



Stelform Pty Ltd

A wholly owned subsidiary of RCR Tomlinson Ltd.

QP-01
QUALITY PLAN
For

Client
Project – Heat Exchanger

Title
Job Description

Order No. xxxx

Job No. xxxx

AMENDMENT CONTROL

REV	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
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Section 1 Foreword

This project for Our Client involves the design, supply of all material, manufacture, testing and preparation for transport to site of a new Heat Exchanger as part of the Our Client's Project.

This quality plan sets out the requirements to be implemented for this contract. The plan covers all specific design, manufacturing and testing requirements.

The level of quality assurance associated with the requirements of AS/NZS ISO 9001 shall be applied to the contract using the practices, resources and activities described in the RCR Stelform Quality System.

Section 2 Organisation of Personnel

All client correspondence and document transmittals related to this project shall be directed through the RCR Stelform Project Engineer and the client representative. The project organisation structures are shown in the Appendix 1.

Section 3 Design Information

RCR Stelform shall carry out the mechanical design and drawing requirements.

The design for the heat Exchanger shall be as per the requirements of AS1210-1997 Amdt 3 class1 & 2A. The requirements of RCR Stelform's QSD-20 for Design Control as well as ISO 9001 shall also be met.

Our Client supplied Technical Specification, Design Specification and general site information will form the basis of the design.

Design verification shall be carried out by an RCR Stelform Senior Design Engineer not previously associated with the project.

RCR Stelform shall carry out the registration of the design for the Heat Exchanger with the relevant state authority.

RCR Stelform shall carry out all drawing requirements for the project. Drawings shall be submitted for review and approval prior to the commencement of fabrication.

Copies of "As Built" drawings and calculations shall be included in the final Manufacturing Data Folder (MDF).

Section 4 Procurement

RCR Stelform shall be responsible for the purchase and supply of all material required for the project.

Purchase orders shall be prepared in accordance with RCR Stelform's QSD 5 – Procurement Control and include details critical to the correct supply of that material.

All material shall be required to be supplied with Mill Material Test Certificates that can be positively traced to the material supplied and comply with the requirements of ISO 10474 3.1. showing the heat number, chemical and mechanical test results.

Carbon steel heads to be normalised after forming. A copy of the heat treatment chart shall be supplied with the heads.

All material used in the fabrication shall be as per the requirements of the drawings and design data and shall not be substituted unless written approval is given by our client.

Material certificates supplied shall be available for inspection by a client Authorised Inspector at RCR Stelform's workshop and will form part of the final MDF.

Section 5 Material Control

RCR Stelform shall be responsible for receipt and storage of all materials and components associated with the manufacture.

The material shall be verified as correct against delivery dockets, purchase orders and material certificates supplied. The verification shall confirm the following:

- Material is suitable for use i.e. not damaged, correct size etc
- Specification and heat numbers etc stencilled or marked on the items are correct
- All required tests have been carried out and comply

All plate and pipe material shall be low stress stamped where required with a unique file number that will be transferred to all off cuts to allow full traceability of material.

Forgings such as flanges shall be traceable by manufactures stamped heat number.

No material shall be released for manufacture until it has been inspected and deemed to comply with the job requirements by the Quality Control Officer.

Material information shall be recorded in a Material Register (ITC 04).

The material register shall show drawing item numbers, item location, material grade and description, size, heat, file and certificate numbers.

Additional client and code requirements will be shown on the detail drawings.

All material test certificates supplied shall be included in the final Manufacturing Data Folder (MDF). Any heat number transfer that is required shall be done using "low stress" stamps.

Section 6 Manufacture

6.1 Manufacturing Standards

The manufacture shall be carried out in accordance with the following standards:

- | | |
|--|-----------------------------------|
| • Quality Control | ISO-9001 |
| • Design & Manufacture | AS1210 -1997 Amdt. 3 Class 1 & 2A |
| • Manufacture | AS4458-1997 |
| • Tolerances | ES-C02 |
| • Weld Procedure & Welder Qualifications | AS3992 |
| • Non-Destructive Testing | AS4037 |
| • Surface Treatment | Clients Spec |

6.2 Approval of Subcontractors

Subcontractors associated with machining, plate rolling, non-destructive testing and surface treatment shall be selected from RCR Stelform "Approved Suppliers" list.

6.3 Welding Control

All welding shall be carried out in accordance with code requirements using qualified Welding Procedure Specifications (WPS), in accordance with AS3992 Section 3.

Weld procedures shall be submitted to Our Client for approval prior to the commencement of welding.

When procedures are not available, preliminary procedure specifications shall be prepared, submitted for review and qualified prior to use.

Welding operators shall as a minimum be qualified to AS3992 Section 9 and the requirements associated with the welding procedure used.

Records of the welder's qualifications shall be recorded on Welder Qualification Record ITC 10.

Production test plates shall be provided to cover the requirements of AS4458 Clause 13.4

The production test plates shall cover material of similar specification being welded by similar WPS and shall be tested in accordance with the requirements of AS3992.

The information relating to the weld joints shall be recorded in the Welding Register ITC12. As well as joint number, size and description the welders shall record their ID number, the date and the consumable heat number used for each weld.

The welders will refer to the Welding Register for the correct WPS to be used for the relevant joint.

The WPS shall show the correct consumable to be used.

Consumable control and traceability shall be as per RCR Stelform's QSD13.2 Handling and Storage – Welding Consumables. Consumables to be selected from stock supply or purchased specifically for the job, the consumable to be checked by an authorised person.

Welding consumables for the project shall be supplied with material certificates showing chemical composition and batch number and form part of the final MDF.

Welding consumables are to be stored as per the requirements of QSD 13.2 and manufactures recommendations.

6.4 Non Destructive Examination

A NATA approved subcontractor shall carry out NDE. The interpretation of testing will be as AS4037 Class 1 Vessels. The extent of testing shall be as per AS4037 Table 7.1 and Section 13 cl. 13.1.

6.5 Heat Treatment

Post Weld Heat Treatment shall be carried out in Accordance with AS 4458.

ITC20 shall nominate the Times and Temperatures required for the Heat Treatments.

6.6 Pressure Testing

The Heat Exchanger shall be subjected to hydro tests as per the requirements of RCR Stelform's Technical Procedure TP-M07.

Pressure Test Certificates (ITC20) shall be supplied indicating item tested, test pressure, test duration and date of test.

The Appointed Inspector shall be notified with a minimum of 24 hours notice of the proposed test date for witnessing of the tests.

The pressure gauge shall have a valid calibration certificate.

A copy of the gauge calibration certificate will be included in the MDF.

The testing medium for the test shall be potable water and shall be at a minimum temperature of 7°C. The test duration shall be one half hour.

At the completion of the hydro test all water shall be removed as best possible and the vessel dried. All reinforcing pads and support wrappers are to be subjected to a pneumatic soapy test at 100kPag.

6.7 Dimensional Checks

The Heat Exchanger shall be subjected to in process checks during fabrication. Full dimensional checks will be made after completion of manufacture to enable "as built" drawings to be produced. The dimensional checks are to ensure all dimensions comply with the drawing requirements.

6.8 Item Identification

Engraved steel nameplates as well as hard stamping (low stress) on the rim of the girth flanges shall identify the vessels. All individual removable items shall be hard stamped with equipment number and test date on the flange rim to allow for identification once removed from the vessel. The engraved nameplates shall contain information relating to the design and testing. Stamping shall be recorded by rubbings or digital photographs.

6.9 Surface Treatment

Surface Treatment internal and external shall be in accordance with Client Specification's. Abrasive blasting shall be to AS1627.4 Class 2.5. Primer Coat shall be. Finish Coat shall be.

6.10 Despatch

The vessels shall be prepared for transport to site in accordance with client's requirements. Spares to be supplied as required. Test holes in reinforcing pads shall be filled with heavy grease. All flange faces not fitted with permanent blind flanges will be coated with Shell Ensis Fluid HB and covered with temporary blind flanges bolted in place. All machined surfaces shall be protected against damage and corrosion by the application of a suitable rust inhibitor while in transport and storage. A Despatch Advice shall accompany all shipments listing all items despatched. The Heat Exchanger will not be despatched until the Authorised Inspector has cleared the vessels for delivery.

Section 7 Inspection and Testing

An Inspection and Test Plan (ITP) for shall identify the sequence of operations and the criteria associated. The ITP shall identify RCR Stelform and client's inspection points (Hold Witness etc). RCR Stelform shall liaise with the Authorised Inspector to ensure he is aware of all situations that require his involvement. Where a Hold or inspection point has been indicated by the client, a minimum of 24 hours notice will be provided by RCR Stelform. The Client representative shall be given appropriate access to the RCR Stelform workshop for witnessing of various stages of manufacture as requested.

Section 8 Documentation

At the completion of work, the required number of hard copies and CD-Rom of the MDF will be sent to Our Client.

The MDF shall contain:

- Quality Plan
- Inspection Test Plan
- Material Register
- Material certificates
- Assembly Check sheet
- Weld Procedures

- Welder Qualifications
- Weld Register
- NDE Reports
- Pressure test Certificates
- Surface treatment reports
- Photograph / rubbing of vessel stamping
- Design reports
- Calculations
- "As built" drawings A3
- Statutory Authority Design Notification
- Manufacturers Data Report
- Certificate of Compliance
- Release certificates

