



**PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)**

<b>Test Description</b>													
Line Number or Station Name L-191-1						Division/District Diablo			Job Number 31079361				
Purpose of Test Test New 12" Piping						MAOP to be Established by this Test <u>283</u> PSIG							
Description of Pipe being Tested (include reference drawings, field stationing, and mile points) T-022A-12, Hydrostatically Test New Piping at Location E Required to Test Existing 12" L-191-1, MP 25.30 - 26.73 in Conjunction with 41919143, Test 3. (Refer to DWG 41919143 - Sheets 1-6 of 6)													
<input checked="" type="checkbox"/> New Facility (no spike test required) <input type="checkbox"/> Existing Facility Will spike test be performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (explain on right)						If no spike test for existing facility, explain:							
<b>Static Head Calculation</b>													
Maximum Elevation <u>332</u> FT						For Water <u>105</u> (Elev. Diff.) x 0.433 = <u>46</u> PSIG							
Minimum Elevation <u>227</u> FT						For Other Test Medium _____							
Elevation Difference <u>105</u> FT						Contact the responsible engineer for guidance on completing this field.							
<b>Pipe to be Tested</b>													
Size		API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS			
OD (in.)	WT (in.)									At MAOP	At Min. Test Press.	At Max. Test Press.	
12.750	0.281	API 5L	52000	HFW	1.0	<del>5-0'</del>	3,40'	3	0.5	12.35	39.27	47.77	
12 x 6	STD	—	35000	TEE	1.0	<del>4-EA</del>	0 EA.	3	0.5	13.75	43.71	53.19	
6.625	0.280	API 5L	35000	SMLS	1.0	<del>4-10'</del>	5.64'	3	0.5	9.57	30.42	37.01	
12 x 6	0.281	52000	TEE	1.0			1 EA.	3	0.5	<del>12.35</del>	<del>39.27</del>	<del>47.77</del>	
										<del>8.23</del>	<del>26.18</del>	<del>31.85</del>	
All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe <input checked="" type="checkbox"/>													
Pipe specs verified in field <input checked="" type="checkbox"/>						Signature of person supervising test <i>Curran EXT D</i>							
Component(s) limiting test pressure/Control Point exceptions 12.750" OD x 0.219" WT, API 5LX, X-42, ERW													
<b>Test Specifications (include a spike test when testing existing facilities)</b>													
Test Factor <u>3.18</u>	[1A]	Min. Test Pressure at Max. Elev. <u>900</u> PSIG					[1B]	Max. Test Pressure at Min. Elev. <u>1095</u> PSIG					
Spike Test (complete only for spike test)	[1C]	Spike Factor <u>1.15</u>					[1D]	Spike Pressure at Max. Elev. Box [1A] X [1C] = <u>1035</u> PSIG					
	[1E]	Spike Pressure at Min. Elev. <u>1081</u> PSIG					[1F]	Max. Post-Spike Pressure at Min. Elev. Box [1E] X 0.90 = <u>972</u> PSIG					
Test Medium to be Used <u>Water</u>			Minimum Test Duration <u>8</u> Hours			<ul style="list-style-type: none"> <li>Under 30% SMYS: 1 hour minimum</li> <li>30% SMYS and over: 8 hours minimum</li> <li>Pre-Installation Test: Refer to A-34, Attachment A</li> <li>Spike Test: 30 minutes minimum (included in test)</li> </ul>							
<b>Signatures</b>													
Prepared by (signature) <i>Dirk Ayala</i>			Print Name and Phone Number DIRK AYALA 530-635-2423				Date <u>6/4/2014</u>		LAN ID D1A8				
Approved by (signature) <i>Don Fink</i>			Print Name DONAVON FINK 714-273-1044				Date <u>6-4-14</u>		LAN ID D1F7				
Test Supervised by (signature) <i>Curran</i>			Time and Date Test Pressure Reached (from Part 2) <u>1300 8/8/14</u>			Time and Date Test Ended (from Part 2) <u>2:15 8/8/14</u>		Actual Duration of Test (from Part 2) <u>8 hr 15 min</u>					

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Pacific Gas and Electric Company  
**Gas Pipeline Facilities Strength Test Pressure Report**  
 (For Pipeline Facilities Designed to Operate over 100 PSIG)

62-4921 (12/2012)  
 Use in Accordance with  
 Numbered Document A-34, A-37,  
 and GO 112-E  
 Sheet 2 of 2  
 Test Number 1 of 1  
 STPR Revision Number 0

**PART 2 – TEST DATA (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)**

<b>Test Elevation</b>			
Elevation at Test Point <u>235</u> FT	Max. Elevation in Test Section <u>332</u> FT		Min. Elevation in Test Section <u>227</u> FT
	[2A] Static Head b/t Test Point and Max. Elev. <u>43</u> PSIG	[2B] Static Head b/t Test Point and Min. Elev. <u>4</u> PSIG	
<b>No Spike Test: Calculations and Test Results (complete for strength test without a spike test)</b>			
Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = _____ PSIG		Max. Allowable Test Pressure at Test Point Box [1B] – Box [2B] = _____ PSIG	
[2C] Min. Test Pressure Indicated _____ PSIG	[2D] Max. Test Pressure Indicated _____ PSIG		
Calculated Min. Test Pressure at Max. Elev. Box [2C] – Box [2A] = _____ PSIG		Calculated Max. Test Pressure at Min. Elev. Box [2D] + Box [2B] = _____ PSIG	
<b>Spike Test: Calculations and Test Results (complete for strength test with a spike test)</b>			
Spike Pressure at Test Point Box [1E] – Box [2B] = <u>1077</u> PSIG		Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = <u>943</u> PSIG	
[2E] Spike Pressure Indicated <u>1077</u> PSIG	[2F] Min. Test Pressure Indicated <u>955</u> PSIG	[2G] Max. Post-Spike Test Pressure Indicated <u>957</u> PSIG	Max. Post-Spike Pressure at Test Point Box [1F] – Box [2B] = <u>968</u> PSIG Pressure Range After Spike Test <u>25</u> PSIG
Calculated Spike Pressure at Min. Elev. Box [2E] + Box [2B] = <u>1081</u> PSIG		Calculated Min. Test Pressure at Max. Elev. Box [2F] – Box [2A] = <u>912</u> PSIG	
		Calculated Max. Post-Spike Pressure at Min. Elev. Box [2G] + Box [2B] = <u>961</u> PSIG	
<b>Test Acceptance</b>			
Were Leaks Observed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, explain:	
Acceptable Strength Test? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If no, explain:	
Report strength test failures to Regulatory Compliance			
Test Medium Used <u>Water</u>	Time and Date Test Pressure Reached <u>1300 8/8/14</u>	Time and Date Test Ended <u>2115 8/8/14</u>	Actual Duration of Test <u>8 hr 15 min</u>
<b>Test Instruments</b>			
Make, Range, and Serial No. of Pressure Recording Device <u>TechCal 0-2000 psig S/N 02098</u>		Date Last Calibrated <u>5/28/14</u>	
Make, Range and Serial No. of Dead Weight Tester A dead weight tester and/or an electronic pressure recorder is required for tests of any pipe segment equal to or greater than 90% of SMYS. <u>Ametek 25-3000 psig S/N HL 6406</u>		Date Last Calibrated <u>3/18/2014</u>	
<b>Signatures</b>			
Test Supervised by (signature) <u>[Signature]</u>	Print Name <u>ERIC TSAI</u>	Date <u>8/8/14</u>	LAN ID <u>GXTD</u>
Testing Contractor (if third party)			
Approved by (signature) <u>[Signature]</u>	Print Name <u>AZIZA TARIN</u>	Date <u>8-23-14</u>	LAN ID <u>AXTB</u>

**Attachments**

- Test chart
- Schematic piping sketch
- Test log with pressure noted every 15 minutes

**Distribution**

- Gas Job Closeout Desk, 6121 Bollinger Canyon Road, Building Z1, San Ramon, CA 94583



**PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)**

<b>Test Description</b>												
Line Number or Station Name <u>L-191-1</u>						Division/District <u>Diablo</u>			Job Number <u>41919143</u>			
Purpose of Test <u>Test Existing 12" Piping</u>						MAOP to be Established by this Test <u>283 PSIG</u>						
Description of Pipe being Tested (Include reference drawings, field stationing, and mile points) <u>T-022A-12, Hydrostatically Test New Piping Required to Test Existing 12" L-191-1, MP 25.30 - 26.73 in Lafayette. WMPLAT: 45: F08, F09, &amp; F10; 46: A11. Test in Conjunction with 31079361, Test 1.</u> <u>Rev 1 - MOR Piping Reduced due to the addition of Capital Work at Location E.</u> <u>(Refer to DWG 41919143 - Sheets 1-6 of 6)</u>												
<input checked="" type="checkbox"/> New Facility (no spike test required) <input type="checkbox"/> Existing Facility Will spike test be performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (explain on right)						If no spike test for existing facility, explain:						
<b>Static Head Calculation</b>												
Maximum Elevation <u>332</u> FT						For Water <u>105</u> (Elev. Diff.) x 0.433 = <u>46</u> PSIG						
Minimum Elevation <u>227</u> FT						For Other Test Medium _____						
Elevation Difference <u>105</u> FT						Contact the responsible engineer for guidance on completing this field.						
<b>Pipe to be Tested</b>												
Size		API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS		
OD (in.)	WT (in.)									At MAOP	At Min. Test Press.	At Max. Test Press.
<u>12.750</u>	<u>0.281</u>	<u>API 5L</u>	<u>52000</u>	<u>HFV</u>	<u>1.0</u>	<u>49'-4"</u>	<u>51.21'</u>	<u>3</u>	<u>0.5</u>	<u>12.35</u>	<u>39.27</u>	<u>47.77</u>
<u>12.750</u>	<u>0.375</u>	<u>API 5L</u>	<u>35000</u>	<u>SMLS</u>	<u>1.0</u>	<u>2'-0"</u>	<u>12.95'</u>	<u>3</u>	<u>0.5</u>	<u>13.75</u>	<u>43.71</u>	<u>53.19</u>
<u>6.625</u>	<u>0.280</u>	<u>API 5L</u>	<u>35000</u>	<u>SMLS</u>	<u>1.0</u>	<u>1'-10"</u>	<u>0'</u>	<u>3</u>	<u>0.5</u>	<u>9.57</u>	<u>30.42</u>	<u>37.01</u>
All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe <input checked="" type="checkbox"/>												
Pipe specs verified in field <input checked="" type="checkbox"/> Signature of person supervising test <u>Curran EXTD</u>												
Component(s) limiting test pressure/Control Point exceptions <u>12.750" OD x 0.219" WT, API 5LX, X-42, ERW</u>												
<b>Test Specifications (include a spike test when testing existing facilities)</b>												
Test Factor <u>3.18</u>		[1A] Min. Test Pressure at Max. Elev. <u>900</u> PSIG	[1B] Max. Test Pressure at Min. Elev. <u>1095</u> PSIG									
Spike Test (complete only for spike test)		[1C] Spike Factor <u>1.15</u>	[1D] Spike Pressure at Max. Elev. Box [1A] x [1C] = <u>1035</u> PSIG									
		[1E] Spike Pressure at Min. Elev. <u>1081</u> PSIG	[1F] Max. Post-Spike Pressure at Min. Elev. Box [1E] x 0.90 = <u>972</u> PSIG									
Test Medium to be Used <u>Water</u>			Minimum Test Duration <u>8</u> Hours			<ul style="list-style-type: none"> <li>▪ Under 30% SMYS: 1 hour minimum</li> <li>▪ 30% SMYS and over: 8 hours minimum</li> <li>▪ Pre-installation Test: Refer to A-34, Attachment A</li> <li>▪ Spike Test: 30 minutes minimum (included in test)</li> </ul>						
<b>Signatures</b>												
Prepared by (signature) <u>Dirk Ayala</u>				Print Name and Phone Number <u>DIRK AYALA 530-635-2423</u>				Date <u>6/4/14</u>		LAN ID <u>D1A8</u>		
Approved by (signature) <u>Don Fink</u>				Print Name <u>DONAVON FINK 714-273-1044</u>				Date <u>6-4-14</u>		LAN ID <u>D1F7</u>		
Test Supervised by (signature) <u>Curran</u>				Time and Date Test Pressure Reached (from Part 2) <u>1300 8/8/14</u>		Time and Date Test Ended (from Part 2) <u>2115 8/8/14</u>		Actual Duration of Test (from Part 2) <u>8 hr 15 min</u>				

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**PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)**

<b>Test Description</b>													
Line Number or Station Name L-191-1						Division/District Diablo			Job Number 41919143				
Purpose of Test Test Existing 12" Piping						MAOP to be Established by this Test <u>283</u> PSIG							
Description of Pipe being Tested (include reference drawings, field stationing, and mile points) T-022A-12, Location A (PSTA 0+00) to B (PSTA 82+07). Hydrostatically Test Existing 12" L-191-1, MP 25.30 - 26.73 in Lafayette. WMLPAT: 45: F08, F09, & F10; 46: A11. Test in Conjunction with 31079361, Test 1. Rev 1 - MOR Piping Reduced due to the addition of Capital Work at Location E. (Refer to DWG 41919143 - Sheets 1-6 of 6) *Assumed Value Per PG&E Technical Guidance, Procedure for Resolving Unknown Pipeline Features A-11.1 (12/05/12)													
<input type="checkbox"/> New Facility (no spike test required) <input checked="" type="checkbox"/> Existing Facility Will spike test be performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (explain on right)						If no spike test for existing facility, explain:							
<b>Static Head Calculation</b>													
Maximum Elevation <u>332</u> FT						For Water <u>105</u> (Elev. Diff.) x 0.433 = <u>46</u> PSIG							
Minimum Elevation <u>227</u> FT						For Other Test Medium _____							
Elevation Difference <u>105</u> FT						Contact the responsible engineer for guidance on completing this field.							
<b>Pipe to be Tested</b>													
Size		API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS			
OD (in.)	WT (in.)									At MAOP	At Min. Test Press.	At Max. Test Press.	
12.750	0.250	API 5LX	42000	ERW	1.0	<del>7002'</del>	<u>7010.46'</u>	3	0.5	17.18	54.64	66.48	
12.750	0.219	API 5LX	42000	ERW	1.0	<del>1175'</del>	<u>1171.33'</u>	3	0.5	19.61	62.38	75.89	
12.750	0.375	---	35000	ELBOW	1.0	15 EA	<u>MOR</u>	3	0.5	13.75	43.71	53.19	
12.750	0.375	---	35000*	ELBOW	1.0	1 EA	<u>MOR</u>	3	0.5	13.75	43.71	53.19	
All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe <input checked="" type="checkbox"/>													
Pipe specs verified in field <input checked="" type="checkbox"/> Signature of person supervising test <u>Chris Kani EXID</u>													
Component(s) limiting test pressure/Control Point exceptions 12.750" OD x 0.219" WT, API 5LX, X-42, ERW													
<b>Test Specifications (include a spike test when testing existing facilities)</b>													
Test Factor <u>3.18</u>	[1A]	Min. Test Pressure at Max. Elev. <u>900</u> PSIG					[1B]	Max. Test Pressure at Min. Elev. <u>1095</u> PSIG					
Spike Test (complete only for spike test)	[1C]	Spike Factor <u>1.15</u>					[1D]	Spike Pressure at Max. Elev. Box [1A] x [1C] = <u>1035</u> PSIG					
	[1E]	Spike Pressure at Min. Elev. <u>1081</u> PSIG					[1F]	Max. Post-Spike Pressure at Min. Elev. Box [1E] x 0.90 = <u>972</u> PSIG					
Test Medium to be Used <u>Water</u>			Minimum Test Duration <u>8</u> Hours			<ul style="list-style-type: none"> <li>Under 30% SMYS: 1 hour minimum</li> <li>30% SMYS and over: 8 hours minimum</li> <li>Pre-installation Test: Refer to A-34, Attachment A</li> <li>Spike Test: 30 minutes minimum (included in test)</li> </ul>							
<b>Signatures</b>													
Prepared by (signature) <u>Dirk Ayala</u>			Print Name and Phone Number DIRK AYALA 530-635-2423				Date <u>6/4/14</u>		LAN ID D1A8				
Approved by (signature) <u>Don Fink</u>			Print Name DONAVON FINK 714-273-1044				Date <u>6-4-14</u>		LAN ID D1F7				
Test Supervised by (signature) <u>Chris Kani</u>			Time and Date Test Pressure Reached (from Part 2) <u>1300 8/8/14</u>			Time and Date Test Ended (from Part 2) <u>2:15 8/8/14</u>			Actual Duration of Test (from Part 2) <u>8 hr 15 min</u>				

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**PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)**

Test Description												
Line Number or Station Name L-191-1						Division/District Diablo			Job Number 41919143			
Purpose of Test Test Existing 12" Piping						MAOP to be Established by this Test <u>283</u> PSIG						
Description of Pipe being Tested (include reference drawings, field stationing, and mile points) T-022A-12, Location A (PSTA 0+00) to B (PSTA 82+07). Hydrostatically Test Existing 12" L-191-1, MP 25.30 - 26.73 in Lafayette. WMPLAT: 45: F08, F09, & F10; 46: A11. Test in Conjunction with 31079361, Test 1. <b>Rev 1 - MOR Piping Reduced due to the addition of Capital Work at Location E.</b> (Refer to DWG 41919143 - Sheets 1-6 of 6) *Assumed Value Per PG&E Technical Guidance, Procedure for Resolving Unknown Pipeline Features A-11.1 (12/05/12)												
<input type="checkbox"/> New Facility (no spike test required) <input checked="" type="checkbox"/> Existing Facility Will spike test be performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (explain on right)						If no spike test for existing facility, explain:						
Static Head Calculation												
Maximum Elevation <u>332</u> FT						For Water <u>105</u> (Elev. Diff.) x 0.433 = <u>46</u> PSIG						
Minimum Elevation <u>227</u> FT						For Other Test Medium _____						
Elevation Difference <u>105</u> FT						Contact the responsible engineer for guidance on completing this field.						
Pipe to be Tested												
Size		API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS		
OD (in.)	WT (in.)									At MAOP	At Min. Test Press.	At Max. Test Press.
1.050	0.113	API 5L	35000	SMLS	1.0	<del>4</del>	<u>4.67'</u>	3	0.5	3.76	11.95	14.54
<del>1.050</del>	<del>0.113</del>		<del>35000</del>	<del>ELBOW</del>	<del>1.0</del>	<del>1EA</del>	<u>0 EA.</u>	3	0.5	3.76	11.95	14.54
All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe <input checked="" type="checkbox"/>												
Pipe specs verified in field <input checked="" type="checkbox"/> Signature of person supervising test <i>Curtsom</i>												
Component(s) limiting test pressure/Control Point exceptions 12.750" OD x 0.219" WT, API 5LX, X-42, ERW												
Test Specifications (include a spike test when testing existing facilities)												
Test Factor <u>3.18</u>		[1A] Min. Test Pressure at Max. Elev. <u>900</u> PSIG	[1B] Max. Test Pressure at Min. Elev. <u>1095</u> PSIG									
Spike Test (complete only for spike test)		[1C] Spike Factor <u>1.15</u>	[1D] Spike Pressure at Max. Elev. Box [1A] x [1C] = <u>1035</u> PSIG									
		[1E] Spike Pressure at Min. Elev. <u>1081</u> PSIG	[1F] Max. Post-Spike Pressure at Min. Elev. Box [1E] x 0.90 = <u>972</u> PSIG									
Test Medium to be Used <u>Water</u>			Minimum Test Duration <u>8</u> Hours			<ul style="list-style-type: none"> <li>▪ Under 30% SMYS: 1 hour minimum</li> <li>▪ 30% SMYS and over: 8 hours minimum</li> <li>▪ Pre-installation Test: Refer to A-34, Attachment A</li> <li>▪ Spike Test: 30 minutes minimum (included in test)</li> </ul>						
Signatures												
Prepared by (signature) <i>Dirk Ayala</i>				Print Name and Phone Number DIRK AYALA 530-635-2423				Date <u>6/4/14</u>		LAN ID D1A8		
Approved by (signature) <i>Don Fink</i>				Print Name DONAVON FINK 714-273-1044				Date <u>6-4-14</u>		LAN ID D1F7		
Test Supervised by (signature) <i>Curtsom</i>				Time and Date Test Pressure Reached (from Part 2) <u>1300 8/8/14</u>			Time and Date Test Ended (from Part 2) <u>2115 8/8/14</u>		Actual Duration of Test (from Part 2) <u>8 hr 15 min</u>			

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**PART 2 – TEST DATA (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)**

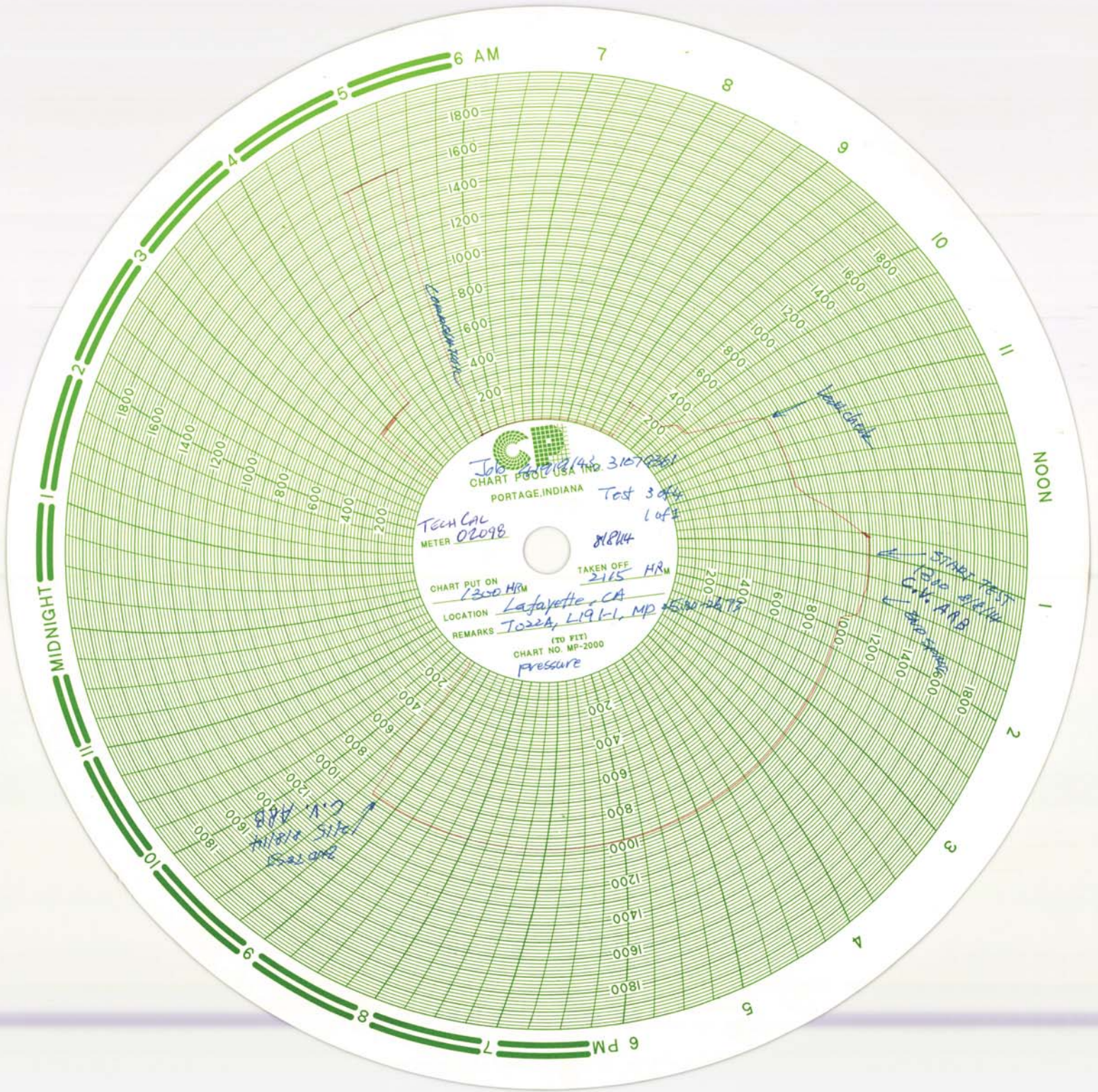
<b>Test Elevation</b>			
Elevation at Test Point <u>235</u> FT		Max. Elevation in Test Section <u>332</u> FT	Min. Elevation in Test Section <u>227</u> FT
[2A]	Static Head b/t Test Point and Max. Elev. <u>43</u> PSIG		[2B] Static Head b/t Test Point and Min. Elev. <u>4</u> PSIG
<b>No Spike Test: Calculations and Test Results (complete for strength test without a spike test)</b>			
Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = _____ PSIG		Max. Allowable Test Pressure at Test Point Box [1B] – Box [2B] = _____ PSIG	Pressure Range During Test _____ PSIG
[2C]	Min. Test Pressure Indicated _____ PSIG	[2D]	Max. Test Pressure Indicated _____ PSIG
Calculated Min. Test Pressure at Max. Elev. Box [2C] – Box [2A] = _____ PSIG		Calculated Max. Test Pressure at Min. Elev. Box [2D] + Box [2B] = _____ PSIG	
<b>Spike Test: Calculations and Test Results (complete for strength test with a spike test)</b>			
Spike Pressure at Test Point Box [1E] – Box [2B] = <u>107</u> PSIG		Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = <u>943</u> PSIG	Max. Post-Spike Pressure at Test Point Box [1F] – Box [2B] = <u>968</u> PSIG
[2E]	Spike Pressure Indicated <u>107</u> PSIG	[2F]	Min. Test Pressure Indicated <u>955</u> PSIG
Calculated Spike Pressure at Min. Elev. Box [2E] + Box [2B] = <u>1081</u> PSIG		Calculated Min. Test Pressure at Max. Elev. Box [2F] – Box [2A] = <u>912</u> PSIG	Calculated Max. Post-Spike Pressure at Min. Elev. Box [2G] + Box [2B] = <u>961</u> PSIG
<b>Test Acceptance</b>			
Were Leaks Observed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, explain:	
Acceptable Strength Test? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If no, explain:	
Report strength test failures to Regulatory Compliance			
Test Medium Used <u>Water</u>	Time and Date Test Pressure Reached <u>1300 8/8/14</u>	Time and Date Test Ended <u>2115 8/8/14</u>	Actual Duration of Test <u>8 hr 15 min</u>
<b>Test Instruments</b>			
Make, Range, and Serial No. of Pressure Recording Device <u>TechCal 0-2000 psi/g SIN 02098</u>			Date Last Calibrated <u>5/28/14</u>
Make, Range and Serial No. of Dead Weight Tester A dead weight tester and/or an electronic pressure recorder is required for tests of any pipe segment equal to or greater than 90% of SMYS. <u>Ametek 25-3000 psi/g SAJ HL6406</u>			Date Last Calibrated <u>3/18/14</u>
<b>Signatures</b>			
Test Supervised by (signature) <u>[Signature]</u>		Print Name <u>ERIC TSAI</u>	Date <u>8/8/14</u>
Testing Contractor (if third party)		LAN ID <u>EXTD</u>	
Approved by (signature)		Print Name	Date
			LAN ID

**Attachments**

- Test chart
- Schematic piping sketch
- Test log with pressure noted every 15 minutes

**Distribution**

- Gas Job Closeout Desk, 6121 Bollinger Canyon Road, Building Z1, San Ramon, CA 94583



Job # 12/143 3107221  
 CHART POC USA INC.  
 PORTAGE, INDIANA

Tech Cal  
 METER 02098

Test 3 of 4  
 Lot #

MR114

CHART PUT ON  
 1300 HRM

TAKEN OFF  
 2115 HRM

LOCATION  
 Lafayette, CA

REMARKS  
 T022A, L191-L, MP 1500-1875

(TO FIT)  
 CHART NO. MP-2000  
 Pressure

START TEST  
 1010 11:14 AM  
 C.V. A.R.B.  
 1010 11:14 AM  
 1010 11:14 AM

1010 11:14 AM  
 C.V. A.R.B.  
 1010 11:14 AM  
 1010 11:14 AM

STRENGTH TEST INFORMATION REV. 1

JOB # 41919143, 31079361, T022A, L191-1 Test 3 of 4, 1 of 1  
 2. LOCATION Lafayette, CA  
 3. DATE 8/8/14 MIN. PRESSURE 955 psig  
 4. TIME 1300 - 2115 DURATION 8 hr 15 min  
 5. RECORDING GA. MFG. TechCel SER.# 02098  
 6. RANGE 0-2000 psig LAST CALIBRATED 5/28/2014  
 7. DEAD WGT MFG. Ametek SER.# HL 6406  
 8. RANGE 25-3000 psig LAST CALIBRATED 3/18/2014  
 9. TEST FLUID Water  
 10. SIZE 12.750 W.T. 0.281 PIPE SPEC API 5L 52000 HPW LENGTH 3.40'  
 11. SIZE 6.625 W.T. 0.280 PIPE SPEC API 5L 35000 SMLS LENGTH 5.64' } 31079361  
 12. SUPERVISED Clintson DATE 8/8/14  
 13. APPROVED Spjitz AXTO DATE 8-23-14

14. SIZE 12.750 W.T. 0.250 PIPE SPEC API 5L X42 ERW LENGTH 7010.46'  
 15. SIZE 12.750 W.T. 0.281 PIPE SPEC API 5L X52 HPW LENGTH 51.21'  
 16. SIZE 12.750 W.T. 0.375 PIPE SPEC API 5L GRB SMLS LENGTH 12.95'  
 17. SIZE 12.750 W.T. 0.375 PIPE SPEC API 5L X42 ERW LENGTH 1171.33'  
 18. SIZE 1.050 W.T. 0.133 PIPE SPEC API 5L GR. B SMLS LENGTH 4.67' } 41919143  
 19. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 20. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 21. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 22. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 23. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 24. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 25. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 26. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_  
 27. SIZE \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC. \_\_\_\_\_ LENGTH \_\_\_\_\_

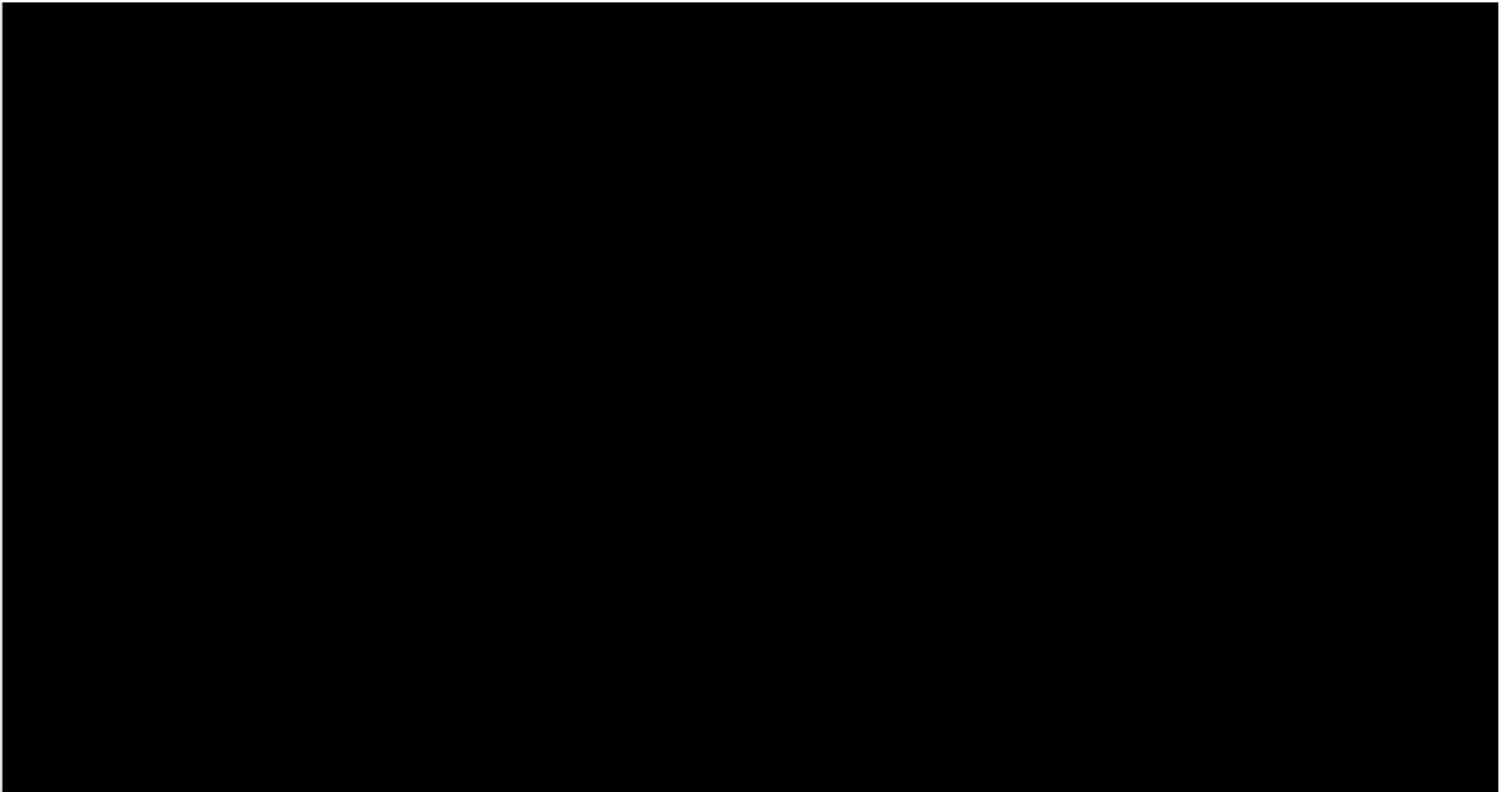




4695 Chabot Suite 115  
Pleasanton, CA 94588  
(925) 398-0805  
EMAIL: [sl@guidasurveying.com](mailto:sl@guidasurveying.com)

PROJECT DESCRIPTION: T-022A-12 CONTRACTOR: ARB PG&E JOB #: 41919143 SKETCH PREPARED  
DATE: 08-07-2014 SHEET: 1 OF 6

JOB NAME: T-022A-12, L-191-1, MP 25.30 - 26.73 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI

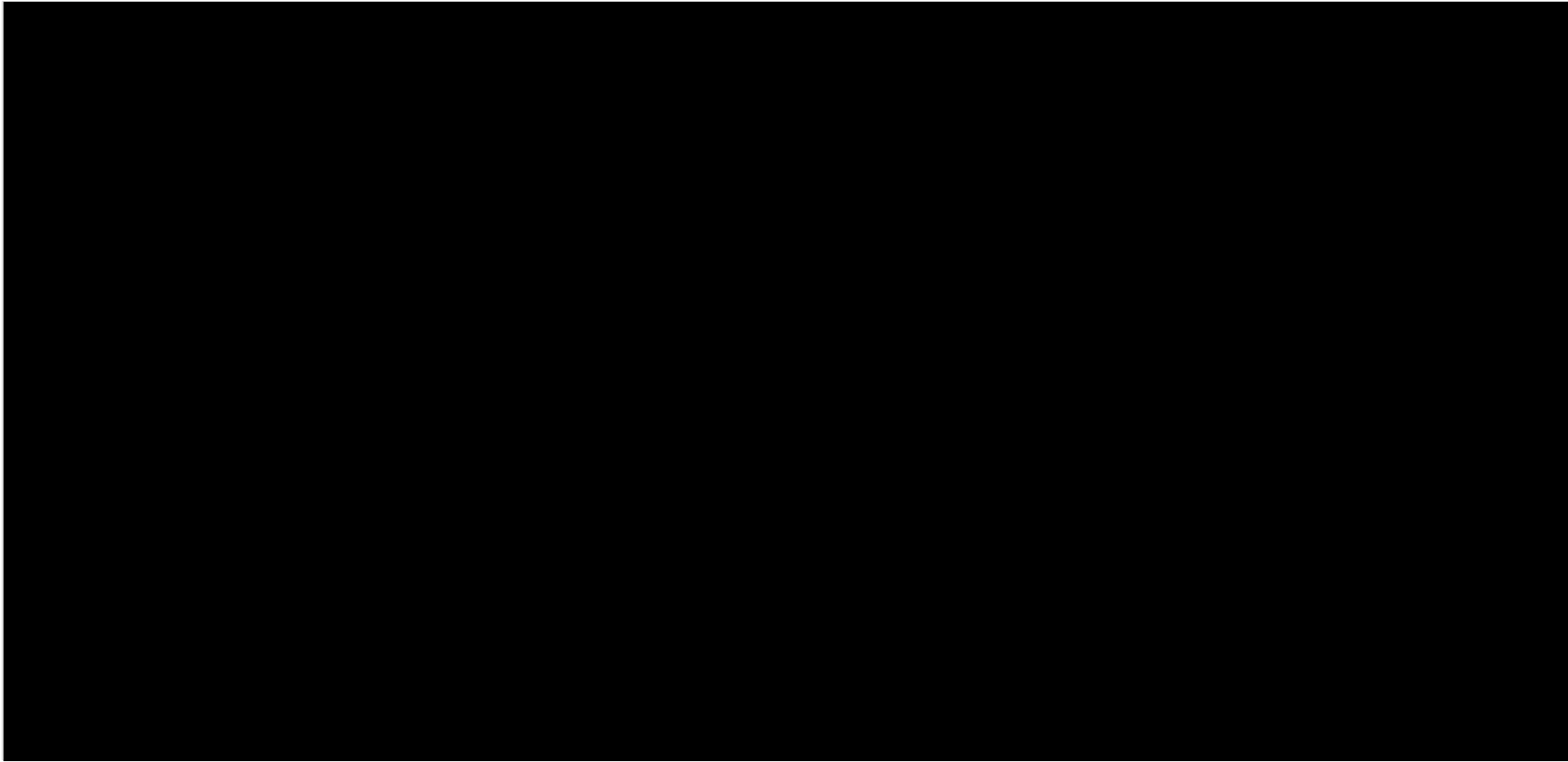




4696 Chabot Suite 115  
Pleasanton, CA 94588  
(925) 398-0100  
EMAIL: [af@guidasurveying.com](mailto:af@guidasurveying.com)

PROJECT DESCRIPTION: T-022A-12 CONTRACTOR: ARB PG&E JOB #: 41919143 SKETCH PREPARED DATE: 08-07-2014 SHEET: 2 OF 6

JOB NAME: T-022A-12, L-191-1, MP 25.30 - 26.73 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI



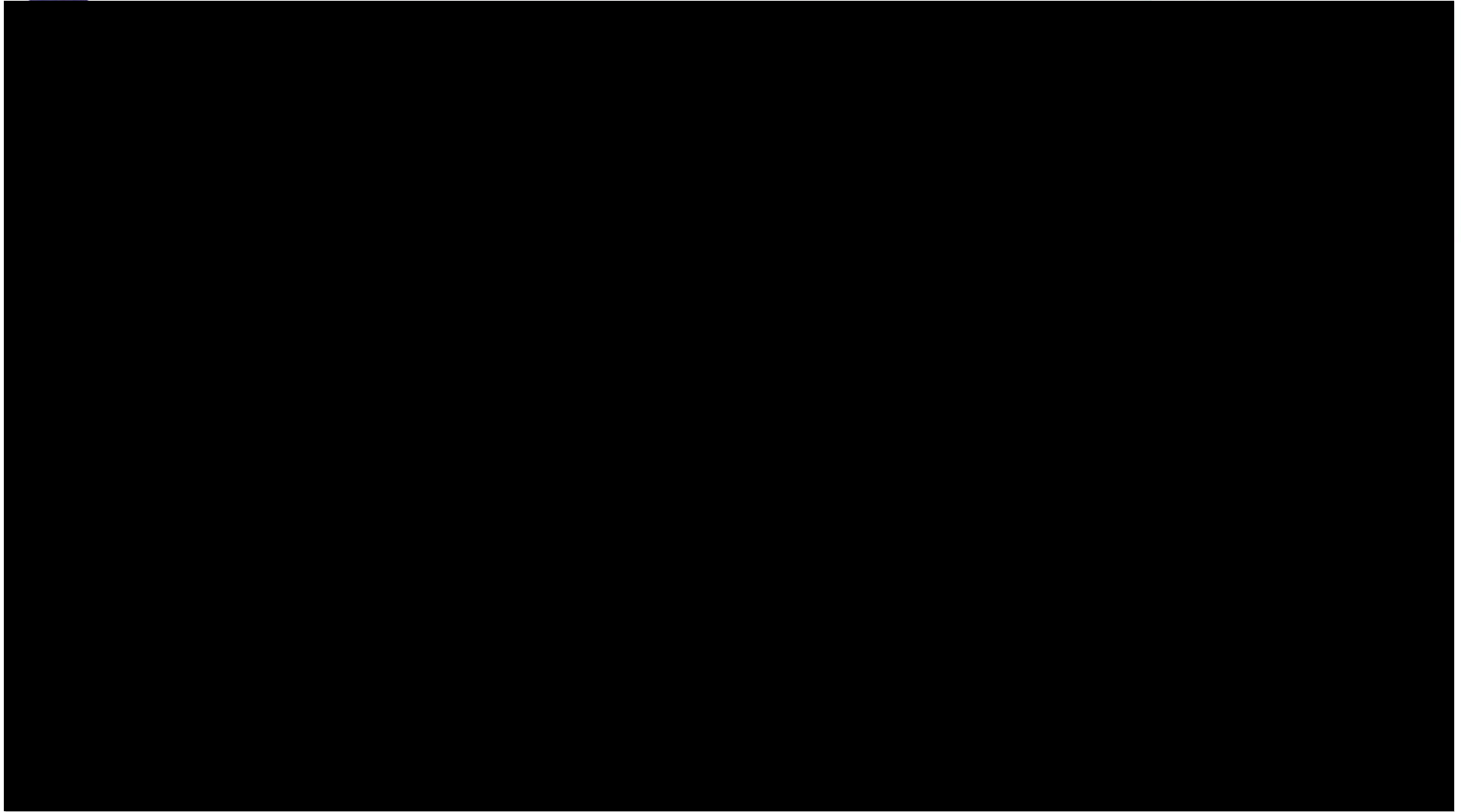
PROFILE VIEW  
NOT TO SCALE



4695 Chabot Suite 115  
Pleasanton, CA 94588  
(925) 398-0905  
EMAIL: [st@guidasurveying.com](mailto:st@guidasurveying.com)

PROJECT DESCRIPTION: T-022A-12 CONTRACTOR: ARB PG&E JOB #: 41919143 SKETCH PREPARED DATE: 08-07-2014 SHEET: 3 OF 6

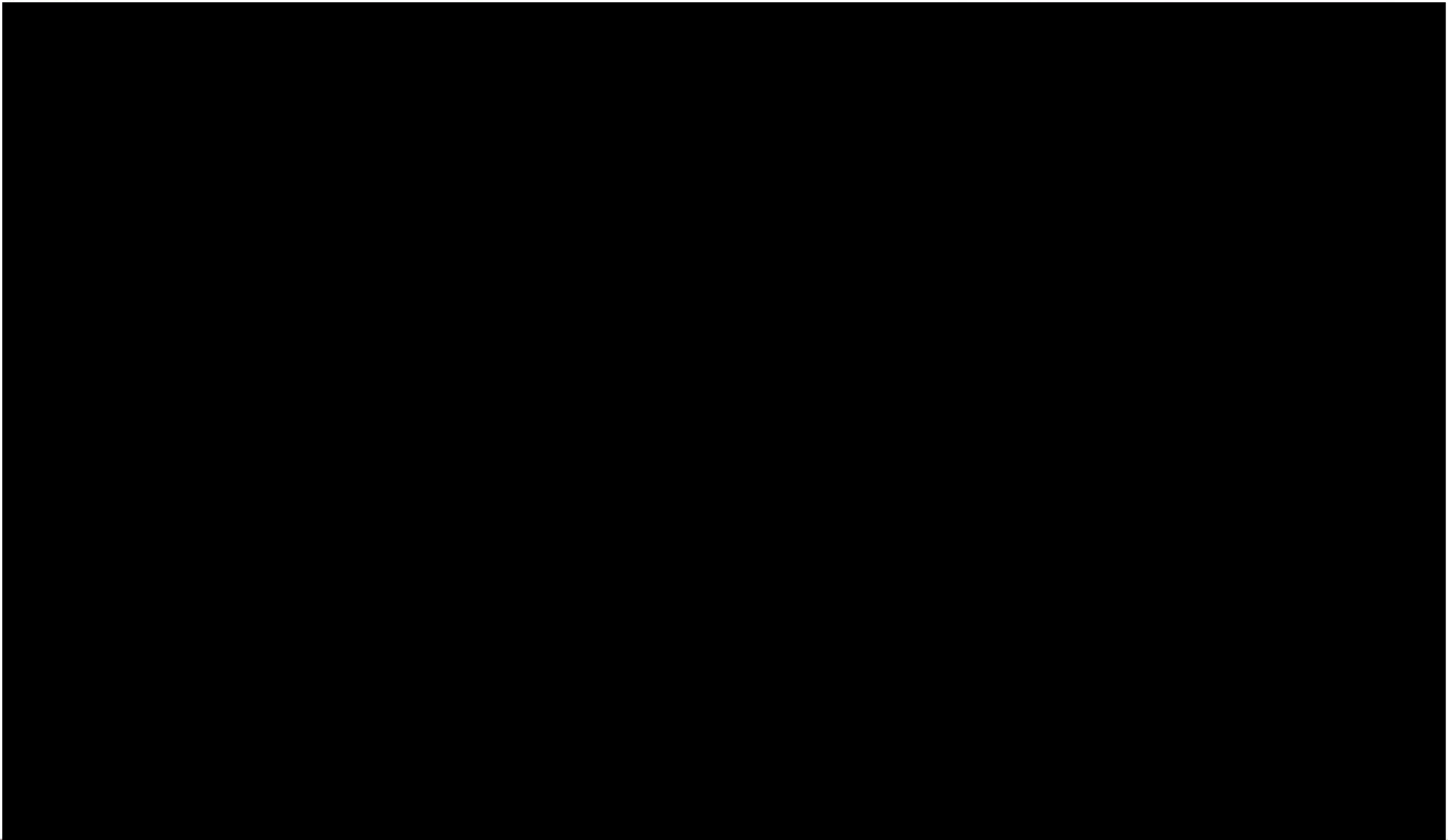
JOB NAME: T-022A-12, L-191-1, MP 25.30 - 26.73 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI





4695 Chabot Suite 115  
Pleasanton, CA 94588  
(925) 398-0005  
EMAIL: [it@guidasurveying.com](mailto:it@guidasurveying.com)

PROJECT DESCRIPTION: T-022A-12 CONTRACTOR: ARB PG&E JOB #: 41919143 SKETCH PREPARED DATE: 08-07-2014 SHEET: 4 OF 6  
JOB NAME: T-022A-12, L-191-1, MP 25.30 - 26.73 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI

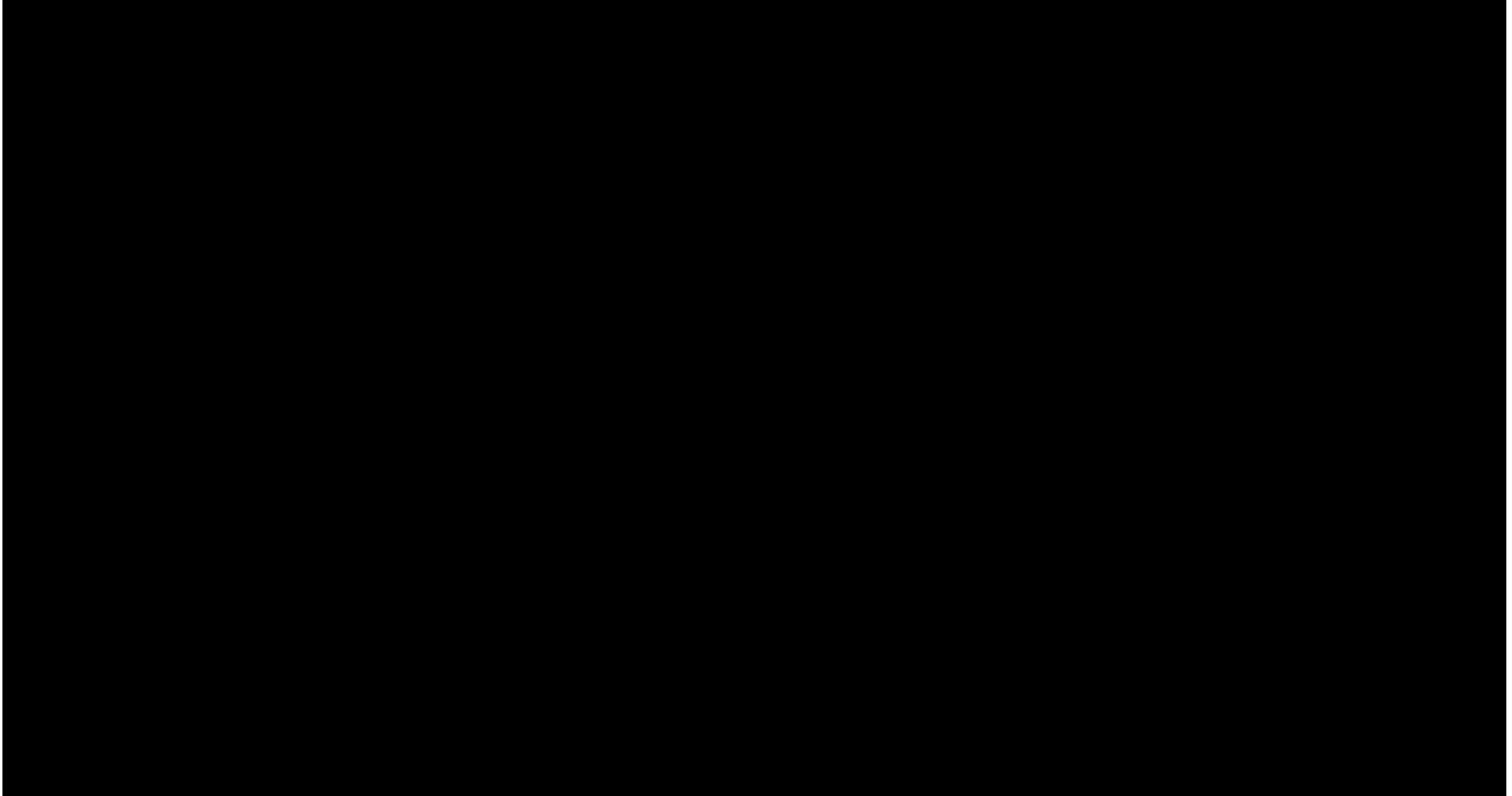




4695 Chabot Suite 115  
Pleasanton, CA 94588  
(925) 395-0205  
EMAIL: [al@guidasurveying.com](mailto:al@guidasurveying.com)

PROJECT DESCRIPTION: T-022A-12 CONTRACTOR: ARB PG&E JOB #: 41919143 SKETCH PREPARED DATE: 08-07-2014 SHEET: 5 OF 6

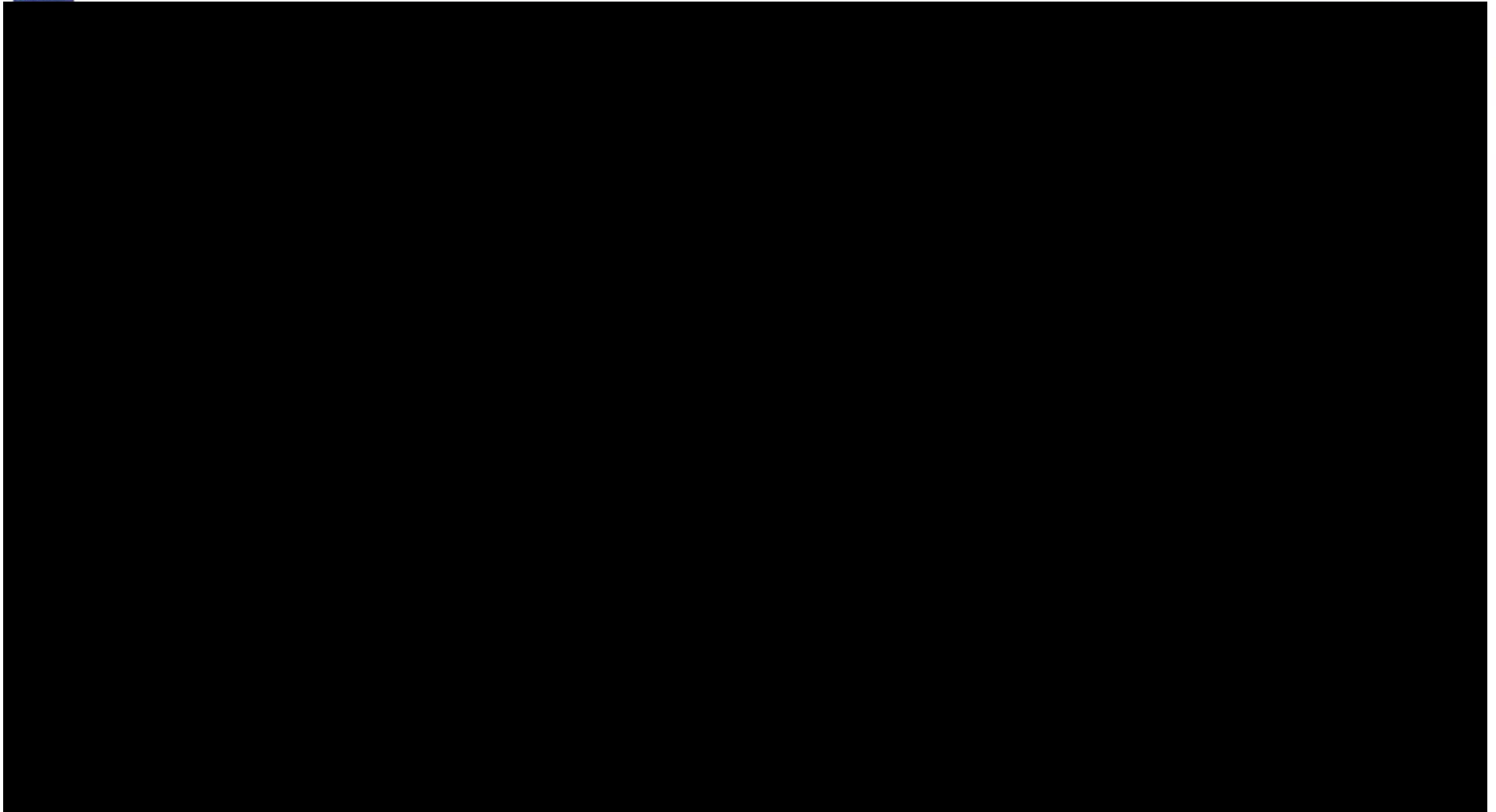
JOB NAME: T-022A-12, L-191-1, MP 25.30 - 26.73 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI





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Pleasanton, CA 94588  
(925) 398-0205  
EMAIL: [info@guidasurveying.com](mailto:info@guidasurveying.com)

PROJECT DESCRIPTION: T-022A-12 CONTRACTOR: ARB PG&E JOB #: 41919143 SKETCH PREPARED  
DATE: 08-07-2014 SHEET: 6 OF 6  
JOB NAME: T-022A-12, L-191-1, MP 25.30 - 26.73 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI



1 2 3 4 5 6 7 8 9 10

E

E

D

D

C

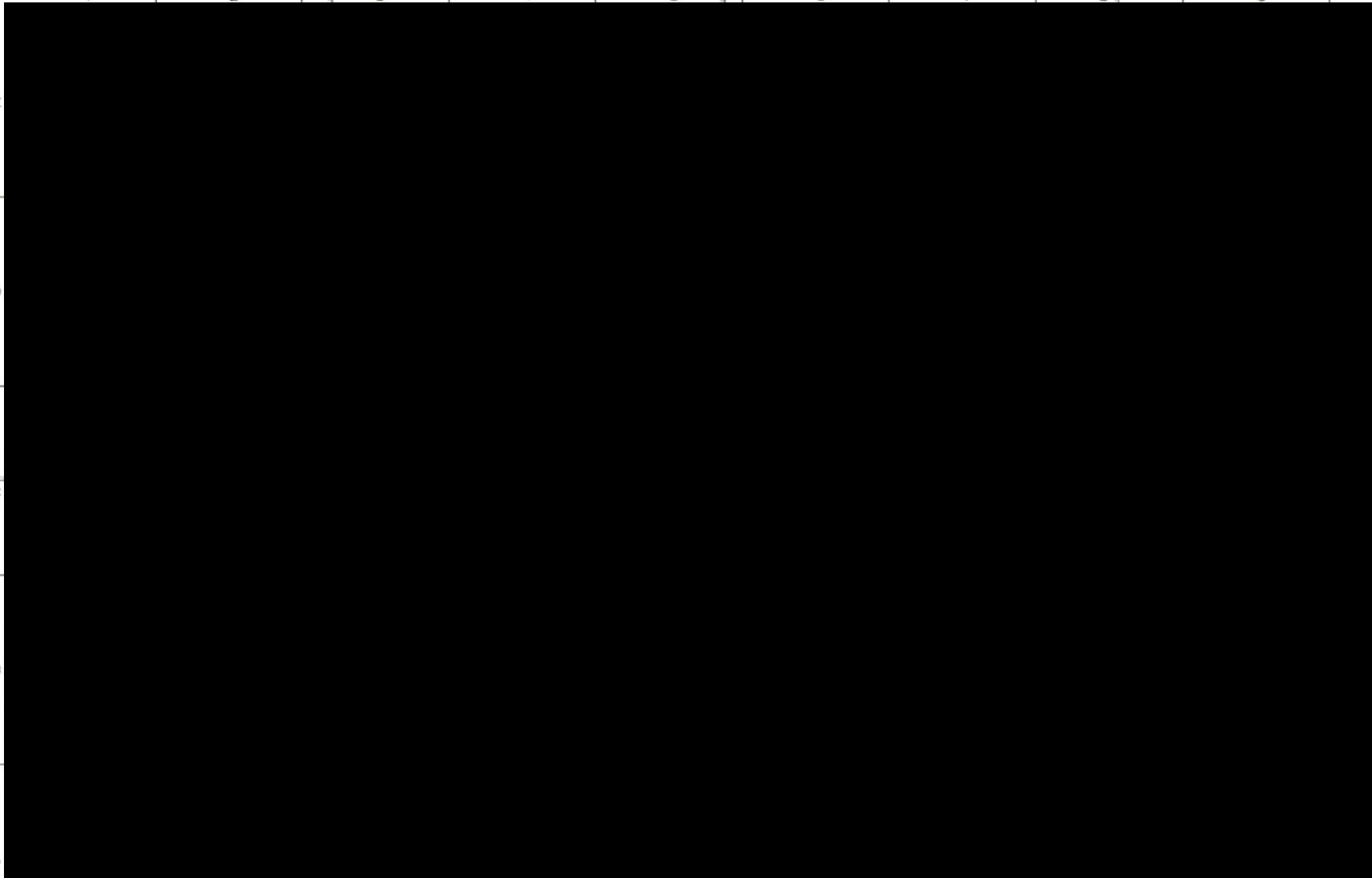
C

B

B

A

A



**COPY**

**SAFETY**  
 SAFETY PLEDGE  
 I ALWAYS PUT SAFETY FIRST  
 I ASK FOR AND ACT TO  
 RESOLVE Unsafe Situations  
 I HELP AND ENCOURAGE  
 OTHERS TO ACT SAFELY

**GTS**  
 875 LAMAR AVENUE  
 WOODLAND, CA 95694  
 Project No. 11710

REGISTERED PROFESSIONAL ENGINEER  
 No. M33704  
 Exp. 06-30-2011  
 STATE OF CALIFORNIA

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 PACIFIC GAS AND ELECTRIC COMPANY



NO.	DATE	DESCRIPTION	DESIGNER	CHECKED	DATE	BY
1	11-11-11	REVISION 1				
2						
3						
4						
5						
6						
7						
8						
9						
10						

HYDROTEST T-022A-12  
 L= 91'-1"  
 MH= 25.50' - 26.75'  
 LAFAYETTE, CALIFORNIA  
 PACIFIC GAS AND ELECTRIC COMPANY  
 SAN FRANCISCO, CALIFORNIA

SHEET NO. 03 OF 08 SHEETS  
 41919143 1

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

E  
D  
C  
B  
A

E  
D  
C  
B  
A



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NO.	DATE	DESCRIPTION	BY	CHKD BY
1	8-14-14	PERMITS EVALUATION & LOCATION 2 & LOCATION 3	48157143 WJM	DAK RJK UF
2	11-20-14	ISSUED FOR CONSTRUCTION	48157143 WJM/EPW	DAK UF

HYDROTEST T-022A-12  
 L-91-1  
 MP 25.39 - 26.73  
 LAFAYETTE, CALIFORNIA  
 PACIFIC GAS AND ELECTRIC COMPANY  
 SAN FRANCISCO, CALIFORNIA

**SAFETY**  
 SAFETY PLEDGE  
 I ALWAYS PUT SAFETY FIRST  
 I ASK FOR AND ACT TO  
 RESOLVE UNSAFE SITUATIONS  
 I HELP AND ENCOURAGE  
 OTHERS TO ACT SAFELY.

**GTS**  
 877 LINDEN ST. #200  
 BERKELEY, CA 94704-1600  
 WWW.GTS.COM  
 Project No. 15108

**REGISTERED PROFESSIONAL ENGINEER**  
 CIVIL  
 No. M33704  
 Exp. 06-30-2015  
 MECHANICAL  
 STATE OF CALIFORNIA

DATE OF THIS SHEET 06  
 SHEET LIST  
 SHEET NO. 04 OF 24 SHEETS  
 41019143 1

1 2 3 4 5 6 7 8 9 10



Order#	Item#	Description	LOCATION:		LOCATION A, LAFAYETTE	LOCATION C, LAFAYETTE	LOCATION E, LAFAYETTE	LOCATION D, DETAIL 4, LAFAYETTE	LOCATION D, DETAIL 5, LAFAYETTE	LOCATION B, LAFAYETTE
			TOTAL SUM:	UNIT	Sum	Sum	Sum	Sum	Sum	Sum
41919143	101	12" x 0.375", GR-B, SMLS, BARE	12.95 ✓	ft.	1.02 ✓	0	0	0	10.94 ✓	0.99 ✓
41919143	102	12" x 0.281", X-52, HFW, FBE	38.06	ft.	9.67 ✓	0	0	12.89 ✓	0	15.50 ✓
41919143	121	90° ELL LR, 12" x 0.281", Y-52	13.15	ft.	6.00 ✓	0	0	1.15 ✓	0	6.00 ✓
41919143	121S	90° ELL LR, 12" x 0.281", Y-52	0.80	ft.	0	0	0	0.80 ✓	0	0
41919143	178	CAP, 3/4", SW, 3000#	1	EA.	0	1 EA.	0	0	0	0
31079361	102	12" x 0.281", X-52, HFW, FBE	3.40	ft.	0	0	3.40 ✓	0	0	0
31079361	103	6" x 0.280", GR-B, SMLS, BARE	2.35	ft.	0	0	2.35 ✓	0	0	0
31079361	133	CAP, 6" x 0.280", GR-B	0.29	ft.	0	0	0.29 ✓	0	0	0
31079361	A	TEE, 12" x 6", 0.281", Y-52	1.67	ft.	0	0	1.67 ✓	0	0	0
31079361	AS	TEE, 12" x 6", 0.281", Y-52	0.72	ft.	0	0	0.72 ✓	0	0	0
31079361	B	90° ELL LR, 6" x 0.280", GR-B	3.00	ft.	0	0	3.00 ✓	0	0	0

STPR #41919143 TEST 3 OF 4 TOTALS			
ITEM #	DESCRIPTION	TOTAL	
101	12" x 0.375", GR-B, SMLS, BARE	12.95	FT. ✓
<b>TOTAL 12" x 0.375", GR-B, SMLS, BARE</b>		<b>12.95</b>	<b>FT.</b>

102	12" x 0.281", X-52, HFW, BARE	38.06	FT. ✓
121	90° ELL LR, 12" x 0.281", Y-52	5	EA. ✓
		13.15	FT. ✓
<b>TOTAL 12" x 0.281", X-52, HFW</b>		<b>51.21</b>	<b>FT.</b> ✓

ITEM  
3 = 13ea  
4 = 1ea

178	CAP, 3/4", SW, 3000#	1	EA.
-----	----------------------	---	-----

STPR #31079361 TEST 1 OF 1 TOTALS			
ITEM #	DESCRIPTION	TOTAL	
102	12" x 0.281", X-52, HFW, FBE	3.40	FT.
<b>TOTAL 12" x 0.281", X-52, HFW</b>		<b>3.40</b>	<b>FT.</b>

103	6" x 0.280", GR-B, SMLS, BARE	2.35	FT. ✓
133	CAP, 6" x 0.280", GR-B	1	EA. ✓
		0.29	FT. ✓
B	90° ELL LR, 6" x 0.280", GR-B	2	EA. ✓
		3.00	FT. ✓
<b>TOTAL 6" x 0.280", GR-B, SMLS</b>		<b>5.64</b>	<b>FT.</b> ✓

A	TEE, 12" x 6", 0.281", Y-52	1	EA. ✓
---	-----------------------------	---	-------



## Hydrostatic Test Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	Test #1 31079361 41919143	Test #3
Construction Co.	ARB	Job Number	Test #1 31079361 41919143	Test #3
Testing Co.	ARB	Job Number	Test #1 31079361 41919143	Test #3

Test Section	Name	PG&E T-022A-12 , L-191-1, MP 25.30-26.73		
		Station (0+00)	Elevation (Feet)	
	Test Location	0+00	235 ft	
	Begin	0+00	235 ft	
	End	81+48	332 ft	
	High Elevation	81+48	332 ft	
Low Elevation	0+00	227 ft		

Pipe Data	Section	Length (ft.)	O. D. (in.)	W.T. (in.)	Unrestrained (ft.)	Restrained (ft.)	Grade	Seam/Joint Type
	102	51.2 ft	12.750 in.	0.281 in.	51.2 ft		API5L-X52	ERW-HF, Arc Weld
	101	13.0 ft	12.750 in.	0.375 in.	13.0 ft		API5L-Grade B	SM, Arc Weld
	mor	4.7 ft	1.050 in.	0.113 in.	4.7 ft		API5L-Grade B	SM, Arc Weld
	1	7,010.5 ft	12.750 in.	0.250 in.		7,010.5 ft	API5L-X42	ERW-HF, Arc Weld
	2	1,171.3 ft	12.750 in.	0.219 in.		1,171.3 ft	API5L-X42	ERW-HF, Arc Weld
	102	3.4 ft	12.750 in.	0.281 in.	3.4 ft		API5L-X52	ERW-HF, Arc Weld
	103	5.6 ft	6.625 in.	0.280 in.	5.6 ft		API5L-Grade B	SM, Arc Weld
	TH	8.4 ft	12.750 in.	0.562 in.	8.4 ft		API5L-X52	SM, Arc Weld
	TH	8.4 ft	12.750 in.	0.562 in.	8.4 ft		API5L-X52	SM, Arc Weld

Test Period	Date	Time	Test Medium	Water	
	Begin	8-Aug-14			13:00
	End	8-Aug-14			21:15

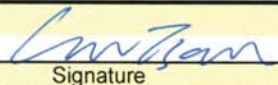

Test Instrumentation	Description	Calibration Checked	Serial Number	Date Calibrated/Certified	Installation Correct
	Dead Weight Pressure Tester		HL6406	3/18/2014	<input checked="" type="checkbox"/> Yes
	Pressure Recorder	<input checked="" type="checkbox"/> Yes	2098	5/28/2014	<input checked="" type="checkbox"/> Yes
	Ambient Temperature Recorder	<input checked="" type="checkbox"/> Yes	4350	5/23/2014	<input checked="" type="checkbox"/> Yes
	Restrained Pipe Temperature Recorder	<input checked="" type="checkbox"/> Yes	4349	5/23/2014	<input checked="" type="checkbox"/> Yes
	Unrestrained Pipe Temperature Recorder	<input checked="" type="checkbox"/> Yes	4352	5/1/2014	<input checked="" type="checkbox"/> Yes

## Hydrostatic Test Log

Log No.	Time	Test Pressure (psig)	Temperature (°F)			Volume		Comments	Model Check: Is test good?
			Ambient	Pipe		<input checked="" type="checkbox"/> Ounces	<input type="checkbox"/> Gallons		
				Unrestrained	Restrained	Bleed	Inject		
1	8/8/14 1:00 PM	1,077 psig	83 °F	84 °F	74 °F			On Test	
2	8/8/14 1:10 PM	1,077 psig	84 °F	86 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	8/8/14 1:20 PM	1,077 psig	84 °F	86 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	8/8/14 1:30 PM	1,077 psig	86 °F	87 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5	8/8/14 1:30 PM	955 psig	86 °F	87 °F	74 °F	3,744.7 oz.			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	8/8/14 2:00 PM	955 psig	88 °F	90 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	8/8/14 2:15 PM	955 psig	88 °F	89 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8	8/8/14 2:30 PM	956 psig	89 °F	90 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
9	8/8/14 2:45 PM	956 psig	90 °F	90 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10	8/8/14 3:00 PM	956 psig	89 °F	90 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
11	8/8/14 3:15 PM	956 psig	90 °F	91 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
12	8/8/14 3:30 PM	956 psig	90 °F	91 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
13	8/8/14 3:45 PM	956 psig	89 °F	91 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
14	8/8/14 4:00 PM	957 psig	89 °F	91 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
15	8/8/14 4:15 PM	957 psig	89 °F	91 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
16	8/8/14 4:30 PM	957 psig	89 °F	91 °F	74 °F				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



## Hydrostatic Test Log Sheet

Owner Company		Pacific Gas and Electric Company				Job Number		Test #1 31079361 41919143	Test #3
Construction Co.		ARB				Job Number		Test #1 31079361 41919143	Test #3
Testing Co.		ARB				Job Number		Test #1 31079361 41919143	Test #3 Yes No
17	8/8/14 4:45 PM	957 psig	89 °F	92 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
18	8/8/14 5:00 PM	957 psig	89 °F	93 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
19	8/8/14 5:15 PM	957 psig	88 °F	93 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
20	8/8/14 5:30 PM	957 psig	87 °F	94 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
21	8/8/14 5:45 PM	957 psig	86 °F	94 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
22	8/8/14 6:00 PM	957 psig	86 °F	94 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
23	8/8/14 6:15 PM	957 psig	84 °F	94 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
24	8/8/14 6:30 PM	957 psig	82 °F	94 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
25	8/8/14 6:45 PM	957 psig	81 °F	94 °F	74 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
26	8/8/14 7:00 PM	957 psig	80 °F	94 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
27	8/8/14 7:15 PM	957 psig	78 °F	94 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
28	8/8/14 7:30 PM	957 psig	76 °F	93 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
29	8/8/14 7:45 PM	957 psig	75 °F	93 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
30	8/8/14 8:00 PM	956 psig	73 °F	92 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
31	8/8/14 8:15 PM	956 psig	72 °F	92 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
32	8/8/14 8:30 PM	956 psig	71 °F	91 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
33	8/8/14 8:45 PM	956 psig	70 °F	91 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
34	8/8/14 9:00 PM	956 psig	69 °F	90 °F	75 °F			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
35	8/8/14 9:15 PM	956 psig	68 °F	89 °F	75 °F		End of Test	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
36								<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
37									
Was a leak observed during test Period?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If "Yes", Explain:						High Test Pressure:		1,077 psig	
						Low Test Pressure:		955 psig	
<b>Certification:</b>						Date:		8-Aug-14	
Test Supervisor:		 Signature				Representative:		 Signature	



# HYDROSTATIC TEST LOG SHEET

Date

8/8/2014

Owner Company:	PG&E	Job Number:	31079361 TEST1 OF 1
Construction Co:	ARB INC	Job Number:	41919143 TEST3 OF 4
Testing Co:	ARB INC	Job Number:	

<b>Test Section</b>	Name:	COREY VINCENT 65075 0628-035C L-191-1 T-022A-12					
		Station (0+00)					Elevation (Feet)
	Test Location:	0+00				235	
	Begin:	0+00				235	
	End:	81+48				332	
	High Elevation:	81+48				332	
Low Elevation:	0+00				227		

<b>Pipe Data</b>	Section	Length (ft.)	O.D. (in.)	W.T. (in.)	Restrained (ft.)	Unrestrained (ft.)	Grade	Seam/Joint Type
	1.	3.40	12.750	0.281		3.40	API 5L 52000	HFW
	2.	5.64	6.625	0.280		5.64	API 5L 35000	SMLS
	3.	51.21	12.750	0.281		51.21	API 5L 52000	HFW
	4.	12.95	12.750	.375		12.95	API 5L 35000	SMLS
	5.	7010.46	12.750	0.250	7010.46		API 5LX 42000	ERW
	6.	1171.33	12.750	0.375	1171.33		API 5LX 42000	ERW
	7.	4.67	1.050	0.133	4.67		API 5L 35000	SMLS
	8.							
	9.							
	10.							
	11.							
	12.							
	13.							
	14.							
	15.							
	16.							
	17.							
	18.							
	19.							
	20.							
	21.							
	22.							
	23.							
	24.							
	25.							
	26.							
	27.							
28.								

<b>Test Period</b>		Date	Time	<b>Test Medium</b>	Water:	<input checked="" type="checkbox"/>	
	Begin:	8/8/2014	1300		Nitrogen:	<input type="checkbox"/>	
	End:	8/8/2014	2130		Other:	<input type="checkbox"/>	

<b>Test Instrumentation</b>	Description	Calibration Checked	Serial Number	Date Calibrated/Certified	Installation Correct?
	Dead Weight Pressure Tester:	<input checked="" type="checkbox"/> Yes	HL6404	3/18/2014	<input checked="" type="checkbox"/> Yes
	Pressure Recorder:	<input checked="" type="checkbox"/> Yes	02098	5/28/2014	<input checked="" type="checkbox"/> Yes
	Ambient Temperature Recorder:	<input checked="" type="checkbox"/> Yes	04350	5/23/2014	<input checked="" type="checkbox"/> Yes
	Restrained Pipe Temperature Recorder:	<input checked="" type="checkbox"/> Yes	04349	5/23/2014	<input checked="" type="checkbox"/> Yes
Unrestrained Pipe Temperature Recorder:	<input checked="" type="checkbox"/> Yes	04352	5/1/2014	<input checked="" type="checkbox"/> Yes	



# DEAD WEIGHT TEST LOG



ARB Job Number: 0628-035C

Log No.	Time	Test Pressure (psig)	Temperature (°F)			Volume		Comments:	Stroke Count
			Ambient	Pipe		<input type="checkbox"/>	<input checked="" type="checkbox"/>		
				Restrained	Unrestrained	Bleed	Inject		
1.	1111	709	73	74	78			1HR. LEAK CHECK	3102
2.	1216	710	74	74	78			START PRESSURE UP	18
3.	1300	1077	83	74	84				2377
4.	1310	1077	84	74	86				
5.	1320	1077	85	74	86				
6.	1330	1077	86	74	87				
7.	1333	1077	86	74	88	START			
8.	1348	1056	87	74	89	5		2 X TEN POUND	
9.	1400	955	88	74	90				
10.	1415	955	88	74	89				
11.	1430	956	89	74	90				
12.	1445	956	90	74	90				
13.	1500	956	89	74	90				
14.	1515	956	90	74	91				
15.	1530	956	90	74	91				
16.	1545	956	89	74	91				
17.	1600	957	89	74	91				
18.	1615	957	89	74	91				
19.	1630	957	89	74	91				
20.	1645	957	89	74	92				
21.	1700	957	89	74	93				
22.	1715	957	88	74	93				
23.	1730	957	87	74	94				
24.	1745	957	86	74	94				
25.	1800	957	86	74	94				
26.	1815	957	84	74	94				
27.	1830	957	82	74	94				
28.	1845	957	81	74	94				
29.	1900	957	80	75	94				
30.	1915	957	18	75	94				
31.	1930	957	76	75	93				
32.	1945	957	75	75	93				
33.	2000	956	73	75	92				
34.	2015	956	72	75	92				
35.	2030	956	71	75	91				
36.	2045	956	70	75	91				
37.	2100	956	69	75	90				
38.	2115	956	68	75	89			END TEST	
39.									
40.									

Was a leak observed during Test Period?  Yes  No **31079361 TEST1 OF 1 ; 41919143 TEST3 OF 4**

If "Yes", Explain: \_\_\_\_\_ High Test Pressure: 1077  
 Low Test Pressure: 955

**Certification:** \_\_\_\_\_ **Date:** 8/8/2014

Test Supervisor:  Company Representative: 

cl\_rev\_3-21-14 Signature \_\_\_\_\_ Signature \_\_\_\_\_



**RCP, Inc**

801 Louisiana, Ste.200  
Houston, Texas 77002  
(713)655-8080  
[idecker@rcp.com](mailto:idecker@rcp.com)

August 8, 2014

Pacific Gas and Electric Company  
6121 Bollinger Canyon road  
San Ramon , Ca. 94583  
Attention: Mark Cabral, Aziza Tarin

Test Contractor: ARB -- 31079361 Test 1 41919143 Test 3  
Asset Owner: Pacific Gas and Electric Company -- 31079361 Test 1 41919143 Test 3  
Construction Contractor: ARB -- 31079361 Test 1 41919143 Test 3  
Test Section: PG&E T-022A-12 , L-191-1, MP 25.30 - 26.73  
Test Date: August 8, 2014  
Certificate Number: J00110 - T-022A-12 , L-191-1, MP 25.30 - 26.73

To whom it may concern,

This letter is to certify that the Water test performed on pipe owned by Pacific Gas and Electric Company and tested by ARB met the requirements of the Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3).

The test segment was subjected to a spike pressure test of 1077 psig (at the test point) for 30 minutes, without observed leakage or yielding of the pipe segment. The 30 minute spike test and subsequent pressure reduction with volume bleed was included and is part of the 8.25 hour test duration period.

This Hydrostatic Pressure test was completed successfully. Pressure was maintained on the test facilities in excess of 8.25 continuous hours without evidence of a leak failure. Water was the test medium. At the highest elevation point in the test section, the calculated test pressure was 912 psig and the MAOP supported by the test, per DOT Part 192 Subpart J, can be as high as 608 psig. The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 283 psig.

Pressure decreased 121 psi during the test. After conclusion of the spike test, 3,732.2 ounces of fluid was intentionally released from the test section, reducing pressure by 122 psig. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 764.19 ounces, loss, which is equivalent to a 0.9 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized.

Test pressure remained steady and no leaks were observed. The volumetric loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.

Sincerely,

James E. Knight

cc. file



### Hydrostatic Pressure Test Certification

Company	Pacific Gas and Electric Company	Job Number	31079361 Test 1 41919143 Test 3
Construction Co.	ARB	Job Number	31079361 Test 1 41919143 Test 3
Hydro. Test Co.	ARB	Project No.	31079361 Test 1 41919143 Test 3
Test Section	PG&E T-022A-12, L-191-1, MP 25.30 - 26.73	<b>Test Fluid = Water</b>	
File Name	J00110 - T-022A-12, L-191-1, MP 25.30 - 26.73		

#### Water Test Pressure

APPLICABLE CODE FOR CERTIFICATION:	Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3)	Test Date:	8-Aug-14
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This is to certify that the pipeline or pipeline section(s) described below was hydrostatically pressure tested in accordance with the following procedure:

Pipeline:	PG&E T-022A-12, L-191-1, MP 25.30 - 26.73
From:	MP 25.30
To:	MP 26.73

#### Pipe Data

Segment	Length	Diameter	Wall Thickness	Specification	100% SMYS
1	102	3.40	12.750 in.	52ksmys, ERW-HF, Arc Weld, Steel	2,292 psi
2	103	5.64	6.625 in.	35ksmys, SM, Arc Weld, Steel	2,958 psi
3	102	51.21	12.750 in.	52ksmys, ERW-HF, Arc Weld, Steel	2,292 psi
4	101	12.95	12.750 in.	35ksmys, SM, Arc Weld, Steel	2,059 psi
5	1	7010.46	12.750 in.	42ksmys, ERW-HF, Arc Weld, Steel	1,647 psi
6	2	1171.33	12.750 in.	42ksmys, ERW-HF, Arc Weld, Steel	1,443 psi
7		4.67	1.050 in.	35ksmys, SM, Arc Weld, Steel	7,533 psi
8	TH	8.42	12.750 in.	52ksmys, SM, Arc Weld, Steel	4,584 psi
9	TH	8.42	12.750 in.	52ksmys, SM, Arc Weld, Steel	4,584 psi

#### Initial Test Conditions

Pressure at Test Point:	1,077 psig	Date/Time:	8-Aug-2014 13:00	Pipe Temperature	
Ambient Temperature:	83.0 °F	Elevation @ Test Point:	235.0 ft	Unrestrained:	84.0 °F
Pressure @ High Point (Cal/Measure):	1,035 psig	Elevation @ High Point:	332.0 ft	Restrained:	74.0 °F
Pressure @ Low Point (Cal/Measure):	1,080 psig	Elevation @ Low Point:	227.0 ft	Location:	0+00
				Location:	81+48
				Location:	0+00

#### Final Test Conditions

Pressure at Test Point:	956 psig	Date/Time:	8-Aug-2014 21:15	Pipe Temperature	
Ambient Temperature:	68.0 °F	Elevation @ Test Point:	235.0 ft	Unrestrained:	89.0 °F
Pressure @ High Point (Cal/Measure):	914 psig	Elevation @ High Point:	332.0 ft	Restrained:	75.0 °F
Pressure @ Low Point (Cal/Measure):	959 psig	Elevation @ Low Point:	227.0 ft	Location:	0+00
				Location:	81+48
				Location:	0+00

Total Fluid Injected:		Total Fluid Withdrawn:	3732.22 fluid ounces	Volume loss	
Net Change in Volume of the Test Section ± (+ Gain, - Loss):	(764.19) oz	loss	(0.0117)%	(0.898) °F equivalent	

Test Duration:	8.25 hours		
Minimum Test Pressure:	955 psig	912 psig	958 psig
Maximum Test Pressure:	1,077 psig	1,034 psig	1,081 psig
% SMYS:	23.5%	22.6%	65.6%

Test Segment Observed % SMYS:	Minimum	14.2%	Maximum	73.0%		
DOT Part 192 Maximum Allowable Operating Pressure	D <sub>r</sub>	Design MAOP	T <sub>r</sub>	Minimum Test Pressure (Calculated/Measured)	Test MAOP	MAOP
	0.5	721 psig	1.5	912 psig	608 psig	608 psig

The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 283 psig.

Is Test to Yield Utilized to Establish MAOP?	No	TTY MAOP @ High Elevation	TTY MAOP @ Test Point
ASME B31.8S - Integrity Assessment Interval	15 years	Desired MAOP % SMYS	19.61%
		ASME B31.8S Minimum Test Factor	2.80

Were leaks observed?	No	Explain:
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Acceptable Hydrostatic Test?	Yes	<p>The test segment was subjected to a spike pressure test of 1077 psig (at the test point) for 30 minutes, without observed leakage or yielding of the pipe segment. The 30 minute spike test and subsequent pressure reduction with volume bleed was included and is part of the 8.25 hour test duration period.</p> <p>No leaks were observed during the test period. The test section included 8,182 feet of buried and 95 feet of exposed pipe. Pressure lost 121 psi during the test. The buried pipe segment gained 1°F fluid temperature and the exposed pipe segment gained 5°F.</p> <p>After conclusion of the spike test, 3,732.2 ounces of fluid was intentionally released from the test section, reducing pressure by 122 psig. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 764.19 ounces, loss, which is equivalent to a 0.9 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized.</p> <p>Test pressure remained steady and no leaks were observed. The volumetric loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.</p>
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Remarks

  
 James E. Knight  
 8-Aug-14



# Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	31079361 Test 1 41919143 Test 3
Construction Co.	ARB	Job Number	31079361 Test 1 41919143 Test 3
Testing Co.	ARB	Project No.	79361 Test 1 41919143 Test 3
Test Section	PG&E T-022A-12 , L-191-1, MP 25.30 - 26.73		
File Name	J00110 - T-022A-12 , L-191-1, MP 25.30 - 26.73		
		Test Fluid = Water	

Date 8-Aug-14

## Test Log

Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
1	8-Aug-2014	12:12	708 psig	78 °F	80 °F	74 °F	Start Spike		
2	8-Aug-2014	12:13	710 psig	78 °F	80 °F	74 °F	Inject		83 oz.
3	8-Aug-2014	12:14	720 psig	78 °F	80 °F	74 °F	Inject		342 oz.
4	8-Aug-2014	12:16	730 psig	78 °F	80 °F	74 °F	Inject		351 oz.
5	8-Aug-2014	12:17	740 psig	78 °F	80 °F	74 °F	Inject		342 oz.
6	8-Aug-2014	12:18	750 psig	78 °F	80 °F	74 °F	Inject		337 oz.
7	8-Aug-2014	12:19	760 psig	78 °F	80 °F	74 °F	Inject		347 oz.
8	8-Aug-2014	12:20	770 psig	78 °F	80 °F	74 °F	Inject		319 oz.
9	8-Aug-2014	12:21	780 psig	78 °F	80 °F	74 °F	Inject		298 oz.
10	8-Aug-2014	12:22	790 psig	78 °F	80 °F	74 °F	Inject		289 oz.
11	8-Aug-2014	12:23	800 psig	78 °F	80 °F	74 °F	Inject		310 oz.
12	8-Aug-2014	12:24	810 psig	78 °F	80 °F	74 °F	Inject		263 oz.
13	8-Aug-2014	12:25	820 psig	78 °F	80 °F	74 °F	Inject		296 oz.
14	8-Aug-2014	12:26	830 psig	78 °F	80 °F	74 °F	Inject		277 oz.
15	8-Aug-2014	12:27	840 psig	78 °F	80 °F	74 °F	Inject		286 oz.
16	8-Aug-2014	12:28	850 psig	78 °F	80 °F	74 °F	Inject		296 oz.
17	8-Aug-2014	12:30	860 psig	78 °F	80 °F	74 °F	Inject		300 oz.
18	8-Aug-2014	12:31	870 psig	78 °F	80 °F	74 °F	Inject		296 oz.
19	8-Aug-2014	12:33	880 psig	78 °F	80 °F	74 °F	Inject		296 oz.
20	8-Aug-2014	12:34	890 psig	78 °F	80 °F	74 °F	Inject		286 oz.
21	8-Aug-2014	12:36	900 psig	78 °F	80 °F	74 °F	Inject		296 oz.
22	8-Aug-2014	12:37	910 psig	78 °F	80 °F	74 °F	Inject		291 oz.
23	8-Aug-2014	12:38	920 psig	78 °F	80 °F	74 °F	Inject		296 oz.
24	8-Aug-2014	12:40	930 psig	78 °F	80 °F	74 °F	Inject		300 oz.
25	8-Aug-2014	12:41	940 psig	78 °F	80 °F	74 °F	Inject		268 oz.
26	8-Aug-2014	12:42	950 psig	78 °F	80 °F	74 °F	Inject		296 oz.
27	8-Aug-2014	12:43	960 psig	78 °F	80 °F	74 °F	Inject		286 oz.
28	8-Aug-2014	12:44	970 psig	78 °F	80 °F	74 °F	Inject		286 oz.
29	8-Aug-2014	12:46	980 psig	78 °F	80 °F	74 °F	Inject		282 oz.
30	8-Aug-2014	12:47	990 psig	78 °F	80 °F	74 °F	Inject		286 oz.
31	8-Aug-2014	12:48	1,000 psig	78 °F	80 °F	74 °F	Inject		291 oz.
32	8-Aug-2014	12:50	1,010 psig	78 °F	80 °F	74 °F	Inject		277 oz.
33	8-Aug-2014	12:51	1,020 psig	78 °F	80 °F	74 °F	Inject		277 oz.
34	8-Aug-2014	12:52	1,030 psig	78 °F	80 °F	74 °F	Inject		291 oz.
35	8-Aug-2014	12:54	1,040 psig	78 °F	80 °F	74 °F	Inject		291 oz.
36	8-Aug-2014	12:55	1,050 psig	78 °F	80 °F	74 °F	Inject		300 oz.
37	8-Aug-2014	12:56	1,060 psig	78 °F	80 °F	74 °F	Inject		273 oz.
38	8-Aug-2014	12:58	1,070 psig	78 °F	80 °F	74 °F	Inject		296 oz.
39	8-Aug-2014	12:59	1,077 psig	78 °F	80 °F	74 °F	Inject		185 oz.
40	8-Aug-2014	13:00	1,077 psig	83 °F	84 °F	74 °F	On Test		
41	8-Aug-2014	13:10	1,077 psig	84 °F	86 °F	74 °F			
42	8-Aug-2014	13:20	1,077 psig	84 °F	86 °F	74 °F			
43	8-Aug-2014	13:30	1,077 psig	86 °F	87 °F	74 °F	End Spike		
44	8-Aug-2014	14:00	955 psig	88 °F	90 °F	74 °F	Bleed Spike	3,732 oz.	
45	8-Aug-2014	14:15	955 psig	88 °F	89 °F	74 °F			
46	8-Aug-2014	14:30	956 psig	89 °F	90 °F	74 °F			
47	8-Aug-2014	14:45	956 psig	90 °F	90 °F	74 °F			
48	8-Aug-2014	15:00	956 psig	89 °F	90 °F	74 °F			
49	8-Aug-2014	15:15	956 psig	90 °F	91 °F	74 °F			
50	8-Aug-2014	15:30	956 psig	90 °F	91 °F	74 °F			
51	8-Aug-2014	15:45	956 psig	89 °F	91 °F	74 °F			
52	8-Aug-2014	16:00	957 psig	89 °F	91 °F	74 °F			







## Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company	Job Number	31079361 Test 1 41919143 Test 3
Construction Co.	ARB	Job Number	31079361 Test 1 41919143 Test 3
Hydro. Test Co.	ARB	Project No.	31079361 Test 1 41919143 Test 3
Test Section	PG&E T-022A-12 , L-191-1, MP 25.30 - 26.73	<b>WATER</b>	
File Name	J00110 - T-022A-12 , L-191-1, MP 25.30 - 26.73		

General Pipe Data								
Description	Segment							
	1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Restrained	Restrained	Unrestrained	Unrestrained
Outside Diameter	12.750 in.	6.625 in.	12.750 in.	12.750 in.	12.750 in.	12.750 in.	1.050 in.	12.750 in.
Wall Thickness	0.281 in.	0.280 in.	0.281 in.	0.375 in.	0.250 in.	0.219 in.	0.113 in.	0.562 in.
Inside Diameter	12.188 in.	6.065 in.	12.188 in.	12.000 in.	12.250 in.	12.312 in.	0.824 in.	11.626 in.
Spec./Grade	52ksmys	35ksmys	52ksmys	35ksmys	42ksmys	42ksmys	35ksmys	52ksmys
Length Unrestrained	3 ft	6 ft	51 ft	13 ft			5 ft	8 ft
Length Restrained					7,010 ft	1,171 ft		
Temperature – On Test	84 °F	84 °F	84.0 °F	84.0 °F	74.0 °F	74.0 °F	84.0 °F	84.0 °F
Temperature – End of Test	89 °F	89 °F	89.0 °F	89.0 °F	75.0 °F	75.0 °F	89.0 °F	89.0 °F
Pressure – On Test	1,077 psig	1,077 psig	1,077 psig	1,077 psig	1,077 psig	1,077 psig	1,077 psig	1,077 psig
Pressure – End of Test	956 psig	956 psig	956 psig	956 psig	956 psig	956 psig	956 psig	956 psig

Unrestrained Pipe								
Vo	508.52 gal 65,091 oz.		Vtp1	509.72 gal 65,244 oz.		Vtp2	509.05 gal 65,158 oz.	
Vo Unrestrained	21 gal	8 gal	310 gal	76 gal			0 gal	46 gal
Fwp 1	1.003301	1.003301	1.003301	1.003301			1.003301	1.003301
Fpp 1	1.001946	1.000972	1.001946	1.001436			1.000327	1.000928
Fpt 1	1.000437	1.000437	1.000437	1.000437			1.000437	1.000437
Fwt 1	1.003044	1.003044	1.003044	1.003044			1.003044	1.003044
Fpwt 1 = Fpt/Fwt	0.997401	0.997401	0.997401	0.997401			0.997401	0.997401
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	20.66 gal	8.48 gal	311.19 gal	76.25 gal			0.13 gal	46.51 gal
Fwp 2	1.002929	1.002929	1.002929	1.002929			1.002929	1.002929
Fpp 2	1.001728	1.000863	1.001728	1.001275			1.000290	1.000824
Fpt 2	1.000528	1.000528	1.000528	1.000528			1.000528	1.000528
Fwt 2	1.003903	1.003903	1.003903	1.003903			1.003903	1.003903
Fpwt = Fpt/Fwt	0.996638	0.996638	0.996638	0.996638			0.996638	0.996638
Vtp = Vo(Fwp)(Fpp)(Fpwt)	20.63 gal	8.47 gal	310.77 gal	76.15 gal			0.13 gal	46.45 gal

Restrained Pipe								
Vo	50,166.08 gal 6,421,258 oz.		Vtp1	50,347.41 gal 6,444,468 oz.		Vtp2	50,312.95 gal 6,440,058 oz.	
Vo Unrestrained					42,922 gal	7,244 gal		
Fwp 1					1.003301	1.003301		
Fpp 1					1.001651	1.001887		
Fpt 1					1.000169	1.000169		
Fwt 1					1.001542	1.001542		
Fpwt 1 = Fpt/Fwt					0.998630	0.998630		
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)					43,075 gal	7,272 gal		
Fwp 2					1.002929	1.002929		
Fpp 2					1.001475	1.001684		
Fpt 2					1.000182	1.000182		
Fwt 2					1.001688	1.001688		
Fpwt = Fpt/Fwt					0.998496	0.998496		
Vtp = Vo(Fwp)(Fpp)(Fpwt)					43,046 gal	7,267 gal		

Combined Pipe								
Vo	50,674.60 gal 6,486,349 oz.		Vtp1	50,857.13 gal 6,509,712 oz.		Vtp2	50,822.00 gal 6,505,216 oz.	



# Pipe Segment Volume Calculations

Company Pacific Gas and Electric Company  
 Construction Co. ARB  
 Hydro. Test Co. ARB  
 Test Section PG&E T-022A-12, L-191-1, MP 25.30 - 26.73  
 File Name J00110 - T-022A-12, L-191-1, MP 25.30 - 26.73

General Pipe Data							
Description	Segment						
	9						
Restrained or Unrestrained?	Unrestrained						
Outside Diameter	12.750 in.						
Wall Thickness	0.562 in.						
Inside Diameter	11.626 in.						
Spec./Grade	52ksmys						
Length Unrestrained	8 ft						
Length Restrained							
Temperature -- On Test	84.0 °F						
Temperature -- End of Test	89.0 °F						
Pressure -- On Test	1,077 psig						
Pressure -- End of Test	956 psig						
Unrestrained Pipe							
Vo							
Vo Unrestrained	46 gal						
Fwp 1	1.003301						
Fpp 1	1.000928						
Fpt 1	1.000437						
Fwt 1	1.003044						
Fpwt 1 = Fpt/Fwt	0.997401						
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	46.51 gal						
Fwp 2	1.002929						
Fpp 2	1.000824						
Fpt 2	1.000528						
Fwt 2	1.003903						
Fpwt = Fpt/Fwt	0.996638						
Vtp = Vo(Fwp)(Fpp)(Fpwt)	46.45 gal						
Restrained Pipe							
Vo							
Vo Unrestrained							
Fwp 1							
Fpp 1							
Fpt 1							
Fwt 1							
Fpwt 1 = Fpt/Fwt							
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)							
Fwp 2							
Fpp 2							
Fpt 2							
Fwt 2							
Fpwt = Fpt/Fwt							
Vtp = Vo(Fwp)(Fpp)(Fpwt)							
Combined Pipe							
Vo							



## Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company	Job Number	31079361 Test 1 41919143 Test 3
Construction Co.	ARB	Job Number	31079361 Test 1 41919143 Test 3
Hydro. Test Co.	ARB	Project No.	31079361 Test 1 41919143 Test 3
Test Section	PG&E T-022A-12, L-191-1, MP 25.30 - 26.73		
File Name	J00110 - T-022A-12, L-191-1, MP 25.30 - 26.73		
<b>WATER</b>			

General Pipe Data								
Description	Segment							
	1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Restrained	Restrained	Unrestrained	Unrestrained
Outside Diameter	12.750 in.	6.625 in.	12.750 in.	12.750 in.	12.750 in.	12.750 in.	1.050 in.	12.750 in.
Wall Thickness	0.281 in.	0.280 in.	0.281 in.	0.375 in.	0.250 in.	0.219 in.	0.113 in.	0.562 in.
Inside Diameter	12.188 in.	6.065 in.	12.188 in.	12.000 in.	12.250 in.	12.312 in.	0.824 in.	11.626 in.
Spec./Grade	52ksmys	35ksmys		35ksmys	42ksmys	42ksmys	35ksmys	52ksmys
Length Unrestrained	3 ft	6 ft	51 ft	13 ft			5 ft	8 ft
Length Restrained					7,010 ft	1,171 ft		
Temperature -- On Test	86.0 °F	86.0 °F	86.0 °F	86.0 °F	74.0 °F	74.0 °F	86.0 °F	86.0 °F
Temperature -- End of Test	87.0 °F	87.0 °F	87.0 °F	87.0 °F	75.0 °F	75.0 °F	87.0 °F	87.0 °F
Pressure -- On Test	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig
Pressure -- End of Test	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig	1,016 psig

Unrestrained Pipe								
Vo	508.52 gal		Vtp1	509.43 gal		Vtp2	509.35 gal	
	65,091 oz.			65,207 oz.			65,196 oz.	
Vo Unrestrained	21 gal	8 gal	310 gal	76 gal		0 gal	46 gal	
Fwp 1	1.003114	1.003114	1.003114	1.003114		1.003114	1.003114	
Fpp 1	1.001836	1.000917	1.001836	1.001355		1.000309	1.000876	
Fpt 1	1.000473	1.000473	1.000473	1.000473		1.000473	1.000473	
Fwt 1	1.003373	1.003373	1.003373	1.003373		1.003373	1.003373	
Fpwt 1 = Fpt/Fwt	0.997110	0.997110	0.997110	0.997110		0.997110	0.997110	
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	20.65 gal	8.47 gal	311.01 gal	76.20 gal		0.13 gal	46.48 gal	
Fwp 2	1.003114	1.003114	1.003114	1.003114		1.003114	1.003114	
Fpp 2	1.001836	1.000917	1.001836	1.001355		1.000309	1.000876	
Fpt 2	1.000491	1.000491	1.000491	1.000491		1.000491	1.000491	
Fwt 2	1.003557	1.003557	1.003557	1.003557		1.003557	1.003557	
Fpwt = Fpt/Fwt	0.996945	0.996945	0.996945	0.996945		0.996945	0.996945	
Vtp = Vo(Fwp)(Fpp)(Fpwt)	20.65 gal	8.47 gal	310.95 gal	76.19 gal		0.13 gal	46.48 gal	

Restrained Pipe								
Vo	50,166.08 gal		Vtp1	50,333.34 gal		Vtp2	50,326.78 gal	
	6,421,258 oz.			6,442,668 oz.			6,441,828 oz.	
Vo Restrained					42,922 gal	7,244 gal		
Fwp 1					1.003114	1.003114		
Fpp 1					1.001561	1.001783		
Fpt 1					1.000169	1.000169		
Fwt 1					1.001542	1.001542		
Fpwt 1 = Fpt/Fwt					0.998630	0.998630		
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)					43,064 gal	7,270 gal		
Fwp 2					1.003114	1.003114		
Fpp 2					1.001564	1.001787		
Fpt 2					1.000182	1.000182		
Fwt 2					1.001688	1.001688		
Fpwt = Fpt/Fwt					0.998496	0.998496		
Vtp = Vo(Fwp)(Fpp)(Fpwt)					43,058 gal	7,269 gal		

Combined Pipe								
Vo	50,674.60 gal		Vtp1	50,842.77 gal		Vtp2	50,836.13 gal	
	6,486,349 oz.			6,507,875 oz.			6,507,024 oz.	
1 °F Change	6.65 gal		850.68 oz.					



# Pipe Segment Volume Allowance Calculations

Company Pacific Gas and Electric Company  
 Construction Co. ARB  
 Hydro. Test Co. ARB  
 Test Section PG&E T-022A-12, L-191-1, MP 25.30 - 26.73  
 File Name J00110 - T-022A-12, L-191-1, MP 25.30 - 26.73

General Pipe Data								
Description	Segment							
	9							
Restrained or Unrestrained?	Unrestrained							
Outside Diameter	12.750 in.							
Wall Thickness	0.562 in.							
Inside Diameter	11.626 in.							
Spec./Grade	52ksmys							
Length Unrestrained	8 ft							
Length Restrained								
Temperature -- On Test	86.0 °F							
Temperature -- End of Test	87.0 °F							
Pressure -- On Test	1,016 psig							
Pressure -- End of Test	1,016 psig							
Unrestrained Pipe								
Vo								
Vo Unrestrained	46 gal							
Fwp 1	1.003114							
Fpp 1	1.000876							
Fpt 1	1.000473							
Fwt 1	1.003373							
Fpwt 1 = Fpt/Fwt	0.997110							
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	46.48 gal							
Fwp 2	1.003114							
Fpp 2	1.000876							
Fpt 2	1.000491							
Fwt 2	1.003557							
Fpwt = Fpt/Fwt	0.996945							
Vtp = Vo(Fwp)(Fpp)(Fpwt)	46.48 gal							
Restrained Pipe								
Vo								
Vo Restrained								
Fwp 1								
Fpp 1								
Fpt 1								
Fwt 1								
Fpwt 1 = Fpt/Fwt								
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)								
Fwp 2								
Fpp 2								
Fpt 2								
Fwt 2								
Fpwt = Fpt/Fwt								
Vtp = Vo(Fwp)(Fpp)(Fpwt)								
Combined Pipe								
Vo								
1 °F Change								



## Hydrostatic Pressure Test Pipe Data Table

Pipe Type	Length	Restrained / Unrestrained	Outside Diameter	Wall Thickness	Specification & Grade	Pipe Yield Pressure	Material	Joint Type	Seam Type	
1	102	3.40 ft	Unrestrained	12.750 in.	0.2810 in.	52ksmys	2,292 psig	Steel	Arc Weld	ERW-HF
2	103	5.64 ft	Unrestrained	6.625 in.	0.2800 in.	35ksmys	2,958 psig	Steel	Arc Weld	SM
3	102	51.21 ft	Unrestrained	12.750 in.	0.2810 in.	52ksmys	2,292 psig	Steel	Arc Weld	ERW-HF
4	101	12.95 ft	Unrestrained	12.750 in.	0.3750 in.	35ksmys	2,059 psig	Steel	Arc Weld	SM
5	1	7,010.46 ft	Restrained	12.750 in.	0.2500 in.	42ksmys	1,647 psig	Steel	Arc Weld	ERW-HF
6	2	1,171.33 ft	Restrained	12.750 in.	0.2190 in.	42ksmys	1,443 psig	Steel	Arc Weld	ERW-HF
7		4.67 ft	Unrestrained	1.050 in.	0.1130 in.	35ksmys	7,533 psig	Steel	Arc Weld	SM
8	TH	8.42 ft	Unrestrained	12.750 in.	0.5620 in.	52ksmys	4,584 psig	Steel	Arc Weld	SM
9	TH	8.42 ft	Unrestrained	12.750 in.	0.5620 in.	52ksmys	4,584 psig	Steel	Arc Weld	SM

### Hydrostatic Test Project Owner & Participants

Owner Company	Pacific Gas and Electric Company	Job Number
Address	6121 Bollinger Canyon road San Ramon, Ca. 94583 Attention: Mark Cabral, Aziza Tarin	31079361 Test 1 41919143 Test 3
Construction Company	ARB	Job Number
Address	1875 Loveridge Road Pittsburg, CA 94565 Attention: T. Barnes	31079361 Test 1 41919143 Test 3
Hydrostatic Test Co.	ARB	Project No.
Address	1875 Loveridge Road Pittsburg, CA 94565 Attention: T. Barnes	31079361 Test 1 41919143 Test 3
Test Section	PG&E T-022A-12, L-191-1, MP 25.30 - 26.73	
	From: 0+00 MP 25.30 To: 81+48 MP 26.73	
File Name	J00110 - T-022A-12, L-191-1, MP 25.30 - 26.73	

### Test Specifications

Test Factor	1.5	[1A]Minimum Test Pressure at Maximum Elevation	900 psig	[1B]Maximum Test Pressure at Minimum Elevation	1,095 psig					
ASME B31.8S – Integrity Assessment Interval		15 years	Desired MAOP % SMYS	19.61%	ASME B31.8S Minimum Test Factor	2.80				
Spike Test	Yes	[1C]Spike Factor	1.15	[1D]Spike Pressure at Maximum Elevation	1,035 psig	[1E]Spike Pressure at Minimum Elevation	1,081 psig	[1F]Max. Post-Spike Pressure at Minimum Elevation @	90%	972 psig
Test Medium to Be Used		Water	Minimum Test Duration	8.00 hours	Spike Duration		30 minutes			

### Test Elevation

Elevation @ Test Point	235 ft	Location	0+00		
Maximum Elevation in Test Section	332 ft	Location	81+48	[2A]Static Head Between Test Point and Maximum Elevation	(43) psi
Minimum Elevation in Test Section	227 ft	Location	0+00	[2B]Static Head Between Test Point and Minimum Elevation	4 psi

### No Spike Test: Calculations and Test Results

Min. Required Test Press At Test Point	NA	Max. Allowable Test Press at Test Point	NA	Pressure Range During Test	NA
[2C]Minimum Test Pressure Indicated	NA	[2D]Maximum Test Pressure Indicated	NA		
Calculated Min. Test Pressure at Max. Elevation	NA	Calculated Max. Test Pressure at Min. Elevation	NA		

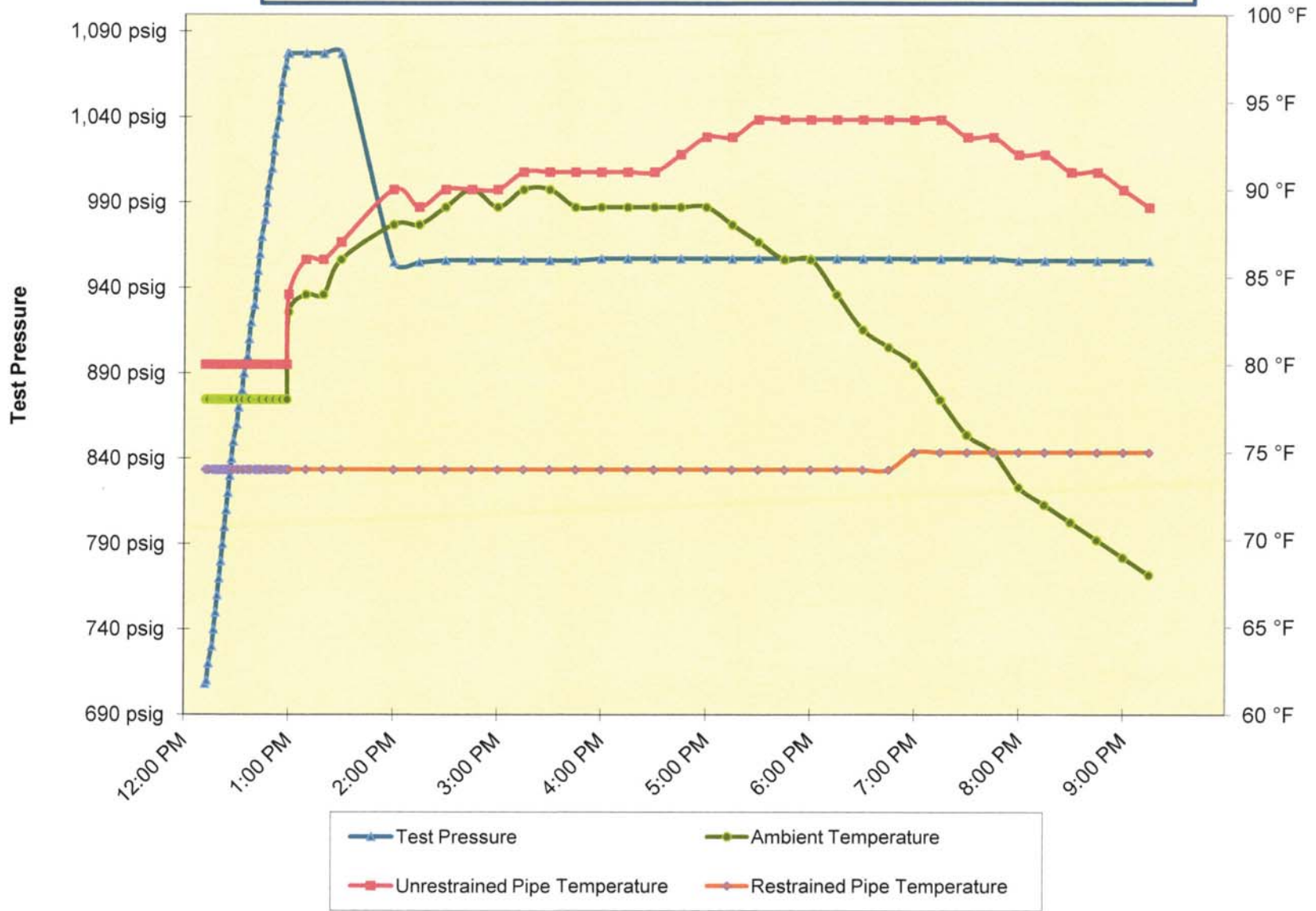
### Spike Test: Calculations and Test Results

Spike Pressure at Test point	1,077 psig	Min. Required Test Press At Test Point	943 psig	Max. Post-Spike Pressure at Test Point	968 psig	Pressure Range After Spike Test	25 psig
[2E]Spike Pressure Indicated	1,077 psig	[2F]Minimum Test Pressure Indicated	955 psig	[2G]Max. Post-Spike Test Pressure Indicated	957 psig		
Calculated Spike Pressure at Min. Elevation	1,081 psig	Calculated Min. Test Pressure at Max. Elevation	912 psig	Calculated Max. Post Spike Pressure at Min. Elevation	961 psig		

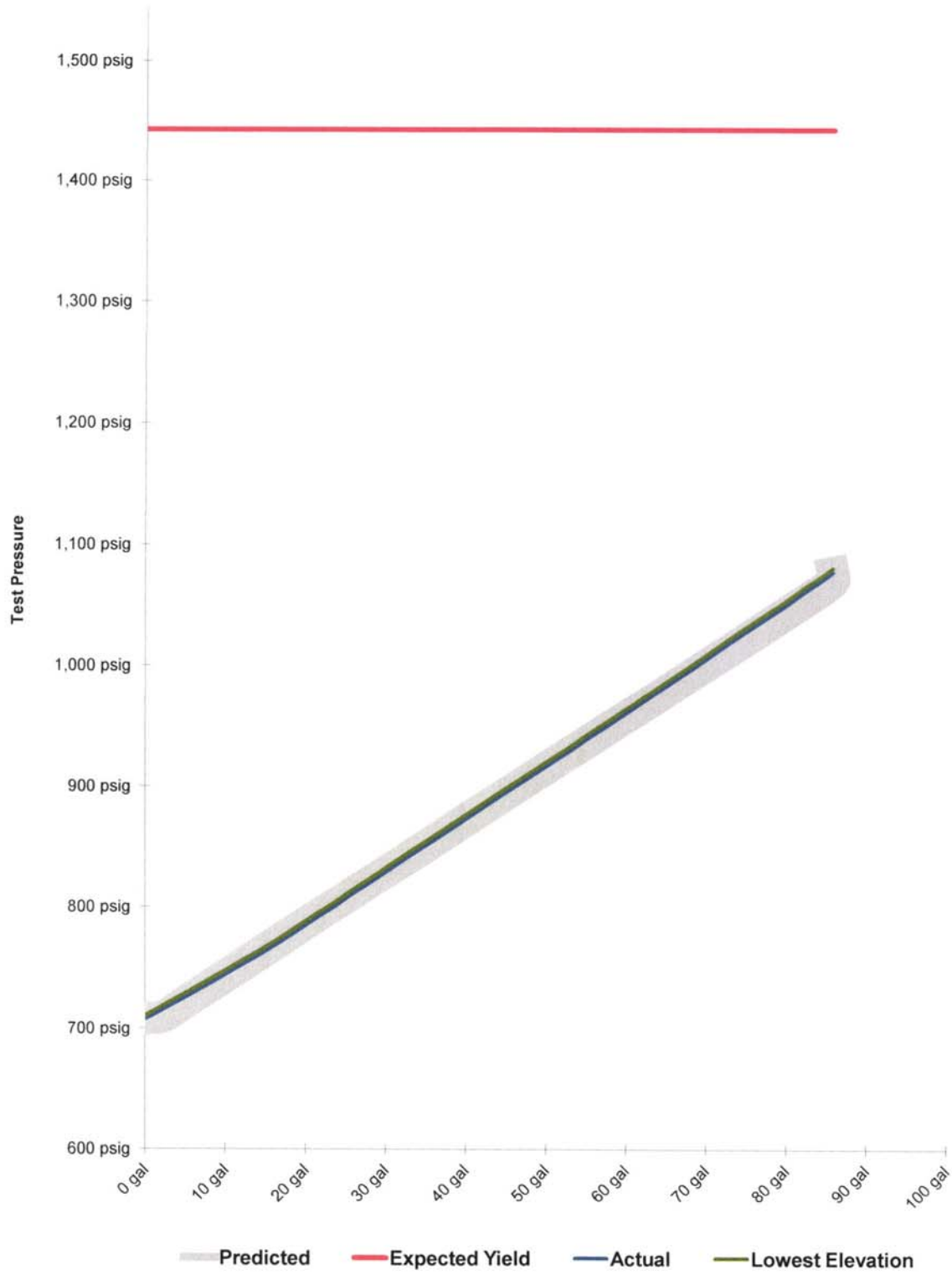
### Test Acceptance

Time and Date Test Pressure Reached	8-Aug-2014 13:00	Time and Date Test Ended	8-Aug-2014 21:15	Actual Duration of Test	8 hours 15 minutes
Hydrostatic Test Date:	8-Aug-2014 12:12	Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3)			
Test Fluid Density	62.40 lb/ft³	Pacific Gas and Electric Company's desired MAOP		283 psig	
Ramp Hold Pressure	708 psig	Target Test Pressure	955 psig		

PG&E T-022A-12 , L-191-1, MP 25.30 - 26.73




**Spike Pressure Test**  
**Stress Strain Curve -- PG&E T-022A-12 , L-191-1, MP 25.30**  
**- 26.73**



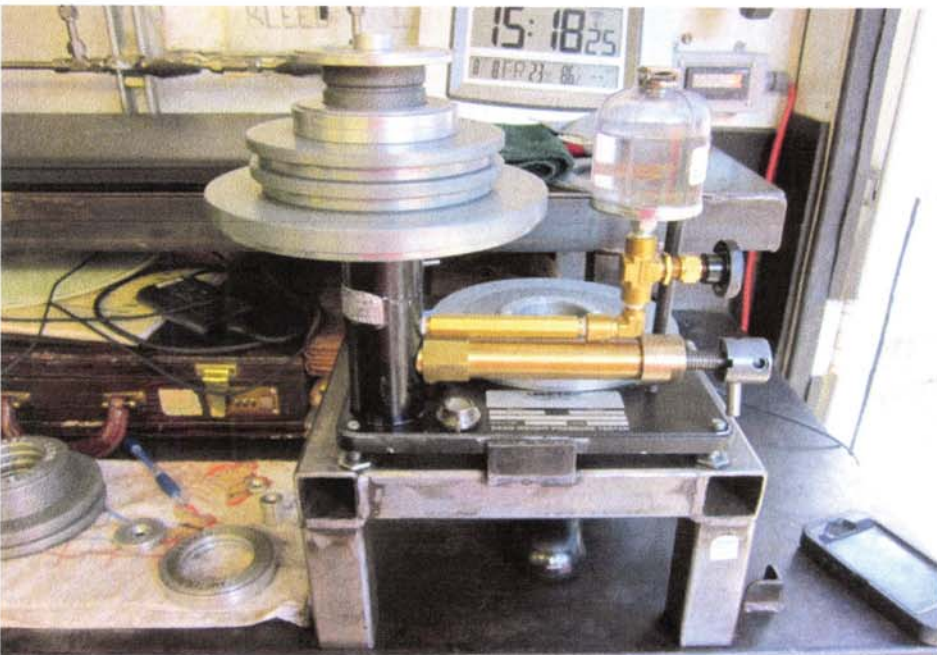




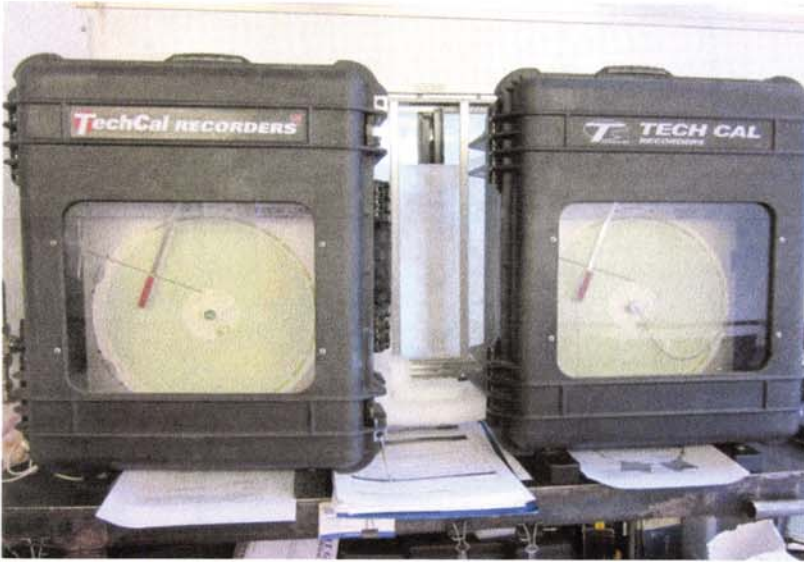
Actual Pressure Volume Plot Data			Spike Pressure Test Stress Strain Curve -- PG&E T-022A-12 , L-191-1, MP 25.30 - 26.73					
Pressure	Pump Strokes	Gallons						
708 psig	0	0.00 gal	Gallons per Pump Strokes @ Efficiency	75.49%	0.03610 gal			
710 psig	18	0.65 gal	Pump Piston Diameter		1.250 in			
720 psig	92	3.32 gal	Pump Piston Stroke		3.00 in			
730 psig	168	6.06 gal	Pump Cylinders per Stroke		3 ea			
740 psig	242	8.74 gal	Volume check gal per Pump Strokes		0.03710 gal			
750 psig	315	11.37 gal	Volume Released (gallons)		2.39 gal			
760 psig	390	14.08 gal	Pressure Reduced (psi)		10 psi			
770 psig	459	16.57 gal	Maximum2		100 gal			
780 psig	523	18.89 gal	Minimum2		0 gal			
790 psig	586	21.15 gal	Maximum		1,543 psig			
800 psig	653	23.57 gal	Minimum1		600 psig			
810 psig	710	25.63 gal	Gallons per Pump Strokes Used		0.0361 gal			
820 psig	774	27.94 gal	Predicted Gallons per Pump Strokes		0.0361 gal			
830 psig	834	30.10 gal	Pressure Increment		10 psi			
840 psig	896	32.34 gal	Max Pressure		1,077 psig			
850 psig	960	34.65 gal	Buried Pipe Temperature		74.0 °F			
860 psig	1025	37.00 gal	Exposed Pipe Temperature		86.0 °F			
870 psig	1089	39.31 gal						
880 psig	1153	41.62 gal						
890 psig	1215	43.86 gal						
900 psig	1279	46.17 gal						
910 psig	1342	48.44 gal						
920 psig	1406	50.75 gal						
930 psig	1471	53.10 gal						
940 psig	1529	55.19 gal						
950 psig	1593	57.50 gal						
960 psig	1655	59.74 gal						
970 psig	1717	61.98 gal						
980 psig	1778	64.18 gal						
990 psig	1840	66.42 gal						
1,000 psig	1903	68.69 gal						
1,010 psig	1963	70.85 gal						
1,020 psig	2023	73.02 gal						
1,030 psig	2086	75.29 gal						
1,040 psig	2149	77.57 gal						
1,050 psig	2214	79.91 gal						
1,060 psig	2273	82.04 gal						
1,070 psig	2337	84.35 gal						
1,077 psig	2377	85.80 gal						
			Predicted Volume of Air in Test Segment		7.0 gal			
					0.01 % of Fill			
			 James E. Knight					
						Date		8-Aug-2014



**Test 022A-12 test 3 test head at Loc. A with test hoses attached**



**Test 022A-12 test 3 deadweights inside test trailer**



Test 022A-14 test 3 dual pressure recorders reunning together for backup.



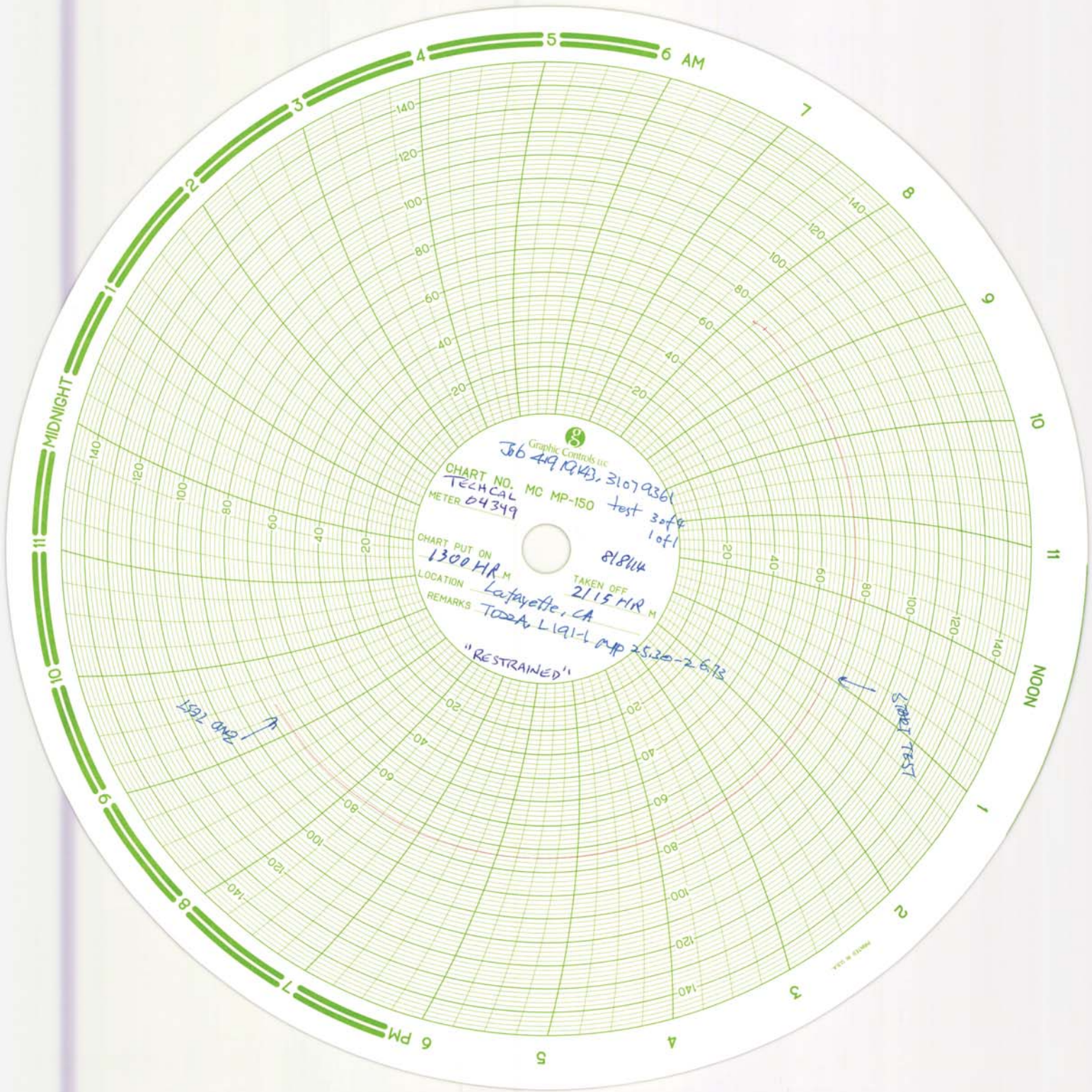
Test 022A-12 test 3 unrestrained pipe temp. recorder



**Test 022A-12 test 3 ambient temp. recorder outside test trailer**



**Test 022A-12 test 3 Loc. B testhead inside shoring box**



Graphic Controls Inc  
3649 19th, 3107 9361  
CHART NO. MC MP-150 test 3 of 4  
TECHCAL METER 04349 1 of 1

CHART PUT ON 1300 HR M 818114  
LOCATION Lafayette, CA  
REMARKS TODAY LIQ-L MP 25.30-26.75  
"RESTRAINED"

592 OHG! ↑

5921 TEST ↑

MIDNIGHT

NOON

6 AM  
7  
8  
9  
10  
11  
12  
1  
2  
3  
4  
5  
6 PM

140  
120  
100  
80  
60  
40  
20  
0  
20  
40  
60  
80  
100  
120  
140



Graphic Controls inc.  
Job 41919143, 31079361

CHART NO. MC MP-150 Test 3 of 4  
TECH CAL 11f1  
METER 04352 P8114

CHART PUT ON 1300 M TAKEN OFF 2115 M

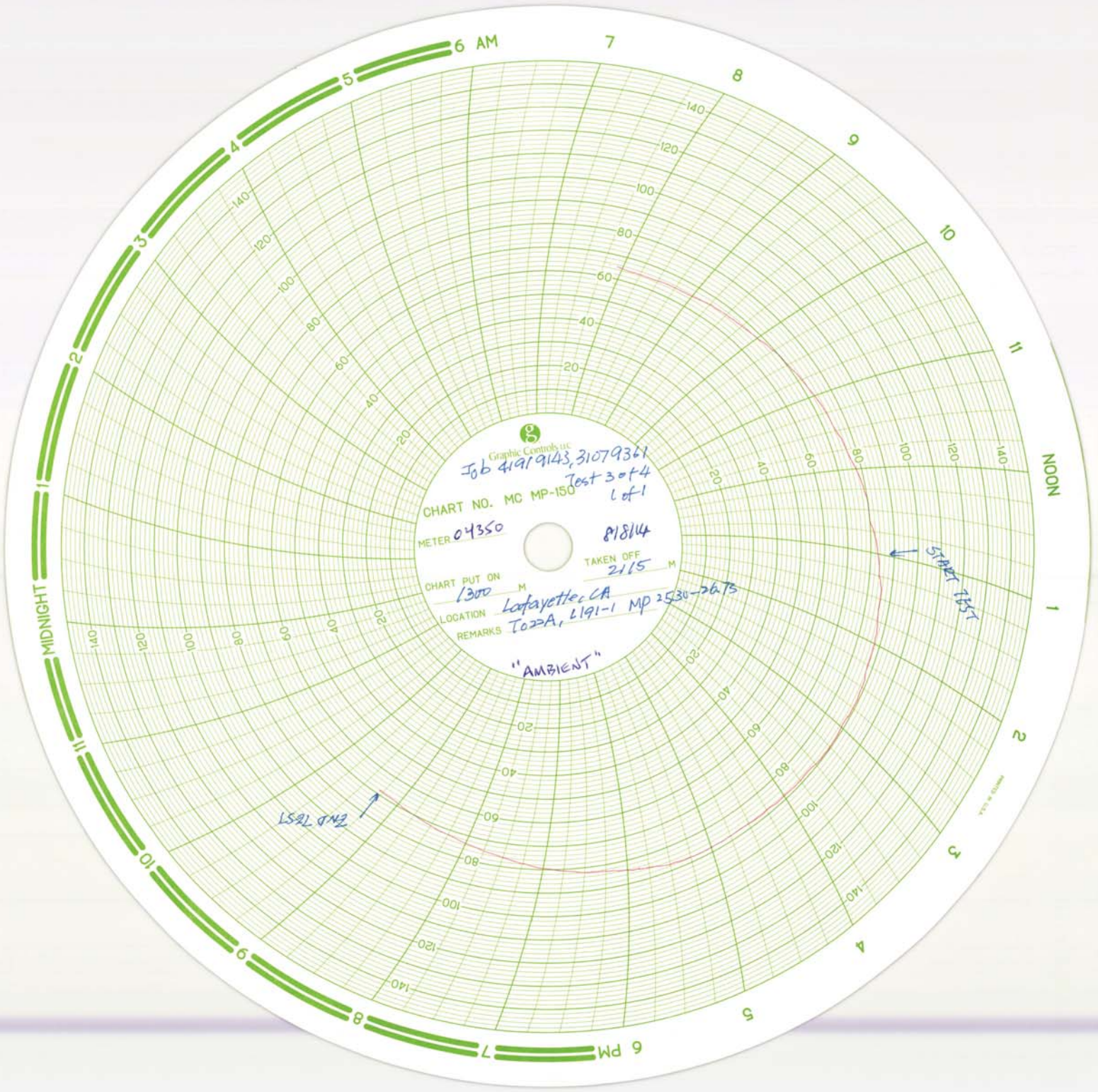
LOCATION Lafayette, CA  
REMARKS TO22A, L191-LMP 25.30-26.73

"UNRESTRAINED"

2ND TEST →

← 5TH TEST

MADE IN U.S.A.



Graphic Controls Inc  
Job 41919143, 31079361  
Test 3 of 4  
1 of 1

CHART NO. MC MP-150

METER 04350

81814

CHART PUT ON  
1300 M

TAKEN OFF  
2115 M

LOCATION Lafayette, CA

REMARKS To 2A, 1191-1 MP 2530-2675

"AMBIENT"

START TEST

END TEST



2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID # 3773

File # 1329

Instrument Type **RECORDER,  
PRESSURE**

Range 0-2000

Units PSIG

Resolution 20

Mfg. TECH CAL

Model 1B100

Cal By **MIKE MCCONNELL  
90765**

Curent Cal Cycle (Months) 12

Previous Cal Cycle 12

Standards Used **AMETEK DM-T-150 S/N 8681  
DUE 3/29/2016 NIST 45209.001**

Certificate Number: **2401778**

Rated Accuracy 1%

Pass/Fail as Found **PASS**

Pass/Fail as Left **PASS**

1st (Mfg) S/N **02098**

2nd S/N **PC-01**

Cal Date **5/28/2014**

Cal Due **5/28/2015**

Notes

**TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT  
HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE  
OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012  
AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED  
MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE  
OR 1 MINOR DIVISION.**





# CALIBRATION DATA SHEET PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

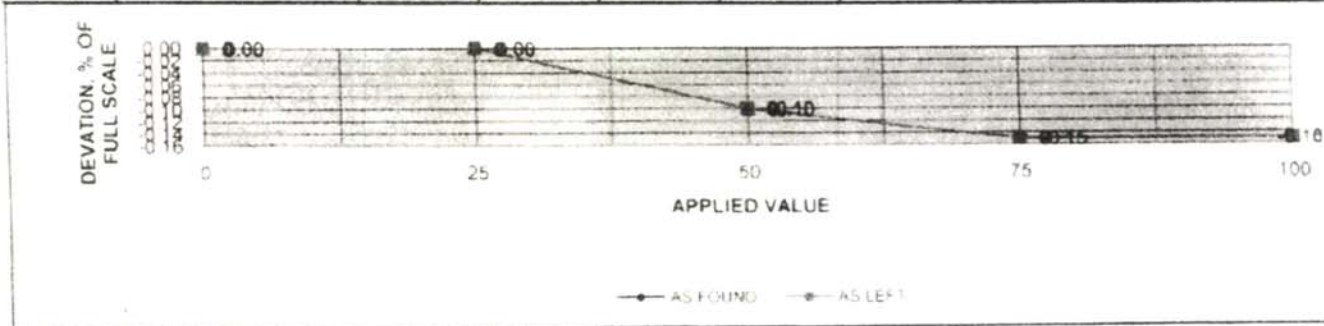
CUSTOMER: ARB  
 TSG JOB & ITEM #: 3773  
 CERTIFICATE NUMBER: 240778  
 CAL DATE: 5/28/2014  
 CAL DUE: 5/28/2015  
 MFG: TECH CAL  
 MODEL: 1B100  
 CAL BY: Mike McConnell  
 MFG S/N: 02098  
 RANGE: M/N 0 MAX 2,000  
 UNITS: PSIG  
 RESOLUTION: 20  
 RATED ACCURACY: % FULL SCALE 1.00 %  
 2ND S/N: PC-01

### INSTRUMENT DESCRIPTION

PRESS: X  
 TEMP: X  
 VACUUM: X  
 CASE SIZE: 11"  
 CONN SIZE: 25"  
 CONN LOCATION: BACK  
 THREAD TYPE: NPT  
 STANDARDS USED:  
 MFG: AMETEK  
 MODEL: DM-T-150  
 S/N: 8681  
 RECAL: 6/4/2014  
 N I S T #: 40568 001  
 MFG: EUTECHNICS  
 MODEL: 139200-1.2  
 S/N: 10049  
 RECAL: 7/31/2014  
 N I S T #: TE188, TE192, TE195

### CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
		AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	500.00	500.00	500.00	0.00	0.00	0.00	0.00	PASS	PASS
50	1,000.00	998.00	998.00	-2.00	-2.00	-0.10	-0.10	PASS	PASS
75	1,500.00	1497.00	1497.00	-3.00	-3.00	-0.15	-0.15	PASS	PASS
100	2,000.00	1997.00	1997.00	-3.00	-3.00	-0.15	-0.15	PASS	PASS



### IMPACT / NOTES

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540 UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION. LABORATORY CONDITIONS AT TECHNICAL SERVICES GROUP 68.72 DEG F ± 40% RH

*[Signature]*  
 TSG CALIBRATION / Q A SUPERVISOR

UNRESTRAINED



2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID # 3773

File # 1329

Instrument Type RECORDER,  
TEMPERATURE

Range 0-150

Units DEG F

Resolution 2

Mfg. TECH-CAL

Model 1BT00

Cal By R.K. STRAHL

Current Cal Cycle (Months) 12

Previous Cal Cycle N/A

Standards Used FLUKE 515A SN 10520  
6/13/14 NIST F26700

Certificate Number: 2401712

Rated Accuracy 1%

Pass Fail as Found PASS

Pass Fail as Left PASS

1st (Mfg) S/N 04352

2nd S/N N/A

Cal Date 5/1/2014

Cal Due 5/1/2015

Notes

**TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.**



# CALIBRATION DATA SHEET PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER: ARB  
 TSG JOB & ITEM #: 3773  
 CERTIFICATE NO.: 2401712  
 CAL DATE: 5/1/2014  
 CAL DUE: 5/1/2015

MFG.: TECH CAL  
 MODEL: 1BT00  
 CAL BY: R.K. STRAHL  
 MFG S/N: 04352

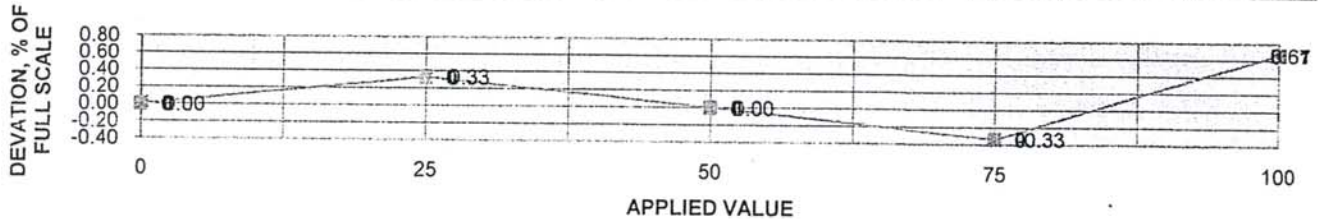
RANGE: MIN 0 MAX 150  
 UNITS: DEG F  
 RESOLUTION: 2  
 RATED ACCURACY, % FULL SCALE: 1.00 %  
 2ND S/N: N/A

INSTRUMENT DISCIPTION  
 PRESS.: X  
 TEMP.: X  
 VACUUM:  
 CASE SIZE: RECORDER  
 CONN. SIZE: N/A  
 CONN. LOCATION: N/A  
 THREAD TYPE: N/A

STANDARDS USED  
 MFG.: AMATEK  
 MODEL: DM-T-150  
 S/N: 8681  
 RECAL: 3/3/2014  
 N.I.S.T #: 40568.001  
 MFG.: FLUKE  
 MODEL: 515A  
 S/N: 10520  
 RECAL: 6/13/2014  
 N.I.S.T #: F26700

### CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
		AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	37.50	38.00	38.00	0.50	0.50	0.33	0.33	PASS	PASS
50	75.00	75.00	75.00	0.00	0.00	0.00	0.00	PASS	PASS
75	112.50	112.00	112.00	-0.50	-0.50	-0.33	-0.33	PASS	PASS
100	150.00	151.00	151.00	1.00	1.00	0.67	0.67	PASS	PASS



◆ AS FOUND    ■ AS LEFT

IMPACT / NOTES :

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION

*[Signature]*  
 TSG CALIBRATION / Q.A. SUPERVISOR

# TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID # 3773

File # 1329

Instrument Type **DEAD WEIGHT  
TESTER**

Range 25-3000

Units PSIG

Resolution AS RATED

Mfg. AMETEK

Model HL36

Cal By R.K. STRAHL

Current Cal Cycle (Months) 12

Previous Cal Cycle 12

Standards Used AMETEK DM-T-150 S/N 8681  
DUE 3/3/2015 NIST 40568.001

Certificate Number: **2802598**

Rated Accuracy .1%

Pass/Fail as Found PASS

Pass/Fail as Left PASS

1st (Mfg) S/N **HL6406**

2nd S/N **N/A**

Cal Date **3/18/2014**

Cal Due **3/18/2015**

Notes

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HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE  
OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012  
AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED  
MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE  
OR 1 MINOR DIVISION.



# CALIBRATION DATA SHEET

## PRESSURE / TEMPERATURE

LAST REVISION: 9/24/2013

2900 MAIN ST ALAMEDA CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER: **ARB**

TSG JOB: **3773** TSG ITEM: \_\_\_\_\_ CUST. P. O. #: \_\_\_\_\_ SHIPPING #: **41725**

DESCRIPTION: PRESS  TEMP  TEST GAGE  ASSIGNED G-T # \_\_\_\_\_  
 RECORDER  OTHER: **Direct wt 1572**

1ST SERIAL #: **HC6406** 2ND SERIAL #: \_\_\_\_\_ MANUFACTURER: **AMETEK** MODEL: **HL 36** RANGE: **25-3000** RESOLUTION: \_\_\_\_\_ DIGITAL: \_\_\_\_\_ ANALOG: \_\_\_\_\_

CASE SIZE: \_\_\_\_\_ CONNECTION TYPE: **BOTTOM**  BACK  CONNECTION SIZE: **1/4"**  1/8"  1/2"  OTHER: \_\_\_\_\_ THREAD TYPE: **NPT**  TUBE  UN  ISO  RATED ACCURACY %: **0.1** NIST TRACEABLE #: \_\_\_\_\_

EXISTING CAL CYCLE: **4/R** CAL CYCLE UPDATE: \_\_\_\_\_ LAST CAL DATE: **8/13** CAL DATE: **3/18/14** RECALIBRATE: **3/18/15**

TECHNICIAN: **R.K. STRANK** BADGE #: **1502** TEMPERATURE DEG. F: **68-72** RELATIVE HUMIDITY %: **< 60 %** CALIBRATION PROCEDURE: **G-A1, SCP-01, SCP-02, SCP-03**

CONDITION				STANDARDS USED				TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI/NCSL Z-540 UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION
AS RECEIVED		AS RETURNED		MFG.	MODEL	SERIAL #	RECALIBRATE	
GOOD <input checked="" type="checkbox"/>	DAMAGED <input type="checkbox"/>	IN TOL. <input type="checkbox"/>	OUT OF TOL. <input checked="" type="checkbox"/>	AMETEK	DM-T-50	8681	3/3/2015	
IN TOL. <input checked="" type="checkbox"/>	OUT OF TOL. <input type="checkbox"/>	LIMITED <input type="checkbox"/>	B.E.R. <input type="checkbox"/>	EUTECHNICS	4600	100049	7/31/2014	
		REPAIRED BEFORE TEST <input type="checkbox"/>	PCS. CALIB. <input type="checkbox"/>					

PARAMETER	RANGE	STANDARD VALUE	OBSERVED INDICATION	CORRECTED INDICATION	TOLERANCE	PASS	FAIL
PRESSURE :							
PSIG <input checked="" type="checkbox"/>							
PSID _____							
PSIA _____							
IN Hg _____							
IN H2O _____							
OTHER _____							
VACUUM :							
IN Hg _____							
OTHER _____							
TEMPERATURE :							
DEG F _____							
DEG C _____							
OTHER _____							
	<b>25-3000</b>	<b>500.0 PSI</b>	<b>500.0 PSI</b>	<b>1%</b>		<input checked="" type="checkbox"/>	
	<b>25 PSI</b>	<b>1000.0 PSI</b>	<b>999.9 PSI</b>		<input checked="" type="checkbox"/>		
		<b>2000.0 PSI</b>	<b>1999.9 PSI</b>		<input checked="" type="checkbox"/>		
		<b>2500.0 PSI</b>	<b>2499.8 PSI</b>		<input checked="" type="checkbox"/>		
		<b>3000.0 PSI</b>	<b>2999.7 PSI</b>		<input checked="" type="checkbox"/>		

DETERMINATION OF IMPACT / NOTES :

*R.K. Strank*  
 TSG CALIBRATION SUP. / QUALITY ASSURANCE SUP.

RESTRAINED

# TECHNICAL SERVICES GROUP

2900 Main St. Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID # 3773

File # 1329

Instrument Type RECORDER,  
TEMPERATURE

Range 0-150

Units DEG F

Resolution 2

Mfg. TECHCAL

Model 1BT00

Cal By J.P. 082277

Current Cal Cycle (Month) 12

Previous Cal Cycle 12

Standards Used EUTECHNICS 139200-1.2 S/N  
100049 DUE 7/31/2014 NIST  
TE188, TE192, TE195

Certificate Number: **2802954**

Rated Accuracy 1%

Pass/Fail as Found PASS

Pass/Fail as Left PASS

1st (Mfg) S/N **04349**

2nd S/N **N/A**

Cal Date **5/23/2014**

Cal Due **5/23/2015**

Notes

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HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE  
OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012  
AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED  
MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE  
OR 1 MINOR DIVISION.



# CALIBRATION DATA SHEET

## PRESSURE / TEMPERATURE

LAST REVISION: 4/16/2014

2900 MAIN ST ALAMEDA CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER <b>ARB</b>		TSG JOB	TSG ITEM	CUST. P. O. #	SHIPPING #	DESCRIPTION: PRESS <input type="checkbox"/> TEMP <input checked="" type="checkbox"/> TEST GAGE <input type="checkbox"/>	ASSIGNED C.T.#
1ST SERIAL# <b>04349</b>		2ND SERIAL#		MANUFACTURER <b>Tech Cal</b>	MODEL <b>1BT00</b>	RANGE <b>0-150</b>	RESOLUTION <b>2</b>
CASE SIZE	CONNECTION TYPE BOTTOM <input type="checkbox"/> BACK <input type="checkbox"/>	CONNECTION SIZE 1/8" <input type="checkbox"/> 1/4" <input type="checkbox"/> 1/2" <input type="checkbox"/> OTHER		THREAD TYPE NPT <input type="checkbox"/> TUBE <input type="checkbox"/> UN <input type="checkbox"/> ISO <input type="checkbox"/>	RATED ACCURACY % <b>1%</b>	NIST TRACEABLE # PRESSURE: 45209.001 TEMPERATURE: TE188, TE192, TE195	
EXISTING CAL. CYCLE <b>12 mo</b>	CAL. CYCLE UPDATE		LAST CAL DATE <b>1/14</b>	CAL DATE <b>5-23-14</b>	RECALIBRATE <b>5-23-15</b>		
TECHNICIAN <b>J.P.</b>		BADGE # <b>082277</b>	TEMPERATURE DEG. F <b>68 - 72</b>	RELATIVE HUMIDITY % <b>&lt; 60 %</b>	CALIBRATION PROCEDURE <b>G-A1, SCP-01, SCP-02, SCP-03</b>		

CONDITION				STANDARDS USED			
AS RECEIVED		AS RETURNED		MFG.	MODEL	SERIAL #	RECALIBRATE
GOOD <input checked="" type="checkbox"/>	DAMAGED	IN TOL. <input checked="" type="checkbox"/>	OUT OF TOL.	AMETEK	DM-T-50	8681	3/29/2016
IN TOL. <input checked="" type="checkbox"/>	OUT OF TOL.	LIMITED	B.E.R.	EUTECHNICS	4600	100049	7/31/2014
		REPAIRED BEFORE TEST	PCS. CALIB. <b>1</b>				

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540 UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION

PARAMETER	RANGE	STANDARD VALUE	OBSERVED INDICATION	CORRECTED INDICATION	TOLERANCE	PASS	FAIL
PRESSURE :							
PSIG	<b>0</b>				<b>1%</b>		
PSID		<b>32°</b>	<b>32°</b>	<b>32°</b>		<input checked="" type="checkbox"/>	
PSIA							
IN Hg		<b>70°</b>	<b>70°</b>	<b>70°</b>		<input checked="" type="checkbox"/>	
IN H2O							
OTHER							
VACUUM :							
IN Hg	<b>0-150</b>	<b>150°</b>	<b>150°</b>	<b>150°</b>		<input checked="" type="checkbox"/>	
OTHER							
TEMPERATURE :							
DEG F <input checked="" type="checkbox"/>							
DEG C <input checked="" type="checkbox"/>							
OTHER							

DETERMINATION OF IMPACT / NOTES :

TSG CALIBRATION SUP. / QUALITY ASSURANCE SUP.



# TECHNICAL SERVICES GROUP

2900 Main St. Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID = 3773

Certificate Number: **2802952**

File # 1329

Rated Accuracy 1%

Instrument Type **RECORDER,  
TEMPERATURE**

Pass/Fail as Found **PASS**

Pass/Fail as Left **PASS**

Range **0-150**

1st (Mfg) S.N. **04350**

Units **DEG F**

Resolution **2**

Mfg **TECHCAL**

2nd S.N. **N/A**

Model **1BT00**

Cal By: **J.P. 082277**

Current Cal Cycle (Months) **12**

Cal Date **5/23/2014**

Previous Cal Cycle **12**

Cal Due **5/23/2015**

Standards Used **EUTECHNICS 139200-1.2 S/N  
100049 DUE 7/31/2014 NIST  
TE188, TE192, TE195**

Notes

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AND ANSI/NCSL Z-540. UNLESS OTHERWISE SPECIFIED  
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OR 1 MINOR DIVISION.**





# CALIBRATION DATA SHEET

## PRESSURE / TEMPERATURE

LAST REVISION: 4/16/2014

2900 MAIN ST ALAMEDA CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER <b>ARB</b>		TSG JOB	TSG ITEM	CUST. P. O. #	SHIPPING #	DESCRIPTION (PRESSURE) <input checked="" type="checkbox"/> RECORDER <input checked="" type="checkbox"/> OTHER	TEMP <input checked="" type="checkbox"/> TEST GAGE	ASSIGNED C.T.# <b>2802952</b>
1ST SERIAL # <b>04350</b>	2ND SERIAL #	MANUFACTURER <b>Tech Cal</b>		MODEL <b>1BT00</b>	RANGE <b>0-150°</b>	RESOLUTION <b>2</b>	DIGITAL	ANALOG <input checked="" type="checkbox"/>
CASE SIZE	CONNECTION TYPE BOTTOM <input type="checkbox"/> BACK <input type="checkbox"/>	CONNECTION SIZE 1/8" <input type="checkbox"/> 1/4" <input type="checkbox"/> 1/2" <input type="checkbox"/> OTHER	THREAD TYPE NPT <input type="checkbox"/> TUBE <input type="checkbox"/> UN <input type="checkbox"/> ISO <input type="checkbox"/>	RATED ACCURACY %	NIST TRACEABLE # PRESSURE: 45209.001 TEMPERATURE: TE188, TE192, TE195			
EXISTING CAL CYCLE <b>12 mo</b>	CAL CYCLE UPDATE	LAST CAL DATE <b>12/13</b>		CAL DATE <b>5-23-14</b>	RECALIBRATE <b>5-23-15</b>			
TECHNICIAN <b>J.P.</b>		BADGE # <b>082277</b>	TEMPERATURE DEG. F <b>68 - 72</b>	RELATIVE HUMIDITY % <b>&lt; 60 %</b>	CALIBRATION PROCEDURE <b>G-A1, SCP-01, SCP-02, SCP-03</b>			

CONDITION				STANDARDS USED				TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI/NCSL Z-540 UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION
AS RECEIVED		AS RETURNED		MFG.	MODEL	SERIAL #	RECALIBRATE	
GOOD <input checked="" type="checkbox"/>	DAMAGED	IN TOL. <input checked="" type="checkbox"/>	OUT OF TOL.	AMETEK	DM-T-50	8681	3/29/2016	
IN TOL. <input checked="" type="checkbox"/>	OUT OF TOL.	LIMITED	B.E.R.	EUTECHNICS	4600	100049	7/31/2014	
		REPAIRED BEFORE TEST	PCS. CALIB.					

PARAMETER	RANGE	STANDARD VALUE	OBSERVED INDICATION	CORRECTED INDICATION	TOLERANCE	PASS	FAIL
PRESSURE :							
PSIG					<b>1%</b>		
PSID	<b>0</b>	<b>32°</b>	<b>32°</b>			<input checked="" type="checkbox"/>	
PSIA		<b>70°</b>	<b>70°</b>			<input checked="" type="checkbox"/>	
IN Hg		<b>150°</b>	<b>150°</b>			<input checked="" type="checkbox"/>	
IN H2O							
OTHER							
VACUUM :							
IN Hg							
OTHER							
TEMPERATURE :							
DEG F <input checked="" type="checkbox"/>							
DEG C <input checked="" type="checkbox"/>							
OTHER							

DETERMINATION OF IMPACT / NOTES :

*J.P.*  
TSG CALIBRATION SUP. / QUALITY ASSURANCE SUP.