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Requirements for Measuring and Pricing of Structural Steelwork

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1. Structural Steelwork

Fabrication and Erection of Steelwork

- Units** 1 The unit of measurement shall be:
- (i) fabrication, permanent erection..... tonne.
 - (ii) erection at the place of fabrication.....item.
- Measurement** 2 The measurement shall be the computed mass of the finished member comprising plates, rolled sections, shear connectors, stiffeners, cleats, packs, splice plates and all fittings, without allowance for tolerances for rolling margin and other permissible deviations from standard masses or nominal dimensions, and excluding the masses of welds, bolts, nuts, washers, rivets and protective coatings. No deductions shall be made for notches, cope holes, bolt and rivet holes, and the like, which are each less than 0.03 square metres.
- The computed mass of rolled and cast steel shall be determined from the dimensions shown on the Drawings on the basis of 7850 kilogrammes per cubic metre of rolled or cast steel.
- 3 Deck panels shall be measured separately only when the deck panel is not integral with the main member. Bracings, external diaphragms and the like shall be measured separately as subsidiary steelwork only when they are not integral with main members or deck panels.
- 4 Main members and deck panels shall be inclusive of connectors, stiffeners, internal diaphragms and other integral components.

Fabrication of Steelwork

- Itemisation** 5 Separate items shall be provided for fabrication of steelwork in accordance with Section 3 of CC-RMP-00010 paragraphs 3 and 4 and the following:

Group	Feature
I	1 Fabrication
II	1 Main members
	2 Deck Panels
	3 Subsidiary steelwork
III	1 Rolled Sections
	2 Plated rolled sections
	3 Plated Girders
	4 Box girders
IV	1 Comprised of different combinations of grades of steel
V	1 Curved on plan or elevation
VI	1 Tapering

- Fabrication** 6 The items for fabrication shall be in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item Coverage**
- (a) examining and checking for segregation, laminations, cracks and surface flaws and carrying out any remedial measures required by the Employer's Representative in respect of such defects;

- (b) cutting, marking off, drilling notching, machining, treatment of outside arrises, smoothing to slopes, form fitting, end and edge preparation and cambering;
- (c) riveting, bolting assembling and pre-heating;
- (d) welds, packing plates, rivets, bolts (including holding down bolts), nuts and washers required to fabricate and to complete the erection and installation on Site, together with spares and service bolts, drifts, draw up cleats and the like;
- (e) pre-production procedural trials;
- (f) welder approval trials and provision of certificates;
- (g) allowance for rolling margins, over-runs and other permissible deviations;
- (h) checking of deviations in plate panels and rolled and built up sections and of alignment at joints, including taking measurements and observations and recording and supplying one copy of the records to the Employer's Representative;
- (i) preparation and supply of marked erection drawings, marking members for identification and delivery in matching sequence;
- (j) in the case of weather resistant steel, blast cleaning after fabrication.

Erection of Steelwork

Itemisation

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Separate items shall be provided for erection of steelwork in accordance with Section 3 of CC-RMP-00010 paragraphs 3 and 4 and the following;

Group Feature

I	1	Trial erection at the place of fabrication
	2	Permanent erection
II	1	Different forms of steel substructure construction
	2	Different forms of steel superstructure construction

Trial Erection at the Place of Fabrication

8

The items for trial erection at the place of fabrication shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) temporary bracing or stays to prevent displacement including the provision and removal of temporary attachments;
- (b) proving dimensions, cambers and profiles and alignment at joints;
- (c) match-making members as required for permanent erection;
- (d) dismantling;
- (e) modifications and refitting of members as a result of the trial erection;
- (f) bolts, nuts, washers, sockets, base plates, anchorage assemblies, drilling or forming holes and pockets and casting in.

Permanent Erection

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The items for permanent erection shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) temporary bracing or stays to prevent displacement including the provision and removal of temporary attachments;

- (b) welder approval trials and provision of certificates;
- (c) procedural trials
- (d) permanent bolted, riveted and welded connections including the provision of preheat and shelters for welding;
- (e) checking of deviations in plate panels and rolled and built-up sections and of alignment at joints, including taking measurements and observations and recording and supplying one copy of the records to the Employer;
- (f) drilling or forming holes and pockets and casting in bars, sockets, base plates and anchorage assemblies;
- (g) adhesives and epoxy or polyester mortar, bedding mortar or grout.

Miscellaneous Metalwork

Definition **10** Miscellaneous metalwork shall comprise items of metalwork incorporated into structures and shall include ladders, brackets, handrails, access covers and frames, mesh panels, walkway panels, screens, grilles and the like.

Units **11** The unit of measurement shall be:

- (i) miscellaneous metalwork.....number.

Measurement **12** Items of metalwork which are:

- (a) included in the computed weight of fabricated items; or
- (b) included in other measured items; or
- (c) separately measured elsewhere;

shall not be measured as miscellaneous metalwork.

Itemisation **13** Separate items shall be provided for miscellaneous metalwork in accordance with Section 3 of CC-RMP-00010 paragraphs 3 and 4 and the following:

Group	Feature
I	1 Miscellaneous metalwork
II	1 Different types
III	1 Different materials
IV	1 Different sizes

Miscellaneous Metalwork **14** The items for miscellaneous metalwork shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) Fabrication (as this document paragraph 6);
- (b) erection (as this document paragraphs 8 and 9);
- (c) protective system (CC-RMP-01900 paragraph 4);
- (d) in situ concrete (CC-RMP-01700 paragraph 4);
- (e) formwork (CC-RMP-01700 paragraph 14)

Corrugated Steel Buried Structures

Units **15** The unit of measurement shall be:

- (i) corrugated steel buried structures (stating the length) number.

Measurement **16** The length stated shall be the extreme length of the corrugated steel buried structure.

Itemisation **17** Separate items shall be provided for corrugated steel buried structures in accordance with Section 3 of CC-RMP-00010 paragraphs 3 and 4 and the following:

Group	Feature
I	1 Corrugated steel buried structures
II	1 Different types
III	1 Different sizes
IV	1 Different thickness or gauge

Corrugated Steel Buried Structures **18** The items for corrugated steel buried structures shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item Coverage**
- (a) cutting, marking off, drilling, notching, bevels, skews, bends, edge preparation, cambering, riveting, bolting and fabricating;
 - (b) marking members for identification and delivery in matching sequence;
 - (c) laps, rivets, bolts, nuts, washers and the like, spares and service bolts, drifts, draw up cleats and the like;
 - (d) protective systems (CC-RMP-01900 paragraph 4)
 - (e) channels;
 - (f) awaiting the results of tests;
 - (g) paved invert

Metal Facing Units for Reinforced Earth Structures

Units **19** The units of measurement shall be:
 (i) metal facing units square metre.
 (ii) metal capping units and the like linear metre.

Measurement **20** The measurement of metal facing units shall be the plane underdeveloped area of the facing.
 The measurement of metal capping units and the like shall be the measurement along the centre line.

Itemisation **21** Separate items shall be provided for metal facing and capping units in accordance with Section 3 of CC-RMP-00010 paragraphs 3 and 4 and the following:

Group	Feature
I	1 Metal facing units
	2 Metal capping units and the like
II	1 Different materials
III	1 Different types
IV	1 Different thicknesses or gauge
V	1 Curved on plan
VI	1 Built to a batter

Metal Facing Units and Capping Units **22** The items for metal facing units and capping units shall in accordance with the Preamble to the Bill of Quantities General Directions include for:

Item Coverage


- (a) fabrication (as this document paragraph 6);
- (b) permanent erection (as this document paragraph 9);
- (c) protective system (CC-RMP-01900 paragraph 4);
- (d) threading over vertical rods;
- (e) sealing joints;
- (f) connection to reinforcing elements;
- (g) matching as required.

2. References

2.1 TII Publications (Standards) References

- | | |
|--------------|-------------------------------------------------------------------------------------|
| CC-RMP-00010 | Introduction to the Requirements for Measuring and Pricing |
| CC-RMP-01700 | Requirements for Measuring and Pricing of Structural Concrete |
| CC-RMP-01900 | Requirements for Measuring and Pricing of Protection of Steelwork against Corrosion |




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