VOLUME 1 — GENERAL REQUIREMENTS

(Expanded – BS EN 1090-2:2018 + Eurocode 3 + UKCA)

(All organization names replaced with XXXXXX)

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1. INTRODUCTION

1.1 Purpose of the Specification

This Technical Specification establishes the minimum technical, performance, quality, testing, fabrication, erection and documentation requirements for structural steelwork used in building and civil engineering applications.
It is intended to ensure that all steelwork is designed, manufactured and installed to a consistent level of safety, durability and performance in accordance with the latest European and British Standards.

This specification is applicable to:

- Hot-rolled steel structures
- Welded steel structures
- Cold-formed steel structures
- Composite steel–concrete structures
- Light-gauge steel structures
- Secondary steelwork associated with façade systems
- Architectural steelwork where structural performance is required

All project-specific names, locations, companies and references have been removed and replaced with **XXXXXX**.

Note: CTI CERT provides technical consultancy and quality documentation support. Final UKCA/CE marking approvals are subject to independent audits conducted by authorized Approved Bodies.

1.2 Scope of Application

This specification covers:

- Design requirements
- Material requirements
- Fabrication requirements

- Welding requirements
- Mechanical fastening requirements
- Surface preparation and corrosion protection
- Inspection and testing
- Site erection
- Documentation and certification
- Quality assurance and control

The specification applies to all structural steelwork executed under Execution Classes EXC1 to EXC4 as defined in **BS EN 1090-2:2018**.

1.3 Exclusions

The following structures are **not** covered by this specification:

- Fatigue-critical structures (cranes, crane runways)
- Railway bridges
- Highway bridges
- Offshore structures
- Pressure vessels
- Nuclear structures

These require separate, specialized specifications.

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2. DEFINITIONS

2.1 General Definitions

The following definitions apply throughout this specification:

- **Employer / Client:** The entity responsible for defining technical requirements and accepting the completed works.
- **Contractor / Fabricator:** The entity responsible for fabrication, erection and delivery of the steelwork.
- **Designer:** The structural engineer responsible for the design of the steelwork.
- **Execution:** All activities necessary to complete the steel structure, including design, fabrication, welding, bolting, erection and inspection.

- **Execution Class (EXC):** A classification system defining the level of quality control required.
- **Consequence Class (CC):** A classification system defining the consequences of failure.
- **Production Category (PC):** A classification defining the complexity of fabrication.
- **Service Category (SC):** A classification defining the loading and environmental conditions.

2.2 Normative Definitions

The following standards define key terminology:

- **BS EN 1090-1:** Requirements for conformity assessment
- **BS EN 1090-2:** Technical requirements for steel structures
- **BS EN 10079:** Definitions of steel products
- **BS EN ISO 3834:** Welding quality requirements
- **BS EN ISO 17637 / 17640 / 23278:** NDT terminology

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3. NORMATIVE REFERENCES

The steelwork shall comply with the latest editions of the following standards:

3.1 Design Standards

- BS EN 1990 – Basis of structural design
- BS EN 1991 – Actions on structures
- BS EN 1993 – Eurocode 3: Steel structures
- BS EN 1994 – Composite steel–concrete structures
- BS EN 1998 – Seismic design (where applicable)
- UK National Annexes

3.2 Execution Standards

- BS EN 1090-2:2018 – Execution of steel structures
- BS EN ISO 3834 – Welding quality requirements
- BS EN ISO 14731 – Welding coordination

3.3 Material Standards

- BS EN 10025 – Hot-rolled steel
- BS EN 10210 – Hot-finished hollow sections

- BS EN 10219 – Cold-formed hollow sections
- BS EN 10204 – Material certificates

3.4 Corrosion Protection

- BS EN ISO 12944 – Paint systems
- BS EN ISO 1461 – Hot-dip galvanizing
- BS EN ISO 2063 – Thermal metal spraying

3.5 Mechanical Fasteners

- BS EN 14399 – Preloaded bolts
- BS EN 15048 – Non-preloaded bolts

3.6 Inspection & Testing

- 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

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4. EXECUTION CLASSES (EXC1–EXC4)

4.1 General

Execution Classes define the level of quality control required for fabrication and erection.
They are selected based on:

- Consequence Class (CC)
- Production Category (PC)
- Service Category (SC)
- Structural complexity

4.2 Execution Class Definitions

EXC1 – Simple Structures

- Agricultural buildings
- Storage sheds

- Non-public structures

EXC2 – Standard Buildings (DEFAULT)

- Residential buildings
- Commercial buildings
- Industrial buildings

EXC3 – High-Importance Structures

- Public buildings
- Schools
- Hospitals
- High-rise buildings

EXC4 – Exceptional Structures

- Stadiums
- Power plants
- Critical infrastructure
- Structures with extreme consequences of failure

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5. CONSEQUENCE CLASSES (CC1–CC3)

5.1 CC1 – Low Consequence

- Agricultural buildings
- Warehouses
- Greenhouses

5.2 CC2 – Medium Consequence

- Residential buildings
- Offices
- Standard public buildings

5.3 CC3 – High Consequence

- Stadiums
- Concert halls
- Shopping malls

- Hospitals
- Emergency facilities

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6. PRODUCTION & SERVICE CATEGORIES

6.1 Production Categories (PC1–PC2)

PC1 – Simple Fabrication

- Non-welded or simple welded components
- Low complexity

PC2 – Complex Fabrication

- Multi-pass welding
- High-strength steels
- Complex geometries

6.2 Service Categories (SC1–SC2)

SC1 – Static Loading

- Buildings with normal loading conditions

SC2 – Fatigue or Dynamic Loading

- Cranes
- Machinery supports
- Vibration-sensitive structures

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7. RESPONSIBILITIES

7.1 Employer Responsibilities

- Provide design intent
- Approve contractor submissions
- Review quality documentation

7.2 Contractor Responsibilities

- Full execution of steelwork
- Compliance with all standards

- Preparation of method statements
- Preparation of ITPs
- Preparation of welding documentation
- Material procurement and traceability
- Fabrication and erection
- Inspection and testing
- As-built documentation

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8. SUBMITTALS

8.1 Pre-Construction Submittals

- Execution Plan
- Quality Plan
- Welding Plan
- Bolting Plan
- Method Statements
- Risk Assessments
- Material Data Sheets
- Proposed paint systems
- Proposed galvanizing procedures

8.2 Design Submittals

- Structural calculations
- Connection design
- Fabrication drawings
- Erection drawings
- Temporary works design

8.3 Quality Submittals

- ITPs
- NDT procedures
- Calibration certificates

- Material certificates
- Welder qualifications
- WPQRs
- WPSs

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9. QUALITY ASSURANCE

9.1 Quality Management System

The Contractor shall operate a Quality Management System certified to:

- **ISO 9001**
- **ISO 14001** (optional)
- **ISO 45001** (optional)

9.2 Factory Production Control (FPC)

Required for CE/UKCA marking under **BS EN 1090-1**.

9.3 Welding Quality Requirements

Welding shall comply with:

- **BS EN ISO 3834-2 (EXC3–EXC4)**
- **BS EN ISO 3834-3 (EXC2)**
- **BS EN ISO 3834-4 (EXC1)**

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10. DOCUMENTATION REQUIREMENTS

10.1 Mandatory Documentation

- Execution Class declaration
- Material certificates
- Welding documentation
- Bolting documentation
- Inspection reports
- NDT reports
- Coating inspection reports
- As-built drawings

- NCRs and corrective actions

10.2 Record Retention

All records shall be retained for **minimum 10 years**.