



Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company	Job Number	41497308
Construction Co.	Snelson	Job Number	41474005-T73
Hydro. Test Co.	Milbar Hydro-test Incorporated	Project No.	FY12-112
Test Section	PG&E T-73 Line 300A, MP 496.36 - 499.77		WATER
File Name	RCP 61362 - T-73, L-300A MP 496.36 - 499.77		

General Pipe Data

Description	Segment										
	1	2	3	4	5	6	7				
Restrained or Unrestrained?	Unrestrained	Restrained	Restrained	Restrained	Unrestrained	Unrestrained	Unrestrained				
Outside Diameter	34.000 in.	34.000 in.	34.000 in.	34.000 in.	34.000 in.	34.000 in.	34.000 in.				
Wall Thickness	0.505 in.	0.380 in.	0.500 in.	0.562 in.	0.500 in.	0.375 in.	0.375 in.				
Inside Diameter	32.990 in.	33.240 in.	33.000 in.	32.876 in.	33.000 in.	33.250 in.	33.250 in.				
Spec./Grade	API5L-X60	API5L-X60	API5L-X46	API5L-X60	API5L-X65	API5L-X60	API5L-X65				
Length Unstrained	73.00 ft				40 ft	5 ft	6 ft				
Length Restrained		2,055 ft	16,246 ft	304 ft							
Temperature -- On Test	76 °F	75 °F	75 °F	75 °F	76 °F	76 °F	76 °F				
Temperature -- End of Test	77 °F	76 °F	76 °F	76 °F	77 °F	77 °F	77 °F				
Pressure -- On Test	1,074 psig	1,074 psig	1,074 psig	1,074 psig	1,074 psig	1,074 psig	1,074 psig				
Pressure -- End of Test	1,074 psig	1,074 psig	1,074 psig	1,074 psig	1,074 psig	1,074 psig	1,074 psig				

Unrestrained Pipe

Sum:	Vo	5,514.92 gal 705,910 oz.		Vtp1	5,541.40 gal 709,299 oz.		Vtp2	5,540.65 gal 709,204 oz.	
Vo Unrestrained	3,242 gal				1,777 gal	226 gal	271 gal		
Fwp 1	1.003292				1.003292	1.003292	1.003292		
Fpp 1	1.002923				1.002954	1.003968	1.003968		
Fpt 1	1.000291				1.000291	1.000291	1.000291		
Fwt 1	1.001813				1.001813	1.001813	1.001813		
Fpwt 1 = Fpt/Fwt	0.998481				0.998481	0.998481	0.998481		
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	3,256.73 gal				1,785.64 gal	226.83 gal	272.20 gal		
Fwp 2	1.003292				1.003292	1.003292	1.003292		
Fpp 2	1.002923				1.002954	1.003968	1.003968		
Fpt 2	1.000309				1.000309	1.000309	1.000309		
Fwt 2	1.001966				1.001966	1.001966	1.001966		
Fpwt = Fpt/Fwt	0.998347				0.998347	0.998347	0.998347		
Vtp = Vo(Fwp)(Fpp)(Fpwt)	3,256.29 gal				1,785.40 gal	226.80 gal	272.16 gal		

Restrained Pipe

Sum:	Vo	827,872.14 gal 105,967,634 oz.		Vtp1	831,237.59 gal 106,398,412 oz.		Vtp2	831,147.16 gal 106,386,837 oz.	
Vo Restrained		92,639 gal	721,828 gal	13,406 gal					
Fwp 1		1.003292	1.003292	1.003292					
Fpp 1		1.002904	1.002204	1.001960					
Fpt 1		1.000182	1.000182	1.000182					
Fwt 1		1.001688	1.001688	1.001688					
Fpwt 1 = Fpt/Fwt		0.998496	0.998496	0.998496					
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		93,073 gal	724,708 gal	13,456 gal					
Fwp 2		1.003292	1.003292	1.003292					
Fpp 2		1.002907	1.002208	1.001963					
Fpt 2		1.000194	1.000194	1.000194					
Fwt 2		1.001813	1.001813	1.001813					
Fpwt = Fpt/Fwt		0.998384	0.998384	0.998384					
Vtp = Vo(Fwp)(Fpp)(Fpwt)		93,063 gal	724,629 gal	13,454 gal					

Combined Pipe

Sum:	Vo	833,387.07 gal 106,673,544 oz.		Vtp1	836,778.99 gal 107,107,711 oz.		Vtp2	836,687.82 gal 107,096,041 oz.	
1 °F Change	91.17 gal		11,669.92 oz.						



Hydrostatic Test Pipe Data Table

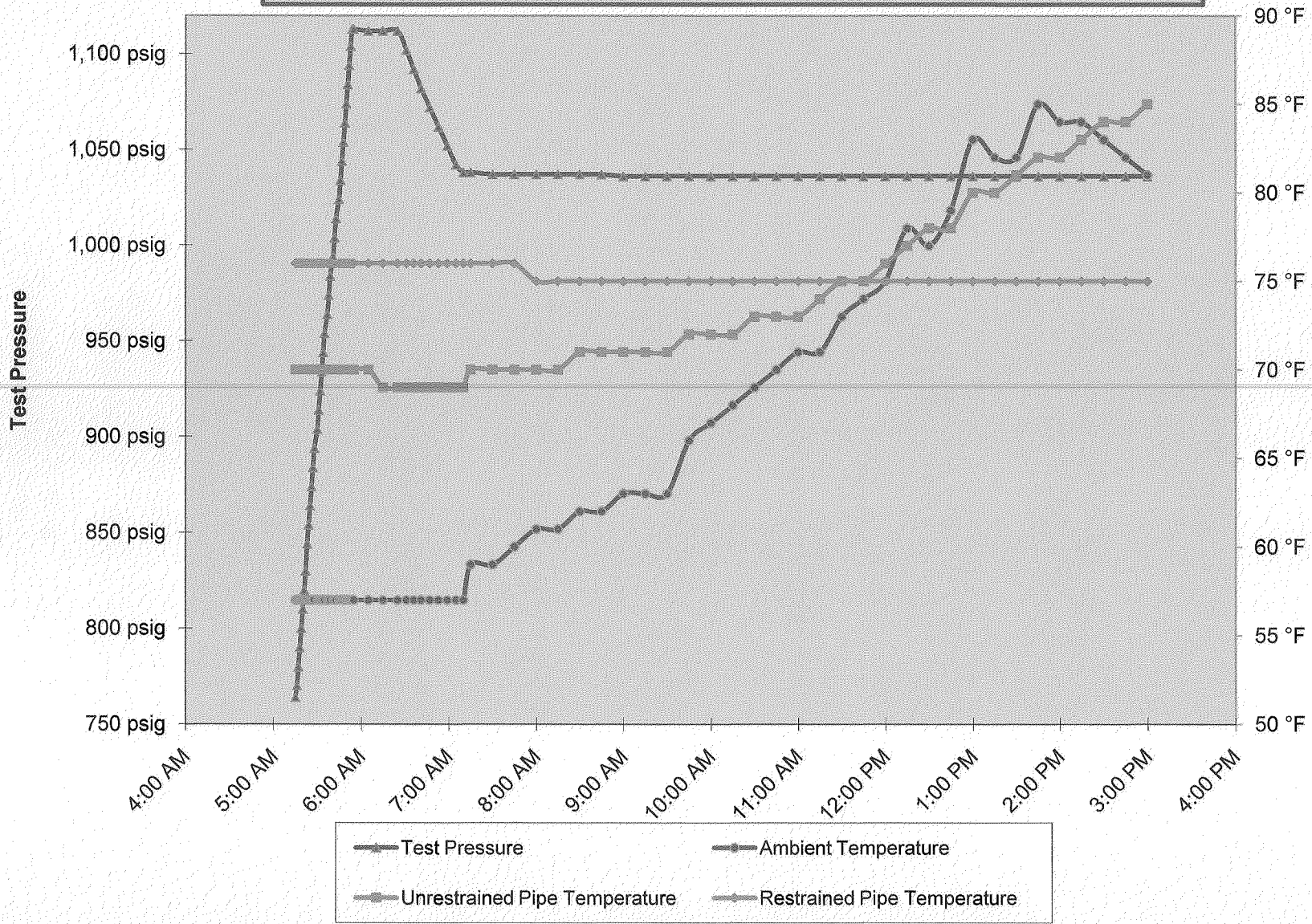
Pipe Type	Length	Restrained / Unrestrained	Outside Diameter	Wall Thickness	Specification & Grade	Pipe Yield Pressure	Material	Joint Type	Seam Type
1	73 ft	Unrestrained	34.000 in.	0.5050 in.	API5L-X60	1,782 psig	Steel	Arc Weld	DSAW
2	2,055 ft	Restrained	34.000 in.	0.3800 in.	API5L-X60	1,341 psig	Steel	Arc Weld	DSAW
3	16,246 ft	Restrained	34.000 in.	0.5000 in.	API5L-X46	1,353 psig	Steel	Arc Weld	DSAW
4	304 ft	Restrained	34.000 in.	0.5620 in.	API5L-X60	1,984 psig	Steel	Arc Weld	DSAW
5	40 ft	Unrestrained	34.000 in.	0.5000 in.	API5L-X65	1,912 psig	Steel	Arc Weld	DSAW
6	5 ft	Unrestrained	34.000 in.	0.3750 in.	API5L-X60	1,324 psig	Steel	Arc Weld	DSAW
7	6 ft	Unrestrained	34.000 in.	0.3750 in.	API5L-X65	1,434 psig	Steel	Arc Weld	DSAW

Hydrostatic Test Project Owner & Participants

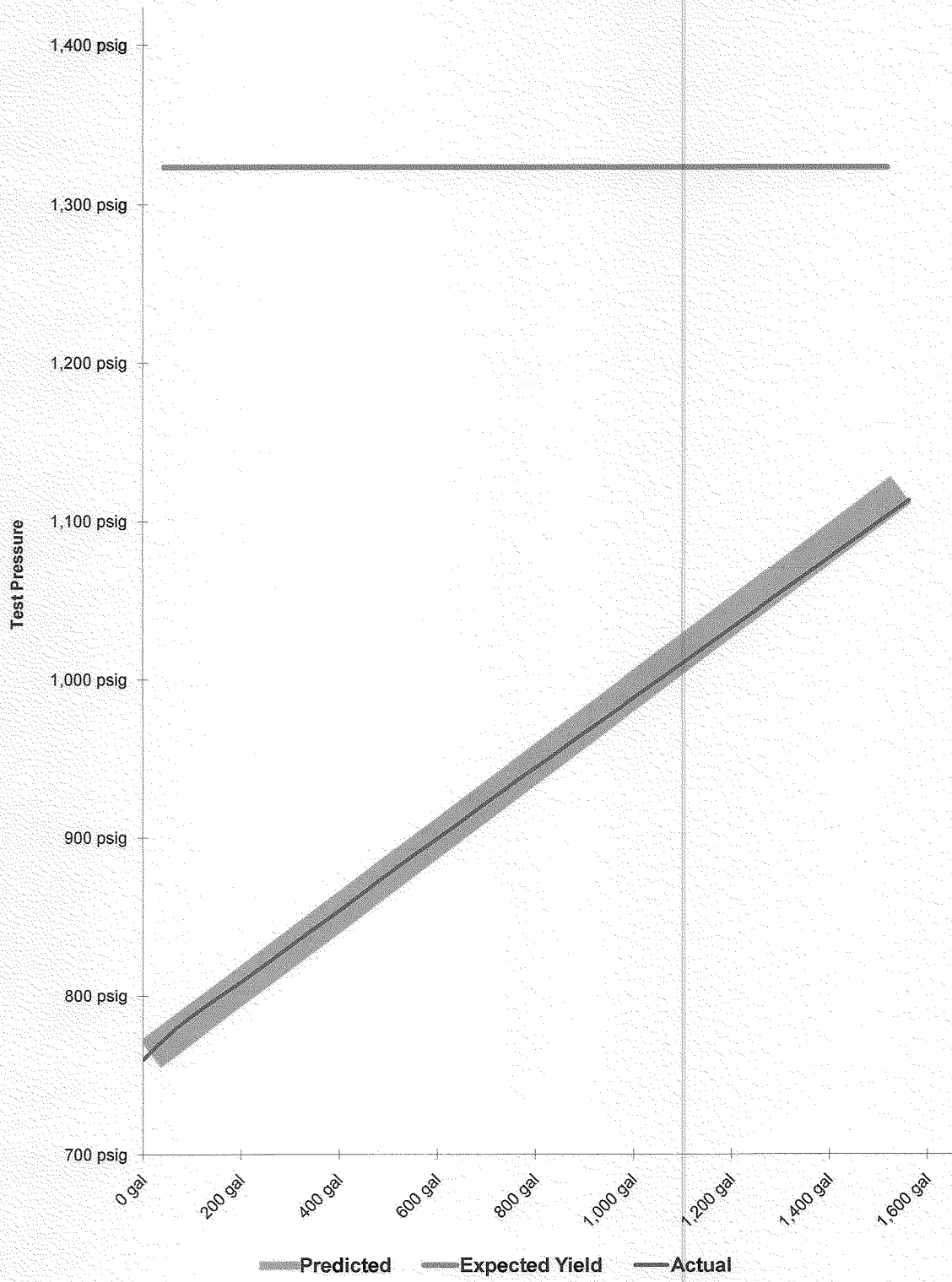
Owner Company	Pacific Gas and Electric Company	Job Number
Address	350 N. Wiget Walnut Creek, CA 94598 Attention: Redacted	41497308
Construction Company	Snelson	Job Number
Address	601 West State Street Sedro-Woolley WA 98284 Attention: Redacted	41474005-T73
Hydrostatic Test Co.	Milbar Hydro-test Incorporated	Project No.
Address	P.O. Box 7701 Shreveport, Louisiana 71137-7701	FY12-112
Test Section	PG&E T-73 Line 300A, MP 496.36 - 499.77 From: 0+00 To: 184+08	
File Name	RCP 61362 - T-73, L-300A MP 496.36 - 499.77	

Part II – Test Data (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)				Note: Minimum test pressure and duration are not to be charged without written approval.			
Time and Date Test Pressure Reached	8/3/11 5:55 AM	Elevation at Test Point	130 ft	Min. Required Test Press At Test Point (1)	1,019.00 psig	Max. Allowable Test Press at Test Point (4)	1,117.50 psig
Time and Date Test Ended	8/3/11 2:45 PM	Max. Elevation in Test Section	140 ft	Min. Indicated Test Pressure (2)	1,036.00 psig	Max. Indicated Test Pressure (5)	1,113.00 psig
Actual Duration of Test	8 hours 50 minutes	Min. Elevation in Test Section	55 ft	Min. Test Pressure at Max. Elevation (3)	1,031.67 psig	Max. Test Pressure at Min. Elevation (6)	1,145.50 psig

PG&E T-73 Line 300A, MP 496.36 - 499.77



**Spike Pressure Test
Stress Strain Curve -- PG&E T-73 Line 300A, MP 496.36 - 499.77**



Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-73 Line 300A, MP 496.36 - 499.77	
Pressure	Strokes	Gallons	Gallons	Actual	Predicted		
760 psig	0	0.00 gal		0	0.00 gal	Pump gal per stroke	0.551 gal/stroke
770 psig	60	33.05 gal	42.96 gal	3.305	4.296	Pump Piston Diameter	3.000 in
780 psig	125	68.85 gal	85.92 gal	3.580	4.296	Pump Piston Stroke	6.00 in
790 psig	203	111.81 gal	128.89 gal	4.296	4.297	Pump Cylinders	3 ea
800 psig	286	157.53 gal	171.86 gal	4.572	4.297	Volume check gal per stroke	0.597 gal/stroke
810 psig	370	203.80 gal	214.83 gal	4.627	4.297	Volume Released (gallons)	48.00 gal
820 psig	451	248.41 gal	257.80 gal	4.461	4.297	Pressure Reduced (psi)	10 psi
830 psig	533	293.58 gal	300.78 gal	4.517	4.298	Maximum2	1,650 gal
840 psig	611	336.54 gal	343.75 gal	4.296	4.298	Minimum2	0 gal
850 psig	694	382.25 gal	386.73 gal	4.572	4.298	Maximum1	1,424 psig
860 psig	774	426.32 gal	429.72 gal	4.406	4.298	Minimum1	700 psig
870 psig	852	469.28 gal	472.70 gal	4.296	4.299	Gallons/Stroke Used	0.551 gal/stroke
880 psig	932	513.34 gal	515.69 gal	4.406	4.299	Predicted Gallons/Stroke	0.535 gal/stroke
890 psig	1013	557.96 gal	558.69 gal	4.461	4.299	1160	10 psi
900 psig	1096	603.68 gal	601.68 gal	4.572	4.299	Max Pressure	1,113 psig
910 psig	1177	648.29 gal	644.68 gal	4.461	4.300	Buried Pipe Temperature	75 °F
920 psig	1256	691.80 gal	687.68 gal	4.351	4.300	Exposed Pipe Temperature	75 °F
930 psig	1337	736.42 gal	730.68 gal	4.461	4.300	ASME B31.8 Appendix N-5 Average Actual Elastic Slope 3.442 Average Predicted Elastic Slope 4.301 Code Prescribed Minimum Yield Slope (less 10%) B31.8 N-5 (c)(2) 6.541 Established Minimum Yield Pressure B31.8 N-5 (c)(2) 1,113 psig Maximum Allowed Volume (After Slope Deviation) B31.8 N-5 (c)(2) 418 gal Volume (After Slope Deviation) B31.8 N-5 (c)(2) 0 gal	
940 psig	1419	781.58 gal	773.68 gal	4.517	4.300		
950 psig	1504	828.40 gal	816.69 gal	4.682	4.301		
960 psig	1585	873.02 gal	859.70 gal	4.461	4.301		
970 psig	1667	918.18 gal	902.71 gal	4.517	4.301		
980 psig	1750	963.90 gal	945.73 gal	4.572	4.302		
990 psig	1831	1,008.51 gal	988.75 gal	4.461	4.302		
1,000 psig	1915	1,054.78 gal	1,031.77 gal	4.627	4.302		
1,010 psig	1997	1,099.95 gal	1,074.79 gal	4.517	4.302		
1,020 psig	2078	1,144.56 gal	1,117.82 gal	4.461	4.303		
1,030 psig	2160	1,189.73 gal	1,160.84 gal	4.517	4.303		
1,040 psig	2243	1,235.44 gal	1,203.87 gal	4.572	4.303		
1,050 psig	2322	1,278.95 gal	1,246.91 gal	4.351	4.303		
1,060 psig	2405	1,324.67 gal	1,289.94 gal	4.572	4.304		
1,070 psig	2486	1,369.29 gal	1,332.98 gal	4.461	4.304		
1,080 psig	2567	1,413.90 gal	1,376.03 gal	4.461	4.304		
1,090 psig	2651	1,460.17 gal	1,419.07 gal	4.627	4.304		
1,100 psig	2731	1,504.23 gal	1,462.12 gal	4.406	4.305		
1,110 psig	2812	1,548.85 gal	1,505.17 gal	4.461	4.305		
1,113 psig	2837	1,562.62 gal	1,518.08 gal	4.590	4.305		
1,113 psig		1,562.62 gal	1,518.08 gal	0.000	0.000	Redacted 8/3/11 Date	
1,113 psig		1,562.62 gal	1,518.08 gal	0.000	0.000		
1,113 psig		1,562.62 gal	1,518.08 gal	0.000	0.000		
1,113 psig		1,562.62 gal	1,518.08 gal	0.000	0.000		
1,113 psig		1,562.62 gal	1,518.08 gal	0.000	0.000		
1,113 psig		1,562.62 gal	1,518.08 gal	0.000	0.000		
1,113 psig		1,562.62 gal	1,518.08 gal	0.000	0.000		



test 73 location B pressure chart



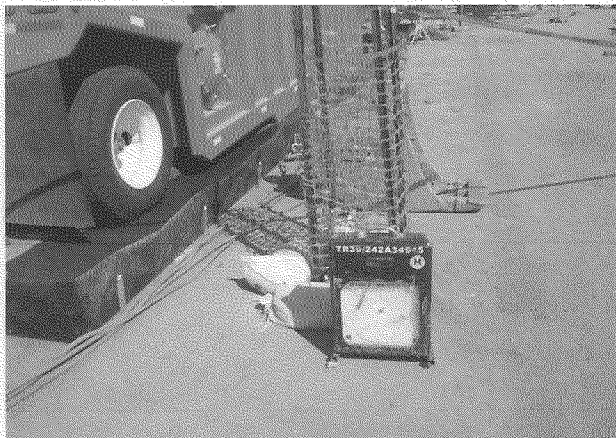
test 73 location B restrained temp. transmitter



test 73 location B test head at ladder



test 73 location B restrained temp. transmitter



test 73 loc. A, remote restrained temp. recorder



test 73 loc.A testheads