2 MORTAR AND GROUT

2.1 GENERAL DESCRIPTION

2.1.1 Scope

1 This Section specifies mortar and grout for masonry, glass blocks and stone works.

2 Related Parts and Sections are as follows:

This Section	
Part 2	Unit Masonry
Part 3	Reinforced Unit Masonry
Part 5	Masonry Laying
Section 5	Concrete

2.1.2 References

1 The following standards are referred to in this Part:

ASTM C270.....Standard Specification for Mortar for Unit Masonry

ASTM C979 / C979M .Standard Specification for Pigments for Integrally Colored Concrete

EN 459-1 .....Building lime. Definitions, specifications and conformity criteria

EN 934-3 .....Admixtures for concrete, mortar and grout. Admixtures for masonry mortar. Definitions, requirements, conformity and marking and labelling

EN 998-2 .....Specification for mortar for masonry. Masonry mortar

EN 12004 .....Adhesives for tiles. Requirements, evaluation of conformity, classification and designation

EN 12878 .....Pigments for the colouring of building materials based on cement and/or lime. Specifications and methods of test

EN 13888 .....Grout for tiles. Requirements, evaluation of conformity, classification and designation

BSI PD 6472 .....Guide to specifying the quality of building mortars

BSI PD 6678 .....Guide to the specification of masonry mortar

2.2 MORTAR MATERIALS

2.2.1 Preparation Requirements

1 The required class of mortar, together with the type of mix, shall be as described in the Project Documentation.

2 Mortar shall be mixed only as and when required in the relevant proportions indicated in Table 2.1, until its colour and consistency are uniform. The constituent materials shall be accurately gauged allowance being made for bulking of sand.

Table 2.1
Mortar Mixes

Recommended Nominal Mix by mass and their compressive strength						
Class	Cement (C), Lime (L) & Sand (S) with or without entrainment (kg)			Cement (C) & Sand (S) with or without entrainment (kg)		Compressive strength at 28 days N/ mm^2
	C	L	S	C	S	
M2	70	50	740	85	775	2
M4	105	35	725	110	755	4
M6	135	25	700	155	710	6
M12	190	20	655	190	675	12

3 The inclusion of mortar plasticisers will not be permitted without approval of the Engineer.

4 All mortar shall be conveyed fresh to the works as required for use. Mortar which has begun to set or which has been site-mixed for a period of more than one hour in the cases of Classes M2, and M6, and two hours in the case of classes M4 and M12 shall not be used.

5 Plasticizing and set retarding mortar admixtures shall comply with EN 934-3 and shall be supplied with instructions for use.

6 Ready-mixed lime: sand for mortar and ready-to-use retarded mortar shall comply with the relevant provisions of EN 998-2 or ASTM C270.

2.2.2 Cement

1 Cement is to comply with the relevant provisions of Section 5, Concrete.

2 Mortar for use in contact with the ground will be mixed using sulphate resistant cement and comply with the relevant provisions of Section 5, Concrete.

2.2.3 Aggregates

1 Aggregates are to generally comply with the relevant provisions of Section 5, Concrete.

2.2.4 Water

1 Water is to comply with the relevant provisions of Section 5, Concrete.

2.2.5 Lime

1 Lime for mortar shall be in the form of lime putty, complying with the relevant provisions of EN 459-1.

2.3 EPOXY

2.3.1 General Requirements

1 Epoxy grouts shall comply with the relevant provisions of EN 12004, EN 13888 as applicable.

2.4 HIGH BOND

1 Mortar mixture is to consist of, by volume, one-part Portland cement, three-parts sand with addition of water and liquid acrylic resin.

2 The mortar will have the following properties when tested in accordance with the relevant provisions of PD 6678:

(a) compressive strength : minimum 20 N/mm², using 50 x 50 x 50 mm cubes

(b) tensile strength : minimum 4 N/mm², using the 25 x 25 x 25 mm briquettes

(c) flexural strength : minimum 6 N/mm², using flexural bar

(d) brick bond strength : minimum 3 N/mm², using crossed brick.

2.5 GROUTS

2.5.1 General Requirements

1 The required class of mortar, together with the type of mix, shall be as described in the Project Documentation.

2 Cement grout shall be mixed in the relevant proportions indicated in the Table 2.2 using the minimum quantity of water to ensure the necessary fluidity and to render it capable of penetrating the work.

Table 2.2
Grout Mixes

Class	Nominal Mix by Mass		
	Cement	Sand	pfa
G1	1	-	-
G2	1	3	-
G3	1	10	-
G4	1	-	10
G5	1	-	4
G6	1	-	½

3 Cement grout shall be used within one hour of mixing, except where containing a retardant admixture.

4 Sulfate-resisting cement shall not be used as a constituent of grouts containing pulverised fuel ash.

5 If thermal or lightweight blocks are used in the construction, then the engineer may ask for using of lightweight mortar with density less than 700kg/m^3 according to EN 998-2 or relevant ASTM standards.

6 Grout to have a compressive strength of 17,500 kPa at 28 days.

2.6 PIGMENTS FOR COLOUR

2.6.1 General Requirements

1 Mineral pigments only to be used.

2 Any pigments used to colour cement or cement products should meet the requirements of EN 12878 or ASTM C979.

3 Pigments shall be inert, stable to atmospheric conditions, alkali resistant and water insoluble.

2.7 TUCK POINTING

2.7.1 General

1 This Clause specifies the requirements for tuck pointing of existing masonry and stone works.

2 Mortars to comply with the relevant provisions of Clause 2.2 of this Part.

2.7.2 Protection

1 Newly pointed joints are to be protected from rain, until pointed joints are sufficiently hard enough to prevent damage.

2.7.3 Existing Mortar Joints

1 The existing mortar joints (both bed and head joints) are to be cut out and removed by means of a toothing chisel or a special pointer's grinder, to a uniform depth of 20mm, or until sound mortar is reached. Care is to be taken so as not to damage the edges of existing masonry units.

1 Remove all dust and debris from the joints by brushing, blowing with air or rinsing with water.

2.7.4 Installation of Tuck-Pointing Mortar

1 Immediately prior to application of mortar, the joints to be tuck-pointed are to be dampened. After dampening, the masonry units should be allowed to absorb all surface water prior to application of pointing mortar

2 The mortar is to be tightly packed into the joints in thin layers, approximately 5 mm thick maximum.

3 Each layer should become "thumbprint hard" before applying the next layer.

4 The final layer is to be flush with surfaces of masonry units. When the mortar becomes "thumbprint hard", joints can be tooled.

2.7.5 Tooling of Joints

1 A jointing tool is to be used to produce a smooth, compacted, concaved joint.

2 Tool joints in patch work are to be finished to match the existing surrounding joints.

2.7.6 Replacement of Masonry Units

1 Mortar joints surrounding masonry units which are to be removed and replaced are to be cut-out with a toothing chisel. The units which are to be removed may be broken and removed, provided that the surrounding units to remain are not damaged. Once the units are removed, old mortar is to be carefully chiselled out, and all dust and debris are to be swept out with a brush. If the units are located in a cavity wall, care should be exercised not to allow debris to fall into the cavity.

2 The surface of the surrounding units are to be dampened before the new units are placed. The existing masonry should absorb all surface moisture prior to the installation of the new replacement units. The contact surfaces of the existing masonry and the new replacement masonry units are to be buttered with mortar. The replacement masonry units should be centred in the opening and pressed into position. Excess mortar is to be removed with a trowel head and bed joints are to pointed. When the mortar becomes “thumbprint hard”, joints are to be tooled.

2.7.7 Cleaning

1 Exposed masonry surfaces shall be cleaned on completion.

2 Mortar droppings and other foreign substances shall be removed from the wall surfaces.

3 Surfaces shall be wetted with clean water, and then washed down with a solution of soapless detergent specially prepared for cleaning masonry. Brush with stiff fibre brushes while washing, and immediately thereafter hose down with clean water. Free clean surfaces from any traces of detergent, foreign streaks or stains of any nature.

4 Protect adjoining construction materials during cleaning operations.

5 Use of muratic acid for cleaning brickwork is prohibited.

END OF PART