IIW Guideline
Alternative Route

Minimum Requirements for the Education, Examination and Qualification

IAB-442r1-25

MINIMUM REQUIREMENTS FOR THE EDUCATION,
TRAINING, EXAMINATION AND QUALIFICATION

ALTERNATIVE ROUTE (AR)

Prepared and issued by the IAB-International Authorisation Board based on the EWF above mentioned guidelines

Under the authority of the IIW – International Institute of Welding

For more information regarding the Qualifications System, the IAB/EWF Management Team or the National ANB should be contacted

(see in the IIW and EWF sites the ANBs contacts)

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Part I – Basic requirements concerning the application for the Alternative Route (AR) within IIW and EWF Systems

1 General introduction and scope of the document

To gain an IIW Diploma under the IIW (and EWF) System, the following routes for qualification are applicable:

1. The Standard Route
2. The Alternative Route
3. Blended Learning Route
4. The Experiential Route
5. Transition Route

Each qualification guideline describes the routes: Standard, Experiential, and Transition. Regarding the Blended Learning route, the training programme and examination are defined in the qualification guideline, but the structure of the blended learning courses is defined in the guideline IAB-195 (latest edition).

This document has the aim to define the rules and requirements for applicants that want to apply for the Alternative Route.

The Alternative Route is aimed at individuals who may already have experience of the job function at a particular level and relevant education level without holding the appropriate qualification diploma. These individuals will have already gained full, or part knowledge of the syllabus defined in this guideline and can demonstrate in a documented way, their capability to proceed to examination either directly without compulsory attendance at an ANB approved training course or by attending only part of such a course

This guideline can be applied for the following qualification levels:

- IWE – International Welding Engineer
- IWT – International Welding Technologist
- IWS – International Welding Specialist
- IWP – International Welding Practitioner
- IWI-C - International Welding Inspector – Comprehensive
- IWI-S - International Welding Inspector – Standard
- IWI-B – International Welding Inspector - Basic

See the more information about these qualification levels on the guideline for Welding Coordination Personnel, IAB-252 (latest edition) and Welding Inspection Personnel, IAB-041 (latest edition).

2 Application and Access Conditions for the Alternative Route (AR)

For Welding Coordination Personnel, applicants shall submit the Application Form (see Appendix I) to the ANB together with the appropriate documents indicated in the sub clause 2.1. for a paper assessment.

For Welding Inspection Personnel (IWIP), applicants shall submit the Application Form (see Appendix V) to the ANB together with the appropriate documents indicated in sub clause 2.2 for a paper assessment

The ANB shall check the documentation submitted to ensure the applicant meets the national Access Conditions (see doc IAB-020- latest edition). In addition, the ANB check should evaluate and verify the applicant's experience, training, education and practice of the job function in welding or welding inspection at the relevant qualification level. The result of this assessment shall determine if the applicant is suitable for further detailed assessment (see Part II).

See the next pages for the AR process for the several qualifications levels.

2.1 For Welding Coordination Personnel

2.1.1 For International Welding Engineer - IWE

The applicant shall submit:

- The Application Form (see Appendix I)
- A copy of a diploma showing graduation in an engineering subject complying with the Access Conditions.
- A curriculum vitae (CV) - resume containing professional information:
  - evidence of at least 4 years' job function in welding at the level of an engineer (in a period of 6 years before application);
  - justification of candidate's experience, training, and education to become IWE (may include other test results).

Applicants who satisfy the Access Conditions AND already hold an IWT diploma should be considered under the Alternative Route

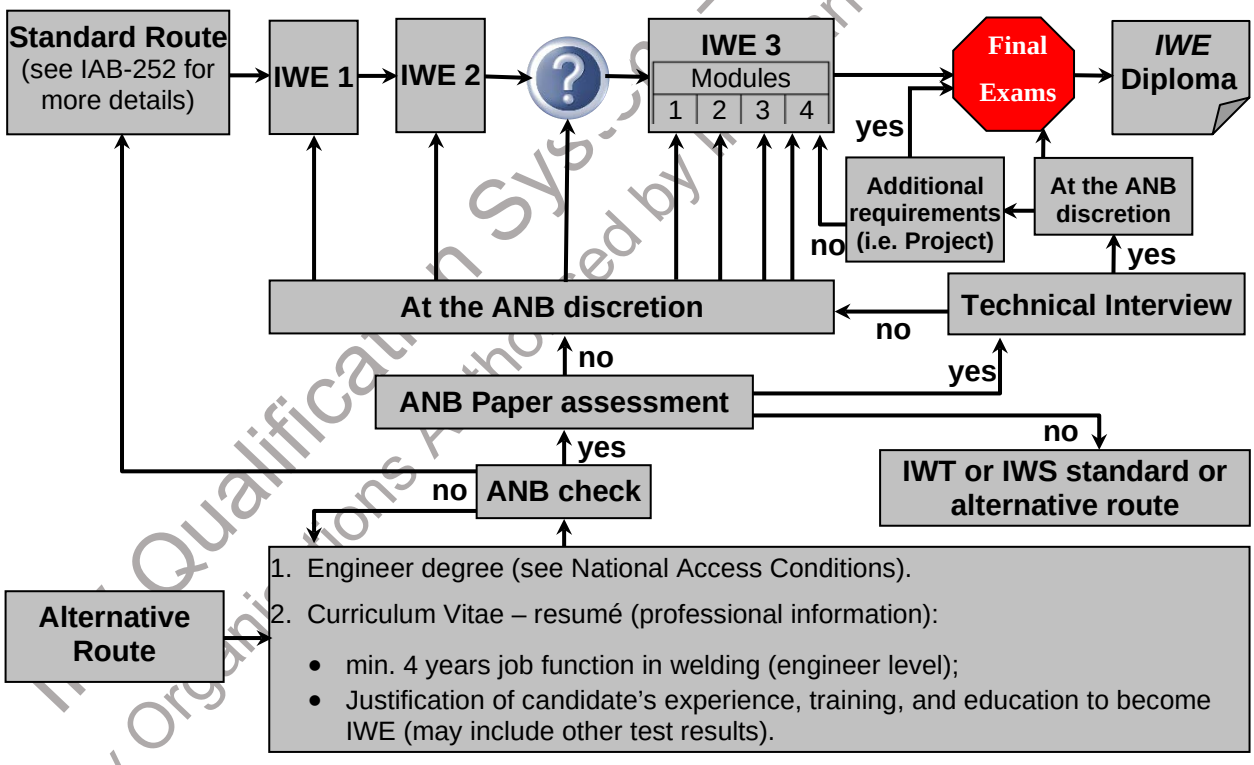

Diagram 1: Alternative versus Standard Routes for IWE qualification

(see also Part II – The Alternative Route Application Evaluation process)

2.1.2 For International Welding Technologist - IWT

The applicant shall submit:

- The Application Form (see Appendix I)
- A copy of a diploma showing graduation as technologist complying with the Access Conditions.
- A curriculum vitae (CV) - resume containing professional information:
  - evidence of at least 4 years' job function in welding at the level of a technologist (in a period of 6 years before application);
  - justification of candidate's experience, training, and education to become IWT (may include other test results).

Applicants who satisfy the Access Conditions AND already hold an IWS diploma should be considered under the Alternative Route.

Applicants who satisfy the Access Conditions AND hold an IWI-C diploma should be considered under the Alternative Route.

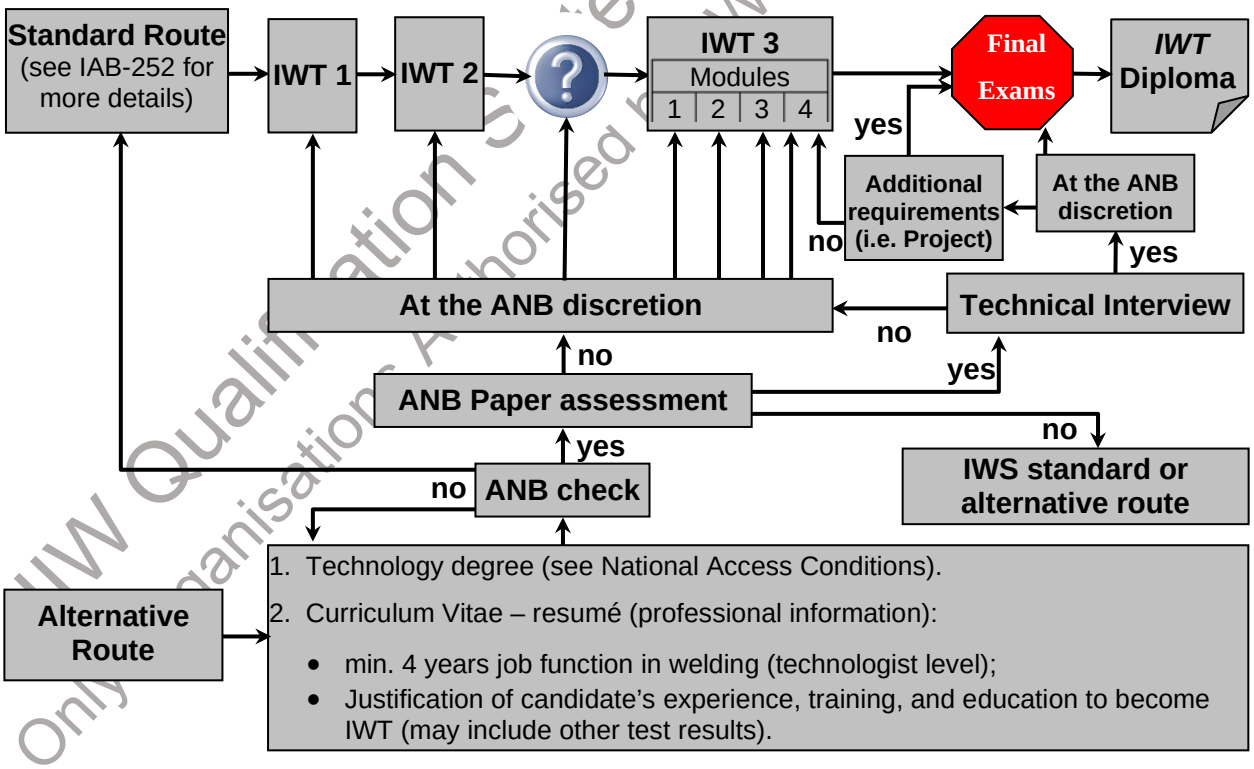

Diagram 2: Alternative versus Standard Routes for IWT qualification

(see also Part II – The Alternative Route Application Evaluation process)

2.1.3 For International Welding Specialist - IWS

The applicant shall submit:

- The Application Form (see Appendix I)
- A copy of documentary proof showing compliance with the Access Conditions for IWS.
- A curriculum vitae (CV) - resume containing professional information:
  - evidence of at least 3 years' job function in welding at a level equivalent to that of a specialist (in a period of 6 years before application);
  - justification of candidate's experience, training, and education to become IWS (may include other test results).

Applicants who satisfy the Access Conditions AND hold an IWI-S diploma should be considered under the Alternative Route.

Applicants who do not satisfy the Access Conditions but who have a minimum of six years of experience in welding coordination and demonstrate to the ANB that their combination of education, training and experience in welding technology has provided a level of knowledge equivalent to the current IIW requirements should be considered under the Alternative Route.

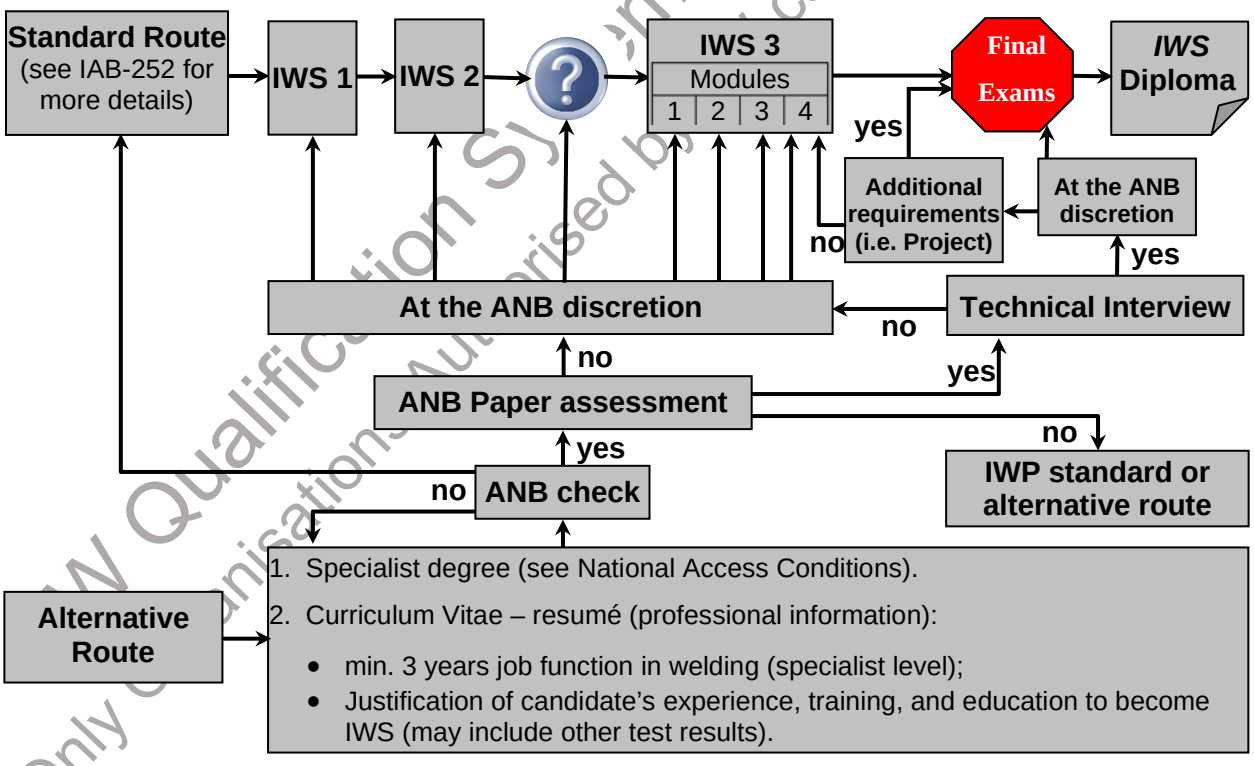

Diagram 3: Alternative versus Standard Routes for IWS qualification

(see also Part II – The Alternative Route Application Evaluation process)

2.1.4 For International Welding Practitioner - IWP

The applicant shall submit

- The Application Form (see Appendix I)
- A copy of a valid welder qualification certificate according with chapter 3.4 of the standard route.
- A curriculum vitae (CV) - resume containing professional information:
  - min. 3 years' job function in welding as a certified plate or tube welder in a period of 5 years before application plus
  - min. 1 year job function in welding practitioner level in a period of 3 years before application;
  - justification of candidate's experience, training, and education to become IWP (may include other test results).

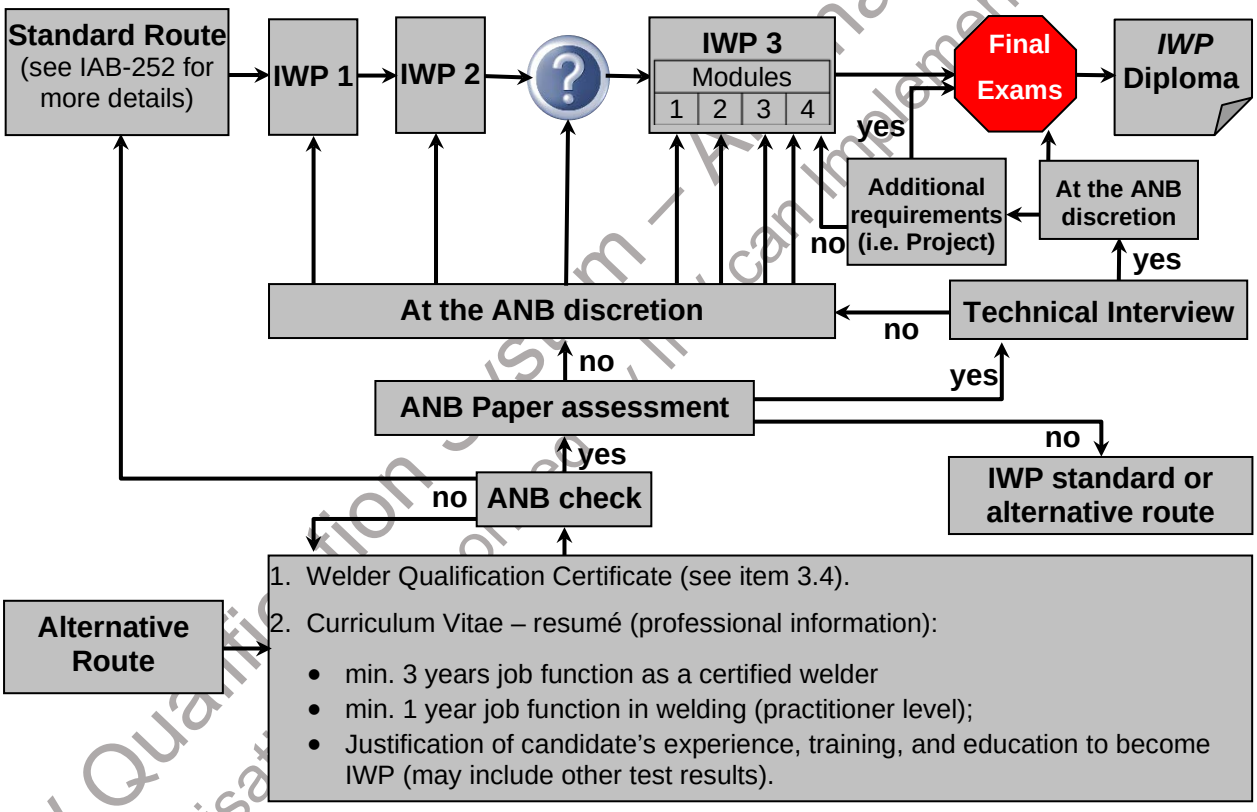

Diagram 4: Alternative versus Standard Routes for IWP qualification

(see also Part II – The Alternative Route Application Evaluation process)

2.2 For Welding Inspection Personnel

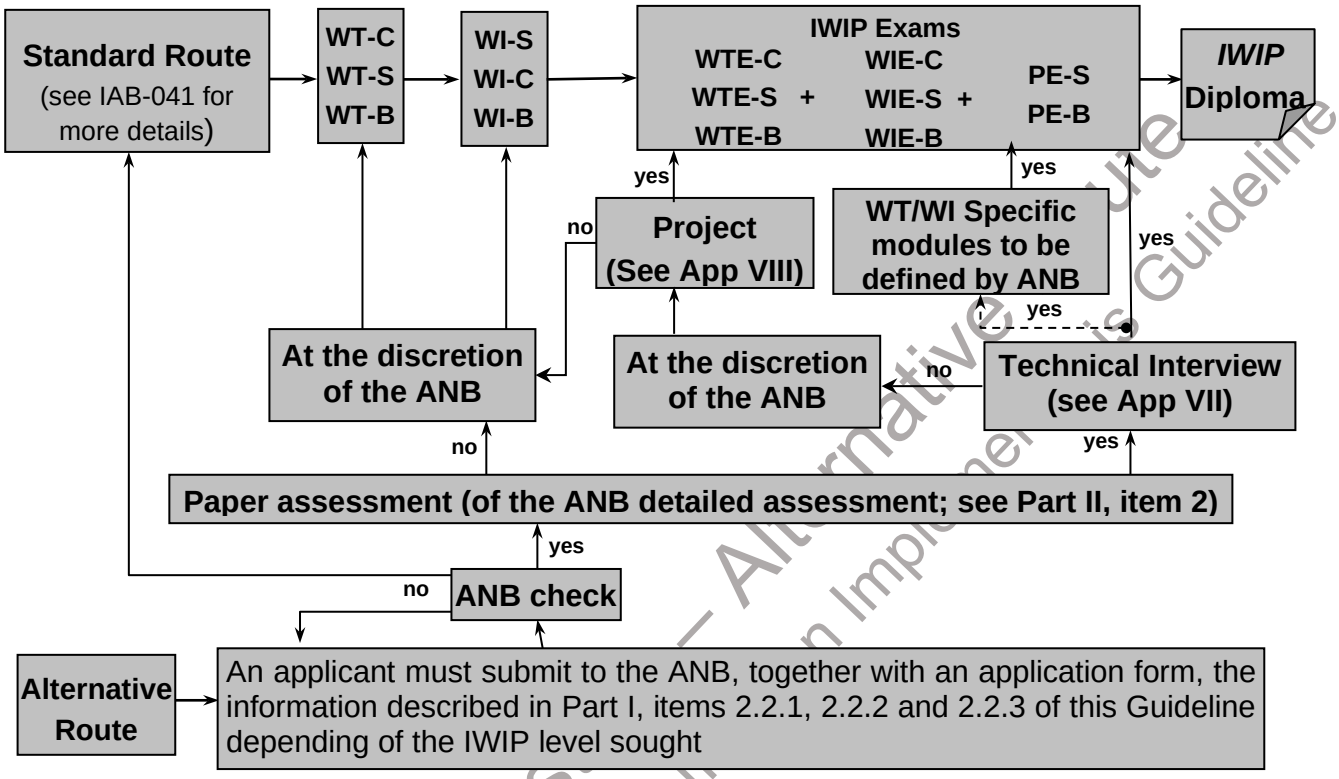

Diagram 5: Alternative versus Standard Routes for IWIP Qualifications

Note: Diagram 5: Alternative Route applicants who have been awarded

- IWT or IWE diplomas (which, according to the Standard Route, are exempt from writing the WTE-B, WTE-S and WTE-C exams) are also exempt from writing these exams when applying for the Alternative Route
- IWS diplomas (which, according to the Standard Route, are exempt from writing the WTE-B, and WTE-S exams) are also exempt from writing these exams when applying for the Alternative Route
- IWP diplomas (which, according to the Standard Route, are exempt from writing the WTE-B exams) are also exempt from writing this exam when applying for the Alternative Route
- IWT or IWE and IWI-S, who are applying for IWI-C, only need to write the WIE-C exam.
- IWS and IWI-S, who are applying for IWI-C, only need to write the WTE-C and WIE-C exams.
- IWS or IWT or IWE and IWI-B, who are applying for IWI-S, only need to write the WIE-S and PE-S exams.

2.2.1 For International Welding Inspector – Comprehensive – IWI-C

The applicant shall submit:

- IWT diploma or evidence of satisfying the access conditions for IWT or higher.
- A curriculum vitae (CV)/resume containing the following professional information:
  - Evidence of at least three years job function in welding and inspection at the Comprehensive level (in a period of 4 years before application)
  - A justification of the candidate's experience, training, and education to become IWI-C (may include other test results)

2.2.2 For International Welding Inspector – Standard – IWI-S

- IWS diploma or evidence of satisfying the access conditions for IWS or higher.
- A curriculum vitae (CV)/resume containing the following professional information:
  - Evidence of at least two years job function in welding and inspection at the Standard level (in a period of 3 years before application)
  - A justification of the candidate's experience, training, and education to become IWI-S (may include other test results)

2.2.3 For International Welding Inspector – Basic – IWI-B

- IWP diploma or evidence of satisfying the access conditions defined for the IWI-B for Route 1 or higher.
- A curriculum vitae (CV)/resume containing professional information:
  - Evidence that the candidate was working in welding and inspection at the Basic level during the last two years before application
  - A justification of the candidate's experience, training, and education to become IWI-B (may include other test results)

2.2.4 Exemptions to the IWIP Final Exams and Detailed Paper Assessment

2.2.4.1 Exemption of Final Exams - WTE

- If applicant has an IWE or IWT diploma is exempt of performing the Final Exams: WTE – B and S and C;
- If applicant has an IWS diploma is exempt of performing the Final Exams: WTE – B and S;
- If applicant has an IWP diploma is exempt of performing the Final Exams: WTE – B.

2.2.4.2 Exemption of Detailed Paper Assessment

If the applicant has an IIW diploma (e.g.: IWE, IWT, IWS, or IWP) or an ANB approved national certificate of welding co-ordination[1], and valid NDT certificates in compliance to ISO 9712 which cover the syllabus of the Welding Inspection Modules of the present Guideline, he/she can proceed to the professional assessment interview for the equivalent level of qualification without a detailed paper assessment.

[1] ANB approved National certificate of welding coordination means certificate content is based on ISO 14731 and issued by a body accredited to ISO 17024.

Part II – The Alternative Route Application Evaluation Process

1 Requirements for ANB Detailed Assessment used in Alternatives Routes for Welding Coordination Personnel

After the candidate has fulfilled the requirements of the ANB paper check he will be admitted to the ANB Detailed Assessment (Diagram 5).

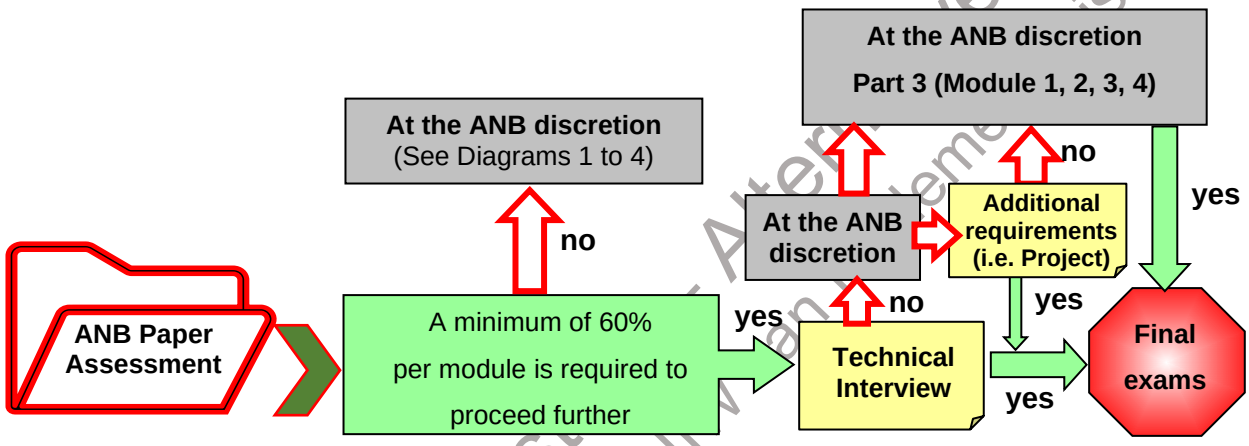

Diagram 6: ANB detailed Assessment for Welding Coordination Personnel

The ANB detailed assessment shall include:

a) The applicant shall submit a fully completed Harmonized Application form (see Appendix I). The applicant is responsible to provide all required evidence to support the information detailed on the Application (e.g. curriculum vitae, course outline, transcripts, certification documents, diplomas, degrees etc.).

b) ANB shall conduct a detailed assessment of the Application and supporting documents against the IIW guideline and access conditions. The assessment will use the Evaluation Matrix (see Appendix II) for the purpose of determining if the candidate's education and experience are consistent with the relevant qualification level of the subject matter in Modules 1 to 4.

The ANB shall apply the Alternative Route Evaluation Matrix, to score the self-evaluation applicant form. As a minimum, the applicant shall reach 60% in each module to be admitted to the technical interview:

Note: If an applicant has a valid certification at the relevant level which covers a module the ANB may accept this as equivalent to the required 60% level.

c) The purpose of the technical interview is to verify the accuracy of the information on the application.

In Modules 1 to 4, at least 50% of the applicant scoring points achieved when the paper assessment was done shall be verified in the Technical Interview (see Appendix III).

d) At the ANBs discretion, an optional requirement may be included prior to the final exams (i.e. project, see Appendix IV).

e) When the ANB has confirmed that the applicant has met the requirements of the detailed assessment (see b) above), technical interview (see c) above) and where applicable, the optional requirement (see d) above), they can be admitted to the final examination defined for the relevant guideline.

It is within the discretion of the ANB to terminate the assessment at any point and defer the application or re-direct the candidate to the standard route.

2. Requirements for ANB Detailed Assessment used in Alternatives Routes for Welding Inspection Personnel

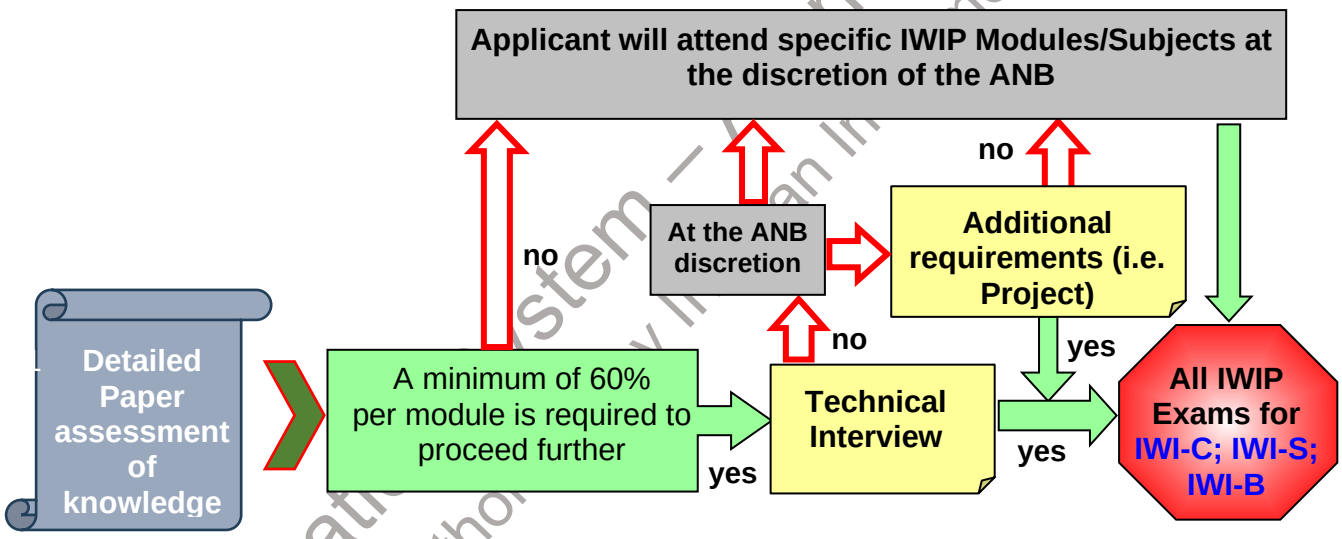

Diagram 7: ANB Detailed Assessment for Welding Inspection Personnel

a) The applicant shall submit a fully completed Harmonized Application form (see Appendix V). The applicant is responsible to provide all required evidence to support the information detailed on the Application (e.g. curriculum vitae, course outline, transcripts, certification documents, diplomas, degrees etc.).

b) ANB shall conduct a detailed assessment of the Application and supporting documents against the IIW guideline and access conditions. The assessment will use the Evaluation Matrix (see Appendix VI) for the purpose of determining if the candidate's education and experience are consistent with the relevant qualification level of the subject matter in Welding Technology Modules 1 to 4 and Welding Inspection Modules 1 to 3.

- If the applicant has a diploma of IIW (IWE, IWT, IWS, or IWP) or an ANB approved national certificate of welding co-ordination and valid NDT certificates in compliance to ISO 9712 which cover the syllabus of the Welding Inspection Modules of the present Guideline, he/she can proceed to the technical interview for the equivalent level of qualification without a detailed paper assessment.

c) The ANB shall apply the Alternative Route Evaluation Matrix, to score the self-evaluation applicant form. As a minimum, the applicant shall reach 60% in each module to be admitted to the technical interview.

d) A technical interview to test the candidate's ability to logically apply the knowledge expected by the relevant qualification guideline in Welding Technology Modules 1 to 4 and Welding Inspection Modules 1 to 3 shall be completed (see Appendix VII).

- In all Modules, at least 50% of the applicant scoring points achieved when the paper assessment was done shall be verified in the Technical Interview

e) At the ANBs discretion, an optional requirement may be included prior to the final exams (i.e. project, see Appendix VIII).

f) When the ANB has confirmed that the applicant has met the requirements of the detailed assessment (see b) above), technical interview (see c) above) and where applicable, the optional requirement (see d) above), they can be admitted to the final examination defined for the relevant guideline. Applicants who hold IWE, IWT, IWS and IWP are exempt from welding technology final exams and are only required to write the welding inspection final exams and practical exams (see Note of Diagram 5).

It is within the discretion of the ANB to terminate the assessment at any point and defer the application or re-direct the candidate to the standard route.

Welding Coordination Personnel – Appendixes

Welding Coordination Personnel

Appendix I (Rev 0) – Alternative Route (AR) Application Form – Welding Coordination

(the Application Form is available as a word file secured)

Candidate Details

Name:

E-mail:

Phone:

Address:

Application for an IIW Diploma via Alternative Route: IWE IWT IWS IWP

Current IIW qualifications held (if applicable):

Instructions:

The requirements for the Alternative Rate (AR) require an assessment of your prior education, training and work experience.

This form provides the method for self-evaluation against the requirements and to provide the ANB with the information required for evaluating your application.

Complete the tables below for each Module and subject within.

For each subject within the Modules, use the below scoring to calculate your total for each module.

Classification of education/experience*	**Points**
Job Function and Education/Training	3
Training at an ATB or an ANB approved course, in accordance with the guideline	3
Job Function	2
General education/training	1
None	0
*During the ANB assessment, points will only be awarded with evidence of the education/experience.	

Points will only be awarded if the application provides supporting evidence of for each subject matter (e.g. job function, training, education etc.).

Job function is defined as professional experience in the subjects at the level of the qualification being sought.

Evidence which may be considered includes, but is not limited to: course content, diplomas, certificates and records of achievement, job description. Resumes must provide clear information on the products fabricated, materials, welding and cutting process, construction/manufacturing codes and standards.

Module 1: Welding processes and equipment

Subject	Details with reference to supporting documentation	Points for the Self-Evaluation	ANB USE ONLY Evaluation
1.1 General introduction to welding technology			
1.2 Oxy-gas Welding and related processes			
1.3 Electrotechnics			
1.4 The arc			
1.5 Power sources for arc welding			
1.6 Introduction to gas shielded arc welding			
1.7 TIG Welding			
1.8.1 MIG/MAG			
1.8.2 Flux Cored Arc Welding			
1.9 MMA Welding			
1.10 Submerged-Arc Welding			
1.11 Resistance Welding			
1.12.1– Laser; Electron Beam; Plasma			
1.12.2 Other Welding Processes			
1.13 Cutting, Drilling and other edge preparation processes			
1.14 Surfacing and Spraying			
1.15 Fully mechanised processes and robotics			
1.16 Brazing and soldering			
1.17 Joining processes for plastics			
1.18 Joining processes for ceramics and composites			
TOTAL – add the totals			

Module 2: Materials and their behavior during welding

Subject	Details with reference to supporting documentation	**Points for the Self-Evaluation**	ANB USE ONLY Evaluation
2.1 Structure and properties of metals			
2.2 Phase Diagrams and Alloys			
2.3 Iron – carbon alloys			
2.4 Manufacture and classification of steels			
2.5 Behaviour of structural steels in fusion welding			
2.6 Cracking phenomena in welded joints			
2.7 Fractures and different kinds of fractures			
2.8 Heat treatment of base materials and welded joints			
2.9 Structural (unalloyed) steels			
2.10 High strength steels			
2.11 Application of structural and high strength steels			
2.12 Creep and creep resistant steels			
2.13 Steels for cryogenic applications			
2.14 Introduction to corrosion			
2.15 Stainless and heat resistant steels			
2.16 Introduction to wear and protective layers			
2.17 Cast irons and steels			
2.18 Copper and copper alloys			
2.19 Nickel and nickel alloys			
2.20 Aluminium and aluminium alloys			
2.21 Titanium and other metals and alloys			
2.22 Joining dissimilar materials			
2.23 Destructive testing of materials and welded joints (except for laboratory exercises)			
TOTAL – add the totals			

Module 3: Construction and design

Subject	**Details with reference to supporting documentation**	**Points for the Self-Evaluation**	ANB USE ONLY Evaluation
3.1 Basic theory of structural systems			
3.2 Fundamentals of the strength of materials			
3.3 Joint design for Welding and Brazing			
3.4 Basics of weld design			
3.5 Behaviour of welded structures under different types of loading			
3.6 Design of welded structures with predominantly static loading			
3.7 Behaviour of welded structures under cyclic loading			
3.8 Design of cyclic loaded welded structures			
3.9 Design of welded pressure equipment			
3.10 Design of aluminium alloys structures			
3.11 Introduction to fracture mechanics			
TOTAL – add the totals			

Module 4: Fabrication, applications engineering

Subject	**Details with reference to supporting documentation**	**Points for the Self-Evaluation**	ANB USE ONLY Evaluation
4.1 Introduction to quality assurance in welded fabrication			
4.2 Quality control during manufacture (except for laboratory exercises)			
4.3 Residual Stresses and Distortion			
4.4 Plant facilities, welding jigs and fixtures			
4.5 Health and Safety			
4.6 Measurement, Control and Recording in Welding			
4.7. Imperfections and Acceptance Criteria			
4.8 Non-Destructive Testing (except for laboratory exercises)			
4.9 Economics and Productivity			
4.10 Repair Welding			
4.11 Reinforcing-steel welded joints			
TOTAL – add the totals			

Work Experience (Complete a reference for each job/employer)

From: To:

Company name:

Job Title:

Address/Contact information:

Explain your duties as related to the above tables. Attach additional pages as required.

TO BE COMPLETED BY REFERENCE (Employer)

Reference Name:

Job title:

Phone number:

E-mail:

I certify the above information to be true and correct. I understand that any false statements may result in the cancellation of this application or the withdrawal of certification.

Reference signature:

Date:

Applicant Education

List the Diploma/certificate/record of achievement, for each one sent the relevant information

Diploma/certificate/record of achievement:	Date	Name Training Body/Seminar

Fro each document attach evidence (copy) of education received.

For the applicant

I certify the above information to be true and correct. I understand that any false statements may result in the cancellation of this application or the withdrawal of certification.

Signature:

Date:

Appendix II (Rev 0) – Evaluation Matrix

(The Evaluation Matrix is available as an excel file secured, it is also available a pdf file with instructions how the Evaluation Matrix performs the calculations and what column shall be fill up by the ANB and with what information)

The **Evaluation Matrix** shall be completed by the ANB with the following scoring system on the checklist:

Classification of education/experience	**Points**
Job Function and Education/Training	3
Training at an ATB, or an ANB approved course in accordance with the guideline	3
Job Function	2
General education/training	1
None	0

The ANB shall apply the Alternative Route Evaluation Matrix, to score the self-evaluation applicant form. As a minimum, the applicant shall reach 60% in each module to be admitted to the technical interview

Note: If an applicant has a valid certification at the relevant level which covers a module the ANB may accept this as equivalent to the required 60% level.

Welder Qualification Certificate (for IWP candidate only)

A minimum of two valid welder qualification certificates corresponding to IAB-252 (latest edition) Section I, Chapter 6 of the standard route shall demonstrate in common with the paper assessment.

Below can be seen part of the Evaluation Matrix

	IAB-442 - Appendix II - Alternative Route Application Evaluation Matrix - Rev 0 - 2022-07-19					
	Applicant Full Name					
	Date of Application and IIW Qualification Level					
	ANB name					
	Date of review					
	Name of the Reviewer					
	Reviewer Comemnts/Observations					
	Course			IWE		
	Total	374		743	57	
	(weight x 3) or %(Total/(weightx 3))	1122		66%	15%	
		Weight of the item	Evaluation (0,1, 2, or 3)	Score = Weight x Evaluation	Non attendance (=weight if evaluation=0)	Recommandation of the ANB
1	**Welding processes and equipment**	85		136	34	
1-01	General introduction to welding technology	3	2	6		
1-02	Oxy-gas Welding and related processes	2	3	6		
1-03	Electrotechnics	1	1	1		
1-04	The arc	3	0	0	3	
1-05	Power sources for arc welding	4	0	0	4	
1-06	Introduction to gas shielded arc welding	2	1	2		
1-07	TIG Welding	5	3	15		
1-08-1	MIG/MAG	8	3	24		
1-08-2	Flux Cored Arc Welding	2	3	6		
1-09	MMA Welding	6	3	18		
1-10	Submerged-Arc Welding	6	3	18		
1-11	Resistance Welding	6	0	0	6	
1-12-1	Laser; Electron Beam; Plasma	8	0	0	8	
1-12-2	Other Welding Processes	6	0	0	6	
1-13	Cutting, Drilling and other edge preparation processes	4	3	12		
1-14	Surfacing and Spraying	2	0	0	2	
1-15	Procédés totalement mécanisés et automatiques ; robotique	8	2	16		
1-16	Brazing and soldering	4	3	12		
1-17	Joining processes for plastics	4	0	0	4	
1-18	Joining processes for ceramics and compositescomposites	1	0	0	1	
1-19	Welding laboratory - Not to be scored					
	maximum score (=weight sum x 3):	255	score sum / maximum score	53%	40%	

Appendix III - Technical Interview

The candidate shall be assessed via a technical interview using the prescribed script.

The recommended duration for the Technical Interview (assuming 5 minutes per question):

Qualification level	IWE	IWT	IWS	IWP
Duration (recommended)	2 hours	1,5 hours	1 hour	45 minutes

Note:

A) The purpose of the Technical Interview is to verify the accuracy of the information on the application and is not an assessment of knowledge;

B) Questions may be applicable for all levels, but answers will be evaluated by the ANB at the qualification level being sought by the candidate. Each qualification level shall have different depth in terms of knowledge and skills expected.

C) The ANB shall maintain documented evidence of the interview questions and the applicant's responses.

D) The minimum scoring for each module is 50%. Failure of any of the modules means the candidate is not authorized to write the final exams. The candidate must provide evidence of training for the failed module(s) at an approved ATB, or an ANB approved course in accordance with the approved guideline as per Diagram 6.

Detailed distribution of points for Modules 1, 2, 3 and 4 and Questions Script

Module 1: Welding processes and equipment	**Max. number of points**		
	IWE and IWT	**IWS**	**IWP**
111 - MMA	3	3	4
14 - TIG and 15 - Plasma	2	2	2
131 - MIG	2	2	2
135 - MAG	2	2	2
114, 136 and 138 - Flux-cored methods	3	3	3
91, 93 and 97 - Brazing methods	2	2	0
81, 82 and 83 - Thermal cutting	2	2	3
12 - SAW	3	3	3
Other methods	3	3	3
Total	**22**	**22**	**22**
Questions Script:			
The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list.			

The questions shall address:

- Working principles;
- Consumables - Filler materials, Electrodes, Shielding and Purging Gases (applications, role/functions, handle/storage, classification, basic principles how to choose)
- Main process variables and influence on the weld bead shape or cutting surface
- Typical imperfections

Module 2: Materials (acc. to ISO/TR 15608) and their behaviour during welding		**Max. number of points**		
		IWE and IWT	**IWS**	**IWP**
Steel alloys	groups 1 – 3 and 11	4	4	6
Cr-Mo- and vanadium steels:	groups 4 - 6	2	1	1
Ferritic and martensitic steels	group 7	2	2	2
Austenitic and aust./fer. steels	groups 8 and 10	4	2	3
Steel-Ni- alloys, max 10% Ni	group 9	1	1	1
Aluminium and alloys	groups 21 - 26	3	2	2
Copper and alloys	groups 31 - 38	1	1	0
Nickel and alloys	groups 41 - 48	1	1	0
Ti, Zr and alloys	groups 51 – 54 and 61 - 62	1	0	0
Cast iron	groups 71 - 76	1	1	0
	Total	**21**	**15**	**15**

Questions Script:

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the **below** question script **regarding** the topics from the above list

The questions shall address:

- Main properties and applications;
- Weldability issues and how to overcome

Module 3: Construction and design	**Max. number of points**		
	IWE and IWT	**IWS**	**IWP**
Stresses and strains	5	2	0
Design of welded structures - static loading	3	3	4
Design of welded structures - cyclic loading	3	1	2
Joint design & design principles of welded structures	4	2	4
Joint design & design principles of pressure vessels	4	2	1
Total	19	11	11

Questions Script:

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list

The questions shall address:

- Types of stresses and how to minimize the problems when welding; - From a certain type of weld joint explain the applications, advantages and disadvantages - Identify welding symbols - Identify measures to increment fatigue strength - Discuss the behaviour of welded joints under different types of loading

Module 4: Fabrication and applications engineering	**Max. number of points**	
	IWE and IWT	**IWS and IWP**
Quality assurance in welded fabrication	4	3
Quality control during manufacture	3	3
Welding stresses and distortion	4	4
Plant facilities, welding jigs and fixtures	2	2
NDT	3	3
Economics	2	1
Health and safety	2	2
Repair welding	2	2
Total	**22**	**20**

Questions Script:

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list

The questions shall address:

- Quality Control and Quality Assurance Control – differences and application;
- Why and how qualification testing of welders shall be performed;
- Why and how *Welding Procedure Qualification Test* shall be done;
- Types of deformations, how to prevent and solve it;
- Residual stresses on weld joints, why and how to minimise the possible problems;
- Main characteristics of NDT methods and applications;
- Health and Safety risks, identification of the risks and how to solve them;
- Repair welding the main factors for success, the content of a repair plan

Appendix IV - Optional Requirement - Project

An ANB may choose to assess the candidate by Technical Interview and Project.

The project shall be in form of a case study. The purpose of the project is to evaluate the candidate's ability to apply knowledge in the area of Fabrication, applications engineering (module 4). The project should be of sufficient complexity and detail that the typical time allocated for completion meets the requirements set out in the table below. Once started the project should be completed within a maximum period of time which is also shown in the table below.

At the discretion of the ANB the case study may be performed as a group exercise. Each candidate shall, however, prepare a final report and presentation (b.1-3 below) individually.

Time conditions	Qualification level			
	IWE	IWT	IWS	IWP
Time allocated for project completion	80 hours	60 hours	40 hours	8 hours
Maximum period in which the project should be completed.	4 weeks	3 weeks	3 weeks	1 week

The project times are simply informative, i.e. on average a project at the IWE level will take 80 hours. The key metric is that the ANB will expect the delivery of the project report 4 weeks from the transmittal date to the candidate.

The ANB shall decide on the choice of project construction and the applicable codes and/or product standards. One of the following types of construction shall be taken:

Type of construction	Qualification level			
	IWE	IWT	IWS	IWP
Pressure vessel	X	X	X	X
Construction – static loading	X	X	X	X
Construction – dynamic loading	X	X	X	
Other construction	X	X	X	X

Alternatively, the ANB may, at its discretion, accept a proposal for a project from the candidate based on the candidate's field of work. In such a case the project shall meet allocated time and maximum period requirements mentioned above.

The project work is detailed as following:

1 Pre-study	IWE	IWT	IWS	IWP
• Pre-study including a workmanship example.	-	-	-	X
• Understand the consequences of the desired manufacturing code.	X	X	X	-
• Evaluation of drawings and technical specifications.	X	X	-	-
• Read and understand drawings and technical specifications.	-	-	X	X
• Evaluation of and comments to the choice of base materials. Discuss the weldability of the materials. Any needs for pre- and post-weld heating.	X	X	-	-
• Knowledge about the choice of base materials. Discuss the weldability of the materials. Any needs for pre- and post-weld heating.	-	-	X	X
• Evaluation of the construction based on the choice of:	X	X	X	
• Discussion of the construction based on the choice of:	-	-	-	X
– Joining method(s) for the base material(s);	X	X	X	X
– Cutting method(s) for preparation of base material parts;	X	X	X	X
– Joint preparation and weld calculation;	X	X	X	-
– Joint preparation;	-	-	-	X
– Welding consumables;	X	X	X	X
– Need of surface treatment before welding;	X	X	X	X
– Surface treatment of finished construction - method(s) to be used.	X	X	-	-
• Preparation of necessary WPSs and testing methods.	X	X	X	-
• Interpretation of necessary WPSs.	-	-	-	X
• Evaluation of necessary welding qualification(s) for welder(s).	X	X	X	-
• Interpretation of necessary welding qualification test(s) for welder(s).	-	-	-	X
• Present NDT methods to be used during and after welding.	X	X	X	-
• Discuss possible NDT methods that can be used during and after welding, including special tests to check the entire quality of the construction.	-	-	-	X
• Prepare:				
– Production plan;	X	X	X	-
– Welding plan – including welding sequence and tack welding;	X	X	X	-
– List of standards needed for the project;	X	X	-	-
– Quality plan for the production based on relevant part of ISO 3834 or equivalent. Type of workshop for this kind of production shall be discussed.	X	X	X	-

2 Practical part on the construction or on test pieces – simulating the same construction – provided by the ANB	IWE	IWT	IWS	IWP
• Checking:				
– Marking(s) and certificate(s) on base material(s);	X	X	X	X
– Welder(s) qualification test certificate(s);	X	X	X	X
– Qualification of personnel for destructive testing, NDT and inspection.	X	X	X	-
• Evaluation of test results and compare with pre-study figures.	X	X	X	-
• Plan for inspection before and during welding.	X	X	X	-
• Inspection after welding based on pre-study plans – (visual inspection and other NDT methods, eventually pressure testing or other testing methods).	X	X	X	-
• Discussion of inspection reports.	-	-	-	X
• Evaluation of the welding and test results based on inspection and NDT reports.	X	X	X	-
• If evaluation shows need for repair, plan(s) for repair welding and eventually WPSs for repair welding to be made.	X	X	X	-
• Evaluation of fabrication costs.	X	-	-	-

3 Final report and presentation	IWE	IWT	IWS	IWP
• The candidate shall prepare a final written report with results from his project based on the pre-study figures and the practical part.	X	X	X	-
• The report shall include viewpoints regarding economy of production and at same time ensure the quality of the product.	X	X	X	-
• The candidate shall give an oral presentation of the project to the board of examiners.	X	X	X	-
• The candidate shall give an oral report of results from his project based on the pre-study figures and the practical part.	-	-	-	X

Welding Inspection Personnel - Appendixes

Appendix V (Rev 0) - Alternative Route (AR) Application Form – Welding Inspection

(the Application Form is available as a word file secured)

Candidate Details

Name:

E-mail:

Phone:

Address:

Application for an IIW Diploma via Alternative Route: IWI-C IWI-S IWI-B

Current IIW qualifications held (if applicable):

- **If option above is other:**
- Attach Diploma copy

Instructions:

The requirements for the Alternative Rate (AR) require an assessment of your prior education, training and work experience.

This form provides the method for self-evaluation against the requirements and to provide the ANB with the information required for evaluating your application.

Complete the tables below for each Module and subject within.

For each subject within the Modules, use the below scoring to calculate your total for each module.

Classification of education/experience*	Points
Job Function and Education/Training	3
Training at an ATB in accordance with the guideline	3
Job Function	2
General education/training	1
None	0
*During the ANB assessment, points will only be awarded with evidence of the education/experience.	

Points will only be awarded if the application provides supporting evidence of for each subject matter (e.g. job function, training, education etc.).

Job function is defined as professional experience in the subjects at the level of the qualification being sought.

Evidence which may be considered includes, but is not limited to: course content, diplomas, certificates and records of achievement, job description. Resumes must provide clear information on the products fabricated, materials, welding and cutting process, construction/manufacturing codes and standards.

Note: Application will be assessed using the total number of teaching subjects specific to the level. (e.g. An application for IWI-B will be evaluated against the subjects with“B“ in the “Application Level“ column).

Welding Tecnology Modules

Module 1: Welding processes and equipment

Subject	Applicable Level: IWI-	Details with reference to supporting documentation	Points for the Self-Evaluation	ANB USE ONLY Evaluation
1.1 General introduction to welding technology	C/S/B			
1.2 Oxy-gas Welding and related processes	C/S/B			
1.3 The arc and Power Sources for Arc Welding	C/S/B			
1.4 Tungsten inert gas arc welding - TIG	C/S/B			
1.5 MIG/MAG and Flux Cored Arc Welding	C/S/B			
1.6 Manual Metal arc welding - MMA	C/S/B			
1.7 Submerged-Arc Welding	C/S/B			
1.8 Resistance Welding	C			
1.9 – Laser, Electron Beam and Plasma arc welding	C			
1.10 Other Welding Processes	C			
1.11 Cutting and other edge preparation processes	C/S/B			
1.12 Surfacing and Spraying	C			
1.13 Fully mechanised processes and robotics	C			
1.14 Brazing and soldering	C/S			
1.15 Joining processes for ceramic materials	C			
TOTAL – add the totals				

Module 2: Materials and their behavior during welding

Subject	Applicable Level: IWI-	Details with reference to supporting documentation	Points for the Self-Evaluation	ANB USE ONLY Evaluation
2.1 Structure and properties of metals and alloys	C/S/B			
2.2 Iron – carbon alloys	C/S/B			
2.3 Manufacture and classification of steels	C/S/B			
2.4 Structure of the welded joint	C/S/B			
2.5 Cracking phenomena and imperfections in welding of steels	C/S/B			
2.6 Fractures and different kinds of fractures (including relation with defects)	C/S/B			
2.7 Heat treatment of base materials and welded joints	C/S/B			
2.8 Carbon, low alloyed, fine grained and thermomechanically treated steels (ISO/TR 15608 groups 1, 2, 3)	C/S/B			
2.9 Introduction to weldability of low alloyed and high alloyed steels	C/S/B			
2.10 Low alloyed creep resistant steels (ISO/TR 15608 groups 4, 5, 6)	C/S			
2.11 Low alloy steels for cryogenic applications (ISO/TR 15608 group 9)	C/S			
2.12 Introduction to corrosion	C/S			
2.13 Stainless and heat-resistance steels (ISO/TR 15608 groups 7, 8, 10)	C/S			
2.14 High Mn Carbon steels (ISO/TR 15608 group 11)	C			
2.15 Cast irons (ISO/TR 15608 group 71 to 76) and cast steels	C			
2.16 Nickel and Nickel alloys (ISO/TR 15608 Group 41 to 48)	C			
2.17 Aluminium and aluminium alloys (ISO/TR 15608 Group 21 to 26)	C/S			

2.18 Non ferrous materials (other than nickel and aluminium)	C			
2.19 Joining dissimilar materials	C/S			
2.20 Introduction to wear	C/S			
2.21 Protective layers	C/S			
TOTAL – add the totals				

Module 3: Construction and design

Subject	Applicable Level: IWI-	Details with reference to supporting documentation	Points for the Self-Evaluation	ANB USE ONLY Evaluation
3.1 Basic theory of structural systems and fundamentals of the strength of materials	C/S/B			
3.2 Welded Joint Design	C/S/B			
3.3 Fabrication drawings	C/S/B			
3.4 Behaviour of welded structures under different types of loading	C/S			
3.5 Design of aluminium alloys structures	C/S			
3.6 Introduction to fracture mechanics	C			
TOTAL – add the totals				

Module 4: Fabrication, applications engineering

Subject	Applicable Level: IWI-	Details with reference to supporting documentation	Points for the Self-Evaluation	ANB USE ONLY Evaluation
4.1 Welding stresses and distortion	C/S/B			
4.2 Plant facilities, welding jigs and fixtures	C/S/B			
4.3 Health and Safety	C/S/B			
4.4 Repair Welding	C/S			
TOTAL – add the totals				

Inspection Modules

Module 1: Quality Assurance / Quality Control in Inspection

Subject	Applicable Level: IWI-	Details with reference to supporting documentation	Points for the Self-Evaluation	ANB USE ONLY Evaluation
1.1 Scope of activity, terms and definitions	C/S/B			
1.2 Role of Welding Inspection Personnel	C/S/B			
1.3 Management of inspection function	C/S			
1.4 Quality Assurance Principles in Welding	C/S/B			
1.5 Welders/Welding Operators and Welding Procedures approval	C/S/B			
1.6 Measurement, inspection and control during welding	C/S/B			
1.7 Types of imperfections	C/S/B			
1.8 Evaluation of Imperfections	C/S/B			
1.9 Engineering Critical Assessment	C			
TOTAL – add the totals				

Module 2: Testing of welds and Reporting

Subject	Applicable Level: IWI-	Details with reference to supporting documentation	Points for the Self-Evaluation	ANB USE ONLY Evaluation
2.1 Destructive testing of welded joints	C/S/B			
2.2 Overview of NDT methods	C/S/B			
2.3 Visual Inspection	C/S/B			
2.4 Liquid penetrant testing (PT)	C/S/B			
2.5 Magnetic particle testing (MT)	C/S/B			
2.6 Radiographic testing (RT)	C/S/B			
2.7 Ultrasonic testing (UT)	C/S/B			
2.8 Advanced and other NDT methods	C			

2.9 Critical review of selection of NDT methods	C/S			
2.10 Other test methods (pressure testing, dimensional tests, etc.)	C/S			
2.11 Qualification and certification of NDT personnel	C/S/B			
2.12 Documents for quality control in welding	C/S/B			
2.13 Economics in Welding Inspection	C			
TOTAL – add the totals				

Module 3: Practical work on testing

Subject	**Applicable Level: IWI-**	**Details with reference to supporting documentation**	**Points for the Self-Evaluation**	ANB USE ONLY Evaluation
3.1 Radiographic interpretation	C/S/B			
3.2 Witnessing mechanical tests	C/S			
3.3 Visual Inspection	C/S/B			
3.4 Metallographic (Micro and Macros) - Analysis	C/S/B			
3.5.1 Liquid penetrant testing (PT)	C/S/B			
3.5.2 Magnetic particle testing (MT)	C/S/B			
3.6 Ultrasonic testing (UT)	C/S/B			
3.7 Witnessing Welders approval (for IWI-B)	C/S/B			
3.7 Witnessing Welders approval and WPQRs (for IWI-S)	C/S/B			
TOTAL – add the totals				

Work Experience (Complete a reference for each job/employer)

From: To:

Company name:

Job Title:

Address/Contact information:

Explain your duties as related to the above tables. Attach additional pages as required.

TO BE COMPLETED BY REFERENCE (Employer)

Reference Name:

Job title:

Phone number:

E-mail:

I certify the above information to be true and correct. I understand that any false statements may result in the cancellation of this application or the withdrawal of certification.

Reference signature:

Date:

Applicant Education

List the Diploma/certificate/record of achievement, for each one sent the relevant information

Diploma/certificate/record of achievement:	Date	Name Training Body/Seminar

Fro each document attach evidence (copy) of education received.

For the applicant

I certify the above information to be true and correct. I understand that any false statements may result in the cancellation of this application or the withdrawal of certification.

Signature:

Date:

Appendix VI (Rev 0) – Evaluation Matrix

(The Evaluation Matrix is available as an excel file secured, it is also available a pdf file with instructions how the Evaluation Matrix performs the calculations and what column shall be fill up by the ANB and with what information)

The **Evaluation Matrix** shall be completed by the ANB with the following scoring system on the checklist:

Classification of education/experience	**Points**
Job Function and Education/Training	3
Training at an ATB, or an ANB approved course in accordance with the guideline	3
Job Function	2
General education/training	1
None	0

The ANB shall apply the Alternative Route Evaluation Matrix, to score the self-evaluation applicant form. As a minimum, the applicant shall reach 60% in each module to be admitted to the technical interview

Note: If the applicant has a diploma of IIW (IWE, IWT, IWS, or IWP) or an ANB approved national certificate of welding co-ordination, and valid NDT certificates in compliance to ISO 9712 which cover the syllabus of the Welding Inspection Modules of the present Guideline, he/she can proceed to the technical interview for the equivalent level of qualification without a detailed paper assessment.

Below can be seen part of the Evaluation Matrix

	IAB-442 - Appendix VI - Alternative Route Application Evaluation Matrix - Rev 0 - 2024-09-30					
	Applicant Full Name					
	Date of Application and IIW Qualification Level					
	ANB name					
	Date of review					
	Name of the Reviewer					
	Reviewer Comemnts/Observations					
	Course	IWI-B				
	Total	98	Collumn to be fill up by the ANB	267	8	
	(weight x 3) or %(Total/(weightx 3))	294	In each item insert the evaluation points see	91%	2%	
		Weight of the item	Evaluation (0,1, 2, or 3)	Score = Weight x Evaluation	Non attendance (=weight if evaluation=0)	Recommandation of the ANB, to be fill up if needed
WT1	**Welding processes and equipment**	13	mark (0,1, 2, or 3)	33	2	
1-01	General introduction to welding technology	1	3	3		
1-02	Oxy-gas Welding and related processes	1	3	3		
1-03	The Arc and Power Sources for Arc Welding	1	3	3		
1-04	Tungsten inert gas arc welding	2	3	6		
1-05	MIG / MAG and Flux Cored arc welding	2	0	0	2	
1-06	Manual Metal arc welding	2	3	6		
1-07	Submerged-arc welding	2	3	6		
1-08	Resistance welding	0				
1-09	Laser, electron beam and plasma arc welding	0				
1-10	Other Welding Processes	0				
1-11	Cutting and other edge preparation processes	2	3	6		
1-12	Surfacing and Spraying	0				
1-13	Fully mechnised processes and robotics	0				
1-14	Brazing and soldering	0				

Appendix VII – Technical interview

The candidate shall be assessed via a technical interview using the prescribed script.

The recommended minimum duration for the Technical Interview (assuming 5 minutes per question):

Qualification level	IWI-C	IWI-S	IWI-B
Duration (recommended)	2 hours	1,5 hours	1 hour

Note:

A) The purpose of the Technical Interview is to verify the accuracy of the information on the application and is not an assessment of knowledge;

B) Questions may be applicable for all levels, but the ANB will evaluate answers at the qualification level being sought by the candidate. Each qualification level shall have a different depth in terms of knowledge and skills expected.

C) The ANB shall maintain documented evidence of the interview questions and the applicant's responses.

D) The minimum scoring for each module is 50%. Failure of any of the modules means the candidate is not authorized to write the final exams. The candidate must provide evidence of training for the failed module(s) at an approved ATB, or by additional requirements (i.e. Project) in accordance with the approved guideline as per Diagram 7.

Detailed distribution of points for Modules WT and WI and Questions Script

Welding Technology Modules **Module 1: Welding processes and equipment**	**Max. number of points**		
	IWI-C	**IWI-S**	**IWI-B**
111 - MMA	2	2	2
14 - TIG and 15 - Plasma	2	2	2
131 – MIG and 135 MAG	2	2	2
114, 136 and 138 - Flux-cored methods	1	1	1
52 Laser, 51 electron beam and 15 plasma arc welding	2	2	0
91, 93 and 97 - Brazing methods (for IWI-S and C)	1	1	0
81, 82 and 83 - Thermal cutting	2	2	2
12 - SAW	1	1	1
Surfacing	1	0	0
Fully Mechanised processes and robotics	1	0	0
Other welding methods	1	0	0
Total	**16**	**13**	**10**
Questions Script:			

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list.

The questions shall address:

- Working principles;
- Consumables - Filler materials, Electrodes, Shielding and Purging Gases (applications, role/functions, handle/storage, classification, basic principles how to choose)
- Main process variables and influence on the weld bead shape or cutting surface
- Typical imperfections

Welding Technology Modules	**Max. number of points**		
Module 2: Materials (acc. to ISO/TR 15608) and their behaviour during welding	**IWI-C**	**IWI-S**	**IWI-B**
Structure and properties of metals	4	3	1
Cracking phenomena and imperfections in welding of steels	2	2	2
Fractures and different kinds of fractures (including relation with defects)	1	1	1
Heat treatments of base materials and welded joints	1	1	1
Steel alloys groups 1 - 3	3	3	3
Cr-Mo- and vanadium steels: groups 4 - 6	2	2	0
Ferritic and martensitic stainless steels group 7	3	2	0
Austenitic and aust./fer. stainless steels groups 8 and 10	1	1	0
Steel-Ni- alloys, max 10% Ni group 9	1	1	0
Aluminium and alloys groups 21 - 26	1	1	0
Nickel and alloys groups 41 - 48	1	0	0
Cast iron and High Mn carbon steels groups 71 – 76 and 11	2	0	0
Joining dissimilar materials	2	1	0
Introduction to wear and protective layers	3	2	0
Total	**27**	**20**	**8**

Questions Script:

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list

The questions shall address:

- Cracking reasons and actions to minimise;
- Types of factures;
- Heat Treatments, types and applications;
- Main properties and applications;
- Weldability issues and how to overcome.

Welding Technology Modules Module 3: Construction and design	Max. number of points		
	IWI-C	IWI-S	IWI-B
Stresses and strains	3	3	2
Design of welded structures - static loading	1	1	2
Design of welded structures - dynamic loading	1	1	1
Joint design & design principles of welded structures	3	2	2
Design of Structures of aluminium and its alloys	2	2	1
Total	**10**	**9**	**8**

Questions Script:

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list

The questions shall address:

- Types of stresses and how to minimize the problems when welding;
- From a certain type of weld joint explain the applications, advantages and disadvantages
- Identify welding symbols
- Identify measures to increment fatigue strength
- Discuss the behaviour of welded joints under different types of loading

Welding Technology Modules Module 4: Fabrication and applications engineering	Max. number of points		
	IWI-C	IWI-S	IWI-B
Quality assurance in welded fabrication	1	1	1
Quality control during manufacture	2	2	2
Welding stresses and distortion	1	1	1
Plant facilities, welding jigs and fixtures	1	1	1
NDT	1	1	1
Repair welding	1	1	1
Health and safety	1	1	1
Total	**8**	**8**	**8**

Questions Script:

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list

The questions shall address:

- Quality Control and Quality Assurance Control – differences and application;
- Why and how qualification testing of welders shall be performed;
- Why and how *Welding Procedure Qualification Test* shall be done;
- Types of deformations, how to prevent and solve it;
- Residual stresses on weld joints, why and how to minimise the possible problems;
- Main characteristics of NDT methods and applications;
- Health and Safety risks, identification of the risks and how to solve them;

Repair welding the main factors for success, the content of a repair plan

Welding Inspection Modules Module 1 – Quality Assurance/Quality Control in inspection	Max. number of points		
	IWI-C	IWI-S	IWI-B
1. Scope of activity, terms and definitions, Role of Welding Inspections Personnel	1	1	1
2. Management of inspection function	3	2	0
3. Quality Assurance Principles in Welding	4	3	2
4. Welders/Welding Operators and Welding Procedures approval	3	3	2
5. Measurement, inspection and control during welding	1	1	1
6. Types of imperfections, Evaluation of Imperfections	1	1	1
7. Engineering Critical Assessment	2	0	0
Total	**15**	**11**	**7**
Questions Script:			
The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list The questions shall address: - Scope of activity, roles, management; - Quality assurance and quality control, goals and tools used to achieved the propose; - Welders and welding operators approvals, how, when and main activities - Welding procedures, how, when and main activities; - Types of imperfections, identification causes and how to minimize - Engineering Critical Assessment, the tools and goals.			

Welding Inspection Modules Module 2 – Testing of welds and Reporting	Max. number of points		
	IWI-C	IWI-S	IWI-B
1. Destructive testing of welded joints	2	2	1
2. Visual Inspection	2	2	2
3. Liquid penetrant testing (PT)	2	2	2
4. Magnetic particle testing (MT)	2	2	2
5. Radiographic testing (RT)	3	3	2
6. Ultrasonic testing (UT)	3	3	2
7. Advanced and other NDT methods	2	0	0
8. Critical review of selection of NDT methods	2	1	0
9. Other test methods (pressure testing, dimensional tests, etc.)	2	1	0
10. Qualification and certification of NDT personnel	1	1	1
11. Documents for quality control in welding	4	3	2
12. Economics in Welding Inspection	2	0	0
Total	**27**	**20**	**14**
Questions Script:			

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list

The questions shall address:

- Destructive tests, identify the tests, the goals for each one and information that can be gather;
- For each NDT technique, identify how it works, the applications, advantages and disadvantages;
- NDT Personnel qualification, certification levels, and competences for each level;
- Other tests, examples and applications;
- Tests Reports, the content;
- Economical aspects.

Welding Inspection Modules	**Max. number of points**		
Module 3 – Practical work on testing	**IWI-C**	**IWI-S**	**IWI-B**
1. Radiographic interpretation	2	2	1
2. Witnessing mechanical tests	2	2	0
3. Visual inspection of Welds	4	4	4
4. Metallographic (Micro and Macros)	3	3	2
5. Liquid penetrant and magnetic particle testing	1	1	1
6. Ultrasonic testing (advanced techniques	1	0	0
7. Witnessing Welders approval (for IWI-B) and WPQRs (for IWI-S)	2	2	1
Total	**15**	**14**	**9**

Questions Script:

The ANB shall verify the accuracy of the information on the Application Form by reviewing the applicant's knowledge, experience, training and at least 50% of applicant scoring point shall be verified by using the below question script regarding the topics from the above list

The questions shall address:

- All questions shall verify if the applicants has practical experience in applying the practical work of the above mentioned items

Appendix VIII – Optional requirement - Project

An ANB may choose to assess the candidate by Technical Interview and Project.

The project shall be in form of a case study. The ANB offers a choice of construction/fabrication, to be in accordance with an approved national or international code and/or product standard. The project should be of sufficient complexity and detail that the typical time allocated for completion meets the requirements set out in the table below. Once started the project should be completed within a maximum period of time which is also shown in the table below.

Time Conditions	Qualification Level		
	IWI-C	IWI-S	IWI-B
Time allocated for project completion	60 hours	40 hours	20 hours
Maximum period in which the project should be completed.	4 weeks	3 weeks	2 weeks

The project times are simply informative. i.e. on average a project at the IWI-C level will take 60 hours. The key metric is that the ANB will expect the delivery of the project report 4 weeks from the transmittal date to the candidate.

Where a project has a wide scope of application, the candi¬date shall be tested on the logical application of his/her knowledge.

The ANB shall decide on the choice of project construction and the applicable codes and/or product standards. One of the following types of construction shall be taken:

Type of construction	Qualification level		
	IWI-C	IWI-S	IWI-B
Pressure vessel	X	X	X
Construction – static loading	X	X	X
Construction – dynamic loading	X	X	
Other construction	X	X	X

Alternatively, the ANB may, at its discretion, accept a proposal for a project from the candidate based on the candidate's field of work. In such a case the project shall meet allocated time and maximum period requirements mentioned above.

When a model of the project work has been detailed, the ANB shall decide in each case, the specific items to be covered by the candidate.

SUBJECTS	IWI-C	IWI-S	IWI-B
2 Drawings	**2**	**2**	**1**
Establish that the manufacturer / repairer is working to approved drawings	X	X	X
Verification that the design of all parts of the fabrication, repairs and modifications are in accordance with the requirements of the applicable approved code	X		
Quality plans	**6**	**2**	**1**
Verify that the quality plan is approved by manufacturer or repairer, client and inspection authority.	X	X	X
Sign and complete the inspection stage requirements of the inspection authority.	X	X	X
Verification that an agreed quality plan is to be implemented. Incorporation of inspection requirements for witness, hold and surveillance points.	X		
Materials	**12**	**6**	**5**
Correlation of material certificates with materials of construction and checking conformity of material specification	X	X	X
Identification of material and witnessing of transfer identification	X	X	X
Visual examination of material, cut edges and heat affected zones.	X	X	X
Welding procedures	**6**	**4**	**2**
Approval of welding procedures.	X		
Verify that applicable approved welding procedures are being used and followed.	X	X	X
Witnesses the production procedure test plates, the mechanical testing of test pieces prepared from the plates, evaluates the results and validates applicable reports.	X	X	X
3 Welder approvals	**8**	**6**	**4**
Approval of welders and operators	X	X	X
Examine fit-up of joint for welding.	X	X	X
Verify second results of dimensional checks. Examine weld preparations and tack welds	X	X	X
Inspect the back side of the weld after the face side is completed and root cleaned	X	X	X
Testing	**16**	**14**	**5**
Examine and accept non-destructive test reports.	X	X	
Verify compliance with agreed procedure and acceptability of any defects	X	X	
Evaluate radiographs and accept or reject components on such evaluation.	X	X	
Verify NDT personnel qualifications.	X	X	

Verify defects reported by NDT personnel as to their capability against a code.	X	X	
Examine NDT procedures, techniques, sheets and/or reports for compliance as having being signed / authorised by the recognised competent personnel.	X	X	
Witness and evaluate mechanical testing of production test welds	X	X	
Examine heat treatment records and verify compliance with procedure.	X	X	
Witness that pre-and post heat treatments are performed in accordance with approved procedures if this requirement is included in the quality plan.	X	X	X
Witness the pressure test if required and verify code requirements.	X	X	X
If required, record the amount of permanent set.	X	X	X
Visually examine the completed fabrication or the repair / modification area, as relevant, internally and externally	X	X	X
Witness dimensional checks made by the manufacturer or repairer. Controlled against drawing requirements.	X	X	X
Verify if required marking of nameplate details and attachment of plate to fabrication.	X	X	
Heat treatment	**2**	**2**	
Examine heat treatment records and verify compliance with procedures	X	X	
Documentation	**8**	**4**	**2**
Collation of documentation	X	X	
Verify collation of documentation for data book or repair report.	X	X	X
Sign construction and test certificate or record of continuance.	X	X	
Verify certification details and co-sign certification with the manufacturer or repairer	X	X	X