Highway Structures & Bridges
Contract preparation

CP 491 Instructions for specifiers for CC 491 Masonry

(formerly)

Version LIVE_2025-02-19

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Contents

Latest release notes

Document Code	Version number	Date of publication of relevant change	Changes made to	Type of change
CP 491	LIVE_2025-02-19	Not available	Core document, England NAA, Northern Ireland NAA, Scotland NAA, Wales NAA	Change to policy, major revision, new document development
This document replaces Series NG 2400 Brickwork, Blockwork and Stonework.				

Previous versions

Document Code	Version number	Date of publication of relevant change	Changes made to	Type of change

Foreword

This document provides specifier instructions for the production of the works specific requirements for CC 491 Masonry.

This document does not form part of the works specification.

The works specification is made up of both the Specification for Highway Works and the works specific requirements completed by the Specifier.

This document is applicable for contracts throughout the UK, complemented by the additional specification requirements and contractual changes of each Overseeing Organisation.

Users are responsible for applying all appropriate documents applicable to their contract.

Users are responsible for archiving contract documentation in accordance with the user's quality management system.

1. General requirements for masonry

1.1 Masonry shall be constructed of bricks, blocks, or stones in accordance with this document.

1.2 The work specific requirements for each area of masonry (brickwork, blockwork, or stonework) shall be as specified in CC 491/WSR/001.

The work specific requirements for each area of masonry (brickwork, blockwork, or stonework)					
Masonry reference	**Structure name**	**Structure reference**	**Structure location**	**Description of masonry**	**Drawing / model reference(s)**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the name of the structure containing the area of masonry.

c) Enter text, to define the reference of the structure containing the area of masonry.

d) Enter text, to define the location of the structure containing the area of masonry.

e) Enter text, to describe the area of masonry.

f) Enter text, to identify drawing/model number(s) that show the area of masonry.

The work specific requirements for each area of masonry (brickwork, blockwork, or stonework) (continued)						
Masonry reference	**Type of masonry**	**Type of brick**	**Type of block**	**Type of stone**	**Type of binder for masonry mortar**	**Type of masonry mortar, concept**
(a)	(g)	(h)	(i)	(j)	(k)	(l)

g) Enter a value, from options brick, concrete block, stone, to define the type of masonry.

h) Enter one or more values, from options Class A clay engineering brick, Class B clay engineering brick, clay masonry units, calcium silicate masonry units, N/A, to define the type of brick.

i) Enter one or more values, from options aggregate concrete masonry units, autoclaved aerated concrete masonry units, N/A, to define the type of block.

j) Enter one or more values, from options manufactured stone, natural stone, N/A, to define the type of stone.

k) Enter a value, from options cement, lime, to define the type of binder for the masonry mortar.

l) Enter a value, from options designed masonry mortar, prescribed masonry mortar, to specify the type of masonry mortar defined according to concept.

The work specific requirements for each area of masonry (brickwork, blockwork, or stonework) (continued)		
Masonry reference	**Type of masonry mortar, mode of manufacture**	**Additional requirements**
(a)	(m)	(n)

m) Enter one or more values, from options factory-made masonry mortar, semi-finished factory made masonry mortar, site made masonry mortar, to specify the type of masonry mortar defined according to mode of manufacture.

n) Enter text, to define any additional requirements for masonry.

Waterproofing requirements for masonry

1.3 The requirements for waterproofing of masonry shall be as specified in CC 491/WSR/001.

The requirements for waterproofing of masonry		
Masonry reference	**Waterproofing requirements**	**Drawing / model reference(s)**
(a)	(b)	(c)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the waterproofing requirements for the area of masonry.

c) Enter text, to identify drawing/model number(s) that show the waterproofing of the area of masonry.

1.4 Verification of the performance of the waterproofing of masonry through testing shall be as specified in CC 491/WSR/001.

Verification of the performance of the waterproofing of masonry through testing					
Masonry reference	**Waterproofing characteristics to be verified**	**Description of test**	**Acceptance criteria**	**Frequency of testing**	**Documentation requirements**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the performance characteristics of the waterproofing to be verified.

c) Enter text, to describe the test required to verify the performance characteristic of the waterproofing of masonry.

d) Enter text, to describe the acceptance criteria for the testing of the performance characteristic of the waterproofing of masonry.

e) Enter text, to define the frequency of the testing of the waterproofing of masonry.

f) Enter text, to define the documentation requirements for the testing of the waterproofing of masonry.

Verification of the performance of the waterproofing of masonry through testing (continued)	
Masonry reference	**Additional requirements**
(a)	(g)

g) Enter text, to define any additional requirements for the testing of the waterproofing of masonry.

1.5 The requirements for Verification and verification activities in Section 14 of GC 101 [Ref 11.N] shall apply to testing of the waterproofing of masonry.

1.6 The requirements for Documentation in Section 2 of GC 101 [Ref 11.N] shall apply to the documentation specified in WSR 491/001 for the testing of waterproofing of masonry.

Aesthetic requirements for masonry

1.7 The aesthetic requirements for masonry shall be as specified in CC 491/WSR/001.

The aesthetic requirements for masonry			
Masonry reference	**Aesthetic requirements**	**Aesthetic approval requirements**	**Documentation requirements**
(a)	(b)	(c)	(d)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the aesthetic requirements for the area of masonry.

c) Enter text, to define any aesthetic approval requirements for the area of masonry.

d) Enter text, to define the documentation requirements to provide evidence that the aesthetic requirements have been complied with.

1.8 Verification of compliance of the proposed masonry and mortar with the aesthetic requirements through construction of a trial panel shall be as specified in CC 491/WSR/001.

Verification of compliance of the proposed masonry and mortar with the aesthetic requirements through construction of a trial panel						
Masonry reference	**Trial panel(s) required**	**Number of trial panels**	**Trial panel requirements**	**Trial panel personnel requirements**	**Documentation requirements**	**Additional requirements**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter a value, from options required, not required, to define whether a trial panel is required.

c) Enter a number, to define the number of trial panels required.

d) Enter text, to define the verification requirements to demonstrate that the aesthetic requirements have been complied with.

e) Enter text, to define any requirements for personnel relating to the trial panel for masonry.

f) Enter text, to define the documentation requirements for the trial panel for masonry.

g) Enter text, to define any additional requirements for the trial panel for masonry.

1.9 The requirements for Verification and verification activities in Section 14 of GC 101 [Ref 11.N] shall apply to the construction of a trial panel to demonstrate the aesthetic requirements for masonry have been complied with.

1.10 The requirements for Documentation in Section 2 of GC 101 [Ref 11.N] shall apply to the documentation specified in WSR 491/001 to demonstrate the aesthetic requirements for masonry have been complied with.

Verification requirements for masonry

1.11 Verification of the performance of masonry through work specific testing shall be as specified in CC 491/WSR/001.

Verification of the performance of masonry through work specific testing					
Test reference	**Masonry reference(s)**	**Masonry performance characteristic to be verified**	**Description of test**	**Acceptance criteria**	**Frequency of testing**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, to provide a unique reference for the test being undertaken on the masonry.

b) Enter text, to provide the unique reference(s) for the area(s) of masonry subject to the test. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

c) Enter text, to define the performance characteristic of the masonry to be verified.

d) Enter text, to describe the test required to verify the performance characteristic of the masonry.

e) Enter text, to define the acceptance criteria for the testing of the performance characteristic of the masonry.

f) Enter text, to define the frequency of the testing of the performance characteristic of the masonry.

Verification of the performance of masonry through work specific testing (continued)			
Test reference	**Trial panel or sample requirements**	**Documentation requirements**	**Additional requirements**
(a)	(g)	(h)	(i)

g) Enter text, to define whether a trial panel or sample is required for the testing of the performance of masonry, the requirements for the trial panel or sample, and whether the trial panel for verifying aesthetic requirements can be used for testing.

h) Enter text, to define the documentation requirements for testing of the masonry.

i) Enter text, to define any additional requirements for testing of the masonry.

1.12 The requirements for Verification and verification activities in Section 14 of GC 101 [Ref 11.N] shall apply to testing of the performance of masonry.

1.13 The requirements for Documentation in Section 2 of GC 101 [Ref 11.N] shall apply to the documentation specified in WSR 491/001 for the testing of the performance of masonry.

Site-won masonry units

1.14 The re-use of site-won masonry units shall be as specified in CC 491/WSR/001.

The re-use of site-won masonry units		
Masonry reference	**Re-use of site won masonry**	**Requirements for the re-use of site won masonry**
(a)	(b)	(c)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter a value, from options required, permitted, not permitted, to define whether the re-use of site won material is required, permitted or not permitted.

c) Enter text, to define the requirements for incorporating site-won masonry units within the works.

1.15 Verification of the performance of site-won masonry units through the testing shall be as specified in CC 491/WSR/001.

Verification of the performance of site-won masonry units through the testing					
Masonry reference	**Masonry unit characteristic to be verified**	**Description of test**	**Acceptance criteria**	**Frequency of testing**	**Documentation requirements**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the performance characteristics of site-won masonry units to be verified.

c) Enter text, to describe the test required to verify the performance characteristics of site-won masonry units.

d) Enter text, to define the acceptance criteria for the testing of the performance characteristics of site-won masonry units.

e) Enter text, to define the frequency of the testing of the performance characteristics of site-won masonry units.

f) Enter text, to define the documentation requirements for testing of site-won masonry units.

Verification of the performance of site-won masonry units through the testing (continued)	
Masonry reference	**Additional requirements**
(a)	(g)

g) Enter text, to define any additional requirements for testing of site-won masonry units.

1.16 The requirements for Verification in Section 14 of GC 101 [Ref 11.N] shall apply to testing of site-won masonry units.

1.17 The requirements for Documentation in Section 2 of GC 101 [Ref 11.N] shall apply to the documentation specified in WSR 491/001 for the testing of site-won masonry units.

2. Cement for masonry mortar

Product requirements for cement for masonry mortar

2.1 Cement types and combinations for masonry mortar shall be:.

1. common cements;
2. portland-composite cement CEM II/C-M;
3. composite cement CEM VI; or
4. masonry cement.

Product requirements for common cement, Portland-composite cement CEM II/C-M and composite cement CEM VI for masonry mortar

2.2 Common cements for masonry mortar shall be compliant with BS EN 197-1 [Ref 4.N].

2.3 Portland-composite cement CEM II/C-M and composite cement CEM VI for masonry mortar shall be compliant with BS EN 197-5 [Ref 5.N].

2.4 The types, and performance characteristics, of cement for masonry mortar shall be as specified in CC 491/WSR/002.

The types, and performance characteristics, of cement for masonry mortar				
Masonry reference	**Type(s) of cement**	**Strength class of cement (N/mm^2)**	**Early strength class of cement**	**Heat of hydration**
(a)	(b)	(c)	(d)	(e)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the types of cement for masonry mortar (common cement or Portland-composite cement CEM II/C-M and composite cement CEM VI), including sulfate resistance.

c) Enter one or more values, from options 35.5, 42.5, 52.5, to define the strength class of the cement for masonry mortar.

d) Enter one or more values, from options L (low early strength), N (ordinary early strength), R (high early strength), to define the early strength class of the cement for masonry mortar.

e) Enter a value, from options Low heat, Not applicable, to define the heat of hydration of cement for masonry mortar.

2.5 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to common cements for masonry mortar.

Product requirements for masonry cement for masonry mortar

2.6 Masonry cement for masonry mortar shall be compliant with BS EN 413-1 [Ref 14.N].

2.7 The type of masonry cement for masonry mortar shall be as specified in CC 491/WSR/002.

The type of masonry cement for masonry mortar	
Masonry reference	**Type(s) of masonry cement**
(a)	(b)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter one or more values, from options MC 5, MC 12.5, MC 12.5X, MC22.5, MC 22.5X, to define the type(s) of masonry cement for masonry mortar.

2.8 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to masonry cement for masonry mortar.

3. Aggregates for masonry mortar

Product requirements for aggregates for masonry mortar

3.1 Aggregates for masonry mortar shall be fine aggregates compliant with BS EN 13139 [Ref 2.N].

3.2 The performance characteristics for fine aggregates for masonry mortar shall be as specified in CC 491/WSR/003.

The performance characteristics for fine aggregates for masonry mortar							
Masonry reference	**Particle size (d/D)**	**Particle density range**	**Fines quality category**	**Maximum water absorption**	**Requirements for durability against alkali-silica reactivity**	**Durability against freeze-thaw**	**Maximum chloride content**
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

a) Enter text, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter a value, from options 0/1mm, 0/2mm, 0/4mm, 0/8mm, to define the particle size (d/D) of fine aggregates for masonry mortar.

c) Enter a number range (e.g. "40-60") in units of kg/m^3, to define the particle density range of fine aggregates for masonry mortar.

d) Enter a value, from options Category 4, Category 5, to define the fines quality category of fine aggregates for masonry mortar.

e) Enter a number in units of %, to define the maximum water absorption of fine aggregates for masonry mortar.

f) Enter text, to define requirements for durability against alkali-silica reactivity of fine aggregates for masonry mortar.

g) Enter a value, from options freeze-thaw resistant, no requirement, to define the requirements for durability against freeze-thaw of fine aggregates for masonry mortar.

h) Enter a number in units of %, to define the maximum chloride content of fine aggregates for masonry mortar.

3.3 The grading of fine aggregates for masonry mortar shall conform to Table 1 of BS EN 13139 [Ref 2.N], unless otherwise stated in CC 491/WSR/003.

SI.3.3 The grading of fine aggregates for masonry mortar shall be [enter free text].

3.4 The acid-soluble sulfates category of fine aggregates for masonry mortar shall be $AS_{0.2}$, or $AS_{1.0}$ for air-cooled blast furnace slag, unless otherwise stated in CC 491/WSR/003.

SI.3.4 The acid soluble sulfates category of fine aggregates for masonry mortar shall be [enter free text].

3.5 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to fine aggregates for masonry mortar.

4. Water for masonry mortar

General requirements for water for masonry mortar

4.1 Water for masonry mortar shall either be clean potable water from the mains network, or compliant with BS EN 1008 [Ref 16.N].

4.2 Water from the sea or tidal rivers shall not be used for masonry mortar.

4.3 The maximum sulfate (SO_4) content of the water for masonry mortar shall be 1400 mg/l, unless otherwise stated in CC 491/WSR/004.

SI.4.3 The maximum sulfate (SO_4) content of water for masonry mortar shall be [enter a number] .

Verification requirements for water for masonry mortar

4.4 Verification shall be undertaken for levels of chlorides, sulfates, alkali, sugars, phosphates, nitrates, lead, and zinc in water for masonry mortar recovered from processes in the concrete industry, from underground sources, natural surface water, and industrial waste water through testing in accordance with BS EN 1008 [Ref 16.N].

4.5 The frequency of sampling and testing of water for masonry mortar recovered from processes in the concrete industry, from underground sources, natural surface water, and industrial waste water shall be in accordance with Section 6.2 of BS EN 1008 [Ref 16.N].

4.6 The requirements for "Verification" in Section 14 of GC 101 [Ref 11.N] shall apply to testing for levels of chlorides, sulfates, alkali, sugars, phosphates, nitrates, lead, and zinc in water for masonry mortar recovered from processes in the concrete industry, from underground sources, natural surface water, and industrial waste water.

5. Masonry mortar

General requirements for masonry mortar

5.1 Mortars for masonry shall be selected and executed in accordance with BS EN 1996-2 [Ref 9.N] and PD 6697 [Ref 17.N].

Product requirements for factory-made masonry mortar and semi-finished factory made masonry mortar

5.2 Factory-made masonry mortar and semi-finished factory made masonry mortar shall be in accordance with BS EN 998-2 [Ref 24.N].

5.3 The strength characteristics of designed factory-made masonry mortar or semi-finished factory made masonry mortar shall be as specified in CC 491/WSR/005.

The strength characteristics of designed factory-made masonry mortar or semi-finished factory made masonry mortar			
Masonry reference	**Minimum compressive strength or compressive strength class**	**Minimum shear bond strength**	**Minimum flexural bond strength**
(a)	(b)	(c)	(d)

a) Enter text, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the minimum compressive strength or compressive strength class of the designed factory-made masonry mortar or semi-finished factory made masonry mortar.

c) Enter a number in units of N/mm^2, to define the minimum shear bond strength of the designed factory-made masonry mortar or semi-finished factory made masonry mortar.

d) Enter a number in units of N/mm^2, to define the minimum flexural bond strength of the designed factory-made masonry mortar or semi-finished factory made masonry mortar.

5.4 The designation, or proportion of constituents, of prescribed factory-made masonry mortar or semi-finished factory made masonry mortar shall be as specified in CC 491/WSR/005.

The designation, or proportion of constituents, of prescribed factory-made masonry mortar or semi-finished factory made masonry mortar	
Masonry reference	**Mortar designation or proportion of constituents**
(a)	(b)

a) Enter text, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the mortar designation or proportion of constituents of the prescribed factory-made masonry mortar or semi-finished factory made masonry mortar.

5.5 The performance characteristics of designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar shall be as specified in CC 491/WSR/005.

The performance characteristics of designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar					
Masonry reference	**Reaction to fire class**	**Maximum water absorption**	**Maximum water vapour permeability**	**Maximum thermal conductivity**	**Requirements for durability**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter text, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter a value, from options A1,A2,B,C,D,E,F,N/A, to define the reaction to fire class of the designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar in accordance with BS EN 13501-1 [Ref 10.N].

c) Enter a number in units of kg/(m^2.$min^{0.5}$), to define the maximum water absorption of the designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar.

d) Enter a number, to define the maximum water vapour permeability of the designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar.

e) Enter a number in units of W/(m.K), to define the maximum thermal conductivity of the designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar.

f) Enter text, to define the requirements for durability of the designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar.

5.6 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to factory-made masonry mortar and semi-finished factory made masonry mortar.

5.7 For reinforced masonry, the maximum content of chlorides of designed or prescribed factory-made masonry mortar or semi-finished factory made masonry mortar shall be 0.3% for Portland cement and 0.2% for sulphate resisting Portland cement.

Product requirements for site made masonry mortar

5.8 Site made masonry mortars shall be compliant with BS EN 1996-2 [Ref 9.N] and BS EN 998-2 [Ref 24.N].

5.9 The designation and requirements for site made masonry mortar shall be as specified in CC 491/WSR/005.

The designation and requirements for site made masonry mortar		
Masonry reference	**Designation of site made masonry mortar**	**Additional requirements for site made masonry mortar**
(a)	(b)	(c)

a) Enter text, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter one or more values, from options (i),(ii),(iii),(iv), to define the designation of the site made masonry mortar.

c) Enter text, to define the additional requirements of the site made masonry mortar.

Product requirements for admixtures for masonry mortar

5.10 Admixtures for masonry mortar shall be compliant with BS EN 934-3 [Ref 1.N].

5.11 The performance characteristics of admixtures for masonry mortar shall be as specified in CC 491/WSR/005.

The performance characteristics of admixtures for masonry mortar			
Masonry reference	**Maximum alkali content**	**Requirements for corrosion behaviour**	**Release of dangerous substances**
(a)	(b)	(c)	(d)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter a number in units of %, to define the maximum alkali content of admixtures for masonry mortar.

c) Enter text, to define the requirements for corrosion behaviour of admixtures for masonry mortar.

d) Enter text, to define any limitations on the release of dangerous substances of admixtures for masonry mortar.

5.12 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to admixtures for masonry mortar.

5.13 Calcium chloride or admixtures containing chloride shall not be used for masonry mortar.

5.14 The additional performance requirements for admixtures for masonry mortar shall be as specified in CC 491/WSR/005.

The additional performance requirements for admixtures for masonry mortar	
Masonry reference	**Additional performance requirements**
(a)	(b)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the additional performance requirements for admixtures for masonry mortar.

Installation requirements for masonry mortar

5.15 The use of masonry mortar shall be compliant with BS 8000-3 [Ref 29.N].

5.16 Factory-made masonry mortar and semi-finished factory made masonry mortar shall be used in accordance with the manufacturer's specification and conditions.

5.17 Admixtures for masonry mortar shall be used in accordance with the manufacturer's specification and conditions.

Verification requirements for masonry mortar

5.18 Verification shall be undertaken for the compressive strength of masonry mortar through testing in accordance with BS EN 998-2 [Ref 24.N] and BS EN 1015-11 [Ref 15.N].

5.19 The frequency of compressive strength testing of masonry mortar shall be at least one set of three specimens for each type of mortar designation used on each structure unless otherwise stated in CC 491/WSR/005.

SI.5.19 The frequency of compressive strength testing of masonry mortar shall be [enter free text].

5.20 The requirements for "Verification" in Section 14 of GC 101 [Ref 11.N] shall apply to compressive strength testing of masonry mortar.

5.21 Verification for the compressive strength of masonry mortar shall be undertaken by an accredited testing laboratory in compliance with "Accredited laboratory" in Section 16 of GC 101 [Ref 11.N].

5.22 Verification for the compressive strength of masonry mortar shall be repeated for each masonry mortar supplier.

Documentation requirements for masonry mortar

5.23 The following Documentation shall be submitted for compressive strength testing of masonry mortar prior to the commencement of the use of the masonry mortar: compressive strength test reports for masonry mortar, in accordance with BS EN 1015-11 [Ref 15.N].

6. Lime mortar for masonry

Product requirements for lime mortar for masonry

6.1 Lime mortars for masonry shall be in accordance with the publication: Hydraulic Lime Mortar for Stone, Brick and Block Masonry: A Best Practice Guide Lime Mortar BPG [Ref 13.N].

6.2 The designation of lime mortar for masonry shall be as specified in CC 491/WSR/006.

The designation of lime mortar for masonry		
Masonry reference	**Lime mortar designation and standard**	**Lime mortar mix**
(a)	(b)	(c)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the designation of lime mortar for masonry and the standard that defines the designation.

c) Enter text, to define the constituents and their proportions of the lime mortar for masonry.

6.3 Natural hydraulic lime, formulated lime, and hydraulic lime shall be compliant with BS EN 459-1 [Ref 3.N].

6.4 The natural hydraulic lime, formulated lime, and hydraulic lime shall meet the performance characteristics as stated in table 18, 22, and 26 of BS EN 459-1 [Ref 3.N] respectively, for the designation specified in WSR 491/006.

6.5 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 11.N] shall apply to natural hydraulic lime, formulated lime, and hydraulic lime.

Installation requirements for lime mortar for masonry

6.6 The use of lime mortar for masonry shall be compliant with BS 8000-3 [Ref 29.N].

Verification requirements for lime mortar for masonry

6.7 Verification of the compressive strength of lime mortar for masonry shall comply with Verification requirements for masonry mortar in "Masonry mortar" in Section 5 of this document.

Documentation requirements for lime mortar for masonry

6.8 Documentation for compressive strength testing of lime mortar for masonry shall comply with Documentation requirements for masonry mortar in "Masonry mortar" in Section 5 of this document.

7. Bricks for masonry

General requirements for bricks for masonry

7.1 Bricks shall be clay masonry units, including Class A and Class B clay engineering bricks, or calcium silicate masonry units.

7.2 Bricks shall be masonry U units, unless otherwise stated in CC 491/WSR/007.

SI.7.2 Masonry P units shall be permitted in the following locations: [enter free text].

Product requirements for clay bricks for masonry

7.3 Clay bricks for masonry, including Class A and Class B clay engineering bricks, shall be compliant with BS EN 771-1 [Ref 21.N].

7.4 Class A and Class B clay engineering bricks for masonry shall meet the performance characteristics stated in table NA.6 of BS EN 771-1 [Ref 21.N].

7.5 The performance characteristics of clay bricks for masonry other than engineering bricks shall be as specified in CC 491/WSR/007.

The performance characteristics of clay bricks for masonry other than engineering bricks						
Masonry reference	**Dimensions (length, width, height)**	**Dimensional tolerances**	**Shape and features (configuration) or reference to the drawings providing details**	**Configuration group category**	**Minimum compressive strength**	**Direction of load for compressive strength**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the dimensions (length, width, height) of the clay bricks for masonry other than engineering bricks.

c) Enter text, to define the dimensional tolerance requirements of the clay bricks for masonry other than engineering bricks.

d) Enter text, to define the shape and features (configuration) of the clay bricks for masonry other than engineering bricks.

e) Enter a value, from options Group 1, Group 2, Group 3, Group 4, no requirement, to define the configuration group category of the clay bricks for masonry other than engineering bricks.

f) Enter a number in units of N/mm^2, to define the minimum compressive strength of the clay bricks for masonry other than engineering bricks.

g) Enter text, to define the direction of the load used to define the minimum compressive strength of the clay bricks for masonry other than engineering bricks.

The performance characteristics of clay bricks for masonry other than engineering bricks (continued)								
Masonry reference	**Unit Category**	**Maximum moisture movement**	**Minimum bond strength**	**Active soluble salts content**	**Reaction to fire**	**Maximum water absorption**	**Water vapour permeability**	**Durability against freeze-thaw**
(a)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)

h) Enter a value, from options Category I, Category II, no requirement, to define the compressive strength category of the clay bricks for masonry other than engineering bricks.

i) Enter a number in units of mm/m, to define the dimensional stability, maximum moisture movement, of the clay bricks for masonry other than engineering bricks.

j) Enter a number in units of N/mm^2, to define the bond strength of the clay bricks for masonry other than engineering bricks.

k) Enter a value, from options S0, S1, S2, no requirement, to define the active soluble salts content of the clay bricks for masonry other than engineering bricks.

l) Enter a value, from options A1, A2, B, C, D, E, F, no requirement, to define the reaction to fire of the clay bricks for masonry other than engineering bricks.

m) Enter a number in units of %, to define the maximum water absorption of the clay bricks for masonry other than engineering bricks.

n) Enter text, to define the water vapour permeability of the clay bricks for masonry other than engineering bricks.

o) Enter a value, from options F0, F1, F2, no requirement, to define durability against freeze-thaw of the clay bricks for masonry other than engineering bricks.

7.6 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to clay bricks for masonry.

Product requirements for calcium silicate bricks for masonry

7.7 Calcium silicate bricks for masonry (masonry units) shall be compliant with BS EN 771-2 [Ref 20.N].

7.8 The performance characteristics of calcium silicate bricks for masonry shall be as specified in CC 491/WSR/007.

The performance characteristics of calcium silicate bricks for masonry						
Masonry reference	**Dimensions: length, width, height**	**Dimensional tolerances**	**Shape and features (configuration) or reference to the drawings providing details**	**Configuration group category**	**Minimum compressive strength**	**Direction of load for compressive strength**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the dimensions, length, width, height, of the calcium silicate bricks for masonry.

c) Enter text, to define the dimensional tolerance requirements of the calcium silicate bricks for masonry.

d) Enter text, to define the shape and features (configuration) of the calcium silicate bricks for masonry.

e) Enter a value, from options Group 1, Group 2, Group 3, Group 4, no requirement, to define the configuration group category of the calcium silicate bricks for masonry.

f) Enter a number in units of N/mm^2, to define the minimum compressive strength of the calcium silicate bricks for masonry.

g) Enter text, to define the direction of the load used to define the minimum compressive strength of the calcium silicate bricks for masonry.

The performance characteristics of calcium silicate bricks for masonry (continued)						
Masonry reference	**Unit Category**	**Minimum bond strength**	**Reaction to fire**	**Maximum water absorption**	**Water vapour permeability**	**Durability against freeze-thaw**
(a)	(h)	(i)	(j)	(k)	(l)	(m)

h) Enter a value, from options Category I, Category II, no requirement, to define the compressive strength category of the calcium silicate bricks for masonry.

i) Enter a number in units of N/mm^2, to define the bond strength of the calcium silicate bricks for masonry.

j) Enter a value, from options A1, A2, B, C, D, E, F, no requirement, to define the reaction to fire of the calcium silicate bricks for masonry.

k) Enter a number in units of %, to define the maximum water absorption of the calcium silicate bricks for masonry.

l) Enter text, to define the water vapour permeability of the calcium silicate bricks for masonry.

m) Enter a value, from options F0, F1, F2, no requirement, to define durability against freeze-thaw of the calcium silicate bricks for masonry.

7.9 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to calcium silicate bricks for masonry.

8. Concrete blocks for masonry

General requirements for concrete blocks for masonry

8.1 Concrete blocks for masonry shall be aggregate concrete masonry units or autoclaved aerated concrete masonry units.

Product requirements for aggregate concrete blocks for masonry

8.2 Aggregate concrete blocks for masonry (masonry units) shall be compliant with BS EN 771-3 [Ref 18.N].

8.3 The performance characteristics of aggregate concrete blocks for masonry shall be as specified in CC 491/WSR/008.

The performance characteristics of aggregate concrete blocks for masonry						
Masonry reference	**Dimensions (length, width, height)**	**Dimensional tolerance category**	**Shape and features (configuration) or reference to the drawings providing details**	**Configuration group category**	**Minimum compressive strength**	**Direction of load for compressive strength**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the dimensions (length, width, height) of the aggregate concrete blocks for masonry.

c) Enter a value, from options D1, D2, D3, D4, no requirement, to define the dimensional tolerance category of the aggregate concrete blocks for masonry.

d) Enter text, to define the shape and features (configuration) of the aggregate concrete blocks for masonry.

e) Enter a value, from options Group 1, Group 2, Group 3, Group 4, no requirement, to define the configuration group category of the aggregate concrete blocks for masonry.

f) Enter a number in units of N/mm^2, to define the minimum compressive strength of the aggregate concrete blocks for masonry.

g) Enter text, to define the direction of load used to define the minimum compressive strength of the aggregate concrete blocks for masonry.

The performance characteristics of aggregate concrete blocks for masonry (continued)								
Masonry reference	**Unit Category**	**Maximum moisture movement**	**Minimum shear bond strength**	**Minimum flexural bond strength**	**Reaction to fire**	**Maximum water absorption by capillarity**	**Maximum water vapour permeability**	**Durability against freeze-thaw**
(a)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)

h) Enter a value, from options Category I, Category II, no requirement, to define the compressive strength category of the aggregate concrete blocks for masonry.

i) Enter a number in units of mm/m, to define the dimensional stability, maximum moisture movement, of the aggregate concrete blocks for masonry.

j) Enter a number in units of N/mm^2, to define the shear bond strength of the aggregate concrete blocks for masonry.

k) Enter a number in units of N/mm^2, to define the flexural bond strength of the aggregate concrete blocks for masonry.

l) Enter a value, from options A1, A2, B, C, D, E, F, no requirement, to define the reaction to fire of the aggregate concrete blocks for masonry.

m) Enter a number in units of g/(m^2.s), to define the maximum water absorption of the aggregate concrete blocks for masonry.

n) Enter text, to define the water vapour permeability of the aggregate concrete blocks for masonry.

o) Enter text, to define requirements for durability against freeze-thaw of the aggregate concrete blocks for masonry.

8.4 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to aggregate concrete blocks for masonry.

Product requirements for autoclaved aerated concrete blocks for masonry

8.5 Autoclaved aerated concrete blocks for masonry (masonry units) shall be compliant with BS EN 771-4 [Ref 19.N].

8.6 The performance characteristics of autoclaved aerated concrete blocks for masonry shall be as specified in CC 491/WSR/008.

The performance characteristics of autoclaved aerated concrete blocks fo masonry							
Masonry reference	**Dimensions (length, width, height)**	**Dimensional tolerance category**	**Shape and features (configuration) or reference to the drawings providing details**	**Configuration group category**	**Minimum mean compressive strength**	**Minimum characteristic compressive strength**	**Direc of lo for comp ve stren**
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to define the dimensions (length, width, height) of the autoclaved aerated concrete blocks for masonry.

c) Enter a value, from options GPLM, TLMA, TLMB, no requirement, to define the dimensional tolerances of the autoclaved aerated concrete blocks for masonry.

d) Enter text, to define the shape and features (configuration) of the autoclaved aerated concrete blocks for masonry.

e) Enter a value, from options Group 1, Group 2, Group 3, Group 4, no requirement, to define the configuration group category of the autoclaved aerated concrete blocks for masonry.

f) Enter a number in units of N/mm^2, to define the minimum mean compressive strength of the autoclaved aerated concrete blocks for masonry.

g) Enter a number in units of N/mm^2, to define the minimum characteristic compressive strength of the autoclaved aerated concrete blocks for masonry.

h) Enter text, to define the direction of load used to define the minimum compressive strength of the autoclaved aerated concrete blocks for masonry.

The performance characteristics of autoclaved aerated concrete blocks for masonry (continued)							
Masonry reference	**Unit Category**	**Maximum moisture movement**	**Minimum shear bond strength**	**Minimum flexural bond strength**	**Reaction to fire**	**Maximum water absorption by capillarity**	**Maximum water vapour permeability**
(a)	(i)	(j)	(k)	(l)	(m)	(n)	(o)

i) Enter a value, from options Category I, Category II, no requirement, to define the compressive strength category of the autoclaved aerated concrete blocks for masonry.

j) Enter text, to define the dimensional stability, maximum moisture movement, of the autoclaved aerated concrete blocks for masonry.

k) Enter a number in units of N/mm^2, to define the shear bond strength of the autoclaved aerated concrete blocks for masonry.

l) Enter a number in units of N/mm^2, to define the flexural bond strength of the autoclave d aerated concrete blocks for masonry.

m) Enter a value, from options A1, A2, B, C, D, E, F, no requirement, to define the reaction to fire of the autoclaved aerated concrete blocks for masonry.

n) Enter a number in units of %, to define the maximum water absorption of the autoclaved aerated concrete blocks for masonry.

o) Enter text, to define the maximum water vapour permeability of the autoclaved aerated concrete blocks for masonry.

The performance characteristics of autoclaved aerated concrete blocks for masonry (continued)	
Masonry reference	**Durability against freeze-thaw**
(a)	(p)

p) Enter text, to define requirements for durability against freeze-thaw of the autoclaved aerated concrete blocks for masonry.

8.7 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to autoclaved aerated concrete blocks for masonry.

9. Manufactured stone for masonry

Product requirements for manufactured stone masonry units

9.1 Manufactured stone masonry units shall be compliant with the requirements of BS EN 771-5 [Ref 22.N].

9.2 The type of manufactured stone masonry units shall be as specified in CC 491/WSR/009.

The type of manufactured stone masonry units				
Masonry reference	**Manufactured stone colour**	**Special mixes**	**Texture**	**Cast-in stainless steel ties**
(a)	(b)	(c)	(d)	(e)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the colour of the manufactured stone masonry units.

c) Enter text, to identify the details of special mixes for manufactured stone masonry units.

d) Enter text, to identify the texture of manufactured stone masonry units.

e) Enter text, to identify the requirements for cast-in stainless steel ties for manufactured stone masonry units.

9.3 The dimensions of manufactured stone masonry units shall be selected to achieve the requirements for layout defined in "Stonework" in Section 14 of this document.

9.4 The performance characteristics of manufactured stone masonry units shall be as specified in CC 491/WSR/009.

The performance characteristics of manufactured stone masonry units							
Masonry reference	**Dimensional tolerance category**	**Shape and features (configuration) or reference to the drawings providing details**	**Configuration group category**	**Minimum mean compressive strength**	**Minimum characteristic compressive strength**	**Direction of load for compressive strength**	**Unit Category**
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

a) Enter text, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter a value, from options D1, D2, D3, D4, no requirement, to define the dimensional tolerances of the manufactured stone masonry units.

c) Enter text, to define the shape and features (configuration) of the manufactured stone masonry units, or the reference(s) of the drawings containing this information.

d) Enter a value, from options Group 1, Group 2, Group 3, Group 4, no requirement, to define the configuration group category of the manufactured stone masonry units.

e) Enter a number in units of N/mm^2, to define the minimum mean compressive strength of the manufactured stone masonry units.

f) Enter a number in units of N/mm^2, to define the minimum characteristic compressive strength of the manufactured stone masonry units.

g) Enter text, to define the direction of load used to define the minimum compressive strength of the manufactured stone masonry units.

h) Enter a value, from options Category I, Category II, no requirement, to define the compressive strength category of the manufactured stone masonry units.

The performance characteristics of manufactured stone masonry units (continued)							
Masonry reference	**Maximum moisture movement**	**Minimum shear bond strength**	**Minimum flexural bond strength**	**Reaction to fire**	**Maximum water absorption, by capillarity**	**Maximum water vapour permeability**	**Durability against freeze-thaw**
(a)	(i)	(j)	(k)	(l)	(m)	(n)	(o)

i) Enter a number in units of mm/m, to define the dimensional stability, maximum moisture movement, of the manufactured stone masonry units.

j) Enter a number in units of N/mm^2, to define the shear bond strength of the manufactured stone masonry units.

k) Enter a number in units of N/mm^2, to define the flexural bond strength of the manufactured stone masonry units.

l) Enter a value, from options A1, A2, B, C, D, E, F, no requirement, to define the reaction to fire of the manufactured stone masonry units.

m) Enter a number in units of $g/(m^2.s)$, to define the maximum water absorption, by capillarity, of the manufactured stone masonry units.

n) Enter text, to define the maximum water vapour permeability of the manufactured stone masonry units.

o) Enter text, to define requirements for durability against freeze-thaw of the manufactured stone masonry units.

9.5 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to manufactured stone masonry units.

10. Natural stone for masonry

Product requirements for natural stone masonry units

10.1 Natural stone masonry units shall be compliant with BS EN 771-6 [Ref 23.N].

10.2 The natural stone masonry unit denomination shall be as specified in CC 491/WSR/010.

The natural stone masonry unit denomination				
Masonry reference	**Traditional name**	**Petrographic name**	**Typical colour**	**Place of origin**
(a)	(b)	(c)	(d)	(e)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the traditional name of the natural stone.

c) Enter text, to identify the petrographic name of the natural stone.

d) Enter text, to identify the typical colour of the stone.

e) Enter text, to identify the place of origin of the stone.

10.3 The dimensions of natural stone masonry units shall be selected to achieve the requirements for layout defined in "Stonework" in Section 14 of this document.

10.4 The performance characteristics of natural stone masonry units shall be as specified in CC 491/WSR/010.

The performance characteristics of natural stone masonry units							
Masonry reference	**Dimensional tolerance category**	**Configuration group category**	**Normalised compressive strength**	**Direction of load for compressive strength**	**Unit Category**	**Minimum shear bond strength**	**Minimum flexural bond strength perpendicular to bed faces**
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

a) Enter text, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter a value, from options D1, D2, D3, D4, no requirement, to define the dimensional tolerances of the natural stone masonry units.

c) Enter a value, from options Group 1, Group 2, Group 3, Group 4, no requirement, to define the configuration group category of the natural stone masonry units.

d) Enter a number in units of N/mm^2, to define the normalised compressive strength of the natural stone masonry units.

e) Enter text, to define the direction of load used to define the minimum compressive strength of the natural stone masonry units.

f) Enter a value, from options Category I, Category II, no requirement, to define the compressive strength category of the natural stone masonry units.

g) Enter a number in units of N/mm^2, to define the minimum shear bond strength of the natural stone masonry units.

h) Enter a number in units of N/mm^2, to define the minimum flexural bond strength perpendicular to bed faces of the natural stone masonry units.

The performance characteristics of natural stone masonry units (continued)					
Masonry reference	**Reaction to fire**	**Maximum water absorption parallel to bed faces**	**Maximum water absorption perpendicular to bed faces**	**Maximum water vapour permeability**	**Durability against freeze-thaw**
(a)	(i)	(j)	(k)	(l)	(m)

i) Enter a value, from options A1, A2, B, C, D, E, F, no requirement, to define the reaction to fire of the natural stone masonry units.

j) Enter a number in units of $g/(m^2.s^{0.5})$, to define the maximum water absorption parallel to bed faces of the natural stone masonry units.

k) Enter a number in units of $g/(m^2.s^{0.5})$, to define the maximum water absorption perpendicular to bed faces of the natural stone masonry units.

l) Enter text, to define the maximum water vapour permeability of the natural stone masonry units.

m) Enter text, to define requirements for durability against freeze-thaw of the natural stone masonry units.

10.5 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to natural stone masonry units.

11. Reinforcement for masonry

General requirements for reinforcement for masonry

11.1 Stainless steel wire fabric or plain bars laid between masonry shall be compliant with BS EN 10088-5 [Ref 26.N].

11.2 The stainless steel wire fabric or plain bars shall meet the following performance characteristics: solution annealed condition, but excluding free machining specifications.

11.3 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 11.N] shall apply to stainless steel wire fabric or plain bars.

11.4 The requirements for reinforcement for masonry shall be as specified in CC 491/WSR/011.

The requirements for reinforcement for masonry			
Masonry reference	**Reinforcement drawings / models**	**Reinforcement requirements**	**Stainless steel grade**
(a)	(b)	(c)	(d)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to provide reference(s) to the drawings / models that detail the reinforcement for masonry, including where stainless steel wire fabric and plain bars are used for reinforcement.

c) Enter text, to define the requirements for the reinforcement for masonry.

d) Enter one or more values, from options 1.4301, 1.4436, to identify the grade of stainless steel for wire fabric or plain bar laid between masonry.

11.5 Ribbed reinforcing bars laid between masonry shall be stainless steel in accordance with BS 6744 [Ref 25.N] Table 5, excluding alloys for low magnetic permeability.

12. Metal ancillary components for masonry

General requirements for metal ancillary components for masonry

12.1 Metal ancillary components for masonry shall include anchorages, dowels, fixings, and ties.

12.2 The requirements for metal ancillary components for masonry shall be as specified in CC 491/WSR/012.

The requirements for metal ancillary components for masonry		
Masonry reference	**Metal ancillary components drawings / models**	**Metal ancillary components requirements**
(a)	(b)	(c)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to provide reference(s) to the drawings / models that show the requirements for metal ancillary components for masonry.

c) Enter text, to define the requirements for metal ancillary components for masonry.

12.3 Metal ancillary components for masonry shall be 1.4301, 1.4401, or 1.4436 stainless steel in the solution annealed condition, excluding free machining specifications, complying with the requirements given in the product standards listed in Table 12.3.

Table 12.3 Product standards for metal ancillary components for masonry	
Form	Product standards
Strip	BS EN 10048 [Ref 12.N], BS EN 10051 [Ref 8.N], BS EN ISO 9445-1 [Ref 6.N], BS EN ISO 9445-2 [Ref 7.N], BS EN 10088-4 [Ref 27.N]
Plain bar, Rod	BS EN 10088-5 [Ref 26.N]
Ribbed Reinforcing Bar	BS 6744 [Ref 25.N]
Tube	BS EN 10296-2 [Ref 28.N]
Wire	BS EN 10088-5 [Ref 26.N]

12.4 The requirements of Designated standards in Section 10 of GC 101 [Ref 11.N] shall apply to stainless steel in accordance with BS EN 10088-5 [Ref 26.N] and BS EN 10088-4 [Ref 27.N].

13. Brickwork and blockwork

13.1 Brickwork and blockwork, the installation of bricks and blocks, shall be executed in compliance with BS 8000-3 [Ref 29.N], BS EN 1996-2 [Ref 9.N], and PD 6697 [Ref 17.N].

13.2 The execution of brickwork and blockwork shall be as specified in CC 491/WSR/013.

The execution of brickwork and blockwork					
Masonry reference	**Bond type**	**Coursing**	**Jointing locations**	**Jointing finish**	**Pointing locations**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the bond type of brickwork and blockwork.

c) Enter text, to identify the required coursing of brickwork and blockwork.

d) Enter text, to identify the locations where jointing is required for brickwork and blockwork.

e) Enter text, to identify the type of jointing finish required for brickwork and blockwork.

f) Enter text, to identify the locations where pointing is required for brickwork and blockwork.

The execution of brickwork and blockwork (continued)				
Masonry reference	**Pointing finish**	**Reinforcement laps**	**Reinforcement cover**	**Wetting**
(a)	(g)	(h)	(i)	(j)

a) Enter text, to identify the type of pointing finish required for brickwork and blockwork.

b) Enter text, to identify the minimum reinforcement laps required for brickwork and blockwork.

c) Enter text, to identify the minimum cover to reinforcement required for brickwork and blockwork.

d) Enter text, to identify the requirements for wetting before laying of brickwork or blockwork.

13.3 Perpends between bricks and blocks shall be filled with mortar before the next mortar bed is laid.

13.4 Whole bricks and blocks shall be used except for closers.

13.5 Exposed surfaces of brickwork and blockwork shall be regular, clean, and free from irregularities.

13.6 Brickwork and blockwork shall be built with undulations or depressions in the surface not exceeding 10 mm when measured with respect to a plane through the peaks.

13.7 Finished surfaces of buried brickwork and blockwork to be waterproofed shall have no abrupt irregularities greater than 3 mm.

13.8 Brickwork and blockwork shall be built level, line, and plumb.

13.9 Corners and other advanced work for brickwork and blockwork shall be stepped back and not raised above the general level more than 900 mm.

13.10 Courses for brickwork and blockwork shall be kept horizontal with matching perpends in vertical alignment.

13.11 The use of overhand work shall not be permitted for brickwork and blockwork.

13.12 Bed-joint reinforcement for brickwork and blockwork shall have a 15 mm minimum of mortar cover to each masonry face.

13.13 Bed-joint reinforcement, Damp Proof Courses (DPCs), and other components for brickwork and blockwork shall be embedded within the mortar bed thickness and not laid dry on a bed face.

13.14 All visible brickwork and blockwork, and any surface below such work which is visible at the completion of the works, shall be clean and free from damage and spillage.

13.15 All purpose-made open joints in brickwork and blockwork shall be free from debris.

14. Stonework

General requirements for stonework

14.1 Stonework, the installation of stone, shall be executed in compliance with BS 8000-3 [Ref 29.N], BS EN 1996-2 [Ref 9.N] and PD 6697 [Ref 17.N].

14.2 The jointing and pointing of stonework shall be as specified in CC 491/WSR/014.

The jointing and pointing of stonework				
Masonry reference	**Jointing locations**	**Jointing requirements**	**Pointing locations**	**Pointing requirements**
(a)	(b)	(c)	(d)	(e)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the locations where jointing is required for stonework.

c) Enter text, to identify the type of jointing finish required for stonework.

d) Enter text, to identify the locations where pointing is required for stonework.

e) Enter text, to identify the type of pointing finish required for stonework.

14.3 The layout and dimensions of stonework for masonry shall be as shown in the drawings referenced in WSR 491/001.

14.4 Finished surfaces of buried stonework to be waterproofed shall have no abrupt irregularities greater than 3 mm.

14.5 Stone shall be laid with its bedding planes perpendicular to the direction of load applied to the stone.

14.6 Stones in masonry arch rings shall have their bedding planes oriented radially.

14.7 Facework quoins in stonework shall be built to a height not exceeding 900 mm in advance of the main body of the work and adjacent walling stepped down on either side.

14.8 Stone facework between the quoins shall be built to a height not exceeding 450 mm above the backing.

14.9 Backing for stonework shall be brought up level with the completed stone facework.

14.10 At no time shall backing for stonework be built up higher than the facework.

14.11 Except for dry rubble walling, there shall be no stone-to-stone contact.

14.12 Except for dry rubble walling, all joints other than movement joints shall be completely filled with mortar.

14.13 Except in the case of fine ashlar, joints shall not be less than 6 mm thick in any part of the bed.

14.14 All visible joints in stonework, and any surface below which is visible at the completion of the works, shall be clean and free from damage.

14.15 All purpose-made open joints in stonework shall be free from debris.

Ashlar and block-in-course stonework

14.16 The requirements for ashlar and block-in-course stonework shall be as specified in CC 491/WSR/014.

The requirements for ashlar and block-in-course stonework						
Masonry reference	**Dressing**	**Maximum size**	**Minimum size**	**Pointing**	**Course depth**	**Fixings**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the amount and type of dressing required on the face and sides of stones for ashlar and block-in-course stonework.

c) Enter a number in units of mm, to define the maximum size of stones for ashlar and block-in-course stonework.

d) Enter a number in units of mm, to define the minimum size of stones for ashlar and block-in-course stonework.

e) Enter text, to identify the requirements for pointing of stones for ashlar and block-in-course stonework.

f) Enter a number in units of mm, to identify the depth of course for coursed stonework.

g) Enter text, to identify the fixings, including dowels, cramps, and joggles, for ashlar and block-in-course stonework.

The requirements for ashlar and block-in-course stonework (continued)					
Masonry reference	**Damp laying requirements**	**Projection limit**	**Maximum joint thickness**	**Minimum joint thickness**	**Exposed face tooling and working**
(a)	(h)	(i)	(j)	(k)	(l)

h) Enter text, to identify the requirements for ashlar and block-in-course stonework to be laid damp.

i) Enter a number in units of mm, to identify the limit of projection of any part of the exposed face of stones for ashlar and block-in-course stonework.

j) Enter a number in units of mm, to identify the maximum joint thickness for ashlar and block-in-course stonework.

k) Enter a number in units of mm, to identify the minimum joint thickness for ashlar and block-in-course stonework.

l) Enter text, to identify requirements for tooling and working the exposed face of block-in-course stonework.

14.17 All ashlar stones shall be dressed to accurate planes on the beds and joints.

14.18 Bed and joints for block-in-course stonework shall be squared and dressed for a distance of at least 225 mm from the exposed face.

14.19 Bond stones for block-in-course stonework shall form a minimum of one sixth of the area of the exposed face.

14.20 Bond stones for block-in-course stonework shall extend at least 900 mm into the wall or for the full thickness of the wall if the latter is less than 900 mm.

14.21 Arrises for block-in-course stonework shall be dressed square at all beds and joints.

Squared random rubble coursed and uncoursed stonework

14.22 All stones for squared random rubble stonework shall be truly squared and dressed on the beds and joints for a distance at least 125 mm from the exposed face.

14.23 Bond stones for squared random rubble stonework shall be provided at the rate of not less than one to every square metre of exposed face.

14.24 Bond stones for squared random rubble stonework shall measure not less than 150 mm x 150 mm on the face and not less than 450 mm or the full thickness of the wall if the latter is less than 450 mm, unless otherwise stated in CC 491/WSR/014.

SI.14.24 The limitations on dimensions of bond stones for squared random rubble stonework shall be [enter free text].

14.25 Sneck stones for squared random rubble stonework shall be not less than 75 mm in any dimension.

14.26 Vertical joints for squared random rubble stonework shall not include more than three consecutive stones.

14.27 Horizontal lapping of the stones at vertical joints for squared random rubble stonework shall be not less than 100 mm.

14.28 The levelling of squared random rubble coursed stonework shall be as specified in CC 491/WSR/014.

The levelling of squared random rubble coursed stonework	
Masonry reference	**Levelling requirements**
(a)	(b)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the requirements for levelling squared random rubble coursed stonework.

Random rubble coursed and uncoursed stonework

14.29 All stones for random rubble stonework shall be carefully set with a bond stone provided at a rate of not less than one to every square metre of exposed face.

14.30 The dimensions of bond stones for random rubble stonework shall be as specified in CC 491/WSR/014.

The dimensions of bond stones for random rubble stonework	
Masonry reference	**Bond stone dimensions**
(a)	(b)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to identify the dimensions of bond stones for random rubble stonework.

14.31 For coursed random rubble stonework the joints shall be levelled.

14.32 For coursed random rubble stonework the backing shall be flushed up in mortar.

Dry rubble stonework

14.33 Dry rubble stonework shall be constructed to the requirements of uncoursed random rubble stonework, as described in this section.

14.34 All stones for dry rubble stonework shall be shaped to obtain a close fit at all beds and joints.

14.35 Any visible interstices between the stones for dry rubble stonework shall be filled with selected stone chippings or spalls.

Special stonework including quoins, copings, plinths, and voussoirs

14.36 Special stonework, including quoins, copings, plinths, and voussoirs, shall be as specified in CC 491/WSR/014.

Special stonework, including quoins, copings, plinths, and voussoirs,					
Special stonework reference	**Masonry reference**	**Drawing / model reference(s)**	**Description**	**Shape**	**Dimensions**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, to define a unique reference for the unit of special stonework.

b) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

c) Enter text, to define the reference(s) of the drawing(s) / model(s) that show the special stonework.

d) Enter text, to describe the unit of special stonework.

e) Enter text, to define the shape for dressing of special stonework.

f) Enter text, to define the dimensions for dressing of special stonework.

Special stonework, including quoins, copings, plinths, and voussoirs, (continued)	
Special stonework reference	**Face work requirements**
(a)	(g)

g) Enter text, to define requirements for face working of the special stonework.

15. Masonry facework fixed to concrete

15.1 The requirements for masonry facework fixed to concrete shall be as specified in CC 491/WSR/015.

The requirements for masonry facework fixed to concrete		
Masonry reference	**Concrete strength requirements**	**Stone depth variation**
(a)	(b)	(c)

a) Enter a unique reference, to provide the unique reference for the area of masonry. The masonry reference is the unique identifier that is used for cross-referencing to that area of masonry throughout this document.

b) Enter text, to provide the requirements for concrete strength prior to building the masonry facework.

c) Enter text, to identify the acceptable variation in depth, from front to back, of stones for natural stone facework.

15.2 The concrete and its surface shall be free of any loose material before any masonry is laid.

15.3 The portion of the stainless steel fixing projecting from the concrete shall be completely embedded in the mortar of the facework.

15.4 The portion of the stainless steel fixing projecting from the concrete shall be kept back a minimum of 30 mm from the face of the brickwork and blockwork or 40 mm from the face of the stonework.

16. Workmanship for unreinforced masonry arch bridges

16.1 Workmanship for unreinforced masonry arch bridges containing brickwork or blockwork shall be in accordance with "Brickwork and blockwork" in Section 13 of this document.

16.2 Workmanship for unreinforced masonry arch bridges containing stonework shall be in accordance with "Stonework" in Section 14 of this document.

16.3 Forms of bonding in which the rings of masonry are jointed by mortar alone, as with concentric rings in stretcher bond, shall not be used, unless otherwise stated in CC 491/WSR/016.

SI.16.3 Forms of bonding in which rings of masonry are jointed by mortar alone shall be as follows: [enter free text].

16.4 Masonry in arch rings shall be flush jointed.

17. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	BSI. BS EN 934-3, 'Admixtures for concrete, mortar and grout. Admixtures for masonry mortar. Definitions, requirements, conformity and marking and labelling (Designated Standard - CPR)'
Ref 2.N	BSI. BS EN 13139, 'Aggregates for mortar (Designated Standard - CPR)'
Ref 3.N	BSI. BS EN 459-1, 'Building lime - Definitions, specifications and conformity criteria [Designated standard - CPR]'
Ref 4.N	BSI. BS EN 197-1, 'Cement. Composition, specifications and conformity criteria for common cements. (Designated Standard - CPR)'
Ref 5.N	BSI. BS EN 197-5, 'Cement. Portland-composite cement CEM II/C-M and Composite cement CEM VI'
Ref 6.N	BSI. BS EN ISO 9445-1, 'Continuously cold-rolled stainless steel. Tolerances on dimensions and form. Narrow strip and cut lengths'
Ref 7.N	BSI. BS EN ISO 9445-2, 'Continuously cold-rolled stainless steel. Tolerances on dimensions and form. Wide strip and plate/sheet'
Ref 8.N	BSI. BS EN 10051, 'Continuously hot-rolled strip and plate/sheet cut from wide strip of non-alloy and alloy steels. Tolerances on dimensions and shape '
Ref 9.N	BSI. BS EN 1996-2, 'Eurocode 6. Design of masonry structures. Design considerations, selection of materials and execution of masonry'
Ref 10.N	BSI. BS EN 13501-1, 'Fire classification of construction products and building elements. Classification using data from reaction to fire tests'
Ref 11.N	National Highways. GC 101, 'General requirements for the Specification for Highway Works'
Ref 12.N	BSI. BS EN 10048, 'Hot rolled narrow steel strip. Tolerances on dimensions and shape'
Ref	Routledge. Geoffrey Allen. Lime Mortar BPG, 'Hydraulic Lime

13.N	Mortar for Stone, Brick and Block Masonry: A Best Practice Guide'
Ref 14.N	BSI. BS EN 413-1, 'Masonry cement - Composition, specifications and conformity criteria (Designated Standard - CPR)'
Ref 15.N	BSI. BS EN 1015-11, 'Methods of test for mortar for masonry. Determination of flexural and compressive strength of hardened mortar'
Ref 16.N	BSI. BS EN 1008, 'Mixing water for concrete. Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete.'
Ref 17.N	BSI. PD 6697, 'Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2'
Ref 18.N	BSI. BS EN 771-3, 'Specification for masonry units. Aggregate concrete masonry units (Dense and lightweight aggregates) (Designated Standard - CPR)'
Ref 19.N	BSI. BS EN 771-4, 'Specification for masonry units. Autoclaved aerated concrete masonry units (Designated Standard - CPR)'
Ref 20.N	BSI. BS EN 771-2, 'Specification for masonry units. Calcium silicate masonry units (Designated Standard - CPR)'
Ref 21.N	BSI. BS EN 771-1, 'Specification for masonry units. Clay masonry units (Designated Standard - CPR)'
Ref 22.N	BSI. BS EN 771-5, 'Specification for masonry units. Manufactured stone masonry units (Designated Standard - CPR)'
Ref 23.N	BSI. BS EN 771-6, 'Specification for masonry units. Natural stone masonry units. (Designated Standard - CPR)'
Ref 24.N	BSI. BS EN 998-2, 'Specification for mortar for masonry. Masonry mortar (Designated Standard - CPR)'
Ref 25.N	BSI. BS 6744, 'Stainless steel bars for the reinforcement of and use in concrete, – Requirements and test methods'
Ref 26.N	BSI. BS EN 10088-5, 'Stainless steels. Technical delivery conditions for bars, rods, wire, sections and bright products of corrosion resisting steels for construction purposes (Designated Standard - CPR)'
Ref 27.N	BSI. BS EN 10088-4, 'Stainless steels. Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for construction purposes. (Designated Standard - CPR)'

Ref 28.N	BSI. BS EN 10296-2, 'Welded circular steel tubes for mechanical and general engineering purposes. Technical delivery conditions. Stainless steel '
Ref 29.N	BSI. BS 8000-3, 'Workmanship on construction sites. Masonry. Code of practice'