

01.		B378-125/126/127-17-44-SS-1001	Scope of Works / Supply	3.0 Scope of Supply	-	<p><b>Modification:</b></p> <p>“3 nos. of dumpsters with Covers and suitable material of construction shall be provided by the Contractor for dry solids disposal from the ZLD plant”.</p> <p>Stands modified with</p> <p>“Bidder shall provide hopper arrangement for collection and bagging of dried solids downstream of the dryer unit. All necessary facilities including cooling provision to enable bagging of the dry solids shall be in the Bidder’s scope”.</p>
02.		B378-125/126-17-44-SS-1003	Scope of works/supply & specifications for operation contract	-	-	<p><b>Addition:</b></p> <p>Bagging of dried salts during 6 months operation period shall be in the Bidder’s scope.</p>

# PIPING MATERIAL SPECIFICATION

## (B378-6-44-0005)

**Client** : GAIL CORPORATE OFF  
**Project** : PDH-PP USAR  
**Location** : USAR  
**Job No.** : B378

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E	31/12/2021	ISSUED FOR BIDS	PK	SD	PKA
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Rev. No	Date	Purpose	Prepared by	Checked by	Approved by
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**Abbreviations:**

**PMS : Piping Material Specifications**

**M : Matching (Schedule/ Thickness)**

**IBR : Indian Boiler Regulations**

**NACE : National Association of Corrosion Engineers**

**HDPE : High Density Poly Ethylene**

**NDT : Non Destructive Testing**

**PE : Plain End**

**BE : Bevel End**

**PBE : Plain Both Ends**

**ASTM : American Society for Testing & Materials**

**API : American Petroleum Institute**

**ASME : American Society of Mechanical Engineers**

**SW : Socket Weld**

**BW : Butt Weld**

**BHN : Brinell Hardness Number**

**MP Test: Magnetic Particle Test**

CONTENTS

Sl. No.	Description	Pages
1	Piping Material Specification (B378-000-6-44-0005-1001)	
2	Piping Material Specification General Notes (B378-6-44-0005-A1)	15
3	Piping Material Specification Extracts (B378-000-6-44-0005-1001-A2)	10
4	Annexure-III, Piping Material Specification-A91S (B378-000-6-44-0005-1001-A3)	5

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	

### PIPING MATERIAL SPECIFICATION INDEX

Sl. No	Piping Class	Rating	C.A	Spl. Req.	Basic Material	Service	Remarks
1	A19A	150	3		CARBON STEEL	NONNACE MILD CORROSIVE SOUR & AMINE - STRESS RELIEVED; NON NACE SOUR FLARE.  CAUSTIC (STRESS RELIEVED ZONE)	
2	A1A	150	1.5		CARBON STEEL	NON CORROSIVE/ FLAMMABLE / NON FLAMMABLE/ NON LETHAL -PROCESS & HYDROCARBONS; HYDROCARBON FLARE ; LUBE OIL BEFORE FILTER; AMMONIA, STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A IN OFFSITES), PLANT AIR, NITROGEN, CARBONDIOXIDE; WATER - BEYOND A3A, VENT TO ATMOSPHERE, DRY OUT AIR IN PDH UNIT, NATURAL GAS, DRYER REGENERATION FEED, PURGE GAS, REGENERATION AIR, WASH OIL, CLOSED HC DRAIN	
3	A1K	150	0		SS 304	PURE NON CORROSIVE OR MILD CORROSIVE HYDROCARBONS FLAMMABLE/NON FLAMMABLE & NON LETHAL HYDROCARBONS, LUBE OIL (AFTER FILTERS), CHEMICALS ETC., INSTRUMENT AIR(BEYOND CAT-'D' WITHIN UNITS & OFFSITE PACKAGES), SEAL OIL	
4	A2A	150	1.5	IBR SERVICE	CARBON STEEL	STEAM (IBR), BOILER FEED WATER (IBR) & CONDENSATE (IBR)	
5	A33A	150	1.5		CARBON STEEL	FIRE WATER (ABOVE GROUND)	
6	A39A	150	1.5		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". BLOW DOWN, CHEMICAL DRAIN, SERVICE WATER, COOLING WATER SUPPLY/ RETURN, NON-CONTAMINATED SEWER, WASTE WATER, OILY CONTAMINATED RAINY WATER DRAIN, TEMPERED WATER	

**Package : IPMCS**
**Report No. : 50**

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	

### PIPING MATERIAL SPECIFICATION INDEX

Sl. No	Piping Class	Rating	C.A	Spl. Req.	Basic Material	Service	Remarks
7	A3A	150	1.5		CARBON STEEL	NON CORROSIVE UTILITIES (ABOVE GROUND) CATEGORY "D" FLUID - COOLING WATER, INSTRUMENT AIR(2) & ABOVE-IN OFFISTES), 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 & 7.0 KG/CM2G RESPECTIVELY.	
8	A3K	150	0		SS 304	DEMINERALISED WATER (OUTSIDE DM PLANT BATTERY LIMITS), POLISHED WATER, POLISHED CONDENSATE, INSTRUMENT AIR(WITHIN UNITS & OFFSITE PACKAGES) - CATEGORY 'D'	
9	A71V	150	0		DUPLEX SS	PROCESS WATER -VACUUM	VACUUM
10	A91A	150	1.5		CARBON STEEL	FIRE WATER (UNDER GROUND ONLY)	U/G
11	A92A	150	1.5		CARBON STEEL	CLOSED BLOWDOWN (UG), HYDRCARBON (UG), WATER (UG)	U/G
12	A93A	150	1.5		CARBON STEEL	COOLING WATER (UNDER GROUND)	U/G
13	A94A	150	1.5		CARBON STEEL	OWS/WWS (UNDER GROUND)	U/G
14	A95A	150	1.5		CARBON STEEL	CRWS ( UNDERGROUND -BY GRAVITY)	U/G
15	A96A	150	1.5		CARBON STEEL	OWS/WWS (UNDER GROUND-BY GRAVITY)	U/G
16	A97A	150	1.5		CARBON STEEL	CRWS (UNDER GROUND)	U/G

**Package : IPMCS**
**Report No. : 50**

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	

### PIPING MATERIAL SPECIFICATION INDEX

Sl. No	Piping Class	Rating	C.A	Spl. Req.	Basic Material	Service	Remarks
17	A9A	150	3		CARBON STEEL	MILD TO MODERATE CORROSIVE PROCESS SERVICES - FLAMMABLE / NON FLAMMABLE & NON LETHAL - HVGO,VGO,RCO,SLOP,VR,VGO,CAUSTIC (NO STRESS RELIEF ZONE)	
18	B1K	300	0		SS 304	PURE PROCESS LIQUID, VAPOUR AND GAS OR MILD CORROSIVE HYDROCARBON - FLAMMABLE/ NON FLAMMABLE & NON LETHAL HYDROCARBONS, CHEMICAL ETC.	
19	B1N	300	0		SS 316L	MILD TO MODERATE CORROSIVE PROCESS SERVICES - FLAMMABLE/NON FLAMMABLE & NON LETHAL.	
20	B2A	300	1.5	IBR SERVICE	CARBON STEEL	STEAM, BOILER FEED WATER & CONDENSATE - ALL IBR	
21	B71V	300	0		DUPLEX SS	PROCESS WATER -VACUUM	VACUUM
22	J2A	150	0		CS (Galv.)	POTABLE WATER (ABOVE GROUND & UG-REFER NOTES), FIRE WATER-SPRINKLER SYSTEM AFTER ORIFICE, BURIED INSTRUMENT AIR LINE TO DELUGE VALVE	
23	J88A	150	0		CS (Galv.)	HIGH PRESSURE WATER SPRAY SYSTEM (A/G & UG)	

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

**2. For PMS Extracts refer Annexure-II of this document**

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A19A</b> Sheet 1 of 6

**PIPE CLASS** : **A19A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 3 MM  
**SPECIAL REQUIREMENT** :

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

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

**SERVICE**

NONNACE MILD CORROSIVE SOUR & AMINE - STRESS RELIEVED; NON NACE SOUR FLARE.

CAUSTIC (STRESS RELIEVED ZONE)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
- 42 ALL WELDS SHALL BE STRESS RELIEVED.
- 75 BALL VALVES SHALL NOT BE USED IN CAUSTIC SERVICE.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	





<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A19A</b> Sheet 3 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	26	STD	B-36.10	ASTM A 672 GR.B60 CL.22	BE, E.FS.W	PI2A913Z0	
PIP	PIPE	30	30	STD	B-36.10	ASTM A 672 GR.B60 CL.22	BE, E.FS.W	PI2A913Z0	32
PIP	PIPE	32	36	XS	B-36.10	ASTM A 672 GR.B60 CL.22	BE, E.FS.W	PI2A913Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG	FLNG.WN	26	36	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	36		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	36		ASME B16.47B/EIL' STD	ASTM A 516 GR.70(NORMALISED)	150, FF/125AARH	FCU8921Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A19A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	2	36	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A19A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 51013	51013ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51313	51313ZZZ0	
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 52013	52013ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52313	52313ZZZ0	
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53013	53013ZZZ0	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53313	53313ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54313	54313ZZZ0	75
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 105/ASTM A 216 GR.WCB,TRIM-PLUG-HARDENED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55313	55313ZZZ0	
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-SS 304	WAF, 150, B-16.5, WAF/125AARH, SHT NO.- 56313	56313ZZZ0	
BFV	VLV.BTRFLY	26	36		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-SS 304	FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 56314	56314ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	36		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK6627Z0	
GAS	GASKET	26	36		B-16.20-	SP.WND	SPIRAL, 150	GK5627Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A19A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Gasket Group</b>									
					ANSI B16.47B	SS316+GRAFIL+ I RING			
<b>Trap/Strainer Group</b>									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70(NOR M);INT:SS304	CONETYPE, 150,FF/125AARH	ST17531Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	14	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	16	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1A</b> Sheet 1 of 8

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

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

<b>TEMP</b>	-29	38	93	149	204	260	316	343	371
<b>PRESS</b>	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; HYDROCARBON FLARE : LUBE OIL BEFORE FILTER; AMMONIA, STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A IN OFFSITES), PLANT AIR, NITROGEN, CARBONDIOXIDE; WATER - BEYOND A3A, VENT TO ATMOSPHERE, DRY OUT AIR IN PDH UNIT, NATURAL GAS, DRYER REGENERATION FEED, PURGE GAS, REGENERATION AIR, WASH OIL, CLOSED HC DRAIN

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 36 THIS IS A PRESSURE BALANCED PLUG VALVES WHICH SHALL BE USED ONLY IF SPECIFIED IN P&ID.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 507 PIPE THICKNESS CALCULATED BASED ON DESIGN TEMP: 130 DEG C & DESIGN PRESSURE:2.81 KG/CM2G , SUBJECT TO MIN. 80% CLASS RATING.
- 611 NDT REQUIREMENT MAY ALSO BE REFERRED FROM EIL STD. 6-44-0016 IF DOC No. B378-6-44-0016 IS NOT PROVIDED WITH THE PACKAGE.
- 627 OD/T >100. SIF FACTOR SHALL BE CHECKED AND TAKEN CARE DURING STRESS ANALYSIS.
- 628 MITRE SHALL BE SHOP FARICATED AND SHALL BE ORDERED AS A SPECIAL ITEM (NOT TO BE ORDERED AS PIPE QTY). THICKNESS SHALL BE CONFIRMED AFTER ETD VERIFICATION.
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1A</b> Sheet 2 of 8

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	





<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1A</b> Sheet 4 of 8

					84.00
					80.00
					76.00
			T		72.00
					70.00
					68.00
			R		66.00
					64.00
					62.00
					60.00
					58.00
					56.00
			R		54.00
					52.00
					50.00
			R		48.00
			R		46.00
			R		44.00
			R		42.00
			R		40.00
					38.00
			R		36.00
			R		34.00
			R		32.00
			R		30.00
			R		28.00
			R		26.00
			R		24.00
			R		22.00
			R		20.00
			R		18.00
			R		16.00
			R		14.00
			R		12.00
			R		10.00
			R		8.00
			R		6.00
					5.00
			R		4.00
					3.50
			R		3.00
					2.50
			R		2.00
			H		1.50
					1.25
			H		1.00
			H		0.75
			H		0.50
800					
700					
700					

BRANCH PIPE (SIZE IN INCHES)

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1A</b> Sheet 5 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	36	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	40	48	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	54	54	14.0	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	627,508
PIP	PIPE	66	66	16.0	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	627,508
PIP	PIPE	72	72	14.0	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	627,508
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG/300	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	300, RF/125AARH	FSC0147Z0	
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG	FLNG.WN	26	48	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z0	
FLG/300	FLNG.WN	2	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	48		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	48		ASME B16.47B/EIL' STD	ASTM A 516 GR.70	150, FF/125AARH	FCU6321Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1A</b> Sheet 6 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
MIT90	MITRE.90	54	72	CALC	EIL/STD	ASTM A 672 GRB60 CL12	BW, 1.5D	WDKG641Z0	628
MIT45	MITRE.45	54	72	CALC	EIL/STD	ASTM A 672 GRB60 CL12	BW, 1.5D	WGKG641Z0	628
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	.5	.75		B-16.11	ASTM A 105	SCRF, 6000	WF60283Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1A</b> Sheet 7 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CAP	CAP	2	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301	51301ZZZ0	92
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52301	52301ZZZ0	
CHV	VLV.CHECK	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301	53301ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54301	54301ZZZ0	
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 105 / A	FLGD, 150, B-16.5, RF/125AARH, SHT	55301ZZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1A</b> Sheet 8 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
						216GR.WCB,TRIM-PLUG-HARDENED	NO.- 55301		
PLV/I	VLV.PLUG	.5	36		BS-5353	BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55315	55315ZZZ0	36
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	WAFI, 150, B-16.5, WAF/125AARH, SHT NO.- 56301	56301ZZZ0	
BFV	VLV.BTRFLY	26	48		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 56315	56315ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK66272Z0	
GAS	GASKET	26	48		B-16.20-ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK56272Z0	
GAS/300	GASKET	2	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 300	GK66274Z0	
<b>Trap/Strainer Group</b>									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S:SS304	FLGD, THRMDNMC, 150,RF/125AARH	TR3065530	
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	14	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	16	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1K</b> Sheet 1 of 5

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

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

<b>TEMP</b>	-29	38	93	149	204	260	316	343	371
<b>PRESS</b>	19.33	19.33	16.17	14.41	13.35	11.95	9.84	8.78	7.73

**SERVICE**

PURE NON CORROSIVE OR MILD CORROSIVE HYDROCARBONS  
 FLAMMABLE/NON FLAMMABLE & NON LETHAL HYDROCARBONS, LUBE OIL (AFTER FILTERS), CHEMICALS ETC.,  
 INSTRUMENT AIR(BEYOND CAT-'D' WITHIN UNITS & OFFSITE PACKAGES), SEAL OIL

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	1	1.5	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	2	2	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	3	8	10S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	10	24	10S	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
<b>Flange Group</b>									
FLG/300	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FSC4147Z0	
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FWC4127Z0	
FLG/300	FLNG.WN	2	24	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FWC4147Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FBC4127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FGK4121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FCK4121Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB90	ELBOW.90	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WAG894Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
ELB45	ELBOW.45	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WBG894Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TEQ	T.EQUAL	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WEG894ZZ0	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
TRED	T.RED	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WRG894ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WUG874ZZ0	
REDC	REDUC.CONC	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WUG894ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WVG874ZZ0	
REDE	REDUC.ECC	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WVG894ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	2	24	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WK642D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WL642D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WM642D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 351 GR CF8,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51345	51345ZZ0	
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 351 GR.CF8,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52345	52345ZZ0	
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A1K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 351 GR.CF8,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53345	53345ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54345	54345ZZZ0	
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 182 GR.F304 / ASTM A 351 GR.CF8,TRIM-PLUG-SS304/SS316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55345	55345ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	24		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK66272Z0	
<b>Trap/Strainer Group</b>									
TSR	STRNR.TEMP	1.5	24		EIL/STD	B:A240TP304;INT:S S304	CONETYPE, 150,FF/125AARH	ST14131Z0	
PSR	STRNR.PERM	.5	1.5		MNF/STD	B:A182GR.F304;IN T:SS304	SW, Y-TYPE, 800	SP307D510	
PSR	STRNR.PERM	2	8	M	EIL/STD	B:A403GR.WP304-S;INT:SS304	BW, T-TYPE	SP15344Z0	
PSR	STRNR.PERM	10	24	M	EIL/STD	B:A403GR.WP304-WX;INT:SS304	BW, T-TYPE	SP15444Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A2A</b> Sheet 1 of 6

**PIPE CLASS** : **A2A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** : IBR SERVICE

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

<b>TEMP</b>	0	38	93	149	204	260	280	300	371
<b>PRESS</b>	20.03	20.03	18.28	16.17	14.06	11.95	11.19	10.44	7.73

**SERVICE**

STEAM (IBR), BOILER FEED WATER (IBR) & CONDENSATE (IBR)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 8 ALL PIPES,FITTINGS,VALVES,FLANGES,TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 9 CARBON CONTENT SHALL NOT EXCEED 0.25% FOR ALL PIPES,FITTINGS FLANGES ETC. THAT MAY REQUIRE WELDING. MOREOVER,FOR FLANGES THE SULPHUR AND PHOSPHOROUS SHALL ALSO BE LIMITED TO 0.05% EACH.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A2A</b> Sheet 3 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	16	36	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
<b>Flange Group</b>									
FLG	FLNG.WN	.5	1.5	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z1	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z1	
FLG	FLNG.WN	26	36	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z1	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z1	
FLB	FLNG.BLIND	26	36		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z1	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z1	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z1	
FEF	SPCR&BLND	26	36		ASME B16.47B/EIL' STD	ASTM A 516 GR.70	150, FF/125AARH	FCU6321Z1	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z1	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z1	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z11	
ELB90	ELBOW.90	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z11	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z1	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z1	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z11	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A2A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB45	ELBOW.45	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z11	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z1	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z1	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ1	
TEQ	T.EQUAL	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ1	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z1	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z1	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ1	
TRED	T.RED	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ1	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ1	
REDC	REDUC.CONC	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ1	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ1	
REDE	REDUC.ECC	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ1	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ1	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ1	
CAP	CAP	2	36	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ1	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z1	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z1	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z1	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z1	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z1	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z1	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z1	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A2A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z1	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51002	51002ZZZ1	
GAV	VLV.GATE	2	36		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51302	51302ZZZ1	92
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52002	52002ZZZ1	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52302	52302ZZZ1	
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53002	53002ZZZ1	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53302	53302ZZZ1	
BLV	VLV.BALL	.5	1.5		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-PEEK	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54302	54302ZZZ1	
G3V	VLV.PISTON	.5	1		MNFSTD	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	SW, 300, 3000, B-16.11, SHT NO.- 64402	64402ZZZ1	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	36		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK66272Z0	
GAS	GASKET	26	36		B-16.20-ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK56272Z0	
<b>Trap/Strainer Group</b>									
TRP	TRAP.STEAM	.5	1.5		MNFSTD	B:A105:T:13%CR;S:SS304	FLGD, THRMDNMC, 150,RF/125AARH	TR3065531	
TSR	STRNR.TEMP	1.5	24		EIL/STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z1	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A2A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Trap/Strainer Group</b>									
PSR	STRNR.PERM	.5	1.5		MNFSTD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D511	
PSR	STRNR.PERM	2	24		MNFSTD	B:A216GR.WCB;IN T:SS304	FLGD, Y-TYPE, 150,RF/125AARH	SP3805531	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A33A</b> Sheet 1 of 6

**PIPE CLASS** : **A33A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65
<b>PRESS</b>	18.9	18.9	18.9	18.9

**SERVICE**

FIRE WATER (ABOVE GROUND)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 88 10% OF THE BUTT WELD JOINTS SHALL BE RADIOGRAPHED. HOWEVER, 50% OF THESE BUTT WELD JOINTS SHALL BE FIELD WELD JOINTS.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016

**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, VC1	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A33A</b> Sheet 3 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	16	6.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	18	24	8.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	26	30	10.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	32	32	10.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	32
PIP	PIPE	34	38	12.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	40	40	12.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	32
PIP	PIPE	42	46	14.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	48	48	16.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	150, RF/125AARH	FSC0127Z0	
FLG	FLNG.WN	26	48	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105	150, RF/125AARH	FNC0127Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	48		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	48		ASME B16.47B/EIL' STD	ASTM A 516 GR.70	150, FF/125AARH	FCU6321Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A33A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A33A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CAP	CAP	2	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105	SW, 6000	WQH02D3Z0	
UNN	UNION	1	1.5		BS-3799	ASTM A 105	SW, 3000	WQH02D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51321	51321ZZZ0	
GAV	VLV.GATE	26	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 513CA	513CAZZZ0	
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52321	52321ZZZ0	
CHV	VLV.CHECK	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL,	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53321	53321ZZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A33A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
						SEATS-STELLITED			
CHV	VLV.CHECK	26	48		API-594	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 533PE	533PEZZZO	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	48		B-16.21-ANSI B16.47B	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKAAAX52Z0	
<b>Trap/Strainer Group</b>									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,RF/125AARH	ST16833Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	6	M	EIL'STD	B:A234GR.WPB;INT:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	8	24	M	EIL'STD	B:A234GR.WPBW;INT:SS304	BW, T-TYPE	SP13644Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 1 of 9

**PIPE CLASS** : **A39A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65	100	150	186
<b>PRESS</b>	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", BLOW DOWN, CHEMICAL DRAIN, SERVICE WATER, COOLING WATER SUPPLY/ RETURN, NON-CONTAMINATED SEWER, WASTE WATER, OILY CONTAMINATED RAINY WATER DRAIN, TEMPERED WATER

**NOTES**

- 6 FOR FABRICATED REDUCERS,REFER EIL'STD 7-44-0485 & 7-44-0487. FOR MITRES, REFER EIL'STD 7-44-0033.
- 18 FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 10KG/CM2G RESPECTIVELY.
- 31 USE BUTTERFLY V 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.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 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.
- 77 FOR SIZES > 24", SPACER & BLIND SHALL BE AS PER EIL'STD 7-44-0164.
- 79 BLIND FLANGES SPECIFIED TO MANUFACTURER'S STANDARD AND CAPS TO ASME SEC VIII SHALL BE DESIGNED FOR 70 DEG.C AND 10.0 KG/CM2G. BLIND FLANGES TO SUIT 150#, FF, 125AARH, AWWA C207 CLD FLANGES.
- 86 BUTTERFLY VALVES FOR THE SPEC ARE PN10 RATED WITH A MAXIMUM PRESSURE OF 10.2 KG/CM2G.
- 97 USE 5 PIECES 90 DEG MITRE FOR SIZE(S) 16 - 18, 24, 38; 6 PIECES 90 DEG MITRE FOR SIZE(S) 20, 26, 32, 40, 46 - 50, 54 - 58, 64- 66, 72-74 ; 7 PIECES 90 DEG MITRE FOR SIZE(S) 28, 30, 34, 36, 42, 44, 52, 60, 62, 68, 70, 76 - 80; 45 DEG MITRE REQUIRES ONE PIECE LESS
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 611 NDT REQUIREMENT MAY ALSO BE REFERRED FROM EIL STD. 6-44-0016 IF DOC No. B378-6-44-0016 IS NOT PROVIDED WITH THE PACKAGE.

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 2 of 9

**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	





<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 4 of 9

			84.00
			80.00
			76.00
		T	72.00
	T	R	70.00
	T	R	68.00
	R	R	66.00
	R	R	64.00
	R	R	62.00
	R	R	60.00
	R	R	58.00
	R	R	56.00
	R	R	54.00
	R	R	52.00
	R	R	50.00
	R	R	48.00
	R	R	46.00
	R	R	44.00
	R	R	42.00
	R	R	40.00
	R	R	38.00
	R	R	36.00
	R	R	34.00
	R	R	32.00
	R	R	30.00
	R	R	28.00
	R	R	26.00
	R	R	24.00
			22.00
	R	R	20.00
	R	R	18.00
	R	R	16.00
	R	R	14.00
	R	R	12.00
	R	R	10.00
	R	R	8.00
	R	R	6.00
			5.00
	R	R	4.00
			3.50
	R	R	3.00
			2.50
	R	R	2.00
	H	H	1.50
			1.25
	H	H	1.00
	H	H	0.75
	H	H	0.50
800	700	600	

**BRANCH PIPE (SIZE IN INCHES)**

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 5 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	20	8.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	24	36	10.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	38	44	12.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	46	52	14.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	54	62	16.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	64	70	18.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	72	80	20.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	150, RF/125AARH	FSC0127Z0	
FLG/300	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	300, RF/125AARH	FSC0147Z0	
FLG/300	FLNG.WN	2	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105	150, RF/125AARH	FNC0127Z0	
FLG	FLNG.SO	26	80		AWWA-C207 CL.D	ASTM A 516 GR.70	150, FF/125AARH	FN46321Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	80		AWWA-C207 CL.D	ASTM A 516 GR.70	150, FF/125AARH	FB46321Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	80		AWWA C207D/EIL'S TD	ASTM A 516 GR.70	150, FF/125AARH	FCT6321Z0	

Package : IPMCS  
Report No. : 50

# A39A

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 6 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	8	14	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	8	14	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
MIT90	MITRE.90	16	28	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	
MIT90	MITRE.90	30	30	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	32
MIT90	MITRE.90	32	34	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	
MIT90	MITRE.90	36	36	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	32
MIT90	MITRE.90	38	60	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	
MIT90	MITRE.90	62	62	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	32
MIT90	MITRE.90	64	78	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	
MIT90	MITRE.90	80	80	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	32
MIT45	MITRE.45	16	28	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	
MIT45	MITRE.45	30	30	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	32
MIT45	MITRE.45	32	34	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	
MIT45	MITRE.45	36	36	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	32
MIT45	MITRE.45	38	60	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	
MIT45	MITRE.45	62	62	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	32
MIT45	MITRE.45	64	78	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	
MIT45	MITRE.45	80	80	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	32

Package : IPMCS  
Report No. : 50

# A39A

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 7 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDC	REDUC.CONC	16	80	M, M	EIL/STD	IS-3589 GR.410	BW	WUKF24ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
REDE	REDUC.ECC	16	80	M, M	EIL/STD	IS-3589 GR.410	BW	WVKF24ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	
CAP	CAP	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	8	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	50	80	CALC	ASME-VIII	ASTM A 285 GR.C	BW	WF3J54ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 8 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105	SW, 6000	WQH02D3Z0	
UNN	UNION	1	1.5		B-16.11	ASTM A 105	SW, 3000	WQ602D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51321	51321ZZZ0	
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52321	52321ZZZ0	
CHV	VLV.CHECK	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53321	53321ZZZ0	
CHV	VLV.CHECK	26	48		API-594	BODY-ASTM A 105 / A 216GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 53316	53316ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54321	54321ZZZ0	
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-	WAF1, 150, B-16.5, WAF/125AARH, SHT	56321ZZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A39A</b> Sheet 9 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
						13% CR.STEEL	NO.- 56321		
BFV	VLV.BTRFLY	26	48		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 56316	56316ZZZ0	
BFV	VLV.BTRFLY	52	52		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 563DD	563DDZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	18	80		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
BOM	BOLT.M/C	.5	16		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	80		AWWA-C207 CL.D	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GK2AX22Z0	
<b>Trap/Strainer Group</b>									
TRP	TRAP.STEAM	.5	1.5		MNFSTD	B:A105;T:13%CR;S:SS304	FLGD, THRMDNMC, 150,RF/125AARH	TR3065530	
TSR	STRNR.TEMP	1.5	24		EILSTD	B:A285GR.C;INT:S S304	CONETYPE, 150,FF/125AARH	ST14431Z0	
PSR	STRNR.PERM	.5	1.5		MNFSTD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	6	M	EILSTD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	8	24	M	EILSTD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	
PSR	STRNR.PERM	52	52	M	MNFSTD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP33644Z0	

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<b>Location</b> USAR	<b>Pipe Class : A3A</b> Sheet 1 of 9

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

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

<b>TEMP</b>	0	38	50	65	100	150	186
<b>PRESS</b>	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-IN OFFISTES), 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 & 7.0 KG/CM2G RESPECTIVELY.

**NOTES**

- 6 FOR FABRICATED REDUCERS,REFER EIL'STD 7-44-0485 & 7-44-0487. FOR MITRES, REFER EIL'STD 7-44-0033.
- 10 USE 5 PIECES 90 DEG MITRE FOR SIZE(S) 16 - 18, 24, 32 - 40, 44 - 50, 54 - 60, 64-70; 6 PIECES 90 DEG MITRE FOR SIZE(S) 20, 26, 42, 52, 62, 72 - 76 ; 7 PIECES 90 DEG MITRE FOR SIZE(S) 28, 30, 80; 45 DEG MITRE REQUIRES ONE PIECE LESS
- 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.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 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.
- 77 FOR SIZES > 24", SPACER & BLIND SHALL BE DESIGNED BY THE MANUFACTURER AS PER ASME B31.3.
- 86 BUTTERFLY VALVES FOR THE SPEC ARE PN10 RATED WITH A MAXIMUM PRESSURE OF 10.2 KG/CM2G.
- 98 FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 7.0 KG/CM2G RESPECTIVELY.
- 99 BLIND FLANGES AND SPACER & BLINDS SPECIFIED TO MANUFACTURER'S STANDARD SHALL BE DESIGNED FOR 70 DEG.C AND 7.0 KG/CM2G TO SUIT 150#, FF, 125AARH, AWWA C207 CL.D FLANGES.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 611 NDT REQUIREMENT MAY ALSO BE REFERRED FROM EIL STD. 6-44-0016 IF DOC No. B378-6-44-0016 IS NOT PROVIDED WITH THE PACKAGE.



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**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	





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<b>Location</b> USAR	<b>Pipe Class : A3A</b> Sheet 5 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	16	8.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	18	20	8.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	24	30	10.0	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	
PIP	PIPE	32	42	10	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	98
PIP	PIPE	44	52	12	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	98
PIP	PIPE	54	62	14	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	98
PIP	PIPE	64	80	16	IS-3589	IS-3589 GR.410	BE, SAW	PI7E316Z0	98
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	150, RF/125AARH	FSC0127Z0	
FLG/300	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105	150, RF/125AARH	FNC0127Z0	
FLG	FLNG.SO	26	80		AWWA-C207 CL.D	ASTM A 516 GR.70	150, FF/125AARH	FN46321Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	48		AWWA-C207 CL.D	ASTM A 516 GR.70	150, FF/125AARH	FB46321Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	80		AWWA C207D/EIL'S TD	ASTM A 516 GR.70	150, FF/125AARH	FCT6321Z0	

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<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3A</b> Sheet 6 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	8	14	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	8	14	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
MIT90	MITRE.90	16	28	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	
MIT90	MITRE.90	30	30	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	32
MIT90	MITRE.90	32	80	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WDKF241Z0	
MIT45	MITRE.45	16	28	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	
MIT45	MITRE.45	30	30	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	32
MIT45	MITRE.45	32	80	M	EIL'STD	IS-3589 GR.410	BW, 1.5D	WGKF241Z0	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3A</b> Sheet 7 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
REDC	REDUC.CONC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDC	REDUC.CONC	16	80	M, M	EIL'STD	IS-3589 GR.410	BW	WUKF24ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
REDE	REDUC.ECC	16	80	M, M	EIL'STD	IS-3589 GR.410	BW	WVKF24ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	
CAP	CAP	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	8	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	50	80	CALC	ASME-VIII	ASTM A 285 GR.C	BW	WF3J54ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105	SW, 6000	WQH02D3Z0	
UNN	UNION	1	1.5		BS-3799	ASTM A 105	SW, 3000	WQH02D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED.STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3A</b> Sheet 8 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51321	51321ZZZ0	
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52321	52321ZZZ0	
CHV	VLV.CHECK	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53321	53321ZZZ0	
CHV	VLV.CHECK	26	48		API-594	BODY-ASTM A 105 / A 216GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 53316	53316ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54321	54321ZZZ0	
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	WAF, 150, B-16.5, WAF/125AARH, SHT NO.- 56321	56321ZZZ0	
BFV	VLV.BTRFLY	26	48		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 56316	56316ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	18	80		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
BOM	BOLT.M/C	.5	16		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	80		AWWA-C207 CL.D	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GK2AX22Z0	
GAS/300	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 300	GK66274Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3A</b> Sheet 9 of 9

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Trap/Strainer Group</b>									
TRP	TRAP.STEAM	.5	1.5		MNFSTD	B:A105;T:13%CR;S:SS304	FLGD, THRMDNMC, 150,RF/125AARH	TR3065530	
TSR	STRNR.TEMP	1.5	24		EILSTD	B:A285GR.C;INT:S304	CONETYPE, 150,FF/125AARH	ST14431Z0	
PSR	STRNR.PERM	.5	1.5		MNFSTD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	6	M	EILSTD	B:A234GR.WPB;INT:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	8	24	M	EILSTD	B:A234GR.WPBW;INT:SS304	BW, T-TYPE	SP13644Z0	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3K</b> Sheet 1 of 5

**PIPE CLASS** : **A3K**  
**RATING** : 150  
**BASE MATERIAL** : SS 304  
**CORROSION ALLOWANCE** : 0 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	93	149	186
<b>PRESS</b>	10.55	10.55	10.55	10.55	10.55

**SERVICE**

DEMINEALISED WATER (OUTSIDE DM PLANT BATTERY LIMITS), POLISHED WATER, POLISHED CONDENSATE, INSTRUMENT AIR(WITHIN UNITS & OFFSITE PACKAGES) - CATEGORY 'D'

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL STD 7-44-0300; FOR SPACER AND BLIND REFER EIL STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 21 NO FIELD HYDROSTATIC TESTING IS PERMITTED IN INSTRUMENT AIR SERVICE.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 611 NDT REQUIREMENT MAY ALSO BE REFERRED FROM EIL STD. 6-44-0016 IF DOC No. B378-6-44-0016 IS NOT PROVIDED WITH THE PACKAGE.

**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, DC3	
	ON LINES >= 2.0"	AS PER P&ID. OR 0.75". REFER EIL STD. 7-44-0351, D3	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VC1	
	ON LINES >= 2.0"	AS PER P&ID. OR 0.75". REFER EIL STD 7-44-0351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	1	1.5	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	2	2	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	3	8	10S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	10	14	10S	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
<b>Flange Group</b>									
FLG/300	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FSC4147Z0	
FLG	FLNG.WN	.5	14	M	B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FWC4127Z0	
FLG/300	FLNG.WN	2	14	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FWC4147Z0	
FLB	FLNG.BLIND	.5	14		B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FBC4127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FGK4121Z0	
FEF	SPCR&BLND	10	14		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FCK4121Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB90	ELBOW.90	10	14	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WAG894Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
ELB45	ELBOW.45	10	14	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WBG894Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TEQ	T.EQUAL	10	14	M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WEG894ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
TRED	T.RED	10	14	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WRG894ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WUG874ZZ0	
REDC	REDUC.CONC	10	14	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WUG894ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WVG874ZZ0	
REDE	REDUC.ECC	10	14	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WVG894ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WF64282Z0	
CAP	CAP	2	14	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WK642D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WL642D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WM642D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 351 GR CF8,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51345	51345ZZ0	
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 351 GR.CF8,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52345	52345ZZ0	
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A3K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
						STELLITED			
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 351 GR.CF8,TRIM-SS 316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53345	53345ZZZ0	
BFV	VLV.BTRFLY	3	14		BS EN 593	BODY-ASTM A 351 GR CF8,TRIM-SS 304	WAFL, 150, B-16.5, SHT NO.- 56351	56351ZZZ0	
<b>Bolt Group</b>									
BOM	BOLT.M/C	.5	14		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	14		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
<b>Trap/Strainer Group</b>									
TSR	STRNR.TEMP	1.5	14		EIL/STD	B:A240TP304;INT:S S304	CONETYPE, 150,FF/125AARH	ST14131Z0	
PSR	STRNR.PERM	.5	1.5		MNF/STD	B:A182GR.F304;IN T:SS304	SW, Y-TYPE, 800	SP307D510	
PSR	STRNR.PERM	2	8	M	EIL/STD	B:A403GR.WP304-S;INT:SS304	BW, T-TYPE	SP15344Z0	
PSR	STRNR.PERM	10	14	M	EIL/STD	B:A403GR.WP304-WX;INT:SS304	BW, T-TYPE	SP15444Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A71V</b> Sheet 1 of 5

**PIPE CLASS** : **A71V**  
**RATING** : 150  
**BASE MATERIAL** : DUPLEX SS  
**CORROSION ALLOWANCE** : 0 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	-29	38	93	149	204	260	315
<b>PRESS</b>	20.38	20.38	18.28	16.17	14.06	11.95	9.84

**SERVICE**

PROCESS WATER -VACUUM

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 40 STIFFENER RINGS, IF NEEDED, SHALL BE PROVIDED AS PER ASME SEC. VIII, DIV. 1
- 96 VALVE TO BE TESTED FOR VACUUM AS PER ASME V, SUBSECTION-A, ARTICLE 10 (HOOD METHOD) APPENDIX IX TO CHECK SUITABILITY FOR VACUUM SERVICE.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A71V</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	80S	B-36.19	ASTM A 790 (UNS S32750)	PE, SEAMLESS	PI3N977Z0	
PIP	PIPE	1	1.5	40S	B-36.19	ASTM A 790 (UNS S32750)	PE, SEAMLESS	PI3N977Z0	
PIP	PIPE	2	2	40S	B-36.19	ASTM A 790 (UNS S32750)	BE, SEAMLESS	PI3N917Z0	
PIP	PIPE	3	6	10S	B-36.19	ASTM A 790 (UNS S32750)	BE, SEAMLESS	PI3N917Z0	
PIP	PIPE	8	8	CALC	B-36.19	ASTM A 790 (UNS S32750)	BE, SEAMLESS	PI3N917Z0	199
PIP	PIPE	10	18	CALC	B-36.19	ASTM A 790 (UNS S32750)	BE, E.F.S.W	PI3N913Z0	199
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 790 (UNS S32205)	PBE, SEAMLESS	PN3L667Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 790 (UNS S32205)	PBE, SEAMLESS	PN3L667Z0	
<b>Flange Group</b>									
FLG	FLNG.WN	.5	1.5	M	B-16.5	ASTM A 182 GR.F53	150, RF/125AARH	FWCD627Z0	
FLG	FLNG.WN	2	18	M	B-16.5	ASTM A 182 GR.F53	150, RF/125AARH	FWCD627Z0	
FLB	FLNG.BLIND	.5	12		B-16.5	ASTM A 182 GR.F53	150, RF/125AARH	FBCD627Z0	
FEF	FLNG.FIG.8	.5	12		ASME-B16.48	ASTM A 182 GR.F53	150, FF/125AARH	FGKD621Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WA6U4D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW, 1.5D	WAGT54Z10	
ELB90	ELBOW.90	10	12	M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW, 1.5D	WAGT64Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WB6U4D2Z0	
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW, 1.5D	WBGT54Z10	
ELB45	ELBOW.45	10	12	M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW, 1.5D	WBGT64Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WE6U4D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WEGT54ZZ0	

Package : IPMCS  
Report No. : 50

# A71V



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A71V</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TEQ	T.EQUAL	10	12	M	B-16.11	ASTM A 815 GR.WP UNS S32750-WX	BW	WE6T64ZZ0	
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WR6U4D2Z0	
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WRGT54ZZ0	
TRED	T.RED	10	12	M, M	B-16.11	ASTM A 815 GR.WP UNS S32750-WX	BW	WR6T64ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WUGT54ZZ0	
REDC	REDUC.CONC	10	12	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW	WUGT64ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WVGT54ZZ0	
REDE	REDUC.ECC	10	12	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW	WVGT64ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F53	PBE	WNHU46ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F53	PBE	WPHU46ZZ0	
CAP	CAP	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WFGT54ZZ0	
CAP	CAP	10	12	M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW	WFGT64ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WJ6U4D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WK6U4D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WL6U4D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WM6U4D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F53,TRIM-STELLITED,STEM-DUPLEX SS UNS S32750	SW, 800, 3000, B-16.11, SHT NO.- 51918	51918ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A71V</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GAV	VLV.GATE	2	12		API 600/ ISO 10434	BODY-ASTM A995 GR.5A UNS J93404,TRIM-STELLITED,STEM-DUPLEX SS UNS S32750	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51938	51938ZZZ0	
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F53,TRIM-STELLITED,STEM-DUPLEX SS UNS S32750	SW, 800, 3000, B-16.11, SHT NO.- 52918	52918ZZZ0	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A995 GR.5A UNS J93404,TRIM-DUPLEX SS UNS 32750	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52938	52938ZZZ0	
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F53,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53918	53918ZZZ0	
CHV	VLV.CHECK	2	12		BS-1868	BODY-ASTM A995 GR.5A UNS J93404,TRIM-DUPLEX SS UNS 32750	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53938	53938ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	12		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	12		B-16.20-ANSI B16.5	UNS S32750+GRAF+S32 750 I RING	SPIRAL, 150	GK6BU72Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A91A</b> Sheet 1 of 7

**PIPE CLASS** : **A91A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65
<b>PRESS</b>	18.9	18.9	18.9	18.9

**SERVICE**

FIRE WATER (UNDER GROUND ONLY)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 88 10% OF THE BUTT WELD JOINTS SHALL BE RADIOGRAPHED. HOWEVER, 50% OF THESE BUTT WELD JOINTS SHALL BE FIELD WELD JOINTS.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS:  
 (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>  
 (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>  
 (3) K Mu FACTOR : 0.19
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-  
 a) 0.5"- 24" - 0.6M  
 b) 26"-40" - 0.8M  
 c) 42"-52" - 1.0M  
 d) 54"-60" : 1.2M  
 e) 62"-64" : 1.4M
- 404 PIPES 4 INCH & ABOVE, SHALL BE EXTERNALLY "3LPE COATED" FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004
- 405 DEPTH OF BURIAL SHALL BE CONSIDERED UPTO 1.5M.
- 408 SUITABILITY OF PIPE THICKNESS FOR UNDERGROUND SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF 18.9 KG/CM<sup>2</sup>G AND TEMPERATURE OF 65 DEG.C.
- 454 PIPES BELOW 4 INCH, SHALL BE COAL TAR TAPEED AS PER SPECIFICATION NO. B378-000-02-42-PCS-0001 AT SITE, AND FLANGES, FITTINGS, VALVES AND STRAINERS SHALL BE EXTERNALLY EPOXY COATED FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004.

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A91A</b> 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, VC1	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	



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<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A91A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	4	14	STD	B-36.10	ASTM A 106 GR.B (PE COATED)	BE, SEAMLESS	PI2R417Z0	
PIP	PIPE	16	16	6.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	18	24	8.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	26	30	10.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	32	32	10.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	32
PIP	PIPE	34	38	12.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	40	40	12.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	32
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B (PE COATED)	PBE, SEAMLESS	PN2R467Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FSC0327Z0	
FLG	FLNG.WN	26	36	M	B-16.47-B	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FWB0327Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FNC0327Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FBC0327Z0	
FLB	FLNG.BLIND	26	48		B-16.47-B	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FBB0327Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FGK0321Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FCK0321Z0	
FEF	SPCR&BLND	26	48		ASME B16.47B/EIL' STD	A516 GR. 70 EPOXY COATED	150, FF/125AARH	FCUJ221Z0	

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<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A91A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WA604D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WA604D2Z0	
ELB90	ELBOW.90	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WAGY84Z10	
ELB90	ELBOW.90	8	36	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW, 1.5D	WAGY94Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WB604D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WB604D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WBGY84Z10	
ELB45	ELBOW.45	8	36	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW, 1.5D	WBGY94Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WE604D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WE604D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WEGY84ZZ0	
TEQ	T.EQUAL	8	36	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WEGY94ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WR604D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WR604D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WRGY84ZZ0	
TRED	T.RED	8	36	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WRGY94ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WUGY84ZZ0	
REDC	REDUC.CONC	8	36	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WUGY94ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WVGY84ZZ0	
REDE	REDUC.ECC	8	36	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WVGY94ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WNH046ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WPH046ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SCRF, 3000	WF60482Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
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<b>Location</b> USAR	<b>Pipe Class : A91A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CAP	CAP	2	36	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WFGY84ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WJ604D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WJ604D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WK604D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WK604D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WL604D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WL604D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WM604D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WM604D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105 (EPOXY-COATED)	SW, 6000	WQH04D3Z0	
UNN	UNION	1	1.5		BS-3799	ASTM A 105 (EPOXY-COATED)	SW, 3000	WQH04D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 510AD	510ADZZZ0	404
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13%CR,STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 513AD	513ADZZZ0	404
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 520AD	520ADZZZ0	404
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-13% CR,STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 523AD	523ADZZZ0	404
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 530AD	530ADZZZ0	404
CHV	VLV.CHECK	2	12		BS-1868	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 533AD	533ADZZZ0	404



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<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A91A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
						13% CR.STEEL			
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.21- ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	36		B-16.21- ANSI B16.47B	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKAAX52Z0	

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<b>Location</b> USAR	<b>Pipe Class : A92A</b> Sheet 1 of 6

**PIPE CLASS** : **A92A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

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

**SERVICE**

CLOSED BLOWDOWN (UG),  
 HYDROCARBON (UG), WATER (UG)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS, REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS, REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS:  
 (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>  
 (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>  
 (3) K Mu FACTOR : 0.19
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-  
 a) 0.5"- 24"- 0.6M  
 b) 26"-40"- 0.8M  
 c) 42"-52"- 1.0M  
 d) 54"-60": 1.2M  
 e) 62"-64" : 1.4M
- 460 DEPTH OF BURIAL SHALL BE CONSIDERED UPTO 2.5M.
- 461 SUITABILITY OF PIPE THICKNESS FOR UNDERGROUND SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF 3.5 KG/CM<sup>2</sup>G AND TEMPERATURE OF 200 DEG.C.
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

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<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A92A</b> Sheet 2 of 6

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A92A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	4	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG/300	FLNG.WN	2	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684Z0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A92A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684Z0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684Z0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684Z0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026Z0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026Z0	
CAP	CAP	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684Z0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZ0	
GAV	VLV.GATE	2	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR,STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301	51301ZZ0	
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR,STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52301	52301ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A92A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
CHV	VLV.CHECK	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301	53301ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK66272Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A93A</b> Sheet 1 of 8

**PIPE CLASS** : **A93A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65	100	150	186
<b>PRESS</b>	10.55	10.55	10.55	10.55	10.55	10.55	10.55

**SERVICE**

COOLING WATER (UNDER GROUND)

**NOTES**

- 6 FOR FABRICATED REDUCERS,REFER EIL/STD 7-44-0485 & 7-44-0487. FOR MITRES, REFER EIL/STD 7-44-0033.
- 18 FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 10KG/CM2G RESPECTIVELY.
- 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.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 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.
- 77 FOR SIZES > 24", SPACER & BLIND SHALL BE AS PER EIL/STD 7-44-0164.
- 79 BLIND FLANGES SPECIFIED TO MANUFACTURER'S STANDARD AND CAPS TO ASME SEC VIII SHALL BE DESIGNED FOR 70 DEG.C AND 10.0 KG/CM2G. BLIND FLANGES TO SUIT 150#, FF, 125AARH, AWWA C207 CL.D FLANGES.
- 86 BUTTERFLY VALVES FOR THE SPEC ARE PN10 RATED WITH A MAXIMUM PRESSURE OF 10.2 KG/CM2G.
- 97 USE 5 PIECES 90 DEG MITRE FOR SIZE(S) 16 - 18, 24, 38; 6 PIECES 90 DEG MITRE FOR SIZE(S) 20, 26, 32, 40, 46 - 50, 54 - 58, 64- 66, 72-74 ; 7 PIECES 90 DEG MITRE FOR SIZE(S) 28, 30, 34, 36, 42, 44, 52, 60, 62, 68, 70, 76 - 80; 45 DEG MITRE REQUIRES ONE PIECE LESS
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS:  
 (1) MODULUS OF ELASTICITY : 120 kg/cm2  
 (2) DENSITY OF MOIST SOIL : 1800 kg/m3  
 (3) K Mu FACTOR : 0.19
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-  
 a) 0.5"- 24"- 0.6M  
 b) 26"-40"- 0.8M  
 c) 42"-52" - 1.0M  
 d) 54"-60": 1.2M  
 e) 62"-64" : 1.4M
- 404 PIPES 4 INCH & ABOVE, SHALL BE EXTERNALLY "3LPE COATED" FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004
- 413 SUITABILITY OF PIPE THICKNESS FOR UNDERGROUND SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF 8 KG/CM2G AND TEMPERATURE OF 65 DEG.C.
- 454 PIPES BELOW 4 INCH, SHALL BE COAL TAR TAPEED AS PER SPECIFICATION NO. B378-000-02-42-PCS-0001 AT SITE, AND FLANGES, FITTINGS, VALVES AND STRAINERS SHALL BE EXTERNALLY EPOXY COATED FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004.



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A93A</b> Sheet 2 of 8

**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	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A93A</b> Sheet 4 of 8

84.00  
80.00  
76.00  
72.00  
70.00  
68.00  
66.00  
64.00  
62.00  
60.00  
58.00  
56.00  
54.00  
52.00  
50.00  
48.00  
46.00  
44.00  
42.00  
40.00  
38.00  
36.00  
34.00  
32.00  
30.00  
28.00  
26.00  
24.00  
22.00  
20.00  
18.00  
16.00  
14.00  
12.00  
10.00  
8.00  
6.00  
5.00  
4.00  
3.50  
3.00  
2.50  
2.00  
1.50  
1.25  
1.00  
0.75  
0.50

**BRANCH PIPE (SIZE IN INCHES)**

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A93A</b> Sheet 5 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	4	14	STD	B-36.10	ASTM A 106 GR.B (PE COATED)	BE, SEAMLESS	PI2R417Z0	
PIP	PIPE	16	20	8.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	24	36	10.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	38	44	12.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	46	52	14.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	54	62	16.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	64	64	18.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FSC0327Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FNC0327Z0	
FLG	FLNG.SO	26	64		AWWA-C207 CL.D	A516 GR. 70 EPOXY COATED	150, FF/125AARH	FN4J221Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FBC0327Z0	
FLB	FLNG.BLIND	26	64		AWWA-C207 CL.D	A516 GR. 70 EPOXY COATED	150, FF/125AARH	FB4J221Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FGK0321Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FCK0321Z0	
FEF	SPCR&BLND	26	64		AWWA C207D/EIL'S TD	A516 GR. 70 EPOXY COATED	150, FF/125AARH	FCTJ221Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A93A</b> Sheet 6 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WA604D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WA604D2Z0	
ELB90	ELBOW.90	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WAGY84Z10	
ELB90	ELBOW.90	8	14	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW, 1.5D	WAGY94Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WB604D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WB604D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WBGY84Z10	
ELB45	ELBOW.45	8	14	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW, 1.5D	WBGY94Z10	
MIT90	MITRE.90	16	64	M	EIL/STD	IS-3589 Gr.410 (PE COATED)	BW, 1.5D	WDKDB41Z0	
MIT45	MITRE.45	16	64	M	EIL/STD	IS-3589 Gr.410 (PE COATED)	BW, 1.5D	WGKDB41Z0	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WE604D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WE604D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WEGY84ZZ0	
TEQ	T.EQUAL	8	48	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WEGY94ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WR604D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WR604D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WRGY84ZZ0	
TRED	T.RED	8	48	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WRGY94ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WUGY84ZZ0	
REDC	REDUC.CONC	8	14	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WUGY94ZZ0	
REDC	REDUC.CONC	16	64	M, M	EIL/STD	IS-3589 Gr.410 (PE COATED)	BW	WUKDB4ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WVGY84ZZ0	
REDE	REDUC.ECC	8	14	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WVGY94ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A93A</b> Sheet 7 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
REDE	REDUC.ECC	16	64	M, M	EIL'STD	IS-3589 Gr.410 (PE COATED)	BW	VVKDB4ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WNH046ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WPH046ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SCRF, 3000	WF60482Z0	
CAP	CAP	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WFGY84ZZ0	
CAP	CAP	8	48	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WFGY94ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WJ604D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WJ604D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WK604D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WK604D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WL604D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WL604D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WM604D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WM604D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105 (EPOXY-COATED)	SW, 6000	WQH04D3Z0	
UNN	UNION	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WQ604D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 510AD	510ADZZZ0	404
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 513AD	513ADZZZ0	404
GAV	VLV.GATE	26	42		BS-1414	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 513PE	513PEZZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A93A</b> Sheet 8 of 8

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 520AD	520ADZZZ0	404
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 523AD	523ADZZZ0	404
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 530AD	530ADZZZ0	404
CHV	VLV.CHECK	2	16		BS-1868	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 533AD	533ADZZZ0	
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13% CR.STEEL	WAFL, 150, B-16.5, RF/125AARH, SHT NO.- 563AD	563ADZZZ0	
BFV	VLV.BTRFLY	52	52		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 563DE	563DEZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	18	80		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
BOM	BOLT.M/C	.5	16		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	64		AWWA-C207 CL.D	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GK2AX22Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A94A</b> Sheet 1 of 6

**PIPE CLASS** : **A94A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65
<b>PRESS</b>	12	12	12	12

**SERVICE**

OWS/WWS (UNDER GROUND)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 88 10% OF THE BUTT WELD JOINTS SHALL BE RADIOGRAPHED. HOWEVER, 50% OF THESE BUTT WELD JOINTS SHALL BE FIELD WELD JOINTS.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS:  
 (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>  
 (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>  
 (3) K Mu FACTOR : 0.19
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-  
 a) 0.5"- 24" - 0.6M  
 b) 26"-40" - 0.8M  
 c) 42"-52" - 1.0M  
 d) 54"-60" : 1.2M  
 e) 62"-64" : 1.4M
- 404 PIPES 4 INCH & ABOVE, SHALL BE EXTERNALLY "3LPE COATED" FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004
- 405 DEPTH OF BURIAL SHALL BE CONSIDERED UPTO 1.5M.
- 410 SUITABILITY OF PIPE THICKNESS FOR UNDERGROUND SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF 11.2 KG/CM<sup>2</sup>G AND TEMPERATURE OF 65 DEG.C.
- 454 PIPES BELOW 4 INCH, SHALL BE COAL TAR TAPEED AS PER SPECIFICATION NO. B378-000-02-42-PCS-0001 AT SITE, AND FLANGES, FITTINGS, VALVES AND STRAINERS SHALL BE EXTERNALLY EPOXY COATED FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004.
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A94A</b> Sheet 2 of 6

**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, VC1	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A94A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	4	12	STD	B-36.10	ASTM A 106 GR.B (PE COATED)	BE, SEAMLESS	PI2R417Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FSC0327Z0	
FLG	FLNG.SO	2	12		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FNC0327Z0	
FLB	FLNG.BLIND	.5	12		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FBC0327Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FGK0321Z0	
FEF	SPCR&BLND	10	12		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FCK0321Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WA604D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WA604D2Z0	
ELB90	ELBOW.90	2	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW, 1.5D	WAGBM4Z10	
ELB90	ELBOW.90	8	12	M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW, 1.5D	WAGBO4Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WB604D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WB604D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW, 1.5D	WGBM4Z10	
ELB45	ELBOW.45	8	12	M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW, 1.5D	WGBGO4Z10	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A94A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WE604D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WE604D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WEGBM4Z20	
TEQ	T.EQUAL	8	12	M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WEGBO4Z20	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WR604D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WR604D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WRGBM4Z20	
TRED	T.RED	8	12	M, M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WRGBO4Z20	
REDC	REDUC.CONC	2	6	M, M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WUGBM4Z20	
REDC	REDUC.CONC	8	12	M, M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WUGBO4Z20	
REDE	REDUC.ECC	2	6	M, M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WVGBM4Z20	
REDE	REDUC.ECC	8	12	M, M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WVGBO4Z20	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WNH046Z20	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WPH046Z20	
CAP	CAP	.5	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SCRF, 3000	WF60482Z0	
CAP	CAP	2	12	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WFGBM4Z20	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WJ604D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WJ604D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WK604D3Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A94A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WK604D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WL604D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WL604D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WM604D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WM604D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105 (EPOXY-COATED)	SW, 6000	WQH04D3Z0	
UNN	UNION	1	1.5		BS-3799	ASTM A 105 (EPOXY-COATED)	SW, 3000	WQH04D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 510AD	510ADZZZ0	404
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 513AD	513ADZZZ0	404
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 520AD	520ADZZZ0	404
CHV	VLV.CHECK	2	16		BS-1868	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 533AD	533ADZZZ0	404
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	12		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	48		B-16.21-ANSI B16.47B	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKAAAX52Z0	

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**PIPE CLASS** : **A95A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65
<b>PRESS</b>	1.03	1.03	1.03	1.03

**SERVICE**

CRWS ( UNDERGROUND -BY GRAVITY)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 77 FOR SIZES > 24", SPACER & BLIND SHALL BE DESIGNED BY THE MANUFACTURER AS PER ASME B31.3.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS:  
 (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>  
 (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>  
 (3) K Mu FACTOR : 0.19
- 402 SUITABILITY OF PIPE THICKNESS FOR UNDERGROUND SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF ATM AND TEMPERATURE OF 65 DEG.C.
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-  
 a) 0.5"- 24" - 0.6M  
 b) 26"-40" - 0.8M  
 c) 42"-52" - 1.0M  
 d) 54"-60" : 1.2M  
 e) 62"-64" : 1.4M
- 404 PIPES 4 INCH & ABOVE, SHALL BE EXTERNALLY "3LPE COATED" FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004
- 406 DEPTH OF BURIAL SHAL BE CONSIDERED UPTO 2.5M.
- 407 USE 5 PIECES 90 DEG MITRE FOR SIZE(S) 16 - 24; 45 DEG MITRE REQUIRES ONE PIECE LESS
- 454 PIPES BELOW 4 INCH, SHALL BE COAL TAR TAPEED AS PER SPECIFICATION NO. B378-000-02-42-PCS-0001 AT SITE, AND FLANGES, FITTINGS, VALVES AND STRAINERS SHALL BE EXTERNALLY EPOXY COATED FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004.

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A95A</b> Sheet 2 of 6

**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 EIL STD 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 JOB STD A545-7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH GATE V ALVE TO SPEC AS PER EIL STD 7-44-0354	





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<b>Location</b> USAR	<b>Pipe Class : A95A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	4	14	STD	B-36.10	ASTM A 106 GR.B (PE COATED)	BE, SEAMLESS	PI2R417Z0	
PIP	PIPE	16	24	6.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	26	30	8.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	32	32	10.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
PIP	PIPE	36	42	10.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FSC0327Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FNC0327Z0	
FLG	FLNG.SO	26	42		AWWA-C207 CL.D	A516 GR. 70 EPOXY COATED	150, FF/125AARH	FN4J221Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FBC0327Z0	
FLB	FLNG.BLIND	26	42		AWWA-C207 CL.D	A516 GR. 70 EPOXY COATED	150, FF/125AARH	FB4J221Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FGK0321Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FCK0321Z0	
FEF	SPCR&BLND	26	42		AWWA C207D/EIL'S TD	A516 GR. 70 EPOXY COATED	150, FF/125AARH	FCTJ221Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WA604D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WA604D2Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A95A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB90	ELBOW.90	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WAGY84Z10	
ELB90	ELBOW.90	8	14	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW, 1.5D	WAGY94Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WB604D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WB604D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WBGY84Z10	
ELB45	ELBOW.45	8	14	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW, 1.5D	WBGY94Z10	
MIT90	MITRE.90	16	80	M	EIL'STD	IS-3589 Gr.410 (PE COATED)	BW, 1.5D	WDKDB41Z0	407
MIT45	MITRE.45	16	80	M	EIL'STD	IS-3589 Gr.410 (PE COATED)	BW, 1.5D	WGKDB41Z0	407
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WE604D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WE604D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WEGY84ZZ0	
TEQ	T.EQUAL	8	48	M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WEGY94ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WR604D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WR604D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WRGY84ZZ0	
TRED	T.RED	8	48	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WRGY94ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WUGY84ZZ0	
REDC	REDUC.CONC	8	14	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WUGY94ZZ0	
REDC	REDUC.CONC	16	80	M, M	EIL'STD	IS-3589 GR.410	BW	WUKF24ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WVGY84ZZ0	
REDE	REDUC.ECC	8	14	M, M	B-16.9	A 234 GR.WPB-W (EPOXY COATED)	BW	WVGY94ZZ0	
REDE	REDUC.ECC	16	80	M, M	EIL'STD	IS-3589 GR.410	BW	WVKF24ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WNH046ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A95A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WPH046ZZ0	
CAP	CAP	2	42	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WFGY84ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WJ604D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WJ604D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WK604D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WK604D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WL604D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WL604D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WM604D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WM604D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13% CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 510AD	510ADZZZ0	454
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13%CR,STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 513AD	513ADZZZ0	404
GAV	VLV.GATE	26	42		BS-1414	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13% CR,STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 513PE	513PEZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	16		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BS41418Z0	
BOS	BOLT.STUD	18	80		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	42		AWWA-C207 CL.D	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GK2AX22Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A96A</b> Sheet 1 of 6

**PIPE CLASS** : **A96A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65
<b>PRESS</b>	1.03	1.03	1.03	1.03

**SERVICE**

OWS/WWS (UNDER GROUND-BY GRAVITY)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS:  
 (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>  
 (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>  
 (3) K Mu FACTOR : 0.19
- 402 SUITABILITY OF PIPE THICKNESS FOR UNDERGROUND SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF ATM AND TEMPERATURE OF 65 DEG.C.
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-  
 a) 0.5"- 24"- 0.6M  
 b) 26"-40"- 0.8M  
 c) 42"-52"- 1.0M  
 d) 54"-60"- 1.2M  
 e) 62"-64" : 1.4M
- 404 PIPES 4 INCH & ABOVE, SHALL BE EXTERNALLY "3LPE COATED" FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004
- 406 DEPTH OF BURIAL SHAL BE CONSIDERED UPTO 2.5M.
- 454 PIPES BELOW 4 INCH, SHALL BE COAL TAR TAPEED AS PER SPECIFICATION NO. B378-000-02-42-PCS-0001 AT SITE, AND FLANGES, FITTINGS, VALVES AND STRAINERS SHALL BE EXTERNALLY EPOXY COATED FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004.
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A96A</b> Sheet 2 of 6

**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 EIL STD 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, 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 7-44-0353	
PRESS.CONN	0.75"	SW, NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A96A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	4	14	STD	B-36.10	ASTM A 106 GR.B (PE COATED)	BE, SEAMLESS	PI2R417Z0	
PIP	PIPE	16	24	STD	B-36.10	A672GR.B60 CL.12 (PE COATED)	BE, SAW	PI2O316Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FSC0327Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FNC0327Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FBC0327Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FGK0321Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FCK0321Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WA604D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WA604D2Z0	
ELB90	ELBOW.90	2	24	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WAGY84Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WB604D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WB604D2Z0	
ELB45	ELBOW.45	2	24	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW, 1.5D	WBGY84Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WE604D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WE604D2Z0	
TEQ	T.EQUAL	2	24	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WEGY84ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A96A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TRED	T.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WR604D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WR604D2Z0	
TRED	T.RED	2	24	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WRGY84ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WUGY84ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WVGY84ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WNH046ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WPH046ZZ0	
CAP	CAP	2	12	M	B-16.9	A 234 GR.WPB (EPOXY COATED)	BW	WFGY84ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WJ604D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WJ604D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WK604D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WK604D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WL604D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WL604D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WM604D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WM604D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.-510AD	510ADZZ0	404
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 513AD	513ADZZ0	454
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.-520AD	520ADZZ0	404



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A96A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 523AD	523ADZZZ0	404
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 530AD	530ADZZZ0	404
CHV	VLV.CHECK	2	16		BS-1868	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 533AD	533ADZZZ0	404
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	24		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	12		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A97A</b> Sheet 1 of 6

**PIPE CLASS** : **A97A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	50	65
<b>PRESS</b>	12	12	12	12

**SERVICE**

CRWS (UNDER GROUND)

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 88 10% OF THE BUTT WELD JOINTS SHALL BE RADIOGRAPHED. HOWEVER, 50% OF THESE BUTT WELD JOINTS SHALL BE FIELD WELD JOINTS.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS:  
 (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>  
 (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>  
 (3) K Mu FACTOR : 0.19
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-  
 a) 0.5"- 24" - 0.6M  
 b) 26"-40" - 0.8M  
 c) 42"-52" - 1.0M  
 d) 54"-60" : 1.2M  
 e) 62"-64" : 1.4M
- 404 PIPES 4 INCH & ABOVE, SHALL BE EXTERNALLY "3LPE COATED" FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004
- 405 DEPTH OF BURIAL SHALL BE CONSIDERED UPTO 1.5M.
- 410 SUITABILITY OF PIPE THICKNESS FOR UNDERGROUND SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF 11.2 KG/CM<sup>2</sup>G AND TEMPERATURE OF 65 DEG.C.
- 454 PIPES BELOW 4 INCH, SHALL BE COAL TAR TAPEED AS PER SPECIFICATION NO. B378-000-02-42-PCS-0001 AT SITE, AND FLANGES, FITTINGS, VALVES AND STRAINERS SHALL BE EXTERNALLY EPOXY COATED FOR U/G SERVICE AS PER PROCESS SPECIFICATION NO. B378-000-02-42-PCS-004.

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A97A</b> Sheet 2 of 6

**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, VC1	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A97A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	4	14	STD	B-36.10	ASTM A 106 GR.B (PE COATED)	BE, SEAMLESS	PI2R417Z0	
PIP	PIPE	16	16	6.0	IS-3589	IS-3589 GR.410 (PE COATED)	BE, SAW	PI7V616Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FSC0327Z0	
FLG	FLNG.SO	2	16		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FNC0327Z0	
FLB	FLNG.BLIND	.5	16		B-16.5	ASTM A 105 (EPOXY-COATED)	150, RF/125AARH	FBC0327Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FGK0321Z0	
FEF	SPCR&BLND	10	16		ASME-B16.48	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FCK0321Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WA604D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WA604D2Z0	
ELB90	ELBOW.90	2	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW, 1.5D	WAGBM4Z10	
ELB90	ELBOW.90	8	16	M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW, 1.5D	WAGBO4Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WB604D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WB604D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW, 1.5D	WBGBM4Z10	
ELB45	ELBOW.45	8	16	M	B-16.9	A234 GR WPB-W(EXT:EPOXY	BW, 1.5D	WBGBO4Z10	

Package : IPMCS  
Report No. : 50

# A97A

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A97A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
						CTD)			
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WE604D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WE604D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WEGBM4ZZ0	
TEQ	T.EQUAL	8	16	M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WEGBO4ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WR604D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WR604D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WRGBM4ZZ0	
TRED	T.RED	8	16	M, M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WRGBO4ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WUGBM4ZZ0	
REDC	REDUC.CONC	8	16	M, M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WUGBO4ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WVGBM4ZZ0	
REDE	REDUC.ECC	8	16	M, M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW	WVGBO4ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WNH046ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105 (EPOXY-COATED)	PBE	WPH046ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SCRF, 3000	WF60482Z0	
CAP	CAP	2	16	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW	WFGBM4ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WJ604D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WJ604D2Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A97A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WK604D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WK604D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WL604D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WL604D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 6000	WM604D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105 (EPOXY-COATED)	SW, 3000	WM604D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105 (EPOXY-COATED)	SW, 6000	WQH04D3Z0	
UNN	UNION	1	1.5		BS-3799	ASTM A 105 (EPOXY-COATED)	SW, 3000	WQH04D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.-510AD	510ADZZZ0	404
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 513AD	513ADZZZ0	404
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB (EPOXY COATED),TRIM-STELLITED,STEM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 533AD	533ADZZZ0	404
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	16		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	48		B-16.21-ANSI B16.47B	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKAAAX52Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A9A</b> Sheet 1 of 6

**PIPE CLASS** : **A9A**  
**RATING** : 150  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 3 MM  
**SPECIAL REQUIREMENT** :

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

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

**SERVICE**

MILD TO MODERATE CORROSIVE PROCESS SERVICES - FLAMMABLE / NON FLAMMABLE & NON LETHAL - HVGO,VGO,RCO,SLOP,VR,VGO,CAUSTIC (NO STRESS RELIEF ZONE)

**NOTES**

- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 25.00 MM.
- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	





<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A9A</b> Sheet 3 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	26	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	30	30	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	32
PIP	PIPE	32	36	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
<b>Flange Group</b>									
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG	FLNG.WN	26	36	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	36		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	36		EIL/STD	ASTM A 516 GR.70	150, FF/125AARH	FCE6321Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A9A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16	36	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16	36	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	2	36	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A9A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301	51301ZZZ0	92
GLV	VLV.GLOBE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52301	52301ZZZ0	
CHV	VLV.CHECK	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301	53301ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54301	54301ZZZ0	
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55301	55301ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	36		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS4040Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK6627Z0	
GAS	GASKET	26	36		B-16.20-ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK5627Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : A9A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Trap/Strainer Group</b>									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	14	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	16	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1K</b> Sheet 1 of 5

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

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

TEMP	-29	38	93	149	204	260	316	343	371	399	427	454
PRESS	50.5	50.5	42.18	37.96	34.8	32.69	30.93	30.23	29.52	29.17	28.47	27.77

**SERVICE**

PURE PROCESS LIQUID, VAPOUR AND GAS OR MILD CORROSIVE HYDROCARBON - FLAMMABLE/ NON FLAMMABLE & NON LETHAL HYDROCARBONS, CHEMICAL ETC.

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 48 FOR INSULATED FLANGED JOINTS BEYOND 427 DEG.C. IN THIS CLASS, USE A453 GR.660 CL.A
- 51 DESIGN PRESSURE AT -29 DEG.C. AND 38 DEG.C. FOR THIS PRESSURE HAS BEEN REDUCED FROM 50.62 KG/CM2G TO 50.50 KG/CM2G TO OPTIMISE THE THICKNESS FOR 6" SIZE.
- 74 STRESS RUPTURE TEST AS DETAILED IN ASTM A453 SHALL BE CARRIED OUT FOR ALL ASTM A453 GR.660A BOLTING MATERIALS.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	1	1.5	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	2	2	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	3	4	10S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	6	6	10S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	51
PIP	PIPE	8	8	6.35	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	10	10	6.35	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
PIP	PIPE	12	12	8.38	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
PIP	PIPE	14	14	7.92	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
PIP	PIPE	16	18	9.53	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
PIP	PIPE	20	24	CALC	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FSC4147Z0	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FWC4147Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 182 GR.F304	300, RF/125AARH	FBC4147Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 182 GR.F304	300, FF/125AARH	FGK4141Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 182 GR.F304	300, FF/125AARH	FCK4141Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB90	ELBOW.90	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WAG894Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
ELB45	ELBOW.45	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WBG894Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TEQ	T.EQUAL	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WEG894ZZ0	
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
TRED	T.RED	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WRG894ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WUG874ZZ0	
REDC	REDUC.CONC	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WUG894ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WVG874ZZ0	
REDE	REDUC.ECC	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WVG894ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	2	24	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WK642D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WL642D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WM642D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 351 GR CF8,TRIM-SS 316	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 51445	51445ZZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1K</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 316	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZZ0	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A 351 GR.CF8,TRIM-SS 316	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52445	52445ZZZ0	
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZZ0	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 351 GR.CF8,TRIM-SS 316	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53445	53445ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT-RPTFE	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54445	54445ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	24		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	48
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 300	GK66274Z0	
<b>Trap/Strainer Group</b>									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A240TP304;INT:S S304	CONETYPE, 300,FF/125AARH	ST14139Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A182GR.F304;IN T:SS304	SW, Y-TYPE, 800	SP307D510	
PSR	STRNR.PERM	2	8	M	EIL'STD	B:A403GR.WP304-S;INT:SS304	BW, T-TYPE	SP15344Z0	
PSR	STRNR.PERM	10	24	M	EIL'STD	B:A403GR.WP304-WX;INT:SS304	BW, T-TYPE	SP15444Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1N</b> Sheet 1 of 5

**PIPE CLASS** : **B1N**  
**RATING** : 300  
**BASE MATERIAL** : SS 316L  
**CORROSION ALLOWANCE** : 0 MM  
**SPECIAL REQUIREMENT** :

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

TEMP	-29	38	93	149	204	260	316	343	371	399	427	454
PRESS	42.1	42.1	35.85	31.99	29.52	27.76	26.01	25.65	25.3	24.95	24.25	23.9

**SERVICE**

MILD TO MODERATE CORROSIVE PROCESS SERVICES - FLAMMABLE/NON FLAMMABLE & NON LETHAL.

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 48 FOR INSULATED FLANGED JOINTS BEYOND 427 DEG.C. IN THIS CLASS, USE A453 GR.660 CL.A
- 52 DESIGN PRESSURE AT -29 DEG.C. AND 38 DEG.C. FOR THIS PRESSURE HAS BEEN REDUCED FROM 42.18 KG/CM2G TO 42.10 KG/CM2G TO OPTIMISE THE THICKNESS FOR 6" SIZE.
- 74 STRESS RUPTURE TEST AS DETAILED IN ASTM A453 SHALL BE CARRIED OUT FOR ALL ASTM A453 GR.660A BOLTING MATERIALS.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1N</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	80S	B-36.19	ASTM A 312 TP316L	PE, SEAMLESS	PI34077Z0	
PIP	PIPE	1	1.5	40S	B-36.19	ASTM A 312 TP316L	PE, SEAMLESS	PI34077Z0	
PIP	PIPE	2	2	40S	B-36.19	ASTM A 312 TP316L	BE, SEAMLESS	PI34017Z0	
PIP	PIPE	3	4	10S	B-36.19	ASTM A 312 TP316L	BE, SEAMLESS	PI34017Z0	
PIP	PIPE	6	6	10S	B-36.19	ASTM A 312 TP316L	BE, SEAMLESS	PI34017Z0	52
PIP	PIPE	8	8	6.35	B-36.19	ASTM A 312 TP316L	BE, SEAMLESS	PI34017Z0	
PIP	PIPE	10	10	6.35	B-36.19	ASTM A 358 TP316L CL.1	BE, E.FS.W	PI36713Z0	
PIP	PIPE	12	12	8.38	B-36.19	ASTM A 358 TP316L CL.1	BE, E.FS.W	PI36713Z0	
PIP	PIPE	14	14	7.92	B-36.19	ASTM A 358 TP316L CL.1	BE, E.FS.W	PI36713Z0	
PIP	PIPE	16	18	9.53	B-36.19	ASTM A 358 TP316L CL.1	BE, E.FS.W	PI36713Z0	
PIP	PIPE	20	24	CALC	B-36.19	ASTM A 358 TP316L CL.1	BE, E.FS.W	PI36713Z0	
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 312 TP316L	PBE, SEAMLESS	PN34067Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 312 TP316L	PBE, SEAMLESS	PN34067Z0	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 182 GR.F316L	300, RF/125AARH	FSC4647Z0	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 182 GR.F316L	300, RF/125AARH	FWC4647Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 182 GR.F316L	300, RF/125AARH	FBC4647Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 182 GR.F316L	300, FF/125AARH	FGK4641Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 182 GR.F316L	300, FF/125AARH	FCK4641Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WA647D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 403 GR.WP316L-S	BW, 1.5D	WAGA34Z10	
ELB90	ELBOW.90	10	24	M	B-16.9	ASTM A 403 GR.WP316L-WX	BW, 1.5D	WAG864Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WB647D2Z0	

Package : IPMCS  
Report No. : 50

# B1N

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1N</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 403 GR.WP316L-S	BW, 1.5D	WBGA34Z10	
ELB45	ELBOW.45	10	24	M	B-16.9	ASTM A 403 GR.WP316L-WX	BW, 1.5D	WBG864Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WE647D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 403 GR.WP316L-S	BW	WEGA34ZZ0	
TEQ	T.EQUAL	10	24	M	B-16.9	ASTM A 403 GR.WP316L-WX	BW	WEG864ZZ0	
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WR647D2Z0	
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 403 GR.WP316L-S	BW	WRGA34ZZ0	
TRED	T.RED	10	24	M, M	B-16.9	ASTM A 403 GR.WP316L-WX	BW	WRG864ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 403 GR.WP316L-S	BW	WUGA34ZZ0	
REDC	REDUC.CONC	10	24	M, M	B-16.9	ASTM A 403 GR.WP316L-WX	BW	WUG864ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 403 GR.WP316L-S	BW	WVGA34ZZ0	
REDE	REDUC.ECC	10	24	M, M	B-16.9	ASTM A 403 GR.WP316L-WX	BW	WVG864ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F316L	PBE	WNH476ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F316L	PBE	WPH476ZZ0	
CAP	CAP	2	24	M	B-16.9	ASTM A 403 GR.WP316L-S	BW	WFGA34ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WJ647D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WK647D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WL647D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F316L	SW, 3000	WM647D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F316L,TRIM-STELLITED,STEM-SS316L	SW, 800, 3000, B-16.11, SHT NO.- 51066	51066ZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 351 GR.CF3M,TRIM-SS 316L	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 51466	51466ZZ0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B1N</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F316L,TRIM-STELLITED,STEM-SS316L	SW, 800, 3000, B-16.11, SHT NO.- 52066	52066ZZZ0	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A 351 GR.CF3M,TRIM-SS 316L	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52466	52466ZZZ0	
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F316L,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53066	53066ZZZ0	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 351 GR.CF3M,TRIM-SS 316L	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53466	53466ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 351 GR.CF3M / ASTM A 182 GR.F316L,TRIM-SEAT-RPTIFE	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54466	54466ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	24		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	48
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316L+GRAFIL+ I RING	SPIRAL, 300	GK66374Z0	
<b>Trap/Strainer Group</b>									
TSR	STRNR.TEMP	1.5	24		EIL/STD	B:A240TP316L,INT:SS316L	CONETYPE, 300,FF/125AARH	ST14339Z0	
PSR	STRNR.PERM	.5	1.5		MNF/STD	B:A182GR.F316L,INT:SS316L	SW, Y-TYPE, 800	SP316D510	
PSR	STRNR.PERM	2	8	M	EIL/STD	B:A403WP316L-S:I:SS316L	BW, T-TYPE	SP15944Z0	
PSR	STRNR.PERM	10	24	M	EIL/STD	B:A403WP316L-WX:I:SS316L	BW, T-TYPE	SP16044Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B2A</b> Sheet 1 of 5

**PIPE CLASS** : **B2A**  
**RATING** : 300  
**BASE MATERIAL** : CARBON STEEL  
**CORROSION ALLOWANCE** : 1.5 MM  
**SPECIAL REQUIREMENT** : IBR SERVICE

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

TEMP	0	38	93	149	204	260	316	343	371	399	427
PRESS	52.02	52.02	47.8	46.05	44.64	42.53	40.07	38.66	37.26	35.5	28.82

**SERVICE**

STEAM, BOILER FEED WATER & CONDENSATE - ALL IBR

**NOTES**

- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 25.00 MM.
- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 8 ALL PIPES,FITTINGS,VALVES,FLANGES,TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 9 CARBON CONTENT SHALL NOT EXCEED 0.25% FOR ALL PIPES,FITTINGS FLANGES ETC. THAT MAY REQUIRE WELDING. MOREOVER,FOR FLANGES THE SULPHUR AND PHOSPHOROUS SHALL ALSO BE LIMITED TO 0.05% EACH.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016

**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 EIL/STD 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 VALVE TO SPEC AS PER EIL STD 7-44-0354	





<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B2A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	16	20	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	
PIP	PIPE	24	24	S30	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	32
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
<b>Flange Group</b>									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	300, RF/125AARH	FSC0147Z1	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z1	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	300, RF/125AARH	FBC0147Z1	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	300, FF/125AARH	FGK0141Z1	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	300, FF/125AARH	FCK0141Z1	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z1	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z1	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z11	
ELB90	ELBOW.90	16	24	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z11	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z1	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z1	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z11	
ELB45	ELBOW.45	16	24	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z11	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z1	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B2A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z1	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ1	
TEQ	T.EQUAL	16	24	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ1	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z1	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z1	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ1	
TRED	T.RED	16	24	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ1	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ1	
REDC	REDUC.CONC	16	24	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ1	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ1	
REDE	REDUC.ECC	16	24	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ1	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ1	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ1	
CAP	CAP	2	24	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ1	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z1	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z1	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z1	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z1	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z1	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z1	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z1	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z1	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105.TRIM-	SW, 800, 3000, B-16.11, SHT NO.- 51002	51002ZZZ1	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B2A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
						STELLITED,STEM-13%CR STEEL			
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 51402	51402ZZZ1	
GLV	VLV.GLOBE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52002	52002ZZZ1	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52402	52402ZZZ1	
CHV	VLV.CHECK	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53002	53002ZZZ1	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-STELLITED	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53402	53402ZZZ1	
G3V	VLV.PISTON	.5	1		MNFSTD	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	SW, 300, 3000, B-16.11, SHT NO.- 64402	64402ZZZ1	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	24		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 300	GK66274Z0	
<b>Trap/Strainer Group</b>									
TRP	TRAP.STEAM	.5	1.5		MNFSTD	B:A105;T:13%CR;S:SS304	FLGD, THRMDNMC, 300,RF/125AARH	TR30655B1	
TSR	STRNR.TEMP	1.5	24		EILSTD	B:A516GR.70;INT:S S304	CONETYPE, 300,FF/125AARH	ST16839Z1	
PSR	STRNR.PERM	.5	1.5		MNFSTD	B:A105;INT:SS304	SW, Y -TYPE, 800	SP303D511	
PSR	STRNR.PERM	2	24		MNFSTD	B:A216GR.WCB;IN T:SS304	FLGD, Y -TYPE, 300,RF/125AARH	SP38055B1	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B71V</b> Sheet 1 of 5

**PIPE CLASS** : **B71V**  
**RATING** : 300  
**BASE MATERIAL** : DUPLEX SS  
**CORROSION ALLOWANCE** : 0 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	-29	38	93	149	204	260	315
<b>PRESS</b>	52.73	52.73	51.85	46.75	43.23	40.78	39.02

**SERVICE**

PROCESS WATER -VACUUM

**NOTES**

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 40 STIFFENER RINGS, IF NEEDED, SHALL BE PROVIDED AS PER ASME SEC. VIII, DIV. 1
- 96 VALVE TO BE TESTED FOR VACUUM AS PER ASME V, SUBSECTION-A, ARTICLE 10 (HOOD METHOD) APPENDIX IX TO CHECK SUITABILITY FOR VACUUM SERVICE.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 199 THE PIPE THICKNESS AND BRANCH REINFORCEMENT SHALL BE CALCULATED BASED ON THE ACTUAL LINE CONDITION.
- 800 ALL GATE VALVES AS PER API-600 AND ALL GATE/ GLOBE VALVES AS PER API-602 SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENTS OF API 624 AS PER CLAUSE 5.9.7 OF API 600 AND 5.9.4 OF API 602.
- 801 FOR HYDROCARBON SERVICE, GATE VALVES OF SIZE 26 INCH & ABOVE, GLOBE VALVES OF SIZE 2 INCH & ABOVE, ALL SIZE OF BALL VALVES, ALL SIZE OF PLUG VALVES AND ALL SIZE OF BUTTERFLY VALVES SHALL COMPLY WITH FUGITIVE EMISSION REQUIREMENT OF ISO-15848-1 WITH TIGHTNESS CLASS-C.

**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 VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B71V</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	CALC	B-36.19	ASTM A 790 (UNS S32750)	PE, SEAMLESS	PI3N977Z0	199
PIP	PIPE	1	1.5	CALC	B-36.19	ASTM A 790 (UNS S32750)	PE, SEAMLESS	PI3N977Z0	199
PIP	PIPE	2	2	CALC	B-36.19	ASTM A 790 (UNS S32750)	BE, SEAMLESS	PI3N917Z0	199
PIP	PIPE	3	6	CALC	B-36.19	ASTM A 790 (UNS S32750)	BE, SEAMLESS	PI3N917Z0	199
PIP	PIPE	8	8	CALC	B-36.19	ASTM A 790 (UNS S32750)	BE, SEAMLESS	PI3N917Z0	199
PIP	PIPE	10	18	CALC	B-36.19	ASTM A 790 (UNS S32750)	BE, E.F.S.W	PI3N913Z0	199
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 790 (UNS S32205)	PBE, SEAMLESS	PN3L667Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 790 (UNS S32205)	PBE, SEAMLESS	PN3L667Z0	
<b>Flange Group</b>									
FLG	FLNG.WN	.5	1.5	M	B-16.5	ASTM A 182 GR.F53	300, RF/125AARH	FWCD647Z0	
FLG	FLNG.WN	2	18	M	B-16.5	ASTM A 182 GR.F53	300, RF/125AARH	FWCD647Z0	
FLB	FLNG.BLIND	.5	12		B-16.5	ASTM A 182 GR.F53	300, RF/125AARH	FBCD647Z0	
FEF	FLNG.FIG.8	.5	12		ASME-B16.48	ASTM A 182 GR.F53	300, FF/125AARH	FGKD641Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WA6U4D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW, 1.5D	WAGT54Z10	
ELB90	ELBOW.90	10	12	M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW, 1.5D	WAGT64Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WB6U4D2Z0	
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW, 1.5D	WBG54Z10	
ELB45	ELBOW.45	10	12	M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW, 1.5D	WBG64Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WE6U4D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WEGT54ZZ0	

Package : IPMCS  
Report No. : 50

# B71V

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B71V</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
TEQ	T.EQUAL	10	12	M	B-16.11	ASTM A 815 GR.WP UNS S32750-WX	BW	WE6T64ZZ0	
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WR6U4D2Z0	
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WRGT54ZZ0	
TRED	T.RED	10	12	M, M	B-16.11	ASTM A 815 GR.WP UNS S32750-WX	BW	WR6T64ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WUGT54ZZ0	
REDC	REDUC.CONC	10	12	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW	WUGT64ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WVGT54ZZ0	
REDE	REDUC.ECC	10	12	M, M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW	WVGT64ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F53	PBE	WNHU46ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F53	PBE	WPHU46ZZ0	
CAP	CAP	2	8	M	B-16.9	ASTM A 815 GR.WP UNS S32750-S	BW	WFGT54ZZ0	
CAP	CAP	10	12	M	B-16.9	ASTM A 815 GR.WP UNS S32750-WX	BW	WFGT64ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WJ6U4D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WK6U4D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WL6U4D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F53	SW, 3000	WM6U4D2Z0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F53,TRIM-STELLITED,STEM-DUPLEX SS UNS S32750	SW, 800, 3000, B-16.11, SHT NO.- 51918	51918ZZ0	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : B71V</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GAV	VLV.GATE	2	12		API 600/ ISO 10434	BODY-ASTM A995 GR.5A UNS J93404,TRIM-STELLITED,STEM-DUPLEX SS UNS S32750	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51938	51938ZZZ0	
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F53,TRIM-STELLITED,STEM-DUPLEX SS UNS S32750	SW, 800, 3000, B-16.11, SHT NO.- 52918	52918ZZZ0	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A995 GR.5A UNS J93404,TRIM-DUPLEX SS UNS 32750	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52938	52938ZZZ0	
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F53,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53918	53918ZZZ0	
CHV	VLV.CHECK	2	12		BS-1868	BODY-ASTM A995 GR.5A UNS J93404,TRIM-DUPLEX SS UNS 32750	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53938	53938ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	12		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	12		B-16.20-ANSI B16.5	UNS S32750+GRAF+S32 750 I RING	SPIRAL, 300	GK6BC74Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J2A</b> Sheet 1 of 6

**PIPE CLASS** : **J2A**  
**RATING** : 150  
**BASE MATERIAL** : CS (Galv.)  
**CORROSION ALLOWANCE** : 0 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	0	38	65
<b>PRESS</b>	10.55	10.55	10.55

**SERVICE**

POTABLE WATER (ABOVE GROUND & UG-REFER NOTES), FIRE WATER-SPRINKLER SYSTEM AFTER ORIFICE, BURIED INSTRUMENT AIR LINE TO DELUGE VALVE

**NOTES**

- 19 THREADED JOINTS SHALL BE MADE WITH 1" WIDTH PTFE JOINING TAPE.
- 20 SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.
- 21 NO FIELD HYDROSTATIC TESTING IS PERMITTED IN INSTRUMENT AIR SERVICE.
- 104 FOR BRANCH CONNECTION "X", USE EQUAL TEE/REDUCING TEE WITH NIPPLE AND REDUCING COUPLING.
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS :
  - (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>
  - (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>
  - (3) K Mu FACTOR : 0.19
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-
  - a) 0.5"- 24" - 0.6M
  - b) 26"-40" - 0.8M
  - c) 42"-52" - 1.0M
  - d) 54"-60" : 1.2M
  - e) 62"-64" : 1.4M
- 405 DEPTH OF BURIAL SHALL BE CONSIDERED UPTO 1.5M.
- 611 NDT REQUIREMENT MAY ALSO BE REFERRED FROM EIL STD. 6-44-0016 IF DOC No. B378-6-44-0016 IS NOT PROVIDED WITH THE PACKAGE.

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J2A</b> Sheet 2 of 6

**SPECIAL NOTES**

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	1.5" & BELOW	UNIONS (SCRF) TO BE KEPT MINIMUM	
	2" & ABOVE	FLANGED (SCREWED) TO BE KEPT MINIMUM	
PIPE JOINTS	UPTO 4"	SCREWED COUPLING	
	6" & ABOVE	BUTT WELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL STD 7-44-0350, DC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D3	
VENTS	ON LINES <= 1.5"	REFER EIL STD 7-440350, VC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V3	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SCRD NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J2A</b> Sheet 4 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	3	4	STD	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	6	12	STD	B-36.10	ASTM A 106 GR.B(GALV)	BE, SEAMLESS	PI22217Z0	
<b>Flange Group</b>									
FLG	FLNG.SCRD	.5	4		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FTC0721Z0	
FLG/150	FLNG.SCRD	.5	4		B-16.5	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FTC0321Z0	
FLG	FLNG.SO	6	12		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FNC0721Z0	
FLG/150	FLNG.SO	6	12		B-16.5	ASTM A 105 (EPOXY-COATED)	150, FF/125AARH	FNC0321Z0	
FLB	FLNG.BLIND	.5	12		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FBC0721Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105(GALV.)	150, FF/125AARH	FGK0721Z0	
FEF	SPCR&BLND	10	12		ASME-B16.48	ASTM A 105(GALV.)	150, FF/125AARH	FCK0721Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WA60882Z0	
ELB90	ELBOW.90	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW, 1.5D	WAG714Z10	
ELB90	ELBOW.90	8	12	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WAG764Z10	
ELB90/3	ELBOW.90	6	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW, 1.5D	WAGBM4Z10	
ELB90/2	ELBOW.90	8	12	M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW, 1.5D	WAGBO4Z10	
ELB90/1	ELBOW.90	.5	4		B-16.9	ASTM A 105 (EPOXY-COATED)	SCRF, 3000	WAG0482Z0	
ELB45	ELBOW.45	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WB60882Z0	
ELB45	ELBOW.45	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW, 1.5D	WBG714Z10	
ELB45	ELBOW.45	8	12	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WBG764Z10	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J2A</b> Sheet 5 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
ELB45/3	ELBOW.45	6	6	M	B-16.9	A 234 GR WPB(EXT:EPOXY CTD)	BW, 1.5D	WBGBM4Z10	
ELB45/2	ELBOW.45	8	12	M	B-16.9	A234 GR WPB-W(EXT:EPOXY CTD)	BW, 1.5D	WBGBO4Z10	
ELB45/1	ELBOW.45	.5	4		B-16.9	ASTM A 105 (EPOXY-COATED)	SCRF, 3000	WBG0482Z0	
TEQ	T.EQUAL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WE60882Z0	
TEQ	T.EQUAL	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WEG714ZZ0	
TEQ	T.EQUAL	8	12	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WEG764ZZ0	
TRED	T.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WR60882Z0	
TRED	T.RED	6	6	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WRG714ZZ0	
TRED	T.RED	8	12	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WRG764ZZ0	
REDC	REDUC.CONC	6	6	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WUG714ZZ0	
REDC	REDUC.CONC	8	12	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WUG764ZZ0	
REDE	REDUC.ECC	6	6	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WVG714ZZ0	
REDE	REDUC.ECC	8	12	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WVG764ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WNH08EZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WPH08EZZ0	
CAP	CAP	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WF60882Z0	
CAP	CAP	6	12	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WFG714ZZ0	
CPLF	CPLNG.FULL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WJ60882Z0	
CPLH	CPLNG.HALF	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WK60882Z0	
CPLL	CPLNG.LH	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WL60882Z0	
CPLR	CPLNG.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WM60882Z0	
UNN	UNION	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WQ60882Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J2A</b> Sheet 6 of 6

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

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2	SCR.F, CL.2, 3000, B-1.20.1, SHT NO.- 51080	51080ZZZ0	626
GAV	VLV.GATE	2	12		IS:14846	BODY-IS 210 GR.FG 200,TRIM-IS 320 ALLOY HT2	FLGD, PN1.6, B-16.5, FF/125AARH, SHT NO.- 51983	51983ZZZ0	626
GAV	VLV.GATE	2	6		IS:14846	BODY-IS 210 GR.FG 200,TRIM- IS 320 ALLOY HT2	FLGD, PN1.6, B-16.1, FF/125AARH, SHT NO.- 51380	51380ZZZ0	626
GAV	VLV.GATE	8	12		IS:14846	BODY-IS 210 GR.FG 200,TRIM-IS 320 ALLOY HT2	FLGD, PN1.6, B-16.5, FF/125AARH, SHT NO.- 51980	51980ZZZ0	626
GAV/1	VLV.GATE	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.2 LEADED TIN BRONZE,TRIM-IS 320 ALLOY HT2	SCR.F, CL.2, 3000, B-1.20.1, SHT NO.- 51981	51981ZZZ0	626
GLV	VLV.GLOBE	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2	SCR.F, CL.2, 3000, B-1.20.1, SHT NO.- 52080	52080ZZZ0	626
CHV	VLV.CHECK	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2	SCR.F, CL.2, 3000, B-1.20.1, SHT NO.- 53080	53080ZZZ0	626
CHV	VLV.CHECK	2	6		IS:5312 (PT-1)	BODY-IS 210 GR.FG 200,TRIM- IS 320 ALLOY HT2	FLGD, PN1.6, B-16.1, FF/125AARH, SHT NO.- 53380	53380ZZZ0	626
<b>Bolt Group</b>									
BOM	BOLT.M/C	.5	12		B-18.2	BOLT:A307 GR.B(GALV), NUT:A563 GR.B(GALV)		BM41519Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	12		B-16.21-ANSI B16.5	BUTYL RUBBER	FULLFACE, 150, 2 MM	GKB0422Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J88A</b> Sheet 1 of 4

**PIPE CLASS** : **J88A**  
**RATING** : 150  
**BASE MATERIAL** : CS (Galv.)  
**CORROSION ALLOWANCE** : 0 MM  
**SPECIAL REQUIREMENT** :

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

<b>TEMP</b>	5	38	65
<b>PRESS</b>	17	17	17

**SERVICE**

HIGH PRESSURE WATER SPRAY SYSTEM (A/G &amp; U/G)

**NOTES**

- 19 THREADED JOINTS SHALL BE MADE WITH 1" WIDTH PTFE JOINING TAPE.
- 20 SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.
- 46 FOR BRANCH CONNECTION "X", USE EQUAL TEE/REDUCING TEE WITH NIPPLE AND REDUCING COUPLING.
- 102 THICKNESS VALID FOR A/G & U/G
- 151 NDT REQUIREMENTS AS PER JOB SPECIFICATION B378-6-44-0016
- 401 SOIL CONDITIONS FOR UNDER-GROUND PIPING ARE AS FOLLOWS :
- (1) MODULUS OF ELASTICITY : 120 kg/cm<sup>2</sup>
- (2) DENSITY OF MOIST SOIL : 1800 kg/m<sup>3</sup>
- (3) K Mu FACTOR : 0.19
- 403 MINIMUM SOIL COVER FOR UNDER GROUND PIPING SHALL BE AS FOLLOWS:-
- a) 0.5"- 24"- 0.6M
- b) 26"-40"- 0.8M
- c) 42"-52" - 1.0M
- d) 54"-60": 1.2M
- e) 62"-64" : 1.4M
- 405 DEPTH OF BURIAL SHALL BE CONSIDERED UPTO 1.5M.

**SPECIAL NOTES**

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	1.5" & BELOW	UNIONS (SCRF) TO BE KEPT MINIMUM	
	2" & ABOVE	FLANGED (SCREWED) TO BE KEPT MINIMUM	
PIPE JOINTS		SCREWED COUPLING (UPTO 4 INCH), BUTTWELDED ( 6 INCH & ABOVE),	
DRAINS	ON LINES <= 1.5"	REFER EIL STD 7-44-0350, DC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D3	
VENTS	ON LINES <= 1.5"	REFER EIL STD 7-440350, VC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V3	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SCRD NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	





<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J88A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Pipe Group</b>									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, WELDED	PI22299Z0	
PIP	PIPE	1	2	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	3	4	STD	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	6	14	STD	B-36.10	ASTM A 106 GR.B(GALV)	BE, SEAMLESS	PI22217Z0	
<b>Flange Group</b>									
FLG	FLNG.SCRD	.5	4		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FTC0721Z0	
FLG	FLNG.WN	6	12	M	B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FWC0721Z0	
FLB	FLNG.BLIND	.5	12		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FBC0721Z0	
FEF	FLNG.FIG.8	.5	12		ASME-B16.48	ASTM A 105(GALV.)	150, FF/125AARH	FGK0721Z0	
<b>Fitting Group</b>									
ELB90	ELBOW.90	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WA60882Z0	
ELB90	ELBOW.90	6	12	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WAG764Z10	
ELB45	ELBOW.45	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WB60882Z0	
ELB45	ELBOW.45	6	12	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WBG764Z10	
TEQ	T.EQUAL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WE60882Z0	
TEQ	T.EQUAL	6	12	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WEG764ZZ0	
TRED	T.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WR60882Z0	
TRED	T.RED	6	12	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WRG764ZZ0	
REDC	REDUC.CONC	6	12	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WUG714ZZ0	
REDE	REDUC.ECC	6	12	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WVG714ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WNH08EZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WPH08EZZ0	
CAP	CAP	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WF60882Z0	
CPLF	CPLNG.FULL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WJ60882Z0	

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect. :</b> 16/43
<b>Project</b> :PDH-PP USAR	
<b>Location</b> USAR	<b>Pipe Class : J88A</b> 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 (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
<b>Fitting Group</b>									
CPLH	CPLNG.HALF	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WK60882Z0	
CPLL	CPLNG.LH	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WL60882Z0	
CPLR	CPLNG.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WM60882Z0	
UNN	UNION	.5	4		B-16.11	ASTM A 234 GR.WPB(GALV)	SCRF, NA	WQ6718ZZ0	
<b>Valves Group</b>									
GAV	VLV.GATE	.5	1.5		MSS-SP80	BODY-ASTM B62 UNS C83600,TRIM-BRONZE	SCRF, 150, 3000, B-1.20.1, SHT NO.- 51090	51090ZZZ0	
GAV	VLV.GATE	2	12		MSS-SP128	BODY-ASTM A 395.TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 51390	51390ZZZ0	
GLV	VLV.GLOBE	.5	1.5		MSS-SP80	BODY-ASTM B62 UNS C83600,TRIM-BRONZE	SCRF, 150, 3000, B-1.20.1, SHT NO.- 52090	52090ZZZ0	
CHV	VLV.CHECK	.5	1.5		MSS-SP80	BODY-ASTM B62 UNS C83600,TRIM-BRONZE	SCRF, 150, 3000, B-1.20.1, SHT NO.- 53090	53090ZZZ0	
CHV	VLV.CHECK	2	12		MSS-SP136	BODY-ASTM A 395.TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 53390	53390ZZZ0	
<b>Bolt Group</b>									
BOS	BOLT.STUD	.5	12		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
<b>Gasket Group</b>									
GAS	GASKET	.5	12		B-16.21-ANSI B16.5	BUTYL RUBBER	FULLFACE, 150, 2 MM	GKB0422Z0	

**ANNEXURE - II (TO PMS)**

# PIPING MATERIAL SPECIFICATION EXTRACTS

**Client : GAIL CORPORATE OFF**

**Project : PDH-PP USAR**

**Location : USAR**

**Job No. : B378**

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E	31/12/2021	ISSUED FOR BIDS	PK	SD	PKA
Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by

**Abbreviations:**

**PMS :** Piping Material Specifications.

CONTENTS

Sl. No.	Description	Pages
1.	Piping Material Specification Extracts, (B378-6-44-0005-A2) Rev.E Annexure - II	10

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect.</b> 16/43
<b>Project</b> :PDH-PP USAR	<b>Job No.</b> : B378
<b>Location</b> :USAR	

**INDEX OF SPECIFICATIONS**

A19A	REV E	, A1A	REV E	, A1K	REV E	, A2A	REV E	,
A33A	REV E	, A39A	REV E	, A3A	REV E	, A3K	REV E	,
A71V	REV E	, A91A	REV E	, A92A	REV E	, A93A	REV E	,
A94A	REV E	, A95A	REV E	, A96A	REV E	, A97A	REV E	,
A9A	REV E	, B1K	REV E	, B1N	REV E	, B2A	REV E	,
B71V	REV E	, J2A	REV E	, J88A	REV E			

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect.</b> 16/43
<b>Project</b> :PDH-PP USAR	<b>Job No.</b> : B378
<b>Location</b> :USAR	

<b>PIPING MATERIAL CLASS :</b> A19A REV : E		<b>GASKET MATERIAL :</b> SP.WND SS316+GRAFIL+ I RING								
<b>CORROSION ALLOWANCE :</b> 03.00 MM	<b>PIPE MATERIAL :</b> ASTM A 672 GR.B60 CL.22	FROM 16.000	TO 36.000							
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 14.000							
Temp (deg. C)	- 29.0	38.0	93.0	149.0	204.0	260.0	316.0	343.0	371.0	
Press (Kg/sq. cm g)	20.03	20.03	18.28	16.17	14.06	11.95	9.84	8.78	7.73	
<b>SERVICE :</b> NONNACE MILD CORROSIVE SOUR & AMINE - STRESS RELIEVED; NON NACE SOUR FLARE.  CAUSTIC (STRESS RELIEVED ZONE)										
<b>VALVE DETAILS</b>										
<b>TYPE FROM TO</b>										
GATE 00.500 24.000										
GLOBE 00.250 16.000										
CHECK 00.500 24.000										
BALL 00.500 16.000										
PLUG 00.500 24.000										
BTRFLY 03.000 36.000										

<b>PIPING MATERIAL CLASS :</b> A1A REV : E		<b>GASKET MATERIAL :</b> SP.WND SS316+GRAFIL+ I RING								
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 14.000							
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 672 GR.B60 CL.12	FROM 16.000	TO 72.000							
Temp (deg. C)	- 29.0	38.0	93.0	149.0	204.0	260.0	316.0	343.0	371.0	
Press (Kg/sq. cm g)	20.03	20.03	18.28	16.17	14.06	11.95	9.84	8.78	7.73	
<b>SERVICE :</b> NON CORROSIVE/ FLAMMABLE / NON FLAMMABLE/ NON LETHAL -PROCESS & HYDROCARBONS; HYDROCARBON FLARE ; LUBE OIL BEFORE FILTER; AMMONIA, STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A IN OFFSITES), PLANT AIR, NITROGEN, CARBONDIOXIDE; WATER - BEYOND A3A, VENT TO ATMOSPHERE, DRY OUT AIR IN PDH UNIT, NATURAL GAS, DRYER REGENERATION FEED, PURGE GAS, REGENERATION AIR, WASH OIL, CLOSED HC DRAIN										
<b>VALVE DETAILS</b>										
<b>TYPE FROM TO</b>										
GATE 00.250 42.000										
GLOBE 00.250 16.000										
CHECK 00.250 24.000										
BALL 00.500 16.000										
PLUG 00.500 36.000										
BTRFLY 03.000 48.000										

<b>PIPING MATERIAL CLASS :</b> A1K REV : E		<b>GASKET MATERIAL :</b> SP.WND SS316+GRAFIL+ I RING								
<b>CORROSION ALLOWANCE :</b> 00.00 MM	<b>PIPE MATERIAL :</b> ASTM A 358 TP304 CL.1	FROM 10.000	TO 24.000							
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 312 TP304	FROM 00.500	TO 08.000							
Temp (deg. C)	- 29.0	38.0	93.0	149.0	204.0	260.0	316.0	343.0	371.0	
Press (Kg/sq. cm g)	19.33	19.33	16.17	14.41	13.35	11.95	9.84	8.78	7.73	
<b>SERVICE :</b> PURE NON CORROSIVE OR MILD CORROSIVE HYDROCARBONS FLAMMABLE/NON FLAMMABLE & NON LETHAL HYDROCARBONS, LUBE OIL (AFTER FILTERS), CHEMICALS ETC., INSTRUMENT AIR(BEYOND CAT-'D' WITHIN UNITS & OFFSITE PACKAGES), SEAL OIL										
<b>VALVE DETAILS</b>										
<b>TYPE FROM TO</b>										
GATE 00.500 24.000										
GLOBE 00.500 16.000										
CHECK 00.500 24.000										
BALL 00.500 16.000										
PLUG 00.500 24.000										

<b>PIPING MATERIAL CLASS :</b> A2A REV : E		<b>GASKET MATERIAL :</b> SP.WND SS316+GRAFIL+ I RING								
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 14.000							
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 672 GR.B60 CL.12	FROM 16.000	TO 36.000							
Temp (deg. C)	0.0	38.0	93.0	149.0	204.0	260.0	280.0	300.0	371.0	
Press (Kg/sq. cm g)	20.03	20.03	18.28	16.17	14.06	11.95	11.19	10.44	7.73	
<b>SERVICE :</b> STEAM (IBR), BOILER FEED WATER (IBR) & CONDENSATE (IBR)										
<b>VALVE DETAILS</b>										
<b>TYPE FROM TO</b>										
GATE 00.500 36.000										
GLOBE 00.500 16.000										
CHECK 00.500 24.000										
BALL 00.500 01.500										
PISTON 00.500 01.000										



<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect.</b> 16/43
<b>Project</b> :PDH-PP USAR	<b>Job No.</b> : B378
<b>Location</b> :USAR	

<b>PIPING MATERIAL CLASS :</b> A33A REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> IS-3589 GR.410	FROM 16.000	TO 48.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 14.000
Temp (deg. C)	0.0	38.0	50.0
Press (Kg/sq. cm g)	18.90	18.90	18.90
<b>SERVICE :</b> FIRE WATER (ABOVE GROUND)		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.250 42.000
		GLOBE	00.250 16.000
		CHECK	00.250 48.000

<b>PIPING MATERIAL CLASS :</b> A39A REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 14.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> IS-3589 GR.410	FROM 16.000	TO 80.000
Temp (deg. C)	0.0	38.0	50.0
Press (Kg/sq. cm g)	10.55	10.55	10.55
<b>SERVICE :</b> 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", BLOW DOWN, CHEMICAL DRAIN, SERVICE WATER, COOLING WATER SUPPLY/ RETURN, NON-CONTAMINATED SEWER, WASTE WATER, OILY CONTAMINATED RAINY WATER DRAIN, TEMPERED WATER		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.250 24.000
		GLOBE	00.250 16.000
		CHECK	00.250 48.000
		BALL	00.500 16.000
		BTRFLY	03.000 52.000

<b>PIPING MATERIAL CLASS :</b> A3A REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> IS-3589 GR.410	FROM 16.000	TO 80.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 14.000
Temp (deg. C)	0.0	38.0	50.0
Press (Kg/sq. cm g)	10.55	10.55	10.55
<b>SERVICE :</b> NON CORROSIVE UTILITIES (ABOVE GROUND) CATEGORY "D" FLUID - COOLING WATER, INSTRUMENT AIR(2" & ABOVE-IN OFFISTES), 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 & 7.0 KG/CM2G RESPECTIVELY.		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.250 24.000
		GLOBE	00.250 16.000
		CHECK	00.250 48.000
		BALL	00.500 16.000
		BTRFLY	03.000 48.000

<b>PIPING MATERIAL CLASS :</b> A3K REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 00.00 MM	<b>PIPE MATERIAL :</b> ASTM A 312 TP304	FROM 00.500	TO 08.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 358 TP304 CL.1	FROM 10.000	TO 14.000
Temp (deg. C)	0.0	38.0	93.0
Press (Kg/sq. cm g)	10.55	10.55	10.55
<b>SERVICE :</b> DEMINEALISED WATER (OUTSIDE DM PLANT BATTERY LIMITS), POLISHED WATER, POLISHED CONDENSATE, INSTRUMENT AIR(WITHIN UNITS & OFFSITE PACKAGES) - CATEGORY 'D'		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.500 24.000
		GLOBE	00.500 16.000
		CHECK	00.500 24.000
		BTRFLY	03.000 14.000

<b>Client</b> :GAIL CORPORATE OFF	<b>Dept./Sect.</b> 16/43
<b>Project</b> :PDH-PP USAR	<b>Job No.</b> : B378
<b>Location</b> :USAR	

<b>PIPING MATERIAL CLASS :</b> A71V <b>REV :</b> E		<b>GASKET MATERIAL :</b> UNS S32750+GRAF+S32750 I RING					
<b>CORROSION ALLOWANCE :</b> 00.00 MM		<b>PIPE MATERIAL :</b> ASTM A 790 (UNS S32750) FROM 00.500 TO 18.000					
<b>ANSI RATING :</b> 150							
Temp (deg. C)	-29.0	38.0	93.0	149.0	204.0	260.0	315.0
Press (Kg/sq. cm g)	20.38	20.38	18.28	16.17	14.06	11.95	9.84
<b>SERVICE :</b> PROCESS WATER -VACUUM				<b>VALVE DETAILS</b>			
				<b>TYPE</b>	<b>FROM</b>	<b>TO</b>	
				GATE	00.500	12.000	
				GLOBE	00.500	12.000	
				CHECK	00.500	12.000	

<b>PIPING MATERIAL CLASS :</b> A91A <b>REV :</b> E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X					
<b>CORROSION ALLOWANCE :</b> 01.50 MM		<b>PIPE MATERIAL :</b> IS-3589 GR.410 (PE COATED) FROM 16.000 TO 40.000					
<b>ANSI RATING :</b> 150		<b>PIPE MATERIAL :</b> ASTM A 106 GR.B FROM 00.500 TO 03.000					
		<b>PIPE MATERIAL :</b> ASTM A 106 GR.B (PE COATE) FROM 04.000 TO 14.000					
Temp (deg. C)	0.0	38.0	50.0	65.0			
Press (Kg/sq. cm g)	18.90	18.90	18.90	18.90			
<b>SERVICE :</b> FIRE WATER (UNDER GROUND ONLY)				<b>VALVE DETAILS</b>			
				<b>TYPE</b>	<b>FROM</b>	<b>TO</b>	
				GATE	00.500	24.000	
				GLOBE	00.250	16.000	
				CHECK	00.500	12.000	

<b>PIPING MATERIAL CLASS :</b> A92A <b>REV :</b> E		<b>GASKET MATERIAL :</b> SP.WND SS316+GRAFIL+ I RING							
<b>CORROSION ALLOWANCE :</b> 01.50 MM		<b>PIPE MATERIAL :</b> ASTM A 106 GR.B FROM 00.500 TO 14.000							
<b>ANSI RATING :</b> 150									
Temp (deg. C)	-29.0	38.0	93.0	149.0	204.0	260.0	316.0	343.0	371.0
Press (Kg/sq. cm g)	20.03	20.03	18.28	16.17	14.06	11.95	9.84	8.78	7.73
<b>SERVICE :</b> CLOSED BLOWDOWN (UG), HYDRCARBON (UG), WATER (UG)				<b>VALVE DETAILS</b>					
				<b>TYPE</b>	<b>FROM</b>	<b>TO</b>			
				GATE	00.250	42.000			
				GLOBE	00.250	16.000			
				CHECK	00.250	24.000			

<b>PIPING MATERIAL CLASS :</b> A93A <b>REV :</b> E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X					
<b>CORROSION ALLOWANCE :</b> 01.50 MM		<b>PIPE MATERIAL :</b> IS-3589 GR.410 (PE COATED) FROM 16.000 TO 64.000					
<b>ANSI RATING :</b> 150		<b>PIPE MATERIAL :</b> ASTM A 106 GR.B FROM 00.500 TO 03.000					
		<b>PIPE MATERIAL :</b> ASTM A 106 GR.B (PE COATE) FROM 04.000 TO 14.000					
Temp (deg. C)	0.0	38.0	50.0	65.0	100.0	150.0	186.0
Press (Kg/sq. cm g)	10.55	10.55	10.55	10.55	10.55	10.55	10.55
<b>SERVICE :</b> COOLING WATER (UNDER GROUND)				<b>VALVE DETAILS</b>			
				<b>TYPE</b>	<b>FROM</b>	<b>TO</b>	
				GATE	00.500	42.000	
				GLOBE	00.500	16.000	
				CHECK	00.500	16.000	
				BTRFLY	03.000	52.000	

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<b>PIPING MATERIAL CLASS :</b> A94A REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B (PE COATEI	FROM 04.000	TO 12.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 03.000
Temp (deg. C)	0.0	38.0	50.0
Press (Kg/sq. cm g)	12.00	12.00	12.00
<b>SERVICE :</b> OWS/WWS (UNDER GROUND)		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.500 24.000
		GLOBE	00.500 01.500
		CHECK	02.000 16.000

<b>PIPING MATERIAL CLASS :</b> A95A REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B (PE COATEI	FROM 04.000	TO 14.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 03.000
	<b>PIPE MATERIAL :</b> IS-3589 GR.410 (PE COATED)	FROM 16.000	TO 42.000
Temp (deg. C)	0.0	38.0	50.0
Press (Kg/sq. cm g)	1.03	1.03	1.03
<b>SERVICE :</b> CRWS ( UNDERGROUND -BY GRAVITY)		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.500 42.000

<b>PIPING MATERIAL CLASS :</b> A96A REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B (PE COATEI	FROM 04.000	TO 14.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> A672GR.B60 CL.12 (PE COATEI	FROM 16.000	TO 24.000
	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 03.000
Temp (deg. C)	0.0	38.0	50.0
Press (Kg/sq. cm g)	1.03	1.03	1.03
<b>SERVICE :</b> OWS/WWS (UNDER GROUND-BY GRAVITY)		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.500 24.000
		GLOBE	00.500 16.000
		CHECK	00.500 16.000

<b>PIPING MATERIAL CLASS :</b> A97A REV : E		<b>GASKET MATERIAL :</b> NONASBESTOS BS7531 GR X	
<b>CORROSION ALLOWANCE :</b> 01.50 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B (PE COATEI	FROM 04.000	TO 14.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> IS-3589 GR.410 (PE COATED)	FROM 16.000	TO 16.000
	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 03.000
Temp (deg. C)	0.0	38.0	50.0
Press (Kg/sq. cm g)	12.00	12.00	12.00
<b>SERVICE :</b> CRWS (UNDER GROUND)		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.500 24.000
		CHECK	02.000 24.000

<b>PIPING MATERIAL CLASS :</b> A9A REV : E		<b>GASKET MATERIAL :</b> SP.WND SS316+GRAFIL+ I RING	
<b>CORROSION ALLOWANCE :</b> 03.00 MM	<b>PIPE MATERIAL :</b> ASTM A 106 GR.B	FROM 00.500	TO 14.000
<b>ANSI RATING :</b> 150	<b>PIPE MATERIAL :</b> ASTM A 672 GR.B60 CL.12	FROM 16.000	TO 36.000
Temp (deg. C)	- 29.0	38.0	93.0
Press (Kg/sq. cm g)	20.03	20.03	18.28
		149.0	204.0
		16.17	14.06
		260.0	260.0
		11.95	11.95
		316.0	316.0
		9.84	9.84
		343.0	343.0
		8.78	8.78
		371.0	371.0
		7.73	7.73
<b>SERVICE :</b> MILD TO MODERATE CORROSIVE PROCESS SERVICES - FLAMMABLE / NON FLAMMABLE & NON LETHAL - HVGO,VGO,RCO,SLOP,VR,VGO,CAUSTIC (NO STRESS RELIEF ZONE)		<b>VALVE DETAILS</b>	
		<b>TYPE</b>	<b>FROM TO</b>
		GATE	00.250 42.000
		GLOBE	00.250 16.000
		CHECK	00.250 24.000
		BALL	00.500 16.000
		PLUG	00.500 24.000



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<b>Project</b> :PDH-PP USAR	<b>Job No.</b> : B378
<b>Location</b> :USAR	

<b>PIPING MATERIAL CLASS :</b> J2A REV : E				<b>GASKET MATERIAL :</b> BUTYL RUBBER		
<b>CORROSION ALLOWANCE :</b> 00.00 MM		<b>PIPE MATERIAL :</b> ASTM A 106 GR.B(GALV)		<b>FROM</b> 00.500 <b>TO</b> 12.000		
<b>ANSI RATING :</b> 150						
Temp (deg. C)	0.0	38.0	65.0			
Press (Kg/sq. cm g)	10.55	10.55	10.55			
<b>SERVICE :</b> POTABLE WATER (ABOVE GROUND & UG-REFER NOTES), FIRE WATER- SPRINKLER SYSTEM AFTER ORIFICE, BURIED INSTRUMENT AIR LINE TO DELUGE VALVE				<b>VALVE DETAILS</b>		
				<b>TYPE</b>	<b>FROM</b>	<b>TO</b>
				GATE	00.500	12.000
				GLOBE	00.500	01.500
				CHECK	00.500	06.000

<b>PIPING MATERIAL CLASS :</b> J88A REV : E				<b>GASKET MATERIAL :</b> BUTYL RUBBER		
<b>CORROSION ALLOWANCE :</b> 00.00 MM		<b>PIPE MATERIAL :</b> ASTM A 106 GR.B(GALV)		<b>FROM</b> 00.500 <b>TO</b> 14.000		
<b>ANSI RATING :</b> 150						
Temp (deg. C)	5.0	38.0	65.0			
Press (Kg/sq. cm g)	17.00	17.00	17.00			
<b>SERVICE :</b> HIGH PRESSURE WATER SPRAY SYSTEM (A/G & UG)				<b>VALVE DETAILS</b>		
				<b>TYPE</b>	<b>FROM</b>	<b>TO</b>
				GATE	00.500	12.000
				GLOBE	00.500	01.500
				CHECK	00.500	12.000