

---

**SERIES NG 1800**  
**STRUCTURAL STEELWORK**

---

**Contents**

Clause	Title	Page
NG 1800	(08/14) General	2
NG 1801	(08/14) Scope	3
NG 1802	(08/14) Normative References	3
NG 1803	(08/14) Terms and Definitions	3
NG 1804	(08/14) Specifications and Documentation	3
NG 1805	(08/14) Constituent Products	4
NG 1806	(08/14) Preparation and Assembly	6
NG 1807	(08/14) Welding	7
NG 1808	(08/14) Mechanical Fastening	8
NG 1809	(08/14) Erection	9
NG 1810	(08/14) Surface Treatment	9
NG 1811	(08/14) Geometrical Tolerances	10F
NG 1812	(08/14) Inspection, Testing and Correction	10F
NG	(08/14) Sample Contract Specific Appendix 18/1	A1

# STRUCTURAL STEELWORK

## NG 1800 (08/14) General

### NG 1800.1 (08/14) Introduction

- 1 (08/14) These Notes for Guidance are primarily for assistance in the development of appropriate contract specific specifications for structural steelwork where Series 1800 is used as the basis for the execution of the structural steelwork.
- 2 (08/14) Guidance is given on the selection of contract specific requirements for inclusion in Appendix 18/1 using NG Sample Contract Specific Appendix 18/1 of this Series.
- 3 (08/14) The recommendations in PD 6705-2:2010+A1:2013 have been used as the basis for the specification of options allowed by and additional information required by BS EN 1090-2:2008+A1:2011.
- 4 (08/14) Background information on selected technical requirements is also given.

### NG 1800.2 (08/14) Clause numbering

- 1 (08/14) The Notes for Guidance should be read in conjunction with the clause in Series 1800 which has the same numerical reference number as the clause in this Series.
- 2 (08/14) The numerical sequence of clauses in this Series is incomplete, as many of the Series 1800 clauses and paragraphs do not require notes for guidance.
- 3 (08/14) The paragraph numbers in the clauses in this Series do not necessarily relate to the paragraph numbers in the same clause in Series 1800. If a specific clause in this Series relates only to a certain paragraph or paragraphs in the Series 1800 clause, the clause in this Series will be followed by the paragraph number of the Series 1800 clause in brackets and an appropriate subtitle, for example NG1804.1.1 (1) Appendix 18/1, where (1) denotes paragraph 1 in Clause 1804.1.1.
- 4 (08/14) Where no bracketed Series 1800 paragraph and subtitle is given, the clause in this series refers to all paragraphs in the Series 1800 clause.

### NG 1800.3 (08/14) Options and additional requirements

- 1 (08/14) Where a clause in this Series gives advice on completion of contract specific requirements in Appendix 18/1 the heading is followed by (18/1).

### NG 1800.6 (08/14) CE Marking

#### NG 1800.6.1 (08/14) General

- 1 (08/14) The harmonised standard for structural steel components is BS EN 1090-1:2009+A1:2011.

#### NG 1800.6.3 (08/14) Component specification reference (18/1)

- 1 (08/14) For the purpose of identifying the component specification as defined in BS EN 1090-1:2009+A1:2011, it should be given the reference number designated as follows:

CS1800-mm/yyyy:\*\*\*\*-\*\*

where:

CS1800 denotes a component specification based on Series 1800 including the Appendix 18/1 requirements for the contract.

mm/yyyy is the month and year of issue of the Series 1800.

\*\*\*\* is the customer's contract reference number (not less than 3 characters).

\*\* is the issue number of the component specification.

This should apply irrespective of the extent to which the Manufacturer's organisation has any design responsibility.

2 (08/14) The component specification reference number should be given in Appendix 18/1.

### **NG 1801** (08/14) **Scope**

1 (08/14) The Series 1800 should be applied to the execution of all steelwork for new highway works, except where specifically covered either fully or in part, by another Series in Volume 1 of the Manual of Contract Documents for Highway Works.

2 (08/14) The Series 1800 should also be applied to the execution of the steelwork for repair and/or strengthening of existing structures.

3 (08/14) The application of the Series 1800 is restricted to the execution of structural steelwork whose design conforms to BS EN 1993 and the relevant parts of BS EN 1994, including the UK National Annexes and the Published Documents and other non-contradictory complementary information referenced therein, and whose execution is within the scope of BS EN 1090-2:2008 +A1:2011.

### **NG 1802** (08/14) **Normative References**

1 (08/14) Normative references already given in BS EN 1090-2:2008+A1:2011 and Series 1800 are not repeated in this Clause.

2 (08/14) The following additional normative references are relevant to this Series:

- PD 6705-2:2010+A1:2013, Structural use of steel and aluminium – Part 2: Recommendations for the execution of steel bridges to BS EN 1090-2, published by BSI.
- BD 2, Technical Approval of Highway Structures, Design Manual for Roads and Bridges: Volume 1 Section 1.

### **NG 1803** (08/14) **Terms and Definitions**

#### (08/14) **(1) Quantified service category**

1 (08/14) This term is fully defined in PD 6705-2:2010+A1:2013, B.2.1, together with the methods for determination and designation (see also NG 1804.1.1(2)).

### **NG 1804** (08/14) **Specifications and Documentation**

#### **NG 1804.1** (08/14) **Execution specification**

##### **NG 1804.1.1** (08/14) **General (18/1)**

#### (08/14) **(1) Appendix 18/1**

1 (08/14) All items listed in NG Sample Contract Specific Appendix 18/1 should be addressed for each contract and the appropriate column completed in the contract specific Appendix 18/1 to indicate whether an item is not applicable, is defined on the drawings listed in Appendix 0/4 or is defined in a document appended to Appendix 18/1.

2 (08/14) A complete list of working drawings should be given in Appendix 0/4. These drawings and any documents appended to Appendix 18/1 should contain all the necessary contract specific specification requirements.

3 (08/14) Where a requirement identified in Appendix 18/1 only applies to specific parts of the work, the appropriate text should be added to the relevant drawings either as a general note or notes relating to specific details or components. If a requirement applies more widely this should be added to the first drawing as a general note applying to all subsequent drawings or be included in a document appended to Appendix 18/1 with reference to it from the relevant drawing(s).

(08/14) **(2) Determination and designation of quantified service category**

- 1 (08/14) Structural steel components for which no fatigue loading specification is required to be applied as part of the design process may be deemed to require a quantified service category of F56.
- 2 (08/14) Structural steel components for which a fatigue loading specification has been applied as part of the design process should be checked for conformance to quantified service category F56 stressing levels using the procedure in PD 6705-2:2010+A1:2013, B.2.2. It should be noted that many structures requiring a fatigue check may entirely conform to F56.
- 3 (08/14) Any components or parts of components which do not conform to F56 stressing levels, should be rechecked for F71 and if necessary F90 and above.
- 4 (08/14) If F56 is applicable everywhere in the structure a general note should be added to the drawings listed in Appendix 0/4 with the wording 'quantified service category F56 applies throughout the structure'.
- 5 (08/14) In the event that there are specific locations in the structure where a quantified service category exceeding F56 is required, a note should be added to the relevant drawing(s) with the wording 'quantified service category F56 applies except where F71 (and higher categories if necessary) is (are) indicated'.
- 6 (08/14) Specific locations where quantified service categories higher than F56 apply should be identified on the detail drawings, together with the applicable stress directions, using the method in PD 6705-2:2010+A1:2013, Figure B.1. The extent of the zone where the higher quantified service category applies should be shown. A note should be added to indicate that the method for designating quantified service category is as defined in PD 6705-2:2010+A1:2013, Annex B. Alternatively, where the higher quantified service category applies to a complete component or a major part of a component, a note may be added to that part of the drawing illustrating the component so designated. The note should include the direction(s) for which the quantified service category applies.
- 7 (08/14) F36 requirements have been included in Series 1800 only to provide for the possibility of allowing relaxations to be considered during execution to an F56 requirement in the event that a non-conformance is found which would have serious implications or present difficulties if it had to be rectified. (See also PD 6705-2:2010+A1:2013, B.3.3) Any such relaxation should be agreed with the Overseeing Organisation prior to being implemented.

**NG 1804.1.2** (08/14) **Execution class**

- 1 The background information in PD 6705-2:2010+A1:2013, 5.4 and 6.1 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1805** (08/14) **Constituent Products**

**NG 1805.1** (08/14) **General (18/1)**

- 1 (08/14) Properties of constituent products not covered by a standard shall include all relevant characteristic values and their testing requirements necessary for assuring their structural performance.

**NG 1805.3** (08/14) **Structural steel products**

**NG 1805.3.1** (08/14) **General (18/1)**

- 1 (08/14) The use of structural steel products which do not conform to the relevant European product standard, where such a European product standard exists, should not be specified.

**NG 1805.3.2** (08/14) **Thickness tolerances**

- 1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.1 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1805.3.3** (08/14) **Surface conditions (18/1)**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.2 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1805.3.4** (08/14) **Special properties (18/1)**

(08/14) **(1), (2) Internal discontinuity class**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.3 is applicable to all structural steelwork applications within the scope of Series 1800.

(08/14) **(3) Improved deformation properties**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.4 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1805.4** (08/14) **Steel castings (18/1)**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.5 is applicable to all structural steelwork applications within the scope of Series 1800 and should be followed in the case of cast products designed by the customer or a specialist sub-contractor.

**NG 1805.5** (08/14) **Welding consumables**

1 (08/14) The guidance given in PD 6705-2:2010+A1:2013, C.6 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1805.6** (08/14) **Mechanical fasteners**

**NG 1805.6.4** (08/14) **Structural bolting assemblies for preloading (18/1)**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.7 is applicable to all structural steelwork applications within the scope of Series 1800.

2 (08/14) The decision to use stainless steel bolts for preloaded applications should take account of the requirements and recommendations in BS EN 1090-2:2008+A1:2011, 8.9 and 8.10.

**NG 1805.6.7** (08/14) **Foundation bolts (18/1)**

1 (08/14) Reinforcing steels should not be specified for foundation bolts carrying applied tensile forces in service or during execution.

**NG 1805.6.8** (08/14) **Locking devices (18/1)**

1 (08/14) Preloaded assemblies installed and tightened in accordance with the Series 1800 requirements will normally be resistant to loosening. Prevailing torque type nuts should not therefore be used as a substitute for nuts conforming to BS EN 14399 when used with bolts conforming to BS EN 14399 in preloaded joints. Non-preloaded assemblies in locations subject to vibration should incorporate locking devices.

**NG 1805.8** (08/14) **Grouting materials (18/1)**

1 (08/14) Guidance on the specification of bedding mortar is given in Series NG 2600, Clause NG 2601.

**NG 1805.9** (08/14) **Expansion joints for bridges**

1 (08/14) Guidance on the specification of expansion joints is given in Series NG 2300, Clause NG 2301. Requirements for type and characteristics of expansion joints should be included in contract specific Appendix 23/1.

**NG 1805.10** (08/14) **High strength cables, rods and terminations (18/1)**

1 (08/14) The specification of materials and corrosion protection should be agreed with the Overseeing Organisation.

**NG 1805.11** (08/14) **Structural bearings (18/1)**

1 (08/14) The guidance given in PD 6703:2009 on the specification of structural bearings including the preparation of bearing schedules should be followed.

**NG 1806** (08/14) **Preparation and Assembly**

**NG 1806.2** (08/14) **Identification (18/1)**

1 (08/14) In addition to the restrictions in 1806.2(2) and (3), stamped, punched or drilled marks may be prohibited where visual or other detriment to the surface finish is likely to occur.

**NG 1806.4** (08/14) **Cutting**

**NG 1806.4.4** (08/14) **Hardness of free edge surfaces (18/1)**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.8 is applicable to all structural steelwork applications within the scope of Series 1800.

2 (08/14) The relaxation of hardness requirements for machine plasma cut edges should not be permitted in the case of energy absorbing elements, where plastic deformation may occur in the event of accidental impact.

**NG 1806.5.4** (08/14) **Cold forming (18/1)**

1 (08/14) For grades of stainless steel not specified in 1806.5.4 b), the minimum bend radii should not be less than those given in 1806.5.4 b), unless tests have been carried out to verify that tighter radii do not result in cracking.

**NG 1806.6** (08/14) **Holing**

**NG 1806.6.3** (08/14) **Execution of holing**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.9 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1806.7** (08/14) **Cut outs (18/1)**

1 (08/14) For quantified service category F36 and below, smaller radii may be acceptable.

**NG 1806.9** (08/14) **Assembly**

(08/14) **(1) Elongations of holes by drifting**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.10 is applicable to all structural steelwork applications within the scope of Series 1800.

(08/14) **(2), (3) Connections for temporary components (18/1)**

1 (08/14) In specifying any requirements for connections for temporary components, consideration should be given to the reinstatement or sealing of holes and the removal or otherwise of temporary components attached by welds. Areas where connections for temporary components are not permitted should be identified. (See also NG 1807.5.6)

**NG 1806.10** (08/14) **Assembly check (18/1)**

1 (08/14) A full or staged trial assembly is strongly recommended to prove fit up between components and critical dimensions where tolerances on overall geometry or joint fit-up are small. This applies particularly to bolted joints with butting faces.

- 2 (08/14) A full or staged trial assembly of a superstructure should be undertaken where:
- erection operations are to be undertaken within restricted possession times;
  - where construction is likely to be on the programme critical path;
  - the vertical camber is critical to the correct dead weight stress distribution in continuous main girders, particularly in cable stayed or suspension bridges; and/or
  - fit-up tolerances are small in latticed structures which contain heavy members and rigid joints.

## **NG 1807 (08/14) Welding**

### **NG 1807.1 (08/14) General (18/1)**

1 (08/14) The quality requirements for EXC2 may be suitable for simple structures (e.g. those designated Category 0 to BD 2) using steel grades of S355 or below and requiring a quantified service category of no more than F56.

2 (08/14) The general guidance given in PD 6705-2:2010+A1:2013, C.11 for bridges is also applicable in principle to other structural steelwork applications within the scope of Series 1800.

### **NG 1807.4 (08/14) Qualification of welding procedures and welding personnel**

#### **NG 1807.4.1 (08/14) Qualification of welding procedures**

##### **NG 1807.4.1.1 (08/14) General**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.12 is applicable to all structural steelwork applications within the scope of Series 1800.

##### **NG 1807.4.1.2 (08/14) Qualification of welding procedures for processes 111, 114, 12, 13 and 14**

1 (08/14) Attention is drawn to the need to carry out impact tests for certain joint types according to BS EN ISO 15614-1.

2 (08/14) The background information on procedure test imperfection acceptance given in PD 6705-2:2010+A1:2013, C.13 is applicable to all structural steelwork applications within the scope of Series 1800.

#### **NG 1807.4.3 (08/14) Welding co-ordination**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.14 is applicable to all structural steelwork applications within the scope of Series 1800.

### **NG 1807.5 (08/14) Preparation and execution of welding**

#### **NG 1807.5.6 (08/14) Temporary attachments (18/1)**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.15 is applicable to all structural steelwork applications within the scope of Series 1800.

2 (08/14) In addition to the limitations of 1807.5.6(1), temporary welded attachments may also be prohibited for reasons of, for example, distortion control, fit up of parts, visual appearance and damage to corrosion protection.

#### **NG 1807.5.9 (08/14) Butt welds**

##### **NG 1807.5.9.2 (08/14) Single sided welds (18/1)**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.16 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1807.5.14** (08/14) **Spot welds for thin gauge components**

**NG 1807.5.14.1** (08/14) **Arc spot welds (18/1)**

1 (08/14) Weld washers should not be used in external environments or where corrosive conditions exist.

**NG 1807.6** (08/14) **Acceptance criteria**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.24 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1807.7** (08/14) **Welding of stainless steels**

**NG 1807.7.3** (08/14) **Welding dissimilar steels (18/1)**

1 (08/14) Expert advice should be sought prior to specifying welded joints between stainless and other steels.

**NG 1808** (08/14) **Mechanical Fastening**

**NG 1808.2** (08/14) **Use of bolting assemblies**

**NG 1808.2.1** (08/14) **General (18/1)**

1 (08/14) The background information on welding of fasteners given in PD 6705-2:2010+A1:2013, C.17 is applicable to all structural steelwork applications within the scope of Series 1800.

**NG 1808.5** (08/14) **Tightening of preloaded bolts**

**NG 1808.5.1** (08/14) **General**

1 (08/14) The background information on minimum preloading force given in PD 6705-2:2010+A1:2013, C.19 is applicable to all structural steelwork applications within the scope of Series 1800.

(08/14) **(1), (2), (3) Fit up of preloaded joints (18/1)**

1 (08/14) The background information on joint fit up given in PD 6705-2:2010+A1:2013, C.18 is applicable to all structural steelwork applications within the scope of Series 1800.

2 (08/14) To achieve adequate contact between the friction surfaces in preloaded lap joints, the out-of-plane bending stiffness of cover plates should be limited. This may be achieved by using two plates of half the thickness each when the thickness of the original cover plate exceeds the bolt size. The option to use two cover plates of half the thickness in preloaded lap joints may be permitted subject to conformance to BS EN 1993-1-8 bolt spacing limitations, unless there are other design reasons why this should not be permitted. If considered necessary, any measures permitted to limit the out-of-plane bending stiffness of cover plates should be described in Appendix 18/1.

(08/14) **(4), (5) Part turn method**

1 (08/14) The background information on the part turn method given in PD 6705-2:2010+A1:2013, C.22 is applicable to all structural steelwork applications within the scope of Series 1800.

(08/14) **(6) Torque method (18/1)**

1 (08/14) The guidance on suitable use of the torque method given in PD 6705-2:2010+A1:2013, C.20 is applicable to all structural steel applications within the scope of Series 1800.

**NG 1808.5.4** (08/14) **Combined method**

1 (08/14) The background information given in PD 6705-2:2010+A1:2013, C.21 is applicable to all structural steelwork applications within the scope of Series 1800.



**NG 1809** (08/14) **Erection**

**NG 1809.4** (08/14) **Survey**

**NG 1809.4.1** (08/14) **Reference system (18/1)**

1 (08/14) A reference temperature of 15°C is widely used in the UK. This may not apply to all fabrication shops or site works, particularly if in colder or hotter climates.

**NG 1809.5** (08/14) **Supports, anchors and bearings**

**NG 1809.5.3** (08/14) **Maintaining suitability of supports (18/1)**

1 (08/14) Where settlements and/or differential settlements of supports are expected to be of a magnitude that would be critical to the design, estimates of the amount of settlements and /or differential settlements anticipated during construction and the limits beyond which compensation is required should be given.

**NG 1809.5.4** (08/14) **Temporary supports (18/1)**

1 (08/14) If packings are to be left in position it should be confirmed that they will not be detrimental to the performance of the structure.

**NG 1810** (08/14) **Surface Treatment**

**NG 1810.1** (08/14) **General (18/1)**

(08/14) **(5) Friction surfaces (18/1)**

1 (08/14) In specifying requirements for friction surfaces in slip resistant connections, reference should be made to Series 1900, Clause 1906 and Series NG1900, Clause NG1906.

(08/14) **(9) Procedure qualification of dipping process (18/1)**

1 (08/14) Expert advice should be sought in specifying requirements for procedure qualification of the dipping process for components that are to be galvanized after manufacture.

(08/14) **(10) Overcoating of galvanised surfaces (18/1)**

1 (08/14) Expert advice should be sought in specifying requirements for the inspection, checking and qualification of the preparation to be carried out before subsequent overcoating of galvanised components.

**NG 1810.2** (08/14) **Preparation of steel substrates (18/1)**

(08/14) **(1) Preparation grade (18/1)**

1 (08/14) Preparation grade P2 to BS EN ISO 8501-3:2007 may be specified in Appendix 18/1 for:

- internal box girder surfaces where the required durability of the corrosion protection is 20 years or less to major maintenance.
- external surfaces where the required durability of the corrosion protection is 15 years or less to major maintenance.

2 (08/14) Preparation grade P2 should not be specified for external surfaces of visually sensitive structures or for visually sensitive areas of structures.

**NG 1810.6** (08/14) **Sealing of spaces (18/1)**

1 (08/14) The internal treatment system for enclosed spaces should be specified with reference to Series 1900.

**NG 1810.7** (08/14) **Surfaces in contact with concrete (18/1)**

**1** (08/14) In specifying specific requirements for coating surfaces in contact with concrete, reference should be made to Series 1900, 1917 and Series NG1900, NG1917.

**NG 1811** (08/14) **Geometrical Tolerances**

**NG 1811.1** (08/14) **Tolerance types (18/1)**

**1** (08/14) Special tolerances should not be such as to relax any of the essential tolerances in 1811.2, otherwise structural performance may be impaired.

**NG 1811.3** (08/14) **Functional tolerances**

**NG 1811.3.3** (08/14) **Alternative criteria (18/1)**

**1** (08/14) The alternative criteria in 1811.3.3 should only be used if there are particular reasons why those in 1811.3.2 are not appropriate.

**NG 1812** (08/14) **Inspection, Testing and Correction**

**NG 1812.2** (08/14) **Constituent products and components**

**NG 1812.2.1** (08/14) **Constituent products (18/1)**

**1** (08/14) Specific testing of products not covered by the European or International standards referenced in BS EN 1090-2:2008+A1:2011 should be specified, eg special fasteners, castings, forgings, tension connectors or mechanical components required for articulation, movement or control of displacement. This should include prototype testing to provide evidence of structural performance to prove the design and establish quality criteria, and production tests to provide evidence that the quality requirements are being met in all supplied items.

**NG 1812.4** (08/14) **Welding**

**NG 1812.4.2** (08/14) **Inspection after welding**

**NG 1812.4.2.2** (08/14) **Scope of inspection**

**1** (08/14) The background information given in PD 6705-2:2010+A1:2013, C.23 is applicable to all structural steel applications within the scope of Series 1800.

**NG 1812.4.2.3** (08/14) **Visual inspection of welds**

**1** (08/14) The background information on acceptance criteria for final acceptance of welds given in PD 6705-2:2010+A1:2013, C.24 is applicable to all structural steel applications within the scope of Series 1800.

**NG 1812.4.2.4** (08/14) **Additional NDT methods**

**1** (08/14) The background information given in PD 6705-2:2010+A1:2013, C.24 is applicable to all structural steel applications within the scope of Series 1800.

# (08/14) NG SAMPLE CONTRACT SPECIFIC APPENDIX 18/1: REQUIREMENTS FOR STRUCTURAL STEELWORK

(08/14)

*[The compiler should include here the:]*

**Contract Title:**.....

**Structure Reference:**.....

**Component Specification Reference:** CS1800-mm/yyyy:\*\*\*\*-\*\* *[See NG 1800.6.3]*

Note: The component specification comprises Series 1800 (issue as dated in the component specification reference) and this Appendix 18/1, which includes the drawings and documents referred to in the table below.

*[The compiler should complete the following table providing an appropriate entry(s) for every Series 1800 Clause Reference given in the left column]*

Series 1800 Clause Reference:	Additional Information Required	Not Applicable (Ticked if not applicable)	Drawings and Documents that give related structural steelwork requirements	
			See Drawings Listed in Appendix 0/4 <i>[The compiler should provide drawing reference(s)]</i>	See Appended Documents <i>[The compiler should provide document reference(s)]</i>
<b>1804 – Specifications and Documentation</b>				
1804.1.1	<b>Execution Specification, General</b> – drawing numbers of all drawings in Appendix 0/4, and document references of all appended documents that give all the necessary requirements for the execution of the steelwork.			
<b>1805 – Constituent Products</b>				
1805.1	<b>Constituent Products, General</b> – properties of products not covered by listed standards.			
1805.3.1	<b>Structural Steel Products, General</b> – grades, qualities and, if appropriate, coating weights, finishes and any required options permitted by product standards for steel products.			
1805.3.3	<b>Surface conditions</b> – additional requirements related to special restrictions on either surface imperfections or repair of surface defects by grinding in accordance with BS EN 10163, or with BS EN 10088 for stainless steel.			
1805.3.3	<b>Surface conditions</b> – surface finish requirements for other products.			
1805.3.3	<b>Surface conditions</b> – where decorative or specialist surface finishes are required.			

Series 1800 Clause Reference:	Additional Information Required	Not Applicable (Ticked if not applicable)	Drawings and Documents that give related structural steelwork requirements	
			See Drawings Listed in Appendix 0/4 <i>[The compiler should provide drawing reference(s)]</i>	See Appended Documents <i>[The compiler should provide document reference(s)]</i>
1805.3.4	<b>Special properties</b> – Additional requirements for special properties if relevant.			
1805.4	<b>Steel castings</b> – Grades, grade suffixes', finishes and options for steel castings.			
1805.6.3	<b>Structural bolting assemblies for non preloaded applications</b> – property classes of bolts and nuts, and surface finishes for structural bolting assemblies for non-preloaded applications.			
1805.6.3	<b>Structural bolting assemblies for non preloaded applications</b> – mechanical properties for large diameter bolting assemblies.			
1805.6.3	<b>Structural bolting assemblies for non preloaded applications</b> – full details for the use of insulation kits.			
1805.6.4	<b>Structural bolting assemblies for preloading</b> – property classes of bolts and nuts and surface finishes for structural bolting assemblies for preloading.			
1805.6.4	<b>Structural bolting assemblies for preloading</b> – where stainless steel bolts can be used in preloaded applications.			
1805.6.7	<b>Foundation bolts</b> – where reinforcing steels may be used for foundation bolts together with the steel grade.			
1805.6.8	<b>Locking devices</b> – where locking devices are required.			
1805.6.8	<b>Locking devices</b> – if products other than those in the referred standards are to be used.			
1805.6.11	<b>Fasteners for thin gauge components</b> – mechanical fastener type for use in stressed skin applications.			
1805.6.12	<b>Special fasteners</b> – special fastener not standardised in CEN or ISO standards, as well as any tests necessary.			
1805.8	<b>Grouting materials</b> – grouting materials to be used.			
1805.10	<b>High strength cables, rods and terminations</b> – tensile strength grade and coating of wires.			
1805.10	<b>High strength cables, rods and terminations</b> – designation and class of strands.			
1805.10	<b>High strength cables, rods and terminations</b> – minimum breaking load and diameter of steel wire ropes and requirements related to corrosion protection.			
1805.11	<b>Structural bearings</b> – Schedule of design requirements and acceptance tests.			

			Drawings and Documents that give related structural steelwork requirements	
Series 1800 Clause Reference:	Additional Information Required	Not Applicable (Ticked if not applicable)	See Drawings Listed in Appendix 0/4 <i>[The compiler should provide drawing reference(s)]</i>	See Appended Documents <i>[The compiler should provide document reference(s)]</i>
<b>1806 – Preparation and Assembly</b>				
1806.2	<b>Identification</b> – where soft or low stress stamps may not be used for stainless steel			
1806.2	<b>Identification</b> – zones where identification marks are not permitted or shall not be visible after completion.			
1806.4.4 (2)	<b>Hardness of free edge surfaces</b> – edge surfaces where the relaxation for machine plasma cutting described in 1806.4.4 (2), is not permitted.			
1806.5.4 c)	<b>Cold forming</b> – minimum bending radii for stainless steels other than those to grades listed in 1806.5.4 b).			
1806.5.4 d)	<b>Cold forming</b> – protective membranes for cold formed thin gauge components.			
1806.6.1	<b>Dimensions of holes</b> – special dimensions for movement joints.			
1806.6.1	<b>Dimensions of holes</b> – nominal hole diameter for hot rivets.			
1806.6.1	<b>Dimensions of holes</b> – dimensions of countersinking.			
1806.7 (1)	<b>Cut outs</b> – re-entrant corners where a smaller radius than that described in 1806.7 is permitted.			
1806.8	<b>Full contact bearing surfaces</b> – where full contact bearing surfaces are required.			
1806.9 (2)	<b>Connections for temporary components</b> – special requirements applying to connections for temporary components, including those related to fatigue.			
1806.9 (3)	<b>Connections for temporary components</b> – where the removal or addition of permanent material or the introduction of permanent notches is permitted.			
1806.10	<b>Assembly check</b> – if, and to what extent, trial assembly is to be used.			
<b>1807 – Welding</b>				
1807.1 (1)	<b>Welding Quality Requirements</b> – if the BS EN ISO 3834 quality requirements shall conform to the requirements for EXC2.			
1807.5.6 (1)	<b>Temporary attachments</b> – areas where welding of temporary attachments is not permitted.			
1807.5.6 (2)	<b>Temporary attachments</b> – use of temporary welded attachments			
1807.5.9.1	<b>Butt welds, general</b> – the location of butt welds used as splices.			

			Drawings and Documents that give related structural steelwork requirements	
Series 1800 Clause Reference:	Additional Information Required	Not Applicable (Ticked if not applicable)	See Drawings Listed in Appendix 0/4 <i>[The compiler should provide drawing reference(s)]</i>	See Appended Documents <i>[The compiler should provide document reference(s)]</i>
1807.5.9.1	<b>Butt welds, general</b> – where a flush surface is required.			
1807.5.9.2 (1)	<b>Single sided welds</b> – where the use of permanent steel backing is permitted.			
1807.5.13	<b>Slot and plug welds</b> – the dimensions of holes for slot and plug welds.			
1807.5.14.1	<b>Arc spot welds</b> – if weld washers are accepted for stainless steels.			
1807.5.14.1	<b>Arc spot welds</b> – the minimum visible width of arc spot welds.			
1807.5.15	<b>Other weld types</b> – requirements for other weld types.			
1807.5.17	<b>Execution of welding</b> – requirements for grinding and dressing of the surface of completed welds			
1807.7.2	<b>Amendments to EN 1011-3 requirements</b> – the surface finish of the weld zones on stainless steels.			
1807.7.3	<b>Welding dissimilar metals</b> – requirements for welding different stainless steels to each other or to other metallic materials.			
<b>1808 – Mechanical Fastening</b>				
1808.2.1	<b>Use of bolting assemblies, General</b> – where, in addition to tightening other measures or means are to be used to secure the nuts.			
1808.2.1 (1)	<b>Welding of mechanical fasteners</b> – where welding of property class 4.6 nuts, bolts and washers is permitted.			
1808.2.2	<b>Bolts</b> – minimum diameter of fasteners for thin gauge components and sheeting.			
1808.2.2	<b>Bolts</b> – dimensions of bolts in connection utilising the shear capacity of the unthreaded shank.			
1808.2.4	<b>Washers</b> – dimensions and steel grade of plate washers to be used with slotted or oversized holes.			
1808.2.4	<b>Washers</b> – dimensions and steel grade of taper washers.			
1808.3	<b>Tightening of non-preloaded bolts</b> – where full contact bearing is required (see 1806.8).			
1808.4	<b>Preparation of contact surfaces in slip resistant connections</b> – requirements related to contact surfaces in slip resistant connections for stainless steels.			
1808.5.1 (2)	<b>Cover Plates in Preloaded Joints</b> – measures permitted to limit the out-of-plane bending stiffness of cover plates.			

			Drawings and Documents that give related structural steelwork requirements	
Series 1800 Clause Reference:	Additional Information Required	Not Applicable (Ticked if not applicable)	See Drawings Listed in Appendix 0/4 <i>[The compiler should provide drawing reference(s)]</i>	See Appended Documents <i>[The compiler should provide document reference(s)]</i>
1808.5.1 (6)	<b>Tightening of preloaded bolts, General – preloaded bolts that shall be tightened</b> by the torque method.			
1808.7.2	<b>Installation of rivets</b> – where a flush surface of countersunk rivets is required.			
1808.7.3	<b>Acceptance criteria</b> – where outer faces of plies are required to be free of indentation by the riveting machine.			
1808.8.4	<b>Fastening side laps</b> – requirements for the side lap fasteners as structural fasteners in stressed skin applications.			
1808.9	<b>Use of special fasteners and fastening methods</b> – requirements for procedure tests.			
1808.9	<b>Use of special fasteners and fastening methods</b> – requirements for use of hexagon injection bolts.			
<b>1809 – Erection</b>				
1809.4.1(1)	<b>Reference system</b> – the reference temperature for setting out and measuring the steelwork if different from 15°C.			
1809.5.3	<b>Maintaining suitability of supports</b> – if compensation for settlement of supports is required.			
1809.5.4	<b>Temporary supports</b> – where levelling nuts on foundation bolts under the base plate are required to be removed.			
1809.5.4	<b>Temporary supports</b> – where packings for bridges may be left in position.			
1809.5.5(1)	<b>Grouting and sealing</b> – requirements for the treatment of steelwork, bearings and concrete surfaces before grouting.			
1809.5.5	<b>Grouting and sealing</b> – the method of sealing the edges of a base plate if no grouting is needed.			
<b>1810 – Surface Treatment</b>				
1810.1 (5)	<b>Surface treatment, General</b> – requirements for friction surfaces and class of treatment or tests required for surfaces in slip resistant connections			
1810.1(7)	<b>Surface treatment general</b> – the extent of surfaces that are affected by pre-loaded bolts in non-slip resistant connections.			
1810.1 (8)	<b>Preparation of fasteners</b> – if the lower embedded part of foundation bolts is required to be untreated.			

			Drawings and Documents that give related structural steelwork requirements	
Series 1800 Clause Reference:	Additional Information Required	Not Applicable (Ticked if not applicable)	See Drawings Listed in Appendix 0/4 <i>[The compiler should provide drawing reference(s)]</i>	See Appended Documents <i>[The compiler should provide document reference(s)]</i>
1810.1 (9)	<b>Galvanizing</b> – Requirements for procedure qualification of the dipping process if hot dip galvanizing of components after manufacture is required.			
1810.1 (10)	<b>Galvanizing</b> – Requirements for the inspection, checking or qualification of the preparation to be carried out before subsequent overcoating, for galvanized components.			
1810.2	<b>Preparation of steel substrates</b> – Requirements for surface cleanliness of stainless steels.			
1810.2 (1)	<b>Preparation of steel substrates</b> – requirements for the preparation of surfaces to receive corrosion protection if they are to be different from those described in Series 1900 and/or BS EN ISO 8501-3:2007 preparation grade P3.			
1810.3	<b>Weather resistant steels</b> – requirements for the surface treatment of non-weather resistant steels in contact with uncoated weather resistant steels.			
1810.5	<b>Galvanizing</b> – where enclosed spaces shall be sealed after galvanizing and, if so, with what sealant.			
1810.6	<b>Sealing of spaces</b> – where weld imperfections permitted by the welding procedure specification require sealing by application of suitable filler material.			
1810.6	<b>Sealing of spaces</b> – the method to be used for sealing the interface if mechanical fasteners penetrate the wall of sealed enclosed spaces.			
1810.6 (2)	<b>Sealing of spaces</b> – internal spaces that are to be hermetically sealed.			
1810.7	<b>Surfaces in contact with concrete</b> – specific requirements for coating surfaces in contact with concrete.			
1810.9 (2)	<b>Repairs of coatings to precoated constituent products</b> – method and extent of repair after welding.			
1810.10.2	<b>Cleaning of stainless steel components</b> – the method, level and extent of cleaning of stainless steels.			
<b>1811 – Geometrical Tolerances</b>				
1811.1	<b>Tolerance types</b> – additional information related to special tolerances if these tolerances are specified.			



			Drawings and Documents that give related structural steelwork requirements	
Series 1800 Clause Reference:	Additional Information Required	Not Applicable (Ticked if not applicable)	See Drawings Listed in Appendix 0/4 <i>[The compiler should provide drawing reference(s)]</i>	See Appended Documents <i>[The compiler should provide document reference(s)]</i>
1811.3.3	Alternative criteria – where the specified alternative criteria for functional tolerances may be applied.			
<b>1812 – Inspection, Testing and Correction</b>				
1812.2.1 (1)	<b>Constituent products</b> – specific testing requirements for proprietary products.			
1812.5.1	<b>Inspection of non-preloaded bolted connections</b> – requirements for checking the installation of an insulation system.			
1812.5.2.1	<b>Inspection of friction surfaces</b> – requirements for the inspection and testing of preloaded bolts used for stainless steels connections.			
1812.5.5.1	<b>Special fasteners and fastening methods, General</b> – requirements for the inspection of connections using special fasteners or special fastening methods.			
1812.7.1 (1)	<b>Inspection of trial erection</b> – additional requirements for the inspection of a trial erection			
1812.7.3.4	<b>Location and frequency</b> – additional measurements, other than the position of components adjacent to site interconnection nodes.			
1812.7.3.4	<b>Location and frequency</b> – conditions other than under the self weight of steelwork, under which positional measurements should be made.			
1812.7.3.6	<b>Definition of nonconformity</b> – envelope of permissible positions where significant movement of a structure is anticipated.			
1812.7.4	<b>Other acceptance tests</b> – specific requirements including tolerance range on the load, if components of a structure are to be erected to a specific load.			

### Appendix 18/1 Appended Documents

*[The compiler should provide a complete list of the appended documents referred to from the table above. The list should include as a minimum the full title, date of issue, revision and reference number for each document. The documents should be attached to the Appendix 18/1.]*

