



FABRICATION NOTES:

1. MELTING SHALL BE IN ACCORDANCE WITH GAS STANDARD D-22. PARTICULAR ATTENTION SHALL BE GIVEN TO THE FOLLOWING ITEMS:
 - A. GAS METAL ARC WELDING OR LOW HYDROGEN WELDING PROCESS SHALL BE USED WHEN WALL THICKNESS OF THE TEST HEAD MATERIAL EXCEEDS 0.500".
 - B. THE TEST HEAD SHALL BE STRESS RELIEVED WHEN THE TEST HEAD MATERIAL IS 0.750" WALL THICKNESS OR GREATER.
 - C. DO NOT LOCATE NIPPLES OR REINFORCING PADS CLOSER THAN 6" TO ANY WELD OR TO EACH OTHER.
2. REINFORCING PADS SHALL BE CONSTRUCTED BY THE MANUFACTURER IN ACCORDANCE WITH GAS STANDARD A-50. NOTE: FOR 3" & 4" TEST HEADS, USE TEES AND ROUERS IN ACCORDANCE WITH GAS STANDARD A-51.
3. ALL GIRTH WELDS ARE TO BE RADIOGRAPHICALLY INSPECTED.
4. ALL FILLET WELDS MUST BE VISUALLY INSPECTED BY A QUALIFIED COMPANY INSPECTOR.
5. THE TEST HEAD MUST BE PROOF HYDROSTATICALLY TESTED TO A MINIMUM OF 200% SMYS AND A MAXIMUM OF 100% SMYS FOR 8 HOURS BEFORE BEING USED. IF TEST PRESSURE EXCEEDS 3240 PSIG (MAXIMUM TEST PRESSURE FOR ANSI 900), ALL ANSI 900 VALVES & FLANGES MUST NOT BE CONNECTED TO THE TEST HEAD DURING THIS HYDROSTATIC TEST. IF TEST PRESSURE EXCEEDS 4500 PSIG (MAXIMUM TEST PRESSURE FOR 2" DIAMETER 3000# SOR D APOLLO BALL VALVES), ALL 2" DIAMETER APOLLO BALL VALVES MUST NOT BE CONNECTED TO THE TEST HEAD DURING THIS HYDROSTATIC TEST. IF TEST PRESSURE EXCEEDS 5575 PSIG (MAXIMUM TEST PRESSURE FOR ANSI 1500), ALL ANSI 1500 VALVES & FLANGES MUST NOT BE CONNECTED TO THE TEST HEAD DURING THIS HYDROSTATIC TEST. (TEST HEAD NIPPLES (ITEM 7) MUST HAVE ADDITIONAL LENGTH TO ALLOW FOR CAPS TO BE ATTACHED DURING THE TEST.)
6. THE FOLLOWING INFORMATION MUST BE RETAINED IN THE GENERAL CONSTRUCTION GAS CONSTRUCTION OFFICE, FOR THE LIFE OF EACH TEST HEAD:
 - A. ALL PURCHASING DOCUMENTS, INCLUDING PHYSICAL AND CHEMICAL MILL REPORTS, FOR ORIGINAL AND RETESTS.
 - B. ALL STRENGTH TEST PRESSURE REPORTS FOR THE TEST HEAD, BOTH ORIGINAL AND RETESTS.
 - C. ALL RADIOGRAPHIC INSPECTION REPORTS, BOTH ORIGINAL AND RETESTS.
7. GAS SYSTEM DESIGN DEPARTMENT MUST BE CONSULTED FOR ANY DEVIATIONS FROM THIS DRAWING.
8. ALL PIPELINE TEST HEADS SHALL BE BUILT BY THE GENERAL CONSTRUCTION GAS CONSTRUCTION DEPARTMENT.
9. THE PIPE USED TO FABRICATE TEST HEADS MUST MEET API-5L SPECIFICATIONS. THE CAPS USED TO FABRICATE TEST HEADS MUST HAVE THE SAME SMYS AND WALL THICKNESS AS THE PIPE USED.
10. PROOF TEST PRESSURE AT 90% TO 100% SMYS AND MAXIMUM ALLOWABLE TEST PRESSURE MUST BE RECALCULATED FOR ANY SMYS OR WALL THICKNESS OTHER THAN THOSE SPECIFIED IN THIS CHART IN ACCORDANCE WITH P-220, P.F. SEE NOTES 5 & 6.
11. PAINT ALL BARE METAL SURFACES WITH POBE NO. 50 PRIMER PER GAS STANDARD E-31.

GENERAL NOTES:

1. WHEN WELDING A TEST HEAD TO A PIPE WITH A DIFFERENT SMYS, A WELDING PROCEDURE QUALIFIED FOR JOINTING THE TWO SMYS MUST BE USED.
2. A VISUAL INSPECTION FOR DAMAGE MUST BE MADE OF EACH TEST HEAD PRIOR TO ITS USE AND ANY DAMAGE MUST BE REPAIRED. THE REPAIR OF SOME TYPES OF DAMAGE WILL REQUIRE A REQUALIFICATION HYDROSTATIC TEST OF THE TEST HEAD TO 90% SMYS. THE DECISION TO REQUALIFY TEST HEADS MUST BE MADE BY THE TEST SUPERVISOR AND CLEARED THROUGH THE GENERAL OFFICE, GENERAL CONSTRUCTION GAS CONSTRUCTION.
3. IF THE WALL THICKNESS OF THE PIPE TO BE TESTED IS NOT WITHIN 5/32" OF THE TEST HEAD PIPE WALL THICKNESS, REFER TO GAS STANDARD D-22 FOR PROPER BACK BEVELING OR FOR THE INSTALLATION OF TRANSITION PIECES.

REFERENCES:

TEST HEAD SKID DETAIL S-----388767

NO.	DATE	DESCRIPTION	BY	CHKD	APP'D	DATE	DESCRIPTION	BY	CHKD	APP'D	DATE
1		ISSUED FOR USE									
2		ISSUED FOR USE									
3		ISSUED FOR USE									
4		ISSUED FOR USE									



PIPING-DETAILS
PIPELINE TEST HEAD
 GAS STANDARD
PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

SHEET NO. 1 OF 2 SHEETS
386527
 4

A-37.1

BILL OF MATERIAL					
ITEM	QUANTITY	DESCRIPTION	QCS STANDARD	REMARKS	PG# CODE
1	1	VALVE, BALL, 3000*, SCREWED, APOLLO	24 F-20	NOT SHOWN ON DWG.	03-4637
1	1	VALVE, BALL, ANSI 900, FLANGED ENDS	4 F-21		03-4556
1	1	VALVE, BALL, ANSI 900, FLANGED ENDS	6 F-21		03-4551
1	1	VALVE, BALL, ANSI 900, FLANGED ENDS	8 F-21		03-4552
2	1	FLANGE, WELDNCK, ANSI 900, RF BORED TO 3.826" I.D.	4" B-43.1		
1	1	FLANGE, WELDNCK, ANSI 900, RF BORED TO 5.761" I.D.	6" B-43.1		
1	1	FLANGE, WELDNCK, ANSI 900, RF BORED TO 7.439" I.D.	8" B-43.1		
1	1	FLANGE, WELDNCK, ANSI 1500, RF BORED TO 7.001" I.D.	8" B-43.1		
FOR 34" B TEST HEAD					
3	1	BLIND FLANGE, ANSI 900, DRILL & TAP 1/4" NPT	4" B-43.2		01-0414
1	1	BLIND FLANGE, ANSI 900, DRILL & TAP 1/4" NPT	6" B-43.2		01-0415
1	1	BLIND FLANGE, ANSI 900, DRILL & TAP 1/4" NPT	8" B-43.2		
1	1	BLIND FLANGE, ANSI 1500, DRILL & TAP 1/4" NPT	8" B-43.2		
FOR 34" B TEST HEAD					
4	1	GASKET, ISOSEAL, ANSI 900, 3.826" I.D.	4" B-45.1		08-2257
1	1	GASKET, ISOSEAL, ANSI 900, 5.761" I.D.	6" B-45.1		
1	1	GASKET, ISOSEAL, ANSI 900, 7.439" I.D.	8" B-45.1		
1	1	GASKET, ISOSEAL, ANSI 1500, 7.001" I.D. FOR 34" B TEST HEAD	8" B-45.1		
5	16	BOLT, STUD, ASTM A-193, GR. B7	1-1/8" x 6-3/4" B-46		19-2960
24	24	BOLT, STUD, ASTM A-193, GR. B7	1-1/8" x 3-3/4" B-46		19-2940
24	24	BOLT, STUD, ASTM A-193, GR. B7	1-3/8" x 8-3/4" B-46		19-2963
24	24	BOLT, STUD, ASTM A-193, GR. B7 FOR 34" B TEST HEAD	1-5/8" x 11-1/2" B-46		
48	48	NUT, HEX, ASTM A-194, GR. 2H	1-1/8" B-46		
48	48	NUT, HEX, ASTM A-194, GR. 2H, FOR 34" B TEST HEAD	1-5/8" B-46		
7	1	NIPPLE, GR. B, SMLS, 2.375" O.D. x 0.438" W.T., T.O.E.	2" x 8"	NOT SHOWN ON DWG.	
1	1	NIPPLE, GR. B, SMLS, 2.375" O.D. x 0.438" W.T.	4" x 8"	FABRICATION NOTE 5	
1	1	NIPPLE, GR. B, SMLS, 2.375" O.D. x 0.438" W.T.	6" x 10"	FABRICATION NOTE 5	
1	1	NIPPLE, GR. B, SMLS, 2.375" O.D. x 0.438" W.T.	8" x 12"	FABRICATION NOTE 5	
FOR 34" B TEST HEAD					
8	1	VALVE, AGCO, HVC-2, 10000 PSIG	1/4" F x 1/4" F		03-5155
9	1	PLUG, STEEL, 6000*	1/4"		
10	1	NIPPLE, GR. B, SMLS, 2H, T.O.E.	1/4" x 3"		
11	2	2 VALVE, BALL, 3000*, SCREWED, APOLLO	2" F-20		03-4637
12	2	2 VALVE, BALL, 3000*, 508 D APOLLO FOR SHORT TEST HEADS ONLY	2" F-20		03-4637
13	2	2 NIPPLE, GR. B, SMLS, 2.375" O.D. x 0.438" W.T., T.O.E.	2" x 4"		
FOR SHORT TEST HEADS ONLY					
14	2	2 PLUG, STEEL, 6000*	2"	NOT SHOWN ON DWG.	
15	2	2 BUSHING, STEEL, 6000*	2" x 1/2"		
16	2	2 VALVE, AGCO, HVC-40, 10000 PSIG	1/2" F x 1/2" F		03-5181
17	2	2 PLUG, STEEL, 6000*	1/2"		
18	2	2 NIPPLE, GR. B, SMLS, 2H, T.O.E.	1/2" x 3"		
19	2	2 SOCKET, 6000*, 1/2" x (CARRIER PIPE DIAMETER)			
20	2	2 EDGE, HIGH PRESSURE, 9000*, MALLE SWIVEL ENDS	1/2"		
21	1	1 REINFORCING PAD, PIPE, 2" x (CARRIER PIPE DIAMETER)	A-50	FABRICATION NOTE 2	
22	1	1 REINFORCING PAD, PIPE, 4" x (CARRIER PIPE DIAMETER)	A-50	FABRICATION NOTE 2	
23	1	1 REINFORCING PAD, PIPE, 6" x (CARRIER PIPE DIAMETER)	A-50	FABRICATION NOTE 2	
24	1	1 REINFORCING PAD, PIPE, 8" x (CARRIER PIPE DIAMETER)	A-50	FABRICATION NOTE 2	
25	1	1 REINFORCING PAD, CAP, 2" x (CAP SIZE)	A-50	FABRICATION NOTE 2	
26	1	1 CAP, TO SUIT, **			
27	1	1 PIPE, TO SUIT, **			
28	1	1 TEST HEAD IDENTIFICATION RING-FIELD FABRICATED	DETAIL 2		

* S₁ - MATERIAL REQUIRED FOR STANDARD TEST HEAD (3" TO 12")
 * S₂ - MATERIAL REQUIRED FOR STANDARD TEST HEAD (14" TO 16")
 * S₃ - MATERIAL REQUIRED FOR STANDARD TEST HEAD (18" TO 30")
 * S₄ - MATERIAL REQUIRED FOR STANDARD TEST HEAD (32" TO 36")
 ** SEE MATERIAL SPEC CHART

MATERIAL SPECIFICATION CHART										MAX. PRESSURE RATING FOR TEST HEAD			PROOF TEST PRESSURE FOR TEST HEAD (INDE. S)			MIN. PIPE LENGTH
NOM. SIZE (IN)	SMYS (PSI)	GRADE	WALL THK. (IN)	MIN. DIMENSION (IN)	FILL VALVE SIZE			MAXIMUM ALLOWABLE TEST PRESS. (PSI) NOTE 11	MINIMUM 95% SMYS OF TEST HEAD (PSI) NOTE 11	MAXIMUM 100% SMYS OF TEST HEAD (PSI) NOTE 11	L x W x C (10" x 10" x 36")					
					A	B	C									
3	42,000	X-42	Y-42	0.180	17	10	16	2	0.5	2160	3888	4320	6'-7"			
4	42,000	X-42	Y-42	0.231	17	10	16	2	0.5	2160	3888	4320	6'-7"			
6	42,000	X-42	Y-42	0.378	20	10	22	2	0.5	2400	3888	4320	7'-4"			
8	42,000	X-42	Y-42	0.444	21	10	23	2	0.5	2160	3888	4320	7'-6"			
10	52,000	X-52	Y-52	0.447	25	10	25	2	0.5	2160	3888	4320	8'-0"			
12	52,000	X-52	Y-52	0.530	25	10	26	2	0.5	2160	3888	4320	8'-11"			
14	52,000	X-52	Y-52	0.592	26	12	27	4	0.5	2160	3888	4320	8'-5"			
16	60,000	X-60	Y-60	0.576	29	12	30	4	0.5	2160	3888	4320	8'-9"			
18	60,000	X-60	Y-60	0.648	34	14	36	6	0.5	2160	3888	4320	9'-8"			
20	65,000	X-65	Y-65	0.616	35	14	37	6	0.5	2000	3600	4000	9'-10"			
22	65,000	X-65	Y-65	0.677	41	14	42	6	0.5	2000	3600	4000	10'-9"			
24	65,000	X-65	Y-65	0.739	42	14	43	6	0.5	2000	3600	4000	10'-11"			
26	65,000	X-65	Y-65	0.800	47	14	48	6	0.5	2000	3600	4000	11'-9"			
30	65,000	X-65	Y-65	0.924	54	14	55	6	0.5	2000	3600	4000	12'-11"			
32	65,000	X-65	Y-65	0.985	56	16	57	8	0.5	2000	3600	4000	13'-5"			
34	65,000	X-65	Y-65	1.070	63	16	64	8	0.5	2000	3600	4000	14'-5"			
36	65,000	X-65	Y-65	1.157	64	16	65	8	0.5	2160	3888	4320	14'-7"			

(1) THE MAXIMUM PROOF TEST PRESSURE IS DETERMINED BY THE MAXIMUM ALLOWABLE SHELL TEST PRESSURE OF 4500 PSI FOR A 2" DIA. 3000* SCREWED APOLLO BALL VALVE. THE X SMYS ON THE TEST HEAD AT THIS PRESSURE IS 93.6%
 (2) THE MAXIMUM PROOF TEST PRESSURE IS DETERMINED BY THE MAXIMUM ALLOWABLE SHELL TEST PRESSURE OF 5575 PSI FOR AN ANSI 1500* BALL VALVE. THE X SMYS ON THE TEST HEAD AT THIS PRESSURE IS 93.2%

NOTES:
 SEE DRAWING NO. 386527, SHEET 1.



NO.	DATE	DESCRIPTION	DESIGNED BY	CHECKED BY	APPROVED BY	ISSUED FOR USE	NO.	DATE	DESCRIPTION	DESIGNED BY	CHECKED BY	APPROVED BY

PIPING-DETAILS
 PIPELINE TEST HEAD
 GAS STANDARD
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

386527
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