

 <p><b>PE&amp;SD-Mech.</b></p>		<h2 style="margin: 0;">PIPING MATERIAL SPECIFICATION</h2>						<b>11D</b>			
<b>Customer:</b> ONGC HAZIRA											
<b>ANSI CLASS:</b> 150											
<b>MATERIAL:</b> CARBON STEEL								Rev00A			
<b>CORR.ALL:</b> 1.0 mm								27.07.15			
Special requirement NON IBR											
<b>TEMPERATURE (Deg.C) &amp; PRESSURE (kg/cm2 g) RATINGS</b>											
TEMP	38	50	100								
PRESS.	7.00	7.00	7.00								
SERVICE	COOLING WATER LINES										
	ITEM	SIZE		DESCRIPTION							
	MAINT. JOINTS	ALL		FLANGED (TO BE KEPT MINIMUM)							
	PIPE JOINTS	ALL		SW COUPLING (REF NOTE-5) BUTT WELDED AS PER ANSI B16.25							
	DRAINS	ALL		1" OR AS PER BHEL STD. DRG. NO.4-38101-02488							
	VENTS	ALL		1" OR AS PER BHEL STD. DRG. NO.4-38101-02488							
	TEMP. CONN.	M33X2		INSTALLATION AS PER BHEL STD. DWG.NO 4-38101-02488							
	PRESS. CONN.	1/2"		INSTALLATION AS PER BHEL STD. DWG.NO 4-38101-02488							
NOTES	1. ALL FLANGED VALVES ABOVE 24" SIZE SHALL HAVE FLANGED END AS PER AWWA C207 CL D.										
	2. VENT & DRAIN ISOLATION VALVES SHALL BE GATE VALVES .										
	3. WELDED PIPE SHALL HAVE ONLY LONGITUDINAL WELD MADE BY EMPLOYING AUTOMATIC WELDING.										
	4. MINIMUM THICKNESS OF FITTING SHALL BE IN LINE WITH THE PIPE SCHEDULE OR THICKNESS.										
	5. USE BUTTERFLY VALVES INSTEAD OF GATE VALVE FROM 10" ON WARDS IN WATER SERVICE UP TO 70 DEG CEN. BUTTER FLY VALVE SHALL BE OF PN 10 RATED WITH DESIGN PRESSURE OF 10 KG/CM2 (g).										
	6. MSW GASKET SHALL BE SELF ALIGNING TYPE WITH INNER RING OF SPIRAL STRIP MATERIAL.										
	7. FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.										
	8. MITRE BENDS 90DEG SHALL BE 5-PIECE FOR SIZES FROM 26" TO 52". MITRE BENDS 45 DEG SHALL BE 3-PIECE FOR SIZES FROM 26" TO 42".										
	9. NDT REQUIREMENTS AS PER BHEL STD DOC NO GT 57124										
	10. FOR GENERAL NOTES ON PMS,PIPING & VALVES REFER STD. NO GT 69959.										
ITEMS	TYPE	ENDS	DIA. RANGE (INCH)		SCH/ THK/	FACE FINISH /	DIM / DESG. STD.	BASIC MATERIAL CARBON STEEL		NOTE	Revision
			LOW	HIGH	RATING	RADIUS		DESCRIPTION	BHEL SPEC		
PIPES	WELDED PIPE	BE	½	2	HVY		IS 1239	IS 1239 PART 1	AA10152	3	
	WELDED PIPE	BE	3	6	HVY		IS 1239	IS 1239 PART 1	AA10152	3	
	WELDED PIPE	BE	8	18	10.0		IS 3589	IS 3589 Gr FE330	GT57880	3	
	WELDED PIPE	BE	20	38	10.0		IS 3589	IS 3589 Gr FE330	GT57880	3	
	WELDED PIPE	BE	24	38	10.0		IS 3589	IS 3589 Gr FE330	GT57880	3	
	WELDED PIPE	BE	40	42	12.0		IS 3589	IS 3589 Gr FE330	GT57880	3	
FLANGES	SLIP ON	RF	½	1½	300	125AARH	B 16.5	ASTM A 105	AA7246106		
	SLIP ON	RF	2	24	150	125AARH	B 16.5	ASTM A 105	AA7246101		
	SLIP ON (HUB TYPE)	FF	26	42	150	125AARH	AWWA-C207 CL.D	ASTM A 105			
	BLIND	RF	½	1½	300	125AARH	B 16.5	ASTM A 105	HY7246772		
	BLIND	RF	2	24	150	125AARH	B 16.5	ASTM A 105	HY7246166		
	BLIND	FF	26	52	150	125AARH	AWWA-C207 CL.D	ASTM A285 GRC		8	
	FIGURE8 BLANK	FF	½	1½	300	125AARH	B 16.48	ASTM A 105	GT57083		
	FIGURE8 BLANK	FF	2	8	150	125AARH	B 16.48	ASTM A 105	GT57083		
	SPACER & BLIND	FF	10	24	150	125AARH	B 16.48	ASTM A 105	GT57083		
	SPACER & BLIND	FF	26	42	150	125AARH	MNF STD AS PER 31.3	ASTM A285 GRC		8	
ELBOWS 90 DEG	SW	½	1½	3000		B 16.11	ASTM A 105				
ELBOWS 90 DEG	BW	2	14	M	R=1.5D	B 16.9	ASTM A 234 GR WPB	HY7242695	4		
ELBOWS 90 DEG	BW	16	24	M	R=1.5D	B 16.9	ASTM A 234 GR WPB-W	HY7242695	4		
MITRE 90	BW	26	42	M	R=1.5D	BHEL STD	IS 3589 GR FE 410	GT57220-0	4,8		
ELBOWS 45 DEG	BW	2	14	M	R=1.5D	B 16.9	ASTM A 234 GR WPB		4		
ELBOWS 45 DEG	BW	16	24	M	R=1.5D	B 16.9	ASTM A 234 GR WPB-W		4		
MITRE 45	BW	26	42	M	R=1.5D	BHEL STD	IS 3589 GR FE 410		4,8		
EQ. TEE	SW	½	1½	3000		B 16.11	ASTM A 105	AA7242510			
EQ. TEE	BW	2	14	M		B 16.9	ASTM A 234 GR WPB	AA7242511	4		
EQ. TEE	BW	16	24	M		B 16.9	ASTM A 234 GR WPB-W	AA7242511	4		
EQ. TEE	BW	26	42	M		B 16.9	ASTM A 234 GR WPB-W		4		

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<b>ANSI CLASS:</b> 150											
<b>MATERIAL:</b> CARBON STEEL											
<b>CORR.ALL.</b> 1.0 mm								Rev00A			
<b>Special requirement</b> NON IBR								27.07.15			
<b>FITTINGS</b>	CON. RDCR	BW	2	14	M,M		B 16.9	ASTM A 234 GR WPB		4	
	CON. RDCR	BW	16	24	M,M		B 16.9	ASTM A 234 GR WPB-W		4	
	CON. RDCR	BW	26	42	M,M		BHEL STD	IS 3589 GR FE 410		4	
	ECC. RDCR	BW	2	14	M,M		B 16.9	ASTM A 234 GR WPB		4	
	ECC. RDCR	BW	16	24	M,M		B 16.9	ASTM A 234 GR WPB-W		4	
	ECC. RDCR	BW	26	42	M,M		BHEL STD	IS 3589 GR FE 410		4	
	CAP	NPT(F)	½	1½	3000		B 16.11	ASTM A 105	HY7242579		
	CAP	BW	2	42	M		B 16.9	ASTM A 234 GR WPB	HY7242570		
	FULL COUPLING	NPT/NPT	½	1½	3000		B 16.11	ASTM A 105	HY7242595		
	FULL COUPLING	SW	½	1½	3000		B 16.11	ASTM A 105	AA7242520		
	VI (HALF CPLG)	SW	½	1½	3000		B 16.11	ASTM A 105			
	NIPPLE	BW /NPT	½	¾	S 160		B 16.11	A106 GRB			
	NIPPLE	BW /NPT	1	1½	S 80		B 16.11	A106 GRB			
	NIPPLE	NPT/NPT	½	¾	S 160		B 16.11	A106 GRB			
NIPPLE	NPT/NPT	1	1½	S 80		B 16.11	A106 GRB				
<b>VALVES</b>	GATE	SW	½	1½	800		API 602 / BS 5352	A 105	AA7521468		
	GATE	FL	2	2	800	B16.5	API 600	A 216 GR. WCB	AA7521408		
	GATE	FL	3	8	150	B16.5	API 600	A 216 GR. WCB	AA7521408		
	GLOBE	SW	½	1½	800		BS 5352	A 105	AA7501468		
	GLOBE	FL	2	2	800	B16.5	BS 1873	A 216 GR. WCB	AA7501408		
	GLOBE	FL	3	16	150	B16.5	BS 1873	A 216 GR. WCB	AA7501408		
	CHECK (PISTON LIFT)	SW	½	2	800		BS 5352	A 105	AA7531468		
	DUEL PLATE CHECK	FF	3	24	150			A 216 GR. WCB			
	DUEL PLATE CHECK	FF	26	42	150			A 216 GR. WCB			
	BUTTER FLY	WAFER WITH LUGS	10	24	150	B16.5	BS 5155	A 216 GR. WCB	GT57213-07		
	BUTTER FLY	FL	26	42	150	AWWA-C207	BS 5155	A 126 CLB;	GT57213-07		
<b>BOLT &amp; GASKET</b>	STUD + 2NUTS		M12	M27			B 18.2	A 193 GR B7/ A194 2H	HY7142198		
	STUD + 2NUTS		M30	M70			B 18.2	A 193 GR B7/ A194 2H	HY7142299		
	GASKET		½	1½	300		B 16.20	NAB MSW (SS304)+ PTFE FILL	AA7240358		
	GASKET		2	24	150		B 16.20	NAB MSW (SS304)+ PTFE FILL	AA7240345		
	GASKET		10	24	150		B 16.21	CNAF NBR B16.5 FF			
<b>MISC.</b>	GASKET		26	42	150		B 16.21	CNAF NBR AWWA-C207D FF			
	Y-TYPE STRAINER	SW	½	1½	800		B 16.11	B: A 105; INT: SS 304			
	Y-TYPE STRAINER	BW	2	42	150		MNF. STD	B: A 234 WPB, INT. SS304			
	RE JOINT	FL	2	48	150		MNF. STD	IS 2062, NEOPRENE RUBBER			
AIR RELEASE VALVE	FL	1½	8	150		IS14845	IS 216 WCB				



PE&SD Mech.

PIPING MATERIAL SPECIFICATION

11D

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ANSI CLASS:	150
MATERIAL :	CARBON STEEL
CORR ALL:	1.0 mm
Special Requirement:	Non IBR

Rev. 00A
27.07.15

BRANCH CONNECTION CHART		LEGEND		RUN PIPE SIZE (INCHES)		BRANCH PIPE SIZE (IN INCHES)
E	TEES BUTT WELD			1/4	1/2	
H	HALF COUPLING			3/4	1	1/2
P	PIPE TO PIPE			1 1/4	1 1/2	1
R	REINFORCED			2	2 1/2	1 1/2
S	SOCKOLETS			3	3 1/2	2
T	TEES SW			4	5	2 1/2
W	WELDOLETS			6	8	3
				10	12	3 1/2
				16	20	4
				24	30	5
				36	48	6
				60	72	8
				96	120	10
				144	180	12
				216	270	16
				324	408	20
				486	612	24
				720	900	30
				1080	1350	40
				1620	2025	60
				2430	3037.5	90
				3645	4556.25	135
				5467.5	6834.375	202.5
				8201.25	10251.5625	303.75
				12301.875	15427.84375	455.625
				18452.8125	23141.765625	683.4375
				27679.21875	34712.64375	1025.15625
				41518.83125	52069.03125	1537.734375
				62278.25	77403.90625	2306.6015625
				93417.375	116105.859375	3459.8271875
				140126.0625	172658.8875	5189.38125
				210189.09375	259038.33125	7784.071875
				315283.540625	388557.496875	11676.1078125
				472925.3109375	582836.2453125	17514.16171875
				709387.96640625	874254.368125	26271.24265625
				1064081.949609375	1311381.7521875	39406.863984375
				1596122.92440625	1967072.628125	58105.2959375
				2379184.386609375	2950608.9421875	86557.9438125
				3568276.58090625	4425913.413125	129836.91765625
				5352414.87140625	6596690.1196875	194755.3765625
				8011602.307109375	9894643.678125	292133.0646875
				12017403.460609375	14841965.5171875	435200.6470625
				18026105.19090625	22262948.2753125	652800.970625
				27038707.78240625	33796422.413125	979200.453125
				40558061.673609375	51194633.6196875	1468800.680625
				60837092.51040625	76791950.328125	2203200.01875
				91255638.765609375	115187925.984375	3304800.028125
				136883458.14840625	172781888.9765625	4963200.040625
				205325186.72240625	261172833.46875	7294800.05625
				307987780.083609375	391666300.5109375	10809600.078125
				459981670.12540625	578417100.765625	16214400.1109375
				692977500.169609375	861600450.328125	24321600.160625
				1039476250.217609375	1281360675.1921875	36482400.230625
				1559214250.27040625	1921940812.78125	54713600.328125
				2338821250.329609375	2867281000.0	81072000.453125
				3493231250.39640625	4284321250.0	121632000.609375
				5239843750.47200625	6441481875.0	182448000.81875
				7859765625.557609375	9599843750.0	273672000.1109375
				11789765625.65440625	14459843750.0	405408000.15625
				17719765625.763609375	21919843750.0	597696000.21875
				26639765625.88640625	33119843750.0	871200000.296875
				39959765625.10240625	49679843750.0	1281600000.396875
				59479765625.11840625	73679843750.0	1881600000.528125
				88479765625.13640625	110119843750.0	2769600000.696875
				132719765625.15640625	164119843750.0	4089600000.90625
				199119765625.179609375	246119843750.0	5990400000.11609375
				295919765625.20640625	364119843750.0	8736000000.15625
				443719765625.237609375	541119843750.0	12768000000.21875
				665519765625.273609375	811119843750.0	18768000000.296875
				995519765625.315609375	1201119843750.0	27696000000.396875
				1487919765625.36400625	1761119843750.0	40896000000.528125
				2231919765625.419609375	2591119843750.0	59769600000.696875
				3371919765625.483609375	3891119843750.0	87120000000.90625
				5071919765625.557609375	5811119843750.0	128160000000.11609375
				7571919765625.643609375	8611119843750.0	188160000000.15625
				1131919765625.74400625	12811119843750.0	276960000000.21875
				1701919765625.86040625	19111119843750.0	408960000000.296875
				2551919765625.99440625	28111119843750.0	597696000000.396875
				3831919765625.11480625	41111119843750.0	871200000000.528125
				5691919765625.13240625	60111119843750.0	1281600000000.696875
				8511919765625.15240625	88111119843750.0	1881600000000.90625
				12711919765625.17520625	13111119843750.0	2769600000000.11609375
				19011919765625.20080625	19411119843750.0	4089600000000.15625
				28311919765625.229609375	28411119843750.0	5976960000000.21875
				42411919765625.27200625	41411119843750.0	8712000000000.296875
				63411919765625.32840625	60411119843750.0	12816000000000.396875
				94411919765625.399609375	89411119843750.0	18816000000000.528125
				141411919765625.48720625	13441119843750.0	27696000000000.696875
				214411919765625.593609375	20141119843750.0	40896000000000.90625
				324411919765625.72040625	29641119843750.0	59769600000000.11609375
				486411919765625.869609375	43641119843750.0	87120000000000.15625
				729411919765625.10440625	64641119843750.0	128160000000000.21875
				109411919765625.12480625	96641119843750.0	188160000000000.296875
				164411919765625.14880625	14164119843750.0	276960000000000.396875
				246411919765625.17680625	20964119843750.0	408960000000000.528125
				366411919765625.21040625	30964119843750.0	597696000000000.696875
				546411919765625.25120625	45964119843750.0	871200000000000.90625
				816411919765625.30000625	69964119843750.0	1281600000000000.11609375
				122411919765625.35840625	104964119843750.0	1881600000000000.15625
				183611919765625.42800625	156964119843750.0	2769600000000000.21875
				275411919765625.51040625	231964119843750.0	4089600000000000.296875
				412411919765625.60720625	341964119843750.0	5976960000000000.396875
				616411919765625.72000625	501964119843750.0	8712000000000000.528125
				916411919765625.85920625	731964119843750.0	12816000000000000.696875
				136411919765625.10240625	1081964119843750.0	18816000000000000.90625
				204411919765625.12240625	1611964119843750.0	27696000000000000.11609375
				304411919765625.14640625	2361964119843750.0	40896000000000000.15625
				454411919765625.17520625	3461964119843750.0	59769600000000000.21875
				684411919765625.21040625	5161964119843750.0	87120000000000000.296875
				102411919765625.25440625	7661964119843750.0	128160000000000000.396875
				153611919765625.30880625	11361964119843750.0	188160000000000000.528125
				228411919765625.37600625	16961964119843750.0	276960000000000000.696875
				344411919765625.45840625	25461964119843750.0	408960000000000000.90625
				516411919765625.55840625	37461964119843750.0	597696000000000000.11609375
				776411919765625.67840625	54461964119843750.0	871200000000000000.15625
				116411919765625.82000625	81461964119843750.0	1281600000000000000.21875
				174411919765625.985609375	121461964119843750.0	1881600000000000000.296875
				264411919765625.11800625	178461964119843750.0	2769600000000000000.396875
				396411919765625.141609375	263461964119843750.0	4089600000000000000.528125
				596411919765625.17000625	393461964119843750.0	5976960000000000000.696875
				896411919765625.20480625	578461964119843750.0	8712000000000000000.90625
				135611919765625.24640625	868461964119843750.0	12816000000000000000.11609375
				204411919765625.29600625	1298461964119843750.0	18816000000000000000.15625
				304411919765625.35600625	1948461964119843750.0	27696000000000000000.21875
				456411919765625.42800625	2898461964119843750.0	40896000000000000000.296875
				684411919765625.51440625	4348461964119843750.0	59769600000000000000.396875
				102411919765625.61680625	6548461964119843750.0	87120000000000000000.528125
				153611919765625.73680625	9848461964119843750.0	128160000000000000000.696875