

VOLUME 8 — INSPECTION, TESTING & ACCEPTANCE

(Expanded – BS EN 1090-2:2018 + ISO NDT Standards + Eurocode 3)

(All organization names replaced with XXXXXX)

1. GENERAL INSPECTION REQUIREMENTS

1.1 Scope

This section defines the inspection, testing, verification, acceptance, and documentation requirements for:

- Materials
- Fabrication
- Welding
- Mechanical fasteners
- Surface preparation
- Coatings
- Site erection
- Final acceptance

All inspection and testing shall comply with:

- **BS EN 1090-2:2018**
 - **BS EN ISO 17637** – Visual testing
 - **BS EN ISO 17640** – Ultrasonic testing
 - **BS EN ISO 23278** – Magnetic particle testing
 - **BS EN ISO 3452** – Penetrant testing
 - **BS EN ISO 5817** – Weld quality levels
 - **BS EN ISO 12944** – Coating inspection
 - **ISO 8501 / 8502 / 8503** – Surface preparation
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1.2 Inspection Levels

Inspection levels vary by Execution Class:

Execution Class Inspection Level Description

EXC1	Basic	Visual checks only
EXC2	Standard	Visual + selective NDT
EXC3	Enhanced	Visual + systematic NDT
EXC4	Full	100% inspection + documentation

1.3 Responsibilities

The Contractor shall:

- Provide qualified inspectors
- Provide calibrated equipment
- Maintain inspection records
- Submit inspection reports
- Perform corrective actions

The Client or their appointed representative reserves the right:

- Witness inspections
 - Request additional testing
 - Reject non-conforming work
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2. MATERIAL INSPECTION

2.1 Material Certificates

All materials shall be inspected for:

- Correct grade
 - Correct thickness
 - Correct dimensions
 - Heat numbers
 - Certificate type (EN 10204)
 - Traceability
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2.2 Visual Inspection

Materials shall be visually inspected for:

- Cracks
 - Laminations
 - Rust
 - Mill scale
 - Surface defects
 - Mechanical damage
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2.3 Dimensional Inspection

Dimensional checks shall include:

- Plate thickness
 - Section dimensions
 - Straightness
 - Flatness
 - Squareness
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2.4 Non-Conforming Materials

Non-conforming materials shall be:

- Tagged
 - Quarantined
 - Recorded in NCR log
 - Removed from site unless approved for rework
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3. FABRICATION INSPECTION

3.1 General

Fabrication inspection shall verify:

- Compliance with drawings
- Compliance with tolerances
- Correct assembly
- Correct fit-up

- Correct hole sizes
 - Correct edge preparation
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3.2 Dimensional Checks

Dimensional checks shall include:

- Member length
 - Hole spacing
 - Hole diameter
 - Squareness
 - Flatness
 - Camber
 - Sweep
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3.3 Fit-Up Inspection

Fit-up shall be inspected for:

- Root gap
 - Alignment
 - Joint preparation
 - Backing materials
 - Tack weld quality
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3.4 Tolerances

Tolerances shall comply with:

- **BS EN 1090-2 Annex D**
 - Project-specific tolerances
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4. WELDING INSPECTION

4.1 Visual Testing (VT)

Visual inspection shall comply with:

- **BS EN ISO 17637**

VT shall check:

- Weld size
 - Weld profile
 - Undercut
 - Overlap
 - Porosity
 - Cracks
 - Arc strikes
 - Spatter
 - Root penetration
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4.2 Magnetic Particle Testing (MT)

MT shall comply with:

- **BS EN ISO 23278**

Used for:

- Surface cracks
 - Toe cracks
 - Root cracks
 - Fillet welds
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4.3 Penetrant Testing (PT)

PT shall comply with:

- **BS EN ISO 3452**

Used for:

- Non-ferrous materials
 - Smooth surfaces
 - Fine cracks
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4.4 Ultrasonic Testing (UT)

UT shall comply with:

- **BS EN ISO 17640**

Used for:

- Butt welds
 - Thick plates
 - Critical joints
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4.5 Radiographic Testing (RT)

RT shall comply with:

- **BS EN ISO 17636**

Used only where required by design.

4.6 Weld Acceptance Criteria

Acceptance criteria shall comply with:

- **BS EN ISO 5817**

Execution Class Quality Level

EXC1	Level D
EXC2	Level C
EXC3	Level B
EXC4	Level B+

4.7 Weld Repair Inspection

Repaired welds shall be:

- Re-tested using the same NDT method
 - Documented
 - Approved by the RWC
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5. MECHANICAL FASTENER INSPECTION

5.1 Bolt Verification

Inspect:

- Bolt grade
 - Bolt length
 - Bolt markings
 - Nut grade
 - Washer type
 - Surface condition
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5.2 Hole Inspection

Check:

- Hole diameter
 - Hole alignment
 - Burr removal
 - Slotted hole dimensions
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5.3 Tightening Inspection

Inspection shall include:

- Snug-tightening
 - Final tightening
 - Torque verification
 - DTI washer checks
 - HRC spline shear checks
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5.4 Slip-Resistant Joints

Inspect:

- Faying surface condition
 - Slip factor class
 - Cleanliness
 - No paint on faying surfaces (unless Class C/D)
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6. SURFACE PREPARATION & COATING INSPECTION

6.1 Surface Cleanliness

Check:

- Blast grade (Sa 2, Sa 2½, Sa 3)
 - Surface profile
 - Dust contamination
 - Salt contamination
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6.2 Coating Inspection

Coating inspection shall include:

- Dry film thickness (DFT)
 - Adhesion
 - Continuity
 - Holiday testing (immersion service)
 - Visual defects
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6.3 Galvanizing Inspection

Check:

- Coating thickness
 - Bare spots
 - Runs and drips
 - Adhesion
 - Drainage
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6.4 Repair Inspection

Repairs shall:

- Match surrounding coating
 - Achieve required DFT
 - Be smooth and continuous
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7. SITE ERECTION INSPECTION

7.1 Alignment Checks

Check:

- Plumbness
 - Level
 - Straightness
 - Base plate position
 - Anchor bolt alignment
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7.2 Temporary Works

Inspect:

- Bracing
 - Shoring
 - Stability
 - Lifting equipment
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7.3 Final Bolting

Check:

- Bolt tension
 - Washer placement
 - Nut orientation
 - Tightening sequence
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7.4 Site Welding

Inspect:

- Preheat
 - Fit-up
 - Weld quality
 - NDT results
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8. NON-CONFORMANCE & CORRECTIVE ACTION

8.1 Non-Conformance Reports (NCR)

NCRs shall include:

- Description of defect
 - Location
 - Cause
 - Corrective action
 - Re-inspection results
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8.2 Corrective Actions

Corrective actions may include:

- Rework
 - Repair
 - Replacement
 - Additional NDT
 - Engineering review
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9. FINAL ACCEPTANCE

9.1 Acceptance Criteria

Steelwork is accepted when:

- All inspections are passed
 - All NCRs are closed
 - All documentation is submitted
 - Structure meets tolerances
 - Coatings are complete
 - Bolting is complete
 - Welding is complete
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9.2 Required Handover Documents

- As-built drawings
- Material certificates



Sample document –

All client information removed for confidentiality

- Welding documentation
- NDT reports
- Bolt tightening logs
- Coating inspection reports
- Survey reports
- NCR log
- Completion certificate