



SECTION 0.1 TITLE / MANUAL CONTROL

PIPELINE QUALITY MANUAL

Issued To :

Contact Info : Phone Number : email : Address :

Issued By : CORPORATE QUALITY ADMINISTRATOR

Manual Copy #:

Issue Date :

Controlled : Yes ☒ No ☐ (No = For Review Only - No Revisions Issued)

Revision Number: 0

MANUAL CONTROL RESTRICTIONS

This Manual Assignment is Valid For: (Check One Only)

¹N/A (Indefinite) ☐ ²One-time project use ☐ ³Expiry Date ☐ (MM/DD/YY)
Project No. :

Instruction to Copy Holder :

1. This manual is assigned to you until its return is requested or until you are no longer employed by Flint. If "controlled" you will receive any revisions. Do not distribute copies of your manual. Request additional copies from the Issuer.
2. This manual copy is valid from Issue Date until project is complete. Return this manual to the Issuer at the end of project.
3. This manual copy is valid from date of Issue Date until Expiry Date. Return this manual to the Issuer at the end of project.

THE MASTER VERSION OF THIS MANUAL IS AVAILABLE ONLINE THROUGH FLINT INTRANET

This manual is confidential and the property of Flint Energy Services Ltd. and is assigned to the person named above.

All rights to this manual are reserved.

No part of this manual may be reproduced, stored in a retrieval system or database, or transmitted in any form or by any means, electronically, mechanically, by photocopying, recording, or otherwise without the prior permission of the Corporate Quality Manager, Flint Energy Services Ltd.

If this manual is referenced in the contract documents, a "controlled" copy must be on site.



PIPELINE QUALITY MANUAL

SECTION 0.4 TABLE OF CONTENTS

SECTION	DESCRIPTION	REVISION	DATE
SECTION 0.1	TITLE / MANUAL CONTROL	1	March 4, 2005
SECTION 0.2	REVISION HISTORY LOG	1	March 4, 2005
SECTION 0.3	FOREWARD	0	March 31, 2004
SECTION 0.4	TABLE OF CONTENTS	1	March 4, 2005
	PART 1: GENERAL		
SECTION 1	STATEMENT OF AUTHORITY	1	March 4, 2005
SECTION 2	ORGANIZATION	1	March 4, 2005
SECTION 3	SPECIFICATION AND DOCUMENT CONTROL	1	March 4, 2005
SECTION 4	INSPECTION AND TEST PLAN	0	March 31, 2004
SECTION 5	FIELD PROCUREMENT	0	March 31, 2004
SECTION 6	MATERIAL RECEIVING EXAMINATION AND INSPECTION	0	March 31, 2004
SECTION 7	IN-PROCESS EXAMINATION AND INSPECTION	0	March 31, 2004
SECTION 8	FINAL INSPECTION, TESTING, ACCEPTANCE AND TURNOVER	0	March 31, 2004
SECTION 9	SPECIFICATION DEVIATION	0	March 31, 2004
SECTION 10	NONCONFORMANCE REPORTING	0	March 31, 2004
SECTION 11	QUALITY TRAINING	0	March 31, 2004
SECTION 12	QUALITY AUDIT	0	March 31, 2004
	PART 2: STANDARD OPERATING PROCEDURES		
SECTION 13	TOPSOIL STRIPPING, GRADING AND CLEARING	0	March 31, 2004
SECTION 14	UNLOADING, HAULING AND STRINGING	0	March 31, 2004
SECTION 15	FIELD BENDING	0	March 31, 2004
SECTION 16	WELDING CONTROL	0	March 31, 2004
SECTION 17	NONDESTRUCTIVE EXAMINATION (NDE)	0	March 31, 2004
SECTION 18	PIPE COATINGS AND INSULATION	0	March 31, 2004
SECTION 19	CROSSINGS	0	March 31, 2004
SECTION 20	BUOYANCY CONTROL	0	March 31, 2004
SECTION 21	TRENCHING AND EXCAVATION	0	March 31, 2004
SECTION 22	LOWERING-IN	0	March 31, 2004
SECTION 23	INTERNAL CLEANING AND SIZING PIGGING	0	March 31, 2004
SECTION 24	BACKFILL	0	March 31, 2004
SECTION 25	TIE-INS AND TRANSITIONS	0	March 31, 2004
SECTION 26	PRESSURE TESTING	0	March 31, 2004
APPENDIX A	DOCUMENTATION / RECORDS	1	March 4, 2005



PIPELINE QUALITY MANUAL

SECTION 2: COMPANY ORGANIZATION

2.1 Construction and installation of pipeline projects will be assigned to a District Office Manager or Project Manager for execution and control within the applicable Flint Energy Services Ltd. (FESL) Business Unit or subsidiary company. The organization chart depicts the relationship between members of the organization, who are part of the Quality Program described in this manual.

2.2 Guideline

All District Office Managers are responsible for the implementation of the Quality Program described in this manual in their respective areas of operation.

All Project Managers are responsible for the implementation of the Quality Program described in this manual.

It is their responsibility to verify contract quality requirements, review the level of quality control required on each project, and the project-specific implementation of the guidelines and procedures in accordance with this manual and all applicable company policy, procedure and guidelines where practicable.

Quality Representatives may develop site-specific procedures, as agreed to jointly with the Owner / Owner's Representative that differ from those stated in this manual that support, clarify or add additional controls but do not adversely affect the intent of the procedures as stated in this manual. In the absence of site-specific written procedure, the procedures and/or guidelines as stated in this manual shall be the standard.



SECTION 3: SPECIFICATION AND DOCUMENT CONTROL

3.1 Guideline

The design specifications and drawings will be prepared and issued by the Owner / Owner's Representative. The Quality Representative is responsible for the implementation and control of documentation and for maintaining a file that contains all pertinent information.

All transmittals of essential documents to the Owner / Owner's Representative must be accompanied by a Document Transmittal form. The Owner / Owner's Representative will sign acceptance and return a copy to Flint, and a record of the transmittal will be retained on file.

3.2 Procedure

This section describes the system for review, approval, distribution and retrieval of all essential documents, including the following:

- 3.2.1.** Design specifications
- 3.2.2.** Drawings
- 3.2.3.** Bills of material
- 3.2.4.** Work instructions and procedures
- 3.2.5.** Pipeline Quality Manual
- 3.2.6.** Quality Control documentation

3.3 The Owner / Owner's Representative is responsible for issuing a scope of work, engineered drawings, specifications (e.g., Bill of Materials, welding details, NDE requirements and testing requirements) and any revisions to them.

3.4 The Quality Representative is responsible for reviewing all specifications issued. Any changes to the project Inspection and Test Plan resulting from the review will be issued by the Quality Representative as described in the Inspection and Test Plan procedure.

3.5 The Quality Representative is responsible for site implementation of this program and control of Quality documentation in the field, as per below.

- 3.5.1.** Review the design specifications and drawings to ensure sufficient information is available to construct and install pipeline facilities, in accordance with relevant pipeline standards and the requirements of the project ITP.
- 3.5.2.** Verify that all drawings and specifications are Approved For Construction and are so indicated by signature and stamp of the Owner / Owner's Representative's Engineer.



PIPELINE QUALITY MANUAL

- 3.5.3.** Ensure that latest revisions of all design specifications, drawings and all other quality related documents are received and issued in accordance with quality guidelines. All superceded documents are to be recalled, destroyed, marked "VOID" or otherwise prevented from unintended use during construction. A Drawing Index, or other appropriate documents shall be maintained to assist in the control of drawings and other quality documentation.
- 3.5.4.** Create, revise and control documentation in accordance with the procedure / guideline as stated in Appendix A.
- 3.5.5.** Maintain a project file, which will be turned-over to the Owner / Owner's Representative at completion of the project and/or store this file at the applicable Operation Center for the duration specified in the contract documents. The minimum time FESL will retain pipeline QC records is 2 years.



SECTION 4: INSPECTION AND TEST PLAN

4.1 Guideline

4.1.1 General Inspection and Test Plan (ITP)

The General Inspection and Test Plan (ITP) covers Quality Assurance and Quality Control activities that cover all areas of general pipeline installation. It provides a general plan indicating the level of inspection and verification activities and associated turnover documentation anticipated to be desired by the client. It is the responsibility of the Project Manager to ensure the Quality Deliverable is defined and understood. Its use in conjunction with the implementation of this quality manual, provides a comprehensive general Project Quality Plan. Where the project scope or activities require an ITP of greater detail, a project-specific ITP shall be developed as applicable.

4.1.2 Project-Specific Inspection and Test Plan

The General ITP may be used as the base document for preparing a project-specific ITP and is the recommended format. The project-specific ITP if required, must be submitted to all parties accountable for its implementation for review, approval and/or revision, before any work within its scope is undertaken.

4.2 Procedure

The following procedure provides the assurance that all work activities meet Federal and Provincial Regulations, CSA Z662 requirements, and Owner / Owner's Representative requirements (the Quality Deliverable). In accordance with Flint's JPM Guidelines (BP- 4 Quality Management; 4.1.0), the ITP is an important planning tool to ensure that the Quality Deliverable is provided consistently on all projects.

- 4.2.1** Upon award of a contract the Quality Representative is responsible for reviewing the Quality requirements as stated in the contract and determining if the General ITP is adequate for use. A project-specific ITP shall be developed if required.
- 4.2.2** A documented agreement of the ITP is recommended, its use is dependent on the project scope and if the level of risk associated with not formally utilizing the document is acceptable, as assessed by the Project Manager.
- 4.2.3** The project ITP shall be reviewed, revised, and accepted as project scope changes may occur. A revised ITP and new agreement will be completed when required noting the changes and a new revision number issued. The ITP and associated documentation shall be controlled on site.
- 4.2.4** If developed, a separate copy of the project-specific ITP shall be retained in the project execution project file.



SECTION 5: FIELD PROCUREMENT

5.1 Scope

This procedure outlines requirements for the field procurement of goods and services including the preparation and verification of purchase orders to client specifications.

5.2 Guideline

All field procurement activities will be governed by the procedure described below. Internal corporate procurement procedure or client's procedures will be used depending on the contract's scope in regards to procurement responsibilities.

5.3 Procedure

5.3.1 Field Procurement

5.3.1.1 The purpose of this section is to describe the methods of implementing the Quality requirements when purchasing goods or services.

5.3.1.2 The Field Engineer (or Project Manager) shall prepare a requisition listing the quantity and requirements of materials to be purchased for the project.

5.3.1.3 A Purchase Order for the supply of goods and materials shall be prepared by the purchaser and reviewed by the Field Engineer (or Project Manager) for completeness and accuracy.

5.3.2 As a minimum the following shall be detailed on the purchase order:

5.3.2.1 Date

5.3.2.2 Bill of Material Number

5.3.2.3 Vendor Name and Address

5.3.2.4 Material specifications and Quality standards

5.3.2.5 Requirements for approval of these goods by the Quality Control Manager or Quality Representative (this may include visits to the site or just a review of the submitted documentation)

5.3.2.6 Request for documentation of compliance with material specifications. This documentation may include Certificates, Mill Test Reports and other such data.

5.3.2.7 Instructions for packaging and shipping the material

5.3.2.8 Instructions for identification of the material (by tags, color coding, or other means)



PIPELINE QUALITY MANUAL

5.3.2.9 Approval signatures of the Field Engineer (or Project Manager) and / or Purchaser

5.3.3 Should there be any revisions or changes required, follow the same approval process as indicated.

5.3.4 Approved Purchase Orders will be distributed as follows, to the various areas and their follow-up.

- Original** – Vendors (a signed acknowledgement may be required)
- 2nd Copy** – District Office (Project Manager's approval / Project Receiving)
- 3rd Copy** – Purchasing File

5.3.5 Field purchase of products and / or services are controlled as follows:

5.3.5.1 PRODUCTS – The Project Manager, Project Superintendent or Designate determines the scope of products required and prepares a Requisition and / or Purchase Order, which contains all pertinent contract requirements, specification references, drawing references, special instructions and quality requirements.

5.3.5.2 SERVICES – Services to be sub-contracted are handled as described in 5.3.6.

5.3.6 Quotations are received and evaluated by the Purchaser and recommendations are made to the Project Manager.

5.3.7 Upon approval by the Project Manager, the Purchaser prepares a Requisition detailing the scope of services required which contain all information relative to contract instructions and quality requirements.

5.3.8 The Project Manager awards the contract.

5.3.9 The Project Manager shall review the subcontract to confirm the following is clearly identified and documented:

5.3.9.1 A clear and concise scope of work is described.

5.3.9.2 That all appropriate documents (such as specifications, drawings and Owner / Owner's Representative requirements) have been issued.

5.3.9.3 That the quality standards are defined with respect to the applicable item or service.

5.3.9.4 That the requirements for approval of products, services, procedures, processes etc. are clearly defined.



PIPELINE QUALITY MANUAL

- 5.3.9.5** That the requirements for proper product identification, packaging and storage are stated.
 - 5.3.9.6** That provision for turnover of the subcontractors quality records are made.
 - 5.3.9.7** That access to the subcontractors work is mandatory for auditing and verification of compliance to the contract requirements by Regulatory Authority and Owner / Owner's Representative.
 - 5.3.9.8** That inspection and test points will be established for the subcontractors work in the same manner as the work undertaken by the Company.
 - 5.3.9.9** That the revisions made to the Purchase Order must follow the same review process as outlined.
- 5.3.10** The Project Manager will ensure that copies of the subcontract purchase order are readily available and in the possession of the project Quality Representative or Material Receiver so as to receive and verify compliance of the subcontractors products or services.



SECTION 6: MATERIAL RECEIVING INSPECTION

6.1 Scope

This procedure outlines requirements for the incoming inspection and verification of materials at the receiving stage for shop and field operations. It is a guideline intended to cover both Flint supplied and Owner / Owner's Representative supplied materials.

6.2 General

All incoming inspection activities will be governed by the following procedures:

6.3 Responsibility

The Quality Representative will be issued a copy of all Purchase Orders. The ITP shall identify responsibilities for incoming material inspection / verification.

6.4 The Quality Representative shall inspect all materials to ensure the following:

- 6.4.1** The materials are properly identified (as required in the Purchase Order) and reference to the appropriate Purchase Order.
- 6.4.2** The material conforms to Code and Owner / Owner's Representative specifications.
- 6.4.3** The materials are tagged or color coded as required.
- 6.4.4** The quantity of materials is confirmed.
- 6.4.5** Any special storage instructions are included with the material.
- 6.4.6** The documentation specified in the Purchase Order is included with the material. Typical documentation includes Mill Certificates or test results. Heat numbers on materials shall be verified against the Mill Test Report.
- 6.4.7** For Owner / Owner's Representative Supplied Materials, the Owner / Owner's Representative is normally responsible to check MTR for compliance to specification and Flint is responsible to check product marking against the MTR. For Flint supplied materials, Flint is responsible to check the MTR for compliance to the specified material grade and to check product marking against the MTR.

6.5 If materials are found to meet the acceptance criteria, the Quality Representative will issue a Material Receiving Report and sign it, accepting the material. This document will become part of the quality records. The material will then be released for storage.

6.6 If the materials are damaged, nonconforming in any way or are not accompanied by required documentation, the Quality Representative will complete a Nonconformance Report and/or Over/Short/Damage Report, tag and place the material in a "quarantined area" for disposition in accordance with the Nonconformance Procedure.



PIPELINE QUALITY MANUAL

- 6.7** The Quality Representative may delegate the above activities to a Material Receiver for the project. His project will be to coordinate the inspection of incoming materials and arrange for their inspection onsite.
- 6.8** The Quality Representative shall be responsible for verification and inspection of this receiving process. He shall ensure that documentation is in order and that Company purchasing procedures are being followed as outlined above.



SECTION 7: IN-PROCESS EXAMINATION AND INSPECTION

7.1 Guideline

In-Process Inspection shall be carried out in accordance with the Inspection and Test Plan.

It is the responsibility of the designated Quality Representative to ensure all in-process inspections and examinations are conducted as stated in the ITP.

7.2 Procedure

This section describes the system of in-process examination and inspection that will ensure all phases of construction and maintenance are conforming to project quality requirements prior to Final Inspection and Acceptance.

7.2.1 The Quality Representative is responsible for the verification of the procedures and any subsequent examination or documentation as detailed in the ITP. Quality requirements for each applicable project activity will be controlled in accordance with the Standard Operating Procedures in Part 2 of this manual.

7.2.2 The Quality Representative is responsible for documenting all nonconforming items as per Nonconformance Procedure.

7.2.3 The Quality Representative is responsible for monitoring reject / repair rates for activities such as welding, pipe or joint coating or other items specified within the ITP as per contract.

7.2.4 All repair rate issues found to be in excess of the limits defined in the ITP and contract will be documented with an NCR and forwarded to the Project Superintendent for resolution.



PIPELINE QUALITY MANUAL

SECTION 8: FINAL INSPECTION, TESTING, ACCEPTANCE AND TURNOVER

8.1 Scope

This section describes the system of implementing the final inspection, testing and acceptance criteria required for Turnover to the Owner / Owner's Representative.

8.2 Guideline

Final inspection, test and acceptance of the completed pipeline project shall be carried out in accordance with the project ITP or as per Owner / Owner's Representative specifications.

It is the responsibility of the Quality Representative to complete all inspection and test functions as outlined in the project ITP as a basis for acceptance of the completed pipeline. This will include a review of the results obtained during in process examinations and inspections as well as final hydrostatic tests.

Turnover of the completed pipeline project shall be contingent on submission of all required QC records as indicated in the project Inspection and Test Plan or stated Owner / Owner's Representative requirements for Turnover.

8.3 Procedure

- 8.3.1** The Quality Representative is responsible for documenting the inspection, test and acceptance of the finished pipeline project as required by the project ITP.
- 8.3.2** The Quality Representative is responsible for documenting and maintaining records, which testify to compliance with specifications. These records shall be made available to the Owner / Owner's Representative at any time during construction, and shall be turned-over to their representative at a predetermined time after completion.
- 8.3.3** The Quality Representative is responsible for the control and disposition of any Nonconforming item discovered during Final Inspection and Testing as per Nonconformance Reporting procedure.

**SECTION 9: SPECIFICATION DEVIATION****9.1 Guideline**

A Specification Deviation Request shall be submitted to all applicable parties prior to any deviation from any stated project specification or agreed procedure. The procedure describes the process for requesting approval for any deviation to stated specification or agreed procedure, as an alternative the Owner / Owner's Representative deviation request process could be used.

9.2 Procedure

- 9.2.1** The Specification Deviation Request form is completed, including the request approval by the Project Manager or delegate. The request is then forwarded to the Owner / Owner's Representative or authorized delegate for review.
- 9.2.2** When the review is completed, the Owner / Owner's Representative or authorized delegate will notify the initiator of the approval or rejection with explanation.
- 9.2.3** The Owner / Owner's Representative's will allow for a reasonable length of time to respond to the request.
- 9.2.4** Deviation Requests should be in chronological order, and a log kept, listing all requests, the Originator and disposition. The Specification and Deviation Request Log can be used as a record.

**SECTION 10: NONCONFORMANCE REPORTING****10.1 Guideline**

All Nonconformities shall be resolved in accordance with the following Nonconformance procedure. A Nonconformity is a non-fulfillment of a requirement and shall be documented. Requirements can be generated by different interested parties (e.g. Code / Jurisdictional, Flint quality management or Owner / Owner's Representative requirements). Reporting of a Code Nonconformance is mandatory and project management shall take additional corrective action measures to eliminate the root cause of nonconformities as applicable. Preventative action is encouraged to eliminate the cause of a potential nonconformity or other undesirable potential situation.

10.2 Procedure

- 10.2.1** A Nonconformance can be identified by any individual. The Nonconformance shall be brought to the attention of the Quality Representative.
- 10.2.2** If agreed that the issue is a Nonconformance, a Nonconformance Report shall be prepared and the Nonconformance Log may be used to track NCR reports.
- 10.2.3** All Nonconformance Reports will be issued to the Project Superintendent and circulated as agreed in the project quality plan.
 - 10.2.3.1** The Project Superintendent shall review the report, along with the proposed correction to eliminate the detected nonconformity and implement the appropriate correction if no further approvals are required.
 - 10.2.3.2** The Quality Representative will submit the report, along with the proposed correction to the Owner / Owner's Representative and the Regulatory Authority (if required) for approval. Non ASME Code related nonconformities may be accepted "as-is" or other disposition if authorized and agreed to by the Owner / Owner's Representative.
 - 10.2.3.3** The Project Superintendent will implement the approved corrective work.
- 10.2.4** The Quality Representative will monitor the actual corrective work and when complete, will ensure the item is re-tested or re-inspected for compliance to the requirement.
- 10.2.5** If the action taken to eliminate the nonconformity is completed and verified, the Report will be signed by all authorized personnel (e.g. Quality Representative, Owner / Owner's Representative and the Regulatory Authority (if required)) and the Report filed in the project file.
- 10.2.6** If the corrective work yields unsatisfactory results, another Nonconformance Report will be prepared and the evaluation and disposition procedure repeated.



SECTION 11: QUALITY TRAINING

11.1 Guideline

The Corporate Quality Manager is responsible for the planning and administration of an ongoing quality training program that is implemented by the Divisional Quality Manager and is continuously improved.

Quality Representatives must be considered competent in performing all required duties within each project's scope of work for which responsibility is assigned, or be suitably supervised by a competent individual as applicable.

11.2 Overview

The Flint Energy Services Ltd. QA / QC Training Manual has been developed as a key tool to assist in providing training for workers employed by Flint and its subsidiary companies. The focus is on providing both general and specific information on Flint's Quality Management System for the safe planning and execution of ASME, CSA Pipeline and Structural Steel project work. The Training Manual consists of "Modules" or specific topics that focus on providing the training knowledge of how to achieve a consistent Quality Deliverable on all project work.

11.3 Goals

Flint Energy Services Ltd.'s goals in training and competency are as follows:

- 11.3.1** To orient and increase basic knowledge about the role and importance that Quality has on our specific field of business.
- 11.3.2** To teach individuals the Flint Quality Management System to ensure associated Guidelines and Procedures are consistently adhered to and to learn from feedback for Continuous Improvement of the Quality Management System.
- 11.3.3** To develop individual and team competency through consistent knowledge and application of QA / QC practices and guidelines, Codes and Standards, and our Owner / Owner's Representative's requirements.

11.4 Procedure

- 11.4.1** Project Managers are responsible for ensuring all project personnel have the appropriate level of knowledge and competency to perform their duties within the project scope of work for which they are responsible. All personnel performing specific activities where training certification is a mandatory Code requirement shall meet the requirement. Verification of training or certification documentation is the responsibility of the Project Manager.



PIPELINE QUALITY MANUAL

- 11.4.2** The Quality Manager is responsible for developing, providing and / or conducting training for project personnel provided a reasonable request for training is made by the District or Project Manager and resources are adequately planned in advance. Training deficiencies noted during planned or unscheduled audits will receive follow-up action commensurate with the risk.
- 11.4.3** The Divisional Quality Manager will maintain a list of people who have received Flint Quality training.
- 11.4.4** Quality Representatives are responsible for ensuring they undertake only the duties they are deemed competent in performing by the Project Manager.
- 11.4.5** All project personnel with responsibilities assigned under the project ITP, must receive a suitable project quality orientation prior to the execution of each project. As a minimum, this requirement is to be documented by each responsible persons signature on the project ITP Plan stating their understanding and agreement.



PIPELINE QUALITY MANUAL

SECTION 12: QUALITY AUDIT

12.1 Guideline

Flint Energy Services Ltd. conducts audits on our projects to verify compliance with corporate quality guidelines and procedure and compliance to project specific quality plans. Audits of suppliers may be carried out to ensure conformance of their products or services to industry standards and the Owner / Owner's Representative's requirements.

12.2 Procedure

12.2.1 Scope

This section describes systems for carrying out internal and external audits, to ensure construction, products and services supplied conform to the specifications specified by contract.

12.3 Responsibilities

12.3.1 The Quality Manager is responsible for conducting audits on construction sites during the construction of pipeline facilities, and shall include the Quality Representative and when possible the Phase Foremen, to ensure that:

12.3.1.1 Procedures in this manual are being adhered to and the ITP followed,

12.3.1.2 Nonconformances discovered during audits will be recorded in the Audit Report. Any project-specific Nonconformance identified which requires immediate corrective action will be brought to the attention of the Quality Representative and Project Superintendent. Issues identified with the content or implementation of the QA/QC program will be documented and submitted to the Corporate Quality Manager via the Divisional Quality Manager for action to prevent recurrence and/or amendment to standard procedures.

12.3.2 Audit Reports will be distributed per the distribution list identified in the Audit Report and will include:

12.3.2.1 Operations Center Manager

12.3.2.2 Project Superintendent

12.3.2.3 Quality Representative

12.3.2.4 Owner / Owner's Representative

12.3.2.5 Divisional Quality Manager

PART 2: STANDARD OPERATING PROCEDURES**SECTION 13: TOPSOIL STRIPPING AND GRADING**

- 13.1** Provincial Pipeline Authority Environment reclamation letters shall be on site and adhered to.
- 13.2** Topsoil shall be stripped to a depth specified in the contract and piled prior to grading in locations indicated in the contract. The method used shall be detailed in the contract.
- 13.3** Approval permits will be obtained for moving equipment over watercourses. These crossings shall be constructed in accordance with the permit and the contract.
- 13.4** Watercourse approaches shall be prepared as the permit indicates. (see Section 19.0)
- 13.5** Stripping may be documented on a Daily Topsoil Stripping Report if required by the Inspection and Test Plan.
- 13.6** Reclamation letters, stripping reports and other documentation received or prepared by Flint Energy Services Ltd. shall be placed in the QC Turnover documentation files.

13.7 Clearing

- 13.7.1** Clearance shall be obtained from the Owner / Owner's Representative prior to Flint Energy Services Ltd. making an initial contact with any landowner.
- 13.7.2** The landowner or tenant shall be notified at least 48 hours prior to the start of the clearing. They shall be asked to examine the condition of the roads, culverts, fences, structures etc. Repair or replacement requests shall be received from the landowner or tenant in writing and retained. Landowner's and tenant's will be allowed to salvage their crops from the Right of Way (R.O.W) during the 48hour notification period (or longer) as determined by the Owner / Owner's Representative.
- 13.7.3** A copy of the PLA, MSL, or individual Landowner Agreement shall be present on site and adhered to. The Provincial Pipeline Authorities will be contacted, as requested by the Owner / Owner's Representative, prior to entry and after construction in areas falling under their jurisdiction.
- 13.7.4** Trees will be felled in the R.O.W and away from watercourses. Leaning and falling trees on the edge of the R.O.W shall be cut, trimmed, and disposed of as per contract. Debris, soil or other deleterious materials must not be deposited into or through watercourse unless a waiver allowing this is in place and in writing.
- 13.7.5** Stump height shall be as per the applicable permit. Where no grubbing is required, stumps shall be flush with the ground. Where grubbing is required, grubbing shall be centered along the ditch line. R.O.W width shall be as per contract.

Approval shall be received from the Landowner or Tenant for the construction of shoo-fly.

- 13.7.6** Temporary gates in fences shall be installed as per the contract.



PIPELINE QUALITY MANUAL

- 13.7.7** Merchantable timber shall be salvaged and handled as per the contract. Slash disposal (windrow, pile, pit burning, rollback, chipping, etc.) shall be as per contract.
- 13.7.8** Municipal District Offices shall be contacted to determine if burning permits are required before burning brush. Where required, permit instructions shall be adhered to.
- 13.7.10** Temporary fences or gates shall be replaced with permanent facilities or removed as per the contract.
- 13.7.11** Agreements and Permits received by Flint Energy Services Ltd. shall be placed in the QC Turnover documentation files.

13.8 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 14: UNLOADING, HAULING AND STRINGING

- 14.1** Appropriate transportation and lifting equipment will be utilized in the handling of joints of pipe in accordance with applicable qualifications, regulations and design requirements.
- 14.2** During the receiving of the pipe the following will be checked for compliance with the Client specifications, (manufacturer's CSA designation, Heat Numbers, grade to wall thickness, etc.). All results will be recorded as per receiving procedure. Mill Test Reports shall be obtained from the Client or the supplier.
- 14.3** Cement-lined pipe shall be inspected to ensure that end caps are in place upon arrival.
- 14.4** All discontinuities will be investigated for acceptability, recorded in the presence of the Owner / Owner's Representative and will be rectified to meet specified requirements.
- 14.5** All project-specific requirements will be developed and approved by the Owner / Owner's Representative prior to the activity commencing.
- 14.6 Inspection Procedure for Loading and Off-Loading Pipes**
- 14.6.1** Each pipe joint will be visually inspected for pipe and coating damage.
- 14.6.2** Pipe joints that contain gouges, dents or scratches will be set aside along with any pipe found to have damaged bevels. If re-beveling can rectify the pipe with the damaged bevels then that pipe will be marked accordingly and strung in sequence.
- 14.6.3** Damage to external coating will be marked with fluorescent spray paint. Pipe joints with extreme damage will be set aside and quarantined until such times as adequate repairs can be made.
- 14.6.4** Type and nature of coating damage will be recorded and submitted to the Customer on a daily basis, only if coating damage is extensive or reoccurring.
- 14.6.5** All pipe arriving on site that does not conform to requirements as noted, will be segregated, and the disposition tracked through a Nonconformance Report, (see Nonconformance section).
- 14.6.6** All unacceptable damages will be rectified to the Customer's satisfaction.
- 14.7 Quality Audit**
- The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 15: FIELD BENDING

- 15.1** No bend shall be made closer than 1.8 m from the end of a joint of pipe. If the pipe is double jointed before bending, the bend shall not be closer to the weld than one pipe diameter.
- 15.2** Mitered weld for the purpose of creating a bend are not permitted. (Mitres of up to 3° for alignment correction are permitted by CSA Z662.)
- 15.3** Pipe longitudinal seams, shall be located near the neutral axis of the bend, (i.e. $\leq 45^\circ$ from bending plane on over bends, sags and side bends), or as specified in the contract.
- 15.4** Bends must have a uniform radius with the curvature spread over, as great a length as is practical. The curvature shall not exceed a deflection of $1\frac{1}{2}^\circ$ per pipe diameter length.
- 15.5** The minimum distance between pipe bends shall be three (3) pipe diameters, or as per design.
- 15.6** The difference between maximum and minimum pipe diameter at any point in the pipe shall not exceed 5% of the nominal specified outside diameter.
- 15.6.1** When a measurement is taken the actual amount of "out-of-roundness" shall be recorded on the Pipeline Bending Report.
- 15.6.2** Buckles, wrinkles, or flat spots, will be cause for rejection and the affected joint will be removed from the work area.
- 15.7** For insulated pipelines, or for other pipelines designed to accommodate an Internal Pipeline Corrosion Inspection Tool (IPCIT), field bends shall be checked with a drift tool before welding. Bends impeding the progress of the tool shall be flagged, or otherwise identified and discarded. A NonConformance Report will be initiated.
- 15.8** Pipe coatings shall be visually inspected immediately after bending. Pipe incurring noticeable coating damage shall be immediately flagged, or otherwise marked at the location of the damage and repaired before lowering—in operation commences.
- 15.9** The outer jacket of insulated pipe shall be checked for punctures, breaks, or other damage and repaired as required by the coating specification.
- 15.10** Insulation shall be checked to ensure any reduction of insulation thickness, as a result of bending, does not exceed specifications. Insulation incurring a greater reduction in thickness shall be flagged, or otherwise marked, and repaired as directed by the Owner / Owner's Representative.
- 15.11** All pre-coated pipe shall be handled using nylon rope chokers or slings and carried, not dragged, to and from the bending machines to minimize coating damage.
- 15.12** No worker shall be near or under the boom or pipe during bending.



PIPELINE QUALITY MANUAL

15.13 The minimum ambient temperature for pipe bending with Owner's approval is – 30 °C.

15.13.1 For bending at lower temperatures, a cold weather bending procedure shall be submitted to the Owner / Owner's Representative for approval, prior to the start of the bending.

15.14 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The internal audit shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 16: WELDING CONTROL

16.1 Weld Information

- 16.1.1** All welding shall be performed in accordance with CSA Z662 and the contract specifications.
- 16.1.2** All welding to any pressure part shall be performed in accordance with the written Owner / Owner's Representative approved Welding Procedures.

16.2 Welding Procedures

- 16.2.1** Welding Procedure Specifications (WPS) and Procedure Qualification Records (WPQR) must be submitted to the Owner / Owner's Representative for approval prior to the start of welding. *Note: When the Owner / Owner's Representative supplies the welding procedure, the Quality Control Manager will review the data sheets provided to ensure they meet the Code criteria.*
- 16.2.2** Copies of all approved and qualified weld procedures shall be kept at each site where welding is being performed. The Welding Foreman and the Quality Control Manager or Quality Control Representative shall be responsible for instructing, supervising and providing the Welding Procedure Specifications to all welders.

16.3 Welding Control Procedures

- 16.3.1** Control methods and procedures need to be implemented to ensure that results meet the required standards and Owner / Owner's Representative specifications.
- 16.3.2** Monitoring and recording of weld parameters will be performed in accordance with applicable standards, Owner / Owner's Representative specifications and procedures as detailed in this section.
- 16.3.3** Welds will be nondestructively tested and results interpreted and recorded prior to lowering pipe into ditch; all in accordance with applicable standards, Owner / Owner's Representative requirements and procedures within this document.
- 16.3.4** Rejectable defects will be flagged, repaired, re-tested and applicable documentation completed with final disposition accepted prior to lowering in.

16.4 Welders

- 16.4.1** All Welders shall be qualified in accordance with CSA Standard Z662 and contract specifications.
 - 16.4.1.1** Each Welder will be tested to the contract requirements prior to commencing work on the pipeline project.

**PIPELINE QUALITY MANUAL**

16.4.1.2 Each welder is required to sign the Welder's Declaration / Orientation Record form once qualified. The form shall be retained in the project QC file.

16.4.2 The Quality Representative shall maintain a record of all welder qualification tests.

16.4.3 All welders shall be assigned an identifying symbol (i.e.: letter, number, etc.). An approved method of applying this symbol shall be agreed upon between the Quality Control Representative and the Owner / Owner's Representative, in compliance with the Code. The Quality Representative shall make certain that all permanent welds are identified with the symbol(s) of the welder who performed the welds. Metallic dies shall not be used to mark the pipe. Markings shall be placed outside the area to be covered by the sleeve so that they are visible until pipe is backfilled.

16.4.4 The Owner / Owner's Representative, Welding Foreman, or Quality Manager has the authority to require requalification of a welder and / or a procedure for just cause.

16.5 Welding Consumables Control

16.5.1 All welding consumables shall meet the specification of CSA W48-01 or AWS5.0 in accordance with CSA Z662 or have chemical and mechanical properties that meet the requirements of the above-mentioned standards even though they were not specifically manufactured in accordance with it. All containers shall be clearly labeled to show the contents meet the applicable standards.

16.5.2 All welding consumables shall be ordered specifying the proper CSA / AWS specification and be traceable to the manufacturer. Any nonconforming materials will be segregated and removed from the site.

16.5.3 All pressure welding materials shall be issued by the Welding Foreman or designate. Subcontractors are not permitted to supply their own electrodes or welding rod.

16.5.4 SMAW electrodes with low hydrogen coatings, such as E7018 electrodes shall be properly stored to prevent moisture absorption. Once "low hydrogen" electrodes have been removed from their sealed containers, electrodes that will not be immediately used, must be continuously stored in rod ovens maintained at a minimum temperature of 120°C (250°F) until all electrodes are consumed. Low hydrogen electrodes with direct moisture contact shall be discarded or dried in accordance with manufacturer's procedure and this action documented and approved by the Quality Representative.

16.5.5 Electrodes shall be supplied to welders in quantities that can be consumed within time limits that are dependent on the electrode type and strength level. For example, standard E7018 electrodes can be safely exposed to the atmosphere for 4 hours of cumulative time outside the oven before requiring disposal. Storage in the oven does not dry the electrodes, reset or extend their time limit.



16.6 In-Process Inspection

This procedure describes the activities performed for in-process inspection of pipe fabrication and installation work.

16.7 Pre-weld Inspection to verify compliance with weld procedure

16.7.1 A pre-weld inspection of pipe welding shall include the following checks:

16.7.1.1 Weld joints have proper weld preparation;

16.7.1.2 Weld joints have proper spacing;

16.7.1.3 Weld joints have proper alignment;

16.7.1.4 Pipe longitudinal seams have proper alignment with a minimum of 30° between abutting seams and the seams shall be in the upper portion of the pipe (except in the case of bends). For example: Longitudinal pipe weld seam orientation between 10 o'clock and 2 o'clock.

16.7.2 Welding Inspection

A random inspection of in-process welding shall be performed. The checks shall include:

16.7.2.1 Only qualified welders are performing welds;

16.7.2.2 The correct welding procedures are being adhered to;

16.7.2.3 **Backwelding is not allowed unless it is treated as an in-process repair** (Policy; note Form B11);

16.7.2.4 The correct weld consumables are being used;

16.7.2.5 The required preheat is applied;

16.7.2.6 The weld rod is being properly stored (in heated rod ovens with calibrated temperature indicator if applicable);

16.7.2.7 Proper ground clamps are being used;

16.7.3 Grounding devices will be securely attached to avoid arc burns under the device. They must not be welded to the pipe of the component being welded.

16.8 Weld Repairs

16.8.2 Any weld, which does not meet the CSA Z662 Code requirements, shall be repaired by qualified welders. The Welding Foreman will ensure an appropriate WPS approved by the Owner / Owner's Representative is used.

16.8.3 The minimum length of any repair shall be 50mm. The defect shall be removed to clean metal using a power grinder.



PIPELINE QUALITY MANUAL

- 16.8.4** Ensure area is preheated at least 50mm each side. A tempil-stick will be used to ensure preheat temperatures required by the weld procedure for repairs are adhered to. The minimum preheat Z662 permits for a repair is 120C and the maximum preheat Z662 permits is 200C.
- 16.8.5** **Backwelding is not allowed unless it is treated as an in-process repair.** (Policy; note Form B11).
- 16.8.6** **BACKWELD POLICY: Unauthorized Backweld repairs are STRICTLY PROHIBITED. Documented written authorization by Site Superintendent & Owner's Rep is mandatory for all repairs to approved Backweld repair procedure.**
- 16.8.7** Each repair will be recorded on a log and signed off only after weld is accepted.

16.9 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The internal audit shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 17: NONDESTRUCTIVE EXAMINATION (NDE)

- 17.1 The NDE function may be undertaken through the direction of the Owner / Owner's Representative.
- 17.2 NDE Technicians must be certified to Canadian General Standards Board (CGSB) Level II or higher for weld interpretation and keeping a copy of their qualification record in the project files. Owner / Owner's Representative acceptance of the NDE contractor may also be required.
- 17.3 NDE Technicians must have a copy of the Owner / Owner's Representative Welding Standards for accept / reject criteria onsite.
- 17.4 The Quality Representative shall check the film to ensure correct identification, verify acceptable film density, image quality, and for any film damage.
- 17.5 Retaining all NDE reports / radiographs on file for quality control documentation turnover to the Owner / Owner's Representative at the completion of the project.
- 17.6 Transferring all required NDE information from the pipe to a weld map for traceability purposes.
- 17.7 Ensuring that welds flagged with ribbon or other method of identification are not removed by anyone other than the NDE Technician or Quality Representative.
- 17.8 Flagging on welds requiring repair or cut out may not be removed until the weld is repaired and re-inspection indicate the weld is satisfactory. Flagging if used, may not be removed by anyone other than the NDE Technician or Quality Representative.
- 17.9 Repairs to welds shall be documented on the Weld Repair form.
- 17.10 **Visual Inspection of Completed Welds**
 - 17.10.1 The Quality Representative shall inspect completed welds on a random basis. The visual inspection shall be performed in accordance with the CSA Z662.
 - 17.10.2 Completed welds requiring repair due to visual inspection shall be repaired and re-inspected by the Quality Representative.
- 17.11 **Quality Audit**

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report / form or as agreed to in the project ITP.



SECTION 18: PIPE COATINGS AND INSULATION

18.1 General

- 18.1.1** Piping will be coated or insulated to comply with Code and / or Owner / Owner's Representative specification.
- 18.1.2** A Field Joint Coating / Insulation Inspection Report will be completed on an audit basis or as detailed in the contract.

18.2 External Coating Application (next to pipe)

- 18.2.1** Prior to commencing work the Quality Representative will review the coating requirements with all personnel involved in 'coating'.
- 18.2.2** Coating personnel must be properly trained and ticketed to apply tape, coating, or shrink sleeves.
- 18.2.3** Owner / Owner's Representative approved systems and materials complete with manufacturer recommendation are to be used at all times.
- 18.2.4** A copy of installation instructions must be on site and be available to all coating personnel and Inspectors. Installation instructions will be retained in the project file.
- 18.2.5** Joints must be prepared by cleaning and preheating until warm to the touch. Grease, dirt, spatter, etc., must be removed from the joint area.
- 18.2.6** The temperature of all coating materials (excluding primer) must be between 10-20°C when they are applied or as otherwise specified by the manufacturer.
- 18.2.7** Pipe risers must be coated to a minimum height of 300mm above final grade, or as stated in the contract, and, if tape is used, the overlapped edges must face down.

18.3 Inspection

- 18.3.1** Coating must be free of wrinkles, runs, overlaps, or other rejectable defects.
- 18.3.2** Holiday Detector must be set at manufacturers recommended voltage for the type of coating system. Calibration of the detector's settings must be verified at the frequency recommended by the manufacturer.
- 18.3.3** Detector is to be checked periodically using a voltage meter. All holiday's detected will be repaired to manufacturer recommendations or project specification and re-examined.
- 18.3.4** Detector will be used over coated pipe and sleeve area over welds.



PIPELINE QUALITY MANUAL

18.3.5 Recommendation from the supplier of the Holiday Detector will be used when grounding the equipment.

18.3.6 The following table (NACE RP-02 Table 1) is a guideline.

NACE RP-02 TABLE 1		
Minimum Test Voltages for Various Coating Thickness		Test Volts
32 nd Inch	Mils	
-	16.00	5 000.00
1.00	31.00	7 000.00
2.00	62.00	9 800.00
3.00	94.00	12 100.00
4.00	125.00	14 000.00
5.00	156.00	15 000.00
6.00	188.00	17 100.00
16.00	500.00	28 000.00
20.00	625.00	31 000.00
24.00	750.00	35 000.00

18.4 PIPE INSULATION

18.4.1 Application

- 18.4.1.1** Corrosion coating must be inspected and repaired prior to the application of the insulation.
- 18.4.1.2** Owner / Owner's Representative or company approved contractors or company personnel will be used for application of insulation. All personnel applying foam insulation shall be trained and qualified: This can be documented at the bottom of the Field Joint Coating / Insulation Report.
- 18.4.1.3** The field joint area between the insulation cut-backs shall be completely coated with a Owner / Owner's Representative approved primer and tape shall be holiday tested as per the inspection requirements noted in "Corrosion, Coating" in the ITP.
- 18.4.1.4** Field joints can be insulated with pre-formed half shells or injection molding as specified in the contract.
- 18.4.1.5** Pre-formed insulation half-shells, when used must be custom fit, using a saw, to fill insulation cutbacks. The facing edges of insulation cutbacks and half shell shall be coated with Owner / Owner's Representative approved mastic. The mastic must not contain ingredients or solvents aggressive to the polyethylene (PE) tape.



18.4.2 Inspection

- 18.4.2.1** Insulation compressive strength and the measurement technique used to determine this must be as specified by the Owner / Owner's Representative.
- 18.4.2.2** The thickness of field applied insulation shall be $\pm 3.2\text{mm}$ of the thickness of shop applied insulation at all points around the pipe.
- 18.4.2.3** A Field Joint Coating/Insulation Inspection Report will be completed on each audit.

18.4.3 Repair

- 18.4.3.1** Insulation, which has been flattened or permanently compressed to a thickness of less than 75% of the minimum specified thickness will be repaired or replaced.
- 18.4.3.2** All damage to insulation except puncture damage, will be repaired by cutting away the damaged outer coating layer and insulation. This is to be replaced with field-molded insulation or half-shells (as applicable to Owner / Owner's Representative specifications) and an outer coating layer applied according to the Owner / Owner's Representative specifications.

18.5 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report / form or as agreed to in the project ITP.



SECTION 19: CROSSINGS

19.1 General Requirements

- 19.1.1** Any water crossing shall be made in full compliance with the terms of the "Right of Way Agreements", applicable requirements of jurisdictional authorities, and the contract.
- 19.1.2** Pipe depth through crossing will be documented on a Crossing Report. At drainage and irrigation ditch inverts, the minimum cover required is 0.75m except where rock excavation by blasting is required (min 0.60m).
- 19.1.3** Pipeline Crossing signs will be erected at each side of crossing as required by contract.

19.2 Major Water Crossings

- 19.2.1** Major water crossings are those for which individual drawings have been prepared and which are indicated as such by the terms of the contract or agreement.
- 19.2.2** The crossing technique used will be according to the contract or agreement and documented on the Crossing Report.
- 19.2.3** When concrete coated pipe is provided by the Owner:
 - 19.2.3.1** Care must be taken in the shipping and handling to avoid damage to the coating.
 - 19.2.3.2** Concrete weight coating must be applied to field butt welds at cutbacks on continuous coating.
- 19.2.4** Pipe depth through crossings will be documented on a Crossing Report. The minimum allowable depth as measured to the top of the pipe will be noted on the crossing design and crossing agreement. Where analysis indicates the erosion potential is minimal or where rock blasting is required, minimum depths allowed will be noted in the crossing design and crossing agreement.
- 19.2.5** If more detail is requested by the Owner / Owner's Representative, "As-Built" drawings can be developed indicating burial depths, start and stop of concrete coated areas, weight locations for buoyancy control, etc. This will be as determined in the contract or Owner / Owner's Representative specifications.

19.3 Existing Pipeline and Buried Utility Crossings

- 19.3.1** A Crossing Agreement will be obtained and on site.



PIPELINE QUALITY MANUAL

- 19.3.2** Approval of the Owner / Owner's Representative shall be obtained before any initial contact with the Owner of any foreign pipeline or utility is made.
- 19.3.3** The Owner of the foreign facility will be notified at least 48 hours prior to the start of any excavation within the Right of Way of the foreign facility.
- 19.3.4** The foreign pipeline Owner's Representative shall be present for the excavation unless this right is expressly waived and documented on the Crossing Report.
- 19.3.5** Identification and marking of all existing facilities during initial survey will be verified. The surveyor's methods of identification will be verified.
- 19.3.6** Products and line pressures within existing pipelines will be identified.
- 19.3.7** The size and number of lines being crossed will be verified. Maps of buried features will be obtained and reviewed.
- 19.3.8** Local gas distribution companies, the Provincial Pipeline License Registrar, Alberta First Call service (1-800-242-3447) or equivalent, the telephone company, the electrical distribution company, landowners, and tenants will be contacted if there is uncertainty about the existence and location of buried facilities.
- 19.3.9** The width and length of required excavation will be established.
 - 19.3.9.1** Each line or cable to be crossed will be daylighted before beginning any other construction activity on the Right of Way to be crossed.
 - 19.3.9.2** All pipelines or cables shall be daylighted prior to any mechanical excavation.
 - 19.3.9.3** No mechanical excavation shall be done within 1.0m of the foreign line or cable.
- 19.3.10** Cathodic protection requirements will be verified.
- 19.3.11** The new line will be installed so that the top of the new line is a minimum of 30cm beneath bottom of existing utility, or according to the Crossing Agreement.
- 19.3.12** All coating damage to both new and foreign pipeline must be repaired.
- 19.3.13** The Owner of the foreign pipeline must be notified at least 24 hours prior to backfilling, or as indicated in the contract.



19.3.14 Backfilling will be carried out in the presence of the foreign pipeline Owner's Representative. Should they waive this requirement it must be documented that they waived the requirement. The installed crossing must be completed to the satisfaction of the Owner's Representative.

19.3.15 Pipeline crossing signs must be installed on each side of the crossed Right of Way as required by contract and federal and provincial regulations.

19.3.16 A Crossing Report must be completed and filled in the quality Turnover files.

19.4 Highway, Railway and Road Crossings

19.4.1 General

19.4.1.1 Railroad, highway and main road crossings shall be crossed in accordance with the drawings and in a manner that meets all the requirements of the Crossing Permit.

19.4.1.2 A Crossing Agreement will be obtained and available on site.

19.4.1.3 The crossing location will be surveyed and staked.

19.4.1.4 For all crossings, barricades, signs, flares and flag persons to divert traffic and warn the traveling public will be utilized as required.

19.4.1.5 Prior to installations, all crossing sections shall be leak tested using soap and air to a maximum test pressure of 700 KPA (100 PSI) or as stated in the contract.

19.4.1.6 A Crossing Report will be completed.

19.4.1.6.1 Open-cut crossings will be backfilled immediately after the pipe has been lowered in.

19.4.1.6.2 Backfilled open-cut crossings must be maintained to the satisfaction of the proper authority.

19.4.1.7 Minimum cover depths shall be checked to ensure that they are as specified in the contract and Crossing Agreement. Adverse subsurface conditions may prevent installation at the recommended depths and allows less cover provided the buried pipeline is appropriately protected against anticipated external loads. Owner / Owner's Representative approval is required for a reduction in minimum cover.

19.4.1.8 The Minimum clearance between the pipeline and any other underground structure or utilities (conduits, cables and other pipelines) is 30cm.



PIPELINE QUALITY MANUAL

19.4.1.9 Open excavation must not be closer than 3.6m from the shoulder of the road, highway, or bored crossing.

19.4.1.10 Casing pipe shall be thoroughly cleaned inside.

19.4.1.10.1 Installation of pipeline insulators or spacers, casing seals and vent pipes will be as specified in the contract and manufacturer's specifications.

19.4.1.10.2 The ends of the casing will be vented and end seals installed in accordance with the drawings.

19.4.2 Uncased Crossings

19.4.2.1 All road crossings will be backfilled and mechanically compacted in successive lifts (thickness as determine in the contract) under traveled portions of road allowance. The method of backfill and compaction on Owner / Owner's Representative or Lease roads will be according to the contract.

19.4.2.2 Open excavation material and equipment will be stored away from the edge of the roadway as determined in the contract.

19.4.3 Cased Crossings

19.4.3.1 Casing will extend as specified by the Owner / Owner's Representative.

19.4.4 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report / form or as agreed to in the project ITP.



SECTION 20: BUOYANCY CONTROL

20.1 General

- 20.1.1** Pipeline weights must be installed at equal intervals, and at locations as detailed on project drawings or in the contract.
- 20.1.2** Information on weights can be entered on the "As-Built" drawings as detailed in the contract.
- 20.1.3** Pipeline coating that is damaged by the installation of weights, must be repaired.

20.2 Saddle Weights

- 20.2.1** Saddle weights require sufficient lifting and holding devices to ensure control of weight and alignment while placing.
- 20.2.2** Backfill must be done in such a way that weights are not moved or tipped.
- 20.2.3** A firm trench bottom is required for saddle set on weights otherwise bolt on or concrete coatings should be supplied to provide negative buoyancy where needed.

20.3 Concrete Weight Coating

- 20.3.1** Adequate care must be taken while shipping, handling or placing pipe to prevent damage to coating.
- 20.3.2** Ditch depth needs to be adequate to provide depth of cover for coated pipe.
- 20.3.3** Pressure testing must be done before field coating.
- 20.3.4** Concrete weight coating must be applied to field butt welds at cutbacks as specified in the contract.
 - 20.3.4.1** After testing according to Owner specifications each joint may be hand coated with two layers of tape and a layer of 40 mil rock shield, followed by reinforcing wire mesh spacers and a formed concrete joint cover of concrete.
 - 20.3.4.2** When necessary the joint concrete shall be protected from freezing.
 - 20.3.4.3** The concrete mix used shall be 20 Mpa seven day strength.

20.4 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report / form or as agreed to in the project ITP.



SECTION 21: TRENCHING AND EXCAVATION

21.1 General

- 21.1.1** Trenching will be performed in accordance with applicable design, specifications, regulations, acts and Owner / Owner's Representative specifications.
- 21.1.2** During the trenching operation the Owner / Owner's Representative will be notified immediately should previously unidentified or unknown objects be encountered and appropriate adjustments will be made prior to proceeding through the affected area.
- 21.1.3** During the trenching operation where excessive rock is encountered, it will be noted on the drawings and the Owner / Owner's Representative will be notified in order to specify the measures to be taken to protect the pipe.
- 21.1.4** Where rock is encountered and blasting is required, a blasting procedure will be developed with approval from the Owner / Owner's Representative prior to the commencement of any blasting.
- 21.1.5** Where buoyancy control is required, appropriate steps will be taken to accommodate the design and specification criteria.
- 21.1.6** If required by the Owner / Owner's Representative, a daily report will be prepared, which will highlight items not identified in the specifications. These should be resolved with the Owner / Owner's Representative on an agreed frequency basis.

21.2 Trenching Procedure

- 21.2.1** All ditching and excavation work must conform to the permit terms and Right-Of-Way easements.
- 21.2.2** Safe passageways across trenches must be allowed in areas where this is desirable to the landowners.
- 21.2.3** On crown lands gaps must be left every 500m interval in the ditch and spoils pile areas where backfill will not occur within 48 hours.
- 21.2.4** The Ditch Foreman is required to measure the ditch dimensions as indicated in the contract and confirm that the minimum cover and width requirements have been met. These measurements will be recorded on the Trenching Checklist.
- 21.2.5** Where required, provide 0.15m of extra depth to allow for bottom padding.
- 21.2.6** Ensure ditch depths are sufficient for each bend.
- 21.2.7** Open ditches in recreational areas, or areas containing livestock will be fenced off.



21.2.8 Ensure the ditch bottom is smooth.

21.2.9 Anchor blocks and pipe supports will be installed on undisturbed soil or rock.

21.3 Quality Audit (Trenching and Excavation)

The Quality Control Representative will audit this construction phase at least once every 5 km to ensure compliance or as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.

21.4 Rock Trench

Rock trench is defined as trench excavation that cannot reasonably be accomplished using machine excavation.

21.5 Rock Trench - Procedure

21.5.1 Blasting a trench in rock is required when the trench cannot be machine excavated or ripped.

21.5.2 The decision to blast will be made by the Owner / Owner's Representative.

21.5.3 Blasting will be performed in accordance with developed and approved procedures and applicable specifications, permits and regulations.

21.5.4 As per Owner / Owner's Representative specifications, safeguards will be placed over the ditch line to prevent loose rock from scattering onto or off the right-of-way.

21.5.5 Scattered rock will be disposed of at a location approved by the Owner / Owner's Representative.

21.5.6 Blasting procedures will be rigidly followed and clearly understood by everyone connected with this operation.

21.5.7 Proper notification will be provided on any detonation of explosives (i.e. 48 hours notice).

21.5.8 As noted in the Trench Procedure an additional depth of 0.15 m will be provided to accommodate sand padding unless otherwise directed by the Owner's Inspector.

21.6 Quality Audit (Rock Trench)

The Quality Control Representative will use the Trenching Checklist for recording the location, length and average thickness of the rock excavation in accordance with the contract and project ITP. The Quality Control Representative and the Owner's Inspector will sign this jointly.



SECTION 22: LOWERING-IN

22.1 General

- 22.1.1** The ditch must be clear of hard objects, which could damage pipe or coating material.
- 22.1.2** Unmovable hard objects must be covered with sand or soft earth to a depth of 150mm, or as directed in the contract. Otherwise sand bags or foam pillows must be used to support the pipe off the ditch bottom at spacing as specified in the contract.
- 22.1.3** Pipes laid in a common ditch require a minimum clearance as specified in the contract. Refer to Crossing Agreements for each crossing.
- 22.1.4** All patches and skid marks must be checked for holidays, unless the pipe is insulated, and damages repaired.
- 22.1.5** Pipe must be clear of the trench bottom through sags, tight to the trench bottom over over-bends, tight to inside corners and tight to the trench bottom at side bends without the use of external force to minimize stress levels and protect the pipe and coating from damage.
- 22.1.6** Open ends of the pipe must be protected by using watertight plugs during work stoppages.
- 22.1.7** Information can be documented on the Daily Trench/Lower-In/Backfill Report if required.

22.2 Rock Shield

- 22.2.1** Rock shield must be used in areas where the spoil pile consists of materials that would damage the coating during backfilling as specified in the contract.
- 22.2.2** Areas where it should be used but not specified in the contract or on drawings will be noted and the Owner / Owner's Representative informed.
- 22.2.3** The decision to install rock shield will be made in consultation with the Owner / Owner's Representative.
- 22.2.4** Rock shield will be installed according to Owner / Owner's Representative specifications or as agreed upon in the contract.

22.3 Laying Pipe

- 22.3.1** The pipeline should be lowered into the ditch in a manner that avoids excessive stress levels.



PIPELINE QUALITY MANUAL

- 22.3.2** Adjustment of the pipe length may be required by cutting and welding as required to assure proper fit of side-bends, over-bends, and sags.
- 22.3.3** Coated pipe shall be treated with care and precautions taken to avoid damage to the coating.
 - 22.3.3.1** It will be handled with non-abrasive slings or a type of cradle that can be disengaged without metal parts coming into contact with the coating.
 - 22.3.3.2** It will not be subjected to impacts.
 - 22.3.3.3** All uninsulated pipe shall be jeeped before lowering in and damages repaired.
- 22.3.4** Sufficient equipment will be utilized to insure the pipe does not drag on ditch side while being lowered in.

22.4 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 23: INTERNAL CLEANING AND SIZING PIGGING

23.1 General

Pigging the inside of a pipeline involves the use of several types of "pigs" and the use of an air compressor to move the "pig". Pigging shall comply with Owner / Owner's Representative specifications.

23.1.1 All dirt and foreign objects must be removed from the pipe by running a foam or neoprene pig through each section.

23.1.2 For internal bare piping, a pig with a sizing plate and wire brushes must be used to ensure that there are no pipe deformations.

23.1.2.1 The sizing plate must be no less than 95% in diameter than that of the internals of the pipe unless otherwise specified by the Owner / Owner's Representative.

23.1.2.2 Any sizing pig emerging from the inside of the pipe in a deformed state will require evaluation and that the deformation area be located and repaired.

23.1.2.3 The line will require to be re-pigged until everything is found to be acceptable.

23.1.3 On internally coated piping, a soft sponge pig must be used.

23.1.4 Soft sponge pigs can be run on above ground sections prior to tie-ins being completed.

23.2 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 24: BACKFILL

24.1 General

- 24.1.1** The trench will be backfilled as quickly as is practicable after lowering in to anchor the pipe.
- 24.1.2** Topsoil will not be used for padding material.
- 24.1.3** Backfill material will be compacted before placing the crown.
- 24.1.4** All trenches will be crowned a minimum of 0.2m but no more than 0.3m unless otherwise specified in contract documents.
 - 24.1.4.1** Crown will be centered on trench.
 - 24.1.4.2** Gaps will be left in the crown at all drainage channels and at all crossings of active trails.
- 24.1.5** Drainage control measures will be used according to the contract.

24.2 Backfilling

- 24.2.1** Backfilling will be performed as soon as possible after the pipe has been lowered into the ditch. When the temperature is below freezing, no length of ditch with pipe in it will be left open for more than 24 hours.
- 24.2.2** Prior to commencing backfill, all large rocks in the spoil bank or between the spoil bank and the ditch must be removed to prevent them from falling directly onto the pipe.
- 24.2.3** In conditions where there is gravel, frozen soil, or large hardened soil clods dictate, shading of backfill will be required to minimize damage to the coated pipe.
- 24.2.4** In no event shall rocks or hard clods or frozen dirt be allowed to fall on the pipe in such a manner as to damage the pipe or coating. Trash, boxes, cans, welding rods, or other refuse of any kind are to be removed from the ditch before backfilling.
- 24.2.5** Construct diversion terraces on hillsides and at other points deemed necessary by Owner / Owner's Representative to direct the flow of water into natural drainage courses and away from the pipeline ditch. Any frozen material must be thawed out prior to use or diversion structures shall be built. Repair or replace all terraces damaged during the construction of the pipeline.
- 24.2.6** The banks of irrigation or drainage ditches shall be restored as specified by the Owner / Owner's Representative. This may involve tamping, reinforcing and backfilling the banks with earth filled sacks or rock riprap.
- 24.2.7** Restore each road to a condition as specified in the contract and maintain all crossings in a condition acceptable to Company. Repair damage caused by settling or washing along the Right-Of-Way until the warranty period has expired. In areas repaired, the backfill shall be placed in layers with each layer compacted by suitable compacting equipment and the surface material replaced together with any select material removed such as sand or gravel.



PIPELINE QUALITY MANUAL

24.2.8 Where requested by the Owner / Owner's Representative or as called for by the drawings, ditch plugs shall be installed.

24.2.9 Sandbags, where required, shall be filled with an acceptable sand material free of silt, rock, clods of dirt, etc.

24.3 Quality Audit

The Quality Control Representative will audit this construction phase at least once every 5 km to ensure compliance or as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 25: TIE-INS AND TRANSITIONS

25.1 General

This activity is necessary to accommodate the numerous obstructions throughout the pipeline route. This operation normally uses the manual shielded metal arc welding process (SMAW).

- 25.1.1** Care will be taken to prepare the joint for welding without unusually stressing the adjoining materials.
- 25.1.2** Locations of this work will be provided all in accordance with applicable specifications and drawings.
- 25.1.3** All welds will be nondestructively tested as specified in the contract, results interpreted and recorded prior to backfill.

25.2 Procedure

Before the start of work, the Foreman will review the checklist with all personnel involved in the tie-in.

- 25.2.1** Locations of this work will be provided in accordance with applicable specifications and drawings.
- 25.2.2** Qualified welders will be assigned to perform tie-in welds.
- 25.2.3** Excavations will be adequately sized to allow sufficient workspace.
- 25.2.4** The excavation will be of sufficient width so that the pipe is exposed on one side of the tie-in location to allow overbreak and lineup of the tie-in weld.
- 25.2.5** Tie-in welds must always be completed without delays and will not be left incomplete overnight.
- 25.2.6** Tie-ins will not be made at transition welds unless specified and prior approval has been obtained from the Owner / Owner's Representative.
- 25.2.7** The tie-in weld will be made in a stress-free condition.
- 25.2.8** Pipe must be properly supported during the welding of tie-ins.
- 25.2.9** Tie-in excavations must not be backfilled until welds have been radiographed and repaired (if required) coated and holiday detected.
- 25.2.10** Tie-in excavations will be properly backfilled and compacted as soon as possible to ensure adequate support for the pipe. Sandbags will be used where proper compacting and support cannot be obtained using backfill material.
- 25.2.11** All non-hydrotested tie-in welds will be constructed using pre-tested pipe then nondestructively tested and results interpreted and recorded prior to backfill.

**25.3 Quality Audit**

The Quality Control Representative / Welding Foreman will audit one tie-in per day, when applicable as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.



SECTION 26: PRESSURE TESTING

26.1 General

- 26.1.1** The Owner / Owner's Representative's approval must be obtained prior to the test. A hydrostatic or air pressure test will then be completed in accordance with the Owner / Owner's Representative specifications, Provincial Regulations and CSA Z662 Clause 8.
- 26.1.2** Provincial Pipeline Regulatory Authorities must be notified at least 48 hours prior to any test. Within Alberta, the appropriate Field Centre must be notified at least 48 hours prior to the commencement of any test (Alberta Pipeline Regulation, Section 32(1,2)).
- 26.1.3** Where pressure piping has been designed in accordance with ASME B31.3 the pressure testing shall be in accordance with ASME B31.3. Refer to the applicable Quality Manual for the requirements of such a test.
- 26.1.4** A detailed testing plan will be provided prior to the commencement of any testing operation. The plan will be developed with the Owner / Owner's Representative and will include for example the following:
 - 26.1.4.1** A detailed section by section line fill and test schedule.
 - 26.1.4.2** Locations of all fill and dewatering points.
 - 26.1.4.3** Copies of necessary water use permits and water quality analysis reports as required.
 - 26.1.4.4** Sizes, numbers and locations of air compressors and pump units.
 - 26.1.4.5** A section by section listing of all key pressures which shall include the following:
 - 26.1.4.5.1** Pressure at which yield plotting will begin (if required)
 - 26.1.4.5.2** Pressures and duration of the strength and leak test per CSA Z662 and pressure at which leak test will begin.
 - 26.1.4.5.3** Calibration reports of dead weight testers and pressure recorders and gauges that will be used for the test. A copy of the calibration record shall be kept in the QC file. See "Pressure Testing Equipment" below for calibration/verification frequency.
 - 26.1.4.6** A detailed description of the methanol wash operation included quantities, method of installation, recovery and disposal of methanol, if a methanol wash is required after the test.
 - 26.1.4.7** Water heater size(s) and locations if they are used.
 - 26.1.4.8** Water/methanol mix ratio for winter hydrotests. See Table Schedule B for freezing points of water-methanol solutions.



PIPELINE QUALITY MANUAL

- 26.1.4.9** The Quality Representative or Designate shall check with the Owner / Owner's Representative regarding the use of Water/Methanol mixtures for testing under watercourses.
- 26.1.5** Pneumatic test procedures must specify the use of a non-toxic, non-flammable gas. The Owner / Owner's Representative shall provide written approval. Provincial regulations shall be checked to determine requirements.
- 26.1.6** Pneumatic tests are not allowed on cement mortar lined pipe, mechanical interference fit joints, non-metallic piping or on piping for which less than 100% of the girth welds have been inspected by RT or UT except with approval as noted above.
- 26.1.7** The ID of internally bare steel pipe must be cleaned as directed by the Owner / Owner's Representative. Confirmation of cleaning shall be signed off using the applicable form (Piping Cleaning Record) if required by the Owner / Owner's Representative.
- 26.1.8** On internally bare pipe and where Internal Pipeline Corrosion Inspection Tools (IPCIT) are to be used a sizing pig must be run before the IPCIT is run as required by the contract.
- 26.1.9** Ensure that the pipeline is ready for testing by using the Pipeline Checklist or as required by the ITP.
- 26.1.10** Access points to the test section must have warning signs in place and the area restricted to only authorized personnel.
- 26.1.11** A sufficient length of pipeline must be tested to ensure that after tie-ins, no pipe section, fitting or component is put in service without being tested.
- 26.1.12** Disconnect process instrumentation or plug the connections downstream of the first valve.
- 26.1.13** Check valve internals must removed, blinds must be installed, and all temporary measures shall be done per the Pressure Test Procedure.
- 26.1.14** Check valves or internals that were removed because they interfered filling or draining must be flagged.
- 26.1.15** Methanol/Water mix solutions shall be used as a freezing point depressant whenever there is a possibility of freezing in the pipeline system under test.
- 26.1.16** Road and Rail Crossings must be pre-tested if the test medium is stressed at or above 80% of the SMYS of the pipe. Otherwise, they must be closed to traffic during the test.
- 26.1.17** For hydrostatic testing, fill pigs must be used to displace air from the test section. Air must be bled off prior to commencing the test.
- 26.1.18** The Superintendent shall review the pressure test procedures, safety rules and co-ordinate personnel prior to the test.
- 26.1.19** Complete Pressure Test Procedure And Data Report form to supplement the chart information. Dead weight readings are to be recorded at regular intervals on Dead Weight Test Report form, as required by ITP.



- 26.1.20** The Pressure Test Chart, Piping Hydrotest Checklist Report and the Pressure Test Procedure And Data Report (and associated Continuation Sheet) shall be kept in the QC file as per ITP.
- 26.1.21** Test records shall be reviewed and any test pressure variations reconciled. Where records are inaccurate or if the pressure variations can't be reconciled the test shall be considered unsuccessful.
- 26.1.22** Check valve internals must be replaced, blinds must be removed and all temporary measures put in place during testing must be removed.
- 26.1.23** Fiberglass reinforced pipe will be tested as required on the drawings or by the contract. Under no circumstances will pneumatic tests in excess of 100kPa be done on FRP pipe unless the procedure is accepted in writing by the Owner / Owner's Representative and the Pipe Manufacturer. FRP is extremely brittle and can be subject to catastrophic failure under these circumstances.

26.2 Pressure Testing Equipment

- 26.2.1** All pigs required for filling and dewatering.
- 26.2.2** One dead weight tester with an accuracy of ± 1.0 kPa. One additional tester may be used at the test site as a backup unit.
- 26.2.3** One chart recorder with temperature and pressure indicators is required for each test to record test pressure and both ambient and test medium temperature. One additional recorder may be used at the test site as a backup unit. Charts are to have a 24 hour clock and the maximum pressure of the chart shall be within 1.1 and 4 times the test pressure (reading occurs between 25% and 90% of the full range of the instrument as per Alberta Regulation AR 122/87 S35(3)).
 - 26.2.3.1** Calibration certificates for each pressure-recording instrument must be obtained prior to use and the instrument's certificate of calibration must be valid to within one year while in use during the project.
 - 26.2.3.2** Each pressure-recording instrument is periodically calibrated to maintain accuracy within 2 per cent of its range. The EUB may require verification of such calibration (Pipeline Regulation, Section 35(4,5); CSA Standard Z662, Clauses 8.6.1, 8.6.2, and 8.6.2.4).
 - 26.2.3.3** The accuracy of chart recorders shall be verified before and after each pressure test; the accuracy of other test instruments shall be verified periodically and records maintained and included in project file documenting the verification of such calibration.
 - 26.2.3.4** Note: As a guideline, in addition to verification of instrument accuracy to within 2 % of its full range, each related instrument should measure values within 4% of the other at all times or the instruments must be replaced or recalibrated.
- 26.2.4** Consider the volume of the line when selecting the pump capacity in order to be able to fill the line in a reasonable length of time but also to ensure that over pressuring of



the line does not occur when approaching test pressure. Where a high capacity pump is used the pressurizing unit's safety relief valve shall be set at a maximum of 5% times the test pressure.

26.2.5 Pressure Test Head Assemblies (all necessary valves, fittings and test heads).

26.2.5.1 Test head assemblies shall meet the requirements of Z662 Clause 8.9 for design, construction and maintenance.

26.2.5.2 The maximum working pressure of test heads assemblies during pressure testing of piping shall not produce hoop stresses in excess of 75% of the specified minimum yield strength (SYMS) of the test head pipe.

26.2.5.3 The ancillary piping, such as the pressurizing lines attached to the test head assembly, shall not be operated at pressures that would produce hoop stresses in excess of 50% of the specified minimum yield strength (SYMS) of the ancillary pipe.

26.2.5.4 Test heads must be 100% radiographed and pressure tested to 125% of the maximum allowable intended pressure for 1 hour.

26.2.5.5 Pressure test assemblies shall be checked for mechanical and corrosion damage prior to use.

26.2.5.6 Where test head assemblies are welded to the pipeline system the weld shall be 100% radiographed.

26.2.6 Heating units and hoardings for winter testing.

26.2.7 When testing during freezing temperatures it is recommended to use a heated shelter to protect the recording equipment and dead weight testers.

26.3 Test Monitoring

26.3.1 Test pressure and temperature must be allowed to stabilize before the test is started.

26.3.2 The start of the test and pressure gradations must be clearly indicated on the chart.

26.3.3 All changes in test pressure shall be accounted for and recorded as appropriate. (CSA Z662 Clause 8.6.1)

26.3.4 If the test pressure in the section drops below the minimum test pressure, the maximum proof pressure shall be reestablished and the 8 or 24 hour test restarted.

26.3.5 Dead weight pressure readings shall be taken every 30 minutes throughout the duration of the proof test or at the duration's specified. The Dead Weight Test Report form is intended for this purpose.

26.3.6 De-watering must be carried out in a manner to minimize erosion or environmental damage. Dispose of liquid test medium in a manner approved by the Regulatory Board and the Owner / Owner's Representative.

26.4 Methanol Wash

26.4.1 When using a methanol wash for drying, the wash must be done during daylight hours. During winter this is to be completed within 24 hours of completion of dewatering.



PIPELINE QUALITY MANUAL

- 26.4.2** The methanol wash is to be run between polyurethane pigs using compressed air and a line pack to ensure a maximum speed of 8 km per hour.
- 26.4.3** Where practical, the wash should be run in the same direction as the proposed gas flow.
- 26.4.4** All methanol solution dispelled from the pipeline shall be recovered and retained for disposal in a manner acceptable to the authorities having jurisdiction. Under no circumstances will it be discharged onto the ground or allowed to reach ground water or a watercourse.
- 26.4.5** If the section is not to be tied-in immediately following the methanol wash, all open ends must be capped with a watertight seal.
- 26.4.6** Winter testing may require additional consideration such as 24 hour per day activity, covered and heated open ditch situations, use of heated water or antifreeze etc. Special care must be taken to drain valve bodies after dewatering.

26.5 Test Failure and Repairs

- 26.5.1** The Quality Representative will notify the Owner / Owner's Representative of any leaks found during the pressure tests.
- 26.5.2** The system must always be de-pressurized before any repairs are attempted.

26.6 Quality Audit

The Quality Control Representative will audit this construction phase as required by the contract and project ITP. The inspection shall be documented on the applicable report/form or as agreed to in the project ITP.



FLINT ENERGY SERVICES LTD.

INTEGRATED. INTEGRAL.

PIPELINE QUALITY MANUAL

PIPELINE QUALITY MANUAL

APPENDIX A: DOCUMENTATION / RECORDS

THE DOCUMENTATION LISTED IN THE TABLE BELOW IS INCLUDED AS EXHIBITS AND ARE OF CURRENT REVISION AS OF THE DATE OF MANUAL ISSUE. DOCUMENTATION UPDATES ARE THE RESPONSIBILITY OF THE COPY HOLDER AS PER BELOW.

IT IS THE RESPONSIBILITY OF THE PROJECT QUALITY REPRESENTATIVE TO ENSURE THE CURRENT REVISION IS USED ON SITE.

ALL DOCUMENTATION MAY BE ACCESSED ONLINE FROM THE OFE / OURFLINTENERGY WEBSITE / INTRANET. ONLINE DOCUMENTATION IS MAINTAINED IN THE MOST RECENT REVISION STATUS.

IT IS PERMISSABLE TO MODIFY STANDARD CONTROLLED DOCUMENTATION (* NOTE BELOW) TO PRODUCE DOCUMENTATION THAT MEETS THE NEEDS OF SPECIAL PROJECT-SPECIFIC REQUIREMENTS. PROJECT QA/QC DOCUMENTATION SHALL BE CONTROLLED IN ACCORDANCE WITH THIS MANUAL OR DETAILED PROJECT-SPECIFIC PROCEDURE. SUCH DOCUMENTATION SHALL BE IDENTIFIED/CONTROLLED USING THE FOLLOWING GUIDELINE :

ORIGINAL CONTROL COPY :

DOCUMENT TITLE : "P02 - PIPELINE GENERAL INSPECTION AND TEST PLAN (ITP) (05-04 REV 1)"

MODIFIED COPY NAMING FORMAT :

DOCUMENT TITLE : "P02(SPECIAL) - PIPELINE GENERAL INSPECTION AND TEST PLAN (ITP) – PROJECT ID (MM -YY REV 0)"

NOTE : UNDERLINED ITEMS MUST BE APPROPRIATELY CHOSEN.

"PROJECT ID" MAY BE THE : • FLINT PROJECT NUMBER OR
• ANY SPECIFIC ID EASILY TRACEABLE TO THE PROJECT

FOR CONTINUAL IMPROVEMENT PURPOSES, PLEASE FORWARD ANY MODIFIED (OR NEW DOCUMENTS CREATED) TO THE QUALITY DEPARTMENT FOR REVIEW THAT MAY BENEFIT OTHERS AND THE QUALITY MANAGEMENT SYSTEM.

* NOTE : DOCUMENTATION REFERENCED IN THIS MANUAL CONTAINS ALL THE INFORMATION CONSIDERED NECESSARY TO ADEQUATELY RECORD EACH ACTIVITY IN ACCORDANCE WITH THE QUALITY SYSTEM. REMOVING INFORMATION MUST BE AUTHORIZED BY THE PROJECT MANAGEMENT TEAM AND/OR CONSULT WITH THE QUALITY DEPARTMENT FOR ADVISE IF REQUIRED. ANY NEW OR MODIFIED DOCUMENTATION MUST BE RECORDED IN THE PROJECT-SPECIFIC INSPECTION AND TEST PLAN.

**PIPELINE QUALITY MANUAL**

FORM No.	TITLE
P01	Pipeline General Inspection and Test Plan (ITP) Cover Page
P02	Pipeline General Inspection and Test Plan (ITP)
P03	Pipeline General Inspection and Test Plan (ITP) Agreement
P04	Topsoil Stripping Report
P05	Pipe Tally
P06	Stockpile Quality
P07	Pipeline Field Bending Report
P08	Welder Qualification Report
P09	Welding Quality Checklist
P10	Coating, Shrink Sleeve or Insulation Quality Checklist
P11	Coating - Tape Adhesion Test Results
P12	Crossing Report
P13	Trenching Checklist
P14	Lower-In Quality Checklist
P15	Pigging Checklist
P16	Trench - Lowerin - Backfill Report
P17	Tie-In and Transition Checklist
P18	Pipeline Abandonment Inspection and Test Plan (ITP) Checklist
P19	Wellsite Reclamation Inspection and Test Plan (ITP) Checklist
P20	Pipeline Reclamation Checklist
A01	Material Receiving Report
A03	Material Receiving Report Register
A07	Over-Short-Damage Report
A08	Nonconformance Report
A09	Nonconformance Log
A11	Document Transmittal
A12	Drawing and Specification Index
A13	Specification Deviation Request
A14	Specification Deviation Request Log
B01	Welders Log
B05	Weld Repair Form
B11	Welder's Declaration
B13	Approved Welding Procedures Log
C03	Reinstatement Checklist for Piping Systems
C05	Pressure Test Procedure And Data
C06	Piping Pressure Test Report - Continuation Sheet
C09	Dead Weight Test Report
C11	Piping Cleaning Record

DOCUMENTS ARE EXHIBITED IN THIS APPENDIX WITHOUT PAGINATION