

7.2.8	Mix proportions	161
7.2.9	Application of mortars and brick setting mixes	162
7.2.10	Trial mixes	171
6.1	Introduction	171
6.2	Tools	vii
6.3	Backgrounds	viii
6.4	Materials for lime plastering	ix
6.5	Plain lime plaster application	171
6.6	Texture and finishes	171
6.7	Ceilings	171
6.8	Gauging with gypsum or plaster	171
7.1	External renders and brown finishes	171
7.2	Introduction	171
7.3	Tools	171
7.4	Materials	171
7.5	External lime render, mixes and applications	171
7.6	Thrown finishes	171
7.7	Traditional Indian renders	171
7.8	Lime gauging (dash and earth finishes)	171
7.9	Gauging with Portland cement	171
7.10	Identification of faults	171
8.1	Introduction	171
8.2	Run mouldings	171
8.3	Cast mouldings	171
8.4	Fairing	171
8.5	Moulding stucco in situ	171
8.6	Plaster	171
8.7	Carved and dispersed plaster	171
8.8	Stucco	171
8.9	Indian stuccos	171
9.1	Earth stabilisation	171
9.2	Damp construction	171
9.3	Plastering of masonry	171
9.4	Lime-stabilised earth bricks and blocks	171
9.5	Lime and cow dung rendering and plastering	171
9.6	Rendered non-hydraulic (Class A) quicklime	171
9.7	Rendered hydraulic (Class C) quicklime	171

Contents

Acknowledgements

Dedication

Foreword

1 An approach to using lime

- 1.1 Lime: a versatile binder
- 1.2 Characteristics of limes
- 1.3 Air limes, hydraulic limes, and those in between
- 1.4 What limes do in buildings
- 1.5 Specifying building limes

2 What lime is and how it is prepared

- 2.1 Introduction
- 2.2 Preparation
- 2.3 Hydraulic limes
- 2.4 Pozzolanic additives
- 2.5 Magnesian limes

3 Tools and equipment

- 3.1 Tools for lime
- 3.2 Plant and equipment
- 3.3 Setting-out tools
- 3.4 Plasterers' tools
- 3.5 Masons' tools and additional equipment

4 Limewashes

- 4.1 Uses and qualities
- 4.2 Preparation of a basic limewash
- 4.3 Additives to the basic limewash
- 4.4 Applying limewash
- 4.5 Performance standards and trial mixes

5 Lime mortars

- 5.1 Definition of mortar
- 5.2 Performance
- 5.3 Basic materials for mortar
- 5.4 Additives
- 5.5 Mortar preparation
- 5.6 Mortar from non-hydraulic (Class A) quicklime
- 5.7 Mortar from hydraulic (Class C) quicklime

BUILDING WITH LIME

5.8	Mix proportions	72
5.9	Application of mortar	72
5.10	Trial mixes	75
6	Plain lime plastering for interiors	77
6.1	Introduction	77
6.2	Tools	77
6.3	Backgrounds	77
6.4	Materials for lime plastering	83
6.5	Plain lime plaster application	88
6.6	Texture and finishes	98
6.7	Ceilings	99
6.8	Gauging with gypsum or plaster of Paris	101
7	External renders and thrown finishes	103
7.1	Introduction	103
7.2	Tools	105
7.3	Backgrounds	106
7.4	Materials	106
7.5	External lime render, mixes and applications	110
7.6	Thrown finishes	112
7.7	Traditional Indian renders	117
7.8	Lime gauging, daub and earth finishes	120
7.9	Gauging with Portland cement	121
7.10	Identification of faults	122
8	Decorative plasterwork	127
8.1	Introduction	127
8.2	Run mouldings	127
8.3	Cast moulds	134
8.4	Pargeting	138
8.5	Modelling stucco <i>in situ</i>	140
8.6	Depeter	143
8.7	Carved and diapered plaster	144
8.8	Sgraffito	146
8.9	Italian stuccos	148
9	Stabilization and other mixes incorporating lime	152
9.1	Earth stabilization	152
9.2	Daub construction	154
9.3	<i>Pisé de terre</i> or rammed earth	156
9.4	Lime-stabilized earth bricks and blocks	157
9.5	Lime and cow dung rendering and pargeting	163
9.6	Renders and slurries for soil structures	164
9.7	Roof finishes	166

CONTENTS

9.8	Tar and lime coating	167
9.9	Calcium silicate bricks and components	168
10	Substructure: floors, roads and lime concrete	171
10.1	Floors and paving	171
10.2	Roads	178
10.3	Lime concrete	182
10.4	Hydraulic mortar and concrete specifications	186
10.5	Lime concrete canal lining in India	189
10.6	Water mortars for making lime concretes	190
11	Limestone recognition, testing and standards	193
11.1	Field investigation	193
11.2	Geological origin of rocks	194
11.3	Limestone recognition	195
11.4	Field tests for lime	203
11.5	Field tests for sand, pozzolans and mortars	216
11.6	Field tests for soil stabilization	223
11.7	Standard test methods	227
11.8	National standards	237
12	Maintenance guidelines	240
12.1	Introduction	240
12.2	Structural movement	240
12.3	Roof coverings	241
12.4	Rainwater goods above ground	241
12.5	Drainage below ground	242
12.6	Sanitary fittings	242
12.7	Maintaining wall finishes	243
12.8	Maintaining ceilings and decorative plasterwork	246
12.9	Metalwork	249
12.10	Floors	249
12.11	Roads and paths	250
12.12	Vegetation	250
12.13	Summary	251
References and bibliography		252
Glossary		259
Appendices		280
1	Proposed classification of building limes by hydraulicity	280
2	Pozzolans: natural and artificial	282
3	Sieve gauge and mesh size conversion table	285
4	Select list of national standards	286
5	Minerals associated with common limestone chemicals	290

BUILDING WITH LIME

167	6	Chemical analysis of hydraulic limes and natural cements	292
168	7	Effects of the addition of pure limes to natural hydraulic limes	293
171	8	Suitability of soils for the addition of lime	294
175	9	Recommended quantities of gypsum for gauging internal lime plaster	295
182	10	Comparative crushing strengths of mortars and associated building materials	296
186	11	Properties of bricks and blocks	297
180	12	Comparative compressive strengths of traditional British lime mortars with those given in some European standards	299
190	13	Conversion tables	300

Index

177	1.1	Introduction	301
178	1.2	Field tests for lime	301
178	1.3	Field tests for sand, pozzolans and mortars	301
178	1.4	Field tests for soil stabilization	301
178	1.5	Standard test methods	301
178	1.6	National standards	301
178	1.7	Thrown finishes	301
178	1.8	Traditional Indian renders	301
178	1.9	Lime gauging, dash and earth	301
178	1.10	Gauging with Portland cement	301
178	1.11	Identification of limes	301
178	1.12	Decorative plasterwork	301
178	1.13	Introduction	301
178	1.14	Structural movement	301
178	1.15	Roof coverings	301
178	1.16	Rainwater goods above ground	301
178	1.17	Drainage below ground	301
178	1.18	Sanitary fittings	301
178	1.19	Maintaining wall finishes	301
178	1.20	Maintaining ceilings and decorative plasterwork	301
178	1.21	Metals	301
178	1.22	Floors	301
178	1.23	Roads and paths	301
178	1.24	Vegetation	301
178	1.25	Summary	301
178	1.26	References and bibliography	301
178	1.27	Glossary	301
178	1.28	Appendices	301
178	1.29	Proposed classification of building limes by hydraulicity	301
178	1.30	Pozzolans, natural and artificial	301
178	1.31	Sieve gauging and mesh characteristics	301
178	1.32	Select list of national standards for limes	301
178	1.33	Minerals associated with common limestone chemically	301