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01. GENERAL

01.01 SCOPE

Supply, fabricate and install a complete structural steel system including but not limited to:

- Steelwork shown on the Architect/engineer's drawings specified herein, or as described in his instructions issued during the currency of the work. It includes surface treatment, storage, delivery to the site, steel to steel connections and their fastenings, steel to concrete and their fastenings, miscellaneous attachments and anchor bolts.
- Shop drawings which accurately describe all structural steel elements, including measurements, connection details and shop-applied surface treatments for review by the Architect and Engineer.
- Erection of the steelwork shown on the Architect/engineer's drawings and includes off-loading, erection, field welding, making steel to steel connections, connection to anchor bolts, permanent grouting and repairs to surface treatment.

01.02 RELATED WORK

Coordinate and cooperate with the following trades:

- Concrete and Precast Concrete
- Light steel framing
- Timber framing
- Masonry

01.03 REFERENCES

Conform to the latest edition, including amendments, of the following Australian Standards (except where varied by this specification or the contract drawings):

CODE	REFERENCE
AS/NZS 1554	Structural steel welding.
1554.1 2014	Welding of steel structures, <i>1 Amdt 2015</i> .
1554.2 2003	Stud welding (steel studs to steel). <i>Plus 1 Amdt 2003</i> .
1554.3 2014	Welding of reinforcing steel.
1554.4 2014	Welding of high strength quenched and tempered steels.
1554.5 2014	Welding of steel structures subject to high levels of fatigue loading.
1554.6 2012	Welding stainless steels for structural purposes.
1554.7 2014	Welding of sheet steel structures.
AS 1627	Metal finishing - Preparation and pre-treatment of surfaces. <i>There are 7 parts, 1997 – 2005</i>
AS/NZS 3678 2016	Structural steel - Hot rolled plates, floorplates and slabs.
AS/NZS 3679	Structural steel.
AS/NZS 3750	Paints for steel structures. <i>There are 24 parts, 1994 – 2009</i> .
AS 4100 1998	Steel structures <i>Plus 1 Supplement, 1999, 1 Amdt 2012</i> .
AS/NZS 4600 2005	Cold-formed steel structures. <i>Plus 1 Amdt, 2010</i> .
AS/NZS 4673 2001	Cold-formed stainless steel structures.
AS/NZS 4680 2006	Hot dip galvanised (zinc) coatings on fabricated ferrous articles.

HB 48 1999 Steel structures design handbook.

01.04 DELIVERY, HANDLING AND STORAGE

Handle and store materials by methods and appliances that will not over-stress or deform the members. Separate materials on site from surface of ground.

Members bent or buckled from handling or storing will be liable to rejection.

Supply bolts, nuts and washers in grit-free containers and stored in water-tight premises.
Reject burred, damaged, corroded or otherwise unserviceable bolts.

02. MATERIALS

02.01 MATERIALS

General

Supply materials required to complete the works under this trade section in accordance with the contract documents and within the tolerances specified. Materials which do not comply will be rejected.

Steel supply

Unless otherwise shown on the drawings, comply with AS/NZS 3678 and AS/NZS 3679. Do not use other types and grades of steel without written approval.

02.02 STRUCTURAL STEEL

Structural steel

All structural steel is to be provided to approved submission of samples and technical data and in full compliance with structural engineer's specification.

Submit shop drawings for checking by the structural engineer and ensure compliance.

Refer to exposure category of site and ensure that steel finishes are in full compliance with the corrosive nature of site when applicable.

Ensure that fire and protective coatings are meeting the exposure category of the site and confirm at the submission stage of the works.

All calculations are to be signed by a qualified structural engineer for compliance.

02.03 SHOP DRAWINGS

Refer PRELIMINARIES Section. Provide a complete set of shop drawings for required components.

02.04 FABRICATION

Fabricate finish in accordance with AS 4100.

Do not exceed the end clearances shown on the drawings. Where these are not shown, ascertain the clearances used in the design of the connections.

02.05 CONNECTIONS

General:

- Supply end cleats, brackets and other connections, not specifically detailed on the drawings, to suit the location and forces shown thereon with gauge and edge distances in accordance with AS 4100.

Bolting General:

- Supply bolts in bearing of such lengths that no threaded portion crosses the interface of the parts joined. Place at least one washer under the bolt head or nut, whichever is to be rotated.
- Provide taper washers where the part under the bolt head or nut is not perpendicular to the centre-line of the bolt.

Welding:

- Do manual welding in accordance with AS/NZS 1554.
- Do semi-automatic welding in accordance with AS/NZS 1554.

Miscellaneous Attachments:

- Allow for the drillings, cleat and other fitments indicated on the contract drawings or shown on other relevant drawings and required by other trades.
- Be entirely responsible for supply of necessary information to the steel fabricator.
- allow to grid all welds flush ready for priming and painting

02.06 SURFACE TREATMENT OF STEEL

Clean steelwork free from loose rust, loose mill scale, dirt, oil and grease and sand-blasting to Class 2.5. Apply a coat of inorganic zinc silicate, 100 microns thick. Refer AS 1627.

02.07 INSPECTION BEFORE DELIVERY

Material and work is subject to inspection before painting and delivery. Provide the necessary access and facilities.

Where steel has been reviewed via shop drawings and/or inspected before being delivered to the site, such inspection does not relieve the contractor of his responsibility to carry out the work in accordance with the drawings and this specification.

02.08 FINISHES

Comply with the following table – refer to COLOUR Schedules for further direction;

CONDITION	SUPPLY FOR FABRICATION	SURFACE TREATMENT	FINISH
Externally exposed steel with no scheduled paint finish.	Mild steel	Hot dip galvanize after fabrication	Paint – refer EXTERNAL COLOUR Schedule for topcoat
Externally exposed steel with scheduled paint finish.	'Duragal'	Cold-galvanize primer to cut/welded components	Paint – refer EXTERNAL COLOUR Schedule
Internal exposed steel with scheduled paint finish	Mild Steel	Inorganic zinc silicate	Paint – refer INTERNAL COLOUR Schedule
Internal steel, not exposed.	Mild steel	Red oxide zinc phosphate	Nil

03. EXECUTION

03.01 APPLIED FINISHES

Where applied finishes are decorative only, provide to the product manufacturer's specifications.
For galvanized and protective coatings applications provide to structural engineer's specifications.
For fire rated protective intumescent coatings ensure full compliance with the required performance levels and show supporting data for this item prior to commencing work.

03.02 EXAMINATION

Inspect site conditions both before fabrication and delivery of steel.
Ensure that on delivery, materials can be directly installed.
Report discrepancies immediately they are found and instruction obtained before continuing with the affected portion of the work.
Shop drawings must be based on actual site measurements, not design drawings for dimensional data.
Start of work means total acceptance of conditions.

03.03 ERECTION

Comply with the requirements of AS 4100.
Adopt an erection procedure such that members can be placed and fixed in position without distortion.
Make safe, during erection, against wind and erection stresses and loading conditions, including those due to erection equipment.
Allow for the cost of temporary erection bracing required and of the Engineer's requirements in connection with such bracing.

03.04 GROUTING OF BASEPLATES

Set plates to precise level at centre of footing for future baseplate placement.
Set plate in high strength mortar. After placement of column base plates, grout fill the void completely. Trim the grout on completion.

03.05 INSPECTION ON SITE

Advise Engineer and/or Architect when erected steel is ready for inspection.

03.06 ADJUSTMENTS

Following erection, adjust the installation as required by Engineer.
Touch up abraded or missing paint areas. Refer next clause.

03.07 CLEANING

Following erection, adjust the installation as required by Engineer and Architect.
Touch up abraded or missing paint areas. Refer next clause.

03.08 COMPLETION

Complete contracted work in accordance with contract documents and written variation orders issued by the Architect.