

EXPRO National Manual for Projects Management

Volume 9, chapter 4

Project Construction Welding Works Procedure



Document No. EPM-KCE-PR-000008 Rev 003



Project Construction Welding Works Procedure

Document Submittal History:

Revision:	Date:	Reason For Issue
000	16/10/2017	For Use
001	29/11/2017	For Use
002	26/11/2018	For Use
003	10/08/2021	For Use



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Project Construction Welding Works Procedure

1.0 PURPOSE

This procedure identifies the minimum controls, timing of exchange, and responsible parties necessary to establish and implement a Welding Program.

This procedure applies to works performed under all Government construction projects executed throughout the Kingdom of Saudi Arabia.

For the purposes of the Construction Management Procedures the Project Management Company is the Entity Project Management Organization (EPMO) appointed by the Entity and references prefixed with "Site", such as Site Construction Department, Site Engineering Department, represent the Project Management Company at Project level, on construction sites.

2.0 SCOPE

This procedure covers the welding of all permanent and temporary Works according to the contract, specifications and drawings and applicable Codes and Standards.

Construction Contractors performing welding work will be required to submit their Welding Program for approval. The Construction Contractors Welding program shall define their requirements and prepare procedures that cover the following as a minimum:

- Welder Training and Upgrading
- Welder Qualification.
- Welding and Non-Destructive Examination (NDE) Documentation and Record Management.
- Welding and NDE Matrix.
- Welding Filler Material (and Storage Requirements)
- Positive Material Identification (PMI)
- Pre-Heat and Post Weld Heat Treatment
- Welding, Cutting and Other Hot Work
- Weld Repair

3.0 DEFINITIONS

Definitions	Description
Non-Destructive Examination (NDE)	Examination methods and techniques used to compare the condition of a part, component, or weld to predetermined acceptance criteria without affecting its future application.
Entity Project Management Organization (EPMO)	An Entity Project Management Organization, this is an integrated team that comprises the Entity and its PMC responsible for managing all the Entity's projects.
Construction Contractor	The Main or Principal Contractor responsible for undertaking the Construction Works on the Project. Individual(s) or firm(s) engaged in the construction of buildings, either residences or commercial structures, as well as construction activities such as paving, highway construction, utility construction and landscape installation.
Site Construction Department	Department within the Project Management Company that is responsible for construction activities/operations.
Architect/Engineer Design Consultant (A/E)	Design Consultant undertaking a part or the whole of the design for a Project.
Positive Materials Identification (PMI)	The process used to verify the percentage of specified elements present for specific materials from the following alloys: a. Carbon & Low Alloy Steels b. Nickel Base Alloys



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Definitions	Description
	c. Chrome-Moly Steels d. Stainless Steels.
CR (Computed Radiography)	The use of a Phosphor Imaging Plate to create a digital image. CR uses a cassette based system like analog film and is more commonly considered to be a bridge between classical radiography and the increasingly popular fully digital methods.
Codes	Welding program is designed to meet the basic requirements of major Codes and Standards such as: American Society of Mechanical Engineers (ASME) American Welding Society (AWS) British Standard European Standard (BS EN).

4.0 REFERENCES

1. EPM-KCQ-PR-000005 - Project Construction Quality Management System Procedure
2. EPM-KCE-PR-000001 - Project Construction Mechanical Works Procedure
3. EPM-KCE-PR-000010 - Project Construction Piping Works Procedure
4. EPM-KCE-PR-000009 - Project Construction Civil Works Piping Procedure
5. EPM-KCE-PR-000004 - Project Construction Electrical Works Procedure
6. EPM-KSS-PR-000020 - Project Welding Operation Procedure
7. EPM-KSS-PR-000030 - Project Safety Watches Procedure

5.0 RESPONSIBILITIES

5.1 Construction Contractor

The Construction Contractor is responsible for the establishment of a Welding Program that includes all planning, defining the appropriate standards, preparation of all Welding procedures, preparing supporting documentation and executing the Works in accordance with the contract, specifications and applicable Codes.

5.2 Site Construction Department

The Site Construction Department shall be responsible for the Oversight of all welding activities on the project and coordinating site-based construction support by monitoring the Construction Contractor's Welding Program.

6.0 PROCESS

6.1 General

The Construction Contractor shall ensure that a Welding Program is identified and prepared that will produce and manage all Welding activities, Welder Qualifications and Approval Records for the Construction Works. The Welding program must also include the requirements for Welding maps with proper identification for the inspection of welds, a program that identifies qualified welders and the processes for re-certification of Welders for excess weld failures.

The Construction Contractor shall appoint a competent person, Welding Engineer, to establish and monitor the Welding and NDE activities and ensure that they are in full compliance with the Welding Program.

The Welding Engineer should as a minimum monitor the following:

- Welder/Welding Operator qualifications.
- Filler Material Control (including appropriate Weld Rod Ovens)
- In-process welding activity.
- Implementation and application of Welding and NDE procedures.



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- Monitor completed welding and NDE inspection records.

The Site Construction Department shall ensure that for projects requiring either site or fabrication shop welding, a competent resource, which is experienced in the review and management of Welding Procedures, Specifications and Welder Qualification records, will be available to the Site Construction Department for review and advice on technical matters of the Works. This resource may not be assigned to the project full-time or may be provided under a specialty contractor provided during Construction.

The Construction Contractor shall undertake all welding activities in accordance with the requirements and best practice described in the HSSE Procedures contained in the Expro Projects White Book; EPM-KSS-PR-000020 - Project Welding Operation Procedure and EPM-KSS-PR-000030 - Project Safety Watches Procedure

6.2 Welding Procedures

6.2.1 Weld Procedure Qualification Record

The Construction Contractor shall prepare Weld Procedure Qualification Records that are used to develop or verify the Weld Procedure Specifications.

6.2.2 Weld Procedure Specification (WPS)

The Construction Contractor will be required to prepare Weld Procedure Specifications for the materials to be welded based upon the contract requirements, specifications and applicable Codes and be submitted to the Site Construction Department for approval.

Note: The Weld Procedure Specifications must be issued and accepted before any welding activity is undertaken.

6.3 Welders Approval Record & Welders Performance Qualification Record

The Construction Contractor shall ensure that all welders are qualified per the applicable Codes to undertake work on the project. The system for qualification and recording competence should be included in the Welding Program and made available and be audited periodically by the Site Construction Department.

Construction Contractor Welder performance qualification tests must be conducted under the direct supervision of a qualified Certified NDE representative and approved by the Site Construction Department

Welder performance qualifications shall be in accordance with applicable welding standards, the tests shall meet the applicable Code under which the welder will be performing production work, must be welded in accordance with a welding procedure approved for the job, and the results shall be recorded.

A daily welding activities log shall be maintained by the Construction Contractor and should include as a minimum: information on the numbers of tests, procedures used and the number of accepted and rejected tests.

A Welder Performance Qualification Log shall be maintained by the Construction Contractor and may be in electronic or manual form. It shall include an entry for each person qualified to weld on the project. The log should be kept current with any performance qualification changes or terminations. The log provides the Construction Contractor and the Site Construction Department with a quick reference to welders' qualifications

6.4 Welding and NDE Documentation

The Construction Contractor shall develop the following suggested forms, records and documents for those items required by the applicable specifications and Codes and shall issue specific instructions/ procedures for filling out each form and include these items in the Construction Contractor's Welding Program.



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- Welder Performance Qualification Test Record
- Welder Qualification Log
- Welding & NDE Assessment Report
- Assessment Finding Report
- Non-Destructive Examination (NDE) Request / Record
- Weld Repair Order/Record
- Welding Information Stamp
- Welding / NDE status log
- Filler Metal Withdrawal Log
- Visual Examination
- Radiographic Technique - "Film"
- Magnetic Particle Examination
- Liquid Penetrate Examination
- NDE Resume
- Visual Acuity Verification
- NDE Level I and II Certification Statement
- NDE Level III Certification Statement
- Radiographic Technique - Digital/CR
- Radiographic Interpretation - Film
- Radiographic Interpretation - Digital/CR
- UT-AWS Performance Check
- UT-AWS Data Examination Record
- Ultrasonic Thickness Measurement Report
- Periodic Technical Performance Assessment

6.5 Welding & NDE Matrix

A Welding and NDE Matrix will be prepared by the Construction Contractor which will denote the Code that will apply to construction, the base material type, the weld joint type and thickness for each component to be welded. It will also denote the welding procedure(s) to be used for each application, as well as any required non-destructive examination(s), preheat or post weld heat treatment. General and specific notes are included, as appropriate, to cover unique or additional requirements and guidance based upon common practice, applicable Codes, and other specified requirements.

6.6 Welding Filler Material

All filler material shall meet the applicable standards, specifications, and code or manufacturers requirements approved by the A/E Design Consultant.

The choice of filler material (manufacturer/brand, diameter and type of rod) is the responsibility of the Construction Contractor, unless the contract references a specific manufacturer/brand. If a specific brand name is referenced in the specifications, its use is mandatory unless otherwise approved by the A/E Design Consultant.

6.7 Undertaking and Testing the Works

Inspection and Testing Requirements of welding activities shall be in accordance with the contract requirements, however it shall at a minimum cover the items identified in Project Inspection and Test Plan for Inspection of Welding Activities Template (Sample) Attachment 1.



7.0 ATTACHMENTS

1. EPM-KCE-TP-000010 - Project Inspection and Test Plan for Inspection of Welding Activities Template



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Attachment 1 - EPM-KCE-TP-000010 - Project Construction Inspection and Test Plan for Inspection of Welding Activities Template

Activity No.	Activity Description	Inspection/Test Requirements		Reference Documentation		Method of Verification (see Legend)			Demonstrated Evidence Report / Checklist Reference No.
		Test or Inspection Performed	Stage / Frequency	Code / Spec / Etc.	Acceptance Criteria	Construction Contractor	Site Construction Department	Project	
1.0	Document review								
1.1		Confirm documents: • Design drawing • Method statement • Material submittal • Weld procedures specification • Weld procedure qualification record • Welders approval record • General arrangement drawings / plans	Prior to commencement	Project Specific	Documents available and latest revision from the ECMS				
2.0	Material receiving								
2.1		Visual inspection for damage, deformity and correct labels	Project Specific	Project Specific	Project Specific				Material Receipt
3.0	Storage								
3.1		Refer to method statement & manufacturer's recommendation: • Tube plate • Weld filler / rod	Project Specific	Project Specific	Project Specific				
4.0	Fabrication								
4.1		Check fit-up, piece arrangement alignment and dimensions.	Project Specific	Project Specific	Project Specific				
4.2		Verify welding operation	Project Specific	Weld Procedure Specification	Project Specific				
4.3		Visual and dimensional check	Project Specific	Project Specific	Project Specific				
5.0	Testing								