



4. GC QC and Inspection Processes

4.1 Project Initiation Process

4.2 Strength Test Documentation Process

4.3 Welding Process

4.4 Surface Preparation Process

4.5 Coating Process

4.6 Trenching, Backfill and Compaction Process

4.7 As Built Documentation Process

4.1 GC QC / Inspection Process for Quality Program Initiation

References:

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Assignment of Activities: Complete Personnel Responsibility section of Hydrostatic Test Procedure and make assignments for all activities. Ensure all responsible parties are aware of their assignments and the QC expectations. Maintain a copy onsite for reference.	Prior to beginning construction	Complete required sections of Hydrostatic Test Procedure.	Familiarity with the related Gas Standards	Project Foreman, with assistance from the Inspector	None Required
B.)	Pre-Construction Hydrostatic Test Procedure Review: Review Hydrostatic Test Procedure for completeness and construction preparation.	Prior to beginning construction	Forms defined within Hydrostatic Test Procedure	None Required	Project Foreman, with assistance from the Inspector	None Required
C.)	Material Verification: Inspect all material received, and confirm the material received matches what was specified in the Bill of Materials. Assign individual joint numbers and document the material received.	Prior to beginning construction	Include the Bill of Lading or delivery receipt for materials with the As-built package. Complete required Forms	None Required	Inspector	None Required

4.2 GC QC / Inspection Process for Strength Testing

References: PG&E Gas Standard A-37, "Hydrostatic Testing Procedure"; and A-34, "Piping Design and Test Requirements"; Project specific Strength Test Pressure Reports (STPR).

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	<p>Hydrostatic Test Procedure : Confirm Hydrostatic Test Procedure updates as required in A-37 (section 5) and in conjunction with the Pipeline Engineer. Communicate the plan to all employees who will participate in or be present in the vicinity of the pipe being tested. Confirm all requirements of A-37 are met. Prepare calculations #1 and #4 on the STPR in order to determine actual test parameters.</p>	Prior to each test	Red line update the Hydrostatic Test Procedure and maintain for the As-Built package	Familiarity with standards A-34, A-37, and experience performing strength tests	Test Supervisor and Pipeline Engineer	None Required
B.)	<p>Test Equipment Verification: Review test equipment calibration records, confirm current.</p>	Prior to each test	Retain a copy of the calibration records, or note that instrument is within recalibration date, include with test documentation	None Required	Test Supervisor	None Required
C.)	<p>Test Results and Documentation: Confirm the documented test results meet the required Standards and project specific test requirements. Minimum pressure was maintained throughout duration of test, and maximum pressure was not exceeded. Verify the actual duration of the test met or exceeded the required length of time. Confirm that the test sketch adequately documents all pipe included in test, and that the chart and STPR are complete, and all calculations are accurate.</p>	At the conclusion of each test	Standard Strength Test Pressure Report (STPR), pressure recording chart, and Hydrostatic Test Log (if using a dead weight tester). Retain all required recordings indicated by the Hydrostatic Test Procedure.	Familiarity with standards A-34, A-37, and experience performing strength tests	Test Supervisor	None Required

4.3 GC QC / Inspection Process for Welding

References: PG&E construction drawings; PG&E Gas Standards: D-22, "Arc Welding Procedure Requirements for All Stress Levels"; D-30.2, "Arc Welder Qualification for Working on Pipelines that Operate at Over 20% of SMYS"; D-31, "Welder Qualification for Under 20% of SMYS"; and D-40, "Weld Inspection"; and the approved Weld Procedures

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Weld Procedures: Confirm that a copy of the proper weld procedure is available at the project location.	Prior to welding	None Required	Familiarity with Weld Procedure Specifications	Inspector, Field Engineer or Foreman	None Required
B.)	Welding Materials: Confirm the proper welding materials are being used per the weld procedures.	Prior to welding	None Required	None Required	Inspector, Field Engineer or Foreman	None Required
C.)	Visual Inspection of Welds: Perform a visual inspection of welds as defined by PG&E Gas Standard D-40. Confirm welder's initials (or LAN ID) and date are written on the pipe at the weld location.	All transmission pipeline welds (100%) are to be visually inspected by qualified individuals.	Visual inspector to write initials (LAN ID) and date on pipe next to welder's info.	Completed visual inspection training	Qualified Inspector, Foreman or peer welder. May be self performed if the only qualified person on site.	Flashlight, GAL V-Wac undercut gage, GAL Cambridge gage, GAL Fillet weld gages, Flexible rule
D.)	Radiographic Inspection of Welds: Confirm radiographic inspection of welds as defined by PG&E Gas standard D-40, or per construction drawings, whichever is more stringent.	Per PG&E Standard D-40 or construction drawings, whichever is more stringent.	All Radiographic Inspection Reports and the original films are to be provided to the Field Engineer.	Level II Radiographic Inspection Certification or better	Contract Radiographer	Per PG&E Specification 4793

4.3 GC QC / Inspection Process for Welding

References: PG&E construction drawings; PG&E Gas Standards: D-22, "Arc Welding Procedure Requirements for All Stress Levels"; D-30.2, "Arc Welder Qualification for Working on Pipelines that Operate at Over 20% of SMYS"; D-31, "Welder Qualification for Under 20% of SMYS"; and D-40, "Weld Inspection"; and the approved Weld Procedures

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
E.)	Magnetic Particle Inspection of Welds: Confirm Mag Particle Inspection of welds as defined by PG&E Gas Standard D-40, or per construction drawings, whichever is more stringent.	Per PG&E Standard D-40 or construction drawings, whichever is more stringent, or as requested by the PLE.	All Magnetic Particle Inspection Reports to be provided to the Field Engineer.	Level II Magnetic Particle Inspection Certification or better	Contract Magnetic Particle Inspector	Per PG&E Specification 4793
F.)	NDT Inspection Report Review: Review Radiographer's Inspection Reports to ensure proper documentation. Confirm form is properly filled out, and information is accurate and complete.	Prior to acceptance of Radiographer's Inspection Reports each working day.	Include all NDT Inspection Reports in the As-Built record	None Required	Inspector, Foreman or Welder (whomever signs the form)	None Required
G.)	Weld Sketch Review: Confirm weld sketch contains sufficient detail, and kept current for completion of weld map and as-builts.	As required during welding activities	Weld sketches	None Required	Inspector or Field Engineer	None Required

4.4 GC QC / Inspection Process for Surface Preparation

References: PG&E Gas Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; Utility Work Procedure WP 4100-12; ASTM Standard D4417, "Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel"; SSPC SP-1, "Solvent Cleaning"; SSPC SP-2, "Hand Tool Cleaning"; SSPC SP-3, "Power Tool Cleaning"; SSPC SP-10, "Near White Metal Blast Cleaning".

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Pre-Surface Preparation Inspection: Perform a Pre-Surface Preparation visual Inspection, on all surfaces to be prepared, per SP-1. Confirm that all visible grease, dirt, oil, or other sources of contamination have been removed using an approved solvent cleaner, including any stickers, tape, and/or adhesive residue. Also confirm that there is no remaining weld splatter.	Prior to any surface prep activities	None Required	None Required	Inspector, Lead Employee on blast crew, or other qualified person as assigned	h
B.)	Visual Inspection per SP-10: Perform visual inspection of Dry Abrasive Blasted surfaces per SSPC SP-10, using the VIS-1 reference photos. Confirm all dirt, dust and abrasive blasting material has been removed.	Visually inspect 100% of all abrasively blasted surfaces	None Required	Training specific to the use of visual reference photos	Inspector, Lead Employee on blast crew, or other qualified person as assigned	SSPC - VIS 1 reference photos
C.)	Surface Profile Inspection: Perform profile inspection of Dry Abrasive Blasted surfaces, according to ASTM D4417, using test method C. The Inspector shall take surface profile measurements at each girth weld, and every 10 linear feet of larger prepared areas. Take profile measurements in each quadrant around the pipe circumference (top, right side, bottom, left side) attempting to measure areas that are questionable. Use the average of these 4 measurements to determine the acceptance of an area or girth weld.	Sample 100% of first 10 locations. Afterward, sample a minimum of 25% of all blasted surface inspection points until project completion. Test frequency should adjust as measured test results indicate, using Table 1 below	Write initials (LAN ID) and profile results (in mils) on coated pipe surface (if available). Sample and record per Table 1 below.	Training specific to the use of Replica Tape and micrometer.	Inspector, Lead Employee on blast crew, or other qualified person as assigned	Testex "Press-O-Film" Replica Tape, and calibrated Micrometer.

4.4 GC QC / Inspection Process for Surface Preparation

References: PG&E Gas Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; Utility Work Procedure WP 4100-12; ASTM Standard D4417, "Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel"; SSPC SP-1, "Solvent Cleaning"; SSPC SP-2, "Hand Tool Cleaning"; SSPC SP-3, "Power Tool Cleaning"; SSPC SP-10, "Near White Metal Blast Cleaning".

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
D.)	<p>Visual Inspection per SP-2 or SP-3:</p> <p>For surfaces prepared by hand and power tool cleaning, as specified by coating requirement, confirm visual inspection per SP-2 or SP-3 as appropriate, using VIS-3 reference photos. Perform a dull putty knife test to confirm that only tightly adhering materials remain.</p>	Visually inspect 100% of all hand and power tool cleaned surfaces	Write initials (LAN ID) and Pass/Fail results on coated pipe surface.	Training specific to the use of visual reference photos	Inspector, Lead Employee on blast crew, or other qualified person as assigned	SSPC - VIS 3 Reference Photos, approved putty knife

4.5 GC QC / Inspection Process for Protective Coatings

References: PG&E Gas Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; Coating Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid; NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates"

Item No:	Quality Control Activity: <i>(as required for coating system)</i>	Frequency:	Documentation <i>(As Required):</i>	Qualifications:	Person Responsible:	Tools Required:
A.)	Ambient Conditions Monitoring: Measure for critical environmental characteristics to confirm within allowable ranges for applying protective coating.	Environmental measurements should be taken at least once per coating day, or more frequently when conditions indicate marginal compliance, or if they change drastically throughout the day.	Write measured results on pipe surface. __ A (Air Temp) __ P (Pipe Temp) __ D (Dew Point) __ H (Humidity) include inspector's initials (LAN ID) and date/time of measurements	Training specific to the proper use of measuring devices	Inspector, Lead employee on coating crew, or other qualified person as assigned	Approved psychrometer and magnetic thermometer
B.)	Coating Product Suitability: Confirm coating product suitability by checking the product expiration date, and verifying the storage conditions were in accordance with the coating manufacturer's recommendations. Do not use the product if the seal on the container is broken.	Expiration date of each container should be checked before use. Improper storage should be noted as materials are acquired for use. If storage conditions are unknown, assume proper storage was maintained.	None Required	None Required	Inspector, Lead employee on coating crew, or other qualified person as assigned	None Required
C.)	Coating Visual Inspection: Perform a visual inspection of each coating layer to confirm application is free of drips, sags, icicles, and other obvious defects.	After application of each coating layer, prior to coating cure	None Required	None Required	Inspector, Lead employee on coating crew, or other qualified person	None Required

4.5 GC QC / Inspection Process for Protective Coatings

References: PG&E Gas Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; Coating Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid; NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates"

Item No:	Quality Control Activity: <i>(as required for coating system)</i>	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
D.)	<p>Coating Film Thickness: Measure coating thickness using an Electronic coating thickness gauge, per SSPC PA-2. Thicknesses shall be measured at a minimum of 4 locations on the pipe circumference (top, right, bottom, and left quadrant), with the average of 3 gauge readings taken at each position. The QC inspector should test each girth weld and/or each 10 linear feet of larger prepared areas, and attempt to test areas that are questionable.</p>	Measure 100% of all coated surfaces.	<p>Write measured thickness results (in Mils) on the pipe surface.</p> <p>___ T (Top) ___ R (Right) ___ B (Bottom) ___ L (Left)</p> <p>Include the QC inspector's initials (LAN ID) and date measured.</p>	Training specific to the proper use of coating thickness gauges.	Inspector, Lead employee on coating crew, or other qualified person as assigned	Approved Electronic dry film thickness gauge capable of reading up to 100 mils.
E.)	<p>Coating Cure/Re-coat Window: Ensure that subsequent coats are applied within the re-coat window, and that the coating has properly cured prior to backfilling, as specified in tables 2 and 3 below. If too much time elapses between coats, verify that the surface is prepared prior to re-coat (sweep blasted for areas greater than 10 sq. in., and roughened with 80 grit sandpaper for areas less than 10 sq. in.)</p>	Prior to application of subsequent coats and/or prior to backfilling	None Required	None Required	Inspector, Lead employee on coating crew, or other qualified person as assigned	None Required

4.5 GC QC / Inspection Process for Protective Coatings

References: PG&E Gas Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; Coating Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid; NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates"

Item No:	Quality Control Activity: <i>(as required for coating system)</i>	Frequency:	Documentation <i>(As Required):</i>	Qualifications:	Person Responsible:	Tools Required:
F.)	Pre-Holiday Detection Visual Inspection: Perform a Pre-Holiday Detection visual inspection of all surfaces to be jeeped. Confirm all non-coating materials have been removed, including; all stickers, tape, adhesive residue, large dirt and grease deposits, etc.	Prior to performing Holiday Detection Test	None Required	None Required	Inspector, Lead employee on coating crew, or other qualified person as assigned	None Required
G.)	High-Voltage Holiday Detection Testing: All coated piping must be Jeeped in accordance with NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates", to ensure the coating is holiday-free. Ensure the jeep is set to the proper settings based on the maximum thickness of coating being tested. Where holidays are detected, verify surface is roughened with 80 grit sandpaper prior to re-coating. All welded joints must be jeeped using the Brush attachment.	The entire pipe joint must be jeeped prior to backfilling (including factory-coated segments).	During holiday detection, each holiday indicated by the equipment should be marked on the pipe (circled or with an X) to alert the person performing the corrective work as to where the holiday is located.	OQ for High Voltage Holiday Detection.	Inspector, Lead employee on coating crew, or other qualified person as assigned	Spring coil High-Voltage Holiday detector, including a brush attachment

4.5 GC QC / Inspection Process for Protective Coatings

References: PG&E Gas Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; Coating Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid; NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates"

Item No:	Quality Control Activity: <i>(as required for coating system)</i>	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
H.)	Petrolatum Wax Tape Applications: Verify wax tape applications are performed in accordance with E-35, and E-30. Measure the pipe surface temperature to confirm it does not exceed the max allowable temperature of 120°F. If surface temperatures exceed, or are in jeopardy of exceeding 120°F, wax tape application activities must be rescheduled for early morning, or tents erected to provide shade over the pipe and help keep the pipe surface temps within allowable ranges.	Prior to and during application of Petrolatum Wax Tape coating systems	None Required.	Training specific to the proper use and application of Wax tape systems	Inspector, Foreman or Lead employee on Wax Tape crew as assigned	Magnetic Thermometer

4.5 GC QC / Inspection Process for Protective Coatings

References: PG&E Gas Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; Coating Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid

Table 2 - *Maximum* allowable time between application of first coat and second coat

Ambient Temp	Max. Re-Coat Window		
	Protal 7200	DevGrip 238	Powercrete J
50 °F	8 hrs	13.5 hrs	Hand - 235 min Spray - 175 min
60 °F	4 hrs	9 hrs	Hand - 150 min Spray - 125 min
70 °F	2 hrs	6 hrs	Hand - 116 min Spray - 83 min
80 °F	75 min	3 hrs	Hand - 75 min Spray - 67 min
90 °F	60 min		Hand - 58 min Spray - 41 min
100 °F	50 min		Hand - 37 min Spray - 31 min

Table 3 - *Minimum* allowable time between application of last coat and backfilling of trench

Ambient Temp	Min. Cure Time Req'd Before Backfilling		
	Protal 7200	DevGrip 238	Powercrete J
50 °F	9 hrs	19.5 hrs	Hand - 75 hrs Spray - 60 hrs
60 °F	4.5 hrs	13 hrs	Hand - 20 hrs Spray - 16 hrs
70 °F	2 hrs	9.5 hrs	Hand - 8 hrs Spray - 6 hrs 15 min
80 °F	1.5 hrs	6 hrs	Hand - 4 hrs 45 min Spray - 4 hrs 10 min
90 °F	60 min		Hand - 2 hrs 50 min Spray - 2 hrs
100 °F	53 min		Hand - 2 hrs Spray - 1 hr 35 min

4.6 GC QC / Inspection Process for Bell Hole, Trenching, Backfill and Compaction

References: PG&E Gas Standard A-36, "Design and Construction Requirements"; Design Change Procedure WP 4900; Standard Practice 463-4; Material Specification 4123, "Backfill Sand". *In the absence of project specifications, the standard minimum requirement is 85% relative compaction on right-of-way, and 95% in roadways. Farmland should be de-compacted to a depth of 18 inches.*

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Bell Hole and Trench Inspection: Bell hole and trenching results must allow the pipeline to be placed without stressing the pipe or damaging the protective coating. Trench dimensions, padding and shading must be placed per the construction drawings. Verify adequate clearance to other underground facilities per Standard Practice 463-4.	100% of trench is to be reviewed for acceptable construction and separation results.	Capture photographs of significant crossings, offsets, tie-ins and other significant features, and retain in as-built package	None required	Inspector, Foreman	Digital Camera
B.)	Trench Location: Confirm the trench location is located as required per the construction drawings. The responsible engineer must approve any deviations in advance, per the design change procedure, WP 4900.	100% of trench is to be reviewed for acceptable location.	Engineer approvals for trench relocation included in as-built folder	None required	Inspector, Field Engineer or Foreman	None Required
C.)	Native Backfill: If native material is to be used for padding and shading, it must contain no particle greater than 1/2" in diameter, have no sharp edges, and be of sufficient gradation to flow around pipe and/or facilities. Ensure all voids are filled.	Native material should be assessed at a maximum of 250-ft intervals, or when it appears out of compliance. 100% of material must pass through a 1/2" sieve, and 75% must pass the #4 screen.	None required	Training specific to the use and interpretation of results using soil sieves	Inspector, Foreman, Equipment Operator, or Lead employee on Backfill Crew	Set of sieves including a 1/2" sieve and #4 screen

4.6 GC QC / Inspection Process for Bell Hole, Trenching, Backfill and Compaction

References: PG&E Gas Standard A-36, "Design and Construction Requirements"; Design Change Procedure WP 4900; Standard Practice 463-4; Material Specification 4123, "Backfill Sand". *In the absence of project specifications, the standard minimum requirement is 85% relative compaction on right-of-way, and 95% in roadways. Farmland should be de-compacted to a depth of 18 inches.*

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
D.)	<p>Compaction Testing: Perform compaction tests using the dynamic cone penetrometer, at 250-ft intervals, and in 24" lifts, unless performed by a 3rd party when required by permit. Take comparison compaction tests in an undisturbed area as close as possible to the trenchline test site. Confirm compaction results meet or exceed the minimum requirements identified in the drawings, permits, or PG&E standards, whichever is more stringent. Minimum requirements for PG&E facilities should not be less than 85% relative compaction.</p>	<p>Conduct the first 4 compaction tests at 250-ft intervals. If compaction test results indicate less than the minimum, increase the testing frequency to 100 ft intervals. This must be repeated if there are any changes to the soil characteristics. Compaction test frequency can be reduced to 1,000-ft intervals once methods are proven reliable from 4 consecutive test results.</p>	<p>Form as required</p>	<p>Training specific to the use and interpretation of results using a Dynamic Cone Penetrometer</p>	<p>Inspector, Field Engineer or Foreman</p>	<p>Dynamic Cone Penetrometer</p>

4.7 GC QC / Inspection Process for As-Built Documentation

References:

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	As-Built Package: Prepare the as-built package in accordance with MOU attachment 6, "Hydrostatic Test Program As Built Documentation Checklist".	At the completion of the job.	Complete the "As-Built Documentation Checklist"	Familiarity with the CGT As-built process	Inspector, Construction Manager	None Required
B.)	Weld Map: Prepare Weld Map, ensuring it contains adequate detail to submit to mapping. If the project is a station, meter set, valve replacement, or otherwise not conducive to the format of a weld map, the welds must be mapped out on the as-built plan and profile construction drawings. (Separate as-built sheet(s) must be used to identify the location of welds on the project when not using a Weld Map.)	Ongoing record keeping required throughout project. Final QC review to be performed at the completion of the job.	Weld map that includes sufficient details as noted by As-Built Checklist requirements.	Familiarity with the weld map requirements	Inspector, Construction Manager	None Required
C.)	Gas Operational Change Notice: Submit a Gas Operational Change Notice to mapping as soon as possible once the newly constructed facilities are in service, but no more than 24 hours later.	Within 24 hours of the facility being in operation	Include copy of the Change Notice in the as-built package.	Familiarity with the Operating Maps and Diagrams requirements	Inspector, Construction Manager	None Required

4.7 GC QC / Inspection Process for As-Built Documentation

References:

Item No:	Quality Control Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
D.)	Package Completion: Complete and submit the staged As-built package to QA in Walnut Creek within required completion date.	Within required completion date	All documentation required per staged As-built Checklist.	Familiarity with the As-Built Process	Inspector, Construction Manager, Surveyor	None Required



5. Required GC QC and Inspection Sampling Forms

Quality Assurance will photograph project data collection while in progress in the field.

GC records of quality control are typically captured as notes written on the pipe.

Contractor inspectors are required to provide inspection records formatted by the PG&E specification 13024, unless approved to use a different format.

General Construction QAQC Program has suggested a goal of using one format of data collection forms for all GC and contractor inspectors.

As recommended forms are developed, they will be included here.



6. Quality Assurance Processes

6.1 Project Initiation Process

6.2 Strength Test Documentation Process

6.3 Welding Process

6.4 Surface Preparation Process

6.5 Coating Process

6.6 Trenching Backfill and Compaction Process

6.7 As Built Documentation Process



7. Required Quality Assurance Sampling Forms

7.1 QA – Site Visit Summary Report

7.2 QA – As-Built Stage One Documentation (STPR and Test Reports)

7.3 QA – Visual Weld Inspection Record

7.4 QA – Surface Preparation Inspection Record

7.5 QA – Coating Inspection Record

7.6 QA – Backfill and Compaction Test Record

7.7 QA – As-Built Stage Two Documentation (Completed Project Records)



6. Quality Assurance Processes

6.1 Project Initiation Process

6.2 Strength Test Documentation Process

6.3 Welding Process

6.4 Surface Preparation Process

6.5 Coating Process

6.6 Trenching Backfill and Compaction Process

6.7 As Built Documentation Process

6.1 Quality Assurance Process for Project Initiation

References:

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Job Procedure Review: Confirm updates to Hydrostatic Test Procedure.	Near the beginning of the project	Hydrostatic Test Procedure	None Required	QA Technician	None Required
B.)	Assignment of QC Activities: Confirm updated form Personnel / Responsibility is available on site.	Near the beginning of the project	Hydrostatic Test Procedure	None Required	QA Technician	None Required
C.)	Material Verification: Confirm QC review of materials delivered to match Bill of Materials. Review required forms.	Near the beginning of the project	Hydrostatic Test Procedure, required forms	None Required	QA Technician	None Required

6.2 Quality Assurance Process for Strength Testing

References: Gas Standard Specifications; A-37, "Hydrostatic Testing Procedure"; and A-34, "Piping Design and Test Requirements"; Project specific Strength Test Pressure Reports (STPR).

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Hydrostatic Test Procedure: Confirm Hydrostatic Test Procedure was prepared per requirements in A-37. Confirm test sketch is accurate and complete. Check STPR to verify calculations #1 and #4 were done prior to the test.	At the conclusion of each test	"Quality Assurance - As Built Stage One Documentation Review"	Familiarity with requirements of A-34, A-37, and Strength Test Pressure Reports (STPRs)	QA Technician	Digital Camera
B.)	Test Equipment Verification: Confirm test equipment calibration records are current.	At the conclusion of each test	Quality Assurance - As Built Stage One Documentation Review	None Required	QA Technician	None Required
C.)	Test Results and Documentation: Confirm documented test results meet the established test parameters. Verify minimum test pressure was maintained and maximum test pressure was not exceeded. Verify the actual duration of test met or exceeded the minimum duration requirements. Confirm that the test sketch accurately documents all pipe included in the test, and that the test chart and STPR are complete. Verify the calculations in Part II of the STPR are correct.	At the conclusion of each test	Quality Assurance - As Built Stage One Documentation Review	Familiarity with requirements of A-34, A-37, and Strength Test Pressure Reports (STPRs)	QA Technician	Digital Camera

6.3 Quality Assurance Process for Welding

References: PG&E construction drawings; PG&E Gas Standards: D-22, "Arc Welding Procedure Requirements for All Stress Levels"; D-30.2, "Arc Welder Qualification for Working on Pipelines that Operate at Over 20% of SMYS"; D-31, "Welder Qualification for Under 20% of SMYS"; and D-40, "Weld Inspection"; and the approved Weld Procedures

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Weld Procedure Specifications: Confirm that a copy of the proper weld procedures are available at the project site.	At least once per project, after welding has started	"Quality Assurance - Visual Weld Inspection Record".	None Required	QA Technician	None Required
B.)	Welding Materials: Confirm the welding materials were checked against weld procedures.	At least once per project, after welding has started	"Quality Assurance - Visual Weld Inspection Record".	None Required	QA Technician	None Required
C.)	Visual Inspection of GC Welds: Perform a visual inspection of welds as defined by PG&E Gas Standard D-40. Confirm welder's and QC Inspector's LAN ID and date are written on the pipe at the weld location.	Perform visual inspections on all exposed completed welds during each field visit	"Quality Assurance - Visual Weld Inspection Record".	Completed visual inspection training	QA Technician	Flashlight, GAL V-Wac undercut gage, GAL Cambridge gage, GAL Fillet weld gages, Flexible rule
D.)	Radiographic Inspection of Welds: Confirm Radiographic Inspection of welds is being performed as defined by Gas Standard D-40, or per construction drawings, whichever is more stringent. Review X-ray inspection records. Confirm any weld failures and subsequent cut outs or repair welds are properly documented per standard.	During each field visit where Radiographic Inspection activities are ongoing.	"Quality Assurance - Visual Weld Inspection Record".	None Required	QA Technician	Digital Camera

6.3 Quality Assurance Process for Welding

References: PG&E construction drawings; PG&E Gas Standards: D-22, "Arc Welding Procedure Requirements for All Stress Levels"; D-30.2, "Arc Welder Qualification for Working on Pipelines that Operate at Over 20% of SMYS"; D-31, "Welder Qualification for Under 20% of SMYS"; and D-40, "Weld Inspection"; and the approved Weld Procedures

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
E.)	Magnetic Particle Inspection of Welds: Confirm Mag Particle Inspection of welds is being performed as defined by Gas Standard D-40 or per construction drawings, whichever is more stringent. Review X-ray inspection records. Confirm any weld failures and subsequent cut outs or repair welds are properly documented per standard.	During each field visit where Magnetic Particle Inspection activities are ongoing.	"Quality Assurance - Visual Weld Inspection Record".	None Required	QA Technician	Digital Camera
F.)	NDT Inspection Report Review: Confirm QC review of Radiographer's reports. Verify all reports have been properly completed.	During each field visit where radiographic inspection activities are ongoing	"Quality Assurance - Visual Weld Inspection Record".	None Required	QA Technician	None Required
G.)	Weld Sketch Review: Review weld sketches to confirm they are current and detailed.	During each field visit where welding activities are ongoing	Photograph copies of weld sketches	None Required	QA Technician	Digital Camera

6.4 Quality Assurance Process for Surface Preparation

References: PG&E Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; Standard E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; and Utility Work Procedure WP 4100-12, "Sandblasting Steel Gas Facilities"; ASTM Standard D4285, "Standard Test Method for Indicating Oil or Water in Compressed Air"; ASTM Standard D4417, "Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel"; SSPC SP-1, "Solvent Cleaning"; SSPC SP-2, "Hand Tool Cleaning"; SSPC SP-3, "Power Tool Cleaning"; SSPC SP-10, "Near White Metal Blast Cleaning"; SSPC AB-1, "Mineral and Slag Abrasives".

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Pre-Surface Preparation Inspection: Confirm the Pre-surface preparation inspections conform to SSPC SP-1 requirements. Confirm no visible dirt, oil, grease, stickers, tape or adhesive residue remain on the surface. Perform the water drop test to confirm no grease/oil contaminants are present on the surface. Confirm all weld splatter has been removed.	Each site visit where crews are performing surface preparation	"Quality Assurance - Surface Preparation Inspection Record"	Training specific to the performance of the water drop test	QA Technician	Spray bottle filled with deionized (distilled) water
B.)	Compressed Air Cleanliness: Confirm the cleanliness of the compressed air to be used in Abrasive Blast Cleaning, per ASTM Standard D4285, using the blotter test.	At each site visit where crews are using an air compressor for abrasive blast cleaning	"Quality Assurance - Surface Preparation Inspection Record"	Training specific to the performance of the blotter test	QA Technician	Clean white cloth or blotter paper, and rigid frame
C.)	Visual Inspection per SP-10: For surfaces prepared by Abrasive Blasting, confirm QC notes are present to indicate results of initial visual inspections. Perform visual inspection of Dry Abrasive Blasted surfaces in accordance with SSPC SP-10 using VIS-1 reference photos. Also perform a tape test to confirm that all dirt, dust and abrasive blast material has been removed.	At each site visit, inspect all available blasted surfaces	"Quality Assurance - Surface Preparation Inspection Record"	Training specific to the use of SSPC Visual Reference Photos.	QA Technician	SSPC VIS-1 reference photos, clear plastic tape

6.4 Quality Assurance Process for Surface Preparation

References: PG&E Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; Standard E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; and Utility Work Procedure WP 4100-12, "Sandblasting Steel Gas Facilities"; ASTM Standard D4285, "Standard Test Method for Indicating Oil or Water in Compressed Air"; ASTM Standard D4417, "Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel"; SSPC SP-1, "Solvent Cleaning"; SSPC SP-2, "Hand Tool Cleaning"; SSPC SP-3, "Power Tool Cleaning"; SSPC SP-10, "Near White Metal Blast Cleaning"; SSPC AB-1, "Mineral and Slag Abrasives".

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
D.)	<p>Visual Inspection per SP-2 or SP-3: For surfaces prepared by Hand or Power tool cleaning, confirm QC notes are present to indicate results of initial visual inspections. Perform visual inspection of prepared surfaces in accordance with SSPC SP-2 or SP-3, using the VIS-3 reference photos.</p>	At each site visit, inspect all available surfaces prepared by hand or power tools	"Quality Assurance - Surface Preparation Inspection Record"	Training specific to the use of SSPC Visual Reference Photos.	QA Technician	SSPC VIS-3 reference photos
E.)	<p>Surface Profile Inspection: Perform profile inspection of Dry Abrasive Blasted surfaces, in accordance with ASTM D4417, using test method C. Surface profile measurements should be taken at each girth weld, and every 10 linear feet of larger prepared areas. Take profile measurements in each quadrant around the pipe circumference (top, right side, bottom, left side) attempting to measure areas that are questionable. Use the average of these 4 measurements to determine the acceptance of an area or girth weld.</p>	At each site visit, inspect all available blasted surfaces	"Quality Assurance - Surface Preparation Inspection Record"	Training specific to the performance of ASTM D4417 Test method C, using Replica tape and Micrometer	QA Technician	Testex "Press-o-Film" replica tape, burnishing tool, and micrometer

6.5 Quality Assurance Process for Protective Coatings

References: PG&E Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; Standard E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; and all Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid; NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates"

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Ambient Conditions Monitoring: Confirm QC measurements of environmental characteristics are documented on the pipe. Take additional environmental measurements as required to confirm QC measurements on each coating day.	At each site visit where coating activities are underway, and several times throughout the day as conditions change	"Quality Assurance - Coating Inspection Record"	Training specific to the use of environmental measurement devices	QA Technician	Digital Pycrometer, magnetic thermometer
B.)	Coating Product Suitability: Verify coating product expiration dates and storage conditions.	At each site visit where coating activities are underway	"Quality Assurance - Coating Inspection Record"	None Required	QA Technician	None Required
C.)	Coating Visual Inspection: Perform a visual inspection of each coating layer to confirm application is free of drips, sags, icicles, and other obvious defects. Take photos of finished coating applications.	Visually inspect every available coated surface at each site visit	"Quality Assurance - Coating Inspection Record"	None Required	QA Technician	Digital camera

6.5 Quality Assurance Process for Protective Coatings

References: PG&E Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; Standard E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; and all Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid; NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates"

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
D.)	<p>Coating Film Thickness: Confirm QC measurements of coating thicknesses are documented on the pipe. Use an electronic thickness guage to confirm film thickness in each quadrant around the pipe circumference (top, right, bottom, and left quadrant) attempting to measure areas that are questionable. Use the average of 3 guage readings at each position to determine coating thickness. Inspect the thickness at each girth weld and/or each 10 linear feet of larger coated areas.</p>	Inspect thickness of every available coated surace at each site visit	"Quality Assurance - Coating Inspection Record"	Training specific to the use of approved electronic thickness measurement guage	QA Technician	Approved electronic dry thickness guage capable of reading up to 100 mils.
E.)	<p>Coating Cure/Re-coat Window: Confirm coating cure time and/or re-coat window has been appropriately observed, in accordance with the PG&E Standards and the tables below. Confirm proper surface preparation is performed prior to coats applied outside the allowable re-coat window.</p>	Confirm allowable time frame has elapsed prior to re-coating and/or prior to backfilling.	"Quality Assurance - Coating Inspection Record"	None Required	QA Technician	None Required

6.5 Quality Assurance Process for Protective Coatings

References: PG&E Standard E-35, "Selecting and Applying Coatings for Buried Transmission Pipe"; Standard E-30, "Selecting and Applying Coatings on Exposed Gas Piping"; PG&E Gas Information Bulletin 191; SSPC PA-2, "Measurement of Dry Coating Thickness with Magnetic Gages"; and all Manufacturer's Product Specifications (Product Data Sheets); Protal Application Job Aid; NACE SP0188, "Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates"

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
F.)	Pre-Holiday Detection Visual Inspection: Verify all surfaces to be jeepeed are free of non-coating materials including; stickers, tape, adhesive residues, large dirt/grease deposits, etc.	Prior to performing Holiday detection test	"Quality Assurance - Coating Inspection Record"	None Required	QA Technician	None Required
G.)	High Voltage Holiday Detection Testing: Verify all coated pipe has been jeepeed prior to installation, in accordance with NACE SP0188,"Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates", and that any holidays detected are properly repaired.	Prior to installation	"Quality Assurance - Coating Inspection Record"	None Required	QA Technician	None Required
H.)	Petrolatum Wax Tape Applications: Inspect all wax tape coated surfaces for conformance with gas standards and manufacturer recommendations. Measure the pipe surface temperature to ensure it does not exceed the max allowable of 120°F.	Prior to and during wax tape applications	"Quality Assurance - Coating Inspection Record"	None Required	QA Technician	Magnetic Thermometer

6.6 Quality Assurance Process for Bell Hole, Trenching, Backfill and Compaction

References: PG&E Gas Standard A-36, "Design and Construction Requirements"; Design Change Procedure WP 4900; Standard Practice 463-4; Material Specification 4123, "Backfill Sand". *In the absence of project specifications, the standard minimum requirement is 85% relative compaction on right-of-way, and 95% in roadways. Farmland should be de-compacted to a depth of 18 inches.*

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	Bell Hole and Trench Inspection: Confirm Bell Hole and trenching results allow the pipeline to be placed without stressing the pipe or damaging the protective coating, per Gas Standard A-36. Confirm trench complies with the requirements of the trench sections in the construction drawings for dimension, padding and shading. Confirm adequate separation between underground facilities, per Standard Practice 463-4.	Review all available trenching at each site visit where trenching and/or pipe installation activities are underway	Photographs as appropriate	None required	QA Technician	Digital Camera
B.)	Trench Location: Confirm trench location per construction drawings. Confirm any deviations in the location have been approved by the responsible engineer per the design change procedure WP 4900.	Review all available trenching at each site visit where trenching activities are underway	None	None required	QA Technician	None required

6.6 Quality Assurance Process for Bell Hole, Trenching, Backfill and Compaction

References: PG&E Gas Standard A-36, "Design and Construction Requirements"; Design Change Procedure WP 4900; Standard Practice 463-4; Material Specification 4123, "Backfill Sand". *In the absence of project specifications, the standard minimum requirement is 85% relative compaction on right-of-way, and 95% in roadways. Farmland should be de-compacted to a depth of 18 inches.*

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
C.)	<p>Native Backfill Material: Confirm any native material used as padding or shading around facilities contains no particle greater than 1/2" in diameter, has no sharp edges, and is of sufficient gradation to flow around pipe and/or facilities, ensuring all voids are filled. Native material may be used if 100% of the material passes the 1/2" sieve, and 75% passes the #4 screen.</p>	Native material should be assessed at a maximum of 250 ft intervals, or when it appears out of compliance	None	Training specific to the use of sieves to analyze soil contents	QA Technician	1/2" Sieve and #4 Screen
D.)	<p>Compaction Testing: Perform compaction tests using the Dynamic Cone Penetrometer to confirm compaction results meet expectations identified in the drawings, permits, or the PG&E Standards, whichever is more stringent. Minimum requirements for PG&E facilities should not be less than 85% relative compaction.</p>	Conduct the first 4 compaction tests at 250-ft intervals. If compaction test results indicate less than the minimum, increase the testing frequency to 100 ft intervals. This must be repeated if there are any changes to the soil characteristics. Compaction testing frequency can be reduced to 1,000-ft intervals once methods are proven reliable from 4 consecutive test results.	"Quality Assurance - Compaction Testing Record"	Training specific to the use and interpretation of results using the Dynamic Cone Penetrometer	QA Technician	Dynamic Cone Penetrometer

6.7 Quality Assurance Process for As-Built Documentation

References: Hydrostatic Test Program As-Built Documentation Checklist"

Item No:	Quality Assurance Activity:	Frequency:	Documentation (As Required):	Qualifications:	Person Responsible:	Tools Required:
A.)	As-Built Package: Review As-Built Package for compliance with all required elements described in the "Hydrostatic Test Program As Built Documentation Checklist".	At completion of the job, and as necessary throughout construction to ensure required documentation is being accrued.	"Quality Assurance - As-Built Documentation Review"	None Required	QA Technician	None Required
B.)	Weld Map: Review Weld Map, verify it contains adequate detail to submit to mapping. (Welds can be mapped on the As-Built Plan and Profile drawings if the project is not conducive to weld map format.)	At completion of the job, and as necessary throughout construction to ensure required documentation is being accrued.	"Quality Assurance - As-Built Documentation Review"	None Required	QA Technician	Digital Camera
C.)	Gas Operational Change Notice: Confirm that a Gas Operational Change Notice was submitted to mapping within 24 hours of the new facilities being in service.	Within 24 hours of the facility being in service	"Quality Assurance - As-Built Documentation Review"	None Required	QA Technician	None Required
D.)	As-Built Package: Confirm completed As-Built package was submitted to the close out desk within 30 days of the project completion date.	After completion of the As-Built Package	"Quality Assurance - As-Built Documentation Review"	None Required	QA Technician	None Required



7. Required Quality Assurance Sampling Forms

7.1 QA – Site Visit Summary Report

7.2 QA – As-Built Stage One Documentation (STPR and Test Reports)

7.3 QA – Visual Weld Inspection Record

7.4 QA – Surface Preparation Inspection Record

7.5 QA – Coating Inspection Record

7.6 QA – Backfill and Compaction Test Record

7.7 QA – As-Built Stage Two Documentation (Completed Project Records)

7.1 Quality Assurance - Site Visit Summary Report

Project Name: _____
 PM Number: _____
 Location: _____
 FE / Inspector: _____

Date of Visit: / /
 QA Technician: _____
 Foreman: _____
 Weather: _____

Quality Assurance for Hydrotest Program Initiation Site Visit		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review Form "Quality Assurance - As-Built Documentation Stage One Review" with project inspection staff.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Verify plan sheets are being kept and red-lined for inclusion in the final as-built package.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Present the QA Hydrotest package review "PASS/HOLD" summary to the inspector, explain the role of the summary in the QA process and what the inspector should expect regarding follow-up correspondence.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Verify Inspectors have a copy of the PG&E Standard Specifications as well as a Copy of the Hydotest Program Manual. Review key points of the manual.	
Quality Assurance for Pre-Test Site Visit		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review Form "Quality Assurance - As-Built Documentation Stage One Review," review all available documentation relating to final as-built packages as outlined in the form.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review calibration records for all test equipment, verify calibration records match equipment used and that dates are within PG&E specified time frames.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Verify dimensioned sketches including pipe specifications are being created for the test head configuration pieces as well as other pipe involved in the test and not on the M.O.R.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review the STPR; determine if "field verified dimensions" are being inputted prior to the start of the test.	
Quality Assurance for Tie-in Site Visit		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review Form "Quality Assurance - As-Built Documentation Stage Two Review," review all available documentation relating to final as-built packages as outlined in the form.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Perform various construction sampling; complete respective forms outlined below (QA for Welding, Surface Prep etc.).	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm the completed As-Built package was submitted to Walnut Creek within 30 days of construction completion.	

7.1 Quality Assurance - Site Visit Summary Report

Project Name: _____
 PM Number: _____
 Location: _____
 FE / Inspector: _____

Date of Visit: / /
 QA Technician: _____
 Foreman: _____
 Weather: _____

Quality Assurance for Welding		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Complete Form "Quality Assurance - Visual Weld Inspection Record" if applicable.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm a copy of the proper Weld Procedure(s) are available at the project site	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Verify all pipe matches the Bill of Materials, and the correct weld metal is being used.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Perform a visual inspection of all available welds. Confirm inspection notes.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm Radiographic and Magnetic Particle inspection of welds is being performed per D-40.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review all NDT inspection reports to date. Confirm they are properly filled out. Photograph each sheet.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review all weld sketches. Confirm they are kept current and include sufficient detail for as-built purposes. Photograph each sheet.	
Quality Assurance for Surface Preparation		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Complete Form "Quality Assurance - Surface Preparation Inspection Record" if applicable.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm all surfaces to be prepared are cleaned in accordance with SP-1 requirements.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	If air compressor will be used in surface preparation, perform the blotter test and document the results.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	For surfaces prepared by abrasive blast cleaning, confirm the results are in accordance with SP-10 using the VIS-1 reference photos.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	For surfaces prepared by hand or power tool cleaning, confirm results are in accordance with SP-2 or SP-3.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm QC of surface profile inspection. Perform additional profile inspections.	

7.1 Quality Assurance - Site Visit Summary Report

Project Name: _____
 PM Number: _____
 Location: _____
 FE / Inspector: _____

Date of Visit: / /
 QA Technician: _____
 Foreman: _____
 Weather: _____

Quality Assurance for Protective Coatings		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Complete Form "Quality Assurance - Coating Inspection Record" if applicable.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm QC of ambient conditions. Take additional measurements of critical ambient conditions at the location where coating will be applied.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm the coating product expiration date and storage conditions.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Perform a visual inspection of the coated surface.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm QC of coating thickness. Take additional coating film thickness measurements.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm that subsequent coats are applied within the re-coat window and adequate cure time is allowed prior to backfill.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Verify all surfaces to be jeeped are free of non-coating materials.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm all coated pipe sections have been jeeped prior to installation, and that all holidays detected are properly repaired.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Inspect all wax tape coated surfaces for conformance with gas standards and manufacturer recommendations.	
Quality Assurance for Trenching, Backfill and Compaction		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Complete Form "Quality Assurance - Compaction Testing Record" if applicable.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm trench dimensions comply with the construction drawings and include adequate padding, shading, and separation.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm the location of the trench is per the construction drawings.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	If native material will be used for padding and shading, perform sieve test to confirm it is suitable for use.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review Form "Quality Control - Compaction Testing Record", to confirm QC results. Perform additional field compaction tests.	

7.1 Quality Assurance - Site Visit Summary Report

Project Name: _____

Date of Visit: / /

PM Number: _____

QA Technician: _____

Location: _____

Foreman: _____

FE / Inspector: _____

Weather: _____

General Site Visit Comments

7.2 Quality Assurance - As-Built Documentation - Stage One Review

Project Name: _____

Date of Review:

 /

 /

PM Number: _____

Operative Date:

 /

 /

Field Engineer: _____

QA Technician: _____

Strength Test Records Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The completed STPR(s), charts, and hand written pressure logs are attached for each required strength test. All forms completed in ink. Main test should include both pressure and temperature charts. Test elevations make sense.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The test sketch for each strength test is attached with STPR (or on back of form), and includes pipe specs, dimensions, angle points, fittings, test heads/temp caps, etc. The project detail sheet is red lined with actual dimensions and tie in joint(s) labeling.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Length tested exceeds length installed as noted from beginning and ending points on construction drawings (if not, an explanation must be provided).	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Pipe specifications on STPR matches what was specified in the Bill of Materials. Check wall thickness, size and grades of pipe.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	STPR indicates correct start and end time based on the chart recording, and actual duration of test exceeds minimum stated for test parameters.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Test pressures were maintained within the minimum and maximum pressures stated in the test parameters. Test pressures match engineered pressures provided in Site Specific Test Procedure and on drawings.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Verify test pressure calculations found on "PART II - TEST DATA" of the STPR, use the sheet notes for reference.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The pressure test wheel notes test location, start/end times and is legible. The back of the wheel has a completed "strength test information" stamp including lengths and specifications of pipe used.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Test chart indicates date of last calibration, and calibration date is current. Supporting photos provided when available.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	STPR is signed by Test Contractor (Test Supervisor) and PG&E Manager (Approver).	

7.2 Quality Assurance - As-Built Documentation - Stage One Review

Project Name: _____

Date of Review:

 /

 /

PM Number: _____

Operative Date:

 /

 /

Field Engineer: _____

QA Technician: _____

Profile and Detail Drawings Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Pipeline stationing is marked up to indicate as-built dimensions.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Changes in pipe specifications are clearly identified and dimensioned.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All leak locations are identified.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All existing pipe and pipe used in test head configurations are labeled by item # with total lengths listed in the STPR. Lengths of pipe in the as-built profile drawings are redlined to match the lengths specified in the "field verified" column of the STPR.	
Hydrostatic Test Certification Documents Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Complete and approved RCP test analysis report. Analysis pipe lengths match field verified pipe lengths. Analysis Pressures and Elevations match the STPR.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Hydrostatic test log sheet is included. Min & Max indicated test pressures match those on the STPR. Temperature and pressure readings are recorded every 15 minutes. The pipe was tested longer than the minimum required test duration. The log sheet is signed by the test supervisor and company representative.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Design Change Notice included (if applicable).	
Miscellaneous Documents Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Dead weight tester and other recording equipment has been calibrated and noted on the STPR + Back of pressure chart. Certificate(s) of calibration with the correct serial number is included.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

7.3 Quality Assurance - Visual Weld Inspection Record

Project Name: _____
 PM Number: _____
 Location: _____

Date: / /

QA Technician: _____

Crew Foreman: _____

Sheet No.: 1 OF _____

Pipe Diameter #1: _____ in.	Wall Thickness: _____ in.	Grade: _____
Pipe Diameter #2: _____ in.	Wall Thickness: _____ in.	Grade: _____
Pipe Diameter #3: _____ in.	Wall Thickness: _____ in.	Grade: _____
Pipe Diameter #4: _____ in.	Wall Thickness: _____ in.	Grade: _____

Description of Welding Work Performed	Inspections Performed
	<input type="checkbox"/> A.) Weld Procedure Specifications
	<input type="checkbox"/> B.) Welding Materials
	<input type="checkbox"/> C.) Visual Inspection of Welds
	<input type="checkbox"/> D.) NDT Inspection (X-ray and Mag Particle)

A.) Weld Procedure Specifications

Are the appropriate Weld Procedure Specifications on-site? Yes No Not inspected

List all Weld Procedures used: _____

Are welders adhering to all essential variable requirements? Yes No Not inspected

If not, what are the discrepancies? _____

B.) Welding Materials

Are all pipe materials being used per the construction drawings and Bill of Materials? Yes No

Are welders using the proper weld metal for the material and per WPS? Yes No Not inspected

C.) Visual Inspection of Welds

Number of welds visually inspected? Were QC notations present on all completed welds? Yes No

If QC notations were not present, how many of the welds inspected were missing notations?

Use the table below to note any defects discovered during Visual Inspection of Welds:

Weld or X-Ray #	Joint Type	Weld Procedure	Defect Type	Location	Dimension (H)	Dimension (L)	Pass/Fail

General Visual Inspection Comments:

7.4 Quality Assurance - Surface Preparation Inspection Record

Project Name: _____
 PM Number: _____
 Location: _____
 Pipe Size(s): _____

Date: / /
 QA Technician: _____
 Paint Crew: GC / Contractor
 Paint Foreman: _____
 Sheet No.: 1 OF _____

Surface Preparation Methods: Solvent Clean Hand Tool Power Tool Abrasive Blast

Description of Areas and Work Performed	Inspections Performed
	<input type="checkbox"/> A.) Pre-Surface Preparation Inspection
	<input type="checkbox"/> B.) Compressed Air Cleanliness
	<input type="checkbox"/> C.) Visual Inspection per SP-10
	<input type="checkbox"/> D.) Visual Inspection per SP-2 or SP-3
	<input type="checkbox"/> E.) Surface Profile Inspection

Initial Surface Condition
 New Steel Existing Buried Service Above Ground In Substructure Other: _____
Degree of Corrosion: None Present Minor Moderate Significant
 Mill Scale Rust Pitting Crevices Sharp Edges Holes Other: _____

Abrasive Media
Media Type: Slag Steel Grit Sand Kleen Blast Other: _____ **Size:** _____
Mfr/Product Name: _____ **Batch/Lot #:** _____

A.) Pre-Surface Preparation Inspection	B.) Compressed Air Cleanliness
Visual Inspection results per SP-1: <input type="checkbox"/> Pass <input type="checkbox"/> Fail Visual inspection results: <input type="checkbox"/> No Contaminants <input type="checkbox"/> Oil/Grease <input type="checkbox"/> Dirt <input type="checkbox"/> Stickers/Tape/Adhesive Residue <input type="checkbox"/> Weld Splatter <input type="checkbox"/> Other: _____ Water Drop Test results: <input type="checkbox"/> No Oil detected <input type="checkbox"/> Oils detected	Time of Test: <input type="text"/> : <input type="text"/> AM / PM Blotter Test results: <input type="checkbox"/> Pass <input type="checkbox"/> Fail Equipment Mfr: _____ Model/Size: _____ Serial #: _____

C.) Visual Inspection Per SP-10	D.) Visual Inspection Per SP-2 or SP-3
Visual inspection results per SP-10: <input type="checkbox"/> Pass <input type="checkbox"/> Fail Tape test results: <input type="checkbox"/> Pass <input type="checkbox"/> Fail	Visual inspection per SP-2: <input type="checkbox"/> Pass <input type="checkbox"/> Fail Visual inspection per SP-3: <input type="checkbox"/> Pass <input type="checkbox"/> Fail

E.) Surface Profile Inspection						
Weld # or Description of Location Tested	Readings (in Mils)					Specified profile range: _____ - _____ Mils
	Top	Left	Bottom	Right	Average	
						<input type="checkbox"/> Pass <input type="checkbox"/> Fail
						<input type="checkbox"/> Pass <input type="checkbox"/> Fail
						<input type="checkbox"/> Pass <input type="checkbox"/> Fail
						<input type="checkbox"/> Pass <input type="checkbox"/> Fail
						<input type="checkbox"/> Pass <input type="checkbox"/> Fail
						<input type="checkbox"/> Pass <input type="checkbox"/> Fail
						<input type="checkbox"/> Pass <input type="checkbox"/> Fail

General Surface Prep Inspection Comments

7.5 Quality Assurance - Coating Inspection Record

Project Name: _____
 PM #: _____
 Location: _____
 Paint Foreman: _____

Date: / /
 QA Technician: _____
 Paint Crew: GC / Contractor
 Sheet No: 1 OF _____

Pipe Sizes (Dia.): _____ Service Environment: Buried Exposed In Substructure

Description of Areas and Work Performed	Inspections Performed
	<input type="checkbox"/> A.) Ambient Conditions Monitoring
	<input type="checkbox"/> B.) Coating Product Suitability
	<input type="checkbox"/> C.) Coating Visual Inspection
	<input type="checkbox"/> D.) Coating Film Thickness
	<input type="checkbox"/> E.) Coating Cure/Re-Coat Window
	<input type="checkbox"/> F.) Pre-Holiday Detection Inspection
	<input type="checkbox"/> G.) High Voltage Holiday Detection
	<input type="checkbox"/> H.) Wax or Poly Tape Applications

A.) Ambient Conditions Monitoring			
	1st	2nd	3rd
Time (AM/PM):			
Air Temp (°F):			
Pipe Temp (°F):			
Dew Point (°F):			
Humidity (%):			
Weather Conditions:			
Acceptable? (Y/N)			

B.) Coating Product Suitability	
Coating Product:	<input type="checkbox"/> Protal 7200 <input type="checkbox"/> DevGrip 238
	<input type="checkbox"/> Powercrete J <input type="checkbox"/> Wax Tape <input type="checkbox"/> Other: _____
Coating Selection per Drawings?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If no, has selection been approved?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Kit Size Used:	_____
Batch # (A):	_____ Batch # (B): _____
Exp. (A)	_____ Exp. (B) _____

C.) Coating Visual Inspection	
Application Method:	<input type="checkbox"/> Brush <input type="checkbox"/> Roller <input type="checkbox"/> Spray <input type="checkbox"/> Hand <input type="checkbox"/> Other: _____
Visual Inspection Results:	<input type="checkbox"/> No Defects <input type="checkbox"/> Runs/Sags <input type="checkbox"/> Drips/Icicles <input type="checkbox"/> Air Bubbles <input type="checkbox"/> Other: _____

D.) Coating Film Thickness			
Minimum specified total DFT:	_____ Mils	Maximum specified total DFT:	_____ Mils
Min. allowable DFT (80% of specified):	_____ Mils	Max. allowable DFT (120% of specified):	_____ Mils

Weld # or Description of Area	Coating Film Thickness Measurements (in Mils)					Visual Inspection Comments
	Top	Right	Bottom	Left	Average	

7.6 Quality Assurance - Compaction Testing Record

Project Name: _____

PM #: _____

Location: _____

Foreman: _____

Date: / /

QA Inspector: _____

GC / Inspector: _____

Sheet No: _____ OF _____

Compaction Testing Record (Continued)

Test No.	Approximate Station	Moisture Meter Readings		No. of Blows using DCP		% Compaction (A ÷ B x 100)	% Compaction Required (85% min)	Pass / Fail
		Trench Test Site	Comparison Test Site	(A) Trench Test Site	(B) Comparison Test Site			

General Compaction Notes/Comments

7.7 Quality Assurance - As-Built Documentation - Stage Two Review

Project Name: _____

Date of Review:

 /

 /

PM Number: _____

Operative Date:

 /

 /

Hydro Engineer: _____

QA Technician: _____

As-Built Drawings Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Pipeline stationing is marked up to indicate as-built dimensions. Changes are highlighted. Start/end stationing and tie-in locations are noted on both profile and test head configuration pages.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Tie-in points are referenced back to a "known point" on existing pipe or to a landmark that exists in the GIS land base. Verify detail sheet in plans includes Weld #, X-Ray #, "P" stationing and survey references. Tie-in and other permanent welds should always be denoted as such (e.g. "TI" or "XR" welds) and not as temporary "TW" welds.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Changes in pipe specifications and coating types are clearly identified and dimensioned. Additionally all coating types for girth welds, PCF's, valves, fittings, etc. are identified.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All pipeline features and appurtenances are identified, including: PCF's, valves, repair sleeves, sav-a-valves, tees, taps, tie-ins, changes in alignment due to offsets/doglegs, etc.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Any repair locations are identified (3rd party/damage, and weld repair locations) . Repair details provided.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Projects with multiple strength tests must identify and station the beginning and ending points of each hydrotest. Each individual test section must be labeled with a number that corresponds to the number written at the top of the STPR for that test. (Test #1, Test #2, etc.)	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All abandoned, removed, and/or sectionalized pipe is identified on drawings, including details of abandonment. Dimensions to any cut and cap locations are provided.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The Bill of Materials is updated with all actual installed material details. Include all changes in quantities, material specifications, ANSI class and yield strength. Material of Record is updated by construction details. Pipe item numbers are consistent throughout all documents.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The fittings and lengths of pipe shown on the Bill of Materials and the Material of Record match the information found on the profile detail, plan test head configurations and STPR.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The "summary of proposed work" on page 1 of the drawings has been red lined to reflect as-built conditions. Present tense language changed to past tense; correct pipe sizes, types etc. are specified. All final coating applied to permanent pieces should be specified in this section (or in the tie-in details section).	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The Visual Weld Inspection Stamp is signed by a qualified weld inspector.	

7.7 Quality Assurance - As-Built Documentation - Stage Two Review

Project Name: _____

Date of Review:

 /

 /

PM Number: _____

Operative Date:

 /

 /

Hydro Engineer: _____

QA Technician: _____

As-Built Drawings Review (Cont'd)		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	An Asset Registry Stamp is complete with manufacturer, model #, and serial # for each new valve, regulator, filter, etc. The Valve Commissioning information is completed for each new valve installed	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Job # is consistent throughout all documentation and red lined if updated. The "Date of Completion" and "Date of Operation" is added to the revision box.	
Chain of Custody Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Chain of Custody form, Form #62-6406 Record of Material Removed from Existing Natural Gas Pipeline, relevant photographs. Only include form for specific test.	
USA Ticket Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	USA tickets for the test area excavations are included. Verify tickets are for the correct test location and all excavations are covered.	
Weld Map Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Weld Map is complete and accurate, including all relevant details. (For stations and valve sets, welds can be mapped on the plan and profile drawings instead of preparing a weld map)	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All final tie-in welds (as well as any other final welds from removed/replaced pieces along the line) are included in the weld map documentation.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm Weld #'s, X-Ray numbers & Stationing match drawings, particularly at tie-in locations.	
Test Procedures Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All required Site Specific Hydrostatic Test Procedure forms are marked up, signed and dated to indicate work completed. "Hold Point" areas are signed by the test supervisor.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Test values inputted in sections "General Information" and "Test Criteria" are consistent with the STPR.	
A-Form Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Main Inspection Reports (A-Forms) are completed for each section of existing pipeline that was exposed. Form filled out per standard instructions and includes all pertinent information. i.e. inspector LAN ID, USA ticket number, all relevant repair sketches.	

7.7 Quality Assurance - As-Built Documentation - Stage Two Review

Project Name: _____

Date of Review:

 /

 /

PM Number: _____

Operative Date:

 /

 /

Hydro Engineer: _____

QA Technician: _____

Radiographic Daily Inspector Sheet Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Verify Form #75-53 "Nondestructive Testing of Welds of Facilities Designed to Operate at 20% or more of SMYS and Piping Systems Located on Bridges and Operating at a Pressure Exceeding 200 psig" is complete and accurate. Repairs to be noted on the form & in the red lined drawings of the details sheet. Verify the accepted/rejected count is correct.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Radiographer's Daily Log Sheets are included for each weld that was x-rayed. Verify all tie-in welds are included and have passed.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Destructive Test Results (ATS) and relevant photographs are included if applicable.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Weld procedures are included, verify pipe data is accurate and matches pipe specifications found in the as-built plans.	
Dew Point Test Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	"Hydrostatic Test, Dew Point Test Form" is included and filled out accurately. Verify form is filled out per the "Drying Sequence of Operations" found in the Hydrostatic test procedure.	
GIS Data Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Confirm GIS data is available. Points listed in table for tie-in welds match those in the as-built drawing details.	
"Out of Engineering" Package Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Review "Out of Engineering" package; verify weld procedures in the package appear in the as-builts. Verify all "Design Change Notice" sheets are copied and in the as-builts; check that all updates to the plans are reflected in the as-builts.	
Other Documentation Review		Comments
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Direct Examination Data Sheet (H-Forms) are completed for sections of existing pipeline that were exposed, per procedures and specifications. Verify H-form test name matches the engineered specified name on the details sheet.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Material Records - Automated Ball Indent test (ATC) results (red lined in as-built drawings). ABI test name matches the engineered specified name on the details sheet. Each tie-in piece has been tested and any additional tests are also included.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Emergency Pipe Test Information Form (if applicable)	

7.7 Quality Assurance - As-Built Documentation - Stage Two Review

Project Name: _____

Date of Review:

 /

 /

PM Number: _____

Operative Date:

 /

 /

Hydro Engineer: _____

QA Technician: _____

<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Results from existing Pipe Coating asbestos tests are included (if applicable).	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Corrosion Mechanic reports are included for any Current Drain/Pipe-to-soils tests performed. CPA Area # found on first page of drawings.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All relevant procedures are included such as pigging, deactivation etc.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Certification of approved hydrostatic test results from Bureau Veritas. Results posted to public web site.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All inspection and quality sampling records/documentation.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Complete and accurate coating inspection reports are included as needed.	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Kiefner pressure analysis sheet included	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		



8. Appendix:

- A. Strength Test Pressure Report Detailed Instructions**
- B. As-Built Documentation Process Flow**
- C. Protal 7200 Tips and Techniques**
- D. Sample Site Specific Hydrostatic Test Procedure**
- E. Sample A-Form with highlighted required information cells**
- F. Sample QA “PASS/HOLD” As-Built Review Summary Sheet**
- G. Hydro- Test Program – Process Manual and Program Execution Plan**

This document is provided by Project Engineering as an electronic file. Due to the size of the document, it is not attached to this manual. It can be obtained at the Program SharePoint site.

H. PG&E Construction Management Specification 13024

This document is provided by Construction Management as a series of 3 PDF files. Due to the size of the Specification 13024 document, it is not attached to this manual.



A. Strength Test Pressure Report Detailed Instructions

STPR Form Part 1 – Design Data Instructions

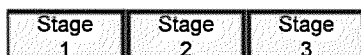
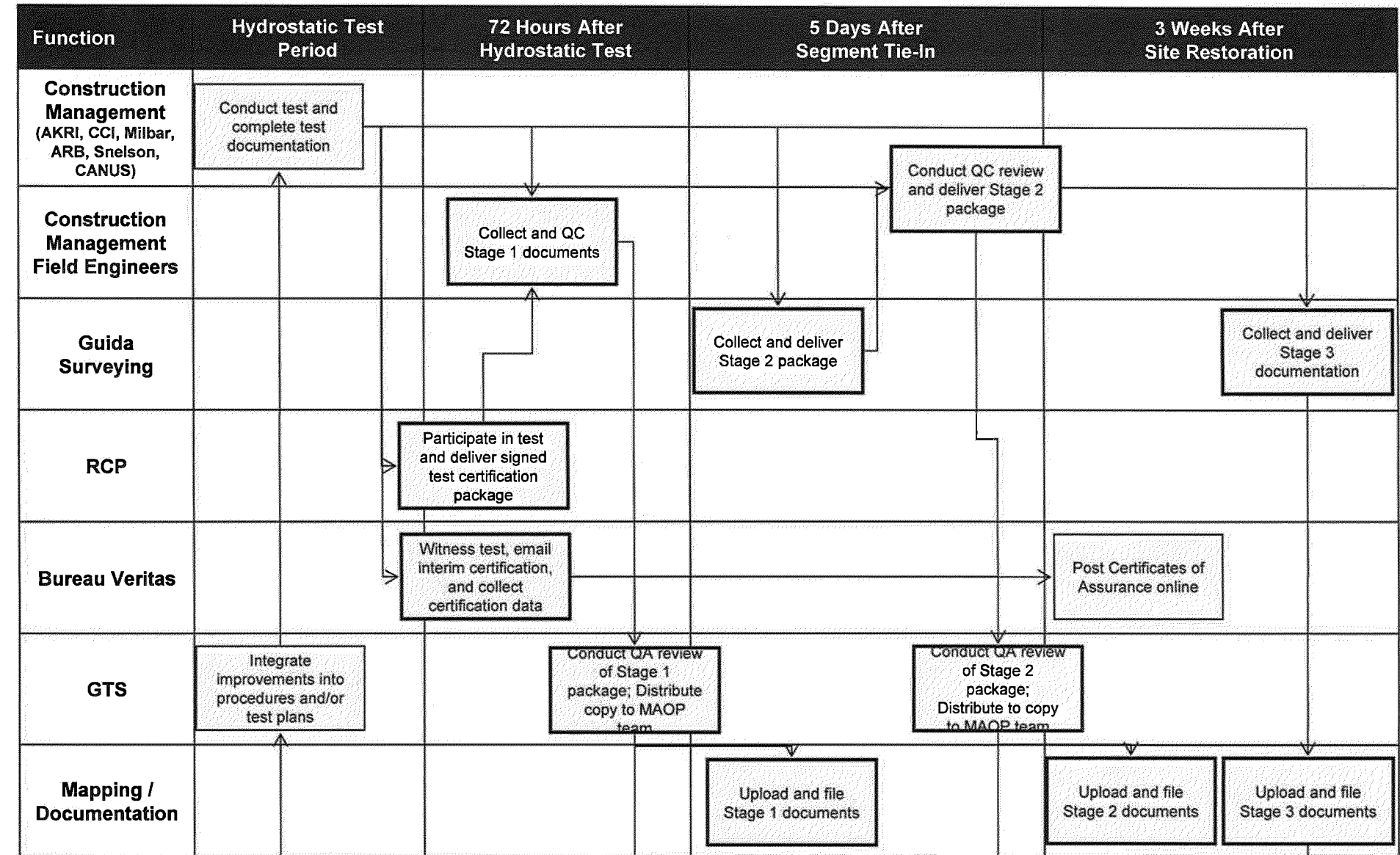
- 1. Pipe Spec. and Footage Verified in Field: Write the measured value and material in all rows. Write the initials of the person taking the measurements.

STPR Form Part II – Test Data Instructions

- 2. Part II – TEST DATA (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST): Write name of test supervisor
3. Elevation at Test Point: Write the measured elevation of test instrument on test table
4. Maximum Elevation of the Test Section: Write measured elevation of pipe high point
5. Minimum Elevation of the Test Section: Write measured elevation of pipe low point
6. Minimum Required Test Press. at Test Point: To calculate:
a. Write the Minimum Test Pressure @ Max Elevation from Part I:
b. Write the Maximum Elevation of the Test Section from Part II:
c. Write the Elevation at Test Point from Part II:
d. Subtract c from b:
e. Multiply the value in d by .433 (This is the static head):
f. Add the value in a to the value in e:
g. Write the value in f in the Minimum Required Test Press. at Test Point field
7. Max. Allowable Test Press at Test Point: To calculate:
a. Write the Maximum Test Pressure @ Min Elevation from Part I:
b. Write the Elevation at Test Point from Part II:
c. Write the Minimum Elevation of the Test Section from Part II:
d. Subtract c from b:
e. Multiply the value in d by .433 (This is the static head)
f. Subtract the value in e from the value in a
g. Write the value in f in the Maximum Allowable Test Press. at Test Point field.
8. Test Fluid Used: Write "water"
9. Pipe Specification and Footage Verified: Write "as noted above"
10. Pressure Recording Gauge and Dead Weight Tester with Calibration Dates: Write gauge type, serial number, and last calibration date for each
11. Time and Date Test Pressure Reached: Write the time and date
12. Time and Date Test Ended: Write the time in 24 hour and mm/dd/yy format
13. Actual Duration of Test: Write the calculated duration of the test, in decimal hours
14. Min. Indicated Test Pressure: Write the lowest pressure reading indicated on the dead weight tester
15. Min. Test Pressure at Max. Elevation: Write the minimum test pressure at maximum elevation. To calculate:
a. Write the Min. Indicated Test Pressure from #14:
b. Write the Minimum Required Test Press. at Test Point from #6f:
c. Subtract b from a:
d. Write the value in c in the Min. Test Pressure at Max. Elevation field
16. Max. Indicated Test Pressure: Write the highest pressure reading indicated on the dead weight tester
17. Max. Test Pressure at Min. Elevation: Write the maximum test pressure at minimum elevation. To calculate:
a. Write the Max. Indicated Test Pressure from #16:
b. Write the Max. Allowable Test Press at Test Point from #7f:
c. Subtract b from a:
d. Write this value in the Max. Test Pressure at Min. Elevation field
18. Attach a sketched schematic of the piping to this form. Show the location of the facility tested, minimum and maximum elevations, mile points, valve numbers, incorporated areas, and all items noted on the front of the STPR. Show the direction North, number all accompanying sheets in X of Y format, and write the job number at the top of each sheet.
19. Test Supervised By and Date: Print the test contractor name and date, and add the signature
20. Approved By and Date: Print Legibly (Bold It) the PG&E representative name and date, and add the signature. The approver must be a PG&E employee. Joel Mannie is the approver for the 2020 Project Hydrostatic Tests.



Document Management Process





As-Built Documentation Package

	Documents	Source	On-Site QC	Package Collection	Full Quality Control Review	Quality Assurance Review	Availability	
Stage 1	STPR(s) (signed)	AKRI/CCI/Milbar*		Construction Management Field Engineers		GTS	Deliver to Walnut Creek within 72 hours after completion of hydrostatic test	
	Pressure / Temperature Recording Charts	AKRI/CCI/Milbar*						
	Dead Weight Pressure Logs	AKRI/CCI/Milbar*						
	Hydrostatic Test Certification Package	RCP						
	Profile Sheet in Drawing Package	ARB/Snelson*						
	Design Change Notice (if applicable)	GTS						
Stage 2	Site Specific Test Procedure (signed)	CANUS*	CANUS*	Guida Surveying*	CANUS*	GTS	Deliver to Walnut Creek within 5 days after test segment tie-in	
	Red-lined Drawings (including GPS coordinates)	CANUS*						
	Weld Inspection Stamp (signed)	ARB/Snelson*						
	Weld Map (may be red-lined)	ARB/Snelson*						
	Dew Point Test Form & Supporting Data	ARB/Snelson*						
	Main Inspection Report (Form A)	General Construction						
	Chain of Custody, Abandonment, Asset Registry Data (if applicable)	ARB/Snelson*						
	Bill of Material	ARB/Snelson*						
	Pipeline Repair, Emergency Pipeline Test Data (if applicable)	ARB/Snelson*						
	Radiographer Daily Inspection Sheets	CANUS*						
	Certification of Results	Bureau Veritas						
	Direct Examination (Form H)	General Electric						
	Max Test Pressure Approvals (signed)	Keifner & Associates						
	ABI	ATC						
	Destructive Test Results	ATS						
Stage 3	Final Package (including Restoration data), Construction Binder	Construction Management	NA	Guida Surveying*	NA	TBD	Deliver to Walnut Creek 3 weeks after site restoration	
	Construction Inspection Documents	CANUS*						
	Quality Sampling Documents	GTS						

* Organizations or contractors under leadership of Construction Management