENTS SHALL BE AS PER 6-44-0016.
- 128 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; FOR DIMENSIONS FOR HANDLE PROJECTION FOR SPACERS AND BLINDS REFER EIL'STD 7-44-0166.

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1A Sheet 2 of 7

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1A Sheet 3 of 7

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
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F	SADDLE FUSED JT	T	TEES
H	H. COUPLING	W	WELDOLETS
P	PIPE TO PIPE	I	INSTRUMENT TEE
R	REINFORCED	X	Refer Notes
S	SOCKOLETS	L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1A Sheet 4 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	00.750	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	01.000	01.500	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	02.000	02.000	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	03.000	14.000	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16.000	36.000	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	40.000	48.000	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
NIP	NIPPLE	00.500	00.750	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	01.000	01.500	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.WN	00.500	24.000	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG	FLNG.WN	26.000	48.000	M	B-16.47-A	ASTM A 105	150, RF/125AARH	FWA0127Z0	
FLB	FLNG.BLIND	00.500	24.000		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26.000	48.000		B-16.47-A	ASTM A 105	150, RF/125AARH	FBA0127Z0	
FEF	FLNG.FIG.8	00.500	08.000		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10.000	24.000		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26.000	48.000		MNF'STD	ASTM A 516 GR.70	150, FF/125AARH	FCG6321Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	02.000	16.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	18.000	48.000	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	02.000	16.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1A Sheet 5 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB45	ELBOW.45	18.000	48.000	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	02.000	16.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	18.000	48.000	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	02.000	16.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	18.000	48.000	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	02.000	16.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	18.000	48.000	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	02.000	16.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	18.000	48.000	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	00.500	03.000	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	00.500	03.000	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	02.000	48.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
PLG	PLUG	00.500	00.750		B-16.11	ASTM A 105	SCRM, 6000	WH60293Z0	
CPLF	CPLNG.FULL	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLF/1	CPLNG.FULL	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WJ60283Z0	
CPLH	CPLNG.HALF	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLH/1	CPLNG.HALF	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WK60283Z0	
CPLL	CPLNG.LH	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1A Sheet 6 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLL	CPLNG.LH	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLL/1	CPLNG.LH	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WL60283Z0	
CPLR	CPLNG.RED	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
CPLR/1	CPLNG.RED	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WM60283Z0	
O'let Group									
WLT	WELDOLET	02.000	06.000	M, S160	MSS-SP97	ASTM A 105	BW	YWS024ZZ0	
TLT	THREADOLET	00.500	00.750		MSS-SP97	ASTM A 105	SCRF, 6000	YTS0283Z0	
Valves Group									
GAV	VLV.GATE	00.250	01.500		API-602	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GLV	VLV.GLOBE	00.250	01.500		BS-5352	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	02.000	16.000		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52301	52301ZZZ0	
CHV	VLV.CHECK	00.250	01.500		BS-5352	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	02.000	30.000		API-6D	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53391	53391ZZZ0	
BLV	VLV.BALL	00.500	01.500		BS-5351	BODY-ASTM A 105,TRIM-13% CR.STEEL, SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54391	54391ZZZ0	
BLV	VLV.BALL	02.000	30.000		API-6D	BODY-ASTM A216 GR.WCB,TRIM/BALL SEAT-(AISI 4140 + 0.003"ENP)/AISI 410	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54398	54398ZZZ0	124
BLV/1	VLV.BALL	02.000	18.000		API-6D	BODY-ASTM A 216 GR.WCB, TRIM-BALL, SEAT-(AISI 4140 + 0.003" ENP)/AISI 410	BW, 150, B-16.25, SHT NO.- 54397	54397ZZZ0	
PLV	VLV.PLUG	00.500	01.500		BS-5353	BODY-ASTM A 105,PLUG - A105 + 0.003" ENP	SW, 800, 3000, B-16.11, SHT NO.- 55091	55091ZZZ0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1A Sheet 7 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
PLV	VLV.PLUG	02.000	30.000		API-6D	BODY-ASTM A 216 GR.WCB,PLUG : ASTM A216 Gr. WCB+0.003" ENP	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55392	55392ZZZ0	
Bolt Group									
BOS	BOLT.STUD	00.500	48.000		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	00.500	24.000		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 150	GK65072Z0	
GAS	GASKET	26.000	48.000		B-16.20-ANSI B16.47A	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK46272Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	00.500	01.500		MNF'STD	B:A105;T:13%CR;S: SS304	FLGD, THRMDNMC, 150,RF/125AARH	TR3065530	
TSR	STRNR.TEMP	01.500	24.000		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z0	
PSR	STRNR.PERM	00.500	01.500		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	02.000	14.000	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	16.000	24.000	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1K Sheet 1 of 4

PIPE CLASS : A1K
RATING : 150
BASE MATERIAL : SS 304
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93
PRESS	19.33	19.33	16.17

SERVICE

CORROSION INHIBITOR (CHEMICALS)

NOTES

- 1 NDT REQUIREMENTS AS PER EIL STANDARD 6-44-0016.
- 102 ALL VENTS AND DRAINS SHALL BE PROVIDED WITH GATE VALVE UNLESS OTHERWISE INDICATED IN P&ID.
- 103 DESIGN FACTOR=0.72
- 111 PIPING DESIGN AS PER ASME B 31.4 & OISD 141.
- 115 FOR VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION , BRANCH CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE GIVEN ON NEXT PAGE. THE BRANCH DETAILS INDICATED IN APPLICABLE STANDARD SHALL BE IGNORED.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.
- 128 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; FOR DIMENSIONS FOR HANDLE PROJECTION FOR SPACERS AND BLINDS REFER EIL'STD 7-44-0166.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1K Sheet 2 of 4

72.							72.
70.							70.
68.							68.
66.							66.
64.							64.
62.							62.
60.							60.
58.							58.
56.							56.
54.							54.
52.							52.
50.							50.
48.							48.
46.							46.
44.							44.
42.							42.
40.							40.
38.							38.
36.							36.
34.							34.
32.							32.
30.							30.
28.							28.
26.							26.
24.							24.
22.							22.
20.							20.
18.							18.
16.							16.
14.							14.
12.							12.
10.							10.
8.0							8.0
6.0							6.0
5.0							5.0
4.0							4.0
3.5							3.5
3.0							3.0
2.5							2.5
2.0						T	2.0
1.5				T	T		1.5
1.25							1.25
1.0		T		T	H		1.0
0.75		T	T		T	H	0.75
0.5	T	T	T		T	H	0.5
	.500	.750	1.000	1.250	1.500	2.000	2.500

RUN PIPE (SIZE IN INCHES)

CODE	DESCRIPTION		
F	SADDLE FUSED JT	T	TEES
H	H. COUPLING	W	WELDOLETS
P	PIPE TO PIPE	I	INSTRUMENT TEE
R	REINFORCED	X	Refer Notes
S	SOCKOLETS	L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1K Sheet 3 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	00.750	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	01.000	01.500	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	02.000	02.000	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
NIP	NIPPLE	00.500	00.750	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	01.000	01.500	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
Flange Group									
FLG	FLNG.WN	00.500	01.500	M	B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FWC4127Z0	
FLG	FLNG.WN	02.000	02.000	M	B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FWC4127Z0	
FLB	FLNG.BLIND	00.500	02.000		B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FBC4127Z0	
FEF	FLNG.FIG.8	00.500	02.000		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FGK4121Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB45	ELBOW.45	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	
ELB45	ELBOW.45	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
TEQ	T.EQUAL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TRED	T.RED	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	
TRED	T.RED	02.000	02.000	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
SWGC	SWAGE.CONC	00.500	02.000	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	00.500	02.000	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WF64282Z0	
CAP	CAP	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
PLG	PLUG	00.500	00.750		B-16.11	ASTM A 182 GR.F304	SCRM, 3000	WH64292Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A1K Sheet 4 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLF	CPLNG.FULL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	
CPLF/1	CPLNG.FULL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WJ64282Z0	
CPLH/1	CPLNG.HALF	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WK64282Z0	
CPLL/1	CPLNG.LH	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WL64282Z0	
CPLR/1	CPLNG.RED	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WM64282Z0	
O'let Group									
TLT	THREAOLET	00.750	00.750		MSS-SP97	ASTM A 182 GR.F304	SCRF, 3000	YTS4282Z0	
Valves Group									
GAV	VLV.GATE	00.500	01.500		API-602	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZZ0	
GLV	VLV.GLOBE	00.500	01.500		BS-5352	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS304	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZZ0	
CHV	VLV.CHECK	00.500	01.500		BS-5352	BODY-ASTM A 182 GR.F304,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZZ0	
BLV	VLV.BALL	00.500	01.500		BS-5351	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT: RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54392	54392ZZZ0	
BLV	VLV.BALL	02.000	02.000		API-6D	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT: RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54393	54393ZZZ0	
PLV	VLV.PLUG	00.500	01.500		BS-5353	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-PLUG SS304/SS316	SW, 800, 3000, B-16.11, SHT NO.- 55093	55093ZZZ0	
Bolt Group									
BOS	BOLT.STUD	00.500	02.000		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	00.500	02.000		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 150	GK65072Z0	
Trap/Strainer Group									
PSR	STRNR.PERM	00.500	01.500		MNF'STD	B:A182GR.F304;IN T:SS304	SW, Y-TYPE, 800	SP307D510	
PSR	STRNR.PERM	02.000	02.000	M	EIL'STD	B:A403GR.WP304-S;INT:SS304	BW, T-TYPE	SP15344Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A3A Sheet 1 of 5

PIPE CLASS : A3A
RATING : 150
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	50	65	100	150	186
PRESS	10.55	10.55	10.55	10.55	10.55	10.55	10.55

SERVICE

NON CORROSIVE UTILITIES (ABOVE GROUND) CATEGORY "D" FLUID - COOLING WATER, INSTRUMENT AIR(2" & ABOVE), PLANT AIR, INERT GAS, CARBON DI OXIDE (DRY), NITROGEN, CONDENSATE & BOILER FEED SUCTION (NON IBR). THIS CLASS DOES NOT COVER UNDERGROUND PIPING AND THE FIRE WATER SERVICE. FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 6.6 KG/CM2G RESPECTIVELY.

NOTES

- 1 NDT REQUIREMENTS AS PER EIL STANDARD 6-44-0016.
- 6 FOR FABRICATED REDUCERS,REFER EIL'STD 7-44-0485 & 7-44-0487. FOR MITRES, REFER EIL'STD 7-44-0033.
- 31 USE BUTTERFLY VALVES INSTEAD OF GATE VALVES FROM 10" ONWARDS IN WATER SERVICE AND UPTO 70 DEG C. DESIGN PRESSURE FOR BUTTERFLY VALVES IS LIMITED UPTO 10 BAR.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 76 FOR PERMANENT BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300.
- 86 BUTTERFLY VALVES FOR THE SPEC ARE PN10 RATED WITH A MAXIMUM PRESSURE OF 10.2 KG/CM2G.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING 3000 LBS.	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-350, DF3	
	ON LINES >= 2.0"	0.75" OR AS PER P&ID. REFER EIL STD. 7-44-351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-350, VC1	
	ON LINES >= 2.0"	0.75" OR AS PER P&ID. REFER EIL STD 7-44-351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-353	
PRESS.CONN	0.75"	SW, SH HVY NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A3A Sheet 2 of 5

[illegible]**RUN PIPE (SIZE IN INCHES)**

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
T	TEES
H	H. COUPLING
W	WELDOLETS
P	PIPE TO PIPE
I	INSTRUMENT TEE
R	REINFORCED
X	Refer Notes
S	SOCKOLETS
L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A3A Sheet 3 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	01.500	HVY	IS-1239-I	IS-1239 (BLACK)	PE, C.WELDED	PI6D471Z0	
PIP	PIPE	02.000	06.000	HVY	IS-1239-I	IS-1239 (BLACK)	BE, C.WELDED	PI6D411Z0	
PIP	PIPE	08.000	12.000	6.0	IS-3589	IS-3589 GR.330	BE, WELDED	PI7D919Z0	
NIP	NIPPLE	00.500	01.500	HVY	IS-1239-I	IS-1239 (BLACK)	PBE, C.WELDED	PN6D461Z0	
Flange Group									
FLG	FLNG.SW	00.500	01.500	M	B-16.5	ASTM A 105	150, RF/125AARH	FSC0127Z0	
FLG	FLNG.SO	02.000	12.000		B-16.5	ASTM A 105	150, RF/125AARH	FNC0127Z0	
FLB	FLNG.BLIND	00.500	12.000		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FEF	FLNG.FIG.8	00.500	08.000		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10.000	12.000		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	02.000	12.000	STD	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB45	ELBOW.45	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	02.000	12.000	STD	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
TEQ	T.EQUAL	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	02.000	06.000	STD	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	08.000	12.000	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	02.000	06.000	STD, STD	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	08.000	12.000	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	02.000	06.000	STD, STD	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	08.000	12.000	M, M	EIL'STD	IS-3589 GR.330	BW	WUKF14ZZ0	
REDE	REDUC.ECC	02.000	06.000	STD, STD	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A3A Sheet 4 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
REDE	REDUC.ECC	08.000	12.000	M, M	EIL'STD	IS-3589 GR.330	BW	WVKF14ZZ0	
SWGC	SWAGE.CONC	00.500	03.000	STD. STD	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	00.500	03.000	STD. STD	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	00.500	01.500		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	
CAP	CAP	02.000	06.000	STD	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	08.000	12.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	00.500	01.500		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
UNN	UNION	00.500	01.500		BS-3799	ASTM A 105	SW, 3000	WQH02D2Z0	
Valves Group									
GAV	VLV.GATE	00.500	01.500		API-602	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	02.000	24.000		API-600	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51321	51321ZZZ0	
GLV	VLV.GLOBE	00.500	01.500		BS-5352	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	02.000	16.000		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52321	52321ZZZ0	
CHV	VLV.CHECK	00.500	01.500		BS-5352	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	02.000	24.000		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53321	53321ZZZ0	
BLV	VLV.BALL	00.500	16.000		BS-5351	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54321	54321ZZZ0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : A3A Sheet 5 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Bolt Group									
BOM	BOLT.M/C	00.500	12.000		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
Gasket Group									
GAS	GASKET	00.500	12.000		B-16.21-ANSI B16.5	IS-2712-GR.W/3	RING, 150, 2 MM	GKB1052Z0	
Trap/Strainer Group									
TSR	STRNR.TEMP	01.500	24.000		EIL'STD	B:A285GR.C;INT:S S304	CONETYPE, 150,FF/125AARH	ST14431Z0	
PSR	STRNR.PERM	00.500	01.500		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	02.000	06.000	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	08.000	12.000	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1A Sheet 1 of 7

PIPE CLASS : B1A
RATING : 300
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93
PRESS	52.02	52.02	47.45

SERVICE

MS/ ULMS/ HSD/ ULSHSD/ SKO

NOTES

- 1 NDT REQUIREMENTS AS PER EIL STANDARD 6-44-0016.
- 102 ALL VENTS AND DRAINS SHALL BE PROVIDED WITH GATE VALVE UNLESS OTHERWISE INDICATED IN P&ID.
- 103 DESIGN FACTOR=0.72
- 104 WALL THICKNESS FOR LINEPIPE USED IN VARIOUS SECTIONS SHALL BE AS PER TABLE-1 OF ANNEXURE-I (GENERAL NOTES) OF THIS DOCUMENT.
- 105 BALL VALVE TO BE USED IN MAIN PIPELINE SHALL HAVE BUTT WELDED ENDS.
- 106 MAINLINE WELDING AND NDT REQUIREMENTS OF WELDS SHALL BE AS PER SPECIFICATION NO. 6-77-0007.
- 109 FOR PIPELINE SPECIALITY ITEMS AND THEIR MATERIAL DESCRIPTION REFER TABLE-3 OF ANNEXURE-I (GENERAL NOTES) OF THIS DOCUMENT.
- 111 PIPING DESIGN AS PER ASME B 31.4 & OISD 141.
- 115 FOR VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION , BRANCH CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE GIVEN ON NEXT PAGE. THE BRANCH DETAILS INDICATED IN APPLICABLE STANDARD SHALL BE IGNORED.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.
- 127 NDT OF WELDS SHALL BE AS FOLLOWS:
RADIOGRAPHY: ALL BUTT WELDS 100%
MPI: SOCKET WELDS 100%.
ALL OTHER REQUIREMENTS SHALL BE AS PER 6-44-0016.
- 128 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; FOR DIMENSIONS FOR HANDLE PROJECTION FOR SPACERS AND BLINDS REFER EIL'STD 7-44-0166.

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1A Sheet 2 of 7

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1A Sheet 3 of 7

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
T	TEES
H	H. COUPLING
W	WELDOLETS
P	PIPE TO PIPE
I	INSTRUMENT TEE
R	REINFORCED
X	Refer Notes
S	SOCKOLETS
L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1A Sheet 4 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	00.750	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	01.000	01.500	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	02.000	02.000	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	03.000	06.000	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	08.000	08.000	6.4	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	10.000	10.000	6.4	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	12.000	12.000	7.9	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	14.000	14.000	8.7	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	16.000	16.000	9.5	API 5L	API 5L GR.B PSL1	BE, SAW	PIAE916Z0	
NIP	NIPPLE	00.500	00.750	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	01.000	01.500	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.SW	00.500	01.500	M	B-16.5	ASTM A 105	300, RF/125AARH	FSC0147Z0	
FLG	FLNG.WN	02.000	16.000	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z0	
FLB	FLNG.BLIND	00.500	01.500		B-16.5	ASTM A 105	300, RF/125AARH	FBC0147Z0	
FLB	FLNG.BLIND	02.000	16.000		B-16.5	ASTM A 105	300, RF/125AARH	FBC0147Z0	
FEF	FLNG.FIG.8	00.500	01.500		ASME-B16.48	ASTM A 105	300, FF/125AARH	FGK0141Z0	
FEF	FLNG.FIG.8	02.000	08.000		ASME-B16.48	ASTM A 105	300, FF/125AARH	FGK0141Z0	
FEF	SPCR&BLND	10.000	16.000		ASME-B16.48	ASTM A 105	300, FF/125AARH	FCK0141Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	02.000	16.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB45	ELBOW.45	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1A Sheet 5 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB45	ELBOW.45	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	02.000	16.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
TEQ	T.EQUAL	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	02.000	16.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TRED	T.RED	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	02.000	16.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
REDC	REDUC.CONC	02.000	16.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDE	REDUC.ECC	02.000	16.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
SWGC	SWAGE.CONC	00.500	03.000	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	00.500	03.000	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	02.000	16.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
PLG	PLUG	00.750	00.750		B-16.11	ASTM A 105	SCRM, 6000	WH60293Z0	
CPLF	CPLNG.FULL	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLF	CPLNG.FULL	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WJ60282Z0	
CPLF/1	CPLNG.FULL	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WJ60283Z0	
CPLH	CPLNG.HALF	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLH	CPLNG.HALF	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WK60282Z0	
CPLH/1	CPLNG.HALF	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WK60283Z0	
CPLL	CPLNG.LH	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1A Sheet 6 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLL	CPLNG.LH	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WL60282Z0	
CPLL/1	CPLNG.LH	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WL60283Z0	
CPLR	CPLNG.RED	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
CPLR	CPLNG.RED	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WM60282Z0	
CPLR/1	CPLNG.RED	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WM60283Z0	
O'let Group									
SLT	SOCKOLET	00.500	00.750		MSS-SP97	ASTM A 105	SW, 6000	YSS02D3Z0	
SLT	SOCKOLET	01.000	01.500		MSS-SP97	ASTM A 105	SW, 3000	YSS02D2Z0	
WLT	WELDOLET	02.000	04.000	M, S160	MSS-SP97	ASTM A 105	BW	YWS024ZZ0	
TLT	THREADOLET	00.750	00.750		MSS-SP97	ASTM A 105	SCRF, 6000	YTS0283Z0	
Valves Group									
GAV	VLV.GATE	00.500	01.500		API-602	BODY-ASTM A 105,TRIM- STELLITED,STEM-13%CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GLV	VLV.GLOBE	00.500	01.500		BS-5352	BODY-ASTM A 105,TRIM- STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	02.000	12.000		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL FACING	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52491	52491ZZZ0	
CHV	VLV.CHECK	00.500	01.500		BS-5352	BODY-ASTM A 105,TRIM- STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	02.000	16.000		API-6D	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL FACING	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53491	53491ZZZ0	
BLV	VLV.BALL	00.500	01.500		BS-5351	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM- SEAT: RPTFE	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54491	54491ZZZ0	
BLV	VLV.BALL	02.000	16.000		API-6D	BODY-ASTM A 216 GR.WCB,TRIM- SEAT- AISI 4140 + 0.003"ENP/ AISI 410	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54497	54497ZZZ0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1A Sheet 7 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
BLV/1	VLV.BALL	02.000	08.000		API-6D	BODY-ASTM A 216 GR.WCB,TRIM-SEAT-(AISI 4140+0.003"ENP)/A ISI 410	BW, 300, B-16.25, SHT NO.- 54498	54498ZZZ0	
PLV	VLV.PLUG	00.500	01.500		BS-5353	BODY-ASTM A 105,PLUG - A105 + 0.003" ENP	SW, 800, 3000, B-16.11, SHT NO.- 55493	55493ZZZ0	
PLV	VLV.PLUG	02.000	08.000		API-6D	BODY-ASTM A 216 GR.WCB,PLUG: ASTM A 216 GR.WCB+0.003" ENP	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 55491	55491ZZZ0	
PLV/1	VLV.PLUG	02.000	08.000		API-6D	BODY-ASTM A 216 GR.WCB,PLUG: ASTM A 216 GR.WCB+0.003" ENP	BW, 300, B-16.25, SHT NO.- 55492	55492ZZZ0	
Bolt Group									
BOS	BOLT.STUD	00.500	16.000		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	00.500	16.000		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 300	GK65074Z0	
Trap/Strainer Group									
PSR	STRNR.PERM	00.500	01.500		EIL'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP103D510	
PSR	STRNR.PERM	02.000	16.000	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1K Sheet 1 of 4

PIPE CLASS : B1K
RATING : 300
BASE MATERIAL : SS 304
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93
PRESS	50.5	50.5	42.18

SERVICE

CORROSION INHIBITOR (CHEMICALS)

NOTES

- 102 ALL VENTS AND DRAINS SHALL BE PROVIDED WITH GATE VALVE UNLESS OTHERWISE INDICATED IN P&ID.
- 103 DESIGN FACTOR=0.72
- 111 PIPING DESIGN AS PER ASME B 31.4 & OISD 141.
- 115 FOR VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION , BRANCH CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE GIVEN ON NEXT PAGE. THE BRANCH DETAILS INDICATED IN APPLICABLE STANDARD SHALL BE IGNORED.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.
- 127 NDT OF WELDS SHALL BE AS FOLLOWS:
RADIOGRAPHY: ALL BUTT WELDS 100%
MPI: SOCKET WELDS 100%.
ALL OTHER REQUIREMENTS SHALL BE AS PER 6-44-0016.
- 128 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; FOR DIMENSIONS FOR HANDLE PROJECTION FOR SPACERS AND BLINDS REFER EIL'STD 7-44-0166.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1K Sheet 2 of 4

72.						72.
70.						70.
68.						68.
66.						66.
64.						64.
62.						62.
60.						60.
58.						58.
56.						56.
54.						54.
52.						52.
50.						50.
48.						48.
46.						46.
44.						44.
42.						42.
40.						40.
38.						38.
36.						36.
34.						34.
32.						32.
30.						30.
28.						28.
26.						26.
24.						24.
22.						22.
20.						20.
18.						18.
16.						16.
14.						14.
12.						12.
10.						10.
8.0						8.0
6.0						6.0
5.0						5.0
4.0						4.0
3.5						3.5
3.0						3.0
2.5						2.5
2.0					T	2.0
1.5				T	T	1.5
1.25						1.25
1.0		T		T	H	1.0
0.75		T	T		T	0.75
0.5	T	T	T		T	0.5
	.500	.750	1.000	1.250	1.500	2.000
					2.500	

RUN PIPE (SIZE IN INCHES)

CODE	DESCRIPTION		
F	SADDLE FUSED JT	T	TEES
H	H. COUPLING	W	WELDOLETS
P	PIPE TO PIPE	I	INSTRUMENT TEE
R	REINFORCED	X	Refer Notes
S	SOCKOLETS	L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1K Sheet 3 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	00.750	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	01.000	01.500	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	02.000	02.000	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
NIP	NIPPLE	00.500	00.750	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	01.000	01.500	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
Flange Group									
FLG	FLNG.SW	00.500	01.500	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FSC4147Z0	
FLG	FLNG.WN	02.000	02.000	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FWC4147Z0	
FLB	FLNG.BLIND	00.500	02.000		B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FBC4147Z0	
FEF	FLNG.FIG.8	00.500	02.000		ASME-B16.48	ASTM A 182 GR.F304	300, FF/125AARH	FGK4141Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB45	ELBOW.45	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	
ELB45	ELBOW.45	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
TEQ	T.EQUAL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TRED	T.RED	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	
TRED	T.RED	02.000	02.000	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
SWGC	SWAGE.CONC	00.500	02.000	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	00.500	02.000	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
PLG	PLUG	00.500	00.750		B-16.11	ASTM A 182 GR.F304	SCRM, 3000	WH64292Z0	
CPLF	CPLNG.FULL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : B1K Sheet 4 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLH	CPLNG.HALF	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WK642D2Z0	
CPLL	CPLNG.LH	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WL642D2Z0	
CPLR	CPLNG.RED	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WM642D2Z0	
O'let Group									
TLT	THREDOLET	00.750	00.750		MSS-SP97	ASTM A 182 GR.F304	SCRF, 3000	YTS4282Z0	
Valves Group									
GAV	VLV.GATE	00.500	01.500		API-602	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZZ0	
GLV	VLV.GLOBE	00.500	01.500		BS-5352	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS304	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZZ0	
CHV	VLV.CHECK	00.500	01.500		BS-5352	BODY-ASTM A 182 GR.F304,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZZ0	
BLV	VLV.BALL	00.500	01.500		BS-5351	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT: RPTFE	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54491	54491ZZZ0	
BLV	VLV.BALL	02.000	02.000		API-6D	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT:RPTFE	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54492	54492ZZZ0	
PLV	VLV.PLUG	00.500	01.500		BS-5353	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-PLUG SS304/SS316	SW, 800, 3000, B-16.11, SHT NO.- 55094	55094ZZZ0	
Bolt Group									
BOS	BOLT.STUD	00.500	02.000		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	48
Gasket Group									
GAS	GASKET	00.500	02.000		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 300	GK66274Z0	
Trap/Strainer Group									
PSR	STRNR.PERM	00.500	01.500		MNF'STD	B:A182GR.F304;IN T:SS304	SW, Y-TYPE, 800	SP307D510	
PSR	STRNR.PERM	02.000	02.000	M	EIL'STD	B:A403GR.WP304-S;INT:SS304	BW, T-TYPE	SP15344Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1A Sheet 1 of 7

PIPE CLASS : D1A
RATING : 600
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93
PRESS	104.05	104.05	94.91

SERVICE

MS/ ULMS/ HSD/ ULSHSD/ SKO

NOTES

- 102 ALL VENTS AND DRAINS SHALL BE PROVIDED WITH GATE VALVE UNLESS OTHERWISE INDICATED IN P&ID.
- 103 DESIGN FACTOR=0.72
- 104 WALL THICKNESS FOR LINEPIPE USED IN VARIOUS SECTIONS SHALL BE AS PER TABLE-1 OF ANNEXURE-I (GENERAL NOTES) OF THIS DOCUMENT.
- 105 BALL VALVE TO BE USED IN MAIN PIPELINE SHALL HAVE BUTT WELDED ENDS.
- 106 MAINLINE WELDING AND NDT REQUIREMENTS OF WELDS SHALL BE AS PER SPECIFICATION NO. 6-77-0007.
- 109 FOR PIPELINE SPECIALITY ITEMS AND THEIR MATERIAL DESCRIPTION REFER TABLE-3 OF ANNEXURE-I (GENERAL NOTES) OF THIS DOCUMENT.
- 111 PIPING DESIGN AS PER ASME B 31.4 & OISD 141.
- 115 FOR VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION , BRANCH CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE GIVEN ON NEXT PAGE. THE BRANCH DETAILS INDICATED IN APPLICABLE STANDARD SHALL BE IGNORED.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.
- 127 NDT OF WELDS SHALL BE AS FOLLOWS:
RADIOGRAPHY: ALL BUTT WELDS 100%
MPI: SOCKET WELDS 100%.
ALL OTHER REQUIREMENTS SHALL BE AS PER 6-44-0016.
- 128 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; FOR DIMENSIONS FOR HANDLE PROJECTION FOR SPACERS AND BLINDS REFER EIL'STD 7-44-0166.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1A Sheet 2 of 7

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>		
F	SADDLE FUSED JT	T	TEES
H	H. COUPLING	W	WELDOLETS
P	PIPE TO PIPE	I	INSTRUMENT TEE
R	REINFORCED	X	Refer Notes
S	SOCKOLETS	L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1A Sheet 3 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	00.750	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	01.000	01.500	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	02.000	02.000	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	03.000	03.000	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	04.000	06.000	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	08.000	08.000	11.1	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	10.000	10.000	12.7	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	12.000	12.000	14.3	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	14.000	14.000	15.9	API 5L	API 5L GR.B PSL1	BE, SEAMLESS	PIAE917Z0	
PIP	PIPE	16.000	16.000	10.3	API 5L	API 5L GR.X-52 PSL1	BE, SAW	PIAG416Z0	
PIP	PIPE	18.000	18.000	11.1	API 5L	API 5L GR.X-52 PSL1	BE, SAW	PIAG416Z0	
NIP	NIPPLE	00.500	00.750	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	01.000	01.500	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.SW	00.500	01.500	M	B-16.5	ASTM A 105	600, RF/125AARH	FSC0167Z0	
FLG	FLNG.WN	02.000	14.000	M	B-16.5	ASTM A 105	600, RF/125AARH	FWC0167Z0	
FLG	FLNG.WN	16.000	18.000	M	B-16.5	MSS SP-44 GR.F-52	600, RF/125AARH	FWC8167Z0	
FLB	FLNG.BLIND	00.500	01.500		B-16.5	ASTM A 105	600, RF/125AARH	FBC0167Z0	
FLB	FLNG.BLIND	02.000	18.000		B-16.5	ASTM A 105	600, RF/125AARH	FBC0167Z0	
FEF	FLNG.FIG.8	00.500	01.500		ASME-B16.48	ASTM A 105	600, FF/125AARH	FGK0161Z0	
FEF	FLNG.FIG.8	02.000	08.000		ASME-B16.48	ASTM A 105	600, FF/125AARH	FGK0161Z0	
FEF	SPCR&BLND	10.000	18.000		ASME-B16.48	ASTM A 105	600, FF/125AARH	FCK0161Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1A Sheet 4 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB90	ELBOW.90	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	02.000	14.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-52	BW, 1.5D	WAGG24Z10	
ELB90	ELBOW.90	18.000	18.000	M	MSS-SP75	MSS SP-75 GR.WPHY-52	BW, 1.5D	WAUG24Z10	
ELB45	ELBOW.45	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	02.000	14.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-52	BW, 1.5D	WBG24Z10	
ELB45	ELBOW.45	18.000	18.000	M	MSS-SP75	MSS SP-75 GR.WPHY-52	BW, 1.5D	WBUG24Z10	
TEQ	T.EQUAL	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	02.000	14.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-52	BW	WEGG24ZZ0	
TEQ	T.EQUAL	18.000	18.000	M	MSS-SP75	MSS SP-75 GR.WPHY-52	BW	WEUG24ZZ0	
TRED	T.RED	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	02.000	14.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16.000	16.000	M, M	B-16.9	MSS SP-75 GR.WPHY-52	BW	WRGG24ZZ0	
TRED	T.RED	18.000	18.000	M, M	MSS-SP75	MSS SP-75 GR.WPHY-52	BW	WRUG24ZZ0	
REDC	REDUC.CONC	02.000	14.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16.000	16.000	M, M	B-16.9	MSS SP-75 GR.WPHY-52	BW	WUGG24ZZ0	
REDC	REDUC.CONC	18.000	18.000	M, M	MSS-SP75	MSS SP-75 GR.WPHY-52	BW	WUUG24ZZ0	
REDE	REDUC.ECC	02.000	14.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16.000	16.000	M, M	B-16.9	MSS SP-75 GR.WPHY-52	BW	WVGG24ZZ0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1A Sheet 5 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
REDE	REDUC.ECC	18.000	18.000	M, M	MSS-SP75	MSS SP-75 GR.WPHY-52	BW	WVUG24ZZ0	
SWGC	SWAGE.CONC	00.500	03.000	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	00.500	03.000	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WF60283Z0	
CAP	CAP	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	
CAP	CAP	02.000	14.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	16.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-52	BW	WFGG24ZZ0	
CAP	CAP	18.000	18.000	M	MSS-SP75	MSS SP-75 GR.WPHY-52	BW	WFUG24ZZ0	
PLG	PLUG	00.500	00.750		B-16.11	ASTM A 105	SCRM, 6000	WH60293Z0	
PLG	PLUG	01.000	01.500		B-16.11	ASTM A 105	SCRM, 3000	WH60292Z0	
CPLF	CPLNG.FULL	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLF	CPLNG.FULL	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WJ60282Z0	
CPLF/2	CPLNG.FULL	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WJ60282Z0	
CPLF/1	CPLNG.FULL	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WJ60283Z0	
CPLH	CPLNG.HALF	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLH	CPLNG.HALF	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WK60282Z0	
CPLH/2	CPLNG.HALF	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WK60282Z0	
CPLH/1	CPLNG.HALF	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WK60283Z0	
CPLL	CPLNG.LH	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLL	CPLNG.LH	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WL60282Z0	
CPLL/2	CPLNG.LH	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WL60282Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1A Sheet 6 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLL/1	CPLNG.LH	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WL60283Z0	
CPLR	CPLNG.RED	00.500	00.750		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	01.000	01.500		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
CPLR	CPLNG.RED	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WM60282Z0	
CPLR/2	CPLNG.RED	01.000	01.500		B-16.11	ASTM A 105	SCRF, 3000	WM60282Z0	
CPLR/1	CPLNG.RED	00.500	00.750		B-16.11	ASTM A 105	SCRF, 6000	WM60283Z0	
O'let Group									
SLT	SOCKOLET	00.500	00.750		MSS-SP97	ASTM A 105	SW, 6000	YSS02D3Z0	
SLT	SOCKOLET	01.000	01.500		MSS-SP97	ASTM A 105	SW, 3000	YSS02D2Z0	
WLT	WELDOLET	02.000	06.000	M, XXS	MSS-SP97	ASTM A 105	BW	YWS024ZZ0	
TLT	THREADOLET	00.500	00.750		MSS-SP97	ASTM A 105	SCRF, 6000	YTS0283Z0	
Valves Group									
GAV	VLV.GATE	00.500	01.500		API-602	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GLV	VLV.GLOBE	00.500	01.500		BS-5352	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	02.000	12.000		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-STELLITED,STEM-13%CR,STEEL	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 52501	52501ZZZ0	
CHV	VLV.CHECK	00.500	01.500		BS-5352	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	02.000	18.000		API-6D	BODY-ASTM A 216 GR.WCB,TRIM-STELLITED	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 53591	53591ZZZ0	
BLV	VLV.BALL	00.500	01.500		BS-5351	BODY-ASTM A 105,TRIM-BODY SEAT -RPTFE	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 54591	54591ZZZ0	
BLV	VLV.BALL	02.000	18.000		API-6D	BODY-ASTM A 216 GR.WCB/A234 GR.WPB,TRIM/SEA T:(AISI4140+0.003" ENP)/AISI410	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 54597	54597ZZZ0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1A Sheet 7 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
BLV/1	VLV.BALL	02.000	18.000		API-6D	BODY-ASTM A 216 GR.WCB/A234 GR.WPB,TRIM: SEAT : (AISI 4140+0.003"ENP)/A ISI 410	BW, 600, B-16.25, SHT NO.- 54598	54598ZZZ0	
PLV	VLV.PLUG	00.500	01.500		BS-5353	BODY-ASTM A 105,PLUG - A105 + 0.003" ENP	SW, 800, 3000, B-16.11, SHT NO.- 55092	55092ZZZ0	
PLV	VLV.PLUG	02.000	18.000		API-6D	BODY-ASTM A 216 GR.WCB,PLUG : ASTM A216 Gr. WCB + 0.003" ENP	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 55591	55591ZZZ0	
PLV/1	VLV.PLUG	02.000	18.000		API-6D	BODY-ASTM A 216 GR.WCB,PLUG: ASTM A 216 GR.WCB+0.003" ENP	BW, 600, B-16.25, SHT NO.- 55592	55592ZZZ0	
Bolt Group									
BOS	BOLT.STUD	00.500	18.000		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	00.500	18.000		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 600	GK65076Z0	
Trap/Strainer Group									
PSR	STRNR.PERM	00.500	01.500		EIL'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP103D510	
PSR	STRNR.PERM	02.000	16.000	M	MNF'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP33344Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1K Sheet 1 of 5

PIPE CLASS : D1K
RATING : 600
BASE MATERIAL : SS 304
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93
PRESS	101.24	101.24	84.36

SERVICE

CORROSION INHIBITOR (CHEMICALS)

NOTES

- 102 ALL VENTS AND DRAINS SHALL BE PROVIDED WITH GATE VALVE UNLESS OTHERWISE INDICATED IN P&ID.
- 103 DESIGN FACTOR=0.72
- 111 PIPING DESIGN AS PER ASME B 31.4 & OISD 141.
- 115 FOR VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION , BRANCH CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE GIVEN ON NEXT PAGE. THE BRANCH DETAILS INDICATED IN APPLICABLE STANDARD SHALL BE IGNORED.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.
- 127 NDT OF WELDS SHALL BE AS FOLLOWS:
 RADIOGRAPHY: ALL BUTT WELDS 100%
 MPI: SOCKET WELDS 100%.
 ALL OTHER REQUIREMENTS SHALL BE AS PER 6-44-0016.
- 128 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; FOR DIMENSIONS FOR HANDLE PROJECTION FOR SPACERS AND BLINDS REFER EIL'STD 7-44-0166.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1K Sheet 2 of 5

[illegible]**RUN PIPE (SIZE IN INCHES)**

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
T	TEES
H	H. COUPLING
W	WELDOLETS
P	PIPE TO PIPE
I	INSTRUMENT TEE
R	REINFORCED
X	Refer Notes
S	SOCKOLETS
L	SWEEPOLET

Package : IPMCS

Report No. : 50

D1K

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1K Sheet 3 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	00.750	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	01.000	01.500	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	02.000	02.000	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
NIP	NIPPLE	00.500	00.750	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	01.000	01.500	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
Flange Group									
FLG	FLNG.SW	00.500	01.500	M	B-16.5	ASTM A 182 GR.F304	600, RF/125AARH	FSC4167Z0	
FLG	FLNG.WN	02.000	02.000	M	B-16.5	ASTM A 182 GR.F304	600, RF/125AARH	FWC4167Z0	
FLB	FLNG.BLIND	00.500	02.000		B-16.5	ASTM A 182 GR.F304	600, RF/125AARH	FBC4167Z0	
FEF	FLNG.FIG.8	00.500	02.000		ASME-B16.48	ASTM A 182 GR.F304	600, FF/125AARH	FGK4161Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB45	ELBOW.45	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	
ELB45	ELBOW.45	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
TEQ	T.EQUAL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TRED	T.RED	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	
TRED	T.RED	02.000	02.000	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
SWGC	SWAGE.CONC	00.500	02.000	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	00.500	02.000	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WF64282Z0	
CAP	CAP	02.000	02.000	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
PLG	PLUG	00.750	00.750		B-16.11	ASTM A 182 GR.F304	SCRM, 3000	WH64292Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1K Sheet 4 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLF	CPLNG.FULL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	
CPLF	CPLNG.FULL	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WJ64282Z0	
CPLH	CPLNG.HALF	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WK642D2Z0	
CPLH	CPLNG.HALF	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WK64282Z0	
CPLL	CPLNG.LH	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WL642D2Z0	
CPLL	CPLNG.LH	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WL64282Z0	
CPLR	CPLNG.RED	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WM64282Z0	
CPLR	CPLNG.RED	00.500	01.500		B-16.11	ASTM A 182 GR.F304	SW, 3000	WM642D2Z0	
O'let Group									
TLT	THREAOLET	00.750	00.750		MSS-SP97	ASTM A 182 GR.F304	SCRF, 3000	YTS4282Z0	
Valves Group									
GAV	VLV.GATE	00.500	01.500		API-602	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZZ0	
GLV	VLV.GLOBE	00.500	01.500		BS-5352	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS304	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZZ0	
CHV	VLV.CHECK	00.500	01.500		BS-5352	BODY-ASTM A 182 GR.F304,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZZ0	
BLV	VLV.BALL	00.500	01.500		BS-5351	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT-RPTFE	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 54592	54592ZZZ0	
BLV	VLV.BALL	02.000	02.000		API-6D	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT-RPTFE	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 54593	54593ZZZ0	
PLV	VLV.PLUG	00.500	01.500		BS-5353	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-PLUG SS304/SS316	SW, 800, 3000, B-16.11, SHT NO.- 55095	55095ZZZ0	
Bolt Group									
BOS	BOLT.STUD	00.500	02.000		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	48

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : D1K Sheet 5 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Gasket Group									
GAS	GASKET	00.500	02.000		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 600	GK66276Z0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : E1A Sheet 1 of 5

PIPE CLASS : E1A
RATING : 900
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : NON IBR

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93
PRESS	156.08	156.08	142.37

SERVICE

MS/ ULMS/ HSD/ ULSHSD/ SKO

NOTES

- 1 NDT REQUIREMENTS AS PER EIL STANDARD 6-44-0016.
- 102 ALL VENTS AND DRAINS SHALL BE PROVIDED WITH GATE VALVE UNLESS OTHERWISE INDICATED IN P&ID.
- 103 DESIGN FACTOR=0.72
- 111 PIPING DESIGN AS PER ASME B 31.4 & OISD 141.
- 115 FOR VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION , BRANCH CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE GIVEN ON NEXT PAGE. THE BRANCH DETAILS INDICATED IN APPLICABLE STANDARD SHALL BE IGNORED.
- 123 FOR APPLICABLE VALVE DATA SHEET NO. REFER TABLE-3 OF ANNEXURE-I.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	ALL	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	AS PER P&ID OR 0.75".TEE, NIPPLE,SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASSEMBLY	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75".WELDOLET,NIPPLE,SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASMBLY	
VENTS	ON LINES <= 1.5"	AS PER P&ID OR 0.75".TEE, NIPPLE,SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASSEMBLY	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75".WELDOLET,NIPPLE,SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASMBLY	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	TEE/WELDOLET & NIPPLE WITH GATE VALVES AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : E1A Sheet 2 of 5

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
T	TEES
H	H. COUPLING
W	WELDOLETS
P	PIPE TO PIPE
I	INSTRUMENT TEE
R	REINFORCED
X	Refer Notes
S	SOCKOLETS
L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : E1A Sheet 3 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	00.500	00.750	S160	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	01.000	01.500	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	02.000	03.000	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	04.000	04.000	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	06.000	06.000	S120	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	08.000	08.000	11.1	API 5L	API 5L GR.X-42 PSL1	BE, SEAMLESS	PIAF917Z0	
PIP	PIPE	10.000	10.000	12.7	API 5L	API 5L GR.X-42 PSL1	BE, SEAMLESS	PIAF917Z0	
PIP	PIPE	12.000	12.000	14.3	API 5L	API 5L GR.X-42 PSL1	BE, SEAMLESS	PIAF917Z0	
PIP	PIPE	14.000	14.000	15.9	API 5L	API 5L GR.X-42 PSL1	BE, SEAMLESS	PIAF917Z0	
PIP	PIPE	16.000	16.000	17.5	API 5L	API 5L GR.X-42 PSL1	BE, SAW	PIAF916Z0	
NIP	NIPPLE	00.500	01.500	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.WN	00.500	02.500	M	B-16.5	ASTM A 105	1500, RTJ/63AARH	FWC0189Z0	
FLG	FLNG.WN	03.000	06.000	M	B-16.5	ASTM A 105	900, RTJ/63AARH	FWC0179Z0	
FLG	FLNG.WN	08.000	16.000	M	B-16.5	MSS SP-44 GR.F-42	900, RTJ/63AARH	FWC7979Z0	
FLB	FLNG.BLIND	00.500	02.500		B-16.5	ASTM A 105	1500, RTJ/63AARH	FBC0189Z0	
FLB	FLNG.BLIND	03.000	16.000		B-16.5	ASTM A 105	900, RTJ/63AARH	FBC0179Z0	
FEF	FLNG.FIG.8	00.500	04.000		ASME-B16.48	ASTM A 105	900, RTJ/63AARH	FGK0179Z0	
FEF	SPCR&BLND	06.000	16.000		ASME-B16.48	ASTM A 105	900, RTJ/63AARH	FCK0179Z0	
Fitting Group									
ELB90	ELBOW.90	00.500	06.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	08.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-42	BW, 1.5D	WAGF94Z10	
ELB45	ELBOW.45	00.500	06.000	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	08.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-42	BW, 1.5D	WBGF94Z10	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : E1A Sheet 4 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
TEQ	T.EQUAL	00.500	06.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	08.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-42	BW	WEGF94ZZ0	
TRED	T.RED	00.500	06.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	08.000	16.000	M, M	B-16.9	MSS SP-75 GR.WPHY-42	BW	WRGF94ZZ0	
REDC	REDUC.CONC	00.500	06.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	08.000	16.000	M, M	B-16.9	MSS SP-75 GR.WPHY-42	BW	WUGF94ZZ0	
REDE	REDUC.ECC	00.500	06.000	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	08.000	16.000	M, M	B-16.9	MSS SP-75 GR.WPHY-42	BW	WVGF94ZZ0	
CAP	CAP	00.500	06.000	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	08.000	16.000	M	B-16.9	MSS SP-75 GR.WPHY-42	BW	WFGF94ZZ0	
O'let Group									
WLT	WELDOLET	00.500	06.000	M, S160	MSS-SP97	ASTM A 105	BW	YWS024ZZ0	
Valves Group									
GAV	VLV.GATE	00.500	01.500		API-602	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	BW, 1500, B-16.25, SHT NO.- 51101	51101ZZZ0	
GLV	VLV.GLOBE	00.500	01.500		BS-5352	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL	BW, 1500, B-16.25, SHT NO.- 52101	52101ZZZ0	
GLV	VLV.GLOBE	02.000	16.000		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-STELLITED,STEM-13% CR,STEEL	FLGD, 900, B-16.5, RTJ/63AARH, SHT NO.- 52691	52691ZZZ0	
CHV	VLV.CHECK	02.000	16.000		API-6D	BODY-ASTM A 105 / A 216GR.WCB,TRIM-STELLITED	FLGD, 900, B-16.5, RTJ/63AARH, SHT NO.- 53691	53691ZZZ0	
BLV	VLV.BALL	00.500	01.500		API-6D	BODY-ASTM A 105,TRIM-BODY SEAT-RPTFE	FLGD, 1500, B-16.5, RTJ/63AARH, SHT NO.- 54691	54691ZZZ0	
BLV	VLV.BALL	02.000	16.000		API-6D	BODY-ASTM A 216 GR.WCB/ASTM A234 GR. WPB,TRIM :(ASTM A 216 GR. WCB+0.003" ENP)/AISI 410	FLGD, 900, B-16.5, RTJ/63AARH, SHT NO.- 54692	54692ZZZ0	

Client : HPCL	Dept./Sect. : 16/71
Project : MUNDRA-DELHI P/L PRJ	
Location : MUNDRA - DELHI	Pipe Class : E1A Sheet 5 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
PLV	VLV.PLUG	00.500	01.500		BS-5353	BODY-ASTM A 105,PLUG - A105 + 0.003" ENP	BW, 1500, B-16.25, SHT NO.- 55191	55191ZZZ0	
PLV	VLV.PLUG	02.000	16.000		API-6D	BODY-ASTM A 216 GR.WCB/ASTM A234 GR. WPB,PLUG: ASTM A 216 GR. WCB + 0.003"ENP	FLGD, 1500, B-16.5, RTJ/63AARH, SHT NO.- 55693	55693ZZZ0	
Bolt Group									
BOS	BOLT.STUD	00.500	16.000		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	00.500	02.500		B-16.20-ANSI B16.5	SOFT IRON	OCT-RING, 1500	GK67238Z0	
GAS	GASKET	03.000	16.000		B-16.20-ANSI B16.5	SOFT IRON	OCT-RING, 900	GK67237Z0	