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AUSTROADS TECHNICAL SPECIFICATION ATS 5440

Fabrication of Stainless Steel Components



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1. Scope

- 1.1 Austroads Technical Specification ATS 5440 sets out the requirements for the fabrication of stainless steel components for bridges, gantries, roadside furniture, poles and related structures. This includes the supply of materials, preparation of materials, assembly, welding, testing, inspection, packing, handling and delivery to site.
- 1.2 It covers:
- a) the fabrication of non-welded components; and
 - b) the fabricated of components using the following processes:
 - i) Gas Tungsten Arc Welding (GTAW);
 - ii) Gas Metal Arc Welding (GMAW);
 - iii) Submerged Arc Welding (SAW); and
 - iv) Flux Cored and Metal Cored Wire Welding.
- 1.3 The Contractor must ensure that the Fabricator complies with this Specification. The Contractor may be the same entity as the Fabricator.

2. Referenced Documents

- 2.1 The following documents are referenced in this specification:

Australian / New Zealand Standards

AS/NZS 1167.2	Welding and Brazing – Filler Metals – Filler Metal for Welding
AS/NZS 1554.6	Structural Steel Welding – Welding Stainless Steels for Structural Purposes
AS 2812	Welding, brazing and cutting of metals - Glossary of terms
AS/NZS 4854	Welding Consumables – Covered Electrodes for Manual Metal Arc Welding of Stainless and Heat-Resisting Steels - Classification
AS/NZS ISO 14343	Welding consumables - Wire electrodes, wires and rods for arc welding of stainless and heat-resisting steels – Classification
AS/NZS ISO 17633	Welding consumables — Tubular cored electrodes and rods for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels — Classification, for flux cored and metal cored wire consumables

International Standards

BS EN ISO 3506-1	Fasteners. Mechanical properties of corrosion-resistant stainless steel fasteners. Bolts, screws and studs with specified grades and property classes including duplex grades.
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ASTM International

ASTM A240 / A240M	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications
ASTM A262	Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels
ASTM A276 / A276M	Standard Specification for Stainless Steel Bars and Shapes
ASTM A312 / A312M	Standard Specification for Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM A380 / A380M	Standard Practice for Cleaning, Descaling and Passivation of Stainless Steel Parts, Equipment and Systems
ASTM A554	Standard Specification for Welded Stainless Steel Mechanical Tubing
ASTM A789/789M	Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Tubing for General Services
ASTM A790/A790M	Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Pipe
ASTM G48	Standard Test Methods for Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution

Austroroads

ATS 5420	Supply of Bolts, Nuts and Washers
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3. Definitions

3.1 The following definitions and abbreviations apply to this Specification.

Fabricator	The company undertaking the fabrication of stainless steel components in accordance with this Specification.
ITP:	Inspection and Test Plan
PQR:	Procedure Qualification Record
Principal's Registration Scheme:	Any scheme for the prequalification, registration or approval of products, manufacturers, suppliers and/or Professional Engineers in operation in the jurisdiction where the steelwork is to be erected.
Ra	Surface Roughness
Robot Welder	The welding process that uses both a robot welding machine and a qualified operator.
WPS	Welding Procedure Specification

4. Quality System Requirements

- 4.1 The Fabricator must prepare and implement a Quality Plan that includes the documentation in Table 4.1.

Table 4.1 Quality plan

Clause	Description of Document
7.1	Procedures for fabrication.
7.24	Anti-galling measures
8.1	Details / procedures for welding,
9.1	Procedures for inspection of welds.
11.1	Procedures for pickling and passivation.
12.1	Procedures for transport, handling and storage,

- 4.2 The Fabricator must submit a program showing the proposed sequence of operations for all members and/or parts, which must be identified by name and mark.

Prequalification or registration of fabricators

- 4.3 Where a Principal's Registration Scheme is in place for fabricators, the Fabricator must comply with that scheme for stainless steel components erected in that jurisdiction. In addition, the Fabricator must be prequalified or registered to the level specified in the tender documents (if applicable).

HOLD POINT 1.

Process Held	Commencement of fabrication.
Submission Details	The Quality Plan, fabrication program and evidence of prequalification / registration (where applicable) must be provided to the Principal at least 10 working days prior to the commencement of fabrication.

5. Shop Drawings

- 5.1 Unless specified otherwise in the Contract documents, the Fabricator is responsible for the preparation of shop detail drawings for the fabrication of all members.
- 5.2 The details shown on the shop detail drawings must be consistent with the Drawings and must comply with the following:
- The marking plan must show the location where each component will be installed;
 - Shop detail drawings must conform to AS 1100 as appropriate;
 - Welding and cutting definitions must conform to AS 2812;
 - Welding symbols must conform to AS 1101.3;
 - Complete information regarding the location, type, size and extent of all welds must be clearly shown;
 - Full details of weld category and level of quality assurance in accordance with AS/NZS 1554.6;
 - Each member must be clearly identified with the identification marks shown on the Drawings. Each type of component must be further identified to readily distinguish it from all other types; and
 - For assemblies, all associated bolting, accessories and/or joining details must be shown on the shop detail drawings.

- 5.3 The shop detail drawings must:
 - a) accurately and completely transfer the information from the construction specification; and
 - b) provide for the development of accurate, detailed dimensional information which allows for the accurate fit-up of components during erection.
- 5.4 Each shop detail drawing must be identified utilizing a numbering system allowing traceability throughout the duration of the work. Revisions must be uniquely identified and dated, with the scope of each revision clearly identified.
- 5.5 Where requests for information (RFIs) are issued as part of the process of producing shop detail documentation, a written record of inquiries and responses must be maintained.
- 5.6 The Contractor must certify that the shop drawings comply with the requirements of this Specification.

HOLD POINT 2.	
Process Held	Commencement of fabrication.
Submission Details	The shop drawings and certification must be submitted to the Principal at least 5 working days prior to the commencement of fabrication.

6. Materials

General

- 6.1 Unless specified otherwise on the Drawings or in the Contract documents, the stainless steel must comply with Table 6.1.

Table 6.1 Stainless steel grades

Specification	Grade
Non-duplex Stainless Steel	Grade 316 (UNS S31600) or Grade 316L (UNS S31603).
Lean / Standard duplex	Grade 2205 (UNS S32205)
Superduplex stainless steel	Grade 2507 (UNS S32750)
Seamless duplex and super duplex pipe	UNS S32205 / UNS S32750

- 6.2 Material manufactured to other equivalent standards will be accepted, provided that the material also complies with the appropriate ASTM standards.
- 6.3 Stainless steel which is bent, corroded or damaged must not be used.
- 6.4 Where practical, the grinding of a surface defects must produce a surface roughness similar to the finish on surrounding areas.
- 6.5 Any significant surface defect areas corrected by grinding must not be located on the outside (visible) surface of outside members. In a corrosive environment, the R_a of the ground area must not exceed $0.5\mu\text{m}$.
- 6.6 Weld repairs to materials are not permitted.

Testing

- 6.7 The Fabricator must submit the following for the stainless steel materials used in the fabrication to the Principal:
 - a) material test certificates;
 - b) material testing results as appropriate; and
 - c) a location map showing where the material will be used.
- 6.8 For duplex and superduplex stainless steel grades, the material test certificate must show corrosion test data in accordance with ASTM G48 and also the ferrite/austenite ratio.
- 6.9 Where required by the Principal, intergranular corrosion test data in accordance with ASTM A262 must be provided
- 6.10 The material test certificate must show the full chemical composition and the mechanical properties of the material, including 0.2% proof (commonly known as 0.2% yield), tensile and elongation results.
- 6.11 If testing is required, the following sampling frequency applies:
 - a) a minimum of one test per size and grade, or
 - b) 2% of the material of the same size and grade.
- 6.12 Test reports must be endorsed by a laboratory which is accredited by a body which is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) for testing laboratories.

HOLD POINT 3.

Process Held	Commencement of fabrication.
Submission Details	The material test certificates and test reports must be submitted to the Principal at least 5 working days prior to the commencement of fabrication.

Traceability and identification

- 6.13 The Fabricator must:
 - a) establish and maintain a comprehensive system of identification records; and
 - b) ensure there is traceability between the material test certificates and the materials being used in the product.
- 6.14 If requested, the Fabricator must demonstrate the method of traceability and provide copies of all relevant records to the Principal.
- 6.15 If traceability cannot be established, the material must be tested by a NATA laboratory accredited for the appropriate testing. The results must show the full chemical composition and the mechanical testing results, including yield, tensile and elongation tests. The sampling rate and number of tests must be in accordance with Clause 6.11.

Storage of materials

- 6.16 All stainless steel, whether fabricated or not, must be stored in such a manner that it is maintained in its original condition, will not be bent or damaged and will be adequately protected against contamination.
- 6.17 Protection must be provided against any contamination from materials which can cause weld porosity such as paint, markers, water or hydrocarbons, e.g., oil or grease. Prevent water from collecting between individual sheets or plates.

6.18 Generally, storage must be in a dry area with an even temperature, with sheets separated with an allowance made for air flow between them, covered with sheet plastic, at least 200 mm above the ground on platforms, slabs, or other supports.

Fasteners

6.19 Unless specified otherwise on the Drawings or in the Contract documents, the fasteners must comply with ATS 5420 and the following:

Bolts: Designation A4

Nuts: Designation A2

Washers: Grade 316 (UNS S31600)

Duplex stainless steel: Grades D6 and D8 (ISO 3506-1)

6.20 The Contractor must provide evidence of compliance with ATS 5420 to the Principal prior to the installation of the fasteners.

HOLD POINT 4.	
Process Held	Installation of fasteners.
Submission Details	Refer ATS 5420.

7. Fabrication

General

7.1 At a minimum, the Quality Plan must include:

- a) Procedures for fabrication and erection;
- b) System for identification of components;
- c) Assembly procedures, including dimensional control and details of manufacturing jigs;
- d) Method of ensuring that equipment is free of potential contamination (such as covering the equipment after use);
- e) Method of ensuring that tools used on stainless steel are kept separate from those used on carbon steel (such as colour coding);
- f) Cutting and edge preparation procedures; and
- g) Procedures for cambering, curving, bending and straightening (if applicable);

7.2 All stainless steel components must be fabricated in accordance with AS/NZS 1554.6.

WITNESS POINT 1.	
Process Witnessed	Commencement of Fabrication
Notice Period	At least 5 working days prior notice of the commencement of fabrication must be provided to the Principal

Handling and storage of stainless steel components

- 7.3 All stainless steel fabrication must be undertaken in a separate building to carbon steel fabrication, unless approved otherwise by the Principal.
- 7.4 All stainless steel, whether fabricated or not, must:
- be wrapped or otherwise protected during transport to avoid contamination and if an adhesive plastic film is used, all traces of adhesive must be removed from the steel with a suitable solvent;
 - be stored in such a manner so that it is maintained in its original condition;
 - not be stored in sunlight for extended periods where the plastic films or adhesives may adhere to the stainless steel;
 - be stored in a dry area which is free from contaminants such as oil, grease or water and including the potential for condensation;
 - not be bent or damaged during handling and storage; and
 - not be stored in contact with carbon steel.
- 7.5 Web slings must be used for lifting stainless steel components.
- 7.6 Tools used to fabricate or assemble stainless steel components must be dedicated tools for stainless steel work. Tools previously used on carbon steel must not be used for stainless steel work.
- 7.7 The marking of stainless steel must not be undertaken with a sharp object or a lead pencil.
- 7.8 Before any marking out or other work is done, the Fabricator must make all plates flat and all bars and sections straight and free from twist so that, when assembled, adjacent surfaces will be in close contact throughout. The methods adopted for the above work must be such that the material is not damaged.

Cutting and edge preparation of stainless steel sections

- 7.9 All material must be cut to the required length and prepared as outlined by Clause 5.4 of AS/NZS 1554.6.
- 7.10 Tools used to fabricate or assemble stainless steel components must be dedicated tools for stainless steel work. Tools previously used on carbon steel must not be used for stainless steel work.
- 7.11 Grinding, cutting and welding must not be carried out over open bundles of stainless steel components or where rooster tails can decorate virgin stainless steel.
- 7.12 Edges to be welded must not be sheared without mechanical dressing to remove shear face cracks.
- 7.13 All butt weld preparation must be prepared by machining, grinding or plasma cutting followed by grinding. All cutting must be generally as smooth and regular as that produced by edge planing and the edge must be left free of slag.
- 7.14 All re-entrant corners must have a radius of not less than 40 mm. The cut edge must transition smoothly into the radius of the re-entrant corner.
- 7.15 No rough edges are allowed to remain, and uneven outer edges must be dressed off to a true line.

Bending of plate or sheet

- 7.16 Prior to processing, all bending equipment must be cleaned of any potential contamination.
- 7.17 Prior to bending, any rags present on sheared edges must be removed by grinding or filing to prevent the possibility of plate splitting on the outside corner.
- 7.18 Bending of stainless steel plate must be carried out in a press to produce clean straight bends with no distortion in the adjacent flat surfaces.

Rolling of plate or sheet

- 7.19 Prior to processing all rolling equipment must be cleaned of any potential contamination.
- 7.20 Prior to rolling any rough edges must be smoothed by grinding to reduce the chance of the material cracking or splitting.
- 7.21 The surfaces of the rollers must be clean so that the plate will not be scratched or pick up contaminants.

Cover plates

- 7.22 Stainless steel cover plates made from material of thickness 9 mm and below must be fabricated from cold rolled stainless steel with a Class 2B mill finish that has no visible ground surfaces.
- 7.23 Stainless steel cover plates made from material of thickness 10 mm and above must be fabricated from stainless steel with a HRAP (Hot Rolled, Annealed and Pickled) finish.

Galling

- 7.24 If anti-galling measures are not specified on the Drawings, the Quality Plan must include details of anti-galling measures, which may include:
 - a) Ensure a hardness difference of at least 50 Brinell between the nut and bolt.
 - b) Confirm that the mechanical fit is correct, the surfaces are smooth, but not mirror like, and that they are clean.
 - c) Select and apply an appropriate lubricant and/or substrate material. Lubrication is required even if the joint is intended to be permanent. Graphite that may cause galvanic corrosion must not be used.
 - d) Use a torque wrench and the correct force for the material class and surface conditions.

Holes for bolting

- 7.25 All holes must be finished accurately to size and in the position shown on the drawings. All holes must be cleaned of all burrs and rough edges.
- 7.26 The axis of the holes must be at right angles to the surface through which they pass, except where otherwise shown on the drawings.
- 7.27 All holes in material with a thickness greater than 10 mm must be drilled.
- 7.28 Punching of holes in material having a thickness greater than 10 mm is not permitted.

Tolerances

7.29 Unless specified otherwise in the Contract documents, the tolerances in Table 7.29 apply.

Table 7.29: Fabrication Tolerances

Application	Tolerance (mm unless specified otherwise)
Bridge traffic barrier and balustrade:	
AS/NZS 1734 Bridge traffic barrier and balustrade	
Length of rails and balustrade	± 2
Height of posts ±2 mm	
Centre of holes ±2 mm	
Finished height of balustrade ±2 mm	
Bow in rail and balustrade 1 mm / m	
Height of posts	± 2
Centre of holes	± 2
Finished height of balustrade	± 2
Plan dimension	± 3
Bow in rail and balustrade	± 1 mm / m
Components other than bridge barrier	± 2

8. Welding

General

8.1 At a minimum, the Quality Plan must include:

- a) Inspection and Test Plans;
- b) qualifications and identification of welders;
- c) qualification of welding supervisors and inspectors;
- d) system of identification of each welder's work;
- e) a copy of the Welding Procedure Specification (WPS);
- f) the corresponding Procedure Qualification Record (PQR);
- g) macro test results for the welding staff for each submitted WPS;
- h) procedures and welding sequence for control of distortion;
- i) welding wire batch certificate;
- j) a draft weld map to show where the WPS will be used; and
- k) material certificates.

8.2 All mechanical and non-destructive testing must be carried out by a laboratory which is accredited by a body which is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) for testing laboratories.

8.3 The WPS must reflect the connection to be welded shown on the Drawings.

8.4 Unless specified otherwise, all welding must conform to Category 1, Class B and Surface Condition II in accordance with AS/NZS 1554.6 and the additional requirements in this Clause 0.

8.5 All weld spatter must be removed from the surface of the weld and the parent metal.

Welding consumables

- 8.6 Welding consumables shall be compatible with the parent material and shall have a classification and designation in accordance with the provisions of AS/NZS 1167.2, AS/NZS 4854 and/or AS/NZS ISO 14343.
- 8.7 Welding consumables must be certified, by a recognised authority complying with the requirements of AS/NZS 1554.6, that the consumables comply with AS/NZS 1554.6 Table 4.6.1.

Qualification of welding procedures

- 8.8 Each welding procedure must be qualified in accordance with AS/NZS 1554.6.

WITNESS POINT 2.

Process	Welding and testing of each test piece and/ assembly
Notification Period	At least 3 working days before the commencement of welding.

- 8.9 The test and / or Inspection Certificates must be obtained from a laboratory with appropriate NATA registration, with all relevant results shown and a statement that the results comply with AS/NZS 1554.6. The testing operator must have the relevant AINDT certification for the test carried out.

Welding Supervisor

- 8.10 Welding must be supervised by a Welding Supervisor who satisfies the requirements of AS/NZS 1554.6 Clause 4.12.1 (a) to (d). If the work is not carried out in Australia, the welding supervisor must satisfy the requirements of AS/NZS 1554.6 Clause 4.12.1 (a).
- 8.11 The nominated welding supervisor must be physically present in the workshop or factory office during all welding processes, including tack welding.

Welding personnel

- 8.12 All welders must demonstrate their competence by welding a test piece qualified by testing in accordance with Clause 4.12.2.3 of AS/NZS 1554.6.
- 8.13 Any welder who during fabrication, repeatedly produces non-conforming welds must be required to be re-tested. Failure of the re-test must preclude such welder from further similar welding on the works until the welder develops the required proven ability to produce sound welds.
- 8.14 If specified in the Contract documents, after the initial qualification, all welding personnel must undertake a macro test on a 12-monthly basis. This also applies to robot welders

Robot welder

- 8.15 All welding undertaken by a robot welder and the associated operator must comply with the initial welder qualification requirements of Clause 4.12.2.3 of AS/NZS 1554.6.
- 8.16 After initial qualification, the robot welder must undertake a macro test on a 12-monthly basis. The macros must be for each WPS used in the Works.
- 8.17 Individual operators of the robot welder must undertake the qualifications detailed in Clause 8.15.
- 8.18 The principal reserves the right to withdraw approval of the robot welder if the welding is below the minimum requirements outlined in AS/NZS 1554.6.

Welding of dissimilar steels

- 8.19 In the case of welding dissimilar steels, the welding technique process must be reviewed for the issues associated with contamination and galvanic corrosion and documented by the Welding Coordinator. Welding of dissimilar metals must comply with any applicable requirements included in Appendix H of AS/NZS 1554.6.

Butt welding preparation

- 8.20 The Fabricator must ensure that the butt weld preparation has been assembled in accordance with the approved WPS, including bevel angle and root gap. If the joint does not comply with the details on the WPS, the Fabricator must either:
- modify the joint preparation so the joint complies with the WPS, or
 - develop and test a PQR with the new joint details, then qualify the necessary welding staff to the subsequent WPS in accordance with Clause 8.12.

HOLD POINT 5.

Process Held	Butt welding.
Submission Details	Notification that the butt weld preparation is complete must be provided to the Principal at 3 working days before the commencement of butt welding.

9. Completion and Inspection of Welds

General

- 9.1 The Quality Plan must include:
- procedures and program for weld inspection;
 - methods of reporting results of weld inspection; and
 - procedures for correction of faulty welding.
- 9.2 The levels of imperfection in fillet and butt welds must not exceed the limits specified in Tables 6.3.2, 6.3.2 and 6.3.3 of AS/NZS 1554.6.
- 9.3 Unless specified otherwise in the Contract documents, the Contractor must appoint a Welding Inspector to carry out the inspection of all welding required under this Specification. The Welding Inspector must:
- not undertake any other role (including carrying out welding or supervising welding) in respect of the fabrication of the Works;
 - not be an employee of the Fabricator (unless approved otherwise by the Principal); and
 - be qualified as a Welding Inspector by an Authorised Training Body which is accredited by the IIW or has other qualifications and experience acceptable to the Principal.
- 9.4 The weld inspections, to be covered by test certificates, must be carried out:
- when all adjacent welds are completed and are sufficiently cool to ensure that no further defects arise after inspection; and
 - prior to the application of any surface treatment.

- 9.5 The Principal may arrange for second or third party inspection of the welds. The Fabricator must ensure the welded items are positioned so they can be inspected; that is, stacking of items that restricts visibility of completed welds is not permitted. If the welding is not carried out in Australia, the Contractor bears any additional costs incurred by the Principal when undertaking an inspection that it would not have incurred if the welding was carried out in Australia.
- 9.6 Any suspected welding defects must be tested with a suitable non-destructive test.

HOLD POINT 6.

Process Held	Removal of fabricated component from the workshop and / or application of surface treatment.
Submission Details	Notification that the completed welds are (or will be) ready for inspection must be provided to the Principal at 3 working days before the removal of the component from the workshop and / or application of any surface treatment.

- 9.7 If the welding is not carried out in Australia, Hold Point 6 applies at least 3 working days before the component is packaged for transportation to Australia.

Nonconforming welds

- 9.8 If a nonconforming weld is detected following inspection, except for a crack, one additional weld (which is represented by the inspected weld) must be tested for every non-conforming weld. This includes the welds adjacent to the nonconforming weld for a distance of 300 mm.
- 9.9 All weld repairs must be re-inspected for conformity.
- 9.10 Repairs must be carried out prior any surface treatment being applied.

Weld maps

- 9.11 Once the welding has been completed, the Fabricator must provide a weld map outlining the welding undertaken in the manufacture of the stainless steel components. The weld map must outline, for each connection, the following:
 - a) WPS number used;
 - b) welder’s initials (or welder ID) and date welded; and
 - c) nominated welding supervisor’s initials (or welder ID) and date inspected.
- 9.12 The weld maps must be submitted to the Principal prior to the stainless steel product being released for any surface treatment.
- 9.13 A table or legend must be made available if requested to identify the welder’s full name and corresponding initials or welder ID.

HOLD POINT 7.

Process Held	Removal of fabricated component from the workshop and / or application of protective coating.
Submission Details	The weld maps must be provided to the Principal prior to the removal of the component from the workshop and / or application of protective coating.

10. Shop Assembly

- 10.1 At the earliest possible stage during fabrication, or as indicated on the Drawings or in the Specification, the Fabricator must shop assemble each different combination of members and panels to check the fit of the components and verify the suitability of the templates used in fabrication.

11. Surface Treatment

- 11.1 The Quality Plan must include procedures for cleaning, descaling and passivating of the stainless steel.
- 11.2 All fabricated stainless steel products must be pickled and passivated in accordance with the requirements of ASTM A380/A380M. The pickling and passivation process must be carried out once the fabrication is complete. The pickled areas must show a clean metallic surface which may either be bright or slightly etched, depending on the pickling conditions.
- 11.3 Descaling by the use of mechanical methods is not permitted.
- 11.4 Further metal removal or repair to the surface is not permitted after the completion of passivation.

12. Marking, Handling and Transportation

- 12.1 The Quality Plan must include:
- a) Procedures for transport, handling and storage, and
 - b) Details of the measures to prevent distortion and damage to the components.
- 12.2 The Fabricator must ensure that each component can be readily identified when delivered to site and provide the Principal with details of the identification system.
- 12.3 The packing and methods of support and lifting during handling and transportation of all structural stainless steel work must be undertaken in a manner to prevent:
- a) Distortion or damage to the stainless steel work;
 - b) Contamination by carbon steel

13. Certification

- 13.1 Within 20 working days of the completion of fabrication of the stainless steel members, the Contractor must submit the following to the Principal:
- a) the Contractor's certification that each item fabricated conforms to the requirements of the Drawings and the Specification; and
 - b) electronic copies of the work-as-executed shop drawings in a format acceptable to the Principal.

Annexure A: Summary of Hold Points, Witness Points and Records

The following is a summary of the Witness Points / Hold Points that apply to this Specification and the Records that the Contractor must submit to the Principal to demonstrate compliance with this Specification.

Clause	Hold point	Witness point	Record
4.1	1. Commencement of fabrication		Quality Plan and program of work
5.3	2. Commencement of fabrication		Shop drawings and certification (where applicable)
6.12	3. Commencement of fabrication.		The material test certificates and test reports
6.20	4. Installation of fasteners.		Refer ATS 5420
7.1		Commencement of fabrication	
8.19	5. Butt welding		
9.6	6. Removal of fabricated component from the workshop and / or application of protective coating		Notification that the completed welds are (or will be) ready for inspection
8.8		Welding qualification	
9.13	7. Removal of fabricated component from the workshop and / or application of protective coating		Weld maps
13			Contractor's certification and the As Constructed Drawings

Amendment Record

Amendment no.	Clauses amended	Action	Date
-	New specification	New	December 2022

Key

Format	Change in format
Substitution	Old clause removed and replaced with new clause
New	Insertion of new clause
Removed	Old clauses removed