1. PURPOSE

1.1 To provide instructions on proper equipment to be utilized, and procedures and precautions to be followed to insure safety during a hydrostatic test.

2. GENERAL

2.1 The Supervisor in charge of the installation shall be responsible for the hydrostatic testing. All personnel involved with the hydrostatic test must be familiar with the test procedure, and safety precautions to be followed during the hydrostatic test.

3. SAFETY CONSIDERATIONS

3.1 Take precautions as necessary to protect employees and the general public during testing. These shall include, but are not limited to the following:

3.1.1 Locate the test equipment and instrumentation a safe distance from the test section. (See Gas Standard A-~~37.1~~ 37.6)

3.1.2 Keep personnel not working on the test operation out of the test area.

3.1.3 Place barriers along the test section where appropriate to prevent public access.

3.1.4 Notify public agencies of the scheduled test (when necessary) and notify parties located in the general vicinity of the test section to avoid the area during the test.

3.1.5 Patrol and use flagmen to keep people away during testing.

3.1.6 Schedule the test at a time that will minimize public exposure in highly populated areas.

3.2 Visually inspect temporary piping, closures, and other equipment used in conjunction with the test to verify that they are in safe working order. Maintain a periodic visual inspection of this equipment from a safe distance during the test.

3.3 Do not remove caps, plugs, or valves from the test head, or any other test equipment, until a positive determination is made from two independent taps that the test section is depressurized.

APPROVED BY									
DSH	MC								
RJA									
FEL									
MJW		REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.

GM	PIPING - DATA SHEET	B/M	
SUPV.	HYDROSTATIC TESTING PROCEDURE	DWG. LIST	
DSGN.	GAS STANDARD	SUPSDS	
DWN.	PACIFIC GAS AND ELECTRIC COMPANY	SUPSD BY	
CHKD.	SAN FRANCISCO, CALIFORNIA	SHEET NO. 1 OF 8 SHEETS	
O.K.		086870	REV.
DATE 4-24-79 / SCALE		MICROFILM	

62-1804 Rev 7-75

4. TEST PROCEDURE

4.1 Establish a plan for the hydrotest. As appropriate, this shall include detailed written instructions covering problem areas for the specific test involved. These shall be developed by the engineer responsible for the test, in conjunction with the supervisor on the test.

4.1.1 Consider the potential for flooding, or other damage should a failure occur.

4.1.2 Consider the safety of ~~occupants of nearby buildings.~~ company personnel and the general public.

4.1.3 Have a copy of the Strength Test Pressure Report and schematic sketch of the test section at the test location.

4.2 Prepare a sketch of the test section showing stationing of the test section and points of maximum and minimum elevation. (See Gas Standard A-37.2).

5. OBTAIN PROPER TEST EQUIPMENT

5.1 Test Heads

5.1.1 The General Construction-Gas Department is responsible for the construction and maintenance of all test heads. Pages 6 to 8 of this Standard lists all test heads authorized for use to date. Test heads not on this list shall not be used until they have been inspected and issued serial numbers by the General Construction-Gas Department.

5.1.2 Test heads are to be constructed in accordance with Gas Standard A-37.1, Drawing No. 386527. All test heads must be visually inspected, X-rayed, hydrostatically tested, properly tagged for maximum test pressure, and issued serial numbers before they are authorized for use. The necessary paperwork to verify the inspection and testing and to verify the wall thickness, size and grade of pipe and fittings used to make each test head shall be on file with General Construction in Oakland.

5.1.3 Test heads shall be requested from General Construction-Gas Department, 4930 Colliseum Way, Oakland 94601, [redacted] Company Phone [redacted] as far in advance as possible. In some instances, when a new test head must be fabricated, the lead time may be as long as 6 to 8 months. Expenses for newly fabricated test heads, and their shipment to and from the requesting location, will be charged to the construction GM. The proper job number and accounting will be required with the request.

5.1.4 If the proper size test heads are not available for a test, substitute test heads may be used with the approval of Gas System Design Department. Due to the unequal O.D. and W.T. of the pipe to be tested and the substitute test heads, Gas System Design Department will determine the proper installation procedures for these test heads.

5.1.5 For the safety of personnel, the protection of the test head and ease of shipment, special steel skids have been made for each test head. Care must be taken in placing the test head on the skid. ~~Most will fit in only one direction, which allows~~ for the proper placement of the chains. Improper mounting could result in an injury, or damage to the test head.

For most test heads, there is only one mounting position which will allow

5.1.6 Modifications, welding or cutting shall not be made in the field (except welding the test head to the pipe being tested). If modifications are required, the test head must be returned to General Construction-Gas Department in Oakland for the modifications.

5.1.7 All test heads shall be returned to General Construction-Gas Department in Oakland immediately after completion of the test. All test heads must be returned with the same valves, plugs, caps and nipples intact.

5.1.8 A pup of tested pipe may be left on the test head only if it is: (a) relatively close to the same grade and wall thickness of the test head, and (b) clearly marked with the grade, wall thickness, and pressure to which it was tested. This information must also be on the shipping notice when returning the test head.

5.1.9 A shipping notice must accompany each test head that is being returned or relocated to another job site.

5.2 Pigs, spheres, scrapers, etc., for use on a job, must be properly sized for the largest internal diameter of the test section or test head. When necessary, use scraper cups, discs, or polyurethane pigs for post test pipeline cleaning. Gas Standard A-37.3 illustrates typical manufacturer's instructions for filling and sizing a sphere.

5.3 Test Instruments

5.3.1 Pressure recorders are required on all hydrostatic tests. The recorders must be calibrated every six months. If both a dead weight tester and a pressure recorder are used on a hydrotest, adjust the pressure recorder to read

~~3.1 Water Supply Survey~~:

8. Water Supply

8.1 The water used for testing shall be reasonably clean. Contaminated water or salt water shall not be used. Water shall be obtained from the most readily available source, subject to authorizations by the appropriate local, county, state or federal regulating agency or agencies.

8.2 If wells must be used as the water source and the quantity of water needed for the test is substantial a draw-down test shall be performed. If the wells prove to be inadequate an alternate source should be found. Transporting water by truck shall be used only as a last resort when the quantity of water needed is substantial.

the same as the dead weight tester before beginning the test. A chart with the proper pressure scale and time interval must be used.

5.3.2 Dead weight testers must be calibrated within the last 12 months by the General Construction, Gas, Measurement and Control Section located at 25051 O'Neil Avenue, Hayward, California 94544, phone [redacted] Company phone [redacted] A dead weight tester is required when testing over 90% SMYS of any segment of the test section.

5.3.3 Indicating pressure gauges should be available for possible installation at the remote end of the test section, or at maximum or minimum elevations of the test section. These gauges are for information purposes only.

5.4 Pressurizing equipment, hoses, and other associated equipment must be checked out and be in good working condition before the test. Make sure the equipment is properly sized and rated for the maximum test pressure.

6. VERIFY THE STRENGTH TEST PRESSURE REPORT

6.1 If Part I of the Strength Test Pressure Report does not show the latest design changes on the design drawings, or the actual pipe to be tested, return the Strength Test Pressure Report to the Project Engineer or Gas System Design for necessary corrections (the Gas Estimators' Manual and the Gas Foremans' Manual give complete instruction on the Strength Test Pressure Report).

7. NOTIFICATION OF HYDROTEST

7.1 For work assigned to General Construction, notify the General Office-Gas Construction Department seven days prior to the date the hydrotest is scheduled.

7.2 If work is performed by the Division, notify the Gas System Design Department seven days prior to the date of hydrotest.

7.3 If the job was reported to the CPUC, it is likely that the hydrotest will be witnessed by a member of the CPUC Staff and Gas System Design Department.

8. WATER ~~SUPPLY~~ Filling (See Gas Standard A-37.4 for Typical Set-up)

8.1 Make sure the following points are considered in the water filling operation:

9.1.1 The test section must be completely filled with water. A pig must be run ahead of the water to force as much air as possible out of the test section. For test sections where a pig cannot be used, the air must be vented at the high points.

9.1.2 Fill the test section from only one direction.

9.1.3 If necessary, anchor or support the pipe to prevent excessive stress levels caused by the weight of the water. Special consideration should be given to bridge crossings and spans.

9.1.4 Open and close fill and drain valves slowly to prevent pressure surges resulting from rapid changes in water velocity.

9.2 Water Filling Equipment

9.2.1 Size the fill pumps considering static head due to elevation difference in the test section, and the fill time desired.

9.2.2 Install filters on the suction line to prevent fish and other foreign matter from entering the test section.

9.2.3 The exhaust of the pump engine must have spark arrestors.

9.2.4 Water may be transferred from one test section to another by use of a hairpin. (See Gas Standard A-37.5). The hairpin shall not be left in place during the test.

10. WATER REMOVAL (See Gas Standard A-37.7 for Typical Set-up)

10.1 Use extreme caution when releasing water at the test pressure. The pressure should be relieved by partially opening a small tap valve before opening the main dewatering valve.

10.2 Remove the water from long test sections by pigging. The most effective speed of a pig for dewatering is considered to be 1 to 5 miles per hour.

10.3 Where removal of moisture is critical, use two pigs with a slug of methanol between them.

10.4 Short sections may be inclined to drain, and swabbed dry by hand.

10.5 Dispose of the water in a manner that will prevent damage to the environment and comply with any water disposal regulations.

11. REPORTS

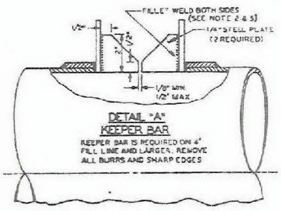
11.1 The Gas Estimators' Manual and the Gas Foremans' Manual contain sections that provide complete instruction on the completion of the Strength Test Pressure Report. Completed reports must be signed, and all copies for distribution must be clear and show all pertinent data.

TEST HEADS AUTHORIZED FOR USE

DIAMETER	SERIAL No.	GRADE	W.T.	MAXIMUM TEST PRESSURE
3"	3761	"B"	.216"	2160
3"	3761-A	"	"	"
4" Comb.	4761-A	"B"	.237"	2160
4" Comb.	4761-B	"	"	"
4"	4791-A	"	"	"
4"	4791-B	"	"	"
4"	4792-A	"	"	"
4"	4792-B	"	"	"
6"	6761-A	X-52	.500"	2160
6"	6761-B	"	"	"
6"	6762-A	"B"	.432"	2738
6"	6762-B	"	"	"
6"	6791-A	"	"	2160
6"	6791-B	"	"	"
8" Comb.	8761-A	"B"	.500"	2160 W/4" Heads
8" Comb.	8761-B	"	"	"
8"	8791-A	"	"	2160
8"	8791-B	"	"	"
8"	8792-A	"	"	"
8"	8792-B	"	"	"
10"	10761	X-52	.500"	2160
10"	10761-A	"	"	"
10"	10762-A	"B"	"	1627
10"	10762-B	"	"	1953
10"	10763-A	X-52	.365"	1765
10"	10763-B	"	"	"

DIAMETER	SERIAL No.	GRADE	W.T.	MAXIMUM TEST PRESSURE
12"	12751-A	X-52	.500"	2039
12"	12751-B	"	"	"
12"	12752-A	"	"	"
12"	12752-B	"	"	"
12"	12763-A	"	"	"
12"	12763-B	"	"	"
16"	16751	X-52	.500"	1625
16"	16752	"	"	"
16"	16753	"	"	"
16"	16753-A	"	"	"
16"	16753-B	"	"	"
16"	16753-C	"	"	"
16"	16764-A	"	"	"
16"	16764-B	"	"	"
16"	16765-A	"	"	"
16"	16765-B	"	"	"
16"	16766-A	"	.680"	2160
16"	16766-B	"	"	"
18"	18761-A	X-52	.500"	1733
18"	18761-B	"	"	"
20"	20761-A	X-42	.750"	1440
20"	20761-B	"	"	"
20"	20762-A	X-52	.500"	1560
20"	20762-B	"	"	"
22"	22761-A	Y-60	1.000"	3853
22"	22761-B	"	"	3853

DIAMETER	SERIAL NO.	GRADE	W.T.	MAXIMUM TEST PRESSURE
24"	24761-A	X-52	.625"	1440
24"	24761-B	"	"	"
24"	24762-A	"	.750"	1950
24"	24762-B	"	"	"
26"	26761-A	Y-52	.750"	1772
26"	26761-B	"	"	"
26"	26762-A	"	"	"
26"	26762-B	"	"	"
34"	34761-A	X-52	1.000"	1835
34"	34761-B	"	"	"
36"	36761-A	X-60	.750"	1440
36"	36761-B	"	"	"
36"	36762-A	"	.730"	"
36"	36762-B	"	"	"



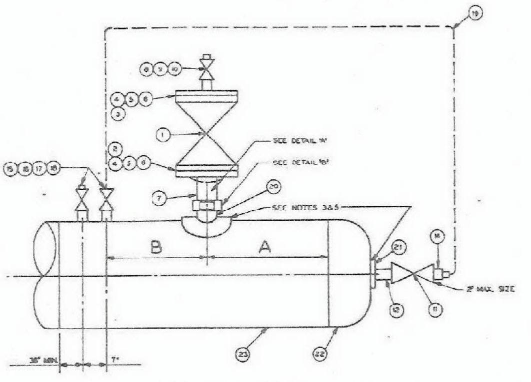
DETAIL "A"
KEEPER BAR

KEEPER BAR IS REQUIRED ON 4" FILL LINE AND LARGER. REMOVE ALL BURRS AND SHARP EDGES

DETAIL "B"
TEST HEAD IDENTIFICATION

THE TEST HEAD IDENTIFICATION TAG IS TO BE TACK WELDED TO A LOOSE FITTING COLLAR INSTALLED AROUND THE FILL NIPPLE THE TAG MUST CONTAIN THE FOLLOWING INFORMATION:

TEST HEAD SERIAL NUMBER.
MAXIMUM TEST PRESSURE RATING.
GRADE, SIZE AND WALL THICKNESS OF PIPE.
DATE TESTED TO 90% SMYS.



STANDARD TEST HEAD
(SEE CHART FOR TEST PRESSURES)

MATERIAL SPECIFICATION CHART							DESIGN INFORMATION			
NOM. SIZE	SMYS (PSI)	GRADE ⚠1 PIPE	GRADE ⚠1 CAP	WALL THICKNESS ⚠1 (IN)	DIMENSION (IN.) A	DIMENSION (IN.) B	FILL VALVE SIZE	f ⚠2	MAX ALLOW ⚠3 TEST PRESS. (PSI)	90% SMYS OF ⚠3 TEST HEAD (PSI)
4	35,000	GR.B	GR.B	0.237	8	8	2	0.6	T 2160	3318
6	42,000	X-42	Y-42	0.280	9	8	2	0.6	2130	3195
8	"	"	"	0.322	12	8	2	0.6	1881	2822
10	52,000	X-52	Y-52	0.365	15	8	2	0.6	2118	3178
12	"	"	"	0.375	18	10	2	0.6	1835	2753
14	"	"	"	0.438	21	13	4	0.5	1626	2928
16	"	"	"	0.500	24	15	4	0.5	1625	2925
18	56,000	X-56	Y-56	0.500	27	15	6	0.5	1555	2800
20	60,000	X-60	Y-60	0.500	30	15	6	0.5	1500	2700
22	"	"	"	0.625	33	16	6	0.5	1704	3068
24	"	"	"	0.625	36	16	6	0.5	1562	2812
26	"	"	"	0.625	39	20	6	0.6	1730	2596
28	"	"	"	0.750	42	20	6	0.6	1928	2893
30	"	"	"	0.750	45	21	6	0.6	1800	2700
32	65,000	X-65	Y-65	0.738	48	22	8	0.5	1499	2698
34	"	"	"	0.785	51	23	8	0.5	1500	2701
36	"	"	"	0.831	54	24	8	0.6	1800	2700

T-MAX. ALLOW TEST PRESS- RATING OF WEAKEST FITTING

⚠1 THE PIPE USED TO FABRICATE TEST HEADS MUST MEET API-5L OR 5LX SPECIFICATIONS. THE CAPS USED TO FABRICATE TEST HEADS MUST HAVE THE SAME S.M.Y.S. AND WALL THICKNESS AS THE PIPE USED.

⚠2 IN GENERAL, TEST HEADS ARE DESIGNED TO OPERATE AT A MAXIMUM OF 0.6 SMYS. HOWEVER, DUE TO DESIGN STRESS LIMITATIONS ON PAD REINFORCEMENT FOR FILL VALVE TAP, SEVERAL SIZE OF TESTS HEADS ARE DESIGNED FOR USE AT A MAXIMUM OF 0.5 SMYS (SEE GAS STD A-51). f IS A DESIGN FACTOR BASED ON THE FACT THAT PAD REINFORCING MUST BE USED AT THE FILL VALVE-SEE NOTE 3.

⚠3 90% S.M.Y.S. OF TEST HEAD $[P=\frac{2(0.9 \times S.M.Y.S.)T}{D}]$ AND MAX. TEST PRESSURE $[P=\frac{2(f \times S.M.Y.S.)T}{D}$ OR (RATING OF WEAKEST FITTING)] MUST BE RECALCULATED FOR ANY S.M.Y.S. OR WALL THICKNESS OTHER THAN THOSE SPECIFIED IN THIS CHART - SEE NOTES 6 AND 10.

NOTES:

1. FOR TEST PRESSURES HIGHER THAN THOSE SHOWN IN THE TABLE, CONSULT GAS SYSTEM DESIGN DEPARTMENT.
2. WELDING MUST BE IN ACCORDANCE WITH GAS STANDARD D-22. PARTICULAR ATTENTION SHOULD BE GIVEN TO THE FOLLOWING ITEMS:
   A.-USE THE LOW HYDROGEN WELDING PROCESS WHEN THE WALL THICKNESS OF THE TEST HEAD MATERIAL EXCEEDS 0.500"
   B.-WHEN THE TEST HEAD MATERIAL EXCEEDS 0.750" WALL THICKNESS THE TEST HEAD MUST BE STRESS RELIEVED.
   C.-WHEN INSTALLING TEST HEAD ON A GAS MAIN WITH A DIFFERENT SMYS, THE WELDING PROCEDURE QUALIFIED FOR THE HIGHER YIELD PIPE MUST BE USED.
   D.-THE SAME PREHEATING PROCEDURES ARE TO BE USED BEFORE REMOVING THE TEST HEAD AS WERE USED BEFORE INSTALLING IT.
   E.-DO NOT LOCATE NIPPLES OR REINFORCING RINGS CLOSER THAN 6" TO ANY WELD OR TO EACH OTHER.
3. REINFORCING RINGS MUST BE CONSTRUCTED IN ACCORDANCE WITH GAS STANDARD A-50.
4. ALL GIRTH WELDS ARE TO BE RADIOGRAPHICALLY INSPECTED.
5. ALL FILLET WELDS MUST BE VISUALLY INSPECTED BY A QUALIFIED COMPANY INSPECTOR.
6. THE TEST HEAD MUST BE HYDROSTATICALLY TESTED TO 90% SMYS FOR 8 HOURS BEFORE BEING USED. VALVES & FLANGES 2" AND LARGER MUST NOT BE CONNECTED TO THE TEST HEAD DURING THIS HYDROSTATIC TEST. TEST HEAD NIPPLES (ITEMS 7 & 12) MUST HAVE ADDITIONAL LENGTH TO ALLOW FOR EXTRA HEAVY CAPS TO BE ATTACHED DURING THE TEST.
7. THE FOLLOWING INFORMATION MUST BE RETAINED IN THE GENERAL OFFICE, GENERAL CONSTRUCTION GAS DEPARTMENT OFFICE, FOR THE LIFE OF EACH TEST HEAD:
   A.-ALL PURCHASING DOCUMENTS FOR ORIGINAL AND REPAIR MATERIALS.
   B.-ALL STRENGTH TEST PRESSURE REPORTS FOR THE TEST HEAD, BOTH ORIGINAL AND RETESTS.
   C.-ALL RADIOGRAPHIC INSPECTION REPORTS, BOTH ORIGINAL AND RETESTS.
8. 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 REHYDROSTATICALLY TEST MUST BE MADE BY THE TEST SUPERVISOR AND CLEARED THROUGH THE GENERAL OFFICE, GENERAL CONSTRUCTION GAS DEPARTMENT.
9. IF THE WALL THICKNESS OF THE PIPE TO BE TESTED IS NOT WITHIN 3/32" OF THE TEST HEAD PIPE WALL THICKNESS, REFER TO GAS STANDARD D-22 FOR PROPER INSTALLATION OF TRANSITION PIECES.
10. GAS SYSTEM DESIGN DEPARTMENT MUST BE CONSULTED FOR ANY DEVIATIONS FROM THIS DRAWING.
11. ALL PIPELINE TEST HEADS SHALL BE BUILT BY THE GENERAL CONSTRUCTION GAS DEPARTMENT.

BILL OF MATERIAL						
ITEM	QUANTITY * S_1	S_2	S_3	S_4	DESCRIPTION	REMARKS
1	1				VALVE, ROCKWELL FIG.2344, ANSI 900, SCRD. ENDS, 2"	NOT SHOWN ON DRWG.
		1			VALVE, BALL, ANSI 900, FLANGED ENDS, 4"	
			1		" " " " " " 6"	
				1	" " " " " " 8"	
2		1			FLANGE, ANSI 900, WN-RF 4"	BORED TO 4.026" I.D.
			1		" " " " 6"	BORED TO 5.761" I.D.
				1	" " " " 8"	BORED TO 7.625" I.D.
3		1			BLIND FLANGE, ANSI 900, DRILLED TAP 1/4" N.P.T., 4"	
			1		" " " " " " " " 6"	
				1	" " " " " " " " 8"	
4		1			GASKET, ISOSEAL, ANSI 900, P.T. NO.04351-900-610, 4"	
			1		" " " " " " 06375-900-610, 6"	
				1	" " " " " " 06376-900-610, 8"	
5		16			BOLT, STUD, ASTM-A-193 GRB7, 1-1/8" X 6-1/2"	
			24		" " " " " " 1-1/8" X 7-1/2"	
				24	" " " " " " 1-3/8" X 8-1/2"	
6		32	48		NUT, ASTM-A-194 GD. 2H, HEXAGON, 1-1/8"	
				48	" " " " " " 1-3/8"	
7	1				NIPPLE, GR.B, SMLS, 2.375" O.D. X 0.218" W.T., TOE 2"X6"	NOT SHOWN ON DRWG.
		1			" " " , 4.500" O.D. X 0.237" W.T., 4" X 8"	
			1		" " " , 6.625" O.D. X 0.432" W.T., 6" X 10"	
				1	" " " , 8.625" O.D. X 0.500" W.T., 8" X 12"	
8		1	1	1	VALVE, AGCO, HIC-2, 6000 PSIG, 1/4"F X 1/4"F	
9		1	1	1	PLUG, STEEL, 3000# OR BETTER, 1/4"	
10		1	1	1	NIPPLE, GR.B SMLS, E.H., T.B.E., 1/4" X 3"	
11	1	1	1	1	VALVE, ROCKWELL FIG. 2344, ANSI 900, SCRD ENDS, 2"	
12	1	1	1	1	NIPPLE, GR.B SMLS, E.H., T.O.E., 2" X 4"	
13	1				PLUG, STEEL, 3000# OR BETTER, 2"	NOT SHOWN ON DRWG.
14	1	1	1	1	BUSHING, STEEL, 3000# OR BETTER, 2" X 1/2"	
15	2	2	2	2	VALVE, AGCO, HIC-40, 6000 PSIG 1/2"F X 1/2"F	
16	1	1	1	1	PLUG, STEEL, 3000# OR BETTER, 1/2"	
17	2	2	2	2	NIPPLE, GR.B SMLS, E.H., T.O.E., 1/2" X 3"	
18	2	2	2	2	SOCK-O-LET, 3000#, 1/2" X (CARRIER PIPE DIAMETER)	
19	1	1	1	1	HOSE, HIGH PRESSURE, 5000#, MALE SWIVEL ENDS, 1/2"	
20		1			REINFORCING PAD, PIPE, 4" X (CARRIER PIPE DIAMETER)	G.S. A-50
			1		" " " 6" X (CARRIER PIPE DIAMETER)	G.S. A-50
				1	" " " 8" X (CARRIER PIPE DIAMETER)	G.S. A-50
21		1	1	1	REINFORCING PAD, CAP, 2" X (CAP SIZE)	G.S. A-50
22		1	1	1	CAP, TO SUIT.	**
23		1	1	1	PIPE, TO SUIT.	**

*S_1 - MATERIAL REQUIRED FOR STANDARD TEST HEAD, (4" TO 12")
S_2 - " " " " " " (14" TO 16")
S_3 - " " " " " " (18" TO 30")
S_4 - " " " " " " (32" TO 36")

** SEE MATERIAL SPEC. CHART

NO.	DATE	DESCRIPTION	GM SPEC	DWN	CHKD	SUPV	APVD BY
3	5-7-79	REVISED MATER. SPEC CHART, B.L. & MATERIAL					

REVISIONS

NO.	DATE	DESCRIPTION	GM SPEC	DWN	CHKD	SUPV	APVD BY
2	8-30-78	ADDED NOTE 11, REMOVED REDUCED SKET. Revised Identification					
1	1-20-76	Revised Fill Valve Size & Cap Material and Max Allowable Test Pressure					
0	9-23-75	Issued for Use					

REVISIONS

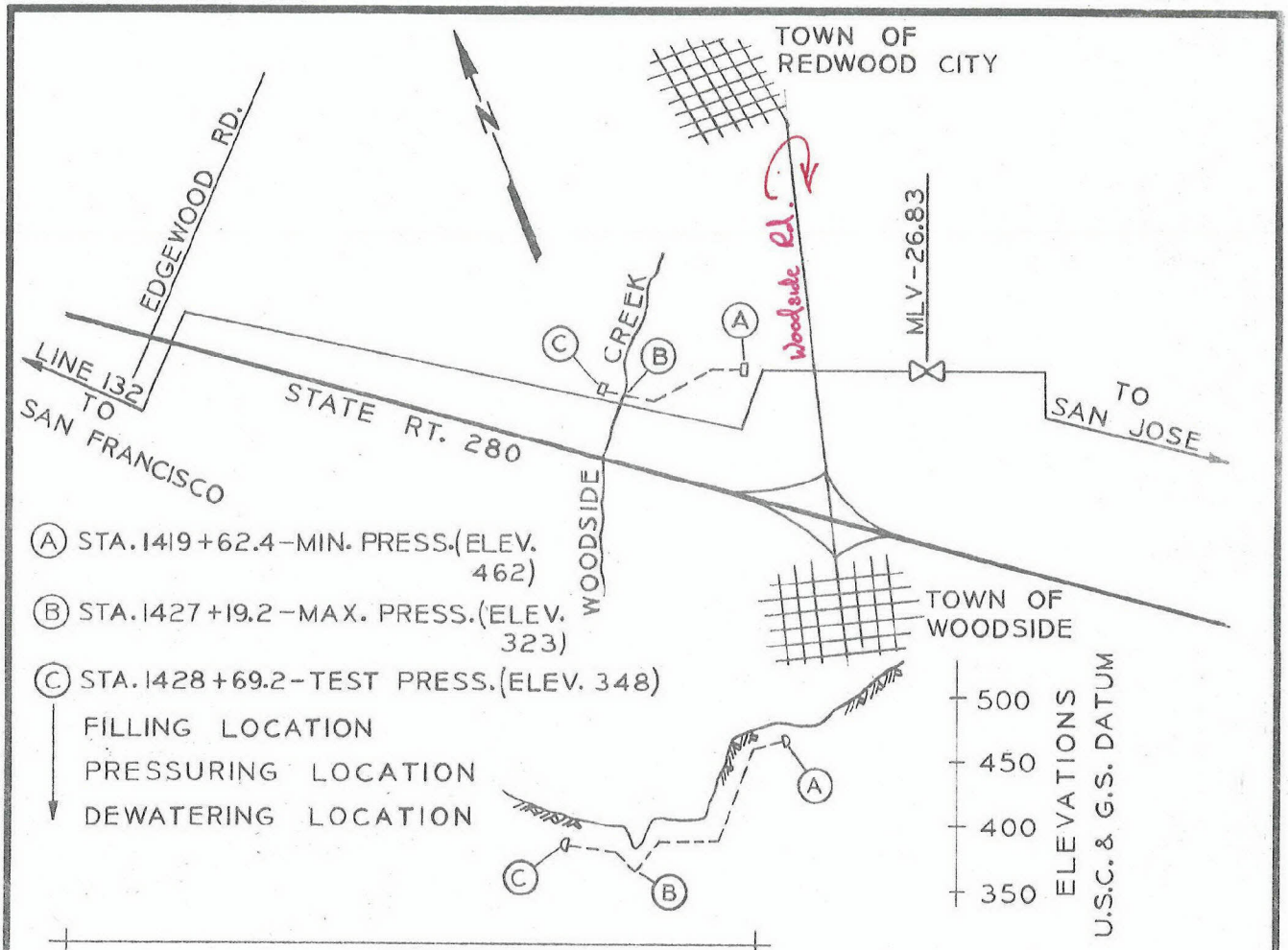
APPROVED BY
GM [redacted]
DSGN.
DWN.
CHKD.
DATE 6-24-75
SCALES NONE

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

MICROFILM
BILL OF MATERIAL
DRAWING LIST
SUPERSEDES
SUPERSEDED BY
SHEET NO. 386527
SHEETS
REV. 3

A-37.1

A-37.2



RELOCATE SECTION OF 24" LINE 132
SAN JOSE DIV. PENINSULA DIST.
TOWN OF WOODSIDE (INCORP.)

REF. DWG. B-7621
REF. DWG. 483619 SH. 1&2

STATE OF CALIF. B.M. – 1" BRASS DISK LOCATED IN A.C. BERM ON S/W CORNER OF WOODSIDE RD. & ACCESS ROAD TO P.G.& E. CO. WOODSIDE STA. (ELEV. 457.27)

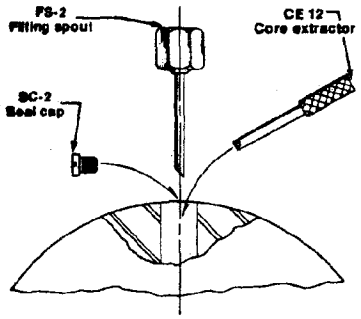
APPROVED BY									
WSH									
REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.		

GM	PIPELINE-SCHEMATIC	B/M	
SUPV.	SAMPLE OF HYDROSTATIC TEST SKETCH	DWG. LIST	
DSGN. [redacted]	GAS STANDARD	SUPSDS	
DWN.	PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	SUPSD BY	
CHKD.		SHEET NO.	SHEETS
O.K.		086872	REV.
DATE 4-18-79 / SCALE		MICROFILM	

62-1804 Rev 7-75

NOTE: THESE INSTRUCTION ARE SPECIFICALLY FOR SPHERES MANUFACTURED BY THE F.H. MALONEY CO. MANUFACTURER'S LITERATURE SHOULD BE CONSULTED FOR OTHER BRANDS OF SPHERES.

Filling instructions
4"



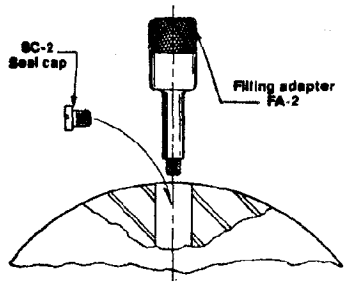
To fill a sphere it is necessary to follow this sequence:

1. With a screwdriver remove seal cap (SC-2).
2. Remove valve core with core extractor (CE-12).
3. Using the filling spout (FS-2) or a small funnel, fill sphere completely.

NOTE:
It may be necessary to tap sphere to remove trapped air during this operation.

4. Replace valve core with core extractor (CE-12).

Sizing instructions



To size a sphere it is necessary to follow this sequence:

1. Hand tighten filling adapter (FA-2) to sphere valve.
2. Thread filling adapter (FA-2) into quick coupling on pressure pump.
3. Inflate sphere to proper size.
4. Remove filling adapter (FA-2) from sphere valve.
5. Replace seal cap (SC-2).

For efficient operation, spheres must be filled with liquid and sized to proper diameter.

Recommended liquid fillers for pipeline spheres	
Temperature range	Liquid filler
Below 32°F	50% Ethylene glycol and water
32°F – 150°F	Water
Above 150°F	Glycerol
CAUTION Do not use hydrocarbon filling liquids	

Sphere sizing recommendations

Recommendations are intended as a guide only. Actual experience will allow more accurate sizing for any given line under actual operating conditions.
Urethane – 1% larger than pipe ID.
All other compounds – 2% larger than pipe ID.

Required tools and accessories

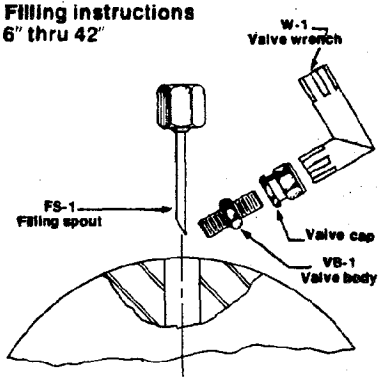
Pressure pump
Valve wrench
Core extractor
Filling adapter
Filling spout

Optional tools, parts and accessories

Description

1. Replacement valve core (all spheres).
2. Replacement valve – spheres 6" and larger (complete with valve body, core, cap, and "O" ring).
3. Replacement caps
4. Radioactive source container.
5. Sizing rings (per customer specifications).

Filling instructions
6" thru 42"



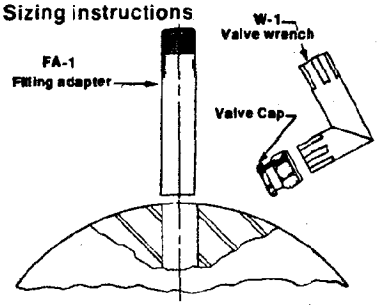
To fill a sphere it is necessary to follow this sequence:

1. Remove valve cap with small end of valve wrench (W-1).
2. Remove valve body (VB-1) with large end of valve wrench (W-1).
3. Using the filling spout (FS-1) or a small funnel, fill sphere completely.

NOTE:
It may be necessary to tap sphere to remove trapped air during this operation.

4. Replace valve body (VB-1) with valve wrench (W-1).

Sizing instructions



To size a sphere it is necessary to follow this sequence:

1. Hand tighten filling adapter (FA-1) to sphere valve.
2. Thread filling adapter (FA-1) into quick coupling on pressure pump.
3. Inflate sphere to proper size.
4. Remove filling adapter (FA-1) from sphere valve.
5. Replace valve cap with valve wrench (W-1).

APPROVED BY									
WSN									
RJA									
REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.		

GM	PIPING – DATA SHEET	B/M	
SUPV.	FILLING AND SIZING INSTRUCTION FOR PIPELINE SPHERE	DWG. LIST	
DSGN.	GAS STANDARD	SUPSDS	
DWN.	PACIFIC GAS AND ELECTRIC COMPANY	SUPSD BY	
CHKD.	SAN FRANCISCO, CALIFORNIA	SHEET NO. 1 OF 2 SHEETS	
O.K.		086873	REV.
DATE 4-18-79	SCALE	MICROFILM	

62-1804 Rev 7-75

GENERAL DESCRIPTION

The pressure pump is designed to facilitate the filling and sizing of Maloney Pipeline Spheres in permanent and temporary installations.

The pump is a single acting, positive displacement, hand operated unit capable of pressures up to approximately 300 p.s.i. Effective volume is approximately four cubic inches per stroke. Both suction and discharge sides are equipped with check valves, and a manual pressure relieving valve is included on the discharge side. The suction side of the pump is piped to standard ¼-inch IPS threads with a removable hard rubber reservoir.

The complete unit includes the pump, reservoir, pressure discharge hose with quick coupling fitting, and one quick coupling adapter to fit the sphere filling adapters.

ACCESSORIES

Available as accessories for this pump are:

a. Pressure gauge kit (includes 0-400 p.s.i. gauge, and necessary tee and nipple), not installed.

b. Drain hose, with hose clamp.

c. Extra quick coupling adapters, one included with pump, to fit sphere filling adapters.

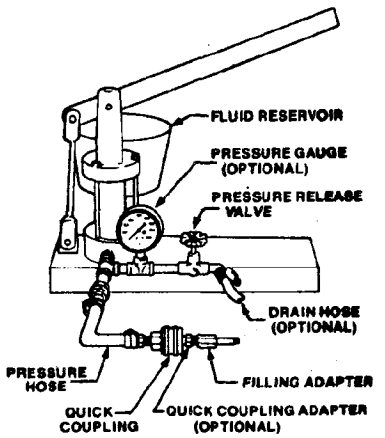
None of the above are required for the proper operation of the pump, but may be required for convenience.

OPERATION

To fill and size a sphere it is necessary to follow this sequence:

1. With the valve wrench, remove the entire valve from the sphere.
2. Using the filler spout or a small funnel, fill the sphere completely with water. (It may be necessary to tap the sphere to remove trapped air during this operation.)
3. Replace the valve in the sphere and tighten firmly (with 4" spheres only the valve core is removable).
4. Hand tighten the filling adapter (FA-1 or FA-2) to the sphere valve.
5. Remove the quick coupling from the pressure hose end and thread it into the filling adapter.
6. Fill the reservoir with liquid. (Consult your Maloney representative for the proper liquid to use in unusual temperature applications.) Water is preferred.
7. Operate the pump until all air is evacuated from the pump and hose.

NOTE: THESE INSTRUCTIONS ARE SPECIFICALLY FOR SPHERES AND PUMPS MANUFACTURED BY THE F.H. MALONEY CO. MANUFACTURER'S LITERATURE SHOULD BE CONSULTED FOR OTHER BRANDS OF SPHERES AND PUMPS.



8. Recouple the hose filling adapter and proceed to inflate sphere to proper diameter.
9. After reaching proper size, the pressure may be relieved from the filler hose with the small hand valve.
10. Remove the filling adapter from the sphere valve.
11. Replace the valve cap firmly.

The only precautions necessary in inflating the sphere are as follows:

a. Make sure that all air is evacuated from the sphere during filling and inflating.

b. Tighten valve and valve caps firmly, but do not force threads.

c. In the event of valve leakage replace the entire valve assembly in the sphere.

MAINTENANCE

In normal use the pump requires no maintenance other than a few drops of oil on the roll pin bushings. For long periods of storage it would be advisable to pump a clean mineral oil through the pump before packaging.

HOW TO ORDER

The pressure pump for pipeline spheres is furnished with the necessary fittings up to the valve filling adapter. Specify on order "Pressure pump complete". The filling adapter and the various accessories listed for use with the pump must be ordered separately as needed.

APPROVED BY								
REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.

GM		B/M	
SUPV.		DWG. LIST	
DSGN.		SUPSDS	
DWN.		SUPSD BY	
CHKD.		SHEET NO. 2 OF 2	SHEETS
O.K.			REV.
DATE 4-18-79	SCALE	086873	
		MICROFILM	

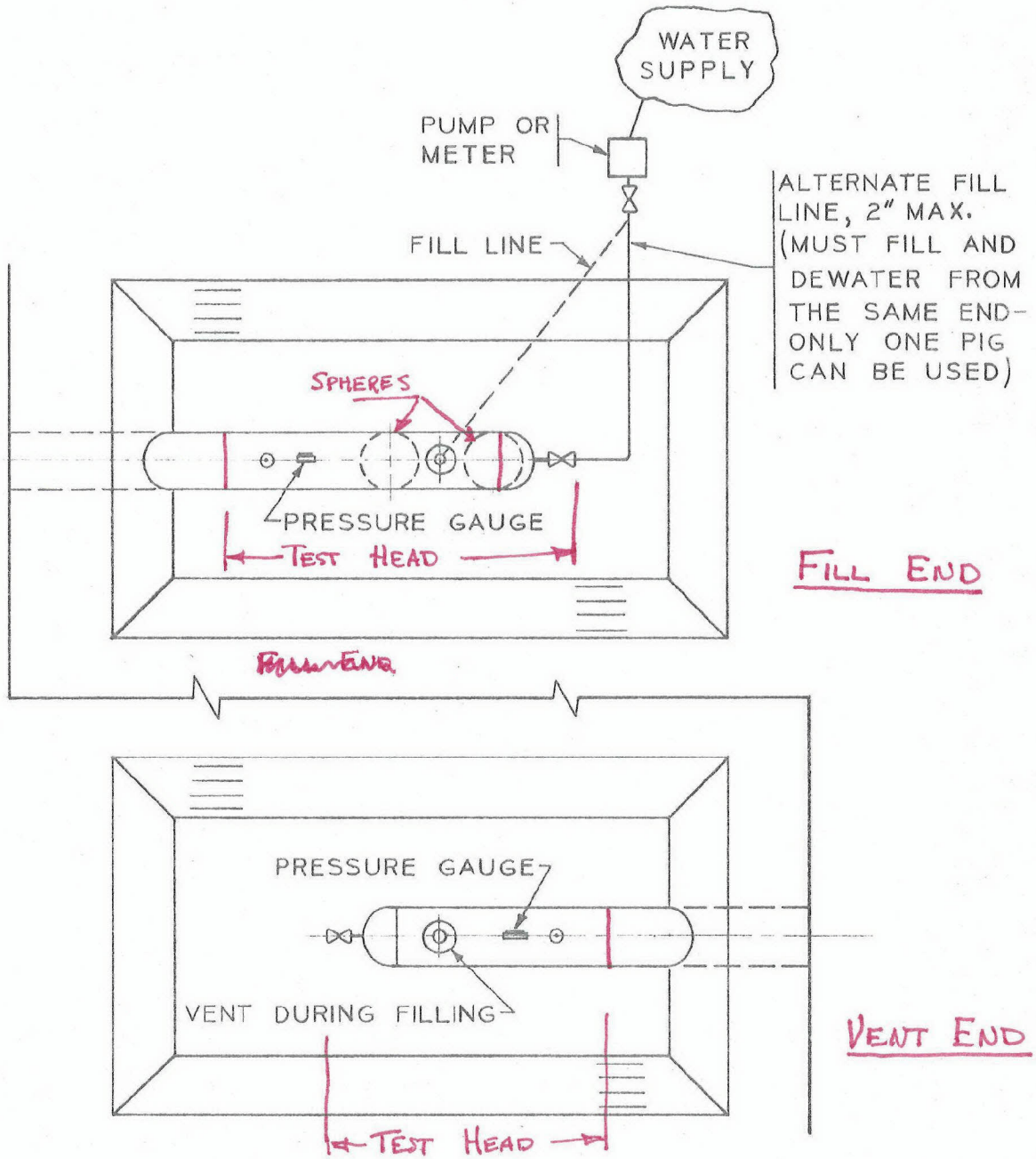
PIPING-DATA SHEET

FILLING AND SIZING INSTRUCTION FOR PIPELINE SPHERE

GAS STANDARD

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

62-1804 Rev 7-75



APPROVED BY	REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.

GM			B/M
SUPV.			DWG. LIST
DSGN. [redacted]			SUPSDS
DWN.			SUPSD BY
CHKD.			SHEET NO. / SHEETS
O.K.			086874 / REV.
DATE 4-18-79 / SCALE			MICROFILM

PIPING-SCHEMATIC

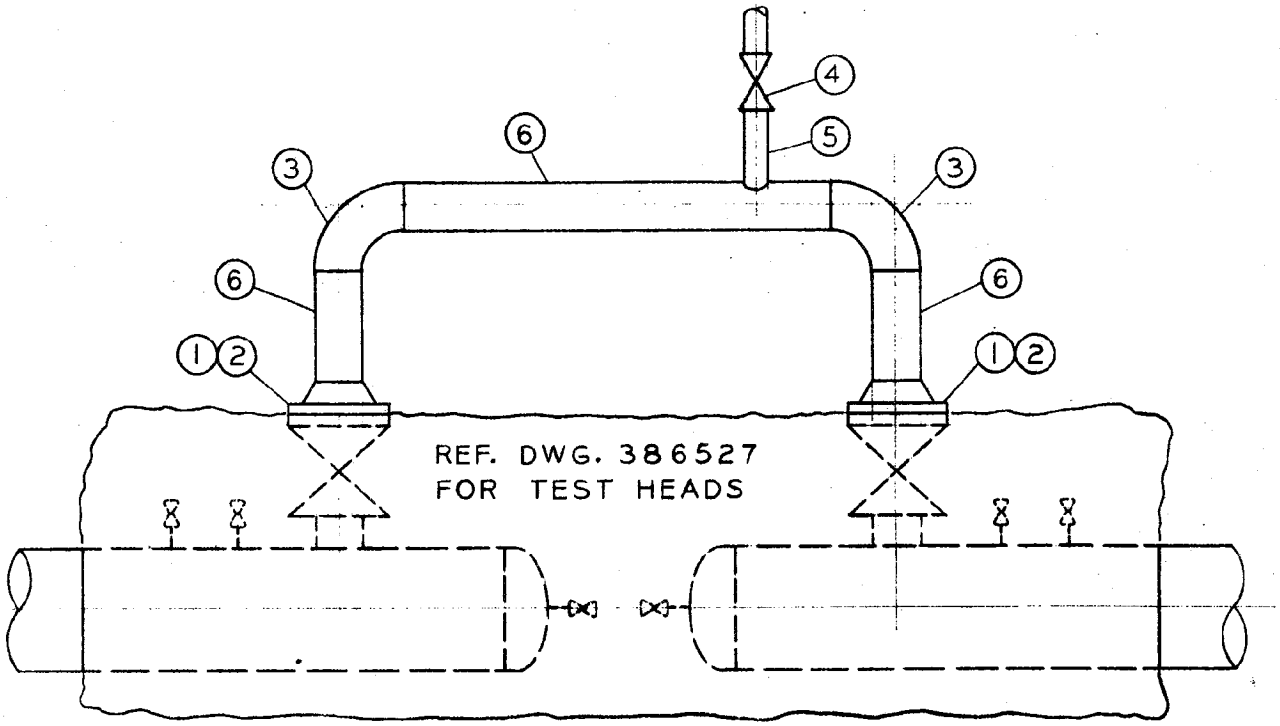
HYDROSTATIC TEST-SAMPLE FOR FILLING GAS STANDARD

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

62-1804 Rev 7-75

A-37.5

NOTE: MANIFOLDS ARE FOR THE TRANSFER OF WATER FROM ONE TEST SECTION TO ANOTHER. MANIFOLDS ARE NOT TO BE IN PLACE DURING A HYDROSTATIC TEST.



* S_1 = TEST HEAD 14"-16"
S_2 = TEST HEAD 18"-30"
S_3 = TEST HEAD 32"-36"

ITEM	QTY. S_1	QTY. S_2	QTY. S_3	DESCRIPTION		REMARKS
1	2			FLANGE, ANSI 900, WN., R.F.	4"	BORED TO 4.026"
		2		FLANGE, ANSI 900, WN., R.F.	6"	BORED TO 5.761"
			2	FLANGE, ANSI 900, WN., R.F.	8"	BORED TO 7.625"
2	2			GASKET, ISOSEAL, ANSI 900	4"	
		2		GASKET, ISOSEAL, ANSI 900	6"	
			2	GASKET, ISOSEAL, ANSI 900	8"	
3	2			ELBOW, 90°, L.R., STD., GR. B	4"	
		2		ELBOW, 90°, L.R., STD., GR. B	6"	
			2	ELBOW, 90°, L.R., STD., GR. B	8"	
4	1	1	1	VALVE, ROCKWELL FIG. 2344, ANSI 900	2	SCREWED
5	1	1	1	NIPPLE, SMLS. STL., GR. B, E.H., T.O.E.	2"x 6"	
6	*			PIPE, SMLS. STL., GR. B, 4.5" x 0.237" W.T.		*CUT TO SUIT
		*		PIPE, SMLS. STL., GR. B, 6.625" x 0.432" W.T.		*CUT TO SUIT
			*	PIPE, SMLS. STL., GR. B, 8.625" x 0.500" W.T.		*CUT TO SUIT

APPROVED BY	REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.

GM
SUPV.
DSGN. [redacted]
DWN.
CHKD.
O.K.
DATE 4-18-79
SCALE

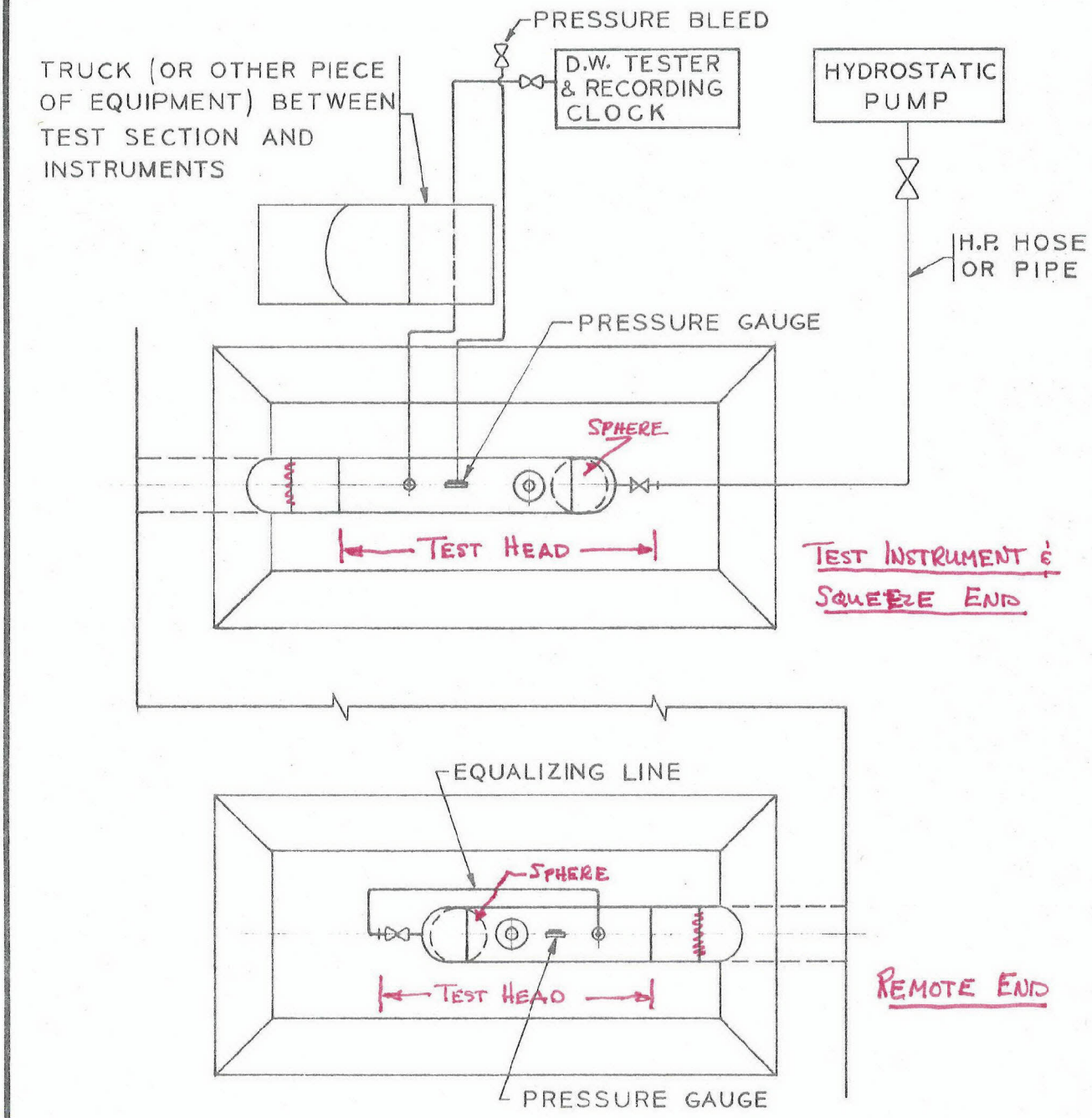
PIPING-DETAILS

HYDROSTATIC TEST MANIFOLD (HAIRPIN)

GAS STANDARD
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

B/M
DWG. LIST
SUPSDS
SUPSD BY
SHEET NO. 086875
SHEETS
REV.
MICROFILM

62-1804 Rev 7-75

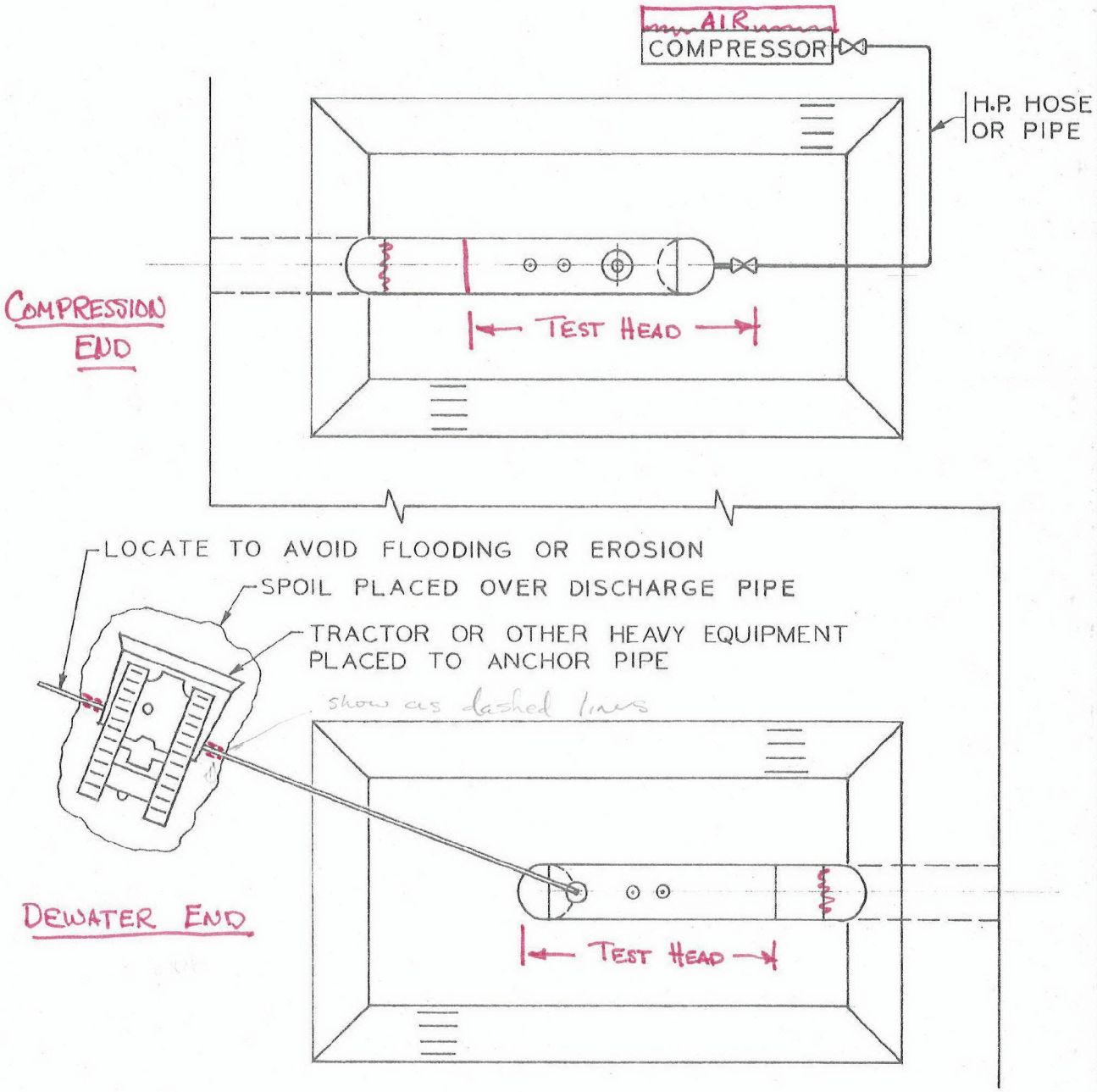


APPROVED BY		REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.
WSH	MM								
RTA									
MW									

GM			B/M
SUPV.			DWG. LIST
DSGN.	[redacted]		SUPSDS
DWN.			SUPSD BY
CHKD.			SHEET NO. / SHEETS
O.K.			086871 / REV.
DATE	SCALE		
4-18-79			MICROFILM

PIPING-SCHEMATIC
HYDROSTATIC TEST
SAMPLE SET UP FOR SQUEEZE
GAS STANDARD
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

62-1804 Rev 7-75



APPROVED BY	REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.
WSH RTA								

GM	PIPING - SCHEMATIC	B/M	
SUPV.	HYDROSTATIC TEST - SAMPLE FOR DEWATERING	DWG. LIST	
DSGN. [redacted]	GAS STANDARD	SUPSDS	
DWN.	PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	SUPSD BY	
CHKD.		SHEET NO.	SHEETS
O.K.		086876	REV.
DATE 4-18-79 / SCALE		MICROFILM	

62-1804 Rev 7-75