



MAGNUM CONSTRUCTION SERVICES INC.

CONCRETE / MASONRY / WELDING PROCEDURES (PQR, WPS)

Document Code: MCS-QM-F06 | **Revision:** 1.0 | **Effective Date:** October 31, 2025

1. PURPOSE

To define standardized **procedures for concrete, masonry, and welding operations**, ensuring all works comply with contract specifications, international standards (ACI, ASTM, AWS, NFPA), and Magnum Construction Services' Quality Management System.

These procedures establish requirements for **procedure qualification records (PQRs), welding procedure specifications (WPS), inspection and testing, and documentation traceability.**

2. SCOPE

This procedure applies to all **site and off-site construction works** involving:

- **Concrete:** batching, placement, curing, and testing
 - **Masonry:** block and brickwork, mortar, grout, reinforcement, and workmanship
 - **Welding:** structural steel, rebar couplers, embedded plates, and pipe systems
-

3. REFERENCES

- ACI 301, 318, 347, 530 – Structural Concrete & Masonry Codes
- ASTM C31, C39, C90, A615 – Testing & Material Standards
- AWS D1.1 / D1.4 – Structural & Reinforcing Steel Welding Codes
- ISO 3834 – Quality Requirements for Welding
- MCS-QM-03 Inspection & Test Plan (ITP)
- MCS-QHSE-14 Crane, Rigging & Lifting Plan
- OSHA 29 CFR 1926 Subpart Q / Subpart E

4. RESPONSIBILITIES

Role	Responsibilities
Project Manager	Ensures implementation of approved procedures and required qualifications.
Quality Manager	Approves WPS/PQRs, maintains master register, and coordinates third-party verification.
Site QA/QC Engineer	Conducts inspections, sampling, and maintains field logs per ITP.
Construction Superintendent	Ensures field crews adhere to approved mix designs and weld procedures.
Welding Inspector (CWI)	Monitors welding operations, verifies welder qualifications, maintains WQT records.
Lab Technician	Performs material and compressive-strength tests per ASTM requirements.

5. CONCRETE PROCEDURE

5.1 Mix Design

- Mix designs to be approved by **Engineer of Record (EOR)** before use.
- Design to include target compressive strength (f'_c), w/c ratio, admixtures, and temperature limits.
- Trial batches required before production.

5.2 Batching & Delivery

- Use calibrated batching equipment.
- Verify concrete delivery tickets against mix design and batch time (< 90 minutes).

5.3 Placement & Compaction

- Pour within placement window; maintain uniform layers ≤ 18 in.
- Use vibrators at $1.5 \times$ bar spacing; avoid over-vibration.



5.4 Curing & Protection

- Begin curing within 2 hours of finishing; maintain moisture for ≥ 7 days.
- Protect from thermal shock and rapid drying.

5.5 Testing

Test	Standard	Frequency
Slump / Temperature	ASTM C143 / C1064	Each Load
Compressive Strength Cylinders	ASTM C31 / C39	Each Pour
Air Content	ASTM C231	As Required

6. MASONRY PROCEDURE

- Use only approved block and mortar mix designs (ASTM C90 / C270).
 - Mortar mixed within 2 hours of batching; discard beyond 2.5 hours.
 - Ensure clean, damp surfaces before laying units.
 - Reinforcement placed per ACI 530; fully grouted cells where specified.
 - Field verification of dimensions, coursing, and alignment every 1.2 m lift.
-

7. WELDING PROCEDURE

7.1 Procedure Qualification Record (PQR)

- Prepared and witnessed per **AWS D1.1** or **D1.4**.
- Includes base metal, filler, position, current, voltage, and results of mechanical tests.
- Approved PQR forms the basis for corresponding **Welding Procedure Specification (WPS)**.

7.2 Welding Procedure Specification (WPS)

- Issued by certified Welding Engineer and approved by Quality Manager.
- Must specify parameters: process (SMAW, GMAW, FCAW), electrode type, preheat/interpass temps, travel speed.
- Filed and distributed to all welding crews before work begins.

7.3 Welder Qualification Tests (WQT)

- Conducted on coupons representative of site joints.
- Certified to AWS D1.1 / D1.4; retest required if > 6 months inactive or failed inspection.

7.4 Welding Inspection

Stage	Inspection Type	Acceptance Criteria	Reference
Before Welding	Visual	Clean joint, correct fit-up	AWS D1.1 / Clause 5
During Welding	Monitoring	Parameters within WPS limits	WPS
After Welding	VT / MT / UT	No cracks, porosity, undercut	AWS D1.1 / Clause 6

8. RECORDS & FORMS

Record Type	Form Code	Retention
Concrete Mix Design Approval	MCS-QM-F06A	10 Years
Masonry Inspection Checklist	MCS-QM-F06B	10 Years
PQR / WPS Register	MCS-QM-F06C	10 Years
Welder Qualification Log	MCS-QM-F06D	10 Years
Welding Inspection Report	MCS-QM-F06E	10 Years

9. REVISION & CONTROL

This procedure shall be reviewed annually by the **Corporate Quality Department** or when:

- Specification or standard changes (AWS / ACI / ASTM).
- Introduction of new material, process, or welding technique.
- Non-conformance linked to material or workmanship deviation.

10. APPROVALS

Prepared By	QA/QC Engineer	Date
Reviewed By	Project Manager	Date
Approved By	Corporate Quality Director	Date
