

GUIDE TO INTERNATIONAL CERTIFICATION OF WELDING INSPECTORS

CANADIAN EDITION

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**Prepared by Codes and Standards Training Institute (CASTI)
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1. Introduction to International Certification of Welding Inspectors

There are several national standards for the certification of welding inspectors (see list in Appendix A). The organizations that administer these standards may have agreements allowing either reciprocity or recognition among these standards.

Appendices B to E compares the eligibility, examinations, renewals, reciprocity and recognition among 6 different inspector certification programs in a matrix format. Although these matrices are useful tools for comparison purposes, they do not contain all details of each program. It is advised that each inspector certification standard be thoroughly reviewed to ensure that all details are considered.

2. Introduction to AWS Certification of Welding Inspector Program

The AWS Certification of Welding Inspector Program is widely recognized by the welding industries in Canada, the USA, and overseas. Successful companies have come to rely on this AWS certification to ensure the highest level of quality workmanship.

AWS QC1:2007 Standard for AWS Certification of Welding Inspectors establishes the requirements for AWS certification of welding inspection personnel. It describes how personnel are certified and the principles of conduct and practice by which certification may be maintained.

AWS B5.1:2003 Specification for the Qualification of Welding Inspectors establishes the requirements for qualification and defines the body of knowledge for welding inspection personnel.

Welding inspector exam candidates must read both of the above AWS documents prior to submitting the exam application form to CASTI. They can be downloaded for free at www.casti.ca/aws.

3. Levels of Qualification

There are three levels of qualifications for welding inspection personnel defined in AWS B5.1 Section 3, as follows.

- a) Certified Associate Welding Inspector (CAWI)
- b) Certified Welding Inspector (CWI)
- c) Senior Certified Welding Inspector (SCWI)

The education and experience requirements are listed in section 5 of AWS B5.1 and AWS QC1.

4. Exam Application Submittal

To qualify for examination registration for exams sponsored by CASTI, a Welding Inspector Exam Application and the required supporting documentation (Visual Acuity Record, work experience documentation, etc.) must be submitted to CASTI prior to the exam application deadline (check www.casti.ca for specific date). Exam applications with incomplete information will be considered unqualified unless the missing documentation can be provided within two (2) weeks of notification (via telephone or e-mail) that the application is incomplete. If the applicant fails to meet the exam qualification criteria, the exam fee will be refunded minus a processing fee.

We recommend using courier delivery (with tracking) when sending your exam application to:

AWS Exam Administrator
Codes and Standards Training Institute (CASTI)
Suite 205, 10544 - 106 Street
Edmonton, Alberta T5H 2X6

PLEASE RETAIN A COPY OF ALL SENT DOCUMENTS FOR YOUR OWN RECORDS.

5. Exam Approval Notification

All Welding Inspector Exam Applications received by CASTI by the submittal deadline will be forwarded to the AWS Certification Department for review and approval. The standard AWS processing time is 2 to 3 weeks after the exam application deadline and applicants will be notified by AWS in a written exam confirmation package.

An exam seat is not guaranteed if the application has not been received in a timely manner and has not been processed and/or approved by the AWS Certification Department. When circumstances do not permit meeting the registration deadlines, fast track processing is available for an additional fee. Please notify CASTI if you intend to use the fast track procedure.

6. Exam Payment

Payment must accompany your exam application or it will not be processed. EXAM APPLICATIONS WILL NOT BE PROCESSED UNTIL PAYMENT HAS BEEN FULLY SATISFIED. If you wish to pay by credit card, please complete the payment section on the exam application form. If you wish to pay by cheque, please make them payable to CASTI. Purchase orders are not accepted for exam payment. Please see the exam application form for exam fees.

7. Education and Experience Requirements

Welding inspector exam applicants seeking certification shall meet the applicable education and experience requirements as stated in AWS B5.1, paragraph 5.5 for the desired level of certification.

Please note that there are additional education and experience criteria options listed in AWS QC1, section 5.

You must read both of these AWS documents thoroughly prior to submitting your exam application form to CASTI. AWS QC1 and AWS B5.1 can be downloaded for free at www.casti.ca/aws.

8. Examination Requirements for a CAWI

Exam applicants seeking CAWI certification shall successfully meet the welding inspection requirements contained in AWS B5.1, paragraphs 6.2 and 7.1 and AWS QC1, section 6.2. Exam applicants shall pass the following examinations.

Examination	Minimum Number of Questions	Minimum Percentage of Correct Answers
Part A—Fundamentals (2 hours, closed book)	150	60%
Part B—Practical (2 hours, hands-on)	46	60%
Part C—Code Book (2 hours, open book)	46	60%

9. Examination Requirements for a CWI

Exam applicants seeking CWI certification shall successfully meet the welding inspection requirements contained in AWS B5.1, paragraphs 6.2 and 7.1 and AWS QC1, section 6.2. Exam applicants shall pass the following examinations:

Examination	Minimum Number of Questions	Minimum Percentage of Correct Answers
Part A—Fundamentals (2 hours, closed book)	150	72%
Part B—Practical (2 hours, hands-on)	46	72%
Part C—Code Book (2 hours, open book)	46	72%

Exam applicants who achieve a 72% overall composite score (simple average of three parts of the examination) and fail to meet the requirements in the table above may retake those parts

failed subject to the requirements of AWS QC1, paragraph 6.2.5 (see section on Re-examination below).

Since CAWI and CWI exam candidates write the same exams, should exam results be below 72% but equal to or greater than 60%, the exam candidate would pass the CAWI qualification.

10. Examination Requirements for a SCWI

Every CWI who has held CWI certification for a minimum of six years and possesses the requisite 15 years of experience, is not necessarily a candidate for the SCWI exam. Ideal candidates for the SCWI exam have sought out opportunities to expand their careers. Senior Certified Welding Inspector candidates typically will have supplemented their basic education or gained extensive problem-solving experience. Such a background should provide them with a deep and specific understanding of advanced NDE topics, quality systems, procedure qualifications, and other SCWI knowledge areas as identified below.

SCWI Experience Requirements

- a) Design-preparation of plans and drawing for weldments, preparation of inspection procedures, requirements, acceptance criteria.
- b) Production-planning, control, and supervision of welding materials, procedures and operations.
- c) Construction-personnel supervision and fabrication or erection of weldments.
- d) Quality control-detection and measurement of weld discontinuities, procedures, supervision of personnel, specification of QC methods, review of QC programs of vendors.
- e) Quality assurance-specification of QA methods, review QA programs of vendors, and conducting audits of vendors
- f) Examination-examination testing, application of visual or other nondestructive evaluation process
- g) Repair-repair of defective welds or supervision of personnel performing repair.

CWI Wishing to Advance to SCWI

For CWI applicants in the 6th year renewal cycle who wish to pursue and who qualify for SCWI status, they will need to complete an SCWI, CWI & CAWI Renewal & Upgrade Application along with a SCWI application. However, the applicant is only required to pay the SCWI application fee. If the applicant is not successful in passing the test at the SCWI level, their CWI status will be renewed for no additional charge.

For CWI applicants in the 9th year renewal cycle who wish to pursue and who qualify for SCWI status, you will need to complete a CWI 9-Year Re-Certification Application along with an SCWI application. Your CWI can be re-certified at the 9-year mark by either taking the Part B Practical Examination or by evidence of continuing education (see QC1:2007, Section 16.3.2 for more information). You may schedule the Part B examination at the same site location that you will be taking the SCWI examination. If you qualify for re-certification via continuing education, the supporting documents along with the completed exempt application must be submitted at the

same time as your SCWI application. However, you will still only be required to pay for the SCWI application fee.

Applicants who are still active CWI's and are not due to expire for at least six months from their desired SCWI testing date, will need to complete the SCWI application only. If you are not successful in passing the SCWI examination, you will maintain your active CWI status until your expiration date. At that time, you must pay the regular renewal/re-certification fees.

SCWI Exams

SCWI exam applicants shall successfully meet the SWI requirements as contained in AWS B5.1, paragraphs 6.2 and 7.2 and AWS QC1, paragraph 6.1. SCWI exam applicants shall pass the following examinations.

Examination	Minimum Number of Questions	Minimum Percentage of Correct Answers
Part A (closed book) Part B (hands-on)	200	72% (144 correct answers)

11. Part C - Code Exam

An exam applicant shall select and indicate on his/her certification application the Code to which they are to be tested. Applicants are responsible for verifying with the AWS Certification Department which Codes are available and which editions of those Codes are applicable to the examination.

The CASTI CAWI/CWI course will prepare exam candidates to write the ASME code exam. However, an exam candidate may write any of the code exams available as part of the welding inspector certification.

CAWI/CWI Code Exams

- AWS D1.1 – Structural Steel: 2002, 2004, or 2006 editions permissible
- AWS D15.1 – Railroad: 1993 edition
- AWS D1.5 – Bridges: 2002 edition
- API-1104 – Pipelines 20th edition with 2007 errata/addenda
- ASME Section IX-2007, B31.1-2007, and B31.3-2006

Note: For individuals considering registration in the CASTI CAWI/CWI course, please be advised that prior ASME code experience is recommended before taking this course. For individuals without prior ASME code experience, it is recommended that the CASTI ASME Section IX - Welding Codes and Metallurgy course be taken in advance.

SCWI Code Exam

AWS B2.1:2005; AWS B4.0:2007; AWS QC1:2007; and ASNT SNT-TC-1A:2006 editions only

12. CAWI and CWI Re-examinations

Re-examinations shall be considered as retaking the same exam. Candidates may take one (1) re-examination within one year of the original test date without further training. Any additional retests taken will require documentation of 40 hours of further training received in welding inspection meeting the requirements of AWS QC1, paragraph 16.5.1. The maximum number of retests taken in any three-year period is three (3).

13. CAWI and CWI Examination Structure

CAWI and CWI Examination Structure	Percent of Total Questions*
Code Applications	
Material and Design	10
Fabrication	30
Inspection	25
Qualification	30
Fundamentals	
Welding Processes	10
Heat Control & Metallurgy (carbon and low-alloy steel)	6
Weld Examination	9
Welding Performance	9
Definitions and Terminology	12
Symbols—Welding and NDE	10
Test Methods—NDE	8
Reports and Records	6
Duties and Responsibilities	4
Safety	5
Destructive Tests	4
Cutting	3
Brazing	2
Soldering	1
Practical Applications	
Procedure and Welder Qualifications	30
Mechanical Test and Properties	10
Welding Inspection and Flaws	36
NDE	10
Utilization of Specification and Drawings	10

*Percentages indicate the minimum required for each category in an examination.

14. CAWI, CWI, and SCWI Renewal

Certification becomes effective on the first day of the month following the date of examination. On that same month and day, expiration occurs three years later.

CAWIs are not eligible for renewal. A CAWI may only hold the CAWI certification for a three-year period. The CAWI must meet the requirements of a CWI in or before the third year of their CAWI certification.

CWI and SCWI certification is maintained every 3 years by submitting an approved renewal application to the AWS Certification Department by the expiration date of the current certification and no earlier than 6 months prior to the expiration date of that certification. AWS may send a renewal notice, but if not received, it remains the responsibility of the SCWI or CWI to renew on time.

15. CAWI to CWI Upgrading

CAWIs who score 72% or greater in Parts A, B, and C exams are eligible for upgrading to CWI status once the CWI experience requirements are met (see AWS QC1 5.2.2 and 14.1). Upgrading is not automatic and requires application within the 3 year CAWI period.

CAWIs who score less than 72% in Parts A, B, and C exams are eligible for upgrading by examination (see AWS QC1 6.2.1) once the CWI experience requirements are met.

16. CWI and SCWI 9-Year Recertification

Before the end of the 9th year from the date of initial certification, and each nine years thereafter, CWI seeking recertification shall make application to the AWS Certification Department by the expiration date of the current certification and no earlier than 6 months prior to the expiration date of the current certification.

CWI recertification may be made by taking the Part B Practical examination or by taking a Code endorsement exam. Alternatively, a CWI recertification may be made by experience and continuing education (see AWS QC1 16.4).

SCWI recertification by examination by rewriting the Part A and B exams or by taking a Code endorsement exam. Alternatively, SCWI recertification may be made by experience and continuing education (see AWS QC1 16.2.2).

The SCWI and CWI requesting renewal of certification shall attest to having no period of continuous inactivity greater than two years in activities as described in AWS B5.1 during the previous three years of certification. SCWI and CWI certification renewals are limited to two consecutive three-year periods. Before the end of the third three-year period, SCWIs and CWIs are required to recertify by complying with the 9-year recertification requirements. CWIs who are renewing or are at their 9-year recertification but seek SCWI certification must complete two

applications. One application shall be for 9-year CWI recertification (by either Part B exam or continuing education) and the other application shall be to take the SCWI exam.

CWIs who recertify by taking the Part B Practical examination or by taking a Code endorsement exam and desire to sit for the SCWI examinations will have to take both the CWI Part B Practical and the SCWI examinations. Applicants for SCWI certification who successfully meet the requirements for CWI renewal or recertification in advance but fail to meet the requirements of the SCWI Part A and Part B exams shall not lose their CWI status.

For more details regarding recertification, see AWS QC1 section 16.

17. Code Packages

The ASME code package is available to CASTI course registrants at an educational discount price. These documents are available as a package only, not on an individual basis. To purchase this code package, go to the Courses web page at www.casti.ca.

The following ASME Codes are found in the CASTI CWI ASME Code Package:

- a) ASME Section IX – 2007*
- b) ASME B31.1 – 2007*
- c) ASME B31.3 – 2006*

***Note:** only the specific portions of the three ASME codes required for the CWI ASME code exam are supplied in this code package. Subsequent addenda, interpretations, or errata are not included with this educational discounted package.

18. Welding Inspector Exam Preparation Training by CASTI

The CASTI welding inspector exam preparation course outline and online registration are available on the Courses web page at www.casti.ca.

Note: Prior ASME code experience is recommended before taking this course. For individuals without prior ASME code experience, it is recommended that the CASTI ASME Section IX - Welding Codes and Metallurgy course be taken in advance.

The CASTI SCWI exam preparation course is currently under development. Please check www.casti.ca/aws for update information regarding this course.

Registration in a CASTI welding inspector course does **not** automatically include registration for an AWS exam. If applying for the course and the examination, approval for the exam is contingent upon:

- a) meeting the examination registration criteria described in the latest editions of AWS QC1 and AWS B5.1, and
- b) formal approval by the AWS Certification Department.

19. CSA W178.2 Recognition of AWS QC1 Welding Inspector Certification

The Canadian Welding Bureau (CWB) as the Administrator of CSA Standard W178.2 recognizes the welding inspector certifications granted by the American Welding Society (AWS), subject to the following limitations.

Individuals who hold a valid AWS certification to AWS QC-1:2007 as a:

- Certified Associate Welding Inspector (CAWI) may apply for a CSA W178.2 Level 1 welding inspector certification.
- Certified Welding Inspector (CWI) may apply for a CSA W178.2 Level 2 certification. However, to obtain the Level 2 certification the CWI must have 2 years of visual welding inspection experience at this level.
- Senior Certified Welding Inspector (SCWI) may apply for a CSA W178.2 Level 2 welding inspector certification.

The following conditions apply for the above candidates:

1. Candidates must complete and submit CWB Forms 450 and 455 and the fee.
2. Candidates must provide a copy of their Certificate and wallet card issued by AWS. The AWS certification must still be valid in order to obtain the examination exemption. The AWS certification must be as a Certified Associate Welding Inspector (CAWI), Certified Welding Inspector (CWI) or Senior Certified Welding Inspector (SCWI) to AWS QC-1:2007.
3. Candidates, who meet the above criteria, are exempt from all examinations except for the examination on CSA Standard W178.2-08. The candidate's certification to CSA W178.2-08 will be for 3 years commencing from the date certification is granted. Renewal will be in accordance with the requirements of CSA W178.2-08.
4. Inspectors who have allowed their AWS certification to lapse may apply for certification in the appropriate level, but must write all of the applicable examinations.
5. Candidates who possess the AWS CWI certification and who have 7 years of visual welding inspection experience at this level may apply to write the full CSA W178.2-08 Level 3 welding inspector examinations.
6. Candidates who possess the AWS CAWI certification and who have 2 years of visual welding inspection experience at this level may apply to write the full CSA W178.2-08 Level 2 welding inspector examinations.

For more details see CWB Form 301 - Guide - Applying for Certification as Welding Inspectors to CSA Standard W178.2 which can be found at www.cwbgroup.org.

20. AWS QC1 Reciprocity with CSA W178.2 Welding Inspector Certification

The AWS Reciprocity Program is specifically designed for Canadian Welding Inspectors who have successfully completed the Canadian Standard CSA W178.2 examination and is currently holding a valid Canadian Welding Bureau (CWB) card. The Canadian Welding Bureau levels II and III are equivalent to the AWS Certified Welding Inspector (CWI) and level I is equivalent to the Certified Associate Welding Inspector (CAWI).

Under the Reciprocity Program, these individuals are eligible for the Certified Welding Inspector or Certified Associate Welding Inspector certification. Reciprocal CWI certification carries the same corresponding expiration month and year of the CWB card.

To apply for Reciprocity, please complete the Reciprocity Application (Be sure to check the “1st Time Reciprocity” box in the upper left hand corner of the application). Attach a copy of your CWB certificate card that confirms you are certified to the Canadian Standard CSA W178.2 and shows a current expiration date.

In order to maintain your certification status with AWS, your CWB certification must remain current. During the same time you renew your CWB certification, you must also submit the Reciprocity Application (Be sure to check the “Reciprocity Renewal” box in the upper left hand corner of the application). If you allow your CWB certification to lapse, you will also lose your AWS certification.

The standard processing time is six weeks and applicants will be notified AFTER your application has been submitted.

If you choose to mail your application via overnight delivery, please mail directly to:

American Welding Society
550 NW LeJeune Road
Miami, Florida 33126

Please retain a copy of your completed application for your records.

Please refer to the AWS Price List and the AWS Exam Cancellation Refund Policies and other Fees for all applicable fees that can be found at www.aws.org. Be sure to complete the Method of Payment section on the application. All checks and money orders must be in U.S. currency and made payable to AWS. Payment must accompany your application.

CERTIFICATION DOCUMENTATION WILL NOT BE MAILED UNTIL PAYMENT HAS BEEN FULLY SATISFIED.

If there any questions or concerns regarding the Reciprocity process, please feel free to contact the AWS Certification Department at: 1-800-443-9353, ext. #273.

21. CSA W178.2 Recognition of Recognition of API 510 Pressure Vessel and API 570 Piping Inspector Certifications

The Canadian Welding Bureau (CWB), as the Administrator of CSA Standard W178.2, recognizes either the API 510 or API 570 certification granted by the American Petroleum Institute (API), subject to the following conditions.

1. Candidates must complete and submit CWB Forms 450 and 455 and the fee.
2. Candidates must provide proof of API certification. The API certification must still be valid in order to obtain the examination exemption.
3. Level 1: Candidates may obtain a Level 1 certification upon demonstrating they meet the W178.2-08 vision requirement and must complete the practical exam, the full closed book exam and the examination on CSA Standard W178.2-08. See items 7 & 8 for code exam requirements.
4. Level 2: Candidates may obtain a Level 2 certification upon demonstrating they meet the W178.2-08 vision requirement and have 3 years of experience as an API 510 or API 570 inspector. Candidates must also complete the practical exam, the full closed book exam and the examination on CSA Standard W178.2-08. See items 7 & 8 for code exam requirements.
5. Level 3: Candidates may obtain a Level 3 certification upon demonstrating they meet the W178.2-08 vision requirement and have 7 years of experience as an API 510 or API 570 inspector. Candidates must also complete the practical examination, the full closed book exam and the examination on CSA Standard W178.2-08. See items 7 & 8 for code exam requirements.
6. Inspectors who have allowed their API certification to lapse may apply for certification in Level 1, 2 or 3, as applicable, but must write all examinations.
7. Candidates applying for certification and who have held their API 510 or 570 certification for six (6) or more years are also required to write the CWB's examination on ASME Sections VIII & IX or ASME B31.3, as applicable.
8. Candidates applying for certification and who have held their API 510 or 570 certification for less than six (6) years are exempt from writing the CWB's examinations on ASME Sections VIII & IX or ASME B31.3, as applicable. However, they must complete all of the other qualifying exams for the level sought prior to the six year anniversary of their API 510 or 570 certification, otherwise they are also required to write the CWB's examination on ASME Sections VIII & IX or ASME B31.3, as applicable. The candidate's 6 year code re-examination date will be based on either the date of completion of either the CWB or API examination.
9. The candidate's certification to CSA W178.2-08 will be for 3 years commencing from completion of the applicable examinations. Renewal will be in accordance with the requirements of CSA W178.2-08.

For more details see CWB Form 301 - Guide - Applying for Certification as Welding Inspectors to CSA Standard W178.2 which can be found at www.cwbgroup.org.

Appendix A

Organizations and Inspection Standards

Organizations

- API: American Petroleum Institute
- ABSA: Alberta Boiler Safety Association
- AWS: American Welding Society
- BWF: Brazilian Welding Federation
- CSA: Canadian Standards Association
- CWB: Canadian Welding Bureau
- SAIW: South Africa Institute of Welding
- TWI: The Welding Institute (UK)
- WTIA: Welding Technology Institute of Australia

Inspection Standards

- Alberta Pressure Welders Regulation 169/2002 (administered by ABSA)
- API 510-2006 Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration
- API 570-2006 Piping Inspection Code: Inspection, Repair, Alteration, and Rerating of In-service Piping Systems
- AWS QC1-2007 Certification of Welding Inspectors
- AWS B5.1:2003 Qualification of Welding Inspectors
- CSA W178.2-01 Certification of Welding Inspectors (administered by CWB)
- TWI CSWIP-WI-6-92 Certification of Welding Inspectors
(CSWIP: Certification Scheme for Welding Inspector Personnel)

Certification Terms

- CWI: certified welding inspector
- CAWI: certified associate welding inspector
- SCWI: senior certified welding inspector
- SWI: senior welding inspector
- VWI: visual welding inspector
- WE: welding examiner
- WI: welding inspector

Appendix B

Welding Inspector Matrix Education and Experience Requirements

CSA W178.2	AWS QC1	TWI CSWIP	ALBERTA WE	API 510/570
<p>Level 1 WI shall have:</p> <p>a) obtained at least 1 yr of <i>qualified</i> experience or</p> <p>b) successfully completed recognized courses in the fundamental principles and practices of welding, quality control, and welding inspection</p> <p><i>Note:</i> Level 1 WI shall perform welding inspection under Level 2 or Level 3 WI or by non-certified personnel who, in the opinion of the CWB, possess the knowledge, skills training, and experience required to perform such supervision</p>	<p>CAWI shall have:</p> <p>a) high school graduate and</p> <p>b) min. of 2 yrs of <i>qualified</i> experience with welding fabrication and standards and directly involved in 1 or more <i>qualified</i> areas</p> <p>c) alternatively, 2 yrs post-high school education in welding curriculum or engineering technology, engineering, or physical sciences, and a min. of 6 months experience in any of the welding functions</p> <p><i>Note:</i> CAWI shall perform inspections under the active supervision of a CWI or SCWI</p>	<p>Level 1 VWI:</p> <p>a) there is no specific experience requirement, but it is recommended that candidates possess a min. of 6 months welding related engineering experience and 2 yrs industrial experience and</p> <p>b) candidates must attend a CSWIP approved course of training for this level prior to examination</p> <p><i>Note:</i> VWI shall perform inspections under the supervision of a Level 2 WI or Level 3 SWI</p>	<p>WE must satisfy at least one of the following:</p> <p>a) P.Eng. with a B.Sc. in metallurgy, welding or mechanical eng. or</p> <p>b) first class power engineer</p> <p>c) CET in materials or mechanical eng. tech.</p> <p>d) diploma in welding eng. tech.</p> <p>e) grade A or B pressure welder</p> <p>f) CSA W178.2 Level III WI</p> <p>g) safety codes officer boiler discipline</p> <p>h) other equivalent qualifications</p>	<p>API 510 or 570 inspector shall have:</p> <p>a) B.Sc. in eng. or tech. plus 1 yr of <i>qualified</i> experience in supervision or performance of inspection activities or</p> <p>b) 2-yr degree or certificate in eng. or tech. plus 2 yrs of <i>qualified</i> experience of which 1 yr must be in supervision or performance of inspection activities or</p> <p>c) high school diploma plus 3 yrs of <i>qualified</i> experience of which 1 yr must be in supervision or performance of inspection activities or</p> <p>d) a min. 5 yrs of <i>qualified</i> experience of which 1 yr must be in supervision or performance of inspection activities</p>
<p>Level 2 WI shall have:</p> <p>a) min. 2 yrs of experience as a certified Level 1 welding inspector</p>	<p>CWI shall have::</p> <p>a) high school graduate and</p> <p>b) min. of 5 yrs of <i>qualified</i> experience with welding fabrication and standards and directly involved in 1 or more <i>qualified</i> areas</p> <p>c) alternatively, max. of 2 yrs of post-high school education may be substituted for an equal number of years of the required 5 yrs experience, as follows:</p> <p>i) eng., eng. tech., or sc. degree; 2 yrs max.</p> <p>ii) eng. or eng. tech. courses; 2 yrs max.</p> <p>iii) trade/vocational courses related to welding; 1 yr max.</p>	<p>Level 2 WI shall have:</p> <p>a) min. 3 yrs <i>qualified</i> experience under <i>qualified</i> supervision, independently verified or</p> <p>b) certified as Level 1 VWI for a min. of 2 yrs with <i>qualified</i> experience or</p> <p>c) been a welding instructor or welding foreman/supervisor for a min. of 5 yrs</p> <p>d) in addition to all of the above, candidates must attend a CSWIP approved course of training for this level prior to examination</p>	N/A	N/A

Welding Inspector Matrix - Education and Experience Requirements (Continued)				
CSA W178.2	AWS QC1	TWI CSWIP	ALBERTA WE	API 510/570
<p>Level 3 WI shall have:</p> <p>a) a min. 4 yrs of experience as a certified Level 2 welding inspector</p>	<p>SCWI shall have:</p> <p>a) high school graduate and</p> <p>b) min. of 15 yrs of <i>qualified</i> experience with welding fabrication and standards and directly involved in 2 or more <i>qualified</i> areas and</p> <p>c) qualified as a CWI for a min. 6 of yrs</p> <p>d) alternatively, max. 2 yrs of post-high school education may be substituted for an equal number of yrs of the required 15 yrs experience, as follows:</p> <p>i) eng., eng. tech., or sc. degree; 2 yrs max.</p> <p>ii) eng. or tech. courses; 2 yrs max.</p> <p>iii) trade/vocational courses related to welding; 1 yr max.</p>	<p>Level 3 SWI shall:</p> <p>a) be a Level 2 WI for a min. of 2 yrs with <i>qualified</i> experience or</p> <p>b) have 5 yrs of <i>qualified</i> experience</p> <p>c) in addition to the above, candidates must attend a CSWIP approved course of training for this level prior to examination</p>	N/A	N/A
<p>Note: In exceptional cases, practicing welding inspectors may be eligible to qualify directly as Level 2 or Level 3. In such cases, candidates shall demonstrate to the CWB that their combination of education, training, and experience is equivalent to either Level 2 or Level 3.</p>	<p>Note: there are 12 areas of <i>qualified</i> experience options listed in AWS B5.1 para. 5.5.</p>	<p>Note: a mature candidate route offering exemption from formal training is available for candidates for Level 1 VWI and Level 2 WI who are able to demonstrate at least 10 yrs of recent continuous <i>qualified</i> experience under <i>qualified</i> supervision, independently verified.</p>	<p>Note: Other qualifications may be considered under provisions that allows the Administrator to accept equivalencies. The candidate must have relevant experience, which would include involvement in the pressure equipment industry related to fabrication, inspection, repair, welding, design, quality control or operation. The candidate would also have suitable academic qualifications in recognized courses in welding, materials, ASME Codes and NDE.</p>	N/A

Appendix C

Welding Inspector Matrix – Examinations

CSA W178.2	AWS QC1	TWI CSWIP	Alberta WE	API 510/570
<p>Level 1: a) welding inspection; 1.5 hrs, closed b) product category code exam; 2 hrs, open c) W178.2; 0.5 hrs, open d) visual; 0.5 hr min. grade: 70% total: 4.5 hrs</p>	<p>CAWI: a) fundamentals; 2 hrs, closed b) practical; 2 hrs c) selected code; 2 hrs, open min. grade: 60% total: 6 hrs</p>	<p>Level 1 VWI: a) practical A1 (butt weld); 1.5 hrs b) practical B1 (fillet weld); 1 hr min. grade 70% total: 2.5 hrs</p>	<p>WE: a) welding processes (closed) and filler metal standards (open); 3.5 hrs b) metallurgy (closed) and material standards (open); 3.5 hrs c) quality control and weld evaluation (closed) codes (open); 3.5 hrs d) regulations and codes (open); 3.5 hrs min. grade 70% total 14 hrs</p>	<p>API 510: a) API 510 b) API 571-portion c) API 572 d) API 576 e) API 577 f) ASME V: Articles 1, 2, 6, 7, 9, and 23 g) ASME VIII-1: UG, UW, UCS, UHT, App. 1-4, 6, 8, 12 h) ASME IX-QW; 4 hrs open 4 hrs closed min. grade varies with exam, usually 70-74% total: 8 hrs</p>
<p>Level 2: a) welding fundamentals and welding inspection; 3 hrs, closed b) descriptive report writing; 1 hr, closed c) product category code exam; 2 hrs, open d) W178.2; 0.5 hrs, open e) visual; 0.5 hr min. grade: 70% total: 7.0 hrs</p>	<p>CWI: a) fundamentals; 2.0 hrs, closed b) practical; 2.0 hrs c) selected code; 2.0 hrs, open min. grade: 72% total: 6 hrs</p>	<p>Level 2 WI: a) general welding technology and NDT; 0.75 hr closed b) specific welding technology; 1.25 hrs closed c) practical A2; 1.25 hrs d) practical B2; 1.75 hrs e) practical C2; 0.75 hr min. grade 70% total: 5.75 hrs</p>	<p>N/A</p>	<p>API 570: a) API 570 b) API 571-portion c) API 574 d) API 577 e) API 578 f) ASME V: Articles 1, 2, 6, 7, 9, 10 and 23 g) ASME IX-QW h) ASME B16.5 i) ASME B31.3; 4 hrs open and 4 hrs closed min. grade varies with exam, usually 70-74% total: 8 hrs</p>

Welding Inspector Matrix – Examinations (Continued)				
CSA W178.2	AWS QC1	TWI CSWIP	Alberta WE	API 510/570
<p>Level 3:</p> <p>a) welding fundamentals, welding inspection, and welding metallurgy; 3.5 hrs, closed</p> <p>b) descriptive report writing; 1 hr, closed</p> <p>c) product category code exam; 2.0 hrs, open</p> <p>d) W178.2; 0.5 hr, open</p> <p>e) visual; 0.5 hr</p> <p>min. grade: 70%</p> <p>total: 7.5 hrs</p>	<p>SCWI:</p> <p>a) technical fundamentals; 2.0 hrs, closed</p> <p>b) administrative fundamentals; 2.0 hrs</p> <p>min. grade: 72%</p> <p>total: 6 hrs</p>	<p>Level 3 SWI:</p> <p>a) specific welding technology (including audit); 1.25 hr closed</p> <p>b) general welding technology and NDT closed; 0.75 hr</p> <p>c) practical; 1 hr</p> <p>d) oral: management, QC; no time limit</p> <p>e) practical: weld failures; 1 hr</p> <p>f) practical: fabrication drawing; 1 hr</p> <p>g) standard radiographic interpretation option; 0.5 hr</p> <p>h) practical radiographic interpretation (optional); 2.25 hrs</p> <p>min. grade 70%</p> <p>total: 5 hrs + oral 7.75 hrs with RI option</p>	N/A	N/A
<p>Code Exams:</p> <p>a) CSA W47.1 and W59</p> <p>b) ABS</p> <p>c) CSA S473</p> <p>d) ASME B31.3</p> <p>e) CSA Z662</p> <p>f) ASME VIII-1 and IX</p> <p>g) API 650</p>	<p>Code Exams:</p> <p>a) AWS D1.1</p> <p>b) AWS D1.2</p> <p>c) AWS D1.5</p> <p>d) AWS D15.1</p> <p>e) API 1104</p> <p>f) ASME IX, B31.1, and B31.3</p> <p>g) ASME VIII-1 and IX</p>	<p>Code Exams:</p> <p>a) BS 1113</p> <p>b) BS EN 12952 (15 parts)</p> <p>c) BS 2633 Cl 1</p> <p>d) BS 2654</p> <p>e) BS 2971 Cl 11</p> <p>f) BS 4515</p> <p>g) BS 4677</p> <p>h) PD 5500</p> <p>i) BS 5400 Part 6</p> <p>j) EEMUA</p> <p>k) ASME B31-3</p> <p>l) API 1104</p> <p>m) ASME VIII-1</p> <p>n) AWS D1.1</p> <p>o) ABS</p> <p>p) AS 4037</p> <p>q) AS 4041</p> <p>r) AS 2885.2</p> <p>s) any other national or international standard may also be included.</p>	<p>Code Exams:</p> <p>a) ASME I-PW</p> <p>b) ASME II-A (SA-106, 312, 333, 387 and 516)</p> <p>c) ASME II-C</p> <p>d) ASME V</p> <p>e) ASME VIII-1</p> <p>f) ASME IX-QW</p> <p>g) ASME B31.1-Chapter V</p> <p>h) ASME B31.3-Chapter VI</p> <p>i) National Board Inspection Code Part 3</p>	<p>Optional Exams:</p> <p>a) API 571</p> <p>b) API 577</p> <p>c) API 580</p> <p>(4 hrs each)</p>

Appendix D

Welding Inspector Matrix – Renewals

CSA W178.2	AWS QC1	TWI CSWIP	Alberta WE	API 510/570
Levels 1, 2, 3: - 3 yrs reapply - 6 yrs re-exam; written exam(s) on certified code(s)	CAWI: - valid for 3 yrs, non-renewable CWI: - 3 yrs reapply - 9 yrs re-exam; either a practical or code exam or by experience and continuing education (min. 80 PDH with 20 PDH within last 3 yrs) SCWI: - 3 yrs reapply - 9 yrs re-exam; either written or practical or code exam or by experience and continuing education (min. 80 PDH with 20 PDH within last 3 yrs)	Levels 1, 2, 3: - 5 yrs reapply - 10 yrs re-exam; 1 written exam; 1 practical exam	- 3 yrs reapply	- 3 yrs reapply - 6 yrs re-exam; online exam on latest edition of 510 or 570
	CAWI to CWI Upgrading: CAWIs who score 72% or greater in Parts A, B, and C exams are eligible for upgrading to CWI status once the CWI experience requirements are met.			

Appendix E

Welding Inspector Matrix – Reciprocity and Recognition

Read ↓	CSA W178.2	AWS QC1	TWI CSWIP	Alberta WE	API 510/570
CSA W178.2	---	CAWI* → Level 1 CWI* → Level 2 (after 2 yrs as CWI) CWI* → Level 3 (after 7 yrs as CWI) SCWI* to Level 2 reciprocity * must write a 0.5 hr open-book W178.2 exam	Level 1 → Level 1 - must write Level 1 welding inspection exam Level 2 → Level 2 - must write a code exam Level 3 → Level 3 - must write a code exam and W178.2 exam	None	API 510/570* → Level 1 API 510/570* → Level 2 (after 3 yrs as API inspector) API 510/570* → Level 3 (after 7 yrs as API inspector) * must write 0.5 hr practical exam, closed-book exam, and W178.2 exam * Candidates who have had API certification more than 6 years must write CWB exam on ASME VIII & IX, or B31.3.
AWS QC1	Level 1 → CAWI Level 2 → CWI No Level 3 to SCWI reciprocity	---	Level 1* → CAWI Level 2* → CWI Level 3* → SCWI * must write a practical exam	None	None
TWI CSWIP	None	CAWI* → Level 1 CWI* → Level 2 SCWI* → Level 3 * must write a practical exam	---	None	None
Alberta WE	None	None	None	---	None
API 510/570	None	None	None	None	---
			Note: TWI CSWIP has agreements with BWF, SAIW, and WTIA		